



DRAFT BASIC ASSESSMENT REPORT

Basic Assessment for the
Mojaletema Primary Co-
Operative (Pty) Ltd's proposed
piggery facility on Portion 15 of
Farm Bultfontein 192 IR,
Nigel, Gauteng.

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CSIR Report Number:
CSIR/IU/EMS/ER/2016/0003/A

November 2017



Basic Assessment for the Mojaletema Primary Co-Operative (Pty) Ltd's
proposed piggery facility on Portion 15 of Farm Bultfontein 192 IR,
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CSIR Report Number: CSIR/IU/EMS/ER/2016/0003/A

November 2017

Prepared for:

Mojaletema Primary Co-Operative (Pty) Ltd

Prepared by:

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Minnelise Levendal

report details

Title:	Basic Assessment for the proposed development of a pig production facility on Portion 15 of Farm Bultfontein 192 IR, Nigel, Gauteng.
Purpose of this report:	The purpose of this BA Report is to: • Present the proposed project and the need for the proposed project; • Describe the affected environment at a sufficient level of detail to facilitate informed decision-making; • Provide an overview of the BA Process being followed, including public consultation; • Assess the predicted positive and negative impacts of the proposed project on the environment; • Provide recommendations to avoid or mitigate negative impacts and to enhance the benefits of the project; • Provide an Environmental Management Programme (EMPr) for the proposed project. • Provide a Maintenance Management Plan (MMP) for the proposed project. This BA Report is being made available to all Interested and Affected Parties (I&APs) and stakeholders for a 30-day review period. All comments submitted during the review of the BA Report will be incorporated into the finalised BA Report as applicable and where necessary. This finalised BA Report will then be submitted to the Gauteng Department of Agriculture and Rural development (GDARD) for decision-making.
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CSIR Report Number:	CSIR/IU/EMS/ER/2016/0003/A
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opportunity for review

Opportunity for Review:

This Draft Basic Assessment Report and Draft Environmental Management Programme (EMPr) are hereby released for review by stakeholders. Review comments are to be submitted to the project manager below:

Project Manager - Samukele Ngema

Council for Scientific and Industrial Research (CSIR)

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contents

SECTION A: ACTIVITY INFORMATION	20
SECTION B: DESCRIPTION OF RECEIVING ENVIRONMENT	30
SECTION C: PUBLIC PARTICIPATION (SECTION 41)	41
SECTION D: RESOURCE USE AND PROCESS DETAILS	43
SECTION E: IMPACT ASSESSMENT	47
SECTION F: APPENDICES	69

Appendix A	Site plan(s) - (must include a scaled layout plan of the proposed activities overlain on the site sensitivities indicating areas to be avoided including buffers)
Appendix B	Photographs
Appendix C	Facility illustration(s)
Appendix D	Route position information - <i>N/A</i>
Appendix E	Public participation information
Appendix F	Water use license(s) authorisation - <i>Not applicable at this stage</i> SAHRA information Service letters from municipalities - <i>Not applicable</i> Water supply information - <i>Not applicable at this stage</i>
Appendix G	Specialist Reports
Appendix H	Environmental Management Programme
Appendix I	CVs of the BA Project team

tables

Table S.1: Listed activities to be triggered	6
Table S.2: Summary of Impacts	8
Table 1: Listed Activities relating to the proposed project	22
Table 2: Racial Demographics of Nigel Municipality	37
Table 3: Gender Demographics of the Nigel Municipality	37
Table 4: Economic Distribution of the Nigel Municipality	38

figures

Figure 1: Location of the proposed pig production facility of Mojaletema Primary Co-operative on Portion 15 of Farm Bultfontein 192, Nigel, Johannesburg.	7
Figure 2: Photographs of Conservation Important plant species in the surrounds of the survey area	33
Figure 3: Location of the site relative to regional terrestrial Priority Areas and Threatened Ecosystems	34
Figure 4: Employment Distribution of the Nigel Municipality	38
Figure 5: Guide to assessing risk/impact significance as a result of consequence and probability.	49
Figure 6: Ekurhuleni Metropolitan Municipality Spatial Development Framework 2015-2020 (Project area, Bottom Right of map) Region E- Ward 88	63
Figure 7: Regional Development Overview (Source: Ekurhuleni Metropolitan Spatial Development Framework: 2015-2020)	64

executive summary

INTRODUCTION AND BACKGROUND

The Mojaletema Primary Co-Operative is a small scale commercial farming enterprise that was established in 2012. This Co-Operative comprises of five members who are proposing the establishment of a commercial pig production facility on Portion 15 of Farm Bultfontein 192 IR, Nigel, Gauteng. The farm currently is operating as a cattle, sheep and goat herding facility with maize also being cultivated. There is a slurry dam next to the proposed site which is currently not being used. There are ruins from a dairy production plant which have no historical significance. The proposed development footprint is 1.8 hectare and will consist of pig production facilities (production house, farrowing house, living quarters, silo and office). The proposed facility will house 248 pigs with an estimated throughput of 4800 pigs per annual cycle.

ENVIRONMENTAL ASSESSMENT PROCESS

The Council for Scientific and Industrial Research (CSIR) was appointed by the National Department of Environmental Affairs (DEA), to manage the Special Needs and Skills Development Programme which is aimed at providing *pro-bono* Environmental Services to small-scale businesses. The programme offers the undertaking of a Basic Assessment for projects that require this assistance in applying for Environmental Authorisation. The CSIR is managing this Basic Assessment (BA) Process on behalf of the project applicant under the Special Needs and Skills Development Programme.

The proposed development triggers listed activities in terms of the Environmental Impact Assessment (EIA) Regulations, Government Regulations (GNR) 324,325 and 327 (as amended) of 07 April 2017 promulgated under the National Environmental Management Act (Act no 107 of 1998) (NEMA). The proposed development also triggers listed activities in terms of the National Environmental Management: Waste Act (Act no 59 of 2008) (NEMWA). In terms of these Regulations, a BA needs to be undertaken and must include an application for a Waste Management Licence.

In terms of the NEMA EIA Regulations published in GNR 324, 325 and 327 (as amended) of 07 April 2017 in Government Gazette Number 40772, a BA process is required as the project triggers the following listed activities (detailed in Table 1 below).



Table S.1: Listed activities to be triggered

Relevant notice:	Activity No (s) (in terms of the relevant notice) :	Description of each listed activity as per the Government Notice:
GN. R 327 as Amended 7 April 2017	4	The development and related operation of facilities or infrastructure for the concentration of animals for the purpose of commercial production in densities that exceeds- (ii) 8 square meters per small stock unit and; (a) More than 1 000 units per facility excluding pigs where (b) more than 250 pigs per facility excluding piglets that are not yet weaned.
	27	The clearance of an area of 1 hectare or more, but less than 20 hectares of indigenous vegetation, except where such clearance of indigenous vegetation is required for- (ii) maintenance purposes undertaken in accordance with a maintenance management plan.
GNR 921, 29 November 2013	Category A1	Storage of waste- The storage of general waste in lagoons
	Category A2.	Construction, expansion or decommissioning of facilities and associated structures and infrastructure. The construction of a facility for a waste management activity listed in Category A of this Schedule (not in isolation to associated waste management activity).

These listed activities require Environmental Authorisation from the competent authority, i.e. the Gauteng Department of Agriculture and Rural Development (GDARD).

PROJECT DESCRIPTION

The proposed site is located on Portion 15 of Farm Bultfontein 192 IR in Nigel, within Ward 88 of the Ekurhuleni Metropolitan Municipality in Gauteng. The property is located 1.5 km off the major R51 which links Nigel to Springs. The site is currently zoned for agriculture. The Mojaletema Primary Co-operative comprises five family members who are currently farming with maize, sheep, goats and cattle. The livestock is sold to the local market.

This application is to obtain Environmental Authorisation to commence with a piggery production facility. The proposed project will increase the company's supply to the local market by adding 248 pigs (240 sows and 8 boars) with an annual through put of roughly 4 800 pigs of mixed ages.

The layout plan of the preferred alternative has been developed based on the outcome of the specialist studies and sensitivity mapping undertaken as part of this assessment. The proposed development footprint totals 1.2 ha. This will consist of the following:

- a Slurry Dam (119 m³)
- 3 pig houses,
- Sales office,
- living quarters
- feeding silo.

DRAFT BASIC ASSESSMENT REPORT

Basic Assessment for the Mojaletema Primary Co-Operative (Pty) Ltd's proposed piggery facility on Portion 15 of Farm Bultfontein 192 IR, Nigel, Gauteng

The pig facilities will have a mixture of both slated and concrete floors. The pig waste will fall through the slated flooring and will be stored there temporarily before being washed via a closed gutter to the slurry dam. The slurry dam will have water covering the solid waste that will settle at the bottom for odour control. The water that will overflow will be disinfected and reused to clean the piggery. After the slurry digestion process; where the pig waste is broken down and integrated with the water to form a slurry, the waste will be pumped out of the dam and used as fertilizer on the maize crops.

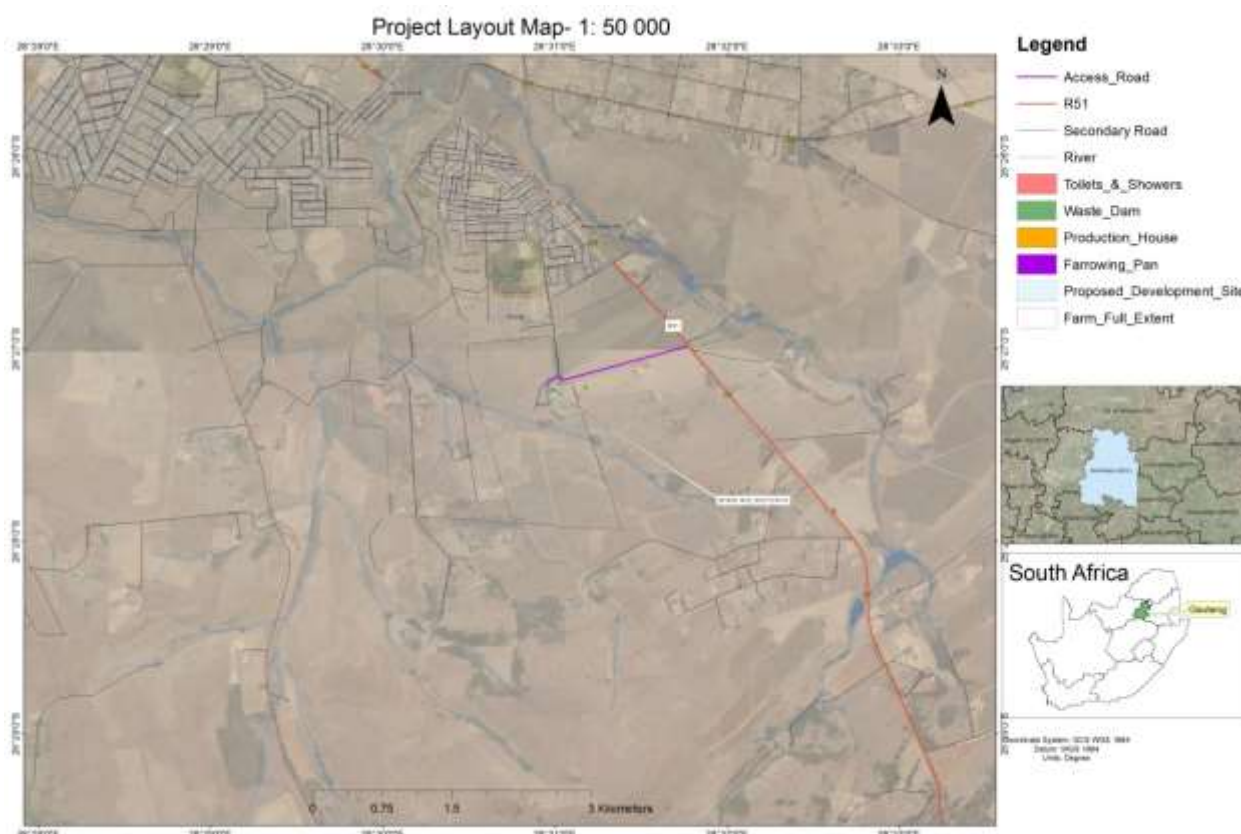


Figure 1: Location of the proposed pig production facility of Mojaletema Primary Co-operative on Portion 15 of Farm Bultfontein 192, Nigel, Johannesburg.

IMPACT ASSESSMENT

Two specialist studies were conducted as part of the BA Process, i.e. an Ecological study and a Heritage Impact Assessment. Seen below:

Table S.2: Summary of Impacts

Potential Ecological Impacts	Significance Rating Without Mitigation	Significance Rating With Mitigation
Construction Phase		
Loss or degradation of local wetland areas	Moderate	Low
Loss of terrestrial vegetation and faunal habitat	Moderate	Low
Loss of Conservation Important (CI) or medicinal flora	Moderate	Low
Loss of CI fauna	Moderate	Low
Introduction and proliferation of alien species	Moderate	Low
Increased dust and erosion	Moderate	Low
Sensory disturbance of fauna	Low	Low
Operational Phase		
Loss or degradation of local wetland areas	Moderate	Low
Environmental contamination (including odours)	High	Low
Poor / Inappropriate control of vertebrate pests	Moderate	Low
Disease transmission	Moderate	Low
Introduction and proliferation of alien species	Moderate	Low
Loss of CI or medicinal flora	Moderate	Low
Loss of CI fauna	Moderate	Low
Sensory disturbance of fauna	Low	Low
Decommissioning Phase		
Loss or degradation of local wetland areas	Moderate	Low
Introduction and proliferation of alien species	Moderate	Low
Increased dust and erosion	Moderate	Low
Sensory disturbance of fauna	Low	Low
Potential Heritage Impacts	Significance Rating Without Mitigation	Significance Rating With Mitigation
Construction Phase		
Destruction of archaeological artefacts	Very Low	Very Low
Operational Phase		
Existence of new structure on the landscape	Very Low	Very Low
Cumulative Impacts		
Impacts to heritage resources	Very Low	Very Low

EAP'S RECOMMENDATION

This BA Report has investigated and assessed the significance of the predicted, potential positive and negative, direct and indirect as well as cumulative impacts associated with the proposed development. Based on the findings of this BA process, it is the opinion of the Environmental Assessment Practitioner (EAP) that no potential negative impacts have been identified within this BA that are to be considered “fatal flaws” from an environmental perspective, and thereby necessitate substantial re-design or termination of the project.

Section 24 of the Constitution states that “everyone has the right to an environment that is not harmful to their health or well-being and to have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures, that prevents pollution and ecological degradation; promotes conservation; and secures ecologically sustainable development and use of natural resources while promoting justifiable economic and social development.” Based on this, this BA was undertaken to ensure that these principles are met through the inclusion of appropriate management and mitigation measures and monitoring requirements. These measures will be implemented to promote conservation by avoiding the sensitive environmental features present on site.

Based on the findings of the BA process undertaken, it is the opinion of the EAP that the project benefits outweigh the negative environmental impacts, and that the project will make a positive contribution towards skills development, women empowerment and economic growth in the Ekurhuleni Metropolitan Municipality.

An Environmental Management Programme (EMPr) has been compiled for the proposed project and is included as Appendix H of the BAR. This Draft EMPr includes the potential impacts associated with each project phase as well as the mitigation measures to avoid or reduce the potential impacts. The Draft EMPr is a dynamic document that should be updated regularly and provides clear and implementable measures for the establishment and operation of the proposed piggery

Concluding statement from EAP: Provided that the specified mitigation measures in the BAR and Draft EMPr are implemented effectively, it is proposed that the project receives Environmental Authorisation in terms of the EIA Regulations promulgated under the NEMA.



glossary

BA	Basic Assessment
BID	Background Information Document
CSIR	Council for Scientific and Industrial Research
DEA	National Department of Environmental Affairs
EAP	Environmental Assessment Practitioner
EIA	Environmental Impact Assessment
EMP	Environmental Management Plan
EMPr	Environmental Management Programme
GDARD	Gauteng Department of Agriculture and Rural Development
I&AP	Interested and Affected Party
IDP	Integrated Development Plan
NWA	National Water Act (Act 36 of 1998)
NEM: AQA	National Environment Management: Air Quality Act (Act 39 of 2004)
NEM: ICMA	National Environmental Management: Integrated Coastal Management Act (Act 24 of 2008)
NEMA	National Environmental Management Act (Act 107 of 1998)
NEMWA	National Environmental Management: Waste Act (Act 59 of 2008)
NHRA	National Heritage Resources Act (Act 25 of 1999)
PPP	Public Participation Process
SAHRA	South African Heritage Resources Agency
SAHRIS	South African Heritage Resources Information System
SDF	Spatial Development Framework
ToR	Terms of Reference

Summary of where requirements of Appendix 1 of the 2014 NEMA EIA Regulations (GN R 324, 325 and 327, as amended 07 April 2017) are provided in this Basic Assessment Report

APPENDIX 1 OF THE REGULATIONS	YES / NO	SECTION IN BAR
2) A basic assessment report must contain the information that is necessary for the competent authority to consider and come to a decision on the application, and must include-		
(a) details of –		
i. the EAP who prepared the report; and	✓	Appendix I
ii. the expertise of the EAP, including a curriculum vitae;	✓	Appendix I
(b) the location of the activity, including		
i) the 21 digit Surveyor General code of each cadastral land parcel;	✓	Section A Appendix A, B
(ii) where available, the physical address and farm name;		
(iii) where the required information in items (i) and (ii) is not available, the coordinates of the boundary of the property or properties;		
(c) a plan which locates the proposed activity or activities applied for as well as associated structures and infrastructure at an appropriate scale; or, if it is-		
(i) a linear activity, a description and coordinates of the corridor in which the proposed activity or activities is to be undertaken; or	✓	Section B
(ii) on land where the property has not been defined, the coordinates within which the activity		
(iii) is to be undertaken;		
(d) a description of the scope of the proposed activity, including		
(i) all listed and specified activities triggered and being applied for; and	✓	Section A2
(ii) a description of the activities to be undertaken including associated structures and infrastructure ;		
(e) a description of the policy and legislative context within which the development is proposed including-		
(i) an identification of all legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks, and instruments that are applicable to this activity and have been considered in the preparation of the report; and	✓	Section C Appendix E
(ii) how the proposed activity complies with and responds to the legislation and policy context, plans, guidelines, tools frameworks, and instruments		
(f) a motivation for the need and desirability for the proposed development including the need and desirability of the activity in the context of the preferred location	✓	Section E9

APPENDIX 1 OF THE REGULATIONS	YES / NO	SECTION IN BAR
(g) a motivation for the preferred site, activity and technology alternative;	✓	Section A3
(h) a full description of the process followed to reach the proposed preferred alternative within the site, including: (i) details of all the alternatives considered; (ii) details of the public participation process undertaken in terms of regulation 41 of the Regulations, including copies of the supporting documents and inputs; (iii) a summary of the issues raised by interested and affected parties, and an indication of the manner in which the issues were incorporated, or the reasons for not including them; (iv) the environmental attributes associated with the alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects; (v) the impacts and risks identified for each alternative, including the nature, significance, consequence, extent, duration and probability of the impacts, including the degree to which these impacts- (aa) can be reversed; (bb) may cause irreplaceable loss of resources; and (cc) can be avoided, managed or mitigated; (vi) the methodology used in determining and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks associated with the alternatives; (vii) positive and negative impacts that the proposed activity and alternatives will have on the environment and on the community that may be affected focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects; (viii) the possible mitigation measures that could be applied and level of residual risk; (ix) the outcome of the site selection matrix; (x) if no alternatives, including alternative locations for the activity were investigated, the motivation for not considering such; and (xi) a concluding statement indicating the preferred alternatives, including preferred location of the activity;	✓	Section E Appendix G
(i) a full description of the process undertaken to identify, assess and rank the impacts the activity will impose on the preferred location through the life of the activity, including- (i) a description of all environmental issues and risks that were identified during the environmental impact assessment process; and (ii) an assessment of the significance of each issue and risk and an indication of the extent to which the	✓	Section E Appendix H

DRAFT BASIC ASSESSMENT REPORT

Basic Assessment for the Mojaletema Primary Co-Operative (Pty) Ltd's proposed piggery facility on Portion 15 of Farm Bultfontein 192 IR, Nigel, Gauteng

APPENDIX 1 OF THE REGULATIONS	YES / NO	SECTION IN BAR
issue and risk could be avoided or addressed by the adoption of mitigation measures;		
(j) an assessment of each identified potentially significant impact and risk, including- (i) cumulative impacts; (ii) the nature, significance and consequences of the impact and risk; (iii) the extent and duration of the impact and risk; (iv) the probability of the impact and risk occurring; (v) the degree to which the impact and risk can be reversed; (vi) the degree to which the impact and risk may cause irreplaceable loss of resources; and (vii) the degree to which the impact and risk can be avoided, managed or mitigated;	✓	Section E Appendix G
(k) where applicable, a summary of the findings and impact management measures identified in any specialist report complying with Appendix 6 to these Regulations and an indication as to how these findings and recommendations have been included in the final report;	✓	Appendix H
(l) an environmental impact statement which contains- (i) a summary of the key findings of the environmental impact assessment; (ii) a map at an appropriate scale which superimposes the proposed activity and its associated structures and infrastructure on the environmental sensitivities of the preferred site indicating any areas that should be avoided, including buffers; and (iii) a summary of the positive and negative impacts and risks of the proposed activity and identified alternatives;	✓	Section E2
(m) based on the assessment, and where applicable, impact management measures from specialist reports, the recording of the proposed impact management objectives, and the impact management outcomes for the development for inclusion in the EMPr;	✓	Section E5
(n) any aspects which were conditional to the findings of the assessment either by the EAP or specialist which are to be included as conditions of authorisation;	✓	Appendix E4 and E5
(o) a description of any assumptions, uncertainties, and gaps in knowledge which relate to the assessment and mitigation measures proposed;		Appendix G
(p) a reasoned opinion as to whether the proposed activity should or should not be authorised, and if the opinion is that it should be authorised, any conditions that should be made in respect of that authorisation;		Appendix G
(q) where the proposed activity does not include operational aspects, the period for which the environmental authorisation is required, the date on which the activity will be concluded, and the post construction monitoring requirements finalised;	✓	N/A

DRAFT BASIC ASSESSMENT REPORT

Basic Assessment for the Mojaletema Primary Co-Operative (Pty) Ltd's proposed piggery facility on Portion 15 of Farm Bultfontein 192 IR, Nigel, Gauteng

APPENDIX 1 OF THE REGULATIONS	<u>YES / NO</u>	<u>SECTION IN BAR</u>
(r) an undertaking under oath or affirmation by the EAP in relation to: (i) the correctness of the information provided in the reports; (ii) the inclusion of comments and inputs from stakeholders and I&APs; (iii) the inclusion of inputs and recommendations from the specialist reports where relevant; and (iv) any information provided by the EAP to interested and affected parties and any responses by the EAP to comments or inputs made by interested and affected parties; and	✓	Appendix E4 and E5
(s) where applicable, details of any financial provisions for the rehabilitation, closure, and ongoing post decommissioning management of negative environmental impacts;	N/A	N/A
(t) any specific information that may be required by the competent authority; and	N/A	N/A
(u) any other matters required in terms of section 24(4)(a) and (b) of the Act.	N/A	N/A

A close-up photograph of a pink pig in a pen, looking directly at the camera. Other pigs are visible in the background.

Basic Assessment for the
Mojaletema Primary Co-
Operative (Pty) Ltd's proposed
piggery facility on Portion 15 of
Farm Bultfontein 192 IR,
Nigel, Gauteng.

BASIC ASSESSMENT REPORT





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

Kindly note that:

1. This **Basic Assessment Report** is the standard report required by GDARD in terms of the EIA Regulations, 2014.
2. This application form is current as of 8 December 2014. It is the responsibility of the EAP to ascertain whether subsequent versions of the form have been published or produced by the competent authority.
3. **A draft Basic Assessment Report must be submitted, for purposes of comments within a period of thirty (30) days, to all State Departments administering a law relating to a matter likely to be affected by the activity to be undertaken.**
4. **A draft Basic Assessment Report (1 hard copy and two CD's) must be submitted, for purposes of comments within a period of thirty (30) days, to a Competent Authority empowered in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended to consider and decide on the application.**
5. Five (5) copies (3 hard copies and 2 CDs-PDF) of the final report and attachments must be handed in at offices of the relevant competent authority, as detailed below.
6. The report must be typed within the spaces provided in the form. The size of the spaces provided is not necessarily indicative of the amount of information to be provided. The report is in the form of a table that can extend itself as each space is filled with typing.
7. Selected boxes must be indicated by a cross and, when the form is completed electronically, must also be highlighted.
8. An incomplete report may lead to an application for environmental authorisation being refused.
9. **Any report that does not contain a titled and dated full colour large scale layout plan of the proposed activities including a coherent legend, overlain with the sensitivities found on site may lead to an application for environmental authorisation being refused.**
10. The use of "not applicable" in the report must be done with circumspection because if it is used in respect of material information that is required by the competent authority for assessing the application, it may result in the application for environmental authorisation being refused.
11. No faxed or e-mailed reports will be accepted. Only hand delivered or posted applications will be accepted.
12. Unless protected by law, and clearly indicated as such, all information filled in on this application will become public information on receipt by the competent authority. The applicant/EAP must provide any interested and affected party with the information contained in this application on request, during any stage of the application process.
13. Although pre-application meeting with the Competent Authority is optional, applicants are advised to have these meetings prior to submission of application to seek guidance from the Competent Authority.

DEPARTMENTAL DETAILS

Gauteng Department of Agriculture and Rural Development
Attention: Administrative Unit of the of the Environmental Affairs Branch
P.O. Box 8769
Johannesburg
2000

Administrative Unit of the of the Environmental Affairs Branch
Ground floor Diamond Building
11 Diagonal Street, Johannesburg

Administrative Unit telephone number: (011) 240 3377
Department central telephone number: (011) 240 2500

DRAFT BASIC ASSESSMENT REPORT

Basic Assessment for the Mojaletema Primary Co-Operative (Pty) Ltd's proposed piggery facility on
Portion 15 of Farm Bultfontein 192 IR, Nigel, Gauteng

(For official use only)

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

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

N/A

Is a closure plan applicable for this application and has it been included in this report?

NO

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

This application is for the development of a piggery which will exist for the foreseeable future, therefore there are no intentions to close the piggery.

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

Yes

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

Yes

If no, state reasons for not attaching the list.

--

Have State Departments including the competent authority commented?

No

If no, why?

The BA Report is currently being released for a 30-day review period. Following the review period any comments received from State Departments (including the competent authority) will be incorporated into the final BAR which will be submitted to Gauteng Department of Agriculture and Rural Development for decision-making.

--

INTRODUCTION

Project Background

The proposed site is located on Portion 15 of Farm Bultfontein 192 IR in Nigel, within Ward 88 of the Ekurhuleni Metropolitan Municipality in Gauteng. The property is located 1.5 km off the major R51 which links Nigel to Springs. The site falls within an area currently zoned for agriculture. The Mojaletema Primary Co-operative comprises of five family members who are currently farming with maize, sheep, goats and cattle. The livestock is sold to the local market.

This application is to obtain Environmental Authorisation to commence with a piggery production facility. The proposed project will increase the company's supply to the local market by adding 248 pigs (240 sows and 8 boars) with an annual through put of roughly 4 800 pigs of mixed ages.

The layout plan of the preferred alternative has been developed based on the outcome of the specialist studies and sensitivity mapping undertaken as part of this assessment. The proposed development footprint totals 1.2 ha. This will consist of the following:

- a Slurry Dam (119 m³)
- 3 pig houses,
- Sales office,
- living quarters
- feeding silo.

The pig facilities will have a mixture of both slated and concrete floors. The pig waste will fall through the slated flooring and will be stored there temporarily before being washed via a closed gutter to the slurry dam. The slurry dam will be covered with water and the solid waste will settle at the bottom for odour control. The water that will overflow will be disinfected and reused to clean the piggery. After the slurry digestion process; where the pig waste is broken down and integrated with the water to form a slurry, the waste will be pumped out of the dam and used as fertilizer on the maize crops on site.

DRAFT BASIC ASSESSMENT REPORT

Basic Assessment for the Mojaletema Primary Co-Operative (Pty) Ltd's proposed piggery facility on Portion 15 of Farm Bultfontein 192 IR, Nigel, Gauteng

contents

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SECTION A: ACTIVITY INFORMATION

1. PROPOSAL OR DEVELOPMENT DESCRIPTION

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

Basic Assessment for the proposed expansion of agricultural production in the form of the commencement of a piggery housing 248 pigs with a throughput of roughly 4800 pigs per annum cycle.

Select the appropriate box

The application is for an upgrade of an existing development

☐

The application is for a new development

☒

Other, specify

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

YES

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

National Environmental Management Waste Act GNR. 921 of 29 November 2013, and the Competent Authority is the Gauteng Department of Agriculture and Rural Development (GDARD).

National Water Act, 1998 (Act 36 of 1998), and the Competent Authority is the Department of Water and Sanitation.

National Heritage Resources Act (Act 25 of 1999), and the Competent Authority is the South African Heritage Resources Agency (SAHRA).

If yes, have you applied for the authorisation(s)?

YES

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

NO

2. APPLICABLE LEGISLATION, POLICIES AND/OR GUIDELINES

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

Title of legislation, policy or guideline:	Administering authority:	Promulgation Date:
National Environmental Management Act, 1998 (Act No. 107 of 1998 as amended).	National & Provincial	27 November 1998
National Water Act, 1998 (Act No. 36 of 1998) as amended	National	26 August 1998
National Heritage Resources Act, 1999 (Act No. 25 of 1999)	National & Provincial	28 April 1999
National Environmental Management Biodiversity Act, 2004 (Act No. 10 of 2004)	National & Provincial	7 June 2004
National Environmental Management Waste Act, 2009 (Act No. 59 of 2008)	National & Provincial	10 March 2009

DRAFT BASIC ASSESSMENT REPORT

Basic Assessment for the Mojaletema Primary Co-Operative (Pty) Ltd's proposed piggery facility
on Portion 15 of Farm Bultfontein 192 IR, Nigel, Gauteng

Title of legislation, policy or guideline:	Administering authority:	Promulgation Date:
Environmental Impact Assessment Regulations, 2017 (as amended)	National & Provincial	7 April 2017
National Development Plan: A Vision for 2030	National	19 February 2013
Department of Environmental Affairs Guidelines on Public Participation	National & Provincial	10 October 2012
Spatial Planning Land Use Management Act, 2013 (Act No. 16 of 2013)	National	6 August 2013
Gauteng Provincial Environmental Framework, 2014	Provincial	November 2014
Ekurhuleni Integrated Development Plan: 2016-2021	Provincial & Local	10 March 2016
Ekurhuleni Spatial Development Framework	Provincial & Local	29 November 2015

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

Legislation, policy of guideline	Description of compliance
National Environmental Management Act, 1998 (Act No. 107 of 1998 as amended).	The Environmental Authorisation for the proposed development is lawfully applied for in terms of the EIA Regulations, 2014, promulgated under NEMA. The conditions on the Environmental Authorisation, if approved, will be adhered to.
National Water Act, 1998 (Act No. 36 of 1998) as amended	Pertinent legislation published under this act will be adhered to as well as a Water Use License Application.
National Heritage Resources Act, 1999 (Act No. 25 of 1999)	Submitted the proposed project to the South African Heritage Resources Agency (SAHRA) online platform South African Heritage Resources Information System (SAHRIS)
National Environmental Management Biodiversity Act, 2004 (Act No. 10 of 2004)	The National Environmental Management Biodiversity Act, 2004 (Act No. 10 of 2004) as amended (NEMBA) including all the pertinent legislation published in terms of this act was considered in undertaking this Basic Assessment process. This included the identification and assessment of the fauna and flora prevailing in the proposed project area and the handling thereof in terms of NEMBA.
National Environmental Management Waste Act, 2009 (Act No. 59 of 2008)	An application for a Waste Management Licence will be submitted in terms of NEM:WA as the proposed activity pertains to the following activities of the Act: Category A (1): The storage of general waste in lagoons. Category A (12): The construction of a facility for a waste management activity listed in Category A of this Schedule (not in isolation to associated waste management activity).
Environmental Impact Assessment Regulations, 2017	All the triggered activities as per National Environmental Management Act (Act No. 107 of 1998) have been listed below.
National Development Plan: A Vision for 2030	The South African Government through the Presidency has published a National Development Plan. The Plan aims to eliminate poverty and reduce inequality by 2030. The Plan has the target of developing people's capabilities to be to improve their lives through education and skills development, health care, better

DRAFT BASIC ASSESSMENT REPORT

Basic Assessment for the Mojaletema Primary Co-Operative (Pty) Ltd's proposed piggery facility on Portion 15 of Farm Bultfontein 192 IR, Nigel, Gauteng

Legislation, policy of guideline	Description of compliance
	access to public transport, jobs, social protection, rising income, housing and basic services, and safety. It proposes the following strategies to address the above goals: 1. Creating jobs and improving livelihoods; 2. Expanding infrastructure; 3. Transition to a low-carbon economy; 4. Transforming urban and rural spaces; 5. Improving education and training; 6. Providing quality health care; 7. Fighting corruption and enhancing accountability; 8. Transforming society and uniting the nation.
Ekurhuleni Integrated Development Plan: 2016-2021	The Spatial Development Framework (SDF) is the legislated component of the municipality's IDP that prescribes development strategies and policy guidelines to restructure and re-engineer the urban and rural form. The SDF is the municipality's long-term vision of what it wishes to achieve spatially, and within the programmes and projects identified in the IDP. The SDF should not be interpreted as a blueprint or master plan aimed at controlling physical development, but rather the framework giving structure to an area while allowing it to grow and adapt to changing circumstances. The proposed project falls within ward 88 of Region EMM of the SDF and is located on the South Eastern boundary of the Ekurhuleni Municipality. The farm portion holds large undeveloped areas, which could accommodate future growth. Description of compliance with the relevant legislation, policy or guideline: According to the Regional IDP (Region EMM) for Ekurhuleni, the proposed project is in a rural area which is marked for creating employment providing food and work opportunities.
Ekurhuleni Spatial Development Framework:	

In terms of the National Environmental Management Act (NEMA) EIA Regulations published in GNR 324, 325 and 327 on the 4 December 2014 as Amended 07 April 2017 Government Gazette Number 40772 a Basic Assessment (BA) process is required as the proposed project triggers the following listed activities (detailed in Table 1 below).

Table 1: Listed Activities relating to the proposed project

Relevant Notice:	Activity No (s) (relevant notice):	Describe each listed activity as per the Government notices:
GN. R 327 (as amended) 7 April 2017	4.	The development and related operation of facilities or infrastructure for the concentration of animals for the purpose of commercial production in densities that exceed-

DRAFT BASIC ASSESSMENT REPORT

Basic Assessment for the Mojaletema Primary Co-Operative (Pty) Ltd's proposed piggery facility on Portion 15 of Farm Bultfontein 192 IR, Nigel, Gauteng

Relevant Notice:	Activity No (s) (relevant notice):	Describe each listed activity as per the Government notices:
		(ii) 8 square meters per small stock unit and; b. more than 250 pigs per facility excluding piglets that are not yet weaned.
	27.	The clearance of an area of 1 hectares or more, but less than 20 hectares of indigenous vegetation, except where such clearance of indigenous vegetation is required for- (i)The undertaking of a linear activity; or (ii)Maintenance purposes undertaken in accordance with a maintenance management plan.
GNR 921, 29 November	Category A	1.Storage of waste- The storage of general waste in lagoons.
	Category A	12. Construction, expansion or decommissioning of facilities and associated structures and infrastructure- The construction of a facility for a waste management activity listed in Category A of this Schedule (not in isolation to associated waste management activity).

3. ALTERNATIVES

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

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

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

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

The proposed site was chosen based on the sites sensitivities which are presented in the ecological (fauna and flora) and Heritage specialist studies undertaken as part of this process (Appendix G). There are no additional locational alternatives for this proposed project as this is the only available site to the applicant.

DRAFT BASIC ASSESSMENT REPORT

Basic Assessment for the Mojaletema Primary Co-Operative (Pty) Ltd's proposed piggery facility on Portion 15 of Farm Bultfontein 192 IR, Nigel, Gauteng

Provide a description of the alternatives considered

No.	Alternative type, either alternative: site on property, properties, activity, design, technology, energy, operational or other(provide details of "other")	Description
1	Proposal	<u>Site Location and Layout:</u> The proposed project which is the development of a piggery production facility is proposed on a site located on portion 15 of Farm Bultfontein 192, Blue Valley Agricultural Holdings in Nigel. The site falls within Ward 88 of the Ekurhuleni Metropolitan in Gauteng. The property is located 1.5 kilometres off the major R51 which links Nigel to Springs. The site is currently zoned and operating as agricultural use. The proposed project seeks to increase its sustainable production of local produce to the market with the inclusion of 248 pigs (240 sows & 8 boars) to their current crop and animal output. The layout plan of the proposed development site has been developed based on the outcome of the specialist studies and sensitivity mapping undertaken as part of this assessment process. The current development footprint totals 1.2 ha. This will be broken down into a slurry dam, 3 pig houses, and sales office, living quarters and a feed silo. The pig housing will have a mixture of both slated and concrete floors. The pig waste will fall through the slatted flooring and stored there temporarily before being washed via a closed gutter to the slurry dam. The slurry dam will be covered with water with the solid waste settling at the bottom to eliminate the odours. The overflowing water will be disinfected and reused to clean the piggery again. After the digestion period, the waste will be pumped out of the dam and used as fertilizer on the maize crops. The site is currently serviced by the Municipality with electricity services being available from Eskom. However, electricity to the piggery will be applied for once the funding for the project has been approved. The sewage for the offices and living quarters will be connected to those of the current sewage system of the farm and may be installed to the Municipality's standard at the projects expense. There is a total of four boreholes, only one is currently operating and another to be certified for the proposed project once funding has been approved. There are already access roads to and on the site.
2	Property Alternative	There have been no alternative properties or locations identified for the proposed project due to the applicants'

DRAFT BASIC ASSESSMENT REPORT

Basic Assessment for the Mojaletema Primary Co-Operative (Pty) Ltd's proposed piggery facility on Portion 15 of Farm Bultfontein 192 IR, Nigel, Gauteng

No.	Alternative type, either alternative: site on property, properties, activity, design, technology, energy, operational or other(provide details of "other")	Description
		lack of funding and that the applicant is already leasing the proposed portion of land from the Land Bank. Therefore this is the only piece of land the applicant has available and it would not be economically feasible for the business to find or purchase a new property. Therefore, no alternate properties have been investigated in the Basic Assessment.
3	Activity Alternative	The applicant already undertakes other farming activities on the plot of land, however at a smaller scale, this being the only industry which can be scaled up to commercial scale due to climate, weather and land topography.
	Design or Layout Alternative	The proposed design and layout of the proposed development is done in a way to minimise the the potential impacts on the environment. The layout of the pig houses is focused on the biosecurity measures, which allows for more effective management of piggery production as it lessens the risk of the pigs catching diseases if the activity were to be in an open environment. Therefore no alternative layouts have been proposed as the current and preferred layout are on transformed land with relatively low impact significance and allow for the most efficient compliance to pig welfare legislation, maximising pig production outputs.
	Technology to be used	The technology to be used is in line with piggery farming standards, it further leads to pig welfare as well as complying with best practices in piggery production. No other technologies have been investigated as the current proposed technologies will be in line with SAPPOS guidelines in terms of best practice associated with piggery production.

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

Motivation
<u>Site layout and Location: Alternatives</u> The Council for Scientific and Industrial Research (CSIR) has been appointed by the Department of Environmental Affairs (DEA) to manage the Special Needs and Skills Development Programme (SNSD). This is a <i>pro bono</i> programme providing Environmental Impact Assessments (EIAs) to businesses considered as Small, Medium and Micro Enterprises (SMMEs) who do not have the financial means to comply with the EIA regulations. Also included in this category are Community Trusts, Individuals or Government Programmes. To this effect, the CSIR received a successful application from Mojaletema Farming Co-Operative and is assisting them by managing the BA on their behalf to obtain an Environmental Decision from the Competent Authority. Mojaletema Farming Co-Operative is a 100% black owned entity being supported by the Land Bank which offers support to previously disadvantaged individuals who do not have the start-up capital to launch their own enterprise. Mojaletema Farming Co-Operative is leasing the land from the Land Bank on a 30 year

lease. There is therefore no scope for identifying an alternative property as this is the only property they could acquire. The proposed layout is in line with the biosecurity measures and has been informed by the Ecological Impact Assessment (Appendix G) to avoid impacts in areas with high conservation priority.

Activity Alternative

In their process of due diligence and market feasibility **Mojaletema Farming Co-Operative** preferred to undertake a business that could function at a small to medium scale enterprise focusing on producing high quality produce but with the ability and intension to grow in the future. This resulted in their decision to start with a piggery. With the current growth in this industry, roughly 5% on an annual basis, it also gives opportunities of employment and is a solution to the lack of rural development in the area.

Technology and Design: Alternatives

The pre-development research which has been conducted on this project has been extensive, including feasibility studies and market research as well as production research. The best principles for piggeries will be adopted by **Mojaletema Farming Co-Operative**. The structure of the pig houses will be made of slates and concrete floors, the pig sties will be cleaned frequently as to avoid diseases developing and spreading. The pig houses will have ventilation which is manually controlled in order to control the air and light entering the pig houses.

The proposed development will therefore not utilise intensive technologies, which would results in high energy demand. There will be an attempt to make use of very little energy and also making use of resource saving techniques, no other major technological structures have been proposed. Therefore the proposed **Mojaletema Farming Co-Operative** project alternatives are the only viable alternatives to take forward to the Impact Assessment phase.

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:

Proposed activity (*Total environmental (landscaping, parking, etc.) and the building footprint*)

Alternatives:

Alternative 1 (if any)

Alternative 2 (if any)

Size of the activity:

1.2 ha

Ha/ m²

or, for linear activities:

Proposed activity

Alternatives:

Alternative 1 (if any)

Alternative 2 (if any)

Length of the activity:

N/A

N/A

N/A

m/km

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

Size of the
site/servitude:

Proposed activity

435 ha

Alternatives:

Alternative 1 (if any)

Alternative 2 (if any)

DRAFT BASIC ASSESSMENT REPORT

Basic Assessment for the Mojaletema Primary Co-Operative (Pty) Ltd's proposed piggery facility
on Portion 15 of Farm Bultfontein 192 IR, Nigel, Gauteng

Ha/m²

5. SITE ACCESS

Proposal

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

YES	
N/A	

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

Describe the type of access road planned:

N/A

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

Alternative 1

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

YES	NO
N/A	

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

Describe the type of access road planned:

N/A

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

Alternative 2

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

YES	NO
m	

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

Describe the type of access road planned:

N/A

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

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

Section A 6-8 has been duplicated

0

Number of times

(only complete when applicable)

6. LAYOUT OR ROUTE PLAN

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

- the layout plan is printed in colour and is overlaid with a sensitivity map (if applicable);
- layout plan is of acceptable paper size and scale, e.g.
 - A4 size for activities with development footprint of 10sqm to 5 hectares;
 - A3 size for activities with development footprint of > 5 hectares to 20 hectares;
 - A2 size for activities with development footprint of >20 hectares to 50 hectares);
 - A1 size for activities with development footprint of >50 hectares);
- The following should serve as a guide for scale issues on the layout plan:
 - A0 = 1: 500
 - A1 = 1: 1000
 - A2 = 1: 2000
 - A3 = 1: 4000
 - A4 = 1: 8000 (±10 000)
- shapefiles of the activity must be included in the electronic submission on the CD's;
- the property boundaries and Surveyor General numbers of all the properties within 50m of the site;
- the exact position of each element of the activity as well as any other structures on the site;
- the position of services, including electricity supply cables (indicate above or underground), water supply pipelines, boreholes, sewage pipelines, septic tanks, storm water infrastructure;
- servitudes indicating the purpose of the servitude;

- sensitive environmental elements on and within 100m of the site or sites (including the relevant buffers as prescribed by the competent authority) including (but not limited thereto):
 - Rivers and wetlands;
 - the 1:100 and 1:50 year flood line;
 - ridges;
 - cultural and historical features;
 - areas with indigenous vegetation (even if it is degraded or infested with alien species);
- Where a watercourse is located on the site at least one cross section of the water course must be included (to allow the position of the relevant buffer from the bank to be clearly indicated)

Note from CSIR: A Locality map depicting the current and proposed piggery facility on the farm has been included as Appendix A. Photographs indicating sensitive features on site can also be found in this Appendix and in the Ecological Specialist Report (NSS, February 2017) attached as Appendix G.

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

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

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.

Note from CSIR: Site photographs in the eight major compass directions have been included as Appendix B. Photographs indicating sensitive features on site can also be found in the Ecological Specialist Report (NSS, 2017) attached as Appendix G.

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.

Note from CSIR: An illustration of the structures for the proposed activities on site has been included as Appendix C.

SECTION B: DESCRIPTION OF RECEIVING ENVIRONMENT

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

Instructions for completion of Section B for linear activities

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

Section B has been duplicated for sections of the route

N/A

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
(complete only when appropriate)

N/A

times

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

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

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

Section B - Section of Route

N/A

(complete only when appropriate for above)

Section B - Location/route Alternative No.

N/A

(complete only when appropriate for above)

1. PROPERTY DESCRIPTION

Property description:
(Including Physical
Address and Farm name,
portion etc.)

Portion 15 of Farm Bultfontein 192 IR, Nigel, Gauteng.

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

DRAFT BASIC ASSESSMENT REPORT

Basic Assessment for the Mojaletema Primary Co-Operative (Pty) Ltd's proposed piggery facility on Portion 15 of Farm Bultfontein 192 IR, Nigel, Gauteng

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):

28.515652

26.454474

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

N/A

The 21 digit Surveyor General code of each cadastral land parcel

PROPOSAL	T	7	7	4	6	5	7	2	0	1	4									
Alt. 1																				
Alt. 2																				
etc.																				

** Note from CSIR: there is no SG code available for the site, please refer to the coordinates ABOVE

3. GRADIENT OF THE SITE

Indicate the general gradient of the site.

1:50 – 1:20

1:20 – 1:15

4. LOCATION IN LANDSCAPE

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

Side slope of
hill/ridge

Undulating
plain/low hills

5. GROUNDWATER, SOIL AND GEOLOGICAL STABILITY OF THE SITE

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

- Shallow water table (less than 1.5m deep)
- 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

NO

NO

NO

NO

NO

NO

NO

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).

DRAFT BASIC ASSESSMENT REPORT

Basic Assessment for the Mojaletema Primary Co-Operative (Pty) Ltd's proposed piggery facility on Portion 15 of Farm Bultfontein 192 IR, Nigel, Gauteng

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

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)

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)

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

6. AGRICULTURE

Does the site have high potential agriculture as contemplated in the Gauteng Agricultural Potential Atlas (GAPA 4)?

YES

NO

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

7. GROUNDCOVER

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

NOTE FROM CSIR: All Conservation Important species on site have been identified and included in the Ecological Specialist Report (NSS, February 2017) attached as Appendix G.

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 % = 19	Natural veld with heavy alien infestation % = 30	Veld dominated by alien species % = 11	Landscaped (vegetation) % =
Sport field % =	Cultivated land % = 32	Paved surface (hard landscaping) % =	Building or other structure % = 3	Bare soil % = 5

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

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

YES

NO

If YES, specify and explain:

Inputs from the Ecological Specialist Report- Appendix G(NSS, 2017)

Although there were no Red Listed Species that were recorded being present on the site, in addition to the declining *Gunnera* species were recorded, a number of *Gladiolus* individuals were located within the Rocky Grassland vegetation. These are considered Protected species under Schedule 11 Protected Plants (Section 86 (1) (a)) of the Gauteng Nature Conservation Ordinance, 12 of 1983 (Gauteng General Law Amendment Act No. 4 of 2005) (Figure 2). Protected Species may not be cut, disturbed, damaged, destroyed without obtaining a permit from Gauteng Province or a delegated authority. Based on the infrastructural layout for the proposed project, it is not expected that these Protected and the Declining *Gunnera* species will be affected by the development. There is also little to no information available on water quality of wetland systems and the effects it has on species such as *Gunnera perpensa*.



Gunnera perpensa - leaves



Gunnera perpensa - flower

Figure 2: Photographs of Conservation Important plant species in the surrounds of the survey area

Are there any rare or endangered flora or fauna species (including red list species) present within a 200m (if within urban area as defined in the Regulations) or within 600m (if outside the urban area as defined in the Regulations) radius of the site.

YES

NO

If YES, specify and explain:

Are there any special or sensitive habitats or other natural features present on the site?

YES

If YES, specify and explain:

The proposed development site is situated within the **Moist Grasslands Priority Area (Figure 3)**, which supports a high diversity of birds and other native biodiversity, but which is subject to intensive livestock agriculture involving annual burning and over-grazing. Recently the area has also become target for water storage schemes and renewable electricity energy projects (Maphisa et al. 2016).

The proposed development site is situated within the **Blesbokspruit Highveld Grassland Threatened Ecosystem (Figure 3)**. Key biodiversity features of this Ecosystem include the Blesbokspruit, Klein-Blesbokspruit, Verdrietlaagte, and various other wetlands and pans, as well as the Andesite Mountain Bushveld, Eastern Highveld Grassland, Eastern Temperate Freshwater Wetlands, Gold Reef Mountain Bushveld, Rand Highveld Grassland, Soweto Highveld Grassland and Tsakane Clay Grassland vegetation types. Red or Orange Listed plant and animal species in the Ecosystem include e.g. *Delosperma leendertziae* and *Khadia beswicki*; Spotted-necked Otter and Brown Hyena; African Grass-owl, the Greater and Lesser Flamingos, African Marsh-harrier, Secretarybird, Yellow-billed Stork, Caspian Tern, Melodious Lark, Lesser Kestrel, White-bellied Korhaan, and Corncrake; the Giant Bullfrog; Heidelberg Copper (Opal) Butterfly, and the Golden Starburst Baboon Spider (SANBI & DEAT 2009).

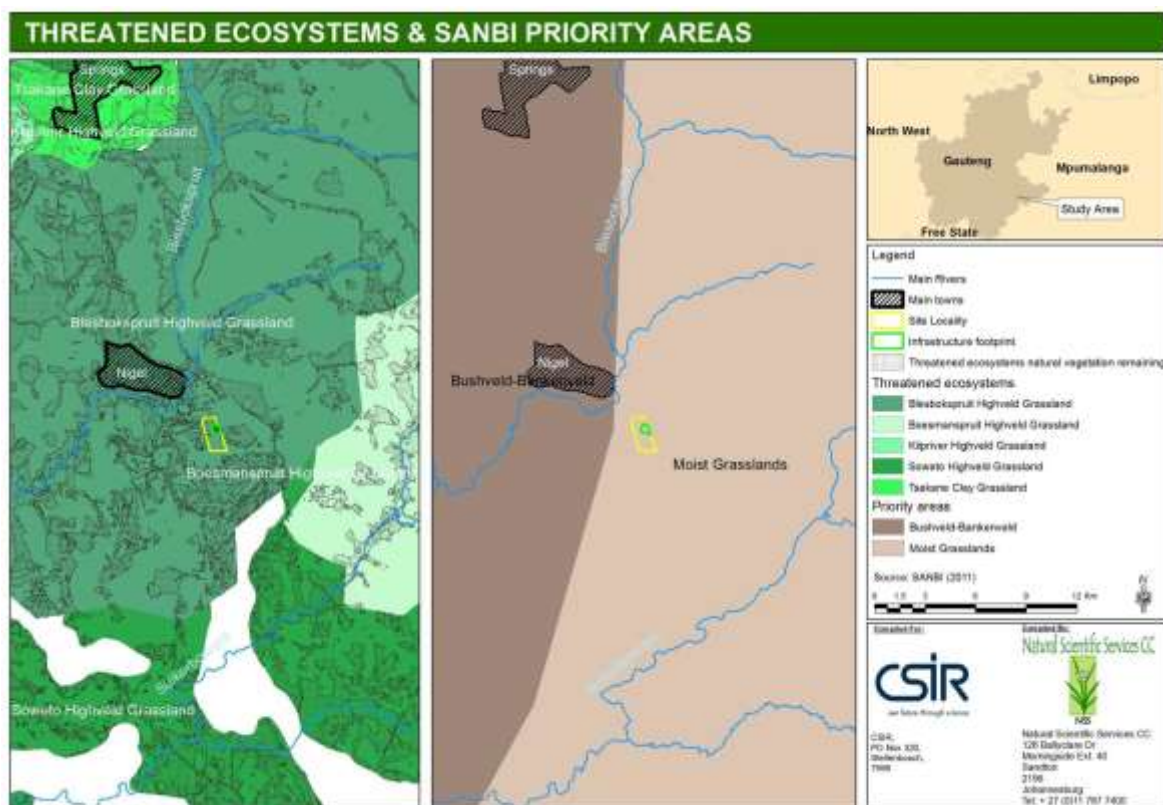


Figure 3: Location of the site relative to regional terrestrial Priority Areas and Threatened Ecosystems

Was a specialist consulted to assist with completing this section

YES

NO

If yes complete specialist details

Name of the specialist:

Natural Scientific Services CC (NSS)

Contributors and Authors:

Susan Abell

DRAFT BASIC ASSESSMENT REPORT

Basic Assessment for the Mojaletema Primary Co-Operative (Pty) Ltd's proposed piggery facility on Portion 15 of Farm Bultfontein 192 IR, Nigel, Gauteng

Qualification(s) of the specialist:	MSc Resource Conservation Biology (Ecology) University of the Witwatersrand, Johannesburg (2000 – 2001) BSc Hons University of the Witwatersrand, Johannesburg (1999) BSc University of the Witwatersrand, Johannesburg (1998)		
Postal address:	126 Ballyclare Dr Morningside ext 40 Sandton, Johannesburg		
Postal code:	2195		
Telephone:	(011) 787-7400	Cell:	
E-mail:	susan@nss-sa.co.za	Fax:	
Are any further specialist studies recommended by the specialist?	YES	NO	
If YES, specify:			
If YES, is such a report(s) attached?	YES	NO	
If YES list the specialist reports attached below			

Signature of specialist: _____ Date: _____

Note from CSIR: Please see the Specialist Declaration as per Appendix 6 of the NEMA EIA Regulations 2014) on Page iv of the Ecological Specialist Report, attached as Appendix G.

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

8. LAND USE CHARACTER OF SURROUNDING AREA

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

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

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

DRAFT BASIC ASSESSMENT REPORT

Basic Assessment for the Mojaletema Primary Co-Operative (Pty) Ltd's proposed piggery facility on Portion 15 of Farm Bultfontein 192 IR, Nigel, Gauteng

		NORTH					
		1	10	10	7	7	
		1	1	1	7	7	
WEST		2	1		1	1	EAST
		1	2	2	1	1	
		1	1	7	2	2	
		SOUTH					

Note from CSIR: The proposed development is surrounded by few small holdings with some agricultural practices and the dwellings are fairly spaced apart. There are also a few small seasonal wetlands 600m South East of the proposed site. Please see locality and aerial maps for an indication of the seeps/wetlands and small holdings (Page 30, 33 & 56 of the Ecological Report, Appendix G).

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

If yes indicate the type of reports below

Ecological Opinion/Scan for Mojaletema Primary Co-Operative for the proposed Pig Production Facility Portion 15 of Farm Bultfontein 192, , Nigel, Gauteng Province.
Natural Scientific Services (NSS), 2017
Appendix G

9. SOCIO-ECONOMIC CONTEXT

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

9.1 Project Demographic Baseline

The full consideration of all the anticipated impacts that may occur in a project, be they social as well as environmental help fully understand the scope of the proposed project and should be taken into consideration. These said impacts are very often broad, not concentrated or limited to the site of the proposed project. The social and environmental impacts of a project often filter their way out into the neighboring communities and towns. Therefore, a proper project demographic baseline should incorporate at least the municipal, nearby towns and neighbors of the proposed project. This baseline study will include a brief overview of the socio-economic conditions of the Gauteng Province, concentrated on the Ekurhuleni Metropolitan Municipality and the Nigel area specifically. The project falls within Ward 88 of Nigel. Households and communities within Ward 88 should therefore be provided preference when implementing socio-economic policies and mitigation measures.

This Southern section with Duduza being the closest town and the biggest close hub being Springs to the North. According to the latest population report (Statistics South Africa, 2011), the total population for the Nigel area is 38 318 people. It has an average household size of 3.2 people per household at a density of 276 persons per square kilometer. The majority of the Nigel population falls within the youth category, with the highest population specifically falling into the 20-29 year olds. The over 70 year old population group is least represented. This large percentage of youth in the area means additional pressure on job creation in future. It also implies a high dependency ratio, which in this case is 44.9% as more people reach the economically activity stage. The racial make up of the area is shown in Table 2 below and Table 3 indicates the gender distribution.

Table 2: Racial Demographics of Nigel Municipality

Racial make up	
Group	Percentage
Black African	44.9%
Coloured	16.7%
Indian/ Asian	3.9%
White	33.4%
Other	1.1%

Table 3: Gender Demographics of the Nigel Municipality

Gender Classification	
Group	Percentage
Male	50.2%
Female	49.8 %

The language most spoken at home within the Nigel area is Afrikaans 43.5%, followed by IsiZulu 23.3% and English 16.1%. In terms of education, 4.4% of adults have no schooling whatsoever and 35.3% of adults are schooled up to Grade 12. In general, the level of education in the region is moderate which gives limited access to employment and economic growth. According to Statistics South Africa (2011), a majority of the households (90.6%) have access to a flush toilet (connected to sewage system) whilst 2.9% have no access to toilet facilities. 69.9 % of households in Nigel have access to electricity for cooking, heating and lighting. In terms of tenure status, 6.7% of the population occupied rent free, 73.3% fully own their dwellings and rented dwellings account for 20%. The main sources of water for households in the area are 97.5% Regional/Local water scheme, only 0.6% water tanker and the remainder a combination of water vendors, rain boreholes, springs and dams.

9.2 Baseline economic information

Unemployment is a challenging factor at a national scale, this includes Nigel, where, according to StatsSa 2011, approximately 15.7% of the Nigel population has no income. However, this is lower than the national average of 25.2% as shown in Figure 4 below.

Employment Status 2011: Nigel

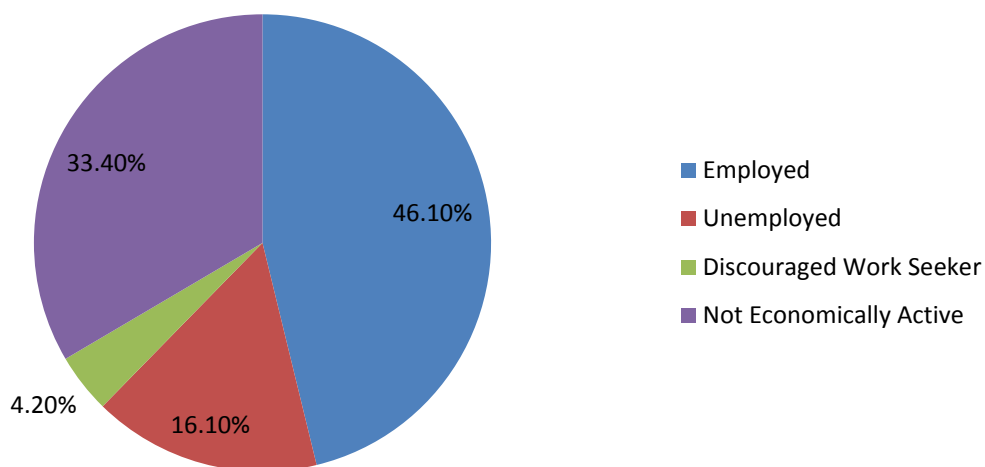


Figure 4: Employment Distribution of the Nigel Municipality

The economy of the Ekurhuleni is driven by both agricultural and industrial development, these which are the largest economic contributor of this metropolitan and dispersed all over the area. The area of Nigel is seen as a rural area which has an agricultural focus and most employment to be created in this area would be in this industry for the population of the area. The incomes of those who tend to find work in the Nigel area tend to be on the middle of the scale as shown in Table 4 below. Mojaletema Farming Co-Operative has thus identified an opportunity in Nigel that through the proposed Piggery will add great socio-economic value to the area both economically and through allowing local employment opportunities, as well as contributing on a broader scale to the farming industry of South Africa.

Table 4: Economic Distribution of the Nigel Municipality

Income Distribution of Nigel	
Income	Percentage
No income	23,1%
R1 - R4,800	2,4%
R4,801 - R9,600	3,6%
R9,601 - R19,600	10%
R19,601 - R38,200	12,9%
R38,201 - R76,400	12%
R76,401 - R153,800	14,4%
R153,801 - R307,600	15,5%
R307,601 - R614,400	9,8%
R614,001 - R1,228,800	2,5%
R1,228,801 - R2,457,600	0,6%
R2,457,601+	0,5%

DRAFT BASIC ASSESSMENT REPORT

Basic Assessment for the Mojaletema Primary Co-Operative (Pty) Ltd's proposed piggery facility on Portion 15 of Farm Bultfontein 192 IR, Nigel, Gauteng

Anticipated CAPEX value of the project on completion	Pig Structure: R 8 680 000.00 Capital Total: R 1 865 150.00
What is the expected annual income to be generated by or as a result of the project?	R 4 320 000.00
New skilled employment opportunities created in the construction phase of the project	Bricklayers, Welding, Carpentry, Landscaping and Power tools operations. Depending on the contractor, a foreman or site supervisor will be used. Resulting in 4-6 jobs being created.
New skilled employment opportunities created in the operational phase of the project	An on-call handy man for electrical and mechanical works. A farm manager (Applicant)
New un-skilled employment opportunities created in the construction phase of the project	This may be at the discretion of the contractor, estimated 6-10 labourers.
New un-skilled employment opportunities created in the operational phase of the project	Dependent on the period of the piggery production cycle: cleaners and labourers for the waste management process. The process of moving the pigs from house to house for mating season, weaning stages etc. The moving of pigs when being sold (5- 7 labourers)
What is the expected value of the employment opportunities during the operational and construction phase?	R 350 000 for Construction (Once –off) R 360 000 per annum for Operational
What percentage of this value that will accrue to previously disadvantaged individuals?	70 % During Construction 100 % During Operational
The expected current value of the employment opportunities during the first 10 years	Estimated R 5 Million R 360 000.00 per annum at 6% increase per year
What percentage of this value that will accrue to previously disadvantaged individuals?	85%

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*

DRAFT BASIC ASSESSMENT REPORT

Basic Assessment for the Mojaletema Primary Co-Operative (Pty) Ltd's proposed piggery facility on Portion 15 of Farm Bultfontein 192 IR, Nigel, Gauteng

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

N/A

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:

Heritage Impact Assessment for proposed agricultural development by Mojaletema Farming Co-Operative (Pty) Ltd on Portion 15 of Farm Bultfontein 192, Nigel, Gauteng.

A Heritage Impact Assessment was undertaken by ASHA Consulting (see Appendix G)

Based on the study, no heritage resources were found within the study area. However, in close proximity there is a farmhouse and outbuildings that are older than 60 years. They are probably early-mid-20th century and of relatively low significance. Historical aerial photography shows that historical tree lines were present in the area. These, however, have largely been destroyed in recent years.

No significant impacts to heritage resources are expected and no cumulative impacts were identified. As such, it is recommended that the proposed piggery be authorised but subject to the following condition being incorporated into the Environmental Authorisation:

- If any archaeological material or human burials are uncovered during the course of development then work in the immediate area should be halted. The find would need to be reported to the heritage authorities and may require inspection by an archaeologist. Such heritage is the property of the state and may require excavation and curation in an approved institution.

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

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

YES

NO

YES

NO

Note from CSIR: A heritage screening report was submitted to South African Heritage Resources Agency (SAHRA) via the SAHRIS portal (Case ID 10179). The project was required to perform a Heritage Impact Assessment (HIA), including to explore Archaeological and Paleontological Assessment. The Provincial Heritage Resources Authority Gauteng (PHRAG) was also informed about the proposed development and provided an opportunity to comment during the first round of Public Participation. A letter from PHRAG in response to the BID is included in Appendix F, in which a consideration of heritage resources was requested by PHRAG. A heritage specialist, ASHA Consulting, was appointed to comment on the sensitivity of heritage resources on site. The report from ASHA Consulting has been included in Appendix G.

SECTION C: PUBLIC PARTICIPATION (SECTION 41)

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

2. LOCAL AUTHORITY PARTICIPATION

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

Was the draft report submitted to the local authority for comment?

☒ YES

☐ NO

If yes, has any comments been received from the local authority?

☒ YES

☐ NO

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

This Draft report is hereby released for a 30-day commenting period. The comments will be incorporated into the final BA Report which will be submitted to GDARD for decision-making.

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

The Draft BAR is only released now and will be submitted to the local authority for comment.

3. CONSULTATION WITH OTHER STAKEHOLDERS

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

Has any comment been received from stakeholders?

☐ YES

☒ NO

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

A Comment was received following the release of the Background Information Document::

Comment: "Department of Agriculture Forestry and Fisheries (DAFF), Directorate of Land Use and Soil Management acknowledged receipt of proposed project application documents on 24 October 2017 and was received from Mr HJ Buys pp(DAFF Director: Land Use and Soil Management)."

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

N/A

4. GENERAL PUBLIC PARTICIPATION REQUIREMENTS

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

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

5. APPENDICES FOR PUBLIC PARTICIPATION

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

Appendix 1 - Proof of site notice

Appendix 2 - Written notices issued as required in terms of the regulations

Appendix 3 - Proof of newspaper advertisements

Appendix 4 - Communications to and from interested and affected parties

Appendix 5 - Minutes of any public and/or stakeholder meetings - N/A

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 - N/A at this point

Appendix 9 - Copy of the register of I&APs

SECTION D: RESOURCE USE AND PROCESS DETAILS

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

Instructions for completion of Section D for alternatives

- 1) For each alternative under investigation, where such alternatives will have different resource and process details (e.g. technology alternative), the entire Section D needs to be completed
- 4) Each 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
(complete only when appropriate)

0

times

Section D Alternative No.

"insert alternative number"

(complete only when appropriate for above)

1. WASTE, EFFLUENT, AND EMISSION MANAGEMENT

Solid waste management

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

YES

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

25m³

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

The expected construction waste produced will be in the form of building rubble, packaging material and general waste produced by the construction staff. It will be collected and stored temporarily in a waste container and disposed at the nearest licensed waste site.

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

Waste will be disposed of at the nearest appropriate licensed landfill site which allows the disposing of building rubble.

Will the activity produce solid waste during its operational phase?

YES

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

Pig Waste 119 m³

Other waste = 2 m³

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

All solid waste which is the outcome of the operational phase will be temporarily stored in containers to be sent to the nearest licensed landfill site. All medical waste from vaccinations etc. will be sent to existing medical waste management companies in the area to be dealt with appropriately. Pig waste will be stored in a slurry dam and used as fertilizer in the agricultural activities on site.

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

NO

DRAFT BASIC ASSESSMENT REPORT

Basic Assessment for the Mojaletema Primary Co-Operative (Pty) Ltd's proposed piggery facility on Portion 15 of Farm Bultfontein 192 IR, Nigel, Gauteng

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

All waste generated, except for pig waste, will always be disposed of at a registered landfill site.

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?

	NO
--	----

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

Is the activity that is being applied for a solid waste handling or treatment facility?

	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 solid waste produced by the pigs will be gathered and stored in a slurry dam to allow the aerobic process to occur. Thereafter there will be the separation where the solids are stored on a flat concrete pan for composting, the liquids will be used for cleaning and watering of crops on the farm. The recyclable waste such as plastic, glass, paper etc will be taken to the nearest recycling warehouse.

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?

	NO
--	----

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

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

	NO
--	----

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

Yes	
	119 m ³

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

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

As the pig waste falls through the slatted floors it will remain there till it is flushed through a covered gutter to the concrete slurry dam. The slurry dam, filled with water, will allow the solids to sink to the bottom.. As more and more solids are pumped into the slurry dam, the overflowing water will be funneled into a watering tank which will be disinfected and pumped back into the pig houses for cleaning. The remaining water will be used for irrigating the maize crops fields. These water savings methods are in line with recommendations of Section 21 (e) of the National Water Act: The use of waste water for agricultural purposes is in accordance with the Department of Water Affairs' recognition of waste water as a valuable resource for use as a fertilizer.

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

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

	NO
--	----

If yes, provide the particulars of the facility:

Facility name:	N/A
Contact person:	
Postal address:	
Postal code:	

DRAFT BASIC ASSESSMENT REPORT

Basic Assessment for the Mojaletema Primary Co-Operative (Pty) Ltd's proposed piggery facility on Portion 15 of Farm Bultfontein 192 IR, Nigel, Gauteng

Telephone:

Cell:

E-mail:

Fax:

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

The water used to clean the pig facility will be a mixture of fresh water as well as water which has been disinfected from the overflow of the slurry dam. The remaining water from the slurry dam will be used to irrigate the maize crop fields

Liquid effluent (domestic sewage)

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

YES	NO
-----	----

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

N/A

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

YES	NO
-----	----

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

YES	NO
-----	----

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

N/A

Emissions into the atmosphere

Will the activity release emissions into the atmosphere?

YES	NO
-----	----

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

YES	NO
-----	----

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

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

The emissions released from the proposed piggery development will be in the form of construction emissions, dust from trucks on gravel roads. This dust generated will however be minimal due to the length of the project as well as little traffic being generated. Further, due to the clearing/levelling of land for construction there will also be dust generated temporarily.

Operational emissions will be in the form of odour from the piggery waste, these are a result of the anaerobic metabolic process occurring in the slurry dam. A constant water level will be kept in the slurry dam to cover the solid waste in order to suppress the odor.

Odors from the piggeries will be managed to ensure that it does not have a negative impact on the quality of life.

2. WATER USE

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

	groundwater	
--	-------------	--

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:

Estimated 2000 kiloliters

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

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

YES	NO
-----	----

If yes, list the permits required

DRAFT BASIC ASSESSMENT REPORT

Basic Assessment for the Mojaletema Primary Co-Operative (Pty) Ltd's proposed piggery facility on Portion 15 of Farm Bultfontein 192 IR, Nigel, Gauteng

The proposed project will require a Water Use License due to the amount of water that will be required on a daily basis (75 kilolitres per day) which will be pumped from a borehole. The site already uses water pumped from an underground source for domestic use, there will be an increase in the amount due to the need to be used for the proposed piggery activity. A water use licence is required for the facility as it triggers Section 21(a), (b) and (e) of the National Water Act 36 of 1998 (NWA): "general authorisation which replaces the need for a water user to apply for a licence in terms of the Act, provided that the water use is within the limits and conditions as set out in this general authorization." The recycling of water, used in the pig cleaning process and the use of waste water to irrigate maize crop field is in line with best practices where its use is part of a general authorization regarded as a Controlled Water Use Activity, provided that the activity complies with the conditions specified in Government Notice No. 665 of 6 September 2013 (National Water Act, Act 36 of 1998).

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

YES	NO
-----	----

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

YES	NO
-----	----

3. POWER SUPPLY

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

The facility would rely on renewable energy (solar panels) and possibly Eskom via Municipality

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

N/A

4. ENERGY EFFICIENCY

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

Should the projects application for funding be approved, there would be a consideration of the extensive use of solar power for electrifying the piggery facility. This electricity would be used for lighting and the powering of water pumps.

This would aid self-efficiency in allowing the farm to carry on with operations even during load shedding from Eskom.

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

Solar panels will be used to generate electricity The Applicant has not indicated such a plan

SECTION E: IMPACT ASSESSMENT

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

1. ISSUES RAISED BY INTERESTED AND AFFECTED PARTIES

Summarise the issues raised by interested and affected parties.

The issues/comments that were raised by Interested and Affected Parties following the release of the Background Information Document and prior to the release of the Draft Basic Assessment Report can be seen in the comments and responses report which is attached as Appendix E4:

The Comments and Responses Report (CRR) will be updated following the release of the Draft Basic Assessment Report will form part of the Final BAR..

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

The issues/comments that were raised by Interested and Affected Parties following the release of the Background Information Document and prior to the release of the Draft Basic Assessment Report and the response given by the EAP can be seen in the comments and responses report which is attached as Appendix E4.

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

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

APPROACH TO THE BASIC ASSESSMENT

1) METHODOLOGY OF IMPACT ASSESSMENT

According to the DEA IEM Series guideline on "Impact Significance" (2002), there are a number of quantitative and qualitative methods that can be used to identify the significance of impacts resulting from a development. The process of determining impact significance should ideally involve a process of determining the acceptability of a predicted impact to society. Making this process explicit and open to public comment and input would be an improvement of the EIA/BA process. The CSIR's approach to determining significance is generally as follows:

- Use of expert opinion by the specialists ("professional judgement"), based on their experience, a site visit and analysis, and use of existing guidelines and strategic planning documents and conservation mapping (e.g. SANBI biodiversity databases);
- Review of specialist assessment by all stakeholders including authorities such as nature conservation officials, as part of the report review process (i.e. if a nature conservation official disagreed with the significance rating, then we could negotiate the rating); and

- Our approach is more a qualitative approach - we do not have a formal matrix calculation of significance as is sometimes done.

2) SPECIALIST CRITERIA FOR IMPACT ASSESSMENT

The following methodology has been provided by the CSIR to the specialists for incorporation into their specialist assessment:

Assessment of Potential Impacts

The assessment of impact significance is based on the following conventions:

Nature of Impact - this reviews the type of effect that a proposed activity will have on the environment and should include "what will be affected and how?"

Spatial Extent - this should indicate whether the impact will be:

- Site specific;
- Local (<2 km from site);
- Regional (within 30 km of site); or
- National.

Duration - The timeframe during which (lifetime of) the impact will be experienced:

- Temporary (less than 1 year);
- Short term (1 to 6 years);
- Medium term (6 to 15 years);
- Long term (the impact will cease after the operational life of the activity); or
- Permanent (mitigation will not occur in such a way or in such a time span that the impact can be considered transient).

Intensity - it should be established whether the impact is destructive or innocuous and should be described as either:

- High (severe alteration of natural systems, patterns or processes such that they temporarily or permanently cease);
- Medium (notable alteration of natural systems, patterns or processes; where the environment continues to function but in a modified manner); or
- Low (negligible or no alteration of natural systems, patterns or processes); can be easily avoided by implementing appropriate mitigation measures, and will not have an influence on decision-making.

Probability - this considers the likelihood of the impact occurring and should be described as:

- Improbable (little or no chance of occurring);
- Probable (<50% chance of occurring);
- Highly probable (50 – 90% chance of occurring); or
- Definite (>90% chance of occurring).

Reversibility - this considers the degree to which the adverse environmental impacts are reversible or irreversible. For example, an impact will be described as low should the impact have little chance of being rectified to correct environmental impacts. On the other hand, an impact such as the nuisance factor caused by noise impacts from wind turbines can be considered to be highly reversible at the end of the project lifespan. The assessment of the reversibility of potential impacts is based on the following terms:

- High - impacts on the environment at the end of the operational life cycle are highly reversible;
- Moderate - impacts on the environment at the end of the operational life cycle are reasonably reversible;
- Low - impacts on the environment at the end of the operational life cycle are slightly reversible; or
- Non-reversible - impacts on the environment at the end of the operational life cycle are not reversible and are consequently permanent.

Irreplaceability - this reviews the extent to which an environmental resource is replaceable or irreplaceable. For example, if the proposed project will be undertaken on land that is already transformed and degraded, this will yield a low irreplaceability score; however, should a proposed development destroy unique wetland systems for example, these may be considered irreplaceable and thus be described as high. The assessment of the degree to which the impact causes irreplaceable loss of resources is based on the following terms:

- High irreplaceability of resources (this is the least favourable assessment for the environment);
- Moderate irreplaceability of resources;
- Low irreplaceability of resources; or
- Resources are replaceable (this is the most favourable assessment for the environment).

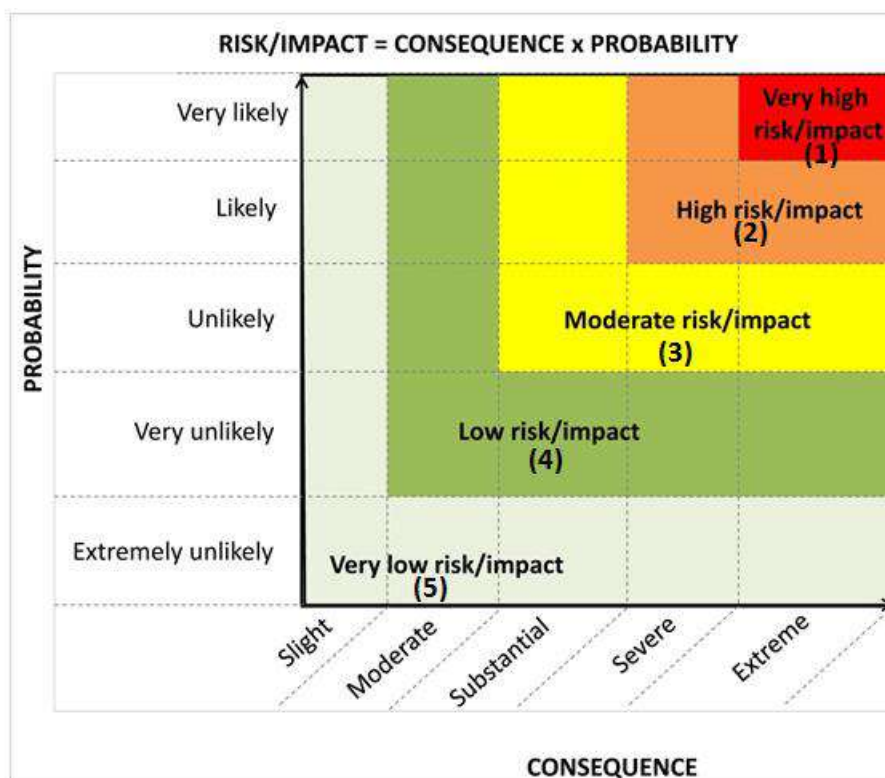


Figure 5: Guide to assessing risk/impact significance as a result of consequence and probability.

The status of the impacts and degree of confidence with respect to the assessment of the significance is stated as follows:

Status of the impact: A description as to whether the impact will be:

- Positive (environment overall benefits from impact);
- Negative (environment overall adversely affected); or
- Neutral (environment overall not affected).

Degree of confidence in predictions: The degree of confidence in the predictions, based on the availability of information and specialist knowledge. This should be assessed as:

- High;
- Medium; or
- Low.

Based on the above considerations, the specialist provides an overall evaluation of the significance of the potential impact, which should be described as follows:

- **Low to very low:** the impact may result in minor alterations of the environment and can be reduced or avoided by implementing the appropriate mitigation measures, and will only have an influence on the decision-making if not mitigated;
- **Medium:** the impact will result in moderate alteration of the environment and can be reduced or avoided by implementing the appropriate mitigation measures, and will only have an influence on the decision-making if not mitigated; or
- **High:** Where it could have a “no-go” implication for the project unless mitigation or re-design is practically achievable.

Furthermore, the following must be considered:

- Impacts should be described both before and after the proposed mitigation and management measures have been implemented.
- All impacts should be evaluated for the construction, operation and decommissioning phases of the project, where relevant.
- The impact evaluation should take into consideration the cumulative effects associated with this and other facilities which are either developed or in the process of being developed in the region, if relevant.

Management Actions:

- Where negative impacts are identified, mitigatory measures will be identified to avoid or reduce negative impacts. Where no mitigatory measures are possible this will be stated.
- Where positive impacts are identified, augmentation measures will be identified to potentially enhance these.
- Quantifiable standards for measuring and monitoring mitigatory measures and enhancements will be set. This will include a programme for monitoring and reviewing the recommendations to ensure their ongoing effectiveness.

Monitoring:

Specialists should recommend monitoring requirements to assess the effectiveness of mitigation actions, indicating what actions are required, by whom, and the timing and frequency thereof.

Cumulative Impact:

Consideration is given to the extent of any accumulative impact that may occur due to the proposed development. Such impacts are evaluated with an assessment of similar developments already in the environment. Such impacts will be either positive or negative, and will be graded as being of negligible, low, medium or high impact.

Mitigation:

The objective of mitigation is to firstly avoid and minimise impacts where possible and where these cannot be completely avoided, to compensate for the negative impacts of the development on the receiving environment and to maximise re-vegetation and rehabilitation of disturbed areas. For each impact identified, appropriate mitigation measures to reduce or otherwise avoid the potentially negative impacts are suggested. All impacts are assessed without mitigation and with the mitigation measures as suggested.

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.

Note from the CSIR: Feasible alternatives (i.e. location, activity and property alternatives) do not exist for the proposed project as this is the only land parcel that the owners was able to acquire, and it would not be economically feasible for the business to find and or purchase new property. Environmental impacts would be significantly higher if a new facility on different land were to be established compared to expanding an existing farming activities. The No-Go alternative will be considered.

PROPOSAL

Potential Impacts:	Extent	Duration	Consequence:	Probability:	Reversibility:	Irreplaceability:	Significance Rating Positive/Negative:	Degree of confidence	Can Impact be avoided?	Can impact be managed or mitigated?	Proposed Mitigation	Significance Rating after Mitigation
Construction Phase												
Loss or degradation of local wetland areas from construction activities, increased vehicle traffic, dust, erosion, sedimentation and possible spills	Local	Permanent	Low	Highly Probable	Low	Moderate	Moderate Negative	High	No	Yes	- Demarcate or fence in the construction site. - Highlight all prohibited activities to workers through training and notices. - Commence (and preferably complete) construction activities during winter when the risk of erosion and and sedimentation should be least. - Design measures to effectively control vehicle access, vehicle speed, dust, stormwater run-off, erosion and sedimentation on the road. - Implement the measures that were designed to control impacts on the road preferably during winter, when the risk of erosion should be least.	Low
Loss of terrestrial vegetation and faunal habitat from clearing of vegetation, increased vehicle activity, altered burning and proliferation of alien flora	Local	Permanent	Medium	Probable	High	High	Moderate Negative	High	No	Yes	- Modify the layout of planned infrastructure to avoid important floral communities (rocky grassland around the entrance area) and large indigenous trees. - Identify and mark any indigenous trees (these are limited on site) on the ground. Those that are small and cannot be avoided should be transplanted elsewhere on site. - Demarcate or fence in the construction site. - Highlight all prohibited activities to workers through training and notices. - Commence (and preferably complete) construction activities during winter, when the risk of disturbing growing plants should be least. - Briefly and effectively stockpile topsoil preferably 1-1.5m in height. - Use the topsoil to allow natural vegetation to establish in disturbed areas. If recovery is slow, then a seed mix for the area (using indigenous grass species listed within this report) should be sourced and planted. - Do not undertake any landscaping with alien flora.	Low
Loss of CI or medicinal flora from clearing of vegetation, proliferation of alien flora, altered burning, and harvesting by people	Local	Permanent	High	Probable	Low	High	Moderate Negative	High	No	Yes	- Obtain permits to remove CI species. - Transplant CI and medicinally important floral specimens from the infrastructure footprint to suitable and safe locations elsewhere on site or nearby. - Obtain guidance from a suitably qualified vegetation specialist or horticulturist regarding the collection,	Low

Potential Impacts:	Extent	Duration	Consequence:	Probability:	Reversibility:	Irreplaceability:	Significance Rating Positive/Negative:	Degree of confidence	Can Impact be avoided?	Can impact be managed or mitigated?	Proposed Mitigation	Significance Rating after Mitigation
											propagation/storage and transplantation of plants. - Highlight all prohibited activities to workers through training and notices. - Prohibit harvesting of CI and medicinal flora on site by community members through notices and site access control (e.g. fencing).	
Loss of CI fauna from clearing of vegetation, earth-moving activities, wetland disturbance, and increased vehicle, human, livestock and pet activity	Local	Permanent	Moderate	Probable	Low	High	Moderate Negative	High	No	Yes	- Commence (and preferably complete) construction during winter, when the risk of disturbing active (including breeding and migratory) animals, should be least. - Check open trenches for trapped animals (e.g. reptiles, frogs and small terrestrial mammals), and relocate trapped animals with advice from an appropriate specialist. - Educate workers about dangerous animals (e.g. snakes, scorpions, bees) and highlight all prohibited activities to workers through training and notices. - Prohibit harvesting of CI and other indigenous fauna on site by community members through notices and site access control (e.g. fencing).	Low
Introduction and proliferation of alien species from influx of vehicles, people and materials, site disturbance, and lack of alien species control	Local	Permanent	Moderate	Highly Probable	Low	High	Moderate Negative	High	No	Yes	- Demarcate or fence in the construction site. - Carefully limit / regulate access by vehicles and materials to the construction site. - Prohibit the introduction of domestic animals such as dogs and cats. - Keep construction activities neat and tidy. When complete, remove all sand piles, and landscape all uneven ground while re-establishing a good topsoil layer. - Plant only locally indigenous flora if landscaping needs to be done. - Remove Category species using mechanical methods, and minimize soil disturbance as far as possible. Alien wood could be donated to the surrounding community.	Low
Increased dust and erosion from clearing of vegetation, earth-moving activities, and increased vehicle traffic	Local	Medium Term	Moderate	Definite	Moderate	Moderate	Moderate Negative	High	No	Yes	- Limit vehicles, people and materials to the construction site. - Commence (and preferably complete) construction during winter, when the risk of erosion should be least. - Revegetate denude areas with locally indigenous flora a.s.a.p. - Implement erosion protection measures on site. Measures could include bunding around soil stockpiles, and vegetation of areas not to be developed.	Low

Potential Impacts:	Extent	Duration	Consequence:	Probability:	Reversibility:	Irreplaceability:	Significance Rating Positive/ Negative:	Degree of confidence	Can Impact be avoided?	Can impact be managed or mitigated?	Proposed Mitigation	Significance Rating after Mitigation
											Implement effective and environmentally-friendly dust control measures, such as mulching or periodic wetting.	
Sensory disturbance of fauna from noise, dust and light associated with construction activities	Local	Long Term	Moderate-Low	Probable	Moderate	High	Low Negative	High	No	Yes	- Commence (and preferably complete) construction during winter, when the risk of disturbing active (including breeding and migratory) animals, should be least. - Minimize noise to limit its impact on calling and other sensitive fauna (e.g. frogs). - Limit construction activities to day time hours. - Minimize or eliminate security and construction lighting, to reduce the disturbance of nocturnal fauna.	Low
Potential Heritage Impacts from Construction												
Destruction of archaeological artefacts	Site	Permanent	Low	Improbable	Non-Reversible	High	Very Low Negative	High	No	No	None	Very Low
Existence of new structure on the landscape	Site	Long Term	Low	Highly probable	Moderate	High	Very Low Neutral	High	No	No	None	Very Low
Existence of new structure on the landscape	Site	Permanent	Low	Improbable	Non-Reversible	High	Very Low Negative	High	No	No	None	Very Low
Indirect Impacts												
The creation of employment and skills development in the area, resulting in social upliftment in the area	Regional	Short Term	Moderate-High	Highly Probable	High	High	High Positive	Medium	No	Yes	Ensure the employment of local people and develop skills of people within the local area. Pass on the knowledge to the local community.	High
No-Go Alternative												
Direct Impacts: - All identified impacts will not occur (no clearance of natural vegetation). - All structures on the site will remain.												
Indirect Impacts - No new construction employment will be created. - No new jobs in the construction jobs will occur.												
Operational Phase												
Loss or degradation of local wetland areas from operational activities, vehicle traffic, dust, erosion, sedimentation and possible	Local	Permanent	Moderate	Probable	Low	Moderate	Moderate Negative	High	No	Yes	- Monitor and maintain the road impact control measures to ensure that they remain effective. - Highlight all prohibited activities to workers through training and notices.	Low

Potential Impacts:	Extent	Duration	Consequence:	Probability:	Reversibility:	Irreplaceability:	Significance Rating Positive/Negative:	Degree of confidence	Can Impact be avoided?	Can impact be managed or mitigated?	Proposed Mitigation	Significance Rating after Mitigation
spills												
Environmental contamination from pig excrement, bedding, feed, carcasses and other operational waste	Regional	Long Term	Very-High	Probable	Low	Moderate	High Negative	High	No	Yes	- Ensure that the facility is designed in accordance with international best practice norms, and with advice from an appropriate specialist, to ensure that there is no environmental contamination from effluent, fodder, carcasses and other waste, and to ensure that there is also effective storm water management. - Designate a secured, access restricted, signposted room for the storage of potentially hazardous substances such as herbicides, pesticides dips and medications. - Adhere to best practice pig husbandry and waste disposal norms. - All hazardous waste should be disposed of at an appropriate licensed facility for this. - Waste recycling should be incorporated into the facility's operations as far as possible. - Educate workers about the facility's waste management and handling of hazardous substances with regular training and notices. - Establish appropriate emergency procedures for accidental contamination of the surroundings. - Rehabilitate contaminated areas a.s.a.p. in accordance with advice from appropriate contamination and environmental specialists. - Educate workers about the facility's waste emergency procedures with training and notices.	Low
Poor / Inappropriate control of animal pests from poor waste management and hygiene, and insufficient, inappropriate and/or ineffectual pest control	Local	Long Term	Moderate	Highly Probable	Moderate	Moderate	Moderate Neutral	High	No	Yes	- Ensure that floors are sloped and slatted to facilitate drainage. - Ensure that there is effective storm water drainage around the facility. - Screed concrete floors properly to seal all cracks and limit the pooling of effluent and water. - Effectively seal and maintain all pipes and reservoirs containing slurry, to prevent animals from accessing the effluent. - Ensure that the facility is sufficiently ventilated to keep floors, bedding, and fodder as dry as possible. - Check that fan louvers (if installed) work properly, and close fans completely when off. - Prevent and manage unwanted animal	Low

Potential Impacts:	Extent	Duration	Consequence:	Probability:	Reversibility:	Irreplaceability:	Significance Rating Positive/Negative:	Degree of confidence	Can Impact be avoided?	Can impact be managed or mitigated?	Proposed Mitigation	Significance Rating after Mitigation
											access to fodder. ▪ Clean floors regularly. ▪ Clean up excess fodder regularly from under troughs and feed bins. ▪ Keep areas surrounding the facility free of spilled manure and litter. ▪ Remove all trash, and sources of feed and water for pests from the outside perimeter of the facilities. ▪ Keep weeds and grass mowed to 5cm or less immediately around the facilities, to reduce the prevalence of insects. ▪ Electrocutation devices are available to kill flies, while other mechanical devices include traps, sticky tapes or baited traps. ▪ Control rodents through effective sanitation, rodent proofing and (as humane as possible) extermination. ▪ Ensure that measures to control pests are tightly restricted to areas where these are problematic. ▪ Pest control measures should be taxon-specific. If necessary, advice should be sought from an appropriate specialist. ▪ Rodenticides are not advised.	
Disease transmission from poor waste management and hygiene, and insufficient, inappropriate and/or ineffectual pest control	Local	Long Term	Moderate	Probable	Moderate	Moderate	Moderate Negative	High	No	Yes	▪ Ensure that floors are sloped and slatted to facilitate drainage. ▪ Ensure that there is effective storm water drainage around the facility. ▪ Screed concrete floors properly to seal all cracks and limit the pooling of effluent and water. ▪ Effectively seal and maintain all pipes and reservoirs containing slurry, to prevent animals from accessing the effluent. ▪ Ensure that the facility is sufficiently ventilated to keep floors, bedding, and fodder as dry as possible. ▪ Check that fan louvers (if installed) work properly, and close fans completely when off. ▪ Prevent and manage unwanted animal access to fodder. ▪ Clean floors regularly. ▪ Clean up excess fodder regularly from under troughs and feed bins. ▪ Keep areas surrounding the facility free of spilled manure and litter. ▪ Remove all trash, and sources of feed and water for pests from the outside perimeter of the facilities. ▪ Keep weeds and grass mowed to 5cm or	Low

Potential Impacts:	Extent	Duration	Consequence:	Probability:	Reversibility:	Irreplaceability:	Significance Rating Positive/Negative:	Degree of confidence	Can Impact be avoided?	Can impact be managed or mitigated?	Proposed Mitigation	Significance Rating after Mitigation
											less immediately around the facilities, to reduce the prevalence of insects. ▪ Electrocutation devices are available to kill flies, while other mechanical devices include traps, sticky tapes or baited traps. ▪ Control rodents through effective sanitation, rodent proofing and (as humane as possible) extermination. ▪ Ensure that measures to control pests are tightly restricted to areas where these are problematic. ▪ Pest control measures should be taxon-specific. If necessary, advice should be sought from an appropriate specialist. ▪ Rodenticides are not advised.	
Introduction and proliferation of alien species from influx of vehicles, people and materials, site disturbance, and lack of alien species control	Local	Permanent	Medium	Highly Probable	Moderate	Moderate	Moderate Negative	High	No	Yes	▪ Carefully limit / regulate access by vehicles and materials to the site. ▪ Prohibit the introduction of domestic animals such as dogs and cats. ▪ Minimize the accumulation and dispersal of excess fodder on site. ▪ Employ best practices regarding tilling of soil and weed management. ▪ Plant only locally indigenous flora if landscaping needs to be done. ▪ Remove Category species using mechanical methods, and minimize soil disturbance as far as possible. Alien wood could be donated to the surrounding community.	Low
Loss of CI or medicinal flora from proliferation of alien flora, altered burning, harvesting by people and increased livestock activity	Local	Permanent	High	Probable	Low	High	Moderate Negative	High	No	Yes	▪ -Highlight all prohibited activities to workers through training and notices. ▪ -Prohibit harvesting of CI and medicinal flora on site by community members through notices and site access control (e.g. fencing).	Low
Loss of CI fauna from operational activities, wetland disturbance, and increased vehicle, human, livestock and pet activity	Local	Permanent	Moderate	Probable	Low	High	Moderate Negative	High	No	Yes	▪ Educate workers about dangerous animals (e.g. snakes, scorpions, bees) and highlight all prohibited activities to workers through training and notices. ▪ Prohibit harvesting of CI and other indigenous fauna on site by community members through notices and site access control (e.g. fencing).	Low
Sensory disturbance of fauna from noise, dust and light associated with operational activities	Local	Long Term	Moderate-Low	Probable	Moderate	High	Low Negative	High	No	Yes	▪ Install motion-sensitive lights. ▪ Ensure that all outdoor lights are angled downwards and/or fitted with hoods. ▪ Use bulbs that emit warm, long wavelength (yellow-red) light, or use UV filters or glass housings on lamps to filter out UV. ▪ Avoid using metal halide, mercury or other	Low

Potential Impacts:	Extent	Duration	Consequence:	Probability:	Reversibility:	Irreplaceability:	Significance Rating Positive/ Negative:	Degree of confidence	Can Impact be avoided?	Can impact be managed or mitigated?	Proposed Mitigation	Significance Rating after Mitigation
											bulbs that emit high UV (blue-white) light that is highly and usually fatally attractive to insects. - Conduct regular maintenance of machinery, fans and other noisy equipment. - Encourage workers to minimize light and noise pollution through training and notices.	
Potential Heritage Impacts from Operations												
Existence of new structure on the landscape	Site	Long Term	Low	Highly probable	Moderate	High	Very Low Neutral	High	No	No	None	Very Low
Impacts to heritage resources	Site	Permanent	Low	Improbable	Non-Reversible	High	Very Low Negative	High	No	No	None	Very Low
Indirect Impacts												
Proposed development will contribute to local economy through employment and skills development	Local	Long Term	Moderate-High	Probable	High	High	High Positive	Moderate	Yes	Yes	Increase the possibility of local economy improvement through employment and skills development.	High
The proposed project may contribute to the local pork market by supplying increase products to local distributors	Municipal District	Long Term	Moderate-High	Probable	High	High	High Positive	Moderate	Yes	Yes	Make provisions that local businesses are the target market of the projects output products.	High
No-Go Alternatives												
Direct Impacts							Significance Rating					
Potential Impact on Vegetation and faunal habitats:							None					
Impact on soil erosion and dust:							None					
Impact on water quality and downstream aquatic ecology:							Moderate(Negative)- Current activities on the farm (cattle and goat herding) may harm water quality					
Potential for groundwater impact:							Moderate(Negative)- Current activities may be affected due to the use of a borehole.					
Air Quality impact:							Low(Negative)- The current farm activities will continue and they produce little odor or dust from the herding of animals and maize crop farming.					
Waste generation:							Low(Negative)- The farm operations will continue and the current activities produce a small amount of waste.					
Indirect Impacts												
- There won't be any contribution to the pork industry output. - There will be improving of food security in the district municipality - There won't be any employment increases on the farm.												

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

Ecological Opinion/Scan for Mojaletema Primary Co-Operative for the proposed Pig Production Facility on Portion 15 of Farm Bultfontein 192, Nigel, Gauteng Province. (Appendix G)

Heritage Impact Assessment: Basic Assessment for the proposed development of a Piggery on Portion 15 of Farm Bultfontein 192, Nigel, Gauteng (Appendix G)

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

Although the site was under agriculture in the past, it is important to note that the absence of species on site does not conclude that the species is not present at the site. Reasons for not finding certain species during the summer site visit may be due to:

- The short duration of fieldwork as well as the timing of the fieldwork (just after the rains). The 2015/2016 season has experienced below average rainfall and is considered to be in a drought period. This has influenced flowering and species abundance at other sites that NSS has revisited.
- Some plant species, which are small, have short flowering times, rare or otherwise difficult to detect may not have been detected even though they were potentially present on site.
- Vegetation mapping was based on the brief in-field survey as well as aerial imagery. Positioning of the vegetation units may not be exact due to potential georeferencing errors displayed in Google Earth, GPS accuracy in field as well as the age of the aerial image.

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.

Note from the CSIR: Decommissioning and/or closure phase is not expected to occur for the proposed piggery. Should there be plans to close down the piggery; a closure plan will be submitted to the competent authority for approval and it will comply to the relevant legislation at the time of closure.

Potential Impacts	Extent	Duration	Consequence	Probability	Reversibility	Irreplaceability	Significance Rating Positive/Negative	Degree of confidence	Can Impact be avoided?	Can impact be managed or mitigated?	Proposed Mitigation	Significance Rating after Mitigation
<i>Loss or degradation of wetland areas from decommissioning activities, increased vehicle traffic, dust, erosion, sedimentation and possible spills</i>	Local	Permanent	Moderate	Highly Probable	Low	Moderate	Moderate Negative	High	No	Yes	- Demarcate or fence in the decommissioning site. - Highlight all prohibited activities to workers through training and notices. - Commence (and preferably complete) decommissioning activities during winter when the risk of erosion and wetland sedimentation should be least. - Monitor and maintain the road impact control measures to ensure that they remain effective.	Low
<i>Introduction and proliferation of alien species from influx of vehicles, people and materials, site disturbance, and lack of alien species control</i>	Local	Permanent	Moderate	Highly Probable	Moderate	Moderate	Moderate Negative	High	No	Yes	- Remove Category species using mechanical methods, and minimize soil disturbance as far as possible. - Alien wood could be donated to the surrounding community.	Low
<i>Increased dust and erosion from destruction of infrastructure, earth-moving activities, and increased vehicle traffic</i>	Local	Medium Term	Moderate	Definite	Moderate	Moderate	Moderate Negative	High	No	Yes	- Limit vehicles, people and materials to the decommissioning site. - Commence (and preferably complete) decommissioning during winter, when the risk of erosion should be least. - Revegetate denude areas with locally indigenous flora a.s.a.p. - Implement erosion protection measures on site. Measures could include bunding around soil stockpiles, and vegetation of areas not to be developed. - Implement effective and environmentally-friendly dust control measures, such as mulching or periodic wetting.	Low
<i>Sensory disturbance of fauna from noise, dust and light associated with decommissioning activities</i>	Local	Long Term	Moderate	Probable	Moderate	High irreplaceability	Low Negative	High	No	Yes	- Commence (and preferably complete) decommissioning during winter, when the risk of disturbing active (including breeding and migratory) animals, should be least. - Minimize noise to limit its impact on sensitive fauna. - Limit demolition activities to day time hours. - Minimize or eliminate security and decommissioning lighting, to reduce the disturbance of nocturnal fauna.	Low

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

Ecological Opinion/Scan for Mojaletema Primary Co-Operative for the proposed Pig Production Facility on Farm Portion 5, Blue Valley Agricultural Holdings, Uitkyk, Nigel, Gauteng Province. (Appendix G)

Heritage Impact Assessment: Basic Assessment for the proposed development of a Piggery on Portion 15 of Farm Bultfontein 192, Nigel, Gauteng (Appendix G)

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

N/A

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:

A potential cumulative impact can come from both the construction and operational phase and resulting from the trucks needed in both stages. During the construction phase the trucks bringing in the construction materials. During operational phase the transportation of the pigs to the markets. However, both of these would be temporary in both instances. The said impacts would be in the form of noise and dust levels being increased. Further, there could be the potential of increased traffic due to accessing the site by the trucks.

A second potential cumulative impact which is also evident in both the construction and operational phases is that of water use. The continued use of water for the farming activities may lead to a negative impact on the water table of the area. Due to the need of more water, the project may look into a second borehole to meet water demand for the piggery facility activities. A water saving scheme will be established which recycles water by using disinfected water to clean the pig facilities and the storing of rain water in tanks for domestic uses.

The proposed project has the potential to impact the socio economic status of the local area through job creation, skills development and increased pork production for the local market, as this is a positive impact, it will be encouraged.

5. ENVIRONMENTAL IMPACT STATEMENT

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

Proposal

The proposed piggery facility is on land which has previously been transformed for a dairy farm, with the remaining land being used for cattle, sheep and goat rearing as well as maize crop growing. The most significant environmental impacts of the proposed project are:

Site preparation and clearance

The clearance of land in preparation for the construction of the piggery facilities and supporting infrastructure

is unavoidable. This may result in the exposing of soil leading to potential erosion and dust from the wind. The occurrence of erosion may result in loss of fertile land and sedimentation in watercourses (loss of wetland). This impact will be a temporary one and the impact will be contained to some extent, with the aid of construction measures which minimise these from occurring, this will limit probability.

Vegetation and habitat loss

Vegetation loss during construction will be unavoidable due to the clearance of land for the facilities. However, the development site has been transformed, resulting in a low possibility of vegetation loss. With the appropriate mitigation there is very little probability of this occurring.

Waste

There will be waste generated in both stages of the project, construction and operational, and will be ongoing during the operational phase. The proposed methods of dealing with the waste generated through the operational stage will minimise any impact occurring therefore resulting in a low probability. The recycling of the waste will be practiced to minimise impacts.

Socio-economic

The proposed project is expected to contribute to the growth of the local economy during both the construction and operational phases. These may be in the form of local labour to produce the pork to be sold in the local market. Overall this can be said to be the creation of employment opportunities and skills development in the area. The impact will be of temporal nature during the construction phase and permanent for the operational phase. The probability of this impact occurring is high and as such a potential high positive impact.

The proposed piggery facility is concluded, based the environmental impacts assessment shown, to have relatively low impact on the environment. If the proposed mitigation and management measures are implemented as recommended the significance of these impacts found on the site will be low environmentally. Other potential impacts will be on vegetation and habitat, water quality, soil, dust, and odour as a result of earthworks associated with the activity, influx of vehicles, waste generated by the piggery and pig farming as a whole. Based on the selected development site, it is NSS's (Specialist) opinion that based on the brief field scan of the site and on the available information to date, there are no fatal flaws associated with the project and that provided the mitigation set out is adhered to NSS have no objections to the project going forward. An Environmental Management Programme supporting this BA outlines adequate methods and mitigation measures that need to be implemented in order for the identified impacts to not pose any environmental flaws associated with the proposed development of the piggery production facility and associated infrastructure.

Alternative 1

N/A

Alternative 2

N/A

No-go (compulsory)

Should the No-Go alternative take preference, it would result in there being no change to the farm operations. There will be no ability to develop increased profit and increase pork production to supply the pork industry. This opportunity to improve the local socio-economic situation and to use best practice pig farming methods, including improved pig welfare, will not be lost. There wont be increased and complicated waste to be managed on site where, odour and pest control problems associated with piggeries will not be present. The environment will not be affected and will remain as it is currently. The environmental impacts associated with the proposed development are considered to be of an acceptable level and can be effectively managed with the implementation of effective mitigation methods as discussed in the EMPr.

6. IMPACT SUMMARY OF THE PROPOSAL OR PREFERRED ALTERNATIVE

For proposal:

- Impact on soil (erosion and dust)
- Loss of vegetation and faunal habitat
- Impact on Conservation Important species
- Introduction and increase in alien vegetation
- Impact on wetland habitat
- Potential for pollution of water sources
- Waste generation
- Impact of pests and disease transmission
- Impact of traffic
- Employment opportunities created

For alternative:

N/A

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

This proposed project is the development of a piggery facility and associated infrastructure. These developments will be according to the SAPPO best guidelines when it comes to pig farming within the environmental legislation and ensuring minimal environmental impacts.

It is not feasible for the relocating of the proposed piggery site as firstly, this is the only available land to the applicant; secondly the chosen sight has the smallest impact on the environment. The site further ensure minimal biosecurity threats to the piggery where there is controlled access by people as well as other animals, by this preventing pests and transmission of infections posing a threat to the pigs. Lastly, as the land has previously been transformed, there will be further minimal environmental damage done to the site.

7. SPATIAL DEVELOPMENT TOOLS

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

The Spatial Development Framework (SDF) is the legislated component of the municipality's Integrated Development Plan (IDP) that prescribes development strategies and policy guidelines to restructure and reengineer the urban and rural form. The MSDF is a visual representation of the 'development vision' and 'interventions' required to achieve the development objectives of the Growth and Development Strategy (GDS) and Integrated Development Plan (IDP) of the Ekurhuleni Metropolitan Municipality. Further to providing the objectives reflecting the desired urban form of Ekurhuleni, the Spatial Development Framework also puts forward policies and strategies for achieving these objectives. It is of utmost importance that Ekurhuleni pursues an approach to development and build a city around a development area that takes cognisance of the four disadvantaged township areas on the peripheries of the metro. Ekurhuleni Metropolitan Spatial Development Framework: 2015 Ekurhuleni MSDF: 2015 44 Final activities in order to address the huge social agenda of the state and the Millennium Development Goals (MDGs). The proposed project falls within Region E- Ward 88 in the Ekurhuleni Metropolitan Municipality, (Figure below).

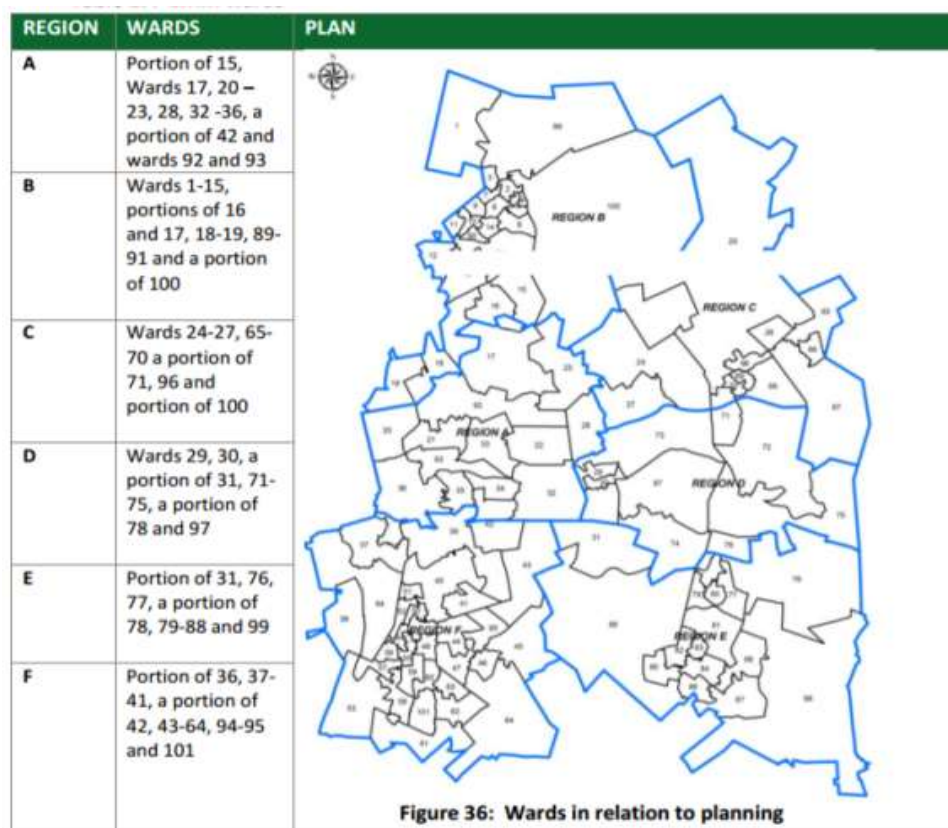


Figure 6: Ekurhuleni Metropolitan Municipality Spatial Development Framework 2015-2020 (Project area, Bottom Right of map) Region E- Ward 88

The proposed project falls within the rural category of land use where there is a high potential for agricultural practices. These areas have been earmarked by the regional authorities as vital in contributing to the region's economy and food security. This project will also be in the way forward in growing vibrant and sustainable rural communities. The proposed development has ticked these points and its development would have a multiplier effect by way of creating jobs and raising the money to be spent in the broader regional economy.

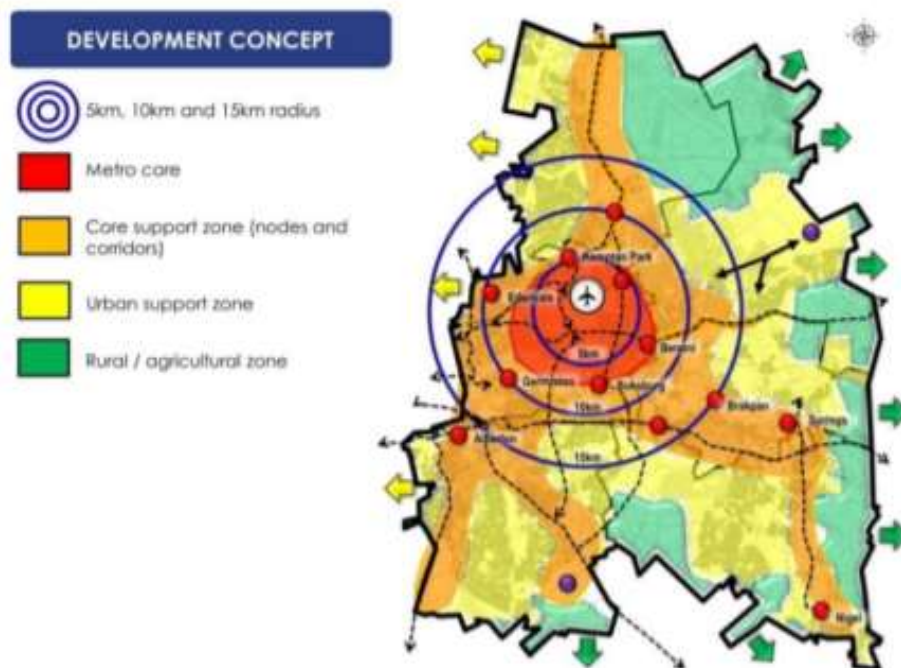


Figure 7: Regional Development Overview (Source: Ekurhuleni Metropolitan Spatial Development Framework: 2015-2020)

The regional overview of Ekurhuleni and its economic trends and tendencies indicates that the area is characterised by growing unemployment and increasing job losses especially in manufacturing – the primary activity in the area. This gives opportunity to the agricultural sector to take up this slack as said by the intentions of the proposed project.

The apparent weaknesses identified at the time were as follows:

- Ageing infrastructure and service interruptions;
- Decaying CBDs;
- Poor tourist promotion of assets; and
- Business costs of crime and violence.

The threats which were also apparent could be identified as being:

- Not realising the potential of the Metropolitan;
- Increased unemployment;
- Development constraints due to dolomite and undermining; and
- Inability to provide municipal services.

DRAFT BASIC ASSESSMENT REPORT

Basic Assessment for the Mojaletema Primary Co-Operative (Pty) Ltd's proposed piggery facility on
Portion 15 of Farm Bultfontein 192 IR, Nigel, Gauteng

8. RECOMMENDATION OF THE PRACTITIONER

Is the information contained in this report and the documentation attached hereto sufficient to make a decision in respect of the activity applied for (in the view of the Environmental Assessment Practitioner as bound by professional ethical standards and the code of conduct of EAPASA).

YES	NO
-----	----

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

N/A

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:

Through this BAR process, there has been the detailed analysis of all potential impacts of the proposed project. According to the specialist studies conducted on site the overall impact of the project results in a low environmental impact. This was however aided by certain management and mitigation measures as suggested in both the report and EMPr. Based on these findings, it is suggested that this proposal be approved, with the implementation of these mitigations:

- The EMPr of this proposed development must form part of the contractual agreement and be adhered to by both the contractors and the applicant.
- The recommendations of the specialists must be implemented.
- The applicant to ensure that there is representation of the applicant on site, at all times of the project phases, ensuring compliance with the conditions of the EMPr and Environmental Authorisation thereof.
- A Waste Management Licence must be obtained for the storage of pig waste in the lagoon.
- A Water Use Licence/ Borehole license must be obtained for the water usage associated with the piggery operations as well as the re-use of waste water for fertilisation.

It is the opinion of the EAP that the proposed development will comply with current relevant legislation, and that with the implementation of the mitigation measures suggested in this Report, there are no environmental impacts identified as highly detrimental to the environment or resulting as fatal flaws to the proposed project.

9. THE NEEDS AND DESIREBILITY OF THE PROPOSED DEVELOPMENT (as per notice 792 of 2012, or the updated version of this guideline)

PART I: NEED		
1	Is the land use associated with the activity being applied for considered within the timeframe intended by the existing approved SDF agreed to be the relevant environmental authority?	Yes. The proposed project land use (Agricultural) is aligned with the Ekurhuleni Metropolitan Municipality 2015-2020 where this has been identified as a means for rural development.
2	Should the development, or if applicable, expansion of the town/area concerned in terms of this land use occurs here at this point in time?	Yes. This is the optimal use of the land and aligns with the Ekurhuleni Metropolitan Municipality 2015-2020 with intended plans of developing economically vibrant and sustainable rural areas through agricultural developments.
3	Does the community/area need the activity and	Yes. The local context is one of a low income area

DRAFT BASIC ASSESSMENT REPORT

Basic Assessment for the Mojaletema Primary Co-Operative (Pty) Ltd's proposed piggery facility on Portion 15 of Farm Bultfontein 192 IR, Nigel, Gauteng

	the associated land use concerned? This refers to the strategic as well as local level.	with declining employment from dropping manufacturing plants. The increase of agricultural activities would result in employment opportunities and raising the socio-economic level through the pork industry on a local and regional level
4	Are the necessary services with adequate capacity currently available (at the time of application) or must additional capacity be created to cater for the development?	Yes. There are adequate services available in the area, electricity is already on site, it would need a new connection application to the piggery facility. Water use will be from a borehole for which a water use license would be required.
5	Is this development provided for in the infrastructure planning of the municipality, and if not what will the implication be on the infrastructure planning of the municipality (priority and placement of the services and opportunity cost)?	Yes and No. The project is already catered for in terms of electricity provision, however there would need to be an application for a new connectivity point for the piggery facility. For water there is a plan to provide water for domestic use as stated in the Ekurhuleni Metropolitan Municipality 2015-2020, as the area is water scarce the project may not have municipal water provided to it for commercial use. However the project would use borehole water therefore no impacts would be felt in this regard and the project wont impact the infrastructure planning of the Municipality.
6	Is the project part of a national programme to address an issue of national concern or importance?	The project does not fall into any specific national project, it does however address a specific national goal of improving food security as well as aiding in decreasing unemployment in the country through job creation.
PART II: DESIRABILITY		
1	Is the development the best practicable environmental option for this land/site?	Yes. As it is a small track of land, not enough for crop raising on that particular plot. A structure of a piggery facility best suits the size and the chosen industry (pork) yields the best results economically. Further, this results in the minimal impact on the environment.
2	Would the approval of this application compromise the integrity of the existing approved and credible IDP and SDF as agreed to by the relevant authorities?	No. The approval of this project would be in line with the relevant authorities attempt to make rural areas more economically vibrant and sustainable as stated in the Ekurhuleni Metropolitan Municipality Spatial Development Framework 2015-2020.
3	Would the approval of this application compromise the integrity of the existing environmental management priorities for the area (e.g. as defined in EMFs), and if so, can it be justified in terms of sustainability considerations?	No. This area according to the Ekurhuleni Metropolitan Municipality Spatial Development Framework has been targeted as one of the areas agricultural areas. This project is aligning with that development goal whilst not causing any harm to the surrounding environment as supported in the Specialist Study on the Ecology of the area (Appendix G).
4	Do location factors favour this land use at this place? (this relates to the contextualization of the proposed land use on this site within its broader context).	Yes. The site is within the intended agricultural zones of the municipality as well as the greater Gauteng spatial development plans. Further, proximity to a major road makes it more suited for distribution means to market both locally and provincially.
5	How will the activity of the land use associated	The proposed project does not need a land use

DRAFT BASIC ASSESSMENT REPORT

Basic Assessment for the Mojaletema Primary Co-Operative (Pty) Ltd's proposed piggery facility on Portion 15 of Farm Bultfontein 192 IR, Nigel, Gauteng

	with the activity being applied for, impact on sensitive natural and cultural areas (built and rural/natural environment)?	change as is already marked as agricultural. The impacts of the proposed project as outlined in both the Ecological and Heritage studies conducted (Appendix G). Further, within these studies it states the proposed project as having a low impact on the environment and none on heritage of the site with the proposed mitigation measures being implemented.
6	How will the development impact on people's health and well-being? (E.g. In terms of noise, odours, visual character and sense of place, etc.)?	The proposed project will have a positive impact on peoples health and well-being in the form of providing them with better food security and nutrition at affordable prices. The only effects in terms of noise would mostly be during the construction phase, thereafter the noise levels would be negligible. Odour will be present from the anaerobic process of dealing with the slurry produced during the operational stages of the project, however this will be minimal due to the methods used to mask the smell. The proposed project will occur in an already functioning farm so there will be minimal impact visually and the sense of place.
7	Will the proposed activity or the land use associated with the activity being applied for, result in unacceptable opportunity costs?	No. The proposed industry (pork) is the second fastest growing industry in South Africa, due to the limited amount of land available, this is the best option for economic development on this farm. Further the turnaround time of the industry make its more viable. Further, the industry presents the opportunity to export to the SADC region in future.
8	Will the proposed land use result in unacceptable cumulative impacts?	No. The proposed projects cumulative impacts have been labeled as having a low impact expect those resulting in job creation therefore raising the socio-economic status of the area. The other impacts have mitigation measures proposed which would lessen their impact, these outlined in the EMPr.

10. THE PERIOD FOR WHICH THE ENVIRONMENTAL AUTHORISATION IS REQUIRED (consider when the activity is expected to be concluded)

The Environmental Authorisation is required for a minimum of 20 years.

11. ENVIRONMENTAL MANAGEMENT PROGRAMME (EMPr) (must include post construction monitoring requirements and when these will be concluded.)

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

EMPr attached.

YES

A close-up photograph of a pig's face, looking directly at the camera. The pig has a large, pink snout and is standing on a metal grate floor. Other pigs are visible in the background.

Basic Assessment for the
Mojaletema Primary Co-
Operative (Pty) Ltd's proposed
piggery facility on Portion 15 of
Farm Bultfontein 192 IR,
Nigel, Gauteng.

SECTION F: APPENDICES



SECTION F: APPENDICES

The following appendices are attached to this BA Report:

Appendix A	Site plan(s) - (must include a scaled layout plan of the proposed activities overlain on the site sensitivities indicating areas to be avoided including buffers)
Appendix B	Photographs
Appendix C	Facility illustration(s)
Appendix D	Route position information - N/A
Appendix E	Public participation information
Appendix F	Water use license(s) authorisation - Not applicable at this stage SAHRA information Service letters from municipalities - Not applicable Water supply information - Not applicable at this stage
Appendix G	Specialist Reports
Appendix H	Environmental Management Programme
Appendix I	CVs of the BA Project team

A close-up photograph of a pink pig in a pen, looking directly at the camera. The pig's large, pink ear is prominent on the left side of the frame. The background shows other pigs and the metal bars of the pen.

Basic Assessment for the
Mojaletema Primary Co-
Operative (Pty) Ltd's proposed
piggery facility on Portion 15 of
Farm Bultfontein 192 IR,
Nigel, Gauteng.

SECTION F: APPENDICES



SECTION F: APPENDICES

DRAFT BASIC ASSESSMENT REPORT

Basic Assessment for the Mojaletema Primary Co-Operative (Pty) Ltd's proposed piggery facility on Portion 15 of Farm Bultfontein 192 IR, Nigel, Gauteng.

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Appendix G	Specialist Reports
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Appendix I	CVs of the BA Project team



SECTION F: APPENDICES

DRAFT BASIC ASSESSMENT REPORT

Basic Assessment for the Mojaletema Primary Co-Operative (Pty) Ltd's proposed piggery facility on Portion 15 of Farm Bultfontein 192 IR, Nigel, Gauteng.

BASIC ASSESSMENT REPORT

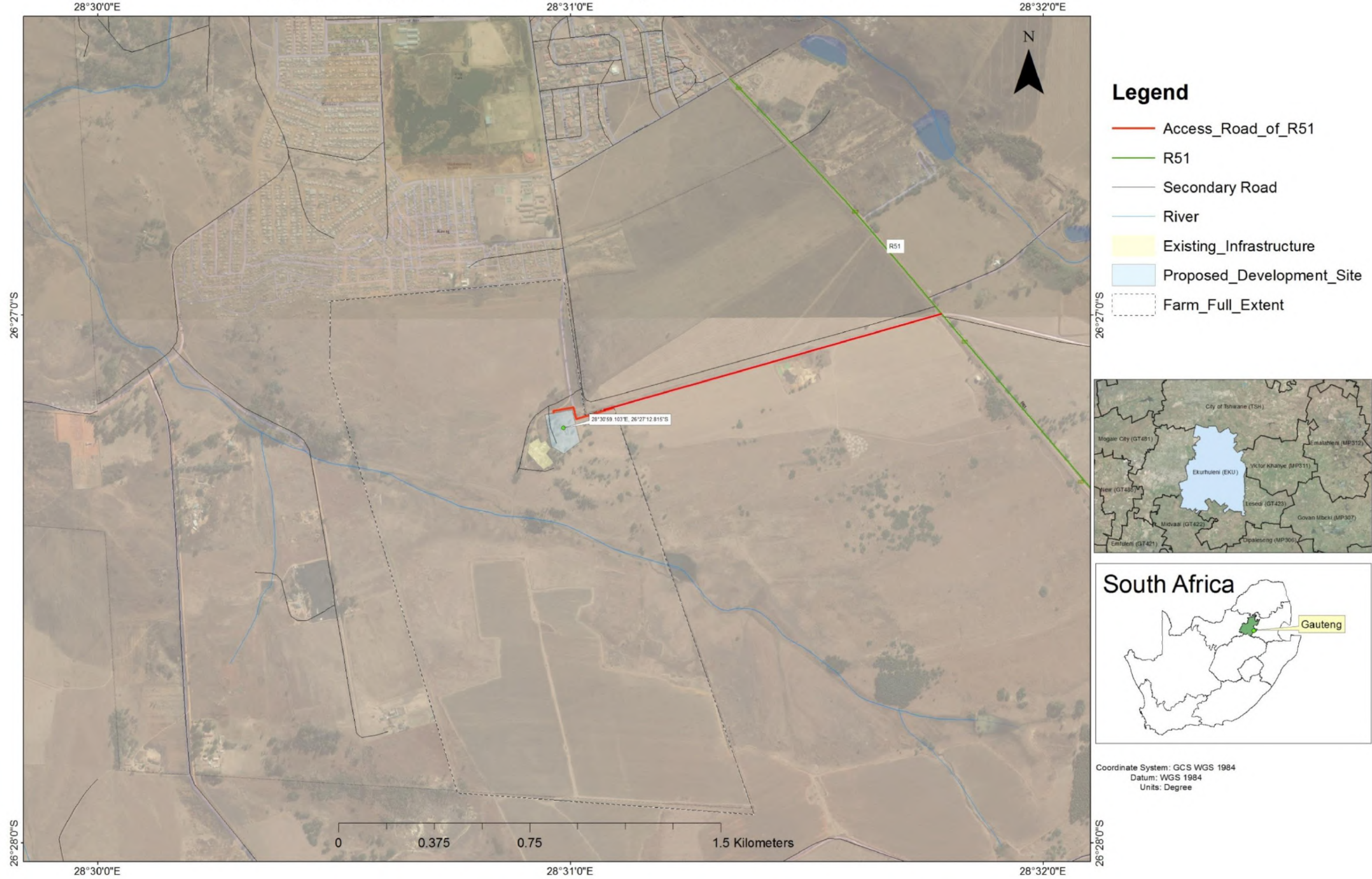
APPENDIX A: SITE LAYOUT PLANS

contents

Appendix 1.A:	Location of proposed project site of Mojaletema Primary Co-Operative on Portion 15 of Farm Bultfontein in Nigel, Gauteng.	3
Appendix 1.B:	Proposed site layout of Mojaletema Primary Co-Operative	4
Appendix 1.C:	Layout of vegetation found on the Mojaletema Primary Co-Operative site	5

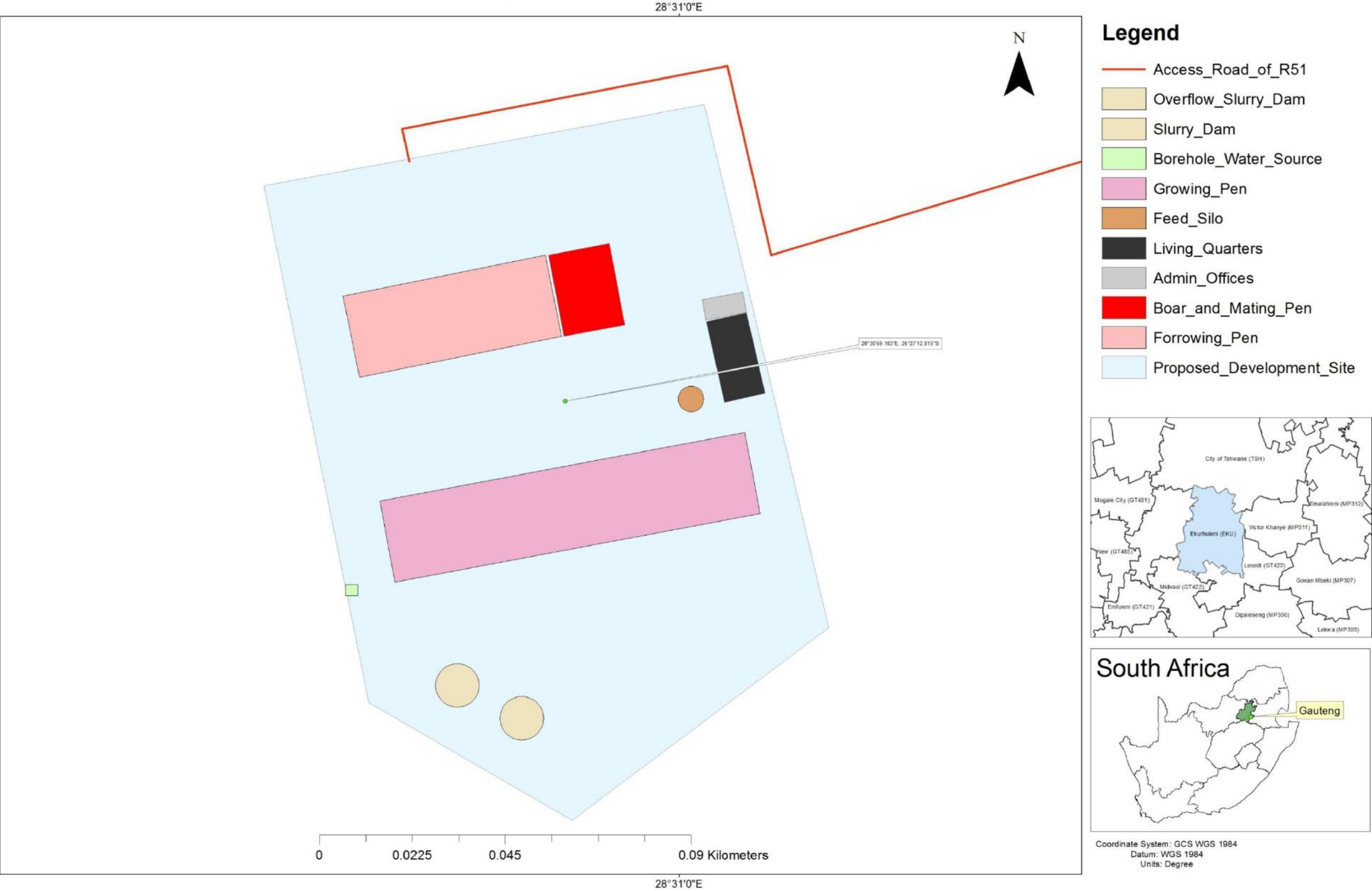
Appendix 1.A: Location of proposed project site of Mojaletema Primary Co-Operative on Portion 15 of Farm Bultfontein in Nigel, Gauteng.

Map 1A: Mojaletema Primary Co-Operative Site Location

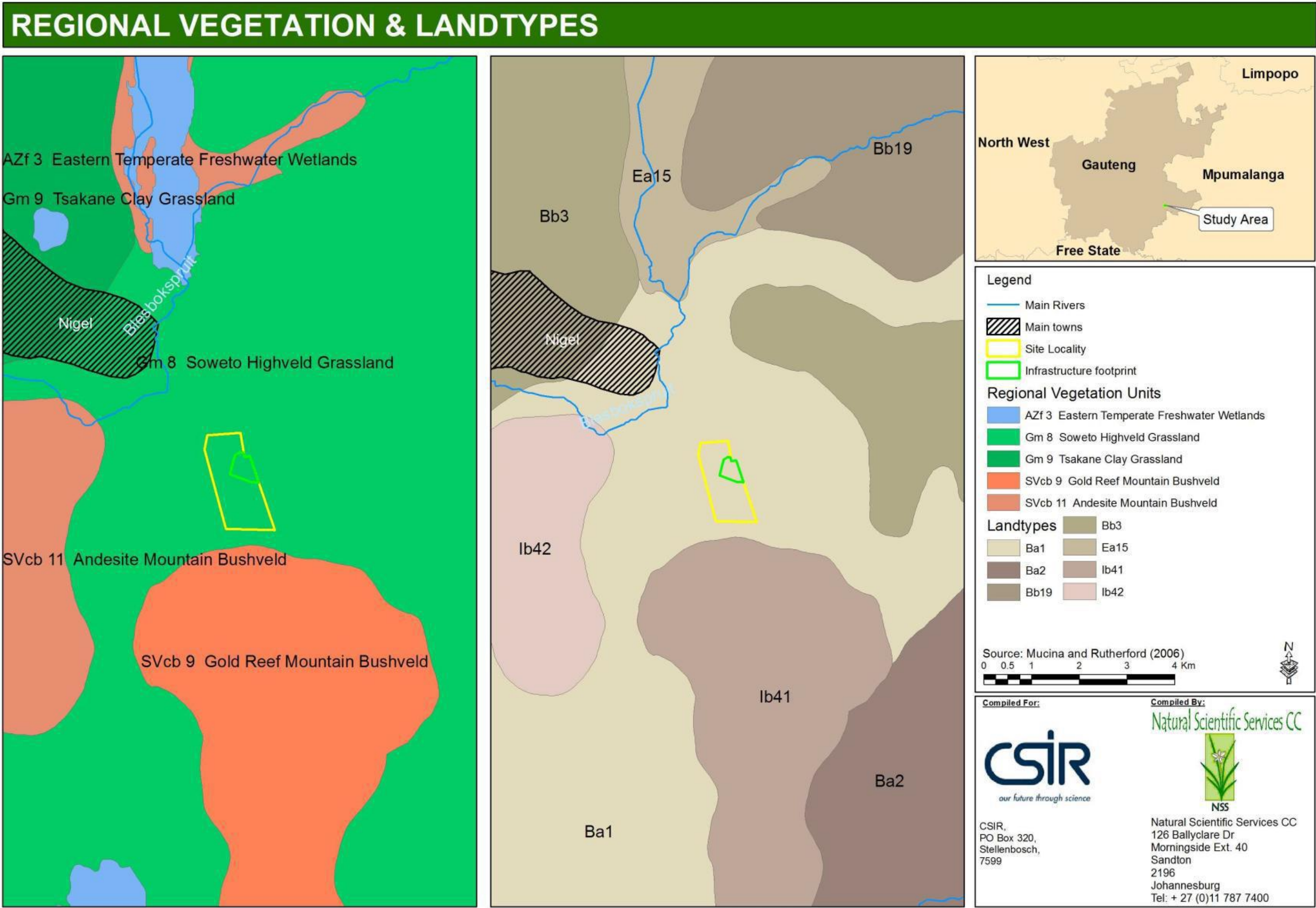


Appendix 1.B: Proposed site layout of Mojaletema Primary Co-Operative

Mojaletema Proposed Site Layout Map



Appendix 1.C: Layout of vegetation found on the Mojaletema Primary Co-Operative site



SECTION F: APPENDICES

DRAFT BASIC ASSESSMENT REPORT

Basic Assessment for the Mojaletema Primary Co-Operative (Pty) Ltd's proposed piggery facility on Portion 15 of Farm Bultfontein 192 IR, Nigel, Gauteng

BASIC ASSESSMENT REPORT

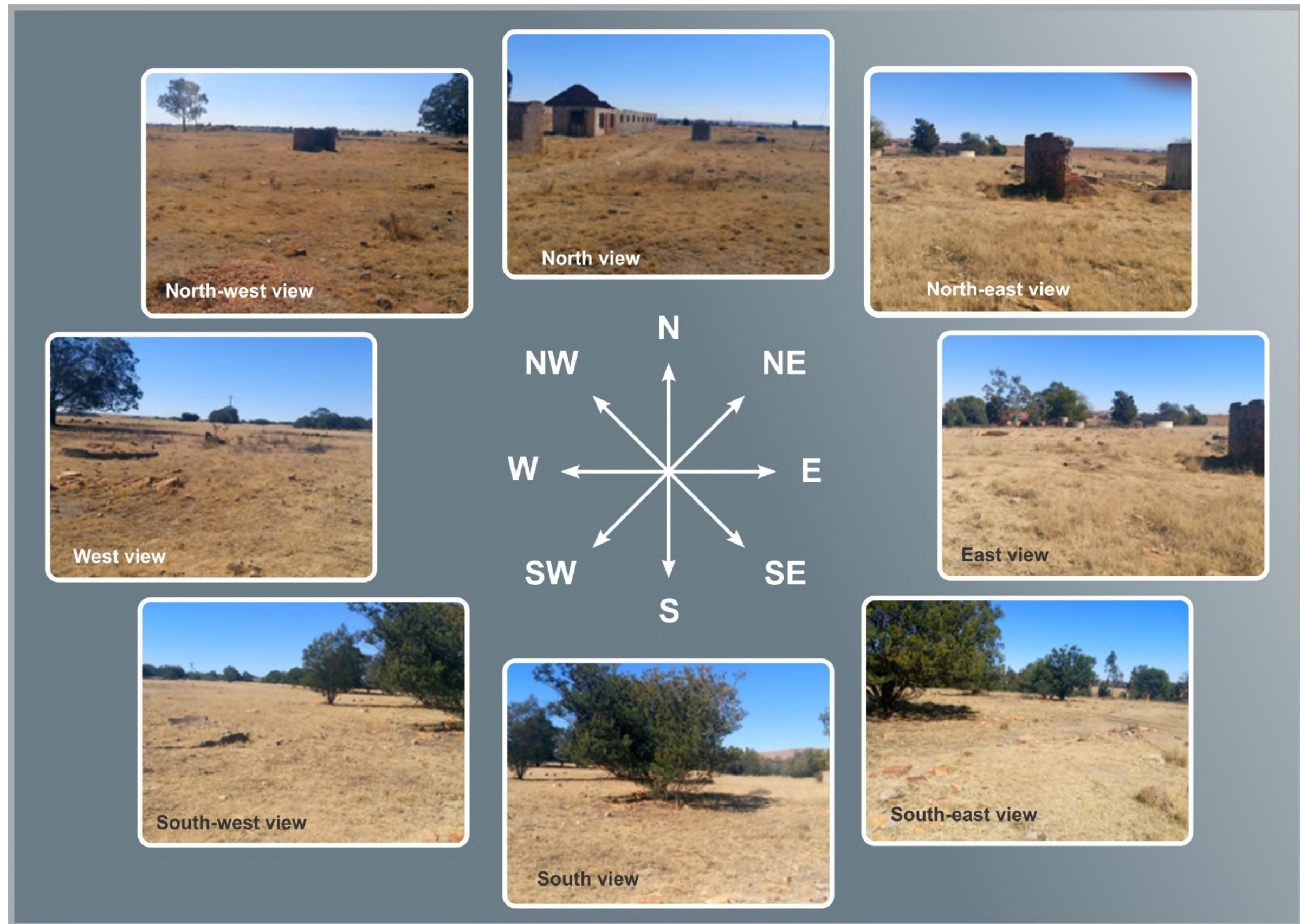
APPENDIX B: PHOTOGRAPHS

contents

Appendix B:	Site photographs taken in the eight major compass directions for the proposed piggery development of Mojaletema Primary Co-Operative	2
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SECTION F: APPENDICES

Appendix B: Site photographs taken in the eight major compass directions for the proposed piggery development of Mojaletema Primary Co-Operative



SECTION F: APPENDICES

DRAFT BASIC ASSESSMENT REPORT

Basic Assessment for the Mojaletema Primary Co-Operative (Pty) Ltd's proposed piggery facility on
Portion 15 of Farm Bultfontein 192 IR, Nigel, Gauteng

BASIC ASSESSMENT REPORT

APPENDIX C: FACILITY ILLUSTRATION

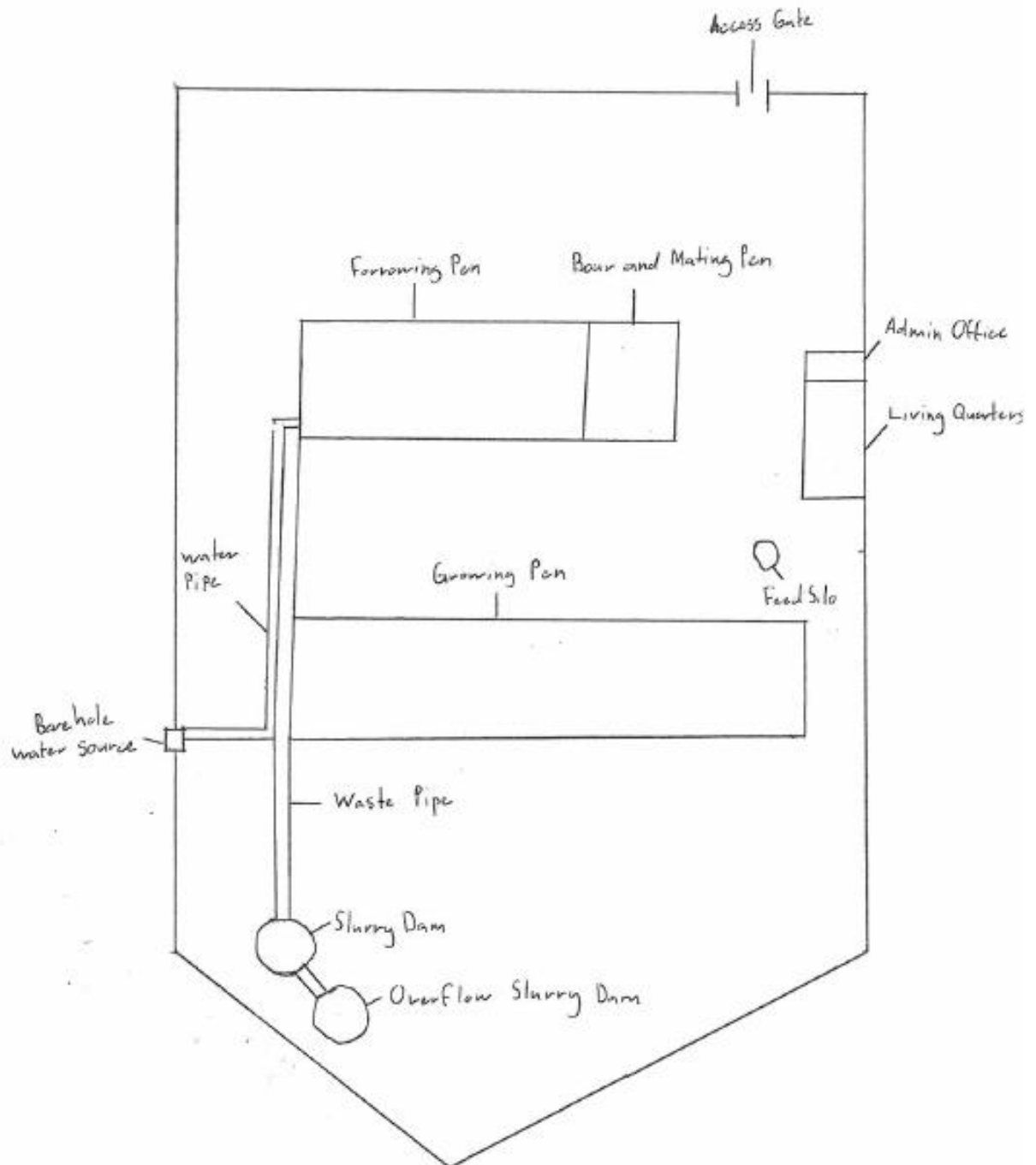
contents

Appendix C: Hand drawing of the site facility _____ 2

SECTION F: APPENDICES

Appendix C: Hand drawing of the site facility

Majaletema Primary Co-Operative Facility Illustration



1cm = 5m

BASIC ASSESSMENT REPORT

APPENDIX D: Route position information

N/A

SECTION F: APPENDICES

DRAFT BASIC ASSESSMENT REPORT

Basic Assessment for the Mojaletema Primary Co-Operative (Pty) Ltd's proposed piggery facility on Portion 15 of Farm Bultfontein 192 IR, Nigel, Gauteng

BASIC ASSESSMENT REPORT

APPENDIX E: PUBLIC PARTICIPATION

contents

Appendix E1: Proof of site notices	3
Contents of the site notices (English) placed at the gate to the proposed site (GPS co-ordinates)	4
Appendix E2: Letter to Interested and Affected Parties to notify them of the proposed piggery project	6
Background Information Document and Postal List: Project Announcement (including letter 1, comment form and BID)- 30 September 2016	6
Email 1 to I&Aps: Project Announcement (30 September 2016)	12
Appendix E3: Proof of newspaper advertisements	17
Newspaper Advertisement (English) placed in Heidelberg/Nigel Heraut on 24 August 2016	17
Newspaper Advertisement (Tswana) placed in Heidelberg/Nigel Rekord on 30 August 2016	18

SECTION F: APPENDICES

DRAFT BASIC ASSESSMENT REPORT

Basic Assessment for the Mojaletema Primary Co-Operative (Pty) Ltd's proposed piggery facility on Portion 15 of Farm Bultfontein 192 IR, Nigel, Gauteng

Contents of the Newspaper Advertisement (English) placed in Heidelberg/ Nigel Heraut on 24 August 2016	19
Contents of the Newspaper Advertisement (Tswana) placed in Heidelberg/ Nigel Rekord on 30 August 2016	20
Appendix E4: –Communications to and from interested and affected parties	21
Appendix E5: Minutes of any public and/or stakeholder meetings- Not Applicable	28
Appendix E6: Comments and Responses Report (To be received after draft Basic Report)	28
Appendix E7: Comments from I&APs on Basic Assessment (BA) Report- (To be received after draft Basic Report).	28
Appendix E8: Comments from I&APs on amendments to the BA Report- N/A at this stage of the BA process	28
Appendix E9: Copy of the register of I&APs.	29



SECTION F: APPENDICES

Appendix E1: Proof of site notices



SECTION F: APPENDICES

Contents of the site notices (English) placed at the gate to the proposed site (GPS co-ordinates)

Mojaletema Co-Operative (Pty) Ltd Pig Production Facility on farm portion 5 Uitkyk, Nigel, Gauteng

Reference number: CSIR/IU/EMS/ER/2016/0003/A
NOTICE OF A BASIC ASSESSMENT (BA) PROCESS

Notice is hereby given, in terms of the Environmental Impact Assessment (EIA) Regulations, under sub-regulation 41(1) and sub-regulation 41(4), published in Government Gazette No 38282 of 8 December 2014, of the National Environmental Management Act, 1998 (Act No 107 of 1998), that **Mojaletema Co-Operative (Pty) Ltd**, proposes a small-scale pig production facility on 1.8 hectares of the farm portion 5 Uitkyk, located in the Nigel area of Ekurhuleni, Gauteng Province.

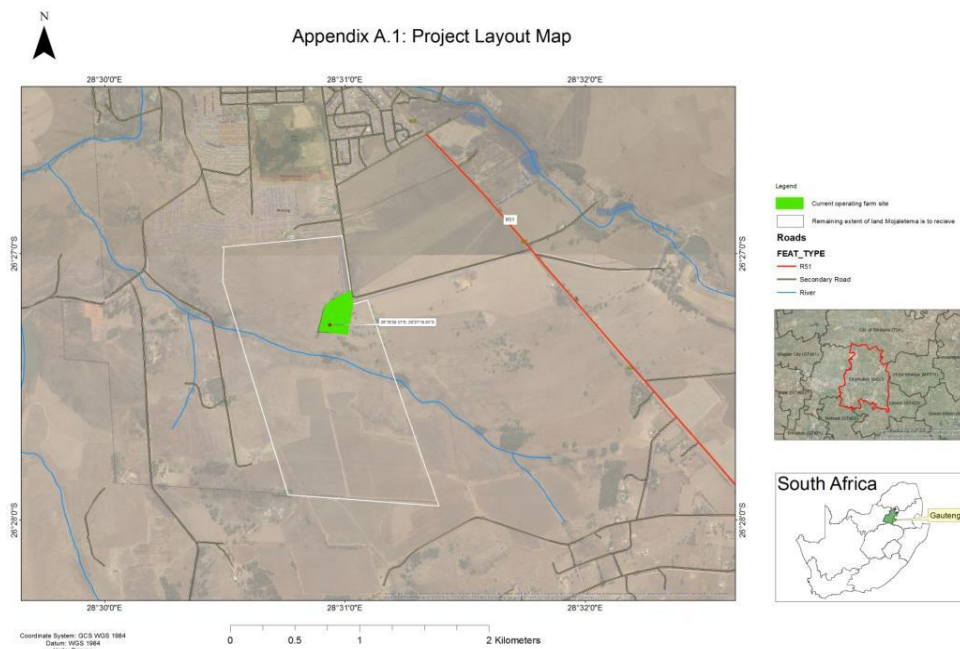
The Council for Scientific and Industrial Research (CSIR), as the independent Environmental Assessment Practitioner, will manage the required Basic Assessment process for the proposed project. The project will be registered with the Gauteng Department of Agriculture and Rural Development (GDARD). The need for a Basic Assessment is triggered by the following activities listed in Government Notice Regulations (GNR) 983 of 8 December 2014:

Government Notice	Listed Activity Number
GNR 983, 8 December 2014	4
GNR 983, 8 December 2014	27
GNR 921, 29 November 2013	Category A: 1 & 12

To obtain further information with regards to the project and Basic Assessment process, or to register as Interested and Affected Party (I&AP), please contact:



Ms. Babalwa Mqokeli
PO Box 320, Stellenbosch, 7599
Tel: 021 888 2432
Fax: 021 888 2473
Email: bmqokeli@csir.co.za



Locality Map depicting the location of the Proposed Project

SECTION F: APPENDICES

Mojaletema Co-Operative (Pty) Ltd Pig Production Facility on farm portion 5 Uitkyk, Nigel, Gauteng

Inombolo ye-Nkomba: CSIR/IU/EMS/ER/2016/0003/A

ISAZISO NGOQHUBO LOKUHLOLA SISEKELO

ISaziso sikhishwa ngokweMithethonqubo yokuHlola Umthelela kwezeMvelo (Environmental Impact Assessment (EIA), kwisigatshana somthethonqubo 41 (2) (a), enyatheliswe kwi Gazette Ka Hulumeni nombolo 38282 ka 4 December 2014, kumthetho i-National Environmental Management Act 1998 (Act No. 107 of 1998), ukuba iMojaletema Co-Operative (Pty) Ltd ihlongoza ukwakha ibhizinisi lokukhulisa izingulube endaweni engamahektha awu 1.8 kwingxenye 5 yePulazi Uitkyk, esendaweni yase Nigel, Ekurhuleni, eGoli.

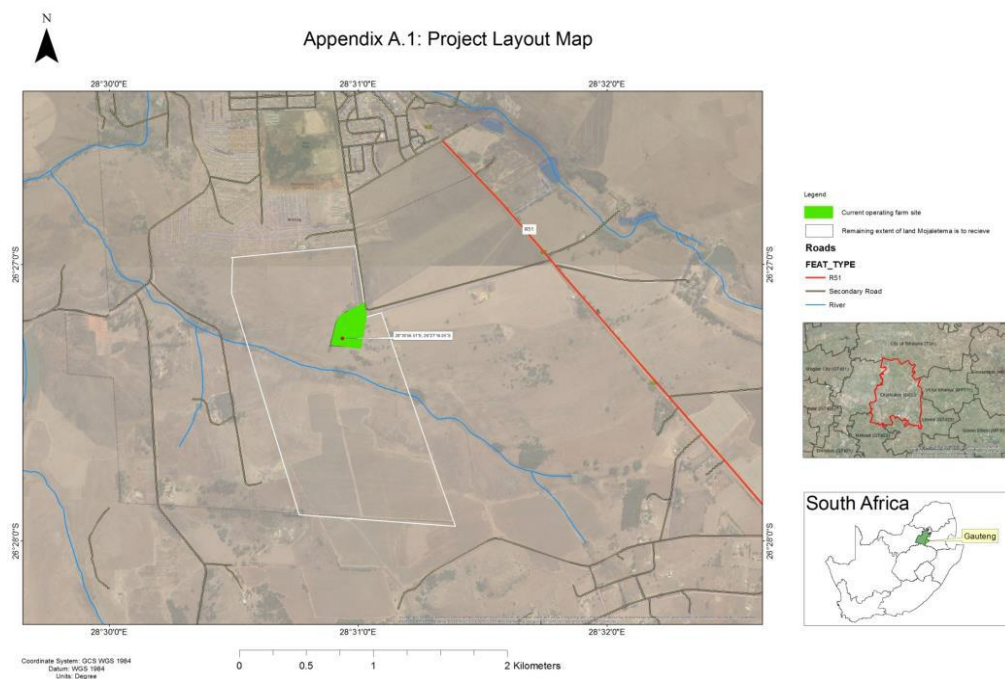
i-Council for Scientific and Industrial Research (i-CSIR), njenge Environmental Assessment Practitioner ezimele, izophatha imisebenzi ehambisana ne-Basic Assessment Process mayelana nalephrojekthi ephakamisiwe. Iphrojekthi izobhaliswe ne-Gauteng Department of Agriculture and Rural Development (GDARD). Isidingo se-Basic Assessment silethwa ilemisebenzi elandelayo ebaliwe kwimithethonqubo ye-Saziso sika Hulumeni 983, ka 8 December 2014.

ISaziso sika Hulumeni	Inombolo yomsebenzi Obaliwe
GNR 983, 8 December 2014	4
GNR 983, 8 December 2014	12
GNR 921, 29 November 2013	Category A: 1 & 12

Ukuthola ulwazi ngalephrojekthi nokuhamba kwe-Basic Assessment, noma ufuna ukwaziwa njengo muntu othikamezekayo i-lephrojekthi, sicela uxhumane nathi kulemininingwane elandelayo.



Ms. Babalwa Mqokeli
PO Box 320, Stellenbosch, 7599
Tel: 021 888 2432
Fax: 021 888 2473
Email: bmqokeli@csir.co.za



Isithombe 1: Indawo lapho i-Mojaletema Co-Operative ihlongoza ukwakha ibhizinisi lokukhulisa izingulube kwingxenye 5 yePulazi Uitkyk, esendaweni yase Nigel, Ekurhuleni, eGoli.

SECTION F: APPENDICES

Appendix E2: Letter to Interested and Affected Parties to notify them of the proposed piggery project

Background Information Document and Postal List: Project Announcement (including letter 1, comment form and BID)- 30 September 2016

Background Information Document

Basic Assessment for the proposed Mojaletema Co-Operative (Pty) Ltd Pig Production facility on farm portion 5 Uitkyk, Nigel, Gauteng

Prepared by CSIR on behalf of Mojaletema Co-Operative (Pty) Ltd



Babalwa Mqokeli

bmqokeli@csir.co.za

Tel: (021) 888 2432



SECTION F: APPENDICES

You are invited to participate in the following process:

INTRODUCTION TO THE PROPOSED PROJECT

Mojaletema Co-Operative (Pty) Ltd is proposing a small-scale pig production endeavour on 1.8 hectares of the farm portion 5 Uitkyk, located in the Nigel, Gauteng Province. This area falls under the Ekurhuleni Municipality, and is approximately 65 km South East of Johannesburg (Figure 1). The proposed project will include the following components:

- Build a pig house for 80 sow and 5 boars
- Build a processing and packaging room
- Already existing municipal infrastructure (roads and electricity connection).

South African pork industry is relatively large in terms of overall South African agricultural sector. It contributes around 2.15% to the primary agricultural sector. The Mojaletema Co-Operative will seek to boost local economic development in the area and provide opportunities to decrease poverty and unemployment. Mojaletem Co-Operative (Pty) Ltd is being provided *pro-bono* environmental services by the DEA/CSIR's Special Needs and Skills Development Programme, which aims to assist small-medium micro-enterprises with the application for Environmental Authorisation in order to enhance local economic development.

SUMMARY OF THE BASIC ASSESSMENT PROCESS

In terms of the National Environmental Management Act (NEMA) EIA Regulations published in GNR 983, 984 and 985 of 4 December 2014 Government Gazette Number 38282, and NEM:WA Regulations published in GNR 921 on the 29 November 2013 Government Gazette No 37083, a **Basic Assessment** (BA) process and a **Waste Management License** is required as the project applies to the following listed activities (detailed in Table 1 below).

Table 1: Listed activities relating to the proposed project

Relevant notice:	Activity No (s) (in terms of the relevant notice) :	Description of each listed activity as per the Government Notice:
GN. R 983, 4 December 2014	4	The development and related operation of facilities or infrastructure for the concentration of animals for the purpose of commercial production in densities that exceed- (i) 20 square metres per large stock unit and more than 500 units per facility; (ii) 8 square metres per small stock unit and; a. More than 1000 units per facility excluding pigs where (b) applies; b. More than 250 pigs per facility excluding piglets that are not yet weaned.
GN. R 983, 4 December 2014	27	The clearance of an area of 1 hectare or more, but less than 20 hectares, of indigenous vegetation, except where such clearance of indigenous vegetation is required for- (i) The undertaking of a linear activity. (ii) Maintenance purposes undertaken in accordance with a maintenance management plan.
GN. R 985, 4 December 2014	12.	The clearance of an area of 300 square meters or more of indigenous vegetation except where such clearance of indigenous vegetation is required for maintenance purposes undertaken in accordance with a maintenance management plan.(ii) Within the critical biodiversity areas identified in bioregional plans.
GN. R 985, 4 December 2014	14.	The development of-(iv) dams, where the dam, including infrastructure and water surface areas exceeds 10 square meters in size Sites identified as Critical Biodiversity Areas (CBAs) and Ecological Support Areas (ESAs) in the Gauteng Conservation Plan or in bioregional

SECTION F: APPENDICES

Relevant notice:	Activity No (s) (in terms of the relevant notice) :	Description of each listed activity as per the Government Notice:
		plans
GN. R 921, 29 November 2013	Category A - 1	The storage of general waste in lagoons.
GN. R 921, 29 November 2013	Category A - 12	The construction of a facility for a waste management activity listed in Category A of this Schedule (not in isolation to associated waste management activity).

The proposed project requires Environmental Authorization (EA) from the Department of Agriculture and Rural Development, Gauteng (GDARD). The Basic Assessment process that will be undertaken for this project is summarised in the following steps below:

Step 1: Notify Authorities and potential Interested and affected parties (I&APs) (30 days)

The first stage in the process entails notifying all potential I&APs of the proposed project, by sending out a Background Information Document (BID), and providing I&APs with an opportunity to register as an I&AP. I&APs are required to register their interest on the project database within 30 days hereof.

Step 2: Basic Assessment Report (BAR) for Public Comment (30 days)

The BA process is undertaken in order to identify and assess potential environmental impacts, both positive and negative, that may be associated with the project. Mitigation and management measures will be identified to reduce potential negative impacts and will be included in the Environmental Management Programme (EMPr) for this project. The BAR will include comments received from all I&APs on this document and findings of the specialist study.

Step 3: BAR to be submitted to GDARD for decision-making

The BAR will be drafted and will be submitted to GDARD for decision-making. The comments and issues raised will be included in the BAR. All I&APs will be provided with written notification on whether the project has been granted or refused EA and about the appeal process.

HOW CAN YOU GET INVOLVED?

1. By mailing, emailing or faxing a comment form to the Environmental Assessment Practitioner indicated below/telephonically contacting the Environmental Assessment Practitioner if you have a query, comment, or require further information regarding the BA process.
2. By reviewing the various reports and provide comments within the stipulated comment periods provided (i.e. the BID and BAR).

To register as an I&AP or to comment on the project, please complete the Comment/Registration Form that has been included with this BID and kindly send to **Ms. Babalwa Mqokeli** on or before 30 September 2016:

Ms. Babalwa Mqokeli	
	Email: bmqokeli@csir.co.za
	Tel: 021-888-2432
	Fax: 021-888-2693
	Address: CSIR, PO Box 320, Stellenbosch, 7599
	Website: http://www.csir.co.za/ems/specialneeds/

SECTION F: APPENDICES

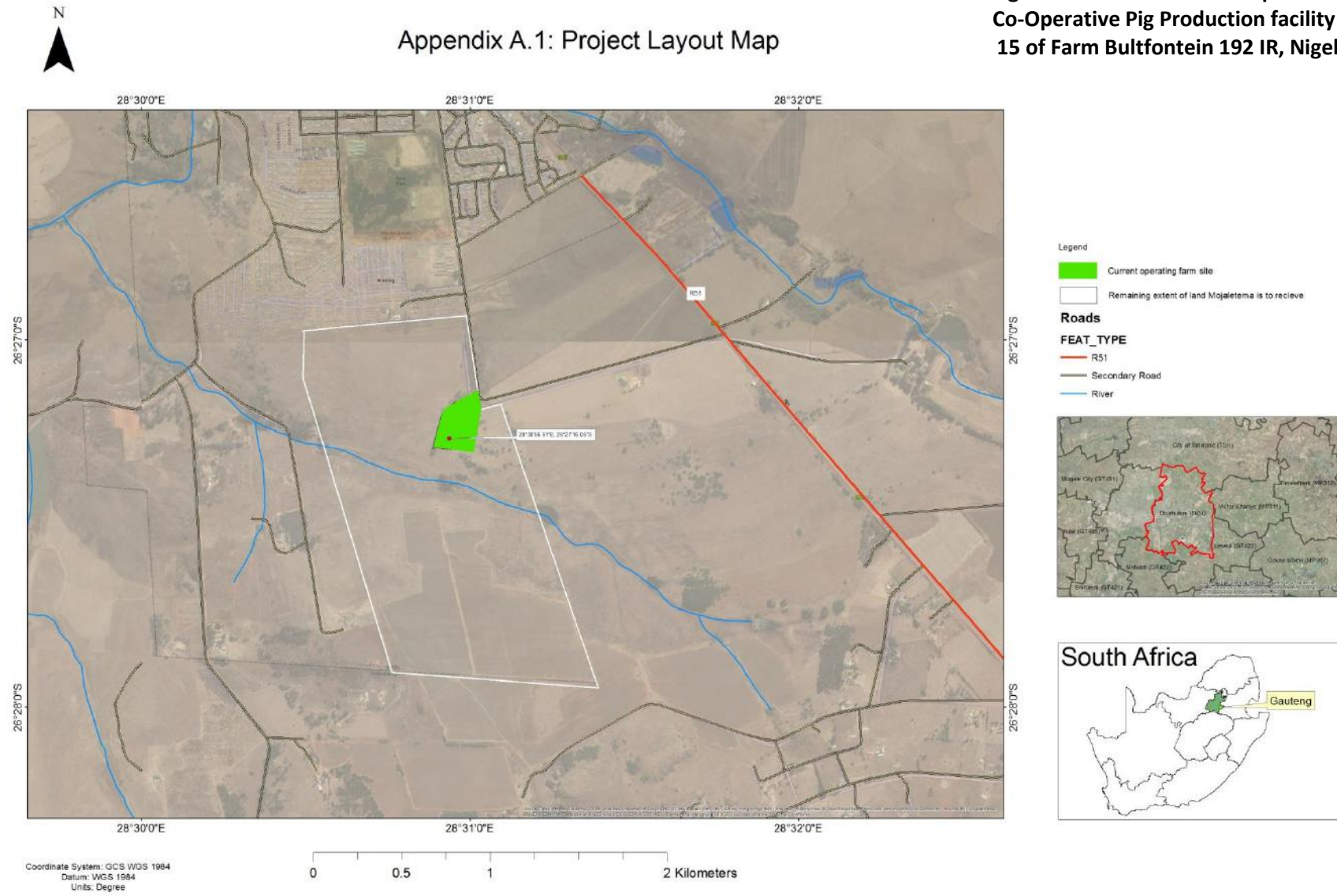


Figure 1: Location of the Proposed Mojaletema Co-Operative Pig Production facility on Portion 15 of Farm Bultfontein 192 IR, Nigel, Gauteng.



CSIR Implementation Unit

PO Box 320
Stellenbosch
7599
South Africa
Tel: +27 21 888 2432
Fax: +27 21 888 2473
Email: bmqokeli@csir.co.za

30 September 2016

Dear Interested and/or Affected Party,

PROJECT ANNOUNCEMENT

BASIC ASSESSMENT FOR THE PROPOSED MOJALETEMA CO-OPERATIVE (PTY) LTD PIG PRODUCTION FACILITY ON PORTION 5 OF FARM UITKYK, NIGEL, GAUTENG

REFERENCE NUMBER: CSIR/IU/EMS/ER/2016/0003/A

The National Department of Environmental Affairs (DEA) have initiated the Special Needs and Skills Development Programme, whereby small-medium micro-enterprises and community trusts who are lacking financial means are provided with *pro-bono* environmental services to decrease the burden of the cost associated with starting a business. The Council for Scientific and Industrial Research (CSIR) was appointed by DEA to manage the project on their behalf. **Mojaletema Co-Operative (Pty) Ltd** has been identified as an eligible client for this service and is proposing to develop a small-scale pig production on Portion 5 of Farm Uitkyk, located in Nigel, in the Ekurhuleni municipality area, Gauteng.

In terms of Government Notice Regulations (GNR) 983, 984 and 985 of 4 December 2014 of the National Environmental Management Act (Act 107 of 1998) published in Government Gazette 38282 on 8 December 2014, Environmental Authorisation from the Competent Authority, in this case the Gauteng Department of Agriculture and Rural Development (GDARD), is required prior to the undertaking of any activity triggered within GNR 983, 984 and/or 985. The CSIR will be managing the Basic Assessment and Public Participation Process for this proposed project.

In line with the Environmental Impact Assessment requirements of December 2014, Interested and Affected Parties (I&APs) must be notified and are requested to register for this project in order to receive future correspondence on this project and/or provide comments on issues of concern that will be considered during the Basic Assessment process. Please find enclosed with this letter a **Background Information Document (BID)** and a **Comment and Registration form**. You have until on or before 30 September 2016 to register and submit your comments for this project. To register and submit comments for the project please complete the Registration Form together by supplying your full name, contact details (preferred method of notification, e.g., full postal or email address), fax/phone number(s) and an indication of any direct business, financial, personal or other interest you have in the application to the contact person listed below.

Yours sincerely,

Ms. Babalwa Mqokeli (Project Manager)

Postal address: PO Box 320, Stellenbosch, 7599, South Africa
Tel: 021 888 2432
Fax: 021 888 2693
E-mail: bmqokeli@csir.co.za
Website: <http://www.csir.co.za/ems/specialneeds/>

SECTION F: APPENDICES

Name & Signature of person responsible for post: JOHN: JRL

19 Items – NORMAL post (Mojaletema – Sent on 30 Aug 2016)

NMS0076 / RU N / 02100 / 0215E

Dept of Environmental Affairs – National Mmatlala Rabothata Fedsure Building Private Bag X 447 Pretoria 0001	Dept of Rural Development & Land Reform Bonginkosi Zulu Fedsure Building Private Bag X 447 Pretoria 0001	Dept of Agriculture, Forestry & Fisheries Mashudu Marubini Private Bag X 138 Pretoria 0001
National Dept of Mineral Resources Kgauta Mokoena Private Bag X59 Arcadia 0007	National Dept of Mineral Resources Khayaletu Matrose Private Bag X59 Arcadia 0007	Dept of Agriculture, Forestry & Fisheries Ms Thoko Buthelezi Private Bag X 120 Pretoria 0001
Dept of Agriculture and Rural Development Mr Lebogang Malle PO Box 8769 Johannesburg 2000	Dept of Community Safety Ms Sizakele Nkosi-Malobane PO Box 62440 Masharlitown 2107	Lerato Senakhomo Project Applicant PO Box 860 Nigel 1490
Matshidiso Care of Lerato Senakhomo Project Applicant PO Box 860 Nigel 1490	Sonia Care of Lerato Senakhomo Project Applicant PO Box 860 Nigel 1490	Gladys Care of Lerato Senakhomo Project Applicant PO Box 860 Nigel 1490
Dept of Cooperative Governance and Traditional Affairs Mr Paul Mashatile Private Bag X 86 Masharlitown 2107	Dept of Water and Sanitation Mr Philemon Mashoko Private Bag X 1069 Germiston 1400	Dept of Enterprise Programme Management Mr Andile Mahlalutye Private Bag X 1069 Germiston 1400
Dept of Waste Management Qaphile Gwensa Private Bag X 1069 Germiston 1400	Dept of Environmental Resource Management and Development Hezekiel Nkosi Private Bag X 1069 Germiston 1400	Dept of Economic Development Calphus Chauke Private Bag X 1069 Germiston 1400

Dept of City Planning and Development Mr Aubrey Motubatse Private Bag X 1069 Germiston 1400		
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SECTION F: APPENDICES

Email 1 to I&As: Project Announcement (30 September 2016)

From: Samukele Ngema

To: Samukele Ngema; Babalwa Mqokeli; Minnelise Levendal

BC mrabothata@environment.gov.za; SHlela@environment.gov.za; tnenarude@environment.gov.za;
ncamisile.nkabinde@drdlr.gov.za; mashuduma@daff.gov.za; kgauta.mokoena@dmr.gov.za; MohapiN@dwa.gov.za;
MuthraparsadN@dwa.gov.za; khayaletu.matrose@dmr.gov.za; MMolefane@thedti.gov.za; thokob@daff.gov.za;
Thandeka.Mbasa@gauteng.gov.za; Thabo.Ntuli@gauteng.gov.za; Ntlakanipho.Nkontwana@gauteng.gov.za;
Thokozile.Makgato@gauteng.gov.za; Phindile.Mbanjwa@gauteng.gov.za; Agnes.Vumazonke@gauteng.gov.za;
Edward.Mosuwe@gauteng.gov.za; Khanyisa.Nkuna@gauteng.gov.za; phumeza.langa@gauteng.gov.za;
Tebogo.Photo@gauteng.gov.za; Daphney.Ngoasheng@gauteng.gov.za; Jane.Hlongwane@gauteng.gov.za;
tumelo.maimane@gauteng.gov.za; Sofia.Yusuf@gauteng.gov.za; Ronald.Swartz@gauteng.gov.za;
phumza.ndlede@gauteng.gov.za; Shoki.tshabalala@gauteng.gov.za; Vivian.Moloi@gauteng.gov.za;
Namhla.Siqaza@gauteng.gov.za; Mamokwe.makoloka@gauteng.gov.za; Goodwill.nkosi@gauteng.gov.za;
mknight@upe.ac.za; dsibayi@sahra.org.za; anneliza@nda.agric.za; tumi.lehabe@wessa.co.za; stephaniea@ewt.org.za;
adamp@ewt.org.za; ewt@ewt.org.za; maphata.ramphele@gauteng.gov.za; advocacy@birdlife.org.za; motsisl@eskom.co.za;
gertrude.mshumpela@ekurhuleni.gov.za; hencil.b@ekurhuleni.gov.za

Date: 30/08/2016 13:42

Subject: Notification of Release of BID for Basic Assessment for the Proposed Development of a Pig Production Enterprise, and Associated Infrastructure, Nigel, Ekurhuleni.

Attachments: Comments & Reg Form.docx; Letter to I&As_BID_Mojaletema Co-Operative.pdf; Mojaletema Co-Operative (Pty) Ltd BID March 2016.pdf

Good day,

You are hereby notified about the release of the Background Information Document (BID) regarding a Basic Assessment for the proposed development of a pig production enterprise on Farm Portion 5 Uityk, Nigel, Ekurhuleni. Please find attached the BID, which has been released for 30 day review, and the Registration/ Comment Form. Please return the comment form with your comments or any issues relating to this project on or before 30 September 2016.

Should the contents of this project not pertain to you, kindly forward the documents to the person in your department that is affected/interested. Additionally, please forward their contact details to the CSIR Project Manager or ask the affected party to contact the CSIR Project Manager. Should you wish to be registered or de-registered from receiving any further information during the Basic Assessment and Public Participation Process, kindly contact the CSIR Project Manager. Correspondence in this regard should preferably be written, i.e. Email, Fax or Letter.

Contact via: Ms. Babalwa Mqokeli

Email: bmqokeli@csir.co.za
Tel: 021 888 2432
Fax: 021 888 2693
Postal: PO Box 320
Stellenbosch
7599
South Africa

SECTION F: APPENDICES

Proof of delivery of email: Project announcement (30 September 2016)

adamp@ewt.org.za Transferred 30/08/2016 13:43 BC: adamp@ewt.org.za	Transferred
advocacy@birdlife.org.za Transferred 30/08/2016 13:44 BC: advocacy@birdlife.org.za	Transferred
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anneliza@nda.agric.za Transferred 30/08/2016 13:43 BC: anneliza@nda.agric.za	Transferred
Babalwa Mqokeli Delivered 30/08/2016 13:42 Read 30/08/2016 14:09 To: BMqokeli@csir.co.za	Read
Daphney.Ngoasheng@gauteng.gov.za Transfer Failed 30/08/2016 13:44 Transfer Delayed 30/08/2016 13:44 BC: Daphney.Ngoasheng@gauteng.gov.za	Transfer Delayed
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ewt@ewt.org.za Transferred 30/08/2016 13:43 BC: ewt@ewt.org.za	Transferred
gertrude.mshumpela@ekurhuleni.gov.za Transfer Delayed 30/08/2016 13:42 Transferred 30/08/2016 14:03 BC: gertrude.mshumpela@ekurhuleni.gov.za	Transfer Delayed
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Jane.Hlongwane@gauteng.gov.za Transfer Failed 30/08/2016 13:44	Transfer Delayed

SECTION F: APPENDICES

Jane.Hlongwane@gauteng.gov.za	Transfer Delayed
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maphata.ramphele@gauteng.gov.za	Transfer Delayed
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Emptied	07/11/2016 01:02
To: MLevendal@csir.co.za	
mknight@upe.ac.za	Transferred
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ncamisile.nkabinde@drdlr.gov.za	Transferred

SECTION F: APPENDICES

Ntlakanipho.Nkontwana@gauteng.gov.za Undelivered

phumza.ndlede@gauteng.gov.za Undelivered

Ronald.Swartz@gauteng.gov.za Transfer Delayed

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BC: Ronald.Swartz@gauteng.gov.za

Samukele Ngema

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30/08/2016 13:42

Forwarded

30/08/2016 14:08

To: SNgema@csir.co.za

SHlela@environment.gov.za

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BC: SHlela@environment.gov.za

Shoki.tshabalala@gauteng.gov.za

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Sofia.Yusuf@gauteng.gov.za

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stephaniea@ewt.org.za

Transferred

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BC: stephaniea@ewt.org.za

Tebogo.Photo@gauteng.gov.za

Transfer Delayed

Thabo.Ntuli@gauteng.gov.za

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Thandeka.Mbasa@gauteng.gov.za

Undelivered

thokob@daff.gov.za

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Thokozile.Makgato@gauteng.gov.za

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tnemarude@environment.gov.za

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BC: tnmearude@environment.gov.za

tumelo.maimane@gauteng.gov.za

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BC: tumelo.maimane@gauteng.gov.za

tumi.lehabe@wessa.co.za

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SECTION F: APPENDICES

tumi.lehabe@wessa.co.za

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30/08/2016 13:44

BC: tumi.lehabe@wessa.co.za

Vivian.Moloi@gauteng.gov.za

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Appendix E3: Proof of newspaper advertisements

Newspaper Advertisement (English) placed in Heidelberg/Nigel Heraut on 24 August 2016

24 AUGUSTUS 2016 HEIDELBERG/NIGEL HERAUT Got a story in the Nigel area? Phone 011 814 1020/40 BLADSY3

Chamber members receive pointers on how to improve profit

HEIDELBERG - Werner Froneman (marketing consultant) gave members of Heidelberg Chamber of Business some pointers on how to improve their businesses at the meeting on August 16.

Werner told them to make a list of the things that their businesses need more of to improve profitability and growth. They also had to make a list of those things that the business don't need and that is not worth the effort or take up a lot of the business owner's time.

A good principle to live by is the concept of 'under-promise' and 'over-deliver'. "Stick to your promise and if you can not deliver, tell your client and make a plan. Rather under-promise than to promise something that you can not deliver on. Quality service at a value for money price is essential," Werner said.

Werner ended with pearls of wisdom when he told members that it is important to be in a business that they are passionate about. Do something that is worth your effort, but it is not just about money. It is more important to do something that you love.

Heidelberg Business Chamber's next meeting is on September 13 at 19:00. For more information phone Suzann on 072 523 9657.

New kids on the block show their nails at first council meeting

Lydia Riea news1.neraia@nraic.net

HEIDELBERG - The three new EFF councillors of Lesedi Local Municipality stood out in their red attire at the first council meeting after the local elections. Mgodi Isaac Khithika promised on August 17 that LLM will never be the same again and said the EFF will be the voice of the voiceless.

26 Councillors were sworn in by Mr Kierwint de Bruyn (chief magistrate of Heidelberg). Mululeki Nelson Nkosi was elected as the new speaker. Thabani Simon Moremi who was the previous speaker was elected as one of the five MMCs (members of the mayoral committee) and will be in charge of corporate services. Lenato Francis Molekwa has unanimously been re-elected as the executive mayor. The 26 seats have been assigned between the ANC (16), DA (6), EFF (3) and VF Plus (1).

Mr Nkosi congratulated all the parties and new members and said he hoped that they will all work together in taking the council forward. He referred to the three EFF members as the "new kids on the block" and mentioned that the EFF in their red attire brings colour to the council. "I thank you for showing confidence in me as speaker and together we will strive to bring quality service to the community," Nkosi said.

The other ANC councillors are: Themba Motepe (MMC: Development and Planning), Mamezwane Kati Rakilla (MMC: Community Service), Thembekele Ellen Ramothibe (MMC: Finance), Mapule Vionah Moletepe (MMC: Service Delivery), Lalama Shirley-Anne Gamede, Mziwaka Phisoaniso Mkhatepe, Phisoaniso Rane Molana, Modiyehi Emily Mapeni, Themba Joseph Curra, Nsibatsang Trosas Mofokeng, Zandile Silvia Twala, Simon Japi Mayakemi and Machele Sebonkhalo Luthle.

The DA councillors are: Thulani Paulos Ntshibe, Bostle Veronica Moagi, Remotilewe Simphiwe Hlatshwayo, Mirna-Ana Mulder, Gerhard (Gerry) Charles Hlatshwayo and Sieghard (Siep) Heinrich Adolph Carl Paul.

The other two EFF councillors are Aweona Zinhle Abdulla and Molebogeng Malefela. Mari Boochoff represents the VF Plus as councillor. Gamade from the ANC and Mulder from the DA will be LLM's representatives in the Sedibeng District Municipality.



The new EFF councillors provided a bit of colour to the chamber.

They are Zinhle Abdulla, Isaac Khithika and Molebogeng Malefela.



Mululeki Nelson Nkosi was elected as the new speaker of Lesedi Local Municipal Council.

Notice of Basic Assessment (BA) Process

REGISTRATION NUMBER: CSIR/BA/HS/2016/00031A

Basic Assessment for the proposed Hela-Mona Co-Operative (Pty) Ltd Pig Production facility on farm Portion 5 Uthego, Nigel, Gauteng.

Notice is hereby given, in terms of the Environmental Impact Assessment (EIA) Regulations, under sub-regulation 4(1)(i) and sub-regulation 4(4), published in Government Gazette No 38203 of 8 December 2014, of the National Environmental Management Act, 1998 (Act No. 107 of 1998), that **Hela-Mona Co-Operative (Pty) Ltd** proposes to establish pig production on 1.8 hectares of farm portion 5 Uthego, located in the Nigel area of Ekurhuleni, Gauteng Province.

The Council for Scientific and Industrial Research (CSIR) is the Environmental Assessment Facilitator (EAF) who will be managing the process. In terms of the NEPA (EIA) Regulations published in Government Notice Regulation (GNR) 983 of 4 December 2014 (Government Gazette No 38202, and NEPA (EIA) Regulations published in GNR 921 of 20 November 2013 (Government Gazette No 37502), a BA process and a Waste Management License is required on the project triggers the following listed activities:

- GNR 983 4, 12 and 27
- GNR 985 12 and 14
- GNR 921 1 and 12.

You are invited to register as an interested and/or Affected Party (I&AP) and/or to provide any written comments on the BA process. To obtain further information, to comment and/or to register as an I&AP, please provide your full name, full postal address, phone numbers, email address and date over which you intend and/or concern to: **Mrs. Bebelwa Ngqolweni, CSIR, PO Box 326, Midrand 2009, Phone: (021) 400 2422, Fax: (021) 400 2472 or Email: bebelwa@csir.co.za**. You have until or before **30th September 2016** to do so (10 days from the date of this publication, including weekends, but excluding public holidays).

CSIR

Our Heidelberg Mall Branch is now open longer, visit us.

Monday - Thursday	09h00 - 17h30
Friday	09h00 - 18h00
Saturday	09h00 - 13h00

We've put **more hours** on our clock, so you can get **more done**.

FNB
First National Bank

how can we help you?

30 AUGUST 2016

NIGEL/HEIDELBERG REKORD - ONLINE EDITION www.rekord.org.za

PAGE 11

Meisieskoor aan die brand!



Hoërskool John Vorster se meisieskoor onder leiding van Sanel Bekker het tydens 'n fondsinwaaierprojek die minderbevoordeelde leerlinge van Laerskool Hannes Visagie vermaak met hul prag sangiens. Hulle het op uitnodiging saam met die opkomende sanger Michael Lindt van George opgetree. Hulle het op 27 Augustus by die NG Gemeente Nigel - Oos se vrouediens, tydens hul moedersaamfundingsprojek opgetree. Hulle gaan later vanjaar by Heidelberg Mall tydens 'n koorfees optree.

AUCTION / VEILING

KITSISO YA TSHEKATSEHO YA TIKOLOGO

Reference number: CSIR/UNHS/ER286/6005A

Kitsiso ya Tshetsho ya Tikoogo (Basic Assessment, BA) e fana molanong wa Mojalekane Co-Operative (Pty) Ltd (molekane) wa Projekete, ba ba bafang wa chesetle kgwato ya go rwa dithakale, ba ntsheing ya 5 Uthlaph, Nigel, Gauteng.

Leqatlo la Dipatlisiso tsa Science le Indasteri (Council for Scientific and Industrial Research, CSIR) e fana tsheko ya Tshetsho ya Tikoogo (NEMA BA Regulations) e e gaisang ka le fose ga Kitsiso ya Molao wa Molao (GNR) 983 le 985 ya 4 Sedimantole 2014, Gaisang ya Molao 2002, le Molao ya Tshetsho ya Molokale (NEMA/BA), e e gaisang ka le fose ga Kitsiso ya Molao wa Molao (GNR) 921 ya 29 Ngwanetshele 2013 GG No. 37083, e leka gore Tshetsho ya Tikoogo (BA) e ya dithakale ka efito ya ditha ba di lateleng:

GNR 983 Ditha 4, 12 & 27

GNR 985 Ditha 12 & 14

GNR 921 Ditha 1

Go fana ka go tshetsho molokale ka tsonaing ya Tshetsho ya Tikoogo, le lateleng go fana tsheko ya Tshetsho ya Tikoogo (NEMA BA Regulations) e e gaisang ka le fose ga Kitsiso ya Molao wa Molao (GNR) 983 le 985 ya 4 Sedimantole 2014, Gaisang ya Molao 2002, le Molao ya Tshetsho ya Molokale (NEMA/BA), e e gaisang ka le fose ga Kitsiso ya Molao wa Molao (GNR) 921 ya 29 Ngwanetshele 2013 GG No. 37083, e leka gore Tshetsho ya Tikoogo (BA) e ya dithakale ka efito ya ditha ba di lateleng:

GNR 983 Ditha 4, 12 & 27

GNR 985 Ditha 12 & 14

GNR 921 Ditha 1

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GNR 983 Ditha 4, 12 & 27

GNR 985 Ditha 12 & 14

GNR 921 Ditha 1

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GNR 983 Ditha 4, 12 & 27

GNR 985 Ditha 12 & 14

GNR 921 Ditha 1

Go fana ka go tshetsho molokale ka tsonaing ya Tshetsho ya Tikoogo, le lateleng go fana tsheko ya Tshetsho ya Tikoogo (NEMA BA Regulations) e e gaisang ka le fose ga Kitsiso ya Molao wa Molao (GNR) 983 le 985 ya 4 Sedimantole 2014, Gaisang ya Molao 2002, le Molao ya Tshetsho ya Molokale (NEMA/BA), e e gaisang ka le fose ga Kitsiso ya Molao wa Molao (GNR) 921 ya 29 Ngwanetshele 2013 GG No. 37083, e leka gore Tshetsho ya Tikoogo (BA) e ya dithakale ka efito ya ditha ba di lateleng:

GNR 983 Ditha 4, 12 & 27

GNR 985 Ditha 12 & 14

GNR 921 Ditha 1

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GNR 983 Ditha 4, 12 & 27

GNR 985 Ditha 12 & 14

GNR 921 Ditha 1

Go fana ka go tshetsho molokale ka tsonaing ya Tshetsho ya Tikoogo, le lateleng go fana tsheko ya Tshetsho ya Tikoogo (NEMA BA Regulations) e e gaisang ka le fose ga Kitsiso ya Molao wa Molao (GNR) 983 le 985 ya 4 Sedimantole 2014, Gaisang ya Molao 2002, le Molao ya Tshetsho ya Molokale (NEMA/BA), e e gaisang ka le fose ga Kitsiso ya Molao wa Molao (GNR) 921 ya 29 Ngwanetshele 2013 GG No. 37083, e leka gore Tshetsho ya Tikoogo (BA) e ya dithakale ka efito ya ditha ba di lateleng:

GNR 983 Ditha 4, 12 & 27

GNR 985 Ditha 12 & 14

GNR 921 Ditha 1

Go fana ka go tshetsho molokale ka tsonaing ya Tshetsho ya Tikoogo, le lateleng go fana tsheko ya Tshetsho ya Tikoogo (NEMA BA Regulations) e e gaisang ka le fose ga Kitsiso ya Molao wa Molao (GNR) 983 le 985 ya 4 Sedimantole 2014, Gaisang ya Molao 2002, le Molao ya Tshetsho ya Molokale (NEMA/BA), e e gaisang ka le fose ga Kitsiso ya Molao wa Molao (GNR) 921 ya 29 Ngwanetshele 2013 GG No. 37083, e leka gore Tshetsho ya Tikoogo (BA) e ya dithakale ka efito ya ditha ba di lateleng:

GNR 983 Ditha 4, 12 & 27

GNR 985 Ditha 12 & 14

GNR 921 Ditha 1

Go fana ka go tshetsho molokale ka tsonaing ya Tshetsho ya Tikoogo, le lateleng go fana tsheko ya Tshetsho ya Tikoogo (NEMA BA Regulations) e e gaisang ka le fose ga Kitsiso ya Molao wa Molao (GNR) 983 le 985 ya 4 Sedimantole 2014, Gaisang ya Molao 2002, le Molao ya Tshetsho ya Molokale (NEMA/BA), e e gaisang ka le fose ga Kitsiso ya Molao wa Molao (GNR) 921 ya 29 Ngwanetshele 2013 GG No. 37083, e leka gore Tshetsho ya Tikoogo (BA) e ya dithakale ka efito ya ditha ba di lateleng:

GNR 983 Ditha 4, 12 & 27

GNR 985 Ditha 12 & 14

GNR 921 Ditha 1

Go fana ka go tshetsho molokale ka tsonaing ya Tshetsho ya Tikoogo, le lateleng go fana tsheko ya Tshetsho ya Tikoogo (NEMA BA Regulations) e e gaisang ka le fose ga Kitsiso ya Molao wa Molao (GNR) 983 le 985 ya 4 Sedimantole 2014, Gaisang ya Molao 2002, le Molao ya Tshetsho ya Molokale (NEMA/BA), e e gaisang ka le fose ga Kitsiso ya Molao wa Molao (GNR) 921 ya 29 Ngwanetshele 2013 GG No. 37083, e leka gore Tshetsho ya Tikoogo (BA) e ya dithakale ka efito ya ditha ba di lateleng:

GNR 983 Ditha 4, 12 & 27

GNR 985 Ditha 12 & 14

GNR 921 Ditha 1

Go fana ka go tshetsho molokale ka tsonaing ya Tshetsho ya Tikoogo, le lateleng go fana tsheko ya Tshetsho ya Tikoogo (NEMA BA Regulations) e e gaisang ka le fose ga Kitsiso ya Molao wa Molao (GNR) 983 le 985 ya 4 Sedimantole 2014, Gaisang ya Molao 2002, le Molao ya Tshetsho ya Molokale (NEMA/BA), e e gaisang ka le fose ga Kitsiso ya Molao wa Molao (GNR) 921 ya 29 Ngwanetshele 2013 GG No. 37083, e leka gore Tshetsho ya Tikoogo (BA) e ya dithakale ka efito ya ditha ba di lateleng:

GNR 983 Ditha 4, 12 & 27

GNR 985 Ditha 12 & 14

GNR 921 Ditha 1

Go fana ka go tshetsho molokale ka tsonaing ya Tshetsho ya Tikoogo, le lateleng go fana tsheko ya Tshetsho ya Tikoogo (NEMA BA Regulations) e e gaisang ka le fose ga Kitsiso ya Molao wa Molao (GNR) 983 le 985 ya 4 Sedimantole 2014, Gaisang ya Molao 2002, le Molao ya Tshetsho ya Molokale (NEMA/BA), e e gaisang ka le fose ga Kitsiso ya Molao wa Molao (GNR) 921 ya 29 Ngwanetshele 2013 GG No. 37083, e leka gore Tshetsho ya Tikoogo (BA) e ya dithakale ka efito ya ditha ba di lateleng:

GNR 983 Ditha 4, 12 & 27

GNR 985 Ditha 12 & 14

GNR 921 Ditha 1

Go fana ka go tshetsho molokale ka tsonaing ya Tshetsho ya Tikoogo, le lateleng go fana tsheko ya Tshetsho ya Tikoogo (NEMA BA Regulations) e e gaisang ka le fose ga Kitsiso ya Molao wa Molao (GNR) 983 le 985 ya 4 Sedimantole 2014, Gaisang ya Molao 2002, le Molao ya Tshetsho ya Molokale (NEMA/BA), e e gaisang ka le fose ga Kitsiso ya Molao wa Molao (GNR) 921 ya 29 Ngwanetshele 2013 GG No. 37083, e leka gore Tshetsho ya Tikoogo (BA) e ya dithakale ka efito ya ditha ba di lateleng:

GNR 983 Ditha 4, 12 & 27

GNR 985 Ditha 12 & 14

GNR 921 Ditha 1

Go fana ka go tshetsho molokale ka tsonaing ya Tshetsho ya Tikoogo, le lateleng go fana tsheko ya Tshetsho ya Tikoogo (NEMA BA Regulations) e e gaisang ka le fose ga Kitsiso ya Molao wa Molao (GNR) 983 le 985 ya 4 Sedimantole 2014, Gaisang ya Molao 2002, le Molao ya Tshetsho ya Molokale (NEMA/BA), e e gaisang ka le fose ga Kitsiso ya Molao wa Molao (GNR) 921 ya 29 Ngwanetshele 2013 GG No. 37083, e leka gore Tshetsho ya Tikoogo (BA) e ya dithakale ka efito ya ditha ba di lateleng:

GNR 983 Ditha 4, 12 & 27

GNR 985 Ditha 12 & 14

GNR 921 Ditha 1

NOTICE / KENNISGEWINGS

PUBLIC PARTICIPATION NOTICE FOR A PROSPECTING RIGHT APPLICATION

NOTICE OF PROSPECTING RIGHT APPLICATION AND ASSOCIATED ENVIRONMENTAL AUTHORISATION WITHOUT BULK SAMPLING IN RESPECT OF PORTIONS 1, 11 AND 14 OF THE FARM WINTERHOEK 314 IR, IN THE MAGISTERIAL DISTRICT OF NIGEL, GAUTENG PROVINCE OF SOUTH AFRICA.

Notice is hereby given in terms of the Minerals and Petroleum Resources Act (Act No.28 of 2002) Hereafter as Amended Section by 12(d) of The Minerals and Development Resources Development Amendment Act, 2008 (Act 49 Of 2008) together with Regulation 3 (6) of the National Environmental Management Act (Act No.107 Of 1998): Environmental Impact Assessment Regulations 2014 (As Amended), that Yoctolux Collieries (Pty) Ltd has applied for a Prospecting Right. Referenced GP 30/5/1/1/2 (10445) PR and would like to engage the local property owners, interested and affected parties on Portions 1, 11 and 14 on the farm Winterhoek 314 IR, Nigel, Gauteng Province, South Africa.

PROJECT TITLE: Yoctolux Collieries (Pty) Ltd Coal Prospecting Right Application - Winterhoek 314 IR.

PROJECT PROPOSAL:

The applicant proposes to prospect for coal on the abovementioned farm. The prospecting activity triggers a Basic Assessment (BA) in terms of the NEMA regulations which will be undertaken as part of the Environmental Authorisation Application Process.

A Basic Assessment Report (BAR) will be available for review for 30 days from the 01st of September 2016 to the 30th of September 2016, reports will be emailed upon request and made available at the Nigel library - Alra Park Library.

LOCATION: Portions 1, 11 and 14 on the farm Winterhoek 314 IR, Nigel, Gauteng Province, South Africa.

DATE OF PUBLICATION OF THIS NOTICE: 30 August 2016

DEPARTMENT MINERALS RESOURCES REFERENCE NUMBER: GP 30/5/1/1/2 (10445) PR

Queries regarding this matter should be referred to: Environmental Assessment Practitioners: Eco Elementum (Pty) Ltd

Mr. Vernon Siemlink

Office: 012 807 0383 / 012 348 5214

Mobile: 072 196 9928

Fax: 086 714 5399

E-mail: info@ecoelementum.co.za

Project Ref: Yoctolux - Winterhoek 314 IR.



OPPORTUNITY TO PARTICIPATE: Interested and affected parties (I&APs) are invited to register and provide written comments. I&APs should refer to the relevant reference number(s), and must provide their comments together with their name, contact details (preferred method of notification, e.g. e-mail address or fax number) and an indication of any direct business, financial, personal or other interest which they have in the application to the contact person indicated below within 30 days from the date of this notice.

PUBLIC PARTICIPATION NOTICE FOR A PROSPECTING RIGHT APPLICATION

NOTICE OF PROSPECTING RIGHT APPLICATION AND ASSOCIATED ENVIRONMENTAL AUTHORISATION WITHOUT BULK SAMPLING IN RESPECT OF PORTIONS 2, 3, AND 9 OF THE FARM HONINGFONTEIN 339 IR, PORTIONS 4, 6, 17, 31, AND 32 OF THE FARM PALMIETFOEIN 337 IR, PORTIONS 4, 6 AND 14 OF THE FARM PALMIETKUL 322 IR, PORTIONS 4 AND 7 OF THE FARM WOLVENBANK 338 IR IN THE MAGISTERIAL DISTRICT OF NIGEL, GAUTENG PROVINCE OF SOUTH AFRICA.

Notice is hereby given in terms of the Minerals and Petroleum Resources Act (Act No.28 of 2002) Hereafter as Amended Section by 12(d) of The Minerals and Development Resources Development Amendment Act, 2008 (Act 49 Of 2008) together with Regulation 3 (6) of the National Environmental Management Act (Act No.107 Of 1998): Environmental Impact Assessment Regulations 2014 (As Amended), that Mafatiki Anagumated Commodities (Pty) Ltd has applied for a Prospecting Right. Referenced GP 30/5/1/1/2 (10436) PR and would like to engage the local property owners, interested and affected parties on Portions 2, 3, And 9 of the Farm Honingfontein 339 IR, Portions 4, 6, 17, 31, and 32 of the Farm Palmietfontein 337 IR, Portions 4, 6 and 14 of the Farm Palmietkull 322 IR, Portions 4 and 7 of the Farm Wolvenbank 338 IR, Nigel, Gauteng Province of South Africa.

PROJECT PROPOSAL:

The applicant proposes to prospect for coal on the abovementioned farms. The prospecting activity triggers a Basic Assessment (BA) in terms of the NEMA regulations which will be undertaken as part of the Environmental Authorisation Application Process.

A Basic Assessment Report (BAR) will be available for review for 30 days from the 01st of September 2016 to the 30th of September 2016, reports will be emailed upon request and made available at the Nigel library - Alra Park Library.

LOCATION: Portions 2, 3, And 9 of the Farm Honingfontein 339 IR, Portions 4, 6, 17, 31, and 32 of the Farm Palmietfontein 337 IR, Portions 4, 6 and 14 of the Farm Palmietkull 322 IR, Portions 4 and 7 of the Farm Wolvenbank 338 IR, Nigel, Gauteng Province of South Africa.

DATE OF PUBLICATION OF THIS NOTICE: 30 August 2016

DEPARTMENT MINERALS RESOURCES REFERENCE NUMBER: GP 30/5/1/1/2 (10436) PR

Queries regarding this matter should be referred to: Environmental Assessment Practitioners: Eco Elementum (Pty) Ltd

Mr. Vernon Siemlink

Office: 012 807 0383 / 012 348 5214

Mobile: 072 196 9928

Fax: 086 714 5399

E-mail: info@ecoelementum.co.za

Project Ref: Mafatiki - Palmietfontein 337IR



OPPORTUNITY TO PARTICIPATE: Interested and affected parties (I&APs) are invited to register and provide written comments. I&APs should refer to the relevant reference number(s), and must provide their comments together with their name, contact details (preferred method of notification, e.g. e-mail address or fax number) and an indication of any direct business, financial, personal or other interest which they have in the application to the contact person indicated below within 30 days from the date of this notice.

Notice of Basic Assessment (BA) Process

Reference number: CSIR/IU/EMS/ER/2016/0003/A

Basic Assessment for the proposed Mojaletema Co-Operative (Pty) Ltd
Pig Production facility on farm Portion 5 Uitkyk, Nigel, Gauteng.

Notice is hereby given, in terms of the Environmental Impact Assessment (EIA) Regulations, under sub-regulation 41(1) and sub-regulation 41(4), published in Government Gazette No 38282 of 8 December 2014, of the National Environmental Management Act, 1998 (Act No 107 of 1998), that **Mojaletema Co-Operative (Pty) Ltd** proposes a small-scale **pig production** on 1.8 hectares of the farm portion 5 Uitkyk, located in the Nigel area of Ekurhuleni, Gauteng Province.

The Council for Scientific and Industrial Research (CSIR) is the Environmental Assessment Practitioner (EAP) who will be managing the process. In terms of the NEMA EIA Regulations published in Government Notice Regulation (GNR) 983 on 4 December 2014 Government Gazette No 38282, and NEM:WA Regulation published in GNR 921 on 29 November 2013 Government Gazette No 37083, a BA process and a Waste Management License is required as the project triggers the following listed activities:

GNR 983 4, 12 and 27

GNR 985 12 and 14

GNR 921 1 and 12

You are invited to register as an Interested and/or Affected Party (I&AP) and/or to provide any written comments on the BA process. To obtain further information, to comment and/or to register as an I&AP, please provide your full name, full postal address, phone numbers, email address and state your area of interest and/or concern to; **Ms. Babalwa Mqokeli, CSIR, PO Box 320, Stellenbosch 7599, Phone: (021) 888 2432, Fax: (021) 888 2473 or Email: bmqokeli@csir.co.za**. You have until or before **30th September 2016** to do so (30 days from the date of this publication - including weekends, but excluding public holidays).

The logo of the Council for Scientific and Industrial Research (CSIR) is displayed in the bottom right corner. It features the letters 'CSIR' in a bold, sans-serif font. Below the letters, there is a smaller line of text that reads 'COUNCIL FOR SCIENTIFIC AND INDUSTRIAL RESEARCH'. The logo is positioned above a thick, black, wavy horizontal line that spans the width of the advertisement.

SECTION F: APPENDICES

Contents of the Newspaper Advertisement (Tswana) placed in Heidelberg/ Nigel Rekord on 30 August 2016

KITSISO YA TSHEKATSHEKO YA TIKOLOGO

Reference number: CSIR/IU/EMS/ER/2016/0003/A

Kitsiso ya Tlhatlhobo ya Tikologo (Basic Assessment, BA) e fiwa molemong wa Mojaletema Co-Operative (Pty) Ltd (makhadisi wa Projekete), ba ba batlang go simolola kgwebo ya go rua dikolobe, fa tshimong ya 5 Uitkyk, Nigel, Ekurhuleni, Gauteng.

Lekgotla la Dipatlisiso tsa Saense le Indasteri (Council for Scientific and Industrial Research, CSIR) e tlo laola tsamaiso ya Tshekatsheko ya Tikologo ya Projekete. Go ya ka melao ya Tshekatsheko ya Tikologo (NEMA EIA Regulations) e e gatisitsweng ka fa tlase ga Kitsiso ya Molao wa Mmuso (GNR) 983 le 985 ya 4 Sedimonthole 2014, Gazeteng ya Mmuso 38282, le Molao ya Tshelatsheko ya Matlakala (NEM:WA), e e gatisitsweng ka fa tlase ga Kitsiso ya Molao wa Mmuso (GNR) 921 ya 29 Ngwanatsele 2013 GG No. 37083, e laola gore Tlhatlhobo ya Tikologo (BA) e ya tlhokagala ka ntlha ya ditiro tse di latelang:

GNR 983 Ditiro 4, 12 & 27
GNR 985 Ditiro 12 & 14
GNR 921 Ditiro 1

Go fana ka go tlhagisa maikutlo ka tsamaisong ya Tshekatsheko ya Tikologo, le lalediwa go ikwadisa jaaka mokgatlhegi/moamegi wa projekete. Fa le tlhoka dintlha tsa projekete le/kgotsa go ikwadisa jaaka mokgatlhegi/moamegi, fana ka leina le sefane ka boitlalo, aterese ya poso, nomoro ya fono, aterese ya imeile, le go fa lebaka la kgatlhegi kgotsa la kamego go: **Ms. Babalwa Mqokeli, CSIR, PO Box 320, Stellenbosch 7599, Phone: (021) 888 2432, Fax: (021) 888 2693 or Email: bmqokeli@csir.co.za**. Ka kopo, ikopanye le motho yo pele ga **30th September 2016** go simolola ka la tsebiso ena.

CSIR

our future through science

SECTION F: APPENDICES

Appendix E4: –Communications to and from interested and affected parties

Basic Assessment for Mojaletema Farming Co-Operative (Pty) Ltd's proposed development of a Pig Production Enterprise on Farm Portion 5 Uitkyk, Nigel, Ekurhuleni.

24 August 2016

CSIR Reference number: CSIR/IU/EMS/ER/2016/0003/A

COMMENT AND REGISTRATION FORM

Name: <u>KANOGKLO RANOGALE</u>	
ID no: <u>920721 0535 081</u>	Telephone: <u>011 999 3296</u>
Organisation: <u>EKURHULENI MUNICIPALITY</u> RESIDENT MANAGER	Fax:
Position: <u>INTERIM</u>	Email: <u>kanogklo.ranogale@ekurhuleni.gov.za</u>
Physical address: <u>CORNER VAN RIEBEEK AVE & HENORIK BOTEVETER STR</u>	Postal address: <u>SAME AS PHYSICAL ADDRESS</u>
<u>P.O. BOX 26</u>	
<u>SPRINGS</u>	

Please indicate if you would like to register as an Interested and Affected Party (I&AP). Registration is required in order to receive further correspondence during the Basic Assessment Process. Please tick the appropriate box.

YES

NO

☒

Please indicate if you have any interest (business, financial, personal or other) in the application for Environmental Authorisation:

Please describe any issues or concerns you may have regarding the proposed project, which you think should be considered during the Basic Assessment Process.

Please provide details of any other individuals or organisations that should be registered as I&APs:

Please complete this Comment and Registration Form and submit it to:

Ms. Babalwa Mqokeli
P O Box 320,
Stellenbosch, 7599
Tel: 021 888 2432
Fax: 021 888 2693
E-mail: bmqokeli@csir.co.za



Board members: Prof T. Majosi (Chairperson), Adv G. Badela, Ms P. Baieni, Dr P. Goyns, Dr A. Llobell, Dr R. Masango, Ms M. Maseko, Mr J. Ntshilenzhe, Ms A. Noah, Prof M. Phakeng, Dr S. Sibisi (CEO)

www.csir.co.za

SECTION F: APPENDICES

Basic Assessment for Mojaletema Farming Co-Operative (Pty) Ltd's proposed development of a Pig Production Enterprise on Farm Portion 5 Uitkyk, Nigel, Ekurhuleni.

24 August 2016

CSIR Reference number: CSIR/IE/EMS/ER/2016/0003/A

COMMENT AND REGISTRATION FORM

Name: <u>SANDI NAPPÉ</u>	
ID no: <u>8606010141089</u>	Telephone: <u>013 25 60 858</u>
Organisation:	Fax:
Position: <u>Neighbour</u>	Email: <u>sandi.nappe173@gmail.com</u>
Physical address: <u>Same as postal</u>	Postal address: <u>59 BOSBOK STREET</u> <u>ALFA PARK</u> <u>NIGEL, 1491</u>

Please indicate if you would like to register as an Interested and Affected Party (I&AP). Registration is required in order to receive further correspondence during the Basic Assessment Process. Please tick the appropriate box.	
YES	☒ <u>Interested</u>
NO	
Please indicate if you have any interest (business, financial, personal or other) in the application for Environmental Authorisation:	

Please describe any issues or concerns you may have regarding the proposed project, which you think should be considered during the Basic Assessment Process.

Please provide details of any other individuals or organisations that should be registered as I&APs:

Please complete this Comment and Registration Form and submit it to:

Ms. Babalwa Mqokeli P O Box 320, Stellenbosch, 7599 Tel: 021 888 2432 Fax: 021 888 2693 E-mail: bmqokeli@csir.co.za
--



Board members: Prof T. Majosi (Chairperson), Adv G. Badela, Ms P. Baleni, Dr P. Goyns, Dr A. Llobell, Dr R. Masango, Ms M. Maseko, Mr J. Netshitenzhe, Ms A. Noah, Prof M. Phakeng, Dr S. Sibisi (CEO)

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SECTION F: APPENDICES

Basic Assessment for Mojaletema Farming Co-Operative (Pty) Ltd's proposed development of a Pig Production Enterprise on Farm Portion 5 Uitkyk, Nigel, Ekurhuleni.

24 August 2016

CSIR Reference number: CSIR/IU/EMS/ER/2016/0003/A

COMMENT AND REGISTRATION FORM

Name: Moipane Gladys Maestoweng	Telephone: 078 254 4186
ID no: 6212210490087	Fax:
Organisation:	Email:
Position: Farm owner.	Postal address:
Physical address: Farm portion 6 Buffontein Nigel.	

Please indicate if you would like to register as an Interested and Affected Party (I&AP). Registration is required in order to receive further correspondence during the Basic Assessment Process. Please tick the appropriate box.

YES

NO

X

Interested

Please indicate if you have any interest (business, financial, personal or other) in the application for Environmental Authorisation:

Please describe any issues or concerns you may have regarding the proposed project, which you think should be considered during the Basic Assessment Process.

Please provide details of any other individuals or organisations that should be registered as I&APs:

Please complete this Comment and Registration Form and submit it to:

Ms. Babalwa Mqokeli
P O Box 320,
Stellenbosch, 7599
Tel: 021 888 2432
Fax: 021 888 2693
E-mail: bmqokeli@csir.co.za



Board members: Prof T. Majosi (Chairperson), Adv G. Badela, Ms P. Baleni, Dr P. Goyns, Dr A. Llobell, Dr R. Masango, Ms M. Maseko, Mr J. Nelshilenzhe, Ms A. Noah, Prof M. Phakeng, Dr S. Sibisi (CEO)

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SECTION F: APPENDICES

Basic Assessment for Mojaletema Farming Co-Operative (Pty) Ltd's proposed development of a Pig Production Enterprise on Farm Portion 5 Uitkyk, Nigel, Ekurhuleni.

24 August 2016

CSIR Reference number: CSIR/IU/EMS/ER/2016/0003/A

COMMENT AND REGISTRATION FORM

Name: Sego Gacibuse Godfrey	
ID no: 8006175638088.	Telephone: 078 912 4629
Organisation:	Fax:
Position: Herd - MAN.	Email: N/A
Physical address: 256 Ext 3 Monguni str Clira-park Nigel	Postal address: 256 Ext 3 Monguni str Clira-park Nigel

Please indicate if you would like to register as an Interested and Affected Party (I&AP). Registration is required in order to receive further correspondence during the Basic Assessment Process. Please tick the appropriate box.

YES

NO

☒ **Interested.**

Please indicate if you have any interest (business, financial, personal or other) in the application for Environmental Authorisation:

Please describe any issues or concerns you may have regarding the proposed project, which you think should be considered during the Basic Assessment Process.

Please provide details of any other individuals or organisations that should be registered as I&APs:

Please complete this Comment and Registration Form and submit it to:

Ms. Babalwa Mqokeli
P O Box 320,
Stellenbosch, 7599
Tel: 021 888 2432
Fax: 021 888 2693
E-mail: bmqokeli@csir.co.za



Board members: Prof T. Majazi (Chairperson), Adv G. Badela, Ms P. Baleni, Dr P. Goyns, Dr A. Llobell, Dr R. Masango, Ms M. Maseko, Mr J. Netshitenzhe, Ms A. Noah, Prof M. Phakeng, Dr S. Sibisi (CEO)

www.csir.co.za

SECTION F: APPENDICES

Basic Assessment for Mojaletema Farming Co-Operative (Pty) Ltd's proposed development of a Pig Production Enterprise on Farm Portion 5 Uitkyk, Nigel, Ekurhuleni.

24 August 2016

CSIR Reference number: CSIR/IU/EMS/ER/2016/0003/A

COMMENT AND REGISTRATION FORM

Name: Lerato Senakhomo	
ID no: 9108070419082	Telephone: 083 741 2192
Organisation: Mojaletema	Fax:
Position: Director	Email: mojaletemalerato1@gmail.com
Physical address: Farm portion 5 Uitkyk Nigel.	Postal address: P.O Box 860 Nigel 1490

Please indicate if you would like to register as an Interested and Affected Party (I&AP). Registration is required in order to receive further correspondence during the Basic Assessment Process. Please tick the appropriate box.	
YES NO	✓ Interested
Please indicate if you have any interest (business, financial, personal or other) in the application for Environmental Authorisation.	
Interest I think this project will open alot of doors for community members.	
Please describe any issues or concerns you may have regarding the proposed project, which you think should be considered during the Basic Assessment Process.	

Please provide details of any other individuals or organisations that should be registered as I&APs:

Please complete this Comment and Registration Form and submit it to:

Ms. Babalwa Mqokeli
 P O Box 320,
 Stellenbosch, 7599
 Tel: 021 888 2432
 Fax: 021 888 2693
 E-mail: bmqokeli@csir.co.za



Board members: Prof T. Majazi (Chairperson), Adv G. Badela, Ms P. Baleni, Dr P. Goyns, Dr A. Llobell, Dr R. Masango, Ms M. Maseko, Mr J. Netshitenzhe, Ms A. Noah, Prof M. Phakeng, Dr S. Sibisi (CEO)

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SECTION F: APPENDICES

From: Babalwa Mqokeli

To: Samukele Ngema

Date: 21/10/2016 13:27

Subject: Fwd: BA for proposed development of a Pig Production Enterprise on Farm Portion 5 Uitkyk Nigel

Attachments: CSIR notification.pdf

>>> Kamogelo Ramogale <Kamogelo.Ramogale@ekurhuleni.gov.za> 21/10/2016 13:12 >>>

Good day,

The above matter refers.

The Environmental Resource Management department received the notice and thus would like to be registered as an interested party and would like a hard copy of the report to be sent to our offices:

Att: Cecilia Rakgoale

Corner Van Riebeek Ave and Hendrik Potgieter Street

P. O. Box 25

Edenvale

1610

Warm Regards,

Kamogelo

To read City of Ekurhuleni's Disclaimer for this email click on the following address or copy into your Internet browser:
<http://www.ekurhuleni.gov.za/email-disclaimer>

SECTION F: APPENDICES



agriculture,
forestry & fisheries

Department:
Agriculture, forestry & fisheries
REPUBLIC OF SOUTH AFRICA

Directorate Land Use and Soil Management, Private Bag x120, Gezina Pretoria, 0031
Delpen Building, c/o Annie Botha & Union Streets, Riviera

From: Director: Land Use and Soil Management

Tel: (012) 319 7634 **Fax:** (012) 329 5938 **e-mail:** nhlakad@daff.gov.za

CSIR
PO Box 320
Stellenbosch
7599

21 October 2016

Dear Si/Madam

This serves as a notice of receipt and confirms that your application has been captured in our electronic AgriLand tracking and management system. It is strongly recommended that you use the on-line AgriLand application facility in future.

Detail of your application as captured:

Application type: Piggery Mojaletema Farming

Your reference:

Property Description: ***Uitkyk327-IR, ptn 5 & Bultfontein 192-IR, ptn 15***

Dated: ***17 October 2016***

Please use the following reference number in all enquiries:

AgriLand reference number: 2016_10_0158

Enquiries can be made to the above postal, fax or e-mail address.

Yours sincerely,

HJ Buys
pp DIRECTOR: LAND USE AND SOIL MANAGEMENT

<http://www.agis.agric.za/agriland>

SECTION F: APPENDICES

Appendix E5: Minutes of any public and/or stakeholder meetings- Not Applicable

Appendix E6: Comments and Responses Report (*To be received after draft Basic Report*)

**Appendix E7: Comments from I&APs on Basic Assessment (BA) Report-
(*To be received after draft Basic Report*).**

**Appendix E8: Comments from I&APs on amendments to the BA Report-
*N/A at this stage of the BA process***

SECTION F: APPENDICES

Appendix E9: Copy of the register of I&APs.

National	
Department of Environmental Affairs- National	Mmatlala Rabothata
Department of Rural Development and Land Reform	Bonginkosi Zulu
Department of Agriculture, Forestry and Fisheries	Mashudu Marubini
National Department of Mineral Resources	Kgauta Mokoena
National Department of Water Affairs	Ms Ndileka K mohapi
National Department of Water Affairs	Namisha Muthraparsad
National Department Mineral Resources	Khayaletu Matrose
National Department of Trade and Industry	Maoto Molefane
Department of Agriculture, Forestry and Fisheries	Ms Thoko Buthelezi

Provincial: Gauteng	
Department of Agriculture and Rural Development	Mr Lebogang Maile
	Ms Thandeka Mbasa- Sigabi
Department of Community Safety	Ms Sizakele Nkosi-Malobane
	Adv Mongezi Tshongweni
Department of Cooperative Governance and Traditional Affairs	Mr Paul Mashatile
	Ms Ntlakanipho Nkontwana
Department of Economic Development	Mr Lebogang Maile
	Ms Phindile Mbanjwa
Department of Education	Mr Panyaza Lesufi
	Mr Edward Mosuwe
Department of Health	Ms Qedani Mahlangu
	Dr Hugh Gosnell
Department of Human Settlement	Mr Paul Mashatile
	Ms Daphney Ngoasheng
Department of Infrastructure Development	Ms Jacob Mamabolo
	Mr Bethuel Netshiswinzhe
Department of Roads and Transport	Mr Ismail Vadi
	Mr Ronald Swartz
Department of Social Development	Nandi Mayathula-Khoza
	Ms Shoki Tshabalala
Department of Sport, Arts, Culture and Recreation	Nonhlanhla Faith Mazibuko
	Ms Namhla Siqaza
Department of Provincial Treasury	Ms Barbara Creecy
	Ms Nomfundo Tshabalala

SECTION F: APPENDICES

Local Municipality: Ekurhuleni	
Office of the Executive Mayor	Mondli Gungubele
Municipal Manager	Mr Khaya Ngema
Ward Councillors (Ward 88)	Wally Labuschagne
Neighbours	Matshidiso
	Sonia Nappie
	Gladys Moipane
	Godfrey Segolo Gaobuse
Water and Sanitation	Philemon Mashoko
Enterprise Programme Management	Andile Mahlalutye
Waste Management	Qaphile Gcwensa
Environmental Resource Management and Development	Kamogelo Ramogale/ Cecilia Rakgoale
	Hezekiel Nkosi
Economic Development	Caiphus Chauke
City Planning and Development	Aubrey Motubatse

Other	
SANParks: Planning and Development	Dr. Mike Knight
South African National Parks (SANParks)	Dr. Howard Hendriks
South African Heritage Resources Agency (SAHRA)	Mr Dumisani Sibayi
AgriLand	Anneliza Collett
Grasslands Society of South Africa	Freyne du Toit
WESSA	Tumi Lehabe
EWT	Stephanie Aken
EWT	Adam Pires
EWT: Conservation Science	Dr Harriet Davies- Mostert
The Provincial Heritage Resources Authority Gauteng	Maphata Ramphela
Birdlife South Africa	Simon Gear
Eskom: Servitude and Investigations Department	Lungile Motsisi

SECTION F: APPENDICES

DRAFT BASIC ASSESSMENT REPORT

Basic Assessment for the Mojaletema Primary Co-Operative (Pty) Ltd's proposed piggery facility on Portion 15 of Farm Bultfontein 192 IR, Nigel, Gauteng

BASIC ASSESSMENT REPORT

APPENDIX F: Water use license(s) authorisation & SAHRA information

contents

Water Use License Authorisation: Not Applicable at this stage, still in the process of applying.

SAHRA Information

Service letters: *Not Applicable*

Water Supply information: *Not Applicable*

Letter from Provincial Heritage Resources Authority Gauteng _____ 2

SECTION F: APPENDICES

DRAFT BASIC ASSESSMENT REPORT

Basic Assessment for the Mojaletema Primary Co-Operative (Pty) Ltd's proposed piggery facility on Portion 15 of Farm Bultfontein 192 IR, Nigel, Gauteng

Letter from Provincial Heritage Resources Authority Gauteng



PROVINCIAL HERITAGE RESOURCES AUTHORITY - GAUTENG

PRIVATE BAG X33, JOHANNESBURG, 2000
35 RISSIK STREET, SURREY HOUSE
JOHANNESBURG, 2000
TEL: 011 355 2609

Our Ref : H133/16
Enquiries : Tebogo Molokomme
Date : 10 February 2017

CSIR

Tel: 021 888 2432
E-mail: bmqokell@csir.co.za

Dear Sir/Madam

Background Information Document: Basic Assessment for the proposed Mojaletema Co-Operative (Pty) Ltd Pig Production facility on Farm Portion 5 Uitkyk, Nigel, Gauteng

1. The above-mentioned application was discussed by the PHRA-G Heritage Impact Assessment (HIA) Committee on Friday, 10 February 2017.

2. After reviewing your report, the following recommendations were made:

- a) A Heritage Impact Assessment (HIA) must be conducted which must amongst other things:
- clearly identify and map the heritage resources on the earmarked property/area.
 - give the historical background of the area.
 - show how the proposed work might have an impact on heritage resources
 - outline mitigation measures
 - give a report on the Public Participation process during the assessment process

b) The Committee kindly requests that you send only the requested information as explained above, and no other reports that need the other authorities' approval.

c) The requested information will assist the Committee in making an informed decision.

Kind Regards 

Tebogo Molokomme

For the Heritage Impact Assessment (HIA) Committee
Provincial Heritage Resources Authority – Gauteng (PHRA-G)

A close-up photograph of several piglets' faces, showing their pink snouts and eyes. They are looking towards the camera.

Basic Assessment for the
Mojaletema Primary Co-
Operative (Pty) Ltd's proposed
piggery facility on Portion 15 of
Farm Bultfontein 192 IR,
Nigel, Gauteng.

A photograph of three piglets in a trough, eating a dark, crumbly feed. The piglets are pink and have their heads down in the feed.

APPENDIX G.1:
Ecological Opinion/Scan
for the proposed Pig
Production Facility on
Portion 15 of Farm
Bultfontein 192, Nigel,
Gauteng.



ECOLOGICAL OPINION/SCAN

PIG PRODUCTION FACILITY ON PORTION 15 OF FARM BULTFONTEIN
192, NIGEL, GAUTENG



Compiled By:

Natural Scientific Services



64A Coleraine Drive
Riverclub Ext 7
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2191
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NSS Ref No: 2294
Date: February 2017

Compiled For:

CSIR (Council for Scientific and Industrial Research)
CAS - EMS unit



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Stellenbosch
7600

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All pictures taken on site

PIG PRODUCTION FACILITY ON PORTION 15 OF FARM BULTFONTEIN 192, NIGEL, GAUTENG

ECOSCAN REPORT

Compiled For:



CSIR Stellenbosch (CAS, EMS)

11 Jan Cilliers Street
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Ref No: 2294
Date: February 2017

EXECUTIVE SUMMARY

Natural Scientific Services CC was appointed by the Council for Scientific and Industrial Research to perform a terrestrial ecoscan assessment (a brief floral and faunal assessment) for a proposed pig production facility on Portion 15 of the Farm Bultfontein 192 near Nigel in Gauteng Province.

Desktop research and findings from our site visit in December 2016 indicated that the proposed development site comprises mostly built infrastructure, pasture and alien bush clumps. In contrast, a significant portion of the remainder of Portion 15 comprises healthy grassland and wetland, which likely support a number of conservation important (CI) plant and animal species. The nearby drainage line (an unnamed tributary of the **Critically Endangered** Blesbokspruit), and patches of rocky grassland (which are representative of the **Threatened Blesbokspruit** Highveld Grassland (Soweto Highveld Grassland vegetation type), are considered to represent the most CI local biodiversity features.

Summarized in the **Table** below are potential impacts of the proposed development on biodiversity, without and with mitigation. Without mitigation, the most significant potential impacts are considered to be environmental contamination of the wetland downstream from poor waste management during operation. Other impacts include:

- Loss or degradation of the nearby drainage line during all phases of the project.
- Loss of adjoining natural terrestrial vegetation and faunal habitat during construction.
- Further introduction and proliferation of alien flora during all phases of the project.
- Loss of various potentially occurring CI fauna during construction and operation.
- Increased dust and erosion during construction and decommissioning, which could impact the nearby drainage line.

Table Summary of impact significance, without and with mitigation

POTENTIAL IMPACTS	SIGNIFICANCE	
CONSTRUCTION	Without mitigation	With mitigation
<i>Loss or degradation of local wetland areas</i>	Moderate	Low
<i>Loss of terrestrial vegetation and faunal habitat</i>	Moderate	Low
<i>Loss of CI or medicinal flora</i>	Moderate	Low
<i>Loss of CI fauna</i>	Moderate	Low
<i>Introduction and proliferation of alien species</i>	Moderate	Low
<i>Increased dust and erosion</i>	Moderate	Low
<i>Sensory disturbance of fauna</i>	Low	Low
OPERATION		
<i>Loss or degradation of local wetland areas</i>	Moderate	Low
<i>Environmental contamination</i>	High	Low
<i>Poor / Inappropriate control of animal pests</i>	Moderate	Low
<i>Disease transmission</i>	Moderate	Low
<i>Introduction and proliferation of alien species</i>	Moderate	Low

POTENTIAL IMPACTS		SIGNIFICANCE	
<i>Loss of CI or medicinal flora</i>	Moderate	Low	
<i>Loss of CI fauna</i>	Moderate	Low	
<i>Sensory disturbance of fauna</i>	Low	Low	
DECOMMISSIONING			
<i>Loss or degradation of local wetland areas</i>	Moderate	Low	
<i>Introduction and proliferation of alien species</i>	Moderate	Low	
<i>Increased dust and erosion</i>	Moderate	Low	
<i>Sensory disturbance of fauna</i>	Low	Low	

DECLARATION

I, Susan Abell, in my capacity as a specialist consultant, hereby declare that I -

- Act as an independent consultant;
- Do not have any financial interest in the undertaking of the activity, other than remuneration for the work performed in terms of the National Environmental Management Act, 1998 (Act 107 of 1998);
- Have and will not have vested interest in the proposed activity proceeding;
- Have no, and will not engage in, conflicting interests in the undertaking of the activity;
- Undertake to disclose, to the competent authority, any material information that has or may have the potential to influence the decision of the competent authority or the objectivity of any report, plan or document required in terms of the National Environmental Management Act, 1998 (Act 107 of 1998);
- 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;
- As a registered member of the South African Council for Natural Scientific Professions, will undertake my profession in accordance with the Code of Conduct of the Council, as well as any other societies to which I am a member;
- Based on information provided to me by the project proponent and in addition to information obtained during the course of this study, have presented the results and conclusion within the associated document to the best of my professional ability; and
- Reserve the right to modify aspects pertaining to the present investigation should additional information become available through ongoing research and/or further work in this field.



Susan Abell Pr.Sci.Nat.
SACNASP Reg. No. 400116/05
(Ecological & Environmental Science)

February 2017
Date

LIST OF ACRONYMS & ABBREVIATIONS

ACRONYM	DESCRIPTION
ADU	Animal Demography Unit – a research unit of the Department of Zoology at the University of Cape Town
AGIS	Agricultural Geo-referenced Information System
ARC	Agricultural Research Council
CBA	Critical Biodiversity Area
CI	Conservation Important
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
C-Plan	Conservation Plan
CR	Critically Endangered
CSIR	Council for Scientific and Industrial Research
D	Declining population trend
DACE	Department of Agriculture, Conservation and Environment
DD	Data Deficient
DDD	Data Deficient - Insufficient Information
DDT	Data Deficient - Taxonomically Problematic
DEA	Department of Environmental Affairs
DEAT	Department of Environmental Affairs and Tourism
DREAD	Department of Rural, Environment and Agricultural Development
DWA	Department of Water Affairs (previously known as DWAF)
DWAF	Department of Water Affairs and Forestry
DWS	Department of Water and Sanitation (previously known as DWAF and DWA)
EN	Endangered
End	Endemic
ES	Ecological Sensitivity
ESA	Ecological Support Area
EWT	Endangered Wildlife Trust
FEPA	Freshwater Ecosystem Priority Area
GG	Government Gazette
GIS	Geographic Information System
GN	Government Notice
GPS	Global Positioning System
IA	Impact Assessment
IBA	Important Bird Area
IUCN	International Union for Conservation of Nature and Natural Resources, based in Gland, Switzerland
LC	Least Concern
LoO	Likelihood of Occurrence of a taxon in an area
NBI	National Botanical Institute
NEMBA	National Environmental Management: Biodiversity Act (Act 10 of 2004)
NEMA	National Environmental Management Act (Act 107 of 1998)
NEPAD	New Partnership for Africa's Development

ACRONYM	DESCRIPTION
NFEPA	National Freshwater Ecosystem Priority Areas project
NSS	Natural Scientific Services CC
NT	Near Threatened
NWA	National Water Act (Act 36 of 1998)
PG	Protected Game
POSA	Plants of South Africa
Pr.Nat.Sci.	Professional Natural Scientist
PRECIS	The National Herbarium of Pretoria's Computerized Information System
PS	Protected Species
PWA	Protected Wild Animal
QDS	Quarter Degree Square – the basic unit used by the Surveyor General for creation of 1:50 000 topographical maps
S	Stable population trend
SABAP 1 & 2	First and second Southern African Bird Atlas Projects, managed by the ADU
SANBI	South African National Biodiversity Institute
SACNASP	South African Council for Natural Scientific Professions
ToPS	Threatened or Protected Species
TSP	Threatened Species Programme — a programme managed by SANBI to assess the Red Data status of South African plants
U	Unknown population trend
UJ	University of Johannesburg
UP	University of Pretoria
VU	Vulnerable
WA	Wild Animal
WITS	University of the Witwatersrand

TABLE OF CONTENTS

1. Introduction.....	10
2. Terms of Reference	10
3. Project Team	11
4. Applicable Legislation, Policies & Guidelines	11
4.1. International Agreements	11
4.2. Regional Agreements.....	12
4.3. National Legislation.....	12
4.4. National Policies, Guidelines & Programmes	12
4.5. Provincial Legislation, Policies & Guidelines	13
5. Project Description	13
6. Study Region.....	13
6.1. Locality & Land-use.....	13
6.2. Climate.....	16
6.3. Geology and soils.....	16
6.4. Vegetation.....	17
6.5. Hydrology.....	18
7. Methodology	21
7.1. Vegetation & Floral Communities	21
7.2. Fauna.....	23
7.3. Impact Assessment.....	25
8. Survey Results	27
8.1. Vegetation and Floral Communities	27
8.2. Fauna.....	39
9. Areas of Significance.....	51
9.1. International Areas of Conservation Significance	51
9.2. National and Regional Areas of Conservation Significance	51
9.3. Local Areas of Conservation Significance	58
10. Impacts & Mitigation	61
10.1. Impacts	61
10.2. Management and Mitigation Recommendations.....	63
11. Concluding Remarks	64
12. References	72
13. Appendices	75
13.1. Species recorded on and near the survey area	75
13.2. Mammal list for the study area	79
13.3. Bird list for the study area.....	82

13.4. Reptile list for the study area.....	107
13.5. Frog list for the study area.....	109
13.6. Butterfly list for the study area.....	110
13.7. Odonata list for the study area	113
13.8. Scorpion list for the study area.....	113

LIST OF TABLES

Table 3-1	NSS project team.....	11
Table 6-1	Lithostratigraphic units and principal rock types in land type Ba1.....	17
Table 6-2	Description of regional soil types (adapted from GAPA 2002).....	17
Table 6-3	Dominant plant species in the Soweto Highveld Grassland vegetation type	18
Table 7-1	Rating of impact spatial extent.....	26
Table 7-2	Rating of impact duration	26
Table 7-3	Rating of potential impact intensity	26
Table 7-4	Rating of impact probability.....	27
Table 7-5	Rating of overall impact significance	27
Table 8-1	Top 12 dominant families and most dominant growth forms obtained from the POSA website for the QDS 2628BC & 2628AD and on site	28
Table 8-2	Broad Habitat/Vegetation communities	28
Table 8-3	Numbers of conservation important plant species per Red Data category within South Africa and North West (date accessed: January 2017)	34
Table 8-4	Potential CI species based on information obtained from 2628AD & BC QDS.....	35
Table 8-5	Alien and Invasive Species detected during the survey	37
Table 8-1	Potentially occurring Conservation Important mammal species	42
Table 8-2	Potentially occurring Conservation Important bird species	42
Table 8-3	Potentially occurring Conservation Important reptile species	47
Table 8-4	Potentially occurring Conservation Important frog species.....	47
Table 8-5	Potentially occurring Conservation Important butterfly species	47
Table 10-1	Summary of impact significance, without and with mitigation	63
Table 11-1	Impact Assessment	65
Table 11-2	Mitigation measures.....	67

LIST OF FIGURES

Figure 6-1	Photographs of the site and surrounds	14
Figure 6-2	Location of Portion 15 and the proposed infrastructure footprint therein ..	15

Figure 6-3	Monthly rainfall and temperature measured in Springs (WeatherSA 2016) or *O.R. Tambo International Airport in Kempton Park (AccuWeather 2016) 16
Figure 6-4	Ecoregion and quaternary catchment wherein the development site is situated 19
Figure 6-5	Regional vegetation and land type wherein the development site is situated 20
Figure 7-1	Main vegetation sampling points..... 22
Figure 7-1	IUCN Red List categories 25
Figure 8-1	Photographs of the different habitats within and surrounding the site (not immediately within the footprint of the site) 29
Figure 8-1	Photographs of the different transformed habitats within and surrounding the site (including the infrastructural footprint. 30
Figure 8-2	Examples of species found on site..... 32
Figure 8-3	Vegetation communities within the study area 33
Figure 8-6	Photographs of Conservation Important plant species in the surrounds of the survey area 36
Figure 8-7	The Category 1 Listed <i>Opuntia</i> species 38
Figure 8-1	Evidence of local mammal species 39
Figure 8-2	Evidence of local bird species..... 43
Figure 8-3	Photographic evidence of local reptile habitat and species 45
Figure 8-4	Evidence of local butterfly species 48
Figure 8-5	Evidence of local dragonfly species 50
Figure 9-1	Location of the site in relation to Important Bird Areas, and Protected Areas 54
Figure 9-2	Location of the site relative to regional terrestrial Priority Areas and Threatened Ecosystems 55
Figure 9-3	Location of the site in relation to regional Freshwater Ecosystem Priority Areas 56
Figure 9-4	Location of the site in relation to Gauteng CBAs and ESAs 57
Figure 9-5	Areas of biodiversity conservation significance 60

1. Introduction

South African legislation affirms the national commitment to conservation. The National Environmental Management Act (NEMA; Act 107 of 1998) provides for “the integration of social, economic and environmental factors into planning, implementation and decision-making so as to ensure that development serves present and future generations.” The National Environmental Management: Biodiversity Act (NEMBA; Act 10 of 2004) affords *inter alia*: the management and conservation of South Africa’s biodiversity within the framework of NEMA; the protection of species and ecosystems that warrant national protection; and the sustainable use of indigenous biological resources. The National Water Act (NWA; Act 36 of 1998) is the principle legal instrument relating to water resource management in South Africa. All wetlands are protected under the NWA, wherein numerous measures are stipulated “which are together intended to ensure the comprehensive protection of all water resources.”

The Council for Scientific and Industrial Research’s (CSIR’s) “Special Needs Skills and Development Programme” is currently undertaking the necessary environmental authorisations under NEMA, NEMBA and the NWA for a pig production facility near the south-eastern boundary of Gauteng Province. To this end the CSIR appointed Natural Scientific Services CC (NSS) to perform an ecological scan (a brief terrestrial floral and faunal assessment - excluding wetland assessment work) for the proposed project.

Biodiversity is defined as “...**the variability among living organisms from all sources including...terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are a part; this includes diversity within species, between species and of ecosystems**” (The Convention of Biological Diversity, 1992). In other words, plants, animals and micro-organisms, their genes, and the ecosystems that living organisms inhabit, are all facets of biodiversity.

2. Terms of Reference

The ecoscan was performed according to the methodology agreed between the CSIR and NSS, and this report includes:

- A broad description of (relevant) biophysical attributes of the study area;
- A list of applicable legislation, guidelines, standards and criteria to be considered in project planning;
- A broad determination of the (national and provincial) conservation importance of local biodiversity;
- A description of *in situ* vegetation and floral communities, including their structure, dominant plant species composition and condition;
- Discussion about observed and potentially occurring conservation important (e.g. Protected, Red List and medicinal) species;

- An assessment of potential impacts of the proposed project on biodiversity, and recommended measures to mitigate these.

3. Project Team

All aspects of the EcoScan were performed by NSS (**Table 3-1**). The NSS team has extensive experience in completing biodiversity assessments involving floral, faunal, wetland and aquatic work, as well as Environmental Impact Assessments, Environmental Management Programme Reports, Strategic Management Plans and Environmental Management Plans for the conservation, mining, waste, commercial and industrial sectors.

In terms of accreditation and professional registrations the following is applicable to NSS:

- Senior team members are registered Professional Natural Scientists in the ecological, environmental, and zoological fields.
- The senior wetland team member is acknowledged by the Department of Water and Sanitation (DWS) as a competent wetland delineator.

Table 3-1 NSS project team

ROLE	NAME	QUALIFICATIONS
Flora / Wetlands	Susan Abell	M.Sc. Resource Conservation Biology (WITS). Pr.Sci.Nat. registered (400116/05) – Ecology & Environmental Science
Fauna	Dr Caroline Lötter	Ph.D. – Zoology (UP). Pr.Sci.Nat. registered (400182/09) – Zoology.
GIS Mapping	Tim Blignaut	B.Sc. Honours - Geography (UJ).

4. Applicable Legislation, Policies & Guidelines

Legislation, policies and guidelines, which could apply to impacts of the proposed project on biodiversity, are listed below. Although the list is comprehensive, additional legislation, policies and guidelines that have not been mentioned may apply.

4.1. International Agreements

- Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES).
- (Bonn) Convention on the Conservation of Migratory Species of Wild Animals.
- Convention on Biological Diversity including eco-systems and genetic resources.
- Agenda 21 regarding the sustainable development at global and national levels.
- Johannesburg Declaration and Plan of Implementation for sustainable development.

4.2. Regional Agreements

- Action Plan of the Environmental Initiative of NEPAD for sustainable development in Africa.

4.3. National Legislation

- Conservation of Agricultural Resources Act (Act 43 of 1983).
- Environmental Conservation Act (Act 73 of 1989).
- Constitution of the Republic of South Africa (Act 108 of 1996).
- Water Services Act (Act 108 of 1997).
- National Water Act (Act 36 of 1998).
- National Forests Act (Act 84 of 1998) and Protected Tree Species.
- National Veld and Forest Fire Act (Act 101 of 1998).
- National Environmental Management Act (NEMA; Act 107 of 1998).
- National Heritage Resources Act (Act 25 of 1999).
- National Mineral and Petroleum Resources Development Act (Act 28 of 2002).
- Draft Sustainable Utilization of Agricultural Resources Bill (2003).
- National Environmental Management: Protected Areas Act (Act 57 of 2003).
- National Environmental Management: Biodiversity Act (NEM:BA; Act 10 of 2004):
 - National list of Ecosystems Threatened and in need of Protection (Government Gazette [GG] 34809, Government Notice [GN] 1002, 9 December 2011).
 - Alien and Invasive Species Regulations (GG 37885, 1 August 2014).
 - Threatened or Protected Species Regulations (GG 587, GN 38600, 31 March 2015).
- National Environmental Management: Air Quality Act (Act 39 of 2004).
- National Environmental Management: Waste Act (Act 59 of 2008).

4.4. National Policies, Guidelines & Programmes

- National Aquatic Ecosystem Health Monitoring Program including the River Health Programme (initiated by the DWAF, now the DWA), which has recently been replaced with the River Eco-status Monitoring Programme.
- South African Water Quality Guidelines (DWAF 1996).
- White Paper on Environmental Management Policy for South Africa (1998).
- National Spatial Biodiversity Assessment (Driver *et al.* 2004) including Priority Areas and Threatened Ecosystems.
- National Biodiversity Strategy and Action Plan (DEAT 2005).
- National Freshwater Ecosystem Priority Areas project (Driver *et al.* 2011).
- Mining and Biodiversity Guideline (DEA *et al.* 2013).
- National Water Resource Strategy (DWAF 2013).
- Draft national guidelines on biodiversity offsets (DEA 2012 and 2015).

4.5. Provincial Legislation, Policies & Guidelines

- Gauteng Nature Conservation Ordinance (Ordinance 12 of 1983), amended by the Gauteng General Law Amendment Act (Act 4 of 2005).
- Gauteng Provincial Integrated Waste Management Policy (GDARD 2006).
- Gauteng Conservation Plan (C-Plan). Version 3.3 (GDARD 2011).
- Gauteng Protected Areas Expansion Strategy (GDARD 2011).
- Gauteng State of the Environment Report (SoER; GDARD 2012).
- Draft Gauteng Biodiversity Offset Guidelines (GDARD 2013).
- GDARD Requirements for Biodiversity Assessments. Version 3 (GDARD 2014).
- Draft Gauteng Nature Conservation Bill (GDARD 2014) – to repeal the Gauteng Nature Conservation Ordinance (Ordinance 12 of 1983).
- GDARD Red List Plant Species Guidelines (GDARD 2015).

5. Project Description

Mojaletema Co-Operative (Pty) Ltd (Mojaletema) proposes to develop a small-scale pig production endeavour comprising/involving:

- A pig house for 240 sow and 8 boars.
- A processing and packaging room.
- Existing municipal infrastructure (roads and an electricity connection).

6. Study Region

6.1. Locality & Land-use

The approximately 1.8ha development site is situated on Portion 15 of the Farm Bultfontein 192 in Blue Valley Agricultural Holdings near Nigel in south-eastern Gauteng Province (**Figure 3 1**). The Portion falls under the Sedibeng Metropolitan Municipality, where it is situated immediately south of the Cerutiville settlement, and north of Bothasgeluk Agricultural Holdings. Available satellite imagery indicates, and our field observations confirmed that approximately 49% of the proposed survey area comprises built infrastructure, alien bushclumps, pasture, and other transformed areas. The remainder of Portion 15 comprises cultivated fields, natural rocky grassland and wetland habitat.



Pasture and alien trees on site



Rocky area on site



Farm house and associated infrastructure on site



Building ruins on site



Rocky ridge north-west of the site



Grassland west of the site



Drainage line south-west of the site



Drainage line south of the site

Figure 6-1 Photographs of the site and surrounds

INFRASTRUCTURE LAYOUT

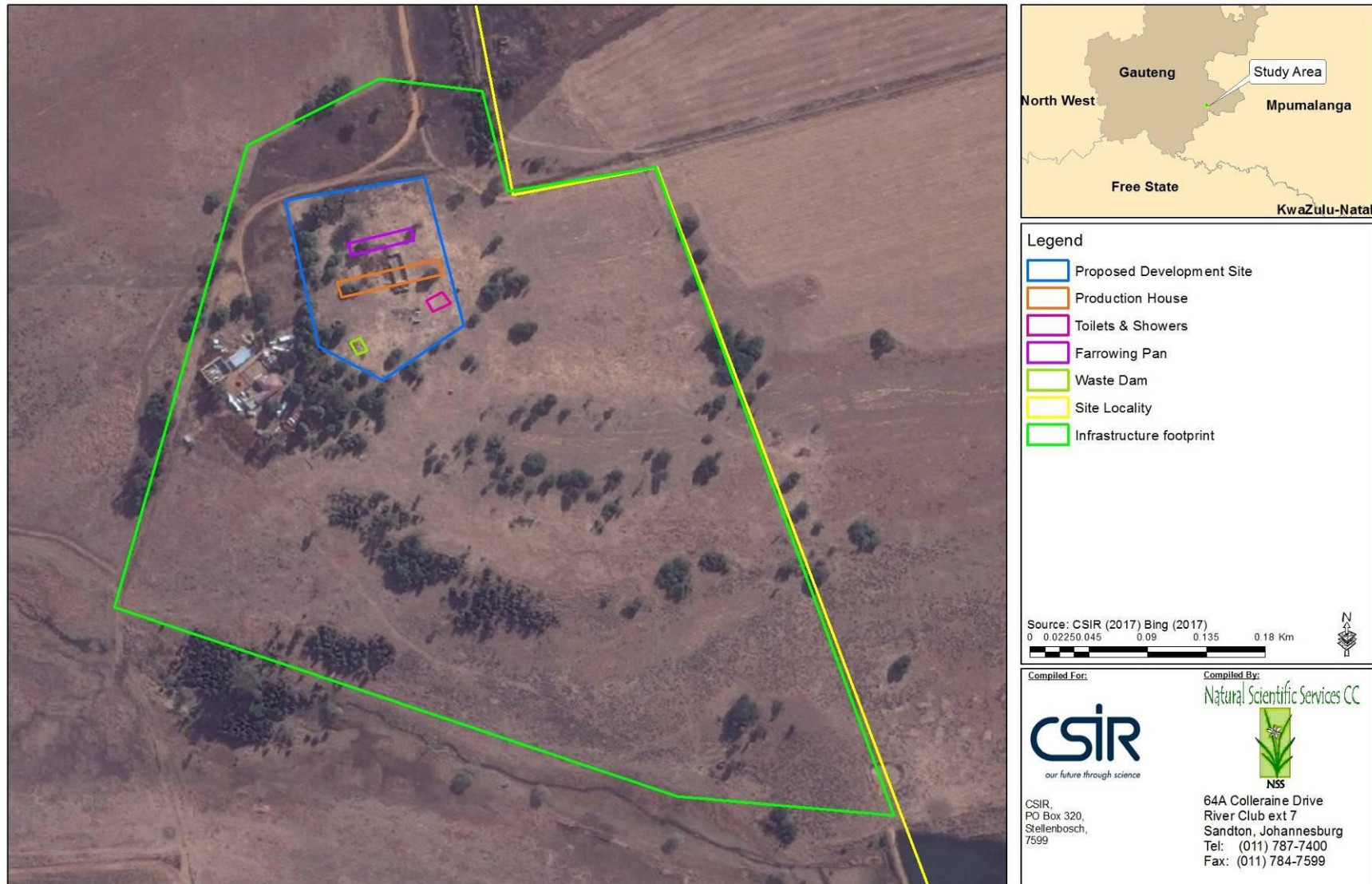


Figure 6-2 Location of Portion 15 and the proposed infrastructure footprint therein

6.2. Climate

The site falls within a summer rainfall and cool-temperate region with thermic continentality (i.e. high extremes between maximum summer and minimum winter temperatures). There are also large thermic diurnal differences (especially in autumn and spring). Winters are very dry with frequent frost. Average annual precipitation for the regional vegetation type is 662mm, with the most rainfall usually falling in January (~110mm) and no rain during July, August and September (Mucina & Rutherford 2006). Overall mean annual temperature is 14.8°C with the coldest months (0°C) in June and July, and the hottest months (27°C) in December and January (Mucina & Rutherford 2006).

Shown in **Figure 6-3** is the monthly rainfall and maximum, mean and minimum atmospheric temperatures measured during the past two years in Springs (www.weathersa.co.za) or at O.R. Tambo International Airport in Kempton Park (accuweather.co.za). Prior to our site visit on 1 December 2016, the region had received a slightly above-average amount of (756mm) rainfall between November 2015 and 2016. Preceding our site visit the region had received more than 200mm rainfall since the (1 October) start of the 2016/2017 summer season, and temperatures had been mild to warm, not hot. The weather was similarly favourable for biodiversity on the day when the site visit was performed.

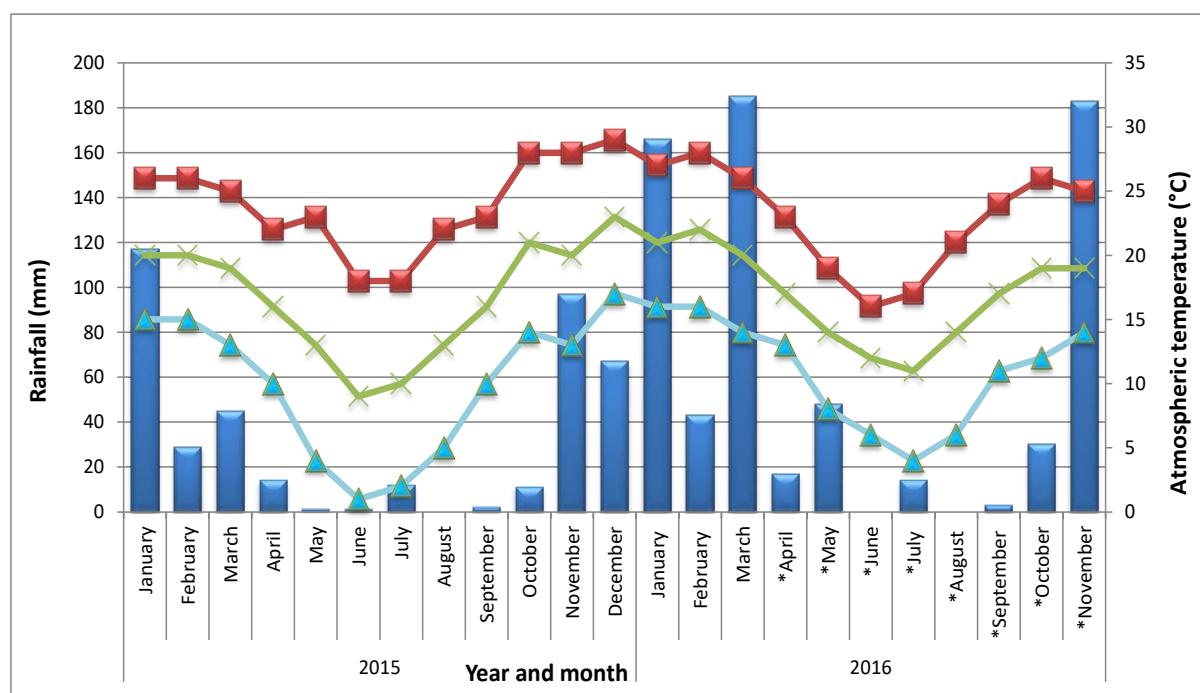


Figure 6-3 Monthly rainfall and temperature measured in Springs (WeatherSA 2016) or *O.R. Tambo International Airport in Kempton Park (AccuWeather 2016)

6.3. Geology and soils

“Land types,” which have been identified by the ARC’s Institute for Soil, Climate and Water, represent areas that are uniform with respect to climate, terrain form, geology and soil. The data, obtained through the Agricultural Geo-referenced Information System (AGIS 2010),

provide useful baseline information on land capability (especially agricultural potential). According to this data, the study site is situated in land type Ba1. Historically this land type featured a gently to moderately undulating landscape. Elevation across Portion 15 ranges from approximately 1 604m a.s.l. in the north and 1 629m a.s.l. in the south to 1 587m at its lowest point where the drainage line exists the western boundary of the Portion. The infrastructure footprint slopes from 1 614m a.s.l. in the north-east to 1 598m a.s.l. in the south-west. Land type Ba1 includes three different geological types, namely the Vryheid, Dwyka and Malmani subgroups. The principle rock types for each group are listed in **Table 6-1**, and the soils are described in **Table 6-2**.

Table 6-1 Lithostratigraphic units and principal rock types in land type Ba1

LITHOSTRATIGRAPHIC UNITS	PRINCIPAL ROCK TYPES
Dwyka	Tillite with subordinate sandstone, mudstone, shale; intruded by dolerite dykes and sheets
Malmani Subgroup, Assen and Black Reef Formations:	Dolomite, chert, subordinate quartzite, conglomerate, shale; diabase and syenite dykes and sills
Vryheid	Arenite, shale and coal

Table 6-2 Description of regional soil types (adapted from GAPA 2002)

GENERAL DESCRIPTION OF SOIL GROUP	SOIL-SLOPE UNIT	DOMINANT SLOPE CLASS (%)	BRIEF DESCRIPTION OF DOMINANT SOILS
Moderately well-drained, yellow-brown, apedal on soft plinthite soils of the Avalon (Av) form usually overlying hydromorphic, weathering rock or unconsolidated materials (Soils are wet in the deep subsoil for short periods during the year.)	sAv9	0-5	Shallow (300 - 500 mm), dystrophic to mesotrophic loam in association with similar soils of the Glencoe form and other shallow, brown, coarse sand on weathering rock of the Glenrosa form
Well-drained, red, apedal soils of the Hutton form (Hu) overlying weathering and hard rock and various other unconsolidated materials	mHu6	0-5	Moderately deep (500 - 1000 mm), dystrophic to mesotrophic loam

6.4. Vegetation

The study site falls within South Africa's Grassland Biome as classified by Rutherford & Westfall (1986), and the Gm8 Soweto Highveld Grassland vegetation type (**Figure 6-5**) as described by Mucina & Rutherford (2006). Soweto Highveld Grassland represents short to medium-high, dense tufted grassland dominated almost entirely by *Themeda triandra* and accompanied by a variety of other grasses such as *Elionurus muticus*, *Eragrostis racemosa*, *Heteropogon contortus* and *Tristachya leucothrix*. In places not disturbed, only scattered small wetlands, narrow stream alluvia, pans and occasional ridges or rocky outcrops interrupt the continuous grassland cover. **Although the disturbed infrastructure footprint is not representative of Soweto Highveld Grassland, remaining natural areas on Portion 15 are.**

Soweto Highveld Grassland is listed as an **Endangered** vegetation type (Mucina & Rutherford 2006). The national target is to protect 24% of the unit, but currently only a handful of patches are statutorily conserved (in the Waldrift, Krugersdorp, Leeuwkuil, Suikerbosrand, and Rolfe's Pan Nature Reserves) and privately conserved (in the Johanna Jacobs, Tweefontein, Gert Jacobs, Nikolaas and Avalon Nature Reserves, and the Heidelberg Natural Heritage Site). Almost half of the vegetation unit has been transformed by cultivation, urban sprawl, mining and building of road infrastructure. Some areas have been flooded by dams (such as the Grootdraai, Leeuwkuil, Trichardtsfontein, Vaal, and Willem Brummer). Erosion is generally very low (Mucina & Rutherford 2006).

Table 6-3 Dominant plant species in the Soweto Highveld Grassland vegetation type

GROWTH FORM	DOMINANT SPECIES
Low Shrubs:	<i>Anthospermum hispidulum</i> , <i>Anthospermum rigidum</i> subsp. <i>pumilum</i> , <i>Berkheya annectens</i> , <i>Felicia muricata</i> , <i>Ziziphus zeyheriana</i>
Herbaceous Climber:	<i>Rhynchosia totta</i> .
Graminoids:	<i>Andropogon appendiculatus</i> , <i>Brachiaria serrata</i> , <i>Cymbopogon pospischilii</i> , <i>Cynodon dactylon</i> , <i>Elionurus muticus</i> , <i>Eragrostis capensis</i> , <i>Eragrostis chloromelas</i> , <i>Eragrostis curvula</i> , <i>Eragrostis plana</i> , <i>Eragrostis planiculmis</i> , <i>Eragrostis racemosa</i> , <i>Heteropogon contortus</i> , <i>Hyparrhenia hirta</i> , <i>Setaria nigrirostris</i> , <i>Setaria sphacelata</i> , <i>Themeda triandra</i> , <i>Tristachya leucothrix</i>
Herbs:	<i>Hermannia depressa</i> , <i>Acalypha angustata</i> , <i>Berkheya setifera</i> , <i>Dicoma anomala</i> , <i>Euryops gilfillanii</i> , <i>Geigeria aspera</i> var. <i>aspera</i> , <i>Graderia subintegra</i> , <i>Haplocarpha scaposa</i> , <i>Helichrysum micronifolium</i> , <i>Helichrysum nudifolium</i> var. <i>nudifolium</i> , <i>Helichrysum rugulosum</i> , <i>Hibiscus pusillus</i> , <i>Justicia anagalloides</i> , <i>Lippia scaberrima</i> , <i>Rhynchosia effusa</i> , <i>Schistostephium crataegifolium</i> , <i>Selago densiflora</i> , <i>Senecio coronatus</i> , <i>Hillardia oligocephala</i> , <i>Wahlenbergia undulata</i>
Geophytic Herbs:	<i>Haemanthus humilis</i> subsp. <i>hirsutus</i> , <i>Haemanthus montanus</i>

6.5. Hydrology

The proposed development site is situated in the Level 1 (Highveld) Ecoregion 11 and quaternary catchment C21E (**Figure 6-4**), approximately 1.7km south-east of an unnamed tributary of the **Critically Endangered Blesbokspruit** in the Upper Vaal Water Management Area (WMA) 8. The Blesbokspruit drains into the Suikerbosrand River, which enters the Vaal River at the Vaal River Barrage roughly 90km south-west of the site. The Blesbokspruit catchment falls within the jurisdiction of Randwater which manages the water quality of the Vaal River Barrage Reservoir. **The Blesbokspruit wetland in the Suikerbosrand catchment has been identified as a wetland of international importance as defined in the Ramsar Convention.** However, large quantities of urban and industrial effluent, together with urban wash-off and mine pumpage from Boksburg and Benoni, have a major impact on the water quality in some tributary rivers in the north-western part of the water management area e.g. Waterval, Blesbokspruit, Natalspruit and Klip River.

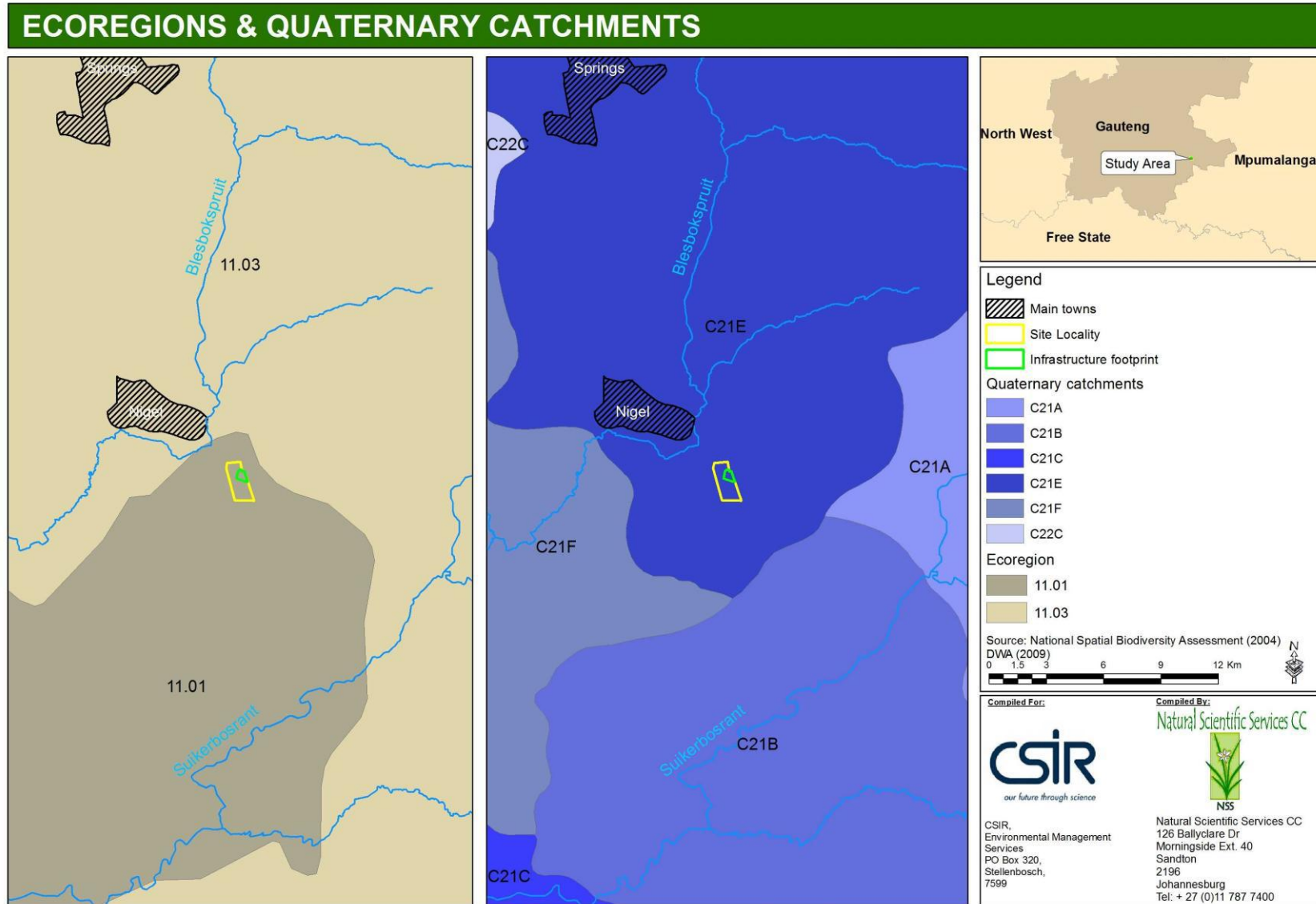


Figure 6-4 Ecoregion and quaternary catchment wherein the development site is situated

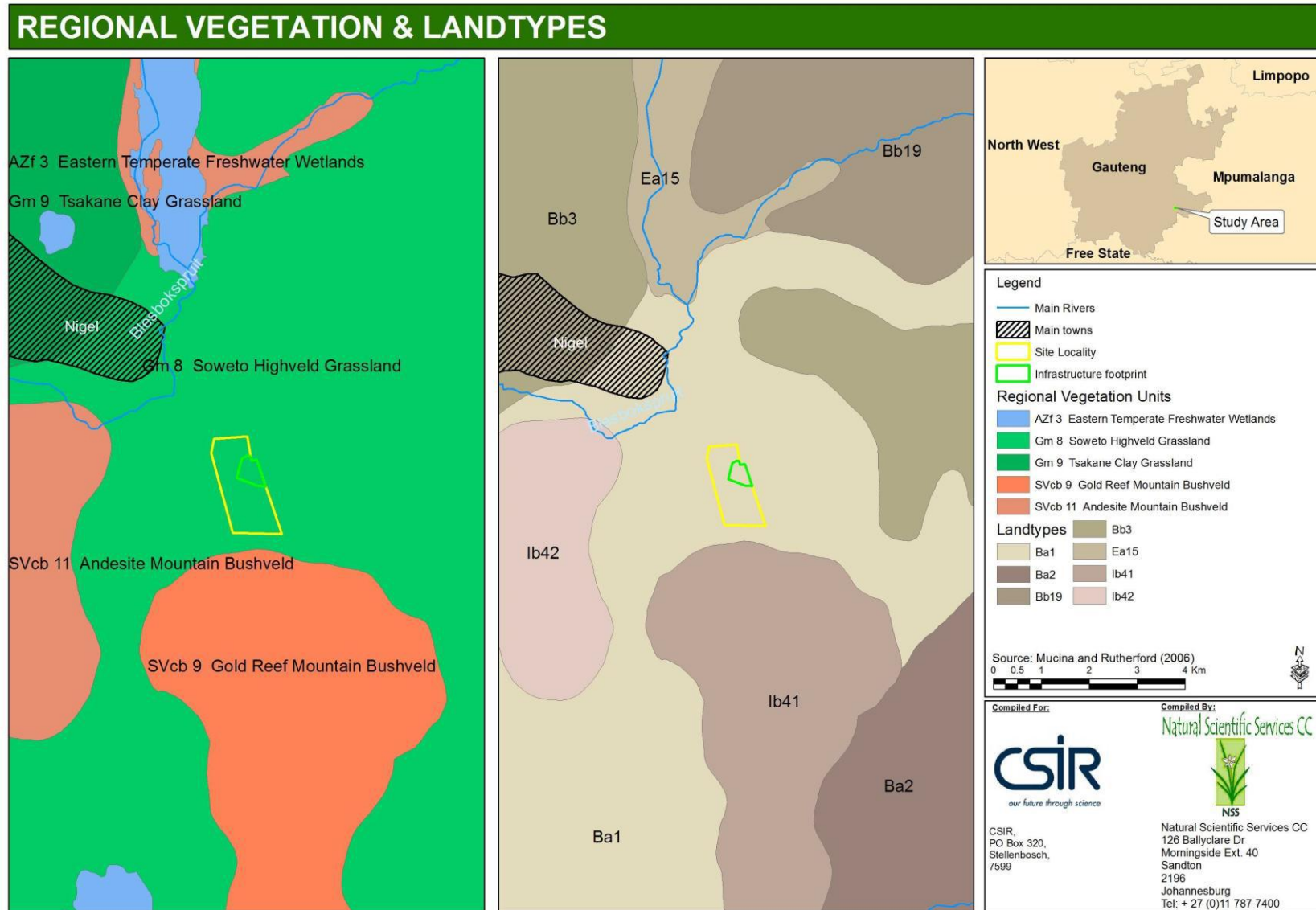


Figure 6-5 Regional vegetation and land type wherein the development site is situated

7. Methodology

7.1. Vegetation & Floral Communities

Due to the small extent of the site and the homogeneous nature, the sampling methods such as Braun-Blanquet cover-abundance approach (Mueller-Dombois & Ellenberg, 1974) was used as a basis to form broader habitat units but the data was not analysed using TWINSPLAN. The vegetation component therefore included:

- A desktop assessment of the vegetation within the region and potential community structure based on the information obtained from:
 - SANBI's¹ Plants of South Africa (POSA) 2628BC QDS
 - Mucina & Rutherford's (2006) vegetation map of southern Africa.
 - The current GDARD C-Plan 3.3.
 - CI plant species records in the study region (mainly obtained through POSA)
- A one day field investigation walking transects through the site:
 - Noting species, habitats and cover abundance. Sampling points are presented in **Figure 7-1**. Plant taxa were identified to species level (some cases, *cf* would be used if identification was limiting – *cf* means 'confer' or 'looks like'). Scientific names follow POSA (Accessed, December 2016).
 - Recording any observed alien and invasive plant species on site was also conducted. The identification of declared weeds and invader species as promulgated under: the NEMBA August 2014 regulations (GG37885); and the amended regulations (Regulation 15) of the Conservation of Agricultural Resources Act, 1983 (Act No. 43 of 1983).
- Reporting including vegetation community descriptions, mapping of broad habitat types / vegetation communities and CI species analysis. For CI floral species, Likelihood of Occurrence (LO) rating is assigned to each species based on the availability of suitable habitat using the following scale: Present; Highly likely; Possible; Unlikely or No Habitat available.

¹ The South African National Biodiversity Institute

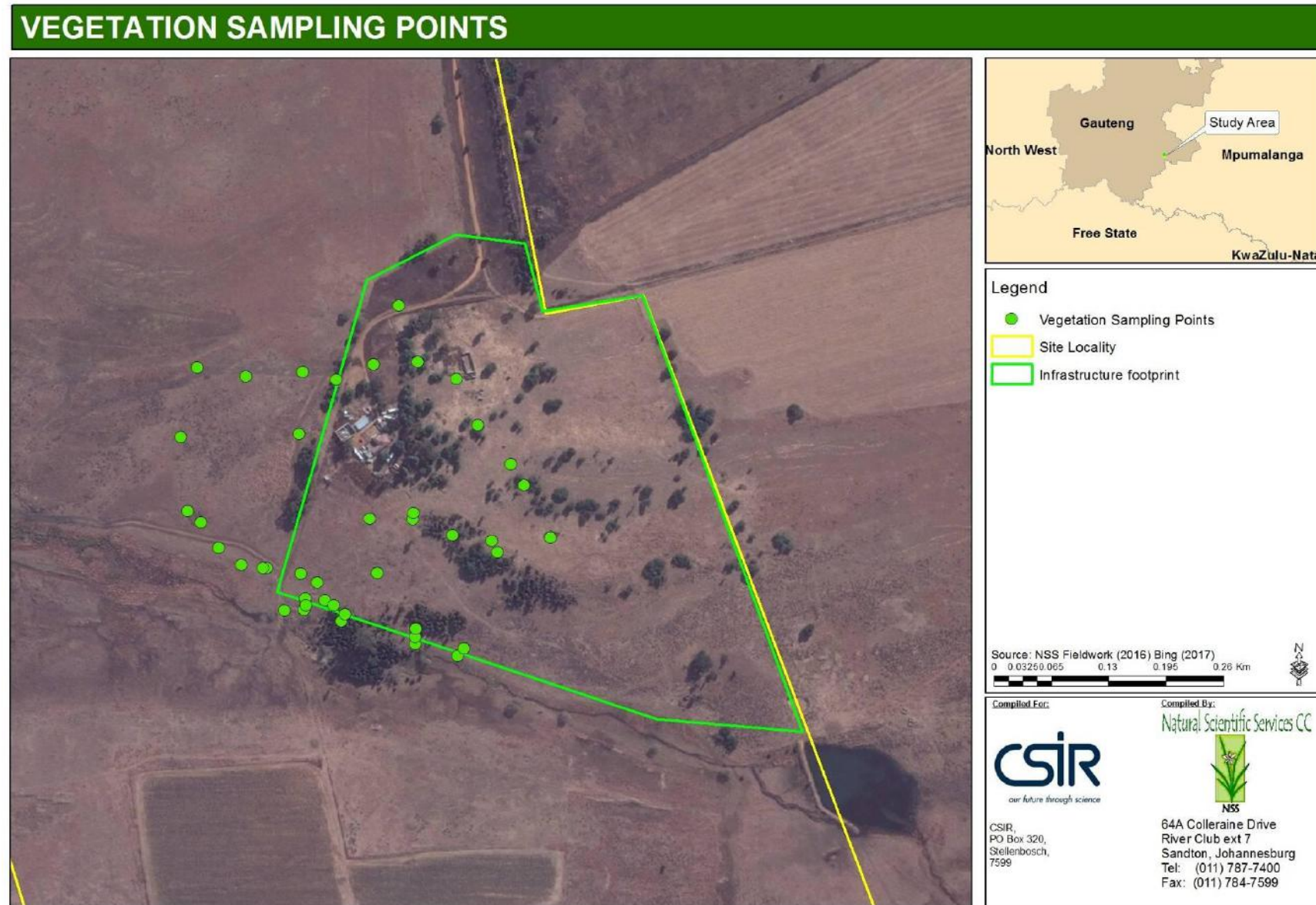


Figure 7-1 Main vegetation sampling points

Limitations

Although the site was under agriculture in the past, it is important to note that the absence of species on site does not conclude that the species is not present at the site. Reasons for not finding certain species during the summer site visit may be due to:

- The short duration of fieldwork as well as the timing of the fieldwork (just after the rains). The 2015/2016 season has experienced below average rainfall and is considered to be in a drought period. This has influenced flowering and species abundance at other sites that NSS has revisited.
- Some plant species, which are small, have short flowering times, rare or otherwise difficult to detect may not have been detected even though they were potentially present on site.
- Vegetation mapping was based on the brief in-field survey as well as aerial imagery. Positioning of the vegetation units may not be exact due to potential georeferencing errors displayed in Google Earth, GPS accuracy in field as well as the age of the aerial image.

7.2. Fauna

7.2.1. Desktop Research

A list of species potentially occurring in the study area was compiled for:

- Mammals, including bats, using the published species distribution maps in Friedmann & Daly (2004) and Stuart & Stuart (2007), and Monadjem *et al.* (2010), respectively, and online species distribution data from MammalMAP (2017) for quarter degree square (QDS) 2628BC.
- Birds, using the list of bird species for QDS 2628BC from the Roberts VII (2013) mobile phone app., and the latest online list of bird species for pentad 2625_2830 from the second Southern African Bird Atlas Project (SABAP 2 2017), which included records of bird species that were observed in QDS 2628BC during the first SABAP (SABAP 1).
- Reptiles, using the published species distribution maps in Bates *et al.* (2014), and online species distribution data from ReptileMAP (2017) for the relevant QDS.
- Frogs, using the published species distribution maps in Minter *et al.* (2004), and online species distribution data from FrogMAP (2017) for the relevant QDS.
- Butterflies, using the published species distribution maps in Mecenero *et al.* (2013), and online species distribution data from LepiMAP (2017) for the relevant QDS.
- Odonata, using the published distribution maps in Samways (2008), and online species distribution data from OdonataMAP (2017) for the relevant QDS.
- Scorpions, using the published species distribution maps in Leeming (2003). ScorpionMAP (2017) did not have any species records for QDS 2628BC.

The lists were refined based on faunal records for the area, which were received from GDARD (*pers. comm.* 2016), and our field observations, where the Likelihood of Occurrence (LoO) of each species was rated using the following scale:

1. Present: the species, or signs of its presence, was recorded.
2. High: the species is highly likely to occur.
3. Moderate: the species may occur.
4. Low: the species is unlikely to occur.

7.2.2. Fieldwork

Faunal observations were made while driving, walking, and inspecting different habitats on site and in the area. Taxa were identified based on observations of dead or live specimens, spoor, droppings, burrows and other evidence. Rocks and logs were turned to find reptiles, scorpions, frogs and invertebrates. A sweep net was used to catch butterflies and odonata.

7.2.3. Conservation Status of Species

The appended faunal lists indicate the status of relevant species according to:

- The latest (2015) list of Threatened or Protected Species (ToPS) under the National Environmental Management: Biodiversity Act (NEM:BA 2004).
- The latest list of Threatened or Protected Species under the relevant provincial legislation, in this case, the Transvaal Nature Conservation Ordinance of 1983.
- The latest national or regional Red List assessment for:
 - Mammals by the SANBI & EWT (2016).
 - Birds by Taylor *et al.* (2015).
 - Reptiles by Bates *et al.* (2014).
 - Frogs by Minter *et al.* (2004).
 - Butterflies by Mecenero *et al.* (2013).
 - Dragonflies and damselflies (odonata) by Samways (2006).
- The IUCN Red List, where the global Red List status of a taxon has not been assessed during the relevant afore-mentioned national or regional Red List assessment.

An atlas and Red List assessment for South African scorpion species has not yet been published. Due to spatio-temporal variation in human disturbances, the conservation status of some species differs between the NEM:BA, provincial legislation and the relevant regional or national Red List assessment publication. Unless otherwise stated, the *most* threatened status of a species is provided in text, whether this is at a global or other spatial scale. Shown in **Figure 7-2** are the IUCN's Red List categories, which have been adopted to a large extent in regional / national assessments of animal taxa.

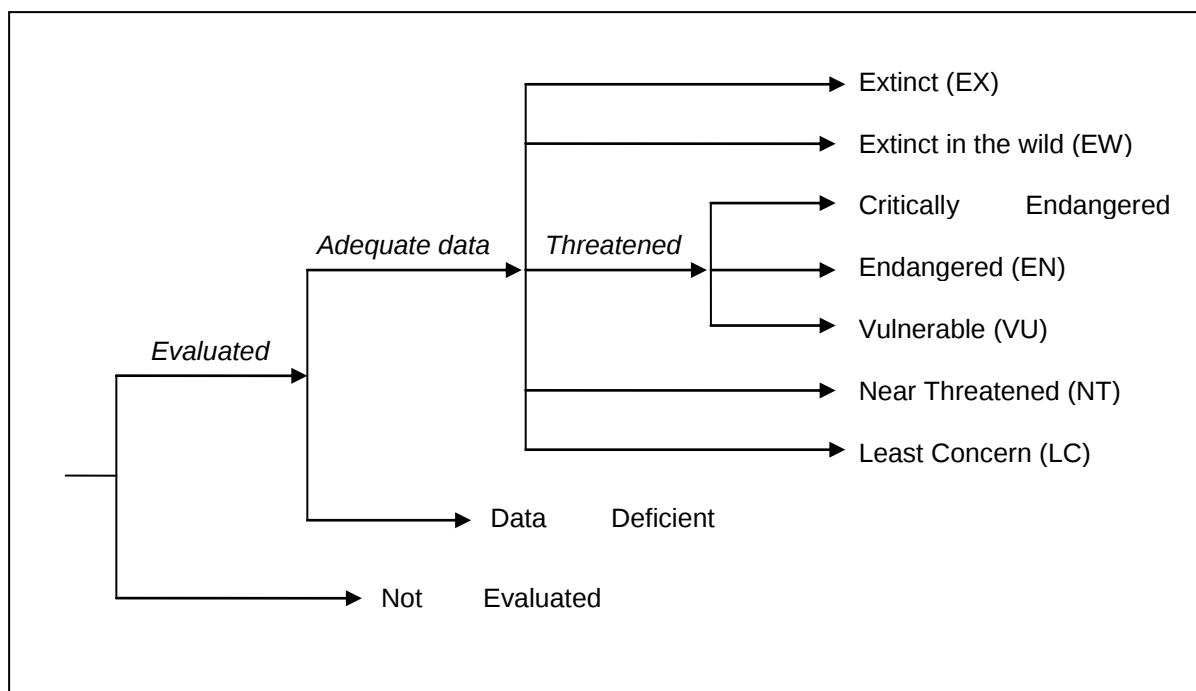


Figure 7-2 IUCN Red List categories

7.2.4. Limitations

- The site visit was limited to a few day time hours and, therefore, not all potentially occurring (especially nocturnal) species were likely to be detected.
- Some species, which are uncommon, small, migratory, secretive or otherwise difficult to detect may not have been detected even though they were potentially present.

7.3. Impact Assessment

The Impact Assessment (IA) was performed according to the CSIR's IA methodology, which takes into account:

- Impact nature (direct, indirect and cumulative);
- Impact status (positive, negative or neutral);
- Impact spatial extent (**Table 7-1**);
- Impact duration (**Table 7-2**);
- Potential impact intensity (**Table 7-3**);
- Impact reversibility (high, moderate, low or irreversible);
- Irreplaceability of the impacted resource (high, moderate, low or replaceable);
- Impact probability (**Table 7-4**);
- Our confidence in the ratings (high, moderate or low);

Overall impact significance (**Table 7-5**) is calculated as:

Impact significance = Impact magnitude x Impact probability

where

Impact magnitude = Potential impact intensity + Impact duration + Impact extent

Table 7-1 Rating of impact spatial extent

EXTENT DESCRIPTION	SCORE
Site specific	1
Local (<2km from site)	2
Regional (within 30km of site)	3
National	4
International/Global	5

Table 7-2 Rating of impact duration

DURATION DESCRIPTION	SCORE
Temporary (less than 2 years) or duration of the construction period. This impact is fully reversible. <i>E.g. the construction noise temporary impact that is highly reversible as it will stop at the end of the construction period</i>	1
Short term (2 to 5 years). This impact is reversible.	2
Medium term (5 to 15 years). The impact is reversible with the implementation of appropriate mitigation and management actions.	3
Long term (>15 years but where the impact will cease after the operational life of the activity). The impact is reversible with the implementation of appropriate mitigation and management actions. <i>E.g. the noise impact caused by the desalination plant is a long term impact but can be considered to be highly reversible at the end of the project life, when the project is decommissioned</i>	4
Permanent (mitigation will not occur in such a way or in such a time span that the impact can be considered transient). This impact is irreversible. <i>E.g. The loss of a palaeontological resource on site caused by construction activities is permanent and would be irreversible.</i>	5

Table 7-3 Rating of potential impact intensity

NEGATIVE POTENTIAL INTENSITY DESCRIPTION	RATING	SCORE
Potential to severely impact human health (morbidity/mortality); or to lead to loss of species ² (fauna and/or flora)	Very High/Fatal Flaw	16
Potential to reduce faunal/flora population or to lead to severe reduction/alteration of natural process, loss of livelihoods / severe impact on quality of life ³ , individual economic loss	High	8
Potential to reduce environmental quality – air, soil, water. Potential Loss of habitat, loss of heritage, reduced amenity	Medium	4
Nuisance	Medium-Low	2
Negative change – with no other consequence	Low	1
POSITIVE POTENTIAL INTENSITY DESCRIPTION	RATING	SCORE
Potential Net improvement in human welfare	High	8
Potential to improve environmental quality – air, soil, water.	Medium	4

²Note that a loss of species is a global issue and is differentiated from a loss of “floral/faunal” populations.

³Note that a visual impact or air emissions for example could be considered as severely impacting on quality of life should it constitute more than a nuisance but not being life threatening.

NEGATIVE POTENTIAL INTENSITY DESCRIPTION	RATING	SCORE
Improved individual livelihoods		
Potential to lead to Economic Development	Medium-Low	2
Potential positive change – with no other consequence	Low	1

“Irreplaceable loss of a resource” must be factored into the potential intensity rating of an impact

Table 7-4 Rating of impact probability

PROBABILITY DESCRIPTION	SCORE
Improbable (little or no chance of occurring <10%)	0.1
Low probability(10 - 25% chance of occurring)	0.25
Probable (25 - 50% chance of occurring)	0.5
Highly probable (50 – 90% chance of occurring)	0.75
Definite (>90% chance of occurring).	1

Table 7-5 Rating of overall impact significance

SCORE	RATING	SIGNIFICANCE DESCRIPTION
18-26	Fatally flawed	The project cannot be authorised unless major changes to the engineering design are carried out to reduce the significance rating.
10-17	High	The impacts will result in major alteration to the environment even with the implementation on the appropriate mitigation measures and will have an influence on decision-making.
5-9	Medium	The impact will result in moderate alteration of the environment and can be reduced or avoided by implementing the appropriate mitigation measures, and will only have an influence on the decision-making if not mitigated.
<5	Low	The impact may result in minor alterations of the environment and can be easily avoided by implementing appropriate mitigation measures, and will not have an influence on decision-making.

8. Survey Results

8.1. Vegetation and Floral Communities

8.1.1. Comparative Regional Vegetation

SANBI frequently collect/collate floral data within Southern Africa and update their PRECIS database system (National Herbarium Pretoria (PRE) Computerised Information System) which is captured according to quarter degree squares (QDSs). This is referred to the POSA database. For this study, the Site falls within 2628BC. This QDG yielded only 11 species and has not been surveyed enough to obtain a representative of the area. The adjacent grid (2628AD) yielded 536 species within 92 families. The dominant families being ASTERACEAE, POACEAE and FABACEAE (Table 8-1), with the Herbs representing 45%, Graminoids representing 11%, and Geophytes representing just over 10% of the total species listed for the area (Table 8-1). As expected within grassland habitat, wooded species in total constitute approximately 16% of the species within the larger study region. In

terms of the site, structural representation was following the trend presented within the larger region, with Herbs, Graminoids and Geophytes being the most dominant. Wooded vegetation constituted over 20%. (**Table 8-1**).

Table 8-1 Top 12 dominant families and most dominant growth forms obtained from the POSA website for the QDS 2628BC & 2628AD and on site

IMPORTANT FAMILIES	No. OF SPP	GROWTH FORMS	% TOTAL SPP	ON SITE
ASTERACEAE	77	Herb	45.45	36.03
POACEAE	60	Graminoid	11.36	22.79
FABACEAE	40	Geophyte	10.61	7.35
APOCYNACEAE	30	Dwarf shrub	10.23	8.09
RUBIACEAE	18	Shrub, tree	5.3	2.21
CYPERACEAE	17	Shrub	5.11	7.35
MALVACEAE	14	Cyperoid	3.22	6.62
HYACINTHACEAE	12	Climber	2.84	0.74
SCROPHULARIACEAE	12	Succulent	1.52	2.21
CRASSULACEAE	10	Helophyte	1.52	2.21
LAMIACEAE	10	Bryophyte	1.14	-
SOLANACEAE	9	Tree	0.57	3.68

8.1.2. On Site - Vegetation Communities

The proposed infrastructure is positioned within the alien vegetation (bushclumps) and disturbed grassland. There is no naturally structured communities remaining within the infrastructural footprint. Within the remainder of the study area and surrounds, natural to semi natural habitats include Rocky Grassland, *Seriphium* Dominated Grassland and the *Typha- Juncus – Eleocharis* Wetland (**Figure 8-1** and **Figure 8-4**). The wetland system is approximately 230m south of the proposed footprint and disturbance area. These areas only constituted less than 37% of the area surveyed (refer to **Table 8-2**). Analysis of Google Earth aerial imagery dated from 2004 to 2016 indicates that there has been an increase / spread in wooded alien vegetation on site.

Table 8-2 Broad Habitat/Vegetation communities

Vegetation Community	Conservation Significance	Area -%
Natural – Semi Natural Grasslands		
<i>Themeda</i> Rocky Grassland (with outcrops)	Moderate-High	5.88
<i>Seriphium</i> Dominated Grassland	Moderate	30.09
Disturbed Grassland	Moderate-Low	13.11
Wetlands and Watercourses		
<i>Typha- Juncus – Eleocharis</i> Wetland	High	1.42
Alien Bushclumps		
<i>Acacia mearnsii</i> Bushclumps	Moderate-Low	10.61

Vegetation Community	Conservation Significance	Area -%
<i>Eucalyptus</i> Stumps	Moderate-Low	0.3
<i>Eucalyptus</i> Dominated Bushclumps	Moderate-Low	1.81
Mixed Alien Bushclumps	Moderate-Low	9.7
Agriculture		
<i>Eragrostis</i> pastures	Low	17.23
Transformed		
<i>Pennisetum</i> (Kikuyu) Dominated	Low	5.71
Transformed - Build Up	Low	4.12



Themeda Rocky Grassland



Typha- Juncus – Eleocharis Wetland



Themeda Rocky Grassland (within outcrops)



Figure 8-1 Photographs of the different habitats within and surrounding the site (not immediately within the footprint of the site)



Alien Bushclumps (Typha- Juncus – Eleocharis wetland in the foreground)



Pennisetum (Kikuyu) Dominated



Disturbed Eragrostis Grassland



Built Structures and dumping

Figure 8-2 Photographs of the different transformed habitats within and surrounding the site (including the infrastructural footprint.

A limited description can be provided for such a transformed habitat. However, a brief overview of the semi to natural communities are described below.

Themeda Rocky Grassland (with outcrops)

This community was mainly found to the west of the survey area, although some remnants of outcrops was located in the central section of the survey area, south east of the infrastructure footprint. These smaller remnants are now dominated by alien species such as *Acacia mearnsii* and *Eucalyptus* species and have limited herbaceous cover. Species (Figure 8-4) within the broader community include:

- *Cyanotis speciosa* (L.f.) Hassk.
- *Eragrostis* spp
- *Brachiaria serrata* (Thunb.) Stapf
- *Cyperus obtusiflorus* Vahl var. *obtusiflorus*
- *Ocimum obovatum* E.Mey. ex Benth. subsp. *obovatum* var. *obovatum*
- *Polygala amatymbica* Eckl. & Zeyh.
- *Polygala hottentotta* C.Presl
- *Scabiosa columbaria* L.



- *Eragrostis lehmanniana* Nees var. *lehmanniana*
- *Eragrostis racemosa* (Thunb.) Steud.
- *Felicia muricata* (Thunb.) Nees subsp. *muricata*
- *Gazania krebsiana* Less.
- *Helichrysum nudifolium* (L.) Less. var. *nudifolium*
- *Hilliardiella* (Vernonia) *aristata* (*natalensis*) (DC.) H. Rob.
- *Hypoxis acuminata* Baker
- *Ledebouria ovatifolia* (Baker) Jessop
- *Microchloa caffra* Nees
- *Loudetia simplex* (Nees) C.E. Hubb.
- *Senecio coronatus* (Thunb.) Harv.
- *Seriphium plumosum* L.
- *Themeda triandra* Forssk.
- *Tribulus terrestris* L.*
- *Lantana camara* L.*
- *Richardia brasiliensis* Gomes*
- *Cynodon dactylon* (L.) Pers.
- *Diospyros lycioides* Desf. subsp. *lycioides*
- *Elephantorrhiza elephantina* (Burch.) Skeels
- *Melinis repens* (Willd.) Zizka subsp. *repens*
- *Leonotis microphylla* Scan
- *Lopholaena coriifolia* (Sond.) E. Phillips & C.A. Sm.

Seriphium Dominated Grassland

Within the survey area, a transformed habitat through excessive grazing pressure has allowed for species such as *Seriphium* to become dominant. This area is found both to the west and south of the infrastructural footprint and includes species such as:

- *Ajuga ophrydis* Burch. ex Benth.
- *Aloe greatheadii* Schönland
- *Aristida congesta* Roem. & Schult. subsp. *congesta*
- *Brachiaria serrata* (Thunb.) Stapf
- *Chaetacanthus costatus* (Pers) Lindl.
- *Cleome rubella* Burch.
- *Commelina africana* L. var. *krebsiana* (Kunth) C.B. Clarke
- *Conyza podocephala* DC.
- *Cynodon dactylon* (L.) Pers.
- *Eragrostis lehmanniana* Nees var. *lehmanniana*
- *Eragrostis racemosa* (Thunb.) Steud.
- *Felicia muricata* (Thunb.) Nees subsp. *muricata*
- *Gazania krebsiana* Less. subsp. *serrulata* (DC.) Roessler
- *Gomphrena celosioides* Mart.
- *Hermannia depressa* N.E.Br.
- *Heteropogon contortus* (L.) Roem. & Schult.
- *Hyparrhenia hirta* (L.) Stapf
- *Ledebouria ovatifolia* (Baker) Jessop
- *Melinis repens* (Willd.) Zizka subsp. *repens*
- *Monsonia angustifolia* E.Mey. ex A. Rich.
- *Scabiosa columbaria* L.
- *Seriphium plumosum* L.

Typha- Juncus – Eleocharis Wetland

This habitat is found approximately 230m to the south of the Infrastructural footprint and

borders the survey area.

The wetlands system is relatively intact containing a diverse array of indigenous species. However, downstream (border of survey area), the stream enters an alien bushclump and therefore contains less herbaceous cover. Species within this system include:

- *Andropogon appendiculatus* Nees
- *Centella asiatica* (L.) Urb.
- *Cleome rubella* Burch.
- *Cyperus* cf. *leptocladus* Kunth
- *Cyperus compressus* L.
- *Eleocharis dregeana* Steud.
- *Gunnera perpensa* L.
- *Imperata cylindrica* (L.) Raeusch.
- *Juncus dregeanus* Kunth subsp. *dregeanus*
- *Juncus effusus*
- *Kyllinga erecta* Nees
- *Leersia hexandra* Sw.
- *Phragmites australis* (Cav.) Steud.
- *Plantago longissima* Decne.
- *Ranunculus multifidus* Forssk.
- *Salix babylonica* L. var. *babylonica**
- *Scirpoides burkei* (C.B. Clarke) Goetgh., Muasya & D.A. Simpson
- *Setaria sphacelata* (Schumach.) Stapf & C.E. Hubb.
- *Typha capensis* (Rohrb.) N.E. Br.
- *Verbena bonariensis* L.*
- *Verbena brasiliensis* Vell.*



Polygala amatymbica



Cyperus obtusiflorus



Cyanotis speciosa



Pygmaeothamnus chamaedendrum

Figure 8-3 **Examples of species found on site**

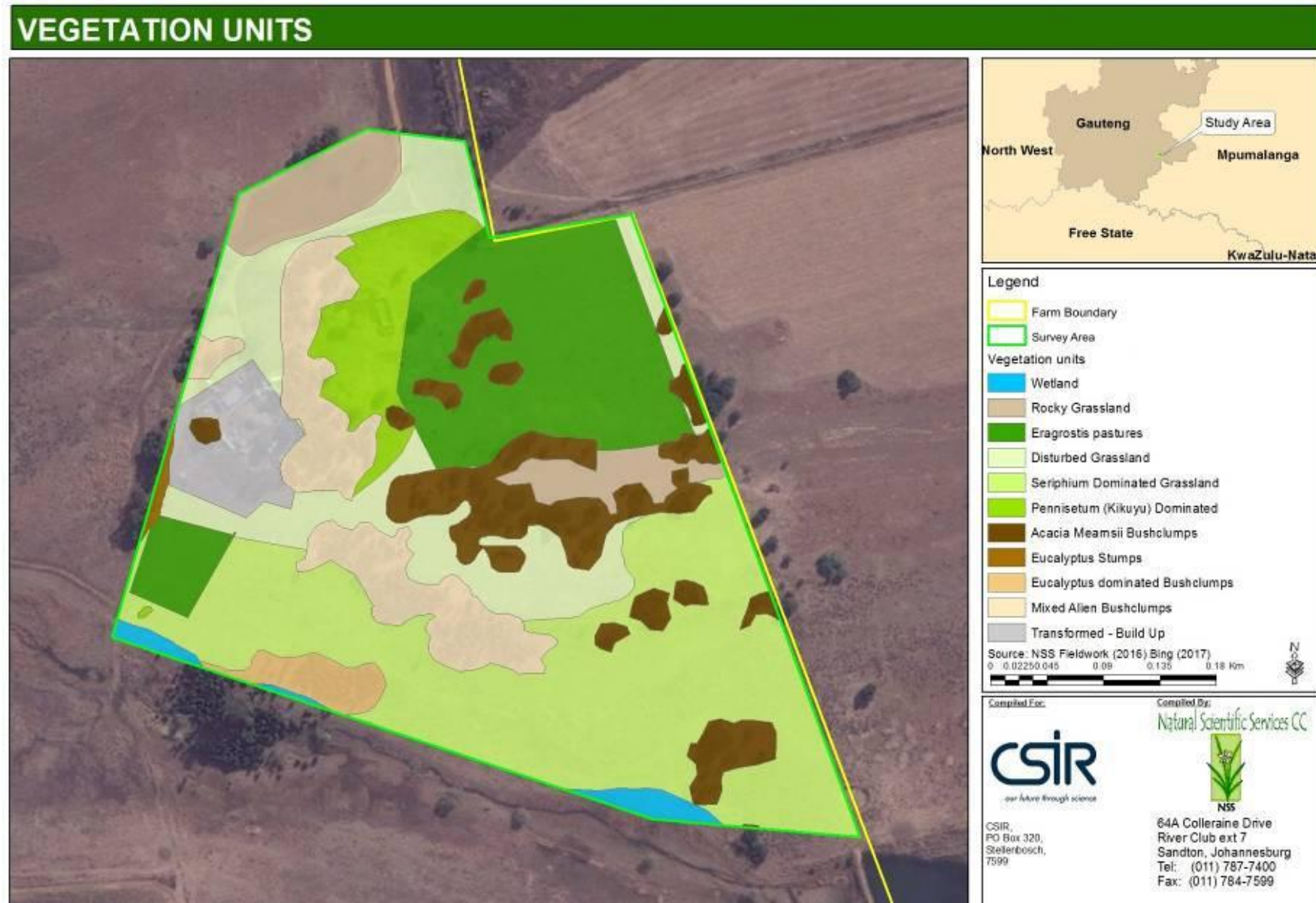


Figure 8-4 Vegetation communities within the study area

8.1.3. Conservation Important Species

Heterogeneous landscapes, diverse geology and a range of environmental conditions, provide a diverse number of habitats for plant species (well documented through articles from Pickett, *et.al.* 1997; O'Farrell, 2006; KNNCS, 1999). These areas are normally associated with high levels of species endemism and richness. For example, at least 74% of the 23 threatened Highveld plant taxa occur on the crests and slopes of ridges and hills (Pfab & Victor 2002). However, homogenous landscapes, either natural or that have been transformed through historical farming practices and infrastructural development contain minimal diversity and endemism. The current infrastructural footprint is almost 100% transformed through past agricultural activities, building and planting and spreading of alien trees. The larger survey area is more heterogeneous with elements of exposed rock, southern slopes, and soil wetness. Although these areas have some transformation from past activities, they could still provide habitat for CI species. Although considered a brief Vegetation Scan report, NSS has included a section on Conservation Important (CI) species that were detected or could possibly be detected on site. Within this section the CI species are discussed. These include the National Threatened Plant Species Programme (TSP) lists, any Protected species according to the Nature Conservation Ordinance (12 of 1983) and any specific Endemic or Rare species.

The Threatened Plant Species Programme (TSP) is an ongoing assessment that revises all threatened plant species assessments made by Craig Hilton-Taylor (1996), using IUCN Red Listing Criteria modified from Davis *et al.* (1986). According to the TSP Red Data list of South African plant taxa (accessed January 2017), there are 77 Red Data listed species (including Data Deficient and Rare species) (**Table 8-3**) out of a possible 2762 species within Gauteng Province of which 1 species is Extinct, 1 species is Critically Endangered (CR), 410 Endangered (EN), 13 are Vulnerable (VU) and 19 are Near Threatened.

Table 8-3 Numbers of conservation important plant species per Red Data category within South Africa and North West (date accessed: January 2017)

Threat Status	South Africa	GAUTENG	2628AD / BC
EX (Extinct)	28	1	0
EW (Extinct in the wild)	7	0	0
CR PE (Critically Endangered, Possibly Extinct)	57	0	0
CR (Critically Endangered)	332	1	0
EN (Endangered)	716	10	0
VU (Vulnerable)	1217	13	3
NT (Near Threatened)	402	19	2
Critically Rare (known to occur only at a single site)	153	0	0
Rare (Limited population but not exposed to any direct or potential threat)	1212	4	0
Declining (not threatened but processes are causing a continuing decline in the population)	47	9	2
LC (Least Concern)	13 856	1997	455
DDD (Data Deficient - Insufficient Information)	348	1	0
DDT (Data Deficient - Taxonomically Problematic)	904	19	5

Threat Status	South Africa	GAUTENG	2628AD / BC
Total spp (including those not evaluated)	23 399	2762	525

**Date accessed – January 2017

From the POSA website (2628AD & BC QDS) 12 listed CI species have been recorded in the greater region (**Table 8-4**). Of these 7 species have a possibility of occurring in the surrounding natural to semi-natural vegetation communities around the site and *Hypoxis hemerocallidea* is highly likely to occur. *Gunnera perpensa* was located within the wetland to the south west of the infrastructural footprint. This species is listed as Declining in the Red List. According to Williams *et al* (2008) large volumes of this species is traded in traditional medicine markets and declines in availability and local extirpations have been noted. It is, however, widespread, somewhat resilient to harvesting and tends to grow back after the roots have been removed. However, given the high volumes traded, successive harvesting will have an impact on the population in conjunction with the degradation and decline of its habitat.

Table 8-4 Potential CI species based on information obtained from 2628AD & BC QDS

Family	Species	Status	Flowering Times	Habitat	LoO
EUPHORBIACEAE	<i>Acalypha caperonioides</i> Baill. var. <i>caperonioides</i>	DDT	Spring - Summer	In grassland, <i>Brachystegia</i> woodland and at margins of vleis, typically after grass fires	Possible
CRASSULACEAE	<i>Adromischus umbraticola</i> C.A.Sm. subsp. <i>umbraticola</i>	NT	September - January	Rock crevices on rocky ridges, usually south-facing, or in shallow gravel on top of rocks, but often in shade of other vegetation.	Possible
APIACEAE	<i>Alepidea peduncularis</i> A.Rich.	DDT	Summer	Montane grassland	Unlikely
ASTERACEAE	<i>Cineraria longipes</i> S.Moore	VU	March - May	Koppies to the south of Johannesburg, amongst rocks and along seep lines in association with <i>Pteridium</i> .	Possible
HYACINTHACEAE	<i>Drimys elata</i> Jacq.	DDT	September - January	Grassland and bushveld	Possible
ORCHIDACEAE	<i>Eulophia coddii</i> A.V.Hall	VU	Early December	Steep hillsides on soil derived from sandstone, grassland or mixed bush.	Unlikely
HYPOXIDACEAE	<i>Hypoxis hemerocallidea</i> Fisch., C.A.Mey. & Avé-Lall.	DEC	Summer	Occurs in a wide range of habitats, from sandy hills on the margins of dune forests to open rocky grassland; also grows on dry, stony, grassy slopes, mountain slopes and plateaux; appears to be drought and fire tolerant.	Highly Likely
AQUIFOLIACEAE	<i>Ilex mitis</i> (L.) Radlk. var. <i>mitis</i>	DEC	October - December	Along rivers and streams in forest and thickets, sometimes in the open. Found from sea level to inland mountain slopes.	Unlikely

Family	Species	Status	Flowering Times	Habitat	LoO
MESEMBRYANTHEMACEAE	<i>Khadia beswickii</i> (L.Bolus) N.E.Br.	VU	October - March	Open areas on shallow surfaces above rocks in grassland.	Possible
MESEMBRYANTHEMACEAE	<i>Lithops lesliei</i> (N.E.Br.) N.E.Br. subsp. <i>lesliei</i>	NT	March, April and May	Grassland with dark pinkish-red ferruginous shaly siltstone.	Possible
MYROTHAMNACEAE	<i>Myrothamnus flabellifolius</i> Welw.	DDT	September - November	In shallow soil over sheets of rock	Possible
SANTALACEAE	<i>Thesium boissierianum</i> A.DC.	DDT	Summer	Not known at time of report compilation	?

* Vulnerable – VU; Data Deficient Taxonomically – DDT; Near Threatened – NT; Declining - DEC

In addition to the Declining *Gunnera* species were recorded, a number of *Gladiolus* individuals were located within the Rocky Grassland vegetation. These are considered Protected species under Schedule 11 Protected Plants (Section 86 (1) (a)) of the Gauteng Nature Conservation Ordinance, 12 of 1983 (Gauteng General Law Amendment Act No. 4 of 2005) (**Figure 8-5**). Protected Species may not be cut, disturbed, damaged, and destroyed without obtaining a permit from Gauteng Province or a delegated authority. Based on the infrastructural layout for the proposed project, it is not expected that these Protected and the Declining *Gunnera* species will be affected by the development. There is also little to no information available on water quality of wetland systems and the effects it has on species such as *Gunnera perpensa*.



Gunnera perpensa - leaves



Gunnera perpensa - flower

Figure 8-5 Photographs of Conservation Important plant species in the surrounds of the survey area

Alien and Invasives Species

Alien, especially invasive⁴ plant species are a major threat to the ecological functioning of

⁴ Two main pieces of national legislation are applicable to alien, invasive plants, namely the:

■ Conservation of Agriculture Resources Act (CARA; Act 43 of 1983); and

natural systems and to the productive use of land. The trend within areas with such high past disturbances and transformation, is considered to be infested with a number of alien species. This is typical to what has been found on site. The large stands of alien bushclumps and *Pennisetum* patches dominate the area. Over 19% of the species found on site were alien. Of these, over 38% were NEMBA Category 1b and 7% were Category 2 (**Table 8.5** and **Figure 8-6**).

Table 8-5 Alien and Invasive Species detected during the survey

Family	Species	Growth forms	NEMBA
FABACEAE	<i>Acacia dealbata</i> Link	Shrub, tree	2
FABACEAE	<i>Acacia mearnsii</i> De Wild.	Shrub, tree	2
AMARANTHACEAE	<i>Amaranthus hybridus</i> L. subsp. <i>hybridus</i> var. <i>hybridus</i>	Herb	Not listed
PAPAVERACEAE	<i>Argemone ochroleuca</i>	Herb	1b
ASTERACEAE	<i>Bidens pilosa</i> L.	Herb	Not listed
PINACEAE	<i>Cedrus deodara</i>	Tree	Not listed
CHENOPODIACEAE	<i>Chenopodium album</i> L.	Herb	Not listed
SOLANACEAE	<i>Datura stramonium</i> L.	Herb, shrub	1b
POACEAE	<i>Eragrostis tef</i> (Zuccagni) Trotter	Graminoid	Not listed
MYRTACEAE	<i>Eucalyptus camaldulensis</i> Dehnh.	Tree	1b in Grassland Biome
AMARANTHACEAE	<i>Gomphrena celosioides</i> Mart.	Herb	Not listed
VERBENACEAE	<i>Lantana camara</i> L.	Shrub	1b
OXALIDACEAE	<i>Oxalis corniculata</i> L.	Herb	Not listed
POACEAE	<i>Paspalum dilatatum</i> Poir.	Graminoid	Not listed
POACEAE	<i>Pennisetum clandestinum</i> Hochst. ex Chiov.	Graminoid	1b in wetlands
RANUNCULACEAE	<i>Ranunculus multifidus</i> Forssk.	Herb	Not listed
RUBIACEAE	<i>Richardia brasiliensis</i> Gomes	Herb	Not listed
SALICACEAE	<i>Salix babylonica</i> L. var. <i>babylonica</i>	Tree	Not listed
LAMIACEAE	<i>Salvia runcinata</i> L.f.	Herb	Not listed
SOLANACEAE	<i>Solanum mauritianum</i> Scop.	Tree	1b
SOLANACEAE	<i>Solanum sisymbriifolium</i> Lam.	Herb, shrub	1b
ASTERACEAE	<i>Tagetes minuta</i> L.	Herb	Not listed
VERBENACEAE	<i>Verbena aristigera</i> S.Moore	Herb	Not listed
VERBENACEAE	<i>Verbena bonariensis</i> L.	Herb	1b
VERBENACEAE	<i>Verbena brasiliensis</i> Vell.	Herb	1b
ASTERACEAE	<i>Xanthium strumarium</i> L.	Shrublet	1b



Solanum sisymbriifolium



Argemone ochroleuca

Figure 8-6 The Category 1 Listed *Opuntia* species

***Alien Invasive Categories according
to NEM:BA; Act 10 of 2004:***

Category 1a

Species requiring compulsory control.

Category 1b

Invasive species controlled by an
invasive species management
programme

Category 2

Invasive species controlled by area

Category 3

8.2. Fauna

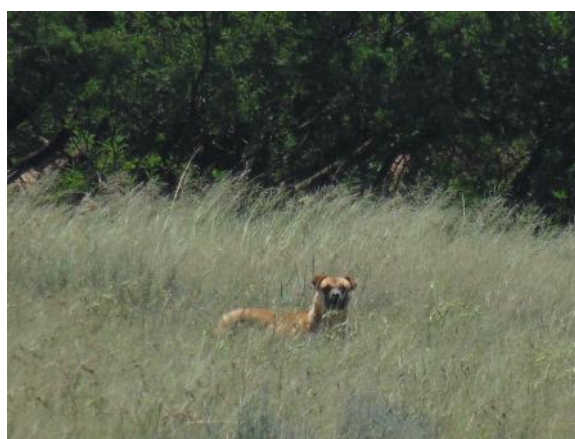
Provided in the appended lists under **13.2-13.8** is the name and conservation status of each mammal, bird, reptile, frog, butterfly, odonata (dragonfly and damselfly) and scorpion species that has been recorded, or is considered highly likely or likely to occur in the study area.

8.2.1. Mammals

Approximately 44 mammal species are considered highly likely or likely to occur at least occasionally in the study area (**Appendix 13.2**). Of these, the Southern African / Common Mole-rat was detected during the brief site visit along with domestic dogs, cattle and sheep (**Figure 8-7**). Rocky patches in the study area likely provide habitat for Eastern Rock Elephant Shrew and Namaqua Rock Mouse. The nearby unnamed tributary of the Blesbokspruit potentially provides habitat for the Southern African Vlei Rat, Marsh Mongoose, Swamp Musk Shrew, and African Clawless Otter. Most other mammal species, which have been listed for the study area, are wide-ranging and/or habitat generalists such as the Black-backed Jackal, Bush Duiker, Cape Porcupine, Cape Serotine and Egyptian Free-tailed bats, Common Genet, Four-striped Grass Mouse, Highveld Gerbil, Slender and Yellow Mongoose, and Southern African Mastomys.



Southern African Mole-rat
(*Cryptomys hottentotus*) mounds



Dog



Cattle



Sheep

Figure 8-7 Evidence of local mammal species

Up to 10 threatened or Protected mammal species were rated with a high or moderate Likelihood of Occurrence (LoO) in the study area (**Table 8-6**).

- The globally Endangered (EN) and nationally Vulnerable (VU) African White-tailed Rat is known to occur *inter alia* in undisturbed grassland areas in southern Gauteng. The species is poorly understood and difficult to detect due to its nocturnal and fossorial (burrowing) habits (Stuart & Stuart 2007). Considering that any local population would likely be threatened by crop cultivation, livestock grazing and increasing human settlement, this species was rated with a moderate LoO in the study area.
- The globally and nationally VU Black-footed Cat, which is also listed as a national Protected Species, inhabits moist and arid grassland where it utilizes burrows made by other animals, and termite mounds (Stuart & Stuart 2007). As with the afore-mentioned species, Black-footed Cats are difficult to detect due to their secretive nocturnal and fossorial habits. Considering on the one hand that there is natural grassland and termitaria for this species, and on the other hand that there is increasing human settlement and pet activity in the area, the Black-footed Cat was rated with a moderate LoO.
- The globally and nationally Near Threatened (NT) Brown Hyena, which is also listed as a national Protected Species and a provincial Protected Game species, is known to scavenge opportunistically from human settlements. Given that there are at least two records of this species from QDS 2628BC (MammalMAP 2017), and that the study area is situated on the periphery of a human settlement area, the Brown Hyena was rated with a high LoO.
- The globally and nationally NT Highveld Golden Mole occurs in high-altitude grassland where it is restricted to friable soil at the edges of marshes in valleys, and in meadows on mountainsides. The species is also common in well-irrigated farmyards, gardens, golf courses, and exotic plantations. Habitat loss from coal-mining is the main threat to this species (IUCN 2017). As the distribution range of the Highveld Golden Mole is marginal to the study area, and there are no records for this species from QDS 2628BC (MammalMAP 2017), it was rated with a moderate LoO at best.
- The African Clawless Otter has recently been listed as globally and nationally NT (SANBI & EWT 2016). Although it is widely distributed in sub-Saharan Africa, populations are restricted to areas of permanent fresh water where there is good shoreline cover and an abundant prey base. In addition to wetland habitat loss and pollution, otters are also predicted to be impacted by global climate change and increasing human/otter conflict for increasingly scarce resources such as water, land and fish (IUCN 2017). Although no otter scat was found during the site visit, there are 17 records of African Clawless Otter from QDS 2628BC (MammalMAP 2017), and, therefore, this species was rated with a high LoO.
- The nationally NT and Protected Serval typically frequents dense, grassy habitat near water. The South African population is small (<10,000 individuals) and highly fragmented

due to wetland and grassland transformation (Friedmann & Daly 2004). NSS has noticed, however, that Serval can tolerate extensive crop cultivation and even mining activities in some areas, where they may seek refuge in e.g. alien bushclumps. Given this, and that there is also a record for Serval from QDS 2628BC (MammalMAP 2017), this species was rated with a high LoO in the study area.

- The nationally NT Southern African Hedgehog inhabits the temperate eastern interior of South Africa where it requires good ground cover for nesting. It is threatened by habitat transformation, road traffic, and the wildlife trade (Friedmann & Daly 2004) and is listed as a Protected Game species in Gauteng. Individuals tend to avoid wet ground and require thick, dry cover for nesting and resting by day during summer, and while in torpor during winter. The drier, higher-lying parts of the study area are considered suitable for hedgehogs, and given that there is at least one Hedgehog record from QDS 2628BC (MammalMAP 2017), this species was rated with a high LoO in the study area.
- The national status of the African Striped Weasel has recently been up-listed from Least Concern to NT (SANBI & EWT 2016). Although the Striped Weasel is widely distributed in South Africa, it is poorly understood due to its secretive nocturnal habits, and appears to be rare. Given this, and that there is no record for this species from QDS 2628BC (MammalMAP 2017), it was rated with a moderate LoO in the study area.
- The nationally NT Swamp Musk Shrew typically inhabits dense, matted vegetation near wetlands (Stuart & Stuart 2000). As with the afore-mentioned species, due to its inconspicuous behaviour, little is known about Swamp Musk Shrews. NSS has found, however, that where undisturbed wetland habitat exists, this species is almost inevitably present. Given that downstream wetland conditions seem relatively healthy, and that there are as many as 97 Swamp Musk Shrew records from QDS 2628BC (MammalMAP 2017), this species was rated with a high LoO.
- The Cape Fox is common across much of its range in southern Africa, although problem animal control activities (hunting and poisoning) have resulted in population reductions in some areas. For this reason it is listed as a national Protected Species. The species typically occupies open country including grassland, grassland with scattered thickets, and lightly wooded areas, and is generally most abundant in areas receiving <500mm annual rainfall (IUCN 2017). Given this, and that there is no record for Cape Fox from QDS 2628BC (MammalMAP 2017), this species was rated with a moderate LoO.
- The Aardwolf is listed as a provincial Protected Game species as it has also been subject to persecution for problem animal control. Although relatively widely distributed in Africa, the Aardwolf is not common within its range. In prime habitat (open grassland and scrub regions), densities may reach one adult/km² on farms with good populations of termites and no persecution by farmers (IUCN 2017). Although there is no record for this species from QDS 2628BC (MammalMAP 2017), termitaria are common in the study area and, therefore, the Aardwolf was rated with a moderate LoO.
- The Steenbok is also listed as a provincial Protected Game species. Due to the proximity of human settlement and the observed presence of hunting dogs, this species was rated with a moderate LoO in the study area.

Table 8-6 Potentially occurring Conservation Important mammal species

SCIENTIFIC NAME	COMMON NAME	RSA LEGAL STATUS (NEM:BA ToPS 2015)	GAUTENG LEGAL STATUS (Transvaal Nature Conservation Ordinance 1983)	GLOBAL RED LIST STATUS (IUCN 2016-3)	RSA RED LIST STATUS (SANBI & EWT 2016)	LoO IN QDS (Friedmann & Daly 2004; MammalMAP 2017)	LoO IN PORTION 15
<i>Raphicerus campestris</i>	Steenbok		PG Schedule 2 Section 15(1)(a)	LC (S)	LC	3	3
<i>Vulpes chama</i>	Cape Fox	PS		LC (S)	LC	2	2
<i>Amblysomus septentrionalis</i>	Highveld Golden Mole			NT (D)	NT	2	3
<i>Atelerix frontalis (frontalis)</i>	Southern African Hedgehog		PG Schedule 2 Section 15(1)(a)	LC (S)	NT	1	2
<i>Felis nigripes</i>	Black-footed Cat	PS		VU (D)	VU	1	3
<i>Leptailurus serval</i>	Serval	PS		LC (S)	NT	1	2
<i>Hyaena brunnea</i>	Brown Hyena	PS	PG Schedule 2 Section 15(1)(a)	NT (S)	NT	1	2
<i>Proteles cristata</i>	Aardwolf		PG Schedule 2 Section 15(1)(a)	LC (S)	LC	2	3
<i>Aonyx capensis</i>	African Clawless Otter			NT (D)	NT	1	2
<i>Poecilogale albinucha</i>	African Striped Weasel			LC (U)	NT	3	3
<i>Mystromys albicaudatus</i>	African White-tailed Rat			EN (D)	VU	3	3
<i>Crociodura mariquensis</i>	Swamp Musk Shrew			LC (U)	NT	1	2

Status: D = Declining; EN = Endangered; LC = Least Concern; NT = Near Threatened; PG = Protected Game; PS = Protected Species; S = Stable; VU = Vulnerable; U = Unknown

Likelihood of Occurrence (LoO): 1 = Present; 2 = High; 3 = Moderate

Sources: Transvaal Nature Conservation Ordinance (1983); Friedmann & Daly (2004); NEM:BA ToPS (2015); SANBI & EWT (2016); IUCN (2016-3); MammalMAP (2017)

Table 8-7 Potentially occurring Conservation Important bird species

SCIENTIFIC NAME	COMMON NAME	RSA LEGAL STATUS (NEM:BA ToPS 2015)	GAUTENG LEGAL STATUS (Transvaal Nature Conservation Ordinance 1983)	GLOBAL RED LIST STATUS (Taylor et al. 2015)	REGIONAL RED LIST STATUS (Taylor et al. 2015)	LoO IN QDS (Roberts VII 2013)	LoO IN PENTAD (SABAP2 2017)	LoO IN PORTION 15
<i>Anthropoides paradiseus</i>	Crane, Blue	PS	PG Schedule 2 Section 15(1)(a)	VU	NT	1	1	3
<i>Falco biarmicus</i>	Falcon, Lanner		PG Schedule 2 Section 15(1)(a)	LC	VU	1	1	3
<i>Circus ranivorus</i>	Harrier, African Marsh		PG Schedule 2 Section 15(1)(a)	LC	EN	1	1	3
<i>Circus macrourus</i>	Harrier, Pallid		PG Schedule 2 Section 15(1)(a)	NT	NT	1		3
<i>Eupodotis caerulescens</i>	Korhaan, Blue		PG Schedule 2 Section 15(1)(a)	NT	LC	1	1	2
<i>Eupodotis senegalensis</i>	Korhaan, White-bellied		PG Schedule 2 Section 15(1)(a)	LC	VU	1		3
<i>Mirafraga cheniana</i>	Lark, Melodious		PG Schedule 2 Section 15(1)(a)	NT	LC	1		3
<i>Tyto capensis</i>	Owl, African Grass		PG Schedule 2 Section 15(1)(a)	LC	VU	1	1	2
<i>Ciconia abdimii</i>	Stork, Abdim's		PG Schedule 2 Section 15(1)(a)	LC	NT	1		3

Status: EN = Endangered; LC = Least Concern; NT = Near Threatened; PG = Protected Game; PS = Protected Species; VU = Vulnerable

Likelihood of Occurrence (LoO): 1 = Present; 2 = High; 3 = Moderate

Sources: Transvaal Nature Conservation Ordinance (1983); Roberts VII (2013); NEM:BA ToPS (2015); Taylor et al. (2015); SABAP 2 (2017)

8.2.2. Birds

Approximately 355 bird species are listed for QDS 2628BC (Roberts VII 2013), of which 216 were rated with a high or moderate LoO in the study area. Approximately 236 bird species have been recorded in pentad 2625_2830 (SABAP 2 2017), and 34 bird species were detected during the brief site visit (**Appendix 13.3**). Regionally-occurring montane bird species (e.g. Jackal Buzzard, Rock Kestrel and Verreaux's Eagle) , as well as open water and wading bird species (e.g. grebes, flamingos, sandpipers, stints, etc.) are considered unlikely to occur due to the absence of appropriate habitats for these birds in the study area. The bird species that were recorded during the site visit (**Figure 8-8**) represent common, widespread bird taxa (e.g. bishops, cisticolas, doves, larks, prinias, shrikes, swallows and swifts), which are more or less tolerant of crop cultivation, human settlement, livestock grazing, and dog activity. The Alien Common Myna was also recorded on site.



Southern Red Bishop
(*Euplectes orix*)



Pin-tailed Whydah
(*Vidua macroura*)



Crowned Lapwing
(*Vanellus coronatus*)

Figure 8-8 Evidence of local bird species

Under the 1983 Transvaal Nature Conservation Ordinance (refer to **Appendix 13.3**), most bird species that are listed for the study area represent provincial Protected Game. A few species (i.e. the Egyptian and Spur-winged geese, Orange River and Red-winged francolins, Yellow-billed Duck and Red-billed Teal) represent provincial "Other Game." Certain common indigenous bird taxa (e.g. bulbuls, cormorants, crows, doves, mousebirds, Red-billed Quelea and weavers) represent provincial "Wild Animals." Nine threatened or nationally Protected bird species were rated with a high or moderate LoO in the study area (**Table 8-7**).

- The regionally EN African Marsh Harrier is limited to large wetland systems in eastern and southern Africa. Populations are declining due to wetland transformation caused by drainage, damming, over-grazing and pesticides (BirdLife International 2013). Fires during the breeding season are also problematic for these birds (Roberts VII 2013). Given the small size of the nearby unnamed tributary of the Blesbokspruit, and that this species has

not yet been recorded in pentad 2625_2830 by SABAP 2 observers (SABAP 2 2017), it was rated with a moderate LoO.

- The globally VU and regionally NT Blue Crane is listed also as a national Protected Species. Although Blue Cranes forage in a diversity of habitats including cultivated fields, they breed preferentially at high elevations in secluded natural grass- and sedge-dominated habitats where the vegetation is thick and short (BirdLife International 2013). Although much of Portion 15 might support Blue Crane foraging, local breeding by these birds is unlikely given the proximity of human settlement and the prevalence of people, livestock and pets. Given this, and that the Blue Crane has not yet been recorded in pentad 2625_2830 by SABAP 2 observers (SABAP 2 2017), this species was rated with a moderate LoO at best.
- The regionally VU Lanner Falcon favours open grassland or woodland in the vicinity of cliff or electricity pylon breeding sites (Roberts VII 2013). Cliffs and large pylons appear to be limited in the study area, and since Lanner Falcons have not yet been recorded in pentad 2625_2830 (SABAP 2 2017), this species was rated with a moderate LoO.
- The regionally VU White-bellied Korhaan inhabits open grassland and lightly wooded savanna where it prefers taller grass than most other korhaans (BirdLife International 2013). There is currently no record of this species in pentad 2625_2830 (SABAP 2 2017), and since the observed height of local grassland and pasture was mostly moderate or short, this species was rated with a conservative moderate LoO.
- The regionally VU African Grass-owl is a habitat specialist requiring tall (at least knee-high), dense grasses and sedges in which to construct nests and roost tunnels. Suitable habitat is typically found along drainage systems, around pans, and within slope seepage zones and the occurrence of these owls in an area is dependent on the retention of such areas. Nesting has been recorded even in small ($\leq 4\text{m}^2$) patches of suitable habitat within generally unsuitable *Hyparrhenia hirta* grassland (Geoff Lockwood pers. comm.). Grass-owls hunt over a mixture of wetland, grassland, cropland and fallow fields, and have been shown through radio telemetry to forage up to 4km away from their roosts and nests (Geoff Lockwood pers. comm.). During foraging, grass-owls are able to fly over extensive areas of unsuitable habitat to reach favoured hunting areas, and it is this behaviour combined with the species' nesting adaptability, which could enable this species to occur in the study area. Considering that there is sufficient vegetation along the wetland system – specifically to the west, the African Grass-owl was rated with a High LoO in the larger area.
- The globally and regionally NT Pallid Harrier is a migratory, non-breeding visitor to South Africa. It occupies grasslands associated with flood plains and pans, and also croplands, where it preys predominantly on insects and birds. Populations are mainly threatened by poisoning from pesticides and transformation of grassland by fire and overgrazing (BirdLife International 2013). Although there seems to be some suitable habitat for Pallid Harriers on Portion 15, there is currently no SABAP record for this species from either pentad 2625_2830 or QDS 2628BC (SABAP 2 2017), and, therefore, this species was rated with a moderate LoO.

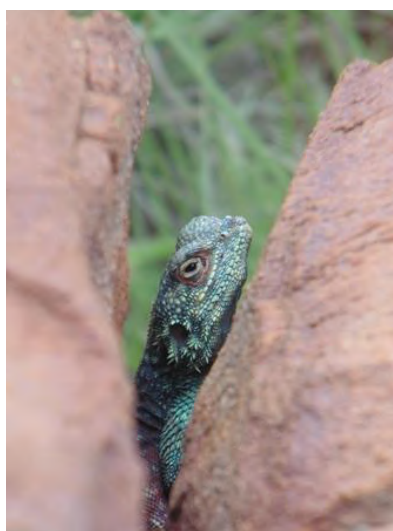
- The globally NT Blue Korhaan is endemic to the grassland biome in South Africa and Lesotho where increasing habitat transformation is the main threat to the species (BirdLife International 2013). Compared to White-bellied Korhaans, Blue Korhaans typically feed and nest in areas with shorter grass, and seem capable of persisting in areas where there is crop cultivation, livestock grazing, and a low density of human settlement (NSS pers. obs.). Given this, and that the observed height of local grassland and pasture was mostly moderate or short, Blue Korhaans were rated with a high LoO.
- The globally NT Melodious Lark preferentially inhabits areas where the grass is short, and there are open spaces between the grass tussocks. Wetter low-lying areas are avoided, and the species is sensitive to grazing by livestock (BirdLife International 2013). Although the higher-lying parts of Portion 15 might be suitable for this species, grazing by cattle and sheep could be problematic. There is also no SABAP record of Melodious Lark from either pentad 2625_2830 or QDS 2628BC (SABAP 2 2017). This species was, therefore, rated with a conservative moderate LoO.
- The regionally NT Abdim's Stork inhabits grassland, savanna woodland and cultivated fields where it preys on mainly insects (especially orthoptera), army worms, and small vertebrates. Although Abdim's Stork does not breed in South Africa, these birds require large trees or cliffs for roosting at night (Roberts VII 2013). Although local grassland and alien bushclumps might provide suitable foraging and roosting habitat for Abdim's Storks, levels of disturbance from people, traffic and pets may be problematic. There is also no SABAP record of Abdim's Stork from either pentad 2625_2830 or QDS 2628BC (SABAP 2 2017). This species was, therefore, rated with a moderate LoO at best.

8.2.3. Reptiles

Approximately 45 reptile species are considered highly likely or likely to occur at least occasionally in the study area (**Appendix 13.413.4**). During the site visit, Speckled Rock Skink was recorded on site, and the Southern Rock Agama was encountered on the rocky ridge in the north-western section of Portion 15 (**Figure 8-9**).



Termitaria



Southern Rock Agama



Rocky ridge

Figure 8-9 Photographic evidence of local reptile habitat and species

In Gauteng, the Water Monitor and all snake species represent provincial Wild Animals. Other reptile taxa in the study area, such as agamas, chameleons, geckos, lizards, skinks and terrapins) represent provincial Protected Game (refer to **Appendix 13.4**). Three reptile species of conservation concern potentially occur in the study area (**Table 8-8**).

- The globally NT Coppery Grass Lizard has a patchy distribution along South Africa's eastern escarpment, where populations inhabit grassy mountain slopes and plateaus (Branch 1990). The species is adapted to moving like a snake through grass, and is compromised where grassland has been destroyed or degraded, and the ground is exposed and hardened (Alexander 2009). As the rocky ridge and adjoining grassland to the west of the development site is considered to represent suitable habitat for this species, it was rated with a high LoO within these habitats.
- The Striped Harlequin Snake is endemic to South Africa, and due to grassland loss and degradation is listed as globally NT. It lives mainly underground and inside moribund termite mounds where it feeds exclusively on thread snakes (Branch 1990). The species has a patchy occurrence and is rare. Therefore, although grassland and termitaria are present in the study area, this species was rated with a moderate LoO.
- Although widely distributed and listed as Least Concern, the uncommon Aurora Snake is reportedly experiencing rapid population declines in Gauteng and elsewhere. Threats to this species include habitat loss, harvesting for the pet trade, and their mortality caused by road traffic (Alexander & Marais 2008). There is at least one record of this species from QDS 2628BC (ReptileMAP 2017), and considering that there is suitable grassland habitat for this species on Portion 15, it was rated with a high LoO.

8.2.4. Frogs

Approximately 15 frog species are considered highly likely or likely to occur in the study area (**Appendix 13.5**). The Common Platanna is likely to be prevalent throughout much of the nearby Blesbokspruit tributary. Flowing sections of the spruit provide habitat that appears to be suitable for the Cape River Frog, Delalande's River Frog, Raucous Toad and even the Striped Stream Frog. A small permanently-inundated dam adjoining the eastern boundary of Portion 15 approximately mid-way, likely provides breeding habitat for Guttural and Red toads. Only one Conservation Important frog species is likely to occur in the study area.

- The Giant Bullfrog is listed as regionally NT by Minter *et al.* (2004), and is also listed as provincial Protected Game. It is threatened mainly by habitat loss, but it's mortality on roads, and it's harvesting for food and the pet trade are also problematic. For most of the year bullfrogs are buried in a state of torpor, and are typically active aboveground for a night or two after heavy rain in November-January. Bullfrog breeding is limited to a few days in the year and occurs in shallow, standing, seasonal water with emergent grassy vegetation. Bullfrog foraging appears to be concentrated around their burrows, which may be situated up to 1km from their breeding site (Yetman & Ferguson 2011). There is at least one record of the Giant Bullfrog from QDS 2628BC (FrogMAP 2017), but suitable breeding habitat for bullfrogs seems to be limited on Portion 15. This species was, therefore, rated with a moderate LoO.

Table 8-8 Potentially occurring Conservation Important reptile species

SCIENTIFIC NAME	COMMON NAME	GAUTENG LEGAL STATUS (Transvaal Nature Conservation Ordinance 1983)	RED LIST STATUS (Bates <i>et al.</i> 2014)	LoO IN QDS (ReptileMAP 2017)	LoO IN PORTION 15
<i>Chamaesaura aenea</i>	Coppery Grass Lizard	PG Schedule 2 Section 15(1)(a)	1NT End	2	2
<i>Homoroselaps dorsalis</i>	Striped Harlequin Snake	WA Schedule 5 Section 43	1NT End	3	3
<i>Lamprophis aurora</i>	Aurora House Snake	WA Schedule 5 Section 43	1LC	1	2

Status: 1 = Global; 2 = Regional; End = Endemic; LC = Least Concern; NT = Near Threatened; PG = Protected Game; WA = Wild Animal

Likelihood of Occurrence (LoO): 1 = Present; 2 = High; 3 = Moderate

Sources: Transvaal Nature Conservation Ordinance (1983); Bates *et al.* (2014); NEM:BA ToPS (2015); ReptileMAP (2017)

Table 8-9 Potentially occurring Conservation Important frog species

SCIENTIFIC NAME	COMMON NAME	GAUTENG LEGAL STATUS (Transvaal Nature Conservation Ordinance 1983)	GLOBAL RED LIST STATUS (IUCN)	RSA, LSO & SWZ RED LIST STATUS (Minter <i>et al.</i> 2004)	LoO IN QDS (FrogMAP 2017)	LoO IN PORTION 15
<i>Pyxicephalus adspersus</i>	Giant Bullfrog	PG Schedule 2 Section 15(1)(a)	LC (D)	NT	1	3

Status: D = Declining; LC = Least Concern; NT = Near Threatened; PG = Protected Game

Likelihood of Occurrence (LoO): 1 = Present; 2 = High; 3 = Moderate

Sources: Transvaal Nature Conservation Ordinance (1983); Minter *et al.* (2004); NEM:BA ToPS (2015); FrogMAP (2017)

Table 8-10 Potentially occurring Conservation Important butterfly species

SCIENTIFIC NAME	COMMON NAME	GAUTENG LEGAL STATUS (Transvaal Nature Conservation Ordinance 1983)	RED LIST STATUS (Mecenero <i>et al.</i> 2013)	LoO IN QDS (LepiMAP 2017)	LoO IN PORTION 15
<i>Aloeides dentatis dentatis</i>	Roodepoort Copper	Schedule 7 Section 45	1EN End	3	3
<i>Chrysoritis aureus</i>	Heidelberg Opal	Schedule 7 Section 45	1EN End	3	4
<i>Orachrysops mijburghi</i>	Mijburgh's Blue		1EN End	3	3
<i>Metisella meninx</i>	Marsh Sylph		1LC Rare Habitat Specialist	2	2

Status: 1 = Global; EN = Endangered; End = Endemic; LC = Least Concern

Likelihood of Occurrence (LoO): 1 = Present; 2 = High; 3 = Moderate; 4 = Low

Sources: Transvaal Nature Conservation Ordinance (1983); Mecenero *et al.* (2013); NEM:BA ToPS (2015); LepiMAP (2017)

8.2.5. Butterflies

Based on the published butterfly distribution maps in Mecenero *et al.* (2013), approximately 44 butterfly species are considered highly likely to occur in QDS 2628BC, and 32 were rated with a moderate LoO. LepiMAP (2017) holds records for 20 butterfly species from QDS 2628BC (**Appendix 13.6**), most of which are likely to occur on, or at least pass through the site. Ten butterfly species were encountered during the site visit (**Figure 8-10**), all of which have previously been recorded in QDS2628BC except for Wichgraf's Hillside Brown, which we caught on the rocky ridge to the north-west of the site.



Wichgraf's Brown
(*Stygionympha wichgrafi*)



Broad-bordered Grass Yellow
(*Eurema brigitta brigitta*)



Citrus Swallowtail
(*Papilio demodocus demodocus*)



Brown-veined White
(*Belenois aurota*)



African Monarch
(*Danaus chrysippus orientis*)



Meadow White
(*Pontia helice helice*)

Figure 8-10 Evidence of local butterfly species

All the observed butterfly species and most of the potentially occurring butterfly species are common and widespread. However, as many as four conservation important butterfly species are known to occur in the region.

- The globally EN Roodepoort Copper subspecies *Aloeides dentatis dentatis*, is known from five locations in southern Gauteng where it inhabits fairly flat, rocky grassland (including Soweto Highveld Grassland), along or below ridges above 1 500m a.s.l.. Larval host plants of this butterfly species include *Hermannia depressa* and *Lotononis eriantha* (Mecenero *et al.* 2013). Although this species is rare, habitat

conditions seem suitable to the west of the site. The Roodepoort Copper subspecies *A. d. dentatis* was rated with a Moderate LoO.

- The globally EN Heidelberg Opal is limited to south-eastern Gauteng and south-western Mpumalanga where it inhabits steep, south-facing boulder-strewn patches of Gold Reef and Andesite mountain bushveld at an altitude of 1 600m – 1 800m a.s.l.. The vegetation must support a diversity of forbs, its host plant *Clutia pulchella*, and associated ant species *Crematogaster liengmei* (Mecenero *et al.* 2013). As this important set of habitat requirements is not met in the study area, this species was rated with a low LoO.
- The globally EN Mijburgh's Blue is known from five localities in southern Gauteng and the north-eastern Free State, where populations inhabit moist grassland (including Soweto Highveld Grassland), fringing ephemeral streams in undulating flatlands (Mecenero *et al.* 2013). Although native grassland on Portion 15 is representative of Soweto Highveld Grassland, the unnamed Blesbokspruit tributary is seasonal, not ephemeral. Based on observed habitat conditions where NSS recently encountered Mijburgh's Blue at a site near Heilbron, the presence of this species in the Blue Valley study area was not ruled out and was therefore given a LoO of Moderate.
- The rare Marsh Sylph is limited to grassland wetlands where contiguous patches of its larval food plant occur. Larval food plants include the rushes *Juncus oxycarpus* and *Juncus exsertus exsertus*, the sedge *Schoenoplectus decipiens* and the grasses *Diplachne fusca* and *Leersia hexandra*, in particular. Adults can be seen flying in suitable habitat patches between December and March. During the site visit sufficient patches of *Leersia hexandra* was present along the system and therefore, this species was rated with a High LoO.

8.2.6. Odonata

Based on the published odonatan distribution maps in Samways (2006), at least 13 dragonfly and damselfly species are considered highly likely to occur in QDS 2628BC, and 10 were rated with a moderate LoO in the QDS (**Appendix 13.6**). During our visit the terrestrial-wandering Pantala and the Two-striped Skimmer were observed in the development footprint. The former species has a Biotic Index Score of 0, while the latter has a score of 3. Samways' (2008) Biotic Index is "based on three criteria: geographical distribution, conservation status and sensitivity to change in habitat. It ranges from a minimum of 0 to a maximum of 9. A very common, widespread species which is highly tolerant of human disturbance scores 0. In contrast, a range-restricted, threatened and sensitive endemic species scores 9." The observed presence of the moderate-scoring Two-striped Skimmer suggests that the unnamed Blesbokspruit tributary is in a fair condition.



Female Pantala
(*Pantala flavescens*)



Female Two-striped Skimmer
(*Orthetrum caffrum*)

Figure 8-11 Evidence of local dragonfly species

Of the 23 odonatan species that are listed for the study area, at least five have been recorded in QDS 2628BC, including the common and widespread Blue Emperor, Broad Scarlet, Marsh Bluetail and Swamp Bluet, as well as the endemic Sapphire Bluet (OdonataMAP 2017). The Sapphire Bluet, which has a Biotic Index score of 4, can be found at pools and dams with fringing tall grasses and sedges (Samways 2008), and was rated with a moderate LoO in the study area. The Mountain Malachite, which is the only other potentially occurring high-scoring odonatan species (with a Biotic Index score of 4), inhabits streams with pools and an abundance of tall grass, reeds and small bushes over the water (Samways 2008), and was also rated with a moderate LoO. No potentially occurring odonatan species has a threatened or Protected status.

8.2.7. Scorpions

Approximately five scorpion species are considered highly likely or likely to occur in the study area (**Appendix 13.8**). Scorpion species, which were rated with the highest LoO based on their distributions and observed habitat conditions (esp. substrates and shelter) include: *Uroplectes triangulifer*, which is common in grassland areas where it makes a shallow scrape under rocks and may also enter houses; *Cheloctonus jonesii*, which burrows in peaty soils, avoiding areas that become waterlogged; and *Opisthophthalmus pugnax* which constructs burrows under rocks on ridges and outcrops in Gauteng (Leeming 2003). None of the potentially occurring scorpion species has a threatened or Protected status.

9. Areas of Significance

The site significance assessment, which includes a significance map for terrestrial biodiversity in the study area, was based on the findings from the ecological scan, as well as relevant international, national and provincial planning and other biodiversity conservation initiatives as described below.

9.1. International Areas of Conservation Significance

The site does not fall into any proclaimed:

- *Ramsar Site.* The Blesbokspruit Ramsar Site is, however, situated roughly 7km north of the proposed development site, and the unnamed stream, which flows in a north-westerly direction along the southern boundary of the site, joins the Blesbokspruit approximately 2.2km north-west of the site (see **Figure 9-4**).
- *World Heritage Site.*
- *Important Bird Area (IBA)* – see **Figure 9-1**. The site is, however, situated approximately 7km south of the Blesbokspruit IBA, and approximately 7km west of the Devon Grasslands IBA. These distances are well within the flight capability of many of the conservation important bird species, which occur within these IBAs (e.g. cranes, harriers and the Secretarybird).

9.2. National and Regional Areas of Conservation Significance

A number of biodiversity features with recognised national or provincial conservation importance, require consideration.

9.2.1. Protected Areas

The proposed development site is situated approximately 7km south of the **Marievale Bird Sanctuary and Provincial Nature Reserve (Figure 9-1)**. Habitats in this reserve include shallow open water, reedbeds and grassland, which collectively support more than 240 bird species. These include rare, threatened and Protected bird species such as the African Grass-owl, Red-chested Flufftail, Curlew Sandpiper, Sand Martin, Caspian Tern, Baillon's Crake, Black-winged Pratincole, Black-tailed Godwit, Slaty Egret, Yellow Wagtail, as well as Baird's, Pectoral and Buff-breasted sandpipers (www.gauteng.net).

9.2.2. Terrestrial Priority Areas & Threatened Ecosystems

The Terrestrial Component (Rouget *et al.* 2004) of the National Spatial Biodiversity Assessment integrated data on species, habitats and ecological processes to identify areas of greatest terrestrial biodiversity significance. This resulted in the identification of nine spatial terrestrial Priority Areas, which represent high concentrations of biodiversity features and/or areas where there are few options for meeting biodiversity targets.

The proposed development site is situated within the **Moist Grasslands Priority Area (Figure 9-2)**, which supports a high diversity of birds and other native biodiversity, but which is subject to intensive livestock agriculture involving annual burning and over-grazing. Recently the area has also become target for water storage schemes and renewable electricity energy projects (Maphisa *et al.* 2016).

A list of Threatened Ecosystems within each terrestrial Priority Area was gazetted on 9 December 2011 under the NEMBA (Act 10 of 2004). The Threatened Ecosystems occupy 9.5% of South Africa, and were selected according to six criteria which included;(1) irreversible habitat loss,(2) ecosystem degradation,(3) rate of habitat loss,(4) limited habitat extent and imminent threat,(5) threatened plant species associations, and (6) threatened animal species associations.

The proposed development site is situated within the **Blesbokspruit Highveld Grassland Threatened Ecosystem (Figure 9-2)**. Key biodiversity features of this Ecosystem include the Blesbokspruit, Klein-Blesbokspruit, Verdrietlaagte, and various other wetlands and pans, as well as the Andesite Mountain Bushveld, Eastern Highveld Grassland, Eastern Temperate Freshwater Wetlands, Gold Reef Mountain Bushveld, Rand Highveld Grassland, Soweto Highveld Grassland and Tsakane Clay Grassland vegetation types. Red or Orange Listed plant and animal species in the Ecosystem include e.g. *Delosperma leendertziae* and *Khadia beswicki*; Spotted-necked Otter and Brown Hyena; African Grass-owl, the Greater and Lesser Flamingos, African Marsh-harrier, Secretarybird, Yellow-billed Stork, Caspian Tern, Melodious Lark, Lesser Kestrel, White-bellied Korhaan, and Corncrake; the Giant Bullfrog; Heidelberg Copper (Opal) Butterfly, and the Golden Starburst Baboon Spider (SANBI & DEAT 2009).

9.2.3. Water Resources

A broad spectrum of international, regional and national legislation and guidelines applies to the protection of wetlands and their biodiversity. The National Water Act (NWA; Act 36 of 1998) is the principle legal instrument relating to water resource management in South Africa. Under the NWA, all wetlands and their buffer zones are protected. The NWA points out that it is:

“the National Government's overall responsibility for and authority over the nation's water resources and their use, including the equitable allocation of water for beneficial use, the redistribution of water, and international water matters.”

According to Chapter 3 of the NWA on the protection of water resources:

“The protection of water resources is fundamentally related to their use, development, conservation, management and control. Parts 1, 2 and 3 of this Chapter lay down a series of measures which are together intended to ensure the comprehensive protection of all water resources.”

9.2.4. *Freshwater Ecosystem Priority Areas*

The National Freshwater Ecosystem Priority Areas project (NFEPA; Driver *et al.* 2011) provides strategic spatial priorities for conserving freshwater ecosystems and supporting sustainable use of water resources in South Africa. Freshwater Ecosystem Priority Areas (FEPAs) were identified using a range of criteria dealing with the maintenance of key ecological processes and the conservation of ecosystem types and species associated with rivers, wetlands and estuaries. The NFEPA spatial data indicate that the nearby unnamed tributary of the Blesbokspruit has not yet been classified. The **Blesbokspruit** proper (~1.7km north-west of the site), and the **Suikerbosrantspruit** (~11.5km south of the site) are, however, classified as Wetland FEPAs.

The NFEPA guidelines state that FEPAs should be regarded as ecologically important and as generally sensitive to changes in water quality and quantity, owing to their role in protecting freshwater ecosystems and supporting sustainable use of water resources. FEPAs that are in a good condition should remain so, and FEPAs that are not in a good condition should be rehabilitated to their best attainable ecological condition. Land-use practices or activities that will lead to deterioration in the current condition of a FEPA are considered unacceptable, and land-use practices or activities that will make rehabilitation of a FEPA difficult or impossible are also considered unacceptable.

9.2.5. *Gauteng C-Plan v.3.3.*

The Gauteng Conservation or C- Plan is the outcome of systematic conservation planning by the Gauteng Department of Agriculture and Rural Development (GDARD), for improved conservation of biodiversity in the province. According to the latest available C-Plan, the area wherein the main farm house and associated infrastructure are situated, is classified as an **Ecological Support Area (ESA)**. Remaining parts of the site have been classified as an **Important Critical Biodiversity Area (CBAs)**.

ESAs are not essential for meeting provincial biodiversity targets, but play an important role in supporting CBAs and/or in delivering ecosystem services (GDARD 2014). In Gauteng, Critical Biodiversity Areas (CBAs) were identified using data on land cover, vegetation, threatened species, aquatic features and features pertaining to climate change. ESAs include dolomite outcrops, rivers, pans, other wetlands, corridors for climate change and species migration, rocky ridges, and biodiversity priority areas aligned with existing Metropolitan Open Space Systems in Johannesburg, Ekurhuleni and Tshwane (GDARD 2014).

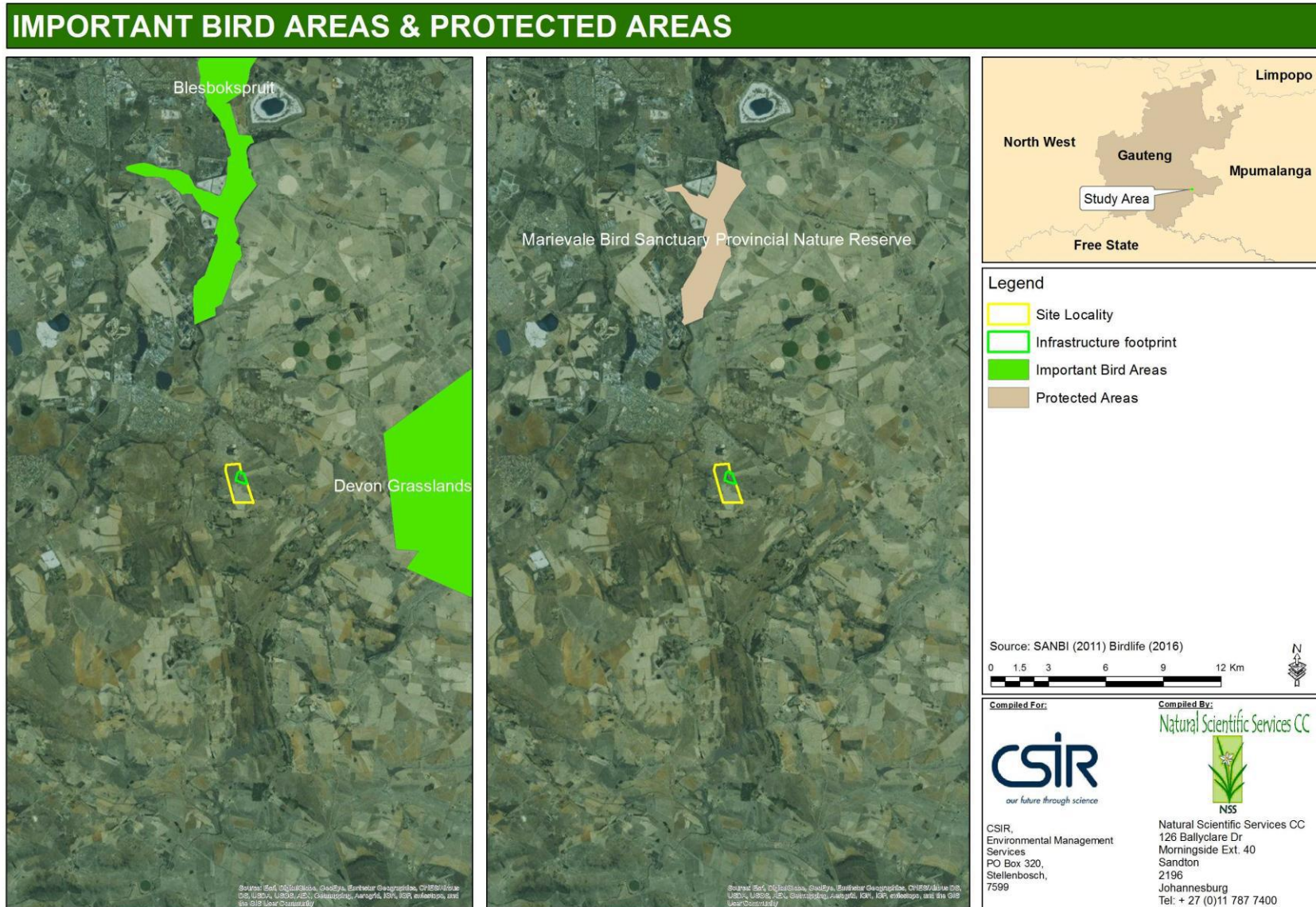


Figure 9-1 Location of the site in relation to Important Bird Areas, and Protected Areas

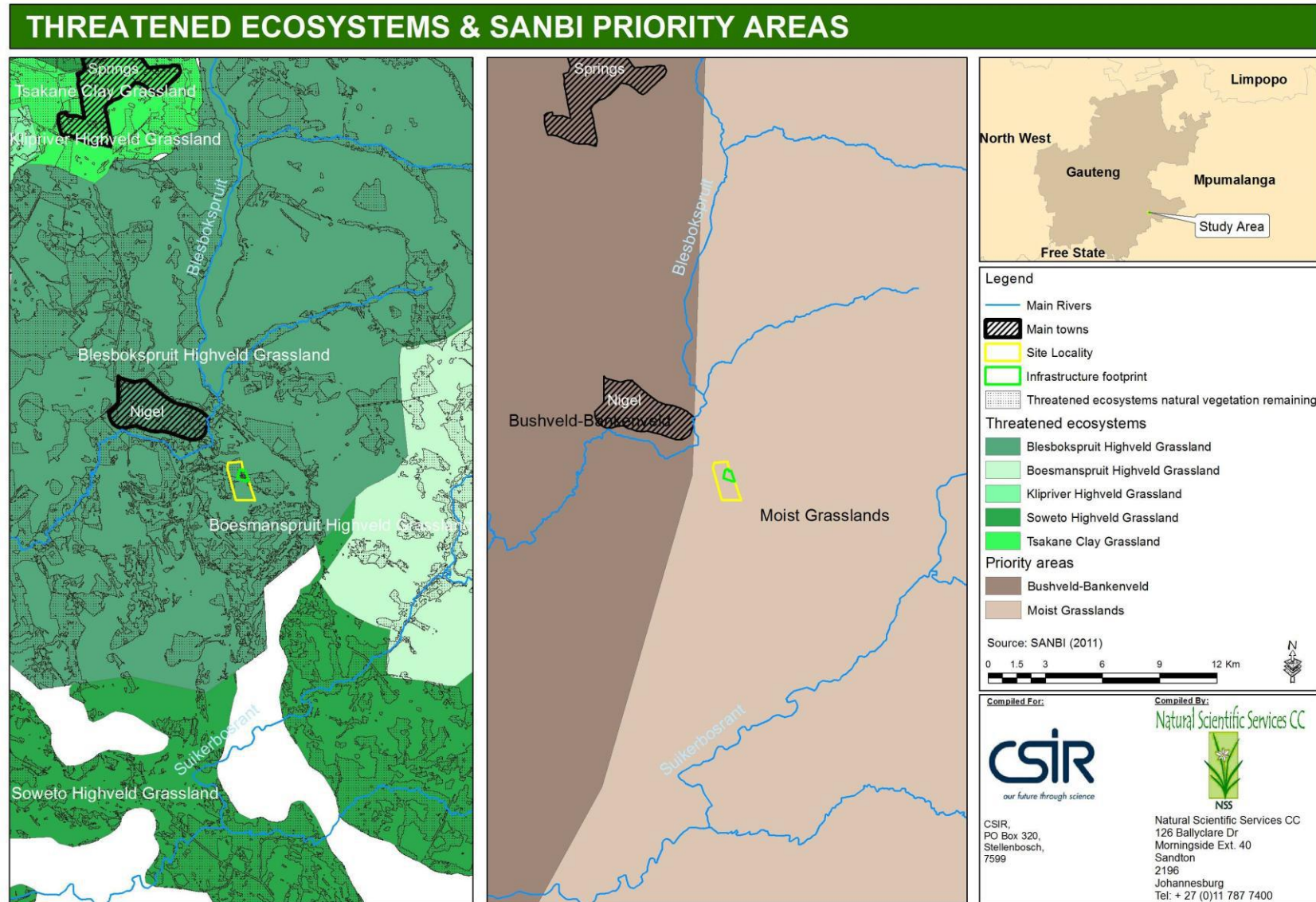


Figure 9-2 Location of the site relative to regional terrestrial Priority Areas and Threatened Ecosystems

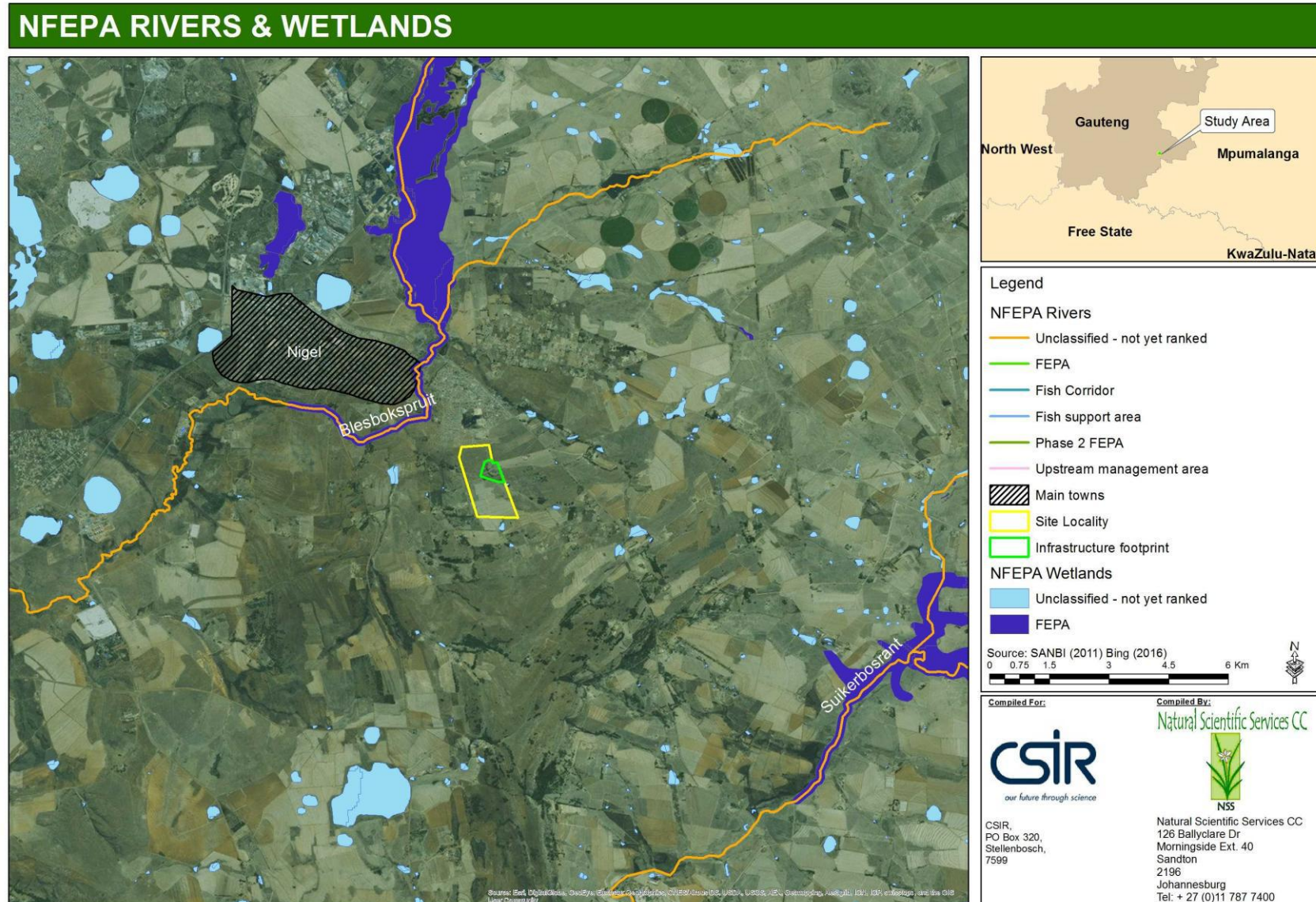


Figure 9-3 Location of the site in relation to regional Freshwater Ecosystem Priority Areas

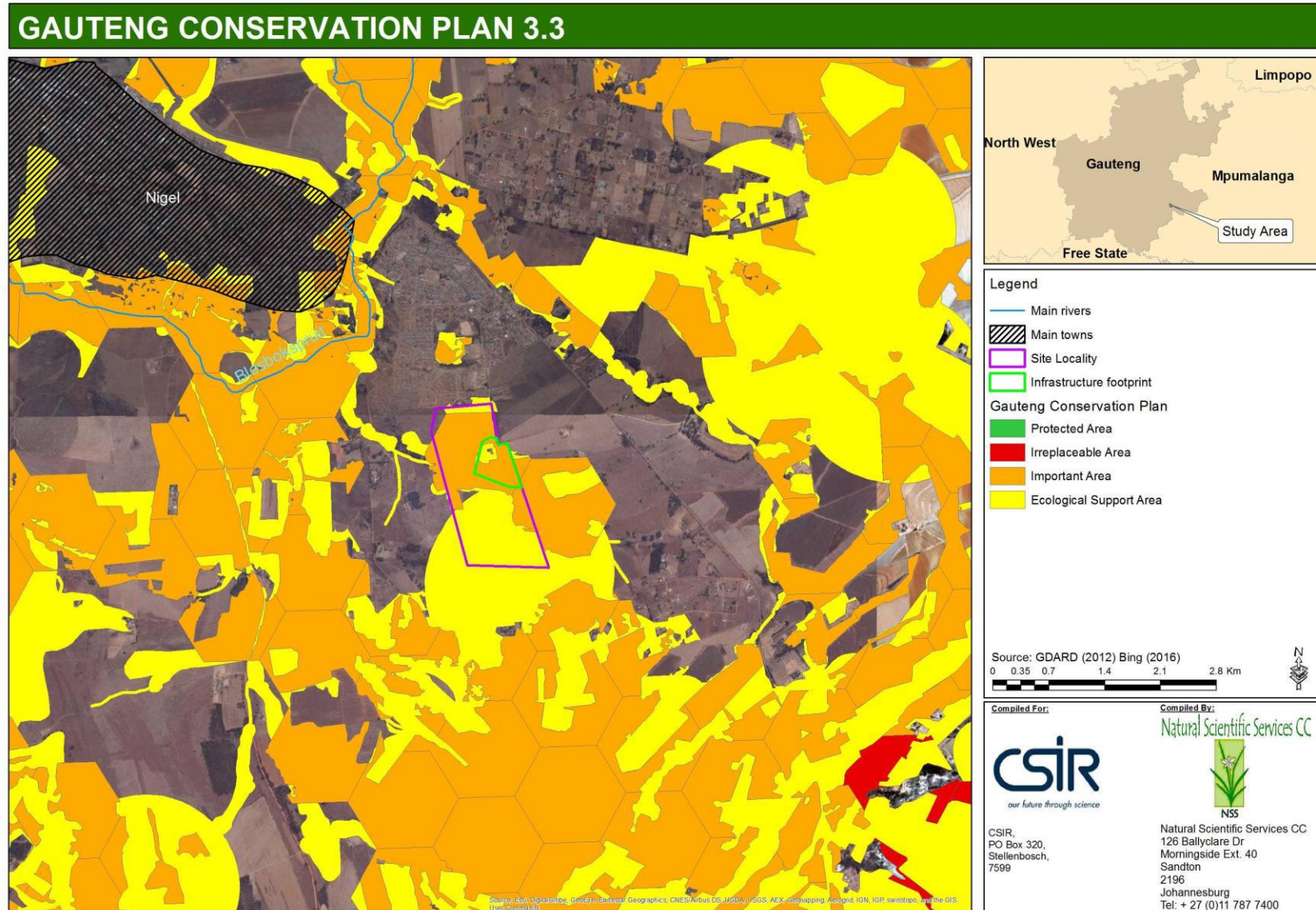


Figure 9-4 Location of the site in relation to Gauteng CBAs and ESAs

9.3. Local Areas of Conservation Significance

The conservation significance of local biodiversity was rated and mapped based on:

- Ecological sensitivity (including renewability/success for rehabilitation);
- Level/Extent of disturbance;
- Presence of CI species (identified at the vegetation unit/habitat level); and
- Conservation value (at a regional, national, provincial and local scale).

Areas within the study area were ranked with **High**, **Medium-high**, **Medium**, **Medium-low** or **Low** biodiversity conservation significance based on the scoring system shown in **Table 8-1**. The scoring system was based on available information for the area, and our site assessment and professional experience. A map showing the relative conservation significance of areas within the study site is presented in **Figure 9-5**.

Table 8-1 Scoring Range for the Areas of Significance

Category	Scoring Range	
	Upper	Lower
High	15	11.1
Moderate - High	11	7.1
Moderate	7	3.1
Moderate - Low	3	-0.9
Low	-1	-5

Based on our findings and relevant national and provincial biodiversity conservation planning initiatives, a combined biodiversity significance map for the site was compiled (**Figure 9-5**), where:

- **High** rated areas include:
 - ⊙ All *in situ* and neighbouring wetland areas. This is because on a national scale all wetlands are Protected, and in Gauteng, all wetlands are to be assigned as sensitive (GDARD 2014). Moreover, the unnamed tributary of the Blesbokspruit has been classified as a provincial Ecological Support Area (GDARD 2012), which drains within roughly 2km into the **Critically Endangered** Blesbokspruit.
- **Moderate-High** rated areas include:
 - ⊙ Remaining patches of native grassland, which are representative of the **Endangered** Soweto Highveld Grassland regional vegetation type and the Gazetted Threatened Blesbokspruit Highveld Grassland. These are found mainly to the west of the survey area and a small patch to the north.
 - ⊙ A minimum 50m buffer around all local wetland areas.
- **Moderate** rated areas include:
 - ⊙ The *Seriphium* dominated grasslands. These areas, although overgrazed, are remnants of the Soweto Highveld Grassland and could, with the correct management, become more complex grassland systems.
- **Moderate-Low** rated areas include:
 - ⊙ The Disturbed *Eragrostis* dominated areas (past pastures); and

- ② The Alien Bushclumps (refuge for small mammals and raptor species)
- **Low** rated areas include:
 - ② Infrastructure.
 - ② Areas denude of vegetation.
 - ② *Eragrostis* Pastures

The Areas of Significance (AoS) map should guide the proposed development where:

- Disturbances should preferentially occur in Moderate – Low and Low sensitive areas.
- **High** sensitive areas should be avoided.
- **Moderate-High** sensitive areas should be subject to very limited disturbance and rigorous mitigation.
- **Moderate** sensitive areas may be disturbed with effective mitigation.
- **Moderate-Low** sensitive areas may be disturbed with minimal or no mitigation.
- **Low** sensitive areas should be rehabilitated if not developed.

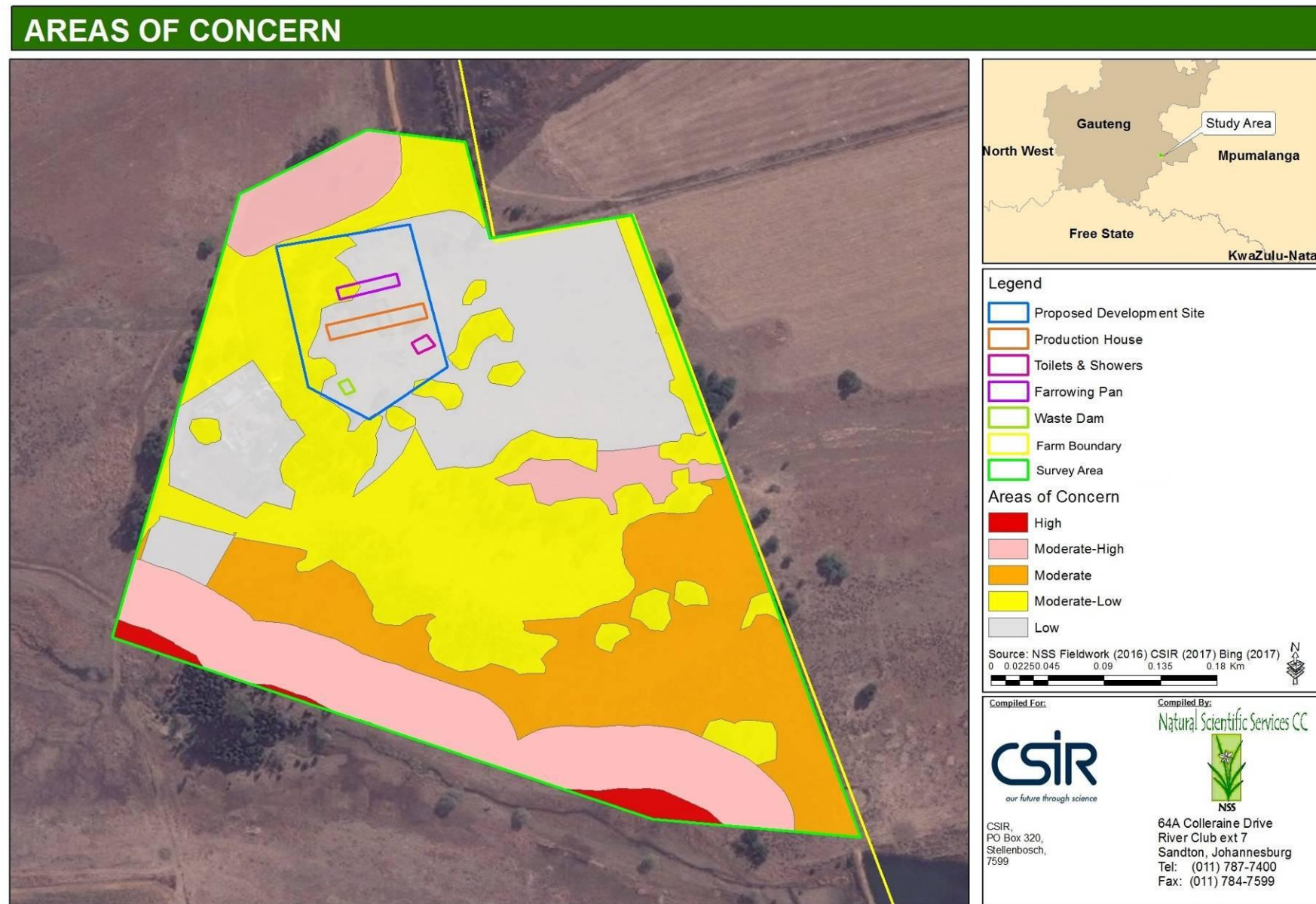


Figure 9-5 Areas of biodiversity conservation significance

10. Impacts & Mitigation

Potential impacts of the proposed project on biodiversity are summarized in **Table 11-1**, and briefly discussed below, followed by recommended measures to mitigate these during relevant phases of the development.

10.1. Impacts

10.1.1. Loss or degradation of local wetland areas

The unnamed Blesbokspruit tributary is situated along the southern boundary of the survey area but 230m south of the infrastructural footprint. It is unlikely that construction activities could cause further destruction or degradation of this system, which feeds into the Critically Endangered Blesbokspruit approximately 2.2km north-west of the site. However, during all phases of the project, continued vehicle and livestock activity, and proliferation of alien flora could cause degradation of local wetland areas through increased erosion and sedimentation. Given the fair to good condition of the local drainage system (as revealed by the diversity of species, presence of protected species - *Gunnera* and sensitive species such as the Two-striped Skimmer), this potential impact was rated with **Moderate** significance.

10.1.2. Loss of terrestrial vegetation and faunal habitat

Although the development site mainly comprises built infrastructure, pasture and alien bushclumps, potential loss or degradation of remaining native terrestrial vegetation and faunal habitat on adjoining parts of Portion 15 is a concern. This potential impact from construction, operational and decommissioning activities, vehicle and livestock activity, and proliferation of alien flora, was rated with **Moderate** significance considering that a significant portion of Portion 15 is representative of the Gazetted Threatened Blesbokspruit Highveld Grassland vegetation type.

10.1.3. Loss of CI or medicinal flora

Due to the small size and disturbed nature of the site, only a few observed and potentially occurring conservation important (CI) or medicinal plant species may be lost during clearing vegetation within the construction footprint. A greater concern is the potential loss of CI or medicinal flora in adjoining areas during all phases of the project due to proliferation of alien flora, livestock activity and human harvesting. This potential impact was rated with **Moderate** significance.

10.1.4. Loss of CI fauna

Earth-moving activities during construction present a threat to small, slow-moving fossorial and terrestrial fauna including CI species such as the potentially occurring NT Giant Bullfrog, Striped Harlequin Snake and Southern African Hedgehog. Increased human, livestock and pet activity during operation present a risk to ground-nesting CI bird species such as the

potentially occurring VU African Grass-owl, and NT Blue Korhaan and Melodious Lark. Inappropriate pest control during operation could impact hunting and scavenging CI species such as the NT Brown Hyena and Serval. Destruction or degradation of local wetland areas could impact potentially occurring CI wetland fauna such as the NT African Clawless Otter and Swamp Musk Shrew. The potential loss of CI fauna during construction and operation was rated with **Moderate** significance given the number of CI animal species that potentially occurs in the study area.

10.1.5. Introduction and proliferation of alien plant species

The proposed project will increase the existing diversity (i.e. species richness and abundance) of alien flora as a result of soil disturbance, as well as the introduction of alien seed with the influx of vehicles and materials during all phases of the project. This potential impact was rated with **Moderate** significance in the absence of effective control measures.

10.1.6. Increased dust and erosion

Construction and decommissioning activities are likely to increase bare ground, dust and the land's susceptibility to erosion. Furthermore, because the unnamed Blesbokspruit tributary is situated where elevation across the site is lowest, there is a good chance that significant erosion and sedimentation could adversely affect this system. Given the current fair to good condition of the system, this potential impact was rated with **Moderate** significance.

10.1.7. Sensory disturbance of fauna

Sensory disturbance of fauna from increased dust, noise and light pollution will likely cause certain fauna to vacate the area, at least temporarily during construction and decommissioning. Considering, however, that fauna in the study area are currently accustomed to a noticeable level of noise, light and dust, this impact was rated with **Low** significance.

10.1.8. Environmental contamination

Various contaminants are present in pig effluent including nutrients, pathogens, veterinary pharmaceuticals (including inter alia antibiotics), and naturally excreted hormones. Inappropriate slurry management and improper disposal of carcasses as well as excess fodder, chemicals (e.g. pesticides) and any other operational waste could cause contamination / eutrophication of local soils and more importantly, downstream wetland areas. Given the fair to good condition of the nearby unnamed Blesbokspruit tributary, this potential impact was rated with **High** significance.

10.1.9. Poor / Inappropriate control of animal pests

During operation, substandard animal husbandry / hygiene and waste generation in the form of pig effluent and excess fodder could facilitate aggregation and/or breeding of invertebrate pests such as flies, weevils, ants, termites, cockroaches, fleas, lice, mites, ticks, etc. Poor waste management and hygiene practices also have the potential to attract vertebrate pests

including rodents (Black Rat, House Mouse), mammalian Carnivores (Black-backed Jackal, dogs, cats) and birds (Common Myna, Pied Crow, Sacred Ibis). Proliferation of alien pest species could adversely affect indigenous fauna through competition, predation and disease transmission, and inappropriate poisoning of pests could affect non-target predatory and scavenging animals. As vulnerable CI species such as the NT Brown Hyena might occur in the study area, this potential impact was rated with **Moderate** significance.

10.1.10. Disease transmission

Diseases could be transmitted either directly from pigs and their effluent, or indirectly from an increased prevalence of pests, which could in turn adversely affect the population dynamics of native fauna in the surrounding area. Given the current prevalence of dogs, and the probable presence of scavenging wild fauna such as Black-backed Jackal, the potential impact of a possible disease outbreak was rated with **Moderate** significance.

10.2. Management and Mitigation Recommendations

Recommended management and mitigation measures are detailed in **Table 11-1**. With successful implementation of the recommended measures, the significance of impacts can be reduced to **Low**, as highlighted in **Table 10-1**.

Table 10-1 Summary of impact significance, without and with mitigation

POTENTIAL IMPACTS	SIGNIFICANCE	
CONSTRUCTION	Without mitigation	With mitigation
<i>Loss or degradation of local wetland areas</i>	Moderate	Low
<i>Loss of terrestrial vegetation and faunal habitat</i>	Moderate	Low
<i>Loss of CI or medicinal flora</i>	Moderate	Low
<i>Loss of CI fauna</i>	Moderate	Low
<i>Introduction and proliferation of alien species</i>	Moderate	Low
<i>Increased dust and erosion</i>	Moderate	Low
<i>Sensory disturbance of fauna</i>	Low	Low
OPERATION		
<i>Loss or degradation of local wetland areas</i>	Moderate	Low
<i>Environmental contamination</i>	High	Low
<i>Poor / Inappropriate control of animal pests</i>	Moderate	Low
<i>Disease transmission</i>	Moderate	Low
<i>Introduction and proliferation of alien species</i>	Moderate	Low
<i>Loss of CI or medicinal flora</i>	Moderate	Low
<i>Loss of CI fauna</i>	Moderate	Low
<i>Sensory disturbance of fauna</i>	Low	Low
DECOMMISSIONING		
<i>Loss or degradation of local wetland areas</i>	Moderate	Low
<i>Introduction and proliferation of alien species</i>	Moderate	Low
<i>Increased dust and erosion</i>	Moderate	Low
<i>Sensory disturbance of fauna</i>	Low	Low

11. Concluding Remarks

With the implementation of the mitigation measures suggested in this report, the significance of impacts on site can be reduced to **Low**. Based on our site visit and the information that was available to date, it is NSS's opinion that there are no fatal flaws to the project. If the recommended mitigation measures are implemented, NSS has no objection to the project going forward. *Most importantly, the nearby unnamed Blesbokspruit tributary and remaining patches of native grassland on Portion 15 must remain undisturbed by the project.*

Table 11-1 Impact Assessment

POTENTIAL IMPACTS	MITIGATION	STATUS	EXTENT		DURATION		INTENSITY		REVERSIBILITY	IRREPLACEABILITY	PROBABILITY		SIGNIFICANCE		CONFIDENCE	
			RATING	SCORE	RATING	SCORE	RATING	SCORE	RATING	RATING	RATING	SCORE	RATING	SCORE	RATING	SCORE
CONSTRUCTION																
Loss or degradation of local wetland areas																
from construction activities, increased vehicle traffic, dust, erosion, sedimentation and possible spills	Without	Negative	Local (<2km from site)	2	Permanent	5	Low	1	Low reversibility	Moderate irreplaceability	Highly probable (50-90% chance)	0.75	Medium	6.00	High	3
	With	Negative	Site specific	1	Temporary (<2 years)	1	Low	1	High reversibility	Moderate irreplaceability	Probable (25-50% chance)	0.5	Low	1.50	High	3
Loss of terrestrial vegetation and faunal habitat																
from clearing of vegetation, increased vehicle activity, altered burning and proliferation of alien flora	Without	Negative	Local (<2km from site)	2	Permanent	5	Medium	4	Irreversible	High irreplaceability	Probable (25-50% chance)	0.5	Medium	5.50	High	3
	With	Negative	Site specific	1	Long term (>15 years)	4	Low	1	Moderate reversibility	Low irreplaceability	Low probability (10-25% chance)	0.25	Low	1.50	High	3
Loss of CI or medicinal flora																
from clearing of vegetation, proliferation of alien flora, altered burning, and harvesting by people	Without	Negative	Local (<2km from site)	2	Permanent	5	High	8	Low reversibility	High irreplaceability	Probable (25-50% chance)	0.5	Medium	7.50	High	3
	With	Negative	Site specific	1	Long term (>15 years)	4	Low	1	Moderate reversibility	High irreplaceability	Low probability (10-25% chance)	0.25	Low	1.50	High	3
Loss of CI fauna																
from clearing of vegetation, earth-moving activities, wetland disturbance, and increased vehicle, human, livestock and pet activity	Without	Negative	Local (<2km from site)	2	Permanent	5	Medium	4	Low reversibility	High irreplaceability	Probable (25-50% chance)	0.5	Medium	5.50	High	3
	With	Negative	Site specific	1	Temporary (<2 years)	1	Medium	4	High reversibility	High irreplaceability	Low probability (10-25% chance)	0.25	Low	1.50	High	3
Introduction and proliferation of alien species																
from influx of vehicles, people and materials, site disturbance, and lack of alien species control	Without	Negative	Local (<2km from site)	2	Permanent	5	Medium	4	Low reversibility	High irreplaceability	Highly probable (50-90% chance)	0.75	Medium	8.25	High	3
	With	Negative	Site specific	1	Temporary (<2 years)	1	Low	1	High reversibility	High irreplaceability	Probable (25-50% chance)	0.5	Low	1.50	High	3
Increased dust and erosion																
from clearing of vegetation, earth-moving activities, and increased vehicle traffic	Without	Negative	Local (<2km from site)	2	Medium term (5-15 years)	3	Medium	4	Moderate reversibility	Moderate irreplaceability	Definite (>90% chance)	1	Medium	9.00	High	3
	With	Negative	Site specific	1	Temporary (<2 years)	1	Medium-low	2	High reversibility	Low irreplaceability	Low probability (10-25% chance)	0.25	Low	1.00	High	3
Sensory disturbance of fauna																
from noise, dust and light associated with construction activities	Without	Negative	Local (<2km from site)	2	Long term (>15 years)	4	Medium-low	2	Moderate reversibility	High irreplaceability	Probable (25-50% chance)	0.5	Low	4.00	High	3
	With	Negative	Site specific	1	Temporary (<2 years)	1	Low	1	High reversibility	High irreplaceability	Probable (25-50% chance)	0.5	Low	1.50	High	3
OPERATION																
Loss or degradation of local wetland areas																
from operational activities, vehicle traffic, dust, erosion, sedimentation and possible spills	Without	Negative	Local (<2km from site)	2	Permanent	5	Medium	4	Low reversibility	Moderate irreplaceability	Probable (25-50% chance)	0.5	Medium	5.50	High	3
	With	Negative	Site specific	1	Temporary (<2 years)	1	Low	1	High reversibility	Moderate irreplaceability	Probable (25-50% chance)	0.5	Low	1.50	High	3
Environmental contamination																
from pig excrement, bedding, feed, carcasses and other operational waste	Without	Negative	Regional (within 30km of site)	3	Long term (>15 years)	4	Very high / Fatal flaw	16	Low reversibility	Moderate irreplaceability	Probable (25-50% chance)	0.5	High	11.50	High	3
	With	Negative	Site specific	1	Short term (2-5 years)	2	Medium	4	High reversibility	Moderate irreplaceability	Low probability (10-25% chance)	0.25	Low	1.75	High	3
Poor / Inappropriate control of animal pests																
from poor waste management and hygiene, and insufficient, inappropriate and/or ineffectual pest control	Without	Neutral	Local (<2km from site)	2	Long term (>15 years)	4	Medium	4	Moderate reversibility	Moderate irreplaceability	Highly probable (50-90% chance)	0.75	Medium	7.50	High	3
	With	Neutral	Site specific	1	Temporary (<2 years)	1	Low	1	High reversibility	Moderate irreplaceability	Probable (25-50% chance)	0.5	Low	1.50	High	3
Disease transmission																
from poor waste management	Without	Negative	Local (<2km from	2	Long term (>15	4	Medium	4	Moderate	Moderate	Probable (25-50%	0.5	Medium	5.00	High	3

POTENTIAL IMPACTS	MITIGATION	STATUS	EXTENT		DURATION		INTENSITY		REVERSIBILITY	IRREPLACEABILITY	PROBABILITY		SIGNIFICANCE		CONFIDENCE	
and hygiene, and insufficient, inappropriate and/or ineffectual pest control			site)		years)				reversibility	irreplaceability	chance)					
	With	Negative	Local (<2km from site)	2	Temporary (<2 years)	1	Low	1	High reversibility	Moderate irreplaceability	Low probability (10-25% chance)	0.25	Low	1.00	High	3
Introduction and proliferation of alien species																
from influx of vehicles, people and materials, site disturbance, and lack of alien species control	Without	Negative	Local (<2km from site)	2	Permanent	5	Medium	4	Moderate reversibility	Moderate irreplaceability	Highly probable (50-90% chance)	0.75	Medium	8.25	High	3
	With	Negative	Site specific	1	Temporary (<2 years)	1	Low	1	High reversibility	Moderate irreplaceability	Probable (25-50% chance)	0.5	Low	1.50	High	3
Loss of CI or medicinal flora																
from proliferation of alien flora, altered burning, harvesting by people and increased livestock activity	Without	Negative	Local (<2km from site)	2	Permanent	5	High	8	Low reversibility	High irreplaceability	Probable (25-50% chance)	0.5	Medium	7.50	High	3
	With	Negative	Site specific	1	Long term (>15 years)	4	Low	1	Moderate reversibility	High irreplaceability	Low probability (10-25% chance)	0.25	Low	1.50	High	3
Loss of CI fauna																
from operational activities, wetland disturbance, and increased vehicle, human, livestock and pet activity	Without	Negative	Local (<2km from site)	2	Permanent	5	Medium	4	Low reversibility	High irreplaceability	Probable (25-50% chance)	0.5	Medium	5.50	High	3
	With	Negative	Site specific	1	Temporary (<2 years)	1	Medium	4	High reversibility	High irreplaceability	Probable (25-50% chance)	0.5	Low	3.00	High	3
Sensory disturbance of fauna																
from noise, dust and light associated with operational activities	Without	Negative	Local (<2km from site)	2	Long term (>15 years)	4	Medium-low	2	Moderate reversibility	High irreplaceability	Probable (25-50% chance)	0.5	Low	4.00	High	3
	With	Negative	Site specific	1	Temporary (<2 years)	1	Low	1	High reversibility	High irreplaceability	Probable (25-50% chance)	0.5	Low	1.50	High	3
DECOMMISSIONING																
Loss or degradation of local wetland areas																
from decommissioning activities, increased vehicle traffic, dust, erosion, sedimentation and possible spills	Without	Negative	Local (<2km from site)	2	Permanent	5	Medium	4	Low reversibility	Moderate irreplaceability	Highly probable (50-90% chance)	0.75	Medium	8.25	High	3
	With	Negative	Site specific	1	Temporary (<2 years)	1	Low	1	High reversibility	Moderate irreplaceability	Probable (25-50% chance)	0.5	Low	1.50	High	3
Introduction and proliferation of alien species																
from influx of vehicles, people and materials, site disturbance, and lack of alien species control	Without	Negative	Local (<2km from site)	2	Permanent	5	Medium	4	Moderate reversibility	Moderate irreplaceability	Highly probable (50-90% chance)	0.75	Medium	8.25	High	3
	With	Negative	Site specific	1	Temporary (<2 years)	1	Low	1	High reversibility	Moderate irreplaceability	Probable (25-50% chance)	0.5	Low	1.50	High	3
Increased dust and erosion																
from destruction of infrastructure, earth-moving activities, and increased vehicle traffic	Without	Negative	Local (<2km from site)	2	Medium term (5-15 years)	3	Medium	4	Moderate reversibility	Moderate irreplaceability	Definite (>90% chance)	1	Medium	9.00	High	3
	With	Negative	Site specific	1	Temporary (<2 years)	1	Medium-low	2	High reversibility	Low irreplaceability	Low probability (10-25% chance)	0.25	Low	1.00	High	3
Sensory disturbance of fauna																
from noise, dust and light associated with decommissioning activities	Without	Negative	Local (<2km from site)	2	Long term (>15 years)	4	Medium-low	2	Moderate reversibility	High irreplaceability	Probable (25-50% chance)	0.5	Low	4.00	High	3
	With	Negative	Site specific	1	Temporary (<2 years)	1	Low	1	High reversibility	High irreplaceability	Probable (25-50% chance)	0.5	Low	1.50	High	3

Table 11-2 Mitigation measures

OBJECTIVE / TARGET	MITIGATION / MANAGEMENT ACTION	METHODOLOGY	FREQUENCY	RESPONSIBILITY
CONSTRUCTION				
Loss or degradation of local wetland areas				
Minimize loss and degradation of wetland areas and their buffers.	Avoid disturbing <i>in situ</i> and neighbouring wetland areas and their buffers.	*Demarcate or fence in the construction site.	Prior to and during construction	Mojaletema Management, Construction Crew
		*Highlight all prohibited activities to workers through training and notices.	Prior to and during construction	Mojaletema Management, Construction Crew
		*Commence (and preferably complete) construction activities during winter when the risk of erosion and wetland sedimentation should be least.	Prior to and during construction	Mojaletema Management, Construction Crew
	Establish measures on the access road to reduce dust, erosion and sedimentation.	*Design measures to effectively control vehicle access, vehicle speed, dust, stormwater run-off, erosion and sedimentation on the road.	Pre-construction	CSIR, Mojaletema Management
		*Implement the measures that were designed to control impacts on the road preferably during winter, when the risk of erosion should be least.	During construction	Mojaletema Management, Construction Crew
Loss of terrestrial vegetation and faunal habitat				
Minimize loss and degradation of terrestrial vegetation (esp. Soweto Highveld Grassland) and faunal habitat.	Avoid unnecessary loss of indigenous vegetation and faunal habitats.	*Modify the layout of planned infrastructure to avoid important floral communities (rocky grassland around the entrance area) and large indigenous trees.	Pre-construction	CSIR, Mojaletema Management, with advice from a Botanist / Horticulturist
		*Identify and mark any indigenous trees (these are limited on site) on the ground. Those that are small and cannot be avoided should be transplanted elsewhere on site.	Pre-construction	Mojaletema Management, Construction Crew, with advice from a Botanist / Horticulturist
		*Demarcate or fence in the construction site.	Prior to and during construction	Mojaletema Management, Construction Crew
		*Highlight all prohibited activities to workers through training and notices.	Prior to and during construction	Mojaletema Management, Construction Crew
		*Commence (and preferably complete) construction activities during winter, when the risk of disturbing growing plants should be least.	Prior to and during construction	Mojaletema Management, Construction Crew
	Promote re-establishment of indigenous vegetation in disturbed areas.	*Briefly and effectively stockpile topsoil preferably 1-1.5m in height.	During construction	Mojaletema Management, Construction Crew
		*Use the topsoil to allow natural vegetation to establish in disturbed areas. If recovery is slow, then a seed mix for the area (using indigenous grass species listed within this report) should be sourced and planted.	During construction	Mojaletema Management, Construction Crew, with advice from a Botanist / Horticulturist
		*Do not undertake any landscaping with alien flora.	During construction	Mojaletema Management, Construction Crew, with advice from a Botanist / Horticulturist
Loss of CI or medicinal flora				
Minimize loss of CI and medicinally important flora.	Adhere to law and best practice guidelines regarding CI and medicinally important flora.	*Obtain permits to remove CI species.	Pre-construction	CSIR, Mojaletema Management
		*Transplant CI and medicinally important floral specimens from the infrastructure footprint to suitable and safe locations elsewhere on site or nearby.	Pre-construction	Mojaletema Management, Construction Crew, with advice from a Botanist / Horticulturist
		*Obtain guidance from a suitably qualified vegetation specialist or horticulturist regarding the collection, propagation/storage and transplantation of plants.	During construction	Mojaletema Management, Construction Crew, with advice from a Botanist / Horticulturist
	Prohibit harvesting of CI and medicinally important flora.	*Highlight all prohibited activities to workers through training and notices.	Prior to and during construction	Mojaletema Management, Construction Crew
		*Prohibit harvesting of CI and medicinal flora on site by community members through notices and site access control (e.g. fencing).	During construction	Mojaletema Management
Loss of CI fauna				
Minimize mortality and displacement of fauna, especially CI species.	Adhere to law and best practice guidelines regarding the displacement of CI faunal species.	*Commence (and preferably complete) construction during winter, when the risk of disturbing active (including breeding and migratory) animals, should be least.	Prior to and during construction	Mojaletema Management, Construction Crew
		*Check open trenches for trapped animals (e.g. reptiles, frogs and small terrestrial mammals), and relocate trapped animals with advice from an appropriate specialist.	Daily during construction	Mojaletema Management, Construction Crew, with advice from a Zoologist / Ecologist
	Prohibit disturbance and harvesting of CI and other indigenous fauna.	*Educate workers about dangerous animals (e.g. snakes, scorpions, bees) and highlight all prohibited activities to workers through training and notices.	Prior to and during construction	Mojaletema Management
		*Prohibit harvesting of CI and other indigenous fauna on site by community members through notices and site access control (e.g. fencing).	During construction	Mojaletema Management
Introduction and proliferation of alien species				
Minimize the introduction and proliferation of invasive alien species during construction.	Limit / Regulate access by potential vectors of alien flora.	*Demarcate or fence in the construction site.	Prior to and during construction	Mojaletema Management, Construction Crew
		*Carefully limit / regulate access by vehicles and materials to the construction site.	Prior to and during construction	Mojaletema Management, Construction Crew
		*Prohibit the introduction of domestic animals such as dogs and cats.	During construction	Mojaletema Management, Farm Management
	Maintain a tidy construction site.	*Keep construction activities neat and tidy.	During construction	Mojaletema Management, Construction Crew
		When complete, remove all sand piles, and landscape all uneven ground while re-establishing a good topsoil layer.	During construction	Mojaletema Management, Construction Crew

OBJECTIVE / TARGET	MITIGATION / MANAGEMENT ACTION	METHODOLOGY	FREQUENCY	RESPONSIBILITY
		*Plant only locally indigenous flora if landscaping needs to be done.	During construction	Mojaletema Management, Construction Crew, with advice from a Botanist / Horticulturist
	By law, remove and dispose of Category 1b alien species on site. All Category 2 species that remain on site will require a permit.	*Remove Category species using mechanical methods, and minimize soil disturbance as far as possible. Alien wood could be donated to the surrounding community.	During construction	Mojaletema Management, Construction Crew, with advice from a Botanist / Horticulturist
Increased dust and erosion				
Minimize dust and erosion.	Implement effective measures to control dust and erosion.	*Limit vehicles, people and materials to the construction site.	During construction	Mojaletema Management, Construction Crew
		*Commence (and preferably complete) construction during winter, when the risk of erosion should be least.	During construction	Mojaletema Management, Construction Crew
		*Revegetate denude areas with locally indigenous flora a.s.a.p.	During construction	Mojaletema Management, Construction Crew
		*Implement erosion protection measures on site. Measures could include bunding around soil stockpiles, and vegetation of areas not to be developed.	During construction	Mojaletema Management, Construction Crew
		*Implement effective and environmentally-friendly dust control measures, such as mulching or periodic wetting.	During construction	Mojaletema Management, Construction Crew
Sensory disturbance of fauna				
Minimize sensory disturbance of fauna.	Time construction activities to minimize sensory disturbance of fauna.	*Commence (and preferably complete) construction during winter, when the risk of disturbing active (including breeding and migratory) animals, should be least.	Prior to and during construction	Mojaletema Management, Construction Crew
	Minimize noise pollution.	*Minimize noise to limit its impact on calling and other sensitive fauna (e.g. frogs).	During construction	Mojaletema Management, Construction Crew
	Minimize light pollution.	*Limit construction activities to day time hours.	During construction	Mojaletema Management, Construction Crew
		*Minimize or eliminate security and construction lighting, to reduce the disturbance of nocturnal fauna.	During construction	Construction Crew
OPERATION				
Loss or degradation of local wetland areas				
Minimize loss and degradation of wetland areas and their buffers.	Maintain measures on the access road to reduce dust, erosion and sedimentation.	*Monitor and maintain the road impact control measures to ensure that they remain effective.	Throughout operation	Mojaletema Management, Farm Management
		*Highlight all prohibited activities to workers through training and notices.	During operation	Mojaletema Management, Farm Management
Environmental contamination				
Avoid environmental contamination.	Ensure that excrement, carcasses, feed, and other operational waste and hazardous materials are appropriately and effectively contained and disposed of without detriment to the environment.	*Ensure that the facility is designed in accordance with international best practice norms, and with advice from an appropriate specialist, to ensure that there is no environmental contamination from effluent, fodder, carcasses and other waste, and to ensure that there is also effective storm water management.	Pre-construction	CSIR, Mojaletema Management, with advise from agricultural experts
		*Designate a secured, access restricted, signposted room for the storage of potentially hazardous substances such as herbicides, pesticides dips and medications.	Throughout operation	Mojaletema Management, Farm Management
		*Adhere to best practice pig husbandry and waste disposal norms.	Throughout operation	CSIR, Mojaletema Management, Farm Management, with advise from agricultural experts
		*All hazardous waste should be disposed of at an appropriate licensed facility for this.	Throughout operation	Mojaletema Management, Farm Management
		*Waste recycling should be incorporated into the facility's operations as far as possible.	Throughout operation	Mojaletema Management, Farm Management
		*Educate workers about the facility's waste management and handling of hazardous substances with regular training and notices.	Throughout operation	Mojaletema Management, Farm Management
	Ensure that there are appropriate control measures in place for any contamination event.	*Establish appropriate emergency procedures for accidental contamination of the surroundings.	Pre-construction	CSIR, Mojaletema Management
		*Rehabilitate contaminated areas a.s.a.p. in accordance with advice from appropriate contamination and environmental specialists.	A.s.a.p. following contamination	Mojaletema Management, Farm Management, with advise from appropriate contamination and environmental specialists
		*Educate workers about the facility's waste emergency procedures with training and notices.	At least annually during operation	Mojaletema Management, Farm Management
Poor / Inappropriate control of animal pests				

OBJECTIVE / TARGET	MITIGATION / MANAGEMENT ACTION	METHODOLOGY	FREQUENCY	RESPONSIBILITY
Ensure effective pest control that does not affect non-target animals.	Control the access and proliferation of pests as far as possible.	*Ensure that floors are sloped and slatted to facilitate drainage.	Pre-construction	CSIR, Mojaletema Management, Construction Crew
		*Ensure that there is effective storm water drainage around the facility.	All phases	CSIR, Mojaletema Management, Farm Management
		*Screed concrete floors properly to seal all cracks and limit the pooling of effluent and water.	Construction and operation	Construction Crew, Farm Management
		*Effectively seal and maintain all pipes and reservoirs containing slurry, to prevent animals from accessing the effluent.	Construction and operation	Construction Crew, Farm Management
		*Ensure that the facility is sufficiently ventilated to keep floors, bedding, and fodder as dry as possible.	Pre-construction, construction and operation	CSIR, Mojaletema Management, Farm Management
		*Check that fan louvers (if installed) work properly, and close fans completely when off.	Throughout operation	Farm Management and Team
		*Prevent and manage unwanted animal access to fodder.	Pre-construction, construction and operation	Mojaletema Management, Farm Management and Team
		*Clean floors regularly.	Throughout operation	Farm Management and Team
		*Clean up excess fodder regularly from under troughs and feed bins.	Throughout operation	Farm Management and Team
		* Keep areas surrounding the facility free of spilled manure and litter.	Throughout operation	Farm Management and Team
		*Remove all trash, and sources of feed and water for pests from the outside perimeter of the facilities.	Throughout operation	Farm Management and Team
		*Keep weeds and grass mowed to 5cm or less immediately around the facilities, to reduce the prevalence of insects.	Throughout operation	Farm Management and Team
		*Electrocution devices are available to kill flies, while other mechanical devices include traps, sticky tapes or baited traps.	Throughout operation	Farm Management and Team
		*Control rodents through effective sanitation, rodent proofing and (as humane as possible) extermination.	During operation	Farm Management and Team
	Avoid affecting non-target animals.	*Ensure that measures to control pests are tightly restricted to areas where these are problematic.	During operation	Farm Management and Team
	*Pest control measures should be taxon-specific. If necessary, advice should be sought from an appropriate specialist.	During operation	Farm Management and Team	
	*Rodenticides are not advised.	During operation	Farm Management and Team	
Disease transmission				
Avoid transmission of diseases to wildlife.	Ensure that excrement, carcasses, feed, and other operational waste and hazardous materials are appropriately and effectively contained and disposed of without detriment to the environment.	As described above.	As described above.	As described above.
	Ensure that there are appropriate control measures in place for any contamination event.	As described above.	As described above.	As described above.
	Control the access and proliferation of pests as far as possible.	As described above.	As described above.	As described above.
Introduction and proliferation of alien species				
Minimize the introduction and proliferation of invasive alien species during operation.	Limit / Regulate access by potential vectors of alien flora.	*Carefully limit / regulate access by vehicles and materials to the site.	Throughout operation	Mojaletema Management, Farm Management
		*Prohibit the introduction of domestic animals such as dogs and cats.	Throughout operation	Mojaletema Management, Farm Management
	Maintain a tidy production facility.	*Minimize the accumulation and dispersal of excess fodder on site.	Throughout operation	Farm Management and Team
		*Employ best practices regarding tilling of soil and weed management.	Throughout operation	Farm Management and Team
		*Plant only locally indigenous flora if landscaping needs to be done.	Throughout operation	Mojaletema Management, Farm Management, with advice from a Botanist / Horticulturist
	By law, remove and dispose of Category 1b alien species on site. All Category 2 species that remain on site will require a permit.	*Remove Category species using mechanical methods, and minimize soil disturbance as far as possible. Alien wood could be donated to the surrounding community.	Throughout operation	Mojaletema Management, Farm Management and Team, with advice from a Botanist / Horticulturist

OBJECTIVE / TARGET	MITIGATION / MANAGEMENT ACTION	METHODOLOGY	FREQUENCY	RESPONSIBILITY
Loss of CI or medicinal flora				
Prohibit harvesting of CI and medicinally important flora.	Harvesting of indigenous flora for medicine, fire wood, building materials, and other purposes must be prohibited.	*Highlight all prohibited activities to workers through training and notices.	Prior to and during operation	Mojaletema Management, Farm Management
		*Prohibit harvesting of CI and medicinal flora on site by community members through notices and site access control (e.g. fencing).	Throughout operation	Mojaletema Management, Farm Management
Loss of CI fauna				
Prohibit harvesting of CI and other fauna.	Harvesting of indigenous fauna for food, sport, medicine, and other purposes must be prohibited.	*Educate workers about dangerous animals (e.g. snakes, scorpions, bees) and highlight all prohibited activities to workers through training and notices.	Prior to and during operation	Mojaletema Management, Farm Management
		*Prohibit harvesting of CI and other indigenous fauna on site by community members through notices and site access control (e.g. fencing).	Throughout operation	Mojaletema Management, Farm Management
Sensory disturbance of fauna				
Minimize sensory disturbance of fauna.	Minimize essential lighting	*Install motion-sensitive lights.	Construction and operation	Mojaletema Management, Farm Management
		*Ensure that all outdoor lights are angled downwards and/or fitted with hoods.	Construction and operation	Mojaletema Management, Farm Management
		*Use bulbs that emit warm, long wavelength (yellow-red) light, or use UV filters or glass housings on lamps to filter out UV.	Throughout operation	Farm Management and Team
	Minimize unavoidable noise	*Avoid using metal halide, mercury or other bulbs that emit high UV (blue-white) light that is highly and usually fatally attractive to insects.	Throughout operation	Farm Management and Team
		*Conduct regular maintenance of machinery, fans and other noisy equipment.	Throughout operation	Farm Management and Team
		Prevent unnecessary light and noise pollution	*Encourage workers to minimize light and noise pollution through training and notices.	Throughout operation
DECOMMISSIONING				
Loss or degradation of local wetland areas				
Minimize loss and degradation of wetland areas and their buffers.	Avoid disturbing <i>in situ</i> and neighbouring wetland areas and their buffers.	*Demarcate or fence in the decommissioning site.	Prior to and during decommissioning	Mojaletema Management, Decommissioning Crew
		*Highlight all prohibited activities to workers through training and notices.	Prior to and during decommissioning	Mojaletema Management, Decommissioning Crew
		*Commence (and preferably complete) decommissioning activities during winter when the risk of erosion and wetland sedimentation should be least.	Prior to and during decommissioning	Mojaletema Management, Decommissioning Crew
	Maintain measures on the access road to reduce dust, erosion and sedimentation.	*Monitor and maintain the road impact control measures to ensure that they remain effective.	Until there is no more project-associated activity on site	CSIR, Mojaletema Management
Introduction and proliferation of alien species				
Minimize the introduction and proliferation of invasive alien species during decommissioning.	By law, remove and dispose of Category 1b alien species on site. All Category 2 species that remain on site will require a permit.	*Remove Category species using mechanical methods, and minimize soil disturbance as far as possible. Alien wood could be donated to the surrounding community.	Throughout decommissioning until all Category 1b and Category 2 alien species have been effectively removed from the site.	Mojaletema Management, Farm Management
Increased dust and erosion				
Minimize dust and erosion.	Implement effective measures to control dust and erosion.	*Limit vehicles, people and materials to the decommissioning site.	During decommissioning	Mojaletema Management, Decommissioning Crew
		*Commence (and preferably complete) decommissioning during winter, when the risk of erosion should be least.	During decommissioning	Mojaletema Management, Decommissioning Crew
		*Revegetate denude areas with locally indigenous flora a.s.a.p.	During decommissioning	Mojaletema Management, Decommissioning Crew
		*Implement erosion protection measures on site. Measures could include bunding around soil stockpiles, and vegetation of areas not to be developed.	During decommissioning	Mojaletema Management, Decommissioning Crew
		*Implement effective and environmentally-friendly dust control measures, such as mulching or periodic wetting.	During decommissioning	Mojaletema Management, Decommissioning Crew
Sensory disturbance of fauna				
Minimize sensory disturbance of fauna.	Time demolition and other noisy decommissioning activities to minimize sensory disturbance of fauna.	*Commence (and preferably complete) decommissioning during winter, when the risk of disturbing active (including breeding and migratory) animals, should be least.	Prior to and during decommissioning	Mojaletema Management, Decommissioning Crew

OBJECTIVE / TARGET	MITIGATION / MANAGEMENT ACTION	METHODOLOGY	FREQUENCY	RESPONSIBILITY
	Minimize noise pollution.	*Minimize noise to limit its impact on sensitive fauna.	During decommissioning	Mojaletema Management, Decommissioning Crew
	Minimize light pollution.	*Limit demolition activities to day time hours.	During decommissioning	Mojaletema Management, Decommissioning Crew
		*Minimize or eliminate security and decommissioning lighting, to reduce the disturbance of nocturnal fauna.	During decommissioning	Decommissioning Crew



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13. Appendices

13.1. Species recorded on and near the survey area

Family		Species	Growth forms
ACANTHACEAE		<i>Chaetacanthus costatus</i> (Pers) Lindl.	Dwarf shrub
ACANTHACEAE		<i>Crabbea acaulis</i> N.E.Br.	Herb
AMARANTHACEAE	*	<i>Amaranthus hybridus</i> L.	Herb
AMARANTHACEAE	*	<i>Gomphrena celosioides</i> Mart.	Herb
ANACARDIACEAE		<i>Searsia magalismontana</i> (Sond.) Moffett	Dwarf shrub
ANTHERICACEAE		<i>Chlorophytum fasciculatum</i> (Baker) Kativu	Herb
APIACEAE		<i>Centella asiatica</i> (L.) Urb.	Climber
ASPHODELACEAE		<i>Aloe greatheadii</i> Schönland	Succulent
ASPHODELACEAE		<i>Bulbine</i> spp	Geophyte
ASTERACEAE		<i>Berkheya setifera</i> DC.	Herb
ASTERACEAE	*	<i>Bidens pilosa</i> L.	Herb
ASTERACEAE		<i>Conyza podocephala</i> DC.	Herb
ASTERACEAE		<i>Cotula coronopifolia</i> L.	Helophyte
ASTERACEAE		<i>Felicia muricata</i> (Thunb.) Nees subsp. <i>muricata</i>	Shrub
ASTERACEAE		<i>Gazania krebsiana</i> Less.	Herb
ASTERACEAE		<i>Helichrysum nudifolium</i> (L.) Less. var. <i>nudifolium</i>	Herb
ASTERACEAE		<i>Helichrysum rugulosum</i> Less.	Herb
ASTERACEAE		<i>Hilliardiella</i> (Vernonia) <i>aristata</i> (natalensis) (DC.) H.Rob.	Herb
ASTERACEAE		<i>Hilliardiella hirsuta</i> (DC.) H.Rob.	Herb
ASTERACEAE		<i>Hilliardiella oligocephala</i> (DC.) H.Rob.	Herb
ASTERACEAE		<i>Lopholaena coriifolia</i> (Sond.) E.Phillips & C.A.Sm.	Succulent
ASTERACEAE		<i>Nidorella hottentotica</i> DC.	Herb
ASTERACEAE		<i>Senecio coronatus</i> (Thunb.) Harv.	Herb
ASTERACEAE		<i>Seriphium plumosum</i> L.	Shrublet
ASTERACEAE	*	<i>Tagetes minuta</i> L.	Herb
ASTERACEAE		<i>Vernonia galpinii</i> Klatt	Herb
ASTERACEAE	*	<i>Xanthium strumarium</i> L.	Shrublet
CAMPANULACEAE		<i>Wahlenbergia undulata</i> (L.f.) A.DC.	Herb
CAPPARACEAE		<i>Cleome maculata</i> (Sond.) Szyzyl.	Herb
CAPPARACEAE		<i>Cleome rubella</i> Burch.	Herb
CAPPARACEAE		<i>Cleome</i> spp	Herb
CARYOPHYLLACEAE		<i>Silene</i> spp	Herb
CHENOPODIACEAE	*	<i>Chenopodium album</i> L.	Herb
COMMELINACEAE		<i>Commelina africana</i> L.	Herb
COMMELINACEAE		<i>Cyanotis speciosa</i> (L.f.) Hassk.	Succulent
CYPERACEAE		<i>Bulbostylis burchellii</i> (Ficalho & Hiern) C.B.Clarke	Cyperoid
CYPERACEAE		<i>Cyperus</i> cf. <i>leptocladus</i> Kunth	Cyperoid
CYPERACEAE		<i>Cyperus compressus</i> L.	Cyperoid
CYPERACEAE		<i>Cyperus esculentus</i> L. var. <i>esculentus</i>	Cyperoid
CYPERACEAE		<i>Cyperus obtusiflorus</i> Vahl var. <i>obtusiflorus</i>	Cyperoid
CYPERACEAE		<i>Cyperus rupestris</i> Kunth	Cyperoid

Family		Species	Growth forms
CYPERACEAE		<i>Eleocharis dregeana</i> Steud.	Cyperoid
CYPERACEAE		<i>Juncus effusus</i>	Helophyte
CYPERACEAE		<i>Kyllinga alba</i> Nees	Cyperoid
CYPERACEAE		<i>Scirpoides burkei</i> (C.B.Clarke) Goetgh., Muasya & D.A.Simpson	Cyperoid
DIPSACACEAE		<i>Scabiosa columbaria</i> L.	Herb
EBENACEAE		<i>Diospyros lycioides</i> Desf. subsp. <i>lycioides</i>	Shrub, tree
EUPHORBIACEAE		<i>Acalypha angustata</i> Sond.	Dwarf shrub
EUPHORBIACEAE		<i>Euphorbia striata</i> Thunb. var. <i>striata</i>	Dwarf shrub
FABACEAE	*	<i>Acacia dealbata</i> Link	Shrub, tree
FABACEAE	*	<i>Acacia mearnsii</i> De Wild.	Shrub, tree
FABACEAE		<i>Elephantorrhiza elephantina</i> (Burch.) Skeels	Dwarf shrub
FABACEAE		<i>Eriosema</i> spp	Herb
FABACEAE		<i>Indigofera</i> sp	Shrublet
FABACEAE		<i>Pearsonia cajanifolia</i> (Harv.) Polhill subsp. <i>cajanifolia</i>	Herb, shrub
FABACEAE		<i>Pearsonia sessilifolia</i> (Harv.) Duemmer subsp. <i>sessilifolia</i>	Herb
GERANIACEAE		<i>Monsonia angustifolia</i> E.Mey. ex A.Rich.	Herb
GERANIACEAE		<i>Pelargonium luridum</i> (Andrews) Sweet	Geophyte
GUNNERACEAE		<i>Gunnera perpensa</i> L.	Declining
HYACINTHACEAE		<i>Dipcadi</i> cf <i>marlothii</i> Engl.	Geophyte
HYACINTHACEAE		<i>Ledebouria</i> cf. <i>revoluta</i> (L.f.) Jessop	Geophyte
HYACINTHACEAE		<i>Ledebouria ovatifolia</i> (Baker) Jessop	Geophyte
HYPOXIDACEAE		<i>Hypoxis acuminata</i> Baker	Geophyte
HYPOXIDACEAE		<i>Hypoxis iridifolia</i> Baker	Geophyte
HYPOXIDACEAE		<i>Hypoxis rigidula</i> Baker var. <i>rigidula</i>	Geophyte
IRIDACEAE		<i>Gladiolus</i> spp	Geophyte
JUNCACEAE		<i>Juncus dregeanus</i> Kunth	Helophyte
LAMIACEAE		<i>Ajuga ophrydis</i> Burch. ex Benth.	Herb
LAMIACEAE		<i>Leonotis microphylla</i> Scan	Shrub
LAMIACEAE		<i>Ocimum obovatum</i> E.Mey. ex Benth. subsp. <i>obovatum</i> var. <i>obovatum</i>	Herb
LAMIACEAE	*	<i>Salvia runcinata</i> L.f.	Herb
MALVACEAE		<i>Hermannia depressa</i> N.E.Br.	Herb
MYRTACEAE	*	<i>Eucalyptus camaldulensis</i> Dehnh.	Tree
OXALIDACEAE	*	<i>Oxalis corniculata</i> L.	Herb
PAPAVERACEAE	*	<i>Argemone ochroleuca</i>	Herb
PINACEAE	*	<i>Cedrus deodara</i>	Tree
PLANTAGINACEAE		<i>Plantago longissima</i> Decne.	Herb
PLANTAGINACEAE		<i>Plantago virginica</i> L.	Herb
POACEAE		<i>Alloteropsis semialata</i> (R.Br.) Hitchc. subsp. <i>semialata</i>	Graminoid
POACEAE		<i>Andropogon appendiculatus</i> Nees	Graminoid
POACEAE		<i>Aristida congesta</i> Roem. & Schult. subsp. <i>congesta</i>	Graminoid
POACEAE		<i>Brachiaria serrata</i> (Thunb.) Stapf	Graminoid
POACEAE		<i>Cynodon dactylon</i> (L.) Pers.	Graminoid
POACEAE		<i>Digitaria eriantha</i> Steud.	Graminoid
POACEAE		<i>Elionurus muticus</i> (Spreng.) Kunth	Graminoid
POACEAE		<i>Eragrostis curvula</i> (Schrud.) Nees	Graminoid

Family		Species	Growth forms
POACEAE		<i>Eragrostis lehmanniana</i> Nees var. <i>lehmanniana</i>	Graminoid
POACEAE		<i>Eragrostis racemosa</i> (Thunb.) Steud.	Graminoid
POACEAE		<i>Eragrostis</i> spp	Graminoid
POACEAE		<i>Eragrostis superba</i> Peyr.	Graminoid
POACEAE	*	<i>Eragrostis tef</i> (Zuccagni) Trotter	Graminoid
POACEAE		<i>Harpochloa falx</i> (L.f.) Kuntze	Graminoid
POACEAE		<i>Heteropogon contortus</i> (L.) Roem. & Schult.	Graminoid
POACEAE		<i>Hyparrhenia hirta</i> (L.) Stapf	Graminoid
POACEAE		<i>Imperata cylindrica</i> (L.) Raeusch.	Graminoid
POACEAE		<i>Leersia hexandra</i> Sw.	Graminoid
POACEAE		<i>Loudetia simplex</i> (Nees) C.E.Hubb.	Graminoid
POACEAE		<i>Melinis repens</i> (Willd.) Zizka subsp. <i>repens</i>	Graminoid
POACEAE		<i>Microchloa caffra</i> Nees	Graminoid
POACEAE	*	<i>Paspalum dilatatum</i> Poir.	Graminoid
POACEAE	*	<i>Pennisetum clandestinum</i> Hochst. ex Chiov.	Graminoid
POACEAE		<i>Phragmites australis</i> (Cav.) Steud.	Graminoid
POACEAE		<i>Pogonarthria squarrosa</i> (Roem. & Schult.) Pilg.	Graminoid
POACEAE		<i>Setaria sphacelata</i> (Schumach.) Stapf & C.E.Hubb. ex M.B.Moss	Graminoid
POACEAE		<i>Themeda triandra</i> Forssk.	Graminoid
POACEAE		<i>Tragus</i> spp	herb
POACEAE		<i>Tristachya biseriata</i> Stapf	Graminoid
POACEAE		<i>Tristachya leucothrix</i> Trin. ex Nees	Graminoid
POACEAE		<i>Tristachya rehmannii</i>	Graminoid
POLYGALACEAE		<i>Polygala amatymbica</i> Eckl. & Zeyh.	Herb
POLYGALACEAE		<i>Polygala hottentotta</i> C.Presl	Dwarf shrub
PORTULACACEAE		<i>Portulaca grandiflora</i> Hook.	Succulent
RANUNCULACEAE	*	<i>Ranunculus multifidus</i> Forssk.	Herb
ROSACEAE		<i>Cliffortia linearifolia</i> Eckl. & Zeyh.	Shrub
RUBIACEAE		<i>Galium capense</i> Thunb. subsp. <i>capense</i>	Herb
RUBIACEAE		<i>Oldenlandia herbacea</i> (L.) Roxb	Herb
RUBIACEAE		<i>Pentanisia angustifolia</i> (Hochst.) Hochst.	Herb
RUBIACEAE		<i>Pygmaeothamnus chamaedendrum</i>	Dwarf shrub
RUBIACEAE	*	<i>Richardia brasiliensis</i> Gomes	Herb
SALICACEAE	*	<i>Salix babylonica</i> L. var. <i>babylonica</i>	Tree
SANTALACEAE		<i>Thesium utile</i> A.W.Hill	Parasite
SCROPHULARIACEAE		<i>Nemesia fruticans</i> (Thunb.) Benth.	Dwarf
SCROPHULARIACEAE		<i>Selago densiflora</i> Rolfe	Herb
SINOPTERIDACEAE		<i>Cheilanthes viridis</i> (Forssk.) Sw.	Geophyte
SOLANACEAE	*	<i>Datura stramonium</i> L.	Shrub
SOLANACEAE		<i>Solanum campylacanthum</i> Hochst. ex A.Rich. subsp. <i>panduriforme</i> (Drège ex Dunal) J.Samuels	Herb
SOLANACEAE	*	<i>Solanum mauritianum</i> Scop.	Tree
SOLANACEAE	*	<i>Solanum sisymbriifolium</i> Lam.	Shrub
TYPHACEAE		<i>Typha capensis</i> (Rohrb.) N.E.Br.	
VERBENACEAE	*	<i>Lantana camara</i> L.	Shrub
VERBENACEAE	*	<i>Verbena aristigera</i> S.Moore	Herb

Family		Species	Growth forms
VERBENACEAE	*	<i>Verbena bonariensis</i> L.	Herb
VERBENACEAE	*	<i>Verbena brasiliensis</i> Vell.	Herb
ZYGOPHYLLACEAE		<i>Tribulus terrestris</i> L.	Herb

13.2. Mammal list for the study area

FAMILY & SCIENTIFIC NAME	COMMON NAME	RSA LEGAL STATUS	GAUTENG LEGAL STATUS	GLOBAL RED LIST STATUS	RSA RED LIST STATUS	LoO IN QDS	LoO IN PORTION 15
BATHYERGIDAE	Mole-rats						
<i>Cryptomys hottentotus</i>	Southern African Mole-rat			LC (S)	LC	2	1
BOVIDAE	Even-toed antelope						
<i>Raphicerus campestris</i>	Steenbok		PG Schedule 2 Section 15(1)(a)	LC (S)	LC	3	3
<i>Redunca arundinum</i>	Southern Reedbuck		PG Schedule 2 Section 15(1)(a)	LC (S)	LC	1	4
<i>Sylvicapra grimmia</i>	Bush Duiker			LC (S)	LC	1	2
CANIDAE	Dogs, foxes, jackals & relatives						
<i>Canis mesomelas</i>	Black-backed Jackal			LC (S)	LC	1	2
<i>Vulpes chama</i>	Cape Fox	PS		LC (S)	LC	2	2
CERCOPITHECIDAE	Baboon & monkeys						
<i>Papio ursinus</i>	Chacma Baboon			LC (S)	LC	3	4
CHRYSOCHLORIDAE	Golden moles						
<i>Amblysomus septentrionalis</i>	Highveld Golden Mole			NT (U)	NT	2	3
ERINACEIDAE	Hedgehog						
<i>Atelerix frontalis (frontalis)</i>	Southern African Hedgehog		PG Schedule 2 Section 15(1)(a)	LC (S)	NT	1	2
FELIDAE	Cats						
<i>Felis nigripes</i>	Black-footed Cat	PS		VU (D)	VU	1	3
<i>Leptailurus serval</i>	Serval	PS		LC (S)	NT	1	2
GALAGIDAE	Bushbabies						
<i>Galago moholi</i>	Moholi Bushbaby			LC (S)	LC	3	4
GLIRIDAE	Dormice						
<i>Graphiurus platyops</i>	Flat-headed African Dormouse			LC (U)	LC	3	4
HERPESTIDAE	Meerkat & mongooses						
<i>Atilax paludinosus</i>	Marsh Mongoose			LC (D)	LC	1	2
<i>Cynictis penicillata</i>	Yellow Mongoose			LC (S)	LC	1	2
<i>Herpestes pulverulentus</i>	Cape Gray Mongoose			LC (S)	LC	1	
<i>Herpestes sanguineus</i>	Slender Mongoose			LC (S)	LC	1	2
<i>Ichneumia albicauda</i>	White-tailed Mongoose			LC (S)	LC	3	3
<i>Suricata suricatta</i>	Meerkat			LC (U)	LC	1	3
HYAENIDAE	Aardwolf & hyenas						
<i>Hyaena brunnea</i>	Brown Hyena	PS	PG Schedule 2 Section 15(1)(a)	NT (D)	NT	1	2
<i>Proteles cristata</i>	Aardwolf		PG Schedule 2 Section 15(1)(a)	LC (S)	LC	2	3
HYSTRICIDAE	Porcupine						

FAMILY & SCIENTIFIC NAME	COMMON NAME	RSA LEGAL STATUS	GAUTENG LEGAL STATUS	GLOBAL RED LIST STATUS	RSA RED LIST STATUS	LoO IN QDS	LoO IN PORTION 15
<i>Hystrix africaeaustralis</i>	Cape Porcupine			LC (S)	LC	1	2
LEPORIDAE	Hares & rabbits						
<i>Lepus saxatilis</i>	Scrub Hare			LC (D)	LC	2	2
<i>Pronolagus randensis</i>	Jameson's Red Rock Hare			LC (U)	LC	2	4
MACROSCOLIDIDAE	Elephant shrews						
<i>Elephantulus myurus</i>	Eastern Rock Elephant Shrew			LC (S)	LC	1	2
MOLOSSIDAE	Free-tailed & related bats						
<i>Tadarida aegyptiaca</i>	Egyptian Free-tailed Bat			LC (U)	LC	2	2
MURIDAE	Gerbils, rock mice, vlei rats & relatives						
<i>Aethomys ineptus</i>	Tete Veld Aethomys			LC (U)	LC	1	2
<i>Aethomys namaquensis</i>	Namaqua Rock Mouse			LC (S)	LC	1	2
<i>Gerbilliscus brantsii</i>	Highveld Gerbil			LC (U)	LC	1	2
<i>Mastomys coucha</i>	Southern African Mastomys			LC (S)	LC	2	2
<i>Otomys auratus / irroratus</i>	Southern African Vlei Rat			LC (S)	LC	1	2
<i>Rhabdomys pumilio</i>	Xeric Four-striped Grass Rat			LC (S)	LC	1	2
MUSTELIDAE	Badger, otters, polecat & weasel						
<i>Aonyx capensis</i>	African Clawless Otter			LC (S)	NT	1	2
<i>Hydricis maculicollis</i>	Spotted-necked Otter			LC (D)	VU	1	4
<i>Ictonyx striatus</i>	Striped Polecat			LC (S)	LC	1	2
<i>Poecilogale albinucha</i>	African Striped Weasel			LC (U)	NT	3	3
NESOMYIDAE	Climbing & fat mice & relatives						
<i>Dendromus melanotis</i>	Gray African Climbing Mouse			LC (S)	LC	3	3
<i>Dendromus mystacalis</i>	Chestnut African Climbing Mouse			LC (S)	LC	3	3
<i>Mystromys albicaudatus</i>	African White-tailed Rat			EN (D)	VU	3	3
<i>Saccostomus campestris</i>	Southern African Pouched Mouse			LC (S)	LC	1	2
<i>Steatomys krebsii</i>	Kreb's African Fat Mouse			LC (S)	LC	3	3
<i>Steatomys pratensis</i>	Common African Fat Mouse			LC (S)	LC	3	3
ORYCTEROPODIDAE	Aardvark						
<i>Orycteropus afer</i>	Aardvark	PS	PG Schedule 2 Section 15(1)(a)	LC (U)	LC	2	4
PEDETIDAE	Spring Hare						
<i>Pedetes capensis</i>	South African Spring Hare			LC (U)	LC	2	4
PROCAVIIDAE	Hyraxes						
<i>Procavia capensis</i>	Rock Hyrax			LC (U)	LC	2	4
RHINOLOPHIDAE	Horseshoe bats						
<i>Rhinolophus clivosus</i>	Geoffroy's Horseshoe Bat			LC (U)	LC	3	3

FAMILY & SCIENTIFIC NAME	COMMON NAME	RSA LEGAL STATUS	GAUTENG LEGAL STATUS	GLOBAL RED LIST STATUS	RSA RED LIST STATUS	LoO IN QDS	LoO IN PORTION 15
SCIURIDAE	Squirrels						
<i>Xerus inauris</i>	South African Ground Squirrel			LC (S)	LC	3	4
SORICIDAE	Shrews						
<i>Crocidura cyanea</i>	Reddish-gray Musk Shrew			LC (S)	LC	2	2
<i>Crocidura mariquensis</i>	Swamp Musk Shrew			LC (U)	NT	1	2
<i>Myosorex cafer</i>	Dark-footed Mouse Shrew			LC (U)	VU	2	4
<i>Myosorex varius</i>	Forest Shrew			LC (S)	LC	2	3
<i>Suncus infinitesimus</i>	Least Dwarf Shrew			LC (U)	LC	1	3
<i>Suncus varilla</i>	Lesser Dwarf Shrew			LC (U)	LC	3	3
SUIDAE	Hogs & pigs						
<i>Potamochoerus larvatus</i>	Bush-pig			LC (S)	LC	3	4
THRYONOMYIDAE	Cane Rat						
<i>Thryonomys swinderianus</i>	Greater Cane Rat			LC (U)	LC	3	4
VESPERTILIONIDAE	House, pipistrelle, serotine & related bats						
<i>Miniopterus natalensis</i>	Natal / Shreiber's Long-fingered Bat			LC (U)	LC	3	3
<i>Neoromicia capensis</i>	Cape Serotine			LC (S)	LC	2	2
VIVERRIDAE	Civet & genets						
<i>Genetta genetta</i>	Common Genet			LC (S)	LC	2	2

Status: D = Declining; EN = Endangered; LC = Least Concern; NT = Near Threatened; PG = Protected Game; PS = Protected Species; PWA = Protected Wild Animal; S = Stable; U = Unknown; VU = Vulnerable

Likelihood of Occurrence (LoO): 1 = Present; 2 = High; 3 = Moderate; 4 = Low

Sources: Transvaal Nature Conservation Ordinance (1983); Friedmann & Daly (2004); NEM:BA ToPS (2015); IUCN (2016); SANBI & EWT (2016); MammalMAP (2017)

13.3. Bird list for the study area

SCIENTIFIC NAME	COMMON NAME	RSA LEGAL STATUS	GAUTENG LEGAL STATUS	GLOBAL RED LIST STATUS	REGIONAL RED LIST STATUS	RECORDS IN QDS	RECORDS IN PENTAD	LoO IN PORTION 15
<i>Diomedea amsterdamensis</i>	Albatross, Amsterdam		PG Schedule 2 Section 15(1)(a)	CR	NA			
<i>Thalassarche chlororhynchos</i>	Albatross, Atlantic Yellow-nosed		PG Schedule 2 Section 15(1)(a)	EN	EN			
<i>Thalassarche melanophrys</i>	Albatross, Black-browed		PG Schedule 2 Section 15(1)(a)	EN	EN			
<i>Thalassarche bulleri</i>	Albatross, Buller's		PG Schedule 2 Section 15(1)(a)	NT	NA			
<i>Thalassarche eremita</i>	Albatross, Chatham		PG Schedule 2 Section 15(1)(a)	VU	NA			
<i>Thalassarche chrysostoma</i>	Albatross, Grey-headed		PG Schedule 2 Section 15(1)(a)	EN	EN			
<i>Thalassarche carteri</i>	Albatross, Indian Yellow-nosed		PG Schedule 2 Section 15(1)(a)	EN	EN			
<i>Phoebastria immutabilis</i>	Albatross, Laysan		PG Schedule 2 Section 15(1)(a)	NT	NA			
<i>Phoebastria palpebrata</i>	Albatross, Light-mantled		PG Schedule 2 Section 15(1)(a)	NT	NT			
<i>Diomedea sanfordi</i>	Albatross, Northern Royal		PG Schedule 2 Section 15(1)(a)	EN	EN			
<i>Thalassarche salvini</i>	Albatross, Salvin's		PG Schedule 2 Section 15(1)(a)	VU	NA			
<i>Thalassarche cauta</i>	Albatross, Shy		PG Schedule 2 Section 15(1)(a)	NT	NT			
<i>Phoebastria fusca</i>	Albatross, Sooty		PG Schedule 2 Section 15(1)(a)	EN	EN			
<i>Diomedea epomophora</i>	Albatross, Southern Royal		PG Schedule 2 Section 15(1)(a)	VU	VU			
<i>Diomedea dabbenena</i>	Albatross, Tristan		PG Schedule 2 Section 15(1)(a)	CR	CR			
<i>Diomedea exulans</i>	Albatross, Wandering		PG Schedule 2 Section 15(1)(a)	VU	VU			
<i>Apalis thoracica</i>	Apalis, Bar-throated		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	2
<i>Apalis ruddi</i>	Apalis, Rudd's		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Apalis flavida</i>	Apalis, Yellow-breasted		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Recurvirostra avosetta</i>	Avocet, Pied		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	4
<i>Turdoides jardineii</i>	Babbler, Arrow-marked		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	2
<i>Turdoides bicolor</i>	Babbler, Southern Pied		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Tricholaema leucomelas</i>	Barbet, Acacia Pied		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	3
<i>Lybius torquatus</i>	Barbet, Black-collared		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	2
<i>Trachyphonus vaillantii</i>	Barbet, Crested		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	2
<i>Stactolaema olivacea</i>	Barbet, Green		PG Schedule 2 Section 15(1)(a)	LC	EN			
<i>Stactolaema leucotis</i>	Barbet, White-eared		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Terathopius ecaudatus</i>	Bateleur	EN	PG Schedule 2 Section 15(1)(a)	NT	EN			
<i>Batis capensis</i>	Batis, Cape		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Batis molitor</i>	Batis, Chinspot		PG Schedule 2 Section 15(1)(a)	LC	LC	1		2
<i>Batis pririt</i>	Batis, Pririt		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Batis fratum</i>	Batis, Woodward's		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Merops persicus</i>	Bee-eater, Blue-cheeked		PG Schedule 2 Section 15(1)(a)	LC	LC			

SCIENTIFIC NAME	COMMON NAME	RSA LEGAL STATUS	GAUTENG LEGAL STATUS	GLOBAL RED LIST STATUS	REGIONAL RED LIST STATUS	RECORDS IN QDS	RECORDS IN PENTAD	LoO IN PORTION 15
<i>Merops apiaster</i>	Bee-eater, European		PG Schedule 2 Section 15(1)(a)	LC	LC	1		2
<i>Merops pusillus</i>	Bee-eater, Little		PG Schedule 2 Section 15(1)(a)	LC	LC	1		2
<i>Merops superciliosus</i>	Bee-eater, Olive		PG Schedule 2 Section 15(1)(a)					
<i>Merops nubicoides</i>	Bee-eater, Southern Carmine		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Merops hirundineus</i>	Bee-eater, Swallow-tailed		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Merops bullockoides</i>	Bee-eater, White-fronted		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	3
<i>Merops albicollis</i>	Bee-eater, White-throated		PG Schedule 2 Section 15(1)(a)					
<i>Euplectes orix</i>	Bishop, Southern Red		WA Schedule 5 Section 43	LC	LC	1	1	1
<i>Euplectes capensis</i>	Bishop, Yellow		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	2
<i>Euplectes afer</i>	Bishop, Yellow-crowned		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	1
<i>Ixobrychus sturmii</i>	Bittern, Dwarf		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Botaurus stellaris</i>	Bittern, Eurasian		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	2
<i>Ixobrychus minutus</i>	Bittern, Little		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	2
<i>Lioptilus nigricapillus</i>	Blackcap, Bush		PG Schedule 2 Section 15(1)(a)	NT	VU			
<i>Sylvia atricapilla</i>	Blackcap, Eurasian		PG Schedule 2 Section 15(1)(a)					
<i>Telophorus zeylonus</i>	Bokmakierie		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	2
<i>Sula leucogaster</i>	Booby, Brown		PG Schedule 2 Section 15(1)(a)					
<i>Sula sula</i>	Booby, Red-footed		PG Schedule 2 Section 15(1)(a)					
<i>Laniarius ferrugineus</i>	Boubou, Southern		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	2
<i>Laniarius major</i>	Boubou, Tropical		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Smithornis capensis</i>	Broadbill, African		PG Schedule 2 Section 15(1)(a)	LC	VU			
<i>Phyllastrephus terrestris</i>	Brownbul, Terrestrial		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Nilaus afer</i>	Brubru		PG Schedule 2 Section 15(1)(a)	LC	LC	1		3
<i>Pycnonotus nigricans</i>	Bulbul, African Red-eyed		WA Schedule 5 Section 43	LC	LC	1	1	3
<i>Pycnonotus capensis</i>	Bulbul, Cape		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Pycnonotus tricolor</i>	Bulbul, Dark-capped		WA Schedule 5 Section 43	LC	LC	1	1	1
<i>Emberiza capensis</i>	Bunting, Cape		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	3
<i>Emberiza tahapisi</i>	Bunting, Cinnamon-breasted		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	3
<i>Emberiza flaviventris</i>	Bunting, Golden-breasted		PG Schedule 2 Section 15(1)(a)	LC	LC	1		3
<i>Emberiza impetuari</i>	Bunting, Lark-like		PG Schedule 2 Section 15(1)(a)	LC	LC	1		3
<i>Chlorophoneus nigrifrons</i>	Bush-shrike, Black-fronted		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Chlorophoneus viridis</i>	Bush-shrike, Gorgeous		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Malaconotus blanchoti</i>	Bush-shrike, Grey-headed		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Chlorophoneus olivaceus</i>	Bush-shrike, Olive		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Telophorus sulfureopectus</i>	Bush-shrike, Orange-breasted		PG Schedule 2 Section 15(1)(a)	LC	LC			

SCIENTIFIC NAME	COMMON NAME	RSA LEGAL STATUS	GAUTENG LEGAL STATUS	GLOBAL RED LIST STATUS	REGIONAL RED LIST STATUS	RECORDS IN QDS	RECORDS IN PENTAD	LoO IN PORTION 15
<i>Lissotis melanogaster</i>	Bustard, Black-bellied		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Neotis denhami</i>	Bustard, Denham's	VU	PG Schedule 2 Section 15(1)(a)	NT	VU			
<i>Ardeotis kori</i>	Bustard, Kori	PS	PG Schedule 2 Section 15(1)(a)	NT	NT			
<i>Neotis ludwigii</i>	Bustard, Ludwig's	EN	PG Schedule 2 Section 15(1)(a)	EN	EN			
<i>Turnix nanus</i>	Buttonquail, Black-rumped		PG Schedule 2 Section 15(1)(a)	LC	VU			
<i>Turnix sylvaticus</i>	Buttonquail, Common (Kurrichane)		PG Schedule 2 Section 15(1)(a)	LC	LC	1		2
<i>Turnix hottentottus</i>	Buttonquail, Hottentot		PG Schedule 2 Section 15(1)(a)	EN	EN			
<i>Buteo vulpinus</i>	Buzzard, Common (Steppe)		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	2
<i>Pernis apivorus</i>	Buzzard, European Honey		PG Schedule 2 Section 15(1)(a)	LC	LC	1		3
<i>Buteo trizonatus</i>	Buzzard, Forest		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Buteo rufofuscus</i>	Buzzard, Jackal		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	4
<i>Kaupifalco monogrammicus</i>	Buzzard, Lizard		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Camaroptera brachyura</i>	Camaroptera, Green-backed		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Camaroptera brevicaudata</i>	Camaroptera, Grey-backed		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Serinus alario</i>	Canary, Black-headed		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Crithagra atrogularis</i>	Canary, Black-throated		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	1
<i>Crithagra sulphurata</i>	Canary, Brimstone		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Serinus canicollis</i>	Canary, Cape		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	2
<i>Crithagra scotops</i>	Canary, Forest		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Crithagra citrinpectus</i>	Canary, Lemon-breasted		PG Schedule 2 Section 15(1)(a)	LC	NT			
<i>Crithagra albogularis</i>	Canary, White-throated		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Crithagra flaviventris</i>	Canary, Yellow		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	2
<i>Crithagra mozambicus</i>	Canary, Yellow-fronted		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	2
<i>Fringilla coelebs</i>	Chaffinch, Common		PG Schedule 2 Section 15(1)(a)					
<i>Myrmecocichla formicivora</i>	Chat, Ant-eating		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	2
<i>Pentholaea arnotti</i>	Chat, Arnot's		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Pinarornis plumosus</i>	Chat, Boulder		PG Schedule 2 Section 15(1)(a)					
<i>Campicoloides bifasciata</i>	Chat, Buff-streaked		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Cercomela familiaris</i>	Chat, Familiar		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	2
<i>Cercomela schlegelii</i>	Chat, Karoo		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Thamnolaea cinnamomeiventris</i>	Chat, Mocking Cliff		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	4
<i>Cercomela sinuata</i>	Chat, Sickie-winged		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Cercomela tractrac</i>	Chat, Tractrac		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Cisticola textrix</i>	Cisticola, Cloud		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	1
<i>Cisticola natalensis</i>	Cisticola, Croaking		PG Schedule 2 Section 15(1)(a)	LC	LC			

SCIENTIFIC NAME	COMMON NAME	RSA LEGAL STATUS	GAUTENG LEGAL STATUS	GLOBAL RED LIST STATUS	REGIONAL RED LIST STATUS	RECORDS IN QDS	RECORDS IN PENTAD	LoO IN PORTION 15
<i>Cisticola aridulus</i>	Cisticola, Desert		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	1
<i>Cisticola subruficapilla</i>	Cisticola, Grey-backed		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Cisticola aberrans</i>	Cisticola, Lazy		PG Schedule 2 Section 15(1)(a)	LC	LC	1		4
<i>Cisticola tinniens</i>	Cisticola, Levaillant's		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	1
<i>Cisticola cinnamomeus</i>	Cisticola, Pale-crowned		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Cisticola chiniana</i>	Cisticola, Rattling		PG Schedule 2 Section 15(1)(a)	LC	LC	1		4
<i>Cisticola erythrops</i>	Cisticola, Red-faced		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Cisticola galactotes</i>	Cisticola, Rufous-winged		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Cisticola rufilatus</i>	Cisticola, Tinkling		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Cisticola lais</i>	Cisticola, Wailing		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	3
<i>Cisticola ayresii</i>	Cisticola, Wing-snapping		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	1
<i>Cisticola juncidis</i>	Cisticola, Zitting		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	1
<i>Fulica cristata</i>	Coot, Red-knobbed		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	4
<i>Phalacrocorax neglectus</i>	Cormorant, Bank		PG Schedule 2 Section 15(1)(a)	EN	EN			
<i>Phalacrocorax capensis</i>	Cormorant, Cape		PG Schedule 2 Section 15(1)(a)	EN	EN			
<i>Phalacrocorax coronatus</i>	Cormorant, Crowned		PG Schedule 2 Section 15(1)(a)	NT	NT			
<i>Phalacrocorax africanus</i>	Cormorant, Reed		WA Schedule 5 Section 43	LC	LC	1	1	3
<i>Phalacrocorax carbo</i>	Cormorant, White-breasted		WA Schedule 5 Section 43	LC	LC	1	1	3
<i>Centropus grillii</i>	Coucal, Black		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Centropus burchellii</i>	Coucal, Burchell's		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	2
<i>Centropus senegalensis</i>	Coucal, Senegal		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Rhinoptilus chalcopterus</i>	Courser, Bronze-winged		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Cursorius rufus</i>	Courser, Burchell's		PG Schedule 2 Section 15(1)(a)	LC	VU			
<i>Rhinoptilus africanus</i>	Courser, Double-banded		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Cursorius temminckii</i>	Courser, Temminck's		PG Schedule 2 Section 15(1)(a)	LC	LC	1		3
<i>Rhinoptilus cinctus</i>	Courser, Three-banded		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Crecopsis egregia</i>	Crake, African		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	2
<i>Porzana pusilla</i>	Crake, Baillon's		PG Schedule 2 Section 15(1)(a)	LC	LC	1		3
<i>Amaurornis flavirostris</i>	Crake, Black		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	3
<i>Crex crex</i>	Crake, Corn		PG Schedule 2 Section 15(1)(a)	LC	LC	1		2
<i>Porzana parva</i>	Crake, Little		PG Schedule 2 Section 15(1)(a)					
<i>Porzana porzana</i>	Crake, Spotted		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	2
<i>Aenigmatolimnas marginalis</i>	Crake, Striped		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Anthropoides paradiseus</i>	Crane, Blue	PS	PG Schedule 2 Section 15(1)(a)	VU	NT	1	1	3
<i>Balearica regulorum</i>	Crane, Grey Crowned	EN	PG Schedule 2 Section 15(1)(a)	EN	EN	1		4

SCIENTIFIC NAME	COMMON NAME	RSA LEGAL STATUS	GAUTENG LEGAL STATUS	GLOBAL RED LIST STATUS	REGIONAL RED LIST STATUS	RECORDS IN QDS	RECORDS IN PENTAD	LoO IN PORTION 15
<i>Bugeranus carunculatus</i>	Crane, Wattled	CR	PG Schedule 2 Section 15(1)(a)	VU	CR	1		4
<i>Sylvietta rufescens</i>	Crombec, Long-billed		PG Schedule 2 Section 15(1)(a)	LC	LC	1		4
<i>Corvus capensis</i>	Crow, Cape		WA Schedule 5 Section 43	LC	LC	1		3
<i>Corvus splendens</i>	Crow, House		PG Schedule 2 Section 15(1)(a)					
<i>Corvus albus</i>	Crow, Pied		WA Schedule 5 Section 43	LC	LC	1	1	2
<i>Cuculus gularis</i>	Cuckoo, African		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Chrysococcyx cupreus</i>	Cuckoo, African Emerald		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Cercococcyx montanus</i>	Cuckoo, Barred Long-tailed		PG Schedule 2 Section 15(1)(a)					
<i>Cuculus clamosus</i>	Cuckoo, Black		PG Schedule 2 Section 15(1)(a)	LC	LC	1		4
<i>Cuculus canorus</i>	Cuckoo, Common		PG Schedule 2 Section 15(1)(a)	LC	LC	1		4
<i>Chrysococcyx caprius</i>	Cuckoo, Diederik		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	1
<i>Clamator glandarius</i>	Cuckoo, Great Spotted		PG Schedule 2 Section 15(1)(a)	LC	LC	1		4
<i>Clamator jacobinus</i>	Cuckoo, Jacobin		PG Schedule 2 Section 15(1)(a)	LC	LC	1		4
<i>Chrysococcyx klaas</i>	Cuckoo, Klaas's		PG Schedule 2 Section 15(1)(a)	LC	LC	1		4
<i>Clamator leuallantii</i>	Cuckoo, Leuallant's		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Cuculus rochii</i>	Cuckoo, Madagascar		PG Schedule 2 Section 15(1)(a)					
<i>Cuculus solitarius</i>	Cuckoo, Red-chested		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	2
<i>Pachycoccyx audeberti</i>	Cuckoo, Thick-billed		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Campephaga flava</i>	Cuckooshrike, Black		PG Schedule 2 Section 15(1)(a)	LC	LC	1		4
<i>Coracina caesia</i>	Cuckooshrike, Grey		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Coracina pectoralis</i>	Cuckooshrike, White-breasted		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Numenius arquata</i>	Curlew, Eurasian		PG Schedule 2 Section 15(1)(a)	NT	NT			
<i>Anhinga rufa</i>	Darter, African		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	3
<i>Streptopelia decipiens</i>	Dove, African Mourning		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Turtur afer</i>	Dove, Blue-spotted Wood		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Streptopelia capicola</i>	Dove, Cape Turtle		WA Schedule 5 Section 43	LC	LC	1	1	1
<i>Turtur chalcospilos</i>	Dove, Emerald-spotted Wood		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Streptopelia turtur</i>	Dove, European Turtle		PG Schedule 2 Section 15(1)(a)	VU	NA			
<i>Streptopelia senegalensis</i>	Dove, Laughing		WA Schedule 5 Section 43	LC	LC	1	1	1
<i>Columba larvata</i>	Dove, Lemon		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Oena capensis</i>	Dove, Namaqua		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	3
<i>Streptopelia semitorquata</i>	Dove, Red-eyed		WA Schedule 5 Section 43	LC	LC	1	1	2
<i>Columba livia</i>	Dove, Rock		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	2
<i>Turtur tympanistria</i>	Dove, Tambourine		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Limnodromus semipalmatus</i>	Dowitcher, Asiatic		PG Schedule 2 Section 15(1)(a)	NT	NA			

SCIENTIFIC NAME	COMMON NAME	RSA LEGAL STATUS	GAUTENG LEGAL STATUS	GLOBAL RED LIST STATUS	REGIONAL RED LIST STATUS	RECORDS IN QDS	RECORDS IN PENTAD	LoO IN PORTION 15
<i>Dicrurus adsimilis</i>	Drongo, Fork-tailed		PG Schedule 2 Section 15(1)(a)	LC	LC	1		3
<i>Dicrurus ludwigii</i>	Drongo, Square-tailed		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Anas sparsa</i>	Duck, African Black		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	4
<i>Dendrocygna bicolor</i>	Duck, Fulvous Whistling		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	3
<i>Sarkidiornis melanotos</i>	Duck, Knob-billed		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	4
<i>Oxyura maccoa</i>	Duck, Maccoa		PG Schedule 2 Section 15(1)(a)	NT	NT	1	1	4
<i>Thalassornis leuconotus</i>	Duck, White-backed		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	4
<i>Dendrocygna viduata</i>	Duck, White-faced Whistling		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	4
<i>Anas undulata</i>	Duck, Yellow-billed		OG Schedule 3 Section 15(1)(b)	LC	LC	1	1	1
<i>Calidris alpina</i>	Dunlin		PG Schedule 2 Section 15(1)(a)					
<i>Haliaeetus vocifer</i>	Eagle, African Fish		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	3
<i>Aquila spilogaster</i>	Eagle, African Hawk		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Hieraaetus ayresii</i>	Eagle, Ayres's Hawk		PG Schedule 2 Section 15(1)(a)	LC	LC	1		4
<i>Circaetus pectoralis</i>	Eagle, Black-chested Snake		PG Schedule 2 Section 15(1)(a)	LC	LC	1		3
<i>Hieraaetus pennatus</i>	Eagle, Booted		PG Schedule 2 Section 15(1)(a)	LC	LC	1		4
<i>Circaetus cinereus</i>	Eagle, Brown Snake		PG Schedule 2 Section 15(1)(a)	LC	LC	1		4
<i>Stephanoaetus coronatus</i>	Eagle, Crowned		PG Schedule 2 Section 15(1)(a)	NT	VU			
<i>Clanga pomarina</i>	Eagle, Lesser Spotted		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Lophaetus occipitalis</i>	Eagle, Long-crested		PG Schedule 2 Section 15(1)(a)	LC	LC	1		3
<i>Polemaetus bellicosus</i>	Eagle, Martial	EN	PG Schedule 2 Section 15(1)(a)	VU	EN	1		4
<i>Circaetus fasciolatus</i>	Eagle, Southern Banded Snake		PG Schedule 2 Section 15(1)(a)	NT	CR			
<i>Aquila nipalensis</i>	Eagle, Steppe		PG Schedule 2 Section 15(1)(a)	EN	LC			
<i>Aquila rapax</i>	Eagle, Tawny	EN	PG Schedule 2 Section 15(1)(a)	LC	EN			
<i>Aquila verreauxii</i>	Eagle, Verreaux's		PG Schedule 2 Section 15(1)(a)	LC	VU	1		4
<i>Aquila wahlbergi</i>	Eagle, Wahlberg's		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Egretta alba</i>	Egret, Great		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	2
<i>Egretta garzetta</i>	Egret, Little		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	2
<i>Egretta vinaceigula</i>	Egret, Slaty		PG Schedule 2 Section 15(1)(a)	VU	NA	1		4
<i>Egretta thula</i>	Egret, Snowy		PG Schedule 2 Section 15(1)(a)					
<i>Bubulcus ibis</i>	Egret, Western Cattle		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	1
<i>Egretta intermedia</i>	Egret, Yellow-billed		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	2
<i>Eremomela usticollis</i>	Eremomela, Burnt-necked		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Eremomela scotops</i>	Eremomela, Green-capped		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Eremomela gregalis</i>	Eremomela, Karoo		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Eremomela icteropygialis</i>	Eremomela, Yellow-bellied		PG Schedule 2 Section 15(1)(a)	LC	LC	1		4

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<i>Falco amurensis</i>	Falcon, Amur		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	2
<i>Falco eleonora</i>	Falcon, Eleonora's		PG Schedule 2 Section 15(1)(a)					
<i>Falco biarmicus</i>	Falcon, Lanner		PG Schedule 2 Section 15(1)(a)	LC	VU	1	1	3
<i>Falco peregrinus</i>	Falcon, Peregrine		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Polihierax semitorquatus</i>	Falcon, Pygmy		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Falco vespertinus</i>	Falcon, Red-footed		PG Schedule 2 Section 15(1)(a)	NT	NT	1		4
<i>Falco chicquera</i>	Falcon, Red-necked		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Falco concolor</i>	Falcon, Sooty		PG Schedule 2 Section 15(1)(a)	NT	NA	1		4
<i>Falco fasciinucha</i>	Falcon, Taita	CR	PG Schedule 2 Section 15(1)(a)	VU	CR			
<i>Anomalospiza imberbis</i>	Finch, Cuckoo		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	3
<i>Amadina fasciata</i>	Finch, Cut-throat		PG Schedule 2 Section 15(1)(a)	LC	LC	1		4
<i>Amadina erythrocephala</i>	Finch, Red-headed		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	2
<i>Sporopipes squamifrons</i>	Finch, Scaly-feathered		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Podica senegalensis</i>	Finfoot, African		PG Schedule 2 Section 15(1)(a)	LC	VU			
<i>Lagonosticta rubricata</i>	Firefinch, African		PG Schedule 2 Section 15(1)(a)	LC	LC	1		3
<i>Lagonosticta rhodopareia</i>	Firefinch, Jameson's		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Lagonosticta senegala</i>	Firefinch, Red-billed		PG Schedule 2 Section 15(1)(a)	LC	LC	1		4
<i>Lanius collaris</i>	Fiscal, Southern (Common)		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	1
<i>Phoenicopterus ruber</i>	Flamingo, Greater		PG Schedule 2 Section 15(1)(a)	LC	NT	1	1	4
<i>Phoenicopterus minor</i>	Flamingo, Lesser		PG Schedule 2 Section 15(1)(a)	NT	NT	1	1	4
<i>Sarothrura elegans</i>	Flufftail, Buff-spotted		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Sarothrura rufa</i>	Flufftail, Red-chested		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	2
<i>Sarothrura boehmi</i>	Flufftail, Streaky-breasted		PG Schedule 2 Section 15(1)(a)					
<i>Sarothrura affinis</i>	Flufftail, Striped		PG Schedule 2 Section 15(1)(a)	LC	VU			
<i>Sarothrura ayresi</i>	Flufftail, White-winged		PG Schedule 2 Section 15(1)(a)	CR	CR			
<i>Muscicapa adusta</i>	Flycatcher, African Dusky		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Terpsiphone viridis</i>	Flycatcher, African Paradise		PG Schedule 2 Section 15(1)(a)	LC	LC	1		2
<i>Muscicapa caerulescens</i>	Flycatcher, Ashy		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Bias musicus</i>	Flycatcher, Black-and-white (Vanga)		PG Schedule 2 Section 15(1)(a)					
<i>Trochocercus cyanomelas</i>	Flycatcher, Blue-mantled Crested		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Bradornis infuscatus</i>	Flycatcher, Chat		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Ficedula albicollis</i>	Flycatcher, Collared		PG Schedule 2 Section 15(1)(a)					
<i>Stenostira scita</i>	Flycatcher, Fairy		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	4
<i>Sigelus silens</i>	Flycatcher, Fiscal		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	2

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<i>Myioparus plumbeus</i>	Flycatcher, Grey Tit-		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Bradornis mariquensis</i>	Flycatcher, Marico		PG Schedule 2 Section 15(1)(a)	LC	LC	1		4
<i>Bradornis pallidus</i>	Flycatcher, Pale		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Melaenornis pammelaina</i>	Flycatcher, Southern Black		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Muscicapa striata</i>	Flycatcher, Spotted		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	2
<i>Peliperdix coqui</i>	Francolin, Coqui		OG Schedule 3 Section 15(1)(b)	LC	LC	1		4
<i>Dendroperdix sephaena</i>	Francolin, Crested		OG Schedule 3 Section 15(1)(b)	LC	LC	1		4
<i>Scleroptila afra</i>	Francolin, Grey-winged		OG Schedule 3 Section 15(1)(b)	LC	LC	1		4
<i>Scleroptila levaillantoides</i>	Francolin, Orange River		OG Schedule 3 Section 15(1)(b)	LC	LC	1	1	2
<i>Scleroptila levaillantii</i>	Francolin, Red-winged		OG Schedule 3 Section 15(1)(b)	LC	LC	1	1	2
<i>Scleroptila shelleyi</i>	Francolin, Shelley's		OG Schedule 3 Section 15(1)(b)	LC	LC			
<i>Fregata minor</i>	Frigatebird, Greater		PG Schedule 2 Section 15(1)(a)					
<i>Fregata ariel</i>	Frigatebird, Lesser		PG Schedule 2 Section 15(1)(a)					
<i>Fulmarus glacialis</i>	Fulmar, Southern		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Porphyrio alleni</i>	Gallinule, Allen's		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Porphyrio martinicus</i>	Gallinule, American (Purple)		PG Schedule 2 Section 15(1)(a)					
<i>Morus serrator</i>	Gannet, Australasian		PG Schedule 2 Section 15(1)(a)					
<i>Morus capensis</i>	Gannet, Cape		PG Schedule 2 Section 15(1)(a)	VU	VU			
<i>Anas querquedula</i>	Garganey		PG Schedule 2 Section 15(1)(a)			1		4
<i>Corythaixoides concolor</i>	Go-away-bird, Grey		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	2
<i>Limosa lapponica</i>	Godwit, Bar-tailed		PG Schedule 2 Section 15(1)(a)	NT	LC			
<i>Limosa limosa</i>	Godwit, Black-tailed		PG Schedule 2 Section 15(1)(a)	NT	NA	1		4
<i>Limosa haemastica</i>	Godwit, Hudsonian		PG Schedule 2 Section 15(1)(a)					
<i>Nettapus auritus</i>	Goose, African Pygmy		PG Schedule 2 Section 15(1)(a)	LC	VU			
<i>Alopochen aegyptiacus</i>	Goose, Egyptian		OG Schedule 3 Section 15(1)(b)	LC	LC	1	1	2
<i>Plectropterus gambensis</i>	Goose, Spur-winged		OG Schedule 3 Section 15(1)(b)	LC	LC	1	1	2
<i>Accipiter tachiro</i>	Goshawk, African		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Melierax metabates</i>	Goshawk, Dark Chanting		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Melierax gabar</i>	Goshawk, Gabar		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Melierax canorus</i>	Goshawk, Pale Chanting		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Sphenoeacus afer</i>	Grassbird, Cape		PG Schedule 2 Section 15(1)(a)	LC	LC	1		3
<i>Podiceps nigricollis</i>	Grebe, Black-necked		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	4
<i>Podiceps cristatus</i>	Grebe, Great Crested		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	4
<i>Tachybaptus ruficollis</i>	Grebe, Little		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	4
<i>Andropadus importunus</i>	Greenbul, Sombre		PG Schedule 2 Section 15(1)(a)	LC	LC			

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<i>Chlorocichla flaviventris</i>	Greenbul, Yellow-bellied		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Phyllastrephus flavostriatus</i>	Greenbul, Yellow-streaked		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Tringa nebularia</i>	Greenshank, Common		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	4
<i>Guttera pucherani</i>	Guinea fowl, Crested		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Numida meleagris</i>	Guinea fowl, Helmeted		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	1
<i>Chroicocephalus ridibundus</i>	Gull, Common Black-headed		PG Schedule 2 Section 15(1)(a)					
<i>Leucophaeus pipixcan</i>	Gull, Franklin's		PG Schedule 2 Section 15(1)(a)					
<i>Larus cirrocephalus</i>	Gull, Grey-headed		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	4
<i>Chroicocephalus hartlaubii</i>	Gull, Hartlaub's		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Larus dominicanus</i>	Gull, Kelp		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Larus fuscus</i>	Gull, Lesser Black-backed		PG Schedule 2 Section 15(1)(a)			1		4
<i>Xema sabini</i>	Gull, Sabine's		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Chroicocephalus genei</i>	Gull, Slender-billed		PG Schedule 2 Section 15(1)(a)					
<i>Scopus umbretta</i>	Hamerkop		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	2
<i>Circus ranivorus</i>	Harrier, African Marsh		PG Schedule 2 Section 15(1)(a)	LC	EN	1	1	3
<i>Circus maurus</i>	Harrier, Black		PG Schedule 2 Section 15(1)(a)	VU	EN	1		4
<i>Circus pygargus</i>	Harrier, Montagu's		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	3
<i>Circus macrourus</i>	Harrier, Pallid		PG Schedule 2 Section 15(1)(a)	NT	NT	1		3
<i>Circus aeruginosus</i>	Harrier, Western Marsh		PG Schedule 2 Section 15(1)(a)			1	1	3
<i>Aviceda cuculoides</i>	Hawk, African Cuckoo		PG Schedule 2 Section 15(1)(a)	LC	LC	1		4
<i>Polyboroides typus</i>	Hawk, African Harrier-		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	2
<i>Macheiramphus alcinus</i>	Hawk, Bat		PG Schedule 2 Section 15(1)(a)	LC	EN			
<i>Prionops scopifrons</i>	Helmet-shrike, Chestnut-fronted		PG Schedule 2 Section 15(1)(a)					
<i>Prionops retzii</i>	Helmet-shrike, Retz's		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Prionops plumatus</i>	Helmet-shrike, White-crested		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Egretta ardesiaca</i>	Heron, Black		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	3
<i>Nycticorax nycticorax</i>	Heron, Black-crowned Night		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	3
<i>Ardea melanocephala</i>	Heron, Black-headed		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	2
<i>Ardea goliath</i>	Heron, Goliath		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	4
<i>Butorides striata</i>	Heron, Green-backed		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	3
<i>Ardea cinerea</i>	Heron, Grey		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	2
<i>Egretta caerulea</i>	Heron, Little Blue		PG Schedule 2 Section 15(1)(a)					
<i>Ardea purpurea</i>	Heron, Purple		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	3
<i>Ardeola rufiventris</i>	Heron, Rufous-bellied		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Ardeola ralloides</i>	Heron, Squacco		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	2

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<i>Gorsachius leuconotus</i>	Heron, White-backed Night		PG Schedule 2 Section 15(1)(a)	LC	VU			
<i>Falco cuvierii</i>	Hobby, African		PG Schedule 2 Section 15(1)(a)					
<i>Falco subbuteo</i>	Hobby, Eurasian		PG Schedule 2 Section 15(1)(a)	LC	LC	1		4
<i>Prodotiscus regulus</i>	Honeybird, Brown-backed		PG Schedule 2 Section 15(1)(a)	LC	LC	1		4
<i>Indicator indicator</i>	Honeyguide, Greater		PG Schedule 2 Section 15(1)(a)	LC	LC	1		4
<i>Indicator minor</i>	Honeyguide, Lesser		PG Schedule 2 Section 15(1)(a)	LC	LC	1		4
<i>Indicator variegatus</i>	Honeyguide, Scaly-throated		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Upupa africana</i>	Hoopoe, African		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	2
<i>Tockus nasutus</i>	Hornbill, African Grey		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Tockus alboterminatus</i>	Hornbill, Crowned		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Bucorvus leadbeateri</i>	Hornbill, Southern Ground-	EN	PG Schedule 2 Section 15(1)(a)	VU	EN			
<i>Tockus erythrorhynchus</i>	Hornbill, Southern Red-billed		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Tockus leucomelas</i>	Hornbill, Southern Yellow-billed		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Bycanistes bucinator</i>	Hornbill, Trumpeter		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Hylia australis</i>	Hylia, Southern		PG Schedule 2 Section 15(1)(a)					
<i>Threskiornis aethiopicus</i>	Ibis, African Sacred		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	2
<i>Plegadis falcinellus</i>	Ibis, Glossy		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	2
<i>Bostrychia hagedash</i>	Ibis, Hadedash		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	1
<i>Geronticus calvus</i>	Ibis, Southern Bald	VU	PG Schedule 2 Section 15(1)(a)	VU	VU			
<i>Vidua funerea</i>	Indigobird, Dusky		PG Schedule 2 Section 15(1)(a)	LC	LC	1		3
<i>Vidua purpurascens</i>	Indigobird, Purple		PG Schedule 2 Section 15(1)(a)	LC	LC	1		4
<i>Vidua chalybeata</i>	Indigobird, Village		PG Schedule 2 Section 15(1)(a)	LC	LC	1		3
<i>Actophilornis africanus</i>	Jacana, African		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	4
<i>Microparra capensis</i>	Jacana, Lesser		PG Schedule 2 Section 15(1)(a)	LC	VU			
<i>Stercorarius longicaudus</i>	Jaeger, Long-tailed		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Stercorarius parasiticus</i>	Jaeger, Parasitic		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Falco dickinsoni</i>	Kestrel, Dickinson's		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Falco rupicoloides</i>	Kestrel, Greater		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	3
<i>Falco naumanni</i>	Kestrel, Lesser		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	2
<i>Falco rupicolus</i>	Kestrel, Rock		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	4
<i>Ispidina picta</i>	Kingfisher, African Pygmy		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Halcyon albiventris</i>	Kingfisher, Brown-hooded		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	2
<i>Megaceryle maximus</i>	Kingfisher, Giant		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	4
<i>Halcyon leucocephala</i>	Kingfisher, Grey-headed		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Alcedo semitorquata</i>	Kingfisher, Half-collared		PG Schedule 2 Section 15(1)(a)	LC	NT	1		4

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<i>Alcedo cristata</i>	Kingfisher, Malachite		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	4
<i>Halcyon senegaloides</i>	Kingfisher, Mangrove		PG Schedule 2 Section 15(1)(a)	LC	EN			
<i>Ceryle rudis</i>	Kingfisher, Pied		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	3
<i>Halcyon chelicuti</i>	Kingfisher, Striped		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Halcyon senegalensis</i>	Kingfisher, Woodland		PG Schedule 2 Section 15(1)(a)	LC	LC	1		4
<i>Milvus migrans</i>	Kite, Black		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	4
<i>Elanus caeruleus</i>	Kite, Black-shouldered		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	2
<i>Milvus aegyptius</i>	Kite, Yellow-billed		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	3
<i>Rissa tridactyla</i>	Kittiwake, Black-legged		PG Schedule 2 Section 15(1)(a)					
<i>Calidris tenuirostris</i>	Knot, Great		PG Schedule 2 Section 15(1)(a)	EN	NA			
<i>Calidris canutus</i>	Knot, Red		PG Schedule 2 Section 15(1)(a)	NT	LC			
<i>Eupodotis caerulescens</i>	Korhaan, Blue		PG Schedule 2 Section 15(1)(a)	NT	LC	1	1	2
<i>Eupodotis vigorsii</i>	Korhaan, Karoo		PG Schedule 2 Section 15(1)(a)	LC	NT			
<i>Afrotis afraoides</i>	Korhaan, Northern Black		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	2
<i>Lophotis ruficrista</i>	Korhaan, Red-crested		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Afrotis afra</i>	Korhaan, Southern Black		PG Schedule 2 Section 15(1)(a)	VU	VU			
<i>Eupodotis senegalensis</i>	Korhaan, White-bellied		PG Schedule 2 Section 15(1)(a)	LC	VU	1		3
<i>Vanellus senegallus</i>	Lapwing, African Wattled		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	2
<i>Vanellus melanopterus</i>	Lapwing, Black-winged		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Vanellus armatus</i>	Lapwing, Blacksmith		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	2
<i>Vanellus coronatus</i>	Lapwing, Crowned		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	1
<i>Vanellus crassirostris</i>	Lapwing, Long-toed		PG Schedule 2 Section 15(1)(a)					
<i>Vanellus lugubris</i>	Lapwing, Senegal		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Vanellus albiceps</i>	Lapwing, White-crowned		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Certhilauda brevirostris</i>	Lark, Agulhas Long-billed		PG Schedule 2 Section 15(1)(a)	NR	NT		1	
<i>Calendulauda barlowi</i>	Lark, Barlow's		PG Schedule 2 Section 15(1)(a)	LC	NT			
<i>Eremopterix australis</i>	Lark, Black-eared Sparrow-		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Spizocorys fringillaris</i>	Lark, Botha's		PG Schedule 2 Section 15(1)(a)	EN	EN			
<i>Mirafrapa apiata</i>	Lark, Cape Clapper		PG Schedule 2 Section 15(1)(a)	LC	LC		1	
<i>Certhilauda curvirostris</i>	Lark, Cape Long-billed		PG Schedule 2 Section 15(1)(a)	LC	LC		1	
<i>Eremopterix leucotis</i>	Lark, Chestnut-backed Sparrow-		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	2
<i>Pinarocorys nigricans</i>	Lark, Dusky		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Mirafrapa fasciolata</i>	Lark, Eastern Clapper		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	2
<i>Certhilauda semitorquata</i>	Lark, Eastern Long-billed		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	2
<i>Calendulauda africanoides</i>	Lark, Fawn-coloured		PG Schedule 2 Section 15(1)(a)	LC	LC			

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<i>Mirafra rufocinnamomea</i>	Lark, Flappet		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Eremopterix verticalis</i>	Lark, Grey-backed Sparrow		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Calendulauda albescens</i>	Lark, Karoo		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Certhilauda subcoronata</i>	Lark, Karoo Long-billed		PG Schedule 2 Section 15(1)(a)	LC	LC		1	
<i>Galerida magnirostris</i>	Lark, Large-billed		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Mirafra cheniana</i>	Lark, Melodious		PG Schedule 2 Section 15(1)(a)	NT	LC	1		3
<i>Mirafra passerina</i>	Lark, Monotonous		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Spizocorys conirostris</i>	Lark, Pink-billed		PG Schedule 2 Section 15(1)(a)	LC	LC	1		3
<i>Calendulauda burra</i>	Lark, Red		PG Schedule 2 Section 15(1)(a)	VU	VU			
<i>Calandrella cinerea</i>	Lark, Red-capped		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	2
<i>Heteromirafra ruddi</i>	Lark, Rudd's		PG Schedule 2 Section 15(1)(a)	VU	EN			
<i>Mirafra africana</i>	Lark, Rufous-naped		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	1
<i>Calendulauda sabota</i>	Lark, Sabota		PG Schedule 2 Section 15(1)(a)	LC	LC	1		4
<i>Spizocorys sclateri</i>	Lark, Sclater's		PG Schedule 2 Section 15(1)(a)	NT	NT			
<i>Certhilauda chuana</i>	Lark, Short-clawed		PG Schedule 2 Section 15(1)(a)	LC	NT			
<i>Chersomanes albofasciata</i>	Lark, Spike-heeled		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	3
<i>Spizocorys starki</i>	Lark, Stark's		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Macronyx capensis</i>	Longclaw, Cape		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	2
<i>Macronyx ameliae</i>	Longclaw, Rosy-throated		PG Schedule 2 Section 15(1)(a)	LC	NT			
<i>Macronyx croceus</i>	Longclaw, Yellow-throated		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Agapornis roseicollis</i>	Lovebird, Rosy-faced		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Ceuthmochares australis</i>	Malkoha, Green		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Anas platyrhynchos</i>	Mallard		PG Schedule 2 Section 15(1)(a)			1		4
<i>Spermestes cucullatus</i>	Mannikin, Bronze		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	2
<i>Lonchura fringilloides</i>	Mannikin, Magpie		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Lonchura nigriceps</i>	Mannikin, Red-backed		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Riparia cincta</i>	Martin, Banded		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	2
<i>Riparia paludicola</i>	Martin, Brown-throated		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	2
<i>Delichon urbicum</i>	Martin, Common House		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	3
<i>Hirundo fuligula</i>	Martin, Rock		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	4
<i>Riparia riparia</i>	Martin, Sand		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	3
<i>Gallinula chloropus</i>	Moorhen, Common		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	3
<i>Gallinula angulata</i>	Moorhen, Lesser		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Urocolius indicus</i>	Mousebird, Red-faced		WA Schedule 5 Section 43	LC	LC	1	1	1
<i>Colius striatus</i>	Mousebird, Speckled		WA Schedule 5 Section 43	LC	LC	1	1	2

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<i>Colius colius</i>	Mousebird, White-backed		WA Schedule 5 Section 43	LC	LC	1		4
<i>Acridotheres tristis</i>	Myna, Common		PG Schedule 2 Section 15(1)(a)			1	1	1
<i>Cisticola fulvicapilla</i>	Neddicky		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	1
<i>Nicator gularis</i>	Nicator, Eastern		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Luscinia luscinia</i>	Nightingale, Thrush		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Caprimulgus europaeus</i>	Nightjar, European		PG Schedule 2 Section 15(1)(a)	LC	LC	1		3
<i>Caprimulgus pectoralis</i>	Nightjar, Fiery-necked		PG Schedule 2 Section 15(1)(a)	LC	LC	1		4
<i>Caprimulgus tristigma</i>	Nightjar, Freckled		PG Schedule 2 Section 15(1)(a)	LC	LC	1		4
<i>Caprimulgus vexillarius</i>	Nightjar, Pennant-winged		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Caprimulgus rufigena</i>	Nightjar, Rufous-cheeked		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Caprimulgus fossii</i>	Nightjar, Square-tailed		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Caprimulgus natalensis</i>	Nightjar, Swamp		PG Schedule 2 Section 15(1)(a)	LC	VU			
<i>Anous stolidus</i>	Noddy, Brown		PG Schedule 2 Section 15(1)(a)					
<i>Anous tenuirostris</i>	Noddy, Lesser		PG Schedule 2 Section 15(1)(a)					
<i>Anastomus lamelligerus</i>	Openbill, African		PG Schedule 2 Section 15(1)(a)	LC	LC		1	
<i>Oriolus auratus</i>	Oriole, African Golden		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Oriolus larvatus</i>	Oriole, Black-headed		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Oriolus oriolus</i>	Oriole, Eurasian Golden		PG Schedule 2 Section 15(1)(a)	LC	LC	1		4
<i>Pandion haliaetus</i>	Osprey, Western		PG Schedule 2 Section 15(1)(a)	LC	LC	1		4
<i>Struthio camelus</i>	Ostrich, Common			LC	LC	1	1	5
<i>Tyto capensis</i>	Owl, African Grass		PG Schedule 2 Section 15(1)(a)	LC	VU	1	1	?
<i>Otus senegalensis</i>	Owl, African Scops		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Strix woodfordii</i>	Owl, African Wood		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Bubo capensis</i>	Owl, Cape Eagle-		PG Schedule 2 Section 15(1)(a)	LC	LC	1		4
<i>Asio capensis</i>	Owl, Marsh		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	2
<i>Scotopelia peli</i>	Owl, Pel's Fishing		PG Schedule 2 Section 15(1)(a)	LC	EN			
<i>Ptilopsis granti</i>	Owl, Southern White-faced		PG Schedule 2 Section 15(1)(a)	LC	LC	1		4
<i>Bubo africanus</i>	Owl, Spotted Eagle-		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	2
<i>Bubo lacteus</i>	Owl, Verreaux's Eagle-		PG Schedule 2 Section 15(1)(a)	LC	LC	1		4
<i>Tyto alba</i>	Owl, Western Barn		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	2
<i>Glaucidium capense</i>	Owlet, African Barred		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Glaucidium perlatus</i>	Owlet, Pearl-spotted		PG Schedule 2 Section 15(1)(a)	LC	LC	1		4
<i>Buphagus erythrorhynchus</i>	Oxpecker, Red-billed		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Buphagus africanus</i>	Oxpecker, Yellow-billed		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Haematopus moquini</i>	Oystercatcher, African Black		PG Schedule 2 Section 15(1)(a)	NT	NA			

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<i>Haematopus ostralegus</i>	Oystercatcher, Eurasian		PG Schedule 2 Section 15(1)(a)	NT	NA			
<i>Rostratula benghalensis</i>	Painted-snipe, Greater		PG Schedule 2 Section 15(1)(a)	LC	NT	1		4
<i>Psittacula krameri</i>	Parakeet, Rose-ringed		PG Schedule 2 Section 15(1)(a)					
<i>Poicephalus cryptoxanthus</i>	Parrot, Brown-headed		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Poicephalus robustus</i>	Parrot, Cape	EN	PG Schedule 2 Section 15(1)(a)	NR	EN			
<i>Poicephalus fuscicollis</i>	Parrot, Grey-headed	PS	PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Poicephalus meyeri</i>	Parrot, Meyer's		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Alectoris chukar</i>	Partridge, Chukar		PG Schedule 2 Section 15(1)(a)					
<i>Pavo cristatus</i>	Peafowl, Indian		PG Schedule 2 Section 15(1)(a)					
<i>Pelecanus onocrotalus</i>	Pelican, Great White		PG Schedule 2 Section 15(1)(a)	LC	VU			
<i>Pelecanus rufescens</i>	Pelican, Pink-backed		PG Schedule 2 Section 15(1)(a)	LC	VU		1	
<i>Anthoscopus minutus</i>	Penduline-tit, Cape		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Anthoscopus caroli</i>	Penduline-tit, Grey		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Spheniscus demersus</i>	Penguin, African		PG Schedule 2 Section 15(1)(a)	EN	EN			
<i>Aptenodytes patagonicus</i>	Penguin, King		PG Schedule 2 Section 15(1)(a)		NT			
<i>Eudyptes chrysolophus</i>	Penguin, Macaroni		PG Schedule 2 Section 15(1)(a)	VU	VU			
<i>Eudyptes moseleyi</i>	Penguin, Northern Rockhopper		PG Schedule 2 Section 15(1)(a)	EN	NA			
<i>Eudyptes chrysocome</i>	Penguin, Southern Rockhopper		PG Schedule 2 Section 15(1)(a)	VU	EN			
<i>Thalassoica antarctica</i>	Petrel, Antarctic		PG Schedule 2 Section 15(1)(a)					
<i>Pterodroma incerta</i>	Petrel, Atlantic		PG Schedule 2 Section 15(1)(a)	EN	NA			
<i>Pterodroma baraui</i>	Petrel, Barau's		PG Schedule 2 Section 15(1)(a)	EN	NA			
<i>Fregetta tropica</i>	Petrel, Black-bellied Storm		PG Schedule 2 Section 15(1)(a)		NT			
<i>Halobaena caerulea</i>	Petrel, Blue		PG Schedule 2 Section 15(1)(a)		NT			
<i>Hydrobates pelagicus</i>	Petrel, European Storm		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Pterodroma macroptera</i>	Petrel, Great-winged		PG Schedule 2 Section 15(1)(a)	LC	NT			
<i>Procellaria cinerea</i>	Petrel, Grey		PG Schedule 2 Section 15(1)(a)	NT	VU			
<i>Garrodia nereis</i>	Petrel, Grey-backed Storm		PG Schedule 2 Section 15(1)(a)		NT			
<i>Lugensa brevirostris</i>	Petrel, Kerguelen		PG Schedule 2 Section 15(1)(a)		NT			
<i>Oceanodroma leucorhoa</i>	Petrel, Leach's Storm		PG Schedule 2 Section 15(1)(a)	LC	CR			
<i>Oceanodroma matsudairae</i>	Petrel, Matsudaira's Storm		PG Schedule 2 Section 15(1)(a)	VU	NA			
<i>Macronectes halli</i>	Petrel, Northern Giant		PG Schedule 2 Section 15(1)(a)	LC	NT			
<i>Daption capense</i>	Petrel, Pintado		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Pterodroma mollis</i>	Petrel, Soft-plumaged		PG Schedule 2 Section 15(1)(a)	LC	NT			
<i>Macronectes giganteus</i>	Petrel, Southern Giant		PG Schedule 2 Section 15(1)(a)	LC	NT			
<i>Procellaria conspicillata</i>	Petrel, Spectacled		PG Schedule 2 Section 15(1)(a)	VU	VU			

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<i>Fregetta grallaria</i>	Petrel, White-bellied Storm		PG Schedule 2 Section 15(1)(a)					
<i>Procellaria aequinoctialis</i>	Petrel, White-chinned		PG Schedule 2 Section 15(1)(a)	VU	VU			
<i>Pelagodroma marina</i>	Petrel, White-faced Storm		PG Schedule 2 Section 15(1)(a)					
<i>Pterodroma lessonii</i>	Petrel, White-headed		PG Schedule 2 Section 15(1)(a)					
<i>Oceanites oceanicus</i>	Petrel, Wilson's Storm		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Petronia superciliaris</i>	Petronia, Yellow-throated		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Phalaropus fulicarius</i>	Phalarope, Red		PG Schedule 2 Section 15(1)(a)	LC	LC	1		4
<i>Phalaropus lobatus</i>	Phalarope, Red-necked		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Phalaropus tricolor</i>	Phalarope, Wilson's		PG Schedule 2 Section 15(1)(a)					
<i>Treron calvus</i>	Pigeon, African Green		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Columba arquatrix</i>	Pigeon, African Olive		PG Schedule 2 Section 15(1)(a)	LC	LC	1		3
<i>Columba delegorguei</i>	Pigeon, Eastern Bronze-naped		PG Schedule 2 Section 15(1)(a)	LC	EN			
<i>Columba guinea</i>	Pigeon, Speckled		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	2
<i>Anas acuta</i>	Pintail, Northern		PG Schedule 2 Section 15(1)(a)					
<i>Anthus cinnamomeus</i>	Pipit, African		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	2
<i>Anthus crenatus</i>	Pipit, African Rock		PG Schedule 2 Section 15(1)(a)	LC	NT	1		4
<i>Anthus vaalensis</i>	Pipit, Buffy		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	2
<i>Anthus caffer</i>	Pipit, Bushveld		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Tmetothylacus tenellus</i>	Pipit, Golden		PG Schedule 2 Section 15(1)(a)					
<i>Anthus similis</i>	Pipit, Long-billed		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	2
<i>Anthus hoeschi</i>	Pipit, Mountain		PG Schedule 2 Section 15(1)(a)	LC	NT			
<i>Anthus leucophrys</i>	Pipit, Plain-backed		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	2
<i>Anthus cervinus</i>	Pipit, Red-throated		PG Schedule 2 Section 15(1)(a)					
<i>Anthus brachyurus</i>	Pipit, Short-tailed		PG Schedule 2 Section 15(1)(a)	LC	VU			
<i>Anthus lineiventris</i>	Pipit, Striped		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	4
<i>Anthus trivialis</i>	Pipit, Tree		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Anthus chloris</i>	Pipit, Yellow-breasted		PG Schedule 2 Section 15(1)(a)	VU	VU			
<i>Pitta angolensis</i>	Pitta, African		PG Schedule 2 Section 15(1)(a)					
<i>Pluvialis dominica</i>	Plover, American Golden		PG Schedule 2 Section 15(1)(a)					
<i>Charadrius asiaticus</i>	Plover, Caspian		PG Schedule 2 Section 15(1)(a)	LC	LC	1		4
<i>Charadrius pallidus</i>	Plover, Chestnut-banded		PG Schedule 2 Section 15(1)(a)	NT	NT	1		4
<i>Charadrius hiaticula</i>	Plover, Common Ringed		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	4
<i>Dromas ardeola</i>	Plover, Crab-		PG Schedule 2 Section 15(1)(a)					
<i>Charadrius leschenaultii</i>	Plover, Greater Sand		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Pluvialis squatarola</i>	Plover, Grey		PG Schedule 2 Section 15(1)(a)	LC	LC			

SCIENTIFIC NAME	COMMON NAME	RSA LEGAL STATUS	GAUTENG LEGAL STATUS	GLOBAL RED LIST STATUS	REGIONAL RED LIST STATUS	RECORDS IN QDS	RECORDS IN PENTAD	LoO IN PORTION 15
<i>Charadrius pecuarius</i>	Plover, Kittlitz's		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	4
<i>Charadrius mongolus</i>	Plover, Lesser Sand		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Pluvialis fulva</i>	Plover, Pacific Golden		PG Schedule 2 Section 15(1)(a)			1		4
<i>Charadrius tricollaris</i>	Plover, Three-banded		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	4
<i>Charadrius marginatus</i>	Plover, White-fronted		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Netta erythrophthalma</i>	Pochard, Southern		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	4
<i>Glareola nordmanni</i>	Pratincole, Black-winged		PG Schedule 2 Section 15(1)(a)	NT	NT	1	1	4
<i>Glareola pratincola</i>	Pratincole, Collared		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Glareola nuchalis</i>	Pratincole, Rock		PG Schedule 2 Section 15(1)(a)					
<i>Prinia flavicans</i>	Prinia, Black-chested		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	1
<i>Prinia hypoxantha</i>	Prinia, Drakensberg		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Prinia maculosa</i>	Prinia, Karoo		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Prinia subflava</i>	Prinia, Tawny-flanked		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	1
<i>Pachyptila desolata</i>	Prion, Antarctic		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Pachyptila vittata</i>	Prion, Broad-billed		PG Schedule 2 Section 15(1)(a)					
<i>Pachyptila turtur</i>	Prion, Fairy		PG Schedule 2 Section 15(1)(a)		NT			
<i>Pachyptila salvini</i>	Prion, Salvin's		PG Schedule 2 Section 15(1)(a)		NT			
<i>Pachyptila belcheri</i>	Prion, Slender-billed		PG Schedule 2 Section 15(1)(a)					
<i>Dryoscopus cubla</i>	Puffback, Black-backed		PG Schedule 2 Section 15(1)(a)	LC	LC	1		2
<i>Pytilia melba</i>	Pytilia, Green-winged		PG Schedule 2 Section 15(1)(a)	LC	LC	1		4
<i>Pytilia afra</i>	Pytilia, Orange-winged		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Ortygospiza atricollis</i>	Quail-finch, African		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	2
<i>Excalfactoria adansonii</i>	Quail, Blue		PG Schedule 2 Section 15(1)(a)					
<i>Coturnix coturnix</i>	Quail, Common		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	2
<i>Coturnix delegorguei</i>	Quail, Harlequin		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	2
<i>Quelea quelea</i>	Quelea, Red-billed		WA Schedule 5 Section 43	LC	LC	1	1	1
<i>Quelea erythrops</i>	Quelea, Red-headed		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Rallus caerulescens</i>	Rail, African		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	2
<i>Corvus albicollis</i>	Raven, White-necked		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Tringa totanus</i>	Redshank, Common		PG Schedule 2 Section 15(1)(a)			1		4
<i>Tringa erythropus</i>	Redshank, Spotted		PG Schedule 2 Section 15(1)(a)			1		4
<i>Phoenicurus phoenicurus</i>	Redstart, Common		PG Schedule 2 Section 15(1)(a)					
<i>Cossypha caffra</i>	Robin-chat, Cape		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	2
<i>Cossypha dichroa</i>	Robin-chat, Chorister		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Cossypha natalensis</i>	Robin-chat, Red-capped		PG Schedule 2 Section 15(1)(a)	LC	LC			

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<i>Cossypha heuglini</i>	Robin-chat, White-browed		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Cossypha humeralis</i>	Robin-chat, White-throated		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Erythropygia quadrivirgata</i>	Robin, Bearded Scrub		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Erythropygia signata</i>	Robin, Brown Scrub		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Cercotrichas paena</i>	Robin, Kalahari Scrub		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Erythropygia coryphoeus</i>	Robin, Karoo Scrub		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Cercotrichas leucophrys</i>	Robin, White-browed Scrub		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Pogonocichla stellata</i>	Robin, White-starred		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Chaetops frenatus</i>	Rockjumper, Cape		PG Schedule 2 Section 15(1)(a)	LC	NT			
<i>Chaetops aurantius</i>	Rockjumper, Drakensberg		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Eurystomus glaucurus</i>	Roller, Broad-billed		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Coracias garrulus</i>	Roller, European		PG Schedule 2 Section 15(1)(a)	LC	NT	1	1	4
<i>Coracias caudatus</i>	Roller, Lilac-breasted		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Coracias naevius</i>	Roller, Purple		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Coracias spatulatus</i>	Roller, Racket-tailed		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Philomachus pugnax</i>	Ruff		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	4
<i>Calidris alba</i>	Sanderling		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Pterocles burchelli</i>	Sandgrouse, Burchell's		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Pterocles bicinctus</i>	Sandgrouse, Double-banded		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Pterocles namaqua</i>	Sandgrouse, Namaqua		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Pterocles gutturalis</i>	Sandgrouse, Yellow-throated		PG Schedule 2 Section 15(1)(a)	LC	NT			
<i>Calidris bairdii</i>	Sandpiper, Baird's		PG Schedule 2 Section 15(1)(a)			1		4
<i>Limicola falcinellus</i>	Sandpiper, Broad-billed		PG Schedule 2 Section 15(1)(a)					
<i>Tryngites subruficollis</i>	Sandpiper, Buff-breasted		PG Schedule 2 Section 15(1)(a)	NT	NA	1		4
<i>Actitis hypoleucos</i>	Sandpiper, Common		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	4
<i>Calidris ferruginea</i>	Sandpiper, Curlew		PG Schedule 2 Section 15(1)(a)	NT	LC	1	1	4
<i>Tringa ochropus</i>	Sandpiper, Green		PG Schedule 2 Section 15(1)(a)			1		4
<i>Tringa stagnatilis</i>	Sandpiper, Marsh		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	4
<i>Calidris melanotos</i>	Sandpiper, Pectoral		PG Schedule 2 Section 15(1)(a)			1		4
<i>Xenus cinereus</i>	Sandpiper, Terek		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Calidris fuscicollis</i>	Sandpiper, White-rumped		PG Schedule 2 Section 15(1)(a)			1		4
<i>Tringa glareola</i>	Sandpiper, Wood		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	4
<i>Psilidoprocne pristoptera</i>	Saw-wing, Black		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Rhinopomastus cyanomelas</i>	Scimitarbill, Common		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Sagittarius serpentarius</i>	Secretarybird		PG Schedule 2 Section 15(1)(a)	VU	VU	1	1	4

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<i>Crithagra leucoptera</i>	Seedeater (Canary), Protea		PG Schedule 2 Section 15(1)(a)	LC	NT			
<i>Crithagra gularis</i>	Seedeater, Streaky-headed		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	3
<i>Calonectris borealis</i>	Shearwater, Cory's		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Puffinus carneipes</i>	Shearwater, Flesh-footed		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Puffinus gravis</i>	Shearwater, Great		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Puffinus assimilis</i>	Shearwater, Little		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Puffinus puffinus</i>	Shearwater, Manx		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Calonectris diomedea</i>	Shearwater, Scopoli's		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Puffinus griseus</i>	Shearwater, Sooty		PG Schedule 2 Section 15(1)(a)	NT	NT			
<i>Calonectris leucomelas</i>	Shearwater, Streaked		PG Schedule 2 Section 15(1)(a)					
<i>Puffinus bailloni</i>	Shearwater, Tropical		PG Schedule 2 Section 15(1)(a)					
<i>Puffinus pacificus</i>	Shearwater, Wedge-tailed		PG Schedule 2 Section 15(1)(a)					
<i>Chionis albus</i>	Sheathbill, Greater		PG Schedule 2 Section 15(1)(a)					
<i>Tadorna cana</i>	Shelduck, South African		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	4
<i>Accipiter badius</i>	Shikra		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Anas smithii</i>	Shoveler, Cape		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	4
<i>Laniarius atrococcineus</i>	Shrike, Crimson-breasted		PG Schedule 2 Section 15(1)(a)	LC	LC	1		4
<i>Lanius minor</i>	Shrike, Lesser Grey		PG Schedule 2 Section 15(1)(a)	LC	LC	1		4
<i>Corvinella melanoleuca</i>	Shrike, Magpie		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Lanius collurio</i>	Shrike, Red-backed		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	4
<i>Eurocephalus anguitimens</i>	Shrike, Southern White-crowned		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Crithagra totta</i>	Siskin, Cape		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Crithagra symonsi</i>	Siskin, Drakensberg		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Rynchops flavirostris</i>	Skimmer, African		PG Schedule 2 Section 15(1)(a)	NT	NA			
<i>Rynchops niger</i>	Skimmer, Black		PG Schedule 2 Section 15(1)(a)					
<i>Stercorarius pomarinus</i>	Skua, Pomarine		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Stercorarius maccormicki</i>	Skua, South Polar		PG Schedule 2 Section 15(1)(a)					
<i>Stercorarius antarcticus</i>	Skua, Subantarctic		PG Schedule 2 Section 15(1)(a)	LC	EN			
<i>Gallinago nigripennis</i>	Snipe, African		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	2
<i>Gallinago media</i>	Snipe, Great		PG Schedule 2 Section 15(1)(a)	NT	NA	1		4
<i>Plocepasser mahali</i>	Sparrow-weaver, White-browed		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	3
<i>Passer melanurus</i>	Sparrow, Cape		WA Schedule 5 Section 43	LC	LC	1	1	2
<i>Passer motitensis</i>	Sparrow, Great		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Passer domesticus</i>	Sparrow, House		PG Schedule 2 Section 15(1)(a)			1	1	2
<i>Passer diffusus</i>	Sparrow, Southern Grey-headed		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	2

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<i>Accipiter melanoleucus</i>	Sparrowhawk, Black		PG Schedule 2 Section 15(1)(a)	LC	LC	1		3
<i>Accipiter minullus</i>	Sparrowhawk, Little		PG Schedule 2 Section 15(1)(a)	LC	LC	1		3
<i>Accipiter ovampensis</i>	Sparrowhawk, Ovambo		PG Schedule 2 Section 15(1)(a)	LC	LC	1		3
<i>Accipiter rufiventris</i>	Sparrowhawk, Rufous-breasted		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Neafrapus boehmi</i>	Spinetail, Böhm's		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Telacanthura ussheri</i>	Spinetail, Mottled		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Platalea alba</i>	Spoonbill, African		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	4
<i>Pternistis capensis</i>	Spurfowl, Cape		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Pternistis natalensis</i>	Spurfowl, Natal		OG Schedule 3 Section 15(1)(b)	LC	LC			
<i>Pternistis adspersus</i>	Spurfowl, Red-billed		OG Schedule 3 Section 15(1)(b)	LC	LC			
<i>Pternistis afer</i>	Spurfowl, Red-necked		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Pternistis swainsonii</i>	Spurfowl, Swainson's		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	2
<i>Notopholia corrusca</i>	Starling, Black-bellied		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Lamprotornis australis</i>	Starling, Burchell's		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Lamprotornis nitens</i>	Starling, Cape Glossy		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	2
<i>Sturnus vulgaris</i>	Starling, Common		PG Schedule 2 Section 15(1)(a)					
<i>Lamprotornis chalybaeus</i>	Starling, Greater Blue-eared		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Lamprotornis mevesii</i>	Starling, Meves's		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Lamprotornis elisabeth</i>	Starling, Miombo Blue-eared		PG Schedule 2 Section 15(1)(a)					
<i>Onychognathus nabouroup</i>	Starling, Pale-winged		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Spreo bicolor</i>	Starling, Pied		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	2
<i>Onychognathus morio</i>	Starling, Red-winged		WA Schedule 5 Section 43	LC	LC	1	1	3
<i>Cinnyricinclus leucogaster</i>	Starling, Violet-backed		PG Schedule 2 Section 15(1)(a)	LC	LC	1		3
<i>Creatophora cinerea</i>	Starling, Wattled		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	3
<i>Himantopus himantopus</i>	Stilt, Black-winged		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	4
<i>Calidris minuta</i>	Stint, Little		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	4
<i>Calidris subminuta</i>	Stint, Long-toed		PG Schedule 2 Section 15(1)(a)					
<i>Calidris ruficollis</i>	Stint, Red-necked		PG Schedule 2 Section 15(1)(a)					
<i>Calidris temminckii</i>	Stint, Temminck's		PG Schedule 2 Section 15(1)(a)					
<i>Saxicola torquatus</i>	Stonechat, African		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	1
<i>Ciconia abdimii</i>	Stork, Abdim's		PG Schedule 2 Section 15(1)(a)	LC	NT	1		3
<i>Ciconia nigra</i>	Stork, Black		PG Schedule 2 Section 15(1)(a)	LC	VU	1		4
<i>Leptoptilos crumeniferus</i>	Stork, Marabou		PG Schedule 2 Section 15(1)(a)	LC	NT	1		4
<i>Ephippiorhynchus senegalensis</i>	Stork, Saddle-billed		PG Schedule 2 Section 15(1)(a)	LC	EN			
<i>Ciconia ciconia</i>	Stork, White		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	3

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<i>Ciconia episcopus</i>	Stork, Woolly-necked		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Mycteria ibis</i>	Stork, Yellow-billed		PG Schedule 2 Section 15(1)(a)	LC	EN	1	1	4
<i>Promerops cafer</i>	Sugarbird, Cape		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Promerops gurneyi</i>	Sugarbird, Gurney's		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Chalcomitra amethystina</i>	Sunbird, Amethyst		PG Schedule 2 Section 15(1)(a)	LC	LC	1		3
<i>Anthodiaeta collaris</i>	Sunbird, Collared		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Cinnyris fuscus</i>	Sunbird, Dusky		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Cinnyris afer</i>	Sunbird, Greater Double-collared		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Cyanomitra veroxii</i>	Sunbird, Grey		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Nectarinia famosa</i>	Sunbird, Malachite		PG Schedule 2 Section 15(1)(a)	LC	LC	1		4
<i>Cinnyris mariquensis</i>	Sunbird, Marico		PG Schedule 2 Section 15(1)(a)	LC	LC	1		3
<i>Cinnyris neergaardi</i>	Sunbird, Neergaard's		PG Schedule 2 Section 15(1)(a)	NT	VU			
<i>Cyanomitra olivacea</i>	Sunbird, Olive		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Anthobaphes violacea</i>	Sunbird, Orange-breasted		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Anthreptes reichenowi</i>	Sunbird, Plain-backed		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Cinnyris bifasciatus</i>	Sunbird, Purple-banded		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Chalcomitra senegalensis</i>	Sunbird, Scarlet-chested		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Cinnyris chalybeus</i>	Sunbird, Southern Double-collared		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Cinnyris venustus</i>	Sunbird, Variable		PG Schedule 2 Section 15(1)(a)					
<i>Cinnyris talatala</i>	Sunbird, White-bellied		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	2
<i>Hirundo rustica</i>	Swallow, Barn		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	1
<i>Hirundo atrocaerulea</i>	Swallow, Blue		PG Schedule 2 Section 15(1)(a)	VU	CR			
<i>Hirundo cucullata</i>	Swallow, Greater Striped		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	1
<i>Pseudhirundo griseopyga</i>	Swallow, Grey-rumped		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Hirundo abyssinica</i>	Swallow, Lesser Striped		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	4
<i>Cecropis senegalensis</i>	Swallow, Mosque		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Hirundo dimidiata</i>	Swallow, Pearl-breasted		PG Schedule 2 Section 15(1)(a)	LC	LC	1		3
<i>Hirundo semirufa</i>	Swallow, Red-breasted		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	4
<i>Hirundo spilodera</i>	Swallow, South African Cliff		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	2
<i>Hirundo albigularis</i>	Swallow, White-throated		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	2
<i>Hirundo smithii</i>	Swallow, Wire-tailed		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Porphyrio madagascariensis</i>	Swamphen, African (Purple)		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	3
<i>Cygnus olor</i>	Swan, Mute		PG Schedule 2 Section 15(1)(a)					
<i>Apus barbatus</i>	Swift, African Black		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	3
<i>Cypsiurus parvus</i>	Swift, African Palm		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	4

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<i>Tachymarptis melba</i>	Swift, Alpine		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	4
<i>Apus bradfieldi</i>	Swift, Bradfield's		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Apus apus</i>	Swift, Common		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	1
<i>Apus horus</i>	Swift, Horus		PG Schedule 2 Section 15(1)(a)	LC	LC	1		3
<i>Apus affinis</i>	Swift, Little		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	2
<i>Apus caffer</i>	Swift, White-rumped		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	2
<i>Tchagra senegalus</i>	Tchagra, Black-crowned		PG Schedule 2 Section 15(1)(a)	LC	LC	1		4
<i>Tchagra australis</i>	Tchagra, Brown-crowned		PG Schedule 2 Section 15(1)(a)	LC	LC	1		4
<i>Tchagra tchagra</i>	Tchagra, Southern		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Anas capensis</i>	Teal, Cape		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	4
<i>Anas hottentota</i>	Teal, Hottentot		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	4
<i>Anas erythrorhyncha</i>	Teal, Red-billed		OG Schedule 3 Section 15(1)(b)	LC	LC	1	1	3
<i>Sterna vittata</i>	Tern, Antarctic		PG Schedule 2 Section 15(1)(a)	LC	EN			
<i>Sterna paradisaea</i>	Tern, Arctic		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Chlidonias niger</i>	Tern, Black		PG Schedule 2 Section 15(1)(a)					
<i>Sterna sumatrana</i>	Tern, Black-naped		PG Schedule 2 Section 15(1)(a)					
<i>Onychoprion anaethetus</i>	Tern, Bridled		PG Schedule 2 Section 15(1)(a)					
<i>Sterna caspia</i>	Tern, Caspian		PG Schedule 2 Section 15(1)(a)	LC	VU	1		4
<i>Sterna hirundo</i>	Tern, Common		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Sterna balaenarum</i>	Tern, Damara		PG Schedule 2 Section 15(1)(a)	NT	CR			
<i>Sterna elegans</i>	Tern, Elegant		PG Schedule 2 Section 15(1)(a)					
<i>Gelochelidon nilotica</i>	Tern, Gull-billed		PG Schedule 2 Section 15(1)(a)					
<i>Thalasseus bengalensis</i>	Tern, Lesser Crested		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Sterna albifrons</i>	Tern, Little		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Sterna dougallii</i>	Tern, Roseate		PG Schedule 2 Section 15(1)(a)	LC	EN			
<i>Thalasseus sandvicensis</i>	Tern, Sandwich		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Onychoprion fuscatus</i>	Tern, Sooty		PG Schedule 2 Section 15(1)(a)					
<i>Thalasseus bergii</i>	Tern, Swift		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Chlidonias hybrida</i>	Tern, Whiskered		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	4
<i>Sterna repressa</i>	Tern, White-cheeked		PG Schedule 2 Section 15(1)(a)					
<i>Chlidonias leucopterus</i>	Tern, White-winged		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	4
<i>Burhinus capensis</i>	Thick-knee, Spotted		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	2
<i>Burhinus vermiculatus</i>	Thick-knee, Water		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Monticola rupestris</i>	Thrush, Cape Rock		PG Schedule 2 Section 15(1)(a)	LC	LC	1		4
<i>Cichladusa arquata</i>	Thrush, Collared Palm		PG Schedule 2 Section 15(1)(a)	LC	LC			

SCIENTIFIC NAME	COMMON NAME	RSA LEGAL STATUS	GAUTENG LEGAL STATUS	GLOBAL RED LIST STATUS	REGIONAL RED LIST STATUS	RECORDS IN QDS	RECORDS IN PENTAD	LoO IN PORTION 15
<i>Psophocichla litsipsirupa</i>	Thrush, Groundscraper		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Turdus smithi</i>	Thrush, Karoo		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	2
<i>Turdus libonyanus</i>	Thrush, Kurrichane		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Turdus olivaceus</i>	Thrush, Olive		PG Schedule 2 Section 15(1)(a)	LC	LC		1	
<i>Geokichla gurneyi</i>	Thrush, Orange Ground		PG Schedule 2 Section 15(1)(a)	LC	NT			
<i>Monticola explorator</i>	Thrush, Sentinel Rock		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	4
<i>Monticola brevipes</i>	Thrush, Short-toed Rock		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Geokichla guttata</i>	Thrush, Spotted Ground		PG Schedule 2 Section 15(1)(a)	EN	EN			
<i>Pogoniulus pusillus</i>	Tinkerbird, Red-fronted		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Pogoniulus chrysoconus</i>	Tinkerbird, Yellow-fronted		PG Schedule 2 Section 15(1)(a)	LC	LC	1		4
<i>Pogoniulus bilineatus</i>	Tinkerbird, Yellow-rumped		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Parisoma subcaeruleum</i>	Tit-Babbler, Chestnut-vented		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	4
<i>Sylvia layardi</i>	Tit-Babbler, Layard's		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Parus cinerascens</i>	Tit, Ashy		PG Schedule 2 Section 15(1)(a)	LC	LC	1		4
<i>Parus afer</i>	Tit, Grey		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Parus niger</i>	Tit, Southern Black		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Apaloderma narina</i>	Trogon, Narina		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Phaethon aethereus</i>	Tropicbird, Red-billed		PG Schedule 2 Section 15(1)(a)					
<i>Phaethon rubricauda</i>	Tropicbird, Red-tailed		PG Schedule 2 Section 15(1)(a)					
<i>Phaethon lepturus</i>	Tropicbird, White-tailed		PG Schedule 2 Section 15(1)(a)					
<i>Tauraco corythaix</i>	Turaco, Knysna		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Tauraco livingstonii</i>	Turaco, Livingstone's		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Tauraco porphyreolophus</i>	Turaco, Purple-crested		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Arenaria interpres</i>	Turnstone, Ruddy		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Mandingoa nitidula</i>	Twinspot, Green		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Hypargos margaritatus</i>	Twinspot, Pink-throated		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Hypargos niveoguttatus</i>	Twinspot, Red-throated		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Gypaetus barbatus</i>	Vulture, Bearded	CR	PG Schedule 2 Section 15(1)(a)	NT	CR			
<i>Gyps coprotheres</i>	Vulture, Cape	EN	PG Schedule 2 Section 15(1)(a)	EN	EN	1		4
<i>Neophron percnopterus</i>	Vulture, Egyptian	CR	PG Schedule 2 Section 15(1)(a)	EN	NA			
<i>Necrosyrtes monachus</i>	Vulture, Hooded	EN	PG Schedule 2 Section 15(1)(a)	CR	CR			
<i>Torgos tracheliotos</i>	Vulture, Lappet-faced	EN	PG Schedule 2 Section 15(1)(a)	EN	EN			
<i>Gypohierax angolensis</i>	Vulture, Palm-nut		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Gyps rueppelli</i>	Vulture, Rüppell's		PG Schedule 2 Section 15(1)(a)	CR	NA			
<i>Gyps africanus</i>	Vulture, White-backed	EN	PG Schedule 2 Section 15(1)(a)	CR	CR			

SCIENTIFIC NAME	COMMON NAME	RSA LEGAL STATUS	GAUTENG LEGAL STATUS	GLOBAL RED LIST STATUS	REGIONAL RED LIST STATUS	RECORDS IN QDS	RECORDS IN PENTAD	LoO IN PORTION 15
<i>Trigonoceps occipitalis</i>	Vulture, White-headed	EN	PG Schedule 2 Section 15(1)(a)	CR	CR			
<i>Motacilla aguimp</i>	Wagtail, African Pied		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	3
<i>Motacilla capensis</i>	Wagtail, Cape		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	2
<i>Motacilla citreola</i>	Wagtail, Citrine		PG Schedule 2 Section 15(1)(a)					
<i>Motacilla cinerea</i>	Wagtail, Grey		PG Schedule 2 Section 15(1)(a)					
<i>Motacilla clara</i>	Wagtail, Mountain		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Motacilla flava</i>	Wagtail, Western Yellow		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	4
<i>Acrocephalus baeticatus</i>	Warbler, African Reed		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	2
<i>Bradypterus barratti</i>	Warbler, Barratt's		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Calamonastes fasciolatus</i>	Warbler, Barred Wren-		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Acrocephalus griseldis</i>	Warbler, Basra Reed		PG Schedule 2 Section 15(1)(a)					
<i>Schoenicola brevirostris</i>	Warbler, Broad-tailed		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Euryptila subcinnamea</i>	Warbler, Cinnamon-breasted		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Iduna natalensis</i>	Warbler, Dark-capped Yellow		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Acrocephalus scirpaceus</i>	Warbler, Eurasian Reed		PG Schedule 2 Section 15(1)(a)					
<i>Sylvia borin</i>	Warbler, Garden		PG Schedule 2 Section 15(1)(a)	LC	LC	1		2
<i>Acrocephalus arundinaceus</i>	Warbler, Great Reed		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	2
<i>Hippolais icterina</i>	Warbler, Icterine		PG Schedule 2 Section 15(1)(a)	LC	LC	1		4
<i>Bradypterus sylvaticus</i>	Warbler, Knysna		PG Schedule 2 Section 15(1)(a)	VU	VU			
<i>Acrocephalus gracilirostris</i>	Warbler, Lesser Swamp		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	2
<i>Bradypterus baboecala</i>	Warbler, Little Rush		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	2
<i>Acrocephalus palustris</i>	Warbler, Marsh		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	4
<i>Phragmacia substriata</i>	Warbler, Namaqua		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Hippolais olivetorum</i>	Warbler, Olive-tree		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Locustella fluviatilis</i>	Warbler, River		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Malcorus pectoralis</i>	Warbler, Rufous-eared		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Acrocephalus schoenobaenus</i>	Warbler, Sedge		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	2
<i>Calamonastes stierlingi</i>	Warbler, Stierling's Wren-		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Cryptillas victorini</i>	Warbler, Victorin's		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Phylloscopus trochilus</i>	Warbler, Willow		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	3
<i>Phylloscopus ruficapilla</i>	Warbler, Yellow-throated Woodland		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Platysteira peltata</i>	Wattle-eye, Black-throated		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Estrilda erythronotos</i>	Waxbill, Black-faced		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	4
<i>Uraeginthus angolensis</i>	Waxbill, Blue		PG Schedule 2 Section 15(1)(a)	LC	LC	1		2
<i>Estrilda astrild</i>	Waxbill, Common		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	1

SCIENTIFIC NAME	COMMON NAME	RSA LEGAL STATUS	GAUTENG LEGAL STATUS	GLOBAL RED LIST STATUS	REGIONAL RED LIST STATUS	RECORDS IN QDS	RECORDS IN PENTAD	LoO IN PORTION 15
<i>Estrilda perreini</i>	Waxbill, Grey		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Amandava subflava</i>	Waxbill, Orange-breasted		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	2
<i>Coccyzygia melanotis</i>	Waxbill, Sweet		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Granatina granatina</i>	Waxbill, Violet-eared		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Ploceus xanthops</i>	Weaver, African (Holub's) Golden		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Ploceus capensis</i>	Weaver, Cape		WA Schedule 5 Section 43	LC	LC	1	1	2
<i>Ploceus rubiginosus</i>	Weaver, Chestnut		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Ploceus bicolor</i>	Weaver, Dark-backed		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Ploceus intermedius</i>	Weaver, Lesser Masked		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Bubalornis niger</i>	Weaver, Red-billed Buffalo		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Anaplectes rubriceps</i>	Weaver, Red-headed		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Philetairus socius</i>	Weaver, Sociable		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Ploceus xanthopterus</i>	Weaver, Southern Brown-throated		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Ploceus velatus</i>	Weaver, Southern Masked		WA Schedule 5 Section 43	LC	LC	1	1	1
<i>Ploceus ocularis</i>	Weaver, Spectacled		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Amblyospiza albifrons</i>	Weaver, Thick-billed		PG Schedule 2 Section 15(1)(a)	LC	LC	1		2
<i>Ploceus cucullatus</i>	Weaver, Village		WA Schedule 5 Section 43	LC	LC	1	1	3
<i>Ploceus subaureus</i>	Weaver, Yellow		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Oenanthe pileata</i>	Wheatear, Capped		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	3
<i>Oenanthe monticola</i>	Wheatear, Mountain		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	3
<i>Oenanthe oenanthe</i>	Wheatear, Northern		PG Schedule 2 Section 15(1)(a)					
<i>Oenanthe pleschanka</i>	Wheatear, Pied		PG Schedule 2 Section 15(1)(a)					
<i>Numenius phaeopus</i>	Whimbrel, Common		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Zosterops senegalensis</i>	White-eye, African Yellow		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Zosterops virens</i>	White-eye, Cape		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	2
<i>Zosterops pallidus</i>	White-eye, Orange River		PG Schedule 2 Section 15(1)(a)	LC	LC		1	
<i>Sylvia communis</i>	Whitethroat, Common		PG Schedule 2 Section 15(1)(a)	LC	LC	1		4
<i>Vidua obtusa</i>	Whydah, Broad-tailed Paradise		PG Schedule 2 Section 15(1)(a)					
<i>Vidua paradisaea</i>	Whydah, Long-tailed Paradise		PG Schedule 2 Section 15(1)(a)	LC	LC	1		4
<i>Vidua macroura</i>	Whydah, Pin-tailed		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	1
<i>Vidua regia</i>	Whydah, Shaft-tailed		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Euplectes axillaris</i>	Widowbird, Fan-tailed		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	2
<i>Euplectes progne</i>	Widowbird, Long-tailed		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	1
<i>Euplectes ardens</i>	Widowbird, Red-collared		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	1
<i>Euplectes albonotatus</i>	Widowbird, White-winged		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	2

SCIENTIFIC NAME	COMMON NAME	RSA LEGAL STATUS	GAUTENG LEGAL STATUS	GLOBAL RED LIST STATUS	REGIONAL RED LIST STATUS	RECORDS IN QDS	RECORDS IN PENTAD	LoO IN PORTION 15
<i>Phoeniculus purpureus</i>	Wood-hoopoe, Green		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	2
<i>Dendropicos namaquus</i>	Woodpecker, Bearded		PG Schedule 2 Section 15(1)(a)	LC	LC	1		4
<i>Campethera bennettii</i>	Woodpecker, Bennett's		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Dendropicos fuscescens</i>	Woodpecker, Cardinal		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	3
<i>Campethera abingoni</i>	Woodpecker, Golden-tailed		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Geocolaptes olivaceus</i>	Woodpecker, Ground		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Campethera notata</i>	Woodpecker, Knysna		PG Schedule 2 Section 15(1)(a)	NT	NT			
<i>Dendropicos griseocephalus</i>	Woodpecker, Olive		PG Schedule 2 Section 15(1)(a)	LC	LC			
<i>Jynx ruficollis</i>	Wryneck, Red-throated		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	2
<i>Tringa flavipes</i>	Yellowlegs, Lesser		PG Schedule 2 Section 15(1)(a)					

Status: CR = Critically Endangered; EN = Endangered; LC = Least Concern; NT = Near Threatened; OG = Ordinary Game; PG = Protected Game; PS = Protected Species; VU = Vulnerable; WA = Wild Animal

Likelihood of Occurrence (LoO): 1 = Present; 2 = High; 3 = Moderate; 4 = Low

Sources: Transvaal Nature Conservation Ordinance (1983); Roberts VII (2013); NEM:BA ToPS (2015); Taylor *et al.* (2015); SABAP 2 (2017)

13.4. Reptile list for the study area

FAMILY & SCIENTIFIC NAME	COMMON NAME	GAUTENG LEGAL STATUS	RED LIST STATUS	LoO IN QDS	LoO IN PORTION 15
AGAMIDAE	Agamas				
<i>Agama aculeata distanti</i>	Distant's Ground Agama	PG Schedule 2 Section 15(1)(a)	1LC	1	2
<i>Agama atra</i>	Southern Rock Agama	PG Schedule 2 Section 15(1)(a)	1LC	1	1
CHAMAELEONIDAE	Chameleons				
<i>Chamaeleo dilepis dilepis</i>	Common Flap-neck Chameleon	PG Schedule 2 Section 15(1)(a)	2LC*	1	2
COLUBRIDAE	Typical snakes				
<i>Crotaphopeltis hotamboeia</i>	Red-lipped Snake	WA Schedule 5 Section 43	2LC	2	2
<i>Dasypeltis scabra</i>	Rhombic Egg-eater	WA Schedule 5 Section 43	2LC	2	2
CORDYLIDAE	Crag, flat & girdled lizards				
<i>Chamaesaura aenea</i>	Coppery Grass Lizard	PG Schedule 2 Section 15(1)(a)	1NT End	2	2
<i>Cordylus vittifer</i>	Common Girdled Lizard	PG Schedule 2 Section 15(1)(a)	1LC	1	2
<i>Pseudocordylus melanotus melanotus</i>	Common Crag Lizard	PG Schedule 2 Section 15(1)(a)	1LC End	3	3
ELAPIDAE	Cobras, mambas & relatives				
<i>Elapsoidea sundevallii media</i>	Highveld Garter Snake	WA Schedule 5 Section 43	1LC*	1	2
<i>Hemachatus haemachatus</i>	Rinkhals	WA Schedule 5 Section 43	1LC	1	2
GEKKONIDAE	Geckos				
<i>Lygodactylus capensis capensis</i>	Common Dwarf Gecko	PG Schedule 2 Section 15(1)(a)	1LC	1	3
<i>Pachydactylus affinis</i>	Transvaal Gecko	PG Schedule 2 Section 15(1)(a)	1LC	3	3
<i>Pachydactylus capensis</i>	Cape Gecko	PG Schedule 2 Section 15(1)(a)	2LC	1	2
GERRHOSAURIDAE	Plated lizards & seps				
<i>Gerrhosaurus flavigularis</i>	Yellow-throated Plated Lizard	PG Schedule 2 Section 15(1)(a)	2LC	1	2
LACERTIDAE	Typical lizards				
<i>Nucras lalandii</i>	Delalande's Sandveld Lizard	PG Schedule 2 Section 15(1)(a)	1LC	1	3
<i>Pedioplanis burchelli</i>	Burchell's Sand Lizard	PG Schedule 2 Section 15(1)(a)	1LC End	3	4
LAMPROPHIIDAE	Lamprophid snakes				
<i>Aparallactus capensis</i>	Black-headed Centipede-eater	WA Schedule 5 Section 43	2LC	2	2
<i>Atractaspis bibronii</i>	Bibron's Stiletto Snake	WA Schedule 5 Section 43	2LC	3	3
<i>Boaedon capensis</i>	Brown House Snake	WA Schedule 5 Section 43	2LC	1	2
<i>Duberria lutrix lutrix</i>	South African Slug-eater	WA Schedule 5 Section 43	1LC	3	3
<i>Homoroselaps dorsalis</i>	Striped Harlequin Snake	WA Schedule 5 Section 43	1NT End	3	3
<i>Homoroselaps lacteus</i>	Spotted Harlequin Snake	WA Schedule 5 Section 43	1LC	2	3
<i>Lamprophis aurora</i>	Aurora House Snake	WA Schedule 5 Section 43	1LC	1	2
<i>Lycodononormorphus inornatus</i>	Olive House Snake	WA Schedule 5 Section 43	1LC	3	3
<i>Lycodononormorphus rufulus</i>	Brown Water Snake	WA Schedule 5 Section 43	1LC	1	2

FAMILY & SCIENTIFIC NAME	COMMON NAME	GAUTENG LEGAL STATUS	RED LIST STATUS	LoO IN QDS	LoO IN PORTION 15
<i>Lycophidion capense capense</i>	Cape Wolf Snake	WA Schedule 5 Section 43	2LC	3	3
<i>Prosymna sundevallii</i>	Sundevall's Shovel-snout	WA Schedule 5 Section 43	1LC	3	3
<i>Psammophis brevirostris</i>	Short-snouted Grass Snake	WA Schedule 5 Section 43	1LC	1	2
<i>Psammophis crucifer</i>	Cross-marked Grass Snake	WA Schedule 5 Section 43	1LC	3	3
<i>Psammophis trinasalis</i>	Fork-marked Sand Snake	WA Schedule 5 Section 43	2LC	3	3
<i>Psammophylax rhombeatus rhombeatus</i>	Spotted Grass Snake	WA Schedule 5 Section 43	2LC	1	2
<i>Psammophylax tritaeniatus</i>	Striped Grass Snake	WA Schedule 5 Section 43	2LC	3	3
<i>Pseudaspis cana</i>	Mole Snake	WA Schedule 5 Section 43	2LC	1	2
LEPTOTYPHLOPIDAE	Thread snakes				
<i>Leptotyphlops scutifrons conjunctus</i>	Eastern Thread Snake	WA Schedule 5 Section 43	1LC*	1	2
<i>Leptotyphlops scutifrons scutifrons</i>	Peters' Thread Snake	WA Schedule 5 Section 43	1LC*	1	3
PELOMEDUSIDAE	Terrapins				
<i>Pelomedusa galeata</i>	South African Marsh Terrapin	PG Schedule 2 Section 15(1)(a)		2	2
SCINCIDAE	Skinks				
<i>Acontias gracilicauda</i>	Thin-tailed Legless Skink	PG Schedule 2 Section 15(1)(a)	1LC	2	2
<i>Afroablepharus wahlbergii</i>	Wahlberg's Snake-eyed Skink	PG Schedule 2 Section 15(1)(a)	2LC	3	3
<i>Trachylepis capensis</i>	Cape Skink	PG Schedule 2 Section 15(1)(a)	2LC	1	2
<i>Trachylepis punctatissima</i>	Speckled Rock Skink	PG Schedule 2 Section 15(1)(a)	2LC	1	1
<i>Trachylepis varia</i>	Variable Skink	PG Schedule 2 Section 15(1)(a)	2LC	1	2
TYPHLOPIDAE	Blind snakes				
<i>Afrotyphlops bibronii</i>	Bibron's Blind Snake	WA Schedule 5 Section 43	1LC	1	2
<i>Rhinotyphlops lalandei</i>	Delalande's Beaked Blind Snake	WA Schedule 5 Section 43	2LC	3	3
VARANIDAE	Monitors				
<i>Varanus niloticus</i>	Water Monitor	WA Schedule 5 Section 43	2LC	3	3
VIPERIDAE	Adders				
<i>Bitis arietans arietans</i>	Puff Adder	WA Schedule 5 Section 43	2LC	2	2
<i>Causus rhombeatus</i>	Rhombic Night Adder	WA Schedule 5 Section 43	2LC	3	3

Status: 1 = Global; 2 = Regional; End = Endemic; LC = Least Concern; NT = Near Threatened; PG = Protected Game; WA = Wild Animal; *Status assigned to species

Likelihood of Occurrence (LoO): 1 = Present; 2 = High; 3 = Moderate; 4 = Low

Sources: Transvaal Nature Conservation Ordinance (1983); Bates *et al.* (2014); NEM:BA ToPS (2015); ReptileMap (2017)

13.5. Frog list for the study area

FAMILY & SCIENTIFIC NAME	COMMON NAME	GAUTENG LEGAL STATUS	GLOBAL RED LIST STATUS	RSA, LSO & SWZ RED LIST STATUS	LoO IN QDS	LoO IN PORTION 15
BUFONIDAE	True toads					
<i>Schismaderma carens</i>	Red Toad		LC (U)	LC	2	2
<i>Sclerophrys capensis</i>	Raucous Toad		LC (D)	LC	2	2
<i>Sclerophrys garmani</i>	Olive Toad		LC (U)	LC	3	3
<i>Sclerophrys gutturalis</i>	Guttural Toad		LC (I)	LC	1	2
HYPEROLIIDAE	Leaf-folding & reed frogs					
<i>Kassina senegalensis</i>	Bubbling Kassina		LC (U)	LC	1	2
<i>Semnodactylus wealii</i>	Rattling Frog		LC (U)	LC	1	2
PHRYNOBATRACHIDAE	Puddle frogs					
<i>Phrynobatrachus natalensis</i>	Snoring Puddle Frog		LC (S)	LC	2	3
PIPIDAE	African clawed frogs					
<i>Xenopus laevis</i>	Common Platanna		LC (I)	LC	1	2
PYXICEPHALIDAE	Moss, river, sand & stream frogs					
<i>Amietia fuscigula</i>	Cape River Frog		LC (S)	LC	1	2
<i>Cacosternum boettgeri</i>	Common Caco		LC (U)	LC	1	2
<i>Pyxicephalus adspersus</i>	Giant Bullfrog	PG Schedule 2 Section 15(1)(a)	LC (D)	NT	1	3
<i>Strongylopus fasciatus</i>	Striped Stream Frog		LC (U)	LC	2	3
<i>Tomopterna cryptotis</i>	Tremolo Sand Frog		LC (S)	LC	1	2
<i>Tomopterna natalensis</i>	Natal Sand Frog		LC (U)	LC	1	2
RHACOPHORIDAE	Foam Nest Frog					
<i>Amietia delalandii</i>	Delalande's River Frog			*LC	1	2

Status: D = Declining; I = Increasing; LC = Least Concern; NT = Near Threatened; PG = Protected Game; S = Stable; U = Unknown population trend; * Status assigned to species

Likelihood of Occurrence (LoO): 1 = Present; 2 = High; 3 = Moderate

Sources: Transvaal Nature Conservation Ordinance (1983); Minter *et al.* (2004); IUCN (2013.1); NEM:BA ToPS (2015); FrogMap (2017)

13.6. Butterfly list for the study area

FAMILY & SCIENTIFIC NAME	COMMON NAME	GAUTENG LEGAL STATUS	RED LIST STATUS	LoO IN QDS	LoO IN PORTION 15
HESPERIIDAE	Sandmen, skippers, sylphs & relatives				
<i>Coeliades forestan forestan</i>	Striped Policeman		1LC	3	3
<i>Coeliades pistratus</i>	Two-pip Policeman		1LC	3	3
<i>Eretis umbra umbra</i>	Small Marbled Elf		1LC End	2	2
<i>Gegenes niso niso</i>	Common Hottentot		1LC	1	1
<i>Kedestes barberae barberae</i>	Barber's Ranger		1LC	3	3
<i>Metisella malgacha malgacha</i>	Grassveld Sylph		1LC End	3	3
<i>Metisella meninx</i>	Marsh Sylph		1LC Rare Habitat Specialist	2	?
<i>Spialia asterodia</i>	Star Sandman		1LC	1	1
<i>Spialia diomus ferax</i>	Common Sandman		1LC	3	3
<i>Spialia mafa mafa</i>	Mafa Sandman		1LC	1	1
<i>Spialia spio</i>	Mountain Sandman		1LC	3	3
<i>Tsitana tsita</i>	Dismal Sylph		1LC	3	3
LYCAENIDAE	Blues, coppers, opals & relatives				
<i>Actizera lucida</i>	Rayed Blue		1LC	2	2
<i>Aloeides dentatis dentatis</i>	Roodepoort Copper	Schedule 7 Section 45	1EN End	3	?
<i>Aloeides henningi</i>	Henning's Copper		1LC End	2	2
<i>Aloeides molomo molomo</i>	Molomo Copper		1LC End	2	3
<i>Aloeides trimeni trimeni</i>	Trimeni's Copper		1LC	2	3
<i>Anthene definita definita</i>	Common Hairtail		1LC	3	4
<i>Anthene livida livida</i>	Pale Hairtail		1LC	3	4
<i>Azanus jesous</i>	Topaz Babul Blue		1LC	3	3
<i>Azanus ubaldus</i>	Velvet-spotted Babul Blue		1LC	2	2
<i>Cacyreus marshalli</i>	Common Geranium Bronze		1LC	3	3
<i>Chilades trochylus</i>	Grass Jewel		1LC	2	2
<i>Chrysoritis aureus</i>	Heidelberg Opal	Schedule 7 Section 45	1EN End	3	4
<i>Cigaritis ella</i>	Ella's Bar		1LC	3	4
<i>Cigaritis natalensis</i>	Natal Bar		1LC	3	3
<i>Cupidopsis cissus cissus</i>	Common Meadow Blue		1LC	2	2
<i>Cupidopsis jobates jobates</i>	Tailed Meadow Blue		1LC	3	3
<i>Eicochrysops messapus mahallakoaena</i>	Cupreous Blue		1LC	2	2
<i>Lampides boeticus</i>	Pea Blue		1LC	1	2
<i>Lepidochrysops ignota</i>	Zulu Blue		1LC End	3	3

FAMILY & SCIENTIFIC NAME	COMMON NAME	GAUTENG LEGAL STATUS	RED LIST STATUS	LoO IN QDS	LoO IN PORTION 15
<i>Lepidochrysops ketsi ketsi</i>	Ketsi Blue		1LC End	3	3
<i>Lepidochrysops letsea</i>	Free State Blue		1LC	3	3
<i>Lepidochrysops ortygia</i>	Koppie Blue		1LC End	3	4
<i>Lepidochrysops patricia</i>	Patricia Blue		1LC	2	2
<i>Lepidochrysops plebeia plebeia</i>	Twin-spot Blue		1LC	2	3
<i>Leptomyrina henningi henningi</i>	Henning's Black-eye		1LC	2	3
<i>Leptotes pirithous pirithous</i>	Common Zebra Blue		1LC	2	2
<i>Lycaena clarki</i>	Eastern Sorrel Copper		1LC End	1	2
<i>Orachrysops lacrimosa</i>	Restless Blue		1LC End	3	4
<i>Orachrysops mijburghi</i>	Mijburgh's Blue		1EN End	3	?
<i>Oraidium barberae</i>	Dwarf Blue		1LC	2	3
<i>Tarucus sybaris sybaris</i>	Dotted Blue		1LC	2	2
<i>Tuxentius melaena melaena</i>	Black Pie		1LC	3	4
<i>Uranotaema nubifer nubifer</i>	Black Heart		1LC	3	3?
<i>Zintha hintza hintza</i>	Hintza Pierrot		1LC	2	3
<i>Zizeeria knysna knysna</i>	African / Sooty Grass Blue		1LC	1	2
<i>Zizina otis antanossa</i>	Dark / Clover Grass Blue		1LC	3	3?
<i>Zizula hylax</i>	Tiny / Gaika Grass Blue		1LC	1	2
NYMPHALIDAE	Acraeas, browns, charaxes & relatives				
<i>Acraea horta</i>	Garden Acraea		1LC	2	3
<i>Acraea neobule neobule</i>	Wandering Donkey Acraea		1LC	1	2
<i>Byblia ilithyia</i>	Spotted Joker		1LC	2	2
<i>Catacroptera cloanthe cloanthe</i>	Pirate		1LC	2	2
<i>Danaus chrysippus orientis</i>	African Monarch, Plain Tiger		1LC	1	1
<i>Hypolimnas misippus</i>	Common Diadem		1LC	1	2
<i>Junonia hierta cebrene</i>	Yellow Pansy		1LC	1	2
<i>Junonia oenone oenone</i>	Blue Pansy		1LC	1	2
<i>Junonia orithya madagascariensis</i>	Eyed Pansy		1LC	1	1
<i>Paternympha narycia</i>	Spotted-eye Brown		1LC End	3	3
<i>Phalanta phalantha aethiopica</i>	African Leopard		1LC	3	4
<i>Precis archesia archesia</i>	Garden Commodore		1LC	2	2
<i>Precis octavia sesamus</i>	Gaudy Commodore		1LC	2	2
<i>Stygionympha wichgrafi wichgrafi</i>	Wichgraf's Hillside Brown		1LC End	2	1
<i>Telchinia rahira rahira</i>	Marsh Acraea		1LC	1	2
<i>Vanessa cardui</i>	Painted Lady		1LC	1	2

FAMILY & SCIENTIFIC NAME	COMMON NAME	GAUTENG LEGAL STATUS	RED LIST STATUS	LoO IN QDS	LoO IN PORTION 15
PAPILIONIDAE	Swallowtails, swordtails & relatives				
<i>Papilio demodocus demodocus</i>	Citrus Swallowtail		1LC	1	1
PIERIDAE	Tips, whites & relatives				
<i>Belenois aurota</i>	Brown-veined White		1LC	1	1
<i>Belenois creona severina</i>	African Common White		1LC	3	3
<i>Catopsilia florella</i>	African Migrant		1LC	1	2
<i>Colias electo electo</i>	African Clouded Yellow		1LC	2	2
<i>Eurema brigitta brigitta</i>	Broad-bordered Grass Yellow		1LC	1	1
<i>Eurema hecabe solifera</i>	Lowveld / Common Grass Yellow		1LC	3	3
<i>Mylothris agathina agathina</i>	Common Dotted Border		1LC	3	3
<i>Pinacopteryx eriphia eriphia</i>	Zebra White		1LC	3	3
<i>Pontia helice helice</i>	Common Meadow White		1LC	1	1
<i>Teracolus subfasciatus</i>	Lemon Traveller		1LC	3	4
Status: 1 = Global; 2 = Regional; EN = Endangered End = Endemic; LC = Least Concern					
Likelihood of Occurrence (LoO): 1 = Present; 2 = High; 3 = Moderate; 4 = Low					
Sources: Transvaal Nature Conservation Ordinance (1983); Mecenero <i>et al.</i> (2013); LepiMAP (2017)					

13.7. Odonata list for the study area

FAMILY & SCIENTIFIC NAME	COMMON NAME	BIOTIC INDEX SCORE	LoO IN QDS	LoO IN PORTION 15
AESHNIDAE	Hawkers			
<i>Anax ephippiger</i>	Vagrant Emperor	2	2	2
<i>Anax imperator</i>	Blue Emperor	1	1	3
<i>Anax speratus</i>	(Eastern) Orange Emperor	2	2	3
<i>Zosterateschna minuscula</i>	Friendly Hawker	5	3	4
COENAGRIONIDAE	Pond damselflies			
<i>Africallagma glaucum</i>	Swamp Bluet	1	1	2
<i>Africallagma sapphirinum</i>	Sapphire Bluet	4	1	3
<i>Ischnura senegalensis</i>	Tropical / Marsh Bluetail	0	1	2
<i>Pseudagrion citricola</i>	Yellow-faced Sprite	3	2	3
<i>Pseudagrion kersteni</i>	Powder-faced / Kersten's Sprite	1	3	4
<i>Pseudagrion salisburyense</i>	Slate Sprite	1	2	2
LESTIDAE	Spreadwings			
<i>Lestes plagiatus</i>	Highland Spreadwing	2	3	3
LIBELLULIDAE	Skimmers			
<i>Crocothemis erythraea</i>	Broad Scarlet	0	1	2
<i>Orthetrum abbotti</i>	Little Skimmer	2	3	4
<i>Orthetrum cafrum</i>	Two-striped Skimmer	3	3	1
<i>Orthetrum trinacria</i>	Long Skimmer	1	3	4
<i>Palpopleura jucunda</i>	Yellow-veined Widow	2	3	4
<i>Pantala flavescens</i>	Wandering Glider / Pantala	0	3	1
<i>Sympetrum fonscolombii</i>	Red-veined Darter / Nomad	0	2	2
<i>Trithemis arteriosa</i>	Red-veined Dropwing	0	2	2
<i>Trithemis dorsalis</i>	Highland / Round-hook Dropwing	0	3	4
<i>Trithemis stictica</i>	Jaunty Dropwing	1	3	3
PLATYCNEMIDIDAE	Featherlegs			
<i>Elatoneura glauca</i>	Common Threadtail	1	2	2
SYNLESTIDAE	Malachites			
<i>Chlorolestes fasciatus</i>	Mountain Malachite	4	2	3

Likelihood of Occurrence (LoO): 1 = Present; 2 = High; 3 = Moderate; 4 = Low

Sources: Samways (2008); OdonataMAP (2017)

13.8. Scorpion list for the study area

FAMILY & SCIENTIFIC NAME	LoO IN REGION	LoO IN PORTION 15
BUTHIDAE (Fat-tailed scorpions)		
<i>Pseudolychas pegleri</i>	2	2
<i>Uroplectes triangulifer</i>	2	2
HORMURIDAE (Flat rock scorpions)		
<i>Cheloctonus jonesii</i>	3	3
<i>Hadogenes gunningi</i>	3	4
SCORPIONIDAE (Burrowing scorpions)		
<i>Opisthophthalmus pugnax</i>	2	2

Likelihood of Occurrence (LoO): 2 = High; 3 = Moderate; 4 = Low

Sources: Leeming (2003)

A close-up photograph of several piglets' faces, showing their pink snouts and eyes, looking towards the camera.

Basic Assessment for the
Mojaletema Primary Co-
Operative (Pty) Ltd's proposed
piggery facility on Portion 15 of
Farm Bultfontein 192 IR,
Nigel, Gauteng.

A photograph of piglets in a trough, eating a large pile of brown, pellet-like feed.

APPENDIX G.2:
Heritage Impact Assessment:
Basic Assessment for the
Proposed Development of a
Piggery on Portion 15 of
Farm Bultfontein 192, Nigel
Magisterial District,
Gauteng.

HERITAGE IMPACT ASSESSMENT: BASIC ASSESSMENT FOR THE PROPOSED DEVELOPMENT OF A PIGGERY ON PORTION 15 OF FARM BULTFONTEIN 192, NIGEL MAGISTERIAL DISTRICT, GAUTENG

Required under Section 38 (8) of the National Heritage Resources Act (No. 25 of 1999).

Report for:

CSIR – Environmental Management Services

P.O. Box 320, Stellenbosch, 7599

Tel: (021) 888 2408

Email: sngema@csir.co.za

On behalf of:

Mojaletema Co-Operative (Pty) Ltd



Dr Jayson Orton

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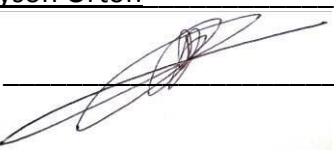
06 February 2017

Specialist declaration

I, Jayson Orton, as the appointed independent specialist, in terms of the 2014 EIA Regulations, hereby declare that I:

- I act as the independent specialist in this application;
- I 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;
- regard the information contained in this report as it relates to my specialist input/study to be true and correct, and do not have and will not have any financial interest in the undertaking of the activity, other than remuneration for work performed in terms of the NEMA, the Environmental Impact Assessment Regulations, 2014 and any specific environmental management Act;
- I declare that there are no circumstances that may compromise my objectivity in performing such work;
- I have expertise in conducting the specialist report relevant to this application, 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 have no, and will not engage in, conflicting interests in the undertaking of the activity;
- I have no vested interest in the proposed activity proceeding;
- 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 have ensured that information containing all relevant facts in respect of the specialist input/study was distributed or made available to interested and affected parties and the public and that participation by interested and affected parties was facilitated in such a manner that all interested and affected parties were provided with a reasonable opportunity to participate and to provide comments on the specialist input/study;
- I have ensured that the comments of all interested and affected parties on the specialist input/study were considered, recorded and submitted to the competent authority in respect of the application;
- all the particulars furnished by me in this specialist input/study are true and correct; and
- I realise that a false declaration is an offence in terms of regulation 48 and is punishable in terms of section 24F of the Act.

Name of Specialist: Jayson Orton

Signature of the specialist: 

Date: 6 March 2017

EXECUTIVE SUMMARY

ASHA Consulting (Pty) Ltd was appointed by the Council for Scientific and Industrial Research (CSIR) to conduct an assessment of the potential impacts to heritage resources that might occur through the proposed development of a piggery on Portion 15 of Farm Bultfontein 192, Nigel Magisterial District, Gauteng. The site lies at S26° 27' 13" E28° 30' 56" and is about 5 km southeast of Nigel.

The site is flat, sandy land but was found to be covered in very dense grass and pioneer bush. Ground visibility was very poor, but the desktop study showed that few archaeological remains have ever been recorded in the general area.

No heritage resources were found within the study area. However, in close proximity there is a farmhouse and outbuildings that are greater than 60 years of age. They are probably early-mid-20th century and of relatively low significance. Historical aerial photography shows that historical tree lines were present in the area. These, however, have largely been destroyed in recent years.

No significant impacts to heritage resources are expected and no cumulative impacts were identified. As such, it is recommended that the proposed piggery be authorised but subject to the following condition being incorporated into the Environmental Authorisation:

- If any archaeological material or human burials are uncovered during the course of development then work in the immediate area should be halted. The find would need to be reported to the heritage authorities and may require inspection by an archaeologist. Such heritage is the property of the state and may require excavation and curation in an approved institution.

Abbreviations

APHP: Association of Professional Heritage Practitioners

ASAPA: Association of Southern African Professional Archaeologists

BAR: Basic Assessment Report

CSIR: Council for Scientific and Industrial Research

CRM: Cultural Resources Management

EAP: environmental assessment practitioner

GDARD: Gauteng Department of Agriculture and Rural Development

GPS: global positioning system

HIA: Heritage Impact Assessment

NEMA: National Environmental Management Act (No. 107 of 1998)

NHRA: National Heritage Resources Act (No. 25) of 1999

PHRAG: Provincial Heritage Resources Authority Gauteng

PPP: Public Participation Process

SAHRA: South African Heritage Resources Agency

SAHRIS: South African Heritage Resources Information System

Compliance with Appendix 6 of the 2014 EIA Regulations

	Addressed in the Specialist Report
1. (1) A specialist report prepared in terms of these Regulations must contain-	Section 1.4 Appendix 1
a) details of- i. the specialist who prepared the report; and ii. the expertise of that specialist to compile a specialist report including a curriculum vitae;	
b) a declaration that the specialist is independent in a form as may be specified by the competent authority;	Page ii
c) an indication of the scope of, and the purpose for which, the report was prepared;	Section 1.3
d) the date and season of the site investigation and the relevance of the season to the outcome of the assessment;	Section 3.2
e) a description of the methodology adopted in preparing the report or carrying out the specialised process;	Section 3
f) the specific identified sensitivity of the site related to the activity and its associated structures and infrastructure;	Section 1.1.1
g) an identification of any areas to be avoided, including buffers;	n/a
h) a map superimposing the activity including the associated structures and infrastructure on the environmental sensitivities of the site including areas to be avoided, including buffers;	n/a
i) a description of any assumptions made and any uncertainties or gaps in knowledge;	Section 3.5
j) a description of the findings and potential implications of such findings on the impact of the proposed activity, including identified alternatives on the environment;	Section 6
k) any mitigation measures for inclusion in the EMPr;	n/a
l) any conditions for inclusion in the environmental authorisation;	Section 12
m) any monitoring requirements for inclusion in the EMPr or environmental authorisation;	Section 9
n) a reasoned opinion- i. as to whether the proposed activity or portions thereof should be authorised; and ii. if the opinion is that the proposed activity or portions thereof should be authorised, any avoidance, management and mitigation measures that should be included in the EMPr, and where applicable, the closure plan;	Section 12
o) a description of any consultation process that was undertaken during the course of preparing the specialist report;	n/a (see Section 3.6)
p) a summary and copies of any comments received during any consultation process and where applicable all responses thereto; and	n/a
q) any other information requested by the competent authority.	n/a

Contents

Specialist declaration	ii
Abbreviations	iv
Compliance with Appendix 6 of the 2014 EIA Regulations	v
1. INTRODUCTION	1
1.1. Project description.....	1
1.1.1. Aspects of the project relevant to the heritage study	2
1.2. Terms of reference	2
1.3. Scope and purpose of the report	2
1.4. The authors.....	2
2. HERITAGE LEGISLATION	3
3. METHODS.....	4
3.1. Literature survey and information sources	4
3.2. Field survey.....	4
3.3. Impact assessment	4
3.4. Grading	4
3.5. Assumptions and limitations	5
3.6. Consultation processes undertaken	5
4. PHYSICAL ENVIRONMENTAL CONTEXT	5
4.1. Site context	5
4.2. Site description	5
5. HERITAGE CONTEXT.....	7
5.1. Archaeological aspects	8
5.2. Historical aspects.....	8
6. FINDINGS OF THE HERITAGE STUDY	8
6.1. Archaeology.....	9
6.2. Palaeontology.....	9
6.3. Graves.....	9
6.4. Built environment.....	10
6.5. Cultural landscape	12
6.6. Summary of heritage resources	14
6.7. Statement of significance and provisional grading	14
7. IMPACT ASSESSMENT	14
8. LEGISLATIVE AND PERMIT REQUIREMENTS	14
9. ENVIRONMENTAL MANAGEMENT PROGRAMME INPUTS.....	15
10. EVALUATION OF IMPACTS RELATIVE TO SUSTAINABLE SOCIAL AND ECONOMIC BENEFITS.....	15
11. CONCLUSIONS	15
12. RECOMMENDATIONS	15
13. REFERENCES	17

APPENDIX 1 – Curriculum Vitae 19

1. INTRODUCTION

ASHA Consulting (Pty) Ltd was appointed by the Council for Scientific and Industrial Research (CSIR) to conduct an assessment of the potential impacts to heritage resources that might occur through the proposed development of a piggery on Portion 15 of Farm Bultfontein 192, Nigel Magisterial District, Gauteng. The site lies at S26° 27' 13" E28° 30' 59" and is about 5 km southeast of Nigel (Figure 1).

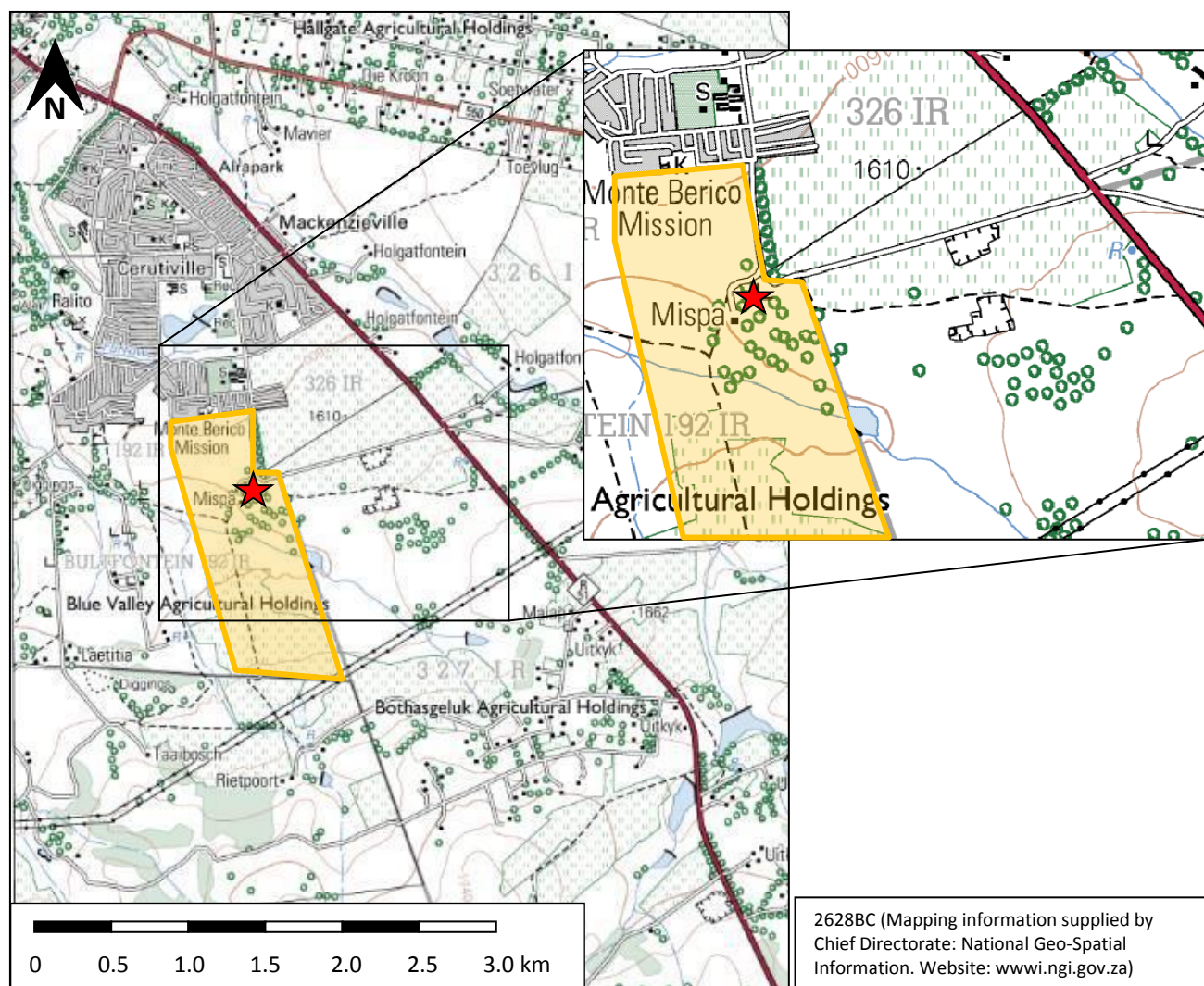


Figure 1: Map showing the location of the site (red star) and farm portion (shaded orange polygon). Nigel lies just out of picture to the northwest along the R51 which is the main road bisecting the map from northwest to southeast.

1.1. Project description

Mojaletema Co-Operative (Pty) Ltd is proposing a small-scale pig production endeavour of 1.8 hectares extent. The proposed project will include the following components:

- Build a pig house for 240 sow and 8 boars;
- Build a processing and packaging room.

No new services will be required because the development would connect to already existing municipal infrastructure (roads and electricity connection).

1.1.1. Aspects of the project relevant to the heritage study

All aspects of the proposed development are relevant since excavations for foundations may impact on archaeological and/or palaeontological remains, while the above-ground aspects create potential visual (contextual) impacts to the cultural landscape and any significant heritage sites that might be visually sensitive.

1.2. Terms of reference

ASHA Consulting (Pty) Ltd was asked to:

- Determine what aspects of heritage were relevant to the proposed site and development;
- Conduct a site visit to locate any physical heritage resources that might be present; and
- Compile a Heritage Impact Assessment (HIA) that would assess all relevant heritage resources.

1.3. Scope and purpose of the report

An HIA is a means of identifying any significant heritage resources before development begins so that these can be managed in such a way as to allow the development to proceed (if appropriate) without undue impacts to the fragile heritage of South Africa. This HIA report aims to fulfil the requirements of the heritage authorities such that a comment can be issued for consideration by the Gauteng Department of Agriculture and Rural Development (GDARD) who will review the Basic Assessment Report (BAR) and grant or withhold authorisation. The HIA report will outline any management and/or mitigation requirements that will need to be complied with from a heritage point of view and that should be included in the conditions of authorisation should this be granted.

1.4. The authors

Dr Jayson Orton has an MA (UCT, 2004) and a D.Phil (Oxford, UK, 2013), both in archaeology, and has been conducting Heritage Impact Assessments and archaeological specialist studies in the Western Cape and Northern Cape provinces of South Africa since 2004 (Please see curriculum vitae included as Appendix 1). He has also conducted research on aspects of the Later Stone Age in these provinces and published widely on the topic. He is an accredited heritage practitioner with the Association of Professional Heritage Practitioners (APHP) and also holds archaeological accreditation with the Association of Southern African Professional Archaeologists (ASAPA) CRM section (Member #233) as follows:

- Principal Investigator: Stone Age, Shell Middens & Grave Relocation; and
- Field Director: Colonial Period & Rock Art.

Jaco van der Walt conducted the fieldwork and necessary background research. He has an MA in Archaeology (Wits, 2012) and has worked in the heritage field since 2001 across much of southern Africa (Please see curriculum vitae included in Appendix 1). He has carried out and published

research on Iron Age sites and is an accredited heritage practitioner with the Association of Southern African Professional Archaeologists (ASAPA) CRM section (Member #159) as follows:

- Field Director: Iron Age, Shell Middens & Grave Relocation; and
- Field Supervisor: Colonial Period, Stone Age & Grave Relocation.

2. HERITAGE LEGISLATION

The National Heritage Resources Act (NHRA) No. 25 of 1999 protects a variety of heritage resources as follows:

- Section 34: structures older than 60 years;
- Section 35: palaeontological, prehistoric and historical material (including ruins) more than 100 years old;
- Section 36: graves and human remains older than 60 years and located outside of a formal cemetery administered by a local authority; and
- Section 37: public monuments and memorials.

Following Section 2, the definitions applicable to the above protections are as follows:

- Structures: “any building, works, device or other facility made by people and which is fixed to land, and includes any fixtures, fittings and equipment associated therewith”;
- Palaeontological material: “any fossilised remains or fossil trace of animals or plants which lived in the geological past, other than fossil fuels or fossiliferous rock intended for industrial use, and any site which contains such fossilised remains or trace”;
- Archaeological material: a) “material remains resulting from human activity which are in a state of disuse and are in or on land and which are older than 100 years, including artefacts, human and hominid remains and artificial features and structures”; b) “rock art, being any form of painting, engraving or other graphic representation on a fixed rock surface or loose rock or stone, which was executed by human agency and which is older than 100 years, including any area within 10m of such representation”; c) “wrecks, being any vessel or aircraft, or any part thereof, which was wrecked in South Africa, whether on land, in the internal waters, the territorial waters or in the maritime culture zone of the Republic, as defined respectively in sections 3, 4 and 6 of the Maritime Zones Act, 1994 (Act No. 15 of 1994), and any cargo, debris or artefacts found or associated therewith, which is older than 60 years or which SAHRA considers to be worthy of conservation”; and d) “features, structures and artefacts associated with military history which are older than 75 years and the sites on which they are found”;
- Grave: “means a place of interment and includes the contents, headstone or other marker of such a place and any other structure on or associated with such place”; and
- Public monuments and memorials: “all monuments and memorials a) “erected on land belonging to any branch of central, provincial or local government, or on land belonging to any organisation funded by or established in terms of the legislation of such a branch of government”; or b) “which were paid for by public subscription, government funds, or a public-spirited or military organisation, and are on land belonging to any private individual.”

While landscapes with cultural significance do not have a dedicated Section in the NHRA, they are protected under the definition of the National Estate (Section 3). Section 3(2)(c) and (d) list “historical settlements and townscapes” and “landscapes and natural features of cultural

significance” as part of the National Estate. Furthermore, Section 3(3) describes the reasons a place or object may have cultural heritage value; some of these speak directly to cultural landscapes.

Section 38 (2a) states that if there is reason to believe that heritage resources will be affected then an impact assessment report must be submitted. This report fulfils that requirement.

Under the National Environmental Management Act (No. 107 of 1998; NEMA), as amended, the project is subject to a BAR. The Provincial Heritage Resources Authority Gauteng (PHRAG; for built environment and landscapes) and the South African Heritage Resources Agency (SAHRA; for archaeology and palaeontology) are required to provide comment on the proposed project in order to facilitate final decision making by the GDARD

3. METHODS

3.1. Literature survey and information sources

A survey of available literature was carried out to assess the general heritage context into which the development would be set. This literature included published material, unpublished commercial reports and online material, including reports sourced from the South African Heritage Resources Information System (SAHRIS). The 1:50 000 map and historical aerial images were sourced from the Chief Directorate: National Geo-Spatial Information.

3.2. Field survey

The project location was shifted slightly to the east after the fieldwork had taken place. The original site was subjected to a detailed foot survey on 28th February 2017 but the current site has not been looked at in detail. The survey was in late summer and the grass cover was very dense meaning that visibility of any surface archaeological resources was almost non-existent. During the survey the positions of finds were recorded on a hand-held GPS receiver set to the WGS84 datum. Photographs were taken at times in order to capture representative samples of both the affected heritage and the landscape setting of the proposed development.

3.3. Impact assessment

For consistency, the impact assessment was conducted through application of a scale supplied by the CSIR.

3.4. Grading

Section 7 of the NHRA provides for the grading of heritage resources into those of National (Grade 1), Provincial (Grade 2) and Local (Grade 3) significance. Grading is intended to allow for the identification of the appropriate level of management for any given heritage resource. Grade 1 and 2 resources are intended to be managed by the national and provincial heritage resources authorities, while Grade 3 resources would be managed by the relevant local planning authority. These bodies are responsible for grading, but anyone may make recommendations for grading.

It is intended under S.7(2) that the various provincial authorities formulate a system for the further detailed grading of heritage resources of local significance but this is generally yet to happen. SAHRA (2007) has formulated its own system¹ for use in provinces where it has commenting authority. In this system sites of high local significance are given Grade IIIA (with the implication that site should be preserved in its entirety) and Grade IIIB (with the implication that part of the site could be mitigated and part preserved as appropriate) while sites of lesser significance are referred to as having 'General Protection' and rated with an A (high/medium significance, requires mitigation), B (medium significance, requires recording) or C (low significance, requires no further action).

3.5. Assumptions and limitations

The study is carried out at the surface only and hence any completely buried archaeological sites will not be readily located. Similarly, it is not always possible to determine the depth of archaeological material visible at the surface. The study was limited by the fact that the study area was shifted after the survey. However, because the surface was densely covered in grass and pioneer bush which hampered visibility of archaeological remains, it is highly likely that the results would have been the same. Although some ruins present on site were not examined physically by the heritage consultant, photographs and observations provided by the environmental assessment practitioner (EAP) are suitable for assessment.

3.6. Consultation processes undertaken

The NHRA requires consultation as part of an HIA but, since the present study falls within the context of an EIA which includes a public participation process (PPP), no dedicated consultation was undertaken as part of the HIA. Interested and affected parties would have the opportunity to provide comment on the heritage aspects of the project during the PPP. During the survey of the original footprint the landowner was asked about heritage resources on site but was not aware of any.

4. PHYSICAL ENVIRONMENTAL CONTEXT

4.1. Site context

The site lies in a generally rural area but the south-eastern edge of Nigel, the suburb of Mackenzieville, lies about 600 m north and northeast of the study area. There is a farmhouse on the subject property to the southwest of the study area, while some ruins inside the study area.

4.2. Site description

The proposed development site is a fairly open area with scattered trees to the northeast of the existing farmhouse. Dense grass was present during the heritage survey of the original site (Figures 3 & 4). During the EAP's site visit, however, drought conditions pertained and the surface was well exposed (Figures 5 & 6). The substrate in the study area is generally sandy but low rocky outcrops and stones do occur (Figure 6).

¹ The system is intended for use on archaeological and palaeontological sites only.

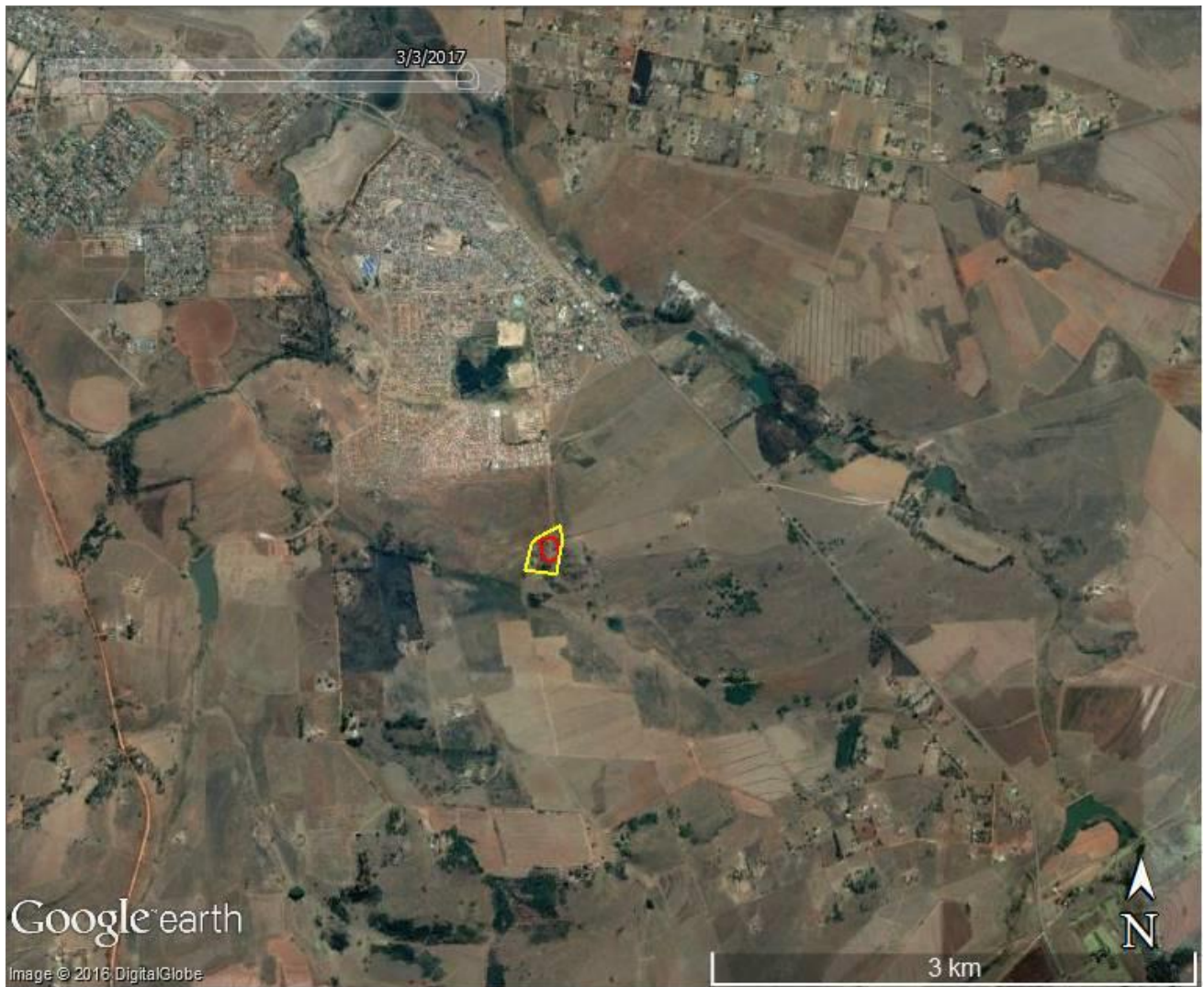


Figure 2: Aerial view of the property (yellow polygon) and study area (red polygon) showing their broader context.



Figure 3: View across the original site towards the south. The farmhouse lies among the trees in the background.



Figure 4: View towards the east with the study area behind the fence. The ruins lie in the background.



Figure 5: View across the site towards the east from showing scattered trees in the vicinity and foundations in the middle ground. This area is to the south of the main ruin.



Figure 6: View across the site towards the southeast showing a low rock outcrop and two small circular foundations. This area is just to the south of the main ruin.

5. HERITAGE CONTEXT

This section of the report contains the desktop study and establishes what is already known about heritage resources in the vicinity of the study area. What was found during the field survey as presented below may then be compared with what is already known in order to gain an improved understanding of the significance of the newly reported resources. It was found that very little research has been carried out in close proximity to Nigel.

5.1. Archaeological aspects

Approximately 50 km to the west of the study area is the Klipriviersberg Nature reserve where large Tswana settlements occur. These sites originate from Fokeng settlements that spread north across the Vaal River into the Balfour, Suikerbosrand, Klipriviersberg and Vredefort areas where the Fokeng interacted with the Sotho Tswana. Associated Ntsuanatsatsi pottery and Type N walling date from the 15th to 17th centuries and are also referred to as Klipriviersberg walling. In Gauteng, Klipriviersberg walling would not have been constructed after about AD 1823, when Mzilikazi entered the area (Huffman 2007). Some 28 km to the west at Suikerbosrand Nature Reserve is another cluster of Late Iron Age stone walled settlements. Here 760 ruins have been recorded (Sadr 2012) and classified into one of Taylor's (1979) three main types. No Iron Age stone walling or other archaeological sites are known from the Nigel area.

5.2. Historical aspects

The town of Nigel owes its existence to gold mining. After a few years of prospecting by a Mr Johnstone, the owner of the farm Varkensfontein, Mr Petrus Marais, received an offer to buy the farm from a stranger. He became suspicious and, because he did not live on the farm, he went to visit. On realising that the prospecting was yielding results, he started his own mining company which he called Nigel in 1888. Nigel remained a mining camp until, with sufficient growth, a local council was established in 1923. In 1930 this was elevated to a Town Council. The village then grew rapidly because its old mine was found to be very rich (Bacchus International 2016).

The Nigel area was also affected by the Anglo-Boer War. Although there were no battles there (Von der Heyde 2013: 203), Generals Alberts and Grobler led British troops into an ambush on 18th February 1902 in which ten British were wounded and fifty captured (Grobler 2004). The Witwatersrand area saw a total of nine black concentration camps being established, of which one was in the Nigel area (Bergh 1999: 54). These were usually located next to the railway lines. Until 1935, however, the nearest railway station was some eight kilometres to the west (Bacchus International 2016).

Sites dating to the Colonial Period primarily related to the Gold Mining industry of the past century and resulting urbanization and industrialization, occur widely in the Highveld and the Witwatersrand. Several impact assessment reports from the general area have recorded such sites (Fourie 2003; Kruger 2015; Van der Walt 2007; Van Schalkwyk & Pelser 2000).

A number of other impact assessments from the area recorded no heritage resources at all (Gaigher 2013; Tomose 2014; Van der Walt 2008).

6. FINDINGS OF THE HERITAGE STUDY

This section describes the heritage resources recorded in the study area during the course of the project. No specific heritage features were found within the study area, but comments on heritage in the broader landscape are offered as appropriate. Figure 7 shows an aerial view of the study area with the survey tracks indicated.



Figure 7: Aerial view of the property (yellow polygon) and study area (red polygon) showing the survey tracks (blue lines). Note that the tracks show the survey of the original site.

6.1. Archaeology

No archaeological resources were recorded in the original study area. Because of the vegetation present after the good summer rains, archaeological survey of the new site is unlikely to provide any new information. There is always the chance that isolated artefacts would be present but from photographs provided by the EAP we are confident that Iron Age stone walled settlements are absent from the proposed development site.

6.2. Palaeontology

The SAHRIS Palaeosensitivity Map indicates that the site lies in an area of low palaeontological sensitivity and that further assessment of this aspect is not required (Figure 8).

6.3. Graves

No graves were observed in the study area or its immediate surrounds. The ruins in the development footprint pertain to a twentieth century dairy which means that it is highly unlikely that graves would be associated with the structures.

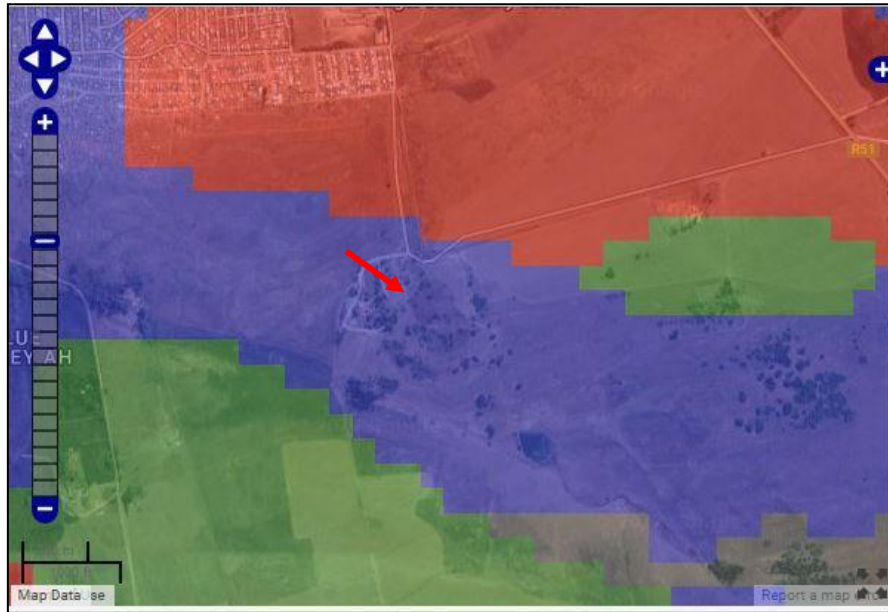


Figure 8: Aerial view of the study area extracted from the SAHRIS Palaeosensitivity Map and indicating the site (red arrow) to be of low sensitivity (blue shading).

6.4. Built environment

There are no built heritage resources in the study area but historical aerial photography indicates that the main house and some of its outbuildings predate 1945. The architectural style of the house indicates it to most likely be from the early-mid-20th Century. The outbuildings, some of which are made of stone, are less informative. A series of ruins pre-dating 1945 stand within the study area. The building fabric indicates that they are relatively modern, likely also dating to the early-mid-20th century. The main ruin was a dairy building, while smaller structures served as outbuildings and reservoirs. A stone and cement kraal (livestock enclosure) was built onto the dairy (Figure 13). Because of their age and derelict state respectively, they are not legally protected as either archaeology or buildings.



Figure 9: View of the farm complex from the study area. The farm house is in the centre, while stone outbuildings occur to the left and right.



Figure 12: View towards the northwest of the main dairy building (centre) and an outbuilding (left).



Figure 13: View of the northern wall of the main dairy building showing modern bricks with a concrete lintel above the doorway. The stone and cement kraal is visible to the right.



Figure 14: View of the north wall of a second outbuilding to the south of the main dairy building. Some cement foundations are visible to the right. Again, modern bricks are evident.

6.5. Cultural landscape

The vast majority of the trees comprising the historical tree lines visible in earlier aerial photography have been chopped down. Figure 4 shows a view towards the east through the area where a large tree line used to stand. This has unfortunately impacted on the historical cultural landscape. Figure 15 shows the broader area in 1945 and indicates that it has been an agricultural landscape for many years. Zooming in, one can see that the tree lines date back to before 1944 and were possibly originally planted as windrows to protect agricultural lands (Figure 16). However, it does not appear that the intervening land was under cultivation at the time. By 1958 the trees had grown larger (Figure 17).



Figure 15: 1945 aerial image (Job 55, strip 021, photograph 01231) and a modern view of the broader landscape around the site. Red arrow indicates the dairy.



Figure 16: 1945 aerial image (Job 55, strip 021, photograph 01231) and a modern view of the immediate context of the site. Red arrow indicates the dairy.



Figure 17: 1958 aerial photograph (Job 412, strip 010, photograph 01967) and modern view of the immediate context of the site.

The first 1:50 000 topographic map of the area dates to 1966 and shows the developing town to the north of the site (Figure 18). The farm is labelled 'Mispa' and the main house and main dairy building are indicated.

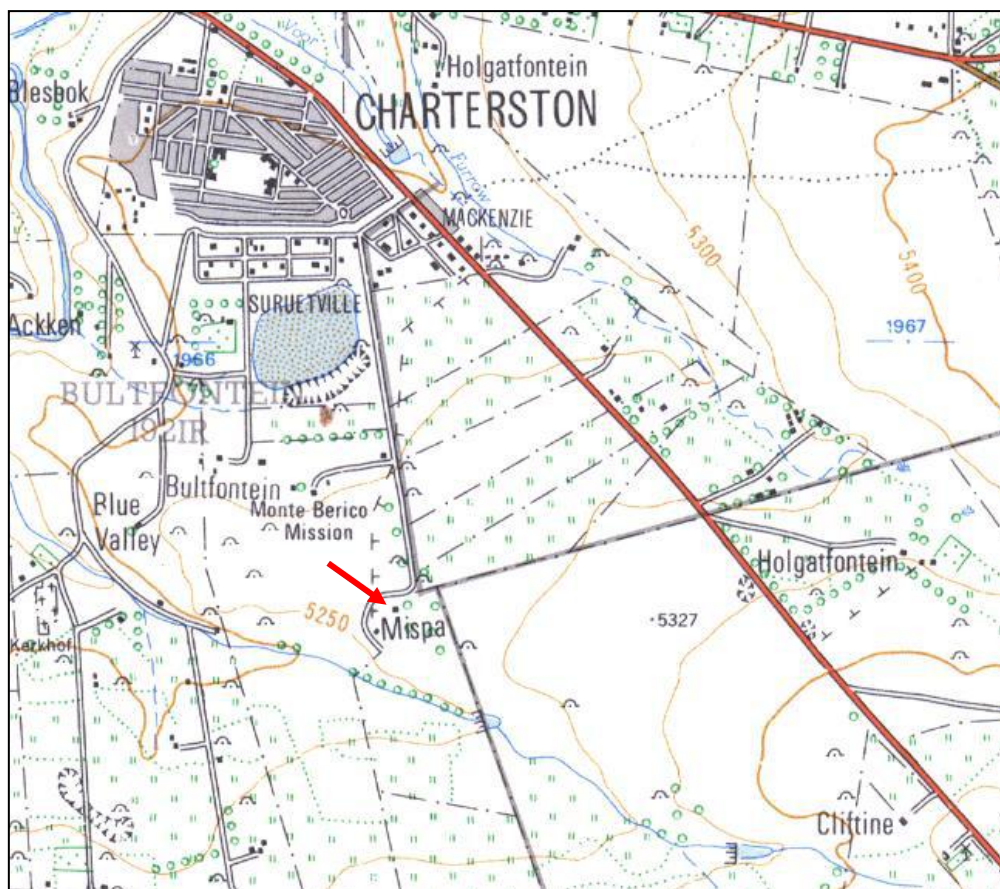


Figure 18: 1966 topographic map (1st edition). The dairy is arrowed.

6.6. Summary of heritage resources

There are no heritage resources within the study area, but the house and outbuildings on the property are regarded as heritage resources.

6.7. Statement of significance and provisional grading

Section 38(3)(b) of the NHRA requires an assessment of the significance of all heritage resources. In terms of Section 2(vi), “cultural significance” means aesthetic, architectural, historical, scientific, social, spiritual, linguistic or technological value or significance.

The only heritage resources in close proximity to the site appear to be the existing buildings on the farm. These are deemed to have no more than low-medium cultural significance for their architectural and social value. PHRAG does not have a grading guide and the SAHRA system applies only to archaeological and palaeontological resources so no grading is applied.

There is a possibility that isolated stone artefacts or potsherds are present on the site, but, because of their isolated nature and poor context, such finds would be regarded as having very low cultural significance for their scientific value. Following the SAHRA grading system, they would be graded as “General Protection C’.

7. IMPACT ASSESSMENT

The chances of impacting unknown archaeological sites in the study area is considered to be negligible. Any direct impacts that did occur would be during the construction phase only and would be of very low significance (Table 1).

The farm house and outbuildings greater than 60 years of age will not be directly impacted by the proposed development. The only possible impact is an indirect, contextual impact but, because the project is essentially adding another outbuilding to the existing farm complex, this is an impact that is in keeping with the agricultural land use and is thus given a neutral status. The significance of this impact is regarded as being very low (Table 1).

No significant cumulative impacts are expected because of the general lack of impacts to heritage resources that will result from this development and the general lack of significant resources known from the surroundings (Table 1).

8. LEGISLATIVE AND PERMIT REQUIREMENTS

Once a comment has been obtained from the relevant heritage authorities, there are no further legal requirements that need to be met in terms of heritage resources. No permits are needed, since no heritage resources have been found on site.

9. ENVIRONMENTAL MANAGEMENT PROGRAMME INPUTS

Due to the lack of heritage resources on the site, no heritage-related input to the environmental management programme is required.

10. EVALUATION OF IMPACTS RELATIVE TO SUSTAINABLE SOCIAL AND ECONOMIC BENEFITS

Section 38(3)(d) requires an evaluation of the impacts on heritage resources relative to the sustainable social and economic benefits to be derived from the development. In this instance there is a clear economic benefit to be derived from the proposed development and no significant heritage resources will be impacted.

11. CONCLUSIONS

No significant impacts to heritage resources are expected and the proposed development is in keeping with the generally agricultural land use in the surrounding area.

12. RECOMMENDATIONS

Because no heritage impacts are expected, it is recommended that the proposed piggery development should be authorised but subject to the following condition which should be incorporated into the Environmental Authorisation:

- If any archaeological material or human burials are uncovered during the course of development then work in the immediate area should be halted. The find would need to be reported to the heritage authorities and may require inspection by an archaeologist. Such heritage is the property of the state and may require excavation and curation in an approved institution.

Table 1: Impact assessment summary table.

Aspect/ Impact pathway	Nature of potential impact/risk	Status	Spatial Extent	Duration	Consequence	Probability	Reversibility of impact	Irreplaceability of receiving environment/resource	Potential mitigation measures	Significance of impact/risk = consequence x probability		Ranking of impact/risk	Confidence level
										Without mitigation /management	With mitigation /management (residual risk/impact)		
CONSTRUCTION PHASE: direct impacts to archaeological resources													
Clearing of site and construction of facility	Destruction of archaeological artefacts	Negative	Site	Permanent	Slight	Extremely unlikely	Non-reversible	High	None	Very Low	Very Low	5	High
CONSTRUCTION & OPERATION PHASES: indirect impacts to built heritage resources													
Construction and operation of facility	Existence of new structure on the landscape	Neutral	Site	Long term	Slight	Very likely	Reversible	High	None	Very Low	Very Low	5	High
CUMULATIVE IMPACTS: all heritage resources													
Clearing of site and construction and operation of facility	Impacts to heritage resources	Negative	Site	Permanent	Slight	Extremely unlikely	Non-reversible	High	None	Very Low	Very Low	5	High

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APPENDIX 1 – Curriculum Vitae



Curriculum Vitae

Jayson David John Orton

ARCHAEOLOGIST AND HERITAGE CONSULTANT

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Birth date and place: 22 June 1976, Cape Town, South Africa
Citizenship: South African
ID no: 760622 522 4085
Driver's License: Code 08
Marital Status: Married to Carol Orton
Languages spoken: English and Afrikaans

Education:

SA College High School	Matric	1994
University of Cape Town	B.A. (Archaeology, Environmental & Geographical Science)	1997
University of Cape Town	B.A. (Honours) (Archaeology)*	1998
University of Cape Town	M.A. (Archaeology)	2004
University of Oxford	D.Phil. (Archaeology)	2013

*Frank Schweitzer memorial book prize for an outstanding student and the degree in the First Class.

Employment History:

Spatial Archaeology Research Unit, UCT	Research assistant	Jan 1996 – Dec 1998
Department of Archaeology, UCT	Field archaeologist	Jan 1998 – Dec 1998
UCT Archaeology Contracts Office	Field archaeologist	Jan 1999 – May 2004
UCT Archaeology Contracts Office	Heritage & archaeological consultant	Jun 2004 – May 2012
School of Archaeology, University of Oxford	Undergraduate Tutor	Oct 2008 – Dec 2008
ACO Associates cc	Associate, Heritage & archaeological consultant	Jan 2011 – Dec 2013
ASHA Consulting (Pty) Ltd	Director, Heritage & archaeological consultant	Jan 2014 –

Memberships and affiliations:

South African Archaeological Society Council member	2004 –
Assoc. Southern African Professional Archaeologists (ASAPA) member	2006 –
ASAPA Cultural Resources Management Section member	2007 –
UCT Department of Archaeology Research Associate	2013 –
Heritage Western Cape APM Committee member	2013 –
UNISA Department of Archaeology and Anthropology Research Fellow	2014 –
Fish Hoek Valley Historical Association	2014 –

Professional Accreditation:

ASAPA membership number: 233, CRM Section member

Principal Investigator: Coastal shell middens (awarded 2007)
Stone Age archaeology (awarded 2007)
Grave relocation (awarded 2014)

Field Director: Rock art (awarded 2007)
Colonial period archaeology (awarded 2007)

Fieldwork and project experience:

Extensive fieldwork as both Field Director and Principle Investigator throughout the Western and Northern Cape, and also in the western parts of the Free State and Eastern Cape as follows:

Phase 1 surveys and impact assessments:

- Project types
 - Notification of Intent to Develop applications (for Heritage Western Cape)
 - Heritage Impact Assessments (largely in the Environmental Impact Assessment or Basic Assessment context under NEMA and Section 38(8) of the NHRA, but also self-standing assessments under Section 38(1) of the NHRA)
 - Archaeological specialist studies
 - Phase 1 test excavations in historical and prehistoric sites
 - Archaeological research projects
- Development types
 - Mining and borrow pits
 - Roads (new and upgrades)
 - Residential, commercial and industrial development
 - Dams and pipe lines
 - Power lines and substations
 - Renewable energy facilities (wind energy, solar energy and hydro-electric facilities)

Phase 2 mitigation and research excavations:

- ESA open sites
 - Duinefontein, Gouda
- MSA rock shelters
 - Fish Hoek, Yzerfontein, Cederberg, Namaqualand
- MSA open sites
 - Swartland, Bushmanland, Namaqualand
- LSA rock shelters
 - Cederberg, Namaqualand, Bushmanland
- LSA open sites (inland)
 - Swartland, Franschhoek, Namaqualand, Bushmanland
- LSA coastal shell middens
 - Melkbosstrand, Yzerfontein, Saldanha Bay, Paternoster, Dwarskersbos, Infanta, Knysna, Namaqualand
- LSA burials
 - Melkbosstrand, Saldanha Bay, Namaqualand, Knysna
- Historical sites
 - Franschhoek (farmstead and well), Waterfront (fort, dump and well), Noordhoek (cottage), variety of small excavations in central Cape Town and surrounding suburbs
- Historic burial grounds
 - Green Point (Prestwich Street), V&A Waterfront (Marina Residential), Paarl

CV Jaco van der Walt

PERSONAL PARTICULARS:

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SYNOPSIS

Jaco has been actively involved as a professional archaeologist within the heritage management field in southern Africa for the past 15 years. Jaco acted as council member for the Association of Southern African Professional Archaeologist (ASAPA Member #159) in the Cultural Resource Management (CRM) portfolio for two years (2011 – 2012). Jaco was also a Research Associate with the University of Johannesburg from 2011 – 2013. He is well respected in his field and published in peer reviewed journals and presented his findings on various national and international conferences.

ACADEMIC QUALIFICATIONS:

Date of matriculation: 1995
Particulars of degrees/diplomas and/or other qualifications:
Name of University or Institution: University of Pretoria
Degree obtained : BA
Major subjects : Archaeology
Cultural Heritage Tourism
Year of graduation : 2001

Name of University or Institution: University of the Witwatersrand
Degree obtained : BA [Honours]
Major subjects : Archaeology
Year of graduation : 2002

Name of University or Institution : University of the Witwatersrand
Degree Obtained : BA [Masters]
Major subject : Archaeology
Year of Graduation : 2012

EMPLOYMENT HISTORY:

2011 – Present: **Owner - Heritage Contracts and Archaeological Consulting CC.**
2007 – 2010 : **CRM Archaeologist**, Managed the Heritage Contracts Unit at the
University of the Witwatersrand.
2005 - 2007: **CRM Archaeologist**, Director of Matakoma Heritage Consultants
2004: **Technical Assistant**, Department of Anatomy University of Pretoria
2003: **Archaeologist**, Mapungubwe World Heritage Site
2001 - 2002: **CRM Archaeologists**, For R & R Cultural Resource Consultants,
Polokwane
2000: **Museum Assistant**, Fort Klapperkop.

Countries of work experience include:

Republic of South Africa, Botswana, Zimbabwe, Mozambique, Tanzania, The Democratic Republic of the Congo, Lesotho and Zambia.

MEMBERSHIP OF PROFESSIONAL ASSOCIATIONS:

- Association of Southern African Professional Archaeologists. Member number 159
- Association of Southern African Professional Archaeologists Cultural Resource Management Section
Accreditation: Field Director Iron Age Archaeology
Field Supervisor – Colonial Period
Archaeology, Stone Age Archaeology and Grave
Relocation
- Accredited CRM Archaeologist with SAHRA
- Accredited CRM Archaeologist with AMAFA
- Co-opted council member for the CRM Section of the Association of Southern African Association
Professional Archaeologists (2011 – 2012)

REFERENCES:

- | | |
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E-mail: mlombard@uj.ac.za |
| 2. Prof TN Huffman | Department of Archaeology Tel: (011) 717 6040
University of the Witwatersrand |
| 3. Alex Schoeman | University of the Witwatersrand E-mail: Alex.Schoeman@wits.ac.za |

A close-up photograph of several pig noses and snouts, showing their pinkish color and texture. The pigs are looking towards the camera.

Basic Assessment for the
Mojaletema Primary Co-
Operative (Pty) Ltd's proposed
piggery facility on Portion 15 of
Farm Bultfontein 192 IR,
Nigel, Gauteng.

APPENDIX H: Environmental Management Programme (EMPr)



SECTION F: APPENDICES

DRAFT BASIC ASSESSMENT REPORT

Basic Assessment for the Mojaletema Primary Co-Operative (Pty) Ltd's proposed piggery facility on Portion 15 of Farm Bultfontein 192 IR, Nigel, Gauteng.

contents

<u>1. INTRODUCTION</u>	<u>2</u>
1.1 Purpose of the Environmental Management Programme	2
1.2 Contents of the EMPr	2
1.3 Environmental Assessment Practitioner	4
<u>2. PROJECT BACKGROUND</u>	<u>5</u>
2.1 Project Activities	5
2.1.1 Reproduction Cycle	6
2.1.2 Piglets	6
2.1.3 Weaner stage	6
2.2 Listed Activities	6
<u>3. DESCRIPTION OF APPLICABLE LEGISLATION, POLICIES AND GUIDELINES.</u>	<u>8</u>
<u>4. ENVIRONMENTAL MANAGEMENT STRUCTURE</u>	<u>10</u>
4.1 Roles and Responsibilities	10
<u>5. ENVIRONMENTAL MANAGEMENT PLAN</u>	<u>12</u>
<u>6. ENVIRONMENTAL AWARENESS AND TRAINING PLAN</u>	<u>26</u>

SECTION F: APPENDICES

DRAFT BASIC ASSESSMENT REPORT

Basic Assessment for the Mojaletema Primary Co-Operative (Pty) Ltd's proposed piggery facility on Portion 15 of Farm Bultfontein 192 IR, Nigel, Gauteng.

1. INTRODUCTION

1.1 Purpose of the Environmental Management Programme

This Draft Environmental Management Programme (EMPr) is prepared as part of the requirements of the Environmental Impact Assessment (EIA) Regulations (December 2014, as amended) promulgated under the National Environmental Management Act (NEMA) (Act 107 of 1998, as amended). The purpose of this Environmental Management Programme (EMPr) is to ensure "good environmental practice" by taking a holistic approach to the management and mitigation of environmental impacts during the construction and operation phase of Mojaletema Primary Co-Operative's proposed piggery development. This EMPr therefore sets out the methods by which proper environmental controls are to be implemented by the piggery's management. The Draft EMPr is to be submitted to the Gauteng Department of Agriculture and Rural Development (GDARD) as part of the Application for Environmental Authorisation for Mojaletema Primary Co-Operative's proposed piggery development Portion 15 of Farm Bultfontein 192 IR in Nigel, Johannesburg. This EMPr is considered as a document that can be updated as new information becomes available during the construction, operational and operational phases, if applicable, of the proposed development. Mitigations measure need to be implemented as addressed in this EMPr, except where they are not applicable, and additional measures should be considered when necessary. The EMPr identifies the following:

- Construction and Operation activities that will impact on the environment;
- Specifications with which the piggery's management shall comply in order to protect the environment from the identified impacts; and
- Actions that shall be taken in the event of non-compliance. This EMPr incorporates management plans for the design, construction, operation and decommissioning phases of the project, which consist of the following components:
 - Impact: The potential positive or negative impact of the development that needs to be enhanced, mitigated or eliminated.
 - Objectives: The objectives necessary in order to meet the goal; these take into account the findings of the specialist studies.
 - Mitigation/Management Actions: The actions needed to achieve the objectives, taking into consideration factors such as responsibility, methods, frequency, resources required and prioritisation.
 - Monitoring: The key monitoring actions required to check whether the objectives are being achieved, taking into consideration responsibility, frequency, methods and reporting.

1.2 Contents of the EMPr

This EMPr specifies the management actions necessary to ensure minimal environmental impacts, as well as procedures for monitoring these impacts associated with the proposed activity. In terms of legal compliance, this EMPr aims to satisfy appendix 4 of Government Notice Regulation 982 of 4 December 2014, presented in Table 1 below.

SECTION F: APPENDICES

DRAFT BASIC ASSESSMENT REPORT

Basic Assessment for the Mojaletema Primary Co-Operative (Pty) Ltd's proposed piggery facility on Portion 15 of Farm Bultfontein 192 IR, Nigel, Gauteng.

Table 1: Compliance with Appendix 4 of Government Notice Regulation 982 of 4 December 2014 and Section 24N of the National Environmental Management Act 107 of 1998.

Requirements according to Appendix 4 of GNR 982 of 4 December 2014	Section
(1) An EMPr must comply with section 24N of the Act and include-	
a) details of -	Section 1.3
(i) the EAP who prepared the EMPr; and	Appendix I
(ii) the expertise of that EAP to prepare an EMPr, including a curriculum vitae;	
b) a detailed description of the aspects of the activity that are covered by the EMPr as identified by the project description;	Section 2
c) a map at an appropriate scale which superimposes the proposed activity, its associated structures, and infrastructure on the environmental sensitivities of the preferred site, indicating any areas that any areas that should be avoided, including buffers;	Section 2, Figure 2-1, 2-2, 2-3
d) a description of the impact management objectives, including management statements, identifying the impacts and risks that need to be avoided, managed and mitigated as identified through the environmental impact assessment process for all phases of the development including-	Section 4
(i) planning and design;	Section 4
(ii) pre-construction activities;	Section 4
(iii) construction activities;	Section 4
(iv) rehabilitation of the environment after construction and where applicable post closure; and	Section 4
(v) where relevant, operation activities;	Section 4
e) a description and identification of impact management outcomes required for the aspects contemplated in paragraph (d);	Section 4
f) a description of proposed impact management actions, identifying the manner in which the impact management objectives and outcomes contemplated in paragraphs (d) and (e) will be achieved, and must, where applicable, include actions to –	Section 4
i. avoid, modify, remedy, control or stop any action, activity or process which causes pollution or environmental degradation;	
ii. comply with any prescribed environmental management standards or practices;	Section 4
iii. comply with any applicable provisions of the Act regarding closure, where applicable; and	N/A
iv. comply with any provisions of the Act regarding financial provisions for rehabilitation, where applicable;	N/A
g) the method of monitoring the implementation of the impact management actions contemplated in paragraph (f);	Section 4
h) frequency of monitoring the implementation of the impact management actions contemplated in paragraph (f);	Section 4
i) an indication of the persons who will be responsible for the implementation of the impact management actions;	Section 4
j) the time periods within which the impact management actions contemplated in paragraph (f) must be implemented;	Section 4
k) the mechanism for monitoring compliance with the impact management actions contemplated in paragraph (f);	Section 4

SECTION F: APPENDICES

DRAFT BASIC ASSESSMENT REPORT

Basic Assessment for the Mojaletema Primary Co-Operative (Pty) Ltd's proposed piggery facility on Portion 15 of Farm Bultfontein 192 IR, Nigel, Gauteng.

Requirements according to Appendix 4 of GNR 982 of 4 December 2014	Section
l) a program for reporting on compliance, taking into account the requirements as prescribed by the Regulations;	Section 4
m) an environmental awareness plan describing the manner in which- (i) the applicant intends to inform his or her employees of any environmental risk which may result from their work; and (ii) risks must be dealt with in order to avoid pollution or the degradation of the environment; and	Section 4
n) any specific information that may be required by the competent authority.	N/A

1.3 Environmental Assessment Practitioner

The Environmental Management Services (EMS) falls under the Specialist Services (SS) group within the Implementation Unit (IU) of the Council for Scientific and Industrial Research (CSIR). The CSIR is amongst the largest multi-disciplinary research and development organizations in Africa, which undertakes applied research and development for implementation across the continent, as well as providing consulting services to industry, government and international agencies. It has been one of the leading organisations in South Africa contributing to the development and implementation of environmental assessment and management methodologies and sustainability science.

The EMS vision is to assist in ensuring the sustainability of projects or plans in terms of environmental and social criteria, by providing a range of environmental services that extend across the project and planning life cycles. This group has over 20 years of experience in environmental management practices and research methodologies, as well as in conducting environmental assessment and management studies in over 15 countries in Africa, in particular in southern and West Africa, and elsewhere in the world. The EMS group links closely with wider CSIR expertise in areas such as resource mapping, biodiversity assessment, socio-economic assessments, strategic infrastructure development studies, environmental screening studies, natural resource management, etc. The group has also prepared guidelines such as the Integrated Management Series and Guidelines for Environmental Impact Assessment for the Western Cape provincial Government.

Organisation	Council for Scientific and Industrial Research (CSIR)
Postal Address	PO Box 320, Stellenbosch, 7599
Email	sngema@csir.co.za / mlevendal@csir.co.za
Telephone	021 888 2408 / 021 888 2495
Fax	021 888 2693
Project Team	
Name	Qualification & Expertise
Samukele Ngema	• MPhil: Urban and Regional Planning (Stellenbosch University) • One years' experience in Environmental Management and conducting Basic Assessments
Minnelise Levendal	• MSC Biological Science (Botany) (Stellenbosch University) • More than 17 years of experience in Environmental Management • Inclusive of 10 years' experience in conducting Environmental Assessments

SECTION F: APPENDICES

DRAFT BASIC ASSESSMENT REPORT

Basic Assessment for the Mojaletema Primary Co-Operative (Pty) Ltd's proposed piggery facility on Portion 15 of Farm Bultfontein 192 IR, Nigel, Gauteng.

This Environmental Management Programme that has been compiled in fulfilment of the requirements of the Environmental Impact Assessment Regulations (2014). This EMPr describe the activities that are proposed, and prescribe the management, mitigation and monitoring measures that must be implemented to ensure that potential negative environmental or socio-economic impacts that may be associated with the development are avoided or mitigated correctly, and to ensure that positive impacts of the proposed development are promoted where possible. This document also intended to ensure that the principles of Environmental Management specified in the National Environmental Management Act are promoted during the different phases of the proposed development of a piggery.

2. PROJECT BACKGROUND

2.1 Project Activities

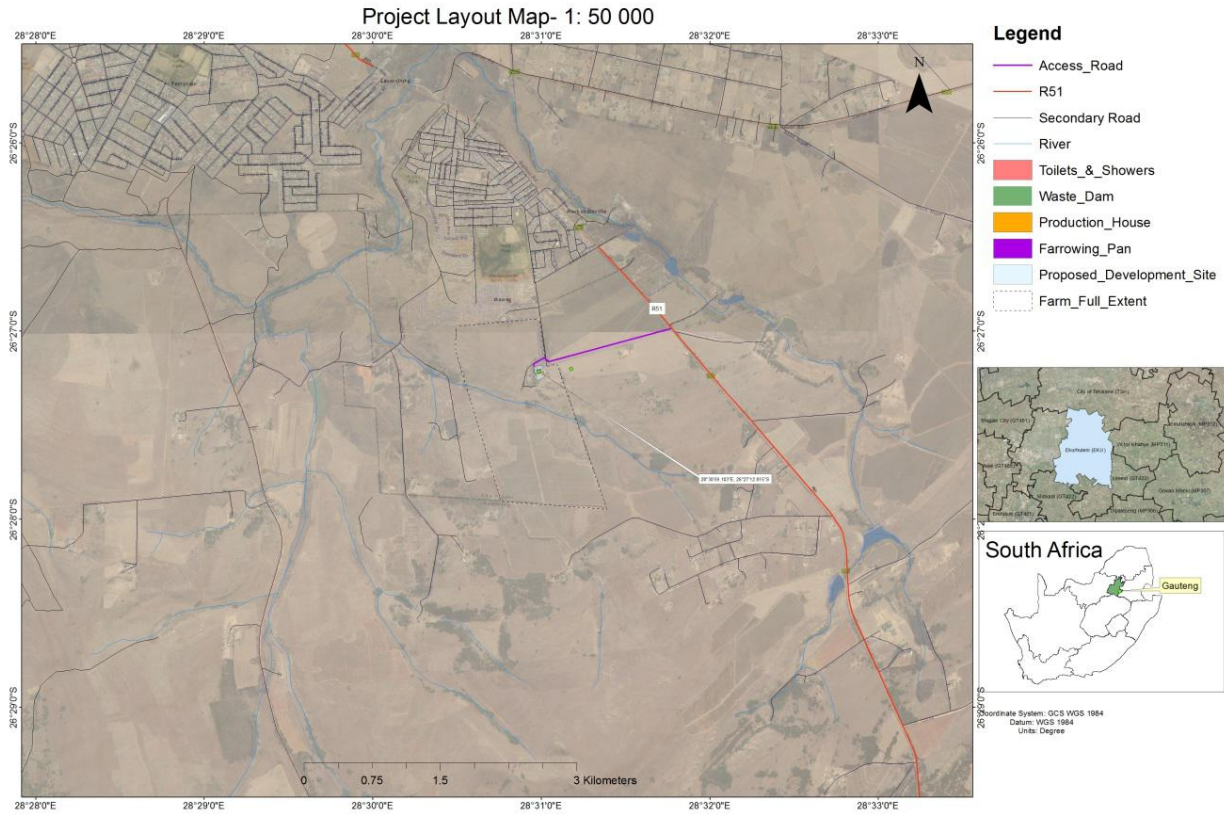
The proposed site is located on Portion 15 of Farm Bultfontein 192 IR in Nigel. The project is within the 88th Ward of the Ekurhuleni Metropolitan Municipality in Gauteng province. The property is located 1.5 kilometers of the major R51 which links Nigel to Springs. The site is currently zoned and operating as agricultural use. The Mojaletema Primary Co-operative is an initiative of five family members who are currently farming maize whilst selling sheep, goats and cattle to the local market. This application is for the commencement of a piggery production. The proposed project seeks to increase its sustainable production of local produce to the market with the inclusion of 248 pigs (240 sows & 8 boars) with a through put of roughly 4800 pigs of mixed ages.

The layout plan of the preferred alternative has been developed based on the outcome of the specialist studies and sensitivity mapping. The current development footprint totals at 1.2 ha. This will be broken down into a 119 m³ Slurry Dam, 3 pig houses, 2 pig houses and sales office, living quarters and feeding silo. The pig housing will have a mixture of both slated and concrete floors. The pig waste will fall through the slatted flooring and stored there temporarily before being washed via a closed gutter to the slurry dam. The slurry dam will be water covered with the waste settling at the bottom to eliminate the smell. The overflowing water will be disinfected and reused to clean the piggery again. After the digestion period the waste will be pumped out of the dam and used as fertilizer on the maize crops.

SECTION F: APPENDICES

DRAFT BASIC ASSESSMENT REPORT

Basic Assessment for the Mojaletema Primary Co-Operative (Pty) Ltd's proposed piggery facility on Portion 15 of Farm Bultfontein 192 IR, Nigel, Gauteng.



2.1.1 Reproduction Cycle

The chosen breed is Landrace because it provides a high litter birth weight, good carcass quality and reproduction characteristics as the sow has a good temperament. All the different stages of the pig production process have different requirements, housing, nutrition and treatment. The sows will be introduced to a boar within 21 days of oestrus, being pregnant after 114 days of the farrowing the litter will be allowed to wean at 28 days. A week after weaning the sow will be mated again, producing twice a year and ending it pregnant.

2.1.2 Piglets

Piglets are kept in farrowing pen with their mother until weaning. They suck from their mother within the first three hours, have iron injections and be marked for identification

2.1.3 Weaner stage

Weaners will be fed grower meal at the start and substituted with feed which will fatten the weaner as it becomes a piglet, eating 2.5 kg feed per day. After 8 to 10 weeks the weaners will be moved to the grower pen and start the next level of the production cycle.

2.2 Listed Activities

As part of the proposed piggery expansion, listed activities defined under the National Environmental Management Act, Act No. 107 of 1998 (NEMA, 1998), as amended, in terms of the Environmental Impact Assessment (EIA) Regulations, Government Notice (GNR) 983 of 4 December 2014, and in terms of the

SECTION F: APPENDICES

DRAFT BASIC ASSESSMENT REPORT

Basic Assessment for the Mojaletema Primary Co-Operative (Pty) Ltd's proposed piggery facility on Portion 15 of Farm Bultfontein 192 IR, Nigel, Gauteng.

National Environmental Management Waste Act (NEM:WA) Regulations GNR 921 of 29 November 2013 there under will take place. Relevant listed activities triggered by the proposed activities are described as follows:

- **GN R 983**, 8 December 2014 Activity 4: The development and related operation of facilities or infrastructure for the concentration of animals for the purpose of commercial production in densities that exceeds- (ii) 8 square meters per small stock unit and; (a) More than 1 000 units per facility excluding pigs were (b) more than 250 pigs per facility excluding piglets that are not yet weaned.
- **GN R 983**, 8 December 2014 Activity 27: The clearance of an area of 1 hectare or more, but less than 20 hectares of indigenous vegetation, except where such clearance of indigenous vegetation is required for- the undertaking of a linear activity; or ii) maintenance purposes undertaken in accordance with a maintenance management plan.
- **GNR 921**, 29 November 2013 Category A1: Storage of waste- The storage of general waste in lagoons
- **GNR 921**, 29 November 2013 Category A2: Construction, expansion or decommissioning of facilities and associated structures and infrastructure- The construction of a facility for a waste management activity listed in Category A of this Schedule (not in isolation to associated waste management activity).

SECTION F: APPENDICES

DRAFT BASIC ASSESSMENT REPORT

Basic Assessment for the Mojaletema Primary Co-Operative (Pty) Ltd's proposed piggery facility on Portion 15 of Farm Bultfontein 192 IR, Nigel, Gauteng.

3. DESCRIPTION OF APPLICABLE LEGISLATION, POLICIES AND GUIDELINES.

Description of compliance with the relevant legislation, policy or guideline:	
Legislation, policy or guideline	Description of compliance
National Environmental Management Act, 1998 (Act No. 107 of 1998 as amended).	The Environmental Authorisation for the proposed development is lawfully applied for in terms of the EIA Regulations, 2014, promulgated under NEMA. The conditions on the Environmental Authorisation, if approved, will be adhered to.
National Water Act, 1998 (Act No. 36 of 1998) as amended	Pertinent legislation published under this act will be adhered to as well as a Water Use License Application.
National Heritage Resources Act, 1999 (Act No. 25 of 1999)	Submitted the proposed project to the South African Heritage Resources Agency (SAHRA) online platform South African Heritage Resources Information System (SAHRIS)
National Environmental Management Biodiversity Act, 2004 (Act No. 10 of 2004)	The National Environmental Management Biodiversity Act, 2004 (Act No. 10 of 2004) as amended (NEMBA) including all the pertinent legislation published in terms of this act was considered in undertaking this Basic Assessment process. This included the determination and assessment of the fauna and flora prevailing in the proposed project and the handling thereof in terms of NEMBA.
National Environmental Management Waste Act, 2009 (Act No. 59 of 2008)	An application for a Waste Management Licence will be submitted in terms of NEM:WA as the proposed activity pertains to the following activities of the Act: <i>Category A (1):</i> The storage of general waste in lagoons. <i>Category A (12):</i> The construction of a facility for a waste management activity listed in Category A of this Schedule (not in isolation to associated waste management activity).
Environmental Impact Assessment Regulations, 2014	All the triggered activities as per National Environmental Management Act (Act No. 107 of 1998) have been listed below.
National Development Plan: A Vision for 2030	The South African Government through the Presidency has published a National Development Plan. The Plan aims to eliminate poverty and reduce inequality by 2030. The Plan has the target of developing people's capabilities to be to improve their lives through education and skills development, health care, better access to public transport, jobs, social protection, rising income, housing and basic services, and safety. It proposes the following strategies to address the

SECTION F: APPENDICES

DRAFT BASIC ASSESSMENT REPORT

Basic Assessment for the Mojaletema Primary Co-Operative (Pty) Ltd's proposed piggery facility on Portion 15 of Farm Bultfontein 192 IR, Nigel, Gauteng.

Description of compliance with the relevant legislation, policy or guideline:	
Legislation, policy of guideline	Description of compliance
	above goals: 1. Creating jobs and improving livelihoods; 2. Expanding infrastructure; 3. Transition to a low-carbon economy; 4. Transforming urban and rural spaces; 5. Improving education and training; 6. Providing quality health care; 7. Fighting corruption and enhancing accountability; 8. Transforming society and uniting the nation.
Ekurhuleni Integrated Development Plan: 2016-2021	The Spatial Development Framework (SDF) is the legislated component of the municipality's IDP that prescribes development strategies and policy guidelines to restructure and reengineer the urban and rural form. The SDF is the municipality's long-term vision of what it wishes to achieve spatially, and within the IDP programmes and projects. The SDF should not be interpreted as a blueprint or master plan aimed at controlling physical development, but rather the framework giving structure to an area while allowing it to grow and adapt to changing circumstances. The proposed project falls within ward 88 of Region EMM of the Spatial Development Framework and is located on the South Eastern part of the Municipality of Ekurhuleni. As a resource, the farm portion holds large undeveloped areas, which could in future accommodate growth. Description of compliance with the relevant legislation, policy or guideline: According to the Regional IDP (Region EMM) for Ekurhuleni, The proposed project is in an area regarded as rural which is marked for creating employment providing food and work opportunities.
Ekurhuleni Spatial Development Framework:	

SECTION F: APPENDICES

DRAFT BASIC ASSESSMENT REPORT

Basic Assessment for the Mojaletema Primary Co-Operative (Pty) Ltd's proposed piggery facility on Portion 15 of Farm Bultfontein 192 IR, Nigel, Gauteng.

4. ENVIRONMENTAL MANAGEMENT STRUCTURE

Mojaletema Primary Co-Operative's management will develop an Environmental Management Structure, in line with this EMPr, that is appropriate to the size and scale of the project to develop and implement roles and responsibilities with regards to environmental management.

4.1 Roles and Responsibilities

Key roles and responsibilities in order to meet the overall goal for environmental management of the proposed piggery development are as follows:

Mojaletema Primary Co-Operative Management (hereafter referred to as "Management")

Management is responsible for the overall environmental monitoring and implementation of the EMPr, and ensuring compliance thereof with the specifications of the Environmental Authorisation (EA) issued in terms of NEMA. Management should also ensure that any other permits or licences required as part of this project are obtained and complied with. Mojaletema Primary Co-Operative may however, at their own costs, render the services of an external environmental consultant to oversee the implementation of the documented mitigation measures of this EMPr. It is also expected that management will appoint an Environmental Control Officer, Environmental Health and Safety Officer, and Construction Manager.

Environmental Control Officer

The Environmental Control Officer (ECO) will be the responsible person for ensuring that the provisions of the EMPr as well as the EA are complied with at all times. The ECO must fully communicate the environmental management processes associated with the project, particularly the EMPr, as well as review and ensure compliance with the conditions of the EMPr. The ECO will be responsible for issuing instructions to contractors and employees in terms of actions required with regards to environmental considerations. The ECO shall, on a regular basis, prepare and submit written reports to Management and the Competent Environmental Authority (GDARD) as required.

Environmental Health & Safety (EHS) Officer

It is important to note that the EHS Manager will be appointed to fulfil the roles of the Environmental Officer during the construction phase and that of the Environmental Manager during the operational phase. A generic term has therefore been assigned to this sector of roles and responsibilities. The responsibility of the EHS Manager includes overseeing the implementation of the EMPr during the construction and operational phases, monitoring environmental impacts, record-keeping and updating of the EMPr as and when necessary. The EHS Manager is also responsible for monitoring compliance with the conditions of the Environmental Authorisation that may be issued to Mojaletema Primary Co-Operative.

The lead contractor and sub-contractors may have their own Environmental Officers, or designate Environmental Officer functions to certain personnel.

During construction, the EHS Manager will be responsible for the following:

- Meeting on site with the Construction Manager prior to the commencement of construction activities to confirm the construction procedure and designated activity zones.
- Daily or weekly monitoring of site activities during construction to ensure adherence to the specifications contained in the EMPr and Environmental Authorisation (should such authorisation be granted by GDARD), using a monitoring checklist that is to be prepared at the start of the construction phase.
- Preparation of the monitoring report based on the daily or weekly site visit.

SECTION F: APPENDICES

DRAFT BASIC ASSESSMENT REPORT

Basic Assessment for the Mojaletema Primary Co-Operative (Pty) Ltd's proposed piggery facility on Portion 15 of Farm Bultfontein 192 IR, Nigel, Gauteng.

- Reporting of any non-conformances within 48 hours of identification of such non-conformance to the relevant agents.
- Conducting an environmental inspection on completion of the construction period and 'signing off' the construction process with the Construction Manager.

During operation, the EHS Manager will be responsible for:

- Overseeing the implementation of the EMPr and monitoring programmes for the operation phase.
- Reviewing the findings of the monitoring and highlight concerns to management and TNPA where necessary.
- Ensuring compliance with the Environmental Authorisation conditions.
- Ensuring that the necessary environmental monitoring takes place as specified in the EMPr.
- Updating the EMPr and ensuring that records are kept of all monitoring activities and results.

During decommissioning, the EHS Manager will be responsible for:

- Overseeing the implementation of the EMPr for the decommissioning phase; and
- Conducting an environmental inspection on completion of decommissioning and 'signing off' the site rehabilitation process.

At the time of preparing this EMPr, the EHS Manager appointment is still to be made by the applicant. The appointment of the EHS Officer is dependent upon the project proceeding to the construction phase.

Construction Manager

The construction manager will be responsible for the following:

- Overall construction programme, project delivery and quality control for the construction of the facility.
- Overseeing compliance with the Health, Safety and Environmental Responsibilities specific to the project construction.
- Promoting total job safety and environmental awareness by employees, contractors and subcontractors and stress to all employees and contractors and sub-contractors the importance that the project proponent attaches to safety and the environment.
- Ensuring that each subcontractor employs an Environmental Officer (or have a designated Environmental Officer function) to monitor and report on the daily activities on-site during the construction period.
- Ensuring that safe, environmentally acceptable working methods and practices are implemented and that sufficient plant and equipment is made available, is properly operated and maintained in order to facilitate proper access and enable any operation to be carried out safely.
- Meeting on site with the EHS Manager prior to the commencement of construction activities to confirm the construction procedure and designated activity zones.
- Ensuring that all appointed contractors and sub-contractors are aware of this EMPr and their responsibilities in relation to the programme.
- Ensuring that all appointed contractors and sub-contractors repair, at their own cost, any environmental damage as a result of a contravention of the specifications contained in the EMPr, to the satisfaction of the EHS Manager.

At the time of preparing this Draft EMPr, a construction manager has not been appointed and appointment will depend on the project receiving authorisation and proceeding to the construction phase.

SECTION F: APPENDICES

DRAFT BASIC ASSESSMENT REPORT

Basic Assessment for the Mojaletema Primary Co-Operative (Pty) Ltd's proposed piggery facility on Portion 15 of Farm Bultfontein 192 IR, Nigel, Gauteng.

5. ENVIRONMENTAL MANAGEMENT PLAN

As part of environmental management and enhancement, an identification and description of impact management objectives must be developed, inclusive of the proposed methods and effective management and mitigation measures required during the design, construction and operational phases of the proposed piggery. The table below lists potential impacts and mitigation measures recommended for the proposed Mojaletema Primary Co-Operative piggery development at the different phases.

SECTION F: APPENDICES

DRAFT BASIC ASSESSMENT REPORT

Basic Assessment for the Mojaletema Primary Co-Operative (Pty) Ltd's proposed piggery facility on Portion 15 of Farm Bultfontein 192 IR, Nigel, Gauteng.

Impact Description	Environmental Objective	Management/Mitigation Measures	Monitoring Compliance & Reporting	Monitoring Frequency	Responsibility
CONSTRUCTION PHASE					
Loss or degradation of local wetland areas	Avoid disturbing in situ and neighbouring wetland areas and their buffers.	Demarcate or fence in the construction site.		Prior to and during construction	Mojaletema Management, Construction Crew
		Highlight all prohibited activities to workers through training and notices.		Prior to and during construction	Mojaletema Management, Construction Crew
		Commence (and preferably complete) construction activities during winter when the risk of erosion and sedimentation should be least.		Prior to and during construction	Mojaletema Management, Construction Crew
	Establish measures on the access road to reduce dust, erosion and sedimentation.	Design measures to effectively control vehicle access, vehicle speed, dust, stormwater run-off, erosion and sedimentation on the road.		Pre-construction	CSIR, Mojaletema Management
		Implement the measures that were designed to control impacts on the road preferably during winter, when the risk of erosion should be least.		During construction	Mojaletema Management, Construction Crew
Loss of terrestrial vegetation and faunal habitat	Avoid unnecessary loss of indigenous vegetation and faunal habitats.	Modify the layout of planned infrastructure to avoid important floral communities (rocky grassland around the entrance area) and large		Pre-construction	CSIR, Mojaletema Management, with advice from a Botanist / Horticulturist

SECTION F: APPENDICES

DRAFT BASIC ASSESSMENT REPORT

Basic Assessment for the Mojaletema Primary Co-Operative (Pty) Ltd's proposed piggery facility on Portion 15 of Farm Bultfontein 192 IR, Nigel, Gauteng.

Impact Description	Environmental Objective	Management/Mitigation Measures	Monitoring Compliance & Reporting	Monitoring Frequency	Responsibility
		indigenous trees.			
		Identify and mark any indigenous trees (these are limited on site) on the ground. Those that are small and cannot be avoided should be transplanted elsewhere on site.		Pre-construction	Mojaletema Management, Construction Crew, with advice from a Botanist / Horticulturist
		Demarcate or fence in the construction site.		Prior to and during construction	Mojaletema Management, Construction Crew
		Highlight all prohibited activities to workers through training and notices.		Prior to and during construction	
		Commence (and preferably complete) construction activities during winter, when the risk of disturbing growing plants should be least.		Prior to and during construction	Mojaletema Management, Construction Crew
	Promote re-establishment of indigenous vegetation in disturbed areas.	Briefly and effectively stockpile topsoil preferably 1-1.5m in height.		During construction	Mojaletema Management, Construction Crew
		Use the topsoil to allow natural vegetation to establish in disturbed areas. If recovery is slow, then a seed mix for the area (using indigenous grass species listed within this report) should be sourced and planted.		During construction	Mojaletema Management, Construction Crew, with advice from a Botanist / Horticulturist

SECTION F: APPENDICES

DRAFT BASIC ASSESSMENT REPORT

Basic Assessment for the Mojaletema Primary Co-Operative (Pty) Ltd's proposed piggery facility on Portion 15 of Farm Bultfontein 192 IR, Nigel, Gauteng.

Impact Description	Environmental Objective	Management/Mitigation Measures	Monitoring Compliance & Reporting	Monitoring Frequency	Responsibility
		Do not undertake any landscaping with alien flora.		During construction	Mojaletema Management, Construction Crew, with advice from a Botanist / Horticulturist
Loss of CI or medicinal flora	Adhere to law and best practice guidelines regarding CI and medicinally important flora.	Obtain permits to remove CI species.		Pre-construction	CSIR, Mojaletema Management
		Transplant CI and medicinally important floral specimens from the infrastructure footprint to suitable and safe locations elsewhere on site or nearby.		Pre-construction	Mojaletema Management, Construction Crew, with advice from a Botanist / Horticulturist
		Obtain guidance from a suitably qualified vegetation specialist or horticulturist regarding the collection, propagation/storage and transplantation of plants.		During construction	
	Prohibit harvesting of CI and medicinally important flora.	Highlight all prohibited activities to workers through training and notices.		Prior to and during construction	Mojaletema Management, Construction Crew
		Prohibit harvesting of CI and medicinal flora on site by community members through notices and site access control (e.g. fencing).		During construction	Mojaletema Management

SECTION F: APPENDICES

DRAFT BASIC ASSESSMENT REPORT

Basic Assessment for the Mojaletema Primary Co-Operative (Pty) Ltd's proposed piggery facility on Portion 15 of Farm Bultfontein 192 IR, Nigel, Gauteng.

Impact Description	Environmental Objective	Management/Mitigation Measures	Monitoring Compliance & Reporting	Monitoring Frequency	Responsibility
Loss of CI fauna	Adhere to law and best practice guidelines regarding the displacement of CI faunal species.	Commence (and preferably complete) construction during winter, when the risk of disturbing active (including breeding and migratory) animals, should be least.		Prior to and during construction	Mojaletema Management, Construction Crew
		Check open trenches for trapped animals (e.g. reptiles, frogs and small terrestrial mammals), and relocate trapped animals with advice from an appropriate specialist.		Daily during construction	Mojaletema Management, Construction Crew, with advice from a Zoologist / Ecologist
	Prohibit disturbance and harvesting of CI and other indigenous fauna.	Educate workers about dangerous animals (e.g. snakes, scorpions, bees) and highlight all prohibited activities to workers through training and notices.		Prior to and during construction	Mojaletema Management
		Prohibit harvesting of CI and other indigenous fauna on site by community members through notices and site access control (e.g. fencing).		During construction	Mojaletema Management
Introduction and proliferation of alien species	Limit / Regulate access by potential vectors of alien flora.	Demarcate or fence in the construction site.		Prior to and during construction	Mojaletema Management, Construction Crew
		Carefully limit / regulate access by vehicles and materials to the construction site.		Prior to and during construction	Mojaletema Management, Construction Crew
		Prohibit the introduction of		During construction	Mojaletema

SECTION F: APPENDICES

DRAFT BASIC ASSESSMENT REPORT

Basic Assessment for the Mojaletema Primary Co-Operative (Pty) Ltd's proposed piggery facility on Portion 15 of Farm Bultfontein 192 IR, Nigel, Gauteng.

Impact Description	Environmental Objective	Management/Mitigation Measures	Monitoring Compliance & Reporting	Monitoring Frequency	Responsibility
		domestic animals such as dogs and cats.			Management, Construction Crew
	Maintain a tidy construction site.	Keep construction activities neat and tidy. When complete, remove all sand piles, and landscape all uneven ground while re-establishing a good topsoil layer.		During construction	Mojaletema Management, Construction Crew
		Plant only locally indigenous flora if landscaping needs to be done.		During construction	Mojaletema Management, Construction Crew, with advice from a Botanist / Horticulturist
	By law, remove and dispose of Category 1b alien species on site. All Category 2 species that remain on site will require a permit.	Remove Category species using mechanical methods, and minimize soil disturbance as far as possible. Alien wood could be donated to the surrounding community.		During construction	Mojaletema Management, Construction Crew, with advice from a Botanist / Horticulturist
Increased dust and erosion	Implement effective measures to control dust and erosion.	Limit vehicles, people and materials to the construction site.		During construction	Mojaletema Management, Construction Crew
		Commence (and preferably complete) construction during winter, when the risk of erosion should be least.		During construction	Mojaletema Management, Construction Crew
		Revegetate denude areas with locally indigenous flora a.s.a.p.		During construction	Mojaletema Management, Construction Crew
		Implement erosion protection		During construction	Mojaletema

SECTION F: APPENDICES

DRAFT BASIC ASSESSMENT REPORT

Basic Assessment for the Mojaletema Primary Co-Operative (Pty) Ltd's proposed piggery facility on Portion 15 of Farm Bultfontein 192 IR, Nigel, Gauteng.

Impact Description	Environmental Objective	Management/Mitigation Measures	Monitoring Compliance & Reporting	Monitoring Frequency	Responsibility
		measures on site. Measures could include bunding around soil stockpiles, and vegetation of areas not to be developed.			Management, Construction Crew
		Implement effective and environmentally-friendly dust control measures, such as mulching or periodic wetting.		During construction	Mojaletema Management, Construction Crew
Sensory disturbance of fauna	Time construction activities to minimize sensory disturbance of fauna.	Commence (and preferably complete) construction during winter, when the risk of disturbing active (including breeding and migratory) animals, should be least.		Prior to and during construction	Mojaletema Management, Construction Crew
	Minimize noise pollution.	Minimize noise to limit its impact on calling and other sensitive fauna (e.g. frogs).		During construction	Mojaletema Management, Construction Crew
	Minimize light pollution.	Limit construction activities to day time hours.		During construction	Mojaletema Management, Construction Crew
		Minimize or eliminate security and construction lighting, to reduce the disturbance of nocturnal fauna.		During construction	Construction Crew
OPERATIONAL PHASE					
Loss or degradation of local wetland areas	Maintain measures on the access road to reduce dust, erosion and sedimentation.	Monitor and maintain the road impact control measures to ensure that they remain effective.		Throughout operation	Mojaletema Management, Farm Management

SECTION F: APPENDICES

DRAFT BASIC ASSESSMENT REPORT

Basic Assessment for the Mojaletema Primary Co-Operative (Pty) Ltd's proposed piggery facility on Portion 15 of Farm Bultfontein 192 IR, Nigel, Gauteng.

Impact Description	Environmental Objective	Management/Mitigation Measures	Monitoring Compliance & Reporting	Monitoring Frequency	Responsibility
Environmental contamination		Highlight all prohibited activities to workers through training and notices.		During operation	Mojaletema Management, Farm Management
	Ensure that excrement, carcasses, feed, and other operational waste and hazardous materials are appropriately and effectively contained and disposed of without detriment to the environment.	Ensure that the facility is designed in accordance with international best practice norms, and with advice from an appropriate specialist, to ensure that there is no environmental contamination from effluent, fodder, carcasses and other waste, and to ensure that there is also effective storm water management.		Pre-construction	CSIR, Mojaletema Management, with advise from agricultural experts
		Designate a secured, access restricted, signposted room for the storage of potentially hazardous substances such as herbicides, pesticides dips and medications.		Throughout operation	Mojaletema Management, Farm Management
		Adhere to best practice pig husbandry and waste disposal norms.		Throughout operation	CSIR, Mojaletema Management, Farm Management, with advise from agricultural experts
		All hazardous waste should be disposed of at an appropriate licensed facility for this.		Throughout operation	Mojaletema Management, Farm Management
		Waste recycling should be incorporated into the facility's		Throughout operation	Mojaletema Management, Farm

SECTION F: APPENDICES

DRAFT BASIC ASSESSMENT REPORT

Basic Assessment for the Mojaletema Primary Co-Operative (Pty) Ltd's proposed piggery facility on Portion 15 of Farm Bultfontein 192 IR, Nigel, Gauteng.

Impact Description	Environmental Objective	Management/Mitigation Measures	Monitoring Compliance & Reporting	Monitoring Frequency	Responsibility
		operations as far as possible.			Management
		Educate workers about the facility's waste management and handling of hazardous substances with regular training and notices.		Throughout operation	Mojaletema Management, Farm Management
	Ensure that there are appropriate control measures in place for any contamination event.	Establish appropriate emergency procedures for accidental contamination of the surroundings.		Pre-construction	CSIR, Mojaletema Management
		Rehabilitate contaminated areas a.s.a.p. in accordance with advice from appropriate contamination and environmental specialists.		A.s.a.p. following contamination	Mojaletema Management, Farm Management, with advise from appropriate contamination and environmental specialists
		Educate workers about the facility's waste emergency procedures with training and notices.		At least annually during operation	Mojaletema Management, Farm Management
Poor / Inappropriate control of animal pests	Control the access and proliferation of pests as far as possible.	Ensure that floors are sloped and slatted to facilitate drainage.		Pre-construction	CSIR, Mojaletema Management, Construction Crew
		Ensure that there is effective storm water drainage around the facility.		All phases	CSIR, Mojaletema Management, Farm Management
		Screed concrete floors properly to seal all cracks and limit the pooling of effluent and water.		Construction and operation	Construction Crew, Farm Management
		Effectively seal and maintain all		Construction and	Construction Crew, Farm

SECTION F: APPENDICES

DRAFT BASIC ASSESSMENT REPORT

Basic Assessment for the Mojaletema Primary Co-Operative (Pty) Ltd's proposed piggery facility on Portion 15 of Farm Bultfontein 192 IR, Nigel, Gauteng.

Impact Description	Environmental Objective	Management/Mitigation Measures	Monitoring Compliance & Reporting	Monitoring Frequency	Responsibility
		pipes and reservoirs containing slurry, to prevent animals from accessing the effluent.		operation	Management
		Ensure that the facility is sufficiently ventilated to keep floors, bedding, and fodder as dry as possible.		Pre-construction, construction and operation	CSIR, Mojaletema Management, Farm Management
		Check that fan louvers (if installed) work properly, and close fans completely when off.		Throughout operation	Farm Management and Team
		Prevent and manage unwanted animal access to fodder.		Pre-construction, construction and operation	Mojaletema Management, Farm Management and Team
		Clean floors regularly.		Throughout operation	Farm Management and Team
		Clean up excess fodder regularly from under troughs and feed bins.		Throughout operation	Farm Management and Team
		Keep areas surrounding the facility free of spilled manure and litter.		Throughout operation	Farm Management and Team
		Remove all trash, and sources of feed and water for pests from the outside perimeter of the facilities.		Throughout operation	Farm Management and Team
		Keep weeds and grass mowed to 5cm or less immediately around the facilities, to reduce the prevalence of insects.		Throughout operation	Farm Management and Team
		Electrocution devices are		Throughout operation	Farm Management and

SECTION F: APPENDICES

DRAFT BASIC ASSESSMENT REPORT

Basic Assessment for the Mojaletema Primary Co-Operative (Pty) Ltd's proposed piggery facility on Portion 15 of Farm Bultfontein 192 IR, Nigel, Gauteng.

Impact Description	Environmental Objective	Management/Mitigation Measures	Monitoring Compliance & Reporting	Monitoring Frequency	Responsibility
		available to kill flies, while other mechanical devices include traps, sticky tapes or baited traps.			Team
		Control rodents through effective sanitation, rodent proofing and (as humane as possible) extermination.		During operation	Farm Management and Team
	Avoid affecting non-target animals.	Ensure that measures to control pests are tightly restricted to areas where these are problematic.		During operation	Farm Management and Team
		Pest control measures should be taxon-specific. If necessary, advice should be sought from an appropriate specialist.		During operation	Farm Management and Team
		Rodenticides are not advised.		During operation	Farm Management and Team
Disease transmission	Ensure that excrement, carcasses, feed, and other operational waste and hazardous materials are appropriately and effectively contained and disposed of without detriment to the environment.	As described above.		As described above.	As described above.
	Ensure that there are appropriate control measures in place for any	As described above.		As described above.	As described above.

SECTION F: APPENDICES

DRAFT BASIC ASSESSMENT REPORT

Basic Assessment for the Mojaletema Primary Co-Operative (Pty) Ltd's proposed piggery facility on Portion 15 of Farm Bultfontein 192 IR, Nigel, Gauteng.

Impact Description	Environmental Objective	Management/Mitigation Measures	Monitoring Compliance & Reporting	Monitoring Frequency	Responsibility
Introduction and proliferation of alien species	contamination event. Control the access and proliferation of pests as far as possible.	As described above.		As described above.	As described above.
	Limit / Regulate access by potential vectors of alien flora.	Carefully limit / regulate access by vehicles and materials to the site.		Throughout operation	Mojaletema Management, Farm Management
		Prohibit the introduction of domestic animals such as dogs and cats.		Throughout operation	Mojaletema Management, Farm Management
	Maintain a tidy production facility.	Minimize the accumulation and dispersal of excess fodder on site.		Throughout operation	Farm Management and Team
		Employ best practices regarding tilling of soil and weed management.		Throughout operation	Farm Management and Team
		Plant only locally indigenous flora if landscaping needs to be done.		Throughout operation	Mojaletema Management, Farm Management, with advice from a Botanist / Horticulturist
	By law, remove and dispose of Category 1b alien species on site. All Category 2 species that remain on site will require a permit.	Remove Category species using mechanical methods, and minimize soil disturbance as far as possible. Alien wood could be donated to the surrounding community.		Throughout operation	Mojaletema Management, Farm Management and Team, with advice from a Botanist / Horticulturist
Loss of CI or medicinal flora	Harvesting of indigenous flora for medicine, fire wood, building materials,	Highlight all prohibited activities to workers through training and notices.		Prior to and during operation	Mojaletema Management, Farm Management

SECTION F: APPENDICES

DRAFT BASIC ASSESSMENT REPORT

Basic Assessment for the Mojaletema Primary Co-Operative (Pty) Ltd's proposed piggery facility on Portion 15 of Farm Bultfontein 192 IR, Nigel, Gauteng.

Impact Description	Environmental Objective	Management/Mitigation Measures	Monitoring Compliance & Reporting	Monitoring Frequency	Responsibility
	and other purposes must be prohibited.				
		Prohibit harvesting of CI and medicinal flora on site by community members through notices and site access control (e.g. fencing).		Throughout operation	Mojaletema Management, Farm Management
Loss of CI fauna	Harvesting of indigenous fauna for food, sport, medicine, and other purposes must be prohibited.	Educate workers about dangerous animals (e.g. snakes, scorpions, bees) and highlight all prohibited activities to workers through training and notices.		Prior to and during operation	Mojaletema Management, Farm Management
		Prohibit harvesting of CI and other indigenous fauna on site by community members through notices and site access control (e.g. fencing).		Throughout operation	Mojaletema Management, Farm Management
Sensory disturbance of fauna	Minimize essential lighting	Install motion-sensitive lights.		Construction and operation	Mojaletema Management, Farm Management
		Ensure that all outdoor lights are angled downwards and/or fitted with hoods.		Construction and operation	Mojaletema Management, Farm Management
		Use bulbs that emit warm, long wavelength (yellow-red) light, or use UV filters or glass housings on lamps to filter out UV.		Throughout operation	Farm Management and Team
		Avoid using metal halide,		Throughout operation	Farm Management and

SECTION F: APPENDICES

DRAFT BASIC ASSESSMENT REPORT

Basic Assessment for the Mojaletema Primary Co-Operative (Pty) Ltd's proposed piggery facility on Portion 15 of Farm Bultfontein 192 IR, Nigel, Gauteng.

Impact Description	Environmental Objective	Management/Mitigation Measures	Monitoring Compliance & Reporting	Monitoring Frequency	Responsibility
		mercury or other bulbs that emit high UV (blue-white) light that is highly and usually fatally attractive to insects.			Team
	Minimize unavoidable noise	Conduct regular maintenance of machinery, fans and other noisy equipment.		Throughout operation	Farm Management and Team
	Prevent unnecessary light and noise pollution	Encourage workers to minimize light and noise pollution through training and notices.		Throughout operation	Mojaletema Management, Farm Management

SECTION F: APPENDICES

DRAFT BASIC ASSESSMENT REPORT

Basic Assessment for the Mojaletema Primary Co-Operative (Pty) Ltd's proposed piggery facility on Portion 15 of Farm Bultfontein 192 IR, Nigel, Gauteng.

6. ENVIRONMENTAL AWARENESS AND TRAINING PLAN

Mojaletema Primary Co-Operative Management has to appoint an independent Environmental Control Officer whose duty is to also implement an effective environmental awareness plan aimed to educate workers and contractors in terms of the biodiversity on site, environmental risks associated with the proposed development and land management of the site. Training and/or awareness should be raised and effectively communicated prior to the commencement of the construction phase. Training sessions should incorporate the management plans addressed in this EMPr as well as any new information and documentation provided by the ECO, as well as that of the Environmental Health & Safety Officer. The ECO would be the most suitable person to conduct these training sessions, identifying sensitive environments as well as all the risks and impacts, such as effluence, associated with the piggery and the methods in which to deal with the impacts in order to avoid environmental degradation. Training sessions can be monitored by providing an attendance register indicating the workers that received training as well as evidence of the training and/or awareness received. These sessions would also need to be carried out throughout the operational phase of the piggery, at least once a year, or as new information becomes available.

SECTION F: APPENDICES

DRAFT BASIC ASSESSMENT REPORT

Basic Assessment for the Mojaletema Primary Co-Operative (Pty) Ltd's proposed piggery facility on Portion 15 of Farm Bultfontein 192 IR, Nigel, Gauteng.

SAPPO Training Course Housing for small Piggeries 2 <i>Why house pigs at all? Because:-</i> • It makes for better biosecurity • It reduces parasites – mange, worms, ticks • It allows controlled feeding • It makes treatment easier • It reduces theft 1	Housing for small Piggeries <i>Welfare aspects:</i> <i>Keeping dry sows outside is often successful, provided there is plenty of space and good shelter for all.</i> <i>Free range systems sound fine , but:-</i> • There is little disease control • Free access to toxic plants, human excreta • Bullying is not eliminated • Rough stony ground, dirty wallows, Ascaris eggs • Feeding is not controlled 2	Housing for small piggeries <i>Intensive housing is not all bad:-</i> –Individuals can be observed, treated, fed, protected individually; –Record-keeping is much easier, so production is easily measured; –Space is more economically used; –All-in all-out systems become possible 3
Housing for small piggeries <i>Is there a practical, affordable compromise?</i> <i>Consider the pig's housing needs, such as:-</i> • Protection from bad weather • Protection from direct sun, and extreme temperatures • Protection from each other • Protection from thirst, hunger, pain, fear, injury • Protection from mishandling by cruel or careless people 4	Housing for small piggeries <i>Whatever housing system is used, it can be made to work, provided that good farming practice is understood and applied.</i> • Be receptive to the messages that pigs are sending out all the time; • Be aware of the pigs' needs; • Be informed about what remedy to apply; • Have the resources to carry out the necessary correction 5	Housing for small piggeries <i>Specifications for the construction of pig pens:</i> • It must be pig-proof; • It should have a hard drained cleanable floor; • It must have clear areas for sleeping, eating, dunging; • Water must be provided in secure, clean containers in every pen: drinking nipples are best; • Different age groups need separate pens; • Face the pens away from the worst weather and cold winds; • Ensure good light and ventilation 6

SECTION F: APPENDICES

DRAFT BASIC ASSESSMENT REPORT

Basic Assessment for the Mojaletema Primary Co-Operative (Pty) Ltd's proposed piggery facility on Portion 15 of Farm Bultfontein 192 IR, Nigel, Gauteng.

Housing for small piggeries

- **Some dimensions:** (see sketches on p19)
- An all-purpose pen can be—
- 4m by 3m i.e. 12 square metres,
- Roof will be 3m x 3m or 3m x 4m in area, sloping from back to front; height 2.5m at back, 1.65 in front;
- Where sows and piglets share the same pen, a creep area across the rear of 1m x 3m keeps sow from creep feed and piglet sleeping area;
- Floor slopes 1% to gate and drain – outside and to a pond or soak-away.

7

This all-purpose pen will accommodate any of the following:-

- 1 or 2 sows with litters (this pen will have a creep area);
- 2 or 3 litters of weaned pigs up to 10 weeks old;
- 4 dry sows or gilts;
- 1 boar with a couple of sows;
- 15 grower pigs up to 70kg live mass; or
- 12 baconers up to 90 - 95 kg livemass

Note: a general rule for space per pig is to allow at least 1sq m per 100 kg of live pig in closed pens; boars and sows need double or more .

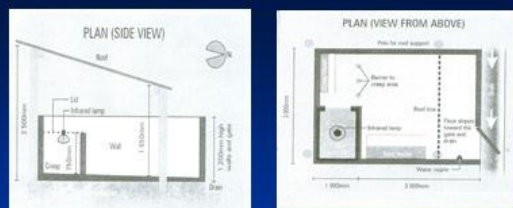
8

Housing for small piggeries

There are cheaper alternatives that are quite acceptable; using locally available materials and ingenuity can go a long way, provided that the basic specs are met.

The following pictures show some examples of inexpensive housing that has been built with an understanding of the needs of pigs of all ages; there are also some that do not meet requirements.

9



An inexpensive all-purpose pen as sketched here has been used successfully for small commercial piggeries



One version with walls – poles or pipes or even old pallets will be fine, and improve animal husbandry, health, etc.

10

SECTION F: APPENDICES

DRAFT BASIC ASSESSMENT REPORT

Basic Assessment for the Mojaletema Primary Co-Operative (Pty) Ltd's proposed piggery facility on Portion 15 of Farm Bultfontein 192 IR, Nigel, Gauteng

BASIC ASSESSMENT REPORT

APPENDIX I: DETAILS OF EAP AND EXPERTISE

contents

Appendix I:	DETAILS OF EAP AND EXPERTISE	2
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SECTION F: APPENDICES

Appendix I: DETAILS OF EAP AND EXPERTISE

Minnelise Levendal (Project Leader)



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CURRICULUM VITAE OF MINNELISE LEVENDAL – PROJECT LEADER

Name of firm	CSIR
Name of staff	Minnelise Levendal
Profession	Environmental Assessment and Management
Position in firm	Project Manager
Years' experience	8 years
Nationality	South African
Languages	Afrikaans and English

CONTACT DETAILS:

Postal Address: P O Box 320, Stellenbosch, 7599
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BIOSKETCH:

Minnelise joined the CSIR Environmental Management Services group (EMS) in 2008. She is focussing primarily on managing Environmental Impact Assessments (EIAs), Basic Assessments (BAs) and Environmental Screening studies for renewable energy projects including wind and solar projects. These include an EIA for a wind energy facility near Swellendam, Western Cape South Africa for BioTherm (Authorisation granted in September 2011) and a similar EIA for BioTherm in Laingsburg, Western Cape (in progress). She is also managing two wind farm EIAs and a solar Photovoltaic BA for WKN-Windcurrent SA in the Eastern Cape. Minnelise was the project manager for the Basic Assessment for the erection of ten wind monitoring masts at different sites in South Africa as part of the national wind atlas project of the Department of Energy in 2009 and 2010..She was also a member of the Project Implementation Team who managed the drafting of South Africa's Second National Communication under the United Nations Framework Convention on Climate Change. The national

SECTION F: APPENDICES

Department of Environmental Affairs appointed the South African Botanical Institute (SANBI) to undertake this project. SANBI subsequently appointed the CSIR to manage this project.

EDUCATION:

▪ M.Sc. (Botany)	Stellenbosch University	1998
▪ B.Sc. (Hons.) (Botany)	University of the Western Cape	1994
▪ B.Sc. (Education)	University of the Western Cape	1993

MEMBERSHIPS:

- International Association for Impact Assessment (IAIA), Western Cape (member of their steering committee from 2001-2003)
- IUCN Commission on Education and Communication (CEC); World Conservation Learning Network (WCLN)
- American Association for the Advancement of Science (AAAS)
- Society of Conservation Biology (SCB)

EMPLOYMENT RECORD:

- **1995:** Peninsula Technicon. Lecturer in the Horticulture Department.
- **1996:** University of the Western Cape. Lecturer in the Botany Department.
- **1999:** University of Stellenbosch. Research assistant in the Botany Department (3 months)
- **1999:** Bengurion University (Israel). Research assistant (Working in the Arava valley, Negev – Israel; 2 months). Research undertaken was published (see first publication in publication list)
- **1999-2004:** Assistant Director at the Department of Environmental Affairs and Development Planning (DEA&DP). Work involved assessing Environmental Impact Assessments and Environmental Management Plans; promoting environmental management and sustainable development.
- **2004 to present:** Employed by the CSIR in Stellenbosch:
 - September 2004 – May 2008: Biodiversity and Ecosystems Services Group (NRE)
 - May 2008 to present: Environmental Management Services Group (EMS)

PROJECT EXPERIENCE RECORD:

The following table presents a list of projects undertaken at the CSIR as well as the role played in each project:

Completion Date	Project description	Role	Client
2011 (in progress)	EIA for the proposed Electrawinds Swartberg wind energy project near Moorreesburg in the Western Cape	Project Manager	Electrawinds
2010-2011 (in progress)	EIA for the proposed Ubuntu wind energy project, Eastern Cape	Project Manager	WKN Windkraft SA
2010-2011 (in progress)	EIA for the proposed Banna ba pifhu wind energy project, Eastern Cape	Project Manager	WKN Windkraft SA
2010-2011	BA for a powerline near Swellendam in the Western Cape	Project Manager	BioTherm Energy (Pty Ltd)
2010-2011 (Environmental Authorisation granted in September 2011)	EIA for a proposed wind farm near Swellendam in the Western Cape	Project Manager	BioTherm Energy (Pty Ltd)
2010 (complete)	Basic Assessment for the erection of two wind monitoring masts near Swellendam and Bredasdorp in the Western Cape	Project Manager	BioTherm Energy (Pty Ltd)
2010 (complete)	Basic Assessment for the erection of two wind monitoring masts near Jeffrey's Bay	Project Manager	Windcurrent (Pty Ltd)

SECTION F: APPENDICES

Completion Date	Project description	Role	Client
	in the Eastern Cape		
2009-2010 (<i>Environmental Authorisations granted during 2010</i>)	Basic Assessment Process for the proposed erection of 10 wind monitoring masts in SA as part of the national wind atlas project	Project Manager	Department of Energy through SANERI; GEF
2010	South Africa's Second National Communication under the United Nations Framework Convention on Climate Change	Project Manager	SANBI
2009 (<i>Environmental Authorisation granted in 2009</i>)	Basic Assessment Report for a proposed boundary wall at the Port of Port Elizabeth, Eastern Cape	Project Manager	Transnet Ltd
2008	Developing an Invasive Alien Plant Strategy for the Wild Coast, Eastern Cape	Co-author	Eastern Cape Parks Board
2006-2008	Monitoring and Evaluation of aspects of Biodiversity	Project Leader	Internal project awarded through the Young Researchers Fund
2006	Integrated veldfire management in South Africa. An assessment of current conditions and future approaches.	Co-author	Working on Fire
2004-2005	Biodiversity Strategy and Action Plan Wild Coast, Eastern Cape, SA	Co-author	Wilderness Foundation
2005	Western Cape State of the Environment Report: Biodiversity section. (Year One).	Co-author and Project Manager	Department of Environmental Affairs and Development Planning

PUBLICATIONS:

Bowie, M. (née Levendal) and Ward, D. (2004). Water status of the mistletoe *Plicossepalus acaciae* parasitic on isolated Negev Desert populations of *Acacia raddiana* differing in level of mortality. *Journal of Arid Environments* 56: 487-508.

Wand, S.J.E., Esler, K.J. and **Bowie, M.R.** (2001). Seasonal photosynthetic temperature responses and changes in ¹³C under varying temperature regimes in leaf-succulent and drought-deciduous shrubs from the Succulent Karoo, South Africa. *South African Journal of Botany* 67:235-243.

Bowie, M.R., Wand, S.J.E. and Esler, K.J. (2000). Seasonal gas exchange responses under three different temperature treatments in a leaf-succulent and a drought-deciduous shrub from the Succulent Karoo. *South African Journal of Botany* 66:118-123.

LANGUAGES

Language	Speaking	Reading	Writing
English	Excellent	Excellent	Excellent
Afrikaans	Excellent	Excellent	Excellent

Minnelise Levendal



August 2017

SECTION F: APPENDICES

Samukele ('Sam') Manqoba Ngema (Project Manager)



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CURRICULUM VITAE OF Samukele ('Sam') Manqoba Ngema – PROJECT MANAGER

Name:	Samukele ('Sam') Manqoba Ngema
I.D. Number:	9203125501081
Nationality:	South African
Languages:	English (Excellent), Isizulu (Good), IsiXhosa (Average) Afrikaans (Average)
Current Employer:	Council for Scientific and Industrial Research (CSIR)
Position:	Junior Environmental Assessment Practitioner
Residence:	Stellenbosch, Western Cape
Email:	sngema@csir.co.za , ngemasam@gmail.com
Contact:	021 888 2408, 072 901 9534
Gender:	Male
Race:	Black
Age:	25

BIOGRAPHICAL SKETCH:

Sam has been employed at the CSIR since May 2016. He has a year's worth of experience working in the environmental management sector. He has a Master of Philosophy Degree in Urban and Regional Planning from Stellenbosch University, South Africa. This research focused on exploring the comparison in land uses which are found between Durban and Cape Town Metropolitan Municipalities. His employment as a junior Environmental Assessment Practitioner (EAP) at CSIR's Environmental Management Services (EMS) group has so far has primarily focused on conducting and assisting in Basic Assessment Reports, assisting in various Strategic Environmental Assessments and Environmental Impact Assessments and Conducting a Environmental Sensitivity Screening.

TERTIARY EDUCATION:

Undergraduate

Bachelor: Development and Environment
Department of Social Sciences
Stellenbosch University, 2011 - 2013

Honours

BComm (Hons): Public and Development Management
Department of Economic Management Science
Stellenbosch University, 2014

SECTION F: APPENDICES

Masters

Master of Philosophy (M.Phil) Urban and Regional Planning
Department of Geography
Stellenbosch University, 2015

WORK EXPERIENCE:

- | | |
|------------------|--|
| 1.) Organisation | Department of Social Development |
| Position | Internship |
| Period | June 2014 - January 2015 |
| 2.) Organisation | Council for Scientific and Industrial Research |
| Position | Junior Environmental Assessment Practitioner |
| Period | May 2016 – present |

Professional Affiliations

- Applicant for South African Council for Planners (SACPLAN) Candidate Planner
- International Association for Impact Assessment South Africa (Membership Number: 5242)

RELEVANT COURSES:

- Project Management 1 — CSIR Innovation Leadership & Learning Academy (CiLLA) (5-7 July, 2016)
- CSIR Media & Science Communication Training (CSIR, Stellenbosch) (2016)

CO-ORDINATED PROJECTS AND REPORTS

Project Description	Role	Date	Client
Environmental Screening Study for Non-Woven filter fabric facility	Project Manager	2016	CSIR Enterprise Creation Development (ECD)
Basic Assessment Report- Nkunzi Agricultural Co-Operative	Project Manager	Ongoing 2016	Nkunzi Agricultural Co-Operative
Basic Assessment Report- Mojaletema Farming Co-Operative	Project Manager	Ongoing 2016	Mojaletema Farming Co-Operative
Strategic Environmental Assessment- Square Kilometer Array	Project Assistant	2016	National Department of Environmental Affairs
Environmental Impact Assessment for the proposed Platberg and Teekloof Projects	Project Assistant	2016	Mainstream Renewable Power