

# Basic Assessment for the proposed development of a chicken broiler facility on Portion 40 of the Farm Jonathan 175- JQ, Brits, North West.

Prepared for:  
Jam Rock (Pty) Ltd

CSIR Report No.: CSIR/02100/EMS/IR/2016/0003/A

August 2017



FINAL BASIC ASSESSMENT REPORT - Basic Assessment for the proposed  
development of a chicken broiler facility on Portion 40 of the Farm  
Jonathan 175- JQ, Brits, North West.

# **FINAL BASIC ASSESSMENT REPORT**

CSIR Report Number: CSIR/02100/EMS/IR/2016/0003/A

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JamRock (Pty) Ltd

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# REPORT DETAILS

<b>Title:</b>	<b>Basic Assessment for the proposed development of a chicken broiler facility on Portion 40 of the Farm Jonathan 175- JQ, Brits, North West.</b>
<b>Purpose of this report:</b>	<p>The purpose of this BA Report is to:</p> <ul style="list-style-type: none"><li>• Present the proposed project and the need for the project;</li><li>• Describe the affected environment at a sufficient level of detail to facilitate informed decision-making;</li><li>• Provide an overview of the BA Process being followed, including public consultation;</li><li>• Assess the predicted positive and negative impacts of the project on the environment;</li><li>• Provide recommendations to avoid or mitigate negative impacts and to enhance the positive benefits of the project;</li><li>• Provide an Environmental Management Programme (EMPr) for the proposed project.</li></ul> <p>This BA Report is being made available to all Interested and Affected Parties (I&amp;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 North West Department of Rural, Environment and Agricultural Development (READ) for decision-making.</p>
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# EXECUTIVE SUMMARY

## INTRODUCTION AND BACKGROUND

Jam Rock (Pty) Ltd is a producer of broiler chickens that are raised with strict considerations for chickens and the environment. It is located in Brits, North West Province. The Enterprise proposes to develop three chicken broiler houses with associated infrastructure including a road, storage unit and farm house. The size of each chicken house will be 20m x 130m, with the capacity to breed 40 000 chickens per cycle. The farm is 9.2 hectares and is situated on Portion 40 of the farm Jonathan 175-JQ. Furthermore the farm has an existing borehole with the capacity to store 10 000 L of water.

## ENVIRONMENTAL ASSESSMENT PROCESS

The Council for Scientific and Industrial Research (CSIR), appointed by National Department of Environmental Affairs (DEA), runs the Special Needs and Skills Development Programme which is aimed at providing Environmental Services, *pro-bono*, 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 currently undertaking a Basic Assessment Process for Jam Rock (Pty) Ltd for their proposed development of a chicken broiler facility on Portion 40 of the Farm Jonathan 175-JQ, Brits, North west.

The development triggers listed activities in terms of the Environmental Impact Assessment (EIA) Regulations, Government Regulations (GNR) 324 and 327 of April 2017 promulgated under the National Environmental Management Act (NEMA) (Act no 107 of 1998). In terms of these Regulations, a Basic Assessment (BA) should be undertaken for the proposed project. The EAP will be managing the BA process on behalf of the project applicant.

In terms of the amended NEMA EIA Regulations published in GNR 324, 325, 326 and 327 on the 7 April 2017 Government Gazette Number 40772, a BA process is required as the project triggers the following listed activities (detailed in Table 1 below).

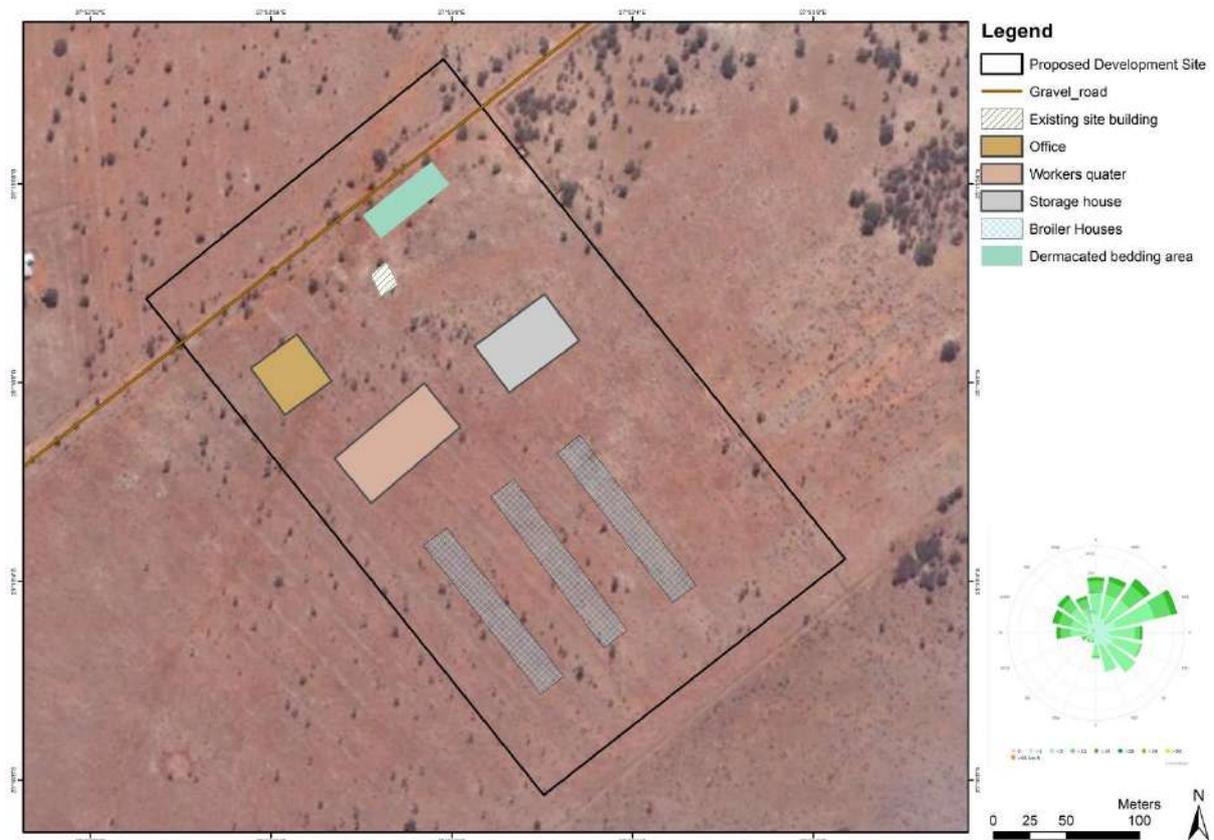
**Table 1: Listed activity relating to the proposed project**

Relevant notice	Activity No (s) (in terms of the relevant notice) :	Description of each listed activity as per the Government Notice
GN. R 327, 7 April 2017	5. (ii) and (iv)	The development and related operation of facilities or infrastructure for the concentration of  (ii) more than 5 000 poultry per facility situated outside an urban area, excluding chicks younger than 20 days and (iv) more than 25000 chicks younger than 20 days per facility situated outside an urban area.

These listed activities require Environmental Authorisation from the Department: Rural, Environment and Agricultural Development (READ).

## PROJECT DESCRIPTION

The Enterprise proposes to develop a 1.6 hectare broiler facility with associated infrastructure including a road, storage unit, workers quarters and office. The size of each chicken house will be 20m x 130m, with the capacity to breed 40 000 chickens per cycle. The farm is 9.2 hectares and is situated on Portion 40 of the farm Jonathan 175-JQ. Furthermore the farm has an existing borehole with the capacity to store 10 000 L of water.



The proposed infrastructure of the broiler facility will entail the following:

- 3x chicken houses (130m x 20m)
- 6m access road
- Workers quarter (80mx 40m)
- Storage unit (60m x 40m)
- Home and office (40m x 40m)
- Used bedding area (20m x 60m)

## IMPACT ASSESSMENT

Two specialist studies were undertaken as part of the BA Process. These studies included a Terrestrial Impact Assessment and Heritage Impact Assessment. The findings of these studies are summarised below. It is important to note that the impacts described below apply to the proposed alternative.

**Table 2: Summary of Impacts**

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<i>POTENTIAL IMPACTS</i>	<i>SIGNIFICANCE RATING</i>	<i>SIGNIFICANCE RATING</i>
<b>CONSTRUCTION</b>	<b>Without</b>	<b>With</b>
Loss or degradation of the wetland on the access road	High (-)	Low (-)
Loss of terrestrial vegetation and faunal habitat	Medium (-)	Low (-)
Loss of CI or medicinal flora.	Medium (-)	Low (-)
Loss of CI fauna	Medium (-)	Low (-)
Introduction and proliferation of alien species	High (-)	Low (-)
Increased dust and erosion	Medium (-)	Low (-)
Sensory disturbance of fauna	Medium (-)	Low (-)
Destruction of palaeontological material	Very Low (-)	Very Low (-)
Destruction of archaeological artefacts	Very Low (-)	Very Low (-)
Destruction of graves	Low (-)	Very Low (+)
Emissions from dust generation and construction vehicles	Low (-)	Low (-)
Potential spillage of by spillage or discharge of construction waste water	Low (-)	Very Low (-)
Potential Pollution of the surrounding water and ground as a result of generation of building rubble and waste scrap material	High (-)	Low (-)
Pollution of the surrounding environment as a result of the handling, temporary storage and disposal of solid waste (general and hazardous).	High (-)	Low (-)
Odour Emissions from operations and environmental contamination of the surrounding environment from chicken organic waste (carcasses and manure).	High (-)	Low (-)
Pollution of the surrounding environment as a result of the handling of sewage	High (-)	Low (-)
Opportunities for employment and skills development	High (+)	High (+)
Potential visual impacts as the result of construction activities	Low (-)	Low (-)
Potential noise impact as the result of the use of construction equipment	Medium (-)	Low (-)
Potential impact on the safety of construction workers and Health injuries to construction personnel as a result of construction work	Medium (-)	Medium (-)
Traffic, congestion and potential for collisions	Low (-)	Low (-)
<b>OPERATION</b>		
Loss or degradation of the wetland on the access road	High (-)	Low (-)
Environmental contamination	Medium (-)	Low (-)
Poor / Inappropriate control of animal pests	High (-)	Low (-)
Disease transmission	Medium (-)	Low (-)
Altered burning	Medium (-)	Low (-)
Introduction and proliferation of alien species	High (-)	Low (-)
Loss of CI or medicinal flora	Medium (-)	Low (-)
Sensory disturbance of fauna	Medium (-)	Low (-)
Destruction of palaeontological material	Very Low (-)	Very Low (-)
Destruction of archaeological artefacts	Very Low (-)	Very Low (-)
Destruction of graves	Low (-)	Very Low (+)
Emissions into the atmosphere as a result of staff vehicles.	Medium (-)	Low (-)
Improved service delivery with regards poultry products	Medium (+)	High (+)
Opportunities for employment and skills development	Medium (+)	High (+)

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<i>POTENTIAL IMPACTS</i>	<i>SIGNIFICANCE RATING</i>	<i>SIGNIFICANCE RATING</i>
Night lighting of the development on the nightscape of the surrounding landscape	Low (-)	Low (-)
Pollution of the surrounding environment as a result of the handling, temporary storage and disposal of solid waste (general and hazardous).	High (-)	Low (-)
Environmental and Health contamination arising from Chicken mortalities (carcasses) during operations.	High (-)	Low (-)
Pollution of the surrounding environment as a result of the handling, temporary storage and disposal of solid waste (general and hazardous)	High (-)	Low (-)
Pollution of the surrounding environment as a result of the handling of sewage	High (-)	Low (-)
Odour Emissions from operations and environmental contamination of the surrounding environment from chicken organic waste (carcasses and manure).	High (-)	Low (-)
Potential noise impact from operations and road transportation of products	Medium (-)	Low (-)
Minor accidents to the public and moderate accidents to operational staff	Medium (-)	Low (-)
Atmospheric pollution due to fumes, smoke from fires	Medium (-)	Low (-)
<b>DECOMMISSIONING</b>		
Loss or degradation of the wetland on the access road	High (-)	Low (-)
Introduction and proliferation of alien species	High (-)	Low (-)
Increased dust and erosion	Medium (-)	Low (-)
Sensory disturbance of fauna	Low (-)	Low (-)
Destruction of palaeontological material	Very Low (-)	Very Low (-)
Destruction of archaeological artefacts	Very Low (-)	Very Low (-)
Destruction of graves	Low (-)	Very Low (+)
Discharge of contaminated stormwater into the surrounding environment	Medium (-)	Low (-)
Emissions from decommissioning vehicles and generation of dust	Medium (-)	Low (-)
Noise generation from demolition activities	Medium (-)	Low (-)
Pollution of the surrounding environment as a result of the handling, temporary storage and disposal of solid waste (general and hazardous).	High (-)	Low (-)
Pollution of the surrounding environment as a result of the handling of sewage	High (-)	Low (-)
Pollution of the surrounding environment as a result of the handling, temporary storage and disposal of solid waste	High (-)	Low (-)

## EAP'S RECOMMENDATION

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Based on the findings of this BA Process, it is therefore the opinion of the EAP that conducted this BA Process, that there are no negative impacts that should be considered as “fatal flaws” from an environmental perspective, and thereby necessitate the development of the chicken broiler. Based on the findings of this Final BA Report, 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 Moretele Local Municipality. An Environmental Management Programme (EMPr) has been compiled for the proposed project. This Draft EMPr captures the project specific information for all phases of the development and includes all mitigation actions identified in this BA Process. The Draft EMPr is a dynamic document that should be updated regularly and provide clear and implementable

measures for the establishment and operation of the proposed project. It is our recommendation that all the mitigation measures be implemented for the proposed project.

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



# GLOSSARY

<b>BA</b>	Basic Assessment
<b>BID</b>	Background Information Document
<b>CSIR</b>	Council for Scientific and Industrial Research
<b>DEA</b>	National Department of Environmental Affairs
<b>EAP</b>	Environmental Assessment Practitioner
<b>EAPs</b>	Environmental Assessment Practitioners
<b>EIA</b>	Environmental Impact Assessment
<b>EMP</b>	Environmental Management Plan
<b>EMPr</b>	Environmental Management Programme
<b>I&amp;AP</b>	Interested and Affected Party
<b>I&amp;APs</b>	Interested and Affected Parties
<b>IDP</b>	Integrated Development Plan
<b>NWA</b>	National Water Act (Act 36 of 1998)
<b>NEM: AQA</b>	National Environment Management: Air Quality Act (Act 39 of 2004)
<b>NEM: ICMA</b>	National Environmental Management: Integrated Coastal Management Act (Act 24 of 2008)
<b>NEMA</b>	National Environmental Management Act (Act 107 of 1998)
<b>NHRA</b>	National Heritage Resources Act (Act 25 of 1999)
<b>PPP</b>	Public Participation Process
<b>SAHRA</b>	South African Heritage Resources Agency
<b>SAHRIS</b>	South African Heritage Resources Information System
<b>SDF</b>	Spatial Development Framework
<b>READ</b>	Department of Rural, Environmental and Agricultural Development
<b>TOR</b>	Terms of Reference

**Summary of where requirements of Appendix 1 of the 2017 NEMA EIA Regulations (GN R 326, as amended) are provided in this Basic Assessment Report.**

<b>APPENDIX 1 OF THE REGULATIONS</b>	<b>YES / NO</b>	<b>SECTION IN BAR</b>
1) 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	<b>v</b>	Appendix K
ii. the expertise of the EAP, including a curriculum vitae;	<b>v</b>	Appendix K
(b) the location of the activity, including i) the 21 digit Surveyor General code of each cadastral land parcel;	<b>v</b>	Section A
(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 (ii) on land where the property has not been defined, the coordinates within which the activity (iii) is to be undertaken;	<b>v</b>	Section A, Appendix A & B
(d) a description of the scope of the proposed activity, including (i) all listed and specified activities triggered and being applied for; and (ii) a description of the activities to be undertaken including associated structures and infrastructure ;	<b>v</b>	Section A1
(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	<b>v</b>	Section A11

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APPENDIX 1 OF THE REGULATIONS	YES / NO	SECTION IN BAR
<p>frameworks, and instruments that are applicable to this activity and have been considered in the preparation of the report; and</p> <p>(ii) how the proposed activity complies with and responds to the legislation and policy context, plans, guidelines, tools frameworks, and instruments</p>		
<p>(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</p>	v	Section A10
<p>(g) a motivation for the preferred site, activity and technology alternative;</p>	v	Section A2
<p>(h) a full description of the process followed to reach the proposed preferred alternative within the site, including:</p> <ul style="list-style-type: none"> <li>(i) details of all the alternatives considered;</li> <li>(ii) details of the public participation process undertaken in terms of regulation 41 of the Regulations, including copies of the supporting documents and inputs;</li> <li>(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;</li> <li>(iv) the environmental attributes associated with the alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects;</li> <li>(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- <ul style="list-style-type: none"> <li>(aa) can be reversed;</li> <li>(bb) may cause irreplaceable loss of resources; and</li> <li>(cc) can be avoided, managed or mitigated;</li> </ul> </li> <li>(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;</li> <li>(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;</li> </ul>	v	Section C & D Appendix G & I

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APPENDIX 1 OF THE REGULATIONS	YES / NO	SECTION IN BAR
<p>(viii) the possible mitigation measures that could be applied and level of residual risk;</p> <p>(ix) the outcome of the site selection matrix;</p> <p>(x) if no alternatives, including alternative locations for the activity were investigated, the motivation for not considering such; and</p> <p>(xi) a concluding statement indicating the preferred alternatives, including preferred location of the activity;</p>		
<p>(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-</p> <p>(i) a description of all environmental issues and risks that were identified during the environmental impact assessment process; and</p> <p>(ii) an assessment of the significance of each issue and risk and an indication of the extent to which the issue and risk could be avoided or addressed by the adoption of mitigation measures;</p>	v	Section C Appendix G
<p>(j) an assessment of each identified potentially significant impact and risk, including-</p> <p>(i) cumulative impacts;</p> <p>(ii) the nature, significance and consequences of the impact and risk;</p> <p>(iii) the extent and duration of the impact and risk;</p> <p>(iv) the probability of the impact and risk occurring;</p> <p>(v) the degree to which the impact and risk can be reversed;</p> <p>(vi) the degree to which the impact and risk may cause irreplaceable loss of resources; and</p> <p>(vii) the degree to which the impact and risk can be avoided, managed or mitigated;</p>	v	Section C Appendix I
<p>(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;</p>	v	Appendix G
<p>(l) an environmental impact statement which contains-</p> <p>(i) a summary of the key findings of the environmental impact assessment;</p> <p>(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</p>	v	Section C2

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APPENDIX 1 OF THE REGULATIONS	YES / NO	SECTION IN BAR
<p>avoided, including buffers; and</p> <p>(iii) a summary of the positive and negative impacts and risks of the proposed activity and identified alternatives;</p>		
<p>(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;</p>	✓	Section E
<p>(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;</p>	✓	Appendix E
<p>(o) a description of any assumptions, uncertainties, and gaps in knowledge which relate to the assessment and mitigation measures proposed;</p>		
<p>(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;</p>		
<p>(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;</p>	✓	N/A
<p>(r) an undertaking under oath or affirmation by the EAP in relation to:</p> <p>(i) the correctness of the information provided in the reports;</p> <p>(ii) the inclusion of comments and inputs from stakeholders and I&amp;APs;</p> <p>(iii) the inclusion of inputs and recommendations from the specialist reports where relevant; and</p> <p>(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</p>	✓	Appendix K
<p>(s) where applicable, details of any financial provisions for the rehabilitation, closure, and ongoing post decommissioning management of negative environmental impacts;</p>	N/A	N/A
<p>(t) any specific information that may be required by the competent authority; and</p>	N/A	N/A
<p>(u) any other matters required in terms of section 24(4)(a) and (b) of the Act.</p>		

**Basic Assessment** for the proposed  
development of a chicken broiler facility on  
Portion 40 of the Farm Jonathan 175- JQ,  
Brits, North West.



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Department:  
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North West Provincial Government  
**REPUBLIC OF SOUTH AFRICA**

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## CHIEF DIRECTORATE: ENVIRONMENTAL SERVICES

### DIRECTORATE: ENVIRONMENTAL QUALITY MANAGEMENT

(For official use only)

Provincial Reference Number:

NEAS Ref Number:

Date Received:


**Basic assessment report in terms of the Environmental Impact Assessment Regulations, 2014, promulgated in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended.**

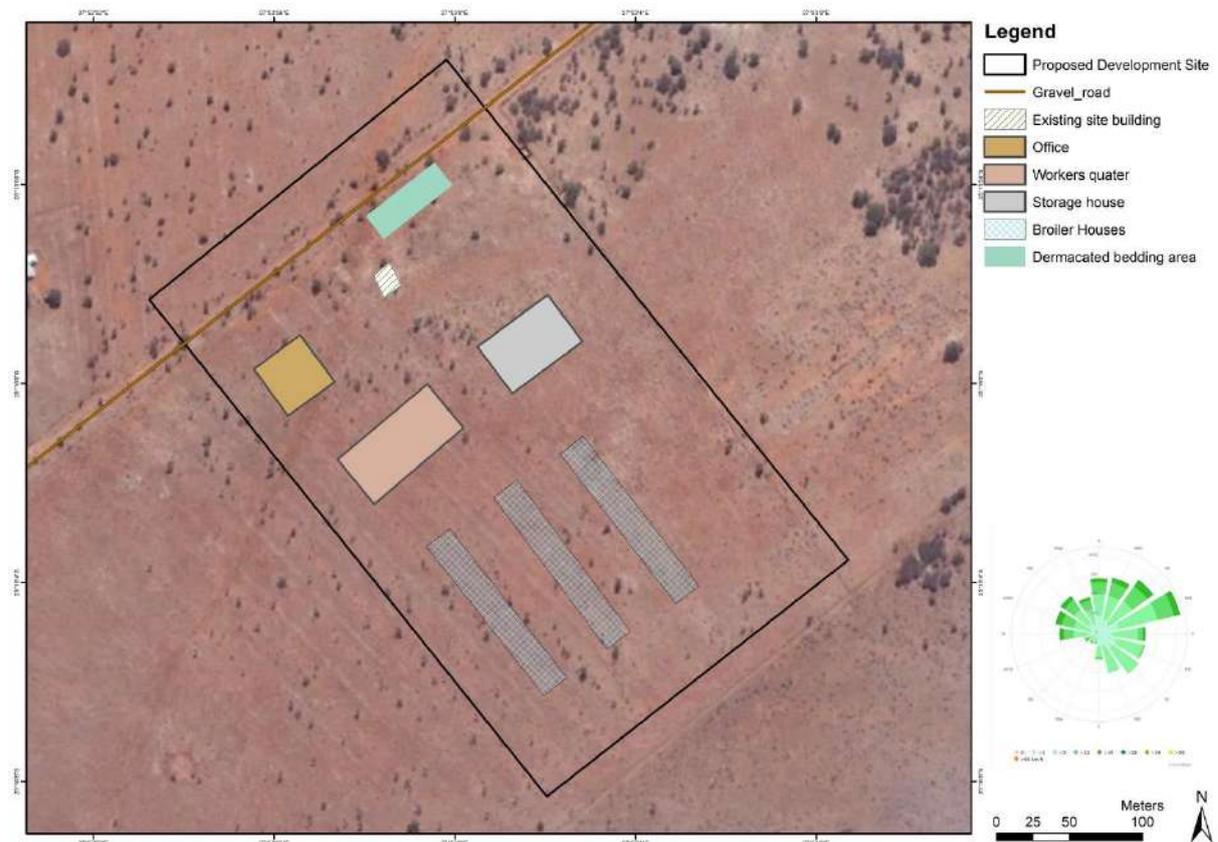
#### Kindly note that:

1. This basic assessment report is a standard report that may be required by a competent authority in terms of the EIA Regulations, 2017 and is meant to streamline applications.
2. This report format is current as of December 2014. It is the responsibility of the applicant to ascertain whether subsequent versions of the form have been published or produced by the competent authority
3. 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.
4. Where applicable tick the boxes that are applicable in the report.
5. The use of "not applicable" in the report must be done with circumspection. An incomplete report or that does not meet the requirements in terms of Regulation 19 of the NEMA EIA Regulations, 2014, will be rejected to be revised and be resubmitted.
- 6.
7. The report must be handed in at offices of the relevant competent authority as determined by each authority.
8. No faxed or e-mailed reports will be accepted.
9. The signature of the Environmental Assessment Practitioner (EAP) on the report must be an original.
10. The report must be compiled by an independent EAP.
11. Unless protected by law, all information in the report will become public information on receipt by the competent authority. Any interested and affected party should be provided with the information contained in this report on request, during any stage of the application process.
12. A competent authority may require that for specified types of activities in defined situations only parts of this report need to be completed.
13. Should a specialist report or report on a specialised process be submitted at any stage for any part of this application, the terms of reference for such report must also be submitted.
14. Two (2) colour hard copies and one (1) electronic copy of the report must be submitted to the competent authority.
15. Shape files (.shp) for maps must be included on the electronic copy of the report submitted to the competent authority.

## SECTION A ACTIVITY INFORMATION

### A.1 PROJECT DESCRIPTION

Jam Rock (Pty) Ltd is a producer of broiler chickens that are raised with strict considerations for chickens and the environment. It is located in Brits, North West Province. The Enterprise proposes to develop three chicken broiler houses with associated infrastructure including a road, storage unit and farm house. The size of each chicken house will be 20m x 130m, with the capacity to breed 40 000 chickens per cycle. The farm is 9.2 hectares and is situated on Portion 40 of the farm Jonathan 175-JQ. Furthermore the farm has an existing borehole with the capacity to store 10 000 L of water.



*The proposed infrastructure of the broiler facility will entail the following:*

- 3 x Chicken houses (130 m x 20 m)
- 6m access road
- Workers quarter (80 m x 40 m)
- Storage unit (60 m x 40 m)
- Home and office (40 m x 40 m)
- Used bedding area (20 m x 60 m)

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**b) Provide a detailed description of the listed activities associated with the project as applied for**

Listed activity as described in GN R.983, 984 and 985	Description of project activity
<b>Example:</b> <i>GN R.983 Activity 12(iii): The development of a bridge exceeding 100 square metres where such construction occurs within a watercourse or within 32 metres of a watercourse, measured from the edge of a watercourse, excluding where such development will occur within existing roads or roads reserve.</i>	<i>A bridge measuring 10m in length, 12 metres wide will be built over the Crocodile river</i>
GN.R.327, Activity 5 (ii) and (iv): The development and related operation of facilities or infrastructure for the concentration of (ii) more than 5 000 poultry per facility situated outside an urban area, excluding chicks younger than 20 days and (iv) more than 25000 chicks younger than 20 days per facility situated outside an urban area.	The concentration of 40 000 chickens per cycle.

**c) Property description/physical address**

<b>Province</b>	North West
<b>District Municipality</b>	Bojanala Platinum District Municipality
<b>Local Municipality</b>	Moretele Local Municipality
<b>Ward Number(s)</b>	Ward 5
<b>Farm name and number</b>	Jonathan 175-JQ
<b>Portion number</b>	Portion 40
<b>21 digit Surveyor General Code</b>	BOJQ00000000017500040

Where a large number of properties are involved (e.g. linear activities) please attach a full list to this application including the same information as indicated above.

## A.2 FEASIBLE AND REASONABLE ALTERNATIVES

*“alternatives”*, in relation to a proposed activity, means different means of meeting the general purpose and requirements of the activity, which may include alternatives to—

- (a) the property on which or location where it is proposed to undertake the activity;
- (b) the type of activity to be undertaken;
- (c) the design or layout of the activity;
- (d) the technology to be used in the activity;
- (e) the operational aspects of the activity; and
- (f) the option of not implementing the activity.

Describe alternatives that are considered in this application as required by EIA Regulation, 2017 Appendix 1(h). Alternatives should include a consideration of all possible means by which the purpose and need of the proposed activity (NOT PROJECT) could be accomplished in the specific instance taking account of the interest of the applicant in the activity. The no-go alternative must in all cases be included in the assessment phase as the baseline against which the impacts of the other alternatives are assessed.

The determination of whether 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. 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.

Should the alternatives include different locations and lay-outs, the co-ordinates of the different alternatives must be provided. The co-ordinates should be in degrees, minutes and seconds using the Hartebeeshoek94 WGS84 co-ordinate system.

### a) Site alternatives

List alternative sites, if applicable.

Site Alternatives	Description
<b>Alternative Site 1 (preferred or only site alternative)</b>	The DEA commissioned the CSIR to run the “Special Needs and Skills Development (SNSD) Programme” which is aimed at providing <i>pro bono</i> Environmental Impact Assessments (EIAs) for people who are classified as special needs clients/applicants, specifically Small, Medium and Micro Enterprises (SMMEs), Community Trusts, Individuals or Government Programmes. The CSIR received an application from Jam rock (Pty) Ltd under the SNSD Programme. The CSIR identified Jam Rock (Pty) Ltd as a client or a special needs applicant and has agreed to assist them with acquiring Environmental Authorization for the project on a pro bono basis, including the cost of the basic assessment, specialist studies, site visits and human resources. Jam Rock is a 100% black owned entity supported by government funding. The applicant has applied for funding through Land Bank which support to previously disadvantaged individuals who do not have the start-up capital to launch their own enterprise. Thus, the site which is being investigated in this report is the only site available to this entity and there are no available alternative sites to be considered.

**Alternative Site 2**

**Alternative Site 3**

**Site Co-ordinates**

**Alternative S1 (preferred or only site alternative)**

**Latitude (S):**

**Longitude (E):**

25°	16'	0.184"	27°	52'	59.8"

**Alternative S2 (if any)**

**Alternative S3 (if any)**

**In the case of linear activities:**

**Alternative:**

**Latitude (S):**

**Longitude (E):**

Alternative S1 (preferred or only route alternative)

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


Alternative S2 (if any)

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


Alternative S3 (if any)

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


For route alternatives that are longer than 500m, please provide an addendum with co-ordinates taken every 250 metres along the route for each alternative alignment.

In the case of an area being under application, please provide the co-ordinates of the corners of the site as indicated on the lay-out map provided in Appendix A.

**b) Lay-out alternatives**

Alternatives	Description
<b>Alternative 1 (preferred or only alternative)</b>	The layout of the proposed project has been carefully informed by the findings of the Ecological Impact Assessment and the Heritage Impact Assessment (Appendix G) so as to avoid sensitive areas and loss of species of conservation concern. Furthermore the development is within areas that have already been transformed previously to limit the disturbance of natural habitats.
<b>Alternative 2</b>	
<b>Alternative 3</b>	

**c) Technology alternatives**

Alternatives	Description
<b>Alternative 1 (preferred or only alternative)</b>	The following measures will be used as part of the resource efficiency of the proposed development: Large fans will be used as a method of cooling, mainly because they have the ability to move air faster than small fans. These fans will be maintained regularly to ensure that they operate efficiently. Furthermore energy saving light bulbs will be used for the development; the use of this energy saving bulbs will improve the efficiency of the development. Furthermore sensor lights will be used thus reducing the energy usage required for lighting.
<b>Alternative 2</b>	
<b>Alternative 3</b>	

**d) Other alternatives (e.g. scheduling, demand, input, scale and design alternatives)**

Alternatives	Description
<b>Alternative 1 (preferred or only alternative)</b>	The proposed development is within a previously transformed agricultural land thus suitable for agricultural related projects such as chicken broilers. The nature of the project was determined based on the farming experience, need and knowledge of the applicant in terms of poultry production, the need of chicken broilers as well as funding opportunities available for the development. Furthermore the operating plan for the proposed project has been informed by extensive market research and an assessment of the need of the products that will be produced.
<b>Alternative 2</b>	
<b>Alternative 3</b>	

**e) No-go alternative**

Should the No-Go Option be implemented, the site would maintain its status quo. As such, the No-Go Option would not be environmentally, socially or economically feasible in the long-term and is thus not deemed feasible. However, the No-Go Option is nevertheless considered and assessed in relation to the potential implications of the proposed project, as required in terms of NEMA and its EIA Regulations

**f) Please motivate for preferred site, activity and technology alternative**

Motivation for the proposed site alternative as well as exclusion of alternatives:

**Site location and layout alternatives**

The DEA commissioned the CSIR to run the “Special Needs and Skills Development (SNSD) Programme” which is aimed at providing pro bono Environmental Impact Assessments (EIAs) for people who are classified as special needs clients/applicants, specifically Small, Medium and Micro Enterprises (SMMEs), Community Trusts, Individuals or Government Programmes. The CSIR received an application from Jam Rock (Pty) Ltd under the SNSD Programme. The CSIR identified Jam Rock as a client or a special needs applicant and has agreed to assist them with acquiring Environmental Authorization for the project on a pro bono basis, including the cost of the basic assessment, specialist studies, site visits and human resources. Jam Rock is a 100% black owned entity supported by government funding. The applicant has applied for funding through Land Bank which support to previously disadvantaged individuals who do not have the start-up capital to launch their own enterprise. Thus, the site which is being investigated in this report is the only site available to this entity and there are no available alternative sites to be considered.

The layout of the proposed project has been carefully informed by the findings of the Ecological Impact Assessment and the Heritage Impact Assessment (Appendix G) so as to avoid sensitive areas and loss of species of conservation concern. Furthermore the development is within areas that have already been transformed previously to limit the disturbance of natural habitats.

**Design, technology & activity alternatives**

The proposed development is within a previously transformed agricultural land thus suitable for agricultural related projects such as chicken broilers. The nature of the project was determined based on the farming experience, need and knowledge of the applicant in terms of poultry production, the need of chicken broilers as well as funding opportunities available for the development. Furthermore the operating plan for the proposed project has been informed by extensive market research and an assessment of the need of the products that will be produced. In terms of the economic viability, the project does not make use of major technologies, which in turn results in the proposed development requiring very little energy. The following measures will be used as part of the resource efficiency of the proposed development:

**Cooling efficiency**

Large fans will be used as a method of cooling, mainly because they have the ability to move air faster than small fans. These fans will be maintained regularly to ensure that they operate efficiently.

**Lighting efficiency**

Energy saving light bulbs will be used for the development; the use of this energy saving bulbs will improve the efficiency of the development. Furthermore sensor lights will be used thus reducing the energy usage required for lighting.

All waste from the chicken broiler will be re-cycled into fertilizer and sold to the local community as manure for vegetable gardens. The poultry will be sold locally and the jobs being created by the proposed development will be sourced to local communities.

The operations of this facility will be under constant supervision. In addition, the project design, technology and operations will make use of Agricultural Technical Support of the South African Poultry Association (SAPA). Thus, due to the nature of the industry, the support structures and the knowledge and experience of Jam Rock, the proposed project alternatives are the only viable alternatives to take forward to the Impact Assessment phase.

**Paragraphs 3 – 13 below should be completed for each alternative.**

### A.3 PHYSICAL SIZE OF THE ACTIVITY

**a) Indicate the physical size of the preferred activity/technology as well as alternative activities/technologies (footprints):**

**Alternative:**

Alternative A1<sup>1</sup> (preferred activity alternative)

Alternative A2 (if any)

Alternative A3 (if any)

**or, for linear activities:**

**Size of the activity:**

m <sup>2</sup>

**Alternative:**

Alternative A1 (preferred activity alternative)

Alternative A2 (if any)

Alternative A3 (if any)

**Length of the activity:**

m
m
m

**b) Indicate the size of the alternative sites or servitudes (within which the above footprints will occur):**

**Alternative:**

Alternative A1 (preferred activity alternative)

Alternative A2 (if any)

Alternative A3 (if any)

**Size of the site/servitude:**

m <sup>2</sup>
m <sup>2</sup>
m <sup>2</sup>

### A.4 SITE ACCESS

**Does ready access to the site exist?**

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

YES
m

**Describe the type of access road planned:**

**Include the position of the access road on the site plan and required map, as well as an indication of the road in relation to the site.**

## **A.5 LOCALITY MAP**

**An A3 locality map must be attached to the back of this document, as Appendix A. The scale of the locality map must be relevant to the size of the development (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 map must indicate the following:**

- an accurate indication of the project site position as well as the positions of the alternative sites, if any;
- indication of all the alternatives identified;
- closest town(s);
- the accurate indication of the site in relation to closest protected environments or national parks (i.e. within 2.5 km)
- road access from all major roads in the area;
- road names or numbers of all major roads as well as the roads that provide access to the site(s);
- all roads within a 1km radius of the site or alternative sites; and
- a north arrow;
- a legend; and
- locality GPS co-ordinates (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 degrees, minutes and seconds using the Hartebeeshoek94 WGS84 co-ordinate system)

## **A.6 LAYOUT/ROUTE PLAN**

A detailed site or route plan(s) must be prepared for each alternative site or alternative activity. It must be attached as Appendix B to this document.

The site or route plans must indicate the following:

- the property boundaries and numbers of all the properties within 50 metres of the site;
- the current land use as well as the land use zoning of the site;
- the current land use as well as the land use zoning each of the properties adjoining the site or sites;
- the exact position of each listed activity applied for (including alternatives);
- servitude(s) indicating the purpose of the servitude;
- a legend; and
- a north arrow.

## **A.7 SENSITIVITY MAP**

The layout/route plan as indicated above must be overlain with a sensitivity map that indicates all the sensitive areas associated with the site, including, but not limited to:

- watercourses;
- the 1:100 year flood line (where available or where it is required by Department of Water and Sanitation);
- ridges;

- for gentle slopes the 1 metre contour intervals must be indicated on the plan and whenever the slope of the site exceeds 1:10, the 500mm contours must be indicated on the plan; and
- cultural and historical features;
- areas with indigenous vegetation (even if it is degraded or infested with alien species); and
- critical biodiversity areas and ecological support area.
- protected areas (e.g Magaliesberg Protected Environment, Pilanesberg National Park etc.)

The sensitivity map must also cover areas within 100m of the site and must be part of Appendix B.

## A.8 SITE PHOTOGRAPHS

Colour photographs from the centre 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 Appendix C to this report. It must be supplemented with additional photographs of relevant features on the site, if applicable.

## A.9 FACILITY ILLUSTRATION

A detailed illustration of the activity must be provided at a scale of at least 1:200 as Appendix D 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.

## A.10 ACTIVITY MOTIVATION

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

Is the activity permitted in terms of the property's existing land use rights?	YES	NO	Please explain
The proposed development site is not administered by any Town planning Scheme. From the municipality's record the property does not have any zoning in terms of the regulations. As such the development of the chicken broiler can be permitted.			
Will the activity be in line with the following?			
(a) Provincial Spatial Development Framework (PSDF)	YES		
The agricultural sector in North West has been identified as the backbone of rural economy; this is mainly because it has the potential to improve food security as well as to stimulate economic growth within the province. The proposed development will contribute towards the agricultural growth of the province in terms of job creation, positive trade balance for agricultural growth as well as skills development. The framework also acknowledges the significant role of emerging farmers towards agricultural production.			
(b) Urban edge / Edge of Built environment for the area		NO	
The proposed development is situated within the rural areas of Moretele Local municipality.			
(c) Integrated Development Plan (IDP) and Spatial Development Framework (SDF) of the Local Municipality (e.g. would the approval of this application compromise the integrity of the existing approved and credible municipal IDP and SDF?).	YES		

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According to the IDP of Moretele Local municipality, agriculture has become a focal point in all economic development prospects for the municipality. Furthermore, the strategic objectives outlined in the IDP have identified agricultural development within the municipality as key performance indicator to achieving economic growth. The proposed development promotes agricultural development and aligns with these objectives.			
(d) Approved Structure Plan of the Municipality			Please explain
(e) An Environmental Management Framework (EMF) adopted by the Department (e.g. Would the approval of this application compromise the integrity of the existing environmental management priorities for the area and if so, can it be justified in terms of sustainability considerations?)	YES	NO	Please explain
According to the Draft environmental management By Law of the Moretele Municipality, The municipality is yet to develop a sensitive habitat management and conservation plan. In addition, The environmental management By law also outlines the principles of NEMA which promotes development that is socially, economically and environmentally sustainable. The undertaking of the Basic Assessment ensures that negative environmental impacts are avoided and minimised where possible.			
(f) Any other Plans (e.g. Guide Plan)		NO	
The EAP is not aware of any other plans within the proposed development site			
Is the land use (associated with the activity being applied for) considered within the timeframe intended by the existing approved SDF agreed to by the relevant environmental authority (i.e. is the proposed development in line with the projects and programmes identified as priorities within the credible IDP)?	YES	NO	Please explain
Agriculture is currently a focal point in developmental prospects within the municipality. As such the proposed development of a chicken broiler aligns with the priorities identified in the IDP.			
Does the community/area need the activity and the associated land use concerned (is it a societal priority)? (This refers to the strategic as well as local level (e.g. development is a national priority, but within a specific local context it could be inappropriate.)	YES		
According to the IDP, the communities within this municipality have identified poultry as a priority need that contributes towards local economic development and job creation.			
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? (Confirmation by the relevant Municipality in this regard must be attached to the final Basic Assessment Report as Appendix E.)	YES		
The applicant shall lodge an application with Eskom for electricity needs of the project. Furthermore the applicant will use groundwater. An application for a Water use License shall be lodged with the Department of Water and Sanitation.			
Is this development provided for in the infrastructure planning of the municipality, and if not what will the implication is on the infrastructure planning of the municipality (priority and placement of services and opportunity costs)? (Comment by the relevant Municipality in this regard must be attached to the final Basic Assessment Report as Appendix I.)			Please explain
No additional connection shall be required, the site already has infrastructure for the supply of electricity. The applicant shall lodge an application for additional capacity.			
Is this project part of a national programme to address an issue of national concern or importance?	YES		

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The proposed development aims to address challenges of food security in South Africa on a local scale. This shall be done through rural economic growth, maintenance of positive trade balance for primary agricultural products as well as skills development and training for the local community.		
Do location factors favour this land use (associated with the activity applied for) at this place? (This relates to the contextualisation of the proposed land use on this site within its broader context.)	YES	
The proposed development is within low-moderate environmental sensitive area; furthermore it has a history of agricultural practices as such providing a suitable location for the broiler houses.		
Is the development the best practicable environmental option for this land/site?	YES	
The proposed development site is not pristine; it has already been transformed as a result of past agricultural practices. The development footprint of the site has been carefully informed by the sensitivities on site and will occur in areas of low-moderate sensitivities ensuring minimal destruction of important flora and fauna.		
Will the benefits of the proposed land use/development outweigh the negative impacts of it?	YES	
The project benefits outweigh the negative impacts; the project will make a positive contribution to sustainable economic growth, skills development and employment opportunities in the Moretele Local Municipality. Furthermore it will be undertaken in a manner that aims to minimise environmental impacts of the chicken broiler.		
Will the proposed land use/development set a precedent for similar activities in the area (local municipality)?	YES	
Will any person's rights be negatively affected by the proposed activity/ies?		
		NO
The project will not affect the rights of the local community; in fact it will economically benefit the local community by creating job opportunities.		
Will the proposed activity/ies compromise the "urban edge" as defined by the local municipality?		
		NO
The proposed project is located outside the urban edge of the Ventersdorp Local Municipality.		
Will the proposed activity/ies contribute to any of the 17 Strategic Integrated Projects (SIPS)?		
		NO
The proposed development is on a small scale and does not contribute towards the Strategic Integrated projects.		
What will the benefits be to society in general and to the local communities?		Please explain
The benefit of the project entails food security and skills development and training for the local community.		
Any other need and desirability considerations related to the proposed activity?		Please explain
No		
How does the project fit into the National Development Plan for 2030?		Please explain
The proposed development aims to maintain and increase South Africa's ability to meet its national food requirements, and also seeks to eliminate inequalities and poverty amongst households. According to Stats SA, about 14.3 million South Africans are vulnerable to food insecurity. As such the proposed development feeds into the food security stream. In addition, the main goals highlighted in the NDP which relate to the proposed project are employment and adequate nutrition. Chapter 6 of the National Development Plan highlights an "inclusive rural economy" and the objectives of this plan are to create jobs in agriculture, maintain a positive trade balance for primary and processed agricultural products and activating rural economies through service to small and micro farmers. As such the proposed development of the chicken broiler aligns with these goals.		
Please describe how the general objectives of Integrated Environmental Management as set out in Section 23 of NEMA as amended have been taken into account.		

The general objectives of Integrated Environmental Management were taken into account by considering all the potential negative and positive impacts of the proposed project on both the biophysical and socio-economic environments. In order to avoid potentially significant impacts, specialist inputs were obtained in relation to terrestrial and aquatic ecology. Based on the findings of the specialist studies a number of recommendations / mitigation measures have been identified for consideration in further project design and implementation. The public and authorities will be given adequate opportunity to comment on the proposed project and to participate in the Basic Assessment Process

Please describe how the principles of environmental management as set out in Section 2 of NEMA as amended have been taken into account.

The basic needs of landowners and the public were taken into account during the planning phase of the proposed project, which aims to stimulate economic growth, create employment opportunities and make significant contribution towards food security. Minimisation of potential negative impacts and optimisation of potential positive impacts will be ensured by way of effective implementation of the Construction EMP. Thus the proposed project is deemed to be socially, environmentally and economically sustainable.

### A.11 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, if applicable:

Title of legislation, policy or guideline	Applicability to the project	Administering authority	Date
National Environmental Management Act, 1998 (Act 107 of 1998).	The proposed development triggers listed activities within this act	National Government, and National Department of Environmental Affairs	1998
National Environmental Management Act EIA Regulations (7 April 2017)	A number of listed activities have been identified that have triggered the need for a Basic Assessment in terms of these regulations	National Government, and National Department of Environmental Affairs	2017
National Water Act, 1998 (Act 36 of 1998).	The proposed development uses groundwater	Department of Water Affairs	1998
The National Heritage Resources Act, 1999 (Act No 25 of 1999) as amended, particularly Chapter II, Section 38	The proposed development site has graves.	South African Heritage Resource Agency	1999
National Environmental Management Biodiversity Act, 2004 (Act No. 10 of 2004)	The NEMBA aims to conserve and provide management of biodiversity in the country. The proposed development site is within a critical biodiversity area.	National Government, and National Department of Environmental Affairs	2004

### A.12 WASTE, EFFLUENT, EMISSION AND NOISE MANAGEMENT

#### a) Solid waste management

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

YES

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

1400 m<sup>3</sup>

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

The following measures shall be undertaken to ensure disposal of solid waste:

- A. The applicant shall appoint someone with overall project authority committed to recycling. He/she can issue a statement explaining that construction waste recycling is important to the project and why. This statement can be used in many ways – in worker training materials etc.
- B. Put recycling into specifications and into all contracts – allocate bins for different materials, assign haulers or vendors to collect materials place a bin on site. This will also generate money back into the project that can be used to buy sports gear for the local school or other charity activities.
- C. Establish who will control the debris. Establish one project authority, usually the construction manager or general contractor, to control all project waste, provide dumpsters and waste services for the project, and enforce recycling rules with all contractors  
(Make sure to put a trash container near recycling containers or the recycling container may become a trash container). For example the department of Public Works may use debris from building to strengthen the roads leading to the site as it becomes muddy and slippery during rains.
- D. Include waste reduction, reuse and recycling from the start
  - a. Order materials just in time, send back extra inventory, utilize reused building materials, consider ways you can reduce and reuse waste during construction and put these methods into contracts
  - b. Ask suppliers to reduce packaging, send you recyclable packaging or take packaging back
  - c. Discuss and encourage reduction, reuse and recycling at pre-construction meetings
- E. Select a coordinator – designate a staff member (typically construction project manager with the cooperation of the site superintendent) to promote and monitor the recycling program. The coordinator will educate staff and subcontractors.

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

- A. Recyclable materials will be collected or delivered to haulers (recyclers): Who in turn give monetary remuneration for materials such as scrap metal.
- B. Debris such as brick, asphalt and concrete to be scattered over road to avoid muddiness during rain
- C. Assign dumpsters (bins) by reputable waste management companies which will periodically pick the bin when it's full for disposing. This will remove materials from the construction site that is otherwise left behind by the haulers.

Will the activity produce solid waste during its operational phase?

YES

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

3900m<sup>3</sup>

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

- Most of the solid waste will be chicken manure, cults or mortalities, normal waste like household rubbish and consumables like sacks or even used coal during winter time.
  - a. Chicken manure: Aged for two to three months it's perfect manure for our crops in the neighbouring farm that we also own and grow crops in. Other than that it sells for R600 per van load market price where we operate, money that could be used to pay casual staff members during the cleaning period.
  - b. Cults and mortalities: Easily disposed by pigs that we will have on our other farm as we aim to grow production of animal stock or sell them to the nearby crocodile farm and utilise the money to service machinery on the farm.
  - c. Normal waste and household rubbish: Disposed of into municipal waste stream.
  - d. Sacks: Will be reused when packaging manure for sale at R50 per sack market price or just storing of the manure until it's ready to be sprayed onto the garden.
  - e. Used coal: With a small mixture of cement it's used to make bricks which can be used to increase the number of pig houses on our other farm.

If the solid waste will be disposed of into a municipal waste stream, indicate which registered landfill site will be used.

Municipal waste collected and dumped at the Moretele landfill (dumpsite)

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

If for some reason the municipal waste is not collected periodically then the local authority will be immediately and the councillor asked to intervene and investigate.

*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, then 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 NEM:WA?  YES  NO

If YES, inform the competent authority and request a change to an application for scoping and EIA. An application for a waste permit in terms of the NEM:WA must also be submitted with this application.

Is the activity that is being applied for a solid waste handling or treatment facility?  YES  NO

If YES, then the applicant should consult with the competent authority to determine whether it is necessary to change to an application for scoping and EIA. An application for a waste permit in terms of the NEM:WA must also be submitted with this application.

**b) Liquid effluent**

Will the activity produce effluent, other than normal sewage, that will be disposed of in a municipal sewage system?  YES  NO

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

Will the activity produce any effluent that will be treated and/or disposed of on site?  YES  NO

**If YES, describe the type of effluent and the disposal mechanism/method**

[Redacted description of effluent and disposal method]

Will the activity produce effluent that will be treated and/or disposed of at another facility?  YES  NO

If YES, provide the particulars of the facility:

**Facility name:** [Redacted]  
**Contact person:** [Redacted]  
**Postal address:** [Redacted]  
**Postal code:** [Redacted]  
**Telephone:** [Redacted] **Cell:** [Redacted]  
**E-mail:** [Redacted] **Fax:** [Redacted]

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

[Redacted description of waste water reuse or recycling measures]

**c) Emissions into the atmosphere**

Will the activity release emissions into the atmosphere other than exhaust emissions and dust associated with construction phase activities?  YES  NO

If YES, is it controlled by any legislation of any sphere of government?  YES  NO

If YES, the applicant must 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:

**d) Waste Licence/Registration**

Will any aspect of the activity produce waste that will require a waste licence/registration in terms of the NEM:WA?  YES  NO

If YES, please submit evidence that an application for a waste licence/registration has been submitted to the competent authority

**e) Generation of noise**

Will the activity generate noise?  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 noise in terms of type and level:

Noise during construction by trucks

**A.13 WATER USE**

Please indicate the source(s) of water that will be used for the activity by ticking the appropriate box(es):

Surface water  Groundwater  Other

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:  0 litres  1-1000 litres  1000-10000 litres  29 400 litres

Does the activity require a water use authorisation (general authorisation or water use license) from the Department of Water and Sanitation?  YES  NO

If YES, please provide proof that the application has been submitted to the Department of Water and Sanitation.

**A.14 ENERGY EFFICIENCY**

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

The following measures will be used as part of the resource efficiency of the proposed development:

**Cooling efficiency**  
 Large fans will be used as a method of cooling, mainly because they have the ability to move air faster than small fans. These fans will be maintained regularly to ensure that they operate efficiently.

**Lighting efficiency**  
 Energy saving light bulbs will be used for the development; the use of this energy saving bulbs will improve the efficiency of the development. Furthermore sensor lights will be used thus reducing the energy usage required for lighting.

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



Has a specialist been consulted to assist with the completion of this section?

	NO
--	----

If YES, please complete the form entitled "Details of specialist and declaration of interest" for the specialist appointed and attach in Appendix F.

## SECTION B SITE/AREA/PROPERTY DESCRIPTION

**Important notes:**

1. For linear activities (pipelines, etc) as well as activities that cover very large sites, it may be necessary to complete this section for each part of the site that has a significantly different environment. In such cases please complete copies of Section B and indicate the area, as it appears on the Site Plan.
  
2. Paragraphs 1 - 6 below must be completed for each alternative.

**Current land-use zoning as per local municipality IDP/records:**

The proposed development site is not administered by any Town planning Scheme

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

Is a change of land-use or a consent use application required?

YES	NO
-----	----

### B.1 GRADIENT OF THE SITE

Indicate the general gradient of the site.

**Alternative S1:**

Flat	
------	--

**Alternative S2 (if any):**

--

**Alternative S3 (if any):**

--

### B.2 LOCATION IN LANDSCAPE

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

2.1 Ridgeline	<input type="checkbox"/>	2.4 Closed valley	<input type="checkbox"/>	2.7 Undulating plain / low hills	<input checked="" type="checkbox"/>
2.2 Plateau	<input type="checkbox"/>	2.5 Open valley	<input type="checkbox"/>	2.8 Dune	<input type="checkbox"/>
2.3 Side slope of hill/mountain	<input type="checkbox"/>	2.6 Plain	<input checked="" type="checkbox"/>	2.9 Seafront	<input type="checkbox"/>

### B.3 GROUNDWATER, SOIL AND GEOLOGICAL STABILITY OF THE SITE

Is the site(s) located on any of the following?

	Alternative S1:	Alternative S2 (if any):	Alternative S3 (if any):
Shallow water table (less than 1.5m deep)	NO		
Dolomite, sinkhole or doline areas	NO		
Seasonally wet soils (often close to water bodies)	NO		
Unstable rocky slopes or steep slopes with loose soil	NO		
Dispersive soils (soils that dissolve in water)	NO		
Soils with high clay content (clay fraction more than 40%)	NO		
Any other unstable soil or geological feature	NO		
An area sensitive to erosion	YES		

If you are unsure about any of the above or if you are concerned that any of the above aspects may be an issue of concern in the application, an appropriate specialist should be appointed to assist in the completion of this section. Information in respect of the above will often be available as part of the project information or at the planning sections of local authorities. Where it exists, the 1:50 000 scale Regional Geotechnical Maps prepared by the Council for Geo Science may also be consulted.

### B.4 GROUNDCOVER

Indicate the types of groundcover present on the site. The location of all identified rare or endangered species or other elements should be accurately indicated on the site plan(s).

Natural veld - good condition <sup>E</sup>	Natural veld with scattered aliens <sup>E</sup>	Natural veld with heavy alien infestation <sup>E</sup>	Veld dominated by alien species <sup>E</sup>	
			Building or other structure	Bare soil

If any of the boxes marked with an “<sup>E</sup>” is ticked, please consult an appropriate specialist to assist in the completion of this section if the environmental assessment practitioner doesn’t have the necessary expertise.

### B.5 SURFACE WATER

Indicate the surface water present on and or adjacent to the site and alternative sites?

Perennial River		NO	
Non-Perennial River		NO	
Permanent Wetland		NO	
Seasonal Wetland	YES		
Artificial Wetland		NO	

If any of the boxes marked YES or UNSURE is ticked, please provide a description of the relevant watercourse.



**Figure 1: Potential wetland areas**

The nearby wetland on the main access road to the site - given the national, provincial and local importance of wetlands (Figure 1). On a national scale all wetlands are Protected. Although the present Eco scan did not entail a wetland assessment, the nearby wetland appears to be Largely Natural, and its highest scoring ecosystem service is probably maintenance of biodiversity including potential CI faunal species such as the NT Giant Bullfrog.

## B.6 LAND USE CHARACTER OF SURROUNDING AREA

Indicate land uses and/or prominent features that currently occur within a 500m radius of the site and give description of how this influences the application or may be impacted upon by the application:

Natural area	
Low density residential	
Agriculture	

If any of the boxes marked with an "N" are ticked, how will this impact / be impacted upon by the proposed activity? Specify and explain

If any of the boxes marked with an "AN" are ticked, how will this impact / be impacted upon by the proposed activity? Specify and explain:

If any of the boxes marked with an "H" are ticked, how will this impact / be impacted upon by the proposed activity? Specify and explain:

Does the proposed site (including any alternative sites) fall within any of the following:

Critical Biodiversity Area (as per provincial conservation plan)	YES	
Core area of a protected area?		NO
Buffer area of a protected area?		NO
Planned expansion area of an existing protected area?		NO
Existing offset area associated with a previous Environmental Authorisation?		NO

If the answer to any of these questions was YES, a map indicating the affected area must be included in Appendix B (as part of sensitivity map).

## B.7 BIODIVERSITY

Please note: The Department may request specialist input/studies depending on the nature of the biodiversity occurring on the site and potential impact(s) of the proposed activity/ies. To assist with the identification of the biodiversity occurring on site and the ecosystem status consult <http://bgis.sanbi.org> or [BGIShelp@sanbi.org](mailto:BGIShelp@sanbi.org). Information is also available on compact disc (cd) from the Biodiversity-GIS Unit, Ph (021) 799 8698. This information may be updated from time to time and it is the applicant/ EAP's responsibility to ensure that the latest version is used. A map of the relevant biodiversity information (including an indication of the habitat conditions as per (b) below) and must be provided as an overlay map to the property/site plan as Appendix B to this report.

- a) **Indicate the applicable biodiversity planning categories of all areas on site and indicate the reason(s) provided in the biodiversity plan for the selection of the specific area as part of the specific category)**

Systematic Biodiversity Planning Category	If CBA or ESA, indicate the reason(s) for its selection in biodiversity plan
Critical Biodiversity Area (CBA)	This CBA was likely assigned because the site is situated within the Springbokvlakte Thornveld Endangered vegetation type and Vulnerable Threatened Ecosystem. Available satellite imagery and our field surveys have confirmed, however, that virtually the entire site comprises regenerating previously cultivated land.

**b) Indicate and describe the habitat condition on site**

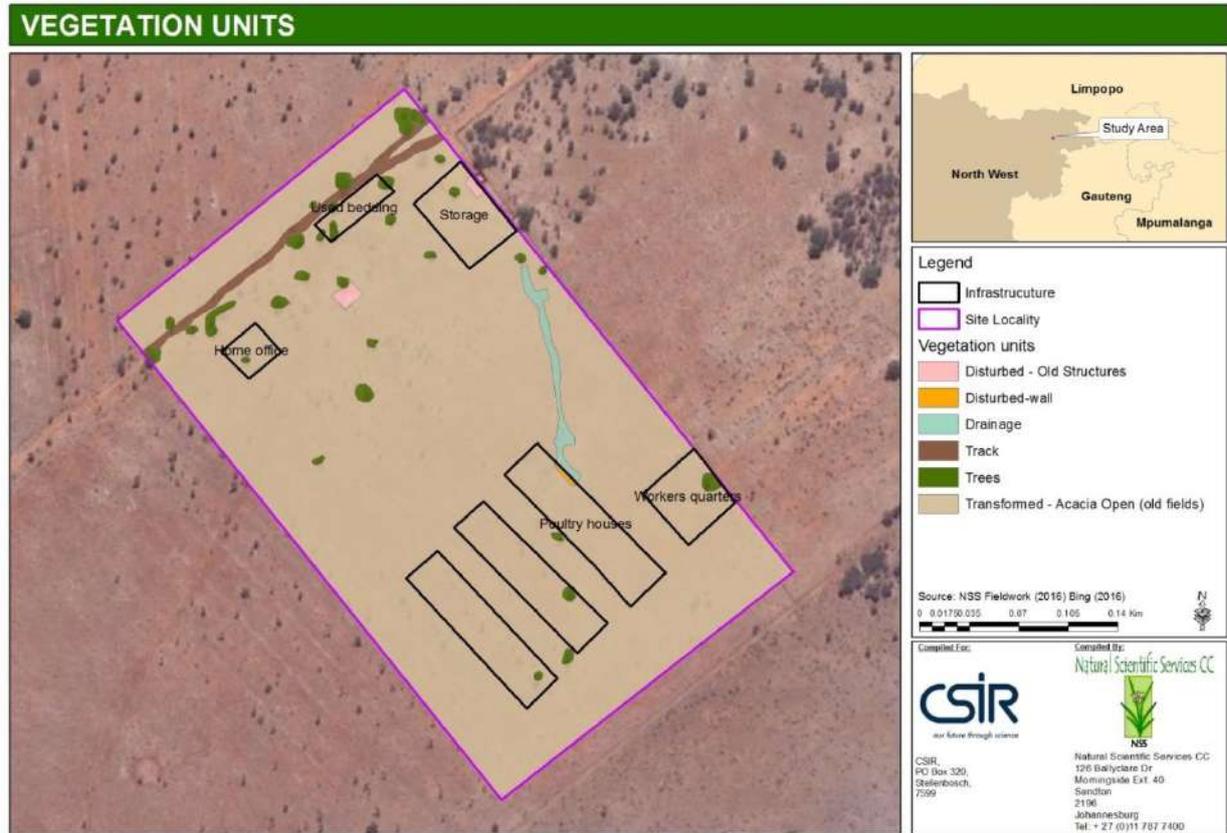
Habitat Condition	Percentage of habitat condition class (adding up to 100%)	Description and additional Comments and Observations (including additional insight into condition, e.g. poor land management practises, presence of quarries, grazing, harvesting regimes etc).
Natural	%	
Near Natural (includes areas with low to moderate level of alien invasive plants)	2.83 %	Possible artificial drainage and Acacia- Boscia Tree Clumps
Degraded (includes areas heavily invaded by alien plants)	%	
Transformed (includes cultivation, dams, urban, plantation, roads, etc)	97.17 %	Transformed - Acacia Open Woodland (old fields)

**c) Complete the table to indicate:**

- (i) the type of vegetation, including its ecosystem status, present on the site; and**
- (ii) whether an aquatic ecosystem is present on site.**

Terrestrial Ecosystems	Aquatic Ecosystems	
Ecosystem threat status as per the National Environmental Management: Biodiversity Act (Act No. 10 of 2004)	<b>Critical</b>	Wetland (including rivers, depressions, channelled and unchannelled wetlands, flats, seeps pans, and artificial wetlands)
	<b>Endangered</b>	
	<b>Vulnerable</b>	
	<b>NO</b>	

- d) Please provide a description of the vegetation type and/or aquatic ecosystem present on site, including any important biodiversity features/information identified on site (e.g. threatened species and special habitats)



**Figure 2: Vegetation units within the proposed development site**

From the field investigations the study area was largely monospecific and almost the entire site had been previously farmed (over 95% - refer to Table 3 and Figure 2). Available aerial imagery from Google Earth dated back to 2009 and still showed past farming practices. Therefore it was very difficult to distinguish a diversity of habitat types. Large trees that have significance as roosting sites for species such as Owls and Raptors were mapped. A small drainage line within the site was also evident but showed no signs of soil wetness or vegetation wetland indicators. During the field investigation, wetlands with limited slope to the north were flooded; however, no pooling of water was evident on the site.

**Table 3: Vegetation units within the proposed development site**

Vegetation Community	Conservation Significance	Area - Ha	Area -%
<b>Drainage Habitat</b>			
Possible Artificial Drainage	Moderate-Low	0.079	0.84
<b>Tree Clumps</b>			
<i>Acacia – Boscia</i> Tree Clumps	Moderate	0.19	1.99
<b>Transformed Habitat</b>			
Transformed - <i>Acacia</i> Open Woodland (old fields)	Moderate-Low	8.92	95.28
<b>Disturbed</b>			
Built-up Areas	Low	0.033	0.35
Track	Low	0.14	1.54

Although no Red Listed species were recorded, *Ammocharis coranica* is considered a Protected species under the Nature Conservation Ordinance, 12 of 1983 (Figure 3). Protected Species may not be cut, disturbed, damaged, and destroyed without obtaining a permit from North West Province or a delegated authority. However, recent legislation [which repeals the Ordinance] passed in January 2017, only weeks before the final compilation of this report, the Protected Status of species was revised and this species is no longer on the list.



*Ammocharis coranica*



*Ammocharis coranica*

**Figure 3: Photographs of Conservation Important plant species on Site**

## B.8 CULTURAL/HISTORICAL FEATURES

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

YES

### Palaeontology

The archaeological field study reported a flat, sandy land surface devoid of bedrock exposure. This lack of bedrock has meant that geological and palaeontological knowledge in this area stems largely from analysis of borehole data. Almond (2016:1) reports that the study area overlies the Irrigasie Formation which is comprised of "reddish-brown, readily-weathered mudrocks with subordinate sandstones and minor conglomerates". The kinds of fossils known to occur in the area are primarily trace fossils, while fossil pollens and spores and very rare dinosaur bones have also been reported. No fossils were seen during the archaeological survey.

### Archaeology

The survey showed that a very low density scatter of Stone Age artefacts was present throughout the general area. There was no focus to these artefacts and no 'site' could be delineated; the artefacts can be ascribed to background scatter. Most were made from quartzite and some displayed cobble cortex indicating that they were made from river cobbles. Because of their very widespread distribution and very low density, these finds are of minimal heritage significance.

A ruined structure was located along the north-eastern boundary of the property. It was made from cement bricks. It is almost certainly less than 100 years of age and thus is not considered to be a heritage resource. It probably dates to the 1950s because historical aerial photography reveals that the area seemed unaltered in 1948-50 (the earliest available series), but by 1961 a number of 'bright spots' had appeared on the landscape. These spots indicate higher reflectivity from areas cleared of vegetation. One of these spots corresponds with the ruin. Another corresponds with the cement slab noted alongside the corrugated iron shack.

### Graves

Two small informal cemeteries were located on the property. Each had three graves in it. The graves of the first were surrounded by cement bricks that were no doubt obtained from a nearby ruined structure made with the same bricks and located some 35 m away to the northwest. The graves are surrounded by a wire fence and aligned east-west. Because the ruin is relatively recent, the graves are also necessarily recent and must post-date the collapse of the brick structure. These graves are very likely less than 60 years of age and would thus not be regarded as heritage resources in terms of the NHRA.

The second cemetery also has three graves in it. These graves are covered by stone mounds and are not enclosed by any fence. Two graves appear to be full (i.e. adult) size, while the third is far smaller and is likely that of a child. Larger stones have been placed at the head and foot of each grave. They are aligned east-west. These three graves are very likely older and perhaps completely unrelated to those in 'Cemetery 1'.

### Cultural landscape

A survey of historical aerial photography reveals that the landscape on the site was little used during the mid-twentieth century. However, the wider region does show evidence of occupation with small cultivated lands and (presumably stone-built) structures in the south and north respectively.

If uncertain, conduct a specialist investigation by a recognised specialist in the field (archaeology or palaeontology) to establish whether there is such a feature(s) present on or close to the site. Briefly explain the findings of the specialist:

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

	NO
	NO

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

If YES, please provide proof that this permit application has been submitted to SAHRA or the relevant provincial authority.

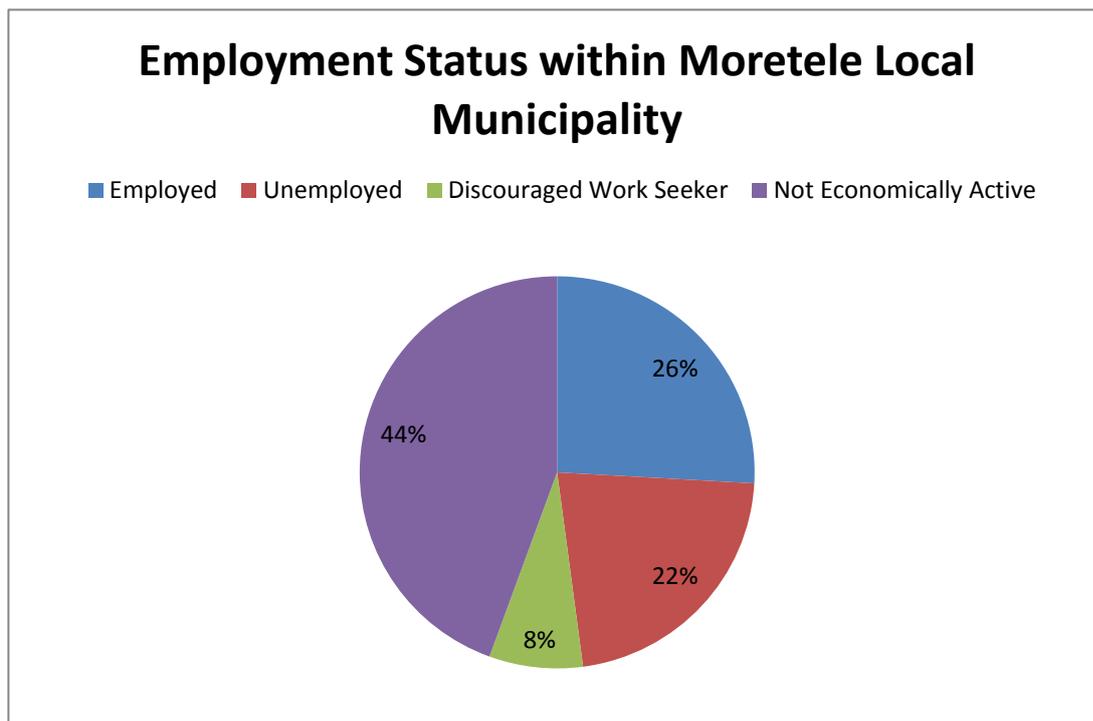
## B.9 SOCIO-ECONOMIC CHARACTER

### a) Local Municipality

Please provide details on the socio-economic character of the local municipality in which the proposed site(s) are situated.

Level of unemployment:

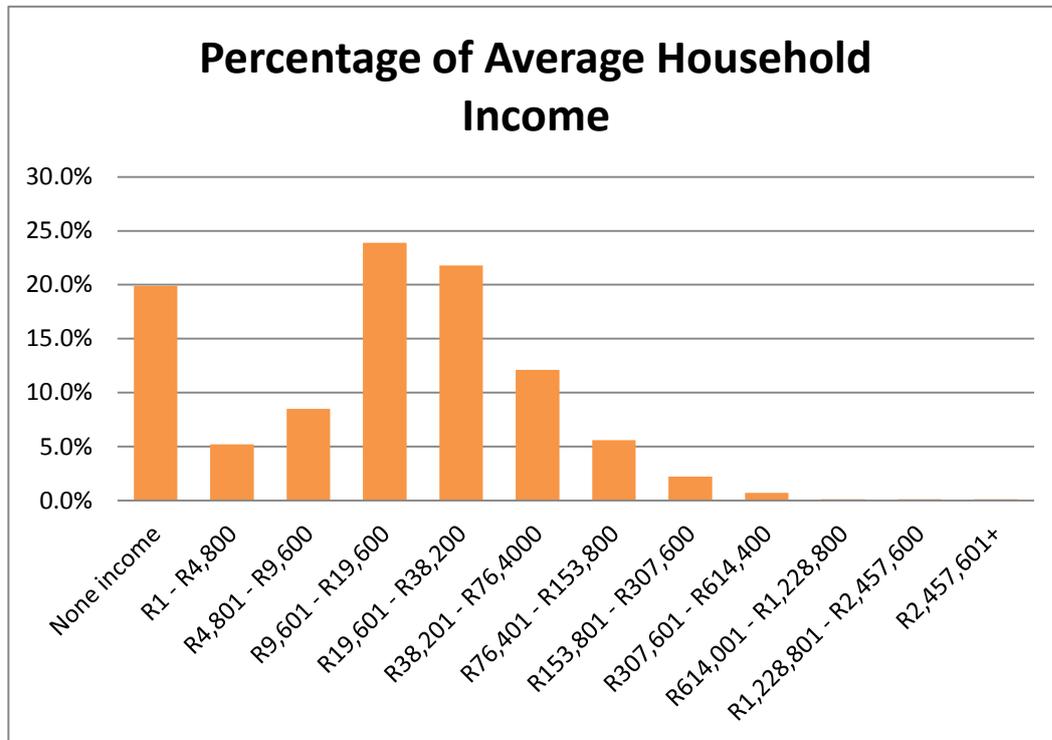
Figure 4 below depicts the employment status of the people within the Moretele Local Municipality. From the information provided, job recreation needs to be prioritised as only 26% of the population is employed, whereas 22% of the population is unemployed. The proposed development of a chicken broiler facility will boost the economic growth of the municipality.



**Figure 4: Employment status within the Moretele Local Municipality**

**Economic profile of local municipality:**

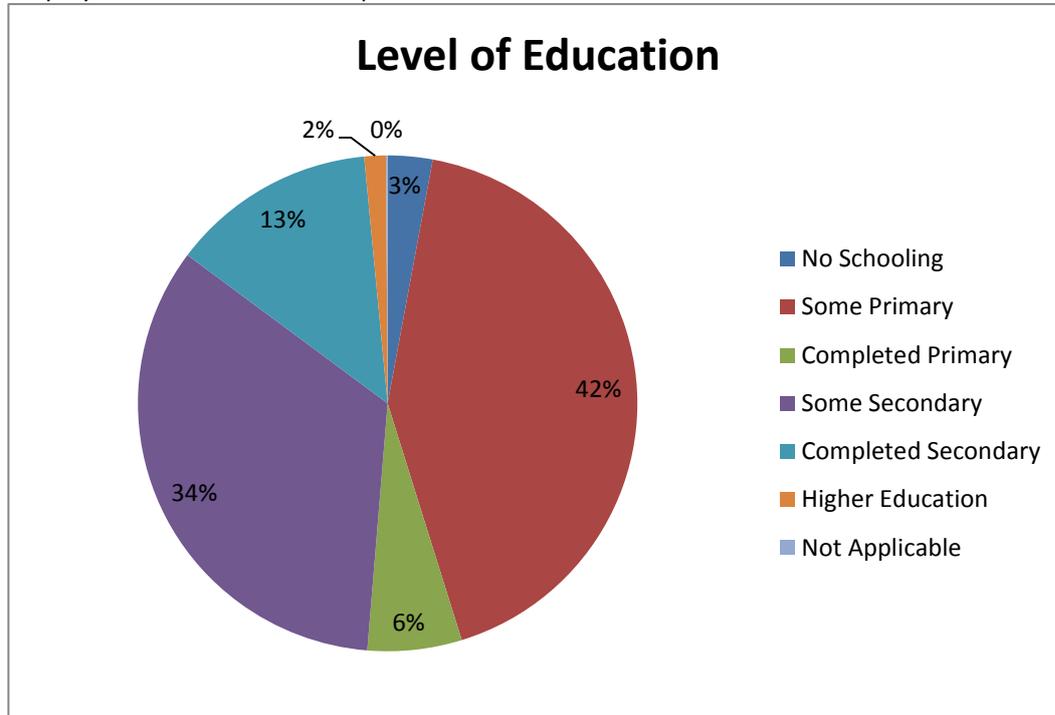
Moretele Local municipality has a low percentage of economically active individuals; this is an area that needs growth. The proposed development of a chicken broiler facility will create opportunities for the local people and hopefully motivate the people who are not economically active to start playing a role in economic growth. Figure 5 below depicts the percentage of average household income within the area. According to this, almost 20% of the population has no income.



**Figure 5: Percentage of average household income**

**Level of education:**

The majority of the people within this municipality had primary schooling or no schooling at all. Only 1.4 percent of the population have higher education. Figure 6 below shows the percentages of the level of employment within the municipal.



**Figure 6: Level of education within Moretele Local Municipality**

**b) Socio-economic value of the activity**

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

R11 586 180.00

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

R2 414 274.00

*Will the activity contribute to service infrastructure?*

YES	NO
-----	----

*Is the activity a public amenity?*

YES	NO
-----	----

*How many new employment opportunities will be created in the development and construction phase of the activity/ies?*

+200

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

R2 414 274.00

*What percentage of this will accrue to previously disadvantaged individuals?*

70%

*How many permanent new employment opportunities will be created during the operational phase of the activity?*

11 permanent employees

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

R 1 591 380.00

*What percentage of this will accrue to previously disadvantaged individuals?*

100%

## **B.10 SPECIALIST(S) CONSULTATION**

**Has a specialist been consulted to assist with the completion of this section?**

**YES**

If YES, please complete the form entitled "Details of specialist and declaration of interest" for each specialist thus appointed and attach it in Appendix F. All specialist reports must be contained in Appendix G and must meet the requirement in Appendix 6 of EIA Regulations, 2017.

# ***SECTION C IMPACT ASSESSMENT***

The assessment of impacts must adhere to the minimum requirements in the EIA Regulations, 2017, 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.

## **C.1 IMPACTS THAT MAY RESULT FROM THE PLANNING AND DESIGN, CONSTRUCTION, OPERATIONAL, DECOMMISSIONING AND CLOSURE PHASES AS WELL AS PROPOSED MANAGEMENT OF IDENTIFIED IMPACTS AND PROPOSED MITIGATION MEASURES**

Provide a summary and anticipated significance of the potential direct, indirect and cumulative impacts that are likely to occur as a result of the planning and design phase, construction phase, operational phase, decommissioning and closure phase, including impacts relating to the choice of site/activity/technology alternatives as well as the mitigation measures that may eliminate or reduce the potential impacts listed. This impact assessment must be applied to all the identified alternatives to the activities identified in Section A(2) of this report.

FINAL BASIC ASSESSMENT REPORT

PROPOSED DEVELOPMENT OF A CHICKEN BROILER FACILITY ON PORTION 40 OF THE FARM JONATHAN 175- JQ, BRITS, NORTH WEST

Activity	Impact summary	Significance	Proposed mitigation
<b>Design and Layout</b>			
Direct Impacts	<i>Loss or degradation of the wetland on the access road</i>	Low (Negative)	<ul style="list-style-type: none"> <li>Design measures to effectively control vehicle access, vehicle speed, dust, stormwater run-off, erosion and sedimentation on the road.</li> <li>Implement the measures that were designed to control impacts on the road preferably during winter, when the risk of erosion should be least.</li> </ul>
	<i>Loss of terrestrial vegetation and faunal habitat</i>	Low (Negative)	<ul style="list-style-type: none"> <li>Ensure that all infrastructure avoids all Very High and High sensitive areas</li> <li>Clearly demarcate or fence in the construction site. Relocate CI plant and animal specimens from the construction footprint, with advice from an appropriate specialist.</li> <li>Commence (and preferably complete) construction during winter, when the risk of disturbing growing plants should be least.</li> </ul>
	<i>Loss of CI or medicinal flora</i>	Low (Negative)	<ul style="list-style-type: none"> <li>Obtain permits to remove CI species</li> <li>Transplant CI and medicinally important floral specimens from the infrastructure footprint to suitable locations in the surrounding area.</li> <li>Obtain guidance from a suitably qualified vegetation specialist or horticulturist regarding the collection, propagation/storage and transplantation of plants.</li> </ul>
	<i>Loss of CI fauna</i>	Low (Negative)	<ul style="list-style-type: none"> <li>Appoint an appropriate specialist to relocate CI fauna from vegetation, termitaria and soil that is removed from the infrastructure footprint.</li> <li>Commence (and preferably complete) construction during winter, when the risk of disturbing active (including breeding and migratory) animals, should be least.</li> <li>Check open trenches for trapped animals (e.g. hedgehogs, reptiles and frogs), and relocate trapped animals with advice from an appropriate</li> </ul>

FINAL BASIC ASSESSMENT REPORT

PROPOSED DEVELOPMENT OF A CHICKEN BROILER FACILITY ON PORTION 40 OF THE FARM JONATHAN 175- JQ, BRITS, NORTH WEST

Activity	Impact summary	Significance	Proposed mitigation
			<p>specialist.</p> <ul style="list-style-type: none"> <li>▪ Prohibit disturbance and persecution (e.g. poaching) of fauna, and introduction of pets and other alien fauna (apart from the production chickens).</li> <li>▪ Provide notices and training to inform workers about dangerous animals (e.g. venomous snakes and scorpions) and prohibited activities (e.g. poaching)</li> <li>▪ Walk fence lines to remove snares.</li> </ul>
	<i>Introduction and proliferation of alien species</i>	Low (Negative)	<ul style="list-style-type: none"> <li>▪ Carefully regulate / limit access by vehicles and materials to the construction site. Demarcate or fence in the construction area.</li> <li>▪ Prohibit the introduction of domestic animals such as dogs and cats.</li> <li>▪ Remove any woody alien species that germinate.</li> <li>▪ Plant only locally indigenous flora if landscaping needs to be done</li> <li>▪ Keep construction activities neat and tidy. When complete, remove all sand piles and landscape all uneven ground while re-establishing a good topsoil layer</li> <li>▪ Remove Category species using mechanical methods, and minimize soil disturbance as far as possible.</li> </ul>
	<i>Increased dust and erosion</i>	Low (Negative)	<ul style="list-style-type: none"> <li>▪ Limit vehicles, people and materials to the construction site.</li> <li>▪ Commence (and preferably complete) construction during winter, when the risk of erosion should be least.</li> <li>▪ Revegetate denude areas with locally indigenous flora a.s.a.p.</li> <li>▪ Implement erosion protection measures on site. Measures could include bunding around soil stockpiles, and vegetation of areas not to be developed.</li> <li>▪ Implement effective and environmentally-friendly dust control</li> </ul>

FINAL BASIC ASSESSMENT REPORT

PROPOSED DEVELOPMENT OF A CHICKEN BROILER FACILITY ON PORTION 40 OF THE FARM JONATHAN 175- JQ, BRITS, NORTH WEST

Activity	Impact summary	Significance	Proposed mitigation
			measures, such as mulching or periodic wetting.
	<i>Sensory disturbance of fauna</i>	Low (Negative)	<ul style="list-style-type: none"> <li>▪ Commence (and preferably complete) construction during winter, when the risk of disturbing active (including breeding and migratory) animals, should be least.</li> <li>▪ Minimize noise to limit its impact on calling and other sensitive fauna (e.g. frogs and Secretary bird).</li> <li>▪ Limit construction activities to day time hours</li> <li>▪ Minimize or eliminate security and construction lighting, to reduce the disturbance of nocturnal fauna.</li> </ul>
	Destruction of palaeontological material	Very Low (Negative)	<ul style="list-style-type: none"> <li>▪ If any archaeological material, palaeontological 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 appropriate specialist. Such heritage is the property of the state and may require excavation and curation in an approved institution.</li> </ul>
	Destruction of archaeological artefacts	Very Low (Negative)	<ul style="list-style-type: none"> <li>▪ If any archaeological material, palaeontological 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 appropriate specialist. Such heritage is the property of the state and may require excavation and curation in an approved institution.</li> </ul>
	Destruction of graves	Low (Negative)	<ul style="list-style-type: none"> <li>▪ The two graveyards should be fenced off clearly and pointed out to all construction workers and other staff on site to ensure that impacts to them are avoided;</li> <li>▪ No construction work should occur within 10 m of any of the graves;</li> </ul>
	Emissions from dust generation and construction vehicles	Medium (Negative)	<ul style="list-style-type: none"> <li>▪ Ensure that cleared (excavated) areas and unpaved surfaces are sprayed with water (obtained from an approved source) to minimise dust generation.</li> </ul>

FINAL BASIC ASSESSMENT REPORT

PROPOSED DEVELOPMENT OF A CHICKEN BROILER FACILITY ON PORTION 40 OF THE FARM JONATHAN 175- JQ, BRITS, NORTH WEST

Activity	Impact summary	Significance	Proposed mitigation
			<ul style="list-style-type: none"> <li>▪ Approved soil stabilisers may be utilised to limit dust generation.</li> <li>▪ Ensure that construction vehicles travelling on unpaved roads do not exceed a speed limit of 40 km/hour.</li> <li>▪ Limit vehicles, people and materials to the construction site</li> <li>▪ Adequate dust control strategies should be applied to minimise dust deposition, for example: Periodic spraying of water on the entrance road when necessary</li> </ul>
	Potential spillage of by spillage or discharge of construction waste water	Low (Negative)	<ul style="list-style-type: none"> <li>▪ Ensure that adequate containment structures are provided for the storage of construction materials on site.</li> <li>▪ Ensure the adequate removal and disposal of construction waste and material</li> </ul>
	Potential Pollution of the surrounding water and ground as a result of generation of building rubble and waste scrap material	High (Negative)	<ul style="list-style-type: none"> <li>▪ Ensure that adequate containment structures are provided for the storage of construction materials on site.</li> <li>▪ Ensure the adequate removal and disposal of construction waste and material</li> </ul>
	Opportunities for employment and skills development	Medium (Positive)	<ul style="list-style-type: none"> <li>▪ Enhance the use of local labour and local skills as far as reasonably possible.</li> <li>▪ Where the required skills do not occur locally, and where appropriate and applicable, ensure that relevant local individuals are trained.</li> <li>▪ Ensure that an equitable percentage allocation is provided for local labour employment as well as specify the use of small-to-medium enterprises and training specifications in the Contractors contract.</li> <li>▪ Ensure that goods and services are sourced from the local and regional economy as far as reasonably possible.</li> </ul>
	Potential visual impacts as the result of construction activities	Low (Negative)	<ul style="list-style-type: none"> <li>▪ No specific mitigation measures are required other than standard construction site housekeeping and dust suppression. These are included below:</li> </ul>

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Activity	Impact summary	Significance	Proposed mitigation
			<ul style="list-style-type: none"> <li>▪ The contractor(s) should maintain good housekeeping on site to avoid litter and minimise waste.</li> <li>▪ Litter and rubble should be timeously removed from the construction site and disposed at a licenced waste disposal facility.</li> <li>▪ The project developer should demarcate construction boundaries and minimise areas of surface disturbance.</li> <li>▪ Appropriate plans should be in place to minimise fire hazards and dust generation.</li> <li>▪ Night lighting of the construction site should be minimised within requirements of safety and efficiency.</li> </ul>
	Potential noise impact as the result of the use of construction equipment	Medium (Negative)	<ul style="list-style-type: none"> <li>▪ Limit construction activities to day time hours</li> </ul>
	Potential impact on the safety of construction workers and Health injuries to construction personnel as a result of construction work	Medium (Negative)	<ul style="list-style-type: none"> <li>▪ Ensure that a skilled and competent Contractor is appointed during the construction phase. The Contractor must be evaluated during the tender/appointment process in terms of safety standards.</li> <li>▪ The Contractor must ensure that all construction personnel are provided with adequate PPE for use where appropriate.</li> <li>▪ The Contractor must undertake a Construction Phase Risk Assessment.</li> <li>▪ A Construction Site Manager or Safety Supervisor should be appointed, in conjunction with the project manager, to monitor all safety aspects during the construction phase. This could be the same person that is assigned to co-ordinate the construction traffic.</li> </ul>
	Traffic, congestion and potential for collisions	Low (Negative)	<ul style="list-style-type: none"> <li>▪ Ensure that roads are not closed during construction, which may restrict access for emergency services.</li> <li>▪ The Contractor must ensure that all construction personnel are provided with adequate PPE for use where appropriate</li> </ul>

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Activity	Impact summary	Significance	Proposed mitigation
<b>Construction Phase</b>			
Direct Impacts	<i>Loss or degradation of the wetland on the access road</i>	High (Negative)	<ul style="list-style-type: none"> <li>Design measures to effectively control vehicle access, vehicle speed, dust, stormwater run-off, erosion and sedimentation on the road.</li> <li>Implement the measures that were designed to control impacts on the road preferably during winter, when the risk of erosion should be least.</li> </ul>
	<i>Loss of terrestrial vegetation and faunal habitat</i>	Medium (Negative)	<ul style="list-style-type: none"> <li>Ensure that all infrastructure avoids all Very High and High sensitive areas</li> <li>Clearly demarcate or fence in the construction site. Relocate CI plant and animal specimens from the construction footprint, with advice from an appropriate specialist.</li> <li>Commence (and preferably complete) construction during winter, when the risk of disturbing growing plants should be least.</li> </ul>
	<i>Loss of CI or medicinal flora</i>	Medium (Negative)	<ul style="list-style-type: none"> <li>Obtain permits to remove CI species</li> <li>Transplant CI and medicinally important floral specimens from the infrastructure footprint to suitable locations in the surrounding area.</li> <li>Obtain guidance from a suitably qualified vegetation specialist or horticulturist regarding the collection, propagation/storage and transplantation of plants.</li> </ul>
	<i>Loss of CI fauna</i>	Medium (Negative)	<ul style="list-style-type: none"> <li>Appoint an appropriate specialist to relocate CI fauna from vegetation, termitaria and soil that is removed from the infrastructure footprint.</li> <li>Commence (and preferably complete) construction during winter, when the risk of disturbing active (including breeding and migratory) animals, should be least.</li> <li>Check open trenches for trapped animals (e.g. hedgehogs, reptiles and frogs), and relocate trapped animals with advice from an appropriate specialist.</li> <li>Prohibit disturbance and persecution (e.g. poaching) of fauna, and</li> </ul>

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Activity	Impact summary	Significance	Proposed mitigation
			<p>introduction of pets and other alien fauna (apart from the production chickens).</p> <ul style="list-style-type: none"> <li>▪ Provide notices and training to inform workers about dangerous animals (e.g. venomous snakes and scorpions) and prohibited activities (e.g. poaching)</li> <li>▪ Walk fence lines to remove snares.</li> </ul>
	<i>Introduction and proliferation of alien species</i>	High (Negative)	<ul style="list-style-type: none"> <li>▪ Carefully regulate / limit access by vehicles and materials to the construction site. Demarcate or fence in the construction area.</li> <li>▪ Prohibit the introduction of domestic animals such as dogs and cats.</li> <li>▪ Remove any woody alien species that germinate.</li> <li>▪ Plant only locally indigenous flora if landscaping needs to be done</li> <li>▪ Keep construction activities neat and tidy. When complete, remove all sand piles and landscape all uneven ground while re-establishing a good topsoil layer</li> <li>▪ Remove Category species using mechanical methods, and minimize soil disturbance as far as possible.</li> </ul>
	<i>Increased dust and erosion</i>	Medium (Negative)	<ul style="list-style-type: none"> <li>▪ Limit vehicles, people and materials to the construction site.</li> <li>▪ Commence (and preferably complete) construction during winter, when the risk of erosion should be least.</li> <li>▪ Revegetate denude areas with locally indigenous flora a.s.a.p.</li> <li>▪ Implement erosion protection measures on site. Measures could include bunding around soil stockpiles, and vegetation of areas not to be developed.</li> <li>▪ Implement effective and environmentally-friendly dust control measures, such as mulching or periodic wetting.</li> </ul>
	<i>Sensory disturbance of fauna</i>	Medium (Negative)	<ul style="list-style-type: none"> <li>▪ Commence (and preferably complete) construction during winter, when the risk of disturbing active (including breeding and migratory) animals,</li> </ul>

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Activity	Impact summary	Significance	Proposed mitigation
			<p>should be least.</p> <ul style="list-style-type: none"> <li>▪ Minimize noise to limit its impact on calling and other sensitive fauna (e.g. frogs and Secretarybird).</li> <li>▪ Limit construction activities to day time hours</li> <li>▪ Minimize or eliminate security and construction lighting, to reduce the disturbance of nocturnal fauna.</li> </ul>
	Destruction of palaeontological material	Very Low (Negative)	<ul style="list-style-type: none"> <li>▪ If any archaeological material, palaeontological 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 appropriate specialist. Such heritage is the property of the state and may require excavation and curation in an approved institution.</li> </ul>
	Destruction of archaeological artefacts	Very Low (Negative)	<ul style="list-style-type: none"> <li>▪ If any archaeological material, palaeontological 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 appropriate specialist. Such heritage is the property of the state and may require excavation and curation in an approved institution.</li> </ul>
	Destruction of graves	Low (Negative)	<ul style="list-style-type: none"> <li>▪ The two graveyards should be fenced off clearly and pointed out to all construction workers and other staff on site to ensure that impacts to them are avoided;</li> <li>▪ No construction work should occur within 10 m of any of the graves;</li> </ul>
	Emissions from dust generation and construction vehicles	Medium (Negative)	<ul style="list-style-type: none"> <li>▪ Ensure that cleared (excavated) areas and unpaved surfaces are sprayed with water (obtained from an approved source) to minimise dust generation.</li> <li>▪ Approved soil stabilisers may be utilised to limit dust generation.</li> <li>▪ Ensure that construction vehicles travelling on unpaved roads do not</li> </ul>

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Activity	Impact summary	Significance	Proposed mitigation
			<p>exceed a speed limit of 40 km/hour.</p> <ul style="list-style-type: none"> <li>▪ Limit vehicles, people and materials to the construction site</li> <li>▪ Adequate dust control strategies should be applied to minimise dust deposition, for example: Periodic spraying of water on the entrance road when necessary</li> </ul>
	Potential spillage of by spillage or discharge of construction waste water	Low (Negative)	<ul style="list-style-type: none"> <li>▪ Ensure that adequate containment structures are provided for the storage of construction materials on site.</li> <li>▪ Ensure the adequate removal and disposal of construction waste and material</li> </ul>
	Odour Emissions from operations and environmental contamination of the surrounding environment from chicken organic waste (carcasses and manure).	High (Negative)	<ul style="list-style-type: none"> <li>▪ Odours produced from manure and urine in chicken broiler facility can be reduced by scraping up and removing manure from the facility and washing down using low-volume high-pressure sprays.</li> <li>▪ Manure should be collected daily and stored in vermin-proof containers at the waste storage facility.</li> <li>▪ Ensure that carcasses and feed, and other operational waste are appropriately and effectively contained and disposed of without detriment to the environment.</li> <li>▪ Establish appropriate emergency procedures for accidental contamination of the surroundings. Waste recycling should be incorporated into the facility's operations as far as possible. Designate a secured, access restricted, sign posted room for the storage of potentially hazardous substances such as herbicides, pesticides, dips and medications</li> <li>▪ The relevant Air Quality norms and standards must be adhered to.</li> </ul>
	Pollution of the surrounding environment as a result of the handling, temporary storage and disposal of solid waste (general and hazardous).	High (negative)	<ul style="list-style-type: none"> <li>▪ General waste and hazardous waste should be stored temporarily on site in suitable (and correctly labelled) waste collection bins and skips (or similar). Waste collection bins and skips should be covered with suitable material, and disposed of at a registered landfill site.</li> </ul>

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Activity	Impact summary	Significance	Proposed mitigation
			<ul style="list-style-type: none"> <li>▪ Should the on-site storage of general waste and hazardous waste exceed 100 m<sup>3</sup> and 80 m<sup>3</sup> respectively, then the National Norms and Standards for the Storage of Waste (published on 29 November 2013 under Government Notice 926) must be adhered to.</li> <li>▪ Ensure that the construction site is kept clean at all times and that construction personnel are made aware of correct waste disposal methods.</li> <li>▪ Ensure that sufficient general waste disposal bins are provided for all construction personnel throughout the site. These bins must be emptied on a regular basis.</li> <li>▪ No solid waste may be burned on site.</li> <li>▪ Segregation of hazardous waste from general waste to be in place</li> <li>▪ The Contractor should provide adequate waste skips (or similar) on site and the Construction Contract should specify that the Contractor must be responsible for the correct disposal of the contents of the waste skips.</li> <li>▪ All construction waste (including rubble) should be frequently removed from site and correctly disposed by a licensed municipal landfill site</li> <li>▪ Establish appropriate emergency procedures for accidental contamination of the surroundings. Waste recycling should be incorporated into the facility's operations as far as possible. Designate a secured, access restricted, sign posted room for the storage of potentially hazardous substances such as herbicides, pesticides dips and medications. All hazardous waste should be disposed of at an appropriate licensed facility for this.</li> <li>▪ Records of removal of infectious waste must be kept</li> </ul>
	Pollution of the surrounding environment as a result of the handling of sewage	High (Negative)	<ul style="list-style-type: none"> <li>▪ Make use of a septic facility to temporarily store waste in an underground septic tank</li> <li>▪ The applicant to appoint a professional septic drainer for extraction of</li> </ul>

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Activity	Impact summary	Significance	Proposed mitigation
	Potential Pollution of the surrounding water and ground as a result of generation of building rubble and waste scrap material	High (Negative)	<p>sewage in a manner that is not detrimental to the environment</p> <ul style="list-style-type: none"> <li>▪ Ensure that adequate containment structures are provided for the storage of construction materials on site.</li> <li>▪ Ensure the adequate removal and disposal of construction waste and material</li> </ul>
	Pollution of the surrounding environment as a result of the handling, temporary storage and disposal of solid waste (general and hazardous).	High (Negative)	<ul style="list-style-type: none"> <li>▪ General waste and hazardous waste should be stored temporarily on site in suitable (and correctly labelled) waste collection bins and skips (or similar). Waste collection bins and skips should be covered with suitable material, where appropriate</li> <li>▪ Should the on-site storage of general waste and hazardous waste exceed 100 m<sup>3</sup> and 80 m<sup>3</sup> respectively, then the National Norms and Standards for the Storage of Waste (published on 29 November 2013 under Government Notice 926) must be adhered to.</li> <li>▪ Ensure that the decommissioning site is kept clean at all times and that construction personnel are made aware of correct waste disposal methods.</li> <li>▪ Ensure that sufficient general waste disposal bins are provided for all decommissioning personnel throughout the site. These bins must be emptied on a regular basis.</li> <li>▪ No solid waste may be burned on site.</li> <li>▪ Segregation of hazardous waste from general waste to be in place.</li> <li>▪ The Contractor should provide adequate waste skips (or similar) on site and the decommissioning Contract should specify that the Contractor must be responsible for the correct disposal of the contents of the waste skips.</li> <li>▪ All decommissioning waste (including rubble) should be frequently removed from site and correctly disposed by a licensed municipal landfill site.</li> </ul>

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Activity	Impact summary	Significance	Proposed mitigation
			<ul style="list-style-type: none"> <li>▪ Establish appropriate emergency procedures for accidental contamination of the surroundings. Waste recycling should be incorporated into the facility's operations as far as possible. Designate a secured, access restricted, sign posted room for the storage of potentially hazardous substances such as herbicides, pesticides dips and medications. All hazardous waste should be disposed of at an appropriate licensed facility for this.</li> </ul>
	Opportunities for employment and skills development	Medium (Positive)	<ul style="list-style-type: none"> <li>▪ Enhance the use of local labour and local skills as far as reasonably possible.</li> <li>▪ Where the required skills do not occur locally, and where appropriate and applicable, ensure that relevant local individuals are trained.</li> <li>▪ Ensure that an equitable percentage allocation is provided for local labour employment as well as specify the use of small-to-medium enterprises and training specifications in the Contractors contract.</li> <li>▪ Ensure that goods and services are sourced from the local and regional economy as far as reasonably possible.</li> </ul>
	Potential visual impacts as the result of construction activities	Low (Negative)	<ul style="list-style-type: none"> <li>▪ No specific mitigation measures are required other than standard construction site housekeeping and dust suppression. These are included below:</li> <li>▪ The contractor(s) should maintain good housekeeping on site to avoid litter and minimise waste.</li> <li>▪ Litter and rubble should be timeously removed from the construction site and disposed at a licenced waste disposal facility.</li> <li>▪ The project developer should demarcate construction boundaries and minimise areas of surface disturbance.</li> <li>▪ Appropriate plans should be in place to minimise fire hazards and dust generation.</li> <li>▪ Night lighting of the construction site should be minimised within</li> </ul>

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Activity	Impact summary	Significance	Proposed mitigation
			requirements of safety and efficiency.
	Potential noise impact as the result of the use of construction equipment	Medium (Negative)	<ul style="list-style-type: none"> <li>▪ Limit construction activities to day time hours</li> </ul>
	Potential impact on the safety of construction workers and Health injuries to construction personnel as a result of construction work	Medium (Negative)	<ul style="list-style-type: none"> <li>▪ Ensure that a skilled and competent Contractor is appointed during the construction phase. The Contractor must be evaluated during the tender/appointment process in terms of safety standards.</li> <li>▪ The Contractor must ensure that all construction personnel are provided with adequate PPE for use where appropriate.</li> <li>▪ The Contractor must undertake a Construction Phase Risk Assessment.</li> <li>▪ A Construction Site Manager or Safety Supervisor should be appointed, in conjunction with the project manager, to monitor all safety aspects during the construction phase. This could be the same person that is assigned to co-ordinate the construction traffic.</li> </ul>
	Traffic, congestion and potential for collisions	Low (Negative)	<ul style="list-style-type: none"> <li>▪ Ensure that roads are not closed during construction, which may restrict access for emergency services.</li> <li>▪ The Contractor must ensure that all construction personnel are provided with adequate PPE for use where appropriate</li> </ul>
<b>Operational Phase</b>			
	Loss or degradation of the wetland on the access road	High (Negative)	<ul style="list-style-type: none"> <li>▪ Monitor and maintain the road impact control measures to ensure that they remain effective</li> </ul>
	Environmental contamination	Medium (Negative)	<ul style="list-style-type: none"> <li>▪ 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</li> <li>▪ Adhere to best practice chicken husbandry and waste disposal norms</li> <li>▪ Establish appropriate emergency procedures for accidental</li> </ul>

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Activity	Impact summary	Significance	Proposed mitigation
			<p>contamination of the surroundings. Waste recycling should be incorporated into the facility's operations as far as possible. Designate a secured, access restricted, signposted room for the storage of potentially hazardous substances such as herbicides, pesticides dips and medications. All hazardous waste should be disposed of at an appropriate licensed facility for this.</p> <ul style="list-style-type: none"> <li>▪ Rehabilitate contaminated areas a.s.a.p. in accordance with advice from appropriate contamination and environmental specialists</li> <li>▪ Educate workers regarding the handling of hazardous substances and about waste management and emergency procedures with regular training and notices and talks.</li> </ul>
	<p>Poor / Inappropriate control of animal pests</p>	<p>High (Negative)</p>	<ul style="list-style-type: none"> <li>▪ Ensure that there is effective storm water drainage around the facility</li> <li>▪ Ensure that the facility is sufficiently ventilated to keep floors, bedding, and fodder as dry as possible.</li> <li>▪ Prevent and manage unwanted animal access to fodder.</li> <li>▪ Check that fan louvers (if installed) work properly, and close fans completely when off.</li> <li>▪ Ensure that floors are sloped and slatted to facilitate drainage.</li> <li>▪ Screed concrete floors properly to seal all cracks and limit the pooling of effluent and water.</li> <li>▪ Effectively maintain and seal all pipes and reservoirs containing slurry, to prevent animals from accessing the effluent.</li> <li>▪ Clean floors regularly.</li> <li>▪ Clean up excess fodder regularly from under troughs and feed bins.</li> <li>▪ Keep areas surrounding the facility free of spilled manure and litter.</li> <li>▪ Remove all trash, and sources of feed and water for pests from the outside perimeter of the facilities.</li> </ul>

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Activity	Impact summary	Significance	Proposed mitigation
			<ul style="list-style-type: none"> <li>▪ Keep weeds and grass mowed to 5cm or less immediately around the facilities, to reduce the prevalence of insects.</li> <li>▪ Electrocutation devices are available to kill flies, while other mechanical devices include traps, sticky tapes or baited traps.</li> <li>▪ Control rodents through effective sanitation, rodent proofing and (as humane as possible) extermination.</li> <li>▪ Rodenticides are not advised.</li> <li>▪ 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.</li> </ul>
	Disease transmission	Medium (Negative)	<ul style="list-style-type: none"> <li>▪ Maintain appropriate pest control measures</li> <li>▪ Effectively maintain and seal all pipes and reservoirs containing slurry, to prevent animals from accessing the effluent.</li> </ul>
	Environmental and Health contamination arising from Chicken mortalities (carcasses) during operations.	High (Negative)	<ul style="list-style-type: none"> <li>▪ Chicken carcasses should be collected daily or when necessary, denatured (with relevant environmentally friendly chemicals) and disposed of at mortality pits</li> <li>▪ Ensure that the development of mortality pits are designed and lined with impermeable substances in accordance with advice from international best practice norms in order to prevent ground water contamination. The applicant shall also seek guidance from relevant authorities' e.g. DAFF on best practice or consult their guidelines and norms and standards if available.</li> <li>▪ Ensure that carcasses and feed, and other operational waste are appropriately and effectively contained and disposed of without detriment to the environment.</li> <li>▪ Establish appropriate emergency procedures for accidental contamination of the surroundings. Designate a secured, access</li> </ul>

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Activity	Impact summary	Significance	Proposed mitigation
			restricted, sign posted room for the storage of potentially hazardous substances such as herbicides,
	Altered burning	Medium (Negative)	<ul style="list-style-type: none"> <li>▪ Create safe storage on the premises for flammable materials. If artificial burning is considered necessary, establish and implement a fire management plan with emergency fire procedures.</li> <li>▪ Maintain an effective fire break between the facility and the surrounding natural environment.</li> <li>▪ Educate workers about the fire plan and emergency procedures with regular training and notices</li> </ul>
	Introduction and proliferation of alien species	High (Negative)	<ul style="list-style-type: none"> <li>▪ Carefully regulate / limit access by vehicles and materials to the site</li> <li>▪ Prohibit the introduction of domestic animals such as dogs and cats.</li> <li>▪ Plant only locally indigenous flora if landscaping needs to be done.</li> <li>▪ Employ best practices regarding tilling of soil and weed management</li> <li>▪ Minimize the accumulation or dispersal of excess fodder on site.</li> <li>▪ Remove Category species using mechanical methods, and minimize soil disturbance as far as possible. Alien debris could be donated to a local community</li> </ul>
	Loss of CI or medicinal flora	Medium (Negative)	<ul style="list-style-type: none"> <li>▪ Educate the personnel prior to operation, and with yearly refresher talks.</li> </ul>
	Sensory disturbance of fauna	Medium (Negative)	<p><i>Minimize essential lighting.</i></p> <ul style="list-style-type: none"> <li>▪ Ensure that all outdoor lights are angled downwards and/or fitted with hoods.</li> <li>▪ Avoid using metal halide, mercury or other bulbs that emit high UV (blue-white) light that is highly and usually fatally attractive to insects.</li> <li>▪ Use bulbs that emit warm, long wavelength (yellow-red) light, or use UV filters or glass housings on lamps to filter out UV.</li> </ul>

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			<p><i>Minimize unavoidable noise</i></p> <ul style="list-style-type: none"> <li>Conduct regular maintenance of machinery and ventilation systems / fans (if any).</li> </ul>
	Destruction of palaeontological material	Very Low (Negative)	<ul style="list-style-type: none"> <li>If any archaeological material, palaeontological 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 appropriate specialist. Such heritage is the property of the state and may require excavation and curation in an approved institution.</li> </ul>
	Destruction of archaeological artefacts	Very Low (Negative)	<ul style="list-style-type: none"> <li>If any archaeological material, palaeontological 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 appropriate specialist. Such heritage is the property of the state and may require excavation and curation in an approved institution.</li> </ul>
	Destruction of graves	Low (Negative)	<ul style="list-style-type: none"> <li>The two graveyards should be fenced off clearly and pointed out to all construction workers and other staff on site to ensure that impacts to them are avoided;</li> <li>No construction work should occur within 10 m of any of the graves;</li> </ul>
	Emissions into the atmosphere as a result of staff vehicles.	Medium (Negative)	<ul style="list-style-type: none"> <li>Efficient movement of traffic through the entrance and exit in order to reduce congestion and vehicle emissions.</li> <li>Ensure that the facility is operated in such a manner whereby potential odours are minimised.</li> </ul>
	Improved service delivery with regards poultry products	Medium (Positive)	<ul style="list-style-type: none"> <li>Ensure that the proposed infrastructure is maintained appropriately to ensure that all facilities and infrastructure operate within its design capacity to deliver as the market requires.</li> </ul>
	Opportunities for employment and skills development	Medium (Positive)	<ul style="list-style-type: none"> <li>Enhance the use of local labour and local skills as far as reasonably possible.</li> </ul>

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Activity	Impact summary	Significance	Proposed mitigation
			<ul style="list-style-type: none"> <li>▪ Where the required skills do not occur locally, and where appropriate and applicable, ensure that relevant local individuals are trained.</li> <li>▪ Ensure that an equitable percentage allocation is provided for local labour employment as well as specify the use of small-to-medium enterprises and training specifications in the Contractors contract.</li> <li>▪ Ensure that goods and services are sourced from the local and regional economy as far as reasonably possible.</li> </ul>
	Night lighting of the development on the nightscape of the surrounding landscape	Medium (Negative)	<ul style="list-style-type: none"> <li>▪ No specific mitigation measures are recommended as it is assumed that night lighting of the proposed storage facility will be planned in such a manner so as to minimize light pollution such as glare and light spill (light trespass) by:               <ul style="list-style-type: none"> <li>▪ Using light fixtures that shield the light and focus illumination on the ground (or only where light is required).</li> <li>▪ Avoiding elevated lights within safety/security requirements.</li> <li>▪ Using minimum lamp wattage within safety/security requirements.</li> <li>▪ Where possible, using timer switches or motion detectors to control lighting in areas that are not occupied continuously (if permissible and in line with minimum security requirements).</li> </ul> </li> <li>▪ Switching off lights when not in use in line with safety and security</li> </ul>
	Potential noise impact from operations and road transport of products	Medium (Negative)	<ul style="list-style-type: none"> <li>▪ It is recommended that the drivers of the vehicles be discouraged from using air brakes at night.</li> <li>▪ Limit the effects of noise associated disturbances from chickens and operational activities on sensitive fauna such as owls and medium-large mammals (especially carnivores), potentially occurring hedgehogs and large terrestrial birds such as Korhaans and Secretary birds.</li> </ul>
	Minor accidents to the public and moderate accidents to operational staff	Medium (Negative)	<ul style="list-style-type: none"> <li>▪ An Emergency Plan should be compiled in order to deal with potential spillages and fires. Records of practices should be kept on site.</li> <li>▪ Scheduled inspections should be implemented by operating personnel in</li> </ul>

FINAL BASIC ASSESSMENT REPORT

PROPOSED DEVELOPMENT OF A CHICKEN BROILER FACILITY ON PORTION 40 OF THE FARM JONATHAN 175- JQ, BRITS, NORTH WEST

Activity	Impact summary	Significance	Proposed mitigation
			<p>order to assure and verify the integrity of hoses, piping and storage lagoon.</p> <ul style="list-style-type: none"> <li>Portable fire extinguishers and fire water hydrants (i.e. appropriate fire-fighting equipment) should be provided at the facility as required.</li> </ul>
	Atmospheric pollution due to fumes, smoke from fires	Medium (Negative)	<ul style="list-style-type: none"> <li>Portable fire extinguishers and fire water hydrants (i.e. appropriate fire-fighting equipment) should be provided at the terminal as required. Mobile fire-fighting equipment should be provided at the berths as a safety precaution during the vessel offloading process. It should be noted that the products planned to be stored at the terminal have high flash points and low volatility. As a result, fires are unlikely, unsustainable, and can be extinguished with basic fire water and portable fire extinguishers.</li> </ul>
<b>Decommission</b>			
Direct Impacts	<i>Loss or degradation of the wetland on the access road</i>	High (Negative)	<ul style="list-style-type: none"> <li>Monitor and maintain the road impact control measures to ensure that they remain effective</li> </ul>
	Introduction and proliferation of alien species	High (Negative)	<ul style="list-style-type: none"> <li>Remove Category species using mechanical methods, and minimize soil disturbance as far as possible.</li> </ul>
	Increased dust and erosion	Medium (Negative)	<ul style="list-style-type: none"> <li>Limit vehicles to the construction site</li> <li>Commence (and preferably complete) decommissioning during winter, when the risk of erosion should be least.</li> <li>Revegetate denude areas with locally indigenous flora a.s.a.p.</li> <li>Implement erosion protection measures on site to reduce erosion and sedimentation of the local drainage system. Measures could include bunding around soil stockpiles, and vegetation of areas not to be developed.</li> <li>Implement effective and environmentally-friendly dust control measures, such as mulching or periodic wetting of the entrance road.</li> </ul>

FINAL BASIC ASSESSMENT REPORT

PROPOSED DEVELOPMENT OF A CHICKEN BROILER FACILITY ON PORTION 40 OF THE FARM JONATHAN 175- JQ, BRITS, NORTH WEST

Activity	Impact summary	Significance	Proposed mitigation
	<i>Sensory disturbance of fauna</i>	Low (Negative)	<ul style="list-style-type: none"> <li>▪ Commence (and preferably complete) demolition / rehabilitation during winter, when the risk of disturbing active (including breeding and migratory) animals, should be least.</li> <li>▪ Minimize noise to limit its impact on sensitive fauna.</li> <li>▪ Limit demolition activities to day time hours</li> <li>▪ Minimize or eliminate security and other lighting, to reduce the disturbance of nocturnal fauna.</li> </ul>
	Destruction of palaeontological material	Very Low (Negative)	<ul style="list-style-type: none"> <li>▪ If any archaeological material, palaeontological 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 appropriate specialist. Such heritage is the property of the state and may require excavation and curation in an approved institution.</li> </ul>
	Destruction of archaeological artefacts	Very Low (Negative)	<ul style="list-style-type: none"> <li>▪ If any archaeological material, palaeontological 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 appropriate specialist. Such heritage is the property of the state and may require excavation and curation in an approved institution.</li> </ul>
	Destruction of graves	Low (Negative)	<ul style="list-style-type: none"> <li>▪ The two graveyards should be fenced off clearly and pointed out to all construction workers and other staff on site to ensure that impacts to them are avoided;</li> <li>▪ No construction work should occur within 10 m of any of the graves;</li> </ul>
	Odour Emissions from operations and environmental contamination of the surrounding environment from chicken organic waste (carcasses and manure).	High (Negative)	<ul style="list-style-type: none"> <li>▪ Odours produced from manure and urine in chicken broiler facility can be reduced by scraping up and removing manure from the facility and washing down using low-volume high-pressure sprays.</li> <li>▪ Manure should be collected daily and stored in vermin-proof containers at the waste storage facility.</li> </ul>

FINAL BASIC ASSESSMENT REPORT

PROPOSED DEVELOPMENT OF A CHICKEN BROILER FACILITY ON PORTION 40 OF THE FARM JONATHAN 175- JQ, BRITS, NORTH WEST

Activity	Impact summary	Significance	Proposed mitigation
	Pollution of the surrounding environment as a result of the handling, temporary storage and disposal of solid waste (general and hazardous).	High (Negative)	<ul style="list-style-type: none"> <li>▪ Ensure that carcasses and feed, and other operational waste are appropriately and effectively contained and disposed of without detriment to the environment.</li> <li>▪ Establish appropriate emergency procedures for accidental contamination of the surroundings. Waste recycling should be incorporated into the facility's operations as far as possible. Designate a secured, access restricted, sign posted room for the storage of potentially hazardous substances such as herbicides, pesticides, dips and medications.</li> <li>▪ The relevant Air Quality norms and standards must be adhered to.</li> </ul> <ul style="list-style-type: none"> <li>▪ General waste and hazardous waste should be stored temporarily on site in suitable (and correctly labelled) waste collection bins and skips (or similar). Waste collection bins and skips should be covered with suitable material, where appropriate</li> <li>▪ Should the on-site storage of general waste and hazardous waste exceed 100 m<sup>3</sup> and 80 m<sup>3</sup> respectively, then the National Norms and Standards for the Storage of Waste (published on 29 November 2013 under Government Notice 926) must be adhered to.</li> <li>▪ Ensure that the construction site is kept clean at all times and that construction personnel are made aware of correct waste disposal methods.</li> <li>▪ Ensure that sufficient general waste disposal bins are provided for all operational personnel throughout the site. These bins must be emptied on a regular basis.</li> <li>▪ No solid waste may be burned on site.</li> <li>▪ Segregation of hazardous waste from general waste to be in place.</li> <li>▪ The farm manager must be responsible for the correct disposal of the contents of the waste skips.</li> <li>▪ All operational waste (including rubble) should be frequently removed</li> </ul>

FINAL BASIC ASSESSMENT REPORT

PROPOSED DEVELOPMENT OF A CHICKEN BROILER FACILITY ON PORTION 40 OF THE FARM JONATHAN 175- JQ, BRITS, NORTH WEST

Activity	Impact summary	Significance	Proposed mitigation
			<p>from site and correctly disposed by a licensed municipal landfill site</p> <ul style="list-style-type: none"> <li>▪ Establish appropriate emergency procedures for accidental contamination of the surroundings. Waste recycling should be incorporated into the facility's operations as far as possible. Designate a secured, access restricted, sign posted room for the storage of potentially hazardous substances such as herbicides, pesticides dips and medications. All hazardous waste should be disposed of at an appropriate licensed facility for this.</li> </ul>
	Pollution of the surrounding environment as a result of the handling of sewage	High (Negative)	<ul style="list-style-type: none"> <li>▪ Make use of a septic facility to temporarily store waste in an underground septic tank</li> <li>▪ The applicant to appoint a professional septic drainer for extraction of sewage in a manner that is not detrimental to the environment</li> </ul>
	Discharge of contaminated stormwater into the surrounding environment	Medium (Negative)	<ul style="list-style-type: none"> <li>▪ The appointed Contractor should compile a Method Statement for Stormwater Management during the decommissioning phase.</li> <li>▪ Provide secure storage for oil, chemicals and other waste materials to prevent contamination of stormwater runoff.</li> </ul>
	Emissions from decommissioning vehicles and generation of dust	Medium (Negative)	<ul style="list-style-type: none"> <li>▪ Ensure that cleared (excavated) areas and unpaved surfaces are sprayed with water (obtained from an approved source) to minimise dust generation.</li> <li>▪ Approved soil stabilisers may be utilised to limit dust generation.</li> <li>▪ Ensure that decommissioning vehicles travelling on unpaved roads do not exceed a speed limit of 40 km/hour.</li> </ul>
	Noise generation from demolition activities	Medium (Negative)	<ul style="list-style-type: none"> <li>▪ A method statement, including detailed procedures, must be drawn up prior to any decommissioning of existing tanks.</li> <li>▪ Decommissioning personnel must wear proper hearing protection, which should be specified as part of the Decommissioning Phase Risk Assessment carried out by the Contractor.</li> <li>▪ The Contractor must ensure that all decommissioning personnel are</li> </ul>

FINAL BASIC ASSESSMENT REPORT

PROPOSED DEVELOPMENT OF A CHICKEN BROILER FACILITY ON PORTION 40 OF THE FARM JONATHAN 175- JQ, BRITS, NORTH WEST

Activity	Impact summary	Significance	Proposed mitigation
	Pollution of the surrounding environment as a result of the handling, temporary storage and disposal of solid waste	Medium (Negative)	<p>provided with adequate PPE, where appropriate.</p> <ul style="list-style-type: none"> <li>▪ General waste (i.e. building rubble, demolition waste, discarded concrete, bricks, tiles, wood, glass, plastic, metal, excavated material, packaging material, paper and domestic waste etc.) and hazardous waste (i.e. empty tins, paint and paint cleaning liquids, oils, fuel spillages and chemicals etc.) generated during the decommissioning phase should be stored temporarily on site in suitable (and correctly labelled) waste collection bins and skips (or similar). Waste collection bins and skips should be covered with suitable material, where appropriate.</li> <li>▪ Should the on-site storage of general waste and hazardous waste exceed 100 m<sup>3</sup> and 80 m<sup>3</sup> respectively, then the National Norms and Standards for the Storage of Waste (published on 29 November 2013 under GN 926) must be adhered to</li> <li>▪ Ensure that general waste and hazardous waste generated are removed from the site on a regular basis and disposed of at an appropriate, licensed waste disposal facility by an approved waste management Contractor. Waste disposal slips or waybills should be kept on file for auditing purposes as proof of disposal.</li> <li>▪ Ensure that sufficient general waste disposal bins are provided for all personnel throughout the site. These bins must be emptied on a regular basis.</li> <li>▪ Appropriately time demolition / rehabilitation activities to minimise sensory disturbance to fauna.</li> </ul>
<p><i>Indirect impacts:</i> <i>Cumulative impacts:</i></p>	<p>Should the proposed development be approved the cumulative impacts will result from the construction and operational phase. Impacts arising from the construction phase include:</p> <ul style="list-style-type: none"> <li>• Noise pollution, this can be mitigated by activities occurring during working hours and dust pollution which can be mitigated by dust reduction strategies.</li> </ul> <p>The above impacts can be mitigated. This small size of the development is relatively small and thus there would not be a need or many construction vehicles.</p>		

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PROPOSED DEVELOPMENT OF A CHICKEN BROILER FACILITY ON PORTION 40 OF THE FARM JONATHAN 175- JQ, BRITS, NORTH WEST

Activity	Impact summary	Significance	Proposed mitigation
Alternative 2			
	<i>Direct impacts:</i>		
	<i>Indirect impacts:</i>		
	<i>Cumulative impacts:</i>		
	<i>Direct impacts:</i>		
	<i>Indirect impacts:</i>		
	<i>Cumulative impacts:</i>		
Alternative 3			
	<i>Direct impacts:</i>		
	<i>Indirect impacts:</i>		
	<i>Cumulative impacts:</i>		
	<i>Direct impacts:</i>		
	<i>Indirect impacts:</i>		
	<i>Cumulative impacts:</i>		
No-go option	<i>Direct impacts:</i>		
Direct impacts:	<ul style="list-style-type: none"> <li>▪ None of the impacts mentioned above will occur.</li> </ul>		

FINAL BASIC ASSESSMENT REPORT

PROPOSED DEVELOPMENT OF A CHICKEN BROILER FACILITY ON PORTION 40 OF THE FARM JONATHAN 175- JQ, BRITS, NORTH WEST

Activity	Impact summary	Significance	Proposed mitigation
<p>Indirect impacts:</p> <p>Cumulative impacts:</p>	<ul style="list-style-type: none"> <li>▪ If the proposed project does not proceed, increased income and economic spin-off activities will not be realised.</li> <li>▪ Approximately 11 new permanent jobs will not be created during the operational phase.</li> <li>▪ If the proposed project does not proceed, the industries that rely on the supply of poultry products could experience hindered economic growth potential.</li> </ul> <p><i>Indirect impacts:</i></p> <ul style="list-style-type: none"> <li>▪ There are no indirect impacts during the construction phase for the No-go Option.</li> </ul> <p><i>Cumulative impacts:</i></p> <ul style="list-style-type: none"> <li>▪ There are no cumulative impacts during the construction phase for the No-go Option</li> </ul>		

A complete impact assessment which include process undertaken to identify, assess and rank the impacts, the activity will impose on the site through the life of the activity in terms of EIA Regulation 2017, Appendix 1(i) and (j) of GN R.982 must be included as Appendix H.

## C.2 ENVIRONMENTAL IMPACT STATEMENT

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

### **Alternative A (preferred alternative)**

The proposed development area is mostly transformed as a result of past agricultural practices (Tilling). About 60% of the habitat has been transformed in the past, mainly by agriculture. There is also an ongoing habitat loss due to expanding rural settlements, overgrazing and alien plant invasion. The main environmental impacts associated with the proposed project include:

Site clearance of previously transformed land and preparation of site for the chicken broiler, this may lead to loss of destruction of an already transformed habitat and habitat destruction. Of most concern however is the number of trees that could be lost. These trees provide roosting and nesting habitat for birds and small raptors. The probability is however, considered to be low with mitigation. Furthermore the proposed development site shall ensure minimal removal of trees from site.

Earth-moving activities during the clearing of vegetation for the construction of the chicken broiler are likely to increase the susceptibility of the site to soil erosion as the result of increased bare ground and dust generation. The potential impact of continued and increased dust during construction with mitigation was rated of low significance.

Graves are of heritage importance and could be easily destroyed as a result of clearing of land and construction of the chicken broiler facility. The initial layout of the proposed development site was within the buffer of the graves as such posing a high risk of the destruction of graves, the probability of occurrence of this impact was very likely. However this layout was amended to ensure that the proposed development does not affect the graves and a 10 meter buffer is respected. The potential impact of with mitigation was rated of very low significance.

Waste will be generated through-out the life cycle of the development. However with proper waste disposal measures, waste impacts will be of low probability post mitigation. Please see Appendix H for full impact assessment and their significance.

### **Alternative B**



### **Alternative C**



### **No-go alternative (compulsory)**

The 'No-Go' option assumes that a conservative approach that would ensure that the environment is not disturbed. It is important to state that this assessment is informed by the current condition of the area. Should the Competent Authority decline the application, the 'No-Go' option will be followed and the status quo of the site will remain.

## **SECTION D PUBLIC PARTICIPATION**

### **D.1 ADVERTISEMENT AND NOTICE**

<b>Publication name</b>	<b>Brits Pos</b>	
<b>Date published</b>	<b>26 August 2016</b>	
<b>Site notice position</b>	<b>Latitude</b>	<b>Longitude</b>
	<b>27° 52' 58.14" E</b>	<b>25° 15' 56.29" S</b>
<b>Date placed</b>	<b>29 July 2016</b>	

Include proof of the placement of the relevant advertisements and notices in Appendix I1.

### **D.2 DETERMINATION OF APPROPRIATE MEASURES**

Provide details of the measures taken to include all potential I&APs as required by Regulation 41(2)(e) and 41(6) of GN R.982.

Key stakeholders (other than organs of state) identified in terms of Regulation 40(2)(d) of GN R.982:

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 PROPOSED DEVELOPMENT OF A CHICKEN BROILER FACILITY ON PORTION 40 OF THE FARM  
 JONATHAN 175- JQ, BRITS, NORTH WEST

Title, Name and Surname	Affiliation/ key stakeholder status	Contact details (tel number or e-mail address)
Mr Ngema	Community Chairman- Plot 260 Jonathan	0791407720
Jan Maseko	Neighbouring Landowner- Plot 46 Jonathan	0782880854
Mathews Mlangeni	Neighbouring Landowner- Plot 48 Jonathan	0760267342
David Maseko	Neighbouring Landowner- Plot 41 Jonathan	0824139564
Boysee Masango	Neighbouring Landowner- Plot 274 Jonathan	0844196644
Joshua Mlangeni	Neighbouring Landowner- Plot 48 Jonathan	0767584083
Edwin Lelaka	Neighbouring Landowner- Plot 61 Jonathan	0833154759
Senza Ngozo	Neighbouring Landowner- Plot 35 Jonathan	0836096408
Alfred Ngobese	Neighbouring Landowner- Plot 46 Jonathan	0822620897
Madoda Maseko	Neighbouring Landowner- Plot 46 Jonathan	0715443686
Sbongseni Mlangeni	Neighbouring Landowner- Plot 48 Jonathan	0820949861
Mndeni Ngozo	Neighbouring Landowner- Plot 35 Jonathan	0728332455
Bongane Radebe	Neighbouring Landowner- Plot 232 Jonathan	0835464370
Mr. Mosetlhe	Ward Councillor	0715114952
Ntomfuthi Mlangeni	Neighbouring Landowner- Plot 48 Jonathan	0725699400
Caiphus Ngozo	Neighbouring Landowner- Plot 35 Jonathan	0762493829

Include proof that the key stakeholder received written notification of the proposed activities as Appendix I2. This proof may include any of the following:

- e-mail delivery reports;
- registered mail receipts;
- courier waybills;
- signed acknowledgements of receipt; and/or
- or any other proof as agreed upon by the competent authority.

### D.3 ISSUES RAISED BY INTERESTED AND AFFECTED PARTIES

Summary of main issues raised by I&APs	Summary of response from EAP
The issue of criminal activity and tree removal were raised as a concern in the running of the project.	The proposed development shall ensure minimal removal of trees from the site. Furthermore security officers shall be hired to address this concern.
A no-go buffer zone of 30 m must be maintained around the identified graves; A Heritage Management Plan (HMP) must be developed for the long term monitoring and management of the identified graves; Monitoring of the graves conducted during the construction phase must be detailed in a report that must be submitted to SAHRA upon completion of the construction phase; If any evidence of archaeological sites or remains (e.g. remnants of stone-made structures, indigenous ceramics, bones, stone artefacts, ostrich eggshell fragments, charcoal and ash concentrations), fossils or other categories of heritage resources are found during the proposed	A 30 m buffer has been maintained around the identified graves; a Heritage Management Plan has been developed and is included as part of Appendix J of this Report; the applicant shall submit a Report for monitoring of the graves during Construction Phase.

<p>development, SAH RA APM Unit (Natasha Higgitt/John Gribble 021 462 5402) must be alerted. If unmarked human burials are uncovered, the SAHRA Burial Grounds and Graves (BGG) Unit (Mimi Seetelo 012 320 8490), must be alerted immediately. A professional archaeologist or palaeontologist, depending on the nature of the finds, must be contracted as soon as possible to inspect the findings. If the newly discovered heritage resources prove to be of archaeological or palaeontological significance, a Phase 2 rescue operation may be required subject to permits issued by SAHRA; and If the development receives an Environmental Authorisation (EA), SAHRA must be informed and all documents pertaining to the EA must be uploaded to the SAHRIS Case file. Should you have any further queries, please contact the designated official using the case number quoted above in the case header.</p>	
<p>Confirmation of services by the local Municipality for the provision of refuse removal and sewerage treatment, Details on how chicken mortalities will be disposed and if applicable any agreements/contracts to that effect.</p>	<p>JamRock will make use of a septic facility to temporarily store waste in an underground septic tank. The septic tank shall be extracted by a septic drainer professional when needed. In terms of refuse removal, the applicant does not have a guaranteed service provider. They have sourced quotations for this service in order to source the best service provider. Please note that a private contractor shall be contracted prior to commencement of construction.</p>

#### D.4 COMMENTS AND RESPONSE REPORT

The practitioner must make report (s) available to I&APs record all comments received from I&APs and respond to each comment before is submitted. The comments and responses must be captured in a comments and response report as prescribed in the EIA Regulations and be attached to the Final BAR as Appendix I3.

#### D.5 AUTHORITY PARTICIPATION

Authorities and organs of state identified as key stakeholders. Key stakeholders identified in terms of Regulation 7(1) and (2) and Regulation 40(2) (a)-(c) of GN R.982:

Authority/Organ of State	Contact person (Title, Name and Surname)	Tel No	Fax No	e-mail	Postal address
Moretele Local Municipality	Ridah Ramarula	0127161327		molekob@nwpg.gov.za	Private Bag X367, Makapanstad, North West, 0404
Bojanala Platinum	Goitsimosimo	0145904500	0145926085	innocents@bojanala	P O Box 1993,

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District Municipality	Tau			.gov.za	Rustenburg,0300
North West READ	Moleko Betty	0183895111		molekob@nwpg.gov.za	Private Bag X2039 Mmabatho 2735
North West Provincial Heritage Resources Authority	Natasha Higgitt	<a href="tel:0214624502">0214624502</a>	<a href="tel:0214624509">0214624509</a>	nhiggitt@sahra.org.za	11 Harrington Street, Cape Town, 8001
Department of Water and Sanitation	Cornia Theunissen	0122537261		theunissenc@dws.gov.za	Department of Water and Sanitation Water Quality Office Old Rustenburg Road Hartbeespoort 0216

Include proof that the Authorities and Organs of State received written notification and draft reports of the proposed activities as Appendix I4.

#### D.6 CONSULTATION WITH OTHER STAKEHOLDERS

Note that, for any activities (linear or other) where deviation from the public participation requirements may be appropriate, the person conducting the public participation process may deviate from the requirements of that sub-regulation to the extent and in the manner as may be agreed to by the competent authority.

Proof of any such agreement must be provided, where applicable. Application for any deviation from the regulations relating to the public participation process must be submitted prior to the commencement of the public participation process.

A list of registered I&APs must be included as Appendix I5.

Copies of any correspondence and minutes of any meetings held must be included in Appendix I6.

## SECTION E RECOMMENDATION OF PRACTITIONER

Is the information contained in this report and the documentation attached hereto sufficient to make a decision in respect of the activity applied for (in the view of the environmental assessment practitioner)?

YES

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

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

This Final BA Report has investigated and assessed the significance of the predicted positive and negative impacts associated with the proposed development of a chicken broiler. No negative impacts have been identified within this BA that, in the opinion of the Environmental Assessment Practitioner who conducted this BA Process, should be considered "fatal flaws" from an environmental perspective, and thereby necessitate substantial re-design or termination of the project. The fact that development occurs on previously transformed land minimises the impacts on the proposed development site.

Taking into consideration the findings of the BA Process, including the findings of the specialist studies, it is the opinion of the Environmental Assessment Practitioner, that the project benefits outweigh the costs and that the project will make a positive contribution to sustainable economic growth, skills development and employment opportunities in the Moretele Local Municipality.

It is recommended that the project receive Environmental Authorisation in terms of the EIA Regulations promulgated under the National Environmental Management Act (Act 107 of 1998, as amended) subjected to the following conditions:

- The EMPr of the proposed development must be adhered to during all phases of the development
- A Water use license must be obtained
- All the recommendations of the specialists must be implemented for the proposed project

In order to ensure the effective implementation of the mitigation and management actions, a Draft EMPr has been compiled and is included in Appendix F of this Final BA Report. The mitigation measures necessary to ensure that the project is planned, constructed, operated and decommissioned in an environmentally responsible manner are listed in this Draft EMPr. The EMPr is a dynamic document that should be updated regularly and provides clear and implementable measures for proposed development of a chicken broiler.

The EMPr that meet the requirements of EIA Regulation, 2017, Appendix 4, must be attached as Appendix J.

Is an EMPr attached?

YES

The details of the EAP who compiled the BAR and the expertise of the EAP to perform the Basic Assessment process must be included as Appendix K

If any specialist reports were used during the compilation of this BAR, please attach the declaration of interest for each specialist in Appendix F

any other information relevant to this application and not previously included must be attached in Appendix L.

### E.1 SECTION F: AFFIRMATION BY EAP

I Reinett Mogotshi (name of person representing EAP) of Council for Scientific and Industrial Research (name of company) declare that the information provided is correct and relevant to the activity/ project and that, the information was made available to interested and affected parties for their comments. All specialist (s) reports are relevant for the competent authority to make informed decision.



SIGNATURE OF EAP

DATE

## *SECTION F APPENDICES*

The following appendices must be attached:

Appendix A	A3 Locality Map
Appendix B	Layout Plan and Sensitivity Maps
Appendix C	Photographs
Appendix D	Facility illustration(s)
Appendix E	Confirmation of services by Municipality (servitude and infrastructure planning)
Appendix F	Details and expertise of Specialist and Declaration of Interest
Appendix G	Specialist reports (including terms of reference)
Appendix H	Impact Assessment
Appendix I	Public Participation
Appendix J	Environmental Management Programme (EMPr)
Appendix K	Details of EAP and expertise
Appendix L	Any other Information
Appendix M	Financial Provision (if applicable)
Appendix N	Closure Plan (where applicable) as described in Appendix 5 of EIA Regulations, 2017

**Basic Assessment** for the proposed  
development of a chicken broiler facility on  
Portion 40 of the Farm Jonathan 175- JQ,  
Brits, North West.



# APPENDICES

# APPENDICES

## DRAFT BASIC ASSESSMENT REPORT

PROPOSED DEVELOPMENT OF A CHICKEN BROILER FACILITY ON PORTION 40 OF THE FARM JONATHAN 175- JQ,  
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Appendix A	A3 Locality Map
Appendix B	Layout Plan and Sensitivity Maps
Appendix C	Photographs
Appendix D	Facility illustration(s)
Appendix E	Confirmation of services by Municipality (servitude and infrastructure planning)
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# APPENDICES

DRAFT BASIC ASSESSMENT REPORT

PROPOSED DEVELOPMENT OF A CHICKEN BROILER FACILITY ON PORTION 40 OF THE FARM JONATHAN 175- JQ,  
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## BASIC ASSESSMENT REPORT

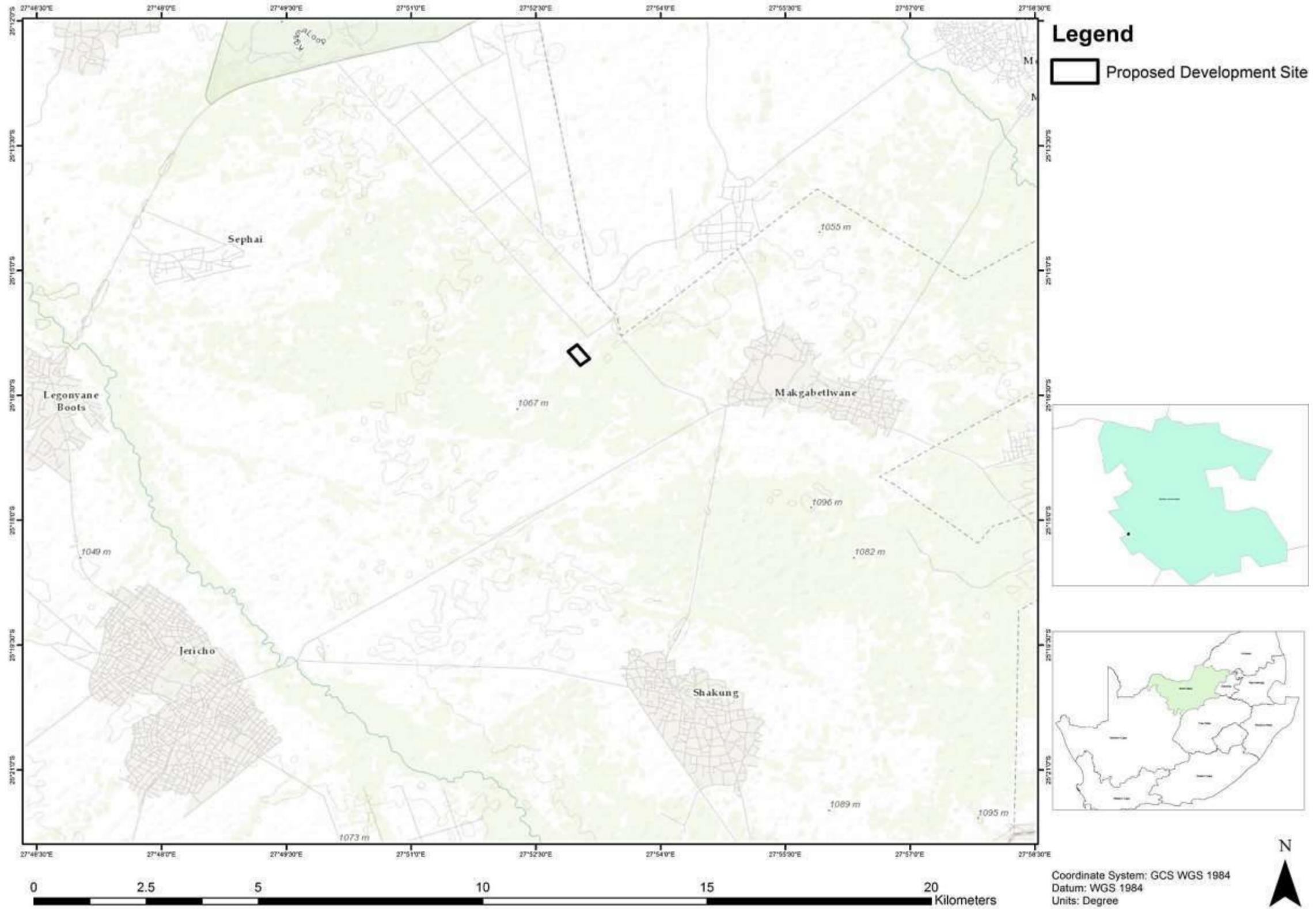
### APPENDIX A: LOCALITY MAP

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APPENDICES

Appendix A.1: Locality Map



# APPENDICES

DRAFT BASIC ASSESSMENT REPORT

PROPOSED DEVELOPMENT OF A CHICKEN BROILER FACILITY ON PORTION 40 OF THE FARM JONATHAN 175- JQ,  
BRITS, NORTH WEST

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## BASIC ASSESSMENT REPORT

### APPENDIX B: LAYOUT PLAN AND SENSITIVITY MAPS

## CONTENTS

Appendix B.1: Site layout of the proposed development site (as supplied by the Project Proponent _____	2
Appendix B.2: Layout of the proposed development with sensitivities _____	3
Appendix B.3: 100 meter buffer of potential wetland areas _____	4
Appendix B.4: The biodiversity map of the proposed development site _____	<b>Error! Bookmark not defined.</b>

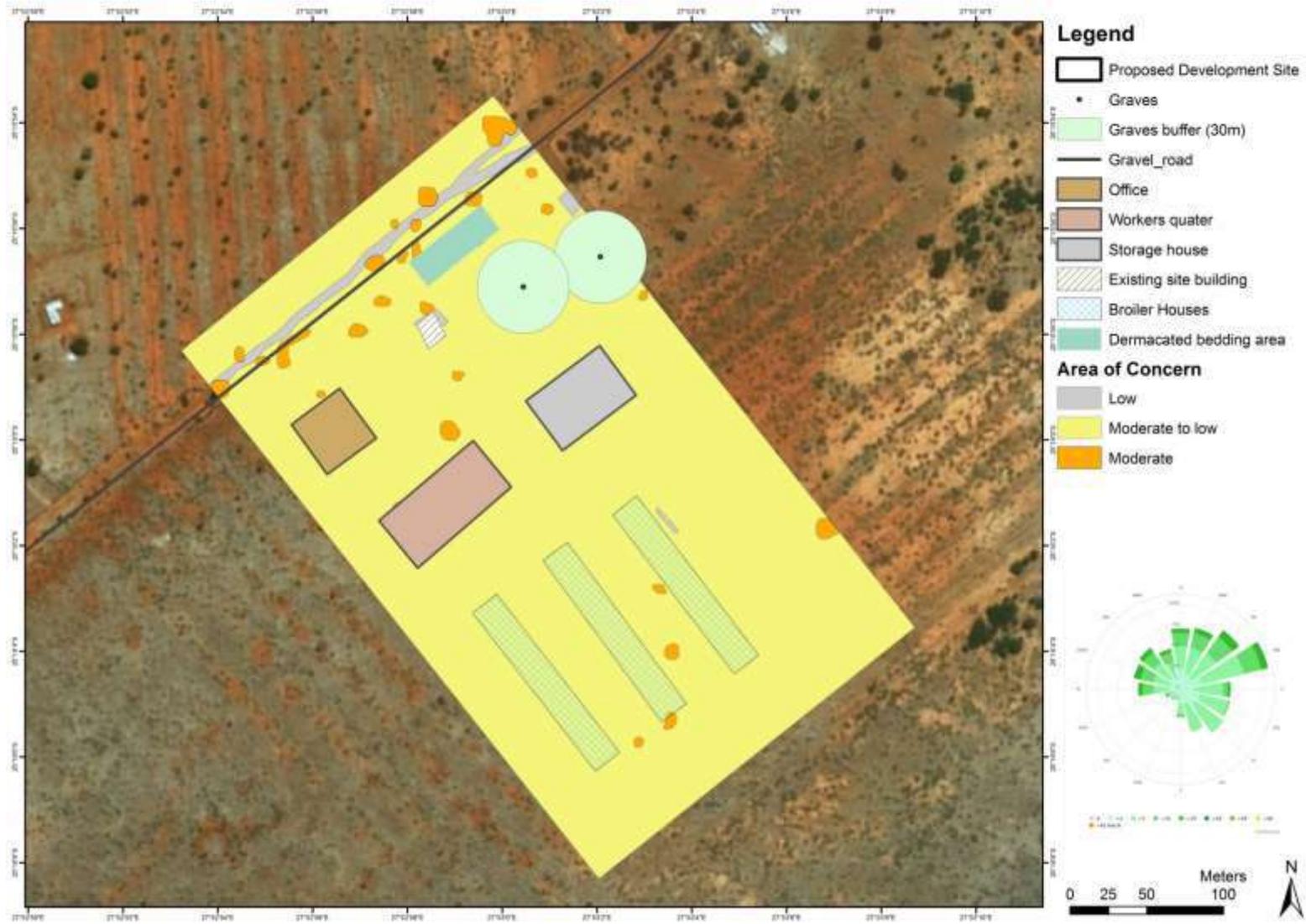
# APPENDICES

## Appendix B.1: Site layout of the proposed development site (as supplied by the Project Proponent)



# APPENDICES

## Appendix B.2: Layout of the proposed development with sensitivities



# APPENDICES

## Appendix B.3: 100 meter buffer of potential wetland areas



# APPENDICES

DRAFT BASIC ASSESSMENT REPORT

PROPOSED DEVELOPMENT OF A CHICKEN BROILER FACILITY ON PORTION 40 OF THE FARM JONATHAN 175- JQ,  
BRITS, NORTH WEST

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## BASIC ASSESSMENT REPORT

### APPENDIX C: PHOTOGRAPHS

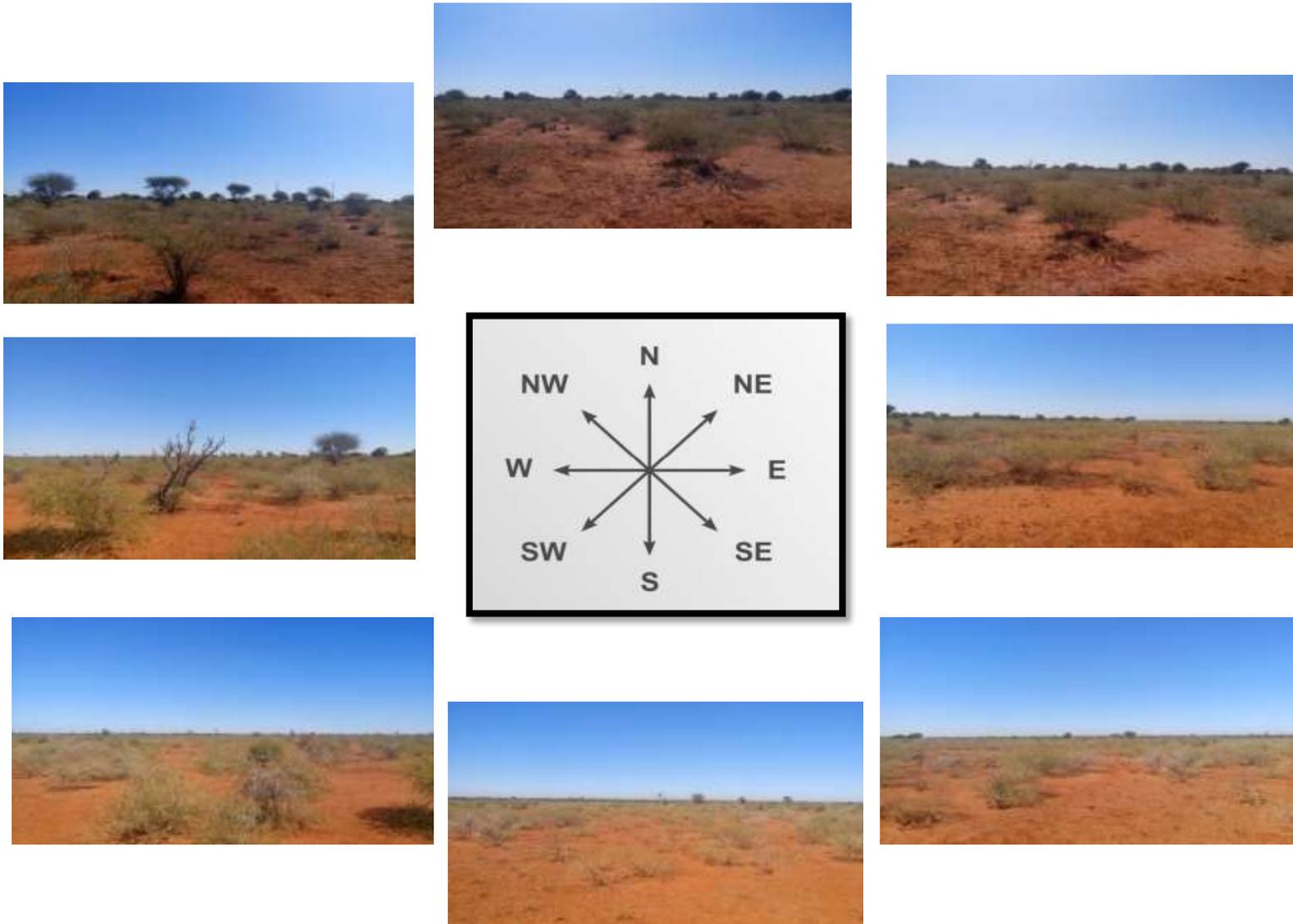
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Jamrock Site photographs taken in the eight major compass directions \_\_\_\_\_ 2

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## Jamrock Site photographs taken in the eight major compass directions



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DRAFT BASIC ASSESSMENT REPORT

PROPOSED DEVELOPMENT OF A CHICKEN BROILER FACILITY ON PORTION 40 OF THE FARM JONATHAN 175- JQ,  
BRITS, NORTH WEST

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## BASIC ASSESSMENT REPORT

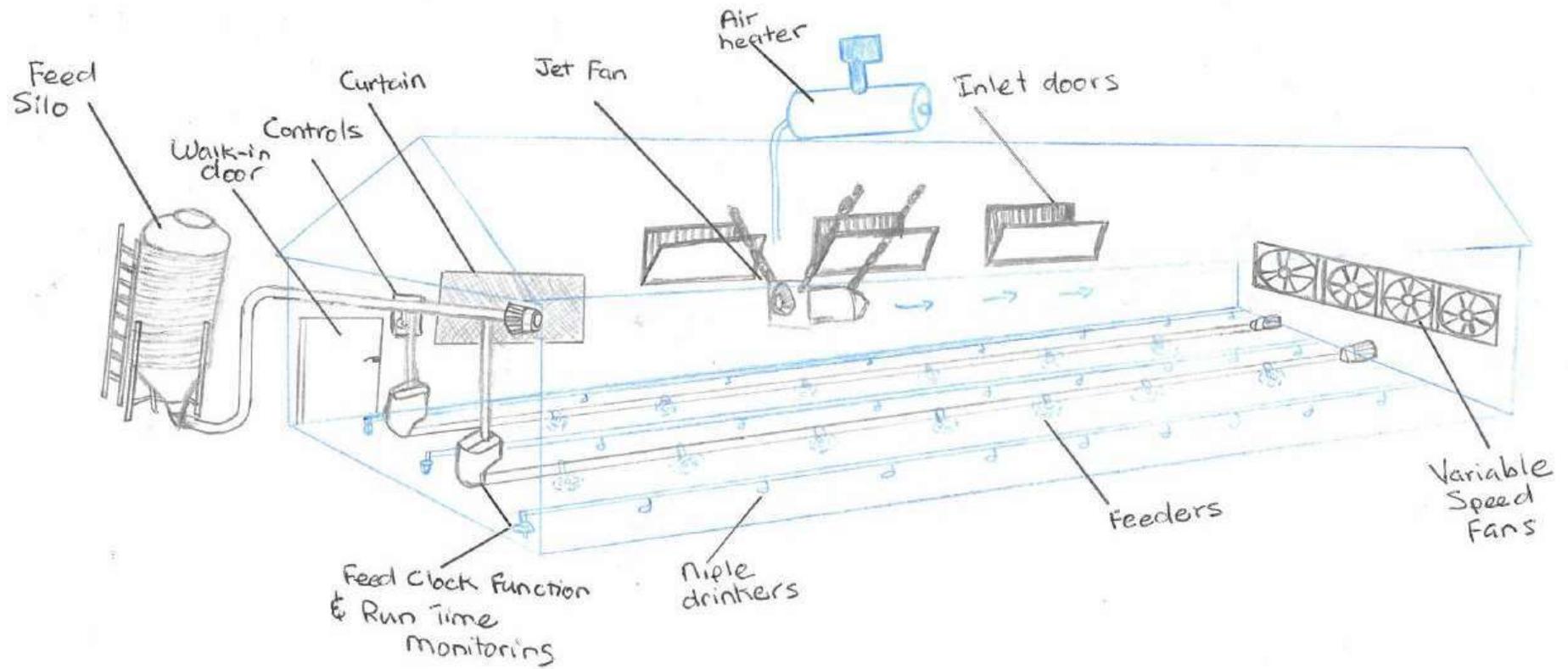
### APPENDIX D: FACILITY ILLUSTRATION(S)

## CONTENTS

Facility illustration of each broiler house for the proposed development \_\_\_\_\_ 2

# APPENDICES

## Facility illustration of each broiler house for the proposed development



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BRITS, NORTH WEST

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## BASIC ASSESSMENT REPORT

### APPENDIX E: Confirmation of services by Municipality (servitude and infrastructure planning)

# APPENDICES

## DRAFT BASIC ASSESSMENT REPORT

PROPOSED DEVELOPMENT OF A CHICKEN BROILER FACILITY ON PORTION 40 OF THE FARM JONATHAN 175- JQ, BRITS, NORTH WEST

**Current Context**

Person: NDLOVU(NO STRUCTURE),PHUMANE PETRUS  
 Account ID: 9810162843 NDLOVU(NO STRUCTURE),PHUMANE PETRUS - Pre-Paid Customer  
 Current Balance: R0.00  
 Premise: PLOT 40 PORTION 175, JONATHAN, WP, JONATHAN, RSA, Pre-Paid Premise, 5489774617

**Premise Information**

Premise Information	PLOT 40 PORTION 175, JONATHAN, WP, JONATHAN, RSA, Pre-Paid Premise, 5489774617
CIS Division	Pretoria
Municipal Authority	MADIBENG LOCAL MUNICIPALITY
Pre-Paid Tax	RSA PPM TAX
Pretoria Cust Serv Area	Mabopane
Service Point Information	Pre-Paid (Default)/PLOT 40 PORTION 175, JONATHAN, WP, JONATHAN, RSA, Pre-Paid Premise, 5489774617
Meter Configuration	STS Keypad (All Manuf) (07-02), 04192506840, Eff 28-09-2009 12:00AM , Pre-Paid (All Meters), 1 register
Last Meter Read	29-04-2010 12:00AM

**SA Premise List**

Premise	Current Balance	Payoff Balance	SA Information
PLOT 40 PORTION 175, JONATHAN, WP, JONATHAN, RSA, Pre-Paid Premise, 5489774617	R0.00	R0.00	Pretoria / Pre-Paid SA(Transactions), PRE-PAID, Active, 29-04-2010, 9810162631
PLOT 40 PORTION 175, JONATHAN, WP, JONATHAN, RSA, Pre-Paid Premise, 5489774617	R0.00	R0.00	Pretoria / Pre-Paid SA Type Fees, PRE-PAID, Active, 04-10-2013, 9810162684

**Utility Links:** Alerts, Favorite Links, Control Central, Control Central-Account Information, Account, Person, Bill, Service Agreement, Meter Read, Service Point, Current Context, To Do Summary.

# APPENDICES

## DRAFT BASIC ASSESSMENT REPORT

PROPOSED DEVELOPMENT OF A CHICKEN BROILER FACILITY ON PORTION 40 OF THE FARM JONATHAN 175- JQ,  
BRITS, NORTH WEST

(A) DeedsWeb

Page 1 of 2

Property	Owner	Deed/Document	LPI Enquiry	Interdict	Document Request	Transfers	Bulk Properties	User Admin	Billing	
<b>Property Enquiry Result</b>										

Property enquiry results for "M P MASEKO" in the Deeds Registry at "PRETORIA"

### Property detail:

Deeds registry	PRETORIA
Property type	FARM
Farm name	JONATHAN
Farm number	175
Portion	40
Province	NORTH-WEST
Registration division/Administrative district	JQ
Local authority	MORETELE LOCAL MUNICIPALITY
Previous description	-
Diagram deed number	T391/1982
Extent	9.1689 H
LPI Code	T0JQ00000000017500040

### Title Deeds detail:

Document	Registration date	Purchase date	Amount	Image Scanned reference	Document copy?
T100899/2015	20151123	20140926	R50000.00	20151127 10:33:29	Yes

### Owners detail:

Document	Full name	Identity Number	Share	Person Enquiry?
T100899/2015	MASEKO MABENA PHILLIP	5704045310085	-	Yes

### Endorsements / Encumbrances:

Endorsement / Encumbrance	Holder	Amount	Microfilm reference	Document copy?
K2474/1977RMBP	-	-	-	Not available
JQ,175,40-BP	-	-	2000 1148 4466	Yes

### History:

<a href="http://www.deeds.gov.za/ITSODeedsWebB/deedsweb/propd_doc_results.jsp?&amp;focusf...">http://www.deeds.gov.za/ITSODeedsWebB/deedsweb/propd_doc_results.jsp?&amp;focusf...</a>	2015/12/03
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DRAFT BASIC ASSESSMENT REPORT

PROPOSED DEVELOPMENT OF A CHICKEN BROILER FACILITY ON PORTION 40 OF THE FARM JONATHAN 175- JQ,  
BRITS, NORTH WEST

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## BASIC ASSESSMENT REPORT

### **APPENDIX F:** Details and expertise of Specialist and Declaration of Interest



**read**

Department:  
**Rural, Environment and Agricultural  
Development**  
North West Provincial Government  
**REPUBLIC OF SOUTH AFRICA**



AgriCentre Building  
Cnr. Dr. James Moroka  
and Stadium Rd  
Private Bag X2039,  
Mmabatho 2735

**CHIEF DIRECTORATE: ENVIRONMENTAL SERVICES**  
**DIRECTORATE: ENVIRONMENTAL QUALITY**

Tel: +27 (18) 389 5156  
Fax: +27(18) 389 5006  
E-mail: [oskosana@nwpg.gov.za](mailto:oskosana@nwpg.gov.za)  
Enq: EIA Admin Officer

**DETAILS AND EXPERTISE OF SPECIALIST AND DECLARATION OF INTEREST**

File Reference Number: NEAS Reference Number: Date Received:	(For official use only)		

Application for authorisation in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended and the Environmental Impact Assessment Regulations, 2014

**PROJECT TITLE**

Basic Assessment for the proposed development of a chicken broiler facility on Portion 40 of the Farm Jonathan 175- JQ, Brits, North West.

**1. Details of Specialist**

Specialist:	ASHA Consulting (Pty) Ltd		
Contact person:	Dr Jayson Orton		
Postal address:	40 Brassie Street, Lakeside		
Postal code:	7945	Cell:	083 272 3225
Telephone:	021 788 8425	Fax:	n/a
E-mail:	jayson@asha-consulting.co.za		
Professional affiliation(s) (if any)	ASAPA CRM Section member No.: 233 APHP accredited professional heritage practitioner		

Project Consultant:	CSIR		
Contact person:	Reinett Mogotshi		
Postal address:	P O Box 320 Stellenbosch		
Postal code:	7599	Cell:	
Telephone:	021 888 2432	Fax:	
E-mail:	Rmogotshi@csir.co.za		

## 2. Expertise of the Specialist including Curriculum vitae (Appendix 6 (1)(a)(ii) of EIA Regulations, 2014)



*Curriculum Vitae*

**Jayson David John Orton**

**ARCHAEOLOGIST AND HERITAGE CONSULTANT**

### **Contact Details and personal information:**

**Address:** 40 Brassie Street, Lakeside, 7945  
**Telephone:** (021) 788 8425  
**Cell Phone:** 083 272 3225  
**Email:** jayson@asha-consulting.co.za

**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 –



### **Professional Accreditation:**

Association of Southern African Professional Archaeologists (ASAPA) membership number: 233  
CRM Section member with the following accreditation:

- 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)

Association of Professional Heritage Practitioners (APHP)

- Accredited Professional Heritage Practitioner

### **Memberships and affiliations:**

South African Archaeological Society Council member	2004 – 2016
Assoc. Southern African Professional Archaeologists (ASAPA) member	2006 –
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 –
Kalk Bay Historical Association	2016 –
Association of Professional Heritage Practitioners member	2016 –

### **Fieldwork and project experience:**

Extensive fieldwork and experience 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:

#### Feasibility studies:

- Heritage feasibility studies examining all aspects of heritage from the desktop

#### Phase 1 surveys and impact assessments:

- Project types
  - Notification of Intent to Develop applications (for Heritage Western Cape)
  - Desktop-based Letter of Exemption (for the South African Heritage Resources Agency)
  - 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 archaeological 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, Namaqualand
- 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

**Awards:**

Western Cape Government Cultural Affairs Awards 2015/2016: Best Heritage Project.



### 3. Declaration by Specialist

I, Jayson Orton ( Name of Specialist), of ASHA Consulting (Pty) Ltd (name of company) declare that;

- I act as an independent specialist in this application.
- I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant.
- 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 undertake to disclose to the applicant/ Environmental Assessment Practitioner appointed by 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;
- **all the particulars furnished by me in this form 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 49B(2) of the Act.**

Signature of the specialist

ASHA CONSULTING (PTY) LTD

Name of company (if applicable)

18 APRIL 2017

Date

Signature of the Commissioner of Oaths

Date

Designation

Official stamp:





**read**

Department:  
**Rural, Environment and Agricultural  
Development**  
North West Provincial Government  
**REPUBLIC OF SOUTH AFRICA**



AgriCentre Building  
Cnr. Dr. James Moroka  
and Stadium Rd  
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**DIRECTORATE: ENVIRONMENTAL QUALITY**

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Enq: EIA Admin Officer

**DETAILS AND EXPERTISE OF SPECIALIST AND DECLARATION OF INTEREST**

File Reference Number: NEAS Reference Number: Date Received:	(For official use only)

Application for authorisation in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended and the Environmental Impact Assessment Regulations, 2014

**PROJECT TITLE**

Basic Assessment for the proposed development of a chicken broiler facility on Portion 40 of the Farm Jonathan 175- JQ, Brits, North West.

**1. Details of Specialist**

Specialist:	Ecologist		
Contact person:	Susan Abell		
Postal address:	64A Coleraine Drive River Club Ext 7, Sandton 2191		
Postal code:	2191	Cell:	
Telephone:	0117877400	Fax:	0117847599
E-mail:	susan@nss-sa.co.za		
Professional affiliation(s) (if any)	SACNASP		

Project Consultant:	CSIR		
Contact person:	Reinett Mogotshi		
Postal address:	P O Box 320 Stellenbosch		
Postal code:	7599	Cell:	
Telephone:	021 888 2432	Fax:	
E-mail:	RMogotshi@csir.co.za		

**2. Expertise of the Specialist including Curriculum vitae (Appendix 6 (1)(a)(ii) of EIA Regulations, 2014)**

## EDUCATIONAL QUALIFICATIONS

---

- ✚ MSc Resource Conservation Biology (Ecology) (2000 – 2001)
- ✚ B Sc Hons (Botanical) University of the Witwatersrand, Johannesburg (1999)
- ✚ B Sc University of the Witwatersrand, Johannesburg (1998)

## KEY QUALIFICATIONS

---

### ✚ **Environmental Impact Assessment:**

Compiled numerous Environmental Impact Assessments, Scoping Reports and Environmental Management Programmes as required by the Environment Conservation Act (Act No. 73 of 1989) and the National Environmental Management Act (Act 107 of 1998).

### ✚ **Specialist Assessments:**

Over 15 years performing ecological and vegetation surveys within Southern Africa. Expertises are strong in the Savanna, Grasslands and Shrubveld within Gauteng, North West, Limpopo, Northern Cape, Mpumalanga, KwaZulu Natal, Lesotho and Botswana. Further experience lies within the Karoid Shrub, Kalahari and Fynbos Areas.

Assistance with CREW (Custodians of Rare and Endangered Wildflowers) expeditions

GIS Mapping, Database management, GIS Modelling undertaken within specialist projects

### ✚ **Strategic / Spatial Planning:**

Co-ordinated and managed strategic spatial planning projects in Gauteng, North West Province and Mpumalanga including the:

- State of Environment Reports
- Gauteng Agricultural Potential Atlas (GAPA)
- North West Biodiversity Site Inventory and Database Development Atlas
- Tshwane Macro Open Space Policy
- Blyde River Strategic Management Plan
- Biodiversity Database for Optimum Collieries (BHP Billiton)

### ✚ **Conference Presentations:**

Undertaken numerous presentations at conferences (SAAB; IAIA)

### ✚ **Educational Training:**

Education training for organisations such as Wits University and Induction Training in Biodiversity Conservation for Mining Operations





### **Skills**

- Vegetation identification, description, analysis and mapping using Twinspan and Juice
- Advanced microscopy (Transmission and scanning electron microscopy)
- Statistics (e.g. ANOVA chi-squared tests)
- Presenting and communication / networking skills



### **Additional Courses Completed:**

- 2013: First aid Level 1 and 2 (Wilcare Safety Solutions)
- 2013: Off Road Driving (Proactive Driving for Sasol Botswana)
- 2010: Wild Flowers Course with Elsa Pooley
- 2010: Carbon Analyst Certification
- 2010: EIA Regulations Course
- 2007: LBJ Bird Course with Geoff Lockwood.

## **EMPLOYMENT EXPERIENCE**

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**Member & Senior Ecologist: Natural Scientific Services. Johannesburg (November 2004-Present)**



**Project Manager: Strategic Environmental Focus (SEF) (November 2003-October 2004)**



**Environmental Manager: SEF, Pretoria (April 2001- November 2003)**



**University of the Witwatersrand (Wits) 1999 – 2001**



**3. Declaration by Specialist**

I, Susan Abell ( Name of Specialist) of - Natural Scientific Services -(name of company) declare that;

- I act as an independent specialist in this application.
- I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant.
- 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 undertake to disclose to the applicant/ Environmental Assessment Practitioner appointed by 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;
- all the particulars furnished by me in this form 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 49B(2) of the Act.

  
\_\_\_\_\_  
Signature of the specialist

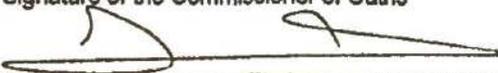
Natural Scientific Services

\_\_\_\_\_  
Name of company (if applicable)

18 April 2017

\_\_\_\_\_  
Date

\_\_\_\_\_  
Signature of the Commissioner of Oaths

  
\_\_\_\_\_  
Date

18/04/2017  
\_\_\_\_\_  
Designation Attorney of Law

Official stamp:      **LOUIS GLOGAUER DO CASAL**  
                                 COMMISSIONER OF OATHS  
                                 57 KOEDOE STREET  
                                 SUNNYRIDGE,  
                                 GERMISTON, 1400  
                                 011 828-7404 / CELL: 076 925 5324

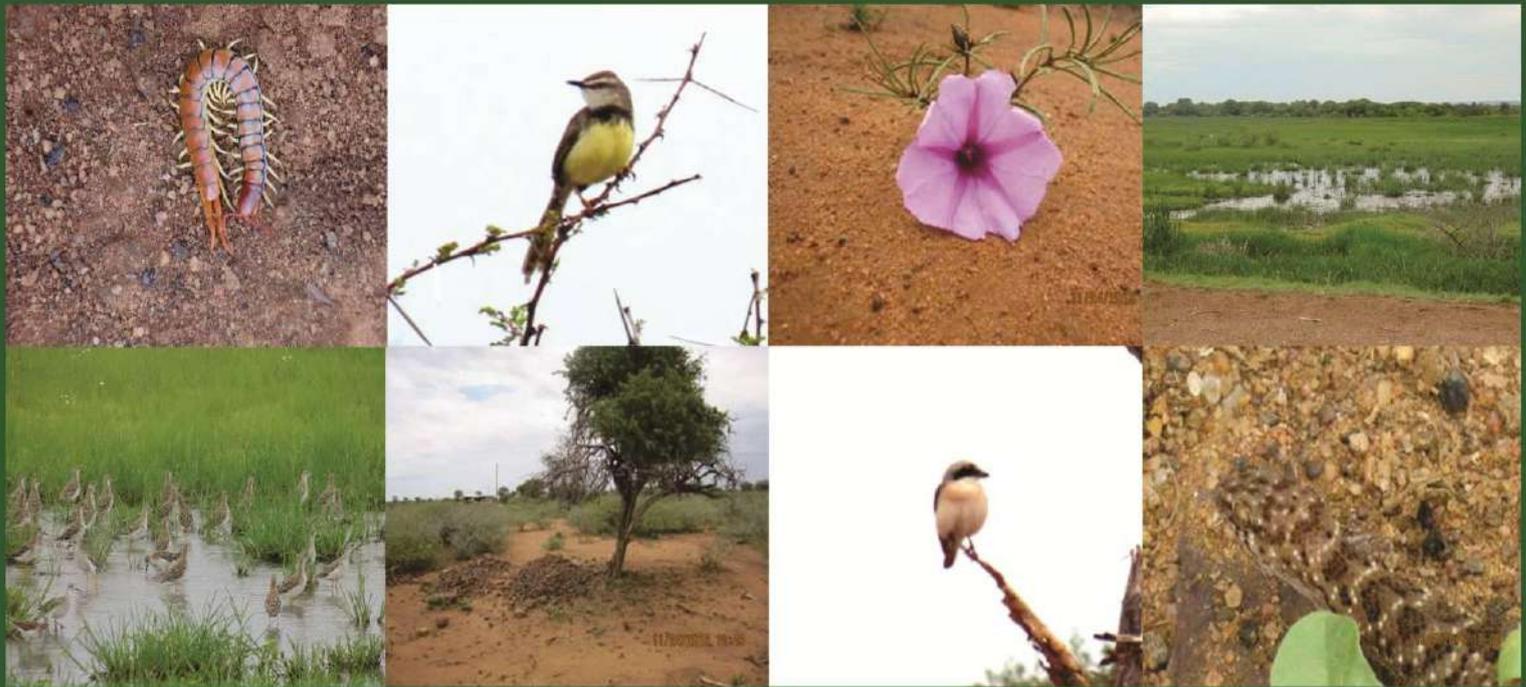


**Basic Assessment** for the proposed  
development of a chicken broiler facility on  
Portion 40 of the Farm Jonathan 175- JQ,  
Brits, North West.



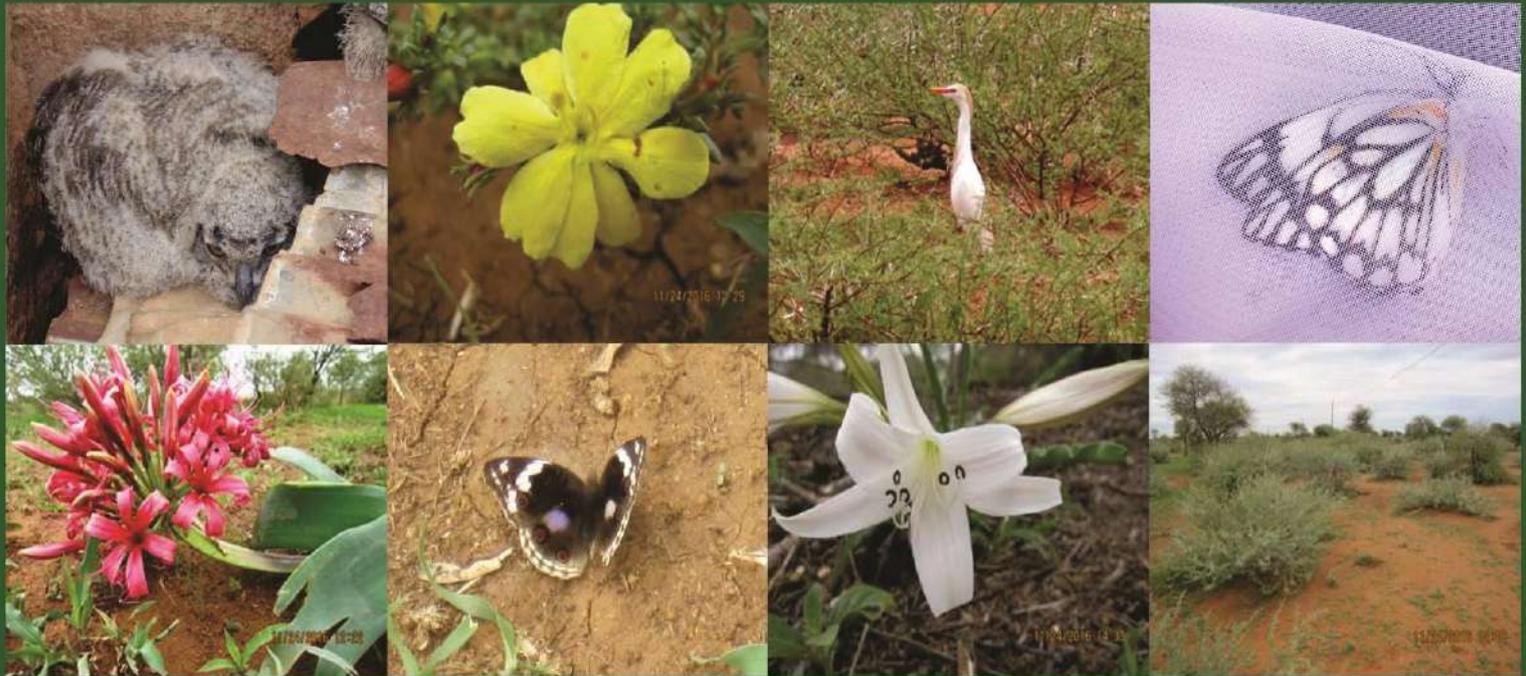
# APPENDIX G: SPECIALIST REPORTS





# ECOLOGICAL OPINION/SCAN

FOR THE PROPOSED DEVELOPMENT ON PORTION 40 OF THE FARM  
JONATHAN 175, NORTH WEST PROVINCE



Compiled By:

Natural Scientific Services



64A Coleraine Drive  
Riverclub Ext 7  
Sandton  
2191  
Tel: (011) 787-7400  
Fax: (011) 784-7599

NSS Ref No: 2293  
Date: February 2017

Compiled For:

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



11 Jan Celliers Street  
Stellenbosch  
7600

Tel: (021) 888 2432  
Fax: (021) 888 2473

All pictures taken on site

# BROILER CHICKEN FACILITY ON PORTION 40 OF FARM JONATHAN 175, NORTH WEST PROVINCE

---

## ECOSCAN REPORT

Compiled For:



**CSIR Stellenbosch (CAS, EMS)**

11 Jan Cilliers Street  
Stellenbosch, 7600  
Western Cape, South Africa  
Tel: (021) 888 2432  
Fax: (021) 888 2473

Compiled By:



**Natural Scientific Services CC**

64 Coleraine Dr  
River Club Ext 7  
Sandton 2191  
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Fax: (011) 784-7599

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Ref No: 2293  
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 broiler chicken facility on Portion 40 of the Farm Jonathan 175 in North West Province.

Desktop research and findings from our site visit in November 2016 indicated that essentially the entire proposed development site comprises regenerating previously cultivated land. A nearby wetland, which is situated on the main access road to the site, is regarded as the most conservation important (CI) local biodiversity feature. Some large indigenous trees on site were also found to provide important roosting and nesting habitat for owls and potentially small raptors.

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 include:

- Degradation of the wetland on the main access road from increased dust, erosion and sedimentation caused by increased traffic.
- Introduction of alien flora with the influx of vehicles, people and materials during construction and operation, and their proliferation in the absence of effective control.
- Poor or inappropriate control of invertebrate and vertebrate pest species due to substandard animal husbandry / hygiene and waste management.

**Table Summary of impact significance, without and with mitigation**

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

POTENTIAL IMPACTS	SIGNIFICANCE	
<b>DECOMMISSIONING</b>		
<i>Loss or degradation of the wetland on the access road</i>	High	Low
<i>Introduction and proliferation of alien species</i>	High	Low
<i>Increased dust and erosion</i>	Medium	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.Nat.Sci.**  
**SACNASP Reg. No. 400116/05**  
**(Ecological & Environmental Science)**

10 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
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
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
EWT	Endangered Wildlife Trust
FEPA	Freshwater Ecosystem Priority Area
GG	Government Gazette
GIS	Geographic Information System
GN	Government Notice
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
NEM:BA	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
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



ACRONYM	DESCRIPTION
Pr.Nat.Sci.	Professional Natural Scientist
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
U	Unknown population trend
UJ	University of Johannesburg
UP	University of Pretoria
VU	Vulnerable
WA	Wild Animal
WITS	University of the Witwatersrand

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## 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 (NEM:BA; 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, NEM:BA and the NWA for a broiler chicken facility in the north-eastern corner of North West 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	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

- North West Biodiversity Conservation Act (Act 4 of 2016).
- Transvaal Nature Conservation Ordinance (1983).
- North West State of the Environment Report (Walmsley & Walmsley 2002).
- North West Environmental Outlook Report (DACE 2008).
- North West Conservation Plan (C-Plan; DREAD 2012).

## 5. Project Description

The enterprise Jam Rock (Pty) Ltd proposes to develop three chicken broiler houses on site, with associated infrastructure including a road, storage unit and farm house. The size of each chicken house will be 20m x 130m, with the capacity to breed 40 000 chickens per cycle. The farm has an existing borehole with the capacity to store 10 000 L of water (refer to Areas of Concern map for brief overview of the layout - **Figure 9-6**).

## 6. Study Region

### 6.1. Locality & Land-use

The approximately 9.5ha development site is situated on Portion 40 of the Farm Jonathan in North West Province (**Figure 6-2**). The site is approximately 3km west of the Makgabelwane and 3km south-east of the Dikgopaneng settlement areas / towns. Available satellite imagery indicates, and our field observations (**Figure 6-1**) confirmed that essentially the entire proposed development site comprises previously cultivated land. Surrounding forms of land use include scattered human settlements and subsistence farming (CSIR 2016).



**Figure 6-1** Photographs of the site

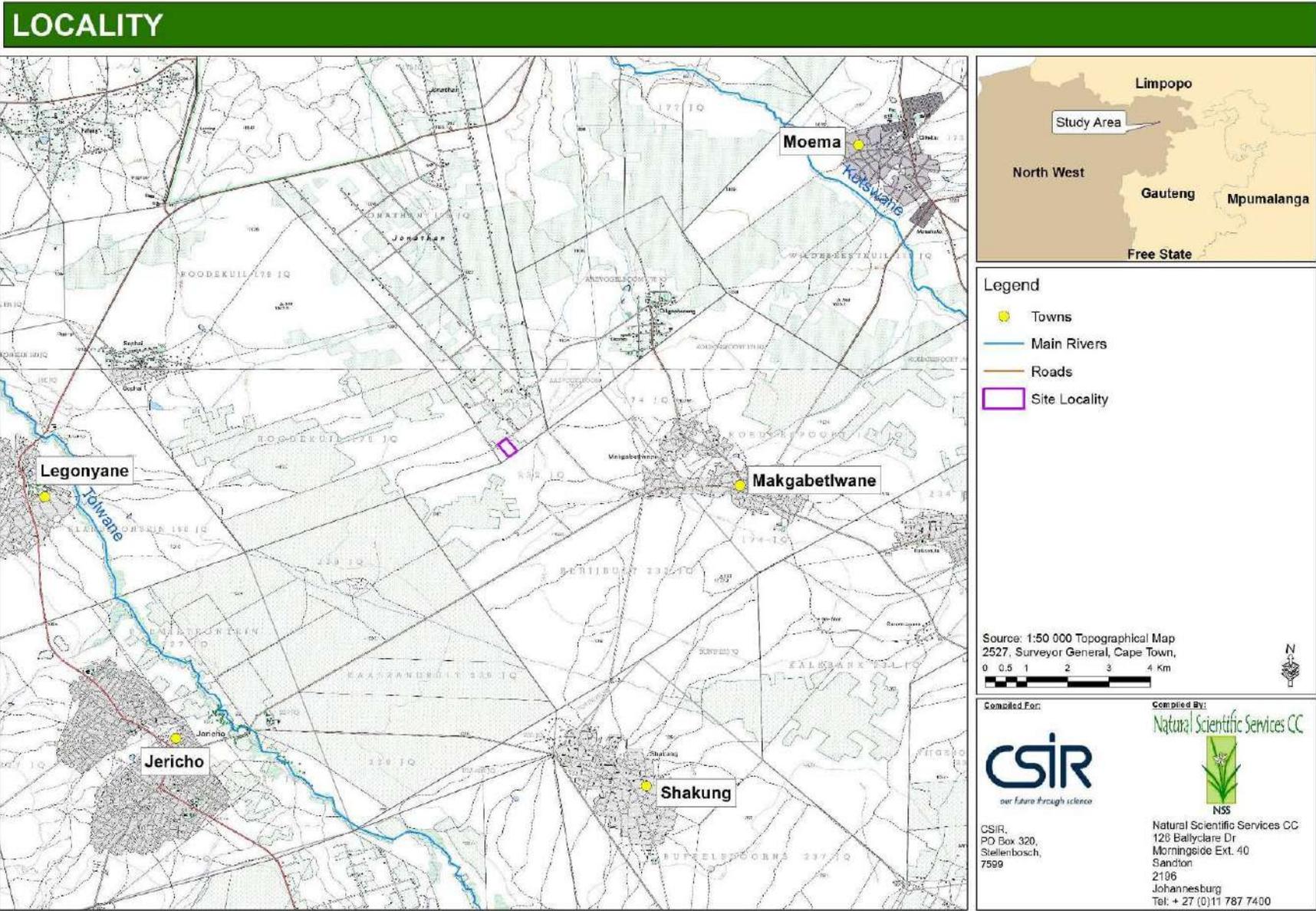


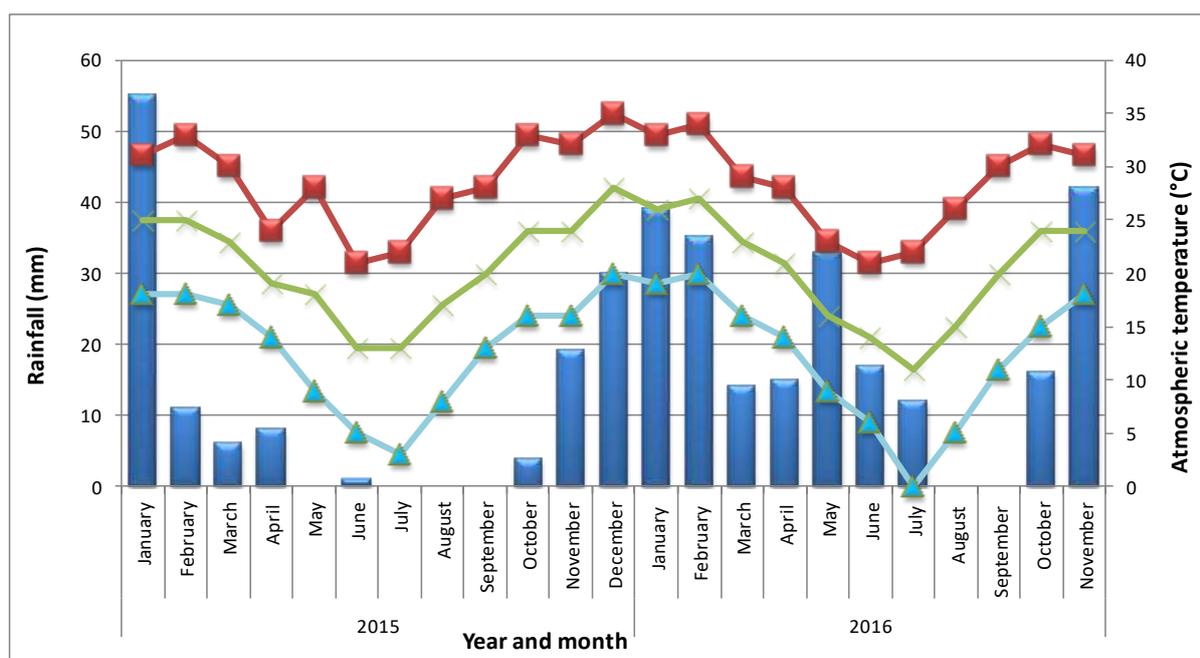
Figure 6-2 Site location



## 6.2. Climate

The regional climate features summer rainfall with very dry winters. Mean annual precipitation is about 500–650mm. Frost is fairly infrequent in winter. Mean monthly maximum and minimum temperatures for Warmbaths – Towoomba are 35.2°C and – 2.0°C for October and July, respectively. Corresponding values are 36.8°C and – 1.2°C for Marble Hall for January and June, respectively (Mucina & Rutherford 2006).

Shown in **Figure 6-3** is monthly rainfall and atmospheric temperatures measured at Rustenberg between January 2015 and November 2016 (data obtained from AccuWeather 2016). This approximate rainfall data indicate that during the 12-month period preceding our site visit on 24 November 2016, the region had received a below-average annual amount of ~272mm rain. The approximate temperature data in **Figure 6-3** indicate that temperatures were typically hot during November 2016. However, when the site visit was undertaken it was evident from the large number of vleis, pans and depressions that the region had recently received substantial rain. On site, conditions were damp, warm and overcast, with little to no wind and, therefore, highly favourable for the floral and faunal survey work.



**Figure 6-3** Measurements of monthly rainfall at Rustenberg (AccuWeather 2016)

## 6.3. Hydrology

The proposed development site is situated in ecoregion 8.05 and quaternary catchment A23J, close to its boundary with adjoining quaternary catchment A23K (**Figure 6-4**). The former quaternary catchment has been rated with Moderate Ecological Sensitivity (ES), and the latter with Low/Marginal ES (DWAF 2011). Although quaternary catchment A23J is drained by the Kutswane River, the site is situated a similar distance (roughly 9km) from both the Kutswane River and the Tolwane River, which drains quaternary catchment A23K. Both these rivers represent tributaries of the Pienaars River, which drains into the Crocodile

River. These (and a moderate diversity of other rivers) collectively comprise the Crocodile (West) and Marico Water Management Area. With approximately half the length of the rivers containing Critically Endangered ecosystems, this WMA is particularly hard pressed to meet South Africa's goal for freshwater ecosystem conservation without a focused effort to rehabilitate some systems. Conservation action in the WMA should be focussed on maintaining the last remaining good condition rivers, and strategically rehabilitating some of the moderately-modified rivers (Nel & Driver 2012). The Crocodile River eventually feeds into the Limpopo River, which flows through the Kruger National Park before entering Mozambique.

#### 6.4. Land Types

“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 proposed development site is situated in land type Ae20, close to it's boundary with land type Ea71 (**Figure 6-5**).

The terrain within land type Ae20 is flat to slightly undulating, and across the proposed development site elevation ranges between 1 051m and 1 054m a.s.l. Rocks within the land type pertain to the volcano – sedimentary Karoo Supergroup. Most abundant in the area are the mafic volcanics (tholeitic and olivine basalts and nephelinites) of the Letaba Formation, then the mudstones of the Irrigasie Formation are the shale, with sandstone units, of the Ecca Group. Soils are red – yellow apedal, freely drained with high base status and self – mulching, black, vertic clays. The vertic soils, with a fluctuating water table, experience prolonged periods of swelling and shrinking during wet and dry periods, considerable soil cracking when dry, a loose soil surface, high calcium carbonate content and gilgai micro – relief.

#### 6.5. Vegetation

The proposed development site is situated in the Savanna Biome, within the SVcb 15 Springbokvlakte Thornveld regional vegetation type (**Figure 6-5**) as defined by Mucina & Rutherford (2006). The Springbokvlakte Thornveld vegetation type represents open to dense, low thorn savanna dominated by *Acacia* species or shrubby grassland with a very low shrub layer. Dominant floral species within the Springbokvlakte Thornveld vegetation type are listed in **Table 6-1**.

**Table 6-1 Dominant flora comprising the Springbokvlakte Thornveld vegetation type**

GROWTH FORM	DOMINANT SPECIES
Small Trees:	<i>Acacia karroo</i> (d), <i>Acacia luederitzii</i> var. <i>retinens</i> (d), <i>Acacia mellifera</i> subsp. <i>detinens</i> (d), <i>Acacia nilotica</i> (d), <i>Ziziphus mucronata</i> (d), <i>Acacia tortilis</i> subsp. <i>heteracantha</i> , <i>Boscia foetida</i> subsp. <i>rehmanniana</i> .

GROWTH FORM	DOMINANT SPECIES
<b>Tall Shrubs:</b>	<i>Euclea undulata</i> (d), <i>Searsia engleri</i> (d), <i>Dichrostachys cinerea</i> , <i>Diospyros lycioides</i> subsp. <i>lycioides</i> , <i>Grewia flava</i> , <i>Tarchonanthus camphoratus</i> .
<b>Low Shrubs:</b>	<i>Acacia tenuispina</i> (d), <i>Ptycholobium plicatum</i> .
<b>Succulent Shrub:</b>	<i>Kleinia longiflora</i> .
<b>Herbaceous Climbers:</b>	<i>Momordica balsamina</i> , <i>Rhynchosia minima</i> .
<b>Graminoids:</b>	<i>Aristida bipartita</i> (d), <i>Dichanthium annulatum</i> var. <i>papillosum</i> (d), <i>Ischaemum afrum</i> (d), <i>Setaria incrassata</i> (d), <i>Aristida canescens</i> , <i>Brachiaria eruciformis</i> .
<b>Herbs:</b>	<i>Aspilia mossambicensis</i> , <i>Indigostrum parviflorum</i> , <i>Nidorella hottentotica</i> , <i>Orthosiphon suffrutescens</i> , <i>Senecio apiifolius</i>

\*The genus *Acacia* has been split internationally into *Vachellia* and *Senegalia*. For this report, these species will remain in the *Acacia* genus.

\* d = Dominant

According to Mucina & Rutherford (2006), the Springbokvlakte Thornveld vegetation type is **Endangered**. The national target is to conserve 19% of this vegetation type, but only 1% is statutorily conserved, mainly in the Mkombo Nature Reserve. Roughly three times this area is conserved in a number of other reserves. At least 49% of the vegetation type is transformed, including about 45% cultivated and 3% urban and built-up. There are dense rural populations in the southern and eastern sides of the vegetation type. Alien plants are scattered over wide areas, and include *Cereus jamacaru*, *Eucalyptus species*, *Lantana camara*, *Melia azedarach*, *Opuntia ficus – indica* and *Sesbania punicea*. Erosion is very low to moderate.

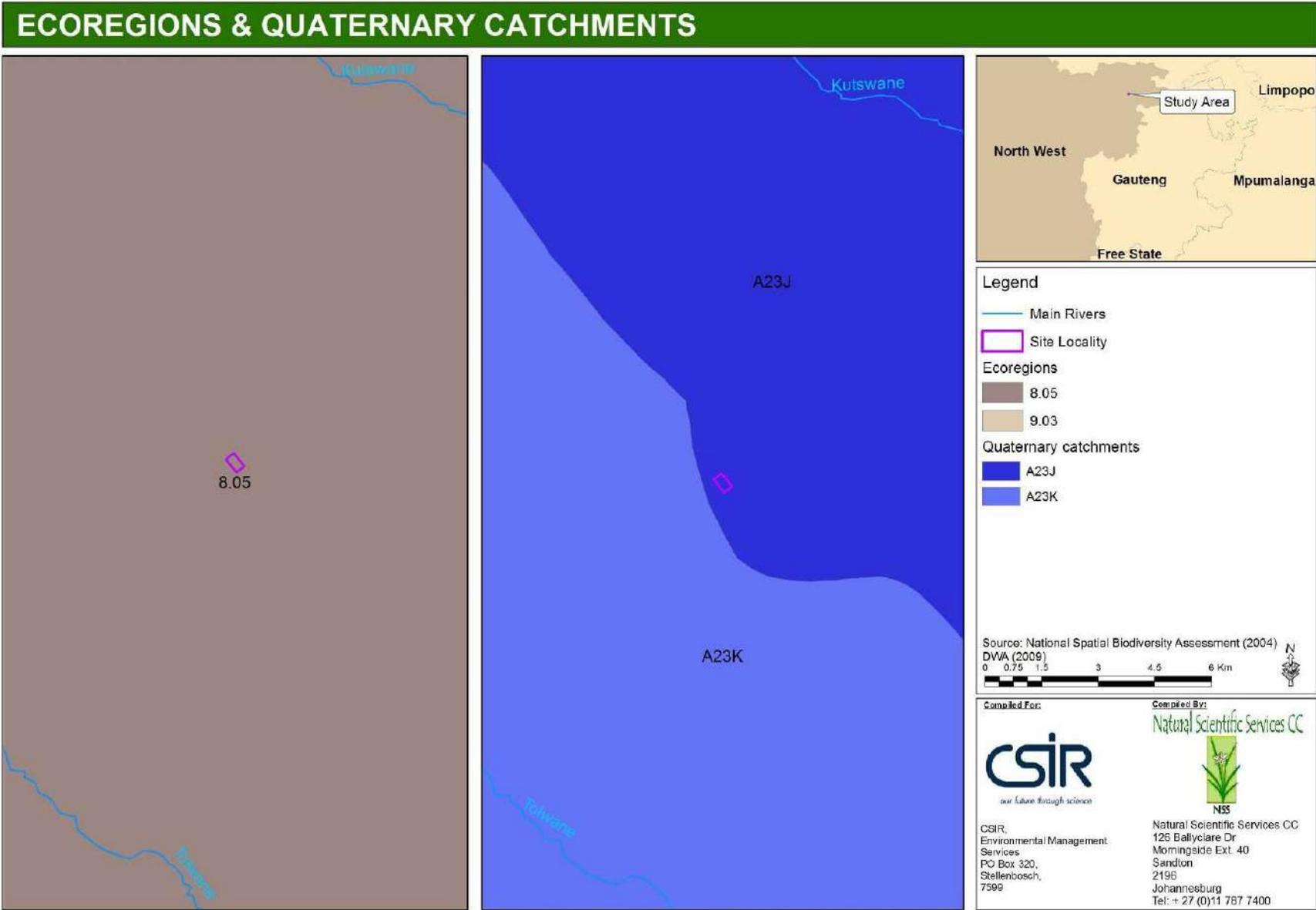


Figure 6-4 Ecoregion and quaternary catchment wherein the development site is situated



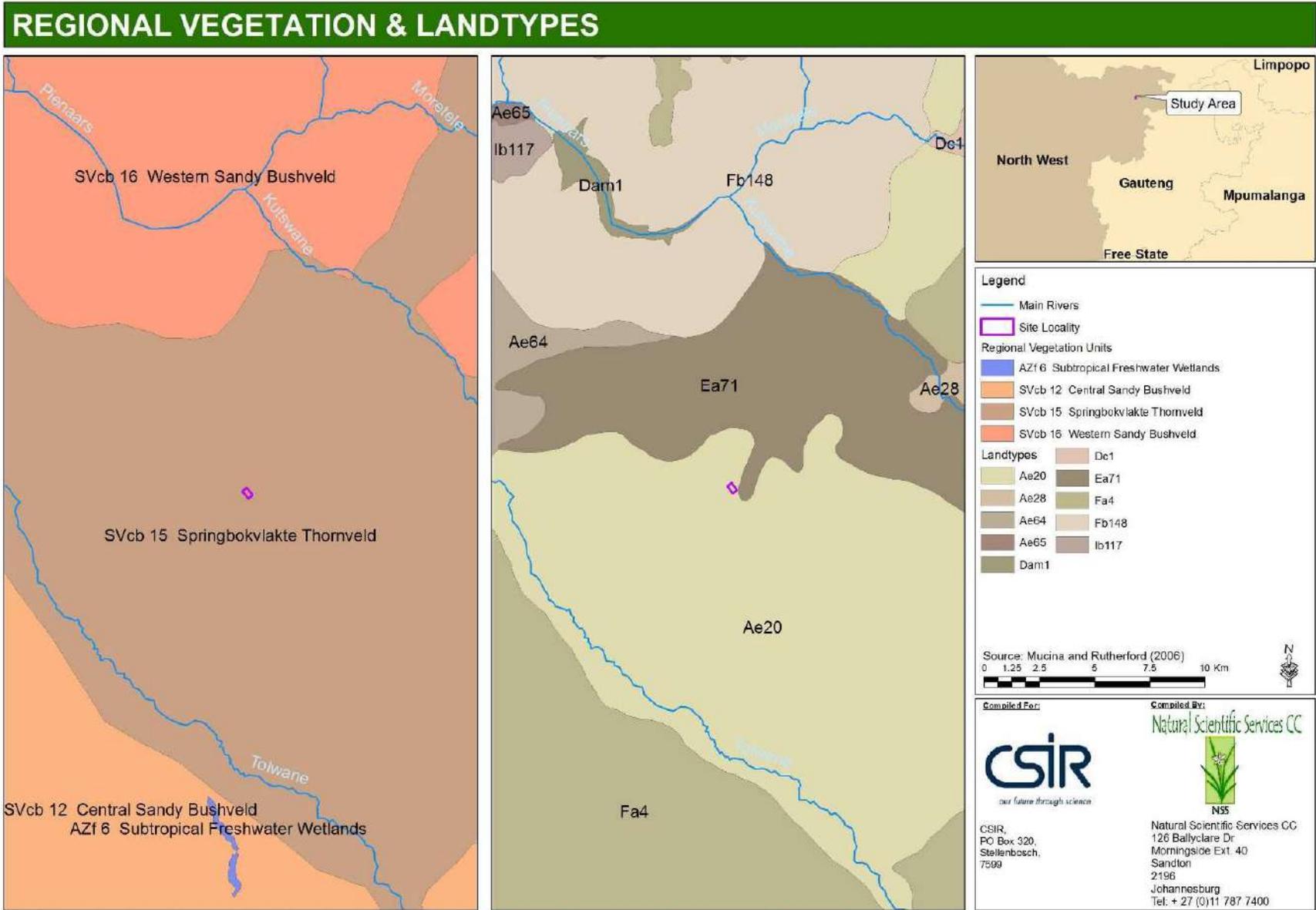


Figure 6-5 Regional vegetation and land type wherein the development site is situated



## 7. Methodology

The ecological scan involved desktop research and fieldwork, which was performed during a site visit on 24 November 2016.

### 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's<sup>1</sup> Plants of South Africa (POSA) 2527BD QDS
  - ⦿ Mucina & Rutherford's (2006) vegetation map of southern Africa.
  - ⦿ The current North West CBA/ESA Plan.
  - ⦿ 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.

<sup>1</sup> The South African National Biodiversity Institute



# VEGETATION SAMPLING POINTS

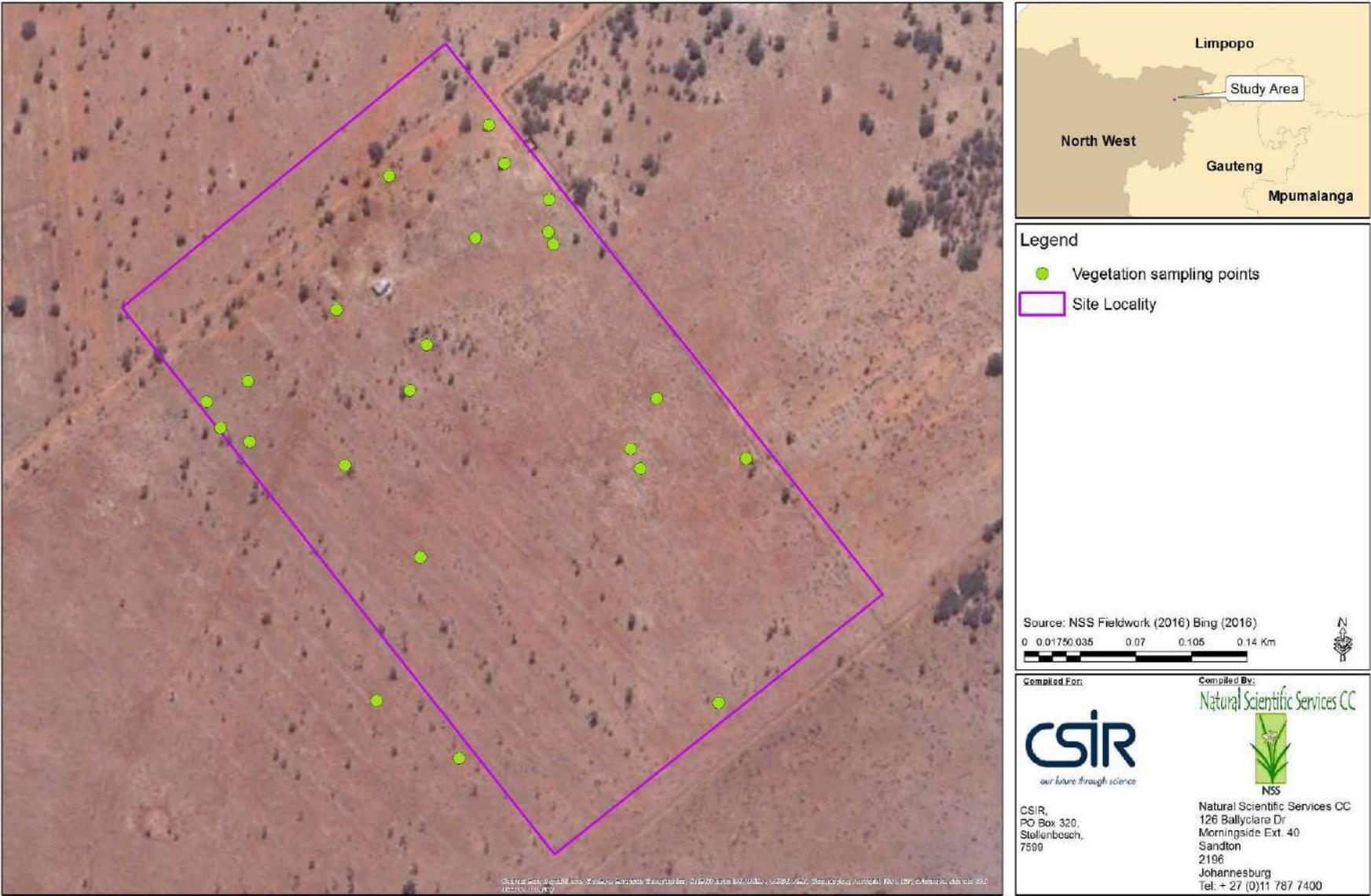


Figure 7-1 Main vegetation sampling points

## Limitations

Although most of the site was under agriculture in the past (tilled), 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 (2016) for quarter degree square (QDS) 2527BD.
- Birds, using the list of bird species for QDS 2527BD from the Roberts VII (2013) mobile phone app., and the latest online list of bird species for pentad 2515\_2750 from the second Southern African Bird Atlas Project (SABAP 2), which included records of bird species that were observed in QDS 2527BD 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 (2016) for the relevant QDS.
- Frogs, using the published species distribution maps in Minter *et al.* (2004), and online species distribution data from FrogMAP (2016) for the relevant QDS.
- Butterflies, using the published species distribution maps in Mecenero *et al.* (2013), and online species distribution data from LepiMAP (2016) for the relevant QDS.
- Odonata, using the published distribution maps in Samways (2008). OdonataMAP (2016) did not have any species records for QDS 2527BD.
- Scorpions, using the published species distribution maps in Leeming (2003), and online species distribution data from ScorpionMAP (2016).

The lists were refined based on faunal records for the Bojanala District and Springbokvlakte Thornveld vegetation type in North West Province, which were received from DREAD (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 / provincial assessments of animal taxa.

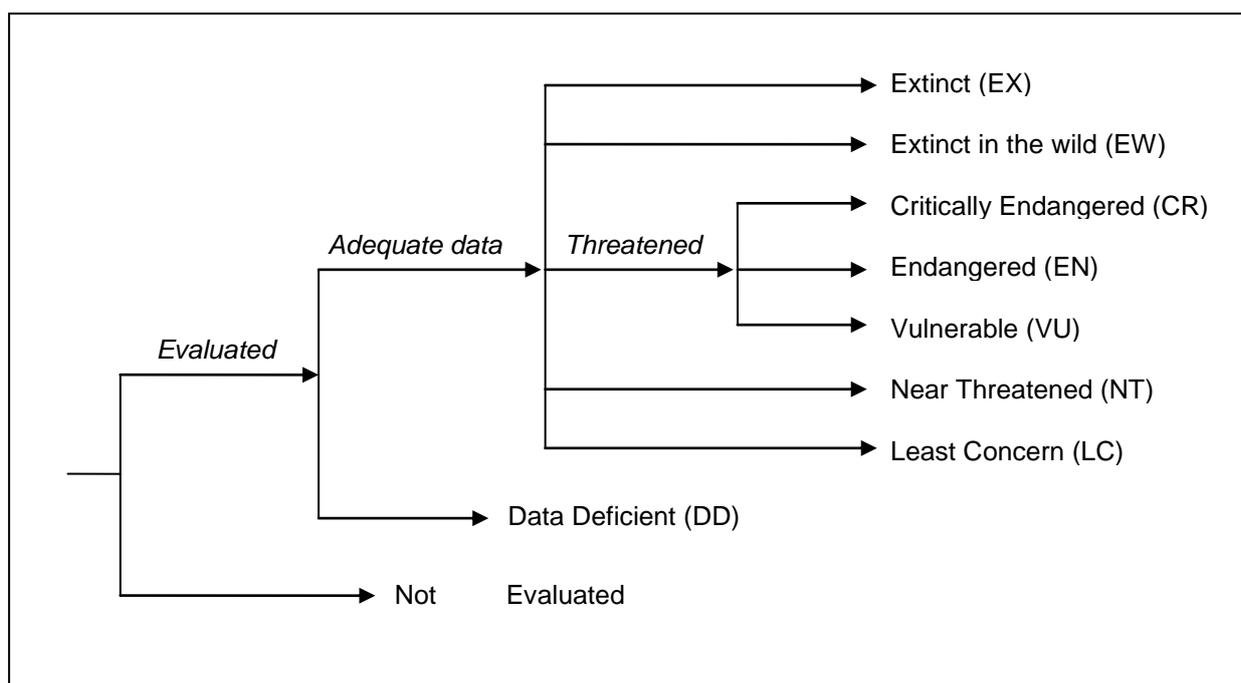


Figure 7-2 IUCN Red List categories

#### 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 <sup>2</sup> (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 <sup>3</sup> , 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. Improved individual livelihoods	Medium	4
Potential to lead to Economic Development	Medium-Low	2

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

<sup>3</sup>Note 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
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 on the boundary of 2527BD. This QDG yielded 88 species within 36 families. The dominant families being FABACEAE, ASTERACEAE, MALVACEAE (**Table 8-1**), with the Herbs representing 44%, shrubs/trees representing 22%, and Dwarf Shrubs representing just under 10% of the total species listed for the area (**Table 8-1**). Wooded species in total constitute over 30% 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 wooded vegetation being dominant (over 40%). The presence of Graminoids and Geophytic species was limited (**Table 8-1**).

**Table 8-1 Top 12 dominant families and most dominant growth forms obtained from the POSA website for the QDS 2527BD and on site**

IMPORTANT FAMILIES	No. OF SPP	GROWTH FORMS	% TOTAL SPP	ON SITE
FABACEAE	16	Herb	44.19	31.43
ASTERACEAE	8	Shrub / Tree	22.09	40
MALVACEAE	6	Dwarf shrub	9.3	8.57
ACANTHACEAE	5	Geophyte	6.98	5.71
RUBIACEAE	5	Graminoid	5.81	5.71
POACEAE	5	Succulent	3.49	5.71
APOCYNACEAE	4	Climber	3.49	2.86
LAMIACEAE	4	Scrambler	1.16	-
SCROPHULARIACEAE	3	Cyperoid	1.16	-
AMARANTHACEAE	3	Creeper	1.16	-
ANACARDIACEAE	2	Carnivore	1.16	-
EUPHORBIACEAE	2			

### 8.1.2. On Site - Vegetation Communities

From the field investigations the study area was largely monospecific and almost the entire site had been previously farmed (over 95% - refer to **Table 8-2**). Available aerial imagery from Google Earth dated back to 2009 and still showed past farming practices (**Figure 8-1** and **Figure 8-3**). Therefore it was very difficult to distinguish a diversity of habitat types. Large trees that have significance as roosting sites for species such as Owls and Raptors were mapped. A small drainage line within the site was also evident but showed no signs of soil wetness or vegetation wetland indicators. During the field investigation, wetlands with limited slope to the north were flooded (**Figure 8-4**), however, no pooling of water was evident on the site.

**Table 8-2 Broad Habitat/Vegetation communities**

Vegetation Community	Conservation Significance	Area - Ha	Area -%
<b>Drainage Habitat</b>			
Possible Artificial Drainage	Moderate-Low	0.079	0.84
<b>Tree Clumps</b>			
<i>Acacia – Boscia</i> Tree Clumps	Moderate	0.19	1.99
<b>Transformed Habitat</b>			
Transformed - <i>Acacia</i> Open Woodland (old fields)	Moderate-Low	8.92	95.28
<b>Disturbed</b>			
Built-up Areas	Low	0.033	0.35
Track	Low	0.14	1.54



Possible artificial drainage



Acacia – Boscia Tree Clumps



Transformed - Acacia Open (old fields)



Built Structures

**Figure 8-1 Photographs of the different habitats within and surrounding the site**

A limited description can be provided for such a homeogenous habitat. However, species recorded within this habitat included (**Figure 8-3**):

ACANTHACEAE	<i>Justicia flava</i> (Vahl) Vahl
ACANTHACEAE	<i>Ruellia patula</i> Jacq.
AMARANTHACEAE	<i>Gomphrena celosioides</i> Mart. **
AMARYLLIDACEAE	<i>Ammocharis coranica</i> (Ker Gawl.) Herb.
ASPHODELACEAE	<i>Aloe greatheadii</i> Schönland var. <i>davyana</i> (Schönland) Glen & D.S.Hardy
ASTERACEAE	<i>Felicia muricata</i> (Thunb.) Nees subsp. <i>muricata</i>
ASTERACEAE	<i>Tagetes minuta</i> L. **
BORAGINACEAE	<i>Heliotropium lineare</i> (A.DC.) Görke
CACTACEAE	<i>Opuntia ficus-indica</i> (L.) Mill. **
CAPPARACEAE	<i>Boscia albitrunca</i> (Burch.) Gilg & Gilg-Ben.
COMMELINACEAE	<i>Commelina</i> sp.
CONVOLVULACEAE	<i>Evolvulus alsinoides</i> (L.) L.
CONVOLVULACEAE	<i>Ipomoea bolusiana</i>
CUCURBITACEAE	<i>Coccinia sessilifolia</i> (Sond.) Cogn.
CUCURBITACEAE	<i>Cucumis hirsutus</i>
EBENACEAE	<i>Diospyros lycioides</i> Desf. subsp. <i>lycioides</i>
FABACEAE	<i>Acacia caffra</i> (Thunb.) Willd.
FABACEAE	<i>Acacia karroo</i> Hayne
FABACEAE	<i>Acacia mellifera</i> (Vahl) Benth. subsp. <i>mellifera</i>
FABACEAE	<i>Acacia nilotica</i> (L.) Willd. ex Delile subsp. <i>kraussiana</i> (Benth.) Brenan
FABACEAE	<i>Acacia tortilis</i> (Forssk.) Hayne subsp. <i>heteracantha</i> (Burch.) Brenan

FABACEAE	<i>Dichrostachys cinerea</i> (L.) Wight & Arn.
FABACEAE	<i>Indigofera</i> spp
FABACEAE	<i>Neorautanenia ficifolius</i>
FABACEAE	<i>Peltophorum africanum</i> Sond.
FABACEAE	<i>Senna didymobotrya</i> (Fresen.) H.S.Irwin & Barneby
GERANIACEAE	<i>Monsonia</i> cf. <i>burkeana</i>
HYACINTHACEAE	<i>Ledebouria</i> cf. <i>revoluta</i> (L.f.) Jessop
HYPERICACEAE	<i>Hypericum</i> spp
MALVACEAE	<i>Grewia flava</i> DC.
POACEAE	<i>Digitaria eriantha</i> Steud.
POACEAE	<i>Panicum maximum</i> Jacq.
SOLANACEAE	<i>Solanum</i> ( <i>panduriforme</i> ) <i>campylacanthum</i> A. Rich.
SOLANACEAE	<i>Solanum nigrum</i> L.
SOLANACEAE	<i>Solanum</i> sp.
ZYGOPHYLLACEAE	<i>Tribulus terrestris</i> L.
RHAMNACEAE	<i>Ziziphus mucronata</i> Willd. subsp. <i>mucronata</i>

*Grewia flava**Coccinia* spp*Monsonia* cf. *burkeana**Aptosimum* cf. *elongatum***Figure 8-2** Examples of species found on site

# VEGETATION UNITS

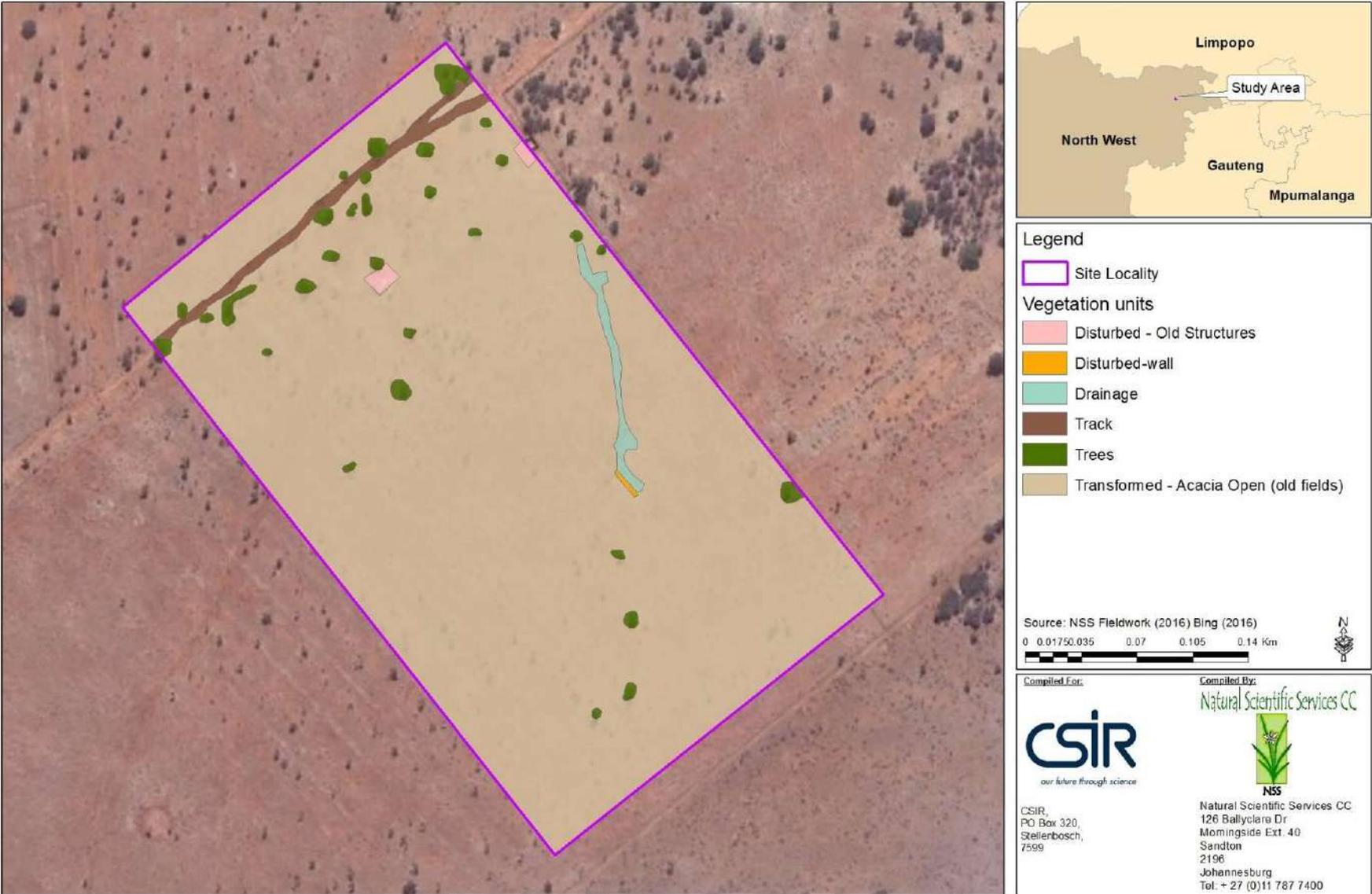


Figure 8-3 Vegetation communities within the study area



**Figure 8-4** Photographs of the wetland to the north of the site

### 8.1.3. Conservation Important Species

It is well documented that heterogeneous landscapes, diverse geology and a range of environmental conditions, provide a diverse number of habitats for plant species (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 site is over 95% transformed through past agricultural activities with a scarce herbaceous layer. 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 December 2016), there are 46 Red Data listed species (**Table 8-3**) out of a possible 2416 species within North West Province (including Data Deficient species) of which 2 species are Critically Endangered (CR), 4 Endangered (EN), 8 are Vulnerable (VU) and 8 are Near Threatened.

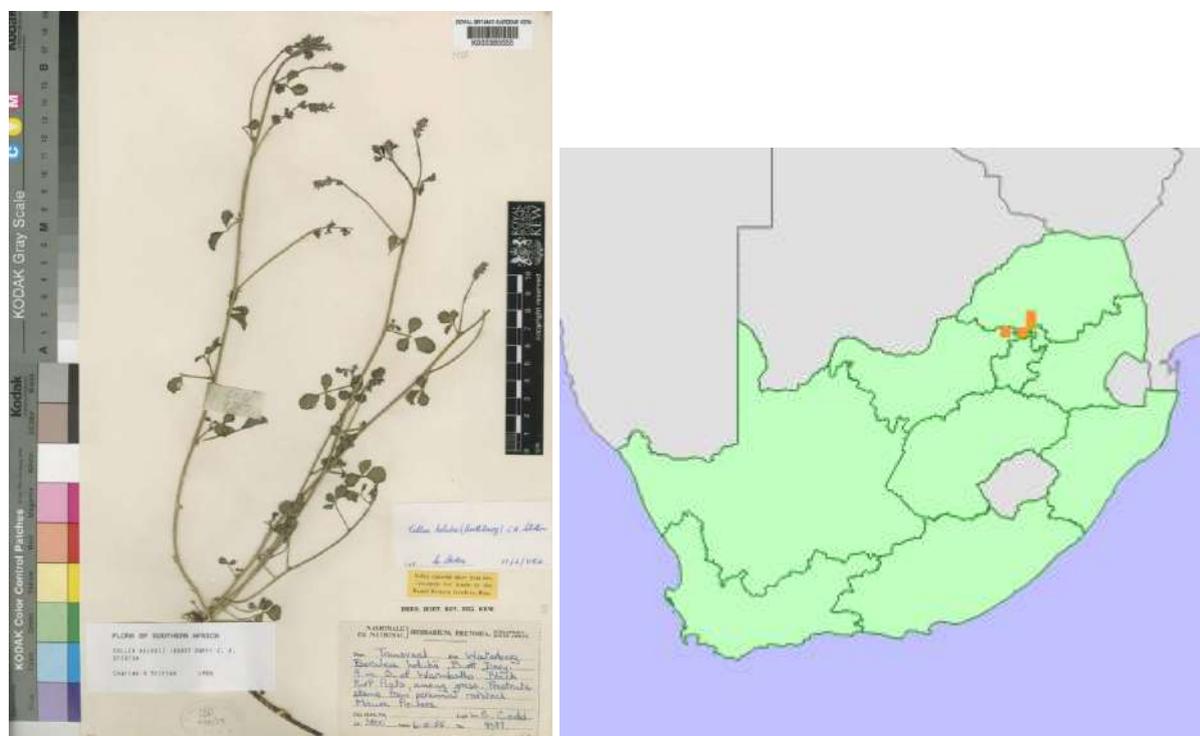
**Table 8-3** Numbers of conservation important plant species per Red Data category within South Africa and North West (date accessed: December 2016)

Threat Status	South Africa	NORTH WEST	2527BD
EX (Extinct)	28	0	0
EW (Extinct in the wild)	7	0	0
CR PE (Critically Endangered, Possibly Extinct)	57	0	0
CR (Critically Endangered)	332	2	0
EN (Endangered)	716	4	0

VU (Vulnerable)	1217	8	1
NT (Near Threatened)	402	8	0
Critically Rare (known to occur only at a single site)	153	1	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	7	0
LC (Least Concern)	13 856	1935	83
DDD (Data Deficient - Insufficient Information)	348	0	0
DDT (Data Deficient - Taxonomically Problematic)	904	12	1
<b>Total spp (including those not evaluated)</b>	<b>23 399</b>	<b>2416</b>	<b>88</b>

\*\*Date accessed – December 2016

From the POSA website (2527BB & 2527BD QDS) 2 listed CI species have been recorded in the greater region (**Table 8-4**). Both species require a different habitat to what is found on site. Please note that this list is not exhaustive and there is still the potential for other listed species to occur in the region. The **Vulnerable** *Cullen holubii* is known from five locations in the northern provinces of South Africa (**Figure 8-5**). These records, however, are all from roadside. According to von Staden (2008), there are potentially up to 10 locations, as its vegetation type is quite widespread. About 60% of the habitat has been transformed in the past, mainly by agriculture. There is ongoing habitat loss due to expanding rural settlements, overgrazing and alien plant invasion.



**Figure 8-5** Photographs and Distribution of the Vulnerable *Cullen holubii* (Data from Kew Gardens, UK)

**Table 8-4** Potential CI species based on information obtained from 2527BB & 2527BD QDG

FAMILY	SPECIES	STATUS	FLOWERING TIME	HABITAT	LoO
FABACEAE	<i>Cullen holubii</i> (Burt Davy) C.H.Stirt.	VU	Summer	Springbokvlakte Thornveld -Turf soils in grasses	Unlikely (but potentially in surrounds)
MYROTHAMNACEAE	<i>Myrothamnus flabellifolius</i> Welw.	DDT	Spring-Summer	In shallow soil over sheets of rock	Highly Unlikely

\* Vulnerable – VU; Data Deficient Taxonomically – DDT

Although no Red Listed species were recorded, *Ammocharis coranica* is considered a Protected species under the Nature Conservation Ordinance, 12 of 1983 (**Figure 8-6**). Protected Species may not be cut, disturbed, damaged, destroyed without obtaining a permit from North West Province or a delegated authority. However, recent legislation [which repeals the Ordinance] passed in January 2017, only weeks before the final compilation of this report, the Protected Status of species was revised and this species is no longer on the list.



*Ammocharis coranica*



*Ammocharis coranica*

**Figure 8-6** Photographs of Conservation Important plant species on Site

### ***Alien and Invasives Species***

Alien, especially invasive<sup>4</sup> plant species are a major threat to the ecological functioning of 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.

However, this was not the case on site. Only seven species were detected of which two were NEMBA Category 1b listed species (**Table 8.5** and **Figure 8-7**).

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

<sup>4</sup> 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
- National Environmental Management: Biodiversity Act (NEM:BA; Act 10 of 2004):

Family	Species	Growth forms	CARA	NEMBA
AMARANTHACEAE	<i>Gomphrena celosioides</i> Mart.	Herb	Weed	
CACTACEAE	<i>Opuntia ficus-indica</i> (L.) Mill.	Succulent	1	1b
FABACEAE	<i>Senna didymobotrya</i> (Fresen.)	Shrub	1	1b
SOLANACEAE	<i>Solanum nigrum</i> L.	Herb	Weed	
SOLANACEAE	<i>Solanum</i> sp.	Dwarf shrub	-	
ASTERACEAE	<i>Tagetes minuta</i> L.	Herb	Weed	
FABACEAE	<i>Trifolium repens</i> L.	Herb	Weed	



**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**

**Figure 8-7 The Category 1 Listed *Opuntia* species**

## 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 49 mammal species are considered highly likely or likely to occur at least sporadically in the study area (**Appendix 13.2**). Many Southern African / Common Mole-rat mounds were encountered, and the droppings of Scrub Hare, Common / Bush Duiker, and possibly Kudu were found on site (**Figure 8-8**). Wild Impala were also seen approximately 1km south-east of the site. Rupicolous mammal species (e.g. Rock Dormouse, Eastern Rock Elephant Shrew, Rock Hyrax, Namaqua Rock Mouse, and Jameson's Red Rock Hare) and wetland-associated mammal species (e.g. Marsh Mongoose, otters, vlei rats, Water Rat) are unlikely to occur due to the absence of suitable habitat on site. Poor grass cover (compounded by over-grazing) probably precludes mammal taxa such as climbing mice, the Near Threatened (NT) Southern African Hedgehog and Serval, and the Vulnerable (VU) Black-footed Cat.

Increasing levels of human settlement in the area have presumably precluded e.g. Aardvark, African Wild Cat and Chacma Baboon.



Common Mole-rat  
(*Cryptomys hottentotus*) mounds



Common Duiker  
(*Sylvicapra grimmia*) droppings

**Figure 8-8 Evidence of mammal species on site**

Apart from various Data Deficient rodent and shrew species, six Protected and/or threatened mammal species may occur at least sporadically in the study area (**Table 8-6**).

- The Cape Fox is classified as a national Protected Species (PS). Given that it preferentially inhabits mesic to arid grassland (as opposed to savanna), and that there are few records for this species from the Bojanala District of North West Province (Power 2011), it was rated with a moderate Likelihood of Occurrence (LoO) at best.
- The Leopard, which is listed as a national PS, and as globally and regionally VU, was rated with a moderate LoO. Although this species is widespread in the District (Power 2011), increasing levels of human settlement in the study region likely pose a growing threat to this species.
- The Brown Hyena, which is listed as a national PS, and as globally and regionally NT, is found throughout the District where it favours areas with rugged terrain (Power 2011). Given the lack of rugged terrain near the study area, this species was rated with a moderate LoO.
- The Aardwolf is listed as a provincial Protected Game (PG) species. It is found throughout the District (Power 2011) and was rated with a high LoO.
- The Steenbok is listed as a provincial PG species. It is common throughout the District (Power 2011) and was rated with a high LoO.
- The regional status of African Striped Weasel has recently been uplisted from Least Concern to NT. Although it occurs widely in the District, it is secretive and rare and as such, was rated with a moderate LoO.

**Table 8-6 Potentially occurring conservation important mammal species**

SCIENTIFIC NAME	COMMON NAME	RSA LEGAL STATUS	NORTH WEST LEGAL STATUS	GLOBAL	REGIONAL	LoO	
				RED LIST STATUS	RED LIST STATUS	QDS	SITE
<i>Vulpes chama</i>	Cape Fox	PS		LC (S)	LC	3	3
<i>Panthera pardus</i>	Leopard	PS	PWA Schedule 4 Section 15(1)(c)	VU (D)	VU	3	3
<i>Hyaena brunnea</i>	Brown Hyena	PS	PG Schedule 2 Section 15(1)(a)	NT (D)	NT	3	3
<i>Proteles cristata</i>	Aardwolf		PG Schedule 2 Section 15(1)(a)	LC (S)	LC	2	2
<i>Raphicerus campestris</i>	Steenbok		PG Schedule 2 Section 15(1)(a)	LC (S)	LC	2	2
<i>Poecilogale albinucha</i>	African Striped Weasel			LC (U)	NT	2	3

**Status:** D = Declining; LC = Least Concern; NT = Near Threatened; PG = Protected Game; PS = Protected Species; PWA = Protected Wild Animal; S = Stable; U = Unknown

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

**Sources:** Transvaal Nature Conservation Ordinance (1983); NEM:BA ToPS (2015); IUCN (2016); MammalMAP (2016); SANBI & EWT (2016)

**Table 8-7 Potentially occurring conservation important bird species**

SCIENTIFIC NAME	ALPHABETICAL COMMON NAME	RSA	NORTH WEST LEGAL STATUS	GLOBAL	REGIONAL	LoO		
		LEGAL STATUS		RED LIST STATUS	RED LIST STATUS	QDS	PENTAD	SITE
<i>Gyps africanus</i>	Vulture, White-backed	EN	PG Schedule 2 Section 15(1)(a)	CR	CR	1		3
<i>Gyps coprotheres</i>	Vulture, Cape	EN	PG Schedule 2 Section 15(1)(a)	EN	EN	1	1	3
<i>Torgos tracheliotos</i>	Vulture, Lappet-faced	EN	PG Schedule 2 Section 15(1)(a)	EN	EN	1		3
<i>Polemaetus bellicosus</i>	Eagle, Martial	EN	PG Schedule 2 Section 15(1)(a)	VU	EN	1		3
<i>Aquila rapax</i>	Eagle, Tawny	EN	PG Schedule 2 Section 15(1)(a)	LC	EN	1		3
<i>Aquila nipalensis</i>	Eagle, Steppe		PG Schedule 2 Section 15(1)(a)	EN	LC	1		3
<i>Sagittarius serpentarius</i>	Secretarybird		PG Schedule 2 Section 15(1)(a)	VU	VU	1		3
<i>Falco biarmicus</i>	Falcon, Lanner		PG Schedule 2 Section 15(1)(a)	LC	VU	1	1	3
<i>Falco vespertinus</i>	Falcon, Red-footed		PG Schedule 2 Section 15(1)(a)	NT	NT	1		2
<i>Coracias garrulus</i>	Roller, European		PG Schedule 2 Section 15(1)(a)	LC	NT	1		2
<i>Pterocles gutturalis</i>	Sandgrouse, Yellow-throated		PG Schedule 2 Section 15(1)(a)	LC	NT	1		3
<i>Ciconia abdimii</i>	Stork, Abdim's		PG Schedule 2 Section 15(1)(a)	LC	NT	1	1	3
<i>Leptoptilos crumeniferus</i>	Stork, Marabou		PG Schedule 2 Section 15(1)(a)	LC	NT	1		3

**Status:** CR = Critically Endangered; EN = Endangered; LC = Least Concern; NT = Near Threatened; PG = Protected Game; 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 (2016)

### 8.2.2. Birds

Approximately 414 bird species are listed for QDS 2527BD (Roberts VII 2013), of which 236 were rated with a high or moderate LoO in the study area. Approximately 215 bird species have been recorded in pentad 2515\_2750 (SABAP 2 2016), and 34 bird species were detected during the brief site visit (**Appendix 13.3**). No rupicolous or montane birds (e.g. rock thrushes, Jackal Buzzard, Rock Kestrel and Verreaux's Eagle) or water birds (e.g. bitterns, cormorants, crakes, ducks, grebes, flamingos, kingfishers, night herons, pelicans, sandpipers, stints, etc.) are likely to occur due to the absence of rocky / montane and aquatic / wetland habitat on site. The bird species that were recorded during the site visit represent common, widespread species that are tolerant to an extent of anthropogenic disturbance (e.g. Helmeted Guineafowl, prinias, shrikes). A couple of Spotted Eagle-owls with three nestlings, and the nest of potentially a small raptor were the most noteworthy bird observations on site.



Potential small raptor nest



Spotted Eagle-owl  
(*Bubo africanus*) nestling



Red-backed Shrike  
(*Lanius collurio*)



Black-chested Prinia  
(*Prinia flavicans*)



Western Cattle Egret  
(*Bubulcus ibis*)



Cape Glossy Starling  
(*Lamprotornis nitens*)

**Figure 8-9 Evidence of bird species on site**

In addition to many regionally-occurring bird species that are classified as provincial Protected Game, at least 13 bird species, which are nationally Protected and/or globally or regionally threatened, may occur at least sporadically in the study area (**Table 8-7**).

- The White-backed Vulture, which is globally and regionally Critically Endangered (CR), and nationally Endangered (EN) under NEM:BA, typically inhabits lowland savanna with *Acacia* trees. It is a gregarious species congregating at carcasses, in thermals, and at roost sites. Breeding birds nest in loose colonies, and require tall trees for nesting. Although this species is listed for QDS 2527BD by Roberts VII (2013), it was not recorded in this QDS during the SABAP 1, nor has it been recorded in pentad 2515\_2750 during the SABAP 2 (2016). The species was rated with a moderate LoO because although White-backed Vultures may soar / forage over the study area, they are unlikely to nest on site.
- The Cape Vulture, which is EN globally, regionally and under NEM:BA, is usually found near mountains where it breeds and roosts on cliffs. However, individuals can travel large distances to search for carrion in open country, and this species was recorded in pentad 2515\_2750 during 2009 (SABAP 2 2016). The likelihood of this species foraging over the study area was, therefore, rated as moderate.
- The Lappet-faced Vulture, which is EN globally, regionally and under NEM:BA, typically inhabits dry savanna where it constructs solitary nests mainly in *Acacia*, but also *Terminalia* and *Balanites* trees. Individual Lappet-faced Vultures can travel large distances in search of carrion, although this vulture species is also known to hunt prey. Although there is no SABAP record for this species from QDS 2527BD or pentad 2515\_2750, the likelihood of this species visiting the site was rated as moderate.
- The Martial Eagle, which is also EN under NEM:BA, inhabits a wide range of wooded habitats where there are large trees for nesting and a sufficient abundance of large prey. Although this species is unlikely to nest on site, the likelihood of it foraging over the study area was rated as moderate.
- The Tawny Eagle, which is EN regionally and under NEM:BA, favours open savanna woodland but is also capable of colonizing treeless areas where pylons can support nest structures (Roberts VII 2013). Although large trees and pylons are not present in the immediate study area, the likelihood of this species foraging over the study area was rated as moderate.
- The Steppe Eagle, which does not have a national threatened or Protected status, has been listed as globally EN. This is because within its European range, the Steppe Eagle has undergone extremely rapid population declines as a result of the conversion of steppes to agricultural land, combined with their direct persecution and mortality on power lines and wind turbines (BirdLife International 2016). Steppe Eagles preferably inhabit open savanna woodland where they prey primarily on termites but also Red-billed Quelea nestlings. Considering, however, that there is no SABAP record for this species from QDS 2527BD or pentad 2515\_2750, the presence of this species in the study area was rated as moderate.



- The globally and regionally VU Secretarybird inhabits a diversity of grasslands and savanna where breeding birds typically nest on flat-topped *Acacia* trees. *In situ* vegetation conditions could support Secretarybird foraging and possibly breeding, but disturbance from increasing human settlement in the region could be problematic. Given this, and that there is no SABAP record for this species from QDS 2527BD or pentad 2515\_2750, the presence of this species in the study area was rated as moderate.
- The regionally VU Lanner Falcon favours open grassland or woodland in the vicinity of cliff or electricity pylon breeding sites (Roberts VII 2013). Although cliffs and pylons are absent /limited, small birds and other suitable prey for Lanner Falcons are not limited in the study area. Given that this species was in fact recorded in pentad 2515\_2750 during March 2016 (SABAP 2 2016), the likelihood of Lanner Falcons foraging over the study area was rated as moderate.
- The globally and nationally NT Red-footed Falcon is considered highly likely to occur in the study area. It favours open semi-arid and arid savannas, and preys mainly on insects, especially termites and grasshoppers (Roberts VII 2013).
- The regionally NT European Roller overwinters in South Africa primarily in dry wooded savanna and bushy plains, and is known to forage in agricultural habitats including fallow lands. Although there is no SABAP record for this species from QDS 2527BD or pentad 2515\_2750, the presence of this species in the study area was rated as high.
- The regionally NT Yellow-throated Sandgrouse favours short grassy plains and cultivated fields where grass seeds can be found. The movements of these birds are not well understood; some populations are resident while others are nomadic (Roberts VII 2013). The sporadic occurrence of this species on site was, therefore, rated with a moderate likelihood at best.
- 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 (Roberts VII 2013). Although Abdim's Stork does not breed in South Africa, these birds require large trees or cliffs for roosting at night. As such, it is unlikely that this species would roost on site, but it may occasionally forage in the study area. Given that this species was recorded in pentad 2515\_2750 during 2011 (SABAP 2 2016), it was rated with a conservative moderate LoO.
- The regionally NT Marabou Stork favours semi-arid areas where populations are concentrated in game reserves where carrion is readily available. Marabou Storks are primarily scavengers, which may frequent rubbish dumps, but also catch small vertebrate and insect prey. Nests are constructed in tall trees often near water, and birds roost communally at traditional sites (Roberts VII 2013). Although Marabous are unlikely to roost or nest on site, individuals may occasionally forage in the study area and, therefore, this species was rated with a conservative moderate LoO.

### 8.2.3. Reptiles

Approximately 62 reptile species are considered highly likely or likely to occur at least occasionally in the study area (**Appendix 13.4**). Of these, the ubiquitous Speckled Rock Skink, Common Dwarf Gecko, and Cape/Transvaal Gecko were encountered on site (**Figure 8-10**). Regionally occurring rupicolous reptiles (e.g. the Southern Rock Agama, Common and Jone's girdled lizards, Turner's and Spotted Dwarf geckos, and Rock Monitor) and wetland-associated reptile species (e.g. the South African Marsh and Serrated Hinged terrapins, South Eastern and Western Natal green snakes, and Water Monitor) are unlikely to occur due to the absence of suitable habitat on site.



Speckled Rock Skink  
(*Trachylepis punctatissima*)



Cape/Transvaal Gecko  
(*Pachydactylus capensis/affinis*)

**Figure 8-10 Evidence of reptile species on site**

In addition to the fact that many local reptile species are listed as provincial Protected Game species, two are also listed as nationally Protected or threatened (**Table 8-8**).

- The globally NT Striped Harlequin is a partially fossorial snake species, which is known to inhabit old termite mounds most often in grassland, and which feeds exclusively on thread snakes. Although the site is representative of savanna (not grassland), a good number of active and moribund termitaria were found, and as thread snakes almost certainly occur on site, the Striped Harlequin Snake was rated with a conservative moderate LoO.
- The Southern African Python is listed as a PS under NEM:BA. It typically inhabits savanna where it favours rocky areas and water. Although there is limited rock cover on site, there is a nearby wetland, and the area still supports suitable prey (as large as Impala) for Pythons. This species was, therefore, rated with a moderate LoO.

**Table 8-8 Potentially occurring conservation important reptile species**

SCIENTIFIC NAME	COMMON NAME	RSA LEGAL STATUS	NORTH WEST LEGAL STATUS	GLOBAL OR REGIONAL RED LIST STATUS	LoO	
					QDS	SITE
<i>Homoroselaps dorsalis</i>	Striped Harlequin Snake		WA Schedule 5 Section 43	1NT	3m	3
<i>Python natalensis</i>	Southern African Python	PS	WA Schedule 5 Section 43	2LC	2	3

**Status:** 1 = Global; 2 = Regional; LC = Least Concern; NT = Near Threatened; PS = Protected Species; WA = Wild Animal

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

**Sources:** Transvaal Nature Conservation Ordinance (1983); Bates *et al.* (2014); NEM:BA ToPS (2015); ReptileMAP (2016)

**Table 8-9 Potentially occurring conservation important frog species**

SCIENTIFIC NAME	COMMON NAME	NORTH WEST LEGAL STATUS	GLOBAL RED LIST STATUS	REGIONAL RED LIST STATUS	LoO	
					QDS	SITE
<i>Pyxicephalus adspersus</i>	Giant Bullfrog	PG Schedule 2 Section 15(1)(a)	LC (D)	NT	2	3

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

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

**Sources:** Transvaal Nature Conservation Ordinance (1983); Minter *et al.* (2004); NEM:BA ToPS (2015); FrogMAP (2016); IUCN (2016)

#### 8.2.4. Frogs

Approximately 15 frog species are considered highly likely or likely to occur at least occasionally in the study area (**Appendix 13.5**). Apart from the Bushveld Rain Frog, which is a terrestrial-breeding frog, the remaining listed species are unlikely to breed on site due to the lack of aquatic / wetland habitat (which is limited to one tiny depression / puddle with ephemeral water). Rather, most of the listed frog species are likely to be concentrated around the nearby wetland that is situated on the main access road to the site. This wetland provides shallow, seasonal / ephemeral water with some emergent grassy vegetation (**Figure 8-11**), which appears favourable for breeding by most of the listed frog species, including the African and Giant bullfrogs (Du Preez & Carruthers 2009). The latter species is the only potentially occurring threatened frog species (**Table 8-9**).

- The Giant Bullfrog is listed as regionally NT by Minter *et al.* (2004). 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). Given this, and that the nearby wetland is considered potentially suitable for Giant Bullfrog breeding, it is possible that bullfrogs may forage and even be buried on the proposed development site.



**Figure 8-11** Photographs of the nearby wetland where various frog species may breed

#### 8.2.5. Butterflies

Based on the published butterfly distribution maps in Mecenero *et al.* (2013), approximately 79 butterfly species are considered highly likely to occur in QDS 2527BD, and 71 were rated with a moderate LoO (including 33 species with marginal distribution ranges). LepiMAP (2016) holds records for 41 butterfly species from QDS 2527BD (**Appendix 13.6**), many of which are likely to occur on, or at least pass through the site. During the brief site visit, only four butterfly species were encountered, which included the ubiquitous Brown-veined White, Blue Pansy, and Pea Blue, and the *Acacia*-associated Silver-spotted Grey (**Figure 8-12**).



Brown-veined White  
(*Belenois aurota*)



Silver-spotted Grey  
(*Crudaria leroma*)



Pea Blue  
(*Lampides boeticus*)



Blue Pansy  
(*Junonia oenone oenone*)

**Figure 8-12 Evidence of butterfly species on site**

No potentially occurring butterfly species has a known threatened or Protected status. The rare Marsh Sylph, which was rated with a moderate LoO in QDS 2527BD, is unlikely to occur on site as its larval food plant *Leersia hexandra* is not present.

### 8.2.6. Odonata

Based on the published odonatan distribution maps in Samways (2006), approximately 23 dragonfly and damselfly species are considered highly likely to occur in QDS 2527BD, and 26 were rated with a moderate LoO (**Appendix 13.6**). During the brief site visit, only one odonatan species was encountered, which was not surprising given the lack of aquatic / wetland habitat on site. The dragonfly species on site was the ubiquitous and terrestrial-wandering Pantala (**Figure 8-12**), which has a Biotic Index score of 0. 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."



*Pantala (Pantala flavescens)*

**Figure 8-13 Evidence of odonata species on site**

None of the potentially occurring odonatan species has a threatened or Protected status. The nationally VU Cryptic Spreadwing, which is known from Mosdene Swamps, Naboomspruit in Limpopo Province, was rated with a low LoO. Although this species inhabits pools and swamps in hot savanna, these must be accompanied by an abundance of tall grass, reeds and nearby thick bush. The wetland on the access road to the site does not meet all these criteria.

### 8.2.7. Scorpions

Approximately eight scorpion species are considered highly likely or likely to occur in the study area (**Appendix 13.8**), and numerous scorpion holes were encountered on site (**Figure 8-14**). Scorpion species most likely to occur based on their distributions, and observed habitat conditions (especially substrates and shelter) on site, include the common and highly venomous *Parabuthus mossambicensis*, the widespread *Uroplectes carinatus*, which is found in scrapes under rocks and surface debris in areas of hard substrate (such as the site). Regionally-occurring rupicolous scorpion species (e.g. *Uroplectes planimanus* and *Opisthophthalmus pugnax*) were rated with a low LoO given the lack of rocky habitat on site. None of the potentially occurring scorpion species has a threatened or Protected status.



**Figure 8-14 Photographs of scorpion burrows on site**

## 9. Areas of Significance

The site significance assessment, which includes a significance map for terrestrial biodiversity on the site, 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.*
- *World Heritage Site.*
- *Important Bird Area (IBA)* – see **Figure 9-1**.

### 9.2. National and Regional Areas of Conservation Significance

As inferred earlier in this report, a number of biodiversity features with recognised national or provincial conservation importance, require consideration.

#### 9.2.1. Protected Areas

Borakalalo Game Reserve is situated approximately 7.5km north-west of the proposed development site (**Figure 9-1**). The Reserve encompasses the 800ha Klipvoor Dam on the Moretele River, and features riparian, broad-leafed and *Acacia* woodland. The Dam is renowned for fishing, and the Reserve supports more than 35 mammal and 350 bird species, including rarities such as the African Finfoot and the White-backed Night Heron.

#### 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 **Bushveld-Bankenveld Priority Area (Figure 9-2)**, which faces the highest pressure of the nine identified national Priority Areas (NBI 2004).

A list of Threatened Ecosystems within each terrestrial Priority Area was gazetted on 9 December 2011 under the NEM:BA (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 **Vulnerable Springbokvlakte Thornveld Threatened Ecosystem (Figure 9-2)**.

The following biodiversity management measures for Threatened Ecosystems are recommended:

- Promote connectivity of natural habitat within and between Threatened Ecosystems.
- Prioritise alien vegetation clearance and habitat rehabilitation in Threatened Ecosystems and in areas important for maintaining ecological processes.
- Ensure that ecological processes such as periodic fires or pollination are maintained.
- Adopt nature-friendly farming practices such as biological pest control, maintaining strips of indigenous vegetation between fields, and reducing the use of fertilisers and pesticides near indigenous vegetation or wetlands.
- Promote sustainable land uses that are compatible with maintaining ecosystem functioning.

### 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 two nearest major drainage lines, i.e. the Kutswane and Tolwane rivers, have not yet been classified, and there are no wetland FEPAs in close proximity to the site (**Figure 9-3**).

### **9.2.5. North West C-Plan**

The North West Conservation or C-Plan is the outcome of systematic conservation planning by the North West Department of Rural, Environment and Agricultural Development (DREAD 2012), for improved conservation of biodiversity in the province. According to the latest available C-Plan, the southern “half” of the proposed development site is situated within an Irreplaceable or Critical Biodiversity Area 1 (CBA1; **Figure 9-4**). This CBA was likely assigned because the site is situated within the Springbokvlakte Thornveld **Endangered** vegetation type and **Vulnerable** Threatened Ecosystem. Available satellite imagery and our field surveys have confirmed, however, that virtually the entire site comprises regenerating previously cultivated land.

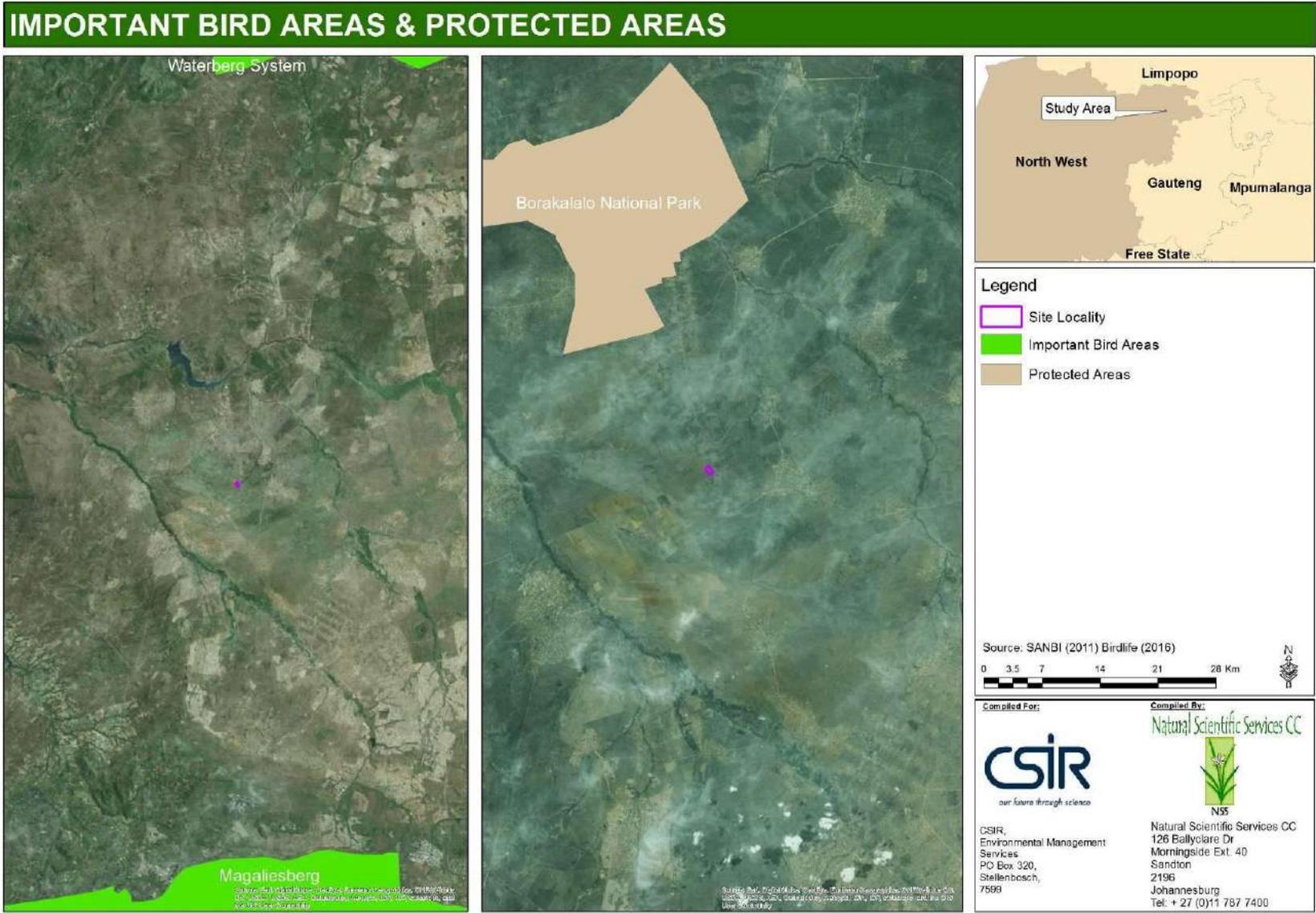


Figure 9-1 Location of the site in relation to Important Bird Areas, and Protected Areas



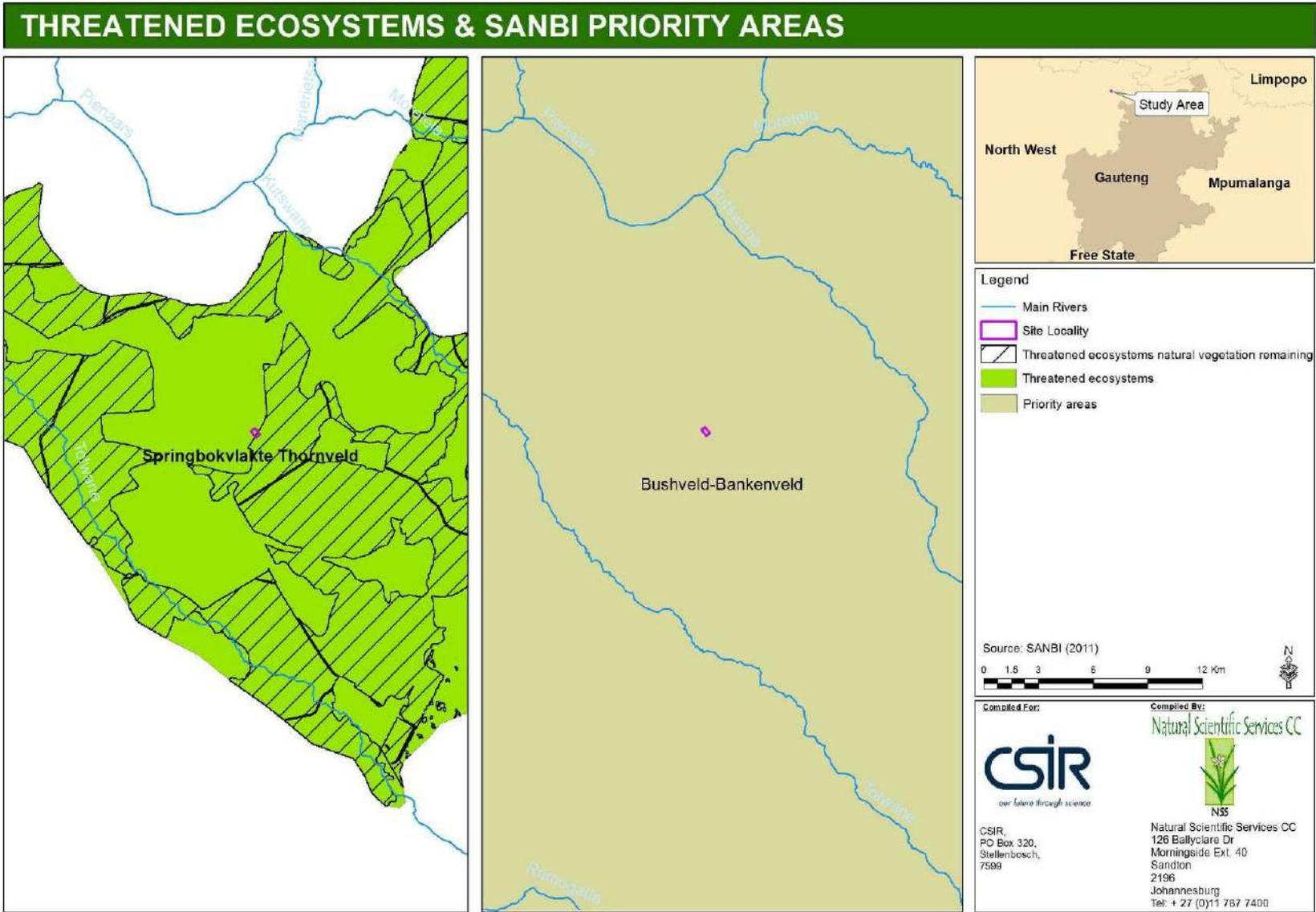


Figure 9-2 Location of the site relative to regional terrestrial Priority Areas and Threatened Ecosystems



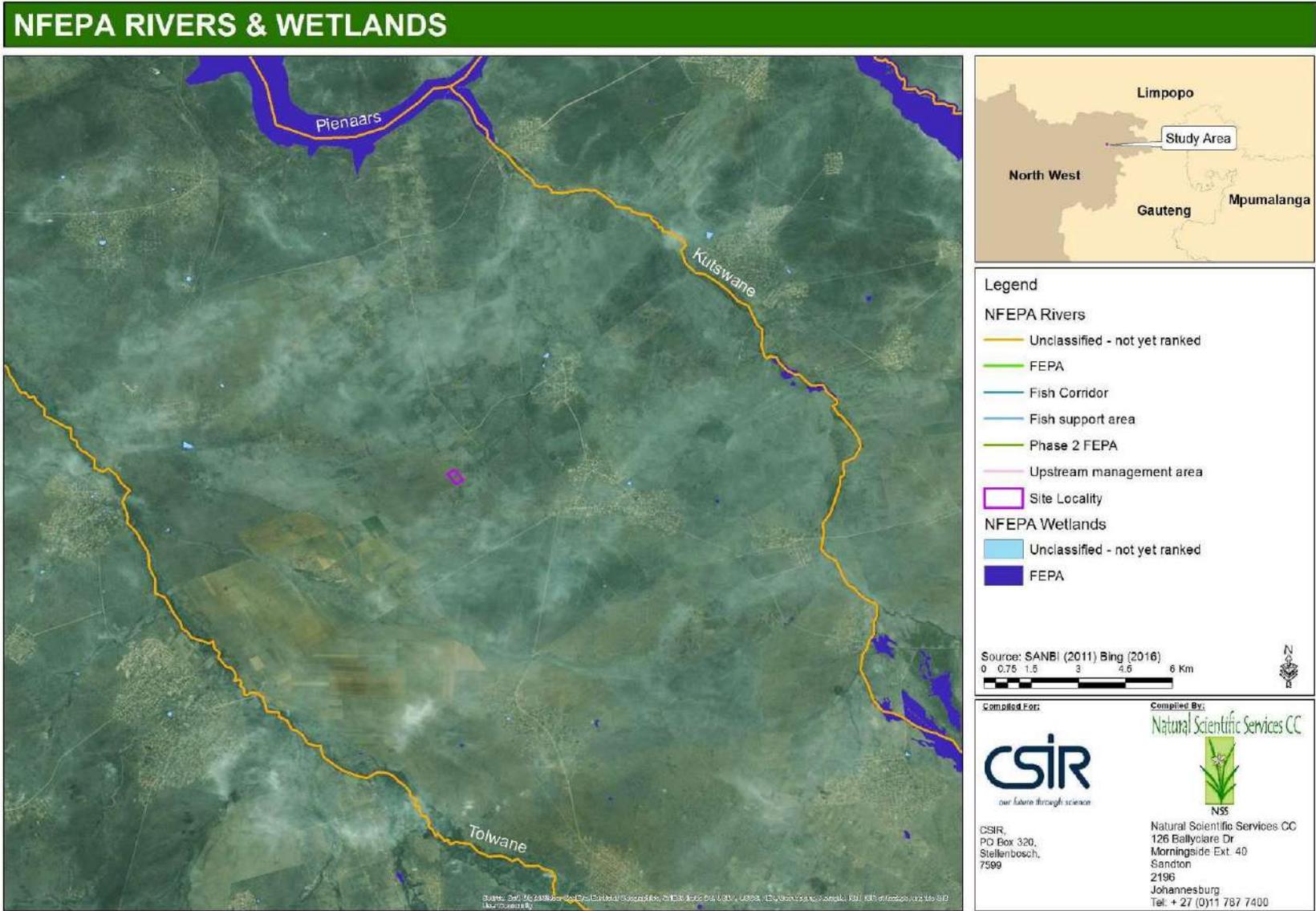


Figure 9-3 Location of the site in relation to regional Freshwater Ecosystem Priority Areas



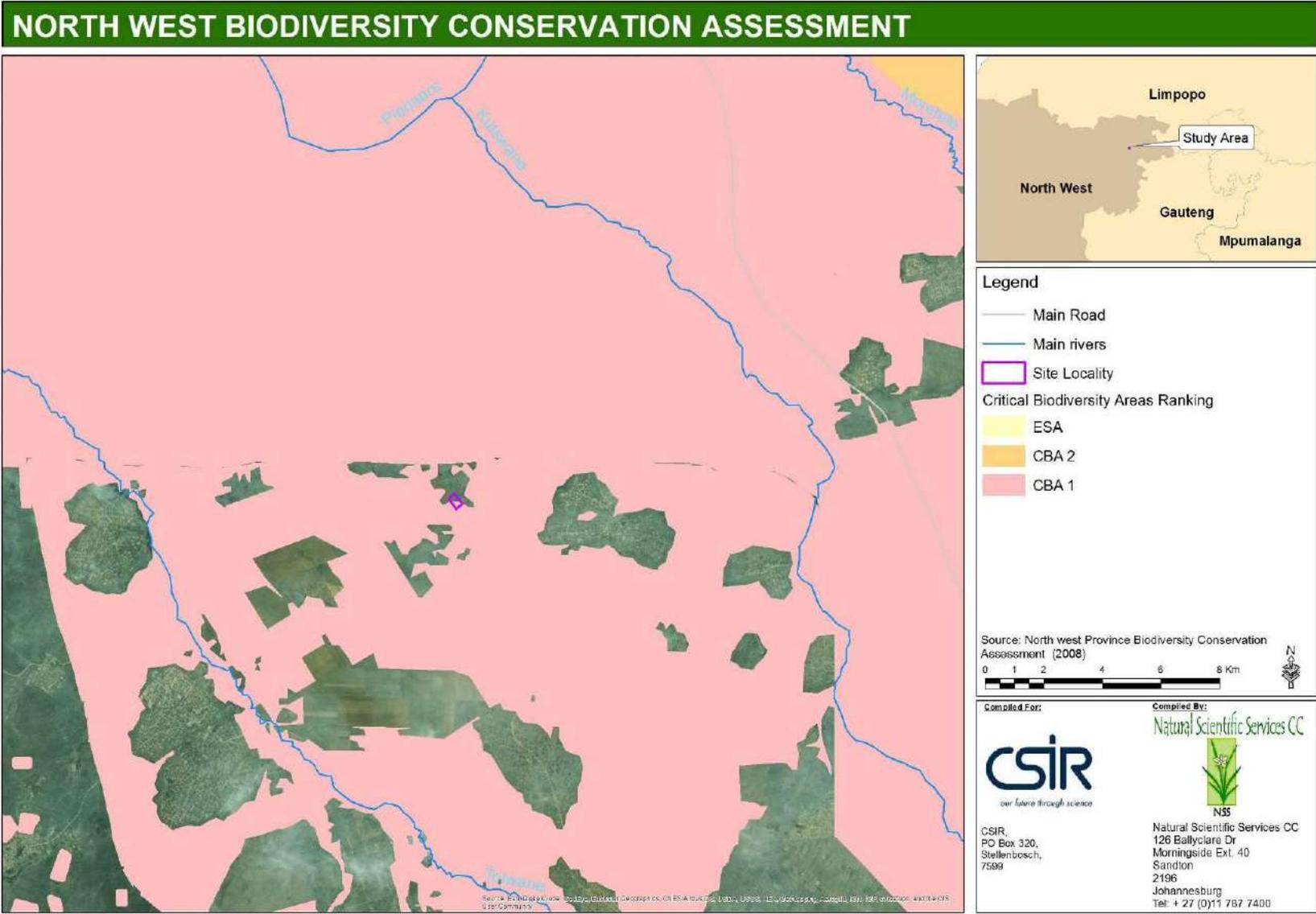


Figure 9-4 Location of the site in relation to North West CBAs and ESAs



### 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).

Identified habitat units within the study site were ranked into **High**, **Medium-high**, **Medium**, **Medium-low** or **Low** classes in terms of significance. This was undertaken according to a sensitivity-value analysis (scoring in **Table 9-1**) and included input based on knowledge of the area, on the ground investigations and experience when dealing with ecological systems and processes. A summary overview of scoring the Areas of Local Conservation Significance is presented in **Table 9-1** and illustrated in **Figure 9-6**.

**Table 9-1 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 9-6**), where:

- **High** rated areas (not on site) include:
  - ⊙ The nearby wetland on the main access road to the site - given the national, provincial and local importance of wetlands (**Figure 9-5**). On a national scale all wetlands are Protected. Although the present ecoscan did not entail a wetland assessment, the nearby wetland appears to be Largely Natural, and its highest-scoring ecosystem service is probably maintenance of biodiversity including potential CI faunal species such as the NT Giant Bullfrog.
- **Moderate-High** rated areas (not on site) include:
  - ⊙ A recommended 100m buffer around the afore-mentioned wetland, to help buffer it from increased noise, dust, erosion, sedimentation, faunal mortalities, with increased traffic resulting from the proposed development.
- **Moderate** rated areas include:
  - ⊙ The more significant trees on site that are providing roosting and nesting habitat for owl and raptor species.
- **Moderate-Low** rated areas include:
  - ⊙ The transformed, but in recovery, *Acacia* open woodland (previously ploughed areas). This also included the potential artificial drainage system. This area holds

little to no conservation value in terms of wetland functioning and showed no typical wetland characteristics as per the DWS guidelines.

- **Low** rated areas include:
  - ⊙ Infrastructure.

The Areas of Significance 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 mitigation.
- **Low** sensitive areas should be rehabilitated if not developed.



**Figure 9-5 Potential wetland areas (Desktop estimate)**

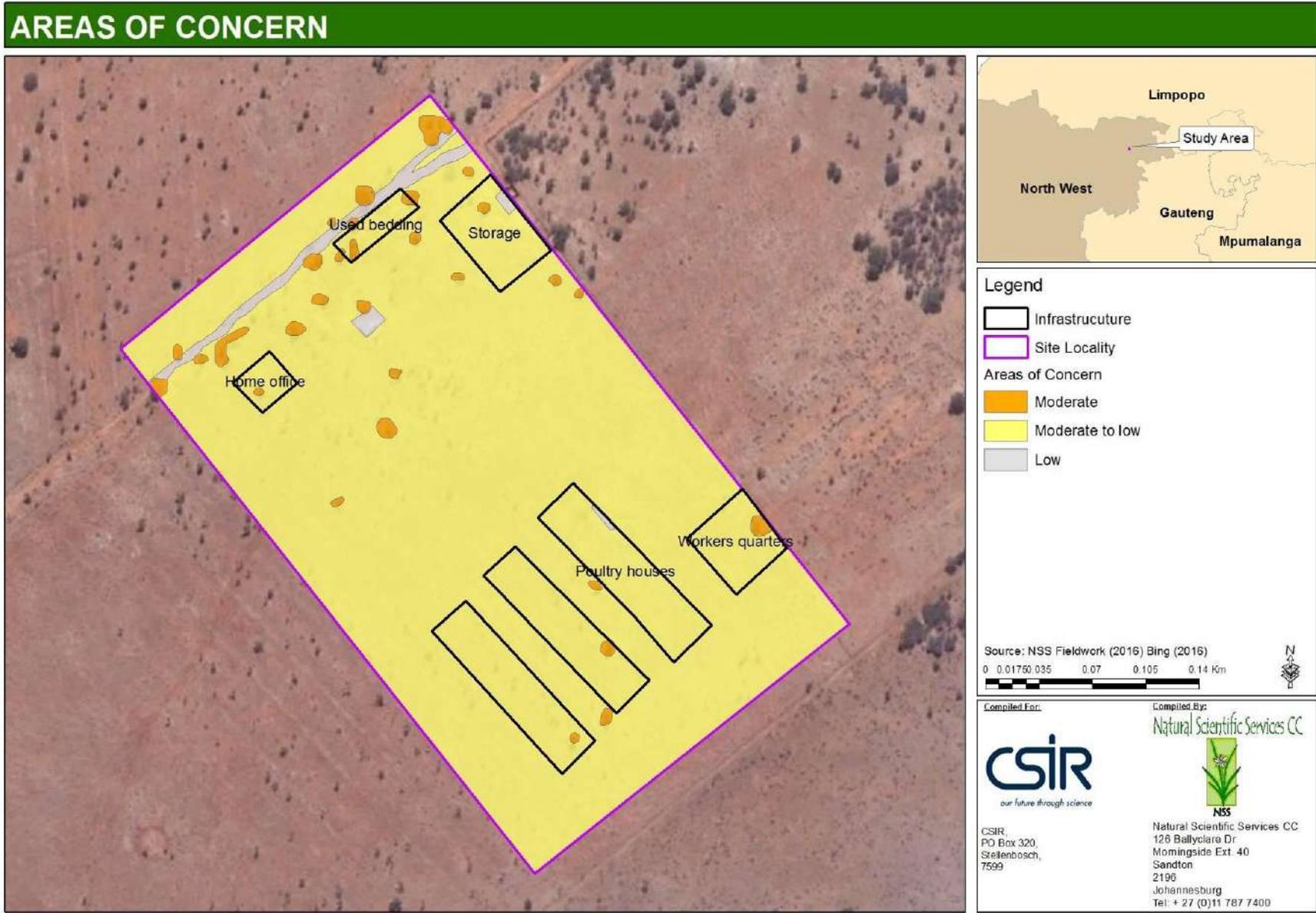


Figure 9-6 Areas of biodiversity conservation significance (broad infrastructure included)



## 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 the wetland on the access road**

Increased traffic on the main access road to the site will cause loss or degradation of the adjoining wetland due to increased dust, erosion and sedimentation with road upgrading and maintenance, and increased traffic during all phases of the development. Given the high conservation importance of wetlands at a national and provincial level, degradation of the roadside wetland was rated with **High** significance.

#### **10.1.2. Loss of terrestrial vegetation and faunal habitat**

Although the site is situated in the Springbokvlakte Thornveld **Endangered** vegetation type and **Vulnerable** Threatened Ecosystem, construction of the chicken facility is occurring on an area that is 95% transformed through past agricultural activities. The main concern is that a number of trees could be lost in the development process, which provide habitat for roosting and nesting birds including owls and potentially small raptors. Given the small size and transformed nature of the site, the loss of terrestrial vegetation and faunal habitat was rated with **Medium** significance.

#### **10.1.3. Loss of CI or medicinal flora**

Observed Protected (Ordinance listed) and potentially occurring conservation important (CI) (Red listed) or medicinal plant species could be lost as a result of vegetation clearing during construction, and increased traffic and human harvesting during all phases of the development. This potential loss of CI flora was rated with **Medium** significance.

#### **10.1.4. Loss of CI fauna**

Of greatest concern is the potentially occurring NT Giant Bullfrog, which could be adversely affected by increased traffic to the site, loss or degradation of the nearby wetland, earth-moving activities on site, and possible human harvesting. The potentially occurring NT Striped Harlequin Snake could be adversely affected by destruction of termitaria especially during clearing of the construction site. This potential loss of these NT faunal species was rated with **Medium** significance.

#### **10.1.5. Introduction and proliferation of alien plant species**

From the field investigation, a limited diversity (i.e. species richness and abundance) of alien flora was evident on site. However, this may change during all phases of the project,

particularly with an expected increase in annual (herbaceous) species. This could occur due to the importation of alien seeds within construction materials such as building soil, with the influx of vehicles (seeds within tyre tread) and people as well as fodder (containing invasive alien plant seeds). Given the **Endangered** status of the regional Springbokvlakte vegetation type, this potential impact was rated with **High** significance in the absence of effective control measures.

#### **10.1.6. Increased dust and erosion**

Clearing of vegetation and earth-moving activities during construction are likely to increase bare ground, dust and the land's susceptibility to erosion. These impacts are, however, likely to have a limited and short term impact and were, therefore, rated with **Medium** significance.

#### **10.1.7. Sensory disturbance of fauna**

Sensory disturbance of fauna from dust, noise and light pollution could cause many fauna to vacate the area, at least temporarily during construction and decommissioning. Animals that would be most adversely affected include calling and/or secretive nocturnal species. Less sensitive common species are likely to tolerate low levels of noise and light pollution, and some species may even benefit - such as bats and frogs, which may forage on insects attracted to lights.

#### **10.1.8. Environmental contamination**

Various contaminants are present in chicken 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. Considering that the site is not situated upstream of a major wetland or other water resource, this potential impact was rated with **Medium** significance.

#### **10.1.9. Poor / Inappropriate control of animal pests**

During operation, substandard animal husbandry / hygiene and waste generation in the form of chicken 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 a number of threatened or Protected mammals (e.g. Brown Hyaena and Leopard) and birds (e.g. vultures, Lanner and Red-footed falcons, and Marabou Stork) may occur at least occasionally in the study area, this potential impact was rated with **High** significance.

**10.1.10. Disease transmission**

Diseases could be transmitted either directly from chickens 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. This potential impact was rated with **Medium** significance.

**10.1.11. Altered burning**

The development could result in an increase or decrease in wild fires in the study area. Although fires might be unintentionally ignited with carcass burning, for example, it is more likely that burning will be prohibited for human and infrastructural safety. Lack of fire will eventually cause local vegetation to become more woody / bush-encroached. This impact was rated with **Medium** significance.

**10.2. Management and Mitigation Recommendations**

Recommended management and mitigation measures are detailed in **Table 11-2**. 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	
	Without mitigation	With mitigation
<b>CONSTRUCTION</b>		
<i>Loss or degradation of the wetland on the access road</i>	High	Low
<i>Loss of terrestrial vegetation and faunal habitat</i>	Medium	Low
<i>Loss of CI or medicinal flora</i>	Medium	Low
<i>Loss of CI fauna</i>	Medium	Low
<i>Introduction and proliferation of alien species</i>	High	Low
<i>Increased dust and erosion</i>	Medium	Low
<i>Sensory disturbance of fauna</i>	Medium	Low
<b>OPERATION</b>		
<i>Loss or degradation of the wetland on the access road</i>	High	Low
<i>Environmental contamination</i>	Medium	Low
<i>Poor / Inappropriate control of animal pests</i>	High	Low
<i>Disease transmission</i>	Medium	Low
<i>Altered burning</i>	Medium	Low
<i>Introduction and proliferation of alien species</i>	High	Low
<i>Loss of CI or medicinal flora</i>	Medium	Low
<i>Sensory disturbance of fauna</i>	Medium	Low
<b>DECOMMISSIONING</b>		
<i>Loss or degradation of the wetland on the access road</i>	High	Low
<i>Introduction and proliferation of alien species</i>	High	Low
<i>Increased dust and erosion</i>	Medium	Low
<i>Sensory disturbance of fauna</i>	Low	Low

## 11. Concluding Remarks

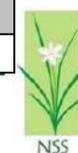
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With the implementation of the mitigation measures suggested in this report, the significance of impacts on site can be reduced to **Low**. Based on the information obtained in the site visit and the information that was available to date, it is NSS's opinion that there are no fatal flaws to the project itself. If the recommended mitigation measures are implemented, NSS has no objection to the project going forward. *Most importantly, the nearby wetland on the main access road to the site will need to be protected from disturbance.*

Table 11-1 Impact Assessment

POTENTIAL IMPACTS	MITIGATION	STATUS	EXTENT RATING	SCORE	DURATION RATING	SCORE	INTENSITY RATING	SCORE	REVERSIBILITY RATING	IRREPLACEABILITY RATING	PROBABILITY RATING	PROBABILITY SCORE	SIGNIFICANCE RATING	SCORE	CONFIDENCE RATING	SCORE
<b>CONSTRUCTION</b>																
<i>Loss or degradation of the wetland on the access road</i>																
Increased traffic on the main access road to the site will cause loss or degradation of the adjoining wetland due to increased dust, erosion and sedimentation with road upgrading and construction traffic.	Without	Negative	Local (<2km from site)	2	Long term (>15 years)	4	Medium	4	Moderate reversibility	Moderate irreplaceability	Definite (>90% chance)	1	High	10	High	3
	With	Neutral	Site specific	1	Temporary (<2 years)	1	Low	1	High reversibility	Moderate irreplaceability	Low probability (10-25% chance)	0,25	Low	1	High	3
<i>Loss of terrestrial vegetation and faunal habitat</i>																
Although the site is situated in the Springbokvlakte Thornveld Endangered vegetation type and Vulnerable Threatened Ecosystem, construction of the chicken facility will result in destruction of an already transformed habitat. Of concern is that a number of trees could be lost, which provide habitat for roosting and nesting birds including owls and potentially small raptors.	Without	Negative	Site specific	1	Long term (>15 years)	4	Medium	4	Moderate reversibility	Moderate irreplaceability	Probable (25-50% chance)	0,5	Medium	5	High	3
	With	Negative	Site specific	1	Long term (>15 years)	4	Low	1	High reversibility	Low irreplaceability	Low probability (10-25% chance)	0,25	Low	2	High	3
<i>Loss of CI or medicinal flora</i>																
Observed Protected and potentially occurring conservation important (CI) or medicinal plant species could be lost as a result of vegetation clearing and increased traffic and human harvesting.	Without	Negative	Local (<2km from site)	2	Long term (>15 years)	4	Medium	4	Moderate reversibility	Moderate irreplaceability	Probable (25-50% chance)	0,5	Medium	5	High	3
	With	Negative	Site specific	1	Temporary (<2 years)	1	Low	1	Moderate reversibility	Moderate irreplaceability	Low probability (10-25% chance)	0,25	Low	1	Medium	2
<i>Loss of CI fauna</i>																
Of greatest concern is the potentially occurring NT Giant Bullfrog, which could be adversely affected by increased traffic to the site, loss or degradation of the nearby wetland, earth-moving activities on site, and possible human harvesting. The potentially occurring NT Striped Harlequin Snake could be adversely affected by destruction of termitaria during clearing of the construction site.	Without	Negative	Local (<2km from site)	2	Long term (>15 years)	4	Medium	4	Low reversibility	Moderate irreplaceability	Highly probable (50-90% chance)	0,75	Medium	8	Medium	2
	With	Negative	Site specific	1	Short term (2-5 years)	2	Low	1	High reversibility	Moderate irreplaceability	Low probability (10-25% chance)	0,25	Low	1	Medium	2
<i>Introduction and proliferation of alien species</i>																
From the field investigation, a limited diversity (i.e. species richness and abundance) of alien flora was evident on site. However, this may change during all phases of the project, particularly with an expected increase in annual (herbaceous) species. This could occur due to the importation of alien seeds within construction materials such as building soil, with the influx of vehicles (seeds within tyre tread) and people as well as fodder (containing invasive alien plant seeds).	Without	Negative	Local (<2km from site)	2	Permanent	5	Medium	4	Moderate reversibility	Moderate irreplaceability	Definite (>90% chance)	1	High	11	High	3
	With	Negative	Site specific	1	Temporary (<2 years)	1	Low	1	Moderate reversibility	Moderate irreplaceability	Probable (25-50% chance)	0,5	Low	2	Medium	2
<i>Increased dust and erosion</i>																
Clearing of vegetation and earth-moving activities during construction are likely to increase bare ground, dust and the land's susceptibility to erosion. These impacts are, however, likely to have a limited and short term impact.	Without	Negative	Local (<2km from site)	2	Short term (2-5 years)	2	Medium	4	Moderate reversibility	Low irreplaceability	Highly probable (50-90% chance)	0,75	Medium	6	Medium	2
	With	Negative	Site specific	1	Short term (2-5 years)	2	Low	1	High reversibility	Low irreplaceability	Probable (25-50% chance)	0,5	Low	2	Medium	2
<i>Sensory disturbance of fauna</i>																
Sensory disturbance of fauna from dust, noise and light pollution could cause many fauna to vacate the area, at least temporarily during construction. Animals that would be most adversely affected include calling and/or secretive nocturnal species.	Without	Negative	Local (<2km from site)	2	Short term (2-5 years)	2	High	8	High reversibility	Low irreplaceability	Definite (>90% chance)	0,75	Medium	9	High	3
	With	Negative	Site specific	1	Short term (2-5 years)	2	Low	1	High reversibility	Low irreplaceability	Highly probable (50-90% chance)	0,75	Low	3	Medium	2
<b>OPERATION</b>																
<i>Loss or degradation of the wetland on the access road</i>																
Road maintenance and regular traffic on the main access road to the site will cause loss or degradation of the adjoining wetland due to dust, erosion and sedimentation.	Without	Negative	Local (<2km from site)	2	Long term (>15 years)	4	Medium	4	Moderate reversibility	Moderate irreplaceability	Definite (>90% chance)	1	High	10	High	3
	With	Neutral	Site specific	1	Temporary (<2 years)	1	Low	1	High reversibility	Moderate irreplaceability	Low probability (10-25% chance)	0,25	Low	1	High	3
<i>Environmental contamination</i>																

POTENTIAL IMPACTS	MITIGATION	STATUS	EXTENT RATING	SCORE	DURATION RATING	SCORE	INTENSITY RATING	SCORE	REVERSIBILITY RATING	IRREPLACEABILITY RATING	PROBABILITY RATING	PROBABILITY SCORE	SIGNIFICANCE RATING	SCORE	CONFIDENCE RATING	SCORE
Various contaminants are present in chicken 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.	Without	Negative	Site specific	1	Long term (>15 years)	4	Medium	4	Low reversibility	Low irreplaceability	Highly probable (50-90% chance)	0,75	Medium	7	Low	3
	With	Negative	Site specific	1	Short term (2-5 years)	2	Low	1	High reversibility	Moderate irreplaceability	Low probability (10-25% chance)	0,25	Low	1	Medium	2
<b>Poor / Inappropriate control of animal pests</b>																
During operation, substandard animal husbandry / hygiene and waste generation in the form of chicken effluent and excess fodder could facilitate aggregation and/or breeding of invertebrate pests. Poor waste management and hygiene practices also have the potential to attract vertebrate pests. 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.	Without	Negative	Local (<2km from site)	2	Long term (>15 years)	4	High	8	Low reversibility	Low irreplaceability	Highly probable (50-90% chance)	0,75	High	11	High	3
	With	Negative	Site specific	1	Short term (2-5 years)	2	Medium-low	2	Moderate reversibility	Low irreplaceability	Probable (25-50% chance)	0,5	Low	3	Medium	2
<b>Disease transmission</b>																
Diseases could be transmitted either directly from chickens 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.	Without	Negative	Local (<2km from site)	2	Long term (>15 years)	4	High	8	Moderate reversibility	Moderate irreplaceability	Probable (25-50% chance)	0,5	Medium	7	Medium	2
	With	Negative	Site specific	1	Temporary (<2 years)	1	Low	1	High reversibility	Low irreplaceability	Low probability (10-25% chance)	0,25	Low	1	Medium	2
<b>Altered burning</b>																
The development could result in an increase or decrease in wild fires in the study area. Although fires might be unintentionally ignited with carcass burning, for example, it is more likely that burning will be prohibited for human and infrastructural safety. Lack of fire will eventually cause local vegetation to become more woody / bush-encroached.	Without	Negative	Local (<2km from site)	2	Long term (>15 years)	4	Medium-low	2	Moderate reversibility	Low irreplaceability	Highly probable (50-90% chance)	0,75	Medium	6	High	3
	With	Negative	Site specific	1	Short term (2-5 years)	2	Low	1	Moderate reversibility	Low irreplaceability	Probable (25-50% chance)	0,5	Low	2	Medium	2
<b>Introduction and proliferation of alien species</b>																
An increase in invasive alien flora is likely to be facilitated by the continued influx of vehicles, people and materials (such as fodder containing invasive alien plant seeds), especially where the site is disturbed, and in the absence of any control measures.	Without	Negative	Local (<2km from site)	2	Long term (>15 years)	4	Medium	4	Low reversibility	Moderate irreplaceability	Definite (>90% chance)	1	High	10	High	3
	With	Negative	Site specific	1	Short term (2-5 years)	2	Medium-low	2	High reversibility	Low irreplaceability	Low probability (10-25% chance)	0,25	Low	1	Medium	2
<b>Loss of CI or medicinal flora</b>																
CI or medicinal plant species could be lost as a result of human harvesting during operation.	Without	Negative	Local (<2km from site)	2	Long term (>15 years)	4	Medium	4	Moderate reversibility	Moderate irreplaceability	Probable (25-50% chance)	0,5	Medium	5	High	3
	With	Negative	Site specific	1	Temporary (<2 years)	1	Low	1	Moderate reversibility	Moderate irreplaceability	Low probability (10-25% chance)	0,25	Low	1	Medium	2
<b>Sensory disturbance of fauna</b>																
Certain fauna are likely to avoid the site with continued noise and light pollution during operation. Less sensitive common species are likely to tolerate low levels of noise and light pollution, and some species may even benefit - such as bats and frogs, which may forage on insects attracted to lights.	Without	Negative	Local (<2km from site)	2	Long term (>15 years)	4	Medium-low	2	Low reversibility	Low irreplaceability	Definite (>90% chance)	1	Medium	8	High	3
	With	Negative	Site specific	1	Long term (>15 years)	4	Medium-low	2	High reversibility	Low irreplaceability	Probable (25-50% chance)	0,5	Low	4	Medium	2
<b>DECOMMISSIONING</b>																
<b>Loss or degradation of the wetland on the access road</b>																
Increased traffic on the main access road to the site during decommissioning will cause loss or degradation of the adjoining wetland due to increased dust, erosion and sedimentation.	Without	Negative	Local (<2km from site)	2	Long term (>15 years)	4	Medium	4	Moderate reversibility	Moderate irreplaceability	Definite (>90% chance)	1	High	10	High	3
	With	Neutral	Site specific	1	Temporary (<2 years)	1	Low	1	High reversibility	Moderate irreplaceability	Low probability (10-25% chance)	0,25	Low	1	High	3
<b>Introduction and proliferation of alien species</b>																
If no rehabilitation and monitoring efforts are implemented,	Without	Negative	Local (<2km from site)	2	Long term (>15 years)	4	High	8	Low reversibility	Low irreplaceability	Definite (>90% chance)	1	High	14	High	3



POTENTIAL IMPACTS	MITIGATION	STATUS	EXTENT	SCORE	DURATION	SCORE	INTENSITY	SCORE	REVERSIBILITY	IRREPLACEABILITY	PROBABILITY	PROBABILITY	SIGNIFICANCE	SCORE	CONFIDENCE	SCORE
			RATING	SCORE	RATING	SCORE	RATING	SCORE	RATING	RATING	RATING	SCORE	RATING	SCORE	RATING	SCORE
alien species will continue to increase and spread.	With	Negative	Site specific	1	Long term (>15 years)	4	Medium-low	2	Moderate reversibility	Low irreplaceability	Probable (25-50% chance)	0,5	Low	4	Medium	2
<b>Increased dust and erosion</b>																
Possible demolition and landscaping activities during decommissioning are likely to increase bare ground, dust and the land's susceptibility to erosion. These impacts are, however, likely to have a limited and short term impact.	Without	Negative	Local (<2km from site)	2	Short term (2-5 years)	2	Medium	4	Moderate reversibility	Low irreplaceability	Highly probable (50-90% chance)	0,75	Medium	6	Medium	2
	With	Negative	Site specific	1	Short term (2-5 years)	2	Low	1	High reversibility	Low irreplaceability	Probable (25-50% chance)	0,5	Low	2	Medium	2
<b>Sensory disturbance of fauna</b>																
Sensory disturbance of fauna from noise, dust and light pollution will cause certain remaining fauna to vacate the site, at least temporarily during decommissioning.	Without	Negative	Local (<2km from site)	2	Temporary (<2 years)	1	Medium-low	2	Moderate reversibility	Low irreplaceability	Highly probable (50-90% chance)	0,75	Low	4	High	3
	With	Negative	Site specific	1	Temporary (<2 years)	1	Low	1	High reversibility	Low irreplaceability	Low probability (10-25% chance)	0,25	Low	1	Medium	2



Table 11-2 Mitigation measures

OBJECTIVE / TARGET	MITIGATION / MANAGEMENT ACTION	METHODOLOGY	MONITORING	FREQUENCY	RESPONSIBILITY
<b>CONSTRUCTION</b>					
<b>Loss or degradation of the wetland on the access road</b>					
Avoid disturbing the wetland (and its buffer).	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 / Jam Rock 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	Jam Rock Management, Construction Crew
<b>Loss of terrestrial vegetation and faunal habitat</b>					
Avoid unnecessary loss of vegetation and faunal habitats.	Restrict all clearing of vegetation and disturbance of habitat from construction activities to the final infrastructure footprint.	*Ensure that all infrastructure avoids all <b>Very High</b> and <b>High</b> sensitive areas.		During design	CSIR / Jam Rock Management
		*Clearly demarcate or fence in the construction site. Relocate CI plant and animal specimens from the construction footprint, with advice from an appropriate specialist.		Pre-construction	CSIR / Jam Rock Management
		Maintain the viability of the indigenous seed bank in excavated soil so that this can be used for subsequent re-vegetation of any disturbed areas. No landscaping should be performed around the facilities.	*Commence (and preferably complete) construction during winter, when the risk of disturbing growing plants should be least. *Briefly and effectively stockpile topsoil preferably 1-1.5m in height. Natural vegetation must be allowed to recover in areas of disturbance. 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
	Avoid unnecessary loss of indigenous trees and termitaria.	*Identify and mark indigenous trees on the ground. Those that are small and cannot be avoided should be transplanted elsewhere on site.		Design / pre-construction	Jam Rock Management, Construction Crew, with advice from an Ecologist
<b>Loss of CI or medicinal flora</b>					
Minimize loss of CI or medicinally important flora, and promote rehabilitation.	Adhere to law and best practice guidelines regarding the displacement of CI and medicinally important floral species.	*Obtain permits to remove CI species.		Pre-construction	CSIR / Jam Rock Management
		*Transplant CI and medicinally important floral specimens from the infrastructure footprint to suitable locations in the surrounding area.		Pre-construction	Botanist / horticulturist
		*Obtain guidance from a suitably qualified vegetation specialist or horticulturist regarding the collection, propagation/storage and transplantation of plants.		During construction	Botanist / horticulturist
<b>Loss of CI fauna</b>					
Minimize mortality and displacement of fauna, especially CI species.	Adhere to law and best practice guidelines regarding the displacement of CI faunal species. Prohibit collection or persecution of fauna.	*Appoint an appropriate specialist to relocate CI fauna from vegetation, termitaria and soil that is removed from the infrastructure footprint.		Pre-construction	Zoologist/Ecologist
		*Commence (and preferably complete) construction during winter, when the risk of disturbing active (including breeding and migratory) animals, should be least.		Pre-construction	Jam Rock Management, Construction Crew
		*Check open trenches for trapped animals (e.g. hedgehogs, reptiles and frogs), and relocate trapped animals with advice from an appropriate specialist.		Daily during construction	Jam Rock Management, Construction Crew, Zoologist
		*Prohibit disturbance and persecution (e.g. poaching) of fauna, and introduction of pets and other alien fauna (apart from the production chickens).		All phases	Jam Rock Management
		*Provide notices and training to inform workers about dangerous animals (e.g. venomous snakes and scorpions) and prohibited activities (e.g. poaching). *Walk fence lines to remove snares.		All phases	Jam Rock Management/ External Ecologist (Advisory Capacity)
			As regularly as possibly during all phases	Jam Rock Management / Farm Management	
<b>Introduction and proliferation of alien species</b>					
Minimize the introduction and spread of invasive alien species during construction.	Regulate / limit access by potential vectors of alien plants.	*Carefully regulate / limit access by vehicles and materials to the construction site. Demarcate or fence in the construction area.		Prior to and during construction	Jam Rock Management / Farm Management
		*Prohibit the introduction of domestic animals such as dogs and cats. *Remove any woody alien species that germinate.		Pre Construction and continued through the life of the project	Jam Rock Management / Farm Management
		*Plant only locally indigenous flora if landscaping needs to be done.		All Phases	Jam Rock Management / horticulturist
	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	Jam Rock Management, Construction Crew
	By law, remove and dispose of Category 1b alien species on site. All Category 2 species that remain on site must require a permit.	*Remove Category species using mechanical methods, and minimize soil disturbance as far as possible.		During construction	Jam Rock Management, Construction Crew
<b>Increased dust and erosion</b>					
Minimize dust and erosion.	Implement effective measures to control dust and erosion.	*Limit vehicles, people and materials to the construction site.		During construction	Jam Rock Management, Construction Crew

OBJECTIVE / TARGET	MITIGATION / MANAGEMENT ACTION	METHODOLOGY	MONITORING	FREQUENCY	RESPONSIBILITY
		*Commence (and preferably complete) construction during winter, when the risk of erosion should be least.		During construction	
		*Revegetate denude areas with locally indigenous flora a.s.a.p.		During construction	
		*Implement erosion protection measures on site. Measures could include bunding around soil stockpiles, and vegetation of areas not to be developed.		During construction	
		*Implement effective and environmentally-friendly dust control measures, such as mulching or periodic wetting.		During construction	
<b>Sensory disturbance of fauna</b>					
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.		During pre-construction and construction planning	Jam Rock Management, Construction Crew
	Minimize noise pollution.	*Minimize noise to limit its impact on calling and other sensitive fauna (e.g. frogs and Secretarybird).		Prior to and throughout construction	Jam Rock Management, Construction Crew
	Minimize light pollution.	*Limit construction activities to day time hours.		Throughout construction	Jam Rock Management, Construction Crew
		*Minimize or eliminate security and construction lighting, to reduce the disturbance of nocturnal fauna.		Throughout construction	Construction Crew
<b>OPERATION</b>					
<b>Loss or degradation of the wetland on the access road</b>					
<b>Avoid disturbing the wetland (and its buffer).</b>	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.		During operation	Jam Rock Management and Farm Manager
<b>Environmental contamination</b>					
Avoid environmental (including soil) contamination	Ensure that excrement/effluent, 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.		During design	CSIR / Jam Rock Management
				During design	CSIR / Jam Rock Management/ Agricultural experts
		*Adhere to best practice chicken husbandry and waste disposal norms.		Throughout operation	CSIR / Jam Rock Management/ Agricultural experts
	Ensure that there are appropriate control measures in place for any contamination event	*Establish appropriate emergency procedures for accidental contamination of the surroundings. Waste recycling should be incorporated into the facility's operations as far as possible. Designate a secured, access restricted, signposted room for the storage of potentially hazardous substances such as herbicides, pesticides dips and medications. All hazardous waste should be disposed of at an appropriate licensed facility for this.		Prior to operation	Jam Rock Management and Farm Manager.
		*Rehabilitate contaminated areas a.s.a.p. in accordance with advice from appropriate contamination and environmental specialists.		A.s.a.p. following contamination	Jam Rock Management and Farm Manager / External contamination specialists
		*Educate workers regarding the handling of hazardous substances and about waste management and emergency procedures with regular training and notices and talks.		At least annually during operation	Jam Rock Management and Farm Manager.
<b>Poor / Inappropriate control of animal pests</b>					
Ensure efficient and effective pest control that does not affect non-target animals.	Prevent, detect and control pest infestations before they become a problem, through frequent and careful cleaning, monitoring and control.	*Ensure that there is effective storm water drainage around the facility.		During design, construction and operation	Jam Rock Management and Farm Manager and on-site team.
		*Ensure that the facility is sufficiently ventilated to keep floors, bedding, and fodder as dry as possible.			
		*Prevent and manage unwanted animal access to fodder.			
		*Check that fan louvers (if installed) work properly, and close fans completely when off.			
		*Ensure that floors are sloped and slatted to facilitate drainage.			
		*Screed concrete floors properly to seal all cracks and limit the pooling of effluent and water.			
		*Effectively maintain and seal all pipes and reservoirs containing slurry, to prevent animals from accessing the effluent.			
		*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.			

OBJECTIVE / TARGET	MITIGATION / MANAGEMENT ACTION	METHODOLOGY	MONITORING	FREQUENCY	RESPONSIBILITY
		*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.			
		*Electrocution 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.			
		*Rodenticides are not advised.			
		*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.			
<b>Disease transmission</b>					
Avoid transmission of diseases to wildlife.	Ensure that pests and other potential vectors are unable to enter areas where they might encounter production animals, carcasses, excrement or bedding, by thoroughly sealing these areas using effective, humane and environmentally-friendly means.	*Maintain appropriate pest control measures.		Life of operation particularly at the onset of the rainy season	Farm Manager and Team
		*Effectively maintain and seal all pipes and reservoirs containing slurry, to prevent animals from accessing the effluent.		Throughout operation	Farm Manager and Team
<b>Altered burning</b>					
Avoid fire on site, without prohibiting wild fires in the surrounding natural environment.	Ensure that flammable materials are stored in an appropriate safe house. Ensure that there are appropriate control measures in place for any accidental fires. If artificial burning is considered necessary to reduce risks to human and infrastructure safety from wild fires, a fire management plan should be compiled with input from an appropriate floral specialist, and diligently implemented. Annual wild fires should be prohibited.	*Create safe storage on the premises for flammable materials. If artificial burning is considered necessary, establish and implement a fire management plan with emergency fire procedures.		Prior to, and through operation	CSIR /Jam Rock Management and Farm Manager
		*Maintain an effective fire break between the facility and the surrounding natural environment.		Prior to, and at least annually during operation	CSIR /Jam Rock Management and Farm Manager
		*Educate workers about the fire plan and emergency procedures with regular training and notices.		At least annually during operation	CSIR /Jam Rock Management and Farm Manager
<b>Introduction and proliferation of alien species</b>					
Minimize the introduction and spread of invasive alien species during operation.	Regulate / limit access by potential vectors of alien plants.	*Carefully regulate / limit access by vehicles and materials to the site.			Jam Rock Management and Farm Manager
	Maintain a neat and tidy production facility.	*Prohibit the introduction of domestic animals such as dogs and cats. *Plant only locally indigenous flora if landscaping needs to be done. *Employ best practices regarding tilling of soil and weed management.		Throughout operation	Farm Management/Agricultural experts
	By law, remove and dispose of Category 1b alien species on site. All Category 2 species that remain on site must require a permit.	*Minimize the accumulation or dispersal of excess fodder on site. *Remove Category species using mechanical methods, and minimize soil disturbance as far as possible. Alien debris could be donated to a local community.			Farm Management CSIR /Jam Rock Management and Farm Manager, with advice from a floral specialist
<b>Loss of CI or medicinal flora</b>					
Prohibit harvesting of CI flora.	Harvesting of indigenous flora for medicine, fire wood, building materials, and other purposes must be prohibited.	*Educate the personnel prior to operation, and with yearly refresher talks.		Prior to and during operation	Farm Manager and Team
<b>Sensory disturbance of fauna</b>					
Minimize sensory disturbance of fauna.	Limit the effects of light pollution on nocturnal fauna (including numerous insects, bats and hedgehogs).	Minimize essential lighting. *Ensure that all outdoor lights are angled downwards and/or fitted with hoods. using metal halide, mercury or other bulbs that emit high UV (blue-white) light that is highly and usually fatally attractive to insects. *Use bulbs that emit warm, long wavelength (yellow-red) light, or use UV filters or glass housings on lamps to filter out UV.	*Avoid	During design, construction and operation	Jam Rock Management and Farm Manager
	Limit the effects of noise from operational activities on fauna such as carnivores, frogs and Secretarybirds.	Minimize unavoidable noise. *Conduct regular maintenance of machinery and ventilation systems / fans (if any).		Prior to and during operation	Jam Rock Management and Farm Manager/ External Noise Specialists
<b>DECOMMISSIONING</b>					
<b>Loss or degradation of the wetland on the access road</b>					

OBJECTIVE / TARGET	MITIGATION / MANAGEMENT ACTION	METHODOLOGY	MONITORING	FREQUENCY	RESPONSIBILITY
<b>Avoid disturbing the wetland (and its buffer).</b>	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	Jam Rock Management and Farm Manager
<b>Introduction and proliferation of alien species</b>					
Minimize introduction and spread 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 must require a permit.	*Remove Category species using mechanical methods, and minimize soil disturbance as far as possible.		Throughout decommissioning until all Category 1b and Category 2 alien species have been effectively removed from the site	Jam Rock Management / Farm Management
<b>Increased dust and erosion</b>					
Minimize dust and erosion.	Implement effective measures to control dust and erosion.	*Limit vehicles to the construction 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 to reduce erosion and sedimentation of the local drainage system. 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 of the entrance road.		Throughout decommissioning  Throughout decommissioning  Throughout decommissioning  Throughout decommissioning	Jam Rock Management, Construction Crew
<b>Sensory disturbance of fauna</b>					
Minimize sensory disturbance of fauna.	Time demolition / rehabilitation activities to minimize sensory disturbance of fauna.  Limit disturbance from noise.  Limit disturbance from light.	*Commence (and preferably complete) demolition / rehabilitation 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 other lighting, to reduce the disturbance of nocturnal fauna.		Throughout decommissioning  Throughout decommissioning  Throughout decommissioning  Throughout decommissioning	Project and Construction managers  Jam Rock Management / Farm Management  Jam Rock Management / Farm Management  Jam Rock Management / Farm Management

## 12. References

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## 13. Appendices

### 13.1. POSA list for QDS 2527BD

Family	** Species	Growth forms
ACANTHACEAE	<i>Barleria bolusii</i> Oberm.	Herb
ACANTHACEAE	<i>Blepharis integrifolia</i> (L.f.) E.Mey. ex Schinz var. <i>integrifolia</i>	Herb
ACANTHACEAE	<i>Crabbea angustifolia</i> Nees	Herb
ACANTHACEAE	<i>Hypoestes forskalii</i> (Vahl) R.Br.	Herb
ACANTHACEAE	<i>Justicia flava</i> (Vahl) Vahl	Dwarf shrub
ACHARIACEAE	<i>Kiggelaria africana</i> L.	Shrub, tree
AMARANTHACEAE	<i>Achyroopsis leptostachya</i> (E.Mey. ex Meisn.) Baker & C.B.Clarke	Herb
AMARANTHACEAE	<i>Cyathula lanceolata</i> Schinz	Herb
AMARANTHACEAE	<i>Hermboetidia odorata</i> (Burch.) T.Cooke var. <i>aurantiaca</i> (Suess.) C.C.Towns.	Herb
ANACARDIACEAE	<i>Ozoroa paniculosa</i> (Sond.) R.& A.Fern. var. <i>salicina</i> (Sond.) R.& A.Fern.	Shrub, tree
ANACARDIACEAE	<i>Searsia pyroides</i> (Burch.) Moffett var. <i>gracilis</i> (Engl.) Moffett	Shrub, tree
APOCYNACEAE	<i>Asclepias aurea</i> (Schltr.) Schltr.	Herb
APOCYNACEAE	<i>Cryptolepis oblongifolia</i> (Meisn.) Schltr.	Scrambler
APOCYNACEAE	<i>Pachycarpus schinzianus</i> (Schltr.) N.E.Br.	Succulent
APOCYNACEAE	<i>Raphionacme velutina</i> Schltr.	Geophyte
ASPHODELACEAE	<i>Bulbine angustifolia</i> Poelln.	Geophyte
ASPLENIACEAE	<i>Asplenium cordatum</i> (Thunb.) Sw.	Geophyte
ASTERACEAE	<i>Dicoma anomala</i> Sond. subsp. <i>gerrardii</i> (Harv. ex F.C.Wilson) S.Ortíz & Rodr.Oubiña	Herb
ASTERACEAE	<i>Helichrysum argyrosphaerum</i> DC.	Herb
ASTERACEAE	<i>Helichrysum candolleanum</i> H.Buek	Herb
ASTERACEAE	<i>Helichrysum cerastioides</i> DC. var. <i>cerastioides</i>	Herb
ASTERACEAE	<i>Senecio pentactinus</i> Klatt	Herb
ASTERACEAE	<i>Senecio pleistocephalus</i> S.Moore	Climber
ASTERACEAE	<i>Senecio serratuloides</i> DC.	Herb
ASTERACEAE	<i>Vernonia sutherlandii</i> Harv.	Herb
CAPPARACEAE	<i>Cleome maculata</i> (Sond.) Szyszyl.	Herb
CONVOLVULACEAE	<i>Evolvulus alsinoides</i> (L.) L.	Herb
CONVOLVULACEAE	<i>Seddera suffruticosa</i> (Schinz) Hallier f.	Dwarf shrub
CYPERACEAE	<i>Bulbostylis burchellii</i> (Ficalho & Hiern) C.B.Clarke	Cyperoid
DIPSACACEAE	<i>Scabiosa columbaria</i> L.	Herb
EBENACEAE	<i>Euclea undulata</i> Thunb.	Shrub, tree
ELATINACEAE	<i>Bergia decumbens</i> Planch. ex Harv.	Dwarf shrub
EUPHORBIACEAE	<i>Acalypha glabrata</i> Thunb. var. <i>pilosa</i> Pax	Shrub, tree
EUPHORBIACEAE	<i>Croton gratissimus</i> Burch. var. <i>subgratissimus</i> (Prain) Burt Davy	Shrub, tree
FABACEAE	<i>Acacia tortilis</i> (Forssk.) Hayne subsp. <i>heteracantha</i> (Burch.) Brenan	Shrub, tree
FABACEAE	<i>Dolichos angustifolius</i> Eckl. & Zeyh.	Herb
FABACEAE	<i>Eriosema cordatum</i> E.Mey.	Herb

Family	**	Species	Growth forms
FABACEAE		<i>Indigofera adenooides</i> Baker f.	Creeper
FABACEAE		<i>Indigofera frondosa</i> N.E.Br.	Shrub
FABACEAE		<i>Mundulea sericea</i> (Willd.) A.Chev. subsp. <i>sericea</i>	Shrub, tree
FABACEAE		<i>Ophrestia oblongifolia</i> (E.Mey.) H.M.L.Forbes var. <i>oblongifolia</i>	Herb
FABACEAE		<i>Ooptera burchellii</i> DC.	Climber
FABACEAE		<i>Rhynchosia confusa</i> Burt Davy	Climber
FABACEAE		<i>Rhynchosia monophylla</i> Schltr.	Herb
FABACEAE		<i>Rhynchosia reptabunda</i> N.E.Br.	Climber
FABACEAE		<i>Stylosanthes fruticosa</i> (Retz.) Alston	Dwarf shrub
FABACEAE		<i>Tephrosia longipes</i> Meisn. subsp. <i>longipes</i> var. <i>longipes</i>	Dwarf shrub
FABACEAE	*	<i>Trifolium repens</i> L.	Herb
FABACEAE		<i>Xerocladia viridiramis</i> (Burch.) Taub.	Shrub
FABACEAE		<i>Zornia capensis</i> Pers. subsp. <i>capensis</i>	Herb
GISEKIACEAE		<i>Gisekia africana</i> (Lour.) Kuntze var. <i>africana</i>	Herb
HYACINTHACEAE		<i>Dipcadi marlothii</i> Engl.	Geophyte
LAMIACEAE		<i>Leucas martinicensis</i> (Jacq.) R.Br.	Herb
LAMIACEAE		<i>Ocimum angustifolium</i> Benth.	shrub
LAMIACEAE		<i>Plectranthus caninus</i> Roth	succulent
LAMIACEAE		<i>Teucrium trifidum</i> Retz.	Herb
LENTIBULARIACEAE		<i>Utricularia welwitschii</i> Oliv.	Carnivore
LYCOPODIACEAE		<i>Lycopodiella cernua</i> (L.) Pic.Serm.	Geophyte
MALVACEAE		<i>Grewia retinervis</i> Burret	Shrub
MALVACEAE		<i>Hermannia burkei</i> Burt Davy	Climber
MALVACEAE		<i>Hermannia floribunda</i> Harv.	Dwarf shrub
MALVACEAE		<i>Hermannia stellulata</i> (Harv.) K.Schum.	Herb
MALVACEAE		<i>Hermannia tomentosa</i> (Turcz.) Schinz ex Engl.	Herb
MALVACEAE		<i>Waltheria indica</i> L.	Herb
MORACEAE		<i>Ficus salicifolia</i> Vahl	Tree
MYROTHAMNACEAE		<i>Myrothamnus flabellifolius</i> Welw.	Dwarf shrub
ONAGRACEAE	*	<i>Oenothera rosea</i> L'Hér. ex Aiton	Herb
OROBANCHACEAE		<i>Cycnium tubulosum</i> (L.f.) Engl. subsp. <i>tubulosum</i>	Herb
PEDALIACEAE		<i>Dicerocaryum senecioides</i> (Klotzsch) Abels	Herb
POACEAE		<i>Bothriochloa insculpta</i> (Hochst. ex A.Rich.) A.Camus	Graminoid
POACEAE		<i>Eragrostis chloromelas</i> Steud.	Graminoid
POACEAE		<i>Eragrostis curvula</i> (Schrad.) Nees	Graminoid
POACEAE		<i>Eragrostis hierniana</i> Rendle	Graminoid
POACEAE		<i>Eragrostis trichophora</i> Coss. & Durieu	Graminoid
PORTULACACEAE		<i>Portulaca kermesina</i> N.E.Br.	succulent
PROTEACEAE		<i>Protea caffra</i> Meisn. subsp. <i>caffra</i>	Shrub, tree
RHAMNACEAE		<i>Phylica paniculata</i> Willd.	Shrub, tree
RUBIACEAE		<i>Anthospermum rigidum</i> Eckl. & Zeyh. subsp. <i>pumilum</i> (Sond.) Puff	Dwarf shrub
RUBIACEAE		<i>Fadogia homblei</i> De Wild.	Herb
RUBIACEAE		<i>Otiophora calycophylla</i> (Sond.) Schltr. & K.Schum. subsp. <i>calycophylla</i>	Herb

Family	**	Species	Growth forms
RUBIACEAE		<i>Spermacoce natalensis</i> Hochst.	Herb
RUBIACEAE		<i>Vangueria parvifolia</i> Sond.	Tree
SAPINDACEAE		<i>Pappea capensis</i> Eckl. & Zeyh.	Shrub, tree
SCROPHULARIACEAE		<i>Chaenostoma leve</i> (Hiern) Kornhall	Herb
SCROPHULARIACEAE		<i>Manulea parviflora</i> Benth. var. <i>parviflora</i>	Herb
SCROPHULARIACEAE		<i>Melanospermum foliosum</i> (Benth.) Hilliard	Herb
SELAGINELLACEAE		<i>Selaginella dregei</i> (C.Presl) Hieron.	Geophyte
STRYCHNACEAE		<i>Strychnos madagascariensis</i> Poir.	Shrub, tree

## 13.2. Mammal list for the study area

FAMILY & SCIENTIFIC NAME	COMMON NAME	RSA LEGAL STATUS	NORTH WEST LEGAL STATUS	GLOBAL RED LIST STATUS	REGIONAL RED LIST STATUS	LoO	
						QDS	SITE
<b>BATHYERGIDAE</b>	<b>Mole-rats</b>						
<i>Cryptomys hottentotus</i>	Southern African Mole-rat			LC (S)	LC	2	1
<b>BOVIDAE</b>	<b>Even-toed antelope</b>						
<i>Aepyceros melampus</i>	Impala			LC (S)	LC	1	2
<i>Pelea capreolus</i>	Vaal Rhebok		PG Schedule 2 Section 15(1)(a)	LC (S)	NT	3	4
<i>Raphicerus campestris</i>	Steenbok		PG Schedule 2 Section 15(1)(a)	LC (S)	LC	2	2
<i>Redunca arundinum</i>	Southern Reedbuck		PG Schedule 2 Section 15(1)(a)	LC (S)	LC	3	4
<i>Sylvicapra grimmia</i>	Bush Duiker			LC (S)	LC	2	1
<i>Tragelaphus angasii</i>	Nyala		PG Schedule 2 Section 15(1)(a)	LC (S)	LC	2	4
<i>Tragelaphus scriptus</i>	Bushbuck			LC (S)	LC	2	4
<i>Tragelaphus strepsiceros</i>	Greater Kudu			LC (S)	LC	2	1?
<b>CANIDAE</b>	<b>Dogs, foxes, jackals &amp; relatives</b>						
<i>Canis mesomelas</i>	Black-backed Jackal			LC (S)	LC	2	2
<i>Vulpes chama</i>	Cape Fox	PS		LC (S)	LC	3	3
<b>CERCOPITHECIDAE</b>	<b>Baboon &amp; monkeys</b>						
<i>Cercopithecus pygerythrus</i>	Vervet Monkey			LC (S)	LC	2	3
<i>Papio ursinus</i>	Chacma Baboon			LC (S)	LC	3	4
<b>EMBALLONURIDAE</b>	<b>Tomb bats</b>						
<i>Taphozous mauritanus</i>	Mauritian Tomb Bat			LC (U)	LC	3	4
<b>ERINACEIDAE</b>	<b>Hedgehog</b>						
<i>Atelerix frontalis (frontalis)</i>	Southern African Hedgehog		PG Schedule 2 Section 15(1)(a)	LC (S)	NT	2	4
<b>FELIDAE</b>	<b>Cats</b>						
<i>Caracal caracal</i>	Caracal			LC (U)	LC	2	2
<i>Felis nigripes</i>	Black-footed Cat	PS		VU (D)	VU	3	4
<i>Felis silvestris</i>	Wildcat			LC (D)	LC	3	4
<i>Leptailurus serval</i>	Serval	PS		LC (S)	NT	2	4
<i>Panthera pardus</i>	Leopard	PS	PWA Schedule 4 Section 15(1)©	NT (D)	VU	3	3
<b>GALAGIDAE</b>	<b>Bushbabies</b>						
<i>Galago moholi</i>	Moholi Bushbaby			LC (S)	LC	2	2
<b>GLIRIDAE</b>	<b>Dormice</b>						
<i>Graphiurus murinus</i>	Forest African Dormouse			LC (S)	LC	2	3
<i>Graphiurus platyops</i>	Flat-headed African Dormouse			LC (U)	LC	3	4

FAMILY & SCIENTIFIC NAME	COMMON NAME	RSA LEGAL STATUS	NORTH WEST LEGAL STATUS	GLOBAL RED LIST STATUS	REGIONAL RED LIST STATUS	LoO	
						QDS	SITE
<b>HERPESTIDAE</b>	<b>Meerkat &amp; mongooses</b>						
<i>Atilax paludinosus</i>	Marsh Mongoose			LC (D)	LC	2	4
<i>Cynictis penicillata</i>	Yellow Mongoose			LC (S)	LC	2	2
<i>Helogale parvula</i>	Common Dwarf Mongoose			LC (S)	LC	3	4
<i>Herpestes sanguineus</i>	Slender Mongoose			LC (S)	LC	2	2
<i>Ichneumia albicauda</i>	White-tailed Mongoose			LC (S)	LC	1	4
<i>Mungos mungo</i>	Banded Mongoose			LC (S)	LC	3	4
<i>Suricata suricatta</i>	Meerkat			LC (U)	LC	3	4
<b>HIPPOSIDERIDAE</b>	<b>Leaf-nosed &amp; related bats</b>						
<i>Cloeotis percivali</i>	Percival's Short-eared Trident Bat			LC (U)	EN	3	4
<i>Hipposideros caffer</i>	Sundevall's Leaf-nosed Bat			LC (D)	LC	3	4
<b>HYAENIDAE</b>	<b>Aardwolf &amp; hyenas</b>						
<i>Hyaena brunnea</i>	Brown Hyena	PS	PG Schedule 2 Section 15(1)(a)	NT (D)	NT	3	3
<i>Proteles cristata</i>	Aardwolf		PG Schedule 2 Section 15(1)(a)	LC (S)	LC	2	2
<b>HYSTRICIDAE</b>	<b>Porcupine</b>						
<i>Hystrix africaeaustralis</i>	Cape Porcupine			LC (S)	LC	2	2
<b>LEPORIDAE</b>	<b>Hares &amp; rabbits</b>						
<i>Lepus saxatilis</i>	Scrub Hare			LC (D)	LC	2	1
<i>Pronolagus randensis</i>	Jameson's Red Rock Hare			LC (U)	LC	2	4
<b>MACROSCOLIDIDAE</b>	<b>Elephant shrews</b>						
<i>Elephantulus brachyrhynchus</i>	Short-snouted Elephant Shrew			LC (U)	LC	2	2
<i>Elephantulus myurus</i>	Eastern Rock Elephant Shrew			LC (S)	LC	2	4
<b>MOLOSSIDAE</b>	<b>Free-tailed &amp; related bats</b>						
<i>Tadarida aegyptiaca</i>	Egyptian Free-tailed Bat			LC (U)	LC	2	2
<b>MURIDAE</b>	<b>Gerbils, rock mice, vlei rats &amp; relatives</b>						
<i>Aethomys ineptus</i>	Tete Veld Aethomys			LC (U)	LC	2	2
<i>Aethomys namaquensis</i>	Namaqua Rock Mouse			LC (S)	LC	2	4
<i>Dasymys incomatus</i>	African Marsh Rat			LC (U)	NT	3	4
<i>Gerbilliscus brantsii</i>	Highveld Gerbil			LC (U)	LC	2	3
<i>Gerbilliscus leucogaster</i>	Bushveld Gerbil			LC (S)	LC	2	2
<i>Lemniscomys rosalia</i>	Single-Striped Lemniscomys			LC (S)	LC	2	2
<i>Mastomys coucha</i>	Southern African Mastomys			LC (S)	LC	2	2
<i>Otomys angoniensis</i>	Angoni Vlei Rat			LC (S)	LC	1	4

FAMILY & SCIENTIFIC NAME	COMMON NAME	RSA LEGAL STATUS	NORTH WEST LEGAL STATUS	GLOBAL RED LIST STATUS	REGIONAL RED LIST STATUS	LoO	
						QDS	SITE
<i>Otomys auratus / irroratus</i>	Southern African Vlei Rat			LC (S)	LC	2	4
<i>Rhabdomys pumilio</i>	Xeric Four-striped Grass Rat			LC (S)	LC	3	3
<i>Thallomys paedulcus</i>	Acacia Thallomys			LC (U)	LC	1	2
<b>MUSTELIDAE</b>	<b>Badger, otters, polecat &amp; weasel</b>						
<i>Aonyx capensis</i>	African Clawless Otter			LC (S)	NT	2	4
<i>Hydrictis maculicollis</i>	Spotted-necked Otter			LC (D)	VU	3	4
<i>Ictonyx striatus</i>	Striped Polecat			LC (S)	LC	3	4
<i>Mellivora capensis</i>	Honey Badger			LC (D)	LC	3	3
<i>Poecilogale albinucha</i>	African Striped Weasel			LC (U)	NT	2	3
<b>NESOMYIDAE</b>	<b>Climbing &amp; fat mice &amp; relatives</b>						
<i>Dendromus melanotis</i>	Gray African Climbing Mouse			LC (S)	LC	3	4
<i>Dendromus mystacalis</i>	Chestnut African Climbing Mouse			LC (S)	LC	3	4
<i>Mystromys albicaudatus</i>	African White-tailed Rat			EN (D)	VU	3	4
<i>Saccostomus campestris</i>	Southern African Pouched Mouse			LC (S)	LC	2	2
<i>Steatomys pratensis</i>	Common African Fat Mouse			LC (S)	LC	2	2
<b>NYCTERIDAE</b>	<b>Slit-faced bats</b>						
<i>Nycteris thebaica</i>	Egyptian Slit-faced Bat			LC (U)	LC	3	2
<b>ORYCTEROPODIDAE</b>	<b>Aardvark</b>						
<i>Orycteropus afer</i>	Aardvark	PS	PG Schedule 2 Section 15(1)(a)	LC (U)	LC	3	4
<b>PEDETIDAE</b>	<b>Spring Hare</b>						
<i>Pedetes capensis</i>	South African Spring Hare			LC (U)	LC	3	3
<b>PROCAVIIDAE</b>	<b>Hyraxes</b>						
<i>Procavia capensis</i>	Rock Hyrax			LC (U)	LC	2	4
<b>RHINOLOPHIDAE</b>	<b>Horseshoe bats</b>						
<i>Rhinolophus blasii</i>	Blasius's Horseshoe Bat			LC (D)	NT	3	4
<i>Rhinolophus clivosus</i>	Geoffroy's Horseshoe Bat			LC (U)	LC	2	3
<i>Rhinolophus darlingi</i>	Darling's Horseshoe Bat			LC (U)	LC	3	4
<i>Rhinolophus simulator</i>	Bushveld Horseshoe Bat			LC (D)	LC	2	3
<b>SCIURIDAE</b>	<b>Squirrels</b>						
<i>Paraxerus cepapi</i>	Smith's Bush Squirrel			LC (S)	LC	3	3
<i>Xerus inauris</i>	South African Ground Squirrel			LC (S)	LC	3	4
<b>SORICIDAE</b>	<b>Shrews</b>						
<i>Crociodura cyanea</i>	Reddish-gray Musk Shrew			LC (S)	LC	2	3
<i>Crociodura fuscomurina</i>	Bicolored Musk Shrew			LC (U)	LC	2	4

FAMILY & SCIENTIFIC NAME	COMMON NAME	RSA LEGAL STATUS	NORTH WEST LEGAL STATUS	GLOBAL RED LIST STATUS	REGIONAL RED LIST STATUS	LoO	
						QDS	SITE
<i>Crocidura hirta</i>	Lesser Red Musk Shrew			LC (U)	LC	1	2
<i>Crocidura mariquensis</i>	Swamp Musk Shrew			LC (U)	NT	2	4
<i>Crocidura silacea</i>	Lesser Gray-brown Musk Shrew			LC (S)	LC	3	3
<i>Myosorex varius</i>	Forest Shrew			LC (S)	LC	3	4
<i>Suncus lixus</i>	Greater Dwarf Shrew			LC (U)	LC	3	4
<b>SUIDAE</b>	<b>Hogs &amp; pigs</b>						
<i>Phacochoerus africanus</i>	Common Warthog			LC (S)	LC	2	3
<i>Potamochoerus larvatus</i> ( <i>koiropotamus</i> )	Bush-pig			LC (S)	LC	3	4
<b>THRYONOMYIDAE</b>	<b>Cane Rat</b>						
<i>Thryonomys swinderianus</i>	Greater Cane Rat			LC (U)	LC	2	4
<b>VESPERTILIONIDAE</b>	<b>House, pipistrelle, serotine &amp; related bats</b>						
<i>Miniopterus natalensis</i>	Natal / Shreiber's Long-fingered Bat			LC (U)	LC	2	3
<i>Neoromicia capensis</i>	Cape Serotine			LC (S)	LC	2	2
<i>Pipistrellus rusticus</i>	Rusty Pipistrelle			LC (U)	LC	3	4
<i>Scotophilus dinganii</i>	Yellow-bellied House Bat			LC (U)	LC	2	3
<i>Scotophilus viridis</i>	Green House Bat			LC (U)	LC	3	3
<b>VIVERRIDAE</b>	<b>Civet &amp; genets</b>						
<i>Genetta genetta</i>	Common Genet			LC (S)	LC	2	3
<i>Genetta maculata</i>	Common Large- / Rusty-spotted Genet			LC(U)	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); NEM:BA ToPS (2015); IUCN (2016); MammalMAP (2016); SANBI & EWT (2016)

## 13.3. Bird list for the study area

SCIENTIFIC NAME	ALPHABETICAL COMMON NAME	RSA LEGAL STATUS	NORTH WEST LEGAL STATUS	GLOBAL RED LIST STATUS	REGIONAL RED LIST STATUS	LoO		
						QDS	PENTAD	SITE
<i>Apalis thoracica</i>	Apalis, Bar-throated		PG Schedule 2 Section 15(1)(a)	LC	LC	1		4
<i>Recurvirostra avosetta</i>	Avocet, Pied		PG Schedule 2 Section 15(1)(a)	LC	LC	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	1	1	2
<i>Tricholaema leucomelas</i>	Barbet, Acacia Pied		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	2
<i>Lybius torquatus</i>	Barbet, Black-collared		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	3
<i>Trachyphonus vaillantii</i>	Barbet, Crested		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	3
<i>Batis molitor</i>	Batis, Chinspot		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	2
<i>Merops persicus</i>	Bee-eater, Blue-cheeked		PG Schedule 2 Section 15(1)(a)	LC	LC	1		3
<i>Merops apiaster</i>	Bee-eater, European		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	1
<i>Merops pusillus</i>	Bee-eater, Little		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	3
<i>Merops nubicoides</i>	Bee-eater, Southern Carmine		PG Schedule 2 Section 15(1)(a)	LC	LC	1		3
<i>Merops hirundineus</i>	Bee-eater, Swallow-tailed		PG Schedule 2 Section 15(1)(a)	LC	LC	1		4
<i>Merops bullockoides</i>	Bee-eater, White-fronted		PG Schedule 2 Section 15(1)(a)	LC	LC	1		3
<i>Euplectes orix</i>	Bishop, Southern Red		WA Schedule 5 Section 43	LC	LC	1	1	4
<i>Euplectes capensis</i>	Bishop, Yellow		PG Schedule 2 Section 15(1)(a)	LC	LC	1		4
<i>Euplectes afer</i>	Bishop, Yellow-crowned		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	4
<i>Ixobrychus sturmii</i>	Bittern, Dwarf		PG Schedule 2 Section 15(1)(a)	LC	LC	1		4
<i>Botaurus stellaris</i>	Bittern, Eurasian		PG Schedule 2 Section 15(1)(a)	LC	LC	1		4
<i>Ixobrychus minutus</i>	Bittern, Little		PG Schedule 2 Section 15(1)(a)	LC	LC	1		4
<i>Telophorus zeylonus</i>	Bokmakierie		PG Schedule 2 Section 15(1)(a)	LC	LC	1		2
<i>Laniarius ferrugineus</i>	Boubou, Southern		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	4
<i>Nilaus afer</i>	Brubru		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	3
<i>Pycnonotus nigricans</i>	Bulbul, African Red-eyed		WA Schedule 5 Section 43	LC	LC	1		3
<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	4
<i>Emberiza tahapisi</i>	Bunting, Cinnamon-breasted		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	4
<i>Emberiza flaviventris</i>	Bunting, Golden-breasted		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	4
<i>Emberiza impetuani</i>	Bunting, Lark-like		PG Schedule 2 Section 15(1)(a)	LC	LC	1		3
<i>Malaconotus blanchoti</i>	Bush-shrike, Grey-headed		PG Schedule 2 Section 15(1)(a)	LC	LC	1		1
<i>Telophorus sulfureopectus</i>	Bush-shrike, Orange-breasted		PG Schedule 2 Section 15(1)(a)	LC	LC	1		2
<i>Neotis denhami</i>	Bustard, Denham's	<b>VU</b>	PG Schedule 2 Section 15(1)(a)	<b>NT</b>	<b>VU</b>	1		4
<i>Turnix sylvaticus</i>	Buttonquail, Common (Kurrichane)		PG Schedule 2 Section 15(1)(a)	LC	LC	1		3

SCIENTIFIC NAME	ALPHABETICAL COMMON NAME	RSA LEGAL STATUS	NORTH WEST LEGAL STATUS	GLOBAL RED LIST STATUS	REGIONAL RED LIST STATUS	LoO		
						QDS	PENTAD	SITE
<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		4
<i>Buteo rufofuscus</i>	Buzzard, Jackal		PG Schedule 2 Section 15(1)(a)	LC	LC	1		4
<i>Kaupifalco monogrammicus</i>	Buzzard, Lizard		PG Schedule 2 Section 15(1)(a)	LC	LC	1		2
<i>Camaroptera brevicaudata</i>	Camaroptera, Grey-backed		PG Schedule 2 Section 15(1)(a)	LC	LC	1		2
<i>Crithagra atrogularis</i>	Canary, Black-throated		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	1
<i>Crithagra flaviventris</i>	Canary, Yellow		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	3
<i>Crithagra mozambicus</i>	Canary, Yellow-fronted		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	2
<i>Myrmecocichla formicivora</i>	Chat, Ant-eating		PG Schedule 2 Section 15(1)(a)	LC	LC	1		2
<i>Cercomela familiaris</i>	Chat, Familiar		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	2
<i>Thamnolaea cinnamomeiventris</i>	Chat, Mocking Cliff		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	4
<i>Cisticola textrix</i>	Cisticola, Cloud		PG Schedule 2 Section 15(1)(a)	LC	LC	1		3
<i>Cisticola aridulus</i>	Cisticola, Desert		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	1
<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		4
<i>Cisticola chiniana</i>	Cisticola, Rattling		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	1
<i>Cisticola rufilatus</i>	Cisticola, Tinkling		PG Schedule 2 Section 15(1)(a)	LC	LC	1		3
<i>Cisticola ayresii</i>	Cisticola, Wing-snapping		PG Schedule 2 Section 15(1)(a)	LC	LC	1		1
<i>Cisticola juncidis</i>	Cisticola, Zitting		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	3
<i>Fulica cristata</i>	Coot, Red-knobbed		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	4
<i>Phalacrocorax africanus</i>	Cormorant, Reed		WA Schedule 5 Section 43	LC	LC	1	1	4
<i>Phalacrocorax carbo</i>	Cormorant, White-breasted		WA Schedule 5 Section 43	LC	LC	1	1	4
<i>Centropus burchellii</i>	Coucal, Burchell's		PG Schedule 2 Section 15(1)(a)	LC	LC	1		3
<i>Rhinoptilus chalcopterus</i>	Courser, Bronze-winged		PG Schedule 2 Section 15(1)(a)	LC	LC	1		3
<i>Cursorius temminckii</i>	Courser, Temminck's		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	3
<i>Crecoptis egregia</i>	Crake, African		PG Schedule 2 Section 15(1)(a)	LC	LC	1		4
<i>Porzana pusilla</i>	Crake, Baillon's		PG Schedule 2 Section 15(1)(a)	LC	LC	1		4
<i>Amaurornis flavirostris</i>	Crake, Black		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	4
<i>Crex crex</i>	Crake, Corn		PG Schedule 2 Section 15(1)(a)	LC	LC	1		4
<i>Porzana porzana</i>	Crake, Spotted		PG Schedule 2 Section 15(1)(a)	LC	LC	1		4
<i>Anthropoides paradiseus</i>	Crane, Blue	PS	PG Schedule 2 Section 15(1)(a)	VU	NT	1		4
<i>Sylvietta rufescens</i>	Crombec, Long-billed		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	3
<i>Corvus capensis</i>	Crow, Cape		WA Schedule 5 Section 43	LC	LC	1	1	3
<i>Corvus albus</i>	Crow, Pied		WA Schedule 5 Section 43	LC	LC	1	1	1

SCIENTIFIC NAME	ALPHABETICAL COMMON NAME	RSA LEGAL STATUS	NORTH WEST LEGAL STATUS	GLOBAL RED LIST STATUS	REGIONAL RED LIST STATUS	LoO		
						QDS	PENTAD	SITE
<i>Cuculus gularis</i>	Cuckoo, African		PG Schedule 2 Section 15(1)(a)	LC	LC	1		3
<i>Cuculus clamosus</i>	Cuckoo, Black		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	1
<i>Cuculus canorus</i>	Cuckoo, Common		PG Schedule 2 Section 15(1)(a)	LC	LC	1		3
<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		2
<i>Clamator jacobinus</i>	Cuckoo, Jacobin		PG Schedule 2 Section 15(1)(a)	LC	LC	1		2
<i>Chrysococcyx klaas</i>	Cuckoo, Klaas's		PG Schedule 2 Section 15(1)(a)	LC	LC	1		3
<i>Clamator levaillantii</i>	Cuckoo, Levaillant's		PG Schedule 2 Section 15(1)(a)	LC	LC	1		3
<i>Cuculus solitarius</i>	Cuckoo, Red-chested		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	3
<i>Campephaga flava</i>	Cuckooshrike, Black		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	2
<i>Anhinga rufa</i>	Darter, African		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	4
<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	1	1	2
<i>Streptopelia senegalensis</i>	Dove, Laughing		WA Schedule 5 Section 43	LC	LC	1	1	1
<i>Oena capensis</i>	Dove, Namaqua		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	2
<i>Streptopelia semitorquata</i>	Dove, Red-eyed		WA Schedule 5 Section 43	LC	LC	1	1	3
<i>Columba livia</i>	Dove, Rock		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	2
<i>Dicrurus adsimilis</i>	Drongo, Fork-tailed		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	2
<i>Anas sparsa</i>	Duck, African Black		PG Schedule 2 Section 15(1)(a)	LC	LC	1		4
<i>Dendrocygna bicolor</i>	Duck, Fulvous Whistling		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	4
<i>Sarkidiornis melanotos</i>	Duck, Knob-billed		PG Schedule 2 Section 15(1)(a)	LC	LC	1		4
<i>Oxyura maccoa</i>	Duck, Maccoa		PG Schedule 2 Section 15(1)(a)	NT	NT	1		4
<i>Thalassornis leuconotus</i>	Duck, White-backed		PG Schedule 2 Section 15(1)(a)	LC	LC	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	4
<i>Haliaeetus vocifer</i>	Eagle, African Fish		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	4
<i>Aquila spilogaster</i>	Eagle, African Hawk		PG Schedule 2 Section 15(1)(a)	LC	LC	1		2
<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		2
<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		2
<i>Lophaetus occipitalis</i>	Eagle, Long-crested		PG Schedule 2 Section 15(1)(a)	LC	LC	1		4
<i>Polemaetus bellicosus</i>	Eagle, Martial	EN	PG Schedule 2 Section 15(1)(a)	VU	EN	1		3
<i>Aquila nipalensis</i>	Eagle, Steppe		PG Schedule 2 Section 15(1)(a)	EN	LC	1		3

SCIENTIFIC NAME	ALPHABETICAL COMMON NAME	RSA LEGAL STATUS	NORTH WEST LEGAL STATUS	GLOBAL RED LIST STATUS	REGIONAL RED LIST STATUS	LoO		
						QDS	PENTAD	SITE
<i>Aquila rapax</i>	Eagle, Tawny	EN	PG Schedule 2 Section 15(1)(a)	LC	EN	1		3
<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	1	1	3
<i>Egretta alba</i>	Egret, Great		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	4
<i>Egretta garzetta</i>	Egret, Little		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	4
<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	4
<i>Eremomela usticollis</i>	Eremomela, Burnt-necked		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	2
<i>Eremomela scotops</i>	Eremomela, Green-capped		PG Schedule 2 Section 15(1)(a)	LC	LC	1		4
<i>Eremomela icteropygialis</i>	Eremomela, Yellow-bellied		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	2
<i>Falco amurensis</i>	Falcon, Amur		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	2
<i>Falco biarmicus</i>	Falcon, Lanner		PG Schedule 2 Section 15(1)(a)	LC	VU	1	1	3
<i>Falco vespertinus</i>	Falcon, Red-footed		PG Schedule 2 Section 15(1)(a)	NT	NT	1		2
<i>Anomalospiza imberbis</i>	Finch, Cuckoo		PG Schedule 2 Section 15(1)(a)	LC	LC	1		4
<i>Amadina fasciata</i>	Finch, Cut-throat		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	2
<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	1	1	1
<i>Podica senegalensis</i>	Finfoot, African		PG Schedule 2 Section 15(1)(a)	LC	VU	1		4
<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	1	1	3
<i>Lagonosticta senegala</i>	Firefinch, Red-billed		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	3
<i>Lanius collaris</i>	Fiscal, Southern (Common)		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	2
<i>Phoenicopterus roseus</i>	Flamingo, Greater		PG Schedule 2 Section 15(1)(a)	LC	NT	1		4
<i>Phoeniconaias minor</i>	Flamingo, Lesser		PG Schedule 2 Section 15(1)(a)	NT	NT	1		4
<i>Sarothrura rufa</i>	Flufftail, Red-chested		PG Schedule 2 Section 15(1)(a)	LC	LC	1		4
<i>Terpsiphone viridis</i>	Flycatcher, African Paradise		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	3
<i>Stenostira scita</i>	Flycatcher, Fairy		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	3
<i>Sigelus silens</i>	Flycatcher, Fiscal		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	2
<i>Myioparus plumbeus</i>	Flycatcher, Grey Tit-		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	3
<i>Bradornis mariquensis</i>	Flycatcher, Marico		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	2
<i>Bradornis pallidus</i>	Flycatcher, Pale		PG Schedule 2 Section 15(1)(a)	LC	LC	1		3
<i>Melaenornis pammelaina</i>	Flycatcher, Southern Black		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	2
<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	1	4

SCIENTIFIC NAME	ALPHABETICAL COMMON NAME	RSA LEGAL STATUS	NORTH WEST LEGAL STATUS	GLOBAL RED LIST STATUS	REGIONAL RED LIST STATUS	LoO		
						QDS	PENTAD	SITE
<i>Dendroperdix sephaena</i>	Francolin, Crested		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		4
<i>Scleroptila shelleyi</i>	Francolin, Shelley's		OG Schedule 3 Section 15(1)(b)	LC	LC	1		4
<i>Corythaixoides concolor</i>	Go-away-bird, Grey		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	2
<i>Limosa limosa</i>	Godwit, Black-tailed		PG Schedule 2 Section 15(1)(a)	NT	NA	1		4
<i>Alopochen aegyptiacus</i>	Goose, Egyptian		OG Schedule 3 Section 15(1)(b)	LC	LC	1	1	3
<i>Plectropterus gambensis</i>	Goose, Spur-winged		OG Schedule 3 Section 15(1)(b)	LC	LC	1	1	4
<i>Melierax gabar</i>	Goshawk, Gabar		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	2
<i>Melierax canorus</i>	Goshawk, Pale Chanting		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	2
<i>Sphenoeacus afer</i>	Grassbird, Cape		PG Schedule 2 Section 15(1)(a)	LC	LC	1		4
<i>Podiceps nigricollis</i>	Grebe, Black-necked		PG Schedule 2 Section 15(1)(a)	LC	LC	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>Tringa nebularia</i>	Greenshank, Common		PG Schedule 2 Section 15(1)(a)	LC	LC	1		4
<i>Numida meleagris</i>	Guineafowl, Helmeted		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	1
<i>Chroicocephalus cirrocephalus</i>	Gull, Grey-headed		PG Schedule 2 Section 15(1)(a)	LC	LC	1		4
<i>Scopus umbretta</i>	Hamerkop		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	4
<i>Circus ranivorus</i>	Harrier, African Marsh		PG Schedule 2 Section 15(1)(a)	LC	EN	1		4
<i>Circus pygargus</i>	Harrier, Montagu's		PG Schedule 2 Section 15(1)(a)	LC	LC	1		4
<i>Circus macrourus</i>	Harrier, Pallid		PG Schedule 2 Section 15(1)(a)	NT	NT	1		4
<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		2
<i>Prionops plumatus</i>	Helmet-shrike, White-crested		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	3
<i>Egretta ardesiaca</i>	Heron, Black		PG Schedule 2 Section 15(1)(a)	LC	LC	1		4
<i>Nycticorax nycticorax</i>	Heron, Black-crowned Night		PG Schedule 2 Section 15(1)(a)	LC	LC	1		4
<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		4
<i>Butorides striata</i>	Heron, Green-backed		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	4
<i>Ardea cinerea</i>	Heron, Grey		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	3
<i>Ardea purpurea</i>	Heron, Purple		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	4
<i>Ardeola ralloides</i>	Heron, Squacco		PG Schedule 2 Section 15(1)(a)	LC	LC	1		4
<i>Gorsachius leuconotus</i>	Heron, White-backed Night		PG Schedule 2 Section 15(1)(a)	LC	VU	1		4
<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	1	3

SCIENTIFIC NAME	ALPHABETICAL COMMON NAME	RSA LEGAL STATUS	NORTH WEST LEGAL STATUS	GLOBAL RED LIST STATUS	REGIONAL RED LIST STATUS	LoO		
						QDS	PENTAD	SITE
<i>Indicator indicator</i>	Honeyguide, Greater		PG Schedule 2 Section 15(1)(a)	LC	LC	1		2
<i>Indicator minor</i>	Honeyguide, Lesser		PG Schedule 2 Section 15(1)(a)	LC	LC	1		3
<i>Upupa africana</i>	Hoopoe, African		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	3
<i>Tockus nasutus</i>	Hornbill, African Grey		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	2
<i>Tockus erythrorhynchus</i>	Hornbill, Southern Red-billed		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	2
<i>Tockus leucomelas</i>	Hornbill, Southern Yellow-billed		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	3
<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		4
<i>Bostrychia hagedash</i>	Ibis, Hadeda		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	2
<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	1	4
<i>Actophilornis africanus</i>	Jacana, African		PG Schedule 2 Section 15(1)(a)	LC	LC	1		4
<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	3
<i>Falco rupicolus</i>	Kestrel, Rock		PG Schedule 2 Section 15(1)(a)	LC	LC	1		4
<i>Ispidina picta</i>	Kingfisher, African Pygmy		PG Schedule 2 Section 15(1)(a)	LC	LC	1		4
<i>Halcyon albiventris</i>	Kingfisher, Brown-hooded		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	3
<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	1		4
<i>Alcedo semitorquata</i>	Kingfisher, Half-collared		PG Schedule 2 Section 15(1)(a)	LC	<b>NT</b>	1		4
<i>Alcedo cristata</i>	Kingfisher, Malachite		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	4
<i>Ceryle rudis</i>	Kingfisher, Pied		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	4
<i>Halcyon chelicuti</i>	Kingfisher, Striped		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	3
<i>Halcyon senegalensis</i>	Kingfisher, Woodland		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	4
<i>Milvus migrans</i>	Kite, Black		PG Schedule 2 Section 15(1)(a)	LC	LC	1		2
<i>Elanus caeruleus</i>	Kite, Black-shouldered		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	1
<i>Milvus aegyptius</i>	Kite, Yellow-billed		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	1
<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	1	1	2
<i>Eupodotis senegalensis</i>	Korhaan, White-bellied		PG Schedule 2 Section 15(1)(a)	LC	<b>VU</b>	1		4
<i>Vanellus senegallus</i>	Lapwing, African Wattled		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	2
<i>Vanellus armatus</i>	Lapwing, Blacksmith		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	3
<i>Vanellus coronatus</i>	Lapwing, Crowned		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	1

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<i>Mirafra apiata</i>	Lark, Cape Clapper		PG Schedule 2 Section 15(1)(a)	LC	LC	1		4
<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	1		4
<i>Mirafra fasciolata</i>	Lark, Eastern Clapper		PG Schedule 2 Section 15(1)(a)	LC	LC	1		3
<i>Certhilauda semitorquata</i>	Lark, Eastern Long-billed		PG Schedule 2 Section 15(1)(a)	LC	LC	1		3
<i>Calendulauda africanoides</i>	Lark, Fawn-coloured		PG Schedule 2 Section 15(1)(a)	LC	LC	1		3
<i>Mirafra rufocinnamomea</i>	Lark, Flappet		PG Schedule 2 Section 15(1)(a)	LC	LC	1		3
<i>Mirafra cheniana</i>	Lark, Melodious		PG Schedule 2 Section 15(1)(a)	NT	LC	1		4
<i>Mirafra passerina</i>	Lark, Monotonous		PG Schedule 2 Section 15(1)(a)	LC	LC	1		2
<i>Spizocorys conirostris</i>	Lark, Pink-billed		PG Schedule 2 Section 15(1)(a)	LC	LC	1		3
<i>Calandrella cinerea</i>	Lark, Red-capped		PG Schedule 2 Section 15(1)(a)	LC	LC	1		3
<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	1	2
<i>Macronyx capensis</i>	Longclaw, Cape		PG Schedule 2 Section 15(1)(a)	LC	LC	1		4
<i>Spermestes cucullatus</i>	Mannikin, Bronze		PG Schedule 2 Section 15(1)(a)	LC	LC	1		3
<i>Riparia cincta</i>	Martin, Banded		PG Schedule 2 Section 15(1)(a)	LC	LC	1		3
<i>Riparia paludicola</i>	Martin, Brown-throated		PG Schedule 2 Section 15(1)(a)	LC	LC	1		3
<i>Delichon urbicum</i>	Martin, Common House		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	4
<i>Hirundo fuligula</i>	Martin, Rock		PG Schedule 2 Section 15(1)(a)	LC	LC	1		4
<i>Riparia riparia</i>	Martin, Sand		PG Schedule 2 Section 15(1)(a)	LC	LC	1		4
<i>Gallinula chloropus</i>	Moorhen, Common		PG Schedule 2 Section 15(1)(a)	LC	LC	1		4
<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
<i>Colius colius</i>	Mousebird, White-backed		WA Schedule 5 Section 43	LC	LC	1	1	2
<i>Acridotheres tristis</i>	Myna, Common		PG Schedule 2 Section 15(1)(a)			1	1	3
<i>Cisticola fulvicapilla</i>	Neddicky		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	2
<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		3
<i>Caprimulgus tristigma</i>	Nightjar, Freckled		PG Schedule 2 Section 15(1)(a)	LC	LC	1		4
<i>Caprimulgus rufigena</i>	Nightjar, Rufous-cheeked		PG Schedule 2 Section 15(1)(a)	LC	LC	1		2
<i>Oriolus larvatus</i>	Oriole, Black-headed		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	2
<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	4

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<i>Tyto capensis</i>	Owl, African Grass		PG Schedule 2 Section 15(1)(a)	LC	VU	1		4
<i>Otus senegalensis</i>	Owl, African Scops		PG Schedule 2 Section 15(1)(a)	LC	LC	1		2
<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		4
<i>Ptilopsis granti</i>	Owl, Southern White-faced		PG Schedule 2 Section 15(1)(a)	LC	LC	1		2
<i>Bubo africanus</i>	Owl, Spotted Eagle-		PG Schedule 2 Section 15(1)(a)	LC	LC	1		1
<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		2
<i>Glaucidium perlatum</i>	Owlet, Pearl-spotted		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	2
<i>Buphagus erythrorhynchus</i>	Oxpecker, Red-billed		PG Schedule 2 Section 15(1)(a)	LC	LC	1		2
<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)			1		4
<i>Poicephalus meyeri</i>	Parrot, Meyer's		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	2
<i>Pelecanus onocrotalus</i>	Pelican, Great White		PG Schedule 2 Section 15(1)(a)	LC	VU	1		4
<i>Pelecanus rufescens</i>	Pelican, Pink-backed		PG Schedule 2 Section 15(1)(a)	LC	VU	1		4
<i>Anthoscopus minutus</i>	Penduline-tit, Cape		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	2
<i>Anthoscopus caroli</i>	Penduline-tit, Grey		PG Schedule 2 Section 15(1)(a)	LC	LC	1		3
<i>Petronia superciljaris</i>	Petronia, Yellow-throated		PG Schedule 2 Section 15(1)(a)	LC	LC	1		2
<i>Treron calvus</i>	Pigeon, African Green		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	4
<i>Columba guinea</i>	Pigeon, Speckled		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	3
<i>Anthus cinnamomeus</i>	Pipit, African		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	3
<i>Anthus vaalensis</i>	Pipit, Buffy		PG Schedule 2 Section 15(1)(a)	LC	LC	1		3
<i>Anthus caffer</i>	Pipit, Bushveld		PG Schedule 2 Section 15(1)(a)	LC	LC	1		2
<i>Anthus similis</i>	Pipit, Long-billed		PG Schedule 2 Section 15(1)(a)	LC	LC	1		3
<i>Anthus leucophrys</i>	Pipit, Plain-backed		PG Schedule 2 Section 15(1)(a)	LC	LC	1		3
<i>Anthus lineiventris</i>	Pipit, Striped		PG Schedule 2 Section 15(1)(a)	LC	LC	1		4
<i>Anthus trivialis</i>	Pipit, Tree		PG Schedule 2 Section 15(1)(a)	LC	LC	1		4
<i>Charadrius asiaticus</i>	Plover, Caspian		PG Schedule 2 Section 15(1)(a)	LC	LC	1		3
<i>Charadrius hiaticula</i>	Plover, Common Ringed		PG Schedule 2 Section 15(1)(a)	LC	LC	1		4
<i>Charadrius pecuarius</i>	Plover, Kittlitz's		PG Schedule 2 Section 15(1)(a)	LC	LC	1		4
<i>Charadrius tricollaris</i>	Plover, Three-banded		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	4
<i>Netta erythrophthalma</i>	Pochard, Southern		PG Schedule 2 Section 15(1)(a)	LC	LC	1		4
<i>Glareola nordmanni</i>	Pratincole, Black-winged		PG Schedule 2 Section 15(1)(a)	NT	NT	1		4
<i>Prinia flavicans</i>	Prinia, Black-chested		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	1

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<i>Prinia subflava</i>	Prinia, Tawny-flanked		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	1
<i>Dryoscopus cubla</i>	Puffback, Black-backed		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	2
<i>Pytilia melba</i>	Pytilia, Green-winged		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	1
<i>Ortygospiza atricollis</i>	Quail-finch, African		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	3
<i>Coturnix coturnix</i>	Quail, Common		PG Schedule 2 Section 15(1)(a)	LC	LC	1		3
<i>Coturnix delegorguei</i>	Quail, Harlequin		PG Schedule 2 Section 15(1)(a)	LC	LC	1		3
<i>Quelea quelea</i>	Quelea, Red-billed		WA Schedule 5 Section 43	LC	LC	1	1	2
<i>Rallus caerulescens</i>	Rail, African		PG Schedule 2 Section 15(1)(a)	LC	LC	1		4
<i>Cossypha caffra</i>	Robin-chat, Cape		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	3
<i>Cossypha humeralis</i>	Robin-chat, White-throated		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	4
<i>Cercotrichas paena</i>	Robin, Kalahari Scrub		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	2
<i>Cercotrichas leucophrys</i>	Robin, White-browed Scrub		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	2
<i>Coracias garrulus</i>	Roller, European		PG Schedule 2 Section 15(1)(a)	LC	NT	1		2
<i>Coracias caudatus</i>	Roller, Lilac-breasted		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	2
<i>Coracias naevius</i>	Roller, Purple		PG Schedule 2 Section 15(1)(a)	LC	LC	1		2
<i>Philomachus pugnax</i>	Ruff		PG Schedule 2 Section 15(1)(a)	LC	LC	1		4
<i>Pterocles bicinctus</i>	Sandgrouse, Double-banded		PG Schedule 2 Section 15(1)(a)	LC	LC	1		4
<i>Pterocles gutturalis</i>	Sandgrouse, Yellow-throated		PG Schedule 2 Section 15(1)(a)	LC	NT	1		3
<i>Actitis hypoleucos</i>	Sandpiper, Common		PG Schedule 2 Section 15(1)(a)	LC	LC	1		4
<i>Calidris ferruginea</i>	Sandpiper, Curlew		PG Schedule 2 Section 15(1)(a)	NT	LC	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		4
<i>Tringa glareola</i>	Sandpiper, Wood		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	4
<i>Rhinopomastus cyanomelas</i>	Scimitarbill, Common		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	2
<i>Sagittarius serpentarius</i>	Secretarybird		PG Schedule 2 Section 15(1)(a)	VU	VU	1		3
<i>Crithagra gularis</i>	Seedeater, Streaky-headed		PG Schedule 2 Section 15(1)(a)	LC	LC	1		2
<i>Tadorna cana</i>	Shelduck, South African		PG Schedule 2 Section 15(1)(a)	LC	LC	1		4
<i>Accipiter badius</i>	Shikra		PG Schedule 2 Section 15(1)(a)	LC	LC	1		3
<i>Anas smithii</i>	Shoveler, Cape		PG Schedule 2 Section 15(1)(a)	LC	LC	1		4
<i>Laniarius atrococcineus</i>	Shrike, Crimson-breasted		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	2
<i>Lanius minor</i>	Shrike, Lesser Grey		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	1
<i>Corvinella melanoleuca</i>	Shrike, Magpie		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	2
<i>Lanius collurio</i>	Shrike, Red-backed		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	1
<i>Eurocephalus anguitimens</i>	Shrike, Southern White-crowned		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	2

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<i>Gallinago nigripennis</i>	Snipe, African		PG Schedule 2 Section 15(1)(a)	LC	LC	1		4
<i>Plocepasser mahali</i>	Sparrow-weaver, White-browed		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	2
<i>Passer melanurus</i>	Sparrow, Cape		WA Schedule 5 Section 43	LC	LC	1	1	1
<i>Passer motitensis</i>	Sparrow, Great		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	2
<i>Passer domesticus</i>	Sparrow, House		PG Schedule 2 Section 15(1)(a)			1	1	3
<i>Passer diffusus</i>	Sparrow, Southern Grey-headed		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	2
<i>Accipiter melanoleucus</i>	Sparrowhawk, Black		PG Schedule 2 Section 15(1)(a)	LC	LC	1		4
<i>Accipiter minullus</i>	Sparrowhawk, Little		PG Schedule 2 Section 15(1)(a)	LC	LC	1		4
<i>Accipiter ovampensis</i>	Sparrowhawk, Ovambo		PG Schedule 2 Section 15(1)(a)	LC	LC	1		4
<i>Platalea alba</i>	Spoonbill, African		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	4
<i>Pternistis natalensis</i>	Spurfowl, Natal		OG Schedule 3 Section 15(1)(b)	LC	LC	1	1	3
<i>Pternistis swainsonii</i>	Spurfowl, Swainson's		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	1
<i>Lamprotornis australis</i>	Starling, Burchell's		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	3
<i>Lamprotornis nitens</i>	Starling, Cape Glossy		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	1
<i>Lamprotornis bicolor</i>	Starling, Pied		PG Schedule 2 Section 15(1)(a)	LC	LC	1		3
<i>Onychognathus morio</i>	Starling, Red-winged		WA Schedule 5 Section 43	LC	LC	1	1	4
<i>Cinnyricinclus leucogaster</i>	Starling, Violet-backed		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	4
<i>Creatophora cinerea</i>	Starling, Wattled		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	2
<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		4
<i>Saxicola torquatus</i>	Stonechat, African		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	4
<i>Ciconia abdimii</i>	Stork, Abdim's		PG Schedule 2 Section 15(1)(a)	LC	NT	1	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		3
<i>Ciconia ciconia</i>	Stork, White		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	4
<i>Mycteria ibis</i>	Stork, Yellow-billed		PG Schedule 2 Section 15(1)(a)	LC	EN	1		4
<i>Chalcomitra amethystina</i>	Sunbird, Amethyst		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	3
<i>Cinnyris afer</i>	Sunbird, Greater Double-collared		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	4
<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	1	2
<i>Cinnyris talatala</i>	Sunbird, White-bellied		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	1
<i>Hirundo rustica</i>	Swallow, Barn		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	2
<i>Hirundo cucullata</i>	Swallow, Greater Striped		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	4
<i>Hirundo abyssinica</i>	Swallow, Lesser Striped		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	2

SCIENTIFIC NAME	ALPHABETICAL COMMON NAME	RSA LEGAL STATUS	NORTH WEST LEGAL STATUS	GLOBAL RED LIST STATUS	REGIONAL RED LIST STATUS	LoO		
						QDS	PENTAD	SITE
<i>Hirundo dimidiata</i>	Swallow, Pearl-breasted		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	4
<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		4
<i>Hirundo albigularis</i>	Swallow, White-throated		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	3
<i>Porphyrio madagascariensis</i>	Swamphen, African (Purple)		PG Schedule 2 Section 15(1)(a)	LC	LC	1		4
<i>Apus barbatus</i>	Swift, African Black		PG Schedule 2 Section 15(1)(a)	LC	LC	1		3
<i>Cypsiurus parvus</i>	Swift, African Palm		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	4
<i>Tachymarptis melba</i>	Swift, Alpine		PG Schedule 2 Section 15(1)(a)	LC	LC	1		4
<i>Apus apus</i>	Swift, Common		PG Schedule 2 Section 15(1)(a)	LC	LC	1		2
<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	3
<i>Apus caffer</i>	Swift, White-rumped		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	3
<i>Tchagra senegalus</i>	Tchagra, Black-crowned		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	2
<i>Tchagra australis</i>	Tchagra, Brown-crowned		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	2
<i>Anas capensis</i>	Teal, Cape		PG Schedule 2 Section 15(1)(a)	LC	LC	1		4
<i>Anas hottentota</i>	Teal, Hottentot		PG Schedule 2 Section 15(1)(a)	LC	LC	1		4
<i>Anas erythrorhyncha</i>	Teal, Red-billed		OG Schedule 3 Section 15(1)(b)	LC	LC	1	1	4
<i>Chlidonias hybrida</i>	Tern, Whiskered		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	4
<i>Chlidonias leucopterus</i>	Tern, White-winged		PG Schedule 2 Section 15(1)(a)	LC	LC	1		4
<i>Burhinus capensis</i>	Thick-knee, Spotted		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	2
<i>Monticola rupestris</i>	Thrush, Cape Rock		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	4
<i>Psophocichla litsipsirupa</i>	Thrush, Groundscraper		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	3
<i>Turdus smithi</i>	Thrush, Karoo		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	4
<i>Turdus libonyanus</i>	Thrush, Kurrichane		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	4
<i>Turdus olivaceus</i>	Thrush, Olive		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	1	1	4
<i>Pogoniulus chrysoconus</i>	Tinkerbird, Yellow-fronted		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	2
<i>Parisoma subcaeruleum</i>	Tit-Babbler, Chestnut-vented		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	2
<i>Parus cinerascens</i>	Tit, Ashy		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	1
<i>Parus niger</i>	Tit, Southern Black		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	3
<i>Gyps coprotheres</i>	Vulture, Cape	EN	PG Schedule 2 Section 15(1)(a)	EN	EN	1	1	3
<i>Torgos tracheliotos</i>	Vulture, Lappet-faced	EN	PG Schedule 2 Section 15(1)(a)	EN	EN	1		3
<i>Gyps africanus</i>	Vulture, White-backed	EN	PG Schedule 2 Section 15(1)(a)	CR	CR	1		3
<i>Motacilla aguimp</i>	Wagtail, African Pied		PG Schedule 2 Section 15(1)(a)	LC	LC	1		4

SCIENTIFIC NAME	ALPHABETICAL COMMON NAME	RSA LEGAL STATUS	NORTH WEST LEGAL STATUS	GLOBAL RED LIST STATUS	REGIONAL RED LIST STATUS	LoO		
						QDS	PENTAD	SITE
<i>Motacilla capensis</i>	Wagtail, Cape		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	4
<i>Motacilla flava</i>	Wagtail, Western Yellow		PG Schedule 2 Section 15(1)(a)	LC	LC	1		4
<i>Acrocephalus baeticatus</i>	Warbler, African Reed		PG Schedule 2 Section 15(1)(a)	LC	LC	1		4
<i>Calamonastes fasciolatus</i>	Warbler, Barred Wren-		PG Schedule 2 Section 15(1)(a)	LC	LC	1		2
<i>Sylvia borin</i>	Warbler, Garden		PG Schedule 2 Section 15(1)(a)	LC	LC	1		4
<i>Acrocephalus arundinaceus</i>	Warbler, Great Reed		PG Schedule 2 Section 15(1)(a)	LC	LC	1		4
<i>Hippolais icterina</i>	Warbler, Icterine		PG Schedule 2 Section 15(1)(a)	LC	LC	1		4
<i>Acrocephalus gracilirostris</i>	Warbler, Lesser Swamp		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	4
<i>Bradypterus baboecala</i>	Warbler, Little Rush		PG Schedule 2 Section 15(1)(a)	LC	LC	1		4
<i>Acrocephalus palustris</i>	Warbler, Marsh		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	4
<i>Hippolais olivetorum</i>	Warbler, Olive-tree		PG Schedule 2 Section 15(1)(a)	LC	LC	1		2
<i>Acrocephalus schoenobaenus</i>	Warbler, Sedge		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	4
<i>Phylloscopus trochilus</i>	Warbler, Willow		PG Schedule 2 Section 15(1)(a)	LC	LC	1		3
<i>Estrilda erythronotos</i>	Waxbill, Black-faced		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	2
<i>Uraeginthus angolensis</i>	Waxbill, Blue		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	1
<i>Estrilda astrild</i>	Waxbill, Common		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	3
<i>Amandava subflava</i>	Waxbill, Orange-breasted		PG Schedule 2 Section 15(1)(a)	LC	LC	1		4
<i>Granatina granatina</i>	Waxbill, Violet-eared		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	2
<i>Ploceus capensis</i>	Weaver, Cape		WA Schedule 5 Section 43	LC	LC	1		4
<i>Ploceus intermedius</i>	Weaver, Lesser Masked		PG Schedule 2 Section 15(1)(a)	LC	LC	1		2
<i>Bubalornis niger</i>	Weaver, Red-billed Buffalo		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	3
<i>Anaplectes rubriceps</i>	Weaver, Red-headed		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	3
<i>Ploceus velatus</i>	Weaver, Southern Masked		WA Schedule 5 Section 43	LC	LC	1	1	1
<i>Ploceus cucullatus</i>	Weaver, Village		WA Schedule 5 Section 43	LC	LC	1	1	3
<i>Oenanthe pileata</i>	Wheatear, Capped		PG Schedule 2 Section 15(1)(a)	LC	LC	1		2
<i>Oenanthe monticola</i>	Wheatear, Mountain		PG Schedule 2 Section 15(1)(a)	LC	LC	1		4
<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	1	4
<i>Sylvia communis</i>	Whitethroat, Common		PG Schedule 2 Section 15(1)(a)	LC	LC	1		3
<i>Vidua paradisaea</i>	Whydah, Long-tailed Paradise		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	2
<i>Vidua macroura</i>	Whydah, Pin-tailed		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	3
<i>Vidua regia</i>	Whydah, Shaft-tailed		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	1
<i>Euplectes progne</i>	Widowbird, Long-tailed		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	4
<i>Euplectes ardens</i>	Widowbird, Red-collared		PG Schedule 2 Section 15(1)(a)	LC	LC	1		4

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<i>Euplectes albonotatus</i>	Widowbird, White-winged		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	4
<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	1	3
<i>Campethera bennettii</i>	Woodpecker, Bennett's		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	4
<i>Dendropicos fuscescens</i>	Woodpecker, Cardinal		PG Schedule 2 Section 15(1)(a)	LC	LC	1	1	2
<i>Campethera abingoni</i>	Woodpecker, Golden-tailed		PG Schedule 2 Section 15(1)(a)	LC	LC	1		2
<i>Jynx ruficollis</i>	Wryneck, Red-throated		PG Schedule 2 Section 15(1)(a)	LC	LC	1		4

**Status:** CR = Critically Endangered; EN = Endangered; LC = Least Concern; NT = Near Threatened; 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 (2016)

## 13.4. Reptile list for the study area

FAMILY & SCIENTIFIC NAME	COMMON NAME	RSA LEGAL STATUS	NORTH WEST LEGAL STATUS	RED LIST STATUS	LoO	
					QDS	SITE
<b>AGAMIDAE</b>	<b>Agamas</b>					
<i>Acanthocercus atricollis atricollis</i>	Southern Tree Agama		<b>PG Schedule 2 Section 15(1)(a)</b>	1LC	2	3
<i>Agama aculeata distanti</i>	Distant's Ground Agama		<b>PG Schedule 2 Section 15(1)(a)</b>	1LC	2	3
<i>Agama atra</i>	Southern Rock Agama		<b>PG Schedule 2 Section 15(1)(a)</b>	1LC	2	4
<b>AMPHISBAENIDAE</b>	<b>Worm lizards</b>					
<i>Monopeltis infuscata</i>	Dusky Worm Lizard		<b>PG Schedule 2 Section 15(1)(a)</b>	2LC	3	3
<b>CHAMAELEONIDAE</b>	<b>Chameleons</b>					
<i>Chamaeleo dilepis dilepis</i>	Common Flap-neck Chameleon		<b>PG Schedule 2 Section 15(1)(a)</b>	2LC*	2	2
<b>COLUBRIDAE</b>	<b>Typical snakes</b>					
<i>Crotaphopeltis hotamboeia</i>	Red-lipped Snake		<b>WA Schedule 5 Section 43</b>	2LC	1	2
<i>Dasypeltis scabra</i>	Rhombic Egg-eater		<b>WA Schedule 5 Section 43</b>	2LC	2	2
<i>Dispholidus typus typus</i>	Boomslang		<b>WA Schedule 5 Section 43</b>	2LC*	2	2
<i>Philothamnus hoplogaster</i>	South Eastern Green Snake		<b>WA Schedule 5 Section 43</b>	2LC	2	4
<i>Philothamnus natalensis occidentalis</i>	Western Natal Green Snake		<b>WA Schedule 5 Section 43</b>	1LC	3	4
<i>Philothamnus semivariiegatus</i>	Spotted Bush Snake		<b>WA Schedule 5 Section 43</b>	2LC	2	2
<i>Telescopus semiannulatus semiannulatus</i>	Eastern Tiger Snake		<b>WA Schedule 5 Section 43</b>	2LC	2	2
<i>Thelotornis capensis capensis</i>	Southern Twig Snake		<b>WA Schedule 5 Section 43</b>	1LC	3	2
<b>CORDYLIDAE</b>	<b>Crag, flat &amp; girdled lizards</b>					
<i>Cordylus jonesii</i>	Jones' Girdled Lizard		<b>PG Schedule 2 Section 15(1)(a)</b>	1LC	3	4
<i>Cordylus vittifer</i>	Common Girdled Lizard		<b>PG Schedule 2 Section 15(1)(a)</b>	1LC	2	4
<b>ELAPIDAE</b>	<b>Cobras, mambas &amp; relatives</b>					
<i>Aspidelaps scutatus scutatus</i>	Speckled Shield Cobra		<b>WA Schedule 5 Section 43</b>	1LC	3	3
<i>Elapsoidea sundevallii sundevallii</i>	Sundevall's Garter Snake		<b>WA Schedule 5 Section 43</b>	1LC*	3	3
<i>Naja annulifera</i>	Snouted Cobra		<b>WA Schedule 5 Section 43</b>	2LC	2	2
<i>Naja mossambica</i>	Mozambique Spitting Cobra		<b>WA Schedule 5 Section 43</b>	2LC	2	2
<b>GEKKONIDAE</b>	<b>Geckos</b>					
<i>Chondrodactylus turneri</i>	Turner's Gecko		<b>PG Schedule 2 Section 15(1)(a)</b>	1LC	2	4
<i>Hemidactylus mabouia</i>	Common Tropical House Gecko		<b>PG Schedule 2 Section 15(1)(a)</b>	2LC	3	2
<i>Lygodactylus capensis capensis</i>	Common Dwarf Gecko		<b>PG Schedule 2 Section 15(1)(a)</b>	1LC	1	1
<i>Lygodactylus (ocellatus) ocellatus</i>	Spotted Dwarf Gecko		<b>PG Schedule 2 Section 15(1)(a)</b>	1LC	3	4
<i>Pachydactylus affinis</i>	Transvaal Gecko		<b>PG Schedule 2 Section 15(1)(a)</b>	1LC	2	3
<i>Pachydactylus capensis</i>	Cape Gecko		<b>PG Schedule 2 Section 15(1)(a)</b>	2LC	2	2
<b>GERRHOSAURIDAE</b>	<b>Plated lizards &amp; seps</b>					

FAMILY & SCIENTIFIC NAME	COMMON NAME	RSA LEGAL STATUS	NORTH WEST LEGAL STATUS	RED LIST STATUS	LoO	
					QDS	SITE
<i>Gerrhosaurus flavigularis</i>	Yellow-throated Plated Lizard		PG Schedule 2 Section 15(1)(a)	2LC	1	2
<b>LACERTIDAE</b>	<b>Typical lizards</b>					
<i>Ichnotropis capensis</i>	Ornate Rough-scaled Lizard		PG Schedule 2 Section 15(1)(a)	1LC	3	3
<i>Meroles squamulosus</i>	Common Rough-scaled Lizard		PG Schedule 2 Section 15(1)(a)	1LC	2	3
<i>Nucras holubi</i>	Holub's Sandveld Lizard		PG Schedule 2 Section 15(1)(a)	2LC	2	3
<i>Nucras intertexta</i>	Spotted Sandveld Lizard		PG Schedule 2 Section 15(1)(a)	2LC	1	3
<i>Nucras lalandii</i>	Delalande's Sandveld Lizard		PG Schedule 2 Section 15(1)(a)	1LC	3	4
<i>Nucras ornata</i>	Ornate Sandveld Lizard		PG Schedule 2 Section 15(1)(a)	2LC	3	3
<i>Pedioplanis lineoocellata lineoocellata</i>	Spotted Sand Lizard		PG Schedule 2 Section 15(1)(a)	2LC	3	3
<b>LAMPROPHIIDAE</b>	<b>Lamprophid snakes</b>					
<i>Aparallactus capensis</i>	Black-headed Centipede-eater		WA Schedule 5 Section 43	2LC	1	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	2	2
<i>Duberria lutrix lutrix</i>	South African Slug-eater		WA Schedule 5 Section 43	1LC	3	3
<i>Gonionotophis capensis capensis</i>	Common File Snake		WA Schedule 5 Section 43	2LC	3	2
<i>Gonionotophis nyassae</i>	Black File Snake		WA Schedule 5 Section 43	2LC	3	2
<i>Homoroselaps dorsalis</i>	Striped Harlequin Snake		WA Schedule 5 Section 43	1NT	3	3
<i>Lamprophis aurora</i>	Aurora House Snake		WA Schedule 5 Section 43	1LC	3	4
<i>Lycodonomorphus inornatus</i>	Olive House Snake		WA Schedule 5 Section 43	1LC	3	3
<i>Lycodonomorphus rufulus</i>	Brown Water Snake		WA Schedule 5 Section 43	1LC	3	3
<i>Lycophidion capense capense</i>	Cape Wolf Snake		WA Schedule 5 Section 43	2LC	2	2
<i>Prosymna bivittata</i>	Two-striped Shovel-snout		WA Schedule 5 Section 43	1LC	3	2
<i>Prosymna sundevallii</i>	Sundevall's Shovel-snout		WA Schedule 5 Section 43	1LC	3	3
<i>Psammophis angolensis</i>	Dwarf Sand Snake		WA Schedule 5 Section 43	2LC	3	4
<i>Psammophis brevirostris</i>	Short-snouted Grass Snake		WA Schedule 5 Section 43	1LC	2	3
<i>Psammophis subtaeniatus</i>	Western Yellow-bellied Sand Snake		WA Schedule 5 Section 43	2LC	3	2
<i>Psammophis trinasalis</i>	Fork-marked Sand Snake		WA Schedule 5 Section 43	2LC	3	2
<i>Psammophylax tritaeniatus</i>	Striped Grass Snake		WA Schedule 5 Section 43	2LC	2	2
<i>Pseudaspis cana</i>	Mole Snake		WA Schedule 5 Section 43	2LC	2	2
<b>LEPTOTYPHLOPIDAE</b>	<b>Thread snakes</b>					
<i>Leptotyphlops distanti</i>	Distant's Thread Snake		WA Schedule 5 Section 43	1LC	2	2
<i>Leptotyphlops incognitus</i>	Incognito Thread Snake		WA Schedule 5 Section 43	1LC	3	2
<i>Leptotyphlops scutifrons conjunctus</i>	Eastern Thread Snake		WA Schedule 5 Section 43	1LC*	3	3
<i>Leptotyphlops scutifrons scutifrons</i>	Peters' Thread Snake		WA Schedule 5 Section 43	1LC*	2	2

FAMILY & SCIENTIFIC NAME	COMMON NAME	RSA LEGAL STATUS	NORTH WEST LEGAL STATUS	RED LIST STATUS	LoO	
					QDS	SITE
<b>PELOMEDUSIDAE</b>	<b>Terrapins</b>					
<i>Pelomedusa galeata</i>	South African Marsh Terrapin		PG Schedule 2 Section 15(1)(a)		2	4
<i>Pelusios sinuatus</i>	Serrated Hinged Terrapin		PG Schedule 2 Section 15(1)(a)	2LC	3	4
<b>PYTHONIDAE</b>	<b>Python</b>					
<i>Python natalensis</i>	Southern African Python	PS	WA Schedule 5 Section 43	2LC	2	3
<b>SCINCIDAE</b>	<b>Skinks</b>					
<i>Acontias occidentalis</i>	Western Legless Skink		PG Schedule 2 Section 15(1)(a)	1LC	3	3
<i>Afroablepharus wahlbergii</i>	Wahlberg's Snake-eyed Skink		PG Schedule 2 Section 15(1)(a)	2LC	2	3
<i>Mochlus (sundevallii) sundevallii</i>	Sundevall's Writhing Skink		PG Schedule 2 Section 15(1)(a)	2LC	1	2
<i>Trachylepis capensis</i>	Cape Skink		PG Schedule 2 Section 15(1)(a)	2LC	2	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
<b>TESTUDINIDAE</b>	<b>Tortoises</b>					
<i>Kinixys lobatsiana</i>	Lobatse Hinged Tortoise		PG Schedule 2 Section 15(1)(a)	1LC	2	3
<i>Kinixys spekii</i>	Speke's Hinged Tortoise		PG Schedule 2 Section 15(1)(a)	2LC	3	3
<i>Psammobates oculifer</i>	Serrated Tent Tortoise		PG Schedule 2 Section 15(1)(a)	1LC	3	3
<i>Stigmochelys pardalis</i>	Leopard Tortoise		PG Schedule 2 Section 15(1)(a)	1LC	2	3
<b>TYPHLOPIDAE</b>	<b>Blind snakes</b>					
<i>Afrotyphlops bibronii</i>	Bibron's Blind Snake		WA Schedule 5 Section 43	1LC	2	2
<i>Rhinotyphlops lalandei</i>	Delalande's Beaked Blind Snake		WA Schedule 5 Section 43	2LC	2	3
<b>VARANIDAE</b>	<b>Monitors</b>					
<i>Varanus albigularis albigularis</i>	Rock Monitor		WA Schedule 5 Section 43	2LC	1	4
<i>Varanus niloticus</i>	Water Monitor		WA Schedule 5 Section 43	2LC	1	4
<b>VIPERIDAE</b>	<b>Adders</b>					
<i>Bitis arietans arietans</i>	Puff Adder		WA Schedule 5 Section 43	2LC	1	2
<i>Bitis caudalis</i>	Horned Adder		WA Schedule 5 Section 43	2LC	3	3
<i>Causus rhombeatus</i>	Rhombic Night Adder		WA Schedule 5 Section 43	2LC	3	2

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

**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 (2016)

## 13.5. Frog list for the study area

FAMILY & SCIENTIFIC NAME	COMMON NAME	NORTH WEST LEGAL STATUS	GLOBAL RED LIST STATUS	REGIONAL RED LIST STATUS	LoO		
					QDS	SITE	
<b>BREVICIPITIDAE</b>	<b>Rain frogs</b>						
<i>Breviceps adspersus adspersus</i>	Bushveld Rain Frog		LC (U)*	LC	2	2	
<b>BUFONIDAE</b>	<b>True toads</b>						
<i>Poyntonophrynus fenoulheti</i>	Northern Pygmy Toad		LC (U)	LC	3	4	
<i>Poyntonophrynus vertebralis</i>	Southern Pygmy Toad		LC (U)	LC	3	4	
<i>Schismaderma carens</i>	Red Toad		LC (U)	LC	1	3	
<i>Sclerophrys garmani</i>	Olive Toad		LC (U)	LC	2	3	
<i>Sclerophrys gutturalis</i>	Guttural Toad		LC (I)	LC	2	2	
<i>Sclerophrys poweri</i>	Power's Toad		LC (U)	LC	3	2	
<b>HYPEROLIIDAE</b>	<b>Leaf-folding &amp; reed frogs</b>						
<i>Kassina senegalensis</i>	Bubbling Kassina		LC (U)	LC	1	3	
<b>MICROHYLIDAE</b>	<b>Rubber frogs</b>						
<i>Phrynomantis bifasciatus</i>	Banded Rubber Frog		LC (U)	LC	1	3	
<b>PHRYNOBATRACHIDAE</b>	<b>Puddle frogs</b>						
<i>Phrynobatrachus natalensis</i>	Snoring Puddle Frog		LC (S)	LC	1	3	
<b>PIPIDAE</b>	<b>African clawed frogs</b>						
<i>Xenopus laevis</i>	Common Platanna		LC (I)	LC	2	4	
<b>PTYCHADENIDAE</b>	<b>Grass frogs</b>						
<i>Ptychadena anchietae</i>	Plain Grass Frog		LC (U)	LC	1	3	
<i>Ptychadena mossambica</i>	Broad-banded Grass Frog		LC (U)	LC	3	3	
<i>Ptychadena porosissima</i>	Striped Grass Frog		LC (U)	LC	3	4	
<b>PYXICEPHALIDAE</b>	<b>Moss, river, sand &amp; stream frogs</b>						
<i>Amietia fuscigula</i>	Cape River Frog		LC (S)	LC	3	4	
<i>Amietia queketti</i>	Quekett's River Frog		LC (S)	LC	1	4	
<i>Cacosternum boettgeri</i>	Common Caco		LC (U)	LC	1	3	
<i>Pyxicephalus adspersus</i>	Giant Bullfrog	<b>PG Schedule 2 Section 15(1)(a)</b>	LC (D)	<b>NT</b>	2	3	
<i>Pyxicephalus edulis</i>	African Bullfrog		LC (U)	LC	3	3	
<i>Strongylopus fasciatus</i>	Striped Stream Frog		LC (U)	LC	3	4	
<i>Tomopterna cryptotis</i>	Tremolo Sand Frog		LC (S)	LC	2	3	
<i>Tomopterna natalensis</i>	Natal Sand Frog		LC (U)	LC	2	3	
<b>RHACOPHORIDAE</b>	<b>Foam Nest Frog</b>						
<i>Chiromantis xerampelina</i>	Southern Foam Nest Frog		LC (U)	LC	3	4	

**Status:** D = Declining; LC = Least Concern; NT = Near Threatened; PG = Protected Game; S = Stable; U = Unknown

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

**Sources:** Transvaal Nature Conservation Ordinance (1983); Minter *et al.* (2004); NEM:BA ToPS (2015); FrogMAP (2016); IUCN (2016)

## 13.6. Butterfly list for the study area

FAMILY & SCIENTIFIC NAME	COMMON NAME	NORTH WEST LEGAL STATUS	RED LIST STATUS	LoO QDS
<b>HESPERIIDAE</b>	<b>Sandmen, skippers, sylphs &amp; relatives</b>			
<i>Abantis tettensis</i>	Spotted Velvet Skipper		1LC	2
<i>Borbo fallax</i>	False Swift		1LC	3
<i>Borbo holtzi</i>	Variable Swift		1LC	3
<i>Caprona pillaana</i>	Ragged Skipper		1LC	2
<i>Coeliades forestan forestan</i>	Striped Policeman		1LC	3
<i>Coeliades pisistratus</i>	Two-pip Policeman		1LC	2
<i>Eretis umbra umbra</i>	Small Marbled Elf		1LC End	3
<i>Gegenes niso niso</i>	Common Hottentot		1LC	1
<i>Gegenes pumilio gambica</i>	Dark Hottentot		1LC	2
<i>Gomalia elma elma</i>	Green-marbled Skipper			2
<i>Kedestes barberae barberae</i>	Barber's Ranger		1LC	3
<i>Kedestes callicles</i>	Pale Ranger		LC	2
<i>Kedestes lepenula</i>	Chequered Ranger		1LC	2
<i>Kedestes macomo</i>	Macomo Ranger		1LC	3
<i>Kedestes nerva nerva</i>	Scarce Ranger		1LC End	3
<i>Leucochitonea levubu</i>	White-cloaked Skipper		1LC	2
<i>Metisella malgacha malgacha</i>	Grassveld Sylph		1LC End	3
<i>Metisella meninx</i>	Marsh Sylph		<b>1LC Rare Habitat Specialist</b>	3
<i>Metisella willemi</i>	Netted Sylph		1LC	2
<i>Parosmodes morantii morantii</i>	Morant's Orange		1LC	3
<i>Pelopidas mathias</i>	Black-banded Swift		1LC	2
<i>Pelopidas thrax</i>	White-banded Swift		1LC	3
<i>Platylesches ayresii</i>	Peppered Hopper		1LC	2
<i>Platylesches neba</i>	Flower-girl Hopper		1LC	2
<i>Sarangesa motozi</i>	Elfin Skipper		1LC	2
<i>Sarangesa phidyle</i>	Small Elfin		1LC	1
<i>Sarangesa seineri seineri</i>	Dark Elfin		1LC	3
<i>Spialia asterodia</i>	Star Sandman		1LC	3
<i>Spialia colotes transvaaliae</i>	Bushveld Sandman		1LC	2

FAMILY & SCIENTIFIC NAME	COMMON NAME	NORTH WEST LEGAL STATUS	RED LIST STATUS	LoO QDS
<i>Spialia delagoae</i>	Delagoa Sandman		1LC	2
<i>Spialia depauperata australis</i>	Wandering Sandman		1LC	3
<i>Spialia diomus ferax</i>	Common Sandman		1LC	1
<i>Spialia dromus</i>	Forest Sandman		1LC	3
<i>Spialia mafa mafa</i>	Mafa Sandman		1LC	3
<i>Spialia paula</i>	Mite Sandman		1LC	3
<i>Spialia spio</i>	Mountain Sandman		1LC	2
<i>Tsitana tsita</i>	Dismal Sylph		1LC	3
<b>LYCAENIDAE</b>	<b>Blues, coppers, opals &amp; relatives</b>			
<i>Actizera lucida</i>	Rayed Blue		1LC	2
<i>Alaena amazoula ochroma</i>	Yellow Zulu		1LC	2
<i>Aloeides aranda</i>	Aranda Copper		1LC	3
<i>Aloeides damarensis damarensis</i>	Damara Copper		1LC	2
<i>Aloeides henningi</i>	Henning's Copper		1LC End	3
<i>Aloeides molomo molomo</i>	Molomo Copper		1LC End	3
<i>Aloeides taikosama</i>	Dusky Copper		1LC	1
<i>Aloeides trimeni trimeni</i>	Trimen's Copper		1LC	3
<i>Anthene amarah amarah</i>	Black Striped Hairtail		1LC	1
<i>Anthene definita definita</i>	Common Hairtail		1LC	2
<i>Anthene dulcis dulcis</i>	Mashuna Hairtail		1LC	2
<i>Anthene livida livida</i>	Pale Hairtail		1LC	2
<i>Anthene millari</i>	Millar's Hairtail		1LC	3
<i>Anthene otacilia otacilia</i>	Otacilia Hairtail		1LC	1
<i>Anthene princeps</i>	Lebombo Hairtail		1LC	3
<i>Anthene talboti</i>	Talbot's Hairtail		1LC	3
<i>Aphnaeus hutchinsonii</i>	Hutchinson's Highflier		1LC	3
<i>Axiocerses amanga amanga</i>	Bush Scarlet		1LC	2
<i>Axiocerses coalescens</i>	Black-tipped Scarlet		1LC	3
<i>Axiocerses tjoane tjoane</i>	Eastern Scarlet		1LC	2
<i>Azanus jesous</i>	Topaz Babul Blue		1LC	1
<i>Azanus mirza</i>	Pale Babul Blue		1LC End	3
<i>Azanus moriqua</i>	Black-bordered Babul Blue		1LC	1



FAMILY & SCIENTIFIC NAME	COMMON NAME	NORTH WEST LEGAL STATUS	RED LIST STATUS	LoO QDS
<i>Azanus natalensis</i>	Natal Babul Blue		1LC	3
<i>Azanus ubaldus</i>	Velvet-spotted Babul Blue		1LC	2
<i>Cacyreus marshalli</i>	Common Geranium Bronze		1LC	2
<i>Cacyreus virilis</i>	Mocker Bronze		1LC	2
<i>Chilades trochylus</i>	Grass Jewel		1LC	1
<i>Cigaritis ella</i>	Ella's Bar		1LC	1
<i>Cigaritis mozambica</i>	Mozambique Bar		1LC	3
<i>Cigaritis natalensis</i>	Natal Bar		1LC	2
<i>Cigaritis phanes</i>	Silvery Bar		1LC	2
<i>Cnodontes penningtoni</i>	Pennington's Buff		1LC	2
<i>Crudaria leroma</i>	Silver Spotted Grey		1LC	2
<i>Cupidopsis cissus cissus</i>	Common Meadow Blue		1LC	3
<i>Cupidopsis jobates jobates</i>	Tailed Meadow Blue		1LC	2
<i>Eicochrysops messapus mahallakoaena</i>	Cupreous Blue		1LC	1
<i>Euchrysops barkeri</i>	Barker's Smoky Blue		1LC	3
<i>Euchrysops dolorosa</i>	Sabie Smoky Blue		1LC	3
<i>Euchrysops malathana</i>	Common Smoky Blue		1LC	2
<i>Euchrysops osiris</i>	Osiris Smoky Blue		1LC	3
<i>Euchrysops subpallida</i>	Ashen Smoky Blue		1LC	3
<i>Hypolycaena philippus philippus</i>	Purplebrown Hairstreak		1LC	2
<i>Iolaus alienus alienus</i>	Brown-line Sapphire		1LC	3
<i>Iolaus mimosae rhodosense</i>	Mimosa Sapphire		1LC	3
<i>Iolaus pallene</i>	Saffron Sapphire		1LC	2
<i>Iolaus trimeni</i>	Trimen's Sapphire		1LC	1
<i>Lachnocnema bibulus</i>	Common Woolly Legs		1LC	2
<i>Lachnocnema durbani</i>	D'Urban's Woolly Legs		1LC	3
<i>Lachnocnema laches</i>	Southern Pied Woolly Legs		1LC	3
<i>Lampides boeticus</i>	Pea Blue		1LC	1
<i>Lepidochrysops glauca</i>	Silvery Blue		1LC	2
<i>Lepidochrysops ignota</i>	Zulu Blue		1LC End	3
<i>Lepidochrysops patricia</i>	Patricia Blue		1LC	2
<i>Lepidochrysops plebeia plebeia</i>	Twin-spot Blue		1LC	2



FAMILY & SCIENTIFIC NAME	COMMON NAME	NORTH WEST LEGAL STATUS	RED LIST STATUS	LoO QDS
<i>Leptomyrina henningi henningi</i>	Henning's Black-eye		1LC	2
<i>Leptotes babaulti</i>	Babault's Zebra Blue		1LC End	3
<i>Leptotes brevidentatus</i>	Short-toothed Zebra Blue		1LC	3
<i>Leptotes jeanneli</i>	Jeannel's Zebra Blue		1LC	3
<i>Leptotes pirithous pirithous</i>	Common Zebra Blue		1LC	1
<i>Myrina silenus ficedula</i>	Common Fig Tree Blue		1LC	3
<i>Oraidium barberae</i>	Dwarf Blue		1LC	3
<i>Pseudonacaduba sichela sichela</i>	Dusky Line Blue		1LC	2
<i>Stugeta bowkeri tearei</i>	Bowker's Marbled Sapphire		1LC	2
<i>Tarucus sybaris sybaris</i>	Dotted Blue		1LC	1
<i>Thestor basutus capeneri</i>	Basuto Skolly		1LC	3
<i>Tuxentius calice</i>	White Pie		1LC	2
<i>Tuxentius melaena melaena</i>	Black Pie		1LC	1
<i>Uranotauma nubifer nubifer</i>	Black Heart		1LC	2
<i>Virachola antalus</i>	Brown Playboy		1LC	1
<i>Virachola dinochares</i>	Apricot Playboy		1LC	2
<i>Zintha hintza hintza</i>	Hintza Pierrot		1LC	2
<i>Zizeeria knysna knysna</i>	African / Sooty Grass Blue		1LC	2
<i>Zizula hylax</i>	Tiny / Gaika Grass Blue		1LC	2
<b>NYMPHALIDAE</b>	<b>Acraeas, browns, charaxes &amp; relatives</b>			
<i>Acraea aglaonice</i>	Clear-spotted / Window Acraea		1LC	2
<i>Acraea anemosa</i>	Broad-bordered Acraea		1LC	2
<i>Acraea axina</i>	Little Acraea		1LC	1
<i>Acraea barberi</i>	Barber's Acraea		1LC	3
<i>Acraea caldarena caldarena</i>	Black-tipped Acraea		1LC	3
<i>Acraea horta</i>	Garden Acraea		1LC	2
<i>Acraea lygus</i>	Lygus Acraea		1LC	3
<i>Acraea natalica</i>	Natal Acraea		1LC	2
<i>Acraea neobule neobule</i>	Wandering Donkey Acraea		1LC	2
<i>Acraea nohara nohara</i>	Light Red Acraea		1LC	3
<i>Acraea oncaea</i>	Window Acraea		1LC	2
<i>Acraea stenobeia</i>	Suffused Acraea		1LC	3



FAMILY & SCIENTIFIC NAME	COMMON NAME	NORTH WEST LEGAL STATUS	RED LIST STATUS	LoO QDS
<i>Byblia anvataracheloia</i>	Joker		1LC	2
<i>Byblia ilithyia</i>	Spotted Joker		1LC	1
<i>Catacroptera cloanthe cloanthe</i>	Pirate		1LC	2
<i>Charaxes achaemenes achaemenes</i>	Bushveld Charaxes	<b>Schedule 7 Section 45</b>	1LC	2
<i>Charaxes brutus natalensis</i>	White-barred Charaxes	<b>Schedule 7 Section 45</b>	1LC	3
<i>Charaxes candiope</i>	Green-veined Charaxes	<b>Schedule 7 Section 45</b>	1LC	3
<i>Charaxes jahlusa rex</i>	Pearl-spotted Charaxes	<b>Schedule 7 Section 45</b>	1LC	2
<i>Charaxes jasius saturnus</i>	Foxy Charaxes	<b>Schedule 7 Section 45</b>	1LC	1
<i>Charaxes vansoni</i>	Van Son's Charaxes	<b>Schedule 7 Section 45</b>	1LC	2
<i>Coenyropsis natalii natalii</i>	Natal Brown		1LC	1
<i>Danaus chrysippus orientis</i>	African Monarch, Plain Tiger		1LC	1
<i>Eurytela dryope angulata</i>	Golden Piper		1LC	3
<i>Hamanumida daedalus</i>	Guinea-fowl Butterfly		1LC	1
<i>Heteropsis perspicua perspicua</i>	Eyed Bush Brown		1LC	2
<i>Hypolimnas misippus</i>	Common Diadem		1LC	1
<i>Junonia hierta cebrene</i>	Yellow Pansy		1LC	1
<i>Junonia oenone oenone</i>	Blue Pansy		1LC	1
<i>Junonia orithya madagascariensis</i>	Eyed Pansy		1LC	1
<i>Melanitis leda</i>	Twilight Brown		1LC End	3
<i>Neptis saclava marpessa</i>	Spotted Sailer		1LC	2
<i>Paternympha narycia</i>	Spotted-eye Brown		1LC End	2
<i>Phalanta phalantha aethiopica</i>	African Leopard		1LC	2
<i>Physcaeneura panda</i>	Dark-webbed Ringlet		1LC	1
<i>Precis antilope</i>	Darker Commodore		1LC	3
<i>Precis archesia archesia</i>	Garden Commodore		1LC	3
<i>Precis ceryne ceryne</i>	Marsh Commodore		1LC	3
<i>Precis octavia sesamus</i>	Gaudy Commodore		1LC	3
<i>Stygionympha wichgrafi williami</i>	Wichgraf's Hillside Brown		1LC End	3
<i>Telchinia burni</i>	Pale-yellow Acraea		1LC	2
<i>Telchinia encedon encedon</i>	White-barred Acraea		1LC	2
<i>Telchinia rahira rahira</i>	Marsh Acraea		1LC	3
<i>Telchinia serena</i>	Dancing Acraea		1LC	1



FAMILY & SCIENTIFIC NAME	COMMON NAME	NORTH WEST LEGAL STATUS	RED LIST STATUS	LoO QDS
<i>Vanessa cardui</i>	Painted Lady		1LC	1
<i>Ypthima asterope asterope</i>	African Ringlet		1LC	2
<i>Ypthima impura paupera</i>	Impure Ringlet		1LC	3
<b>PAPILIONIDAE</b>	<b>Swallowtails, swordtails &amp; relatives</b>			
<i>Graphium antheus</i>	Large Striped Swordtail		1LC	3
<i>Graphium morania</i>	White Lady		1LC	3
<i>Papilio constantinus constantinus</i>	Constantine's Swallowtail		1LC	3
<i>Papilio demodocus demodocus</i>	Citrus Swallowtail		1LC	1
<i>Papilio nireus lyaeus</i>	Green-banded Swallowtail		1LC	2
<b>PIERIDAE</b>	<b>Tips, whites &amp; relatives</b>			
<i>Belenois aurota</i>	Brown-veined White		1LC	1
<i>Belenois creona severina</i>	African Common White		1LC	2
<i>Belenois gidica abyssinica</i>	African Veined White		1LC	3
<i>Belenois zochalia zochalia</i>	Forest White		1LC	3
<i>Catopsilia florella</i>	African Migrant		1LC	1
<i>Colias electo electo</i>	African Clouded Yellow		1LC	2
<i>Colotis annae annae</i>	Scarlet Tip		1LC	3
<i>Colotis antevippe gavisa</i>	Red Tip		1LC	2
<i>Colotis euipe omphale</i>	Smoky Orange Tip		1LC	1
<i>Colotis evagore antigone</i>	Small Orange Tip		1LC	2
<i>Colotis evenina evenina</i>	Orange Tip		1LC	2
<i>Colotis ione</i>	Bushveld Purple Tip		1LC	3
<i>Colotis pallene</i>	Bushveld Orange Tip		1LC	2
<i>Colotis regina</i>	Queen Purple Tip		1LC	2
<i>Colotis vesta argillaceus</i>	Veined Tip		1LC	2
<i>Eurema brigitta brigitta</i>	Broad-bordered Grass Yellow		1LC	1
<i>Eurema hecabe solifera</i>	Lowveld / Common Grass Yellow		1LC	3
<i>Mylothris agathina agathina</i>	Common Dotted Border		1LC	1
<i>Mylothris rueppellii haemus</i>	Twin Dotted Border		1LC	2
<i>Pinacopteryx eriphia eriphia</i>	Zebra White		1LC	1
<i>Pontia helice helice</i>	Common Meadow White		1LC	2
<i>Teracolus agoye agoye</i>	Speckled Sulphur Tip		1LC	2

FAMILY & SCIENTIFIC NAME	COMMON NAME	NORTH WEST LEGAL STATUS	RED LIST STATUS	LoO QDS
<i>Teracolus agoye bowkeri</i>	Speckled Sulphur Tip		1LC	3
<i>Teracolus eris eris</i>	Banded Gold Tip		1LC	1
<i>Teracolus subfasciatus</i>	Lemon Traveller		1LC	2

**Status:** 1 = Global; 2 = Regional; End = Endemic; LC = Least Concern

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

**Sources:** Transvaal Nature Conservation Ordinance (1983); Mecenero *et al.* (2013); LepiMAP (2016)

## 13.7. Odonata list for the study area

FAMILY & SCIENTIFIC NAME	COMMON NAME	BIOTIC INDEX SCORE	GLOBAL RED LIST STATUS	RSA RED LIST STATUS	LoO QDS
<b>AESHNIDAE</b>	<b>Hawkers</b>				
<i>Anax ephippiger</i>	Vagrant Emperor	2			3
<i>Anax imperator</i>	Blue Emperor	1			3
<b>CHLOROCYPHIDAE</b>	<b>Jewels</b>				
<i>Platycypha caligata</i>	Dancing Jewel	2			3
<b>COENAGRIONIDAE</b>	<b>Pond damsels</b>				
<i>Africallagma glaucum</i>	Swamp Bluet	1			2
<i>Africallagma sapphirinum</i>	Sapphire Bluet	4			3
<i>Azuragrion nigridorsum</i>	Sailing Bluet	3			2
<i>Ceriagrion glabrum</i>	Common Citril	0			3
<i>Ischnura senegalensis</i>	Tropical / Marsh Bluetail	0			2
<i>Pseudagrion citricola</i>	Yellow-faced Sprite	3			3
<i>Pseudagrion hageni</i>	Painted Sprite	2 or 5			3
<i>Pseudagrion hamoni</i>	Swarthy / Drab Sprite	2			3
<i>Pseudagrion kersteni</i>	Powder-faced / Kersten's Sprite	1			3
<i>Pseudagrion massaicum</i>	Masai Sprite	1			2
<i>Pseudagrion salisburyense</i>	Slate Sprite	1			2
<b>GOMPHIDAE</b>	<b>Clubtails</b>				
<i>Ceratogomphus pictus</i>	Common Thorntail	2			2
<i>Paragomphus cognatus</i>	Rock / Boulder Hooktail	1			3
<b>LESTIDAE</b>	<b>Spreadwings</b>				
<i>Lestes dissimulans</i>	Cryptic Spreadwing	5		VU	3
<i>Lestes pallidus</i>	Pallid / Pale Spreadwing	2			3
<i>Lestes plagiatus</i>	Highland Spreadwing	2			2
<b>LIBELLULIDAE</b>	<b>Skimmers</b>				
<i>Acisoma panorpoides</i>	Grizzled Pintail	2			3
<i>Brachythemis leucosticta</i>	Southern Banded Groundling	2			2
<i>Crocothemis erythraea</i>	Broad Scarlet	0			2
<i>Crocothemis sanguinolenta</i>	Little Scarlet	3			2
<i>Diplacodes lefebvrii</i>	Black Percher	3			3
<i>Nesiothemis farinosa</i>	Eastern Blacktail / Black-tailed Skimmer	1			2

FAMILY & SCIENTIFIC NAME	COMMON NAME	BIOTIC INDEX SCORE	GLOBAL RED LIST STATUS	RSA RED LIST STATUS	LoO QDS
<i>Orthetrum chrysostigma</i>	Epaulet Skimmer	2			2
<i>Orthetrum icteromelas</i>	Spectacled Skimmer	2			3
<i>Orthetrum trinacria</i>	Long Skimmer	1			3
<i>Palpopleura jucunda</i>	Yellow-veined Widow	2			2
<i>Palpopleura lucia</i>	Lucia Widow	2			2
<i>Palpopleura portia</i>	Portia Widow	2			3
<i>Pantala flavescens</i>	Wandering Glider / Pantala	0			2
<i>Rhyothemis semihyalina</i>	Phantom Flutterer	1			3
<i>Sympetrum fonscolombii</i>	Red-veined Darter / Nomad	0			2
<i>Tholymis tillarga</i>	Twister	3			3
<i>Tamea basilaris</i>	Keyhole Glider	0			2
<i>Tamea limbata</i>	Ferruginous / Voyaging Glider	0			2
<i>Trithemis annulata</i>	Violet Dropwing	1			2
<i>Trithemis arteriosa</i>	Red-veined Dropwing	0			2
<i>Trithemis donaldsoni</i>	Denim Dropwing	4			3
<i>Trithemis dorsalis</i>	Highland / Round-hook Dropwing	0			3
<i>Trithemis furva</i>	Navy Dropwing	0			3
<i>Trithemis kirbyi</i>	Orange-winged / Kirby's Dropwing	0			2
<i>Trithemis stictica</i>	Jaunty Dropwing	1			2
<i>Zygonyx natalensis</i>	Blue / Scuffed Cascader	2			3
<i>Zygonyx torridus</i>	Ringed Cascader	2			3
<b>MACROMIIDAE</b>	<b>Cruisers</b>				
<i>Phyllomacromia picta</i>	Darting Cruiser	2			3
<b>PLATYCNEMIDIDAE</b>	<b>Featherlegs</b>				
<i>Elatoneura glauca</i>	Common Threadtail	1			2
<b>SYNLESTIDAE</b>	<b>Malachites</b>				
<i>Chlorolestes fasciatus</i>	Mountain Malachite	4			3

Status: VU = Vulnerable

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

Sources: Samways (2006); Samways (2008)

### 13.8. Scorpion list for the study area

FAMILY & SCIENTIFIC NAME	LoO	
	QDS	SITE
<b>BUTHIDAE (Fat-tailed scorpions)</b>		
<i>Parabuthus mossambicensis</i>	2	2
<i>Parabuthus transvaalicus</i>	2	4
<i>Pseudolychas pegleri</i>	3	3
<i>Uroplectes carinatus</i>	2	2
<i>Uroplectes olivaceus</i>	3	3
<i>Uroplectes planimanus</i>	3	4
<i>Uroplectes triangulifer</i>	2	3
<i>Uroplectes vittatus</i>	2	2
<b>HORMURIDAE (Flat rock scorpions)</b>		
<i>Cheloctonus jonesii</i>	3	4
<b>SCORPIONIDAE (Burrowing scorpions)</b>		
<i>Opisthophthalmus carinatus</i>	2	3
<i>Opisthophthalmus glabrifrons</i>	2	2
<i>Opisthophthalmus pugnax</i>	3	4

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

Sources: Leeming (2003); ScorpionMAP (2016)

### 13.9. Main CVs

## CURRICULUM VITAE

**Name:** SUSAN ABELL (néé BRADLEY)  
**Position:** Senior Ecologist and Co-Owner of Natural Scientific Services  
**Date of Birth:** 29 March 1976  
**Nationality:** South African  
**Languages:** English (mother tongue), Afrikaans

### EDUCATIONAL QUALIFICATIONS

- ✚ MSc Resource Conservation Biology (Ecology) (2000 – 2001)
- ✚ B Sc Hons University of the Witwatersrand, Johannesburg (1999)
- ✚ B Sc University of the Witwatersrand, Johannesburg (1998)

### KEY QUALIFICATIONS

#### ✚ Environmental Impact Assessment:

Compiled numerous Environmental Impact Assessments, Scoping Reports and Environmental Management Programmes as required by the Environment Conservation Act (Act No. 73 of 1989) and the National Environmental Management Act (Act 107 of 1998).

#### ✚ Specialist Assessments:

Over 14 years performing ecological and vegetation surveys within Southern Africa. Expertises are strong in the Savanna and Grasslands within Gauteng, North West, Limpopo, Mpumalanga, KwaZulu Natal, Lesotho and Botswana. Further experience within the Karoid Shrub, Kalahari and Fynbos Areas.

GIS Mapping, Database management, GIS Modelling undertaken within specialist projects

#### ✚ **Strategic / Spatial Planning:**

Co-ordinated and managed strategic spatial planning projects in Gauteng, North West Province and Mpumalanga including the:

- State of Environment Reporting
- Gauteng Agricultural Potential Atlas (GAPA)
- North West Biodiversity Site Inventory and Database Development Atlas
- Tshwane Macro Open Space Policy
- Biodiversity Database for Optimum Collieries (BHP Billiton)

#### ✚ **Conference Presentations:**

Undertaken numerous presentations at conferences (SAAB; IAIA)

#### ✚ **Educational Training:**

Education training for organisations such as Wits University and Induction Training in Biodiversity Conservation for Mining Operations

## EMPLOYMENT EXPERIENCE

#### ✚ **Member & Senior Ecologist: Natural Scientific Services. Johannesburg (November 2004-Present)**

- Project management and administration
- Project management and compilation of biodiversity assessments within savanna, karoid, fynbos and grassland systems including:
  - Ecological assessments
  - Vegetation/Habitat assessments;
  - Red Data Scans;
  - Ecological Screening, Opinions & Statements;
  - Wetland Assessments.
- Ecological Sensitivity Mapping;
- Project management and compilation of Biodiversity Management & Action Plans (BMAPS);
- Reserve Management Plans (examples below):
  - Blyde River Reserve Strategic Management Plan
  - Monate Reserve Management Plan
- Alien Invasive Management Plans;
- Project Management for Rehabilitation and Land-Use Plans;
- Management and specialist input into Green Star Rating Projects (Ecological Component);
- Environmental Impact Assessments and Scoping Reports;
- Project management and compilation of a number of Environmental Impact Control Reports (EICR) for waste management projects;
- Compilation of Conceptual Closure Plans for a number of mining operations;

- Tender and proposal compilation;
- Marketing;
- Liaison with clients and government officials; and
- Involvement in Specific GIS-related projects (examples below):
  - Blyde Strategic Management Plan
  - Visual Assessment for Natalspruit Hospital
  - Biodiversity Database – Optimum Collieries

#### ✚ **Project Manager: Strategic Environmental Focus (SEF) (November 2003-October 2004)**

- Project management and administration
- Project Management of and input into Ecological Assessments
- Tender and proposal compilation
- Marketing
- Liaison with clients and government officials
- Involvement in GIS-related projects.
  - Tshwane Open Space Project
  - Numerous State of the Environment Reports

#### ✚ **Environmental Manager: SEF, Pretoria (April 2001- November 2003)**

- Project management and administration
- Compilation of environmental assessments and scoping reports including:
  - Tourism & Recreational developments
  - Residential developments
  - Commercial and industrial developments
- Liaison with government officials
- Management and input into GIS-related projects:
  - Gauteng Agricultural Potential Atlas (GAPA )
  - Gauteng Open Space Plan (GOSP)
  - North West Biodiversity Database Development
- Ecological Assessments / vegetation surveys / opinions/ Red Data Scans for various industries – mining, industrial, business, residential and sampling
- Sensitivity mapping

#### ✚ **University of the Witwatersrand (Wits) 1999 – 2001**

- Teaching Assistant:
- Mammalian surveys within Wits Rural Facility, Mpumalanga
- Vegetation sampling for SAFARI 2000- Kruger National Park
  - Scientific Paper: Koedoe Journal 44/1 2001
- Vegetation sampling Nylsvley Nature Reserve (2000)
- Monitoring and growth experiments (1998-1999) Electron and Transmission microscopy

## MEMBERSHIPS IN PROFESSIONAL SOCIETY

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- ✚ South African Council for Natural Scientific Professions (*Pr.Sci.Nat*)
- ✚ Botanical Society of South Africa
- ✚ International Association for Impact Assessment (IAIA)

## PAPERS PUBLISHED

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- ✚ Koedoe Journal 44/1 2001
- ✚ Proceedings: Microscopy Society of South Africa, 1999

## PAPERS PRESENTED

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- ☒ Proceedings of the Microscopy Society of Southern Africa, 1999
- ☒ Population dynamics and regeneration ecology of *Acacia nilotica* and *Acacia tortilis* in Nylsvley Nature Reserve, SAAB Conference 2000
- ☒ Tools for Cooperative Governance: North West Biodiversity Site Inventory And Database Development, IAIA Conference 2003

## CURRICULUM VITAE

**Name:** CAROLINE ANGELA LÖTTER (YETMAN)  
**Firm:** Natural Scientific Services CC  
**Position:** Terrestrial Ecologist  
**Date of Birth:** 6 November 1979  
**Nationality:** South African, British  
**Language:** English, Afrikaans

### KEY EDUCATIONAL QUALIFICATIONS

- ☒ PhD Zoology (2012). Conservation biology of the Giant Bullfrog, *Pyxicephalus adspersus*. (University of Pretoria).
- ☒ MSc African Mammalogy (2002). Effects of body size on the activity budgets of African browsing ruminants. (University of Pretoria).
- ☒ BSc Honours Zoology (2001). Terrain ruggedness and forage patch use by African browsing ungulates. (University of Pretoria).
- ☒ BSc Ecology (2000). (University of Pretoria).

### KEY EXPERIENCE

#### ☒ Specialist Assessments

- International Experience
  - Terrestrial faunal assessments in Sierra Leone (2011 & 2012).
  - Terrestrial faunal assessment in Lesotho (2012).
- Local Experience
  - Biodiversity Management Plans in Gauteng Province (2014-present).
  - Terrestrial faunal assessments in the Free State, Gauteng, Kwa-Zulu Natal, Limpopo, Mpumalanga, Northern Cape and North-West provinces (2011-present).
  - Long-term bat monitoring for wind farm developments in the Western, Eastern, Northern Cape and Kwa-Zulu Natal provinces (2012-2013).
  - Giant Bullfrog assessments in Gauteng, Limpopo, Mpumalanga and North-West provinces (2004-2011).

#### ☒ Research

- Analysis of acoustic bat data using AnalookW (2013).
- Species distribution modelling in MaxEnt (2008-2013).
- Geographic Information Systems (in ArcView and ArcGIS) (2001-2013).
- DNA sequencing and analysis (2003-2011).
- Histology (2003-2011).
- Amphibian and mammal radio- and spool-tracking (2003-2010).
- Amphibian and mammal mark-recapture (2001-2010).
- Extensive data analysis in Statistica (2001-2013).
- Vegetation sampling (1999-2001).
- Cricket behavioural studies (1999-2001).

## ✚ Applied Conservation

- Biodiversity Management Plans for large gold mines in Gauteng Province (2014-present).
- Monitoring and mitigating impacts on bats at wind farms in South Africa, NSS (2012-2013).
- Giant Bullfrog conservation in South Africa, Endangered Wildlife Trust (2004-2007).
- Captive animal care at the National Zoological Gardens (1993-1998).

## ✚ Lecturing

- Third year Animal Physiology (2007).
- First year Amphibian Practicals (2007-2012).
- Giant Bullfrogs (2003-2012).

## KEY EMPLOYMENT EXPERIENCE

### ✚ Natural Scientific Services, Johannesburg (November 2011 – present)

- Project Management
  - Biodiversity Management Plans in Gauteng Province (2014-present).
  - Biodiversity Assessments in Gauteng and Mpumalanga provinces (2012-present).
  - Long-term bat monitoring studies in the Western and Northern Cape provinces (2012-2013).
- Field work, data analysis and report writing
  - Terrestrial faunal assessments in Sierra Leone, Lesotho, and South Africa (2011-present).
  - Long-term bat monitoring for wind farm developments in the Western, Eastern, Northern Cape and Kwa-Zulu Natal provinces (2012-2013).

### ✚ Exclusive Books, Woodlands Boulevard, Pretoria (2008-2011)

- Night-staff management and book sales.

### ✚ University of Pretoria, Pretoria (1999-2011)

- Government Environmental Inspectorate exam invigilation and marking (2009-2011).
- Lecturing (2007-2011).
- Academic Programme Organizer for Dartmouth College, U.S.A. (2003-2007).
- Editorial Assistant for The Kruger Experience (2005) by Du Toit.
- Research Assistant for behavioural and evolution studies on crickets (1999-2001).

### ✚ Endangered Wildlife Trust, Johannesburg (2004-2008)

- Project Executant of the Giant Bullfrog Project.

### ✚ Biodiversity Foundation of Africa, Zimbabwe (December 2001)

- Insect and amphibian collecting expedition on the Barotse Floodplain, Zambia.

### ✚ National Zoological Gardens, Pretoria (1993-1998)

- Public Educator.
- Assistant Nature Conservator.
- Junior Nature Conservator.

## MEMBERSHIP IN PROFESSIONAL SOCIETIES

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- ✚ International Association for Impact Assessment: 2014-present.
- ✚ Gauteng and Northern Regions Bat Interest Group: 2014-present.
- ✚ South African Council for Natural Scientific Professions: 2008-present.
- ✚ Herpetological Association of Africa: 2004-present.
- ✚ Zoological Society of Southern Africa: 2003-present.

## PUBLICATIONS

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- Yetman, C.A., Verburgt, L. & S.D. Laurence (2015). Geographical distributions Pyxicephalidae *Pyxicephalus adspersus* Tschudi, 1838 Giant Bullfrog. *African Herp News* 62: 50-53.
- Scott, E., Visser, J.D., Yetman, C.A. & Oliver, L. (2013). Revalidation of *Pyxicephalus angusticeps* Parry, 1982 (Anura: Natatanura: Pyxicephalidae), a bullfrog endemic to the lowlands of eastern Africa. *Zootaxa* 3599: 201–228.
- Verburgt, L. & Yetman, C.A. (2012). Geographical Distributions: Amphibia: Anura: Pyxicephalidae: *Pyxicephalus adspersus* Tschudi, 1838 Giant Bullfrog. *African Herp News* 57: 18-20.
- Yetman, C.A., P. Mokonoto & J.W.H. Ferguson (2012). Conservation implications of the age/size distribution of Giant Bullfrogs (*Pyxicephalus adspersus*) at three peri-urban breeding sites. *Herpetological Journal* 22: 23-32.
- Yetman, C.A., P. Mokonoto & J.W.H. Ferguson (2012). Conservation implications of the age/size distribution of Giant Bullfrogs (*Pyxicephalus adspersus*) at three peri-urban breeding sites. *Herpetological Journal* 22: 23-32.
- Yetman, C.A. & J.W.H. Ferguson (2011). Conservation implications of spatial habitat use by adult Giant Bullfrogs (*Pyxicephalus adspersus*). *Journal of Herpetology* 45: 56-62.
- Yetman, C.A. & J.W.H. Ferguson (2011). Spawning and non-breeding activity of adult Giant Bullfrogs (*Pyxicephalus adspersus*). *African Journal of Herpetology* 60: 13-29.
- Bateman, P.W., J.W.H. Ferguson & C.A. Yetman (2006). Courtship and copulation, but not ejaculates, reduce the longevity of female field crickets (*Gryllus bimaculatus*). *Journal of Zoology, London* 268: 341-346.
- Du Toit, J.T. & C.A. Yetman (2005). Effects of body size on the diurnal activity budgets of African browsing ruminants. *Oecologia* 143: 317-325.

## AWARDS

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- 2010-2013: Podium positions for various 10km, 21km, 42km and +50km road and trail-running races in Gauteng, Mpumalanga, Limpopo and North-West provinces.
- 2012: PhD, Academic Honorary Colours, University of Pretoria.
- 2009: Best PhD Student Presentation, AGM, Dept. of Zoology & Entomology, University of Pretoria.

- 2005: Nominated: Science & Technology Category, Shoprite Checkers SABC 2 Woman of the Year.
- 2003: Best Student Presentation, Conference, Zoological Society of Southern Africa.
- 2003: MSc, Academic Honorary Colours, University of Pretoria.

## OTHER TRAINING

- Permaculture (2016).
- First Aid (2013).
- Comrades Marathon (2012 & 2013)
- Climbing and Fall Arrest at height (2012).
- Basic 4x4ing (2010).
- Snake handling (2008).

## CONFERENCES

- 2014 & 2015: Annual Oppenheimer De Beers Group Diamond Route Research Conference, Johannesburg, Gauteng.
- 2013: Annual Symposium of the Zoological Society of Southern Africa, Tshipise, Limpopo

### 13.10. NEMBA Requirements

Requirements of Appendix 6 – GN R982	Addressed in This Report
1. (1) A specialist report prepared in terms of these Regulations must contain 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;	Yes
b) a declaration that the specialist is independent in a form as may be specified by the competent authority;	Yes
c) an indication of the scope of, and the purpose for which, the report was prepared;	Yes
d) the date and season of the site investigation and the relevance of the season to the outcome of the assessment;	Yes
e) a description of the methodology adopted in preparing the report or carrying out the specialised process;	Yes
f) the specific identified sensitivity of the site related to the activity and its associated structures and infrastructure;	Yes
g) an identification of any areas to be avoided, including buffers;	Yes
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;	Yes
i) a description of any assumptions made and any uncertainties or gaps in knowledge;	Yes
j) a description of the findings and potential implications of such findings on the impact of the proposed activity, including identified alternatives on the	Yes

Requirements of Appendix 6 – GN R982	Addressed in This Report
environment;	
k) any mitigation measures for inclusion in the EMPr;	Yes
l) any conditions for inclusion in the environmental authorisation;	Yes
m) any monitoring requirements for inclusion in the EMPr or environmental authorisation;	Yes
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;	Yes
o) a description of any consultation process that was undertaken during the course of preparing the specialist report;	No consultation process conducted for a broad level EcoScan
p) a summary and copies of any comments received during any consultation process and where applicable all responses thereto; and	As above
q) any other information requested by the competent authority.	Yes

**HERITAGE IMPACT ASSESSMENT FOR A PROPOSED  
CHICKEN BROILER FACILITY ON PORTION 40 OF THE FARM  
JONATHAN 175-JQ, NORTH WEST, ODI 1 MAGISTERIAL  
DISTRICT, NORTH WEST PROVINCE**

Required under Section 38 (8) of the National Heritage Resources Act (No. 25 of 1999).

SAHRA Case ID: 10049

*Report for:*

**CSIR – Environmental Management Services**

P.O. Box 320, Stellenbosch, 7599

Tel: 021 888 2432

Email: rmogotshi@csir.co.za

*On behalf of:*

**Jam Rock (Pty) Ltd**



**Dr Jayson Orton**

**ASHA Consulting (Pty) Ltd**

6A Scarborough Road, Muizenberg, 7945

Tel: (021) 788 8425 | 083 272 3225

Email: jayson@asha-consulting.co.za

**Jaco van der Walt**

**Heritage Contracts Archaeological Consulting**

37 Olienhout Street, Modimolle, 0510

Tel: 082 373 8491

Email: jaco.heritage@gmail.com

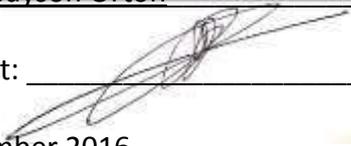
24 November 2016

## 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: 24 November 2016

## 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 chicken broiler facility on Portion 40 of the farm Jonathan 175-JQ in North West Province. The site is 9.1689 ha in extent and is located at S 25.2670° E 27.8836°. The project would include three hen houses, two storage facilities, a house/office and staff quarters.

The site is located in a rural area that lacks any sort of large scale development. Much land has been ploughed in recent decades, although at present most is unused because of drought conditions. The study area is flat and covered in thorn bushes. Open areas between the bushes tended to be sandy. Archaeological visibility was good between the thorn bushes but not all of the site could be accessed due to dense clumps of bush.

The survey revealed a number of relatively recent features including two small informal cemeteries containing three graves each. One features many cement bricks likely to have been reused from a ruin constructed of the same materials and thought to date to no earlier than the 1950s. This suggests the graves to be much more recent. The other three graves are packed with stones and may be older. Although their ages are uncertain, following the precautionary principle both cemeteries are regarded as heritage resources. Human remains are, in any event, important. The only other heritage resource present was a very low density and widespread scatter of stone artefacts, possible dating to the Middle Stone Age. These are not significant. No fossils were seen and the chances of important fossils occurring are deemed to be very small. Trace fossils, fossil pollens and spores and very rare dinosaur bones are known from the region.

The original proposal would have impacted on at least one of the two cemeteries. Once their locations became known the proposal was redesigned in order to avoid impacts. As such, and provided that the graves are clearly fenced off during construction, no significant impacts to heritage resources are expected.

It is recommended that the proposed chicken broiler facility should be authorised but subject to the following conditions which should be incorporated into the Environmental Authorisation:

- The two graveyards should be fenced off clearly and pointed out to all construction workers and other staff on site to ensure that impacts to them are avoided;
- No construction work should occur within 10 m of any of the graves; and
- If any archaeological material, palaeontological 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 appropriate specialist. Such heritage is the property of the state and may require excavation and curation in an approved institution.

## Glossary

**Background scatter:** Artefacts whose spatial position is conditioned more by natural forces than by human agency

**Hominid:** a group consisting of all modern and extinct great apes (i.e. gorillas, chimpanzees, orangutans and humans) and their ancestors.

**Later Stone Age:** Period of the Stone Age extending over the last approximately 20 000 years.

**Middle Stone Age:** Period of the Stone Age extending approximately between 200 000 and 20 000 years ago.

## Abbreviations

**APHP:** Association of Professional Heritage Practitioners

**ASAPA:** Association of Southern African Professional Archaeologists

**BAR:** Basic Assessment Report

**CRM:** Cultural Resources Management

**GPS:** global positioning system

**HIA:** Heritage Impact Assessment

**LSA:** Later Stone Age

**MSA:** Middle Stone Age

**NEMA:** National Environmental Management Act (No. 107 of 1998)

**NHRA:** National Heritage Resources Act (No. 25) of 1999

**READ:** North West Department of Rural Environment and Agricultural Development

**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;	Section 7.1.2
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;	Section 6 (Figure 5)
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;	Sections 6 & 7
k) any mitigation measures for inclusion in the EMPr;	Sections 7 & 13
l) any conditions for inclusion in the environmental authorisation;	Sections 7 & 13
m) any monitoring requirements for inclusion in the EMPr or environmental authorisation;	Section 9
n) a reasoned opinion-	Section 13
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;	
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 (see Section 3.6)
q) any other information requested by the competent authority.	n/a

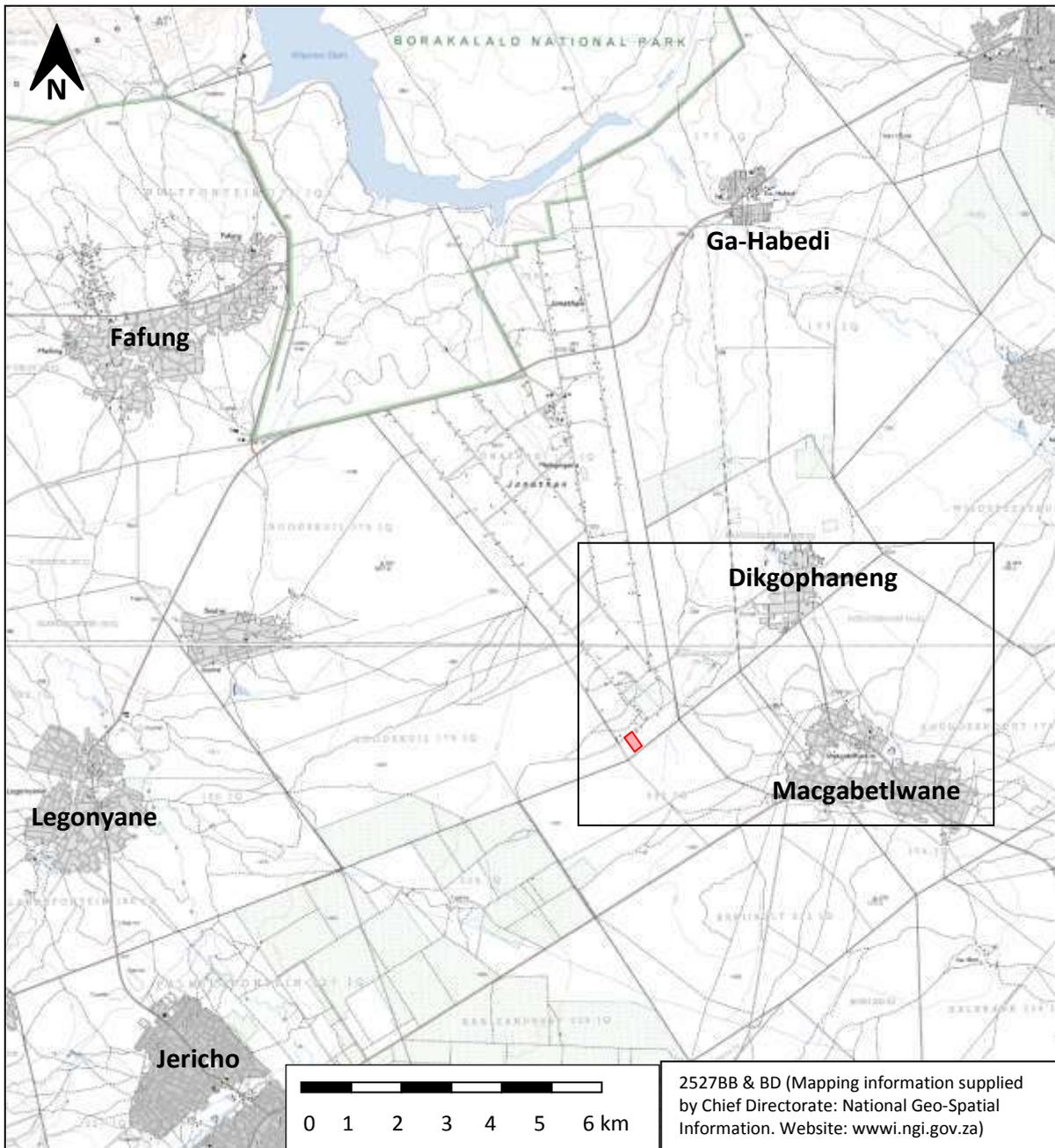
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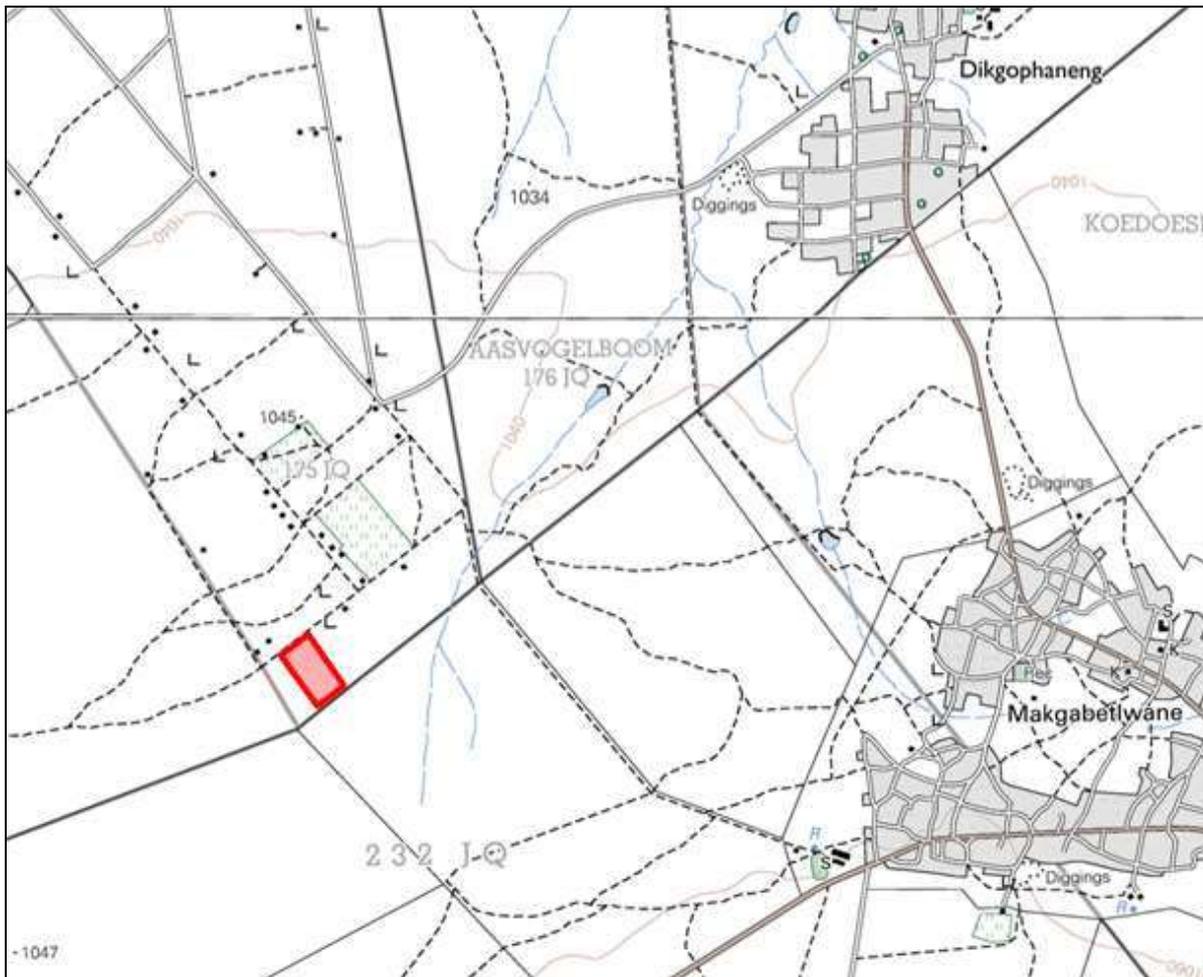
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# 1. INTRODUCTION

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 chicken broiler facility on Portion 40 of the farm Jonathan 175-JQ in North West Province (Figures 1 & 2). The site is 9.1689 ha in extent and is located at S 25.2670° E 27.8836°.



**Figure 1:** Map showing the location of the site (red shaded polygon). The boxed area is enlarged in Figure 2.



**Figure 2:** Enlarged map showing the location of the site (red shaded polygon).

### 1.1. Project description

The proposed chicken broiler facility would include the following components:

- Three chicken broiler houses of 20 m by 130 m each;
- An access road;
- A storage building of 60 m by 40 m;
- A storage building of 60 m by 10 m; and
- A farm house and office of 40 m by 40 m.

The farm has an existing borehole and has the capacity to store 10 000 L of water. Figure 3 shows the proposed layout of the facilities on the property. It should be noted that this layout is a revised layout because the original layout would have impacted on graves discovered on the property.

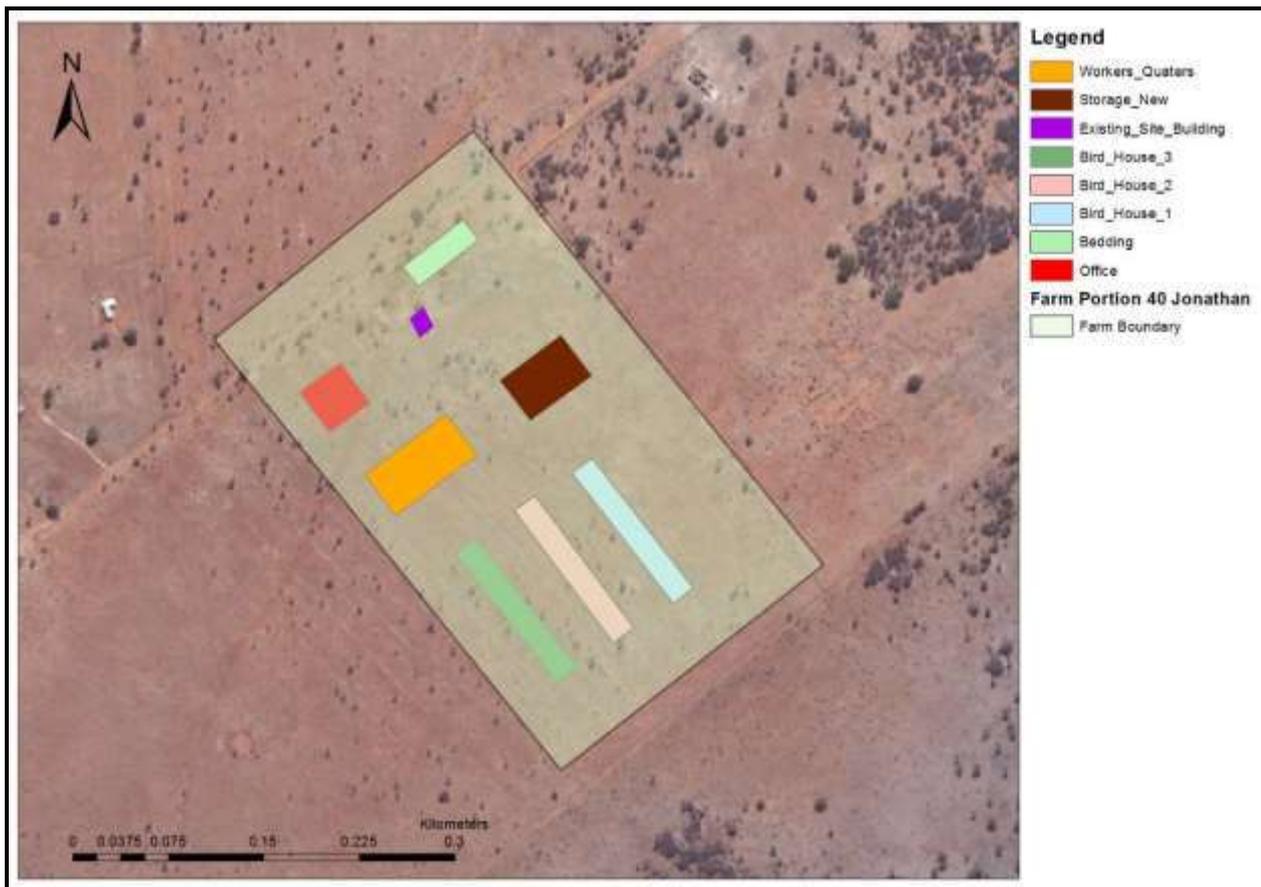
#### 1.1.1. Aspects of the project relevant to the heritage study

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 was asked to produce a heritage impact assessment that would meet the requirements of the South African Heritage Resources Agency (SAHRA) who had requested that a Heritage Impact Assessment (HIA) be submitted to them for comment.

When SAHRA was notified of the proposed development, they responded on 21<sup>st</sup> September 2016 with a comment that requested submission of an HIA that included assessments of archaeological resources, palaeontological resources, and any other heritage resources that might be impacted by the proposed development.



**Figure 3:** Aerial view of the study area showing the spatial layout of the proposed facilities. Turquoise polygon = house / office, orange = storage facilities, green = workers' accommodation, yellow = hen houses.

## 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 North West Department of Rural Environment and Agricultural Development (READ) 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.

In addition a palaeontological specialist study was commissioned. This was carried out by Dr John Almond and is appended to this report.

## 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. SAHRA is required to provide comment on the proposed project in order to facilitate final decision making by the North West READ.

## **3. METHODS**

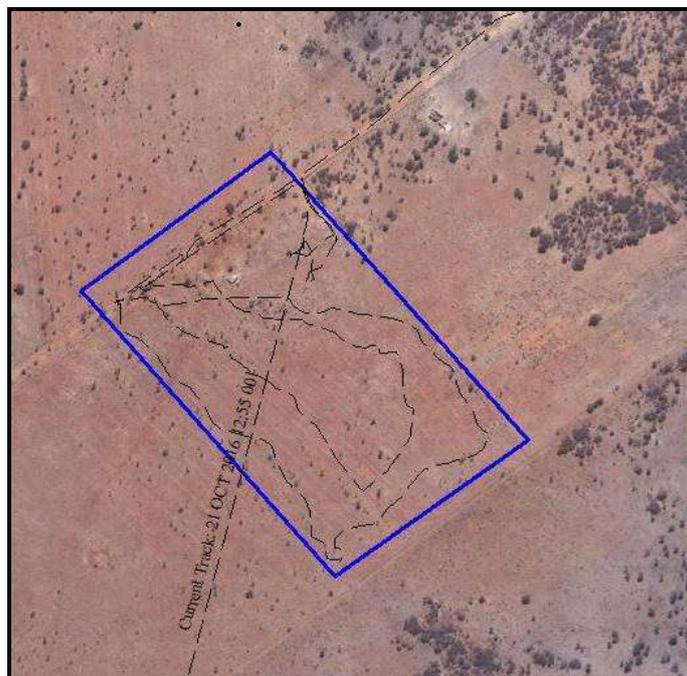
### **3.1. Literature survey and information sources**

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) and site records on the Wits Archaeological Database. The 1:50 000 map and historical aerial images were sourced from the Chief Directorate: National Geo-Spatial Information. The overlay function in Google Earth was used to locate the site on the historical aerial imagery.

### **3.2. Field survey**

The site was subjected to a detailed foot survey by Jaco van der Walt on 21 October 2016. This was at the end of the dry winter season and meant that ground visibility was good, although dense stands of thorn bush prevented comprehensive coverage. 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.



**Figure 4:** Aerial view of the study area (blue polygon) showing the walk-paths on the site (black dashed lines).

### 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 system 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. Bedrock was absent from the surface of the site which meant that the palaeontological assessment had to be based exclusively on desktop work.

The SAHRIS database reflects a number of projects located to the east and southeast but all are more than 15 km away. The majority have no HIA reports attached to them which meant that background information for this project was extremely limited.

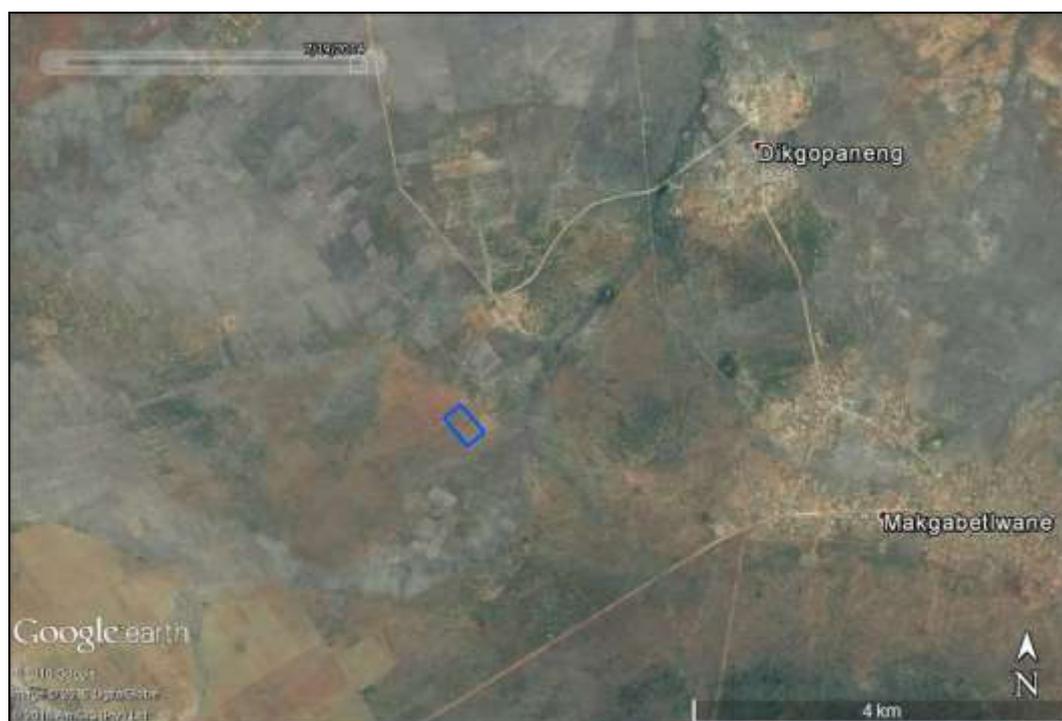
### 3.6. Consultation processes undertaken

The NHRA requires consultation as part of an HIA but, since the present study falls within the context of a BAR which includes a public participation process (PPP), no dedicated consultation was undertaken as part of the HIA. Interested and affected parties will have the opportunity to comment on the heritage aspects of the project during the PPP.

## 4. PHYSICAL ENVIRONMENTAL CONTEXT

### 4.1. Site context

The site lies in a rural area which lacks any sort of large-scale development (Figure 5). The nearest villages are located some 3.5 km to the east and northeast. Only occasional small structures, presumably houses, are scattered on the surrounding farm portions and the access roads tend to be small and relatively informal.



**Figure 5:** Aerial view of the broader area around the site (blue polygon) showing the lack of large-scale development aside from the two villages to the east and northeast.

#### **4.2. Site description**

The site is flat and lacks any sort of landscape feature (e.g. rock outcrops, pans, drainage lines). Although much of the area, including the entire study area, has been ploughed and cultivated in the past, the protracted drought has meant that with the lack of agriculture the thorn bush cover was quite extensive at the time of the field inspection. The sandy areas bear minimal grass cover because of the drought and a few scattered larger trees occur in places. Figures 6 and 7 show two views of the site.



**Figure 6:** View of the site showing an area with less bush cover. The very flat and sandy nature of the general area is evident.



**Figure 7:** View of the study area showing a patch of dense thorn bushes.

## **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. Note that the palaeontological background can be found within the appended palaeontological specialist study.

### **5.1. Archaeological aspects**

The area has seen very little archaeological work carried out and, as such, little background information is on record. The only CRM report relevant here is that by Van Schalkwyk (2013) who examined substation locations and a power line servitude passing through the Winterveldt agricultural holdings area some 20 km to the southeast of the present study area. He found no archaeological heritage resources but did report some graveyards.

Stone Age occupation is likely to be ephemeral in the study area because of the lack of landscape foci, but, broadly-speaking, Stone Age artefacts could be expected almost anywhere.

Iron Age settlement is well-known from the wider area (e.g. Coetzee & Küsel 2008), although the study area and immediate surrounds are unlikely to have been suitable for settlement because of the general lack of stone material with which to build. Iron Age settlement in the broader area would fall into two periods known as the Early Iron Age (approximately AD 400 to AD 1025) and Late Iron Age (approximately AD 1025 to AD 1830).

To the south of the study area, towards Pretoria, many Iron Age sites (more than 127) are on record (Bergh 1999). Approximately 25 km to the south east of the study area is the well known Tswaing Crater where Sotho and Tswana speaking communities produced salt by filtering, boiling and evaporating lake water during AD 1200 – 1830. At the beginning of the nineteenth century, the predominant black tribe in the area north of Pretoria towards the study area was the Manala-Ndebele, the Kgatla were also present in this area

According to the most recent archaeological cultural distribution sequences by Huffman (2007), the study area falls on the boundary of the distribution area of various cultural groupings originating out of both the Urewe Tradition (eastern stream of migration) and the Kalundu Tradition (western stream of migration). The facies that may be present are:

- Urewe Tradition: Moloko Branch – Icon facies AD 1300 - 1500 (Late Iron Age)
- Madikwe facies AD 1500-1700 (Late Iron Age)
- Blackburn Branch- Uitkomst facies AD 1650-1820 (Late Iron Age)
- Rooiberg facies AD 1650-1750 (Late Iron Age)
- Kwale branch- Mzonjani facies AD 450 – 750 (Early Iron Age)
- Kalunda Tradition: Benfica sub-branch – Bambata facies AD 150-650 (Early Iron Age)
- Happy Rest sub-branch – Diamant facies AD 750-1000 (Early Iron Age)
- Eiland facies AD 1000-1300 (Middle Iron Age)

### **5.2. Historical aspects and the built environment**

The area is part of the land that was once incorporated within the homeland state of Bophutatswana. It is very rural and generally lacks historical development. Bophutatswana was a

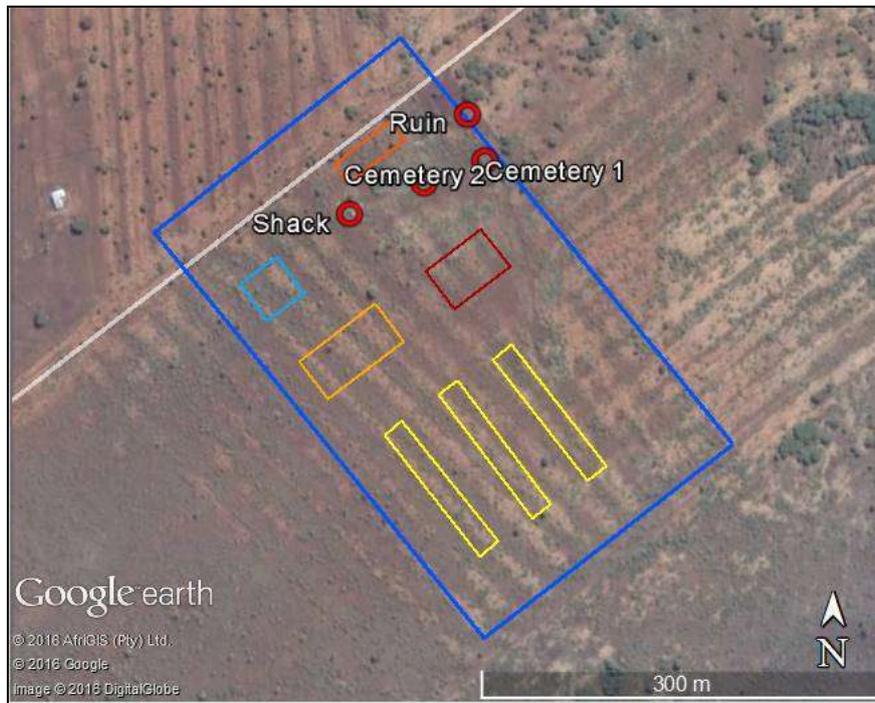
so-called 'black home land state' that was formed in 1977 and continued an independent existence (officially recognised only by South Africa) until 1994.

## 6. FINDINGS OF THE HERITAGE STUDY

This section describes the heritage resources and other features recorded in the study area during the course of the project. They are listed in Table 1 and their locations mapped in Figure 5. The archaeological material is not located or mapped as it was very thinly spread across the area.

**Table 1:** List of sites recorded during the survey. Most appear to be less than 60 years of age and are thus not considered to be heritage resources.

Label	Co-ordinates	Description	Significance
n/a	n/a	Widespread but very low density scatter of stone artefacts located throughout the study area. There was no focus and their age was indeterminate; they are more than likely from the Middle Stone Age.	Very low
Cemetery 1	S25° 15' 56.5344" E27° 53' 02.0723"	This is the location of three graves that are aligned east to west. The graves are marked by a cement brick outline and are fenced in. The cement bricks are possibly sourced from the bricks from the ruin and would therefore post-date this feature.	High (although may not be a heritage resource)
Cemetery 2	S 25° 15' 57.1032" E27° 53' 00.4453"	The site consists of three graves that are aligned east to west. Based on size of the graves, the graves are of two adults and a child. The graves are marked by elongated stone cairns.	High (although may not be a heritage resource)
Shack	S25° 15' 57.8626" E27° 52' 58.4542"	This is a recently built structure of corrugated iron. Although an older more permanent structure must have been present, all that is left is a cement slab indicating the position of the structure.	n/a
Ruin	S25° 15' 55.3988" E27° 53' 01.6069"	This is the remains of a rectangular structure of unknown purpose. The feature is constructed from cement bricks and measures approximately 8 x 6 meters.	n/a



**Figure 5:** Aerial view of the study area showing the locations of the various finds.

### 6.1. Palaeontology

The archaeological field study reported a flat, sandy land surface devoid of bedrock exposure (see Figure 6). This lack of bedrock has meant that geological and palaeontological knowledge in this area stems largely from analysis of borehole data. Almond (2016:1) reports that the study area overlies the Irrigasie Formation which is comprised of “reddish-brown, readily-weathered mudrocks with subordinate sandstones and minor conglomerates”. The kinds of fossils known to occur in the area are primarily trace fossils, while fossil pollens and spores and very rare dinosaur bones have also been reported. No fossils were seen during the archaeological survey.

### 6.2. Archaeology

The survey showed that a very low density scatter of Stone Age artefacts was present throughout the general area. There was no focus to these artefacts and no ‘site’ could be delineated; the artefacts can be ascribed to background scatter. Figure 6 shows a few of these artefacts. Most were made from quartzite and some displayed cobble cortex indicating that they were made from river cobbles. Because of their very widespread distribution and very low density, these finds are of minimal heritage significance.



**Figure 6:** Stone artefacts of quartz (far left) and quartzite. The two in the middle have cobble cortex. Scale in cm.

A ruined structure was located along the north-eastern boundary of the property. It was made from cement bricks (Figure 7). It is almost certainly less than 100 years of age and thus is not considered to be a heritage resource. It probably dates to the 1950s because historical aerial photography reveals that the area seemed unaltered in 1948-50 (the earliest available series), but by 1961 a number of 'bright spots' had appeared on the landscape. These spots indicate higher reflectivity from areas cleared of vegetation. One of these spots corresponds with the ruin. Another corresponds with the cement slab noted alongside the corrugated iron shack (Table 1).



**Figure 7:** View of the cement brick ruin along the north-eastern boundary of the study area.

### 6.3. Graves

Two small informal cemeteries were located on the property. Each had three graves in it. The graves of the first were surrounded by cement bricks that were no doubt obtained from a nearby ruined structure made with the same bricks and located some 35 m away to the northwest (see above). The graves are surrounded by a wire fence and aligned east-west (Figure 8). Because the ruin is relatively recent, the graves are also necessarily recent and must post-date the collapse of the brick structure. These graves are very likely less than 60 years of age and would thus not be regarded as heritage resources in terms of the NHRA (see Section 2 above).



**Figure 8:** View of 'Cemetery 1' showing the three graves surrounded by a wire fence.

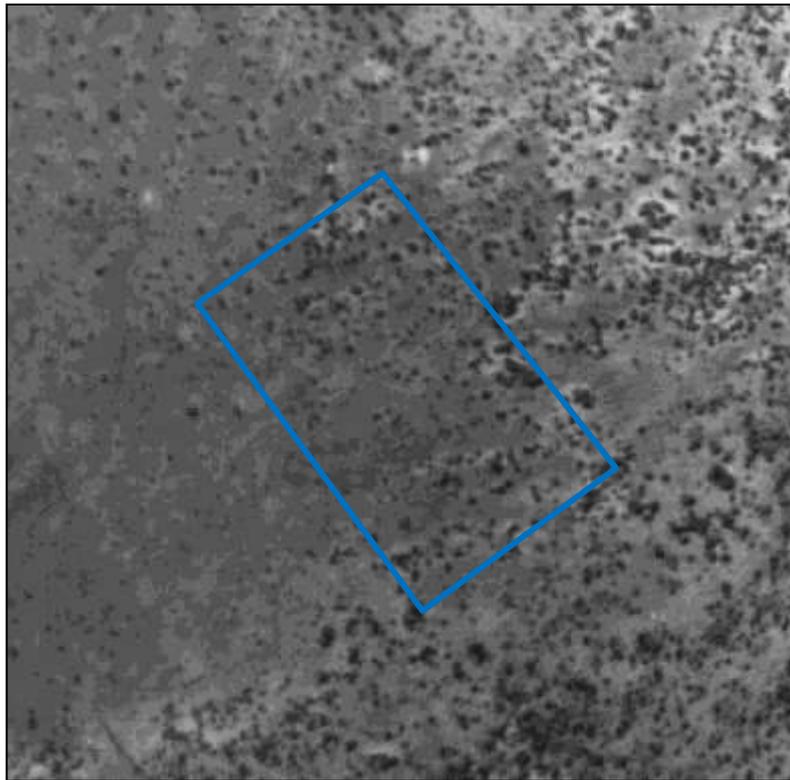
The second cemetery also has three graves in it. These graves are covered by stone mounds and are not enclosed by any fence (Figure 9). Two graves appear to be full (i.e. adult) size, while the third is far smaller and is likely that of a child. Larger stones have been placed at the head and foot of each grave. They are aligned east-west. These three graves are very likely older and perhaps completely unrelated to those in 'Cemetery 1'.



**Figure 9:** View of 'Cemetery 2' with the smaller grave at far left beneath a thorn bush.

#### **6.4. Cultural landscape**

A survey of historical aerial photography reveals that the landscape on the site was little used during the mid-twentieth century (Figure 10). However, the wider region does show evidence of occupation with small cultivated lands and (presumably stone-built) structures in the south and north respectively (Figure 11).



**Figure 10:** Aerial photograph dating to 1948-1950 (Job 218, strip 30, photograph 1205) showing the study area to be entirely undeveloped. There is no sign of any settlement or other disturbance of the natural vegetation patterns. The study area is outlined in blue.



**Figure 11:** Comparative aerial photographs dating to 1948-1950 (Job 218, strip 30, photograph 1205) and 2016. Cultivated lands (yellow arrows) and structures are visible (red arrow). The study area is outlined in blue.

By 1961 there was evidence of cultivation very close to the study area as well as activity on site (Figure 12). Bright spots in the vicinity of the cement brick ruin and cement slab show that structures were likely in place and in use by that time. In the broader area there is quite a bit of agricultural activity (Figure 13). *The study area is outlined in blue.*



**Figure 12:** Aerial photograph dating to 1961 (Job 453, strip 6, photograph 6233) showing signs of activity on the ground as 'bright spots' where the vegetation has been disturbed. The study area is outlined in blue.



**Figure 13:** Comparative aerial photographs dating to 1961 (Job 453, strip 6, photograph 6233) and 2016. It is notable that cultivation has commenced in the vicinity. The study area is outlined in blue.

By 1974 the entire property had been cultivated and the prominent 'bright spot' is still evident around the location of the cement slab (Figure 14). In general the surrounding area shows evidence of far more cultivation than before and houses are visible in places (Figure 15). This evidence shows that a weakly developed agricultural landscape has been developed in the area but it is characterised only by very low grade landscape modification (ploughing) with none of the more

prominent types of features that characterise some agricultural landscapes (like farm complexes, tree lines, dams and farm roads).

## 6.5. Statement of significance

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 archaeological resources are deemed to have very low cultural significance for their scientific value.

Graves are deemed to have high cultural significance for their social value, although it is noted here that the graves present on the site may, in fact, not be heritage resources. Nevertheless, prudence suggests that they should be treated as heritage just to be safe. In any case, human remains should always be regarded as sensitive.

The cultural landscape is of low cultural significance for its aesthetic, historical and social values.



**Figure 14:** Aerial photograph dating to 1974 (Job 729, strip 4, photograph 121) and 2016. The study area is outlined in blue.



**Figure 15:** Comparative aerial photographs dating to 1974 (Job 729, strip 4, photograph 121) and 2016. The study area is outlined in blue.

## 6.6. Summary of heritage indicators and provisional grading

The archaeological resources are of very low significance and can be rated as 'General Protection C'. They comprise of a low density, widespread scatter throughout the area. Although it is uncertain whether the graves are in fact old enough to be considered heritage, it is prudent to regard them as important. The one set ('Cemetery 2') may well be older than 60 years. The graves are assigned a provisional grading of IIIA.

## 7. IMPACT ASSESSMENT

Impacts to heritage resources are possible mainly during the construction phase with a far reduced chance of impacts occurring during the operation phase. No decommissioning phase is envisaged for this project.

### 7.1. Direct Impacts

#### 7.1.1. Palaeontology

Impacts to palaeontological material would occur during the construction phase only. They would be direct impacts in which the fossils would be moved from their original positions and possibly destroyed. Because of the very small likelihood of fossils actually being present, the potential impact significance is also regarded as being **very low**. There are no fatal flaws and no mitigation or management measures are required. The impacts are assessed in Table 2.

#### 7.1.2. Archaeology

Impacts to archaeological material would occur during the construction phase only. They would be direct impacts in which the artefacts would be moved from their original positions (although

already out of place from ploughing) and possibly damaged or destroyed. Because the artefacts are of very low heritage significance, the potential impact significance is also regarded as being **very low**. There are no fatal flaws and no mitigation or management measures are required. The impacts are assessed in Table 2.

### 7.1.3. Graves

Because the graves were potentially under threat from the original layout, a new layout was devised so as to avoid both sets of graves. As such, no impacts to the graves are expected during construction, although there is always the slight chance that they could be damaged in error. There are no fatal flaws but it will be necessary to demarcate the graves during construction and alert all personnel to their existence such that they can be adequately protected. It is also recommended that the proponent consider installing permanent fencing in order to properly mark and protect the graves in perpetuity. No construction work should occur within 10 m of the graves. The significance of the potential construction phase impacts before mitigation is rated as **low** because the chances of impacts, given the proposed layout, are small, while with mitigation in the form of complete avoidance the impact significance is reduced to **very low**. The impacts are assessed in Table 2.

There is also a small chance that the graves could be damaged during the operation phase of the project during some other activity taking place on the site. However, with proper demarcation of the graves as suggested above, this impact is highly unlikely. The impact significance would again be **very low** after mitigation.

Further to the above, there is also a small chance that further marked or unmarked graves could lie concealed in the thorn bushes on the site. There is no way to predict and impacts would have to be dealt with on a case by case basis as or if they occur.

### 7.1.4. Cumulative Impacts

Cumulative impact are unlikely to occur because of the lack of other similar developments in the area. However, there is the potential for further agricultural-related development and the potential cumulative impact significance from such activities on palaeontological resources, archaeological resources and graves is regarded as being very low with mitigation in all three cases (Table 3).

**Table 2:** Impact assessment summary table – Construction Phase and Operation Phase direct impacts.

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)		
<b>CONSTRUCTION PHASE &amp; OPERATION PHASE</b>													
Clearing of land and construction of facilities	Destruction of palaeontological material	Negative	Site	Permanent	Slight	Very unlikely	Non-reversible	High	None	Very low	Very low	5	High
	Destruction of archaeological artefacts	Negative	Site	Permanent	Slight	Likely	Non-reversible	High	None	Very low	Very low	5	High
	Destruction of graves	Negative	Site	Permanent	Substantial	Very unlikely	Non-reversible	High	Avoid	Low	Very low	5	High

**Table 3: Impact assessment summary table – Cumulative impacts**

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)		
<b>CONSTRUCTION PHASE &amp; OPERATION PHASE</b>													
Clearing of land and construction of facilities	Destruction of palaeontological material	Negative	Site	Permanent	Slight	Very unlikely	Non-reversible	High	None	Very low	Very low	5	High
	Destruction of archaeological artefacts	Negative	Site	Permanent	Slight	Likely	Non-reversible	High	None	Very low	Very low	5	High
	Destruction of graves	Negative	Site	Permanent	Severe	Very unlikely	Non-reversible	High	Avoid	Low	Very low	5	High

## **8. LEGISLATIVE AND PERMIT REQUIREMENTS**

There are no specific permit requirements related to this project, since all potentially significant impacts have been averted through the redesign of the facility. However, should the need to move the graves arise in the future then it would be necessary to research the graves in order to try to establish the names of the deceased. The required consultation process would then need to be followed in advance of application for a permit to remove the graves.

## **9. ENVIRONMENTAL MANAGEMENT PROGRAMME INPUTS**

It should be ensured that both sets of graves are clearly demarcated and fenced off during the construction period and that all workers on site are made aware of their existence. Monitoring would involve ensuring that the graves remain undamaged throughout the duration of the construction phase of the project. It should be ensured that if any substantial archaeological or palaeontological remains are uncovered during development they are immediately protected *in situ* and reported to SAHRA so that appropriate action can be taken.

## **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. No significant heritage impacts are expected for this project and the provision of employment to those who will run the facility is regarded as far more important than any archaeological heritage resources that might be disturbed.

## **11. CONCLUSIONS**

The only significant finds were the two small informal cemeteries. One of them is unlikely to be a heritage resource based on its probable young age, while the age of the other is less easy to determine. Nevertheless, following the precautionary principle, they are both regarded as heritage resources and the development proposal was redesigned around them. As such, no significant impacts to heritage resources are expected. There are no fatal flaws and the project should be allowed to proceed.

## **12. RECOMMENDATIONS**

It is recommended that the proposed chicken broiler facility should be authorised but subject to the following conditions which should be incorporated into the Environmental Authorisation:

- The two graveyards should be fenced off clearly and pointed out to all construction workers and other staff on site to ensure that impacts to them are avoided;
- No construction work should occur within 10 m of any of the graves; and
- If any archaeological material, palaeontological 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 appropriate specialist. Such heritage is the property of the state and may require excavation and curation in an approved institution.

## 13. REFERENCES

- Bergh, J.S. 1999. *Geskiedenisatlas vir Suid Afrika: die vier noordelike provinsies*. Edited by J.S. Bergh. 1999. Pretoria: J.L. van Schaik Uitgewers.
- Cotzee, F.P. & Küsel, U.S. 2008. Phase 2 Archaeological Assessment of Late Iron Age Structures on the Farm Ledig 909 JQ (Quality Vacation Club and Golf Course), North West Province. Unpublished report prepared for Chand Environmental Consultants. Pretoria: UNISA.
- Huffman, T.N. 2007. *Handbook to the Iron Age: the Archaeology of Pre-Colonial Farming Societies in Southern Africa*. University of KwaZulu-Natal Press, Scottsville.
- SAHRA. 2007. Minimum Standards: archaeological and palaeontological components of impact assessment reports. Document produced by the South African Heritage Resources Agency, May 2007.
- Van Schalkwyk, J. 2014. Basic heritage assessment report for the proposed construction of the 132 kV Dipompong and Tswaing Substations and overhead power lines. Unpublished report prepared for Envirolution Consulting. Monument Park: J van Schalkwyk.
- Winter, S. & Oberholzer, B. 2013. Heritage and Scenic Resources: Inventory and Policy Framework for the Western Cape. Report prepared for the Provincial Government of the Western Cape Department of Environmental Affairs and Development Planning. Sarah Winter Heritage Planner, and Bernard Oberholzer Landscape Architect / Environmental Planner, in association with Setplan.

## 14. APPENDIX 1 – Curriculum Vitae



*Curriculum Vitae*

**Jayson David John Orton**

ARCHAEOLOGIST AND HERITAGE CONSULTANT

### Contact Details and personal information:

**Address:** 6A Scarborough Road, Muizenberg, 7945  
**Telephone:** (021) 788 8425  
**Cell Phone:** 083 272 3225  
**Email:** jayson@asha-consulting.co.za

**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

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### PERSONAL PARTICULARS:

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**NAME:** Jaco van der Walt  
**MARITAL STATUS:** Married with two dependants  
**DATE OF BIRTH :** 1977-11-04  
**Work Address** 37 Olienhout Street, Modimolle, 0510  
**E-MAIL:** jaco.heritage@gmail.com  
**MOBILE:** +27 82 373 8491  
**FAX:** +27 86 691 6461

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### SYNOPSIS

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Jaco has been actively involved as a professional archaeologist within the heritage management field in southern Africa for the past 17 years. Jaco acted as council member for the Association of Southern African Professional Archaeologists (ASAPA Member #159) in the Cultural Resource Management (CRM) portfolio for two years (2011 – 2012). He is well respected in his field and published in peer reviewed journals and presented his findings on various national and international conferences.

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### ACADEMIC QUALIFICATIONS:

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**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

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### EMPLOYMENT HISTORY:

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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.

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**MEMBERSHIP OF PROFESSIONAL ASSOCIATIONS:**

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- Association of Southern African Professional Archaeologists. Member number 159  
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)

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**REFERENCES:**

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1. Prof Marelize Lombard Senior Lecturer, University of Johannesburg, South Africa  
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

## **15. APPENDIX 2 – Palaeontological study**

## RECOMMENDED EXEMPTION FROM FURTHER PALAEOLOGICAL STUDIES:

### Proposed development of a chicken broiler facility on Portion 40 of the Farm Jonathan 175- JQ, Brits, North West Province

John E. Almond PhD (Cantab.)

*Natura Viva* cc,  
PO Box 12410 Mill Street,  
Cape Town 8010, RSA  
naturaviva@universe.co.za

November 2016

#### 1. OUTLINE OF THE PROPOSED DEVELOPMENT

See the Heritage Impact Assessment for details.

#### 2. GEOLOGICAL BACKGROUND

The study area for the proposed chicken broiler facility on Portion 40 of the Farm Jonathan 175- JQ, situated some 40 km NNE of Brits, North West Province, lies within the Springbok Flats Basin of Karoo age in a region that is characterised by very low relief. Surface exposure of the Karoo Supergroup bedrocks within this basin is correspondingly very poor, with most geological data derived from borehole cores (Walraven 1981, Roberts 1992, Johnson *et al.* 2006). Satellite images of the study area on Farm Jonathan 175- JQ feature flat-lying, ploughed terrain at c. 1050 m amsl between the drainage systems of the Tolwane River in the west and the Kutswane River in the east. Field photos show low-relief terrain mantled with sandy soils and no bedrock exposure.

The bedrocks beneath the study area are assigned to the **Irrigasie Formation** of ill-defined Permo-Triassic age. This succession is of probable meandering fluvial and/or lacustrine origin and is characterised by reddish-brown, readily-weathered mudrocks with subordinate sandstones and minor conglomerates. Reddish hues of the sediments indicate arid, oxidising palaeoclimates during deposition.

#### 3. PALAEOLOGICAL HERITAGE

The only well-established fossil remains from the Irrigasie Formation comprise undescribed trace fossils that are responsible for the extensive bioturbation (biogenic sediment mixing) seen throughout the succession (Johnson *et al.* 2006). Palynomorphs (pollens and spores) within the northern Karoo basins of the RSA have been treated by MacRae (1988). A couple of isolated dinosaur remains – including possible prosauropods / sauropods such as “*Euskelesaurus*” and *Gigantoscelus* - have been reported from the Triassic, and possibly Early Jurassic, portion of the Springbok Flats Basin (Dingle *et al.* 1983 Fig. 37, pp. 68-69 after Haughton 1924, Du Toit 1954) but these are likely to be very rare.

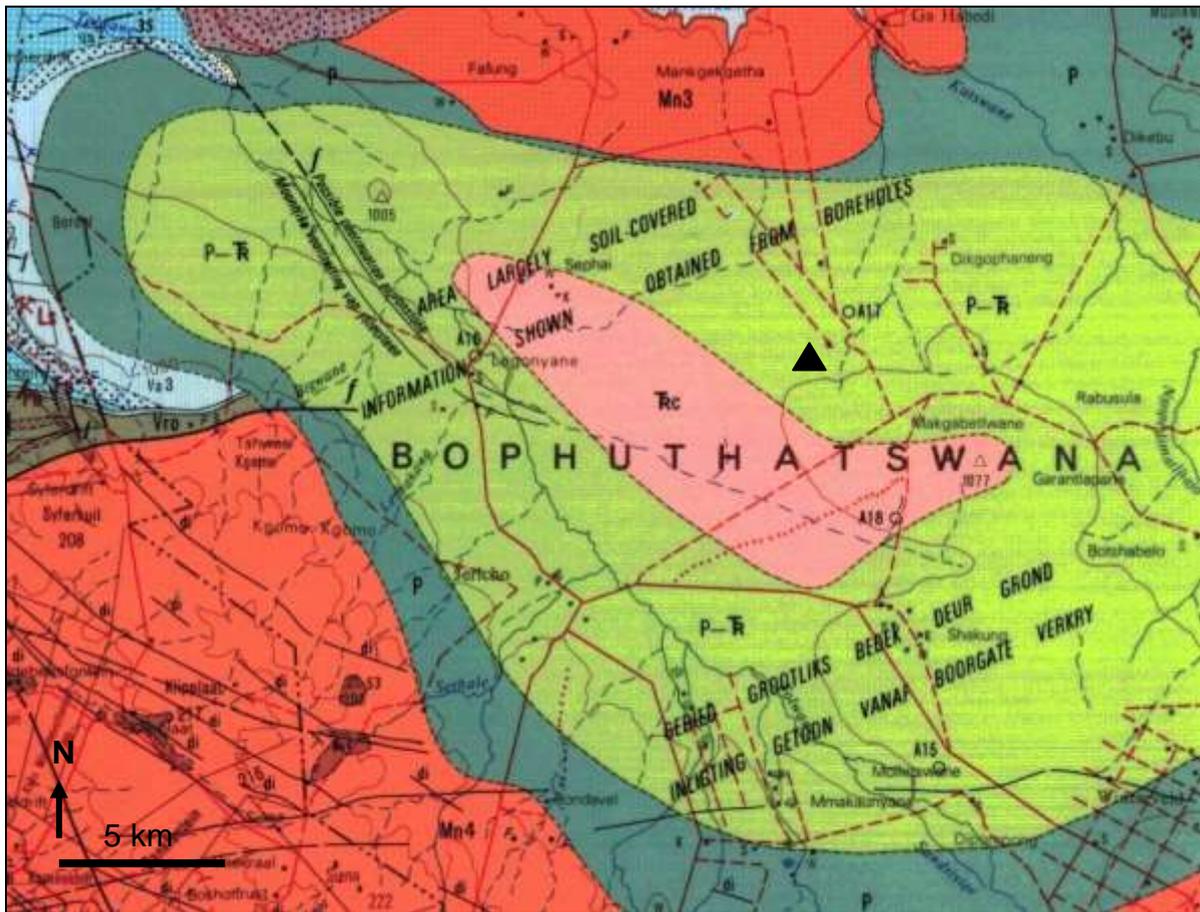


Figure 1: Extract from 1: 250 000 geological map sheet 2526 Rustenburg (Council for Geoscience, Pretoria) showing the approximate location of the study area for the chicken broiler facility on Portion 40 of the Farm Jonathan 175- JQ, c. 40 km NNE of Brits, North West Province (black triangle). The area is underlain by fluvial and / or lacustrine sediments of the Irrigasië Formation (Karoo Supergroup) of Permo-Triassic age (P-TR, pale green).

#### 4. CONCLUSIONS & RECOMMENDATIONS

The proposed study area is small and mantled with disturbed soils, with no bedrock exposure. Construction of the proposed chicken broiler facility is unlikely to involve substantial excavations of fresh (*i.e.* unweathered) bedrock. The only fossils recorded from the broader region are ill-defined trace fossils, microfossils and very rare dinosaur remains. It is concluded that the area is of low palaeontological sensitivity and the proposed development is unlikely to have significant impacts on local palaeontological heritage resources.

**It is therefore recommended that, pending the discovery of significant new fossils remains (e.g. dinosaur bones, teeth) before or during construction, exemption from further specialist palaeontological studies and mitigation be granted for the proposed chicken broiler facility on Portion 40 of the Farm Jonathan 175- JQ, Brits, North West Province.**

Should any substantial fossil remains (*e.g.* dinosaur bones and teeth) be encountered during excavation, however, these should be safeguarded, preferably *in situ*, and reported by the ECO to SAHRA, *i.e.* The South African Heritage Resources Authority, as soon as possible (SAHRA Contact details: Dr Ragna Redelstorff. 111 Harrington Street, Cape Town 8001. P.O. Box 4637, Cape Town 8000. Tel: 021 202 8651. Fax: 021 202 4509. Email: rredelstorff@sahra.org.za) so that

appropriate action can be taken by a professional palaeontologist, at the developer's expense. Mitigation would normally involve the scientific recording and judicious sampling or collection of fossil material as well as associated geological data (e.g. stratigraphy, sedimentology, taphonomy) by a professional palaeontologist.

## 5. KEY REFERENCES

DINGLE, R.V., SIESSER, W.G. & NEWTON, A.R. 1983. Mesozoic and Tertiary geology of southern Africa. viii + 375 pp. Balkema, Rotterdam.

DU TOIT, A. 1954. The geology of South Africa. xii + 611pp, 41 pls. Oliver & Boyd, Edinburgh.

HAUGHTON, S.H. 1924. The fauna and stratigraphy of the Stormberg Series. Annals of the South African Museum 12, 323-495.

JOHNSON, M.R., VAN VUUREN, C.J., VISSER, J.N.J., COLE, D.I., WICKENS, H. DE V., CHRISTIE, A.D.M., ROBERTS, D.L. & BRANDL, G. 2006a. Sedimentary rocks of the Karoo Supergroup. In: Johnson, M.R., Anhaeusser, C.R. & Thomas, R.J. (eds.) The geology of South Africa, pp. 461-499. Geological Society of South Africa, Johannesburg & the Council for Geoscience, Pretoria.

MACRAE, C.S. 1988. Palynostratigraphic correlation between the lower Karoo Sequence of the Waterberg and Pafuri coal-bearing basins and the Hammanskraal macrofossil locality, Republic of South Africa. Memoirs of the Geological Survey of South Africa 75, 217 pp.

ROBERTS, D.L. 1992. The Springbok Flats Basin - a preliminary report. Unpublished Report of the Geological Survey of South Africa 1992-0197, 23 pp. Council for Geoscience, Pretoria.

WALRAVEN, F. 1981. The geology of the Rustenburg area. Explanation to 1: 250 000 geology sheet 2526 Rustenburg, 37 pp. Council for Geoscience, Pretoria.

## 6. QUALIFICATIONS & EXPERIENCE OF THE AUTHOR

Dr John Almond has an Honours Degree in Natural Sciences (Zoology) as well as a PhD in Palaeontology from the University of Cambridge, UK. He has been awarded post-doctoral research fellowships at Cambridge University and in Germany, and has carried out palaeontological research in Europe, North America, the Middle East as well as North and South Africa. For eight years he was a scientific officer (palaeontologist) for the Geological Survey / Council for Geoscience in the RSA. His current palaeontological research focuses on fossil record of the Precambrian - Cambrian boundary and the Cape Supergroup of South Africa. He has recently written palaeontological reviews for several 1: 250 000 geological maps published by the Council for Geoscience and has contributed educational material on fossils and evolution for new school textbooks in the RSA.

Since 2002 Dr Almond has also carried out palaeontological impact assessments for developments and conservation areas in the Western, Eastern and Northern Cape, Mpumalanga, Limpopo, Gauteng, Free State and Northwest Province under the aegis of his Cape Town-based company *Natura Viva* cc. He has been a long-standing member of the Archaeology, Palaeontology and

Meteorites Committee for Heritage Western Cape (HWC) and an advisor on palaeontological conservation and management issues for the Palaeontological Society of South Africa (PSSA), HWC and SAHRA. He is currently compiling technical reports on the provincial palaeontological heritage of Western, Northern and Eastern Cape for SAHRA and HWC. Dr Almond is an accredited member of PSSA and AHP (Association of Professional Heritage Practitioners – Western Cape).

### **Declaration of Independence**

I, John E. Almond, declare that I am an independent consultant and have no business, financial, personal or other interest in the proposed development project, application or appeal in respect of which I was appointed other than fair remuneration for work performed in connection with the activity, application or appeal. There are no circumstances that compromise the objectivity of my performing such work.



**Dr John E. Almond,  
Palaeontologist, *Natura Viva* cc**

# **APPENDICES**

DRAFT BASIC ASSESSMENT REPORT

PROPOSED DEVELOPMENT OF A CHICKEN BROILER FACILITY ON PORTION 40 OF THE FARM JONATHAN 175- JQ,  
BRITS, NORTH WEST

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## **BASIC ASSESSMENT REPORT**

### **APPENDIX H: IMPACT ASSESSMENT**

## APPENDICES

### DRAFT BASIC ASSESSMENT REPORT

#### PROPOSED DEVELOPMENT OF A CHICKEN BROILER FACILITY ON PORTION 40 OF THE FARM JONATHAN 175- JQ, BRITS, NORTH WEST

Nature of the Potential Impact/Risk	Status	Spatial Extent	Duration	Intensity	Probability	Significance of Impact/Risk (Without Mitigation)	Reversibility	Irreplaceability	Confidence level	Can the Impact/Risk be Avoided?	Can the Impact/Risk be Mitigated/Managed?	Potential Mitigation Measures	Significance of Residual Impact/Risk (With Mitigation)
<b>CONSTRUCTION PHASE</b>													
Loss or degradation of the wetland on the access road	Negative	Local	Long term	Medium	Definite	High	Moderate	Moderate	3	Yes	Yes	<ul style="list-style-type: none"> <li>▪ Design measures to effectively control vehicle access, vehicle speed, dust, stormwater run-off, erosion and sedimentation on the road.</li> <li>▪ Implement the measures that were designed to control impacts on the road preferably during winter, when the risk of erosion should be least.</li> </ul>	Low
Loss of terrestrial vegetation and faunal habitat	Negative	Site-specific	Long term	High	Highly probable	High	Low	Low	3	No	Yes	<ul style="list-style-type: none"> <li>▪ Ensure that all infrastructure avoids all Very High and High sensitive areas</li> <li>▪ Clearly demarcate or fence in the construction site. Relocate CI plant and animal specimens from the construction footprint, with advice from an appropriate specialist.</li> <li>▪ Commence (and preferably complete) construction during winter, when the risk of disturbing growing plants should be least.</li> </ul>	Low
Loss of CI or medicinal flora	Negative	Local	Long term	Medium	Probable	Medium	Moderate	Low	3	Yes	Yes	<ul style="list-style-type: none"> <li>▪ Obtain permits to remove CI species</li> <li>▪ Transplant CI and medicinally important floral specimens from the infrastructure footprint to suitable locations in the surrounding area.</li> <li>▪ Obtain guidance from a suitably qualified vegetation specialist or horticulturist regarding the collection, propagation/storage and transplantation of plants.</li> </ul>	Low
Loss of CI fauna	Negative	Local	Long term	Medium	Low probable	Medium	Low	Moderate	2	Yes	Yes	<ul style="list-style-type: none"> <li>▪ Appoint an appropriate specialist to relocate CI fauna from vegetation, termitaria and soil that is removed from the infrastructure footprint.</li> <li>▪ Commence (and preferably complete) construction during winter, when the risk of disturbing active (including breeding and migratory) animals, should be least.</li> <li>▪ Check open trenches for trapped animals (e.g. hedgehogs, reptiles and frogs), and relocate trapped animals with advice from an appropriate specialist.</li> <li>▪ Prohibit disturbance and persecution (e.g. poaching) of fauna, and introduction of pets and other alien fauna (apart from the production chickens).</li> <li>▪ Provide notices and training to inform workers about dangerous animals (e.g. venomous snakes and scorpions) and prohibited activities (e.g. poaching)</li> </ul>	Low
Introduction & proliferation of alien spp.	Negative	Local	Long term	Medium	Definite	High	Low	Low	3	Yes	Yes	<ul style="list-style-type: none"> <li>▪ Regulate / limit access by potential vectors of alien plants.</li> <li>▪ Maintain a tidy construction site</li> <li>▪ By law, remove and dispose of Category 1b alien species on site. All Category 2 species that remain on site must require a permit.</li> </ul>	Low
Increase in dust and erosion degrading habitat integrity	Negative	Local	Long term	Medium-low	Highly probable	Medium	Moderate	Low	2	No	Yes	<ul style="list-style-type: none"> <li>▪ Limit vehicles, people and materials to the construction site</li> <li>▪ Commence (and preferably complete) construction during winter, when the risk of erosion should be least.</li> <li>▪ Revegetate denude areas with locally indigenous flora a.s.a.p.</li> <li>▪ Implement erosion protection measures on site to</li> </ul>	Low

## APPENDICES

### DRAFT BASIC ASSESSMENT REPORT

#### PROPOSED DEVELOPMENT OF A CHICKEN BROILER FACILITY ON PORTION 40 OF THE FARM JONATHAN 175- JQ, BRITS, NORTH WEST

Nature of the Potential Impact/Risk	Status	Spatial Extent	Duration	Intensity	Probability	Significance of Impact/Risk (Without Mitigation)	Reversibility	Irreplaceability	Confidence level	Can the Impact/Risk be Avoided?	Can the Impact/Risk be Mitigated/Managed?	Potential Mitigation Measures	Significance of Residual Impact/Risk (With Mitigation)
												<p>reduce erosion and sedimentation of downstream areas. Measures could include bunding around soil stockpiles, and vegetation of areas not to be developed.</p> <ul style="list-style-type: none"> <li>Implement effective and environmentally-friendly dust control measures, such as mulching or periodic</li> </ul>	
Sensory disturbances	Negative	Local	Long term	Medium-low	Highly probable	Medium	Low	Low	3	No	Yes	<ul style="list-style-type: none"> <li>Time construction activities to minimize sensory disturbance of fauna.</li> <li>Limit disturbance from noise.</li> <li>Limit disturbance from light.</li> </ul>	Low
Destruction of graves	Negative	Site-specific	Permanent	Medium	Probable	Low	Low	High	5	Yes	Yes	<ul style="list-style-type: none"> <li>The two graveyards should be fenced off clearly and pointed out to all construction workers and other staff on site to ensure that impacts to them are avoided;</li> <li>No construction work should occur within 10 m of any of the graves;</li> </ul>	Very low
Destruction of archaeological artefacts	Negative	Site-Specific	Permanent	Medium-low	Definite	Very low	Low	High	5	No	No	<ul style="list-style-type: none"> <li>If any archaeological material, palaeontological 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 appropriate specialist. Such heritage is the property of the state and may require excavation and curation in an approved institution.</li> </ul>	Very low
Destruction of palaeontological material	Negative	Site-Specific	Permanent	Medium-low	Probable	Very low	Low	High	5	No	No	<ul style="list-style-type: none"> <li>If any archaeological material, palaeontological 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 appropriate specialist. Such heritage is the property of the state and may require excavation and curation in an approved institution.</li> </ul>	Very low
Emissions from dust generation and construction vehicles	Negative	Local	Short term	Medium-low	Highly probable	Medium	Moderate	Low	2	No	Yes	<ul style="list-style-type: none"> <li>Ensure that cleared (excavated) areas and unpaved surfaces are sprayed with water (obtained from an approved source) to minimise dust generation.</li> <li>Approved soil stabilisers may be utilised to limit dust generation.</li> <li>Ensure that construction vehicles travelling on unpaved roads do not exceed a speed limit of 40 km/hour.</li> <li>Limit vehicles, people and materials to the construction site</li> <li>Adequate dust control strategies should be applied to minimise dust deposition, for example: Periodic spraying of water on the entrance road when necessary</li> <li>Commence (and preferably complete) construction during winter, when the risk of disturbing active (including breeding and migratory) animals, should be least.</li> <li>Noise should also be minimised throughout construction to limit the impact on sensitive fauna such as owls and large terrestrial birds.</li> <li>Limit construction activities to day time hours</li> </ul>	Low

## APPENDICES

### DRAFT BASIC ASSESSMENT REPORT

#### PROPOSED DEVELOPMENT OF A CHICKEN BROILER FACILITY ON PORTION 40 OF THE FARM JONATHAN 175- JQ, BRITS, NORTH WEST

Nature of the Potential Impact/Risk	Status	Spatial Extent	Duration	Intensity	Probability	Significance of Impact/Risk (Without Mitigation)	Reversibility	Irreplaceability	Confidence level	Can the Impact/Risk be Avoided?	Can the Impact/Risk be Mitigated/Managed?	Potential Mitigation Measures	Significance of Residual Impact/Risk (With Mitigation)
Potential spillage or discharge of construction waste water	Negative	Local	Short term	Medium	Probable	Low	High	High	3	Yes	Yes	<ul style="list-style-type: none"> <li>▪ Ensure that adequate containment structures are provided for the storage of construction materials on site.</li> <li>▪ Ensure the adequate removal and disposal of construction waste and material</li> </ul>	Very Low
Pollution of the surrounding water and ground as a result of generation of building rubble and waste scrap material	negative	Local	Short term	Medium	Probable	High	High	High	3	Yes	Yes	<ul style="list-style-type: none"> <li>▪ Ensure that adequate containment structures are provided for the storage of construction materials on site.</li> <li>▪ Ensure the adequate removal and disposal of construction waste and material</li> </ul>	Low
Opportunities for employment and skills development	Positive	Local	Long term	Medium	Probable	Medium	High	High	3	No	Ye	<ul style="list-style-type: none"> <li>▪ Enhance the use of local labour and local skills as far as reasonably possible.</li> <li>▪ Where the required skills do not occur locally, and where appropriate and applicable, ensure that relevant local individuals are trained.</li> <li>▪ Ensure that an equitable percentage allocation is provided for local labour employment as well as specify the use of small-to-medium enterprises and training specifications in the Contractors contract.</li> <li>▪ Ensure that goods and services are sourced from the local and regional economy as far as reasonably possible.</li> </ul>	High
Potential visual impacts as the result of construction activities	Negative	Local	Short term	Medium-low	Probable	Low	High	High	3	Yes	Yes	<ul style="list-style-type: none"> <li>▪ No specific mitigation measures are required other than standard construction site housekeeping and dust suppression. These are included below: <ul style="list-style-type: none"> <li>- The contractor(s) should maintain good housekeeping on site to avoid litter and minimise waste.</li> <li>- Litter and rubble should be timeously removed from the construction site and disposed at a licenced waste disposal facility.</li> <li>- The project developer should demarcate construction boundaries and minimise areas of surface disturbance.</li> <li>- Appropriate plans should be in place to minimise fire hazards and dust generation.</li> </ul> </li> <li>▪ Night lighting of the construction site should be minimised within requirements of safety and efficiency.</li> </ul>	Low
Potential noise impact as the result of the use of construction equipment	Negative	Local	Short term	Medium-low	Probable	Medium	Moderate	High	3	No	Yes	<ul style="list-style-type: none"> <li>▪ Limit construction activities to day time hours</li> </ul>	Low
Potential impact on the safety of construction workers and Health injuries to construction personnel as a result of construction work	Negative	Site-specific	Short term	Low	Improbable	Medium	High	High	3	Yes	Yes	<ul style="list-style-type: none"> <li>▪ Ensure that a skilled and competent Contractor is appointed during the construction phase. The Contractor must be evaluated during the tender/appointment process in terms of safety standards.</li> <li>▪ The Contractor must ensure that all construction personnel are provided with adequate PPE for use where appropriate.</li> <li>▪ The Contractor must undertake a Construction Phase Risk Assessment.</li> <li>▪ A Construction Site Manager or Safety Supervisor should be appointed, in conjunction with the project</li> </ul>	Medium

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### DRAFT BASIC ASSESSMENT REPORT

#### PROPOSED DEVELOPMENT OF A CHICKEN BROILER FACILITY ON PORTION 40 OF THE FARM JONATHAN 175- JQ, BRITS, NORTH WEST

Nature of the Potential Impact/Risk	Status	Spatial Extent	Duration	Intensity	Probability	Significance of Impact/Risk (Without Mitigation)	Reversibility	Irreplaceability	Confidence level	Can the Impact/Risk be Avoided?	Can the Impact/Risk be Mitigated/Managed?	Potential Mitigation Measures	Significance of Residual Impact/Risk (With Mitigation)
												<p>manager, to monitor all safety aspects during the construction phase. This could be the same person that is assigned to co-ordinate the construction traffic.</p> <ul style="list-style-type: none"> <li>▪ Ensure that roads are not closed during construction, which may restrict access for emergency services.</li> <li>▪ The Contractor must ensure that all construction personnel are provided with adequate PPE for use where appropriate.</li> </ul>	
Traffic, congestion and potential for collisions	Negative	Local	Short term	Medium-Low	Probable	Low	Moderate	Low	3	Yes	Yes	<ul style="list-style-type: none"> <li>▪ During the construction phase, suitable parking areas should be created and designated for construction trucks and vehicles.</li> <li>▪ A construction supervisor should be appointed to co-ordinate construction traffic during the construction phase (by drawing up a traffic plan prior to construction).</li> <li>▪ Road barricading should be undertaken where required and road safety signs should be adequately installed at strategic points</li> </ul>	Low
Odour Emissions from operations and environmental contamination of the surrounding environment from chicken organic waste (carcasses and manure).	Negative	Local	Short term	Medium	Probable	Medium	High	High	3	Yes	Yes	<ul style="list-style-type: none"> <li>▪ Odours produced from manure and urine in chicken broiler facility can be reduced by scraping up and removing manure from the facility and washing down using low-volume high-pressure sprays.</li> <li>▪ Manure should be collected daily and stored in vermin-proof containers at the waste storage facility.</li> <li>▪ Ensure that carcasses and feed, and other operational waste are appropriately and effectively contained and disposed of without detriment to the environment.</li> <li>▪ Establish appropriate emergency procedures for accidental contamination of the surroundings. Waste recycling should be incorporated into the facility's operations as far as possible. Designate a secured, access restricted, sign posted room for the storage of potentially hazardous substances such as herbicides, pesticides, dips and medications.</li> <li>▪ The relevant Air Quality norms and standards must be adhered to.</li> </ul>	Low
Pollution of the surrounding environment as a result of the handling, temporary storage and disposal of solid waste (general and hazardous).	Negative	Local	Short term	Medium	Probable	Medium	High	High	3	Yes	Yes	<ul style="list-style-type: none"> <li>▪ General waste and hazardous waste should be stored temporarily on site in suitable (and correctly labelled) waste collection bins and skips (or similar). Waste collection bins and skips should be covered with suitable material, and disposed of at a registered landfill site.</li> <li>▪ Should the on-site storage of general waste and hazardous waste exceed 100 m<sup>3</sup> and 80 m<sup>3</sup> respectively, then the National Norms and Standards for the Storage of Waste (published on 29 November 2013 under Government Notice 926) must be adhered to.</li> <li>▪ Ensure that the construction site is kept clean at all times and that construction personnel are made aware of correct waste disposal methods.</li> <li>▪ Ensure that sufficient general waste disposal bins are provided for all construction personnel throughout the site. These bins must be emptied on a regular</li> </ul>	Low

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#### PROPOSED DEVELOPMENT OF A CHICKEN BROILER FACILITY ON PORTION 40 OF THE FARM JONATHAN 175- JQ, BRITS, NORTH WEST

Nature of the Potential Impact/Risk	Status	Spatial Extent	Duration	Intensity	Probability	Significance of Impact/Risk (Without Mitigation)	Reversibility	Irreplaceability	Confidence level	Can the Impact/Risk be Avoided?	Can the Impact/Risk be Mitigated/Managed?	Potential Mitigation Measures	Significance of Residual Impact/Risk (With Mitigation)
												basis. <ul style="list-style-type: none"> <li>▪ No solid waste may be burned on site.</li> <li>▪ Segregation of hazardous waste from general waste to be in place.</li> <li>▪ The Contractor should provide adequate waste skips (or similar) on site and the Construction Contract should specify that the Contractor must be responsible for the correct disposal of the contents of the waste skips.</li> <li>▪ Establish appropriate emergency procedures for accidental contamination of the surroundings. Waste recycling should be incorporated into the facility's operations as far as possible. Designate a secured, access restricted, sign posted room for the storage of potentially hazardous substances such as herbicides, pesticides dips and medications. All hazardous waste should be disposed of at an appropriate licensed facility for this.</li> <li>▪ Records of removal of infectious waste must be kept</li> </ul>	
Pollution of the surrounding environment as a result of the handling of sewage	Negative	Local	Short term	Medium	Probable	Medium	High	High	3	Yes	Yes	<ul style="list-style-type: none"> <li>▪ Make use of a septic facility to temporarily store waste in an underground septic tank</li> <li>▪ The applicant to appoint a professional septic drainer for extraction of sewage in a manner that is not detrimental to the environment</li> </ul>	Low
<b>OPERATION PHASE</b>													
Loss or degradation of the wetland on the access road	Negative	Local	Long term	Medium	Definite	High	Moderate	Moderate	3	Yes	Yes	<ul style="list-style-type: none"> <li>▪ Monitor and maintain the road impact control measures to ensure that they remain effective</li> </ul>	
Environmental contamination	Negative	Regional	Long term	Medium	Highly probable	Medium	Low	Moderate	1	No	Yes	<ul style="list-style-type: none"> <li>▪ 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</li> <li>▪ Adhere to best practice chicken husbandry and waste disposal norms</li> <li>▪ Establish appropriate emergency procedures for accidental contamination of the surroundings. Waste recycling should be incorporated into the facility's operations as far as possible. Designate a secured, access restricted, signposted room for the storage of potentially hazardous substances such as herbicides, pesticides dips and medications. All hazardous waste should be disposed of at an appropriate licensed facility for this.</li> <li>▪ Rehabilitate contaminated areas a.s.a.p. in accordance with advice from appropriate contamination and environmental specialists</li> <li>▪ Educate workers regarding the handling of hazardous substances and about waste management and emergency procedures with regular training and notices and talks.</li> </ul>	Low
Environmental and Health contamination arising from	Negative	Local	Short term	Medium	Probable	Medium	High	High	3	Yes	Yes	<ul style="list-style-type: none"> <li>▪ Chicken carcasses should be collected daily or when necessary, denatured (with relevant environmentally</li> </ul>	Low

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#### PROPOSED DEVELOPMENT OF A CHICKEN BROILER FACILITY ON PORTION 40 OF THE FARM JONATHAN 175- JQ, BRITS, NORTH WEST

Nature of the Potential Impact/Risk	Status	Spatial Extent	Duration	Intensity	Probability	Significance of Impact/Risk (Without Mitigation)	Reversibility	Irreplaceability	Confidence level	Can the Impact/Risk be Avoided?	Can the Impact/Risk be Mitigated/Managed?	Potential Mitigation Measures	Significance of Residual Impact/Risk (With Mitigation)
Chicken mortalities (carcasses) during operations.												<p>friendly chemicals) and disposed of at mortality pits</p> <ul style="list-style-type: none"> <li>▪ Ensure that the development of mortality pits are designed and lined with impermeable substances in accordance with advice from international best practice norms in order to prevent ground water contamination. The applicant shall also seek guidance from relevant authorities' e.g. DAFF on best practice or consult their guidelines and norms and standards if available.</li> <li>▪ Ensure that carcasses and feed, and other operational waste are appropriately and effectively contained and disposed of without detriment to the environment.</li> <li>▪ Establish appropriate emergency procedures for accidental contamination of the surroundings. Designate a secured, access restricted, sign posted room for the storage of potentially hazardous substances such as herbicides</li> </ul>	
Odour Emissions from operations and environmental contamination of the surrounding environment from chicken organic waste (carcasses and manure).	Negative	Local	Short term	Medium	Probable	Medium	High	High	3	Yes	Yes	<ul style="list-style-type: none"> <li>▪ Odours produced from manure and urine in chicken broiler facility can be reduced by scraping up and removing manure from the facility and washing down using low-volume high-pressure sprays.</li> <li>▪ Manure should be collected daily and stored in vermin-proof containers at the waste storage facility.</li> <li>▪ Ensure that carcasses and feed, and other operational waste are appropriately and effectively contained and disposed of without detriment to the environment.</li> <li>▪ Establish appropriate emergency procedures for accidental contamination of the surroundings. Waste recycling should be incorporated into the facility's operations as far as possible. Designate a secured, access restricted, sign posted room for the storage of potentially hazardous substances such as herbicides, pesticides, dips and medications.</li> <li>▪ The relevant Air Quality norms and standards must be adhered to.</li> <li>▪ General waste and hazardous waste should be stored temporarily on site in suitable (and correctly labelled) waste collection bins and skips (or similar). Waste collection bins and skips should be covered with suitable material, where appropriate</li> <li>▪ Should the on-site storage of general waste and hazardous waste exceed 100 m<sup>3</sup> and 80 m<sup>3</sup> respectively, then the National Norms and Standards for the Storage of Waste (published on 29 November 2013 under Government Notice 926) must be adhered to.</li> <li>▪ Ensure that the construction site is kept clean at all times and that construction personnel are made aware of correct waste disposal methods.</li> <li>▪ Ensure that sufficient general waste disposal bins are provided for all operational personnel throughout the site. These bins must be emptied on a regular basis.</li> <li>▪ No solid waste may be burned on site.</li> </ul>	Low

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#### PROPOSED DEVELOPMENT OF A CHICKEN BROILER FACILITY ON PORTION 40 OF THE FARM JONATHAN 175- JQ, BRITS, NORTH WEST

Nature of the Potential Impact/Risk	Status	Spatial Extent	Duration	Intensity	Probability	Significance of Impact/Risk (Without Mitigation)	Reversibility	Irreplaceability	Confidence level	Can the Impact/Risk be Avoided?	Can the Impact/Risk be Mitigated/Managed?	Potential Mitigation Measures	Significance of Residual Impact/Risk (With Mitigation)
												<ul style="list-style-type: none"> <li>▪ Segregation of hazardous waste from general waste to be in place.</li> <li>▪ The farm manager must be responsible for the correct disposal of the contents of the waste skips.</li> <li>▪ All operational waste (including rubble) should be frequently removed from site and correctly disposed by a licensed municipal landfill site</li> <li>▪ Establish appropriate emergency procedures for accidental contamination of the surroundings. Waste recycling should be incorporated into the facility's operations as far as possible. Designate a secured, access restricted, sign posted room for the storage of potentially hazardous substances such as herbicides, pesticides dips and medications. All hazardous waste should be disposed of at an appropriate licensed facility for this.</li> </ul>	
Pollution of the surrounding environment as a result of the handling of sewage	Negative	Local	Short term	Medium	Probable	Medium	High	High	3	Yes	Yes	<ul style="list-style-type: none"> <li>▪ Make use of a septic facility to temporarily store waste in an underground septic tank</li> <li>▪ The applicant to appoint a professional septic drainer for extraction of sewage in a manner that is not detrimental to the environment</li> </ul>	Low
Poor / Inappropriate control of animal pests	Negative	Local	Long term	Medium	Highly probable	Medium	Low	Low	3	Yes	Yes	<ul style="list-style-type: none"> <li>▪ Ensure that there is effective storm water drainage around the facility</li> <li>▪ Ensure that the facility is sufficiently ventilated to keep floors, bedding, and fodder as dry as possible.</li> <li>▪ Prevent and manage unwanted animal access to fodder.</li> <li>▪ Check that fan louvers (if installed) work properly, and close fans completely when off.</li> <li>▪ Ensure that floors are sloped and slatted to facilitate drainage.</li> <li>▪ Screed concrete floors properly to seal all cracks and limit the pooling of effluent and water.</li> </ul>	Low
Disease transmission	Negative	Local	Long term	High	Probable	Medium	Moderate	Low	2	Yes	Yes	<ul style="list-style-type: none"> <li>▪ Maintain appropriate pest control measures</li> <li>▪ Effectively maintain and seal all pipes and reservoirs containing slurry, to prevent animals from accessing the effluent.</li> </ul>	Low
Altered burning	Negative	Local	Long term	Medium	Definite	High	Moderate	Low	3	Yes	Yes	<ul style="list-style-type: none"> <li>▪ Create safe storage on the premises for flammable materials. If artificial burning is considered necessary, establish and implement a fire management plan with emergency fire procedures</li> <li>▪ Maintain an effective fire break between the development area and the surrounding natural environment (especially the ridge to the north, where the fire-dependent Highveld Blue butterfly may occur)</li> <li>▪ Educate workers about the plan and emergency procedures with regular training and notices</li> </ul>	Medium
Introduction & proliferation of alien species	Negative	Local	Long term	Medium	Definite	High	Low	Moderate	3	Yes	Yes	<ul style="list-style-type: none"> <li>▪ Carefully regulate / limit access by vehicles and materials to the site</li> <li>▪ Prohibit the introduction of domestic animals such as dogs and cats.</li> <li>▪ Plant only locally indigenous flora if landscaping needs to be done.</li> <li>▪ Employ best practices regarding tilling of soil and</li> </ul>	Low

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Nature of the Potential Impact/Risk	Status	Spatial Extent	Duration	Intensity	Probability	Significance of Impact/Risk (Without Mitigation)	Reversibility	Irreplaceability	Confidence level	Can the Impact/Risk be Avoided?	Can the Impact/Risk be Mitigated/Managed?	Potential Mitigation Measures	Significance of Residual Impact/Risk (With Mitigation)
												weed management <ul style="list-style-type: none"> <li>▪ Minimize the accumulation or dispersal of excess fodder on site.</li> <li>▪ Remove Category species using mechanical methods, and minimize soil disturbance as far as possible. Alien debris could be donated to a local community</li> </ul>	
Sensory disturbances	Negative	Local	Long term	Medium-low	Definite	Medium	Low	Low	3	Yes	Yes	Minimize essential lighting. <ul style="list-style-type: none"> <li>▪ Ensure that all outdoor lights are angled downwards and/or fitted with hoods.</li> <li>▪ Avoid using metal halide, mercury or other bulbs that emit high UV (blue-white) light that is highly and usually fatally attractive to insects.</li> <li>▪ Use bulbs that emit warm, long wavelength (yellow-red) light, or use UV filters or glass housings on lamps to filter out UV.</li> </ul>	Low
Destruction of graves	Negative	Site-specific	Permanent	Medium	Probable	Low	Low	High	5	Yes	Yes	<ul style="list-style-type: none"> <li>▪ The two graveyards should be fenced off clearly and pointed out to all construction workers and other staff on site to ensure that impacts to them are avoided;</li> <li>▪ No construction work should occur within 10 m of any of the graves;</li> </ul>	Very low
Destruction of archaeological artefacts	Negative	Site-Specific	Permanent	Medium-low	Definite	Very low	Low	High	5	No	No	<ul style="list-style-type: none"> <li>▪ If any archaeological material, palaeontological 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 appropriate specialist. Such heritage is the property of the state and may require excavation and curation in an approved institution.</li> </ul>	Very low
Destruction of palaeontological material	Negative	Site-Specific	Permanent	Medium-low	Probable	Very low	Low	High	5	No	No	<ul style="list-style-type: none"> <li>▪ If any archaeological material, palaeontological 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 appropriate specialist. Such heritage is the property of the state and may require excavation and curation in an approved institution.</li> </ul>	Very low
Emissions into the atmosphere as a result of staff vehicles.	Negative	Local	Short term	Medium-low	Highly probable	Medium	Moderate	Low	2	No	Yes	<ul style="list-style-type: none"> <li>▪ Efficient movement of traffic through the entrance and exit in order to reduce congestion and vehicle emissions.</li> <li>▪ Ensure that the facility is operated in such a manner whereby potential odours are minimised.</li> </ul>	Low
Improved service delivery with regards pork products	Positive	Local	Long term	Medium	Probable	Medium	High	High	3	No	Yes	<ul style="list-style-type: none"> <li>▪ Ensure that the proposed infrastructure is maintained appropriately to ensure that all facilities and infrastructure operate within its design capacity to deliver as the market requires.</li> </ul>	High
Opportunities for employment and skills development	Positive	Local	Long term	Medium	Probable	Medium	High	High	3	No	Yes	<ul style="list-style-type: none"> <li>▪ Enhance the use of local labour and local skills as far as reasonably possible. Where the required skills do not occur locally, and where appropriate and applicable, ensure that relevant local individuals are trained</li> <li>▪ Ensure that an equitable percentage allocation is provided for local labour employment as well as specify the use of small-to-medium enterprises and</li> </ul>	High

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Nature of the Potential Impact/Risk	Status	Spatial Extent	Duration	Intensity	Probability	Significance of Impact/Risk (Without Mitigation)	Reversibility	Irreplaceability	Confidence level	Can the Impact/Risk be Avoided?	Can the Impact/Risk be Mitigated/Managed?	Potential Mitigation Measures	Significance of Residual Impact/Risk (With Mitigation)
												training specifications in the Contractors contract.	
Night lighting of the development on the nightscape of the surrounding landscape	Negative	Local	Long term	Medium	Highly probable	Low	Moderate	Low	3	Yes	No	<ul style="list-style-type: none"> <li>No specific mitigation measures are recommended as it is assumed that night lighting of the proposed storage facility will be planned in such a manner so as to minimize light pollution such as glare and light spill (light trespass) by:</li> <li>Using light fixtures that shield the light and focus illumination on the ground (or only where light is required).</li> <li>Avoiding elevated lights within safety/security requirements.</li> <li>Using minimum lamp wattage within safety/security requirements.</li> <li>Where possible, using timer switches or motion detectors to control lighting in areas that are not occupied continuously (if permissible and in line with minimum security requirements).</li> <li>Switching off lights when not in use in line with safety and security.</li> </ul>	Low
Potential noise impact from operations and road transportation of products	Negative	Site specific	Short term	Medium-low	Probable	Medium	Moderate	High	3	No	Yes	<ul style="list-style-type: none"> <li>It is recommended that the drivers of the vehicles be discouraged from using air brakes at night.</li> <li>Limit the effects of noise associated disturbances from chickens and operational activities on sensitive fauna such as owls and medium-large mammals (especially carnivores), potentially occurring hedgehogs and large terrestrial birds such as Korhaans and Secretarybirds.</li> </ul>	Low
Atmospheric pollution due to fumes, smoke from fires	Negative	Local	Short term	Medium-low	improbable	Medium	Moderate	High	3	Yes	Yes	<ul style="list-style-type: none"> <li>Portable fire extinguishers and fire water hydrants (i.e. appropriate fire-fighting equipment) should be provided at the terminal as required. Mobile fire-fighting equipment should be provided at the berths as a safety precaution during the vessel offloading process. It should be noted that the products planned to be stored at the terminal have high flash points and low volatility. As a result, fires are unlikely, unsustainable, and can be extinguished with basic fire water and portable fire extinguishers.</li> </ul>	Low
Minor accidents to the public and moderate accidents to operational staff	Negative	Local	Long term	Medium-low	Improbable	Medium	Moderate	High	3	Yes	Yes	<ul style="list-style-type: none"> <li>An Emergency Plan should be compiled in order to deal with potential spillages and fires. Records of practices should be kept on site.</li> <li>Scheduled inspections should be implemented by operating personnel in order to assure and verify the integrity of hoses, piping and storage lagoon.</li> <li>Portable fire extinguishers and fire water hydrants (i.e. appropriate fire-fighting equipment) should be provided at the facility as required.</li> </ul>	Low
<b>DECOMMISSIONING PHASE</b>													
Loss or degradation of the wetland on the access road	Negative	Local	Long term	Medium	Definite	High	Moderate	Moderate	3	Yes	Yes	<ul style="list-style-type: none"> <li>Monitor and maintain the road impact control measures to ensure that they remain effective</li> </ul>	
Introduction & proliferation of alien spp. - Competition and change in structure	Negative	Local	Long term	High	Definite	High	Low	Low	3	Yes	Yes	<ul style="list-style-type: none"> <li>Remove Category species using mechanical methods and minimize soil disturbance as far as possible.</li> </ul>	Low

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Nature of the Potential Impact/Risk	Status	Spatial Extent	Duration	Intensity	Probability	Significance of Impact/Risk (Without Mitigation)	Reversibility	Irreplaceability	Confidence level	Can the Impact/Risk be Avoided?	Can the Impact/Risk be Mitigated/Managed?	Potential Mitigation Measures	Significance of Residual Impact/Risk (With Mitigation)
Sensory disturbances	Negative	Local	Long term	Medium-low	Highly probable	Low	Moderate	Low	3	Yes	Yes	<ul style="list-style-type: none"> <li>Commence (and preferably complete) demolition / rehabilitation during winter, when the risk of disturbing active (including breeding and migratory) animals, should be least.</li> <li>Minimize noise to limit its impact on sensitive fauna such as owls, korhaans and Secretarybirds</li> <li>Limit demolition activities to day time hours</li> <li>Minimize or eliminate security and other lighting, to reduce the disturbance of nocturnal fauna</li> <li>Implement environmentally-friendly dust control measures (e.g. mulching and wetting) where and when dust is problematic</li> <li>Rehabilitate contaminated areas a.s.a.p. in accordance with advice from appropriate specialists. Implement the selected control measure(s) where dust is problematic. Revegetate denude areas with locally indigenous flora a.s.a.p.</li> </ul>	Low
Destruction of graves	Negative	Site-specific	Permanent	Medium	Probable	Low	Low	High	5	Yes	Yes	<ul style="list-style-type: none"> <li>The two graveyards should be fenced off clearly and pointed out to all construction workers and other staff on site to ensure that impacts to them are avoided;</li> <li>No construction work should occur within 10 m of any of the graves;</li> </ul>	Very low
Destruction of archaeological artefacts	Negative	Site-Specific	Permanent	Medium-low	Definite	Very low	Low	High	5	No	No	<ul style="list-style-type: none"> <li>If any archaeological material, palaeontological 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 appropriate specialist. Such heritage is the property of the state and may require excavation and curation in an approved institution.</li> </ul>	Very low
Destruction of palaeontological material	Negative	Site-Specific	Permanent	Medium-low	Probable	Very low	Low	High	5	No	No	<ul style="list-style-type: none"> <li>If any archaeological material, palaeontological 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 appropriate specialist. Such heritage is the property of the state and may require excavation and curation in an approved institution.</li> </ul>	Very low
Discharge of contaminated stormwater into the surrounding environment	Negative	Local	Long term	High	Highly probable	Medium	Moderate	High	3	Yes	Yes	<ul style="list-style-type: none"> <li>The appointed Contractor should compile a Method Statement for Stormwater Management during the decommissioning phase.</li> <li>Provide secure storage for oil, chemicals and other waste materials to prevent contamination of stormwater runoff.</li> </ul>	Low
Pollution of the surrounding environment as a result of the handling, temporary storage and disposal of solid waste	Negative	Local	Short term	Medium	Probable	Medium	High	High	3	Yes	Yes	<ul style="list-style-type: none"> <li>General waste (i.e. building rubble, demolition waste, discarded concrete, bricks, tiles, wood, glass, plastic, metal, excavated material, packaging material, paper and domestic waste etc.) and hazardous waste (i.e. empty tins, paint and paint cleaning liquids, oils, fuel spillages and chemicals etc.) generated during the decommissioning phase should be stored temporarily on site in suitable (and correctly labelled) waste collection bins and skips (or similar). Waste collection bins and skips should be</li> </ul>	Low

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Nature of the Potential Impact/Risk	Status	Spatial Extent	Duration	Intensity	Probability	Significance of Impact/Risk (Without Mitigation)	Reversibility	Irreplaceability	Confidence level	Can the Impact/Risk be Avoided?	Can the Impact/Risk be Mitigated/Managed?	Potential Mitigation Measures	Significance of Residual Impact/Risk (With Mitigation)
												covered with suitable material, where appropriate. <ul style="list-style-type: none"> <li>Should the on-site storage of general waste and hazardous waste exceed 100 m<sup>3</sup> and 80 m<sup>3</sup> respectively, then the National Norms and Standards for the Storage of Waste (published on 29 November 2013 under GN 926) must be adhered to.</li> <li>Ensure that general waste and hazardous waste generated are removed from the site on a regular basis and disposed of at an appropriate, licensed waste disposal facility by an approved waste management Contractor. Waste disposal slips or waybills should be kept on file for auditing purposes as proof of disposal.</li> <li>Ensure that sufficient general waste disposal bins are provided for all personnel throughout the site. These bins must be emptied on a regular basis.</li> <li>Appropriately time demolition / rehabilitation activities to minimise sensory disturbance to fauna.</li> </ul>	
Emissions from decommissioning vehicles and generation of dust	Negative	Local	Short term	Medium-low	Highly probable	Medium	Moderate	Low	2	No	Yes	<ul style="list-style-type: none"> <li>Ensure that cleared (excavated) areas and unpaved surfaces are sprayed with water (obtained from an approved source) to minimise dust generation.</li> <li>Approved soil stabilisers may be utilised to limit dust generation.</li> <li>Ensure that decommissioning vehicles travelling on unpaved roads do not exceed a speed limit of 40 km/hour.</li> </ul>	Low
Noise generation from demolition activities	Negative	Site specific	Short term	Medium-low	Probable	Medium	Moderate	High	3	No	Yes	<ul style="list-style-type: none"> <li>A method statement, including detailed procedures, must be drawn up prior to any decommissioning of existing tanks.</li> <li>Decommissioning personnel must wear proper hearing protection, which should be specified as part of the Decommissioning Phase Risk Assessment carried out by the Contractor.</li> <li>The Contractor must ensure that all decommissioning personnel are provided with adequate PPE, where appropriate.</li> </ul>	Low

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BRITS, NORTH WEST

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# BASIC ASSESSMENT REPORT

## APPENDIX I: PUBLIC PARTICIPATION

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## APPENDICES

### Contents of Newspaper Advertisement

# Notice of Basic Assessment for the proposed development of a chicken broiler facility on Portion 40 of the Farm Jonathan 175-JQ, Brits, North West.

CSIR Reference No: CSIR/02100/EMS/IR/2016/0003/A

Notice is given of a Basic Assessment (BA) process being undertaken on behalf of Jam Rock Pty Ltd (the Project Applicant) for the proposed development of a chicken broiler facility on Portion 40 of the Farm Jonathan 175-JQ, Brits, North West.

In terms of the NEMA EIA Regulations published in Government Notice Regulation (GNR) 983 and 985 on 4 December 2014 Government Gazette Number 38282, a BA process is required as the project triggers the following listed activities: *GNR 983 Activity 5(iv) & 27 and GNR 985 Activity 12(a)(ii)*. The Council for Scientific and Industrial Research (CSIR) is the Environmental Assessment Practitioner (EAP) who will be managing the process.

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 cite the CSIR Reference Number and provide your full name, full postal address, phone numbers, email address and state your area of interest and/or concern to: Ms. Reinett Mogotshi, CSIR, PO Box 320, Stellenbosch 7599, Phone: (021) 888 2432, Fax: (021) 888 2473 or Email: [rmogotshi@csir.co.za](mailto:rmogotshi@csir.co.za). You have until on or before 19 September 2016 to do so (30 days from the date of this publication - including weekends, but excluding public holidays).



**CSIR**  
our future through science

# APPENDICES

## *Proof of Site Notice*



# APPENDICES

## Contents of the Site Notice

### Jam Rock (Pty) Ltd Chicken Broiler Facility Project Site (North West)

#### 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 4 December 2014, of the National Environmental Management Act, 1998 (Act No 107 of 1998), that the **Jam Rock (Pty) Ltd**, proposes the construction of a chicken broiler facility on the portion 40 of the farm Jonathan 175-JQ, Brits, North West.

**(CSIR Reference Number: CSIR/CAS/EMS/IR/2015/0015/A)**

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 North West Department of Rural, Environment and Agricultural Development (READ). The need for a Basic Assessment is triggered by the following activity listed in Government Notice Regulations (GNR) 983 and 985 of 4 December 2014:

Government Notice	Listed Activity Number
GNR 983, 4 December 2014	5 (iv)
GNR 983, 4 December 2014	27
GNR 985, 4 December 2014	12 (a)(ii)

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 the Project Manager below, and quote the CSIR Reference Number:



**Project Manager**  
**Ms. Reinett Mogotshi**  
PO Box 320,  
Stellenbosch, 7599  
Tel: 021 888 2432  
Fax: 021 888 2693  
Email:  
[rmogotshi@csir.co.za](mailto:rmogotshi@csir.co.za)



Figure 1: Locality Map depicting the location of the Proposed Project

## APPENDICES

### Jam Rock (Pty) Ltd Chicken Broiler Facility Project Site (North West)

#### KITSISO YA TIRELO YA BASIC ASSESSMENT (BA)

Le itsisiwe gore, go ya ka melao ya Tihathobo ya Tikologo (EIA), ka fa tlase ga molawana-tsamaiso 41(1) le molawana-tsamaiso 41(4), e e gatisitweng ka Gazeteng ya Mmuso ya nomoro 38282 wa Sedimonthole 2014, ya Molao wa Lekgotla la Taolo ya Tikologo, 1998 (Molao 107 wa 1998), gore **Jam Rock (Pty) Ltd**, e batla go simolola kgwebo ya go rua dikgogo kwa tshimong on the portion 40 of the farm Jonathan 175-JQ, Brits, North West.

**(CSIR Reference Number: CSIR/CAS/EMS/IR/2015/0015/A)**

Lekgotla la Dipatlisiso tsa Saense le Indasteri (Council for Scientific & Industrial Research -CSIR), le le ikemetseng ka di tihathobo tsa tikologo, le tlo laola tsamaiso ya tihathobo ya tikologo ya projekte. Projekte e tla kwadisiwa le the North West Department of Rural, Environment and Agricultural Development (READ). Tihathobo ya tikologo e tihokagala gonne e tsoitse ditiro tse di latelang tsa Kitsiso ya Melao wa Mmuso(GNR) 983 le 985 ya 4 Sedimonthole 2014:

Kitsiso ya Mmuso	Nomoro ya Tiro
GNR 983, 4 December 2014	5 (iv)
GNR 983, 4 December 2014	27
GNR 985, 4 December 2014	12 (a)(ii)

Go fitlhela dikitsiso tse di amanang le projekte le tsamaiso ya tihathobo ya tikologo, ikwadise jaaka mokgatlhegi le moamegi wa projekte. Ikopantshe le:

**Project Manager**  
**Ms. Reinett Mogotshi**  
**PO Box 320, Stellenbosch, 7599**  
**Tel: 021 888 2432**  
**Fax: 021 888 2693**  
**Email: [rmogotshi@csir.co.za](mailto:rmogotshi@csir.co.za)**



**Setshwantsho 1: Mmepe o o bontshang lefelo la projekte**

## APPENDICES

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### **Appendix I2: Proof that the key stakeholder received written notification of the proposed activities**

*Email to I&AP*

**From:** Reinett Mogotshi  
**Date:** 25/08/2016 14:44  
**Subject:** Notification of Release of BID Basic Assessment for the proposed development of a chicken broiler facility on Portion 40 of the Farm Jonathan 175-JQ, Brits, North West.  
**Bc:** mrabothata@environment.gov.za; SHlela@environment.gov.za; tnamarude@en...  
**Attachments:** BID\_final.pdf; I&APs Cover Letter\_Draft\_ENGLISH.pdf; Register I&APs\_Disclosure of interest\_ENGLISH.docx

Good day,

You are hereby notified about the release of the Background Information Document (BID) for the Basic Assessment for the proposed development of a chicken broiler facility on Portion 40 of the Farm Jonathan 175-JQ, Brits, North West. Please find attached the BID, which has been released for 30 day review, and the Registration/ Comment Form. Please return or before **26 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. 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 via a hard copy, i.e. Email, Fax or Letter.

**Contact via:** Ms. Reinett Mogotshi  
**Email:** [rmogotshi@csir.co.za](mailto:rmogotshi@csir.co.za)  
**Tel:** 021 888 2432  
**Fax:** 021 888 2473  
**Postal:** PO Box 320  
Stellenbosch  
7599  
South Africa

Regards,  
CSIR Project Manager  
Ms. Reinett Mogotshi

## APPENDICES

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### Delivery Report

amogelang.sefara@moretele.org.za	Transferred
Transferred	25/08/2016 14:44
BC: amogelang.sefara@moretele.org.za	
andrew.mvundle@gmail.com	Transferred
Transferred	25/08/2016 14:45
BC: andrew.mvundle@gmail.com	
avanstraaten@nwpg.gov.za	Transferred
Transferred	25/08/2016 14:45
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cmmutle@nwpg.gov.za	Transferred
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BC: cmmutle@nwpg.gov.za	
howard.hendricks@sanparks.org	Transfer Delayed
Transfer Delayed	25/08/2016 14:44
Transferred	25/08/2016 15:05
BC: howard.hendricks@sanparks.org	
innocents@bojanala.gov.za	Transferred
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BC: innocents@bojanala.gov.za	
kgauta.mokoena@dmr.gov.za	Transferred
Transferred	25/08/2016 14:44
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lfourie@nwpg.gov.za	Transferred
Transferred	25/08/2016 14:45
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lmothanke@nwpg.gov.za	Transferred
Transferred	25/08/2016 14:45
BC: lmothanke@nwpg.gov.za	
mashuduma@daff.gov.za	Transferred
Transferred	25/08/2016 14:44
BC: mashuduma@daff.gov.za	
mbila@nwpg.gov.za	Transferred
Transferred	25/08/2016 14:45
BC: mbila@nwpg.gov.za	
mmadire.rampedi@morepele.org.za	Undelivered 421 service unavailable
MMolefane@thedti.gov.za	Transferred
Transferred	25/08/2016 14:45
BC: MMolefane@thedti.gov.za	
MohapiN@dwa.gov.za	Transferred
Transferred	25/08/2016 14:45
BC: MohapiN@dwa.gov.za	
mosadim@nwpg.gov.za	Transferred
Transferred	25/08/2016 14:45

## APPENDICES

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mosadim@nwpg.gov.za		Transferred
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mosianem@nwpg.gov.za		Transferred
Transferred	25/08/2016 14:45	
BC: mosianem@nwpg.gov.za		
mrabothata@environment.gov.za		Transferred
Transferred	25/08/2016 14:44	
BC: mrabothata@environment.gov.za		
mtumane@nwpg.gov.za		Transferred
Transferred	25/08/2016 14:45	
BC: mtumane@nwpg.gov.za		
MuthraparsadN@dwa.gov.za		Transferred
Transferred	25/08/2016 14:45	
BC: MuthraparsadN@dwa.gov.za		
ncamisile.nkabinde@drdlr.gov.za		Transferred
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BC: ncamisile.nkabinde@drdlr.gov.za		
ntnango@nwpg.gov.za	Undelivered	550 5.1.1 <ntnango@nwpg.gov.za>: Recipient address rejected: undeliverable address: host 10.145.142.11[10.145.142.11] said: 550 No such recipient (in reply to RCPT TO command)
Transferred	25/08/2016 14:45	
Undeliverable	25/08/2016 14:45	550 5.1.1 <ntnango@nwpg.gov.za>: Recipient address rejected: undeliverable address: host 10.145.142.11[10.145.142.11] said: 550 No such recipient (in reply to RCPT TO command)
BC: ntnango@nwpg.gov.za		
okgathe@nwpg.gov.za		Transferred
Transferred	25/08/2016 14:45	
BC: okgathe@nwpg.gov.za		
pkhrisjan@nwpg.gov.za	Undelivered	550 5.1.1 <pkhrisjan@nwpg.gov.za>: Recipient address rejected: undeliverable address: host 10.145.142.11[10.145.142.11] said: 550 No such recipient (in reply to RCPT TO command)
rmathebula@nwpg.gov.za		Transferred
Transferred	25/08/2016 14:45	
BC: rmathebula@nwpg.gov.za		
Sfoya@geoscience.org.za		Transferred
Transferred	25/08/2016 14:44	
BC: Sfoya@geoscience.org.za		
SHlela@environment.gov.za		Transferred
Transferred	25/08/2016 14:44	
BC: SHlela@environment.gov.za		

## APPENDICES

smukhola@nwpg.gov.za Undelivered 550 5.1.1 <smukhola@nwpg.gov.za>:  
Recipient address rejected: undeliverable  
address: host  
10.145.142.11[10.145.142.11] said: 550  
No such recipient (in reply to RCPT TO  
command)

Transferred 25/08/2016  
14:45

Undeliverable 25/08/2016 550 5.1.1 <smukhola@nwpg.gov.za>: Recipient address rejected:  
14:45 undeliverable address: host 10.145.142.11[10.145.142.11] said: 550 No  
such recipient (in reply to RCPT TO command)

BC: smukhola@nwpg.gov.za

stephaniea@ewt.org.za Transferred

Transferred 25/08/2016 14:45

BC: stephaniea@ewt.org.za

tboshoff@nwpg.gov.za Transferred

Transferred 25/08/2016 14:45

BC: tboshoff@nwpg.gov.za

tmakhoana@salga.org.za Transferred

Transferred 25/08/2016 14:44

BC: tmakhoana@salga.org.za

tnemarude@environment.gov.za Transferred

Transferred 25/08/2016 14:44

BC: tnamarude@environment.gov.za

vincent.maseko@yahoo.com Transferred

Transferred 25/08/2016 14:45

BC: vincent.maseko@yahoo.com

**Attachments:** User: 3, System: 2

BID_final.pdf	826 KB (846369 Bytes)	23/08/2016 10:20
I&APs Cover Letter_Draft_ENGLISH.pdf	336 KB (344168 Bytes)	25/08/2016 14:35
Register I&APs_Disclosure of interest_ENGLISH.docx	147 KB (150980 Bytes)	23/08/2016 16:36
MESSAGE	4 KB (4667 Bytes)	25/08/2016 14:44
TEXT.htm	5 KB (5948 Bytes)	25/08/2016 14:44

**Send Options:**

## APPENDICES

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*Email2 to I&AP*

**From:** Reinett Mogotshi  
**Date:** 14/06/2017 12:51  
**Subject:** Re: Notification of Release of the Draft Basic Assessment for the proposed development of a chicken broiler facility on Portion 40 of the Farm Jonathan 175-JQ, Brits, North West.  
**Bc:** amogelang.sefara@moretele.org.za; andrew.mvundle@gmail.com ; avanstraa...

Dear Stakeholders

**Reminder:** Public Comment Period for Draft Basic Assessment Report

Please note that the public comment period for the below-mentioned project ends on **14 June 2017**.

A hard copy of the Draft BA Report is available for public viewing at Puo-Phaa Secondary School (341 Jonathan Village, Jericho Area,0189). The Draft BA Report can also be downloaded from the following website:

<https://www.csir.co.za/environmental-impact-assessment>

Please send through any comments on the Draft Report by the end of the above mentioned date to: Ms. Reinett Mogotshi (Project Manager)

Postal address: PO Box 320, Stellenbosch, 7599, South Africa

Tel: 021 888 2432

Fax: 021 888 2693

E-mail: [Rmogotshi@csir.co.za](mailto:Rmogotshi@csir.co.za)

Kind Regards

# APPENDICES

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Letter1 to I&AP



CSIR Environmental Management Services  
PO Box 320  
Stellenbosch  
7599  
South Africa  
Tel: +27 21 888 2432  
Fax: +27 21 888 2693  
Email: [mogotshi@csir.co.za](mailto:mogotshi@csir.co.za)

25 August 2016

Dear Interested and Affected Party

**THE PROPOSED DEVELOPMENT OF A CHICKEN BROILER FACILITY ON PORTION 40 OF THE FARM JONATHAN 175-JQ, BRITS, NORTH WEST. (CSIR REFERENCE NO: CSIR/02100/EMS/IR/2016/0003/A).**

The National Department of Environmental Affairs (DEA) and the Council for Scientific and Industrial Research (CSIR) 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. The project is being assessed in terms of the 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 4 December 2014.

Jam Rock (Pty) Ltd has been identified as an eligible client for this service and is proposing to develop three chicken broiler houses with associated infrastructure on Portion 40 of the Farm Jonathan 175-JQ. The need for a Basic Assessment process is required by the inclusion of the activities listed within GNR 983: Activity 5(iv) & 27 and GNR 985: Activity 12(a)(ii). The CSIR, as the independent Environmental Assessment Practitioner (EAP), will be managing the Basic Assessment and public consultation processes for this proposed development.

Please find enclosed, a Background Information Document (BID) that will assist in your further understanding of the project as well as a Registration and Comment form. A 30 days commenting period has been allocated for the review and the provision of comments to the EAP, as well as for registering as an Interested and Affected Party that will be kept informed of the project for the remainder of the EIA process. Please submit your comments before or on **26 September 2016**.

Should you have any project related queries, please feel free to contact the undersigned

Yours sincerely,

**Ms. Reinett Mogotshi (Project Manager)**

Contact: **Ms. Reinett Mogotshi**  
Postal address: PO Box 320, Stellenbosch, 7599, South Africa  
Tel: 021 888 2432  
Fax: 021 888 2473  
E-mail: [rmogotshi@csir.co.za](mailto:rmogotshi@csir.co.za)  
Website: <http://www.csir.co.za/ems/specialneeds/>

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

[www.csir.co.za](http://www.csir.co.za)

# APPENDICES

Letter2 to I&AP



## CSIR Specialist Services

PO Box 320  
Stellenbosch  
7599  
South Africa  
Tel: +27 21 888 2432  
Fax: +27 21 888 2693  
Email: rmogotshi@csir.co.za

15 June 2017

Dear Interested and/or Affected Party,

### NOTICE OF RELEASE OF DRAFT BASIC ASSESSMENT REPORT FOR A 30-DAY REVIEW PERIOD

#### **BASIC ASSESSMENT FOR THE PROPOSED DEVELOPMENT OF A CHICKEN BROILER FACILITY ON PORTION 40 OF THE FARM JONATHAN 175- JQ, BRITS, NORTH WEST**

CSIR REFERENCE NO: CSIR/02100/EMS/IR/2016/0003/A

The National Department of Environmental Affairs (DEA) and the Council for Scientific and Industrial Research (CSIR) 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. Jam Rock (Pty) Ltd has been identified as an eligible client for this service and is proposing to develop of a chicken broiler facility on Portion 40 of the Farm Jonathan 175-JQ, Brits, North west.

In terms of Government Notice Regulations GNR 324, 325, 326 and 327 on the 7 April 2017 of the National Environmental Management Act (Act 107 of 1998) published in Government Gazette 40772, Environmental Authorisation from the Competent Authority, in this case the North West Department of Rural Environment and Agricultural Development (READ), is required prior to the undertaking of any activity triggered within GNR 324, 325, 326 and 327. The CSIR, as the independent Environmental Assessment Practitioner (EAP), will be managing the Basic Assessment and Public Participation Process for this proposed project.

In line with the Environmental Impact Assessment requirements of 4 December 2014, Interested and Affected Parties (I&APs) are hereby notified of the release of the Draft BA Report for a 30-day review period, which will extend from **15 June to 18 July 2017**. Please submit any review comments on the Draft BAR by 18 July 2017 to the CSIR Project Manager via email or post at the contact details above.

A hard copy of the Draft BA Report is available for public viewing at Puo-Phaa Secondary School (341 Jonathan Village, Jericho Area, 0189). The Draft BA Report can also be downloaded from the following project website:

<https://www.csir.co.za/environmental-impact-assessment>

The next step in the BA Process will entail compiling the Final BA Report and including all comments received from I&APs during the 30-day review period of the Draft BA Report. Once finalised, the Final BA Report will be submitted to the READ for decision making. As a registered I&AP on the project database, you will be notified in writing of the submission of the Final BA Report, as well as the outcome of the decision making process.

Should you have any queries or require additional information please do not hesitate to contact the undersigned using the contact details provided above.

Sincerely,

**Ms. Reinett Mogotshi (Project Manager)**

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)

## APPENDICES

### Proof of Postage

*REGISTERED MAIL: R28.55 X 54 - R 710,160.*

Name & Signature of person responsible for post: John:  : 25.8.2016

32 items –Registered Post (Jam Rock (Pty) Ltd BA 24<sup>th</sup> August 2016) Reinett Mogotshi 021 888 2432

NMS0076 / RUN / 02100 / 021SE

Grasslands Society of South Africa Feyni Du Toit P.O. Box 41, Hilton 3245	Department of Environmental Affairs- National Mmatlala Rabothata Private Bag X447 Pretoria 0002	Vincent Maseko P O Box 60382 Karen Park 0118
Department of Agriculture, Forestry and Fisheries Mashudu Marubini Private Bag X138 Pretoria 0001	Tharina Boshoff Private Bag X2039 Mmabatho 2739	Steven Muklola Private Bag X2039 Mmabatho 2739
Malefyané Mosadi Private Bag X2039 Mmabatho 2736"	Rhuleni Mathebula Private Bag X2039 Mmabatho 2735"	Moretele Local Municipality Amogelang Sefara Private Bag X367, Makapanstad, North West 0404
Moretele Local Municipality Municipal Manager Private Bag X367, Makapanstad, North West, 0404	Bojanala Platinum District Municipality Goitsimosimo Tau P O Box 1993, Rustenburg,0300	Community Chairman Mr Ngema Private Bag X1031 Bethanie, 0270
Jan Maseko Private Bag X1031 Bethanie 0270	Mathews Mlangeni Private Bag X1031 Bethanie, 0270	David Maseko Private Bag X1031 Bethanie, 0270

## APPENDICES

<p>Boysee Masango Private Bag X1031 Bethanie, 0270</p>	<p>Joshua Mlangeni Private Bag X1031 Bethanie, 0270</p>	<p>Edwin Lelaka Private Bag X1031 Bethanie, 0270</p>
<p>Senza Ngozo Private Bag X1031 Bethanie, 0270</p>	<p>Alfred Ngobese Private Bag X1031 Bethanie, 0270</p>	<p>Madoda Maseko Private Bag X1031 Bethanie, 0270</p>
<p>Sbongseni Mlangeni Private Bag X1031 Bethanie, 0270</p>	<p>Mndenl Ngozo Private Bag X1031 Bethanie, 0270</p>	<p>South African National Parks (SANParks) Dr. Howard Hendriks PO Box 787, Pretoria 0001</p>
<p>Bongane Radebe Private Bag X1031 Bethanie, 0270</p>	<p>Ntomfuthi Mlangeni Private Bag X1031 Bethanie, 0270</p>	<p>Caiphus Ngozo Private Bag X1031 Bethanie, 0270</p>
<p>Ward Councillor Mr Moseithe P O Box 1962 Hammanskraal 0400</p>	<p>North West Provincial Heritage Resources Authority Mr Moslane Mothlabane Private Bag X90 Mmabatho 2735</p>	<p>AgriLand Anneliza Collett Private Bag X120, Pretoria 0001</p>
<p>Council for Geoscience Dr Stewart Foya Private Bag X 112, Pretoria 0001</p>	<p>South African Heritage Resources Agency (SAHRA) Marie South PO Box 4637, Cape Town 8000</p>	

## APPENDICES

Attendance register for the community meeting was held on the 29th of April 2017 at Mankgekgetha Primary School in Jonathan.

29 APRIL 2017

	Name & surname	ID NO:	ERF NO:	CONTACT	SIGNATURE
1.	BENEDICT MLAMBO	6210255754086	98	0725904733	<i>[Signature]</i>
2.	MAKHUTLA MASIPA	4406065550087		0828522634	<i>[Signature]</i>
3.	Kennedy Zulu	4806115303087		0788741529	<i>[Signature]</i>
4.	FANNIE MALANGU	551095579087	23	0792447670	<i>[Signature]</i>
5.	JOSEPH NOKWANE	5012225737089	26.8	0795430133	<i>[Signature]</i>
3.	LUKAS TLOA	5203095349087	29	0710503280	<i>[Signature]</i>
7.	MOGALE THOKA	712145414085		0825726785	<i>[Signature]</i>
8.	SIDNEY MAKHATHINI	5805235793087		0825785824	<i>[Signature]</i>
7.	Catherine Manganyi	5912-304596082	16.7	0779419188	Catherine
6.	Melissa Radebe	4810090230085	84	0752908273	Melissa
7.	Makuthu Muzala	6209280403084	10.2	0761952683	N. Nkomo
2.	Tinabile Mkhomo	7103060636086	101	0760779380	<i>[Signature]</i>
8.	Margaret Sithebe		101	0760779380	<i>[Signature]</i>
4.	Sophie Mandiwe	0822625691	280		SMA
5.	Letty Mkhosi		325	N/A	LMKOSI
5.	Lucy Tinkwalo Nkomo	850531009085	245	0715597193	<i>[Signature]</i>
7.	Sibongile Ntshona	5911060353085	227	07187481484	Sibongile
8.	Ping from Ikweni	07142552290	2833	0712582380	<i>[Signature]</i>
7.	Samuel MUDAU	19770626	237	0827218664	<i>[Signature]</i>
20.	ANNAH MUDAU	19500225	237	0755758550	ANNAH
1.	Sibongile Mduli	19560121	234	0714914625	S. C. Mduli
2.	JUDITH MTHEKWA	5609040734	234	0944290263	J. Mthekwa

**APPENDICES**

29 APRIL 2017

	Name & surname	ID NO:	ERF NO:	CONTACT	SIGNATURE
8	ZAMUMUZI XABA	6001026143093	7	0727020550	
2	Elias Ndumbe	-	170	0765900000	Ndumbe
5	Thomas Mkhale	-	155	-	Mkhale
6	Zweli Ntosi	-	313	0769441335	Ntosi
7	Suleman T Sikkie	520229534005	52	N/A	T Sikkie
8	Elina Erasmus	0762142497	157		Erasmus
9	Ernest Mkhale	-	319		Mkhale
10	Piet Mkhale	-	219	0796346376	Mkhale
31	Joseph Ciba	571185092030	01	0766050795	Ciba
2	Joseph + Marlene	3605000000	258	0795567757	Joseph
3	Macu HFF?		44	0715443626	A. Macu
4	Charlotte D. Sibani	860526101006	250	0728815077	Sibani
5	Civiso Moyaha		255	0729310643	Moyaha
6	Joyce Balozi		235	0765580937	Balozi
7	THOKA SH	0823677491			Thoka
8	Sibusiso Maseto	811185516052 0731427556	40/46	0731427556	Maseto
9	Benjamin Nyuvda	-	165	0720668476	Nyuvda
0	Nicco Mkhale		175	0721668100	Mkhale
4	Moses Mlangeni		48	076027342	Mlangeni
5	Ishmael Poto		39	0790922445	Poto
4	Boyce Masango	650329593000	266	0844196644	Masango
4	Gloria Chabane		103	0721503657	Chabane



## APPENDICES

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### **Appendix I3: Comments Received from I&AP**

**From:** "Ogopoleng Kgateha" <okgateha@nwpg.gov.za>  
**To:** "Reinett Mogotshi" <RMogotshi@csir.co.za>  
**Date:** 25/08/2016 15:42  
**Subject:** Re: Notification of Release of BID Basic Assessment for the proposed development of a chicken broiler facility on Portion 40 of the Farm Jonathan 175-JQ, Brits, North West.  
**Cc:** "Happy Mokone" <HMokone@nwpg.gov.za>

Good afternoon

We really appreciate for the info and we are hoping for more in future.

Kind regards  
Secretary: Enterprise Development  
Ogopoleng

**TEL: 018 387 7965**  
**Cell: 073 1708 695**  
**Fax: 086 260 4952**  
**Email: [okgateha@nwpg.gov.za](mailto:okgateha@nwpg.gov.za)**  
**"putting people first"**



**feed**

Department:  
**Economy & Enterprise Development**  
North West Provincial Government  
Republic of South Africa

## APPENDICES

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**From:** "Motlhabane Mosiane" <MosianeM@nwpg.gov.za>  
**To:** "Reinett Mogotshi" <RMogotshi@csir.co.za>  
**Date:** 25/08/2016 15:42  
**Subject:** Re: Notification of Release of BID Basic Assessment for the proposed development of a chicken broiler facility on Portion 40 of the Farm Jonathan 175-JQ, Brits, North West.  
**Cc:** "Natasha Higgitt" <nhiggitt@sahra.org.za>

Greetings,

Thank you for notifying NWPHRA of the proposed development. Please note that SAHRA does not accept emailed, posted, hardcopy or website links as official submissions. Please create a case on the South African Heritage Resources Information System (SAHRIS) and upload all documents (i.e. the Scoping report and all appendices) to the case file. Step-by-step tutorial videos on the SAHRIS homepage (<http://sahra.org.za/sahris/>) will show you how to complete this. Please inform Ms Natasha Higgitt :Heritage Officer: Archaeology, Palaeontology and Meteorites Unit of SAHRA when this has been completed and She will attend to the case.her contact details outlined as follows :TEL: +27 21 462 4502 | FAX: +27 21 462 4509  
EMAIL: [nhiggitt@sahra.org.za](mailto:nhiggitt@sahra.org.za)

I hope you will find the above in order,

Kind Regards,

Motlhabane Mosiane  
Provincial Coordinator:North West PHRA  
Tel:018 388 2826  
E-mail:MotlhabaneM@nwpg.gov.za

## APPENDICES

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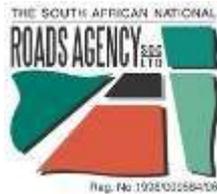
**From:** "Victoria Bota (HO)" <BotaV@nra.co.za>  
**To:** 'Reinett Mogotshi' <RMogotshi@csir.co.za>  
**Date:** 25/08/2016 16:25  
**Subject:** RE: Notification of Release of BID Basic Assessment for the proposed development of a chicken broiler facility on Portion 40 of the Farm Jonathan 175-JQ, Brits, North West.

Good day Reinett

SANRAL will not be affected by the proposed activity as no National Road is affected. Please note that should a National Road be affected in the future, permission will have to be obtained from SANRAL.

Please remove SANRAL from the distribution list for this project. Thank you

Kind regards



**Ms Victoria Bota**  
**Environmental Co-ordinator**

Tel: 012 844 8031  
Cell: 061 647 5212  
Fax: 012 348 1512  
Email: [botav@nra.co.za](mailto:botav@nra.co.za)

---

**Northern Region**  
**38 Ida Street**  
**Menlo Park**  
**Pretoria**

**SANRAL Fraud Hotline: 0800204558**

*One thing I ask of the LORD, this is what I seek: that I may dwell in the house of the LORD all the days of my life...*

## APPENDICES

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**From:** Carmen Barends <carmenb@l2b.co.za>  
**To:** <rmogotshi@csir.co.za>  
**Date:** 29/08/2016 11:21  
**Subject:** Chicken Broiler Facility

Good day Reinett,

Please could I register as an I&A party for the above Project and if possible obtain the Background Information Document for the Project?

Thank you.

Kind Regards,

Carmen Barends  
Regional Content Researcher  
Private Projects

Leads 2 Business ([www.L2B.co.za](http://www.L2B.co.za))

Tel: 033 343 1130 or 0860 836337 (0860 TENDER)

Fax: 033 343 5882

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Please note that any views expressed in this email may be those of the originator and do not necessarily reflect those of Cedrus Internet

## APPENDICES

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*Comments received during a community meeting*

**From:** Vincent Maseko <vincent.maseko@yahoo.com>  
**To:** Karabo Mashabela <KMashabela1@csir.co.za>, Reinett Mogotshi <rmogotshi@c...>  
**Date:** 02/05/2017 17:15  
**Subject:** Re: BAr for public participation  
**Attachments:** Jonathan Att.pdf

Good day

Please see attached is the attendance register for the meeting held on the 29th of April 2017 at Mankgekgetha Primary School in Jonathan.

The meeting was attended by just above 50 members of the community. I Vincent Maseko was able to briefly go through the BAR (Basic Assessment Report) for the proposed poultry business.

The news was met with excitement by most members of the community especially the ones who knew me from previous projects as my father was the founder and chairman of the Jonathan Farming Cooperative. Others however like Mr. Sidney Makhathini had objections which were not welcomed by other members of the community.

Here are some objections and questions asked by attendants.

Objections:

1. How come this type of project is available for the Maseko Family and not the community as a whole?

-> (answer): This is a privately funded and founded project and I Vincent Maseko am not a member of the Cooperative, CPA, Local Authority or represent any political movement. The project will be privately funded and managed.

2. Why is it being announced in the meeting?

-> (answer): First to alert the members of Jonathan of this opportunity coming their way and the need of skills that will be required during the erection and operation of the project.

And how the members of the community can gain or get involved.

3. When will it start?

-> (answer): As soon as the Environmental Impact Assessment has been completed and funding secured. Hopefully towards the end of the year or early next year after all systems would have been put in place.

4. Can you keep us posted?

-> (answer): Yes, follow up announcements will be made during quarterly meetings held by the community.

Thanking you in advance

Vincent Maseko  
073 142 7536

# APPENDICES

Comments received during the release of the Draft Basic Assessment Report



**water & sanitation**

Department:  
Water and Sanitation  
**REPUBLIC OF SOUTH AFRICA**

Provincial Operations: North West, Cnr Dr. James Moroka Drive and Sekame Road, Megacity Shopping Centre, Unit no. 99,  
Ground Floor, Private Bag x5, Mmabatho, 2735; Tel (018) 387 9500, Fax: (018) 392 2998 / 384 0913, [www.dwa.gov.za](http://www.dwa.gov.za)

Fax No:	(012) 253-2761	✉	<b>P/B X 357</b>	✉	Comia Theunissen
			HARTBEESSPOORT	☎	(012) 253-1026
e-mail:	<a href="mailto:theunissenc@dws.gov.za">theunissenc@dws.gov.za</a>		0216	📁	16/2/7/A210/B685

2017-05-11

CSIR Specialist Services  
P.O Box 320  
Stellenbosch  
7599

For Attention : Ms Reinett Mogotshi      Ref No : CSIR 02100/EMS/IR/2016/0003/A

RE: Chicken Broiler Facility - ptn 40, Jonathan 175 JQ - Draft BAR (Jam Rock (Pty) Ltd) + CD

This office acknowledges the receipt of your application documents regards to the above-mentioned on 11 May 2017 (T192/2017). The office responsible for this area is : Ms Lethabo Ramashala and can be contacted at (012) 253-1026.

Comments would be forwarded in due time.

Thank you

**Ms C. THEUNISSEN**  
CHIEF ADMIN CLERK

## APPENDICES

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**From:** "Sampie van der Merwe" <barbersp@lantic.net>  
**To:** "Reinett Mogotshi" <RMogotshi@csir.co.za>  
**Date:** 15/05/2017 13:11  
**Subject:** Re: Notification of Release of the Draft Basic Assessment for the proposed development of a chicken broiler facility on Portion 40 of the Farm Jonathan 175-JQ, Brits, North West.  
**Cc:** "Phuti Mahloko" <pmahloko@nwpb.org.za>, "Phuti Mahloko" <phuti@nwpb.org.za>

GOOD AFTERNOON ME MOGOTSHI

WE WILL NOT GIVE INPUT OR PART TAKE IN THIS ENVIRONMENTAL PROCESS AS BARBERSPAN BIRD SANCTUARY IS SITUATED ABOUT 300 KM FROM BRITS AREA AND IT WILL NOT HAS AN INFLUENCE ON OUR NATURE RESERVE.

THANK YOU FOR INFORMING US ABOUT THIS PROCESS.

FRIENDLY REGARDS.

**SAMPIE VAN DER MERWE  
RESERVE MANAGER  
BARBERSPAN BIRD SANCTUARY**

**Sampie van der Merwe  
North West Parks Board  
Barberspan Bird Sanctuary  
Reserve Manager  
Tel: 087 151 1770  
Cell: 082 443 9777  
Fax: 086 524 0873  
Email: [barbersp@lantic.net](mailto:barbersp@lantic.net)**

## APPENDICES

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**From:** "Gasewabone Ellis Thebe" <gethebe@nwpg.gov.za>  
**To:** <RMogotshi@csir.co.za>  
**Date:** 12/05/2017 08:49  
**Subject:** Fwd: Re: Notification of Release of the Draft Basic Assessment for the proposed development of a chicken broiler facility on Portion 40 of the Farm Jonathan 175-JQ, Brits, North West.  
**Attachments:** Fwd: Re: Notification of Release of the Draft Basic Assessment for the proposed development of a chicken broiler facility on Portion 40 of the Farm Jonathan 175-JQ, Brits, North West.

Good day

Please send NW READ hard copy of Draft basic Assessment Report for comments.

Attention: Ouma Skosana  
Agricentre Building  
cnr Dr James Moroka and Stadium Street  
Mmabatho  
2735

*Regards*  
*G.E. Thebe (Ms)*  
*NW READ*  
*ENVIRONMENTAL QUALITY MANAGEMENT*  
*TEL: (018) 389 5099*

>>> Tharina Boshoff 2017/05/11 05:02 PM >>>

# APPENDICES

Basic Assessment for the proposed development of a chicken broiler facility on Portion 40 of the Farm Jonathan 175- JQ, Brits, North West.

Our Ref:



an agency of the  
Department of Arts and Culture

T: +27 21 482 4502 | F: +27 21 482 4509 | E: info@sahra.org.za  
South African Heritage Resources Agency | 111 Hannington Street | Cape Town  
PO Box 4627 | Cape Town | 8001  
www.sahra.org.za

Enquiries: Natasha Higgitt  
Tel: 021 482 4502  
Email: nhiggitt@sahra.org.za  
CaseID: 10048

Date: Wednesday June 07, 2017

Page No: 1

## Final Comment

In terms of Section 38(2) of the National Heritage Resources Act (Act 25 of 1999)

Attention: Mr Vincent Maseko  
Jam Rock (Pty) Ltd

Jam Rock (Pty) Ltd is a producer of broiler chickens that are raised with strict considerations for chickens and the environment. It is located in Brits, North West Province. The Enterprise proposes to develop three chicken broiler houses with associated infrastructure including a road, storage unit and farm house. The size of each chicken house will be 20m x 130m, with the capacity to breed 40 000 chickens per cycle. The farm is 9.2 hectares and is situated on Portion 40 of the farm Jonathan 175-JQ (Co-Ordinates: 25°39'51.748"E 27°12'20.415"S).

CSIR Environmental Management Services was appointed by Jam Rock (Pty) Ltd to conduct a Basic Assessment Process for the proposed Chicken Broiler facility on portion 40 of the farm Jonathan 175JQ, Brits, North West Province. A Basic Assessment Report is to be completed in terms of the National Environmental Management Act, 1998 (Act 107 of 1998) (NEMA) and the NEMA Environmental Impact Assessment (EIA) Regulations, 2014. The proposed facility will cover 9.1689 ha and will include three chicken broiler houses, an access road, two storage buildings, a farm house and office.

ASHA Consulting and Heritage Contracts Archaeological Consulting, and Natura Viva CC were appointed to complete the Heritage Impact Assessment (HIA) and Palaeontological input for the project.

Orton, J and Van Der Walt, J. 2016. *Heritage Impact Assessment for a proposed Chicken Broiler Facility on Portion 40 of the Farm Jonathan 175JQ, North West, ODI 1 Magisterial District, North West Province.*

Low density wide spread Middle Stone Age stone artefacts were noted, however these were rated as heritage sites of negligible significance. A total of two burial grounds containing three graves each were identified within the project area, and a ruined structure that possibly dates to the 1950s. While one burial ground may not be older than 60 years, there are no headstones to provide dates of the graves, therefore the assumption is that they are older than 60 years old. The second burial ground is assumed to be older than 60 years old. The burial grounds have been rated as sites of very high significance, while the ruin has not been rated as a heritage resource. It is noted that the layout of the development provided in the HIA has taken the location of the graves into consideration to ensure no direct impact to the graves.

Recommendations provided in the report include the following:

# APPENDICES

## Basic Assessment for the proposed development of a chicken broiler facility on Portion 40 of the Farm Jonathan 175- JQ, Brits, North West.

Our Ref:



an agency of the  
Department of Arts and Culture

T: +27 21 482 4502 | F: +27 21 482 4509 | E: info@sahra.org.za  
South African Heritage Resources Agency, 111 Merrifield Street | Cape Town  
| P.O. Box 4827 | Cape Town | 8001  
www.sahra.org.za

Enquiries: Natasha Higgitt  
Tel: 021 482 4502  
Email: nhiggitt@sahra.org.za  
CaseID: 10049

Date: Wednesday June 07, 2017  
Page No: 2

- The identified burial grounds must be clearly demarcated and fenced off during the construction period and that all workers on site are made aware of their existence;
- Monitoring would involve ensuring that the graves remain undamaged throughout the duration of the construction phase of the project;
- It should be ensured that if any substantial archaeological or palaeontological remains are uncovered during development they are immediately protected *in situ* and reported to SAHRA so that appropriate action can be taken;
- No construction work should occur within 10 m of any of the graves;
- If any archaeological material, palaeontological material or human burial 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 appropriate specialist. Such heritage is the property of the state and may require excavation and curation in an approved institution.

*Almond, J. E. 2016. Recommended Exemption from further Palaeontological Studies: Proposed development of a chicken broiler facility on Portion 40 of the Farm Jonathan 175 JQ, North West Province*

The proposed development area is underlain by the Irrigasie Formation within the Springbok Flats Basin of Karoo Age. This formation is known for trace fossils and palynomorphs, while some isolated dinosaur remains have been identified in the from the Triassic and Early Jurassic portions of the Springbok Flats Basin. As the proposed study area is small and mantled with disturbed soil with no bedrock exposure, and the development is unlikely to include substantial excavations, it is unlikely that palaeontological remains will be impacted. Recommendations provided in the report include that should any substantial fossil remains (e.g. dinosaur bones and teeth) be encountered during excavation, however, these should be safeguarded, preferably *in situ*, and reported by the Environmental Control Officer (ECO) to SAHRA so that appropriate action can be taken by a professional palaeontologist, at the developer's expense.

In an Interim Comment issued on the 20/01/2017, SAHRA requested that the Basic Assessment with all appendices be uploaded to the case so that an informed comment could be issued.

### Final Comment

SAHRA Archaeology, Palaeontology and Meteorites (APM) Unit accepts the heritage specialist reports and the recommendations contained therein. The recommendations of the heritage specialists and the following conditions must be incorporated in the Environmental Management Programme (EMPr) for implementation:

- A no-go buffer zone of 30 m must be maintained around the identified graves;
- A Heritage Management Plan (HMP) must be developed for the long term monitoring and management

# APPENDICES

Basic Assessment for the proposed development of a chicken broiler facility on Portion 40 of the Farm Jonathan 175- JQ, Brits, North West.

Our Ref:



Agency of the  
Department of Arts and Culture

T: +27 21 462 4502 | F: +27 21 462 4308 | E: [info@sahra.org.za](mailto:info@sahra.org.za)  
South African Heritage Resources Agency | 111 Marine Drive Street | Cape Town  
P.O. Box 4607 | Cape Town | 8001  
[www.sahra.org.za](http://www.sahra.org.za)

Enquiries: Natasha Higgitt  
Tel: 021 462 4502  
Email: [nhiggitt@sahra.org.za](mailto:nhiggitt@sahra.org.za)  
CaseID: 10049

Date: Wednesday June 07, 2017

Page No: 3

- of the identified graves;
- Monitoring of the graves conducted during the construction phase must be detailed in a report that must be submitted to SAHRA upon completion of the construction phase;
  - If any evidence of archaeological sites or remains (e.g. remnants of stone-made structures, indigenous ceramics, bones, stone artefacts, ostrich eggshell fragments, charcoal and ash concentrations), fossils or other categories of heritage resources are found during the proposed development, SAHRA APM Unit (Natasha Higgitt/John Gribble 021 462 5402) must be alerted. If unmarked human burials are uncovered, the SAHRA Burial Grounds and Graves (BGG) Unit (Mimi Seetelo 012 320 8490), must be alerted immediately. A professional archaeologist or palaeontologist, depending on the nature of the finds, must be contracted as soon as possible to inspect the findings. If the newly discovered heritage resources prove to be of archaeological or palaeontological significance, a Phase 2 rescue operation may be required subject to permits issued by SAHRA; and
  - If the development receives an Environmental Authorisation (EA), SAHRA must be informed and all documents pertaining to the EA must be uploaded to the SAHRIS Case file.

Should you have any further queries, please contact the designated official using the case number quoted above in the case header.

Yours faithfully

Natasha Higgitt  
Heritage Officer  
South African Heritage Resources Agency

John Gribble  
Manager: Maritime and Underwater Cultural Heritage Unit / Acting Manager: Archaeology, Palaeontology and Meteorites Unit

# APPENDICES



**read**

Department:  
**Rural, Environment and Agricultural  
Development**  
North West Provincial Government  
REPUBLIC OF SOUTH AFRICA



AgriCentre Building  
Cnr. Dr. James Moroka  
& Stadium Rd  
Private Bag X2039,  
Mmabatho 2735  
Republic of South Africa

**CHIEF DIRECTORATE: ENVIRONMENTAL SERVICES**  
**DIRECTORATE: ENVIRONMENTAL QUALITY MANAGEMENT**

Tel: +27 (18) 389 5156  
Fax: 086 507 6333  
E-mail: [cs.kosane@nwpq.gov.za](mailto:cs.kosane@nwpq.gov.za)

Reference: **NWP/EIA/12/2017**

**Attention:** Mr. Sibusiso Vincent Maseko  
Jam Rock (Pty) Ltd  
P.O Bcx 60382  
**KAREN PARK**  
0118

Cell No.: 073 142 7536  
E-Mail: [vincentmaseko@yahoo.com](mailto:vincentmaseko@yahoo.com)

Dear Sir

APPLICATION FOR ENVIRONMENTAL AUTHORISATION FOR THE PROPOSED DEVELOPMENT OF A CHICKEN BROILER FACILITY ON PORTION 40 OF THE FARM JONATHAN 175 JQ BRITS, ACTIVITY NUMBERS 5 (ii) (iv) AND 27 IN GN. NO. R. 327, AND ACTIVITY NUMBER 12 (h) (iv) IN GN. NO. R.324 OF ENVIRONMENTAL IMPACT ASSESSMENT REGULATIONS 2014, MORETELE LOCAL MUNICIPALITY, NORTH WEST PROVINCE

The Department have received the above mentioned Application (Application form and Draft Basic Assessment Report) for Environmental Authorisation on 26 May 2017, and the Application Forms has been **accepted**.

Please note that the application has been assigned to **Ms. Tshegofatso Lekgari**, Rustenburg Office, reachable at (014) 597 3597 or [tshegofatso@nwpq.gov.za](mailto:tshegofatso@nwpq.gov.za) and /or

**80 Kerkstraat**  
**Rustenburg**  
**0299**

Kindly quote this **reference number** and the **name of the officer** it has been assigned to and submit all any future correspondence in respect of the application including notification to be used for public participation to the assigned officer.

Please draw the applicant's attention to the fact that the activity may not commence prior to the decision being issued by the Department.

Yours Faithfully

**Mrs. Ellis Thebe**  
Environmental Officer Control Grade B: Development Impact Management

Date: 01/06/2017

Cc: Reinett Mogotshi

Fax No: (021) 888 2473

**WE BELONG WE CARE WE SERVE**

# APPENDICES

From: To: 0218882893 21/08/2017 08:58 #171 P.001/002



**read**

Department:  
Rural, Environment and Agricultural  
Development  
North West Provincial Government  
REPUBLIC OF SOUTH AFRICA



80 Kerk Street  
Private Bag X82298,  
Rustenburg  
0300  
Republic of South Africa

**CHIEF DIRECTORATE: ENVIRONMENTAL SERVICES**  
**DIRECTORATE: ENVIRONMENTAL QUALITY MANAGEMENT**

Tel: +27 (14) 597 3597  
Fax: +27(14) 592 3553  
Email: [Tshesol.Ekgani@nwpg.gov.za](mailto:Tshesol.Ekgani@nwpg.gov.za)

Ref. No.:NWP/EIA/12/2017

Attention: **Ms. Reinett Mogotshi**  
**CSIR**  
P. O Box 320  
**STELLENBOSCH**  
7599

Cell No.: (021) 888 2432  
Fax No.: (021) 888 2473

Dear Madam

**APPLICATION FOR ENVIRONMENTAL AUTHORISATION FOR THE PROPOSED DEVELOPMENT OF A CHICKEN BROILER FACILITY ON PORTION 40 OF THE FARM JONATHAN 175 JQ BRITS, ACTIVITY NUMBERS 5(ii) (iv) AND 27 IN GN. NO. R. 327 AND ACTIVITY NUMBER 12(h) (iv) IN GN. NO. R. 324 OF THE ENVIRONMENTAL IMPACT ASSESSEMENT REGULATIONS 2014, MORETELE LOCAL MUNICIPALITY, NORTH WEST PROVINCE**

1. The Draft Basic Assessment Report (DBAR) submitted for comment, for the above-mentioned application and received by the Department on 26 May 2017 refers.
2. The Department has reviewed the DBAR and recommends the following be included in the Final Basic Assessment Report (FBAR) to be submitted in terms of Regulation 19 of the 2014 Environmental Impact Assessment (EIA) Regulations;
  - Confirmation of services by the local Municipality for the provision of refuse removal and sewerage treatment, if unavailable details on how solid will be disposed and what type of ablution facilities are planned for the site.
  - Details on how chicken mortalities will be disposed and if applicable any agreements/contracts to that effect.
  - A revised Environmental Management Programme that includes handling of sewerage and solid waste including chicken manure and mortalities.
3. The Department also notes that the site,
  - is not located within any specific geographic area as per Listing Notice 3
  - was previously transformed and therefore does not trigger activities 27 of GN. R. 327 and 12(h)(iv) of GN. R. 324.

You are therefore advised to remove these activities in all future submissions with regards to this proposed project.

**WE BELONG WE CARE WE SERVE**

# APPENDICES

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From:

To: 0215562683

21/06/2017 08:57

#171 P.002/002

It is an offense in term of Section 24F of the National Environmental Management Act to commence with a listed activity prior to obtaining an Environmental Authorisation.

Yours Faithfully



Ms. Motshabi Mohlali  
Control Environmental Officer Grade A: Environmental Quality Management  
North West Department of Rural, Environment and Agricultural Development

Date: 20/06/2017

Ref No.: NWP/EIA/12/2017  
Portion 40 of Farm Jonathan 175 JQ, Brits

Department of Rural, Environment  
and Agricultural Development

Page 2 of 2



## APPENDICES

### Comments and Response Trail

ISSUES RAISED	COMMENTATOR	DATE	RESPONSE
We really appreciate for the info and we are hoping for more in future.	Secretary:Enterprise Development Ogopoleng Kgathea	25/08/2016	Thank you for your comment, Noted.
Thank you for notifying NWPHERA of the proposed development. Please note that SAHRA does not accept emailed, posted, hardcopy or website links as official submissions. Please create a case on the South African Heritage Resources Information System (SAHRIS) and upload all documents (i.e. the Scoping report and all appendices) to the case file. Step-by-step tutorial videos on the SAHRIS homepage ( <a href="http://sahra.org.za/sahris/">http://sahra.org.za/sahris/</a> ) will show you how to complete this. Please inform Ms Natasha Higgitt :Heritage Officer: Archaeology, Palaeontology and Meteorites Unit of SAHRA when this has been completed and She will attend to the case.her contact details outlined as follows :TEL: +27 21 462 4502   FAX: +27 21 462 4509 EMAIL: nhiggitt@sahra.org.za I hope you will find the above in order.	Motlhabane Mosiane Provincial Coordinator:North West PHRA	25/08/2016	Thank you for your comment. The Draft Basic Assessment Report shall be uploaded on the SAHRIS website.
SANRAL will not be affected by the proposed activity as no National Road is affected. Please note that should a National Road be affected in the future, permission will have to be obtained from SANRAL.  Please remove SANRAL from the distribution list for this project. Thank you	Ms Victoria Bota SANRAL Environmental Co-ordinator	25/08/2016	Thank you for your comment. Please note that SANRAL has been removed from the distribution list for this project.
Please could I register as an I&AP for the above Project and if possible obtain the Background Information Document for the Project?	Carmen Barends Regional Content Researcher Private Projects Leads 2 Business ( <a href="http://www.L2B.co.za">www.L2B.co.za</a> )	29/08/2016	Noted, you have been registered as an interested and Affected Party.
I like to raise issue of criminal activity as an concern in the running of the project. Trees removal that may hamper the erection of broiler	Phillip Maseko Manager	26/07/2016	Thank you for your comment, the proposed development shall ensure minimal removal of trees

## APPENDICES

ISSUES RAISED	COMMENTATOR	DATE	RESPONSE
facilities.	Jamrock (Post)		from the site. Furthermore a security fence shall be erected on site as a means to address criminal activities issues.
<p>The following questions were raised at the community meeting regarding the proposed development</p> <ol style="list-style-type: none"> <li>1. How come this type of project is available for the Maseko Family and not the community as a whole?</li> <li>2. Why is it being announced in the meeting?</li> <li>3. When will it start?</li> <li>4. Can you keep us posted?</li> </ol>	Comments received from the community (Community Meeting)	29/04/2017	<p>Thank you for your comments,</p> <ol style="list-style-type: none"> <li>1. <b>Response by applicant:</b> This is a privately funded and founded project and I, Vincent Maseko, am not a member of the Cooperative, CPA, Local Authority or represent any political movement. The project will be privately funded and managed</li> <li>2. <b>Response by applicant:</b> First to alert the members of Jonathan of this opportunity coming their way and the need of skills that will be required during the erection and operation of the project. And how the members of the community can gain or get involved.</li> </ol> <p><b>Response by the EAP:</b> In addition to the response by the applicant, this project is announced at the community meeting as part of the public participation process required as part of the Basic Assessment process. This is to ensure that the members of the community are aware of the project and are given an opportunity to raise any issues that they may have.</p> <ol style="list-style-type: none"> <li>3. <b>Response by applicant:</b> As soon as the Basic Assessment has been completed and funding secured. Hopefully towards the end of the year or early next year after all systems would have been put in place.</li> <li>4. <b>Response by applicant:</b> Yes, follow up announcements will be made during quarterly meetings held by the community.</li> </ol>

## APPENDICES

ISSUES RAISED	COMMENTATOR	DATE	RESPONSE
			<p><b>Response by the EAP:</b> Noted, the Draft Basic Assessment Report shall be made available for review at Puo-Phaa Secondary School as well as to the chairman of the community.</p>
<p>This office acknowledges the receipt of your application documents regards to the above-mentioned on 11 May 2017 <b>(T192/2017)</b>. The office responsible for this area is: <b>Ms Lethabo Ramashala</b> and can be contacted at (012) 253-1026.</p> <p>Comments would be forwarded in due time</p>	<p>Ms C. THEUNISSEN Chief admin clerk Department of Water and Sanitation (Email)</p>	<p>11/05/2017</p>	<p>Noted, thank you for the comment.</p>
<p>Good day</p> <p>Please send NW READ hard copy of Draft basic Assessment Report for comments.</p> <p>Attention: Ouma Skosana Agricentre Building Cnr Dr James Moroka and Stadium Street Mmabatho 2735</p>	<p>Gasewabone Ellis Thebe NW READ Environmental Quality Management (Email)</p>	<p>12/05/2017</p>	<p>Noted, A Draft BAR and application form was submitted and has been addressed to Betty Moleko.</p>
<p>We will not give input or part take in this environmental process as barberspan bird sanctuary is situated about 300 km from brits area and it will not has an influence on our nature reserve.</p> <p>Thank you for informing us about this process.</p>	<p>Sampie van der Merwe North West Parks Board Barberspan Bird Sanctuary Reserve Manager (Email)</p>	<p>15/05/2017</p>	<p>Noted, thank you for the comment.</p>
<p>CSIR Environmental Management Services was appointed by Jam Rock (Pty) Ltd to conduct a Basic Assessment Process for the proposed Chicken Broiler facility on portion 40 of the farm Jonathan 175JQ, Brits, North West Province. A Basic Assessment Report is to be completed in terms of the National Environmental Management Act,</p>	<p>Natasha Higgitt Heritage Officer South African Heritage Resources Agency (Email)</p>	<p>07/06/2017</p>	<p>Thank you for the comments, noted and correct.</p>

## APPENDICES

ISSUES RAISED	COMMENTATOR	DATE	RESPONSE
<p>1998 (Act 107 of 1998) (NEMA) and the NEMA Environmental Impact Assessment (EIA) Regulations, 2014. The proposed facility will cover 9.1689 ha and will include three chicken broiler houses, an access road, two storage buildings, a farm house and office.</p> <p>ASHA Consulting and Heritage Contracts Archaeological Consulting, and Natura Viva CC were appointed to complete the Heritage Impact Assessment (HIA) and Palaeontological input for the project.</p> <p>Orton, J and Van Der Walt, J. 2016. Heritage Impact Assessment for a proposed Chicken Broiler Facility on Portion 40 of the Farm Jonathan 175JQ, North West, GD! 1 Magisterial District, North West Province.</p> <p>Low density wide spread Middle Stone Age stone artefacts were noted, however these were rated as heritage sites of negligible significance. A total of two burial grounds containing three graves each were identified within the project area, and a ruined structure that possibly dates to the 1950s. While one burial ground may not be older than 60 years, there are no headstones to provide dates of the graves, therefore the assumption is that they are older than 60 years old. The second burial ground is assumed to be older than 60 years old. The burial grounds have been rated as sites of very high significance, while the ruin has not been rated as a heritage resource. It is noted that the layout of the development provided in the HIA has taken the location of the graves into consideration to ensure no direct impact to the graves.</p> <p>Recommendations provided in the report include the following:</p> <ul style="list-style-type: none"> <li>• The identified burial grounds must be clearly demarcated and fenced off during the construction period and that all workers on site are made aware of their existence;</li> <li>• Monitoring would involve ensuring that the graves remain undamaged throughout the duration of the construction phase of the project;</li> </ul>			

## APPENDICES

ISSUES RAISED	COMMENTATOR	DATE	RESPONSE
<ul style="list-style-type: none"> <li>• It should be ensured that if any substantial archaeological or palaeontological remains are uncovered during development they are immediately protected in situ and reported to SAHRA so that appropriate action can be taken;</li> <li>• No construction work should occur within 10 m of any of the graves;</li> <li>• If any archaeological material, palaeontological material or human burial 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 appropriate specialist. Such heritage is the property of the state and may require excavation and curation in an approved institution.</li> </ul> <p>Almond, J. E. 2016. Recommended Exemption from further Palaeontological Studies: Proposed development of a chicken broiler facility on Portion 40 of the Farm Jonathan 175 JO, North West Province</p> <p>The proposed development area is underlain by the Irrigasie Formation within the Springbok Flats Basin of Karoo Age. This formation is known for trace fossils and palynomorphs, while some isolated dinosaur remains have been identified in the from the Triassic and Early Jurassic portions of the Springbok Flats Basin. As the proposed study area is small and mantled with disturbed soil with no bedrock exposure, and the development is unlikely to include substantial excavations, it is unlikely that palaeontological remains will be impacted.</p> <p>Recommendations provided in the report include that should any substantial fossil remains (e.g. dinosaur bones and teeth) be encountered during excavation, however, these should be safeguarded, preferably in situ, and reported by the Environmental Control Officer (ECO) to SAHRA so that appropriate action can be taken by a professional palaeontologist, at the developer's expense.</p> <p>In an Interim Comment issued on the 20/01/2017, SAHRA requested that the Basic Assessment with all appendices be uploaded to the case</p>			

## APPENDICES

ISSUES RAISED	COMMENTATOR	DATE	RESPONSE
<p>so that an informed comment could be issued.</p> <p>Final Comment</p> <p>SAHRA Archaeology, Palaeontology and Meteorites (APM) Unit accepts the heritage specialist reports and the recommendations contained therein. The recommendations of the heritage specialists and the following conditions must be incorporated in the Environmental Management Programme (EMPr) for implementation:</p> <ol style="list-style-type: none"> <li>1. A no-go buffer zone of 30 m must be maintained around the identified graves;</li> <li>2. A Heritage Management Plan (HMP) must be developed for the long term monitoring and management of the identified graves;</li> <li>3. Monitoring of the graves conducted during the construction phase must be detailed in a report that must be submitted to SAHRA upon completion of the construction phase;</li> <li>4. If any evidence of archaeological sites or remains (e.g. remnants of stone-made structures, indigenous ceramics, bones, stone artefacts, ostrich eggshell fragments, charcoal and ash concentrations), fossils or other categories of heritage resources are found during the proposed development, SAH RA APM Unit (Natasha Higgitt/John Gribble 021 462 5402) must be alerted. If unmarked human burials are uncovered, the SAHRA Burial Grounds and Graves (BGG) Unit (Mimi Seetelo 012 320 8490), must be alerted immediately. A professional archaeologist or palaeontologist, depending on the nature of the finds, must be contracted as soon as possible to inspect the findings. If the newly discovered heritage resources prove to be of archaeological or palaeontological significance, a Phase 2 rescue operation may be required subject to permits issued by SAHRA; and</li> <li>5. If the development receives an Environmental Authorisation (EA), SAHRA must be informed and all documents pertaining to the EA must be uploaded to the SAHRIS Case file. Should you have any further queries, please contact the designated official using the case number quoted above in the case header.</li> </ol>			<ol style="list-style-type: none"> <li>1. Noted, a 30 m buffer has been maintained around the identified graves</li> <li>2. Noted, a Heritage Management Plan has been developed and is included as part of Appendix J of this Report</li> <li>3. Noted, the applicant shall submit a Report for monitoring of the graves during Construction Phase</li> <li>4. Noted and included as part of Section 5 of Appendix J of this Report</li> <li>5. Noted, The Environmental Authorisation, if granted, for this project shall be uploaded on SAHRA</li> </ol>
<p>The Department have received the above mentioned Application</p>	<p>Mrs Ellis Thebe</p>	<p>01/06/2017</p>	<p>Noted, Thank you for the comment.</p>

## APPENDICES

ISSUES RAISED	COMMENTATOR	DATE	RESPONSE
<p>(Application form and Draft Basic Assessment Report) for Environmental Authorisation on 26 May 2017, and the Application Forms has been accepted. Please note that the application has been assigned to Ms. Tshegofatso Lekgari, Rustenburg Office, reachable at (014) 597 3597 or tshegolekgari@nwpg@gov.za and [or 80 Kerkstraat, Rusbenburg,0299]</p> <p>Kindly quote this reference number and the name of the officer it has been assigned to and submit al any future correspondence in respect of the application including notification to be used for public participation to the assigned officer. Please draw the applicant's attention to the fact that the activity may not commence prior to the decision being issued by the Department.</p>	<p>NW READ Development Impact Management (Email)</p>		
<p>1. The Draft Basic Assessment Report (DBAR) submitted for comment, for the above-mentioned application and received by the Department on 26 May 2017 refers.</p> <p>2. The Department has reviewed the DBAR and recommends the following be included in the Final Basic Assessment Report (FBAR) to be submitted in terms of Regulation 19 of the 2014 Environmental Impact Assessment (EIA) Regulations;</p> <p>2.1 Confirmation of services by the local Municipality for the provision of refuse removal and sewerage treatment, if unavailable details on how solid will be disposed and what type of ablution facilities are planned for the site.</p> <p>2.2 Details on how chicken mortalities will be disposed and if applicable any agreements/contracts to that effect.</p> <p>2.3 A revised Environmental Management Programme that includes handling of sewerage and solid waste including chicken manure and mortalities.</p>	<p>Tshego Lekgari NW READ Development Impact Management (Fax)</p>	<p>21/06/2017</p>	<p>1. Noted</p> <p>2. 2.1 The Moretele Local Municipality does not have provision of refuse removal as well as sewage treatment. JamRock will make use of a septic facility to temporarily store waste in an underground septic tank. The septic tank shall be extracted by a septic drainer professional when needed.</p> <p>In terms of refuse removal, the applicant does not have a guaranteed service provider. They have sourced quotations for this service in order to source the best service provider. Please note that a private contractor shall be contracted prior to commencement of construction.</p> <p>2.2 Noted, please see section 5 of the EMPr for disposal of waste</p>

## APPENDICES

ISSUES RAISED	COMMENTATOR	DATE	RESPONSE
<p>3. The Department also notes that the site,</p> <p>3.1 is not located within any specific geographic area as per Listing Notice 3</p> <p>3.2 was previously transformed and therefore does not trigger activities 27 of GN. R. 327 and 12(h)(iv) of GN. R. 324.</p> <p>You are therefore advised to remove these activities in all future submissions with regards to this proposed project.</p>			<p>2.3 Noted, please see section 5 of the EMPr for details on handling mortality</p> <p>3.</p> <p>3.1 Noted and correct. Following the updated CBA data released on SANBI, the area is not within a CBA anymore</p> <p>3.2 Noted, activities 27 of GN. R. 327 and 12(h)(iv) of GN. R. 324 have been removed for the submission of this project.</p>

## APPENDICES

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**Appendix I4: Proof that the Authorities and Organs of State received written notification and draft reports of the proposed activities.**

APPENDICES



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2717893357

DATE	ACCOUNT NUMBER	COST CENTRE	SHIPPER'S REFERENCE	ORIGIN	DESTINATION	No. OF PIECES	
10-5-17	P01521		EM50136 Kun 02100 1021 SE			1	
SHIPPER (YOUR NAME) REINETT MOGATSHI			TO (RECIPIENT'S NAME) Moleko Betty				
COMPANY NAME CSIR - STELLENBOSCH			COMPANY NAME Dept of Rural Environment + Agriculture Dept				
STREET ADDRESS JAN CILLIERS STR			STREET ADDRESS Agricentre; do Dr James Moroko Drive +				
STELLENBOSCH			Stadium Rd; Opposite Convention Centre				
CITY			CITY Mafikeng				
CAPE TOWN			COUNTRY: SA				
COUNTRY: RSA			POST/ZIP CODE: 7599		POST/ZIP CODE: 2479		
TELEPHONE NUMBER & E-MAIL: 021-888 2432			TELEPHONE NUMBER & E-MAIL: 018-389 5111				
GLOBAL DOCUMENT EXPRESS		OVERNIGHT EXPRESS		SAME DAY			
<input type="checkbox"/>		<input checked="" type="checkbox"/>		<input type="checkbox"/>			
GLOBAL PARCEL EXPRESS		IN CITY DELIVERY		DAWN DELIVERY BY 09H00			
<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>			
SPECIALS		BUDGET CARGO 21-48 HRS		SATURDAY DELIVERY			
<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>			
AIRFREIGHT		ROAD FREIGHT 48-96 HRS		AFTER HOURS			
<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>			
CROSS BORDER ROAD FREIGHT				PUBLIC HOLIDAY			
<input type="checkbox"/>				<input type="checkbox"/>			
CUSTOMS VALUE		WE HAVE SEEN AND AGREE TO THE STANDARD CONDITIONS OF CARRIAGE OF GLOBEFLIGHT WORLDWIDE EXPRESS		RECEIVED BY GLOBEFLIGHT WORLDWIDE EXPRESS		RECEIVED IN GOOD ORDER AND CONDITION	
HAZARDOUS CARGO? YES <input type="checkbox"/> NO <input type="checkbox"/>		PRINT NAME: A TAYLOR		PRINT NAME:		PRINT NAME:	
INSURANCE YES <input type="checkbox"/> NO <input type="checkbox"/>		SIGNATURE: <i>A Taylor</i>		SIGNATURE:		SIGNATURE:	
AMOUNT: _____		DATE: 10-5-17 TIME:		DATE: _____ TIME: _____		DATE: _____ TIME: _____	

DIMENSIONS		
1	X	X
	X	X
	X	X
	X	X
	X	X
	X	X
	X	X
IMPORT & EXPORT CODE		
DOCUMENTS		
Documents		

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APPENDICES



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2717893359

DATE	ACCOUNT NUMBER	COST CENTRE	SHIPPER'S REFERENCE	ORIGIN	DESTINATION	NO. OF PIECES
10-5-17	P01521		Emso136 / RUN 02100 / 02156			1
SHIPPER (YOUR NAME) <b>Reinett Mogotshi</b>			TO (RECIPIENT'S NAME) <b>Ridah Ramorula</b>			
COMPANY NAME: <b>CSIR - STELLENBOSCH</b>			COMPANY NAME: <b>Moretele Local Municipality</b>			
STREET ADDRESS: <b>JAN CILLIERS STR</b>			STREET ADDRESS: <b>4065 B</b>			
<b>STELLENBOSCH</b>			<b>Mogodi Section</b>			
CITY <b>CAPE TOWN</b>			CITY <b>Mathibestad</b>			
COUNTRY <b>RSA</b>			COUNTRY <b>S. A.</b>		POST/ZIP CODE: <b>0418</b>	
POST/ZIP CODE: <b>7599</b>			TELEPHONE NUMBER & E-MAIL: <b>021-888 2432</b>			
TELEPHONE NUMBER & E-MAIL: <b>021-888 2432</b>			TELEPHONE NUMBER & E-MAIL: <b>012-7161301 / 1300</b>			
INTERNATIONAL SERVICES		LOGISTIC SERVICES		OTHER SERVICES		
GLOBAL DOCUMENT EXPRESS		OVERNIGHT EXPRESS		SAME DAY		
GLOBAL PARCEL EXPRESS		IN CITY DELIVERY		DAWN DELIVERY BY 09H00		
SPECIALS		BUDGET CARGO 21-48 HRS		SATURDAY DELIVERY		
AIRFREIGHT		ROAD FREIGHT 48-96 HRS		AFTER HOURS		
CROSS BORDER ROAD FREIGHT				PUBLIC HOLIDAY		
CUSTOMS VALUE		WE HAVE DEEMED AND AGREE TO THE STANDARD CONDITIONS OF CARRIAGE OF GLOBEFLIGHT WORLDWIDE EXPRESS		RECEIVED BY GLOBEFLIGHT WORLDWIDE EXPRESS		
HAZARDOUS CARGO? YES <input type="checkbox"/> NO <input type="checkbox"/>		PRINT NAME: <b>A TAYLOR</b>		PRINT NAME:		
INSURANCE YES <input type="checkbox"/> NO <input type="checkbox"/>		SIGNATURE: <i>A Taylor</i>		SIGNATURE:		
AMOUNT:		DATE: <b>10-5-17</b> TIME:		DATE: TIME:		

ACTUAL RECEIPT	
RECEIVED	
1	X X
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	X X
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IMPORT & EXPORT CODE	
CUSTOMS AND DUTY	
REMARKS	
<b>Documents</b>	

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APPENDICES



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2717893361

DATE	ACCOUNT NUMBER	COST CENTRE	SHIPPER'S REFERENCE	ORIGIN	DESTINATION	No. OF PIECES	
10-5-17	P01521		EMSO136 / RUN 02100 / 021 SE			1	
SHIPPER: (YOUR NAME) <b>Reinett Mogotshi</b>			TO: (RECIPIENT'S NAME) <b>Mpho Magasa</b>				
COMPANY NAME: <b>CSIR - STELLENBOSCH</b>			COMPANY NAME: <b>Madibeng Local Municipality</b>				
STREET ADDRESS: <b>JAN CILLIERS STR</b>			STREET ADDRESS: <b>53 Van Velden Street</b>				
CITY: <b>STELLENBOSCH</b>			CITY: <b>Brits</b>				
COUNTRY: <b>CAPE TOWN</b>			COUNTRY: <b>S.A.</b>				
POST/ZIP CODE: <b>RSA 7599</b>			POST/ZIP CODE: <b>0250</b>				
TELEPHONE NUMBER & E-MAIL: <b>021-888 2432</b>			TELEPHONE NUMBER & E-MAIL: <b>012-318 9119</b>				
GLOBAL DOCUMENT EXPRESS GLOBAL PARCEL EXPRESS SPECIALS AIRFREIGHT CROSS BORDER ROAD FREIGHT		OVERNIGHT EXPRESS <input checked="" type="checkbox"/> IN CITY DELIVERY BUDGET CARGO 21-48 HRS ROAD FREIGHT 48-96 HRS		SAME DAY DAWN DELIVERY BY 09H00 SATURDAY DELIVERY AFTER HOURS PUBLIC HOLIDAY			
CUSTOMS VALUE		WE HAVE SEEN AND AGREE TO THE STANDARD CONDITIONS OF CARRIAGE OF GLOBEFLIGHT WORLDWIDE EXPRESS		RECEIVED BY GLOBEFLIGHT WORLDWIDE EXPRESS		RECEIVED IN GOOD ORDER AND CONDITION	
HAZARDOUS CARGO? YES <input type="checkbox"/> NO <input type="checkbox"/>		SIGNATURE: <b>A TAYLOR</b>		SIGNATURE:		SIGNATURE:	
INSURANCE YES <input type="checkbox"/> NO <input type="checkbox"/>		DATE: <b>10-5-17</b> TIME:		DATE: TIME:		DATE: TIME:	
AMOUNT:							

QUANTITY WEIGHT	
1	X X
	X X
	X X
	X X
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	X X
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IMPORT & EXPORT CODE	
SPECIAL INSTRUCTIONS	
RESERVATION OF CONTENTS	
<b>Documents</b>	

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2717893362

DATE	ACCOUNT NUMBER	COST CENTRE	SHIPPER'S REFERENCE	ORIGIN	DESTINATION	No. OF PIECES	
10-5-17	P01521		EMSO36/RUN 02100/021SE			1	
SHIPPER: (YOUR NAME) <b>Reinett Mogotshi</b>			TO (RECIPIENT'S NAME) <b>Cornia Theunissen</b>				
COMPANY NAME: <b>CSIR - STELLENBOSCH</b>			COMPANY NAME: <b>Dept of Water + Sanitation</b>				
STREET ADDRESS: <b>JAN CILLIERS STR</b>			STREET ADDRESS: <b>Water Quality office</b>				
<b>STELLENBOSCH</b>			<b>Old Rustenburg Road</b>				
CITY <b>CAPE TOWN</b>			CITY <b>Hartbees poort</b>				
COUNTRY: <b>RSA</b>		POST/ZIP CODE: <b>7599</b>	COUNTRY: <b>S.A.</b>		POST/ZIP CODE: <b>0216</b>		
TELEPHONE NUMBER & E-MAIL: <b>021 - 888 2432</b>			TELEPHONE NUMBER & E-MAIL: <b>012 - 253 1026</b>				
INTERNATIONAL SERVICES	GLOBAL DOCUMENT EXPRESS		OVERNIGHT EXPRESS	<input checked="" type="checkbox"/>	SAME DAY		
	GLOBAL PARCEL EXPRESS		IN CITY DELIVERY		DAWN DELIVERY BY 09H00		
	SPECIALS		BUDGET CARGO 21-48 HRS		SATURDAY DELIVERY		
	AIRFREIGHT		ROAD FREIGHT 48-96 HRS		AFTER HOURS		
	CROSS BORDER ROAD FREIGHT				PUBLIC HOLIDAY		
CUSTOMS VALUE		WE HAVE SEEN AND AGREE TO THE STANDARD CONDITIONS OF CARRIAGE OF GLOBEFLIGHT WORLDWIDE EXPRESS PRINT NAME: <b>A Taylor</b>		RECEIVED BY GLOBEFLIGHT WORLDWIDE EXPRESS PRINT NAME:		RECEIVED IN GOOD ORDER AND CONDITION PRINT NAME:	
H/ DANGEROUS CARGO? YES <input type="checkbox"/> NO <input type="checkbox"/>	INSURANCE YES <input type="checkbox"/> NO <input type="checkbox"/>	SIGNATURE: <b>Taylor</b>	SIGNATURE:		CONSIGNEE SIGNATURE:		
AMOUNT	DATE <b>10-5-17</b> TIME	DATE		TIME		DATE	

PIECES	DAMAGEABLE
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	X X
	X X
	X X
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SPECIAL INSTRUCTIONS	
YES/NO/OTHER/SEE COMMENTS	
<b>Documents</b>	

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DATE	ACCOUNT NUMBER	COST CENTRE	SHIPPER'S REFERENCE	ORIGIN	DESTINATION	No. OF PIECES		
15/06/2017	P01521		0815E Em50136	CPT	Pretoria	1		
SHIPPER: (YOUR NAME) Reinett Mgothi			TO: (RECIPIENT'S NAME) MABULE R					
COMPANY NAME: CSIR - STELLENBOSCH			COMPANY NAME: DAFF					
STREET ADDRESS: JAN CILLIERS STR			STREET ADDRESS: Cnr Annie Botha and Union					
CITY: CAPE TOWN			CITY: street Riviera					
COUNTRY: RSA		POST/ZIP CODE: 7599		COUNTRY: South Africa		POST/ZIP CODE: 0002		
TELEPHONE NUMBER & E-MAIL:			TELEPHONE NUMBER & E-MAIL: 012 319 7634					
INTERNATIONAL SERVICES	GLOBAL DOCUMENT EXPRESS		DOMESTIC SERVICES	OVERNIGHT EXPRESS	X	DOMESTIC SERVICES	SAME DAY	
	GLOBAL PARCEL EXPRESS			IN CITY DELIVERY			DAWN DELIVERY BY 09H00	
	SPECIALS			BUDGET CARGO 21-48 HRS			SATURDAY DELIVERY	
	AIRFREIGHT			ROAD FREIGHT 48-96 HRS			AFTER HOURS	
	CROSS BORDER ROAD FREIGHT				PUBLIC HOLIDAY			
CUSTOMS VALUE		WE HAVE SEEN AND AGREE TO THE STANDARD CONDITIONS OF CARRIAGE OF GLOBEFLIGHT WORLDWIDE EXPRESS PRINT NAME: Reinett Mgothi		RECEIVED BY GLOBEFLIGHT WORLDWIDE EXPRESS PRINT NAME:		RECEIVED IN GOOD ORDER AND CONDITION PRINT NAME:		
HAZARDOUS CARGO? YES <input type="checkbox"/> NO <input type="checkbox"/>		SIGNATURE: Em50136		SIGNATURE:		CONSIGNEE SIGNATURE:		
INSURANCE YES <input type="checkbox"/> NO <input type="checkbox"/>		DATE: 15/06/17 TIME: 12:00		DATE:		TIME:		
AMOUNT:								

ACTUAL WEIGHT	
PIECES	DIMENSIONS
	X X
	X X
	X X
	X X
	X X
	X X
	X X
IMPORT & EXPORT CODE	
SPECIAL INSTRUCTIONS	
DESCRIPTION OF CONTENTS	

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## APPENDICES

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### Emails requesting comments from the Municipality and Department of Water and Sanitation

**From:** Reinett Mogotshi  
**To:** cmotshegoa@gmail.com  
**Date:** 23/06/2017 11:25  
**Subject:** Re: Request for comments on the Draft Basic Assessment for the proposed development of a chicken broiler facility on Portion 40 of the Farm Jonathan 175- JQ, Brits, North West.

Good Day Mr Charles Motshegoa

I hope that all is in order. I have submitted a Draft Basic Assessment Report for comments on the 11th of May 2017 to Ridah Ramarula. The commenting period for the above mentioned Basic Assessment Report ended on the **14th of June 2017**. Please note that your comments and inputs on this report are important to this Basic Assessment. I called this week and i was told that she is on maternity leave. The comments are needed as soon as possible for this Basic Assessment Report to be finalised.

Your urgent attention to this matter is highly appreciated.

Kind Regards

**Reinett Mogotshi**

Environmental Management Services

CSIR

021 888 2432

## APPENDICES

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**From:** Reinett Mogotshi  
**To:** ramashalal@dws.gov.za  
**Date:** 23/06/2017 11:20  
**Subject:** Re: Request for comments on the Draft Basic Assessment for the proposed development of a chicken broiler facility on Portion 40 of the Farm Jonathan 175-JQ, Brits, North West.  
**Cc:** theunissenc@dws.gov.za  
**Attachments:** Jam Rock (Pty) Ltd, ChickenBroiler, ptn 40, Jonathan 175 JQ, draft BAR, T192.2017.pdf

Good Day Lethabo

I hope that all is in order. The commenting period for the above mentioned Basic Assessment Report ended on the **14th of June 2017**. Please note that your comments and inputs on this report are important to this Basic Assessment. Kindly provide the required comments as soon as possible.

Kind Regards

**Reinett Mogotshi**

Environmental Management Services

CSIR

021 888 2432

## APPENDICES

### Appendix I5: A list of registered Interested and Affected Parties

Company/organization	Name	Postal
<b>NATIONAL, PROVINCIAL AND LOCAL</b>		
Department of Environmental Affairs- National	Mmatlala Rabothata	Fedsure Building, Private Bag X447, 315 Pretorius Street, Pretoria, 0002
Department of Environmental Affairs- National	Sibusisiwe Hlela	Fedsure Building, Private Bag X447, 315 Pretorius Street, Pretoria 0002
Department of Environmental Affairs- National	Takalani Nemarude	Fedsure Building, Private Bag X447, 315 Pretorius Street, Pretoria 0002
Department of Rural Development and Land Reform	Bonginkosi Zulu	Fedsure Building, Private Bag X447, 315 Pretorius Street, Pretoria 0002
Department of Agriculture, Forestry and Fisheries	Mashudu Marubini	Private Bag X138, Pretoria, 0001
National Department of Mineral Resources	Kgauta Mokoena	Private Bag X59, Arcadia 0007
National Department of Water Affairs	Ms Ndileka K mohapi	Private Bag X313, Pretoria, 0001
National Department of Water Affairs	Namisha Muthraparsad	Private Bag X313, Pretoria, 0001
NW READ	Rhuleni Mathebula	Private Bag X2039, Mmabatho, 2739
NW READ	Malefyane Mosadi	Private Bag X2039, Mmabatho, 2739
Moretele Local Municipality	Amogelang Sefara	Private Bag X367, Makapanstad, North West, 0404
Moretele Local Municipality	Municipal Manager	Private Bag X367, Makapanstad, North West, 0404
Bojanala Platinum District Municipality	Goitsimosimo Tau	P O Box 1993, Rustenburg, 0300
<b>LANDOWNERS &amp; NEIGHBOURS</b>		
Community Chairman- Plot 260 Jonathan	Mr Ngema	Private Bag X1031 Bethanie, 0270
Neighbouring Landowner- Plot 46 Jonathan	Jan Maseko	Private Bag X1031 Bethanie, 0271

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Company/organization	Name	Postal
Neighbouring Landowner- Plot 48 Jonathan	Mathews Mlangeni	Private Bag X1031 Bethanie, 0272
Neighbouring Landowner- Plot 41 Jonathan	David Maseko	Private Bag X1031 Bethanie, 0273
Neighbouring Landowner- Plot 274 Jonathan	Boysee Masango	Private Bag X1031 Bethanie, 0274
Neighbouring Landowner- Plot 48 Jonathan	Joshua Mlangeni	Private Bag X1031 Bethanie, 0275
Neighbouring Landowner- Plot 61 Jonathan	Edwin Lelaka	Private Bag X1031 Bethanie, 0276
Neighbouring Landowner- Plot 35 Jonathan	Senza Ngozo	Private Bag X1031 Bethanie, 0277
Neighbouring Landowner- Plot 46 Jonathan	Alfred Ngobese	Private Bag X1031 Bethanie, 0278
Neighbouring Landowner- Plot 46 Jonathan	Madoda Maseko	Private Bag X1031 Bethanie, 0279
Neighbouring Landowner- Plot 48 Jonathan	Sbongseni Mlangeni	Private Bag X1031 Bethanie, 0280
Neighbouring Landowner- Plot 35 Jonathan	Mndeni Ngozo	Private Bag X1031 Bethanie, 0281
Neighbouring Landowner- Plot 232 Jonathan	Bongane Radebe	Private Bag X1031 Bethanie, 0282
Ward Councillor	Mr. Mosetlhe	P O Box 1962, Hammanskraal, 0400
Neighbouring Landowner- Plot 48 Jonathan	Ntomfuthi Mlangeni	Private Bag X1031 Bethanie, 0284
Neighbouring Landowner- Plot 35 Jonathan	Caiphus Ngozo	Private Bag X1031 Bethanie, 0285
<b>OTHER</b>		
North West Parks & Tourism Board	Andrew Mvundle	
NW Parks Board Bird Sanctuary	Sampie van der Merwe	
South African National Parks (SANParks)	Dr. Howard Hendriks	PO Box 787, Pretoria, 0001
Council for Geoscience	Dr Stewart Foya	Private Bag x112, Pretoria 0001
South African Heritage Resources Agency (SAHRA)	Marie South	PO Box 4637, Cape Town, 8000
Endangered Wildlife Trust (EWT)	Stephanie Aken	
AgriLand	Anneliza Collett	Private Bag X120, Pretoria 0001
Client	Vincent Maseko	P O Box 60382, Karen Park, 0118
Department of Agriculture Forestry and Fisheries	Thembi N	Private Bag X120, Pretoria, 001
Leads 2 Business	Carmen Barends	

**Basic Assessment** for the proposed  
development of a chicken broiler facility on  
Portion 40 of the Farm Jonathan 175- JQ,  
Brits, North West.



# APPENDIX J: ENVIRONMENTAL MANAGEMENT PROGRAMME

# ENVIRONMENTAL MANAGEMENT PROGRAMME

Basic Assessment for the proposed development of a chicken broiler facility on Portion 40 of the  
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## 1 INTRODUCTION

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### 1.1 Purpose of the Environmental Management Programme

Jam Rock (Pty) Ltd is a producer of broiler chickens that are raised with strict considerations for chickens and the environment. It is located in Brits, North West Province. The Enterprise proposes to develop three chicken broiler houses with associated infrastructure including a road, storage unit and farm house. The size of each chicken house will be 20m x 130m, with the capacity to breed 40 000 chickens per cycle. The farm is 9.2 hectares and is situated on Portion 40 of the farm Jonathan 175-JQ. Furthermore the farm has an existing borehole with the capacity to store 10 000 L of water. This Draft Environmental Management Programme (EMPr) is prepared as part of the requirements of the Environmental Impact Assessment (EIA) Regulations (December 2017, 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, operation and decommissioning phase of the proposed chicken broiler. This EMPr therefore sets out the methods by which proper environmental controls are to be implemented by the broiler's management. The Draft EMPr is to be submitted to the North West Department of Rural, Environment and Agricultural Development as part of the Application for Environmental Authorisation.

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 broiler'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 326 of 7 April 2017, presented in Table 1-1 below.

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Table 1-1: Compliance with Appendix 4 of Government Notice Regulation 326 of 7 April 2017 and Section 24N of the National Environmental Management Act 107 of 1998.

Requirements according to Appendix 4 of GNR 326 of 7 April 2017	Section
(1) An EMPr must comply with section 24N of the Act and include-	Section 1.3
a) details of -	Appendix I
(i) the EAP who prepared the EMPr; and	
(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
l) a program for reporting on compliance, taking into account the requirements as	Section 4

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Requirements according to Appendix 4 of GNR 326 of 7 April 2017	Section
prescribed by the Regulations;	
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.

**Reinett Mogotshi-** Reinett holds a BSc degree in Environmental Sciences as well as BSc (Hons) in Environmental Management and Analysis from the University of Pretoria. She has two years' experience in the environmental management field. Prior to joining EMS Group of the CSIR, she worked as an Environmental Science Intern in the Environmental management section of the city of Tshwane, where she reviewed Basic Assessment and Scoping and Environmental Reports. Reinett is currently one of the project managers of the Special Needs and Skills Development Programme of the CSIR. Reinett is a member of the IAIAAsa.

**Minnelise Levendal** – Minnelise is a Senior EAP in the EMS group of the CSIR and holds a Master's degree in Biological Science (Botany) from the Stellenbosch University. She has 16 years of experience in Environmental Management (which includes ten years working as an EAP). Before she joined the CSIR she was employed at the Western Cape Department of Environmental Affairs and Development Planning (DEA&DP) for five years where she assessed EIAs, BAs and EMPs. Minnelise is currently managing various EIAs for wind and solar renewable energy projects in South Africa. She was the CSIR project manager for the 100 MW Ubuntu Wind Energy Facility near Jeffreys Bay (Environmental Authorisation granted in June 2012), as well as the 50 MW Banna Ba Pifhu Wind Energy Facility proposed by WKN Windcurrent near Humansdorp in the Eastern Cape (Environmental Authorisation granted in July 2014). She was the project manager of ten BAs for wind

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monitoring masts in South Africa as part of the National Wind Atlas Project of the Department of Energy. Environmental Authorisation from the DEA for all the ten masts was obtained in 2010.

This Environmental Management Programme that has been compiled in fulfilment of the requirements of the Environmental Impact Assessment Regulations (2017). This EMP 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 broiler.

## 1.4 Description of applicable legislation and policies

### 1.4.1 National Environmental Management Act

The National Environmental Management Act (NEMA) (Act 107 of 1998 as amended) is the primary piece of environmental legislation in South Africa, and establishes principles for decision-making on matters affecting the environment, and establishes a framework for integrating good environmental management into all development activities.

Section 2 of NEMA states the principles of environmental management that must be applied through the Republic of South Africa. The key principles that are relevant to the proposed project include:

- Environmental management must place people and their needs at the forefront, and serve their physical, psychological, developmental, cultural and social interests equitably.
- Development must be socially, environmentally and economically sustainable.
- Environmental management must be integrated & take into account the effects of decisions on all aspects of the environment & all people in the environment by pursuing the best practical environmental option.
- Equitable access to environmental resources, benefits and services to meet basic human needs and ensure human well-being must be pursued.
- The environment is held in public trust for the people, the beneficial use of environmental resources must serve the public interest and the environment must be protected as the people's common heritage.
- The participation of all interested and affected parties in environmental governance must be promoted, and all people must have the opportunity to develop the understanding. Skills and capacity necessary for achieving equitable and effective participation and participation by vulnerable and disadvantaged persons must be ensured.
- The social, economic and environmental impacts of activities, including disadvantages and benefits must be considered, assessed and evaluated. Decisions must be appropriate in the light of such consideration and assessment.
- The polluter must pay for the cost of remedying pollution, environmental degradation and adverse health effects.
- Sensitive, vulnerable, highly dynamic or stressed ecosystems, such as coastal shores, estuaries, wetlands, and similar systems require specific attention in management and planning procedures, especially where they are subject to significant human resource usage and development pressure.

In terms of Section 28 of NEMA "Every person who causes, has caused, or may cause significant pollution or degradation of the environment must take reasonable measures to prevent such pollution or degradation

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from occurring, continuing or recurring, or, in so far as such harm cannot reasonably be avoided or stopped, to minimise and rectify such pollution or degradation of the environment.”

The principles of environmental management and the Duty of Care as stated in NEMA must be observed on site, during all phases of the proposed development of a bridge.

## **1.4.2 Environmental Impact Assessment Regulations**

The Environmental Impact Assessment Regulations of 2017 (GN No. R324, 325 and- 327 of April 2017), published under NEMA, list those activities that may have a potentially detrimental impact on the environment, and which require environmental authorisation before those listed activities can be undertaken.

## **1.4.3 National Water Act (Act 36 of 1998)**

In terms of the National Water Act (Act 36 of 1998), there are eleven types of “water use” that require authorisation from the Department of Water & Sanitation (DWS) before the water use activities commences. Given the nature of the project, the type of water use in terms of Section 21 of the National Water Act that is relevant to the proposed project is: Section 21(i) – altering the beds, banks, course or characteristics of a watercourse.

Authorisation for a Water Use Licence Application is required from the DWS in order to undertake the above activity. An application for Water Use Authorisation will be lodged with the DWS.

## **1.4.4 National Environmental Management Waste Act (NEM:WA) GNR 921, 29 November 2013**

In terms of the National Environmental Management Waste Act (Act 59 of 2008) the proposed project does not trigger a Waste Management License under the National Environmental Management: Waste Act (NEMWA Regulations published in GNR 921 on the 29 November 2013 Government Gazette No 37083).

## **1.4.5 National Heritage Resources Act 25 of 1999**

In terms of the National Heritage Resources Act (Act 25 of 1999) an application for Heritage Resources review was submitted to SAHRA (Case ID: 97840) in terms of the National Heritage Resources Act, 1999 (Act No. 25 of 1999) as amended.

## **1.4.6 National Environmental Management Biodiversity Act 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 compiling this EMPr. This included the determination and assessment of the fauna and flora prevailing in the proposed project and the handling thereof in terms of NEMBA.

## **2 THE APPROACH TO THE EMPr**

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A typical EMPr takes the planning and design, construction and operational phases of a project into account. The EMPr is based largely on the findings and recommendations of the BA process. However, the EMPr is considered a “live” document and must be updated with additional information or actions during the lifetime of the project if and when needed.

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The EMPr follows an approach of identifying an over-arching goal and objectives, accompanied by management actions that are aimed at achieving these objectives. The management actions are presented in a table format in order to show the links between the goal and associated objectives, actions, responsibilities, monitoring requirements and targets. The management plans for the Design and Layout, Construction and Operational phases consist of the following components:

- Description of the activity taking place;
- The potential impacts associated with that activity;
- The appropriate mitigation measures;
- The responsible party; and
- Monitoring Frequency.

## 3 ROLES AND RESPONSIBILITIES

---

For the purposes of the EMPr, the generic roles that need to be defined are those of the:

- Farm Manager and Team;
- The Contractor; and
- Environmental Control Officer.

Note: The specific titles for these functions will vary from project to project. The intent of this section is to give a generic outline of what these roles typically require.

### 3.1 Farm Manager and Team

The manager of the Jam Rock farm and the team. The farm manager is responsible to oversee construction, operational and decommissioning aspects of the chicken broiler to make sure that the EMPr is implemented and the conditions of Environmental Authorisation are adhere to throughout the project lifecycle. He will also be responsible for rehabilitation of disturbed areas during construction.

### 3.2 The Contractor

The person or company appointed to undertake construction or decommissioning of the chicken broiler. For the purposes of this EMPr, "Contractor" may also refer to the person undertaking any of the proposed activities whether awarded a contract or not. The contractor will be responsible for the overall construction and decommissioning activities on site and compliance with all conditions of authorization as well as drafting the method statement that is aimed to protect environmental resources, minimise pollution and to rehabilitate disturbed areas and its implementation thereof.

### 3.3 Environmental Control Officer

It can either be an internal staff member of the Engineer / Contractor assigned to the project. The Environmental Control Officer will be part of the project staff and will advise the Engineer on all environmental matters relating to the works, in terms of this EMPr. The environmental officer will also be responsible for monitoring construction activities on site to also ensure that all the recommendations of the EMPr are adhere to during construction phase. He/she will also be responsible for the implementation of the EMPr on site.

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## 4 THE PROJECT DESCRIPTION

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Jam Rock (Pty) Ltd is a producer of broiler chickens that are raised with strict considerations for chickens and the environment. It is located in Brits, North West Province. The Enterprise proposes to develop three chicken broiler houses with associated infrastructure including a road, storage unit and farm house. The size of each chicken house will be 20m x 130m, with the capacity to breed 40 000 chickens per cycle. The farm is 9.2 hectares and is situated on Portion 40 of the farm Jonathan 175-JQ. Furthermore the farm has an existing borehole with the capacity to store 10 000 L of water.

The proposed infrastructure of the chicken broiler will entail the following:

- 3x chicken houses (130m x 20m)
- 6m access road
- Workers quarter (80mx 40m)
- Storage unit (60m x 40m)
- Home and office (40m x 40m)
- Used bedding area (20m x 60m)

### Listed Activities

The development triggers listed activities in terms of the Environmental Impact Assessment (EIA) Regulations, Government Regulations (GNR) 324 and 327 of April 2017 promulgated under the National Environmental Management Act (NEMA) (Act no 107 of 1998). In terms of these Regulations, a Basic Assessment (BA) should be undertaken for the proposed project.

In terms of the amended NEMA EIA Regulations published in GNR 324, 325, 326 and 327 on the 7 April 2017 Government Gazette Number 40772, a BA process is required as the project triggers the following listed activities (detailed in Table 1 below).

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<b>Relevant notice:</b>	<b>Activity No (s) (in terms of the relevant notice)</b>	<b>Description of each listed activity as per the Government Notice</b>
GN. R 327, 7 April 2017	5. (ii) and (iv)	The development and related operation of facilities or infrastructure for the concentration of (ii) more than 5 000 poultry per facility situated outside an urban area, excluding chicks younger than 20 days and (iv) more than 25000 chicks younger than 20 days per facility situated outside an urban area.

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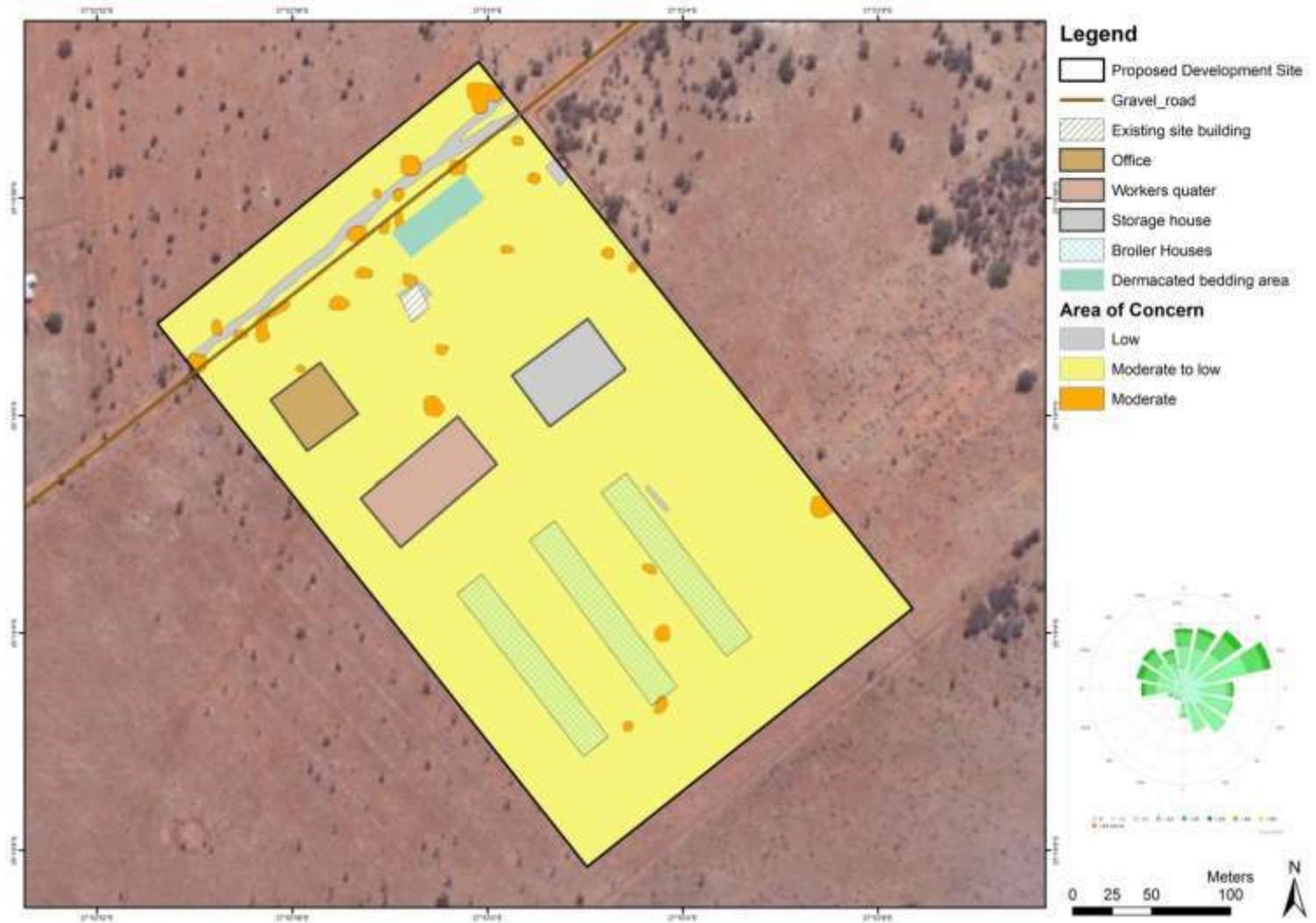


Figure 1: Map showing areas of conservation concerns as identified by (NSS, 2016)

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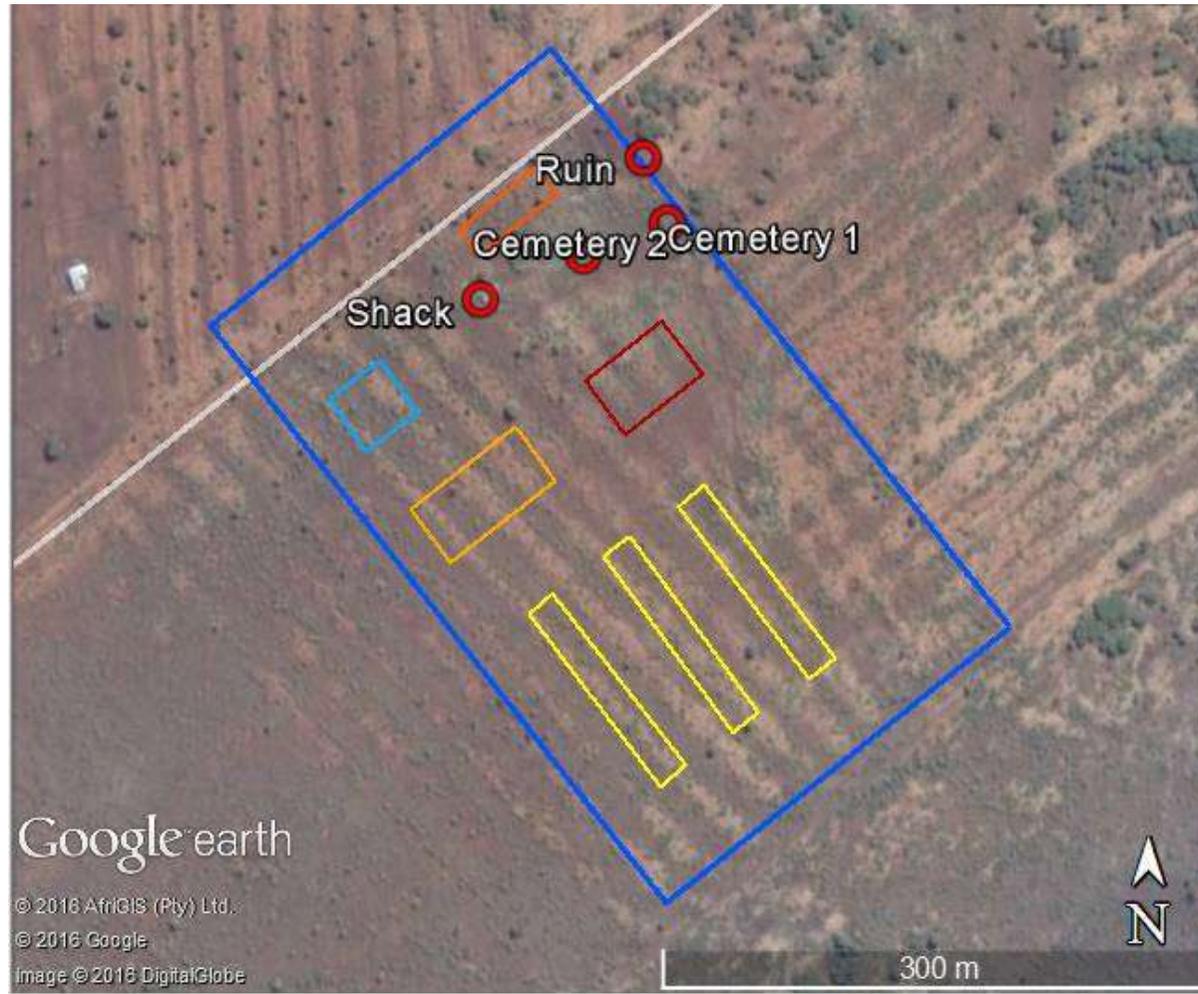


Figure 2: Aerial view of the property showing the locations of the identified finds in relation to the proposed development areas. Red symbols are heritage resources within the proposed development site.

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Figure 3: Site layout of the proposed development site (as supplied by the Project Proponent)

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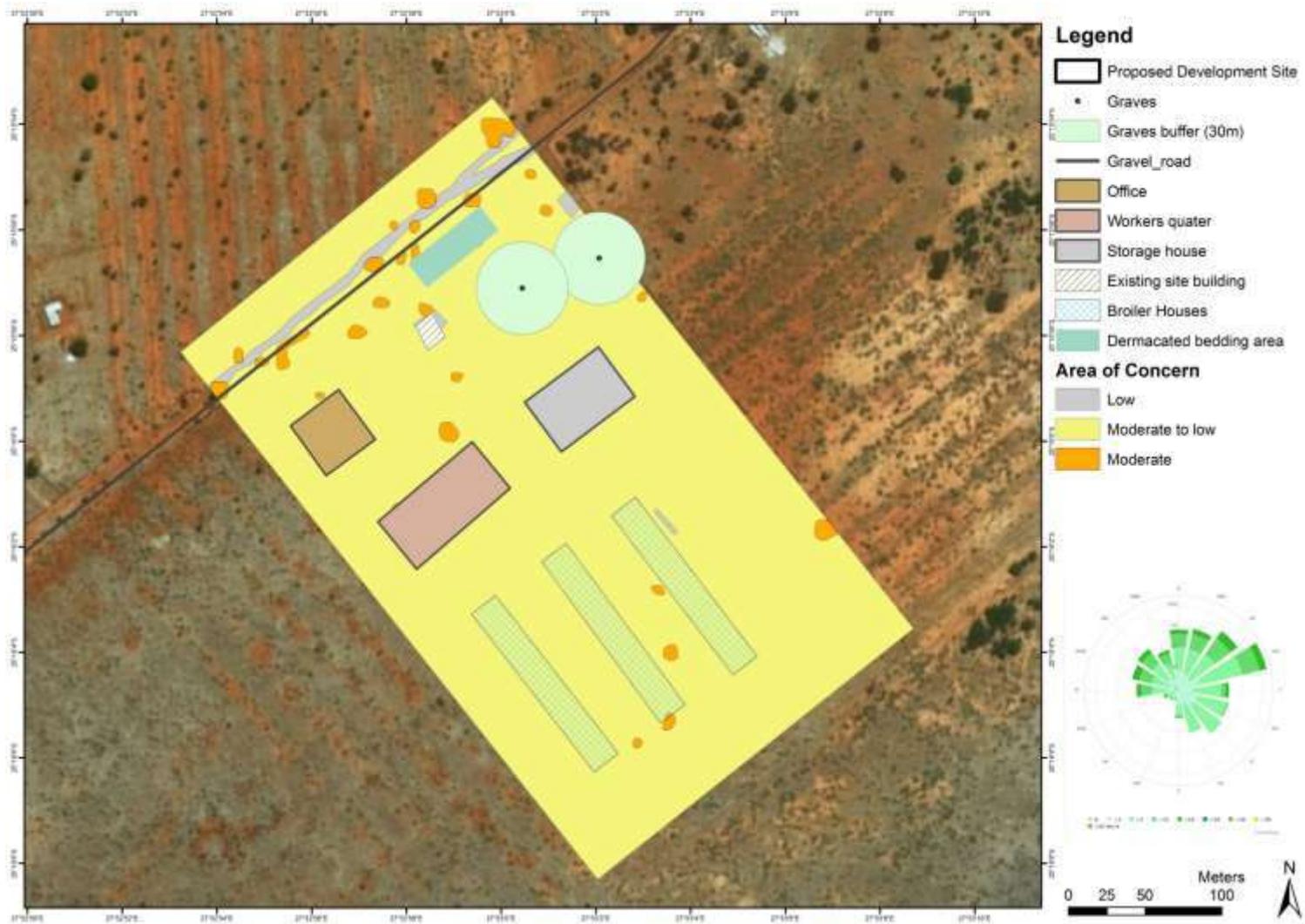


Figure 4: Layout of the proposed development with sensitivities

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## 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 chicken broiler. The table below lists potential impacts and mitigation measures recommended for the proposed chicken broiler facility at the different phases.

**Table 5-1: Impact management plan for the proposed Design and Planning Phase**

Impact	Management/Mitigation Measures	Methodology	Monitoring Frequency	Responsibility
<b>BIODIVERSITY IMPACTS</b>				
Loss or degradation of the wetland on the access road	Establish measures on the access road to reduce dust, erosion and sedimentation	Implement the measures that were designed to control impacts on the road preferably during winter, when the risk of erosion should be least.		Jam Rock Management, Construction Crew
Loss of terrestrial vegetation and faunal habitat	Restrict all clearing of vegetation and disturbance of habitat from construction activities to the final infrastructure footprint.	Ensure that all infrastructure avoids all Very High and High sensitive areas.	During design	CSIR, Farm Manager and Team
		Clearly demarcate or fence in the construction site. Relocate CI plant and animal specimens from the construction footprint, with advice from an appropriate specialist	Pre-construction	Farm Manager and Team
	Avoid unnecessary loss of indigenous trees and termitaria.	Identify and mark indigenous trees on the ground. Those that are small and cannot be avoided should be transplanted elsewhere on site.	Design / pre-construction	Farm Manager and Team, Construction Crew, with advice from an Ecologist
Loss of CI or medicinal flora	Adhere to legal requirements and best practice guidelines regarding the displacement of CI and medicinally important floral species.	Obtain permits to remove CI species	Pre-Construction	Farm Manager and Team
		Transplant CI and medicinally important floral specimens from the infrastructure footprint to suitable locations in the surrounding area.	Pre-Construction	Botanist / horticulturist
Loss of CI fauna	Adhere to law and best practice	Appoint an appropriate specialist to relocate CI	Pre-construction	Zoologist/Ecologist

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Impact	Management/Mitigation Measures	Methodology	Monitoring Frequency	Responsibility
	guidelines regarding the displacement of CI faunal species.	fauna from vegetation, termitaria and soil that is removed from the infrastructure footprint		
	Prohibit collection or persecution of fauna.	Commence (and preferably complete) construction during winter, when the risk of disturbing active (including breeding and migratory) animals, should be least.	Pre-construction	Farm Manager and Team
Introduction & proliferation of alien spp. - Competition and change in structure	Regulate / limit access by potential vectors of alien plants.	Carefully regulate / limit access by vehicles and materials to the construction site. Demarcate or fence in the construction area	Prior to and during construction	Farm Manager and Team  ECO Construction manager
		Prohibit the introduction of domestic animals such as dogs and cats	All Phases	Farm Manager and Team
		Plant only locally indigenous flora if landscaping needs to be done	All Phases	Farm Manager and Team
	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	Farm Manager and Team
	By law, remove and dispose of Category 1b alien species on site. All Category 2 species that remain on site must require a permit.	Remove Category species using mechanical methods, and minimise soil disturbance as far as possible	During construction	Farm Manager and Team / construction crew
Increase in dust and erosion	Implement effective measures to control dust and erosion.	Limit vehicles, people and materials to the construction site.	During construction	Farm Manager and Team, Construction Crew
		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.		

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		Implement erosion protection measures on site to reduce erosion and sedimentation of downstream areas. 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 of the entrance road.		
Sensory disturbance of fauna	Time construction activities to minimise 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	During pre-construction and construction planning	Farm Manager and Team, Construction Crew
	Minimise noise pollution	Minimise noise to limit its impact on calling and other sensitive fauna (e.g. frogs and Secretarybird).	Prior to and throughout construction	Farm Manager and Team, Construction Crew
	Minimise light pollution.	Limit construction activities to day time hours.	Throughout construction	Farm Manager and Team, Construction Crew
		Minimise or eliminate security and construction lighting, to reduce the disturbance of nocturnal fauna.	Throughout construction	Construction Crew
<b>WATER QUALITY IMPACTS</b>				
Pollution of the surrounding environment as a result of contamination of stormwater. Contamination could result from chemicals, oils, fuels, sewage, solid waste, litter etc.	Reduce the contamination of stormwater.	The appointed Contractor should compile a Method Statement for Stormwater Management during the construction phase.	All phases	Construction Crew and Farm Manager and Team
		Provide secure storage for oil, chemicals and other waste materials in order to prevent contamination of stormwater runoff.		

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Impact	Management/Mitigation Measures	Methodology	Monitoring Frequency	Responsibility
		Regular inspections of stormwater infrastructure should be undertaken to ensure that it is kept clear of all debris and weeds.		
<b>STORMWATER IMPACTS</b>				
Impact of the project if a detailed storm water management plan is not correctly prepared and implemented.	A detailed stormwater management plan outlining appropriate treatment measures to address runoff from disturbed portions of the site must be compiled.	Check compliance with specified conditions.	Once-off during design followed by regular control	Contractor
		Ensure that this is taken into consideration during the planning and design phase by reviewing signed minutes of meetings or signed reports.		

**Table 5-2: Impact management plan for the proposed Construction Phase**

Impact	Management/Mitigation Measures	Methodology	Monitoring Frequency	Responsibility
<b>BIODIVERSITY IMPACTS</b>				
Loss or degradation of the wetland on the access road	Establish measures on the access road to reduce dust, erosion and sedimentation	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	Jam Rock Management, Construction Crew
	Maintain the viability of the indigenous seed bank in excavated soil so that this can be used for subsequent re-vegetation of any disturbed areas. No landscaping should be performed around the facilities.	Commence (and preferably complete) construction during winter, when the risk of disturbing growing plants should be least	During construction	Farm Manager and Team
		Briefly and effectively stockpile topsoil preferably 1-1.5m high. Natural vegetation must be allowed to recover in areas of disturbance. If recovery is slow, then a seed mix	During construction	Construction Crew

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Impact	Management/Mitigation Measures	Methodology	Monitoring Frequency	Responsibility
		for the area (using indigenous grass species listed within this report) should be sourced and planted		
Loss of CI or medicinal flora	Adhere to legal requirements and best practice guidelines regarding the displacement of CI and medicinally important floral species.	Obtain guidance from a suitably qualified vegetation specialist or horticulturist regarding the collection, propagation/storage and transplantation of plants	During Construction	Botanist / horticulturist
Loss of CI fauna	Prohibit collection or persecution of fauna.	Check open trenches for trapped animals (e.g. hedgehogs, reptiles and frogs), and relocate trapped animals with advice from an appropriate specialist.	Daily, during Construction	Farm Manager and Team
		Prohibit disturbance and persecution (e.g. poaching) of fauna, and introduction of pets and other alien fauna (apart from the production chickens).	All Phases	Farm Manager and Team / Farm Management
		Walk fence lines to remove snares.	All Phases	Farm Manager and Team / Farm Management
		Provide notices and training to inform workers about dangerous animals (e.g. venomous snakes and scorpions) and prohibited activities (e.g. poaching).	All Phases	Farm Manager and Team / External Ecologist (Advisory Capacity)
Introduction & proliferation of alien spp. - Competition and change in structure	Regulate / limit access by potential vectors of alien plants.	Carefully regulate / limit access by vehicles and materials to the construction site. Demarcate or fence in the construction area	Prior to and during construction	Farm Manager and Team ECO  Construction manager
		Prohibit the introduction of domestic animals such as dogs and cats.	Pre-Construction and continued through the life of the project	Farm Manager and Team

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Impact	Management/Mitigation Measures	Methodology	Monitoring Frequency	Responsibility
		Plant only locally indigenous flora if landscaping needs to be done.	All Phases	Farm Manager and Team
	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	Farm Manager and Team
	By law, remove and dispose of Category 1b alien species on site. All Category 2 species that remain on site must require a permit.	Remove Category species using mechanical methods, and minimise soil disturbance as far as possible	During construction	Farm Manager and Team / construction crew
Increased dust and erosion	Implement effective measures to control dust and erosion.	Limit vehicles, people and materials to the construction site.	During construction	Farm Manager and Team / construction crew
		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		
		Commence (and preferably complete) construction during winter, when the risk of erosion should be least.		
		Implement effective and environmentally-friendly dust control measures, such as mulching or periodic wetting.		
Minimise sensory disturbance of fauna	Time construction activities to minimise 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	During pre-construction and construction planning	Farm Manager and Team, Construction Crew
	Minimise noise pollution	Minimise noise to limit its impact on sensitive fauna such as owls, korhaans and Secretarybirds.	Prior to and throughout construction	Farm Manager and Team, Construction Crew

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Impact	Management/Mitigation Measures	Methodology	Monitoring Frequency	Responsibility
	Minimise light pollution.	Limit construction activities to day time hours.	Throughout construction	Farm Manager and Team, Construction Crew
		Minimise or eliminate security and construction lighting, to reduce the disturbance of nocturnal fauna.	Throughout construction	Construction Crew
<b>HERITAGE IMPACTS</b>				
Destruction of graves	Manage the disturbance of graves	Erect fences 5 m from graves and respect 30 m buffer from fence	Prior to and throughout construction	Farm Manager and Team
Disturbance to and damage to Heritage Artefacts	Prevent damage and destruction to fossils, artefacts and materials of heritage significance.	<p>The construction workers must be briefed on the potential uncovering of heritage features and what actions are then required. In the event that artefacts of heritage significance are discovered, all activities are to cease and the South African Heritage Resources Agency (SAHRA) must be immediately contacted</p> <p>If any evidence of archaeological sites or remains (e.g. remnants of stone-made structures, indigenous ceramics, bones, stone artefacts, ostrich eggshell fragments, charcoal and ash concentrations), fossils or other categories of heritage resources are found during the proposed development, SAHRA APM Unit (Natasha Higgitt/John Gribble 021 462 5402) must be alerted. If unmarked human burials are uncovered, the SAHRA Burial Grounds and Graves (BGG) Unit (Mimi Seetelo 012 320 8490), must be alerted immediately. A professional archaeologist or palaeontologist, depending on the nature of the finds, must be</p>	Prior to and throughout construction	Farm Manager and Team

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		contracted as soon as possible to inspect the findings. If the newly discovered heritage resources prove to be of archaeological or palaeontological significance, a Phase 2 rescue operation may be required subject to permits issued by SAHRA		
<b>WASTE IMPACTS</b>				
Odour Emissions from operations and environmental contamination of the surrounding environment from chicken organic waste (carcasses and manure).	Prevent unnecessary air pollution impacts as a result of the operational procedures.	Odours produced from manure and urine in chicken broiler facility can be reduced by scraping up and removing manure from the facility and washing down using low-volume high-pressure sprays.	Operational phase	Farm Manager and Team
		Manure should be collected daily and stored in vermin-proof containers at the waste storage facility.		
		Ensure that carcasses and feed, and other operational waste are appropriately and effectively contained and disposed of without detriment to the environment.		
		Establish appropriate emergency procedures for accidental contamination of the surroundings. Waste recycling should be incorporated into the facility's operations as far as possible. Designate a secured, access restricted, sign posted room for the storage of potentially hazardous substances such as herbicides, pesticides, dips and medications.		
		The relevant Air Quality norms and standards must be adhered to.		
Pollution of the surrounding environment as a result of	Reduce soil and groundwater contamination as a result of incorrect	General waste and hazardous waste should be stored temporarily on site in suitable (and	Throughout construction	Farm Manager and Team, Construction

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Impact	Management/Mitigation Measures	Methodology	Monitoring Frequency	Responsibility
<p>the handling, temporary storage and disposal of solid waste (general and hazardous).</p>	<p>storage, handling and disposal of general and hazardous waste.</p>	<p>correctly labelled) waste collection bins and skips (or similar). Waste collection bins and skips should be covered with suitable material, and disposed of at a registered landfill site.</p>		<p>Crew</p>
		<p>Should the on-site storage of general waste and hazardous waste exceed 100 m<sup>3</sup> and 80 m<sup>3</sup> respectively, then the National Norms and Standards for the Storage of Waste (published on 29 November 2013 under Government Notice 926) must be adhered to.</p>		
		<p>Ensure that the construction site is kept clean at all times and that construction personnel are made aware of correct waste disposal methods.</p>		
		<p>Ensure that sufficient general waste disposal bins are provided for all construction personnel throughout the site. These bins must be emptied on a regular basis.</p>		
		<p>No solid waste may be burned on site.</p>		
		<p>Segregation of hazardous waste from general waste to be in place.</p>		
		<p>The Contractor should provide adequate waste skips (or similar) on site and the Construction Contract should specify that the Contractor must be responsible for the correct disposal of the contents of the waste skips.</p>		
		<p>All construction waste (including rubble) should be frequently removed from site and correctly disposed by a licensed municipal landfill site</p>		
		<p>Establish appropriate emergency procedures for accidental contamination of the surroundings. Waste recycling should be</p>		

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Impact	Management/Mitigation Measures	Methodology	Monitoring Frequency	Responsibility
		incorporated into the facility's operations as far as possible. Designate a secured, access restricted, sign posted room for the storage of potentially hazardous substances such as herbicides, pesticides dips and medications. All hazardous waste should be disposed of at an appropriate licensed facility for this. Records of removal of infectious waste must be kept		
Pollution of the surrounding environment as a result of the handling of sewage	Reduce soil and groundwater contamination as a result of incorrect storage, handling and disposal of sewage.	Make use of a septic facility to temporarily store waste in an underground septic tank The applicant to appoint a professional septic drainer for extraction of sewage in a manner that is not detrimental to the environment	Throughout all phases	Farm Manager and Team
<b>AIR QUALITY IMPACTS</b>				
Increase in dust and erosion	Implement effective measures to control dust and erosion.	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 to reduce erosion and sedimentation of downstream areas. 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 of the entrance	During construction	Farm Manager and Team, Construction Crew

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Impact	Management/Mitigation Measures	Methodology	Monitoring Frequency	Responsibility
		road.		
Emissions from construction vehicles and generation of dust as a result of earthworks, demolition, as well as the delivery and mixing of construction materials.	Reduce dust emissions during construction activities.	Ensure that cleared (excavated) areas and unpaved surfaces are sprayed with water (obtained from an approved source) to minimise dust generation.	During pre-construction and construction planning	Construction Crew
		Adequate dust control strategies should be applied to minimise dust deposition, for example: Periodic spraying of water on the entrance road when necessary		
		Ensure that construction vehicles travelling on unpaved roads do not exceed a speed limit of 40 km/hour.		
		Commence (and preferably complete) construction during winter, when the risk of disturbing active (including breeding and migratory) animals, should be least.		
		Noise should also be minimised throughout construction to limit the impact on sensitive fauna such as owls and large terrestrial birds.		
Emissions from construction vehicles and generation of dust as a result of earthworks, demolition, as well as the delivery and mixing of construction materials.	Reduce dust emissions during construction activities.	Ensure that cleared (excavated) areas and unpaved surfaces are sprayed with water (obtained from an approved source) to minimise dust generation.	During pre-construction and construction planning	Construction Crew
		Adequate dust control strategies should be applied to minimise dust deposition, for example: Periodic spraying of water on the entrance road when necessary		
		Ensure that construction vehicles travelling on unpaved roads do not exceed a speed limit of 40 km/hour.		

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Impact	Management/Mitigation Measures	Methodology	Monitoring Frequency	Responsibility
		Commence (and preferably complete) construction during winter, when the risk of disturbing active (including breeding and migratory) animals, should be least. Noise should also be minimised throughout construction to limit the impact on sensitive fauna such as owls and large terrestrial birds.		
<b>SOCIO-ECONOMIC IMPACTS</b>				
Socio-economic Impact: Employment creation and skills development opportunities during the construction phase, which is expected to give rise to approximately 6-12 new jobs. This impact is rated as positive.	Maximise local employment and local business opportunities to promote and improve the local economy.	Enhance the use of local labour and local skills as far as reasonably possible. Where the required skills do not occur locally, and where appropriate and applicable, ensure that relevant local individuals are trained	During the construction phase	Farm Manager and Team
		Ensure that an equitable percentage allocation is provided for local labour employment as well as specify the use of small-to-medium enterprises and training specifications in the Contractors contract.		
		Ensure that goods and services are sourced from the local and regional economy as far as reasonably possible.		
<b>VISUAL IMPACTS</b>				
Potential visual intrusion of construction/demolition activities on the views of sensitive visual receptors	Prevent unnecessary visual clutter from focusing attention of surrounding visual receptors on the proposed development.	No specific mitigation measures are required other than standard construction site housekeeping and dust suppression such as demarcating construction boundaries and minimise areas of surface disturbance.	All Phases	Construction Crew

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Impact	Management/Mitigation Measures	Methodology	Monitoring Frequency	Responsibility
		Night lighting of the construction site should be minimised within requirements of safety and efficiency.		
<b>SAFETY, HEALTH AND ENVIRONMENT</b>				
Potential noise impact from the use of construction equipment (for the construction of the proposed infrastructure and demolition of existing infrastructure).	Prevent unnecessary impacts on the surrounding environment by ensuring that the piling noise is mitigated	Limit construction activities to day time hours	During construction	Construction Crew
Noise generation from demolition and construction work (e.g. grinding and use of angle grinders), as well as from the removal of waste material (e.g. crane and truck engines). This impact is rated as neutral.	Reduce the potential noise impacts on the construction workers.	Construction personnel must wear proper hearing protection, which should be specified as part of the Construction Phase Risk Assessment carried out by the Contractor.  The Contractor must ensure that all construction personnel are provided with adequate Personal Protective Equipment (PPE), where appropriate.	During construction	Construction Crew
Potential health injuries to construction personnel as a result of construction work (i.e. welding fumes. This impact is rated as neutral.	Prevent respiratory illnesses caused to the construction personnel.	The Contractor must ensure that all construction personnel are provided with adequate PPE for use where appropriate.	During construction	Construction Crew
Construction safety injuries: potential impact on the safety of construction workers due to construction activities (such as welding,	Prevention of injuries to and fatalities of construction personnel during the construction phase.	Ensure that a skilled and competent Contractor is appointed during the construction phase. The Contractor must be evaluated during the tender/appointment process in terms of safety standards.	During construction	Construction Crew

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cutting, working at heights, lifting of heavy items etc.). This impact is rated as neutral.		The Contractor must ensure that all construction personnel are provided with adequate PPE for use where appropriate.		
		A Construction Site Manager or Safety Supervisor should be appointed, in conjunction with the project manager, to monitor all safety aspects during the construction phase. This could be the same person that is assigned to co-ordinate the construction traffic.		
		The Contractor must undertake a Construction Phase Risk Assessment		
		Ensure that roads are not closed during construction, which may restrict access for emergency services.		
<b>TRAFFIC IMPACTS</b>				
Traffic, congestion and potential for collisions during the construction phase. This impact is rated as neutral.	Prevent unnecessary impacts on the surrounding road network by supplying parking for construction vehicles on site.	During the construction phase, suitable parking areas should be created and designated for construction trucks and vehicles.	During construction	Construction Crew
		A construction supervisor should be appointed to co-ordinate construction traffic during the construction phase (by drawing up a traffic plan prior to construction).		
<b>WATER QUALITY IMPACTS</b>				

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Pollution caused by spillage or discharge of construction waste water into the surrounding environment.	Reduce the spillage of domestic effluent and the impact thereof on the environment.	Ensure that adequate containment structures are provided for the storage of construction materials on site.	During construction	Construction Crew
Pollution of the surrounding water and ground as a result of generation of building rubble and waste scrap material.	Prevent unnecessary pollution impacts on the surrounding environment.	The amount of hazardous materials and liquids (such as cleaning materials) handled will be minimal. Fumes generated during welding will be minimal, within a well-ventilated area.	All phases	Construction Crew and Farm Manager and Team
		The construction site should be cleaned regularly		
		The Contractor should provide adequate waste skips (or similar) on site and the Construction Contract should specify that the Contractor must be responsible for the correct disposal of the contents of the waste skips.		
		All construction waste (including rubble) should be frequently removed from site and correctly disposed by a licensed municipal landfill site.		
Pollution of the surrounding environment as a result of contamination of stormwater. Contamination could result from chemicals, oils, fuels, sewage, solid	Reduce the contamination of stormwater.	The appointed Contractor should compile a Method Statement for Stormwater Management during the construction phase.	All phases	Construction Crew and Farm Manager and Team
		Provide secure storage for oil, chemicals and other waste materials in order to prevent contamination of stormwater runoff.		

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Impact	Management/Mitigation Measures	Methodology	Monitoring Frequency	Responsibility
waste, litter etc.		Regular inspections of stormwater infrastructure should be undertaken to ensure that it is kept clear of all debris and weeds.		
		Ensure that the pig houses and associated drains and slurry facility are designed and lined with impermeable substances (clay-type soils, geosynthetic plastic or concrete) in accordance with advice from suitably qualified agricultural experts and international best practice norms.		
<b>STORMWATER IMPACTS</b>				
Diversion and impedance surface water flows as well as increased run-off as the result of construction activities	Prevent interference with natural run-off patterns, diverting flows and increasing the velocity of surface water flows.	Compile a Method Statement for Stormwater Management and verify if a Method Statement for Stormwater Management has been compiled by the Contractor via audits prior to the commencement of the construction phase.	During construction	Contractor
		Stormwater and any run-off generated by the hard surfaces should be discharged into retention swales or areas with rock rip-rap (or similar). These could be used to enhance the sense of place, if they are planted with indigenous vegetation.		
		Erosion and sedimentation into water bodies must be minimised through the effective stabilisation (gabions and Reno mattresses or similar) and the re-vegetation of any disturbed riverbanks.		
		Unnecessary run-off such as over wetting during dust control and irrigation must be avoided.		
		Perform periodic inspections and maintenance of soil erosion measures and stormwater		

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<p>Pollution of the surrounding environment as a result of contamination of stormwater. Contamination could result from chemicals, oils, fuels, sewage, solid waste, litter etc.</p>	<p>Reduce the contamination of stormwater.</p>	<p>control structures</p>	<p>All phases</p>	<p>Construction Crew and Farm Manager and Team</p>
		<p>The appointed Contractor should compile a Method Statement for Stormwater Management during the construction phase.</p>		
		<p>Provide secure storage for oil, chemicals and other waste materials in order to prevent contamination of stormwater runoff during construction phase.</p>		
		<p>Ensure that the temporary site camp and ablution facilities are established at least 32 m away from areas of high sensitivity.</p>		
<p>Regular inspections of stormwater infrastructure should be undertaken to ensure that it is kept clear of all debris and weeds.</p>				

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**Table 5-3: Impact management plan for the proposed Operational Phase**

Impact Description	Management/Mitigation Measures	Methodology	Monitoring Frequency	Responsibility
<b>BIOSECURITY IMPACTS</b>				
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.	Adhere to best practice chicken husbandry and waste disposal norms..	Throughout Operation	Farm Manager and Team
	Ensure that there are appropriate control measures in place for any contamination event	Establish appropriate emergency procedures for accidental contamination of the surroundings. Waste recycling should be incorporated into the facility's operations as far as possible. Designate a secured, access restricted, signposted room for the storage of potentially hazardous substances such as herbicides, pesticides dips and medications. All hazardous waste should be disposed of at an appropriate licensed facility for this	Prior to operation	
		Rehabilitate contaminated areas a.s.a.p. in accordance with advice from appropriate contamination and environmental specialists.	A.s.a.p. following contamination	
		Educate workers regarding the handling of hazardous substances and about waste management and emergency procedures with regular training and notices and talks.	At least annually during operation	

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Impact Description	Management/Mitigation Measures	Methodology	Monitoring Frequency	Responsibility
Poor / Inappropriate control of animal pests	Prevent, detect and control pest infestations before they become a problem, through frequent and careful cleaning, monitoring and control.	Ensure that there is effective storm water drainage around the facility	During design, construction and operation	Farm Manager and Team
		Ensure that the facility is sufficiently ventilated to keep floors, bedding, and fodder as dry as possible.		
		Prevent and manage unwanted animal access to fodder		
		Check that fan louvers (if installed) work properly, and close fans completely when off		
		Ensure that floors are sloped and slatted to facilitate drainage		
		Screed concrete floors properly to seal all cracks and limit the pooling of effluent and water		
		Effectively maintain and seal all pipes and reservoirs containing slurry, to prevent animals from accessing the effluent.		
		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				

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Impact Description	Management/Mitigation Measures	Methodology	Monitoring Frequency	Responsibility
		<p>Electrocution devices are available to kill flies, while other mechanical devices include traps, sticky tapes or baited traps</p> <p>Control rodents through effective sanitation, rodent proofing and (as humane as possible) extermination.</p> <p>Rodenticides are not advised</p> <p>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.</p>		
<p>Environmental and Health contamination arising from Chicken mortalities (carcasses) during operations.</p>	<p>Prevent infection to other live animals and people, as well as contamination as a result from death of livestock and from inappropriate handling or corpses.</p>	<p>Chicken carcasses should be collected daily or when necessary, denatured (with relevant environmentally friendly chemicals) and disposed of at mortality pits</p> <p>Ensure that the development of mortality pits are designed and lined with impermeable substances in accordance with advice from international best practice norms in order to prevent ground water contamination. The applicant shall also seek guidance from relevant authorities' e.g. DAFF on best practice or consult their guidelines and norms and standards if available.</p> <p>Ensure that carcasses and feed, and other operational waste are appropriately and effectively contained and disposed of without detriment to the environment.</p> <p>Establish appropriate emergency procedures for accidental contamination of the surroundings.</p>	<p>Weekly</p>	<p>Farm manager and team</p>

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Impact Description	Management/Mitigation Measures	Methodology	Monitoring Frequency	Responsibility
		Designate a secured, access restricted, sign posted room for the storage of potentially hazardous substances such as herbicides,		
Transmission of diseases	Ensure that pests and other potential vectors are unable to enter areas where they might encounter production animals, carcasses, excrement or bedding, by thoroughly sealing these areas using effective, humane and environmentally-friendly means.	Maintain the appropriate pest control measures	Life of operation particularly at the onset of the rainy season	Farm Manager and Team
		Effectively maintain and seal all pipes and reservoirs containing slurry, to prevent animals from accessing the effluent.	Throughout Operation	Farm Manager and Team
<b>HERITAGE IMPACTS</b>				
Destruction of graves	Limit disturbance of graves on site	Erect fences of 5 m from graves and respect 30 m buffer from fence	Prior to construction	Construction crew
Disturbance to and damage to Heritage Artefacts	Limit disturbance of any Heritage Artefacts	The construction workers must be briefed on the potential uncovering of heritage features and what actions are then required. In the event that artefacts of heritage significance are discovered, all activities are to cease and the South African Heritage Resources Agency (SAHRA) must be immediately contacted.	Throughout Operation	Farm Manager and Team
		If any evidence of archaeological sites or remains (e.g. remnants of stone-made structures, indigenous ceramics, bones, stone artefacts, ostrich eggshell fragments, charcoal and ash concentrations), fossils or other categories of heritage resources are found during the proposed development, SAHRA APM Unit (Natasha Higgitt/John Gribble 021 462 5402) must be alerted. If unmarked human burials are uncovered, the SAHRA Burial		

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		Grounds and Graves (BGG) Unit (Mimi Seetelo 012 320 8490), must be alerted immediately. A professional archaeologist or palaeontologist, depending on the nature of the finds, must be contracted as soon as possible to inspect the findings. If the newly discovered heritage resources prove to be of archaeological or palaeontological significance, a Phase 2 rescue operation may be required subject to permits issued by SAHRA		
<b>AIR QUALITY</b>				
Atmospheric pollution due to fumes, smoke from fires (involving plant and vegetable oils or MEG).	Prevent unnecessary air pollution impacts as a result of the operational procedures.	Portable fire extinguishers and fire water hydrants (i.e. appropriate fire-fighting equipment) should be provided at the terminal as required. Mobile fire-fighting equipment should be provided at the berths as a safety precaution during the vessel offloading process. It should be noted that the products planned to be stored at the terminal have high flash points and low volatility. As a result, fires are unlikely, unsustainable, and can be extinguished with basic fire water and portable fire extinguishers.		Farm Manager and Team and ECO
Emissions from staff vehicles.	Reduce emissions during operation	Efficient movement of traffic through the entrance and exit in order to reduce congestion and vehicle emissions.  Ensure that the facility is operated in such a manner whereby potential odours are minimised.		Farm Manager and Team
Altered burning	Ensure that flammable materials are stored in an appropriate safe	Create safe storage on the premises for flammable materials. If artificial burning is	Throughout Operation	Farm Manager and Team and ECO

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	house. Ensure that there are appropriate control measures in place for any accidental fires. If artificial burning is considered necessary to reduce risks to human and infrastructure safety from wild fires, a fire management plan should be compiled with input from an appropriate floral specialist, and diligently implemented. Annual wild fires should be strictly prohibited.	<p>considered necessary, establish and implement a fire management plan with emergency fire procedures</p> <p>Maintain an effective fire break between the development area and the surrounding natural environment (especially the ridge to the north, where the fire-dependent Highveld Blue butterfly may occur)</p> <p>Educate workers about the plan and emergency procedures with regular training and notices</p>		
<b>BIODIVERSITY IMPACTS</b>				
Loss or degradation of the wetland on the access road	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.	During operation	Farm Manager and Team
Loss of CI or medicinal flora	Harvesting of indigenous flora for medicine, fire wood, building materials, and other purposes must be prohibited	Education of the Farm Management and team required prior to operation and with yearly refresher talks.	Prior to and during operation	Farm Manager and Team
Introduction & proliferation of alien spp.	Regulate / limit access by potential vectors of alien plants.	Carefully regulate / limit access by vehicles and materials to the site	Throughout Operation	Farm Manager and Team and ECO
		Prohibit the introduction of domestic animals such as dogs and cats.		
		Plant only locally indigenous flora if landscaping needs to be done		
	Maintain a neat and tidy production facility	Employ best practices regarding the tilling of soil and weed management		
		Minimise the accumulation or dispersal of excess fodder on site		

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	By law, remove and dispose of Category 1b alien species on site. All Category 2 species that remain on site must require a permit.	Remove Category species using mechanical methods, and minimise soil disturbance as far as possible. Alien debris could be donated to a local community.		
Sensory disturbances	Limit the effects of light pollution on nocturnal fauna (including numerous insects, bats and hedgehogs).	Minimise essential lighting. <ul style="list-style-type: none"> <li>• Ensure that all outdoor lights are angled downwards and/or fitted with hoods.</li> <li>• Avoid using metal halide, mercury or other bulbs that emit high UV (blue-white) light that is highly and usually fatally attractive to insects.</li> <li>• Use bulbs that emit warm, long wavelength (yellow-red) light, or use UV filters or glass housings on lamps to filter out UV.</li> </ul>	During design, construction and operation	Farm Manager and Team
	Limit the effects of noise from operational activities on fauna such as carnivores, frogs and Secretarybirds.	Minimise unavoidable noise <ul style="list-style-type: none"> <li>• Conduct regular maintenance of machinery and ventilation systems / fans (if any).</li> </ul>	Prior to and during operation	Farm Manager and Team
<b>SOCIO-ECONOMIC IMPACTS</b>				
Improved service delivery with regards to produce and poultry products.	Maximise service delivery through maintenance of infrastructure	Ensure that the proposed infrastructure is maintained appropriately to ensure that all facilities and infrastructure operate within its design capacity to deliver as the market requires.	During Operation	Farm Manager and Team
<b>VISUAL IMPACTS</b>				
Potential impact of night lighting of the development on the nightscape of the surrounding landscape.	Prevent night lights from impacting on surrounding visual receptors by minimizing glare and light spill.	No specific mitigation measures are recommended as it is assumed that night lighting of the proposed storage facility will be planned in such a manner so as to minimise	All phases	Farm Manager and Team

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		<p>light pollution such as glare and light spill (light trespass) by: Using light fixtures that shield the light and focus illumination on the ground (or only where light is required).</p> <p>Avoiding elevated lights within safety/security requirements.</p> <p>Using minimum lamp wattage within safety/security requirements.</p> <p>Where possible, using timer switches or motion detectors to control lighting in areas that are not occupied continuously (if permissible and in line with minimum security requirements). Switching off lights when not in use in line with safety and security.</p>		
<b>HEALTH, SAFETY AND ENVIRONMENT</b>				
Altered burning	Ensure that flammable materials are stored in an appropriate safe house. Ensure that there are appropriate control measures in place for any accidental fires. If artificial burning is considered necessary to reduce risks to human and infrastructure safety from wild fires, a fire management plan should be compiled with input	Create safe storage on the premises for flammable materials. If artificial burning is considered necessary, establish and implement a fire management plan with emergency fire procedures	Prior to, and through operation	Farm Manager and Team
		Create safe storage on the premises for flammable materials. If artificial burning is considered necessary, establish and implement a fire management plan with emergency fire procedures	Prior to, and at least annually during operation	

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	from an appropriate floral specialist, and diligently implemented. Annual wild fires should be prohibited.	Educate workers about the fire plan and emergency procedures with regular training and notices	At least annually during operation	
Potential noise impact from operations and road transport of products during the operational phase (i.e. increased road traffic).	Prevent unnecessary impacts on the surrounding environment by ensuring that the drivers of road tankers minimise the use of air brakes.	<p>It is recommended that the drivers of the vehicles be discouraged from using air brakes at night.</p> <p>Limit the effects of noise associated disturbances from pigs and operational activities on sensitive fauna such as owls and medium-large mammals (especially carnivores), potentially occurring hedgehogs and large terrestrial birds such as Korhaans and Secretarybirds.</p>		Farm Manager and Team
Groundwater contamination as a result of the storage of pig waste in the proposed cement lagoon.	Reduce soil and groundwater contamination as a result of incorrect storage and disposal of waste.	<p>Ensure that that the pig houses and associated drains and slurry facility are designed and lined with impermeable substances (clay-type soils, geosynthetic plastic, or concrete) in accordance with advice from suitably qualified agricultural experts and international best practice norms.</p> <p>Personnel should ensure careful transportation of waste from the pig facilities to the lagoon as to avoid spillage.</p> <p>Adequate infrastructure should ensure waste will not exit the lagoon in an extreme weather event.</p> <p>Ensure adequate treatment of the waste to avoid extreme odours and contaminations.</p>	Throughout operation	ECO

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Impact Description	Management/Mitigation Measures	Methodology	Monitoring Frequency	Responsibility
Potential impact on the health of operating personnel resulting in potential health injuries.	To ensure that there are no adverse effects on the health of operating personnel.	Operational personnel must wear basic PPE (e.g. gloves, goggles etc.) as necessary during the operational phase.		Farm Manager and Team
Minor accidents to the public and moderate accidents to operational staff (e.g. fires).	Ensure operating personnel or the public are not affected or injured by heat from possible fires.	An Emergency Plan should be compiled in order to deal with potential spillages and fires. Records of practices should be kept on site.	Annually	Farm Manager and Team
		Scheduled inspections should be implemented by operating personnel in order to assure and verify the integrity of hoses, piping and storage lagoon.		
		Portable fire extinguishers and fire water hydrants (i.e. appropriate fire-fighting equipment) should be provided at the facility as required.		
Impact of extra operational vehicles on the road network.	Prevent unnecessary or excessive heavy vehicles	Undertake re-calibration of existing traffic signals if required.		Farm Manager and Team
<b>WASTE MANAGEMENT</b>				
Odour Emissions from operations and environmental contamination of the surrounding environment from chicken organic waste (carcasses and manure).	Prevent unnecessary air pollution impacts as a result of the operational procedures.	Odours produced from manure and urine in chicken broiler facility can be reduced by scraping up and removing manure from the facility and washing down using low-volume high-pressure sprays.	Operational	Farm Manager and Team
		Manure should be collected daily and stored in vermin-proof containers at the waste storage facility.		
		Ensure that carcasses and feed, and other operational waste are appropriately and effectively contained and disposed of without detriment to the environment.		

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Impact Description	Management/Mitigation Measures	Methodology	Monitoring Frequency	Responsibility
		<p>Establish appropriate emergency procedures for accidental contamination of the surroundings. Waste recycling should be incorporated into the facility's operations as far as possible. Designate a secured, access restricted, sign posted room for the storage of potentially hazardous substances such as herbicides, pesticides, dips and medications.</p> <p>The relevant Air Quality norms and standards must be adhered to.</p>		
Pollution of the surrounding environment as a result of the handling, temporary storage and disposal of solid waste (general and hazardous).	Reduce soil and groundwater contamination as a result of incorrect storage, handling and disposal of general and hazardous waste.	General waste and hazardous waste should be stored temporarily on site in suitable (and correctly labelled) waste collection bins and skips (or similar). Waste collection bins and skips should be covered with suitable material, where appropriate	Throughout operation	Farm Manager and Team
		Should the on-site storage of general waste and hazardous waste exceed 100 m <sup>3</sup> and 80 m <sup>3</sup> respectively, then the National Norms and Standards for the Storage of Waste (published on 29 November 2013 under Government Notice 926) must be adhered to.		
		Ensure that the construction site is kept clean at all times and that construction personnel are made aware of correct waste disposal methods.		
		Ensure that sufficient general waste disposal bins are provided for all operational personnel throughout the site. These bins must be emptied on a regular basis.		
		No solid waste may be burned on site.		
		Segregation of hazardous waste from general waste to be in place.		

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Impact Description	Management/Mitigation Measures	Methodology	Monitoring Frequency	Responsibility
		<p>The farm manager must be responsible for the correct disposal of the contents of the waste skips.</p> <p>All operational waste (including rubble) should be frequently removed from site and correctly disposed by a licensed municipal landfill site</p> <p>Establish appropriate emergency procedures for accidental contamination of the surroundings. Waste recycling should be incorporated into the facility's operations as far as possible. Designate a secured, access restricted, sign posted room for the storage of potentially hazardous substances such as herbicides, pesticides dips and medications. All hazardous waste should be disposed of at an appropriate licensed facility for this.</p>		
Pollution of the surrounding environment as a result of the handling of sewage	Reduce soil and groundwater contamination as a result of incorrect storage, handling and disposal of sewage.	<p>Make use of a septic facility to temporarily store waste in an underground septic tank</p> <p>The applicant to appoint a professional septic drainer for extraction of sewage in a manner that is not detrimental to the environment</p>	Throughout all phases	Farm Manager and Team
<b>STORMWATER IMPACTS</b>				
Discharge of contaminated stormwater into the surrounding environment. Contamination could result from chemicals, oils, fuels, sewage, solid waste, litter etc.	Reduce the contamination of stormwater during operation.	The appointed Contractor should compile a Method Statement for Stormwater Management during the operation.	Once off and updated as required.	Contractor
		Undertake regular inspections of the stormwater infrastructure (i.e. by implementing walk through inspections).	Throughout Operation	Farm manager and team

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**Table 5-4: Impact management plan for the proposed Decommissioning Phase**

Impact Description	Management/Mitigation Measures	Methodology	Monitoring Frequency	Responsibility
<b>BIODIVERSITY IMPACTS</b>				
Loss or degradation of the wetland on the access road	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.	During operation	Farm Manager and Team
Introduction & proliferation of alien spp. - Competition and change in structure	By law, remove and dispose of Category 1b alien species on site. All Category 2 species that remain on site must require a permit.	Remove Category species using mechanical methods and minimise soil disturbance as far as possible.	Throughout the decommissioning phase.	Farm Manager and Team and ECO
Sensory disturbances	Time demolition / rehabilitation activities to minimise sensory disturbance of fauna.	Commence (and preferably complete) demolition / rehabilitation during winter, when the risk of disturbing active (including breeding and migratory) animals, should be least.	Throughout the decommissioning phase.	Farm Manager and Team and ECO
	Limit disturbance from noise	Minimise noise to limit its impact on sensitive fauna such as owls, korhaans and Secretarybirds		
	Limit disturbance from light	Limit demolition activities to day time hours		
		Minimise or eliminate security and other lighting, to reduce the disturbance of nocturnal fauna		
<b>AIR QUALITY IMPACTS</b>				
Increase in dust and erosion	Implement effective measures to control dust and erosion.	Limit vehicles, people and materials to the construction site.	During construction	Farm Manager and Team, Construction Crew
		Commence (and preferably complete) construction during winter, when the risk of erosion should be least		
		Revegetate denude areas with locally indigenous		

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Impact Description	Management/Mitigation Measures	Methodology	Monitoring Frequency	Responsibility
		flora a.s.a.p. Implement erosion protection measures on site to reduce erosion and sedimentation of downstream areas. 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 of the entrance road.		
<b>HERITAGE IMPACTS</b>				
Destruction of graves	Limit disturbance of graves on site	Erect fence of 5 m from graves and respect 30 m buffer from fence	Carry out monitoring for the decommissioning phase.	Contractor
<b>WATER QUALITY IMPACTS</b>				
Potential spillage of effluent to the surrounding environment (from portable sanitation facilities for decommissioning personnel).	Reduce the spillage of domestic effluent and the impact thereof on the environment.	Normal sewage management practises should be implemented. These include ensuring that portable sanitation facilities are regularly emptied and the resulting sewage is transported safely (by an appointed service provider) for correct disposal at an appropriate, licenced facility. Proof of disposal (in the form of waste disposal slips or waybills) should be retained on file for auditing purposes.	Monthly	ECO
Discharge of contaminated stormwater into the surrounding environment. Contamination could result from	Reduce the contamination of stormwater.	The appointed Contractor should compile a Method Statement for Stormwater Management during the decommissioning phase.	Once off (and thereafter updated as required).	Contractor

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Impact Description	Management/Mitigation Measures	Methodology	Monitoring Frequency	Responsibility
chemicals, oils, fuels, sewage, solid waste, litter etc.		Provide secure storage for oil, chemicals and other waste materials to prevent contamination of stormwater runoff.		
Pollution of the surrounding environment as a result of the handling, temporary storage and disposal of solid waste.	Reduce soil and groundwater contamination as a result of incorrect storage, handling and disposal of general and hazardous waste.	<p>General waste (i.e. building rubble, demolition waste, discarded concrete, bricks, tiles, wood, glass, plastic, metal, excavated material, packaging material, paper and domestic waste etc.) and hazardous waste (i.e. empty tins, paint and paint cleaning liquids, oils, fuel spillages and chemicals etc.) generated during the decommissioning phase should be stored temporarily on site in suitable (and correctly labelled) waste collection bins and skips (or similar). Waste collection bins and skips should be covered with suitable material, where appropriate.</p> <p>Should the on-site storage of general waste and hazardous waste exceed 100 m<sup>3</sup> and 80 m<sup>3</sup> respectively, then the National Norms and Standards for the Storage of Waste (published on 29 November 2013 under GN 926) must be adhered to.</p> <p>Ensure that general waste and hazardous waste generated are removed from the site on a regular basis and disposed of at an appropriate, licensed waste disposal facility by an approved waste management Contractor. Waste disposal slips or waybills should be kept on file for auditing purposes as proof of disposal.</p>	Carry out monitoring for the decommissioning phase.	ECO

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Impact Description	Management/Mitigation Measures	Methodology	Monitoring Frequency	Responsibility
		Ensure that sufficient general waste disposal bins are provided for all personnel throughout the site. These bins must be emptied on a regular basis.		
		Appropriately time demolition / rehabilitation activities to minimise sensory disturbance to fauna.		
<b>NOISE IMPACTS</b>				
Emissions from decommissioning vehicles and generation of dust as a result of earthworks and demolition.	Reduce dust emissions during decommissioning activities.	Ensure that cleared (excavated) areas and unpaved surfaces are sprayed with water (obtained from an approved source) to minimise dust generation.	Carry out monitoring for the decommissioning phase.	Contractor and ECO
		Approved soil stabilisers may be utilised to limit dust generation.		
		Ensure that decommissioning vehicles travelling on unpaved roads do not exceed a speed limit of 40 km/hour.		
<b>VISUAL IMPACTS</b>				
Potential visual intrusion of decommissioning activities on the existing views of sensitive visual receptors.	Prevent unnecessary visual clutter from focusing attention of surrounding visual receptors on the proposed development.	No specific mitigation measures are required other than standard site housekeeping and dust suppression. These are included below: The contractor(s) should maintain good housekeeping on site to avoid litter and minimise waste.	Weekly	Construction Crew and ECO

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Impact Description	Management/Mitigation Measures	Methodology	Monitoring Frequency	Responsibility
		<p>The project developer should demarcate decommissioning boundaries and minimise areas of surface disturbance.</p> <p>Appropriate plans should be in place to minimise fire hazards and dust generation.</p> <p>Litter and rubble should be timeously removed from the work site and disposed at a licenced waste disposal facility.</p> <p>Night lighting of the decommissioning site should be minimised within requirements of safety and efficiency.</p> <p>Limit the effects of light pollution on nocturnal fauna (e.g. The potentially occurring Hedgehog and Rusty Pipistrelle but also various invertebrate species)</p> <p>Limit the effects of light pollution on nocturnal fauna (e.g. The potentially occurring Hedgehog and Rusty Pipistrelle but also various invertebrate species)</p>		
<b>SAFETY, HEALTH AND ENVIRONMENT</b>				
Noise generation from demolition activities (e.g. grinding, steel falling, use of angle grinders) during the decommissioning phase. This impact is rated as neutral.	Reduce the potential noise impacts on the decommissioning personnel	A method statement, including detailed procedures, must be drawn up prior to any decommissioning of existing tanks.	Throughout the decommissioning phase.	ECO and Contractor
		Decommissioning personnel must wear proper hearing protection, which should be specified as part of the Decommissioning Phase Risk Assessment carried out by the Contractor.		

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Impact Description	Management/Mitigation Measures	Methodology	Monitoring Frequency	Responsibility
		The Contractor must ensure that all decommissioning personnel are provided with adequate PPE, where appropriate.		
Potential health injuries to demolition staff during the decommissioning phase. This impact is rated as neutral.	Prevent respiratory illnesses caused to the decommissioning personnel	The Contractor must ensure that all decommissioning personnel are provided with adequate PPE for use where appropriate.	Throughout the decommissioning phase.	ECO and Contractor
<b>TRAFFIC IMPACTS</b>				
Heavy traffic, congestion and potential for collisions. This impact is rated as neutral.	Prevention of injuries, fatalities, and damage to equipment and vehicles during the decommissioning phase.	Suitable parking areas should be created and designated for trucks and vehicles.	Throughout the decommissioning phase.	Contractor and ECO
		A supervisor should be appointed to co-ordinate traffic during the decommissioning phase.		
		Road barricading should be undertaken where required and road safety signs should be adequately installed at strategic points within the site.		
<b>WASTE MANAGEMENT</b>				
Pollution of the surrounding environment as a result of the handling, temporary storage and disposal of solid waste (general and hazardous).	Reduce soil and groundwater contamination as a result of incorrect storage, handling and disposal of general and hazardous waste.	General waste and hazardous waste should be stored temporarily on site in suitable (and correctly labelled) waste collection bins and skips (or similar). Waste collection bins and skips should be covered with suitable material, where appropriate	Throughout operation	Farm Manager and Team
		Should the on-site storage of general waste and hazardous waste exceed 100 m <sup>3</sup> and 80 m <sup>3</sup> respectively, then the National Norms and Standards for the Storage of Waste (published on		

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Impact Description	Management/Mitigation Measures	Methodology	Monitoring Frequency	Responsibility
		<p>29 November 2013 under Government Notice 926) must be adhered to.</p> <p>Ensure that the decommissioning site is kept clean at all times and that construction personnel are made aware of correct waste disposal methods.</p> <p>Ensure that sufficient general waste disposal bins are provided for all decommissioning personnel throughout the site. These bins must be emptied on a regular basis.</p> <p>No solid waste may be burned on site.</p> <p>Segregation of hazardous waste from general waste to be in place.</p> <p>The Contractor should provide adequate waste skips (or similar) on site and the decommissioning Contract should specify that the Contractor must be responsible for the correct disposal of the contents of the waste skips.</p> <p>All decommissioning waste (including rubble) should be frequently removed from site and correctly disposed by a licensed municipal landfill site.</p> <p>Establish appropriate emergency procedures for accidental contamination of the surroundings. Waste recycling should be incorporated into the facility's operations as far as possible. Designate a secured, access restricted, sign posted room for the storage of potentially hazardous substances such as herbicides, pesticides dips and medications. All hazardous waste should be disposed of at an appropriate licensed facility for</p>		

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Impact Description	Management/Mitigation Measures	Methodology	Monitoring Frequency	Responsibility
		this.		
Pollution of the surrounding environment as a result of the handling of sewage	Reduce soil and groundwater contamination as a result of incorrect storage, handling and disposal of sewage.	<p>Make use of a septic facility to temporarily store waste in an underground septic tank</p> <p>The applicant to appoint a professional septic drainer for extraction of sewage in a manner that is not detrimental to the environment</p>	Throughout all phases	Farm Manager and Team

## 6 HERITAGE MANAGEMENT PLAN

Impact Description	Management/Mitigation Measures	Methodology	Monitoring Frequency	Responsibility
Destruction of graves	Limit disturbance of graves on site	<p>Erect fences of 5 m from graves and respect 30 m buffer from fence</p> <p>Graves should be left intact and be fenced at all times throughout the lifecycle of the project.</p> <p>Monthly inspections to be undertaken in order to determine that the condition of the site does not deteriorate</p>	Prior to construction	Construction crew
Disturbance to and damage to Heritage Artefacts	Limit disturbance of any Heritage Artefacts	The construction workers and employees of JamRock must be briefed on the potential uncovering of heritage features and what actions are then required. In the event that artefacts of heritage significance are discovered, all activities are to cease and the South African Heritage Resources Agency (SAHRA) must be immediately contacted.	Throughout Operation	Farm Manager and Team

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Impact Description	Management/Mitigation Measures	Methodology	Monitoring Frequency	Responsibility
		<p>If any evidence of archaeological sites or remains (e.g. remnants of stone-made structures, indigenous ceramics, bones, stone artefacts, ostrich eggshell fragments, charcoal and ash concentrations), fossils or other categories of heritage resources are found during the proposed development, SAH RA APM Unit (Natasha Higgitt/John Gribble 021 462 5402) must be alerted. If unmarked human burials are uncovered, the SAHRA Burial Grounds and Graves (BGG) Unit (Mimi Seetelo 012 320 8490), must be alerted immediately. A professional archaeologist or palaeontologist, depending on the nature of the finds, must be contracted as soon as possible to inspect the findings. If the newly discovered heritage resources prove to be of archaeological or palaeontological significance, a Phase 2 rescue operation may be required subject to permits issued by SAHRA</p>		

# **ENVIRONMENTAL MANAGEMENT PROGRAMME**

Basic Assessment for the proposed development of a chicken broiler facility on Portion 40 of the Farm Jonathan 175- JQ, Brits, North West:  
FINAL BASIC ASSESSMENT REPORT

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## **7 ENVIRONMENTAL EDUCATION/ ENVIRONMENTAL AWARENESS PLAN**

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The farm manager will be responsible for implementing a programme that will raise environmental awareness for all construction workers. The environmental awareness training will be presented to all workers in order to promote a successful implementation of the EMPr. An Environmental Control Officer shall be appointed to assist the manager with effective implementation of the programme and to also ensure compliance with all conditions of authorisations received.

The Awareness training shall emphasise the importance of an EMPr in order to promote compliance. All the environmental impacts that are associated with the proposed development should be outlined together with the proposed mitigation measures. The programme should also focus on sensitive areas in order to ensure that sensitive natural resources are protected.

The environmental awareness training should be undertaken when necessary and it is the responsibility of the farm manager to ensure that every person who will be coming to site is educated about the general conduct. Furthermore a register must be signed as part of the monitoring process; this will serve as proof that workers were made aware of the sensitivities on site. A method statement will be compiled by the contractor prior to commencement of construction activities. The method statement will comply with all the recommendations that have been outlined in the EMPr of the project with aims to protect environmental resources, minimise pollution and to rehabilitate disturbed areas.

## **8 ENVIRONMENTAL MONITORING & REPORTING/ AUDITING**

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The Environmental Control Officer will be responsible for monitoring of construction activities on site to also ensure that all the recommendations of the EMPr are adhered to during the construction phase of the programme. Monitoring of compliance with all the recommendations should be done regularly in order to protect the natural resources on site.

The construction area must be inspected and the Environmental Control Officer must compile a report after each inspection. Should non-compliance be recorded, the construction activities must be ceased until remedial actions are taken to ensure compliance. The report must be submitted to the Farm manager who can then address any issues raised with the engineer and contractor. The reports will be kept as part of record keeping and will be sent to READ should they be requested.

Written records should entail the method statement, the approved EMPr that consists of monitoring reports, a site incident register, relevant authorisations that have been obtained and records of any meeting and training held with the construction workers. The farm manager will also be responsible for post construction phase monitoring programme i.e. clearance of Invasive Alien Species on site, the removal of debris during flooding etc.

# APPENDICES

DRAFT BASIC ASSESSMENT REPORT

PROPOSED DEVELOPMENT OF A CHICKEN BROILER FACILITY ON PORTION 40 OF THE FARM JONATHAN 175- JQ,  
BRITS, NORTH WEST

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## BASIC ASSESSMENT REPORT

### APPENDIX K: DETAILS OF EAP AND EXPERTISE

## CONTENTS

Details of EAP and expertise \_\_\_\_\_ 2

## APPENDICES

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### DETAILS OF EAP AND EXPERTISE

#### Minnelise Levendal (Project Leader)



CSIR  
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South Africa

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Fax: +27 21 888 2693  
Email: mlevendal@csir.co.za



### **CURRICULUM VITAE OF MINNELISE LEVENDAL – PROJECT LEADER**

<b>Name of firm</b>	CSIR
<b>Name of staff</b>	Minnelise Levendal
<b>Profession</b>	Environmental Assessment and Management
<b>Position in firm</b>	Project Manager
<b>Years' experience</b>	8 years
<b>Nationality</b>	South African
<b>Languages</b>	Afrikaans and English

#### **CONTACT DETAILS:**

**Postal Address:** P O Box 320, Stellenbosch, 7599  
**Telephone Number:** 021-888 2495/2661  
**Cell:** 0833098159  
**Fax:** 0865051341  
**e-mail:** mlevendal@csir.co.za

#### **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 Department of Environmental Affairs appointed the South African Botanical Institute (SANBI) to undertake this project. SANBI subsequently appointed the CSIR to manage this project.

## APPENDICES

### 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 <i>(in progress)</i>	EIA for the proposed Electrawinds Swartberg wind energy project near Moorreesburg in the Western Cape	Project Manager	Electrawinds
2010-2011 <i>(in progress)</i>	EIA for the proposed Ubuntu wind energy project, Eastern Cape	Project Manager	WKN Windkraft SA
2010-2011 <i>(in progress)</i>	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 <i>(Environmental Authorisation granted in September 2011)</i>	EIA for a proposed wind farm near Swellendam in the Western Cape	Project Manager	BioTherm Energy (Pty Ltd)
2010 <i>(complete)</i>	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 <i>(complete)</i>	Basic Assessment for the erection of two wind monitoring masts near Jeffrey's Bay in the Eastern Cape	Project Manager	Windcurrent (Pty Ltd)
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

## APPENDICES

Completion Date	Project description	Role	Client
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.** (néé Levendal) and Ward, D. (2004). Water status of the mistletoe *Plicosepalus 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 <sup>13</sup>C 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

<i>Language</i>	<i>Speaking</i>	<i>Reading</i>	<i>Writing</i>
<i>English</i>	<i>Excellent</i>	<i>Excellent</i>	<i>Excellent</i>
<i>Afrikaans</i>	<i>Excellent</i>	<i>Excellent</i>	<i>Excellent</i>

Minnelise Levendal



May 2017

## APPENDICES

### Reinett Mogotshi (Project Manager)



#### CURRICULUM VITAE: REINETT MOGOTSHI

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Stellenbosch  
7599  
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Cell : +27 72 926 8494  
Fax : +27 21 888 2473  
Email [rmogotshi@csir.co.za](mailto:rmogotshi@csir.co.za)

**Position in Firm:** Junior Environmental Assessment Practitioner (306695)  
**Full Name:** Mogotshi, Mashedi Reinett  
**Specialisation:** GIS and Environmental Science  
**Date of Birth:** 09 February 1993  
**Nationality:** South African

#### BIOSKETCH

Reinett holds a Bachelor of Science degree in Environmental Sciences and Honours in Environmental Analysis and Management from University of Pretoria. She is currently studying towards her Master of Philosophy in Environmental Management at the University of Stellenbosch. Reinett was appointed as a teaching assistant for Academic Information Management and Assistant lecturer, where she taught first year students Ms Office (Excel, Word, PowerPoint, Access and Project), internet and database searching from 2013-2014. She then worked for Environmental Management Services department of City of Tshwane Metropolitan Municipality as an Environmental Science Intern in November 2014, where she got exposure in three sub-sections within the department, namely Landscape and Urban Design, Environmental Planning and Open Space Management. Experience acquired included reviewing of BA and S&EI reports, creating thematic maps using ArcGIS, mapping of City of Tshwane Parks; reviewing Landuse applications such as applications for township establishment, rezoning, consolidation, division, subdivision and consent use as well working with project managers and Landscape Architects to do technical quality control for parks development within the City.

Reinett joined the Council for Scientific and Industrial Research (CSIR) as an Environmental Assessment Practitioner (EAP) Intern within the Environmental Management Services (EMS) group in 2015. She is currently a Junior Environmental Practitioner for the same group. Her duties include Assistance to other EAPs within EMS in their projects; Report writing and project management; Participating in various forms of environmental assessments (BAs, EIAs); consultation with stakeholders and public meetings; GIS mapping for Special Needs projects and other EIAs within the group and Project administration (e.g. contracting and invoicing). She is involved with the Special Needs and Skills Development (SNSD) Programme, which assists Community Trusts, Small, Micro to Medium Enterprises, with environmental services to comply with NEMA EIA Regulations.

#### EXPERIENCE

Completion Date	Project description	Role	Client
2016 (In Progress)	Basic Assessment for Scouts South Africa for the proposed expansion of a bridge over the Spruit River on the remainder of the farm Olyvenbosch 326, Wellington, Western Cape.	Project Manager and Mapping	Scouts South Africa

## APPENDICES

Completion Date	Project description	Role	Client
2016 (In Progress)	Basic Assessment and Waste Management Licence for Alphomega Farming Co-operative for the proposed development of a pig production enterprise on Portion 18 of Portion 13 of the Farm Poortje 340-IQ, Vereeniging, Gauteng	Project Manager and Mapping	Alphomega Farming
2017 (In Progress)	Basic Assessment for the proposed development of a chicken broiler facility on Portion 40 of the Farm Jonathan 175- JQ, Brits, North West.	Project Manager and Mapping	JamRock (Pty) Ltd
2016 (In Progress)	Basic Assessment for Khanyani Agricultural Co-operative's proposed maize and bean cultivation and harvesting enterprise on two portions of the Emthembeni Farm, near Estcourt in KwaZulu-Natal.	Project Reviewer	Khanyani Agricultural Co-operative's
2015 (in progress)	<b>Special Needs and Skills Development Programme:</b> Programme management and conducting of Basic Assessments for disadvantaged communities/businesses/enterprises	GIS Technician	National Department of Environmental Affairs (DEA), South Africa
February 2015	Draft Environmental Impact Assessment Report for the proposed Class 3 road between the K34 and the Hazeldean Node in the Pretoria East- To be known as Hazeldean Boulevard submitted to City of Tshwane metropolitan Municipality	Departmental Reviewer	Confidential
April 2015	Final Environmental Impact Assessment Report for the proposed Class 3 road between the K34 and the Hazeldean Node in the Pretoria East- To be known as Hazeldean Boulevard submitted to City of Tshwane metropolitan Municipality	Departmental Reviewer City of Tshwane	Confidential
April 2015	Draft basic Assessment Report for the proposed residential township development as part of Portion 5 of the Farm Tygervalley 334-JR- To be known as Tijger Valley Extension 14 and 34	Departmental Reviewer City of Tshwane	Confidential
January 2015	Final Basic Assessment Report for the proposed township establishment on part of the Remainder of Portion 9 and a part of Portion 145 of the Farm Brakfontein 399-JR- To be known as Rooihuiskraal North extension 29	Departmental Reviewer City of Tshwane	Confidential
2015	GIS screening for sites recommended for parks development in the 2015/2016 financial year.	Project assistant	Confidential
2015	<b>APPLICATION FOR TOWNSHIP ESTABLISHMENT:</b> <ul style="list-style-type: none"> <li>• Bronberg Close Extension 9</li> <li>• Bronberg Close Extension 10</li> <li>• Bronberg Extension 28</li> <li>• Die Hoewes Extension 305</li> <li>• Derdepoort Extension 14</li> <li>• Lotus Gardens Extension 22</li> <li>• Lotus Gardens Extension 18-28</li> <li>• Proposed Monavoni Extensions 74 And 75</li> <li>• Monavoni Extension 65</li> <li>• Monavoni Extension 70</li> <li>• Andeon Extension 28</li> <li>• Heatherview Extension 42</li> <li>• Rosslyn Extension 61</li> <li>• Equestria X206</li> <li>• Zwartkoppies X41</li> <li>• Zwartkoppies X42</li> </ul>	Environmental and GIS Screening and Departmental Reviewer City of Tshwane	Confidential

# APPENDICES

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## EMPLOYMENT RECORD

- 2017 CSIR Environmental Management Services (EMS) Junior Environmental Assessment Practitioner (EAP)
- 2015 CSIR Environmental Management Services (EMS) Environmental Assessment Practitioner (EAP) Intern
- 2015 City Of Tshwane Junior Environmental Science Intern
- 2013-2014 UP School of Information Management Assistant Lecturer & Teaching Assistant

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## QUALIFICATIONS

- 2014 University of Pretoria BSc Honours (Environmental Analysis and Management)
- 2013 University of Pretoria BSc (Environmental Sciences)

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## SHORT-COURSES, CONFERENCES AND WORKSHOPS

- 2016 Technical Workshop on the Roles and Responsibilities of Environmental Control Officers, Brackenfell, November 2016.
- 2016 International Association for Impact Assessors South Africa (IAIASa) National Annual Conference, August 2016, Port Elizabeth.
- 2015 Practical Adaptation for vulnerable communities by Adaptation Network, Kirstenbosch Botanical Gardens, Cape Town, August 2015.
- 2016 Environmental Law on October 2015 at Newlands, Cape Town.
- 2015 CiLLA Project Management I Course on November 2015 at CSIR Pretoria

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## LANGUAGES

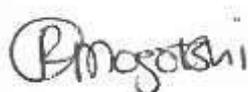
	Speaking	Reading	Writing
Setswana	Excellent	Excellent	Excellent
Sepedi	Excellent	Excellent	Excellent
English	Excellent	Excellent	Excellent

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## PROFESSIONAL REGISTRATIONS

- IAIA: Member of International Association of Impact Assessment South Africa (IAIASa) since 12 January 2016.

Reinett Mogotshi



May 2017

# APPENDICES

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PROPOSED DEVELOPMENT OF A CHICKEN BROILER FACILITY ON PORTION 40 OF THE FARM JONATHAN 175- JQ,  
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## BASIC ASSESSMENT REPORT

### APPENDIX L: ANY OTHER INFORMATION

N/A

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## BASIC ASSESSMENT REPORT

### APPENDIX M: Financial Provision (if applicable)

N/A.

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## BASIC ASSESSMENT REPORT

**APPENDIX N:  
Closure Plan (where applicable)  
as described in Appendix 5  
of EIA Regulations, 2014**

N/A.