BASIC ASSESSMENT REPORT

Final Basic Assessment for the proposed Lewin AgriBusiness (Pty) Ltd Chicken Layer Facility, Plot 226, Mans Street, Withok Estate, Brakpan, Gauteng.

Prepare for LEWIN AGRIBUSINESS (Pty) Ltd

GDARD Reference: 002/18-19/E0109

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November **2018**

BASIC ASSESSMENT PROCESS

FINAL BASIC ASSESSMENT REPORT – PROPOSED EXPANSION OF A CHICKEN EGG-LAYER FACILITY, ON A 4.4 HECTARE FARM ON PLOT 226 WITHOK ESTATE, BRAKPAN, EKURHULENI DRISTRICT, GAUTENG.

FINAL BASIC ASSESSMENT REPORT

November 2018

Prepared for:
Lewin AgriBusiness (Pty) Ltd

Prepared by:
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REPORT DETAILS

Title:	**Basic Assessment for the proposed Lewin AgriBusiness (Pty) Ltd Chicken Layer Facility, Plot 226, Mans Street, Withok Estate, Brakpan , Gauteng.**
Purpose of this report:	The purpose of this BA Report is to: • Present the proposed project and the need for the project; • Describe the affected environment at a sufficient level of detail to facilitate informed decision-making; • Provide an overview of the BA Process being followed, including public consultation; • Assess the predicted positive and negative impacts of the project on the environment; • Provide recommendations to avoid or mitigate negative impacts and to enhance the positive benefits of the project; • Provide an Environmental Management Programme (EMPr) for the proposed project. This BA Report is the Final Version submitted to the Gauteng Department of Agriculture and Rural Development (GDARD) for review.
Prepared for:	Lewin AgriBusiness (Pty) Ltd
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Date:	November 2018
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ENVIRONMENTAL ASSESSMENT PRACTITIONER

Organisation	Council for Scientific and Industrial Research (CSIR)
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Project Team:

NAME	**QUALIFICATION & EXPERTISE**
Rirhandzu Marivate **(Project Manager)**	• BSc (Honours) Ecology, Environment & Conservation (University of the Witwatersrand). Cand.Sci.Nat. • 4+ years' experience in the environmental management field • Over 4 years' experience conducting Environmental Assessments
Minnelise Levendal **(Project Reviewer)**	• MSc Biological Science (Botany) (Stellenbosch University). Pr. Sci.Nat. • 17 years of experience in Environmental Management • Inclusive of 11 years' experience in conducting Environmental Assessments

The Council for Scientific and Industrial Research has been one of the leading organisations in South Africa contributing to the development and implementation of environmental assessment and management methodologies. The CSIR's Environmental Management Services (EMS) unit has over 20 years of experience in environmental management practices, involving conducting environmental assessment and management studies in over 15 countries in Africa. Key sectors of CSIR's work include renewable energy, infrastructure, natural resource management, mining, industrial development and oil and gas. CSIR's environmental assessments are conducted with national legal requirements as well as those of international agencies such as the World Bank, International Finance Corporation and World Health Organisation.

CONTENTS

APPENDIX A:	Site plan(s) – (must include a scaled layout plan of the proposed activities overlain on the site sensitivities indicating areas to be avoided including buffers)
APPENDIX B:	Photographs
APPENDIX C:	Facility illustration(s)
APPENDIX D:	Route position information – **NOT APPLICABLE**
APPENDIX E:	Public Participation information
APPENDIX F:	, Service Letter from municipalities, water supply information, Public Health Permit Application, SAHRA information, HIA Summary
APPENDIX G:	Specialist reports (ecology and heritage)
APPENDIX H:	EMPr
APPENDIX I:	Other information • I-1: CV's of the project team (EAPs who prepared the report) • I-2: EAP declaration

TABLES

FIGURES

GLOSSARY

BA	Basic Assessment
BAR	Basic Assessment Report
CI	Conservation Important
DAFF	Department of Agriculture, Forestry and Fisheries
DEA	Department of Environmental Affairs
DWS	Department of Water and Sanitation
EAP	Environmental Assessment Practitioner
EIA	Environmental Impact Assessment
EMPr	Environmental Management Programme
GDARD	Gauteng Department of Agriculture and Rural Development
HIA	Heritage Impact Assessment
I&APs	Interested and Affected Parties
IDP	Integrated Development Plan
NEMA	National Environmental Management Act, Act No. 107 of 1998
NEM:WA	National Environmental Management: Waste Act, Act No. 59 of 2008
NHRA	National Heritage Resources Act, Act No. 25 of 1999
NSS	Natural Scientific Services
SAHRA	South African Heritage Resources Agency
SAHRIS	South African Heritage Resources Information System
SAPPO	South African Pork Producers' Organisation
SDF	Spatial Development Framework
WUL	Water Use Licence
NWA	National Water Act, Act No. 36 of 1998
WULA	Water Use Licence Application

Requirements according to Appendix 1 of GNR 326 of 4 December 2014 (as amended April 2017) – Scope of Assessment and Content of BAR

SCOPE OF ASSESSMENT AND CONTENT OF BAR	SECTION IN BAR
1) A basic assessment report must contain all 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	Page 2
ii. the expertise of the EAP, including a curriculum vitae;	Page 2 Appendix I
(b) the location of the activity, including: (i) the 21 digit Surveyor General code of each cadastral land parcel; (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;	Section B Appendix A
(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 is to be undertaken;	Appendix A
(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 ;	Section A
(e) a description of the policy and legislative context within which the development is proposed including- (i) an identification of all legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks, and instruments that are applicable to this activity and have been considered in the preparation of the report; and (ii) how the proposed activity complies with and responds to the legislation and policy context, plans, guidelines, tools frameworks, and instruments;	Section A2 Section E7
(f) a motivation for the need and desirability for the proposed development including the need and desirability of the activity in the context of the preferred location;	Section B9 Section E9
(g) a motivation for the preferred site, activity and technology alternative;	Section A3
(h) a full description of the process followed to reach the proposed preferred alternative within the site, including: (i) details of all the alternatives considered; (ii) details of the public participation process undertaken in terms of regulation 41 of the Regulations, including copies of the supporting documents and inputs; (iii) a summary of the issues raised by interested and affected parties, and an indication of the manner in which the issues were incorporated, or the reasons for not including them; (iv) the environmental attributes associated with the alternatives	Section A3 Appendix E

SCOPE OF ASSESSMENT AND CONTENT OF BAR	SECTION IN BAR
focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects; (v) the impacts and risks identified for each alternative, including the nature, significance, consequence, extent, duration and probability of the impacts, including the degree to which these impacts- (aa) can be reversed (bb) may cause irreplaceable loss of resources; and (cc) can be avoided, managed or mitigated; (vi) the methodology used in determining and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks associated with the alternatives; (vii) positive and negative impacts that the proposed activity and alternatives will have on the environment and on the community that may be affected focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects; (viii) the possible mitigation measures that could be applied and level of residual risk; (ix) the outcome of the site selection matrix; (x) if no alternatives, including alternative locations for the activity were investigated, the motivation for not considering such; and (xi) a concluding statement indicating the preferred alternatives, including preferred location of the activity;	Section B Appendix G Section E Appendix F
(i) a full description of the process undertaken to identify, assess and rank the impacts the activity will impose on the preferred location through the life of the activity, including- (i) a description of all environmental issues and risks that were identified during the environmental impact assessment process; and (ii) an assessment of the significance of each issue and risk and an indication of the extent to which the issue and risk could be avoided or addressed by the adoption of mitigation measures;	Section E, Appendix G Appendix H
(j) an assessment of each identified potentially significant impact and risk, including- (i) cumulative impacts; (ii) the nature, significance and consequences of the impact and risk; (iii) the extent and duration of the impact and risk; (iv) the probability of the impact and risk occurring; (v) the degree to which the impact and risk can be reversed; (vi) the degree to which the impact and risk may cause irreplaceable loss of resources; and (vii) the degree to which the impact and risk can be avoided, managed or mitigated;	Section E Appendix G
(k) where applicable, a summary of the findings and impact management measures identified in any specialist report complying with Appendix 6 to these Regulations and an indication as to how these findings and recommendations have been included in the final report;	Appendix H
(l) an environmental impact statement which contains- (i) a summary of the key findings of the environmental impact assessment; (i) 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	Section E Appendix A Appendix G

SCOPE OF ASSESSMENT AND CONTENT OF BAR	SECTION IN BAR
that should be avoided, including buffers; and (iii) a summary of the positive and negative impacts and risks of the proposed activity and identified alternatives;	
(m) based on the assessment, and where applicable, impact management measures from specialist reports, the recording of the proposed impact management objectives, and the impact management outcomes for the development for inclusion in the EMPr;	Section E Appendix G Appendix H
(n) any aspects which were conditional to the findings of the assessment either by the EAP or specialist which are to be included as conditions of authorisation;	Appendix G
(o) a description of any assumptions, uncertainties, and gaps in knowledge which relate to the assessment and mitigation measures proposed;	Appendix G Section E
(p) a reasoned opinion as to whether the proposed activity should or should not be authorised, and if the opinion is that it should be authorised, any conditions that should be made in respect of that authorisation;	Appendix G Section E8
(q) where the proposed activity does not include operational aspects, the period for which the environmental authorisation is required, the date on which the activity will be concluded, and the post construction monitoring requirements finalised;	N/A
(r) an undertaking under oath or affirmation by the EAP in relation to: (i) the correctness of the information provided in the reports; (ii) the inclusion of comments and inputs from stakeholders and I&APs; (iii) the inclusion of inputs and recommendations from the specialist reports where relevant; and (iv) any information provided by the EAP to interested and affected parties and any responses by the EAP to comments or inputs made by interested and affected parties; and	Appendix I Section C Appendix E
(s) where applicable, details of any financial provisions for the rehabilitation, closure, and ongoing post decommissioning management of negative environmental impacts;	N/A
(t) any specific information that may be required by the competent authority; and	N/A
(u) any other matters required in terms of section 24(4)(a) and (b) of the Act.	N/A

GAUTENG PROVINCE
AGRICULTURE AND RURAL DEVELOPMENT
REPUBLIC OF SOUTH AFRICA

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

Kindly note that:

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

DEPARTMENTAL DETAILS

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

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

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

(*For official use only*)

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

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

N/A

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

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

This application is for the development of a chicken layer facility which will exist for the foreseeable future, therefore a closure plan is not applicable in this case.

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

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

Yes

If no, state reasons for not attaching the list.

N/A

Have State Departments including the competent authority commented? No

If no, why?

The Draft BA Report was released for a 30-day review period. Following the review period comments received from State Departments (including the competent authority) were incorporated into the Final BA Report which has been submitted to Gauteng Department of Agriculture and Rural Development for decision-making.

SECTION A: ACTIVITY INFORMATION

A.1 Proposal or Development Description

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

Basic Assessment for the proposed Lewin AgriBusiness (Pty) Ltd Chicken Layer Facility, Plot 226, Mans Street, Withok Estate, Brakpan , Gauteng.

Select the appropriate box

The application is for an expansion of an existing development	X	The application is for a new development		Other, specify	

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

[redacted] NO

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

N/A

If yes, have you applied for the authorisation(s)?
If yes, have you received approval(s)? (attach in appropriate appendix) [redacted]

A.2 Applicable legislation, policies and/or guidelines

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

Title of legislation, policy or guideline:	Administering authority:	Promulgation Date:
National Environmental Management Act, 1998 (Act No. 107 of 1998 as amended).	National & Provincial	27 November 1998
National Water Act, 1998 (Act No. 36 of 1998) as amended	National	26 August 1998
National Heritage Resources Act, 1999 (Act No. 25 of 1999)	National & Provincial	28 April 1999
National Environmental Management Biodiversity Act, 2004 (Act No. 10 of 2004)	National & Provincial	7 June 2004
National Environmental Management Waste Act, 2009 (Act No. 59 of 2008)	National & Provincial	10 March 2009
Environmental Impact Assessment Regulations, 2014	National & Provincial	4 December 2014
National Development Plan: A Vision for 2030	National	19 February 2013
Department of Environmental Affairs Guidelines on Public Participation	National & Provincial	10 October 2012

Title of legislation, policy or guideline:	Administering authority:	Promulgation Date:
Spatial Planning Land Use Management Act, 2013 (Act No. 16 of 2013)	National	6 August 2013
Gauteng Provincial Environmental Framework, 2014	Provincial	November 2014
City of Ekurhuleni Integrated Development Plan 2017/18 - 2020/21	Provincial & Local	29 March 2017
Ekurhuleni Metropolitan Spatial Development Framework: 2015	Provincial	2015
Ekurhuleni Regional Spatial Development Framework: 2015	Regional/Local	2015

Description of compliance with the relevant legislation, policy or guideline:	
Legislation, policy of guideline	**Description of compliance**
National Environmental Management Act, 1998 (Act No. 107 of 1998 as amended).	The Environmental Authorisation for the proposed development is lawfully applied for in terms of the EIA Regulations, 2014, promulgated under NEMA. The conditions on the Environmental Authorisation, if approved, will be adhered to.
National Heritage Resources Act, 1999 (Act No. 25 of 1999)	The proposed project has been submitted to the South African Heritage Resources Agency (SAHRA) online platform South African Heritage Resources Information System (SAHRIS)
National Environmental Management Biodiversity Act, 2004 (Act No. 10 of 2004)	The National Environmental Management Biodiversity Act, 2004 (Act No. 10 of 2004) as amended (NEMBA) including all the pertinent legislation published in terms of this act was considered in undertaking this Basic Assessment process. This included the determination and assessment of the fauna and flora prevailing in the proposed project and the handling thereof in terms of NEMBA.
National Environmental Management Waste Act, 2009 (Act No. 59 of 2008)	The Waste Management practices will be undertaken in respect of the National Environmental Management: Waste Act (Regulations published in GNR 921 on the 29 November 2013 Government Gazette No 37083) as amended NEM:WA. Pieces of legislation published under this act will be adhered to.
Environmental Impact Assessment Regulations, 2014	All the triggered activities as per National Environmental Management Act (Act No. 107 of 1998) have been listed below.
National Development Plan: A Vision for 2030	The South African Government through the Presidency has published a National Development Plan. The Plan aims to eliminate poverty and reduce inequality by 2030. The Plan has the target of developing people's capabilities to be to improve their lives through education and skills development, health care, better access to public transport, jobs, social protection, rising income, housing and basic services, and safety. It proposes the following strategies to address the above goals: 1. Creating jobs and improving livelihoods; 2. Expanding infrastructure; 3. Transition to a low-carbon economy; 4. Transforming urban and rural spaces; 5. Improving education and training; 6. Providing quality health care; 7. Fighting corruption and enhancing accountability; 8. Transforming society and uniting the nation.

Description of compliance with the relevant legislation, policy or guideline:	
Legislation, policy of guideline	**Description of compliance**
City of Ekurhuleni Integrated Development Plan 2017/18 - 2020/21	The City of Ekurhuleni's (CoE) IDP focuses on strategic goals and development strategies for 2017/18 to 2020/21. One of the key goals is food security on the region. The strategy is to strengthen food security and agriculture competitiveness, while lifting marginalized and rural households out of poverty by investing in required infrastructure, services, skills and productivity. Increase job creation in the rural areas (agriculture economy) and reduce the percentage of households who are vulnerable to hunger. This proposed project falls within the ambit of this goal and will aid in CoE reaching their intended food security objectives through agriculture. In terms of "Strategic Proposals and Catalytic Recommendations", the following strategic proposals are highlighted (pertinent to this project): • Agriculture should be developed (in conjunction with Lesedi) to become a meaningful contributor to the Ekurhuleni economy.
Ekurhuleni Metropolitan and Regional Spatial Development Frameworks: 2015	The Spatial Development Framework (SDF) is the legislated component of the municipality's IDP that prescribes development strategies and policy guidelines to restructure and reengineer the urban and rural form. The SDF is the municipality's long-term vision of what it wishes to achieve spatially, and within the IDP programmes and projects. The SDF should not be interpreted as a blueprint or master plan aimed at controlling physical development, but rather the framework giving structure to an area while allowing it to grow and adapt to changing circumstances. The proposed project falls within Region D of the Spatial Development Framework. The area surrounding Brakpan within Region D has been identified in the SDF as "urban farms" and the focus is on the enhancement thereof. Proposed enterprises include: - Fruit and vegetables in the open and under hydroponics; - Fruit and nuts; - Broiler and egg production; - Duck and geese production along the major streams and rivers. All these are in high demand locally and in international markets.

In terms of the National Environmental Management Act (NEMA) EIA Regulations published in GNR 327, 325 and 324 of December 2014 (as amended on 7 April 2017), Government Gazette Number 40772, a Basic Assessment (BA) process is required as the project applies to the following listed activities (detailed in Table 1 below).

Table 1: Listed Activities relating to the proposed project as per NEMA EIA Regulations (as amended 7 April 2017)

Relevant Notices:	Activity No (s) (in terms of the relevant notice):	Description of each listed activity as per the Government Notice:	Description of each listed activity as per the project description
GN R327	40	The expansion and related operation of facilities for the concentration of poultry, excluding chicks younger than 20 days, where the capacity of the facility will be increased by: i. more than 1 000 poultry where the facility is situated within an urban area; or ii. more than 5 000 poultry per facility situated outside an urban area.	The proposed project will include the expansion of the facility from 5000 to 40 000 chickens (20 000 chickens per house x 2 houses).
GN. R 324	12	The clearance of an area of 300 square metres or more of indigenous vegetation except where such clearance of indigenous vegetation is required for maintenance purposes undertaken in accordance with a maintenance management plan. i) Within any critically endangered or endangered ecosystem listed in terms of section 52 of the NEMBA or prior to the publication of such a list, within an area that has been identified critically endangered in the National Spatial Biodiversity Assessment 2004.	The proposed expansion will have a development foot print of 570 m2 (1 x chicken layer facility of 427.5 m2 and 1x waste storage site of 140 m2). The development site falls within the Tsakane Clay Grassland vegetation unit, which is considered Endangered, and the Kliprivier Highveld Grassland Ecosystem which is listed nationally as Critically Endangered, under section 52 of NEMBA).

A.3 Alternatives

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

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

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

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

The proposed alternative was drawn up based on the site sensitivities as determined by the ecological (fauna and flora) specialist study undertaken as part of this process. There are no additional locational alternatives for this proposed project.

Provide a description of the alternatives considered:

No.	**Alternative type,** either alternative: site on property, properties, activity, design, technology, energy, operational or other(provide details of "other")	**Description**
1	Proposal (preferred alternative)	**<u>Site location & layout:</u>** Lewin AgriBusiness (Pty) Ltd (hereafter, Lewin AgriBusiness), is a small scale commercial farming enterprise registered at plot 226, Mans Street, Withok Estate, Brakpan, Gauteng (Figure 1). The property falls within Region D of the Ekurhuleni Metropolitan Municipality and falls on an urban edge. The site is currently zoned for agricultural use (Ekurhuleni MSDF, 2015) and is 4.4 ha in extent, of which approximately 2 ha will be used for the development. The proposed project is aimed at providing "sustainable" products (i.e. chicken layers) and ecologically responsible practices will be incorporated into the life cycle of the development. The layout plan of the preferred alternative has been developed based on the outcome of the specialist study and sensitivity mapping. The total development footprint would thus be 2 ha. This will be broken down into the following: **<u>Current infrastructure on site</u>** Currently, the existing chicken facility has a footprint of 1.5 ha and consists of the following infrastructure: - 1x 20 000 capacity layer house (with a footprint of 9.5 m x 45 m) - 1 x Ablution Facility - 1 x Office - 1 x Vegetable garden (with footprint of 90 m x 90 m) - 1 x Private Residence (with a foot print of 40 m x 25 m) - 1 x Borehole – water capacity: 7 500 L (2 500 L for chicken facility; 5 000 L general domestic use) **<u>Proposed expansion (pertinent to this application)</u>** Lewin AgriBusiness proposes to construct the following additional facilities with a total footprint of 570m² (refer to original layout plan in Figure 2 below, and revised layout plan in Figure 5): • 1 x 20 000 capacity layer house (footprint of 9.5 m x 45 m = 427.5 m^2) • 1 x Waste storage site (footprint of 7m x 20 m = 140 m^2).

No.	**Alternative type,** either alternative: site on property, properties, activity, design, technology, energy, operational or other(provide details of "other")	**Description**
		Bulk Services that may be required, i.e. sewerage, have already been installed privately to the satisfaction of the Municipality. A borehole exists on site for water provision for the proposed project. Power has been sourced from Eskom for the existing facility. Access roads to and on the site are already in existence.
2	Property Alternative	Due to the fact that there is an existing enterprise on the site, there have been no alternative properties or locations identified for the proposed project. Therefore this is the only property the applicant can perform the proposed activities and it would not be economically feasible for the business to find and or purchase new property. Therefore, no alternate properties have been investigated in the Basic Assessment.
3	Activity Alternative	Due to the fact that this site is already housing a chicken layer facility of approximately 5000 chickens, this has become an industry in which the applicant regards as their key skill which is leading to their current and future employment. The expansion will further enhance the sustainability of the business.
4	Design or Layout Alternative	The proposed design and layout will be placed on the property in a means which minimise the impact it can have on the environment. The layout of the chicken houses is focused on the biosecurity measure, which allows for more effective management of chicken broiler production as it lessens the risk of the broiler chickens catching diseases if the activity were to be an open environment or being stolen. These also allow for the most efficient compliance to chicken welfare legislation, maximising chicken production outputs. An alternative layout was submitted by the applicant and used as reference for the Specialists studies. The ecological study found that the proposed chicken facility was located in a moderately environmentally sensitive area, and proposed to move the proposed chicken facility north of the existing facility, where it has the lowest environmental sensitivity. See original and new proposed layout in **Appendix C,** where Figure C.1 shows the original layout and Figure C.3 shows the revised layout to move the proposed chicken house into an area of lower environmental sensitivity.
5	Technology to be used	The technology to be used is in line with chicken layer standards, it further leads to chicken welfare as well as complying with best practices in broiler chicken production. In order to ensure the that the existing and proposed development apply best practice measures, 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.

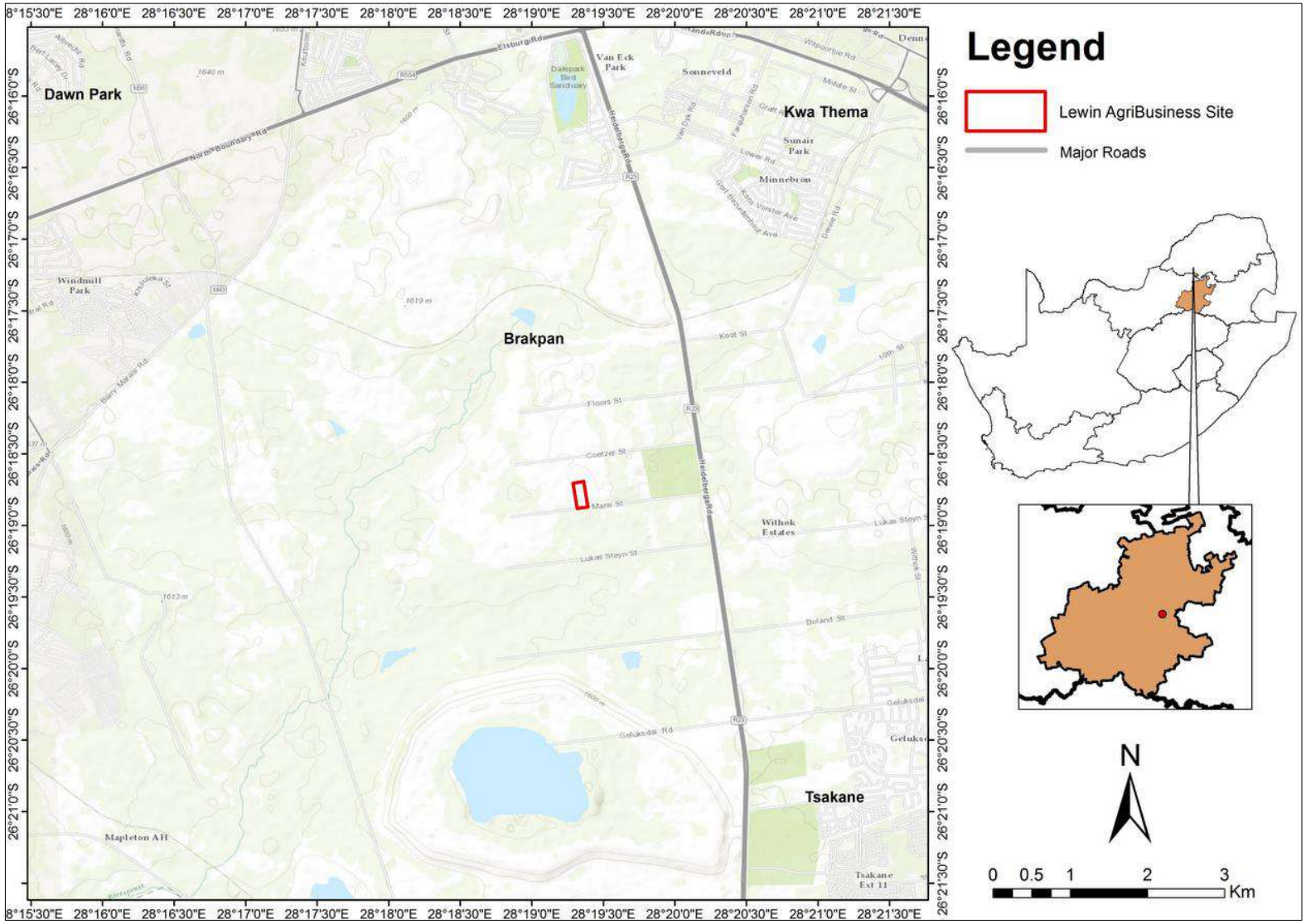
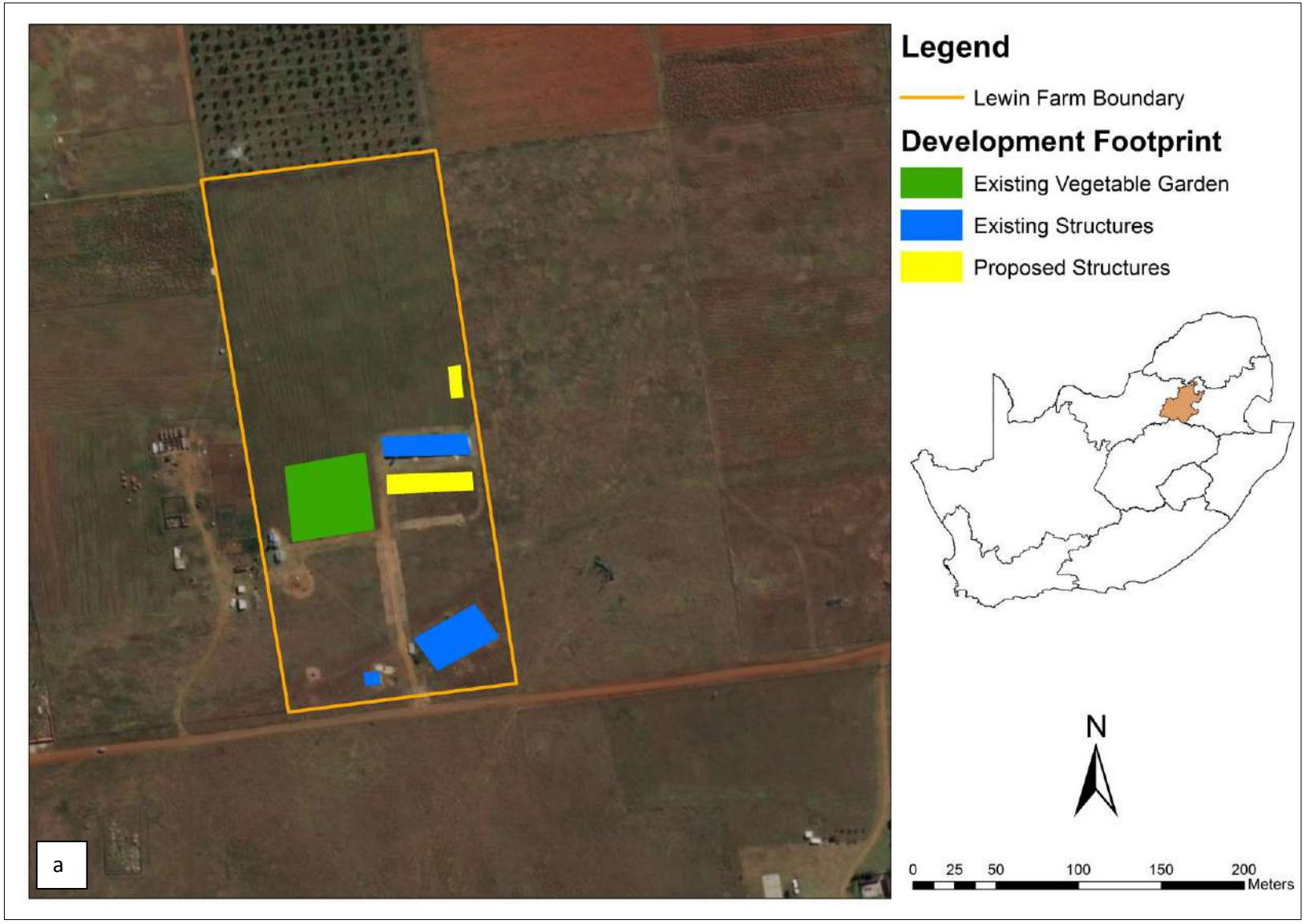


Figure 1: Site location of the preferred alternative (proposal)


Legend
Lewin Farm Boundary
Development Footprint
Existing Vegetable Garden
Existing Structures
Proposed Structures
N
0 25 50 100 150 200
Meters
a

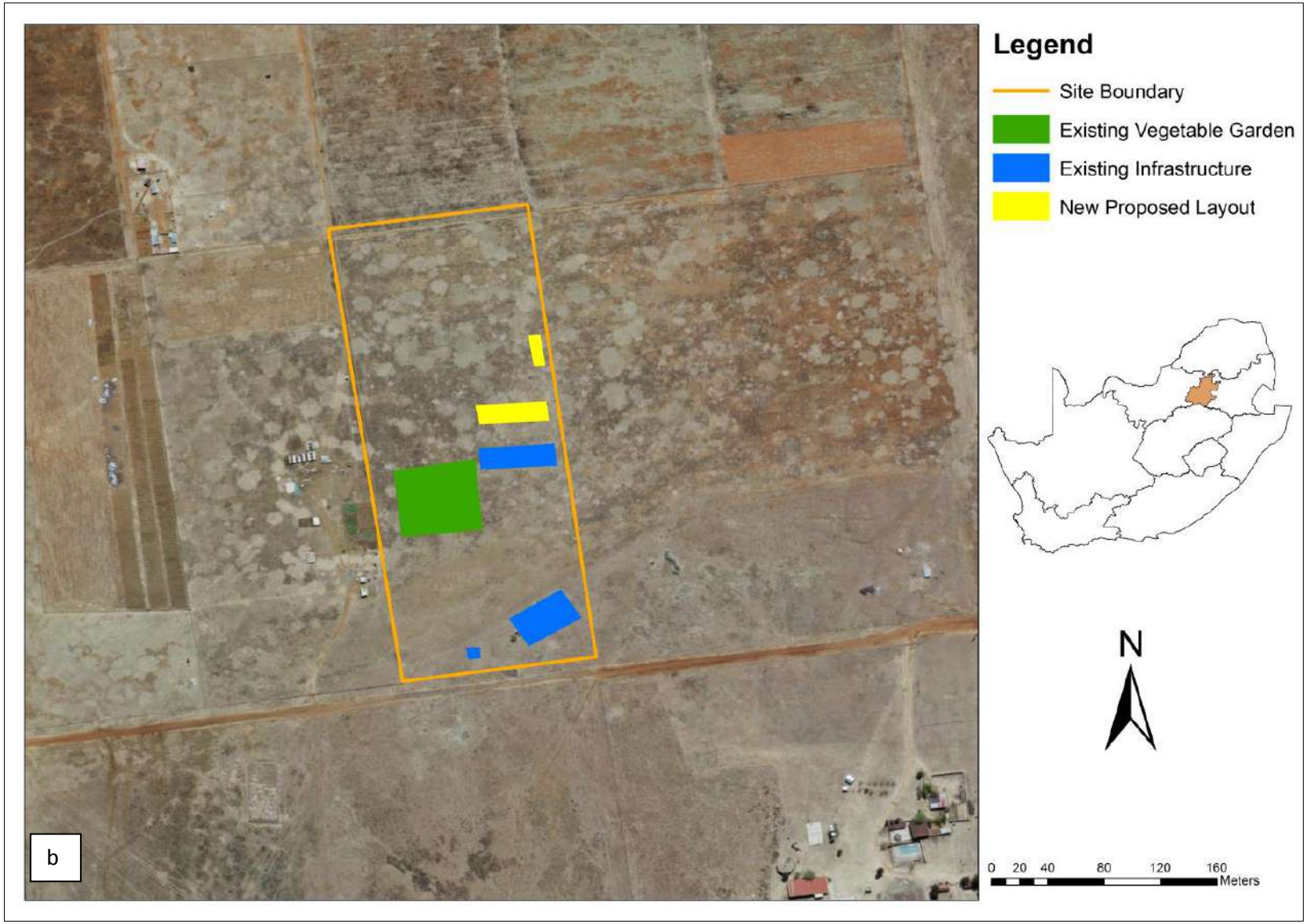


Figure 2: Site Layout of a) original proposed; & b) the preferred alternative

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

Motivation for the exclusion of alternatives:

1. **Site location and layout alternatives**

The Department of Environmental Affairs (DEA) commissioned the Council for Scientific and Industrial Research (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 Lewin AgriBusiness (Pty) Ltd under the SNSD Programme. The CSIR identified the Lewin AgriBusiness (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.

Lewin AgriBusiness is a small enterprise which is aiming to expand to further its economic viability in the future. Currently, Lewin AgriBusiness is operating at a very small and local scale, and the business is positioned on small farm owned by the applicant. 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 (Appendix G).

2. **Design, technology & operational alternatives**

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. A robust economic assessment has been submitted to the SNSDP for the approval of this project. In addition to the economic viability, the project does not make use of major technologies, which in turn results in the proposed development requiring very little energy. All waste from the chicken layer facility is being re-cycled into fertilizer for small vegetable production. The eggs are being sold 100% locally and the jobs being created by the proposed development will be sourced to local communities.The pre-development research which has been conducted on this project has been extensive, including feasibility studies and market research as well as production research. Applying the top principles in egg laying will be adopted by Lewin AgriBusiness. The proposed design and technology include the structure of the chicken houses will be made of slates and concrete floors, it will be cleaned out only at the end of every six week cycle where they combination of saw dust, used as bedding, and manure will be used by on the existing vegetable garden and local farmers as fertilizer. The environment within the chicken house will be completely controlled powered by a generator or boilers, the ventilation will be natural with the drawing or closing of side curtain of the chicken houses to control airflow. In terms of the positives which have given rise to this development option being pursued, some of the major factors are:

- There is currently a small chicken layer facility on site and the applicant has the knowledge and expertise in this area.
- Egg-layer facilities can be established in relatively small areas.
- Feed costs are much lower than alternative meat production costs.
- The demand for poultry products has increased significantly over recent years due to the high price and unavailability of red meat substitutes.

Thus, due to the nature of the industry, the support structures and the knowledge and experience of Lewin AgriBusiness the proposed project alternatives are the only viable alternatives to take forward to the Impact Assessment phase.

A.4 Physical size of the activity

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

	Size of the activity:
Proposed activity ***(Total environmental (landscaping, parking, etc.) and the building footprint)***	570 m²
Alternatives:	
Alternative 1 (if any)	[redacted]
Alternative 2 (if any)	
	Ha/ m²

or, for linear activities:

	Length of the activity:
Proposed activity	[redacted]
Alternatives:	
Alternative 1 (if any)	[redacted]
Alternative 2 (if any)	
	m/km

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

	Size of the site/servitude:
Proposed activity	4.4 ha
Alternatives:	
Alternative 1 (if any)	[redacted]
Alternative 2 (if any)	
	Ha/m²

A.5 Site Access

Proposal

Does ready access to the site exist, or is access directly from an existing road? YES [redacted]
If NO, what is the distance over which a new access road will be built
Describe the type of access road planned:

N/A

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

Alternative 1

Does ready access to the site exist, or is access directly from an existing road? [redacted]
If NO, what is the distance over which a new access road will be built
Describe the type of access road planned:

N/A

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

Alternative 2

Does ready access to the site exist, or is access directly from an existing road? [redacted]
If NO, what is the distance over which a new access road will be built
Describe the type of access road planned:

N/A

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

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

Section A 6-8 has been duplicated | **0** | Number of times

(only complete when applicable)

Note from CSIR: Please see Section 3 above which provides a motivation for the exclusion of alternatives and the assessment thereof. Thus, this section will not be duplicated as only 1 alternative (preferred alternative) applies.

A.6 Layout or Route Plan

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

- the layout plan is printed in colour and is overlaid with a sensitivity map (if applicable);
- layout plan is of acceptable paper size and scale, e.g.
  - A4 size for activities with development footprint of 10sqm to 5 hectares;
  - A3 size for activities with development footprint of > 5 hectares to 20 hectares;
  - A2 size for activities with development footprint of >20 hectares to 50 hectares);
  - A1 size for activities with development footprint of >50 hectares);
-
- The following should serve as a guide for scale issues on the layout plan:
  - A0 = 1: 500
  - A1 = 1: 1000
  - A2 = 1: 2000
  - A3 = 1: 4000
  - A4 = 1: 8000 (±10 000)
- shapefiles of the activity must be included in the electronic submission on the CD's;
- the property boundaries and Surveyor General numbers of all the properties within 50m of the site;
- the exact position of each element of the activity as well as any other structures on the site;
- the position of services, including electricity supply cables (indicate above or underground), water supply pipelines, boreholes, sewage pipelines, septic tanks, storm water infrastructure;
- servitudes indicating the purpose of the servitude;
- sensitive environmental elements on and within 100m of the site or sites (including the relevant buffers as prescribed by the competent authority) including (but not limited thereto):
  - Rivers and wetlands;
  - the 1:100 and 1:50 year flood line;
  - ridges;
  - cultural and historical features;
  - areas with indigenous vegetation (even if it is degraded or infested with alien species);
- Where a watercourse is located on the site at least one cross section of the water course must be included (to allow the position of the relevant buffer from the bank to be clearly indicated)

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

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

Note from CSIR: A Locality map depicting the current and proposed chicken facility on the property has been included as Appendix A. Photographs can also be found in Appendix B and in the Ecological Specialist Report (CSIR, April 2018) attached as Appendix G.

A.7 Site photographs

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

Note from CSIR: Site photographs in the eight major compass directions have been included as Appendix B. Photographs indicating sensitive features on site can also be found in the Ecological Specialist Report (CSIR, 2018) attached as Appendix G.

A.8 Facility illustration

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

Note from CSIR: An illustration of the structures for the proposed activities on site can be found in the "Project Site Sensitivity Map" in Appendix A.

SECTION B: SITE / AREA / PROPERTY DESCRIPTION

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

Note from CSIR: Please see Section 3 above which provides a motivation for the exclusion of alternatives and the assessment thereof. Thus, this section will not be duplicated as only 1 alternative (preferred alternative) applies.

Instructions for completion of Section B for linear activities

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

Section B has been duplicated for sections of the route	**0**	times

Instructions for completion of Section B for location/route alternatives

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

Section B has been duplicated for location/route alternatives	**0**	times	(complete only when appropriate)

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

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

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

Section B - Section of Route	**N/A**	(complete only when appropriate for above)
Section B – Location/route Alternative No.	**N/A**	(complete only when appropriate for above)

B.1 Property Description

Property description: (Including Physical Address and Farm name, portion etc.)	Plot 226, Mans Street, Withok Estate, Brakpan, Gauteng.

B.2 Activity Position

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

Alternative:	**Latitude (S):**	**Longitude (E):**
	26°18'47.16"S	28°19'20.28"E

In the case of linear activities:

Alternative:	**Latitude (S):**	**Longitude (E):**
▪ Starting point of the activity		
▪ Middle point of the activity		
▪ End point of the activity		

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

The 21 digit Surveyor General code of each cadastral land parcel

PROPOSAL	See note below
Alt. 1	
Alt. 2	
etc.	

Note from CSIR: There is no SG code associated with this property. It is identifiable using the Street Address:

Plot 226, Mans Street, Withok Estate, West Brakpan, Gauteng.

B.3 Gradient of the site

Indicate the general gradient of the site.

	1:50 – 1:20

B.4 Location in landscape

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

	Plain

B.5 Groundwater, Soil and Geological stability of the site

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

Shallow water table (less than 1.5m deep)	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	NO

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

b) are any caves located on the site(s) NO

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

Latitude (S): **Longitude (E):**

c) are any caves located within a 300m radius of the site(s) NO

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

Latitude (S): **Longitude (E):**

d) are any sinkholes located within a 300m radius of the site(s) NO

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

Latitude (S): **Longitude (E):**

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

B.6 Agriculture

Does the site have high potential agriculture as contemplated in the Gauteng Agricultural Potential Atlas (GAPA 4)? NO

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

B.7 Groundcover

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

Note from CSIR: All Conservation Important species on Site have been included in the Ecological Specialist Report attached as Appendix G.

Indicate the types of groundcover present on the site and include the estimated percentage found on site

	Natural veld with heavy alien infestation % = 30		
		Building or other structure % =20	Bare soil/transformed vegetation % =50

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

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

If YES, specify and explain:

Please refer to **Appendix G** for a full list of findings of the Ecological Specialist Study. A summary of these findings is described below:

Species richness: The small size of the development, relative to the size of the plot, and the current disturbed nature of the plot, mean that the floral habitats have been transformed. Native fauna species have been displaced from previous land use activities; Furthermore, some faunal species will be displaced from expansion activities, while others may be introduced. The resulting species richness is low.

Conservation Important species: There is a low likelihood of Conservation Important species occurring on site.

Conservation Important Areas: The project falls in the Tsakane Clay Grassland vegetation unit (Figure 3), which is considered to be Endangered as determined by Mucina & Rutherford, in 2006, and the Klipriver Highveld Grassland Ecosystem which is listed nationally as Critically Endangered (Figure 4).

Habitat quality and extent: The site has been transformed and fragmented through fencing, roads, previous and current cultivation, invasive alien plants, and human activities.

Impact on species richness and conservation: The expansion of the chicken layer facility will have a small, permanent footprint. Given the current transformed nature of the site, it is predicted that further impacts on the surrounding ecology will be minimal. However, if management measures are not adhered to, contamination and degradation of the surrounding areas could occur.

Connectivity: The proposed development will have minimal effect on the ecological connectivity of the area.

Management Recommendation: If any native fauna species are encountered or exposed during construction, they should be removed and relocated to preferable natural areas**.** Category 1 Alien and invasive plants must be removed and disposed of in the correct manner. Re-establish indigenous vegetation in disturbed areas when the development is operational. The layout of the proposed chicken house should be revised and moved to an area of Low environmental sensitivity. A revised layout has been proposed in Figure 5 below.

General opinion: From an ecological perspective, there is no objection against the proposed development provided all mitigation measures are implemented.

The construction and operation of a chicken egg layer facility with a total footprint of 570 m^2, could have a negative impact on the ecology of the area. The development of the facility may cause habitat change which may further result in secondary ecological impacts. The proposed chicken egg layer facility will be constructed on transformed grassland, which is has a moderate-low environmental sensitivity. It is, therefore recommended that the facility be moved to the previously cultivated land that is transformed and infested with alien invasive vegetation (Figure 5). This unit was rated with a **low** environmental sensitivity.

It must be mentioned that the development site is situated within 500m of a pan and a seepage area of a wetland, and therefore it is imperative that all mitigation measures, specifically with regards to contamination, be adhered to.

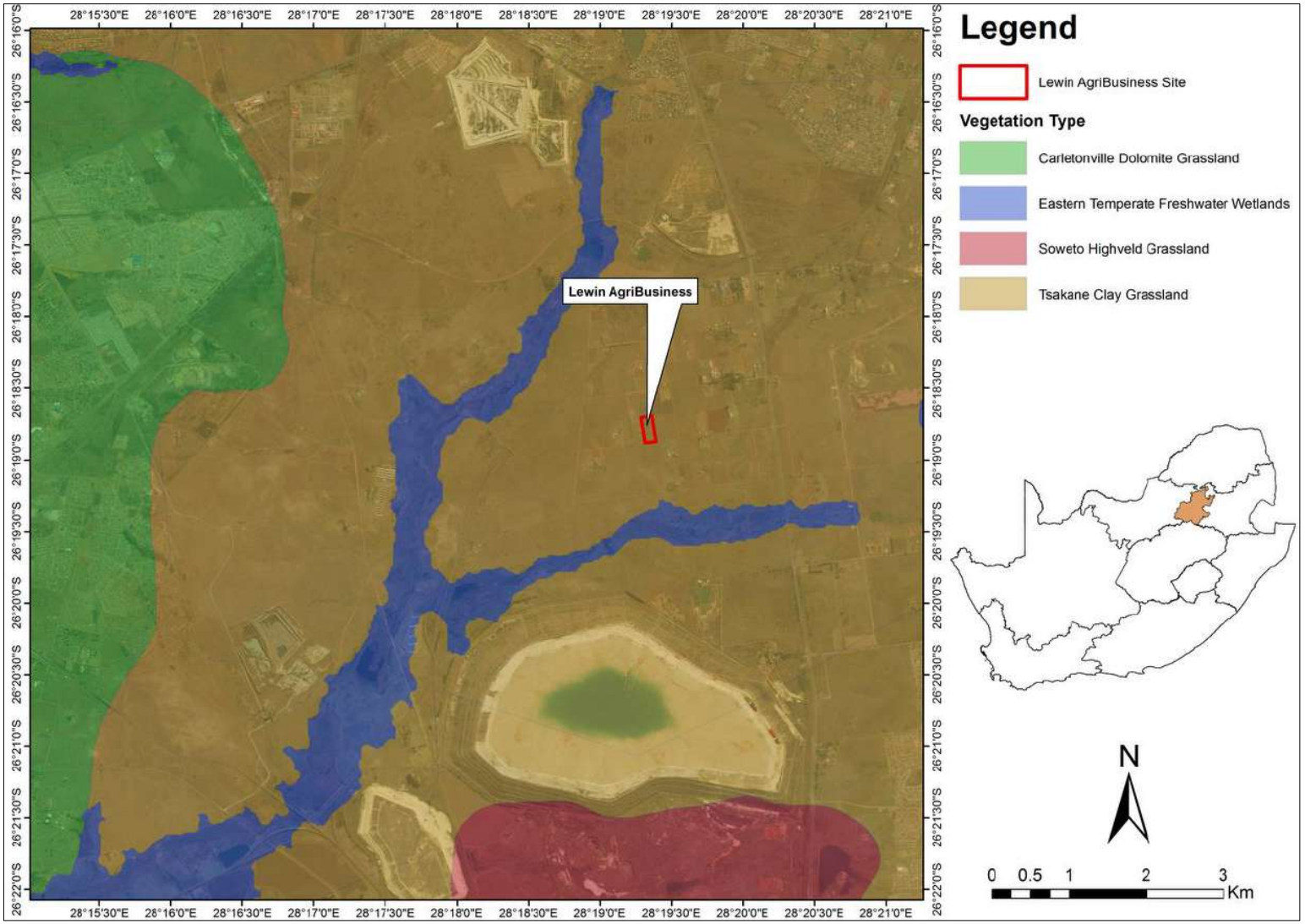


Figure 3: Regional vegetation type wherein the development site is situated (Ecological Specialist Study, Appendix G)

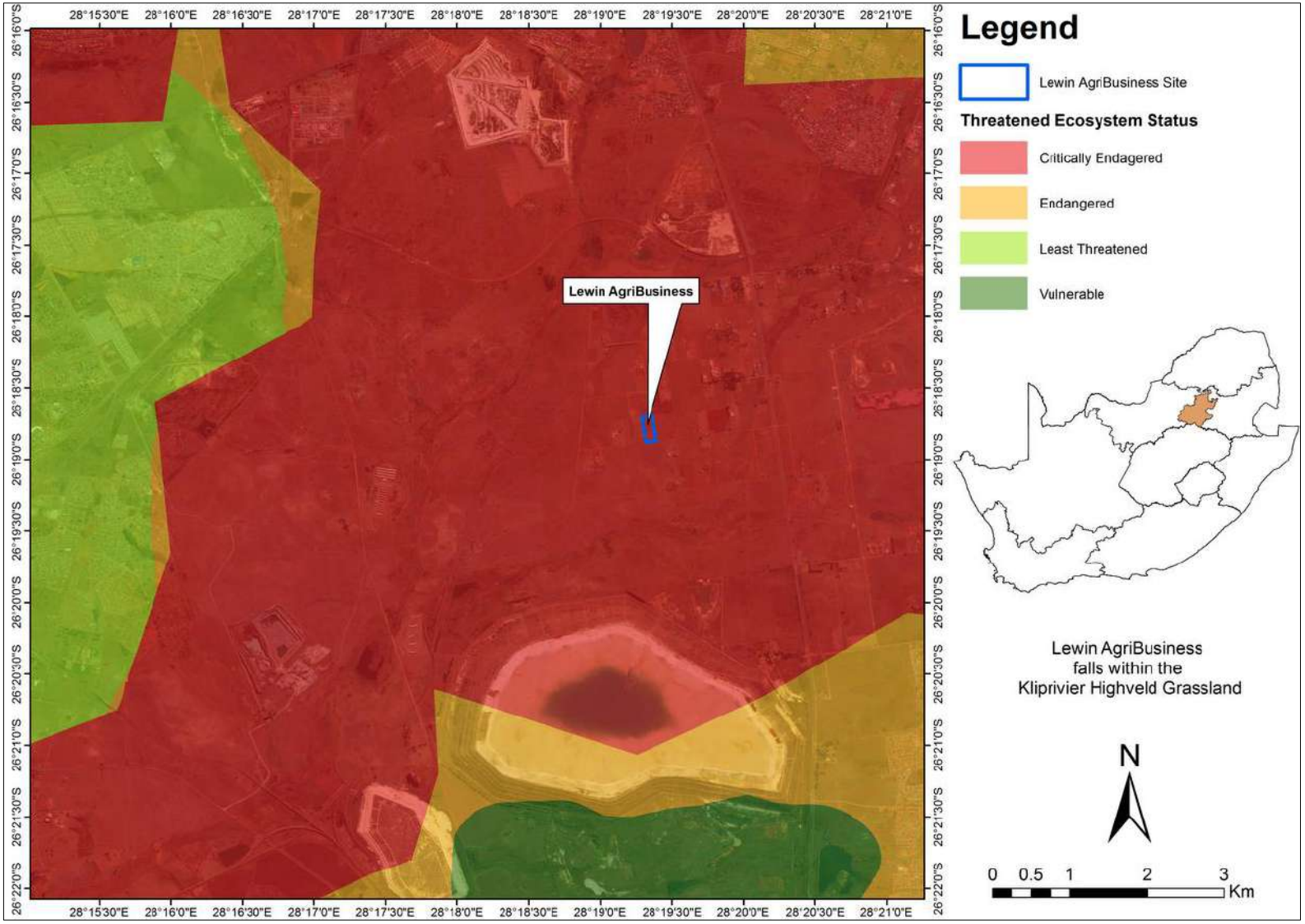


Figure 4: Regional location of the 4.4ha site within the original extent of the Kliprivier Highveld Grassland, a threatened ecosystem (Ecological Specialist Report, Appendix G)

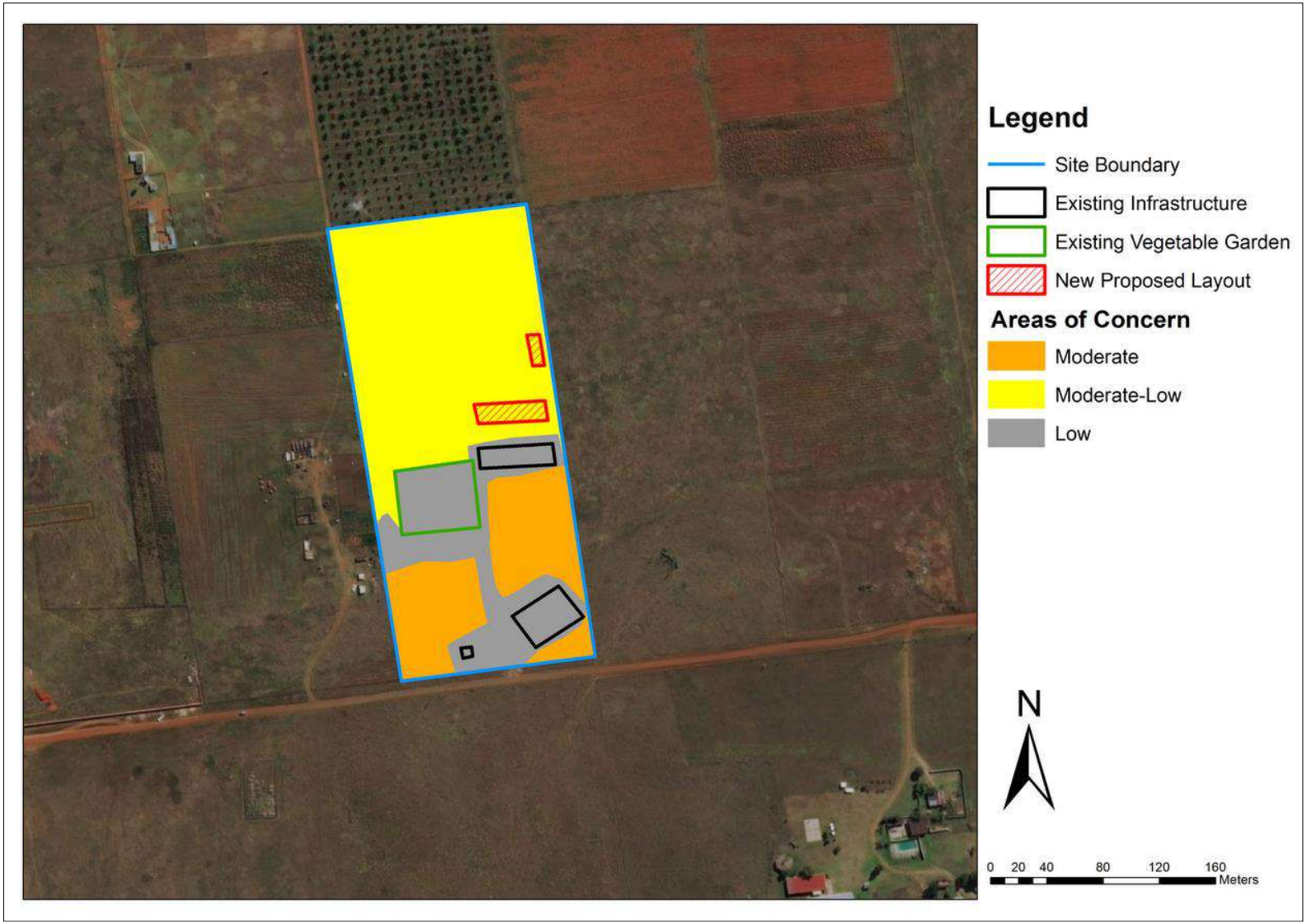


Figure 5: <u>Revised</u> development footprint for the proposed chicken layer house for Lewin AgriBusiness within environmental sensitivities. (Ecological Specialist Report, Appendix G)

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

If YES, specify and explain:

The development site is found within the 500 meters buffer zone of a pan (which is considered part of a wetland system). This pan may be habitat for a number of frog species, and most importantly the Giant Bullfrog, a species considered Near Threatened. The Giant Bullfrog prefers to bury themselves within several hundred meters away from shallow, seasonal wetland areas with grassy vegetation that serve as their breeding grounds (Yetman & Ferguson, 2011). However, the Giant Bullfrog was not specifically found on the development site, but there is some probability of occurrence because of its proximity to the pan.

Are there any special or sensitive habitats or other natural features present on the site?	YES	[redacted]

If YES, specify and explain:

Please see explanation above (as well as Figures 3 and 4), and Appendix G for a full description of the sensitive habitats present on site. In summary:

The project falls in the Tsakane Clay Grassland vegetation unit, which is considered to be Endangered as determined by Mucina & Rutherford, in 2006, and the Klipriver Highveld Grassland Ecosystem which is listed nationally as Critically Endangered. However, the site has been transformed by existing infrastructure, alien invasive vegetation, livestock grazing, previous cultivation, and the the conservation status of the site is deemed to be moderate-low.

Was a specialist consulted to assist with completing this section	YES	[redacted]

If yes complete specialist details

Name of the specialist:	Rirhandzu Marivate		
Qualification(s) of the specialist:	BSc Honours in Ecology, Environment and Conservation from the University of the Witwatersrand; Cand. Sci. Nat. Environmental Sciences – Reg Number: 100147/14		
Postal address:	PO Box 320, Stellenbosch		
Postal code:	7599		
Telephone:	021 888 2432	Cell:	[redacted]
E-mail:	rmarivate@csir.co.za	Fax:	021 888 2473

Are any further specialist studies recommended by the specialist?	[redacted]	NO
If YES, specify:	[redacted]	
If YES, is such a report(s) attached?	[redacted]	

If YES list the specialist reports attached below

[redacted]

Signature of specialist: *See note below* Date: [redacted]

Notes from CSIR:

The Ecological Specialist Study was prepared in-house and thus a qualified external specialist reviewed the report. This review and the details of the reviewer can be found in **Appendix G, Page 94.**

Please see the full CV of the specialist and the specialist declaration as per Appendix 6 of the NEMA EIA Regulations (as amended on 7 April 2017) in the Ecological Specialist Report, attached as **Appendix G.**

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

B.8 Land use character of surrounding area

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

1. Vacant land	
7. Agriculture	8. Low density residential

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

NORTH

1	**1**	**7**	**7**	**7**
7	**7**	**7**	**1**	**1**
7	**7**	**SITE**	**1**	**1**
1	**1**	**1**	**8**	**8**
1	**1**	**1**	**8**	**8**

WEST EAST

SOUTH

Note from CSIR: The proposed development is surrounded by agricultural land with some vacant land and residences. Please see locality and aerial maps for an indication of the density land uses**(Appendix A and Ecological Report, Appendix G).**

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

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

Have specialist reports been attached YES

If yes indicate the type of reports below

1) ECOLOGICAL SPECIALIST STUDY

Basic Assessment of the Proposed Expansion of a Chicken Layer Facility on a 4.4 hectare farm on plot 226 Withok Estate, Brakpan, Ekurhuleni District, Gauteng.

July 2018

Prepared for:
Lewin AgriBusiness (Pty) Ltd.

Prepared by:
CSIR
P O Box 320, Stellenbosch, 7599
Tel: +27 21 888 2482
Fax: +27 21 888 2473
Email: RMarivate@csir.co.za

This report is attached as **Appendix G, Annexure 1.**

2) HERITAGE IMPACT ASSESSMENT

For the proposed Lewin Chicken Layer Facility, Gauteng Province

Type of Development:
Agricultural Development

Client:
CSIR

Developer:
Lewin AgriBusiness (Pty) Ltd.

HCAH-Heritage Consultants
Private Bag X 1049, Suite 34, Modimolle, 0510
Tel: +27 82 373 8491
Fax: +27 86 691 6461
Email: jaco.heritage@gmail.com

This report is attached as Appendix G, Annexure 2.

B.9 Socio-economic context

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

When conceptualising a proposed project, the anticipated social and environmental impacts are generally broad and not limited to the exact site or location. However, compared to the direct, environmental impacts which are usually limited to the site, socio-economic impacts (i.e. additional labour requirements) may impact a wider area, and it is, therefore, important to consider the particular Municipality as well as the nearby towns or Wards in the most holistic way possible.

The proposed project falls within Region D of the Ekurhuleni Metropolitan Municipality (EMM) (Ekurhuleni MSDF, 2015). Region D is one of the six regions in EMM's area of jurisdiction. It comprises the central eastern areas within the EMM and includes three of the nine CBDs within the EMM: Benoni, Brakpan and Springs. Region D is situated to the south of Region C, with Lesedi Local Municipality to the east, Region E to the south and Region A to the west (see Figure 6 below). Region D is predominantly bound by the N12 to the north and the N17 to the south. Both these national.

Figure 6: Region D of EMM in which this proposed project falls (Springs) (EMM MSDF, 2015)

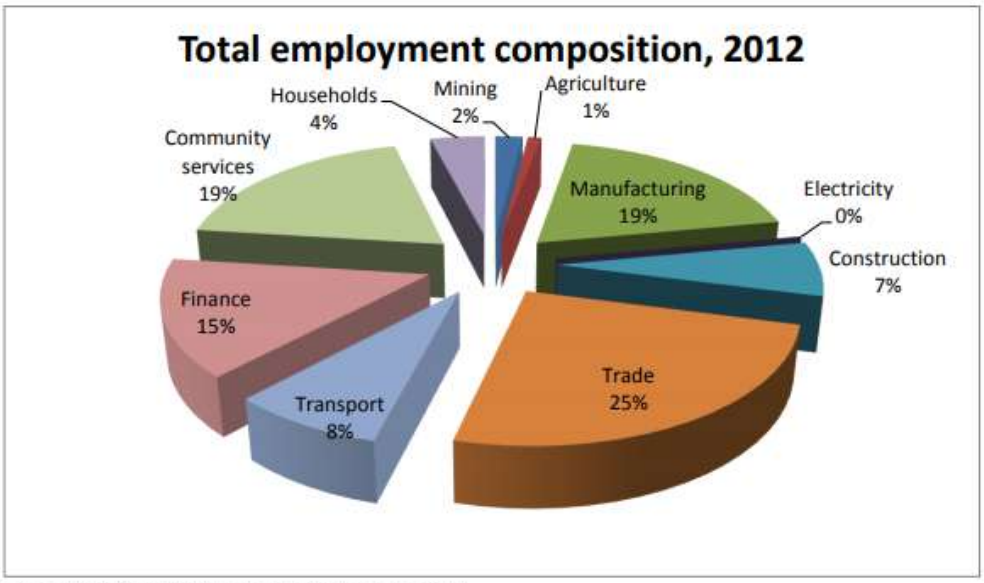
Region D is characterised by three well-established urban nodes: Benoni, **Brakpan** and Springs. These areas are in a state of decay and are in dire need of maintenance and upgrade. Low-density residential housing components go hand in hand with each of these urban nodes. Table 2 below summarizes the population figures for Region D.

Table 2: Key indicators of the population in Region D of EMM (MSDF, 2015)

Region D population indicators	Number/ percentage
Total population (2012)	233 000, people
Number of households (2012) (Average 3 people/household)	71 700 households
Avg. annual population growth rate (2002-2012)	2.43%
Projected population growth rate (2012-2017)	2.0%
Population forecast (2017)	257 000
Population density (2012)	1 090 people/ km²
Male : female split (2012)	1.1 males per female
Predominant age category (2012)	30 - 34 age category

Source: IHS Global Insight Regional eXplorer version 699

In Region D, the economic sector that recorded the largest number of employment in 2012 was the trade sector, with a total of 31 600 or 24.6% of the total employment. The manufacturing sector, with a total of 25 100 (19.5%) employed the second highest relative to the rest of the sectors. The electricity sector with 511 (0.4%) employed the least number of people in Region D, just less than the agricultural sector with 981 (0.8%) people employed. It is necessary to recognize that even though the agriculture sector currently contributes least to the region's economic growth, it is a sector that **offers significant opportunities for future growth** and development. Figure 7 below highlights the total employment in Region D per broad economic sector.



Source: IHS Global Insight Regional eXplorer version 699

Figure 7: Total employment in Region D per broad economic sector (MSDF, 2015)

Region D is located favourably in terms of the Economic Activity and Employment Area of Gauteng Province. This has the potential to impact negatively on the region should a desirable growth and development strategy not be in place. Benoni, Brakpan and Springs CBDs all fall within the growth path of Gauteng and should therefore be considered as important growth nodes. Region D can be described as a multi-centred region as it has multiple locations of economic activity (business and industrial) and human settlements. Urban development in Region D is predominantly concentrated around Benoni, Brakpan and Springs CBDs. However the eastern, western, southern and central areas within Region D are more developed than the northern areas. The existing residential

component in Region D predominantly accommodates the middle income group. Higher income groups reside in areas such as Presidentsdam (Springs), Petersfield Extension (Springs) and Sonneveld (Brakpan). The lower income or more affordable residential areas include Geduld (Springs), Welgedacht (Springs) and Wright Park (Springs). Most applications submitted between 2005 and 2012 were for residential developments predominantly in the Springs and Brakpan area. Informal settlements, backyards and hostels are located mostly in Payneville, Lindelani and Emandeni area. In the EMM there are approximately 165 000 informal structures in 199 informal settlements. 9% (15 200 units) of these informal structures are located in Region D.

Based on the natural resources such as water availability, geology, soil potential, climate and proximity to towns, five development zones were identified in the EMM MSDF (2015). The zones also take into consideration the demand for land by the previously disadvantaged and the benefit gained. The different agricultural zones are indicated in Figure 8. Withok Estates, West Brakpan (area of this proposed project) falls within **"urban farms"** as mentioned previously in this report.

The attributes of the zone are:

- High population density;
- Large portions of high and medium potential land that can be developed
- Potential for use of sewage effluent for irrigation. This is likely the area that has the biggest potential for small scale vegetable production and for stone fruit like peaches, plums and apricots;
- Theft and vandalism are problematic and have left many farms vacant;
- High land-reform potential for cooperative farmers that share marketing, have access to processing facilities within share equity schemes with existing farmers
- Housing development in much of this zone is inevitable over the longer term;

Proposed enterprises for this zone as per the MSDF (2015) include:

- fruit and vegetables in the open and under hydroponics;
- fruit and nuts; o broiler and egg production;
- duck and geese production along the major streams and rivers. This is a much neglected enterprise in South Africa, but is practised very successfully in in the Far-East. Duck and geese feed on grass and other plant material that grows along rivers. It therefore takes very little cost to produce meat, feathers and skins.

All these are in high demand locally and in international markets. The proposed project aligns with the guidelines on "urban farms" contained within the MSDF (2015).

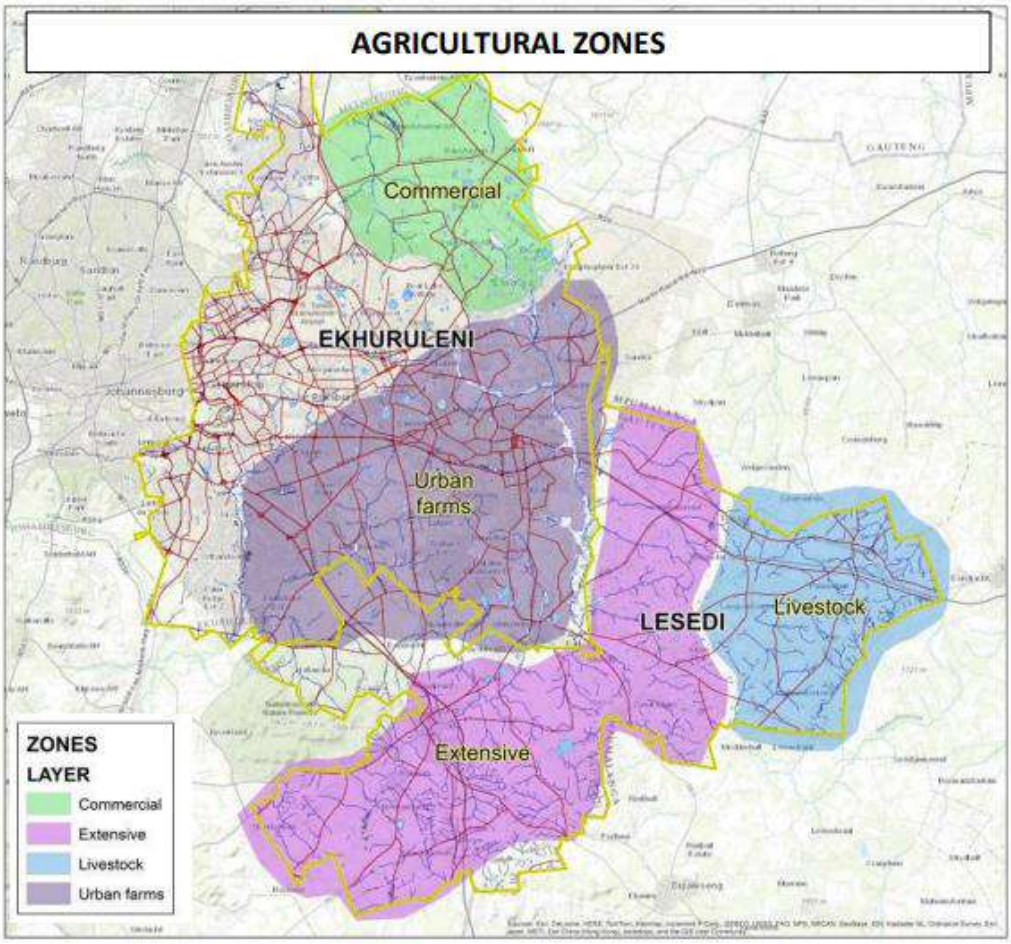


Figure 8: Agricultural zones identified for Region D of EMM (MSDF, 2015)

B.10 Cultural/Historical Features

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

38. (1) Subject to the provisions of subsections (7), (8) and (9), any person who intends to undertake a development categorised as-
(a) the construction of a road, wall, powerline, pipeline, canal or other similar form of linear development or barrier exceeding 300m in length;
(b) the construction of a bridge or similar structure exceeding 50m in length;
(c) any development or other activity which will change the character of a site-
(i) exceeding 5 000 m2 in extent; or
(ii) involving three or more existing erven or subdivisions thereof; or
(iii) involving three or more erven or divisions thereof which have been consolidated within the past five years; or
(iv) the costs of which will exceed a sum set in terms of regulations by SAHRA or a provincial heritage resources
authority;
(d) the re-zoning of a site exceeding 10 000 m2 in extent; or

(e) any other category of development provided for in regulations by SAHRA or a provincial heritage resources authority, must at the very earliest stages of initiating such a development, notify the responsible heritage resources authority and furnish it with details regarding the location, nature and extent of the proposed development.

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

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

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

HCAC was appointed to conduct a Heritage Impact Assessment for the Lewin Chicken Layer Facility. During the survey, no archaeological sites or material was recorded. A paleontological desktop study was conducted by Rossouw (2017) that concluded: *The site is underlain by palaeontologically insignificant volcanic rocks of the Karoo Dolerite Suite, capped by degraded and geologically recent residual soils). Potential impact on palaeontological remains within the development footprint is considered to be negligible and it is recommended that the planned development is exempt from a full Phase 1 Palaeontological Impact Assessment*". No further mitigation prior to construction is recommended in terms of the archaeological and paleontological components of Section 35 for the proposed development to proceed.

In terms of the built environment of the area, no standing structures older than 60 years occur within the study area. In terms of Section 36 of the Act no burial sites were recorded. If any graves are located in future they should ideally be preserved *in-situ* or alternatively relocated according to existing legislation. No public monuments are located within or close to the study area. The area is rural in character and the proposed project is in line with the current land use and will not impact negatively on significant cultural landscapes or viewscapes. During the public participation process conducted for the project no heritage concerns was raised.

Due to the lack of significant heritage resources in the study area the impact of the proposed project on heritage resources is considered **low** and it is recommended that the proposed project can commence on the condition that the following chance find procedure are implemented as part of the EMPr and based on approval from SAHRA.

Will any building or structure older than 60 years be affected in any way?	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 attached the comments from SAHRA in the appropriate Appendix	NO

SECTION C: PUBLIC PARTICIPATION

C.1 The Environmental Assessment Practitioner must conduct Public Participation Process in accordance with the requirement of the EIA Regulations, 2014.

C.2 Local authority participation

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

Was the draft report submitted to the local authority for comment?	YES
If yes, has any comments been received from the local authority?	YES

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

Comments were received from the City of Ekurhuleni Metropolitan Municipality and from the Gauteng Department of Agriculture and Rural Development. All the comments have been captured in the Comment and Responses table in Appendix E. The correspondence from the above mentioned authorities has also been attached in Appendix E.

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

N/A

C.3 Consultation with other stakeholders

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

Has any comment been received from stakeholders?	NO

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

N/A

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

The Draft BA Report was out for a 30-day review period. No comments from stakeholders other than the local authority have been received to date. Kindly refer to **Appendix E, Section E6** for comments received from all stakeholders.

C.4 General public participation requirements

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

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

C.5 Appendices for public participation

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

Appendix 1	Proof of site notice
Appendix 2	Written notices issued as required in terms of the regulations
Appendix 3	Proof of newspaper advertisements
Appendix 4	Communications to and from interested and affected parties
Appendix 5	Minutes of any public and/or stakeholder meetings – ***N/A***
Appendix 6	Comments and Responses Report –
Appendix 7	Comments from I&APs on Basic Assessment (BA) Report -
Appendix 8	Comments from I&APs on amendments to the BA Report – ***N/A at this stage of the process***
Appendix 9	Copy of the register of I&APs

SECTION D: RESOURCE USE AND PROCESS DETAILS

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

Instructions for completion of Section D for alternatives

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

Section D has been duplicated for alternatives | 0 | times (complete only when appropriate)

Section D Alternative No. | N/A | (complete only when appropriate for above)

D.1 Waste, effluent, and emission management

Solid waste management

Will the activity produce solid construction waste during the construction/initiation phase? YES
If yes, what estimated quantity will be produced per month? Approximately 15m³

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

Anticipated construction solid waste to be produced includes building rubble, packaging material, overburden material and general litter from construction staff. It is recommended that construction waste/rubble will be collected and stored temporarily in designated containers for the different waste types, and thereafter disposed of at the nearest appropriate licensed waste disposal site.

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

Waste will be disposed of at an appropriate licensed landfill site, possibly at the nearest landfill site to dispose of building rubble.

Will the activity produce solid waste during its operational phase? YES
If yes, what estimated quantity will be produced per month? 50m³

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

Solid waste generated during the operational phase, normal waste, constituting household rubbish and consumables, will be stored in suitable bins and transported to the nearest licenced disposal site. Chicken waste will be produced collectively when cleaning the facilities during each cycle which can be 3 to 6 months. This waste will be removed from the layer facility and used as fertilizer for the existing vegetable garden the plot, and will be distributed as fertilizer to local farmers.

The waste produced by the broiler facility (40 000 chickens) will be used as fertilizer, which will be created for the vegetables by method of a separation procedure, as described below. The recent increased interest in composting has arisen because of the need for environmentally sound waste treatment technologies. Composting is seen as an environmentally acceptable method of waste treatment.

The stored manure will be treated, either before or during storage.
The reasons for treatment include:

- Odour control.
- Energy recovery.
- Reduction of manure volume—especially where extended transportation is necessary.
- Reduction of nutrient content—in some circumstances where insufficient land is available to receive the manure.
- Enhance (speed up) the decomposition of manure.

The process destroys pathogens, converts N from unstable ammonia to stable organic forms, reduces the volume of waste and improves the nature of the waste. The recommended upper limit for moisture content of substrates to be composted is reported to be 65%. However, composting may be feasible with initial moisture contents above 65% as long as there is enough air in the compost to satisfy the oxygen needs of the microbes.

Please note the GUIDELINE MANUAL FOR THE MANAGEMENT OF ABATTOIRS AND OTHER WASTE OF ANIMAL ORIGIN (GDARD, 2009) will be adhered to.

Has the municipality or relevant service provider confirmed that sufficient air space exists for treating/disposing of the solid waste to be generated by this activity?	[redacted]	NO

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

All waste generated, except for chicken manure (to be used as fertilizer or sold as fertilizer), cults and mortalities, will always be disposed of at a nearby registered disposal site.

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

Can any part of the solid waste be classified as hazardous in terms of the relevant legislation?	[redacted]	NO

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

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

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

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

The majority of waste generated during the operational phase will be from chicken manure, cults and mortalities, as well as chicken bedding. Thus, it will be dried and processes to be used as fertilizer on the vegetables to be introduced on the farm at a later stage. In the meantime, the manure, and other chicken waste will be dried in the attempt to be distributed as feed and fertilizer to local agricultural farms.

Liquid effluent (other than domestic sewage)

Will the activity produce effluent, other than normal sewage, that will be disposed of in a municipal sewage system?	[redacted] NO
If yes, what estimated quantity will be produced per month?	[redacted]
If yes, has the municipality confirmed that sufficient capacity exist for treating / disposing of the liquid effluent to be generated by this activity(ies)?	[redacted] NO

Will the activity produce any effluent that will be treated and/or disposed of on site?	YES [redacted]
If yes, what estimated quantity will be produced per month?	50m^3

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

In the process of cleaning the broiler houses with a low toxicity biodegradable liquid will be used, this will result is a slurry mix of the liquid with parts of chicken manure and mortalities. This liquid will have little impact on the environment. Chicken Cults and mortality waste, will be handle with care disposed of appropriately, in accordance to the **GUIDELINE MANUAL FOR THE MANAGEMENT OF ABATTOIRS AND OTHER WASTE OF ANIMAL ORIGIN (GDARD, 2009.**

A designated waste storage area will be constructed and the chicken waste will be stored in 12kgs bags. The waste will be a mixture of saw dust and chicken faeces. The manure will be dried in the attempt to be distributed fertilizer to local agricultural farms as well as for the existing vegetable garden.

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

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

If yes, provide the particulars of the facility:

Facility name:	[redacted]
Contact person:	
Postal address:	
Postal code:	
Telephone:	
E-mail:	

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

N/A

Liquid effluent (domestic sewage)

Will the activity produce domestic effluent that will be disposed of in a municipal sewage system?	[redacted] NO
If yes, what estimated quantity will be produced per month?	[redacted]
If yes, has the municipality confirmed that sufficient capacity exist for treating / disposing of the domestic effluent to be generated by this activity(ies)?	

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

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

[redacted]

Emissions into the atmosphere

Will the activity release emissions into the atmosphere?	NO
If yes, is it controlled by any legislation of any sphere of government?	NO

If yes, the applicant should consult with the competent authority to determine whether it is necessary to change to an application for scoping and EIA.
If no, describe the emissions in terms of type and concentration:

D.2 Water Use

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

groundwater

If water is to be extracted from groundwater, river, stream, dam, lake or any other natural feature, please indicate the volume that will be extracted per month:

Approximately 750 Kiloliters

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

Does the activity require a water use permit from the Department of Water Affairs?	NO

If yes, list the permits required

If yes, have you applied for the water use permit(s)?	NO
If yes, have you received approval(s)? (attached in appropriate appendix)	NO

D.3 Power supply

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

Eskom/Ekurhuleni Metropolitan Municipality

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

D.4 Energy efficiency

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

Water Pump:

- The borehole pumping system may make use of solar PV powered pumps, thus lessening the energy requirements.

Office buildings and chicken houses:

- Use of building material originating from sensitive environmental resources should be minimised.
- Building material should be legally obtained by the supplier, e.g. wood must have been legally harvested, sand should be obtained only from legal borrow pits and from commercial sources.
- Building material that can be recycled/ reused should be used rather than building material that cannot.
- Use highly durable material for part of the building that is unlikely to be changed during the life of the buildings (unlikely to change due to e.g. renovation, fashion, changes in family life cycle) is highly recommended.

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

SECTION E: IMPACT ASSESSMENT

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

E.1 Issues raised by interested and affected parties

Summarise the issues raised by interested and affected parties.

Kindly refer to **Appendix E, Section E5 &E6** for the full comment received from Ekurhuleni Municipality.

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

Kindly see the all the responses given from the EAP to I&APs in Section E6 of Appendix E.

E.2 Impacts that may result from the construction and operational phase

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

APPROACH TO THE BASIC ASSESSMENT

1) METHODOLOGY OF IMPACT ASSESSMENT

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

- Use of expert opinion by the specialists ("professional judgement"), based on their experience, a site visit and analysis, and use of existing guidelines and strategic planning documents and conservation mapping (e.g. SANBI biodiversity databases);
- Review of specialist assessment by all stakeholders including authorities such as nature conservation officials, as part of the report review process (i.e. if a nature conservation official disagreed with the significance rating, then we could negotiate the rating); and
- Our approach is more a qualitative approach - we do not have a formal matrix calculation of significance as is sometimes done.

2) SPECIALIST CRITERIA FOR IMPACT ASSESSMENT

The following methodology has been provided by the CSIR to all specialists, for incorporation into specialist assessments:

Assessment of Potential Impacts

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

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

Spatial Extent - this should indicate whether the impact will be:
- Site specific;
- Local (<2 km from site);
- Regional (within 30 km of site); or
- National.

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

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

Probability - this considers the likelihood of the impact occurring and should be described as:
- Improbable (little or no chance of occurring);
- Probable (<50% chance of occurring);
- Highly probable (50 – 90% chance of occurring); or
- Definite (>90% chance of occurring).

Reversibility - this considers the degree to which the adverse environmental impacts are reversible or irreversible. For example, an impact will be described as low should the impact have little chance of being rectified to correct environmental impacts. On the other hand, an impact such as the nuisance factor caused by noise impacts from wind turbines can be considered to be highly reversible at the end of the project lifespan. The assessment of the reversibility of potential impacts is based on the following terms:
- High - impacts on the environment at the end of the operational life cycle are highly reversible;
- Moderate - impacts on the environment at the end of the operational life cycle are reasonably reversible;
- Low - impacts on the environment at the end of the operational life cycle are slightly reversible; or
- Non-reversible - impacts on the environment at the end of the operational life cycle are not reversible and are consequently permanent.

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

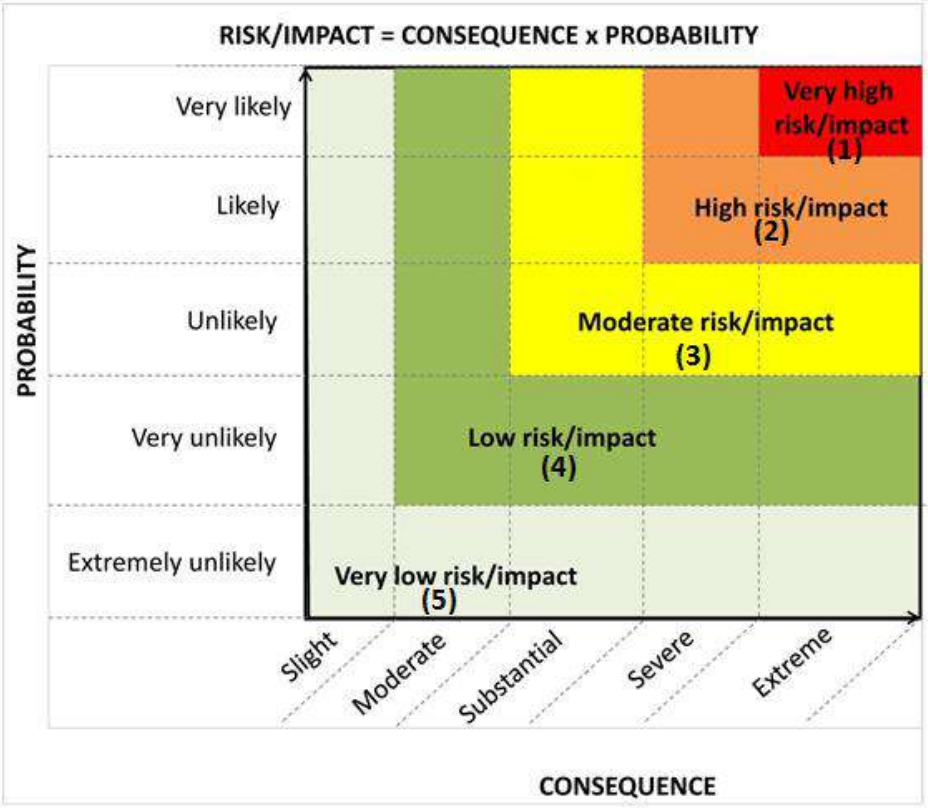


Figure 8: Guide to assessing risk/impact significance as a result of consequence and probability.

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

Status of the impact: A description as to whether the impact will be:
- Positive (environment overall benefits from impact);
- Negative (environment overall adversely affected); or
- Neutral (environment overall not affected).

Degree of confidence in predictions: The degree of confidence in the predictions, based on the availability of information and specialist knowledge. This should be assessed as:
- High;
- Medium; or
- Low.

Based on the above considerations, the specialist provides an overall evaluation of the significance of the potential impact, which should be described as follows:
- **Low to very low:** the impact may result in minor alterations of the environment and can be reduced or avoided by implementing the appropriate mitigation measures, and will only have an influence on the decision-making if not mitigated;
- **Medium:** the impact will result in moderate alteration of the environment and can be reduced or avoided by implementing the appropriate mitigation measures, and will only have an influence on the decision-making if not mitigated; or
- **High:** Where it could have a "no-go" implication for the project unless mitigation or re-design is practically achievable.

Furthermore, the following must be considered:
- Impacts should be described both before and after the proposed mitigation and management measures have been implemented.
- All impacts should be evaluated for the construction, operation and decommissioning phases of the project, where relevant.
- The impact evaluation should take into consideration the cumulative effects associated with this and other

facilities which are either developed or in the process of being developed in the region, if relevant.

Management Actions:

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

Monitoring:

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

Cumulative Impact:

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

Mitigation:

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

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

Note from the CSIR: Feasible site alternatives (i.e. location and property alternatives) do not exist for the proposed project. However, the No-Go alternative will be considered.

IDENTIFIED IMPACTS- CONSTRUCTION PHASE			
IMPACT	**SIGNIFICANCE RATING OF IMPACT BEFORE MITIGATION**	**PROPOSED MITIGATION**	**SIGNIFICANCE RATING OF IMPACT AFTER MITIGATION**
ALTERNATIVE A1 (PREFERRED ALTERNATIVE)			
Direct impacts:			
Impact of project footprint on transformed vegetation and faunal habitat	Moderate (Negative)	▪ Relocate the proposed chicken house to the north of the existing facility, to the lower environmentally sensitive Herbaceous Alien Weeds vegetation (see figure 24). ▪ Ensure that construction areas are well demarcated and restrict clearing of vegetation to minimize loss of vegetation and faunal habitats. ▪ Replant indigenous Highveld grassland vegetation in disturbed areas. ▪ If any indigenous fauna are on site during construction activities, relocate them to the nearest natural area.	**Low (Negative)**
Construction activities and vehicles impact on the occurrence and spread of alien plant species.	Moderate (Negative)	▪ By law, ensure that all Category 1b alien vegetation is removed and disposed of in the correct manner prior to construction. ▪ Limit or regulate access by vehicles to the construction site and ensure that all material entering the construction site is from reputable sources. Certain companies provide guarantees for weed free building sand etc. ▪ Keep construction activities neat and tidy.	**Low (Negative)**
Dust and erosion caused by construction activities on ecosystem on the site	Moderate (Negative)	▪ Ensure vehicles and construction workers are limited to designated areas. ▪ Implement erosion protection measures on site that reduce erosion such as re-vegetate areas that will not be developed; have designated zones for construction materials; bunding soil stockpiles. ▪ Implement dust control measures such as adding mulch, and/ or periodically wetting the bare ground.	**Low (Negative)**
Sensory disturbance as a result of construction activities (incl. moving vehicles) on fauna	Moderate (Negative)	▪ Reduce the duration of construction activities, reducing noise and light pollution that cause sensory disturbance on fauna. ▪ Construction can commence in winter in order to reduce the risk of disturbing active, and possibly breeding, faunal species (including migratory species). ▪ Limit construction activities to day time hours.	**Low (Negative)**

IDENTIFIED IMPACTS- CONSTRUCTION PHASE			
IMPACT	**SIGNIFICANCE RATING OF IMPACT BEFORE MITIGATION**	**PROPOSED MITIGATION**	**SIGNIFICANCE RATING OF IMPACT AFTER MITIGATION**
		▪ Minimize or eliminate security and construction lights in order to reduce disturbance of any nocturnal fauna.	
Loss of Wetland resources from construction activities	Moderate (Negative)	▪ Ensure that the development planning is realigned to areas that avoid wetland and associated wetland areas (i.e. Pan south of the site boundary). ▪ Relocated the proposed chicken house to the north of the existing infrastructure (outside 500 m of the pan). ▪ No construction should be planned within the sensitive environment. ▪ A storm water management plan must be developed prior to the construction of the facility.	**Low (Negative)**
Impact on the regional water balance as a result of increased water usage.	Low (Negative)	▪ Water is required during the construction phase for various purposes, such as earthworks, as well as to fulfil the requirements of construction personnel on-site. Where possible, water conservation should be practiced. Water conservation techniques include making construction personnel aware of the importance of limiting water wastage, as well as reducing water use during the cleaning of the site (such as sweeping the site before it is being washed). Lewin should also ensure that the water infrastructure on site is monitored for leakages on a regular basis to prevent wastage.	**Very Low (Negative)**
Potential spillage of effluent (from portable sanitation facilities for construction personnel).	Low (Negative)	▪ 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 (suitable) 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. ▪ As part of the Environmental Awareness Training, all construction personnel should be made aware of the sewage management practises.	**Very Low (Negative)**
Pollution caused by spillage or discharge of construction waste water	Low (Negative)	▪ Ensure that adequate containment structures are provided for the storage of construction materials on site.	**Very Low (Negative)**

IDENTIFIED IMPACTS- CONSTRUCTION PHASE			
IMPACT	**SIGNIFICANCE RATING OF IMPACT BEFORE MITIGATION**	**PROPOSED MITIGATION**	**SIGNIFICANCE RATING OF IMPACT AFTER MITIGATION**
into the surrounding environment.		▪ Ensure the adequate removal and disposal of construction waste and material,	
Air Quality Impact: Emissions from construction vehicles and generation of dust as a result of earthworks, demolition, as well as the delivery and mixing of construction materials.	Low (Negative)	▪ Ensure that cleared (excavated) areas and unpaved surfaces are sprayed with water (obtained from an approved source) to minimise dust generation. ▪ Approved soil stabilisers may be utilised to limit dust generation. ▪ Ensure that construction vehicles travelling on unpaved roads do not exceed a speed limit of 40 km/hour. ▪ Limit vehicles, people and materials to the construction site ▪ Adequate dust control strategies should be applied to minimise dust deposition, for example: Periodic spraying of the entrance road and environmentally-friendly dust control measures (e.g. mulching and wetting) where and when dust is problematic ▪ Limit construction activities to day time hours.	**Low (Negative)**
Socio-economic Impact: Employment creation and skills development opportunities during the construction phase, which is expected to give rise to approximately 6-10 new jobs.	Moderate (Positive)	▪ Liaise with TNPA to maximise job creation opportunities during the construction phase. ▪ 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. ▪ 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.	**Moderate (Positive)**
Potential visual intrusion of construction/demolition activities on the views of sensitive visual receptors.	Low (Negative)	▪ No specific mitigation measures are required other than standard construction site housekeeping and dust suppression. These are included below: ▪ The contractor(s) should maintain good housekeeping on site to avoid litter and minimise waste. ▪ Litter and rubble should be timeously removed from the construction site and	**Low (Negative)**

IDENTIFIED IMPACTS- CONSTRUCTION PHASE			
IMPACT	**SIGNIFICANCE RATING OF IMPACT BEFORE MITIGATION**	**PROPOSED MITIGATION**	**SIGNIFICANCE RATING OF IMPACT AFTER MITIGATION**
		disposed at a licenced waste disposal facility. ▪ The project developer should demarcate construction boundaries and minimise areas of surface disturbance. ▪ Appropriate plans should be in place to minimise fire hazards and dust generation. ▪ Night lighting of the construction site should be minimised within requirements of safety and efficiency.	
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.	Moderate (Negative)	▪ Limit construction activities to day time hours. ▪ 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.	**Low (Negative)**
Potential health injuries to construction personnel as a result of construction work (i.e. welding fumes	Moderate (Neutral)	▪ The Contractor must ensure that all construction personnel are provided with adequate PPE for use where appropriate.	**Low (Neutral)**
Traffic, congestion and potential for collisions during the construction phase.	Low (Negative)	▪ During the construction phase, suitable parking areas should be created and designated for construction trucks and vehicles. ▪ A construction supervisor should be appointed to co-ordinate construction traffic during the construction phase (by drawing up a traffic plan prior to construction). ▪ Road barricading should be undertaken where required and road safety signs should be adequately installed at strategic points within the construction site.	**Low (Negative)**
Destruction of archaeological artefacts	Very Low (Negative)	▪ None	**Very Low (Negative)**
Indirect impacts:			
Socio-economic impact: Secondary industries may benefit from the proposed project in the form of the provision of produce and	Low (Positive)	▪ Ensure that local industries are utilised as suppliers, where applicable/practical.	**Moderate (Positive)**

IDENTIFIED IMPACTS- CONSTRUCTION PHASE			
IMPACT	**SIGNIFICANCE RATING OF IMPACT BEFORE MITIGATION**	**PROPOSED MITIGATION**	**SIGNIFICANCE RATING OF IMPACT AFTER MITIGATION**
poultry products.			
Cumulative impacts:			
As explained above for each identified impact.			

No-go alternative

Direct impacts:

- None of the impacts mentioned above will occur.
- The existing site will remain uncleared which will result in no clearance of indigenous vegetation and in addition, no clearance of present alien species.
- If the proposed project does not proceed, increased income and economic spin-off activities will not be realised.
- Approximately 6-10 new jobs will not be created during the construction phase.
- Customers of the broiler facility will not be provided with an increase of poultry products on a local scale.
- If the proposed project does not proceed, the industries that rely on the supply of fresh poultry products, could experience hindered economic growth potential.

Indirect impacts:

- There are no indirect impacts during the construction phase for the No-go Option.

Cumulative impacts:

- There are no cumulative impacts during the construction phase for the No-go Option.

IDENTIFIED IMPACTS- OPERATIONAL PHASE			
IMPACT	**SIGNIFICANCE RATING OF IMPACT BEFORE MITIGATION**	**PROPOSED MITIGATION**	**SIGNIFICANCE RATING OF IMPACT AFTER MITIGATION**
ALTERNATIVE A1 (PREFERRED ALTERNATIVE)			
Direct impacts:			
Sensory disturbance on the fauna as a result of noise, lights and dust from the chicken houses	Moderate (Negative)	▪ Ensure that proper design, housing and management of the chicken egg layer facility are implemented in order to ensure good animal well-being. The project design, technology and operations should make use of the Agricultural Technical Support of the South African Poultry Association (SAPA). Ensure that the SAPA Code of Practice for Pullet Rearing and Table Egg Production and the South African National Standards (SANS) for animal welfare are adhered to. ▪ Reduce the essential lighting by ensuring that all outdoor lights are fitted with caps or that they are angled downwards ▪ Ensure that Ultraviolet filtered lights are installed so that warmer, long-wavelength light is emitted to reduce insect attraction. ▪ Ensure that the machinery and ventilation systems emit a low noise. ▪ Activities that will generate the most noise should be limited to during the day.	**Low (Negative)**
Environmental contamination as a result of handling of chicken waste	Moderate (Negative)	▪ Ensure that the facility design and its operations adhere to the best practice norms and standards and that the South African National Standard (SANS) for the care and use of animal waste. ▪ Adhere to best practice chicken husbandry and waste disposal norms as outlined in the NEM:WA (Act 59 of 2008). ▪ Waste must be stored in designated areas for storage. Clearly demarcate appropriate storage for different types of waste. ▪ Ensure regular removal of waste on site is done and ensure that all waste is disposed of at an appropriate licensed waste facility. This can be done by requesting receipts from the facility for each delivery. ▪ Ensure that there are waste management and emergency procedures in place for accidental contamination of the surrounding environment. ▪ Ensure training of staff is done to handle hazardous substances and for other waste management and emergency procedures.	**Low (Negative)**

IDENTIFIED IMPACTS- OPERATIONAL PHASE			
IMPACT	**SIGNIFICANCE RATING OF IMPACT BEFORE MITIGATION**	**PROPOSED MITIGATION**	**SIGNIFICANCE RATING OF IMPACT AFTER MITIGATION**
Animal pests as a result of inappropriate handling of chicken waste and poor hygiene conditions in handling the chickens leading to increased breeding of animal pest.	Moderate (Negative)	▪ Adequate ventilation is required to keep floors, bedding and fodder dry ▪ Clean floors regularly and prevent unwanted animal access to the fodder. ▪ Regularly clean the facility to minimize the influx of pests. ▪ Inspect and clear litter and waste from the site. Ensure that the areas surrounding the chicken facility are free of spilled manure and litter. ▪ Regular mowing of areas around the facility required to reduce prevalence if insects. ▪ Ensure effective sanitation and rodent proofing and humane extermination of rodents. It is strongly recommended that poisons are avoided! ▪ Ensure that appropriate and humane pest control measures are put in place and are restricted to problematic areas, and ensure these measures are taxon-specific, in order to avoid unnecessary extermination of non-pest fauna.	**Low (Negative)**
Diseases as a result of poor chicken waste management and/or prevalence of pests leading to a change in population of native fauna	Moderate (Negative)	▪ 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. ▪ Chicken mortalities must be identified and removed immediately from the facility. The source of these deaths must immediately be investigated. ▪ Train workers to effectively handle sick and dead animals. ▪ Ensure that there are appropriate control measures in place for any contamination event.	**Low (Negative)**
Altered burning from vehicles, human activity and built infrastructure.	Low (Negative)	▪ Implement and train farm workers on the fire plan and emergency protocols regularly. ▪ Create and maintain a fire break between the development and the surrounding environment. ▪ Develop a space for safe storage of flammable material on site. ▪ Ensure that the appropriate measures are implemented in case of any accidental fires.	**Low (Negative)**
Increased water usage as a result of abstraction from the borehole for the	Moderate (Negative)	▪ Water conservation should still be practiced during the operational phase. This includes water saving techniques during irrigation as	**Low (Negative)**

IDENTIFIED IMPACTS- OPERATIONAL PHASE			
IMPACT	**SIGNIFICANCE RATING OF IMPACT BEFORE MITIGATION**	**PROPOSED MITIGATION**	**SIGNIFICANCE RATING OF IMPACT AFTER MITIGATION**
operation of the broiler facility.		well as conservative irrigation practices. ▪ Irrigation systems, borehole abstraction devices and water tanks for storage should be inspected regularly so as to insure there are no leakages.	
Increased stormwater discharge into the surrounding environment.	Low (Negative)	▪ A suitable stormwater/surface water quality monitoring programme should be established and implemented. ▪ Regular inspections of stormwater infrastructure should be undertaken to ensure that it is kept clear of all debris and weeds. ▪ Monitoring programmes should be implemented to ensure that no materials enter the surface water drainage system.	**Low (Negative)**
Air Quality Impact: Increased odours resulting from the broiler facility.	High (negative)	▪ Ensure that excrement, carcasses, feed, and other operational waste and hazardous materials are appropriately and effectively contained and disposed of without detriment to the air quality of the receiving environment.	**Moderate (Negative)**
Socio-economic Impact: Skills development opportunities and economic spin off activities.	Moderate (Positive)	▪ 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. ▪ Ensure that goods and services are sourced from the local and regional economy as far as reasonably possible.	**High (Positive)**
Potential re-establishment of alien plants on site.	Low (Negative)	▪ Ensure that any alien invasive plants that become re-established on site are removed promptly. The removal of these species must be carried out in line with relevant municipal and provincial procedures, guidelines and recommendations. ▪ ▪ The removed alien invasive vegetation should be immediately disposed of correctly and should not be kept on site for prolonged periods of time, as this will enhance the spread of these species.	**Low (Negative)**
Improved service delivery with regards to produce and poultry products.	Moderate (Positive)	▪ 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.	**Moderate (Positive)**

IDENTIFIED IMPACTS- OPERATIONAL PHASE			
IMPACT	**SIGNIFICANCE RATING OF IMPACT BEFORE MITIGATION**	**PROPOSED MITIGATION**	**SIGNIFICANCE RATING OF IMPACT AFTER MITIGATION**
Potential visual intrusion of structures and buildings associated with the proposed development on existing views of sensitive visual receptors.	Low (Negative)	▪ Ensure facility is kept tidy and no decay of chicken houses occurs. ▪ Ensure that building by-laws are adhered to.	**Low (Negative)**
Potential impact on the health of operating personnel resulting in potential health injuries. This impact is rated as neutral.	Moderate (Negative)	▪ Operational personnel must wear basic PPE (e.g. gloves, goggles etc.) as necessary during the operational phase.	**Low (Negative)**
Minor accidents to the public and moderate accidents to operational staff (e.g. fires). This impact is rated as neutral.	Moderate (Negative)	▪ An Emergency Plan should be compiled in order to deal with potential spillages and fires. Records of practices should be kept on site. ▪ Scheduled inspections should be implemented by operating personnel in order to assure and verify the integrity of hoses etc. ▪ Portable fire extinguishers and fire water hydrants (i.e. appropriate fire-fighting equipment) should be provided at the facility as required.	**Low (Negative)**
Impact of extra operational vehicles on the road network.	Low (Negative)	▪ Undertake re-calibration of existing traffic signals if required.	**Low (Negative)**
Indirect impacts:			
Socio-economic impact: Secondary industries may benefit from the proposed project in the form of the provision of produce and poultry products.	Low (Positive)	▪ Ensure that local industries are utilised as suppliers, where applicable/practical.	**Moderate(Positive)**
Cumulative impacts:			
As explained above.			

No-go alternative
Direct impacts: - None of the impacts mentioned above will occur.

- The existing site will remain uncleared which will result in no clearance of indigenous vegetation and in addition, no clearance of present alien species.
- If the proposed project does not proceed, increased income and economic spin-off activities will not be realised.
- Approximately 6-10 new jobs will not be created during the construction phase.
- Customers of the proposed broiler facility will not be provided with an increase of poultry products on a local scale.
- If the proposed project does not proceed, the industries that rely on the supply of fresh poultry products, could experience hindered economic growth potential.

Indirect impacts:

- There are no indirect impacts during the construction phase for the No-go Option.

Cumulative impacts:

- There are no cumulative impacts during the construction phase for the No-go Option.

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

Ecological Specialist Study: Basic Assessment for the proposed Lewin AgriBusiness (Pty) Ltd Chicken Layer Facility, Plot 226, Mans Street, Withok Estate, Brakpan , Gauteng.

Heritage Impact Assessment: For the proposed Lewin Chicken Layer Facility, Gauteng Province

This report is attached as **Appendix G.**

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

The following assumptions and limitations are applicable to the Ecological study:

- The ecological assessment was conducted within the boundaries of the proposed project area, and excluded the neighbouring and adjacent properties. These were, however, considered as part of the desktop assessment.
- Most of the floral and faunal communities have been considered and assessed accurately; however, some aspects may have been unknowingly overlooked due to the dynamic and seasonal nature of ecosystems.
- The increased level of surrounding anthropogenic activities and the nature and behaviour of most faunal taxa may have affected the number of species that were observed during the site visit. The site observations were also supplemented by information obtained from literature/desktop study where necessary.
- The data presented in this report are based on a single site visit, undertaken in summer on 09 November 2017 by Rirhandzu Marivate and Babalwa Mqokeli of the CSIR.
- A more accurate assessment would require that assessments take place in all seasons of the year. However, on-site data was supplemented with all available desktop data. Nonetheless, given the planning context of the proposed development and findings from the databases accessed and the site visit, the level of information sourced is considered appropriate to inform the decision-making on this proposed development with a footprint of 570 m^2.
- No formal consultation process was undertaken as part of the ecology study, apart from consulting with the project development/ land owner as well as the process undertaken as part of the formal Basic Assessment process.
- Due to the limited time spent on site and the date of the site visit, the lack of detection of species on site does not mean that the species is not present at the site. Furthermore, targeted searching for list of taxa compiled during desktop assessment was not done. Another site visit at a different time of the year e.g. during or following the summer rains could lead to the identification of other faunal and floral species and result in additional observations for the site.

- Extreme wind conditions were experienced during the site visit, and may contribute to the low occurrence of species.
- The site is situated near wetlands, which are over 500 m away from the site boundary. A wetland assessment was not conducted, but the importance of the wetland habitats for species of Conservation Concern and their proximity to the site were taken into account.

The following assumptions and limitations are applicable to the Heritage Impact Assessment:

- Due to the subsurface nature of archaeological artefacts, the possibility exists that some features or artefacts may not have been discovered/recorded during the survey and the possible occurrence of unmarked graves and other cultural material cannot be excluded.
- Similarly, the depth of the deposit of heritage sites cannot be accurately determined due its subsurface nature.
- This report only deals with the footprint area of the proposed development and consisted of non-intrusive surface surveys.
- This study did not assess the impact on medicinal plants and intangible heritage as it is assumed that these components would have been highlighted through the public consultation process if relevant.
- It is possible that new information could come to light in future, which might change the results of this Impact Assessment.

E.3 Impacts that may result from the decommissioning and closure phase

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

IDENTIFIED IMPACTS- DECOMISSIONING AND CLOSURE PHASE			
IMPACT	**SIGNIFICANCE RATING OF IMPACT BEFORE MITIGATION**	**PROPOSED MITIGATION**	**SIGNIFICANCE RATING OF IMPACT AFTER MITIGATION**
ALTERNATIVE A1 (PREFERRED ALTERNATIVE)			
Direct impacts:			
Impact of decommissioning and removal of facilities on fauna and flora on site	Moderate (Negative)	▪ Plant only locally indigenous flora if landscaping is required. ▪ Remove all building rubble and waste off site to registered dump sites ▪ Monitor alien invasives and control when necessary on a weekly basis during decommissioning ▪ Manually remove all Category 1 alien species in order to minimize soil disturbance as far as possible.	**Moderate (Negative)**
Potential spillage of effluent to the	Moderate (Negative)	▪ Normal sewage management practises should be implemented. These include	**Low (Negative)**

IDENTIFIED IMPACTS- DECOMISSIONING AND CLOSURE PHASE			
IMPACT	**SIGNIFICANCE RATING OF IMPACT BEFORE MITIGATION**	**PROPOSED MITIGATION**	**SIGNIFICANCE RATING OF IMPACT AFTER MITIGATION**
surrounding environment (from portable sanitation facilities for decommissioning personnel).		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.	
Discharge of contaminated stormwater into the surrounding environment. Contamination could result from chemicals, oils, fuels, sewage, solid waste, litter etc.	Moderate (Negative)	▪ The appointed Contractor should compile a Method Statement for Stormwater Management during the decommissioning phase. ▪ Provide secure storage for oil, chemicals and other waste materials to prevent contamination of stormwater runoff.	**Low (Negative)**
Pollution of the surrounding environment as a result of the handling, temporary storage and disposal of solid waste.	Moderate (Negative)	▪ 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. ▪ Should the on-site storage of general waste and hazardous waste exceed 100 m^3 and 80 m^3 respectively, then the National Norms and Standards for the Storage of Waste (published on 29 November 2013 under GN 926) must be adhered to. ▪ 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.	**Low (Negative)**
Air Quality Impact: Emissions from decommissioning	Low (Negative)	▪ Ensure that cleared (excavated) areas and unpaved surfaces are sprayed with water (obtained from an approved	**Low (Negative)**

IDENTIFIED IMPACTS- DECOMISSIONING AND CLOSURE PHASE			
IMPACT	**SIGNIFICANCE RATING OF IMPACT BEFORE MITIGATION**	**PROPOSED MITIGATION**	**SIGNIFICANCE RATING OF IMPACT AFTER MITIGATION**
vehicles and generation of dust as a result of earthworks and demolition.		source) to minimise dust generation. ▪ 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.	
Potential visual intrusion of decommissioning activities on the existing views of sensitive visual receptors.	Low (Negative)	▪ 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. ▪ Litter and rubble should be timeously removed from the work site and disposed at a licenced waste disposal facility. ▪ The project developer should demarcate decommissioning boundaries and minimise areas of surface disturbance. ▪ Appropriate plans should be in place to minimise fire hazards and dust generation. ▪ Night lighting of the decommissioning site should be minimised within requirements of safety and efficiency.	**Low (Negative)**
Noise generation from demolition activities (e.g. grinding, steel falling, use of angle grinders) during the decommissioning phase.	Moderate (Negative)	▪ A method statement, including detailed procedures, must be drawn up prior to any decommissioning of existing tanks. ▪ Decommissioning personnel must wear proper hearing protection, which should be specified as part of the Decommissioning Phase Risk Assessment carried out by the Contractor. ▪ The Contractor must ensure that all decommissioning personnel are provided with adequate PPE, where appropriate.	**Low (Negative)**
Potential health injuries to demolition staff during the decommissioning phase.	Moderate (Negative)	▪ The Contractor must ensure that all decommissioning personnel are provided with adequate PPE for use where appropriate.	**Low (Negative)**
Heavy traffic, congestion and potential for collisions.	Moderate (Negative)	▪ Suitable parking areas should be created and designated for trucks and vehicles. ▪ A supervisor should be appointed to co-ordinate traffic during the decommissioning phase. ▪ Road barricading should be undertaken	**Low (Negative)**

IDENTIFIED IMPACTS- DECOMISSIONING AND CLOSURE PHASE			
IMPACT	**SIGNIFICANCE RATING OF IMPACT BEFORE MITIGATION**	**PROPOSED MITIGATION**	**SIGNIFICANCE RATING OF IMPACT AFTER MITIGATION**
		where required and road safety signs should be adequately installed at strategic points within the site.	
Pollution of the surrounding water and ground as a result of spillages, generation of building rubble and waste scrap material.	Moderate (Negative)	▪ 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 demolition waste (including rubble) should be frequently removed from site and correctly disposed by a suitable waste Contractor. ▪ The work area should be cleaned regularly. ▪ Contractor should provide adequate waste skips (or similar) on site and the contract should specify that the Contractor must be responsible for the correct disposal of the contents of the waste skips.	**Low (Negative)**
Cumulative impacts:			
As described above.			

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

Ecological Specialist Study: Basic Assessment of the Proposed Expansion of a Chicken Layer Facility on a 4.4 hectare farm on plot 226 Withok Estate, Brakpan, Ekurhuleni District, Gauteng.

Heritage Impact Assessment: For the proposed Lewin Chicken Layer Facility, Gauteng Province.

These reports are attached as **Appendix G.**

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

N/A

E.4 Cumulative impacts

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

Cumulative impacts that may arise from the proposed project

Consideration must be given to the extent of any accumulative impact that may occur due to the proposed development. Such impacts are evaluated with an assessment of similar developments

already in the environment. Such impacts will be either positive or negative, and will be graded as being of negligible, low, medium or high impact. Figure 9 below highlights an example of how cumulative impacts manifest in the environment due to the impacts resulting from numerous developments on given spatial scale.

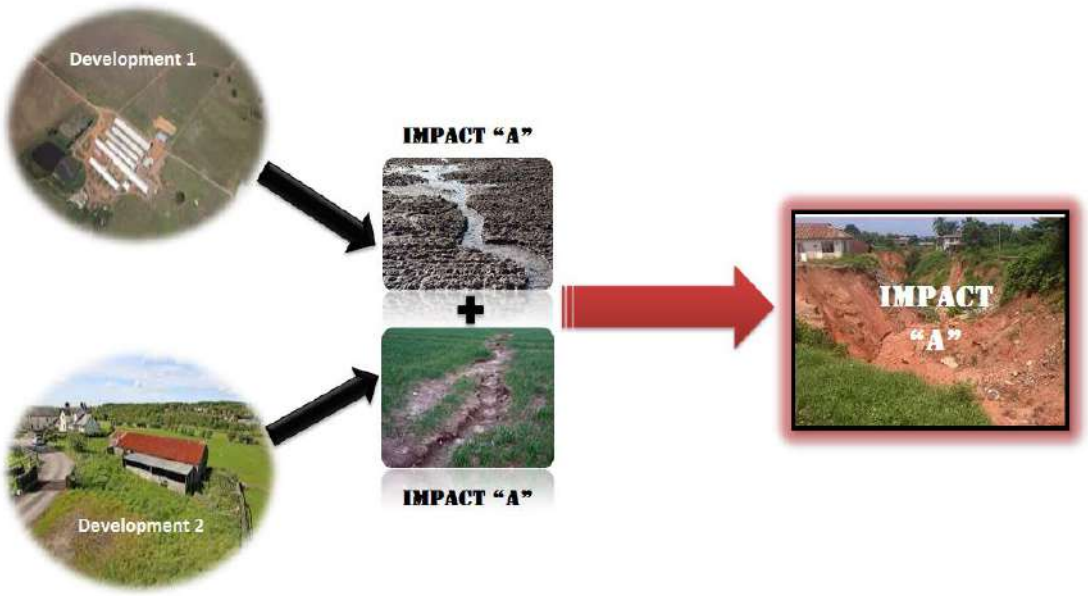


Figure 9: Schematic diagram indicating an example of a cumulative impact

Cumulative Impacts which could result from the proposed project are described below (**Negative):**

- Cumulative hectares of transformed indigenous vegetation and faunal habitat;
- Cumulative impact of construction activities (including movement of vehicles) on occurrence and spread of alien plant species;
- Cumulative increase of dust and erosion caused by construction activities on ecology on the site;
- Cumulative increase in sensory disturbance as a result of construction activities (incl. vehicles) on fauna;
- Cumulative impact on the fauna as a result of noise, lights and dust from the chicken houses leading to sensory disturbance;
- Cumulative potential visual intrusion of activities on the existing views of sensitive visual receptors.
- Cumulative impact on the regional water balance as a result of increased water usage.

The following are the anticipated **positive** cumulative impacts:

- Cumulative benefits in the form of the provision of produce and poultry products and iimproved service delivery with regards to produce and poultry products.
- Cumulative skills development opportunities and economic spin off activities.

All the cumulative impacts above are rated as **Low** after mitigation. The management actions described in the tables above also apply to cumulative impacts.

E.5 Environmental impact statement

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

to types of impact, duration of impacts, likelihood of potential impacts actually occurring and the significance of impacts.

Proposal

Proposed activity: Development of proposed Lewin AgriBusiness (Pty) Ltd Chicken Layer Facility, Plot 226, Mans Street, Withok Estate, Brakpan , Gauteng.

The development of a chicken layer facility and associated infrastructure measuring around 570 square meters in size will exert an impact on the environment; but based on the findings of the Ecological Impact Assessment (Appendix G), and as per the ecologist recommendation and the locality of the site, the impacts associated with this proposed development can be **mitigated to an acceptable level (Low).**

The creation of temporary and permanent job opportunities in the Brakpan area will have a positive impact on the surrounding community. The increase in the production of food products in the region is also viewed as a positive impact. With the implementation of the mitigation measures suggested in this report and based on the information available to date, the site visit undertaken, it is the EAP's opinion that there are no fatal flaws to the project, provided the mitigation set out is adhered to and that the developer shows commitment to the sustainable development.

Alternative 1

[redacted]

Alternative 2

[redacted]

No-go (compulsory)

This option assumes that a conservative approach would ensure that the environment is not impacted upon any more than is currently the case. 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.

E.6 Impact summary of the proposal or preferred alternative

For proposal:

IMPACT SUMMARY- CONSTRUCTION PHASE		
IMPACT	**SIGNIFICANCE RATING OF IMPACT BEFORE MITIGATION**	**SIGNIFICANCE RATING OF IMPACT AFTER MITIGATION**
Impact of project footprint on transformed vegetation and faunal habitat	Moderate (Negative)	Low (Negative)
Construction activities and vehicles impact on the occurrence and spread of alien plant species.	Moderate(Negative)	Low (Negative)
Dust and erosion	Moderate (Negative)	Low (Negative)

IMPACT SUMMARY- CONSTRUCTION PHASE		
IMPACT	**SIGNIFICANCE RATING OF IMPACT BEFORE MITIGATION**	**SIGNIFICANCE RATING OF IMPACT AFTER MITIGATION**
Sensory disturbance on fauna	Moderate (Negative)	Low (Negative)
Loss of Wetland resources from construction activities	Moderate (Negative)	Low (Negative)
Impact on the regional water balance as a result of increased water usage.	Low (Negative)	Very Low (Negative)
Potential spillage of effluent	Low (Negative)	Very Low (Negative)
Pollution caused by spillage or discharge of construction waste water	Low (Negative)	Very Low (Negative)
Air Quality Impact: Emissions from construction vehicles and generation of dust.	Low (Negative)	Low (Negative)
Socio-economic Impact: Employment creation and skills development opportunities	Moderate (Positive)	Moderate (Positive)
Potential visual intrusion of construction/demolition activities on the views of sensitive visual receptors.	Low (Negative)	Low (Negative)
Noise generation from demolition and construction work	Moderate (Negative)	Low (Negative)
Potential health injuries to construction personnel	Moderate (Negative)	Low (Negative)
Traffic, congestion and potential for collisions during the construction phase.	Low (Negative)	Low (Negative)
Destruction of archaeological artefacts	Very Low (Negative)	Very Low (Negative)
Socio-economic impact: Secondary industries may benefit from the proposed project in the form of the provision of produce and poultry products.	Low (positive)	Moderate (Positive)

IMPACT SUMMARY- OPERATIONAL PHASE		
IMPACT	**SIGNIFICANCE RATING OF IMPACT BEFORE MITIGATION**	**SIGNIFICANCE RATING OF IMPACT AFTER MITIGATION**
Sensory disturbance on the fauna	Moderate (Negative)	Low (Negative)
Environmental contamination as a result of handling of chicken waste	Moderate (Negative)	Low (Negative)
Animal pests as a result of inappropriate handling of chicken waste and poor hygiene conditions	Moderate (Negative)	Low (Negative)
Diseases as a result of poor chicken waste management and/or prevalence of pests	Moderate (Negative)	Low (Negative)
Altered Burning	Low (Negative)	Low (Negative)
Increased water usage as a result of abstraction from the	Moderate	Low (Negative)

IMPACT SUMMARY- OPERATIONAL PHASE		
IMPACT	**SIGNIFICANCE RATING OF IMPACT BEFORE MITIGATION**	**SIGNIFICANCE RATING OF IMPACT AFTER MITIGATION**
borehole	(Negative)	
Increased stormwater discharge into the surrounding environment.	Low (Negative)	Low (Negative)
Air Quality Impact: Increased odours resulting from the chicken layer facility.	High (negative)	Moderate (negative)
Socio-economic Impact: Skills development opportunities and economic spin off activities.	Moderate (Positive)	High (Positive)
Potential re-establishment of alien plants on site.	Low (Negative)	Low (Negative)
Improved service delivery with regards to produce and poultry products.	Moderate (Positive)	Moderate (Positive)
Potential visual intrusion of structures and buildings	Low (Negative)	Low (Negative)
Potential impact on the health of operating personnel	Moderate (Negative)	Low (Negative)
Minor accidents to the public and moderate accidents to operational staff (e.g. fires).	Moderate (Negative)	Low (Negative)
Impact of extra operational vehicles on the road network.	Low (Negative)	Low (Negative)
Socio-economic impact: Secondary industries may benefit from the proposed project in the form of the provision of produce and poultry products.	Low (Positive)	Moderate (Positive)

IMPACT SUMMARY- CLOSURE PHASE		
IMPACT	**SIGNIFICANCE RATING OF IMPACT BEFORE MITIGATION**	**SIGNIFICANCE RATING OF IMPACT AFTER MITIGATION**
Impact of decommissioning and removal of facilities on fauna and flora on site	Moderate (Negative)	Low (Negative)
Potential spillage of effluent	Moderate (Negative)	Low (Negative)
Pollution of the surrounding environment as a result of the handling, temporary storage and disposal of solid waste.	Moderate (Negative)	Low (Negative)
Air Quality Impact: Emissions from decommissioning vehicles and generation of dust.	Low (Negative)	Low (Negative)
Potential visual intrusion of decommissioning activities	Low (Negative)	Low (Negative)
Noise generation from demolition activities	Moderate (Negative)	Low (Negative)
Potential health injuries to demolition staff during the decommissioning phase.	Moderate (Negative)	Low (Negative)
Heavy traffic, congestion and potential for collisions.	Moderate (Negative)	Low (Negative)
Pollution of the surrounding water and ground	Moderate (Negative)	Low (Negative)

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

As mentioned above under "Alternatives", this proposed project is the development of a chicken layer facility and associated infrastructure. These developments will be according to best guidelines when it comes to broiler farming within the environmental legislation and ensuring minimal environmental impacts.

As mentioned previously, this project falls under the DEA-CSIR's "Special Needs and Skills Development Programme". Thus, it is not feasible for the relocating of the proposed chicken broiler site as firstly, this is the only available land to the applicant; secondly there is an existing enterprise on this site in which the applicant is engaged in. This has also resulted in a large infestation in alien species and a degraded site (see Appendix G). The site further ensure minimal biosecurity threats to the chicken broiler facility where there is controlled access by people as well as other animals, by this preventing pests and transmission of infections posing a threat to the poultry.

E.7 Spatial development tools

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

1) **INTEGRATED DEVELOPMENT PLAN (IDP) OF CITY OF EKURHULENI 2017/18 TO 2020/21**

The City has a long term development strategy referred to as the Ekurhuleni Growth and Development Strategy 2055 (GDS 2055). The strategy systematically analyses Ekurhuleni's history and its development challenges, wherein it therefore outlines the desired growth and development trajectory. It seeks to ensure that Ekurhuleni transitions from being a fragmented City to being a Delivering City from 2012 to 2020, a Capable City from 2020 – 2030 and lastly a Sustainable City from 2030 to 2055.

The GDS has identified five strategic themes to incrementally measure the success of the City with respect to the above. These are long-term outcomes that have been designed to incrementally measure the success of the City in achieving the objectives of the GDS 2055:

a) Re-urbanise in order to achieve sustainable urban integration;
b) Re-industrialise in order to achieve job creating economic growth;
c) Re-generate in order to achieve environmental well-being;
d) Re-mobilise in order to achieve social empowerment; and
e) Re-govern in order to achieve effective cooperative governance.

In order to achieve targets (b) and (d), food security was highlighted as a major goal. The EMM's strategy is to strengthen food security and agriculture competitiveness, while lifting marginalized and rural households out of poverty by investing in required infrastructure, services, skills and productivity. Increase job creation in the rural areas (agriculture economy) and reduce the percentage of households who are vulnerable to hunger. The key focus areas in order to achieve the goals within these staregic themes above as are follows:

- Implementation of the 10-point economic revival plan towards building an inclusive economy:
  - Aerotropolis Master Plan Implementation;
  - Manufacturing revitalization;
  - Enabling public transport system;
  - Acceleration of the Spatial Economic Zones (SEZ) and Industrial Development Zones(IDZ) programme;
  - Land availability for strategic development;
  - Implementation of township economies strategy;
  - **Support of SMMEs** through public procurement;
  - Massive infrastructure investment;
  - **Promote localization and production;** and
  - Skills and capability development and institutional stabilization.
- Upgrading and renaming of the Springs Fresh Produce Market;

- Implementation of the Vukuphile Programme;
- Implementation of the Mintirho Community Empowerment Programme;
- Improve Local Economic Development through Seed Funding (Grant in Aid);
- Implement the Agricultural Development programme;
- Increase investment attraction;
- Implementation of the City of Ekurhuleni Tourism.

The alignment of the proposed project with the key focus areas above and the goals of the IDP have been carefully considered in the assessment of the viability of this project.

2) EKURHULENI METROPOLITAN MUNICIPALITY REGIONAL SPATIAL DEVELOPMENT FRAMEWORK: REGION D (2015)

A Spatial Development Framework (SDF) provides the framework for making resource-effective decisions. It can be a powerful lever for transforming cities and is instrumental in the realisation of a city's vision. Furthermore, it is a guide that can have an impact on the development of a city over the next 15 years and more if properly conceived and systematically executed. Thus, the purpose of the compilation of a SDF for Region D is to present a clear strategic vision for the future spatial growth of the region.

The socio-economic and spatial challenges created by the amalgamation of the nine towns and the 11 local administrations called for a strategic long term response. Hence, the EMM embarked on a process to formulate a long term development strategy in 2004. This gave rise to the Growth and Development Strategy 2025, which has subsequently been reviewed and in 2012 the Growth and Development Strategy 2055 (GDS) was adopted. In conjunction with the GDS, the Metropolitan Spatial Development Framework (MSDF) and the Regional Spatial Development Frameworks (RSDFs) are plans outlining the desired spatial development of the metropolitan area as contemplated in terms of Section 25(e) of the Local Government Municipal Systems Act (Act 32 of 2000).

A broad overview of the environmental constraints within the EMM indicates that approximately 60% of the municipality contains ecologically important areas, sensitive surface and hydrological features, high potential agricultural land and/or potential pollution sources. Region D is constrained by 64.33% of environmental aspects (indicated in red on Plan 21) within the region, which equates to 12.65% of the EMM. This however does not hinder development but rather affects the type of development that can occur within the environmentally constrained areas.

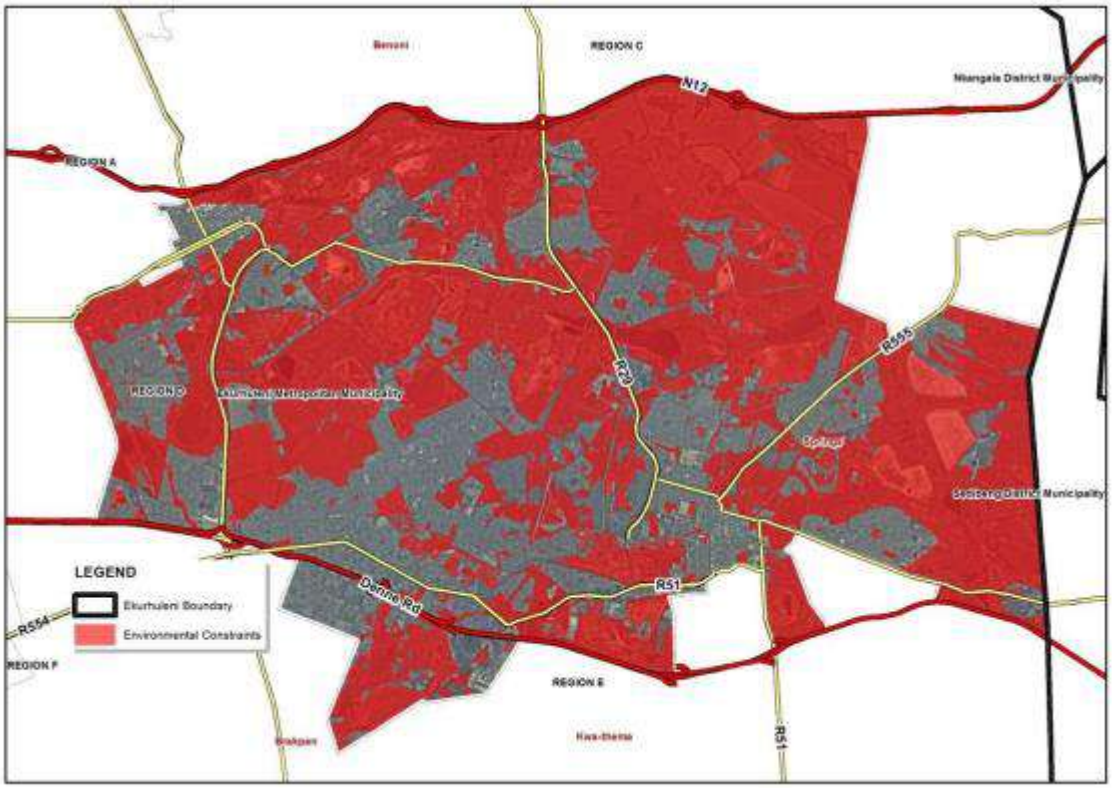


Figure 10: Areas with development constraints in Region D (SDF, 2015)

Approximately 3 050.98 ha of high potential agricultural land in Region D is not used for agricultural activities and approximately 1 860.67 ha of high potential agricultural land is so used. Of the moderate potential agricultural land, 70.72 ha is used and 3 775.07 ha is not used for agricultural activity. Currently 38% of Region D's high potential agricultural land is used for agricultural activities. However the Springs and northern Brakpan area comprises 3 050 ha of high potential agricultural land and 3 775 ha of moderate potential agricultural land not being used. These areas provide an opportunity for the promotion of more intensive agricultural development and economic growth in the region. In addition to the above, part of the Lesedi Agricultural Hub is situated in Region D.

The SDF highlights that the function of Region D is to:

- ensure that urban densification occurs along the rail infrastructure alignment in order to maximise on the opportunities offered by the existing rail network;
- provide north-south linkages such as the proposed PWV 17, as this will enable better connectivity and integration within the EMM and beyond;
- protect the open spaces, these areas include watercourses and pans;
- **maximise on the agricultural potential of the area where possible;**
- make provision for the upgrade and maintenance of certain urban areas to adapt and accommodate changing circumstances in the region;
- retain the existing industrial component and expand on the opportunities offered by these areas;
- provide sufficient social services (social and infrastructure) to accommodate the needs of the growing population;
- capitalise on the N12 and N17 transportation routes; and
- retrofit existing urban nodes as regional activity nodes with strong residential functions and the supporting land uses required by high density residential development.

As mentioned above, based on the natural resources such as water availability, geology, soil potential,

climate and proximity to towns, five development zones were identified. The zones also take into consideration the demand for land by the previously disadvantaged and the benefit gained. The zone in which this proposed project falls was identified for "urban farms", which included **chicken egg production** (Table 13 "Agricultural guidelines", EMM SDF, 2015).

E.8 Recommendation of the practitioner

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

YES [redacted]

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

[redacted]

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:

Please see the Environmental Management Programme (EMPr) attached as **Appendix H** for further detail on mitigation measures. These are summarised as follows:

1. Restrict all habitat loss and disturbances from construction activities to within the proposed and agreed upon site layout.
2. Adhere to law and best practice guidelines regarding the displacement of CI and medicinally important floral species.
3. Limit indiscriminate killing, persecution or hunting of fauna.
4. Regulate / limit access by potential vectors of alien plants.
5. By law, remove and dispose of Category 1b alien species on site. All Category 2 species that remain on site must require a permit.
6. 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.
7. Detect and control pest infestations before they become a problem through frequent and careful cleaning, monitoring and control.
8. Harvesting of indigenous flora for medicine, fire wood, building materials, and other purposes must be prohibited.
9. 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 strictly prohibited.
10. Limit the effects of noise associated disturbances from chickens and operational activities on sensitive fauna.
11. A site specific Stormwater Management Plan must be designed and implemented which includes appropriate attenuation facilities on site.
12. Erosion control measures must be implemented (Including appropriate attenuation facilities).
13. Conservation orientated clauses should be built into contracts for construction personnel, complete with

penalty clauses for non-compliance.

14. During the construction phase there will be increased surface water runoff and a decreased water quality (with increased silt load and pollution). Completing construction during the winter months would help mitigate the environmental impact.
15. The monitoring of the construction site must be carried out by a qualified Environmental Compliance Officer (ECO) with proven expertise in the field so as to ensure compliance to the Environmental Management Programme (EMPr)
16. All mitigation measures listed in the BAR as well as the EMPr must be implemented and adhered to.
17. Mitigation measures and strict waste management should ensure the prevention of groundwater contamination on site.

E.9 The needs and desirability of the proposed development

(as per notice 792 of 2012, or the updated version of this guideline)

NEED AND DESIRABILITY OF THE PROPOSED PROJECT		
Questions (Notice 792, NEMA, 2012)		**Answer**
PART I: NEED		
1.	Is the land use associated with the activity being applied for considered within the timeframe intended by the existing approved SDF agreed to be the relevant environmental authority?	Yes. The Municipalities regional services model and regional structures are an integral part of its rationale to bring services closer to the people and to transform regions into superb places to live, work and stay while capitalising on each regions' uniqueness to create strong, resilient and prosperous areas. The EMM adopted its Integrated Development Plan (IDP) in 2017/18 which maps out the delivery agenda of the current term of office of the City for the period 2017 to 2020/21.
2.	Should the development, or if applicable, expansion of the town/area concerned in terms of this land use occurs here at this point in time?	Yes, according to the Regional Developmental Overview for Region D (MSDF, 2015), the proposed project falls within an area which is prioritized for "Urban Farms", and the intention of development in this area is to create vibrant, equitable and sustainable rural development which provides food and work opportunities.
3.	Does the community/area need the activity and the associated land use concerned? This refers to the strategic as well as local level.	The poultry industry is the largest segment of the South African agricultural sector, contributing more than 16% of its share of gross domestic product. The gross value of primary agricultural production from poultry meat (inclusive of all types of poultry) for the period 2016 was R36.67 billion, reflecting an annual decrease of 5.5% (source: DAFF). Poultry products contributed 30.5% to the gross value of animal products (down from 34.1% in 2015) and 14.1% to all agricultural production (down from 16.6%). The chicken eggs from Lewin AgriBusiness are being sold to a 100% local market. Thus this provides the opportunity for higher competition, and consequently,

NEED AND DESIRABILITY OF THE PROPOSED PROJECT		
Questions (Notice 792, NEMA, 2012)		**Answer**
		lower prices of the products. This will benefit the local communities financially. On a strategic level, the increase in produce will have an effect on South Africa's poverty and food crisis, and this project will aid in the National priority of boosting local economic development to improve the standard of living for rural communities.
4.	Are the necessary services with adequate capacity currently available (at the time of application) or must additional capacity be created to cater for the development?	Yes. The proposed project will be using water directly for the registered borehole and will not rely on municipal water services. In addition, the site already has access to municipal electricity. The road networks are fully intact and the project will not have a major impact on road congestion. Thus, additional capacity does not need to be created for the development.
5.	Is this development provided for in the infrastructure planning of the municipality, and if not what will the implication be on the infrastructure planning of the municipality (priority and placement of the services and opportunity cost)?	The development is not provided for in the infrastructure planning of the municipality as it is a small development of local importance. Thus, the proposed project will not have any implications for the infrastructure planning, as no services and/or infrastructure needs to be upgraded or created to cater for this development. The current status of the infrastructure in the area will suffice for the proposed development.
6.	Is the project part of a national programme to address an issue of national concern or importance?	This project addresses the national challenge of food security in South Africa. The current food security challenge in South Africa consists of two dimensions: the first tries to maintain and increase South Africa's ability to meet its national food requirements, and the second seeks to eliminate inequalities and poverty amongst households that is made apparent by inadequate and unstable food production, lack of purchasing power, poor nutritional status and weak institutional support networks and disaster management systems. According to the most recent data from Statistics South Africa (Stats SA), approximately 14.3 million South Africans are vulnerable to food insecurity. In response, the Government of South Africa is implementing the Integrated Food Security Strategy (IFSS) of 2002. In addition, The National Development Plan (NDP) Vision for 2030 offers a long-term perspective. It defines a desired destination and identifies the role different sectors of society need to play in reaching that goal. The main goals highlighted in the NDP which pertain to the proposed project are employment and adequate nutrition. Chapter 6 of the National

NEED AND DESIRABILITY OF THE PROPOSED PROJECT		
Questions (Notice 792, NEMA, 2012)		**Answer**
		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.
PART II: DESIRABILITY		
1.	Is the development the best practicable environmental option for this land/site?	Yes. This site does not have high crop agricultural potential according to the Gauteng Agricultural Potential Atlas (GAPA 4), which makes the site ideal for broiler production. The site is also located close to local markets and abattoirs and the area is characterized by very low-density dwellings. In addition, there is already an existing small-scale broiler facility on site, and the need for the expansion signifies the likely success of the enterprise on this site.
2.	Would the approval of this application compromise the integrity of the existing approved and credible IDP and SDF as agreed to by the relevant authorities?	No. The proposed project aligns itself with the EMM Vision outlined in the IDP. The following strategic objectives are sought to be achieved and are aligned with the objectives of the proposed project: Promote shared economic growth and job creation; Improve financial sustainability; Continue institutional development, transformation and innovation.
3.	Would the approval of this application compromise the integrity of the existing environmental management priorities for the area (e.g. as defined in EMFs), and if so, can it be justified in terms of sustainability considerations?	No, the integrity of the existing environmental management priorities for the area will not be compromised by this development. The EMM has been identified by the Environmental Management Framework for the whole of Gauteng (GPEMF) in 2014 as one of seven "hubs" for agricultural development. The following three indicators were used to decide on the hub-boundaries: o Land capability = high potential agricultural land; o High intensity of existing agriculture; and o Location and adjacency constraints. The objectives of implementing the Gauteng agricultural hubs were: Prioritise agriculture as the preferred land-use within a confined and pre-defined fixed-boundary area; Focused farm-support and allocation of government resources; Creating hubs of preferred agricultural commodities based on crop suitability and market requirements; and Fulfilling and meeting the requirements of the Gauteng Growth and Development Strategy.
4.	Do location factors favour this land use at this place? (this relates to the contextualization of the	Yes, as mentioned in Question 3 above, this area has been demarcated for agricultural development/ "urban

NEED AND DESIRABILITY OF THE PROPOSED PROJECT		
	Questions (Notice 792, NEMA, 2012)	**Answer**
	proposed land use on this site within its broader context).	farms" in the greater context of the province due to its location and adjacency to favourable markets, high land capability and high intensity of existing agriculture resulting in the services, technologies support and labour to be easily accessible in the area.
5.	How will the activity of the land use associated with the activity being applied for, impact on sensitive natural and cultural areas (built and rural/natural environment)?	The development of the proposed development associated infrastructure measuring around 1 ha in size will exert an impact on the environment; but based on the findings of the Ecological Impact Assessment (Appendix G), and as per the ecologist recommendation and the locality of the site, the impacts associated with this proposed development can be mitigated to an acceptable level (Low) See Section E for a further explanation of the impacts of the proposed project on the environment.
6.	How will the development impact on people's health and well-being? (E.g. In terms of noise, odours, visual character and sense of place, etc.)?	See Section E of this Report with regards to the Impact Assessment. In summary, due to the fact that this area has an extremely low density of residents and dwellings and the site is zoned for agriculture (meaning the majority of the visual and sense of place aesthetics in the area are correlated to agricultural activities), the impacts on well-being, following mitigation, will be as follows: Visual: Low Odours: Medium Noise: Low Sense of place: Low
7.	Will the proposed activity or the land use associated with the activity being applied for, result in unacceptable opportunity costs?	No. The poultry industry provides employment, directly and indirectly, for about 108 000 people throughout its value chain and related industries. It supports many businesses and provides a strong platform for rural development, as well as the government's zero-hunger goals, as it is the main supplier of a protein diet.
8.	Will the proposed land use result in unacceptable cumulative impacts?	No. The proposed project has only been identified to have limited cumulative impacts that can be mitigated to an acceptable level. The measures outlined in the EMPr attached will serve as a method to keep the proposed project from having any serious ling term cumulative impacts on the receiving environment. Please see Section E4 for a description of the potential cumulative impacts.

E.10 The period for which the environmental authorisation is required

(consider when the activity is expected to be concluded)

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

E.11 Environmental Management Programme (EMPr)

(must include post construction monitoring requirements and when these will be concluded.)

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

EMPr attached	**Yes – Appendix H.**

SECTION F: APPENDICES

The following appendices are attached to this BA Report:

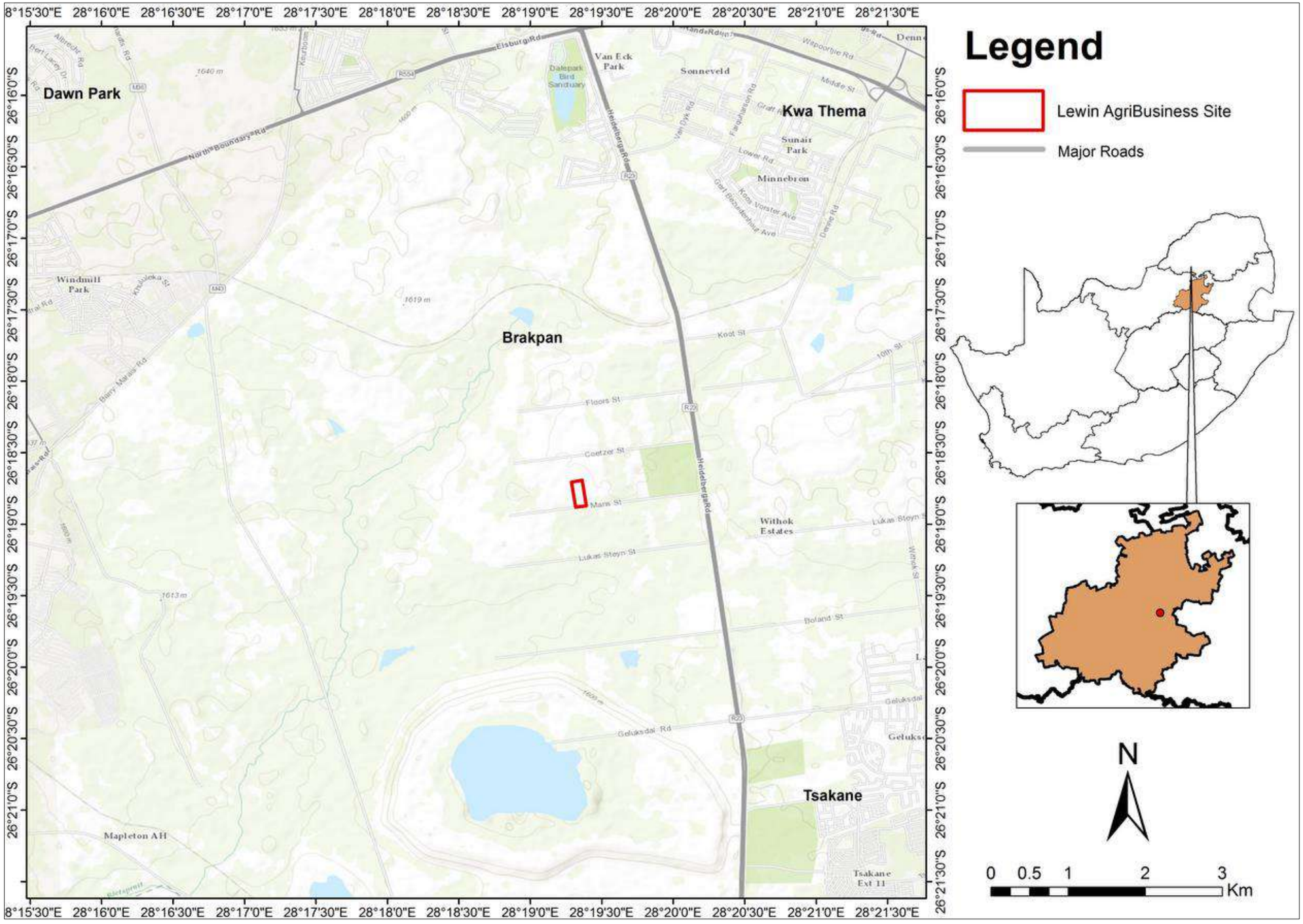
APPENDIX A:	Site plan(s) – (must include a scaled layout plan of the proposed activities overlain on the site sensitivities indicating areas to be avoided including buffers)
APPENDIX B:	Photographs
APPENDIX C:	Facility illustration(s)
APPENDIX D:	Route position information – **NOT APPLICABLE**
APPENDIX E:	Public Participation information
APPENDIX F:	SAHRA information, service letters from municipalities, water supply information
APPENDIX G:	Ecological Specialist report and Heritage Specialist report
APPENDIX H:	EMPr
APPENDIX I:	Other information • I-1: CV's of the project team (EAPs who prepared the report) • I-2: EAP declaration

BASIC ASSESSMENT REPORT

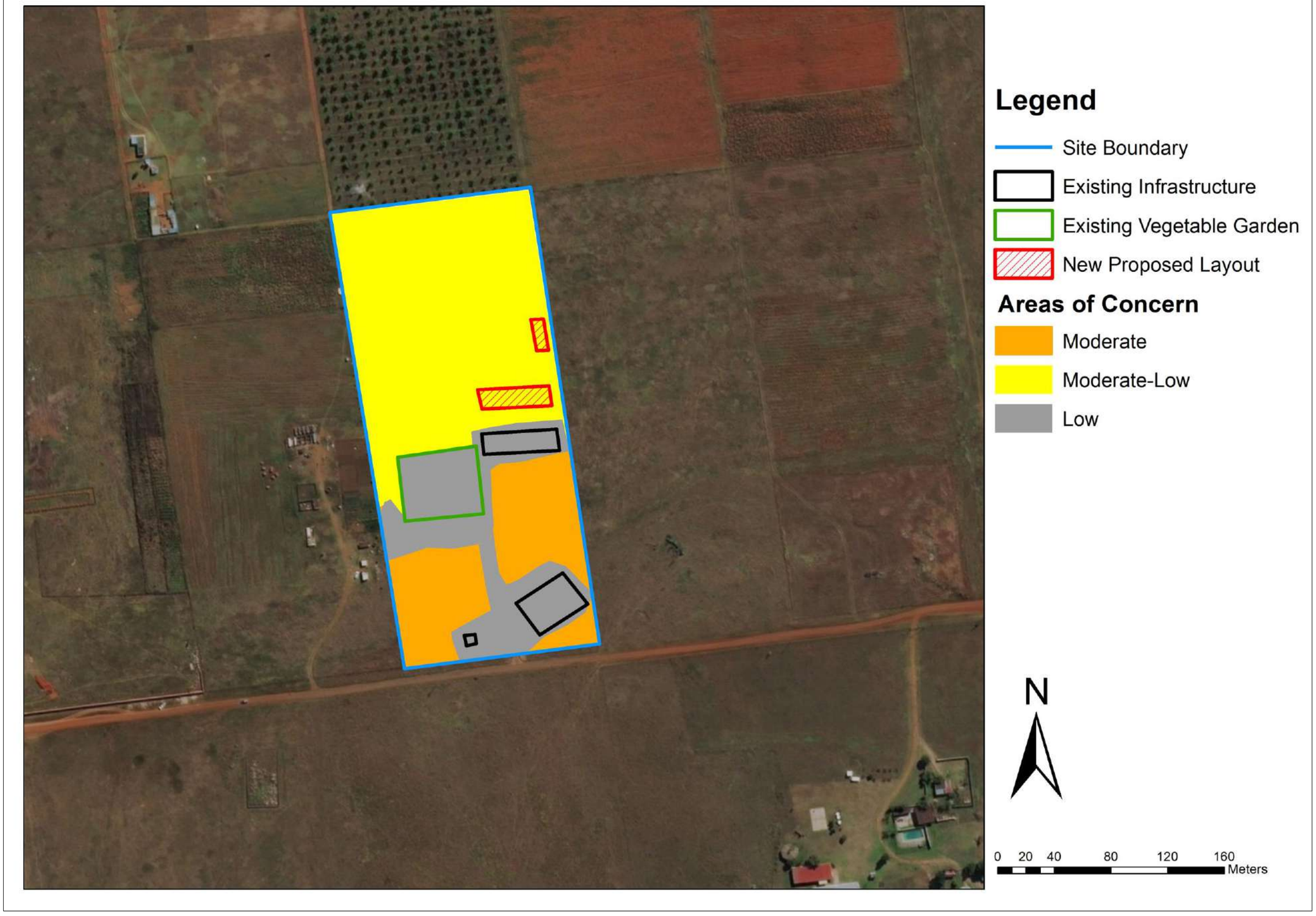
Appendix A: Site Layout Plans

CONTENTS

Map A.1: Site and locality map of the proposed project



Map A.2: Map indicating environmental sensitivities overlain with the site layout of the proposed facility on site



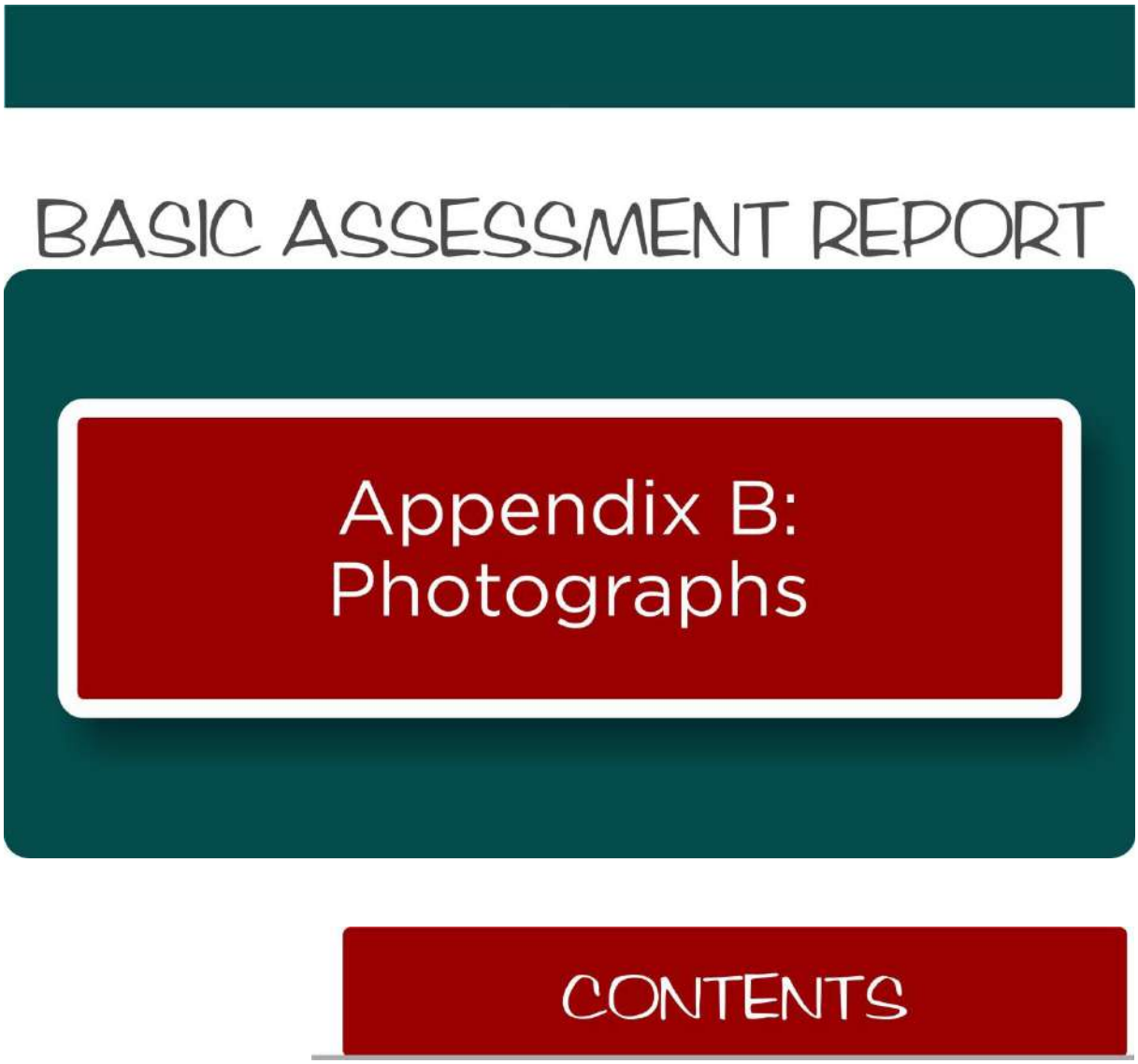
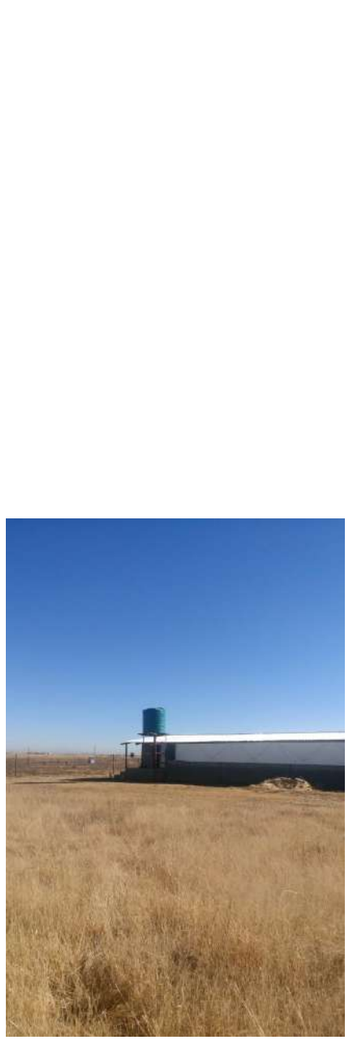
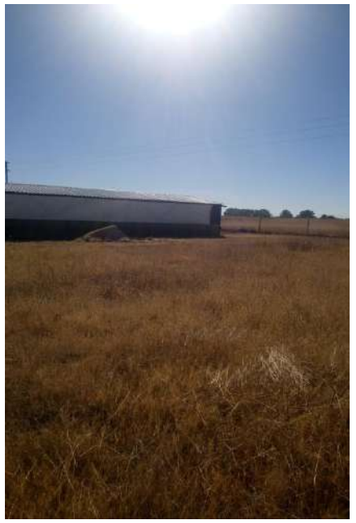
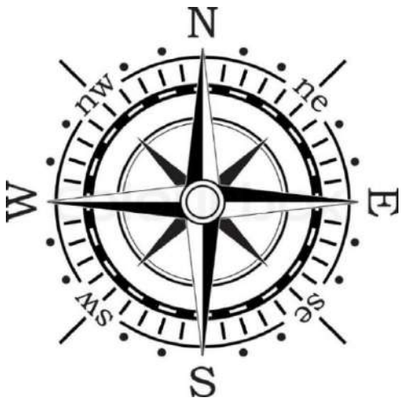


Figure B.1: Site photographs in the 8 compass directions from the centre of the site







BASIC ASSESSMENT REPORT

Appendix C: Facility illustration(s)

CONTENTS

Figure C.1: Layout of the original proposed project

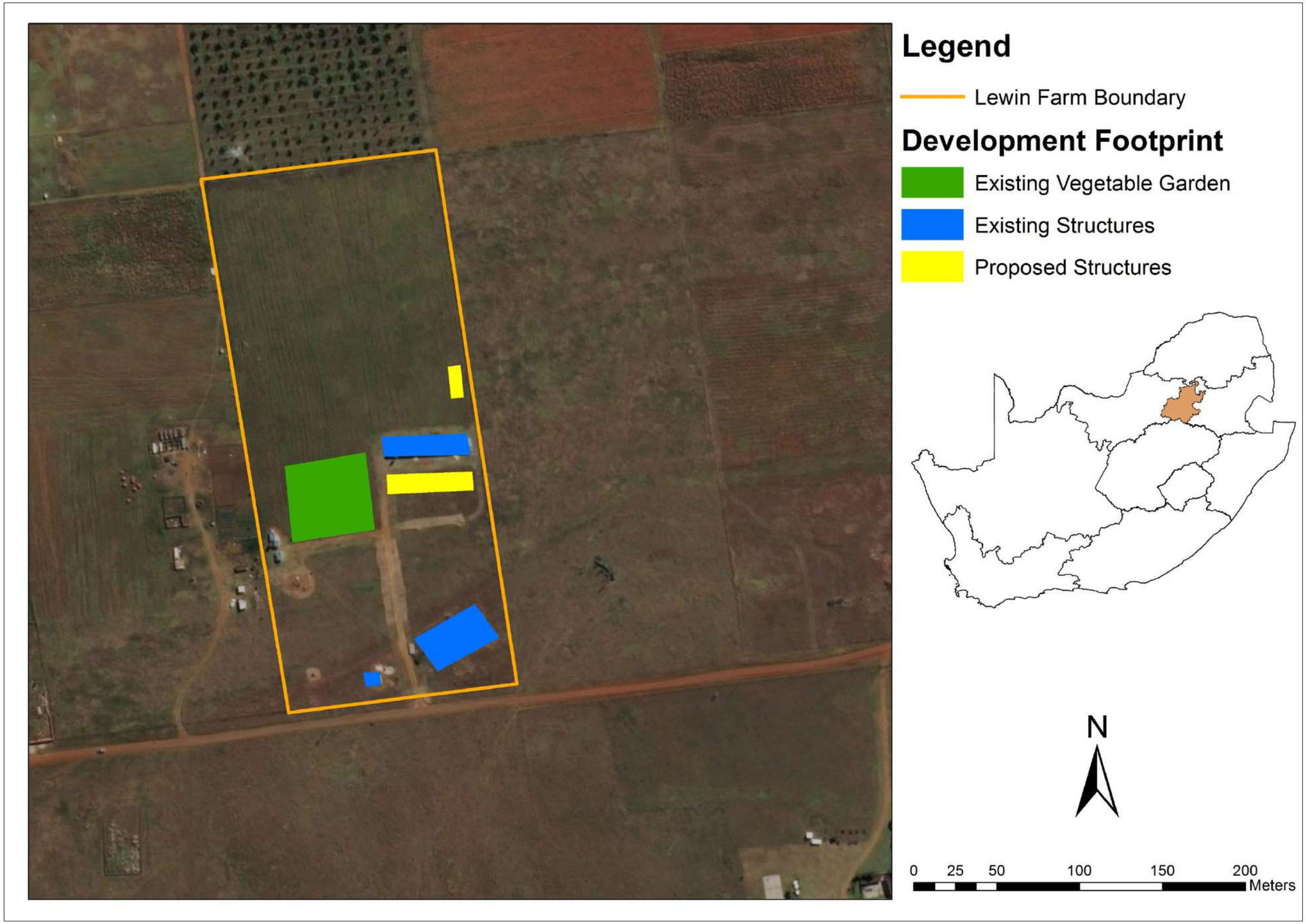
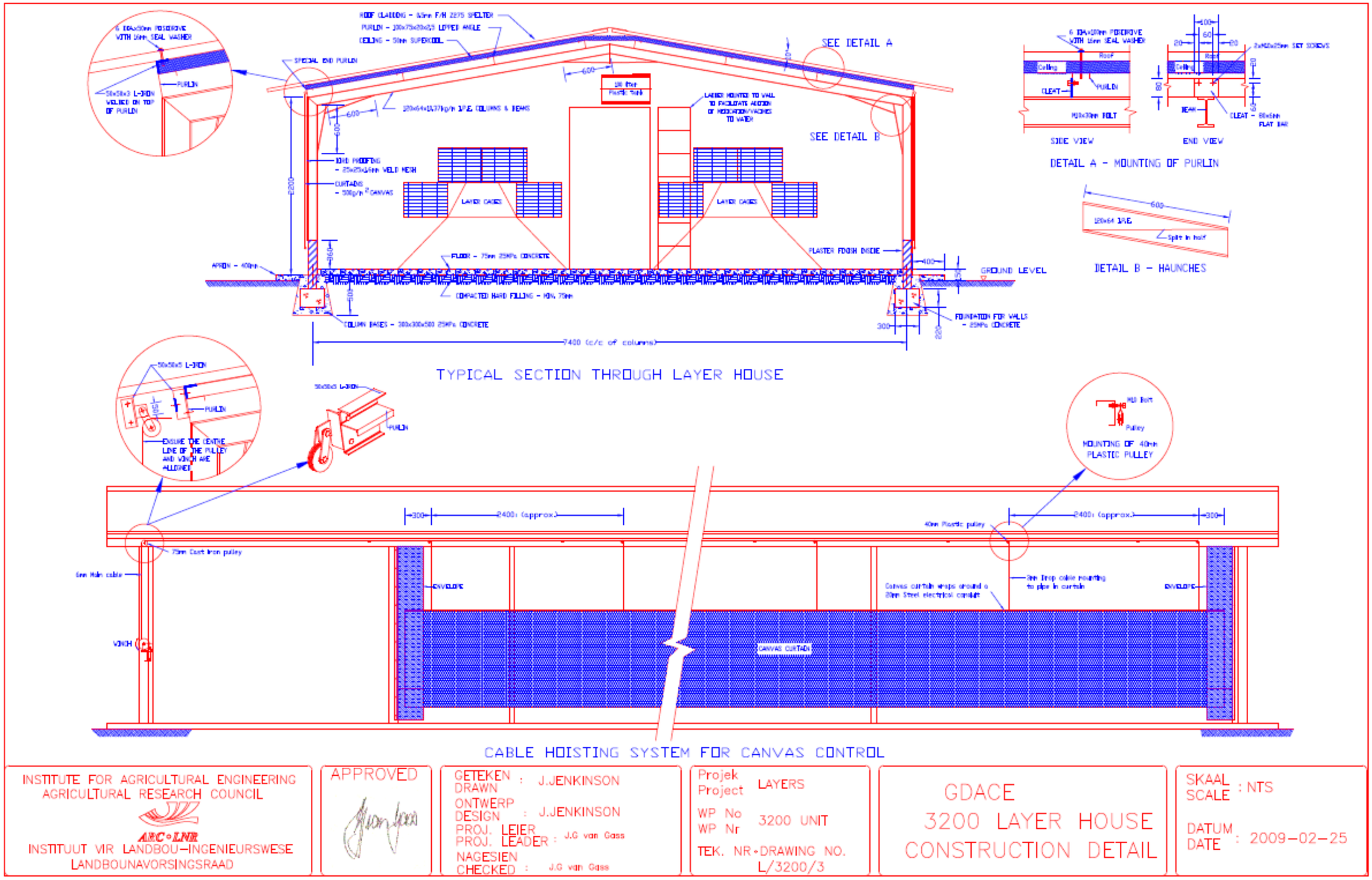
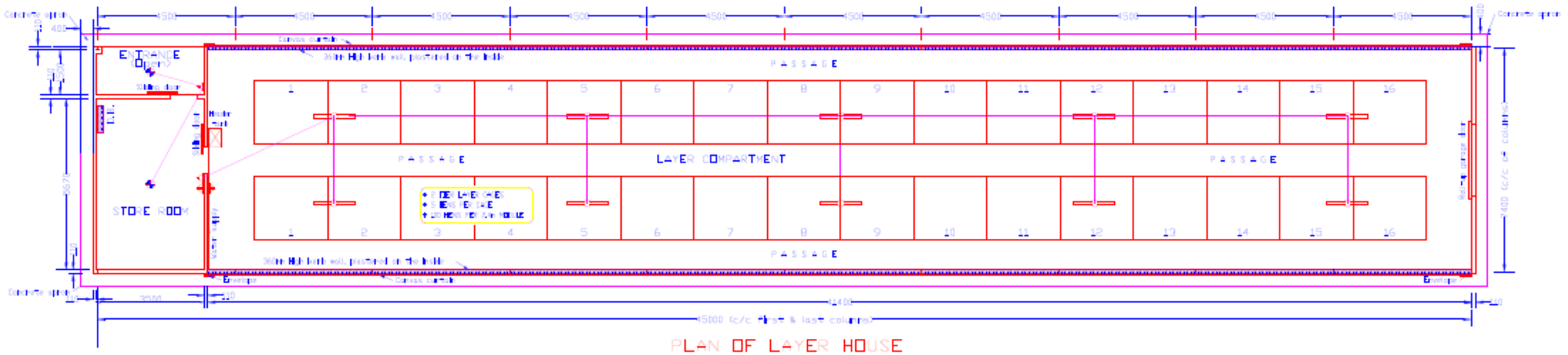
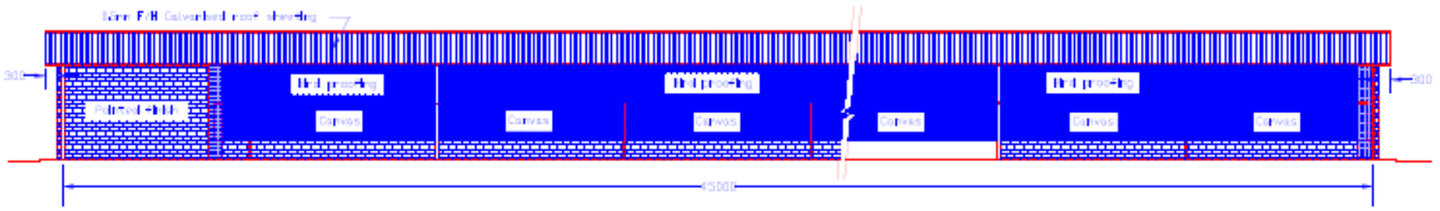


Figure C.2: Facility plans of the proposed project

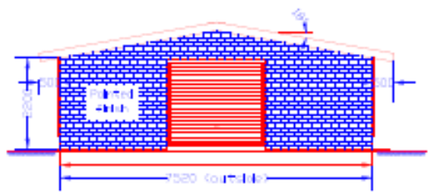




PLAN OF LAYER HOUSE
(3200 LAYERS)



SIDE ELEVATION



END ELEVATION

SCHEDULE OF ELECTRICAL FITTINGS	
SYMBOL	DESCRIPTION
	DISTRIBUTION BOARD
	OVERHEAD MOUNTED FILAMENT LIGHT
	6 FT. FLUORESCENT LIGHT
	ONE-WAY LIGHT SWITCH
	DOUBLE WALL PLUG

NOTES:

1) GENERAL

- FOR CONSTRUCTION DETAIL OF LAYER HOUSE – SEE DRAWING L3200/3
- SLIDING DOORS (1.0m x 2.0m) – 1.6mm MILD STEEL PLATE IN 40x40x5 ANGLE IRON FRAME WITH 200kg HILLMAN HANGER OR SIMILAR TYPE.
- ROLL-UP DOOR – STANDARD 2.0m WIDE x 2.0m HIGH GARAGE DOOR.
- ALL STEEL WORK TO BE PAINTED WITH 2 COATS OF RED ONTE PRIMER.
- BRICKWORK – 110mm WIDE CLAY SEWER OR ASH BRICKS PLASTERED ON THE INSIDE AND POINT FINISHED (CUTTER FINISH) ON THE OUTSIDE

2) EQUIPMENT NEEDED PER 3200 LAYERS:

- 32 x 2-TIER 2.4m LAYER CAGE MODULES @ 5 HENS PER CAGE COMPLETE WITH FEEDING TROUGH, HEADER TANKS AND NIPPLE DRINKER LINES.
- 1 x 100 litre PLASTIC WATER TANK.

3) CONSTRUCTION PROCEDURES:

1. SITE PREPARATION – REMOVE AT LEAST 100mm OF THE TOP SOIL LAYER OVER WHOLE OF BUILDING AREA.
2. EXCAVATE AND CAST CONCRETE BASES OF ROOF COLUMNS.
3. ERECT STEEL STRUCTURE WITH CEILING AND ROOF.
4. EXCAVATE AND CAST ALL WALL FOUNDATIONS.
5. ERECT FOUNDATION WALLS TO FLOOR LEVEL.
6. CAST FLOOR.
7. ERECT ALL WALLS AND PLASTER ON THE INSIDE WHILE ONLY POINT FINISH ON THE OUTSIDE.
8. CAST 400 WIDE CONCRETE APRON AROUND BUILDING.
9. FIT MESH ON SIDE WALLS AND INSTALL CANVAS CURTAIN WITH WINCH AND CABLE SYSTEM.
10. FIT EQUIPMENT, WATER AND ELECTRICAL INSTALLATIONS.

INSTITUTE FOR AGRICULTURAL ENGINEERING
AGRICULTURAL RESEARCH COUNCIL
ARC-LNR
INSTITUUT VIR LANDBOU-INGENIEURSWESE
LANDBOUNAVORSINGSRAAD

APPROVED

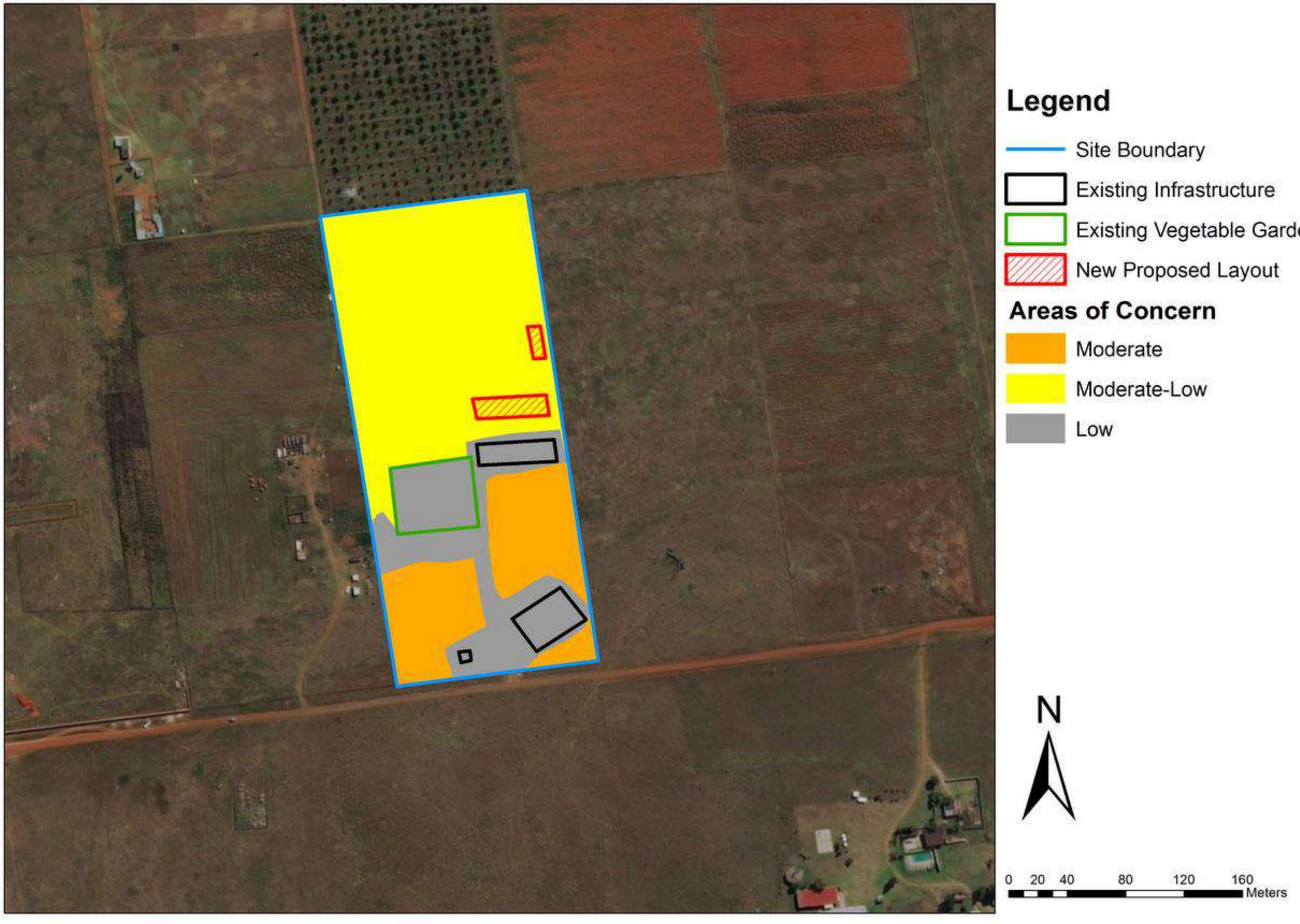
GETEKEN : J.J.ENKINSON
DRAWN
ONTWERP : J.J.ENKINSON
DESIGN
PROJ. LEIER
PROJ. LEADER : J.G van Gass
NAGESIEN
CHECKED : J.G van Gass

Projek LAYERS
Project
WP No 3200 UNIT
WP Nr
TEK. NR-DRAWING NO. L/3200/2

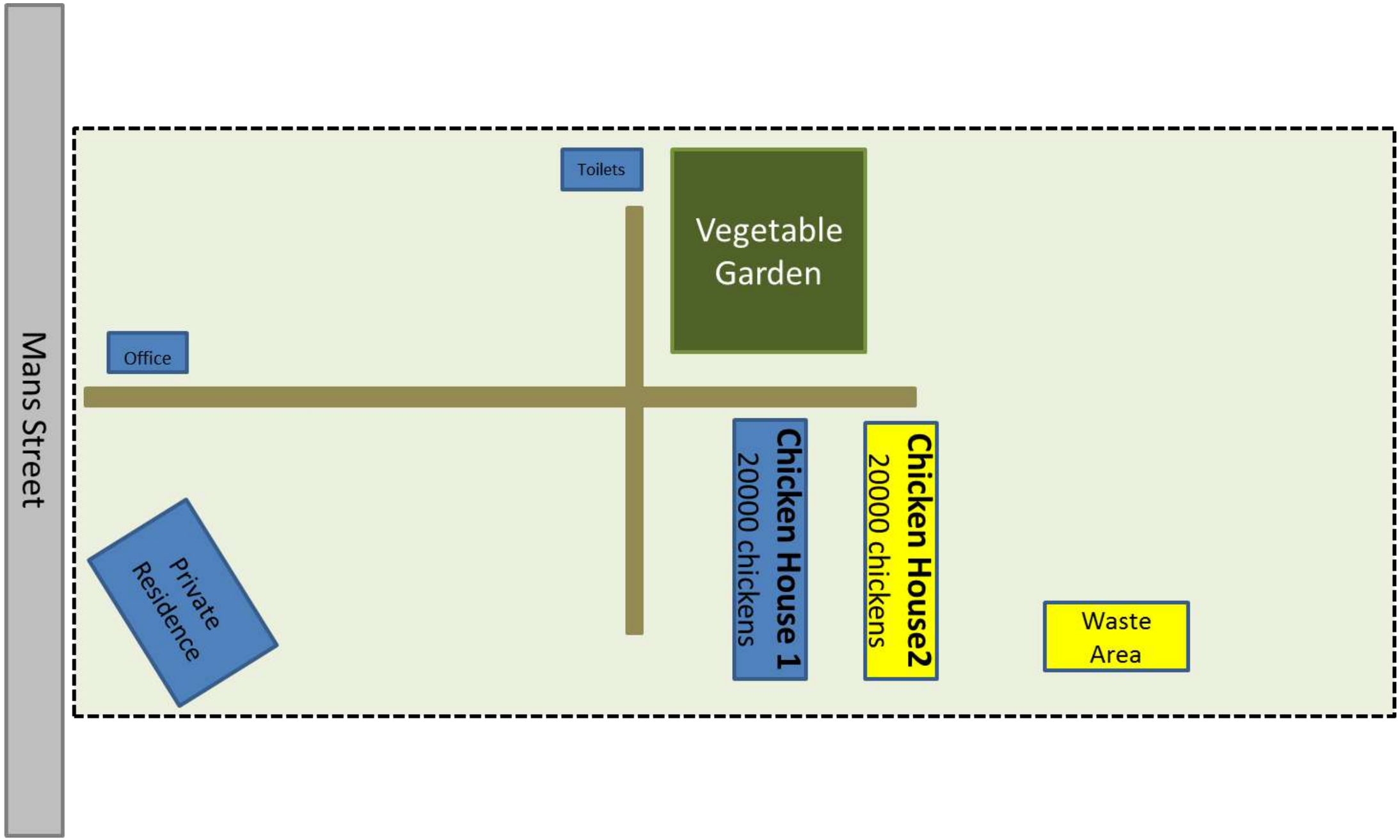
GDACE
3200 LAYER HOUSE
PLAN & ELEVATIONS

SKAAL : NTS
SCALE
DATUM
DATE : 2009-02-26

C3. New facility layout against environmental sensitivities (preferred layout)



C.4: Facility illustration of proposed project



BASIC ASSESSMENT REPORT

Appendix D:

Route Position Information (N/A)

CONTENTS

Route Position Information: **Not Applicable.**

BASIC ASSESSMENT REPORT

Appendix E: Public participation information

CONTENTS

Appendix E1: Proof of site notice

Site notices placed at the gate to the proposed site

Contents of the site notices (English) placed at the gate to the proposed site

Lewin AgriBusiness (Pty) Ltd
Project Site (Gauteng)

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 40772 of 7 April 2017, of the National Environmental Management Act, 1998 (Act No 107 of 1998), that **Lewin Agribusiness (Pty) Ltd**, proposes to expand their existing **chicken layer enterprise** in **Brakpan,** in the **Ekurhuleni, Gauteng.**

The Council for Scientific and Industrial Research (CSIR), as the independent Environmental Assessment Practitioner, will manage the required Basic Assessment process for the proposed project. The project will be registered with the Gauteng Department of Agriculture & Rural Development (GDARD). The need for a Basic Assessment is triggered by the following activities listed in Government Notice Regulations (GNR) 326 of 7 April 2017:

Government Notice	Listed Activity Number
GNR 327, 7 April 2017	40
GNR 324, 7 April 2017	12c

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

Ms. Rirhandzu Marivate
PO Box 320, Stellenbosch, 7599
Tel: 021 888 2432
Fax: 021 888 2693
Email: rmarivate@csir.co.za

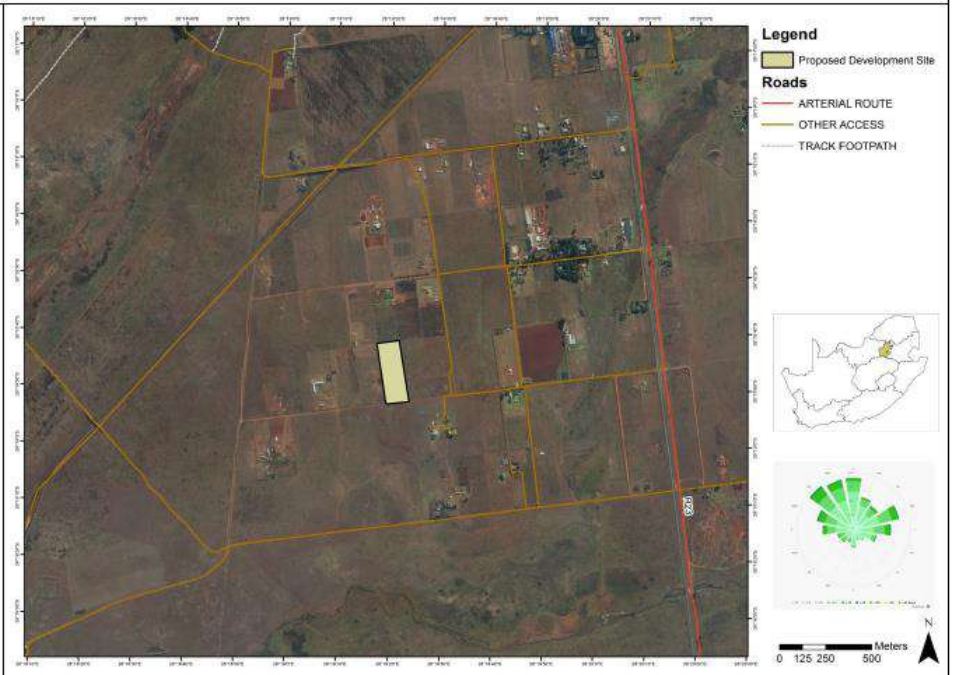


Figure 1:General Locality Map depicting Withok Farm in Brakpan, where project is proposed

Contents of the site notices (IsiZulu) placed at the gate to the proposed site

Indawo ye-Lewin AgriBusiness (Pty) Ltd Project (e-Goli)

ISAZISO NGOQHUBO LOKUHLOLA SISEKELO

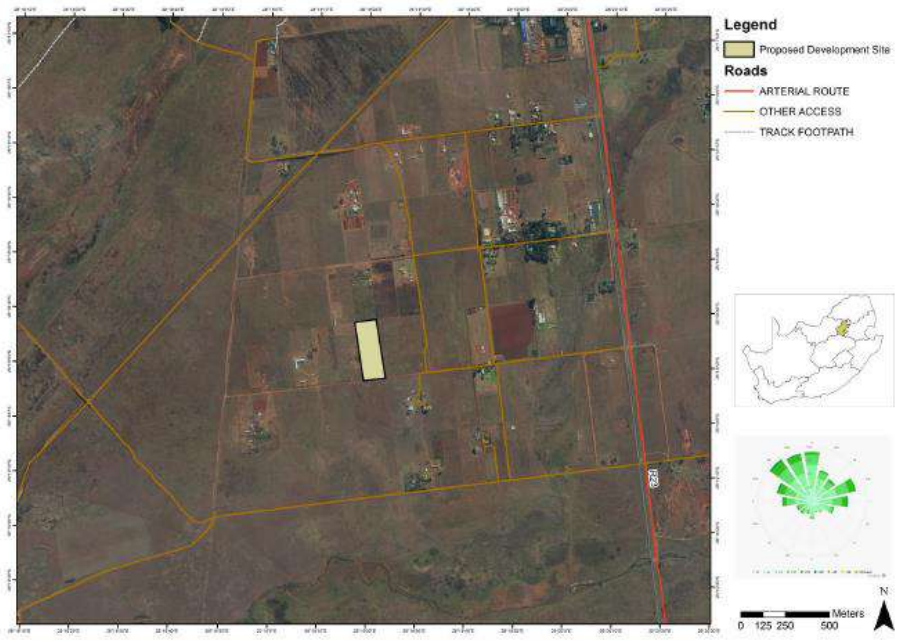
ISaziso sikhishwa ngokweMithethonqubo yokuHlola Umthelela kwezeMvelo (Environmental Impact Assessment (EIA), kwisigatshana somthethonqubo 41(1) kubengaphansi komuthethonqubo 41(4), enyatheliswe kwi Gazette Ka Hulumeni nombolo 40772 ka 7 April 2017, kumthetho i-National Environmental Management Act, 1998 (Act No 107 of 1998), ukuba i-**Lewin Agribusiness (Pty) Ltd**, ihlongoze ukuqhuba ibhizinisi **lokukhulisa izinkukhu (chicken layer enterprise)** endaweni yase **Brakpan,** kumasipala wase-**Ekurhuleni, e-Goli.**

i-Council for Scientic and Industrial Research (i-CSIR), njenge Environmental Assessment Practitioner ezimele, izophatha imisebenzi ehambisana ne-Basic Assessment Process mayelana nalephrojekthi ephakamisiwe. Iphrojekthi izobhaliswe ne-Gauteng Department of Agriculture and Rural Development (GDARD). Isidingo se-Basic Assessment silethwa ilemisebenzi elandelayo ebaliwe kwimithethonqubo ye-Saziso sika Hulumeni 326 of 7 April 2017:

Isaziso sika Hulumeni	Inombolo yomsebenzi Obaliwe
GNR 327, 7 April 2017	40
GNR 324, 7 April 2017	12c

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

Ms. Rirhandzu Marivate
PO Box 320, Stellenbosch, 7599
Tel: 021 888 2432
Fax: 021 888 2693
Email: rmarivate@csir.co.za



Isithombe 1: Indawo lapho okuhleli khona iPulaziG Withok elisendaweni yase Brakpan, okuyilapho okuzoba qhutshwa kona ihizinisi lokukhulisa izinkukhu.

Placement of Site Notices on gate of development (GPS Co-ordinates: Longitude: -26.3131, Latitude: 28.3223)

Appendix E2: Copy of the register of I&APs

Organisations/ Department	Name
NATIONAL	
Department of Environmental Affairs- National	Mmatlala Rabothata
Department of Environmental Affairs- National	Sibusisiwe Hlela
Department of Environmental Affairs- National	Takalani Nemarude
Department of Rural Development and Land Reform	Bonginkosi Zulu
Department of Agriculture, Forestry and Fisheries	Mashudu Marubini
Department of Agriculture, Forestry and Fisheries	Thoko Buthulezi
Department of Water and Sanitation	Ms Ndileka K mohapi
Department of Water and Sanitation	Namisha Muthraparsad
Department of Trade and Industry	Maoto Molefane
PROVINCIAL	
Gauteng Department of Agriculture and Rural Development	Mr Lebogang Maile
Gauteng Department of Agriculture and Rural Development	Ms Thandeka Mbasa- Sigabi
Department of Community Safety	Ms Sizakele Nkosi-Malobane
Department of Community Safety	Adv Mongezi Tshongweni
Department of Economic Development	Mr Lebogang Maile
Department of Economic Development	Ms Phindile Mbanjwa
Department of Education	Mr Panyaza Lesufi
Department of Education	Mr Edward Mosuwe
Department of Health	Ms Qedani Mahlangu
Department of Health	Dr Hugh Gosnell
Department of Human Settlement	Mr Paul Mashatile
Department of Human Settlement	Ms Daphney Ngoasheng
Department of Infrastructure Development	Ms Jacob Mamabolo
Department of Infrastructure Development	Mr Bethuel Netshiswinzhe
Department of Roads and Transport	Mr Ismail Vadi
	Mr Ronald Swartz
Department of Social Development	Nandi Mayathula-Khoza
	Ms Shoki Tshabalala
Department of Water and Sanitation	Ms M Musekene
Department of Water and Sanitation	Ms T Rakgotho
GDARD: Sustainable Use of the Environment	Mokutu Nketu
Gauteng Department of Agriculture and Rural Development	Kholofelo Malomane
Gauteng Department of Agriculture and Rural Development	Khutso Mphiko

Gauteng Department of Agriculture and Rural Development	Makaepea Makita
Gauteng Department of Agriculture and Rural Development	Karabo Mohatla
Gauteng Department of Agriculture and Rural Development	Steven Mukhola
Gauteng Department of Agriculture and Rural Development	Phuti Matlamela
MUNICIPAL	
Ward Councillor	Mr Mduduzi Luval
City of Ekurhuleni: City Manager	Dr Imogen Mashazi
City of Ekurhuleni: Environmental Resource Management and Development	Mr Hezekiel Nkosi
City of Ekurhuleni: Economic Development	Caiphus Chauke
City of Ekurhuleni: City Planning and Development	Motubatse Motubatse
City of Ekurhuleni: Water and Sanitation	Mduduzi Shabangu
City of Ekurhuleni: Health and Social Development	Dr Gilbert Motlatla
City of Ekurhuleni: Enterprise Programme Management	Andile Mahlalutye
City of Ekurhuleni	Sterwart Green
OTHER	
SANParks: Planning and Development	Dr. Mike Knight
South African National Parks (SANParks)	Dr. Howard Hendriks
South African Heritage Resources Agency (SAHRA)	Mr Dumisani Sibayi
AgriLand	Anneliza Collett
Grasslands Society of South Africa	Freyni du Toit
WESSA	Tumi Lehabe
EWT	Stephanie Aken
EWT	Adam Pires
EWT: Conservation Science	Dr Harriet Davies- Mostert
The Provincial Heritage Resources Authority Gauteng	Maphata Ramphele
Birdlife South Africa	Simon Gear
Eskom: Servitude and Investigations Department	Lungile Motsisi
LandBank	Muzi Ndwandwe
National Agricultural Council	Ndumiso Mazibuko
South African Poultry Association	Kevin Lovell
Neighbour	Mr T Mabelane
Neighbour	Mr M Zulu
Applicant	Lesego Senokwane

Appendix E3: Written notices issued in terms of the regulations and communications to interested and affected parties

Letter sent to I&APs for announcement of BA process (14 July 2017)

CSIR Implementation Unit
PO Box 320
Stellenbosch
7599
South Africa
Tel: +27 21 888 2432
Fax: +27 21 888 2693
Email: rmarivate@csir.co.za

14 July 2017

Dear Interested and/or Affected Party

PROPOSED EXPANSION OF COMMERCIAL CHICKEN LAYER FACILITY ON A 4.4 HECTARE FARM ON PLOT 226 WITHOK ESTATE, BRAKPAN, EKURHULENI METROPOLITAN, GAUTENG (CSIR/IU/EMS/IR/2017/0005/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. Lewin AgriBusiness (Pty) Ltd has been identified as an eligible client for this service and is proposing to expand their chicken egg-layer facility and associated infrastructure. Lewin AgriBusiness currently runs a 5000 chicken egg-layer facility. The expansion entails adding a layer facility that will hold 5000 chickens that will produce 2 750 000 eggs annually.

In terms of Government Notice Regulations (GNR) 326 of 7 April 2017of the National Environmental Management Act (Act 107 of 1998) published in Government Gazette 40772 on 7 April 2017, Environmental Authorisation from the Competent Authority, in this case the Gauteng Department of Agriculture & Rural Development (GDARD) is required prior to the undertaking of any activity triggered within GNR 324, 325 and/or 327. The need for a Basic Assessment process is required by the inclusion of the activities listed within GNR 327: Activity 40 & GNR 324: Activity 12c. 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 7 April 2017, Interested and Affected Parties (I&APs) must be notified and are requested to register for this project in order to receive future correspondence on this project and/or provide comments on issues of concern that will be considered during the Basic Assessment process. Please find enclosed with this letter a Background Information Document (BID) and a Comment and Registration form. You have until on or before **14 August 2017** to register and submit your comments for this project. To register and submit comments for the project please complete the Registration Form. Use the CSIR Reference Number above together with your full name, contact details (preferred method of notification, e.g., full postal or email address), fax/phone number(s) and an indication of any direct business, financial, personal or other interest you have in the application to the contact person listed below.
From this point onwards, all communication and documents will be in English.

Yours sincerely,

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

E-mail notification sent to I&APs for announcement of BAR process (14 July 2017)

Dear Interest and/or Affected Party,

The Council for Scientific and Industrial Research is currently conducting a Basic Assessment for Lewin AgriBusiness (Pty) Ltd, who are proposing to expand their chicken egg-layer facility and associated infrastructure, on Plot 226 Mans Street, Withok Estate, Brakpan, Ekurhuleni Metropolitan Municipality, Gauteng. The Basic Assessment is conducted through the Special Needs and Skills Development Programme under the National Department of Environmental Affairs.

In line with the Environmental Impact Assessment requirements of 7 April 2017, Interested and Affected Parties (I&APs) must be notified and are requested to register for this project in order to receive future correspondence of this project and/or provide comments on issues of concern that will be considered during the Basic Assessment process. Please find attached a Letter of Invitation, a Background Information Document (BID) and a Comment and Registration form. You have until on or before 14 August 2017 to register and submit your comments for this project.

Kindest Regards,

Rirhandzu Marivate
Junior Environmental Scientist
Environmental Management Services
Implementation Unit
CSIR

tel: 021-888-2432
email: rmarivate@csir.co.za

Postal List

Name & Signature of person responsible for post: F. Hertogh

24 items – **Registered Post** (Lewin AgriBusiness) Rirhandzu Marivate 021 8882 432 (14 April 2017)

Project Number: EMS0136/ 021SE

14/07/2017

Gauteng Department of Agriculture and Rural Development Mr Lebogang Maile PO Box 8769 Johannesburg 2000	Gauteng Department of Agriculture and Rural Development Ms Thandeka Mbasa-Sigabi PO Box 8769 Johannesburg 2000	Gauteng Department of Agriculture and Rural Development Mokutu Nketu PO Box 8769 Johannesburg 2000
Gauteng Department of Agriculture and Rural Development Kholofelo Malomane PO Box 8769 Johannesburg 2000	City of Ekurhuleni Mr Hezekiel Nkosi Private Bag X1069 Germiston 1400	The Endangered Wildlife Trust Stephanie Aken Private Bag X11 Modderfontein 1609
Gauteng Department of Agriculture and Rural Development Karabo Mohatla PO Box 8769 Johannesburg 2000	Gauteng Department of Agriculture and Rural Development Steven Mukhola PO Box 8769 Johannesburg 2000	Gauteng Department of Agriculture and Rural Development Phuti Matlamela PO Box 8769 Johannesburg 2000
Department of Economic Development Mr Lebogang Maile Private Bag X091 Marshalltown 2107	Department of Economic Development Ms Phindile Mbanjwa Private Bag X091 Marshalltown 2107	Department of Water and Sanitation Ms M Musekene Private Bag X313 Pretoria 0001
National Department of Agriculture, Forestry and Fisheries Thoko Buthelezi Private Bag X120 Pretoria 0001	National Department of Environmnetal Affairs Mmatlala Rabothata Fedsure Building Private Bag X447 315 Pretorius Street Pretoria 0002	National Department of Rural Development and Land Reform Una-Bonginkosi Zulu Fedsure Building Private Bag X447 315 Pretorius Street Pretoria 0002
South African Poultry Association Kevin Lovell PO Box 1202 Honeydew 2040	National Department of Agriculture, Forestry and Fisheries Mashudu Marubini Private Bag X138 Pretoria 0001	South African Heritage Resources Agency (SAHRA) Mr Dumisani Sibayi PO Box 4637 Cape Town 8000

AgriLand Anneliza Collett Private Bag X120 Pretoria	Grasslands Society of South Africa Feyni Du Toit P.O. Box 41 Hilton 3245	City of Ekurhuleni Dr Imogen Mashazi Private Bag X1069 Germiston 1400
Lewin AgriBusiness (Pty) Ltd Mr Lesego Senokwane 226 Mans Street Withok Estate Brakpan 1541	National Agricultural Council Ndumiso Mazibuko Private Bag X 935 PRETORIA 0001	Department of Water and Sanitation Ms T Rakgotho Private Bag X313 Pretoria 0001

Letter sent to I&APs for release of Draft BAR (16 August 2018)

CSIR Environmental Management Services
PO Box 320
Stellenbosch
7599
South Africa
Tel: +27 21 888 2432
Fax: +27 21 888 2693
Email: rmarivate@csir.co.za

16 August 2018

Dear Stakeholder,

PROJECT ANNOUNCEMENT & NOTICE OF RELEASE OF DRAFT BASIC ASSESSMENT REPORT FOR COMMENT

Basic Assessment for the proposed Lewin AgriBusiness (Pty) Ltd Chicken Layer Facility, Plot 226, Mans Street, Withok Estate, Brakpan , Gauteng.

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. **Lewin AgriBusiness (Pty) Ltd** has been identified as an eligible client for this service and is proposing to develop a chicken layer facility on a 4.4 hectare plot located on 226, Mans Street, Withok Estates, Brakpan, Gauteng.

In terms of Government Notice Regulations (GNR) 327, 326 and 325 and 324 of 8 December 2014 (as amended on 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 Gauteng Department of Agriculture and Rural Development, is required prior to the undertaking of any activity triggered in these regulations. 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 above, as a registered Interested and Affected Party (I&AP) on the project database, you are hereby notified of the release of the Draft BA Report to all I&APs for a 30-day review period, which will extend from **17 August 2018 to 17 September 2018** (excluding public holidays). Please submit any comments on the Draft BA Report to the CSIR Project Manager at the contact details provided above by no later than **17th September 2018.**

A hard copy of the Draft BA Report is available for public viewing at the Brakpan Public Library. The Draft BA Report can also be downloaded from the following 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 of the Draft BA Report. Once finalised, the Final BA Report will be submitted to the Gauteng Department of Agriculture and Rural Development (GDARD) for decision making. As a registered I&AP on the project database, you will be notified via email 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. Rirhandzu Marivate
CSIR Project Manager
CSIR Environmental Management Services

Email sent to I&APs for release of Draft BAR (16 August 2018)

Rirhandzu Marivate - Notice of Release of Draft Basic Assessment Report for Lewin AgriBusiness, Withok, Brakpan, Gauteng

From: Rirhandzu Marivate
Date: 16/08/2018 17:16
Subject: Notice of Release of Draft Basic Assessment Report for Lewin AgriBusiness, Withok, Brakpan, Gauteng
Bc: nrabothata@environment.gov.za; SHlela@environment.gov.za; tmamrude@en...
Attachments: Rirhandzu Marivate.vcf; Comments & Reg Form.docx; CSIR Letter to I&APsLewin AgriBusiness Draft BAR.pdf

Dear Sir/ Ma'am,

Special Needs& Skills Development Programme

PUBLIC PARTICIPATION PROCESS: 30 DAY COMMENTING PERIOD ON A BASIC ASSESSMENT REPORT

This e-mail serves to inform you on the release of the Draft Basic Assessment for the proposed development of a chicken layer facility for Lewin AgriBusiness (Pty) Ltd on 4.4 hectare plot 226, Mans Street, Witok Estates, Brakpan, Gauteng. We would like to notify you of your opportunity to comment on the proposed chicken layer project in terms of Government Notice Regulations (GNR) GNR 324, 325, 326 and 327 as amended on 7 April 2017 of the National Environmental Management Act (Act 107 of 1998) published in Government Gazette 40772 on 7 April 2017.

The Basic Assessment Report for the project is now available for a 30 day comment period from 17 August 2018 until 17 September 2018.The Electronic copy of the report is available for download form the CSIR website on the following link:

https://www.csir.co.za/environmental-impact-assessment

Alternatively, the report may be viewed at the Brakpan Public Library, Brakpan, Gauteng.

Should you wish to register as an interested and affected party (I&AP), please submit your comments on the report to the contact details below. Also include your name, contact details and an indication of any direct business, financial, personal or other interest that you may have in the applications in your submission.

Rirhandzu Marivate, Tel: 021 888 2432; email: rmarivate@csir.co.za;

or Fax: 021 888 2693, or Mail: PO Box 320, Stellenbosch, 7599

Furthermore, should you have received this e-mail but are no longer interested in the project, kindly let us know and you will be removed from the database.

Rirhandzu Marivate
Environmental Scientist and Assessment Practitioner
Environmental Management Services
Implementation Unit
CSIR

tel: 021-888-2432 email: rmarivate@csir.co.za web: https://www.csir.co.za/environmental-impact-assessment

Appendix E 4: Proof of placement of newspaper advertisement

Contents of the Newspaper Advert

Notice of Basic Assessment for the expansion of a Chicken Layer Facility on a 4.4 hectare farm on plot 226 Withok Estate, Brakpan, Ekurhuleni District, Gauteng.

CSIR Reference No: CSIR/IU/EMS/IR/2017/0005/A

Notice is given of a Basic Assessment (BA) process being undertaken on behalf of Lewin AgriBusiness (Pty) Ltd (the Project Applicant) for the **proposed expansion of their existing chicken layer enterprise in Withok Estate, Brakpan, in the Ekurhuleni, Gauteng.**

In terms of the NEMA EIA Regulations published in Government Notice Regulation (GNR) 327 and 324 on 4 April 2017 Government Gazette Number 40772, a BA process is required as the project triggers the following listed activities: *GNR 327 Activity 40, GNR 324 Activity 12 (c)*. 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 site 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. Rirhandzu Marivate, CSIR, PO Box 320, Stellenbosch 7599, Phone: (021) 888 2432, Fax: (021) 888 2693 or Email: rmarivate@csir.co.za**. You have until on or before 14 August 2017 to do so (30 days from the date of this publication - including weekends, but excluding public holidays).

CSIR
our future through science

Newspaper Advert in the Brakpan Herald (14 July 2017)

8 Brakpan Herald | Community

Friday, July 14, 2017

Online...

Get your news on www.brakpanherald.co.za, comment on stories or share your views on social media

Breaking news online

Here's what grabbed our online readers' attention:

1. Ma sien hoe vreemdeling poog om doofstom kind in kar te forseer
2. Bekende inwoner sterf na beroerte
3. California comes calling
4. Man arrested after breaking into Brakpan Police Station
5. Erg uitgeteerde hondjie van gewisse dood gered

We have new fans
WELCOME!
PS. We like you too

Video of the week: Baby's priceless reaction after dad asks question
Watch how this adorable baby girl reacts after her father asks if she's in a "bad mood".

Kry dié album aanlyn

Honderde aanhangers van die Emirates Lions rugbyspan het Saterdag hulle gunsteling spelers by Carnival City ontmoet.

Brakpan Herald contact numbers

Editor: Thelma Koorts
Email: brakpanherald@caxton.co.za
News editor: Stacy Slatter
Email: stacys@caxton.co.za
Journalist: Melissa Spies
Email: melissas@caxton.co.za

Sport journalist: Logan Green
Email: lgreen@caxton.co.za
Sales consultant: Eve Davis
Email: eved@caxton.co.za
Property sales consultant: Mercelli Kock
Email: mercellk@caxton.co.za

Your views

Please note that the opinions do not reflect that of the Editor. The Editor reserves the right to edit all communications. Please send your letter to brakpanherald@caxton.co.za

Weldoener is 'n engel

Cathy Malan skryf per e-pos:

Verlede Vrydag was ek en my dogter by die Mall@Carnival en ek het die toilet gebruik.

Ek het my handsak bo-op die spoelbak vergeet en het weggestap sonder om agter te kom dat ek nie my handsak by my gehad het nie. Ek het 'n groot winkelsak by my gehad.

Ons was al naby die uitgang toe 'n vrou my nader, met my handsak en vir my vra of dit aan my behoort. Sy vra toe nog verskoning dat sy my handsak moes oopmaak om my identiteitsboekie te kry sodat sy kon sien hoe die eienaar van die handsak lyk.

Ek dink haar naam is Leonor. Ek wil net vir die vrou sê: Jy is soos 'n engel gestuur en mag die Here jou seën met goedheid en gans seën.

Soos 'n vrou se handsak maar is, is my hele lewe daarin. Vir my is jy soos gister, vandag en môre. Ek sal jou en jou goeie daad nooit vergeet nie.

Dit is goed om te weet dat daar nog sulke pragtige mense daar buite is wat uit hul pad sal gaan om so 'n wonderlike daad te verrig. Baie dankie!

Reader's picture of the week

Brakpan Central resident Lisa Verster sent the Herald this family photo as a symbol of love and appreciation. She added that she has the best family and that they're always there for each other. The Verster family are, from left: Aizahn (6), Lisa, Shaun (11) and Deon (back).

Have you attended a memorable event, or has something special happened in your life recently? Send the photograph and a brief description with names to melissas@caxton.co.za

Your views online

Story: Man arrested after breaking into Brakpan Police Station

Sanet Oosthuizen
My liewe genade. Nou het ek wragtig alles gesien en gehoor. Is dit desperaat of net 'stupid'?

Rita Fouche
Hulle het hom darem gou gevang.

Storie: Groot skade: Inbrekers neem hul tyd om laerskool te plunder

Dienke De Hoog
Selfde modus operandi toe hul so paar jaar terug by Hoërskool Die Anker ook ingebreek het; deur die dak en die kluis ook oop gesny. Chaos! Jammer mense, dis die nuwe SA.

Zenda Fisher
So sorry. These actions have such a ripple effect for staff and learners.

Notice of Basic Assessment for the expansion of a Chicken Layer Facility on a 4.4 hectare farm on plot 226 Withok Estate, Brakpan, Ekurhuleni District, Gauteng.

CSIR Reference No: CSIR/IU/EHS/IR/2017/0005/A

Notice is given of a Basic Assessment (BA) process being undertaken on behalf of Lewin AgriBusiness (Pty) Ltd (the Project Applicant) for the **proposed expansion of their existing chicken layer enterprise in Withok Estate, Brakpan, in the Ekurhuleni District, Gauteng.**

In terms of the NEMA EIA Regulations published in Government Notice Regulation (GNR) 327 and 324 on 4 April 2017 Government Gazette Number 40772, a BA process is required as the project triggers the following listed activities: GNR 327 Activity 40, GNR 324 Activity 12 (c). 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. Rirhandzu Marivate, CSIR, PO Box 320, Stellenbosch 7599, Phone: (021) 888 2432, Fax: (021) 888 2693 or Email: rmarivate@csir.co.za.** You have until on or before 14 August 2017 to do so (30 days from the date of this publication - including weekends, but excluding public holidays).

CSIR

A non-profit organisation that provides residential care for children who have been orphaned, abandoned or removed from their families due to some form of abuse.

Muriel Brand Street, Brenthurst
071 356 2291
erch@erch.co.za
Facebook: East Rand Children's Haven

Appendix E. 5: Communications from Interested and affected parties

Comments from the Gauteng Department Agriculture and Rural Development

agriculture and rural development
Department: Agriculture and Rural Development
GAUTENG PROVINCE

56 Eloff Street, Umnotho House, Johannesburg
P O Box 8769, Johannesburg, 2000

Telephone: (011) 240-2500
Fax: (011) 240-2700
Website: http://www.gdard.gpg.gov.za

Reference:	002/18-19/E0109
Enquiries:	Patience Xaba
Telephone:	(011) 240-3053
Email:	Patience.xaba@gauteng.gov.za

Council For Scientific and Industrial Research (CSIR)

Email/Fax. rmarivate@csir.co.za

Dear Sir / Madam

Basic Assessment Application & Draft Basic Assessment Report: Proposed Lewin AgriBusiness (Pty) Ltd Chicken Layer Facility, Plot 226, Mans Street, Withok Estate, Brakpan, Gauteng

The Department acknowledges having received the basic assessment application & draft basic assessment report for environmental authorisation of the above-mentioned project on 20/08/2018.

You are required to submit five (5) copies (**3 full colour hard copies and 2 CDs-PDF**) of the Final Basic Assessment Report as well as a copy of the previously submitted application form for environmental authorisation.

In terms of Regulation 45 of the EIA Regulations 2014, this application will lapse should you fail to meet any of the time-frames prescribed in terms of these regulations, unless an extension has been granted in terms of regulation 3(7).

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

Yours faithfully

Boniswa Belot
Deputy Director: Strategic Administration Support
Date: 24/08/2018
CC: Lewin AgriBusiness (Pty) Ltd

Att: L Senokwane
Email/Fax: N/A

GAUTENG PROVINCE
AGRICULTURE AND RURAL DEVELOPMENT
REPUBLIC OF SOUTH AFRICA

Reference: Gaut 002/18-19/E0109
Enquiries: Tendani Rambuda
Telephone: 011 240 3386
E-mail: Tendani.Rambuda@gauteng.gov.za

Council for Scientific and Industrial Research (CSIR)
P.O Box 320
11 Jan Celliers Road
STELLENBOSCH
7599

Attention: Ms Rirhandzu Marivate
Tel No: 021 888 2432
E-Mail: marivate@csir.co.za

Dear Madam

COMMENTS ON THE DRAFT BASIC ASSESSMENT REPORT: THE PROPOSED EXPANSION OF THE CHICKEN FACILITY ON PLOT 226 OF THE FARM WITHOK ESTATE AGRICULTURAL HOLDING, CITY OF EKURHULENI METROPOLITAN MUNICIPALITY.

The Draft Basic Assessment Report (DBAR) regarding the above -mentioned development received by this Department on 20 August 2018 has reference.

The proposal entails expansion of the chicken house facility with a total of 570 m^2 footprint in which 1 x 20 000 capacity layer house (427.5m^2 footprint) and 1 x waste storage site (140m^2 footprint). In terms of the Gauteng Environmental Management Framework (GPEMF, 2015), the site falls within Environmental Management Zone 4 (four) dominated by agricultural uses outside an urban development zone as defined by the Gauteng Spatial Development Framework (2011). The site measures 4.4 hectares in extent and the proposed development footprint will be approximately **0, 057** hectares. The total developmental footprint will be 2 hectares and the existing facility footprint 1.5 hectares, and it is not clear what happened to the other **0.443** hectares, since when adding 0.057 plus 1.5 is equals to 1.557 hectares out of 2 hectares.

The Department would like to comment as follows:

1. Alignment of the activity with applicable legislations and policies

The development has a direct bearing on the National Environmental Management Act (NEMA) (Act No. 107 of 1998, as amended) at both national and provincial levels. The proposed development activity applied for, is listed under Activity 40 (ii) of Listing Notice 1, published under the Environmental Impact Assessment (EIA) Regulations, 2014, (GN R.983) of the National Environmental Management Act (NEMA) (Act No. 107 of 1998, as amended).

2. Guidelines GDARD requirements

In terms of the Gauteng Conservation Plan version 3.3 (C-Plan), the proposed site is affected by a threatened ecosystem, dominated by Kliprivier Highveld grassland which is considered vulnerable. However, the site is transformed and there are no environmental sensitivities.

3. Alternatives

The application has taken into consideration a brief description of the "Proposal" which is for the construction of chicken house facility with a total of 570 m^2 footprint in which 1 x 20 000 capacity layer house (427.5m^2 footprint) and 1 x waste storage site (140m^2 footprint). Although motivation and reasons for not providing alternative sites have been indicated in the report, other alternatives such as technology and design alternatives must be considered in the Final Basic Assessment Report.

4. Locality map and layout plans or facility illustrations

The illustration of activities must not only show building plans but also show activities inside the building and this must be included in the Final Basic Assessment Report. Plans and illustration must reflect the proper legends.

5. Environmental Management Programme (EMPr)

A site (project) specific EMPr attached to the Draft Basic Assessment Report is noted. The EMPr must incorporate issues raised in this letter as part of the Final Basic Assessment Report.

6. Public participation process

It is noted that the Draft Basic Assessment Report (DBAR) is currently being circulated for comment and that part of the public participation process is undertaken in accordance with the requirements of the regulations in that the site notice was placed on strategic location. However, all public participation information including, but not limited to, newspaper advert, comments and responses report must be attached to the appropriate Appendices in the Final Basic Assessment Report. These must include confirmation from the City of Ekurhuleni Metropolitan Municipality and the Environmental Management Division of City of Ekurhuleni Metropolitan Municipality.

7. Any other issues noted

a. The application form indicates Activity 40 of Listing Notice 1, GN R 327 and Activity 12 of Listing Notice 3, GN. R 324 that have been applied for, however the Draft Basic Assessment Report only indicated activity 40 of Listing Notice 1 and not Activity 12 of Listing Notice 3. The Final Basic Assessment Report must reflect all activities as indicated in the application form and a detailed explanation why such an Activity (activity 12) was included.
b. A bulk service report to determine infrastructure capacity to cater for the proposed development must be included in the Final Basic Assessment Report. This must include proof of assurance of water supply from the existing borehole on the property to cater for the proposed activity.
c. The Department's directorate of pollution and waste management must be consulted regarding the waste management plans. Waste management plan must takes into consideration all waste streams to be generated during construction and operation phases, must be compiled and included in the final basic assessment report.

Department of Agriculture and Rural Development, 56 Eloff Street, Umnotho House, Johannesburg, 2000. PO Box 8769, Johannesburg, 2000, Tel: (011) 240-2500. Website: www.gdard.gpg.gov.za

d. A detailed stormwater analysis must be carried out and the report must be included in the Final Basic Assessment Report.
e. All information to be submitted as part of the Final Basic Assessment Report for the proposed activity must be clear enough to be reviewed.

If you have any queries regarding this letter, contact the official at the contact details provided above.

Yours faithfully

Mr. T. Rambuda
Control Environmental Officer: Impact Management
Date: 10/09/2018

Comments from the City of Ekurhuleni

City of Ekurhuleni

Head of Department:
Environmental Resource and Waste Management

Cnr. Van Riebeeck Ave and Hendrik Potgieter Street
PO Box 25
Edenvale
1610

Enquiries: Anél Hietbrink
Tel: +27 11 999 3387
Email: anel.hietbrink@ekurhuleni.gov.za

Attention: Rirhadzu Marivate
CSIR
PO Box 320
Stellenbosch
7599

Tel: +27 21 888 2408
Fax: +27 21 888 2493
Email: rmarivate@csir.co.za

Dear Madam

Subject: COMMENTS ON THE DRAFT BASIC ASSESSMENT REPORT FOR THE PROPOSED LEWIN AGRIBUSINESS (PTY) LTD CHICKEN LAYER FACILITY, PLOT 226, MANS STREET, WITHOK ESTATES AGRICULTURAL HOLDINGS, BRAKPAN, CITY OF EKURHULENI

Your Draft Basic Assessment Report, received 14 August 2018 refers.

Herewith kindly find comments by the City of Ekurhuleni.

Comments from Environmental Resource and Waste Management Department, Legislative Compliance Division:

1. The Environmental Resource Management Department in rendering its comments assessed the environmental parameters/constraints of the property against the following environmental management tools:

   1.1. Provincial Environmental Management Framework, 2015
   1.2. Ekurhuleni Biodiversity and Open Space Strategy (EBOSS), 2008
   1.3. The Ekurhuleni Bioregional Plan, 2012
   1.4. Applicable Environmental Legislation

2. Based on the above tools and the information contained in the application, the department does not object to the proposed activities and comment as follows:

   2.1. The site proposed development consist mainly of "*Other Natural Areas*" and "*No Natural Remaining*", in terms of the Bioregional Plan 2012.

   "*Other Natural Areas*", are areas which still contain natural habitat but that are not required to meet biodiversity thresholds.

   "*No Natural Remaining*", are areas that are transformed or degraded and which is not required as Ecological Support Areas, including intensive agriculture, urban development, industry and infrastructure.

2.2. The site has a moderate to high ecological sensitivity rating, and may have geotechnical, agricultural and ecological development constraints.

2.3. The site may contain **endangered** Tsakane Clay Grassland vegetation.

2.4. The Gauteng EMF indicate that the proposed development area falls within the following zone:

2.4.1. Zone 4, Normal Control Zone. This zone is dominated by agricultural uses outside the urban development zone, and agriculture and rural development that support agriculture should be promoted.

2.5. During a site inspection of the proposed development, the official noted stormwater drains and a small attenuation pond in the nearby vicinity. The applicant must ensure that no contaminants enter the City OF Ekurhuleni stormwater system or the surrounding environment. Stormwater management systems must be installed, i.e. cut-off drains, on the perimeter of the property / facilities to aid in capturing and preventing any contaminants from entering the City OF Ekurhuleni stormwater system or the surrounding environment.

2.6. Figure 2, Site layout of the preferred alternative (page 22 and Appendix C) need to be more descriptive to indicate the uses of the current structures and proposed structures on the property.

2.7. All waste must be disposed of in the correct manner in in accordance with relevant National Legislation and Local By-Laws.

2.8. Records of waste disposal must be kept on site, this include:

2.8.1. The waste material converted to manure / fertilizer which is distributed to local farmers; and

2.8.2. Animal carcasses that is disposed at the correct facility.

2.9. The site plan does not indicate the location for waste management i.e. drying of waste product and processing to be used as fertilizer.

2.10. The applicant must supply proof that the borehole on the property is registered with the National Department of Water and Sanitation for its intended use. Further to this, the applicant must keep record of water consumption.

2.11. During the site inspection conducted by the official, it was noted that a second chicken layer was under construction behind the existing chicken layer. This additional structure was not noted on any photographs or layout maps within the DBAR.

2.12. Recommendations contained in the following reports must be implemented:

2.12.1. Ecological Specialist Study, CSIR, July 2018;

2.12.2. Heritage Impact Assessment, HCAC, November 2017;

2.12.3. Guideline manual for the management of abattoirs and other waste of animal origin, GDARD, 2009; and

2.12.4. Environmental Management Programme, CSIR, August 2018.

2.13. The applicant must apply for a Public Health Permit from the City OF Ekurhuleni's Environmental Health Department.

2.14. The applicant must comply with the City OF Ekurhuleni Metro Public Health By-law as well as the National Norms and Standards related to Public Health.

All activities to be undertaken on the said property must be in accordance with all applicable By-Laws, policies and requirements of the Ekurhuleni Metropolitan Municipality.

It should be noted that, in terms of Section 24F of the NEMA, Act No 107 of 1998, as amended, **no listed activity may commence prior to an environmental authorization** being granted by the competent authority.

Regards,

MS F. MABINDISA
HEAD OF THE DEPARTMENT:
ENVIRONMENTAL RESOURCE AND WASTE MANAGEMENT

Date: 11/09/2018

Communications with GDARD's Directorate of Pollution and Waste Management

Rirhandzu Marivate - FW: Inquiry on Chicken Waste Management requirements

From: "TSHIKOVHI, PRECIOUS (GDARD)" <PRECIOUS.TSHIKOVHI@gauteng.gov.za>
To: Rirhandzu Marivate <RMarivate@csir.co.za>
Date: 24/10/2018 15:22
Subject: FW: Inquiry on Chicken Waste Management requirements
Attachments: Rirhandzu Marivate.vcf; A Basic Site Waste Management Plan.docx

[The e-mail server of the sender could not be verified (SPF Record)]

Hi Rirhadzu,

You just need to incorporate the Waste Management Plan into the EMPr and include it in the Final BAR.

Regards

Precious Tshikovhi
Environmental Officer Production Grade A: Waste Management
Gauteng Department of Agriculture & Rural Development
56 Eloff Street, Umnotho House, JOHANNESBURG 2000
tel: 011 240 3039 **fax:** N/A **cell:** N/A **email:** Precious.Tshikovhi@gauteng.gov.za
website: http://www.gdard.gpg.gov.za

From: Rirhandzu Marivate <RMarivate@csir.co.za>
Sent: Tuesday, 16 October 2018 2:45 PM
To: TSHIKOVHI, PRECIOUS (GDARD) <PRECIOUS.TSHIKOVHI@gauteng.gov.za>
Subject: Inquiry on Chicken Waste Management requirements

Good Day Ms Tshikovhi,

We are currently undertaking a Basic Assessment Report for a chicken layer facility in Withok Estates, Brakpan for Lewin AgriBusiness. The facility will have a place to temporarily store its dry chicken waste from operations, including chicken manure.

In accordance with the National Environmental Management: Waste Act (Act 26 of 2014 as amended), the potentially applicable activity may be Category C (1) The storage of general waste at a facility that has the capacity to store in excess of 100m3 of general waste at any one time, excluding the storage of waste in lagoons or temporary storage of such waste.

The specifications for the waste storage site (temporary waste storage) for Lewin Agree Business is as follows:
1 x Waste storage site (footprint of 7m x 20m = 140m2).
Approximately 50m3 of chicken waste will be produced monthly.
Solid waste to be temporarily stored in 12 kg bags.

Currently the levels of waste that are anticipated fall below those specified in NEM:WA.

I have attached the Waste Management Plan that has been integrated into the EMPr for your consultation. Please let me know if any additional measures need to be put in place.

Your inputs are highly appreciated. Looking forward to your response.

Kindest Regards,

Rirhandzu Marivate
Environmental Scientist and Assessment Practitioner
Environmental Management Services
Implementation Unit

Communications received from national Department of Agriculture, Forestry and Fisheries

agriculture, forestry & fisheries
Department:
Agriculture, forestry & fisheries
REPUBLIC OF SOUTH AFRICA

Directorate Land Use and Soil Management, Private Bag x120, Pretoria, 0001
Delpen Building, c/o Annie Botha & Union Streets, Riviera

From: Director: Land Use and Soil Management
Tel: (012) 319 7634 **Fax:** (012) 329 5938 **e-mail:** nhlakad@daff.gov.za
012 3197580 Thokob@daff.gov.za

CSIR
PO Box 320
Stellenbosch
7599

4 August 2017

Dear Sir/Madam

This serves as a notice of receipt and confirms that your application has been captured.
Please note: Agriland system is down and we are currently using a manual system.
Enquiries can be made to the above telephone number, postal and e-mail addresses

Detail of your application as captured:

Type: ***Applicability***
Your reference number:
Property Description: ***Plot 226, Withok Estate***
Dated: ***20 July 2017***

Please use the following reference number in all enquiries:

AgriLand reference number: *2017_08_0036*

Yours sincerely,

HJ Buys
pp DIRECTOR: LAND USE AND SOIL MANAGEMENT

Appendix E.6: Comments and Responses Report
(Comments received after the release of the Draft Basic Assessment Report)

Issues Raised	Commentator	Date	Responses to Comments:
Comments from Gauteng Department of Agricultural and Rural Development (GDARD):	**Mr T Rambuda- Control Environmental Officer: Impact Management**	**10/09/2018**	
A. Alignment of the activity with applicable legislation and policies: The development has a direct bearing on the National Environmental Management Act (NEMA)(Act No. 107 of 1998, as amended) at both national and provincial levels. The proposed development activity applied for, is listed under Activity 40 (ii) of Listing Notice 1, published under the Environmental Impact Assessment (EIA) Regulations, 2014, (GN R. 983) of the National Environmental Management Act (NEMA)			Noted. Therefore the submission of this BAR is in line with the listed requirements and has been submitted for authorization.
B. Guidelines GDARD requirements: In terms of the Gauteng Conservation Plan version 3.3 (C-Plan), the proposed site is affected by a threatened ecosystem, dominated by Kliprivier Highveld grassland which is considered vulnerable. However, the site is transformed and there are no environmental sensitivities.			All the relevant studies have been conducted in this regard. Please refer to Appendix: • Ecological Specialist Study • Heritage Impact assessment
C. Alternatives: The application has taken into consideration a brief description of the "Proposal" which is for the construction of a chicken house facility with a total of 570m2 footprint in which 1 x 20 000 capacity layer house (427.5m2 footprint) and 1 x waste storage site (140m2 footprint). Although motivation and reasons for not providing alternative sites have been indicated in the			Please note that alternative layouts were considered. Refer to the original and new proposed layout in Appendix C, where Figure C.1 shows the original layout and Figure C.3 shows the revised layout to move the proposed chicken house into an area of lower environmental sensitivity, based on the findings from the

report, other alternatives such as technology and design alternatives must be considered in the Final Basic Assessment Report.			BA ecology specialist study. Technology alternatives are also described (see pg 17 of FBAR). The technology to be used is in line with chicken layer standards, it further leads to chicken welfare as well as complying with best practices in broiler chicken production. In order to ensure the that the existing and proposed development apply best practice measures, 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.
D. Locality map and layout plans or facility illustrations: The illustration of activities must not only show building plants but also show activities inside the building and this must be included in the Final Basic Assessment Report. Plans and illustrations must reflect the proper legends.			Facility illustrations have been included in Appendix C: C.4: Facility illustration of proposed project.
E. EMPr: A site (project) specific EMPr attached to the Draft Basic Assessment Report is noted. The EMPr was incorporate issues raised in this letter as part of the Final Basic Assessment Report.			Please refer to Appendix H of the Final Basic Assessment Report for the EMPr. The issues from the GDARD letter have been included in the EMPr were relevant. For example, Waste Management has been included in section 4K, 5I, 6F of the EMPr.
F. Public Participation Process: It is noted that the Draft Basic Assessment Report (DBAR) is currently			All public participation information including the

being circulated for comment and that part of the public participation process is undertaken in accordance with the requirements of the regulations in that the site notice was placed on strategic location. However, all public participation information including, but not limited to, newspaper advert, comments and responses report must be attached to the appropriate Appendices in the Final Basic Assessment Report. These must include confirmation from the City of Ekurhuleni Metropolitan Municipality and the Environmental Management Division of the City of Ekurhuleni Metropolitan Municipality.			newspaper adverts, BID, site notices, comments and responses report etc are included in Appendix E of this FBAR. The City of Ekurhuleni Metropolitan Municipality, the Environmental Resources and Waste Management have acknowledged the receipt of the Draft BAR and have submitted comments in this regard. Comments from the City of Ekurhuleni have been addressed and have been included in the comments and responses table and can also be found on section E.7.2 of Appendix E.
G. Other issues to be considered: i) The application form indicates Activity 40 of Listing Notice 1, GNR 327 and Activity 12 of Listing Notice 3, GNR 324 that have been applied for, however the Draft Basic Assessment Report only indicated activity 40 of Listing Notice 1 and not Activity 12 of Listing Notice 3. The Final Basic Assessment Report must reflect all activities as indicated in the application form and a detailed explanation why such an Activity (activity 12) was included. ii) A bulk services report to determine infrastructure capacity to cater for the proposed development must be included in the Final Basic Assessment Report. This must include proof of assurance of water supply from the existing borehole on the property to cater for the proposed activity. iii) The Department's directorate of pollution and waste management must be consulted regarding the waste management plans. Waste Management plan must take into consideration all waste streams to be generated during construction and operation phases, must be compiled and included in the Final Basic Assessment Report.			i) Table 1 on page 8 of the Basic Assessment report has been amended to include GNR 324 Activity 12 (i): *The clearance of an area of 300 square metres or more of indigenous vegetation except where such clearance of indigenous vegetation is required for maintenance purposes undertaken in accordance with a maintenance management plan:* *c,i)Within any critically endangered or endangered ecosystem listed in terms of section 52 of the NEMBA or prior to the publication of such a list within an area that has been identified critically endangered in the National Spatial Biodiversity Assessment 2004.* The description of the project in line with the listed activity: The proposed expansion will have a development foot print of 570 m2 (1 x chicken layer facility of 427.5 m2 and 1x waste storage site of 140 m2). The development falls within the Endangered Tsakane Clay Grassland vegetation unit,, and the Critically Endangered Kliprivier Highveld Grassland Ecosystem as

iv) A detailed stormwater analysis must be carried out and the report must be included in the Final Basic Assessment Report. v) All information to be submitted as part of the Final Basic Assessment Report for the proposed activity must be clear enough to be reviewed.			listed under section 52 of NEMBA). ii) Proof of the registered Borehole on the development site has been received as well as Proof of Municipal services (Account on Refuse Removal). Both are provided in Appendix F. iii) The Waste Management Plan that has been incorporated into the EMPr (Appendix H of the Final Basic Assessment Report) was submitted and accepted by Ms Precious Tshikovhi, Environmental Officer Production Grade A: Waste Management, of the Gauteng Department of Agriculture & Rural Development. Also see section 2 of the comments and responses that has the Waste Management Plan submitted for review and confirmation to the Department. iv) Detailed storm water management can only be confirmed in the design/construction phase as the plan will depend on micro-siting. The applicant will adhere to this comment in the correct phase of the project. A simple Stormwater Management Plan has been incorporated into the EMPr that forms part of this Basic Assessment. Please Refer to section E.8.2. and Appendix H of the Final Basic Assessment for the EMPr. v) All information provided is to the best of the EAP and Applicant's ability is complete and has been submitted as part of the Final Basic Assessment Report.
Comments from The City of Ekurhuleni Metropolitan Municipality: Environmental Resources and Waste Management Department	**Ms F. Mabindisa: Head of**	**11/09/2018**	

	Department-Environmental Resource and Waste Management		
2. Based on the above tools and the information contained in the application, the department does not object to the proposed activities and comment as follows: 2.1. The site proposed development consists mainly of "Other Natural Areas" and "No Natural Remaining", in terms of the Bioregional Plan 2012. "Other Natural Areas", are areas which still contain natural habitat but that are not required to meet biodiversity thresholds. "No Natural Remaining", are areas that are transformed or degraded and which is not required as Ecological Support Areas, including intensive agriculture, urban development, industry and infrastructure.			Thank you. Noted and Agreed.
2.2. The site has a moderate to high ecological sensitivity rating, and may have geotechnical, agricultural and ecological development constraints.			Thank you. Noted and Agreed.
2.3. The site may contain endangered Tsakane Clay Grassland vegetation.			Thank you. Noted and Agreed.
2.4. The Gauteng EMF indicate that the proposed development area falls within the following zone: 2.4.1. Zone 4, Normal Control Zone. This zone is dominated by agricultural uses outside the urban development zone, and agriculture and rural development that support agriculture should			Thank you. Noted and Agreed.

be promoted.			
2.5. During a site inspection of the proposed development, the official noted stormwater drains and a small attenuation pond in the nearby vicinity. The applicant must ensure that no contaminants enter the City OF Ekurhuleni stormwater system or the surrounding environment. Stormwater management systems must be installed, i.e. cut-off drains, on the perimeter of the property / facilities to aid in capturing and preventing any contaminants from entering the City OF Ekurhuleni stormwater system or the surrounding environment.			Detailed storm water management can only be confirmed in the design/construction phase as the plan will depend on micro-siting. The applicant will adhere to this comment in the correct phase of the project. Kindly refer to section E.8.1. which refers to storm water management for all phases, also refer to the EMPr.
2.6. Figure 2, Site layout of the preferred alternative (page 22 and Appendix C) need to be more descriptive to indicate the uses of the current structures and proposed structures on the property.			Facility illustration have been included in Appendix C : C.4: Facility illustration of proposed project.
2.7. All waste must be disposed of in the correct manner in in accordance with relevant National Legislation and Local By-Laws.			Thank you. Noted and Agreed. Refer to Section 8.1. and Appendix H, EMPr for the Waste Management Plan.
2.8. Records of waste disposal must be kept on site, this include: 2.8.1. The waste material converted to manure / fertilizer which is distributed to local farmers; and 2.8.2. Animal carcasses that is disposed at the correct facility.			Thank you. Noted and Agreed. Refer to Section 8.1. and Appendix H, EMPr for the Waste Management Plan.
2.9. The site plan does not indicate the location for waste management i.e. drying of waste product and processing to be used as fertilizer.			The Chicken waste to be used for manure will be stored on the waste storage site. Treatment will occur while stored. For further information on waste management please refer to Section 7.1 and Appendix H for the EMPr.
2.10. The applicant must supply proof that the borehole on the			Thank you. Noted. As part of the development planning a borehole drilling test was conducted (see

property is registered with the National Department of Water and Sanitation for its intended use. Further to this, the applicant must keep record of water consumption.			Appendix F for drilling test information). The Applicant is currently
2.11. During the site inspection conducted by the official, it was noted that a second chicken layer was under construction behind the existing chicken layer. This additional structure was not noted on any photographs or layout maps within the DBAR.			Noted and Agreed. The Applicant has been made aware of his transgression and has been informed to cease with the construction of the facility.
2.12. Recommendations contained in the following reports must be implemented: 2.12.1. Ecological Specialist Study, CSIR, July 2018; 2.12.2. Heritage Impact Assessment, HCAC, November 2017; 2.12.3. Guideline manual for the management of abattoirs and other waste of animal origin, GDARD, 2009; and 2.12.4. Environmental Management Programme, CSIR, August 2018.			Thank you. Noted and Agreed.
2.13. The applicant must apply for a Public Health Permit from the City of Ekurhuleni's Environmental Health Department.			The Applicant has applied for a Public Health Permit as requested, from the City of Ekurhuleni. Refer to Appendix F.
2.14. The applicant must comply with the City OF Ekurhuleni Metro Public Health By-law as well as the National Norms and Standards related to Public Health			Thank you. Noted and Agreed. The Applicant has applied for a Public Health permit for a poultry facility (see Application in Appendix F).

Appendix E.7: Waste Management and Stormwater Management Plans

Appendix E.7.1- Waste Management Plan (as submitted to GDARD's Directorate of Pollution and Waste Management; also integrated into the EMPr)

Construction Phase:

Anticipated construction solid waste to be produced includes building rubble, packaging material, overburden material and general litter from construction staff. It is recommended that construction waste/rubble will be collected and stored temporarily in designated containers for the different waste types, and thereafter disposed of at the nearest appropriate licensed waste disposal site.

Waste will be disposed of at an appropriate licensed landfill site, possibly at the nearest landfill site to dispose of building rubble.

Operational Phase:

Solid waste generated during the operational phase, normal waste, constituting household rubbish and consumables, will be stored in suitable bins and transported to the nearest licenced disposal site. Chicken waste will be produced collectively when cleaning the facilities during each cycle which can be 3 to 6 months. This waste will be removed from the layer facility and used as fertilizer for the existing vegetable garden the plot, and will be distributed as fertilizer to local farmers.

The waste produced by the chicken layer facility (approximately 50m3, per month) will be used as fertilizer, which will be created for the vegetables by method of a separation procedure, and stored in 12 kg bins. The recent increased interest in composting has arisen because of the need for environmentally sound waste treatment technologies. Composting is seen as an environmentally acceptable method of waste treatment.

The stored manure will be treated, during storage. The reasons for treatment include:

- Odour control.
- Energy recovery.
- Reduction of manure volume—especially where extended transportation is necessary.
- Reduction of nutrient content—in some circumstances where insufficient land is available to receive the manure.
- Enhance (speed up) the decomposition of manure.

The process destroys pathogens, converts N from unstable ammonia to stable organic forms, reduces the volume of waste and improves the nature of the waste. The recommended upper limit for moisture content of substrates to be composted is reported to be 65%. However, composting may be feasible with initial moisture contents above 65% as long as there is enough air in the compost to satisfy the oxygen needs of the microbes.

All waste generated, except for chicken manure (to be used as compost or sold as compost), cults and mortalities, will always be disposed of at a nearby registered disposal site.

Effluent Waste

In the process of cleaning the broiler houses with a low toxicity biodegradable liquid will be used, this will result is a slurry mix of the liquid with parts of chicken manure and mortalities. This liquid will have little impact on the environment. Chicken Cults and mortality waste, will be handle with care disposed of appropriately, in accordance to the **GUIDELINE MANUAL FOR THE MANAGEMENT OF ABATTOIRS AND OTHER WASTE OF ANIMAL ORIGIN (GDARD, 2009).**

A designated waste storage area will be constructed and the chicken waste will be stored in 12kgs bags. The waste will be a mixture of saw dust and chicken faeces. The manure will be dried in the attempt to be distributed fertilizer to local agricultural farms as well as for the existing vegetable garden.

A. Waste Management				
4.1. 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.	4.1.1. 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.	Inspection of the temporary waste storage area.	Daily
		4.1.2. Should the on-site storage of general waste and hazardous waste exceed 100 m^3 and 80 m^3 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.		
		4.1.3. Ensure that the construction site is kept clean at all times and that construction personnel are made aware of correct waste disposal methods.	Conduct training for all construction personnel.	Once-off during construction and ensure that all new staff are inducted. Discuss weekly during HSSE meetings.
		4.1.4. 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.	Monitor waste generation and collection throughout the construction phase.	Daily
		4.1.5. No solid waste may be burned or buried on site.	Monitor via site audits and record non-compliance and incidents.	Daily
		4.1.6. Segregation of hazardous waste from general waste to be in place.	On-site inspection of waste segregation.	Weekly
		4.1.7. Ensure that chicken manure is collected and temporarily stored in compost bins before being sent	Ensure adequate management of waste so	

		out/sold for composting and application	that flies are not a problem. Protect the compost bins are from vermin and scavengers.	
		4.1.8. Waste amounts shall be recorded on a monthly basis.	Waste amounts to be documented. Complete records kept on farm of compost leaving farm through sale or giveaways.	Monthly

B. Spill Contingency, Management and Handling of Chemicals/Dangerous Goods				
4.2. Potential spillage of effluent (from portable sanitation facilities for construction personnel).	Reduce the spillage of domestic effluent and the impact thereof on the environment.	4.2.1. Ensure that normal sewage management practices are implemented during construction such as regularly emptying toilets and ensuring safe transport and disposal of sewage.	Monitor via site audits and record non-compliance and incidents (including incidents that nearly occur).	Monthly
		4.2.2. Ensure that all domestic effluent/waste water is disposed safely at an appropriate, licenced facility by an appointed (suitable) service provider. Ensure that no discharge of waste water to the land surface is permitted. Proof of disposal (i.e. waybills) must be kept on file.	Monitor via site audits and record non-compliance and incidents. EHS Manager to audit disposal slips.	Monthly
		4.2.3. Ensure that the toilet/sanitation facilities are maintained in a clean, orderly and sanitary condition.	Monitor via site audits and record non-compliance and incidents.	Daily
4.3. Contamination of soil and groundwater through spillage of concrete and cement.	To control concrete and cement batching activities in order to prevent spillages and concomitant contamination of soil,	4.3.1. If any concrete mixing takes placed on site, this must be carried out on an impermeable surface (such as on boards or plastic sheeting and/or within a bunded area with an impermeable surface).	Monitor the handling and storage of sand, stone and cement as instructed.	Daily
		4.3.2. Concrete mixing areas must be fitted with a		

	groundwater and the marine environment.		containment facility for the collection of cement-laden water. This facility must be impervious to prevent soil and groundwater contamination.		
		4.3.3.	Bagged cement must be stored in an appropriate facility and at least 10 m away from any water courses, gullies and drains.		
		4.3.4.	A washout facility must be provided for washing of concrete associated equipment. Water used for washing must be restricted.		
		4.3.5.	Hardened concrete from the washout facility or concrete mixer can either be reused or disposed of at an appropriate licenced disposal facility.		
		4.3.6.	Empty cement bags must be secured with adequate binding material if these will be temporarily stored on site. Sand and aggregates containing cement must be kept damp to prevent the generation of dust.		
		4.3.7.	Any excess sand, stone and cement must be removed from site at the completion of the construction period and disposed at a registered disposal facility.		
Potential spillage of domestic effluent from the sewer as a result of the operation.	Reduce the spillage of domestic effluent and the impact thereof on the environment.	0.0.1.	A maintenance plan for the management of the sewer pipes in cases of emergency should be developed.	Compile sewer maintenance plan.	Once off (and thereafter updated as required during the operational phase).
Potential spillage of chicken effluent.	Reduce likelihood of spillage of chicken effluent.	0.1.1.	Proper management of fertilizer separation and transportation of waste should be maintained.	Adhere to waste removal from chicken houses and effluent separation best practice.	Once off (and thereafter updated as required during the operational phase).
Human Health effects due to emergency on site	Reduce effects on human health and/or death by having a thorough	0.2.1.	Develop a sound evacuation and emergency preparedness plan in the event of explosions, fire etc.	Compile plan and train personnel to execute this plan in the event of an	Once off (and thereafter updated as required during

	emergency preparedness plan in place and trained staff to execute this plan.		emergency. Actions in plan could include: - Proper escape routes according to the design on the facility once it is operational. - Proper use of fire extinguishers etc. - Protocol to be followed in the event of explosions etc. - Protocol to be followed in the event of a death or injury to an employee.	the operational phase).

C. Safety, Health and Environment				
6.1. Pollution of the surrounding groundwater as a result of spillages, generation of building rubble and waste scrap material.	Prevent unnecessary pollution impacts on the surrounding environment.	6.1.1. The site should be cleaned regularly and all demolition waste (i.e. concrete, steel, rubble, packaging material etc.) must be removed from site and disposed at a licenced waste disposal facility by an approved Contractor. Waste disposal slips or waybills should be kept on file for auditing purposes as proof of disposal. 6.1.2. All liquid wastes (i.e. used oil, paints, lubricating compounds and grease etc.) must be removed from site and disposed at a licenced hazardous waste disposal facility by an approved waste Contractor. Waste disposal slips or waybills should be kept on file for auditing purposes as proof of disposal.	Monitor activities and record and report non-compliance by undertaking inspections.	Throughout the construction and decommissioning phase.

Appendix E.7.2- Stormwater Management Plan (also integrated into EMPr)

Stormwater management is a way in which to limit the negative impacts on the environment and enhance positive impacts. This section provides methods for removing, reducing or retarding runoff flows, and preventing stormwater runoff constituents, pollutants and contaminants from reaching receiving waters.

Construction Phase

D. Stormwater Management					
4.4. 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.	4.4.1. The appointed Contractor should compile a Method Statement for Stormwater Management during the construction phase.	Compile Method Statement	Once off (and thereafter updated as required).	Contractor
		4.4.2. Provide secure storage for oil, chemicals and other waste materials in order to prevent contamination of	Monitor the bunding and containment structures.	Weekly	EHS Manager

			stormwater runoff.			
		4.4.3.	Construct and install appropriate and effective stormwater infrastructure; including cut-off drains on the perimeter of the property to aid in capturing and preventing any contaminants from entering the City of Ekurhuleni stormwater system or the surrounding environment.	Implement Method Statement for Stormwater; Construct storm water infrastructure.	Once Off	Contactor
		4.4.4.	Regular inspections of stormwater infrastructure should be undertaken to ensure that it is kept clear of all debris and weeds.	Monitor via site audits and record non-compliance and incidents (i.e. by implementing walk through inspections).	Weekly	Contractor, EHS Manager and ECO

Operational Phase

A. Stormwater Management						
Increased stormwater discharge	Reduce the impact of increased stormwater	0.3.1.	A suitable stormwater/ surface	Implement surface water quality monitoring	As agreed during the operational phase.	Project Developer

into the surrounding environment.	discharge to the environment.		water quality monitoring programme should be established and implemented.	programme, based on consultation with the landowner		
		0.3.2.	Regular inspections of stormwater infrastructure should be undertaken to ensure that it is kept clear of all debris and weeds.	Undertake regular inspections of the stormwater infrastructure (i.e. by implementing walk through inspections).	Weekly/Monthly	Farm Manager and EHS Manager

Decommissioning Phase

A. Stormwater Management						
6.2. 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.	6.2.1.	The appointed Contractor should compile a Method Statement for Stormwater Management during the decommissioning phase.	Compile Method Statement	Once off (and thereafter updated as required).	Contractor
		6.2.2.	Provide secure storage for oil, chemicals and other waste materials in order to prevent contamination of stormwater runoff.	Monitor the bunding and containment structures.	Weekly	EHS Manager

BASIC ASSESSMENT REPORT

Appendix F:

Water use license(s) authorisation, SAHRA, information, service letters from municipalities, water supply information.

CONTENTS

Service Letters (municipal account)

City of Ekurhuleni — a partnership that works

Eastern Service Delivery Region
Brakpan Service Delivery Centre
PO Box 15
Brakpan

TAX INVOICE
VAT Reg No. 4280193403

Enquiries: 011 999
Complaints: 011 999

NAME	PERKUR EENTERPRISE PTY LTD
ACCOUNT NUMBER	3406464842
WARD No.	99
PAYMENTS INCLUDED UNTIL	2018/10/31
VAT Reg. No.	
STREET ADDRESS	226 MANS STREET/STRAAT
ELECTRICITY/WATER DEPOSIT CASH	0.00
ELECTRICITY/WATER DEPOSIT GUARANTEE	0.00
STATEMENT DATE	2018/10/27
TOWNSHIP	WITHOK ESTATES AH
VALUATION SITE	
VALUATION IMPROVEMENTS	336000
VALUATION TOTAL VALUE	336000
ERF NUMBER	H66 000 00000226
PORTION	00000 0000 0000
AREA m²	40442

DATE	ICON	DETAILS	CHARGE (EXCL. VAT)	VAT	CHARGE (INCL. VAT)
09/27		BALANCE BROUGHT FORWARD	2403.56		2403.56
10/17		PAYMENT - THANK YOU	-2404.00		-2404.00
		SUB TOTAL	-0.44		-0.44
10/27	RATES	PROPERTY RATES FARMS - V	68.60		68.60
10/27	REFUSE	REFUSE: DOMESTIC 240L BI	162.24	24.34	186.58
		TOTAL CURRENT LEVY	255.18		

30 DAYS	60 DAYS	90 DAYS	90+ DAYS	TOTAL CHARGE (EXCL. VAT)	TOTAL VAT	TOTAL CHARGE (INCL. VAT)
0.00	0.00	0.00	0.00	230.40	24.34	254.7

AMOUNT IN ADVANCE: 0.00
DUE DATE: 2018/11/25
AMOUNT PAYABLE: 255.00

MESSAGE

City of Ekurhuleni — a partnership that works

REMITTANCE ADVICE

PLEASE ATTACH PERFORATED STUB TO ALL CHEQUE PAYMENTS

402 3406464842

EasyPay

>>>>>> 9 1337 3406 4648 425

Name: PERKUR EENTERPRISE PTY LTD
Account Number: 3406464842
Due Date: 2018/11/25
Amount Payable: 255.00

Water Supply Information (Borehole)

BOREHOLE DRILLING RECORD

CUSTOMER	Mr. Lesego Senokwane
Physical Address	226 Mans Street, Brakpan
Supplied by	Hardrock Drilling (Pty) Ltd
Date of Drilling	8 July 2016
Drilling operator	Dewald Deidericks
Estimated Capacity (blow yield test)	5000LPH
Depth	40m
Casing 6.5"	26m
Casing 5"	40m

THE VOLUME IS NOT A GUARANTEE AT A FUTURE DATE.

BOREHOLE GUARANTEE: 12 MONTHS EXCLUDING ACCIDENTAL OR DELIBERATE DAMAGE.

Signed

Hardrock Drilling (Pty) Ltd
P.O. Box 30738
Kyalami 1684
Tel: 011 319-2324

Application for Public Health Permit

EKURHULENI METROPOLITAN MUNICIPALITY
HEALTH AND SOCIAL DEVELOPMENT DEPARTMENT : ENVIRONMENTAL HEALTH DIRECTORATE

APPLICATION:
PUBLIC HEALTH PERMIT
(In terms of Ekurhuleni Metropolitan Municipality Public Health By-Laws, Local Authority Notice 1908 of 27 November 2009: Schedule 2 (Part A)

Prior to this Office considering the application for the issuing of a Public Health Permit, it would be required of you to provide this Office with written confirmation from the Development Planning Department of the current zoning of the premises for intended business

Select type of Permit / Health certificate			Deposit to: **Permit & Certificate Account**
Provision of service to remove human excrement or urine		R549	
Installation of sewage works		R549	Vote no: **2506101354500**
Offensive trades		R549	
Hairdressing, beauty and cosmetology services		R549	
Accommodation establishments		R997	
Child care services(floor plan of in- & outdoor measurements, operation times)		R369	
Keeping of poultry		R549	**NIGEL CUSTOMER CARE AREA**
Keeping of rabbits		R549	
Dog kennels and catteries		R586	
Keeping of bees		R586	
Sale of second hand goods	Type:		

Name of applicant:	LESEGO JOSEPH SENOKWANE		
Name of business / institution:	LEWIN AGRIBUSINESS PTY LTD		
ID number:	7203165840086		
Telephone landline:		**Cell phone no:**	0715116571.
Fax number:		**E-mail address:**	lesegosenokwane@gmail.com
Physical address:	226 MANS STREET WITHOK WEST BRAKPAN		
Stand number:	0226	**Suburb:**	WITHOK.
Postal address:	SAME AS ABOVE		
Exemptions applied for: (If applicable, attach separate motivation):			
Signature of Applicant:		**Date:**	19/10/2018

Edenvale CCA ☎011 999-3330 🖷011 999-4581	Germiston CCA ☎011 999-5737 🖷0866836409	Springs CCA/KwaThema CCA ☎011 999-8771 🖷011 999-8912
Tembisa 1 & 2 CCA ☎011 999-4211 🖷011 920-1011	Alberton CCA ☎011 999-0536 🖷011 871-7527	Nigel CCA ☎011 999-9236 🖷011 999-9006
Benoni CCA ☎011 896-8453 🖷0866241938 🖷011 999-7083	Tokoza CCA/Katlehong CCA ☎011 999-2751 🖷011 999-2151 ☎011 851-2221	Tsakane /Duduza CCA ☎011 999-8032 🖷0865256078
Kempton Park CCA ☎011 999-3952 🖷011 999 4754	Boksburg CCA ☎011 999-5407/5244 🖷0866547905 🖷011 892-0535	Daveyton CCA/Etwatwa CCA ☎011 999-8453 🖷0866241938 🖷011 999-7083
Corporate Office ☎011 999-2970 🖷011 999 2897	Vosloorus CCA ☎011 999-5897 🖷0866547905 🖷011 892-0536	Brakpan CCA ☎011 999-8453 🖷0866241938 ☎011 999-8148 🖷011 999-7083

South African Heritage Resources Agency Letter

Expansion of Egg Layer Facility

Our Ref: 11201

an agency of the Department of Arts and Culture

T: +27 21 462 4502 | F: +27 21 462 4509 | E: info@sahra.org.za
South African Heritage Resources Agency | 111 Harrington Street | Cape Town
P.O. Box 4637 | Cape Town | 8001
www.sahra.org.za

Enquiries: Andrew Salomon
Tel: 021 462 4502
Email: asalomon@sahra.org.za
CaseID: 11201

Date: Tuesday August 08, 2017
Page No: 1

Letter

In terms of Section 38 of the National Heritage Resources Act (Act 25 of 1999)

Attention: Mr Lesego Senokwane
Lewin AgriBusiness

Lewin AgriBusiness (Pty) Ltd is a business that is family owned located in Withok Estates, Plot 226 Mans Street, Brakpan, Benoni (Co-odinates: 26°18' 47.16"S; 28°19' 20.28"E), which is 4.4 hectares in size. Lewin AgriBusiness currently run a 5000 chicken egg-layer facility that will produce 2 750 000 eggs annually. The business employs 3 full time employees and occasional casual labours.

Thank you for your notification regarding this development.

In terms of the National Heritage Resources Act, no 25 of 1999, heritage resources, including archaeological or palaeontological sites over 100 years old, graves older than 60 years, structures older than 60 years are protected. They may not be disturbed without a permit from the relevant heritage resources authority. This means that prior to development it is incumbent on the developer to ensure that a **Heritage Impact Assessment** is done. This must include the archaeological component (Phase 1) and any other applicable heritage components. Appropriate (Phase 2) mitigation, which involves recording, sampling and dating sites that are to be destroyed, must be done as required.

The quickest process to follow for the archaeological component is to contract an accredited specialist (see the web site of the Association of Southern African Professional Archaeologists www.asapa.org.za) to provide a Phase 1 Archaeological Impact Assessment Report. This must be done before any large development takes place.

The Phase 1 Impact Assessment Report will identify the archaeological sites and assess their significance. It should also make recommendations (as indicated in section 38) about the process to be followed. For example, there may need to be a mitigation phase (Phase 2) where the specialist will collect or excavate material and date the site. At the end of the process the heritage authority may give permission for destruction of the sites.

Where bedrock is to be affected, or where there are coastal sediments, or marine or river terraces and in potentially fossiliferous superficial deposits, a Palaeontological Desk Top study must be undertaken to assess whether or not the development will impact upon palaeontological resources - or at least a letter of exemption

Expansion of Egg Layer Facility

Our Ref: 11201

an agency of the
Department of Arts and Culture

T: +27 21 462 4502 | F: +27 21 462 4509 | E: info@sahra.org.za
South African Heritage Resources Agency | 111 Harrington Street | Cape Town
P.O. Box 4637 | Cape Town | 8001
www.sahra.org.za

Enquiries: Andrew Salomon
Tel: 021 462 4502
Email: asalomon@sahra.org.za
CaseID: 11201

Date: Tuesday August 08, 2017
Page No: 2

from a Palaeontologist is needed to indicate that this is unnecessary. If the area is deemed sensitive, a full Phase 1 Palaeontological Impact Assessment will be required and if necessary a Phase 2 rescue operation might be necessary. **Please note that a nationwide fossil sensitivity map is now available on SAHRIS to assist applicants with determining the fossil sensitivity of a study area .**

If the property is very small or disturbed and there is no significant site the heritage specialist may choose to send a letter to the heritage authority motivating for exemption from having to undertake further heritage assessments.

Any other heritage resources that may be impacted such as built structures over 60 years old, sites of cultural significance associated with oral histories, burial grounds and graves, graves of victims of conflict, and cultural landscapes or viewscapes must also be assessed.

Should you have any further queries, please contact the designated official using the case number quoted above in the case header.

Yours faithfully

Andrew Salomon
Heritage Officer: Archaeology
South African Heritage Resources Agency

John Gribble
Manager: Maritime and Underwater Cultural Heritage Unit / Acting Manager: Archaeology, Palaeontology and Meteorites Unit
South African Heritage Resources Agency

Heritage Impact Assessment Executive Summary from Heritage Contracts and Archaeological Consulting (HCAC) – Full Report included in Appendix G

HERITAGE IMPACT ASSESSMENT

(REQUIRED UNDER SECTION 38(8) OF THE NHRA (No. 25 OF 1999)

FOR THE PROPOSED LEWIN CHICKEN LAYER FACILITY, GAUTENG PROVINCE

Type of development:
Agricultural Development

Client:
CSIR

Client info:
Rirhandzu Marivate

E – mail: rmarivate@csir.co.za

Developer: Lewin Agribusiness (Pty) Ltd

HCAC

HCAC - Heritage Consultants
Private Bag X 1049
Suite 34
Modimolle
0510
Tel: 082 373 8491
Fax: 086 691 6461
E-Mail: jaco.heritage@gmail.com

Report Author:
Mr. J. van der Walt
Project Reference:
HCAC Project number 217117
Report date:
November 2017

Executive Summary

Lewin Agribusiness (Pty) Ltd and the CSIR are conducting a Basic Assessment for the Lewin Chicken Layer Facility on Plot 226, Withok Estates, Brakpan, Benoni, Gauteng Province. HCAC was appointed to conduct a Heritage Impact Assessment to determine the presence of cultural heritage sites and the impact of the proposed development on these non-renewable resources. The study area was assessed both on desktop level and by a field survey. The field survey was conducted as a non-intrusive pedestrian survey to cover the extent of Plot 226 as development plans are not available at this stage.

No archaeological sites or material of significance was recorded during the survey. A paleontological desktop study was conducted by Rossouw (2017) that concluded: "*Potential impact on palaeontological remains within the development footprint is considered to be negligible and it is recommended that the planned development is exempt from a full Phase 1 Palaeontological Impact Assessment.*". No further mitigation prior to construction is recommended in terms of the archaeological and paleontological components of Section 35 for the proposed development to proceed.

In terms of the built environment of the area (Section 34), no standing structures older than 60 years occur within the study areas. In terms of Section 36 of the Act no burial sites were recorded. If any graves are located in future they should ideally be preserved *in-situ* or alternatively relocated according to existing legislation. No public monuments are located within or close to the study area. The area is rural in character and the proposed project is in line with the current land use and will not impact negatively on significant cultural landscapes or viewscapes. During the public participation process conducted for the project no heritage concerns was raised.

Due to the lack of significant heritage resources in the study area the impact of the proposed project on heritage resources is considered low and it is recommended that the proposed project can commence on the condition that the following recommendations are implemented as part of the EMPr and based on approval from SAHRA:

- Implementation of a chance find procedure.

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BASIC ASSESSMENT REPORT

Appendix G:

Specialist Study Reports

CONTENTS

Basic Assessment of the Proposed Expansion of a Chicken Layer Facility on a 4.4 hectare farm on plot 226 Withok Estate, Brakpan, Ekurhuleni District, Gauteng.

FINAL ECOLOGY SPECIALIST STUDY

July 2018

Prepared for:
Lewin AgriBusiness (Pty) Ltd

Prepared by:
CSIR
P O Box 320, Stellenbosch, 7599
Tel: +27 21 888 2482
Fax: +27 21 888 2473
Email: RMarivate@csir.co.za

Authors:
Rirhandzu Marivate, Minnelise Levendal and Paul Lochner

The Council for Scientific and Industrial Research (CSIR) conducted a terrestrial ecology study for the proposed expansion of a small-scale chicken layer facility for Lewin AgriBusiness (Pty) Ltd, on Plot 226 Mans Road, Withok Estates, Brakpan, Gauteng Province. The property of approximately 4.4 hectares is zoned for agriculture. On site, there is currently an existing chicken house, housing 5000 chickens that has been operational for approximately 2 years. Lewin AgriBusiness proposes to expand their facility on the property by 35 000 chickens. The expansion will consist of constructing new chicken houses with a total footprint of approximately 570 m².

The site falls within the Tsakane Clay Grassland vegetation type and the Critically Endangered Klipriver Highveld Grassland Ecosystem. However, a desktop research and field investigation conducted in November 2017 indicated that the site has been subjected to previous and current human and agricultural activities with limited remaining natural vegetation. The plot was classified into two vegetation communities based on the species composition, namely *Eragrostis* Disturbed Grassland and Herbaceous Alien Weeds vegetation. Indigenous grasses and herbaceous plants found on site included *Eragrostis curvula, Asclepias fruiticosa* and *Arctosis arctotoides* found in the *Eragrostis* Disturbed Grassland vegetation unit. . Additionally, the Herbaceous Alien Weeds vegetation contains alien invasive plant species that are considered to be Category 1 (Alien and Invasive Species Regulations - Government Gazette No. 37886, 1 August 2014) under the National Environmental Management: Biodiversity Act (Act 10 of 2004). These comprise of *Argemone ochroleuca, Datura ferox*, and *Verbena bonariensis,* and *Opuntia ficus-indica* by the farmhouse and therefore would be required to be removed by law. The development site is situated within close proximity with a number of important rivers and wetlands, and is within 500 m of a pan that contains habitat for species such as the NT Giant Bullfrog. Four protected areas are within 20 km of the development site and host some of the province's important bird life, namely Marievale Bird Sanctuary, Suikerbosrand Provincial Nature Reserve, Rondebult Bird Sanctuary, the Korsman Bird Sanctuary as well as the Blesbokspruit Ramsar Site

Due to the transformation of the site, the ecological sensitivity is considered to be Moderate to Low, with the *Eragrostis* Disturbed Grassland being Moderate and the Herbaceous Alien Weeds vegetation being Low sensitivity. Additionally, a number of fauna species of conservation concern are thought to have a moderate likelihood of occurring, such as the Welwitsch's Hairy Bat, Pallid Harrier, Secretarybird, Giant Bullfrog, Roodeport copper and the Heidelberg copper.

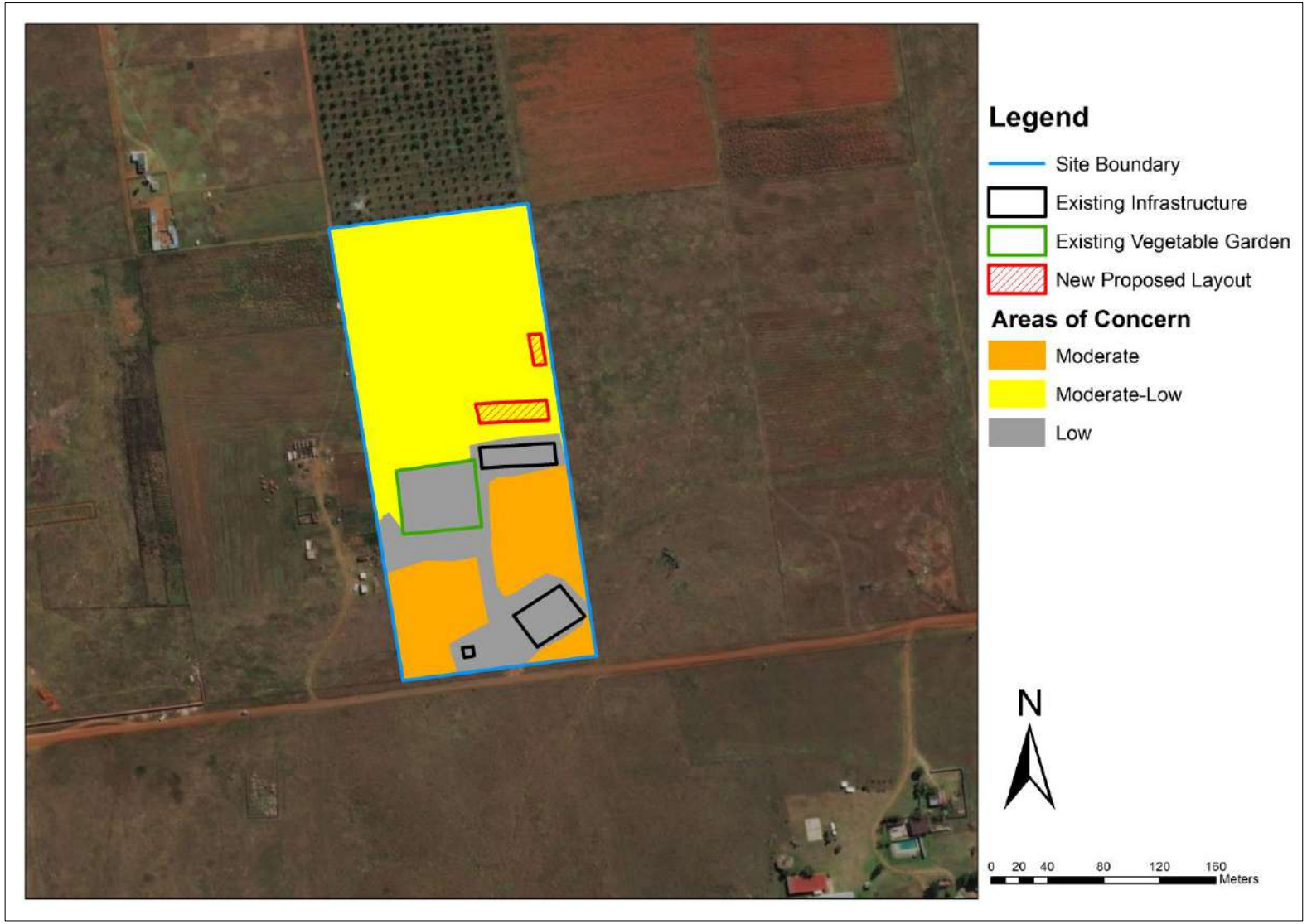
The table below gives a summary of the potential impacts of the proposed project on the ecology and biodiversity of the site, with and without mitigation measures.

Summary of impact significance, without and with mitigation

Potential Impacts	Significance	
	Without mitigation	**With mitigation**
Construction		
1. Loss of transformed terrestrial vegetation and faunal habitat	*Medium*	*Low*
2. Increase in occurrence and spread of alien plant species	*Medium*	*Low*
3. Increased dust and erosion from construction activities	*Low*	*Low*
4. Sensory disturbance on fauna flora from construction activities	*Low*	*Low*
5. Loss of Wetland resources from construction activities	*Medium*	*Low*
Operation		
6. Sensory disturbance on fauna flora from noise and lights from chicken facility	*Medium*	*Low*
7. Contamination of environment from poor waste and chemical management	*Medium*	*Low*
8. Increase in prevalence of pest from poor hygiene and chicken waste management	*Medium*	*Low*
9. Increase of diseases from poor chicken waste management and prevalence of pests on native fauna	*Medium*	*Low*
10. Altered burning	*Low*	*Low*
Decommissioning		
11. Decommissioning and removal of buildings on the flora and fauna on site	*Medium*	*Low*

If the developer continues with the development, they will be required to remove the Category 1b alien invasive species onsite as per the Alien and Invasive Species Regulations (2014). Furthermore, if threatened fauna species are found on the site, the developer will be required to relocate them with input from a specialist. It is also proposed that the development should be relocated to the area of Low sensitivity as seen in the map below.

The development of the chicken layer facility with the implementation of the mitigation measures recommended in this report is predicted to result in an impact on ecology of low significance. Based on the site visit and the information that was available to date, it is the opinion of the CSIR that there are no fatal flaws to the project from an ecological perspective. If the recommended mitigation measures are implemented, the specialists have no objection to the project going forward.



Proposed new layout for Lewin AgriBusiness within environmental sensitivities. Data Source: CSIR, 2017; Google Images, 2018.

Declaration

I, Rirhandzu Marivate, 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 performed 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.

Rirhandzu Marivate
SACNASP Reg. No. 100147/14 **08/05/2018**
(Environmental Science) **Date**

COMPLIANCE WITH THE APPENDIX 6 OF THE 2017 EIA REGULATIONS

Requirements of Appendix 6 - GN R326 (7 April 2017)	**Addressed in the Specialist 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;	Page 5 & Appendix 5
b) a declaration that the specialist is independent in a form as may be specified by the competent authority;	Page 4
c) an indication of the scope of, and the purpose for which, the report was prepared;	Section 2
(cA) an indication of the quality and age of base data used for the specialist report;	Section 6
(cB) a description of existing impacts on the site, cumulative impacts of the proposed development and levels of acceptable change;	
d) the duration, date and season of the site investigation and the relevance of the season to the outcome of the assessment;	Section 2
e) a description of the methodology adopted in preparing the report or carrying out the specialised process inclusive of equipment and modelling used;	Section 3
f) details of an assessment of the specific identified sensitivity of the site related to the proposed activity or activities and its associated structures and infrastructure, inclusive of a site plan identifying alternatives;	Section 8
g) an identification of any areas to be avoided, including buffers;	Section 8
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;	Figure 23
i) a description of any assumptions made and any uncertainties or gaps in knowledge;	Section 3
j) a description of the findings and potential implications of such findings on the impact of the proposed activity or activities;	Section 9
k) any mitigation measures for inclusion in the EMPr;	Section 9
l) any conditions for inclusion in the environmental authorisation;	Section 10
m) any monitoring requirements for inclusion in the EMPr or environmental authorisation;	Section 9
n) a reasoned opinion- i. whether the proposed activity, activities or portions thereof should be authorised; (iA) regarding the acceptability of the proposed activity and activities; and ii. if the opinion is that the proposed activity, activities or portions thereof should be authorised, any avoidance, management and mitigation measures that should be included in the EMPr, and where applicable, the closure plan;	Section 10
o) a description of any consultation process that was undertaken during the course of preparing the specialist report;	Section 4
p) a summary and copies of any comments received during any consultation process and where applicable all responses thereto; and	N/A
q) any other information requested by the competent authority.	N/A
2. Where a government notice gazetted by the Minister provides for any protocol of minimum information requirement to be applied to a specialist report, the requirements as indicated in such notice will apply	

Contents

TABLES

FIGURES

Appendix 1 Fauna (excluding birds) that have been recorded in QDS 2628AD.

Appendix 2 Birds that have been recorded in pentad (SABAP2 2018).

Appendix 3 Approach and terminology used for the impact assessment.

Appendix 4 Curriculum Vitae of Rirhandzu Marivate.

Appendix 5 Letter of confirmation of External Review.

Alien vegetation	Plants that do not occur naturally within the area but have been introduced either intentionally or unintentionally. Vegetation species that originate from outside of the borders of the biome -usually international in origin.
Biome	A broad ecological unit representing major life zones of large natural areas – defined mainly by vegetation structure and climate.
Critical Biodiversity Area	A CBA is an area considered important for the survival of threatened species and includes valuable ecosystems such as wetlands, untransformed vegetation and ridges. CBAs are required to meet biodiversity targets for ecosystems, species and ecological processes as identifies in a systematic biodiversity plan.
Ecological Support Area	An ESA provides connectivity and important ecological processes between CBAs and is therefore important in terms of habitat conservation.
Important Bird and Biodiversity Area	The IBA Programme identifies and works to conserve a network of sites critical for the long-term survival of bird species that: are globally threatened, have a restricted range, are restricted to specific biomes/vegetation types or sites that have significant populations.
Indigenous Vegetation	Vegetation occurring naturally within a defined area.
Red List species	Organisms that fall into the Extinct in the Wild (EW), Critically Endangered (CR), Endangered (EN), Vulnerable (VU) categories of threat status.
Species of Conservation Concern	All RDL (Red Data List) including IUCN (International Union for the Conservation of Nature) listed species as well as protected species of relevance to the project.
Critically Endangered species (CR):	Any indigenous species facing an extremely high risk of extinction in the wild in the immediate future
Endangered species (EN)	Any indigenous species facing a high risk of extinction in the wild in the near future, although it is not a CN species.
Vulnerable species (VU)	Any indigenous species facing an extremely high risk of extinction in the wild in the medium-term future; although it is not a CN species or an EN species
Protected species (PS)	Any species which is of such high conservation value or national importance that it requires national protection under NEM:BA ToPs List. Species listed in this category will include, among others, species listed in terms of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES).

1. INTRODUCTION

The Council for Scientific and Industrial Research (CSIR) has been appointed by the National Department of Environmental Affairs (DEA) to manage the Special Needs and Skills Development Programme. This programme provides *pro-bono* environmental services to community trusts and emerging entrepreneurs with "special needs", i.e. they are from disadvantaged backgrounds without access to financial and other resources that enable them to meet the requirements of the National Environmental Management Act (NEMA), which can then prevent them from implementing projects to support their livelihoods. The programme undertakes Basic Assessments for projects that require this assistance in applying for Environmental Authorisation. This led to the CSIR undertaking this Basic Assessment for Lewin AgriBusiness (Pty) Ltd (hereafter Lewin AgriBusiness) as the applicant qualifies as a special needs applicant and can therefore be assisted under this programme.

This Ecological Assessment was prepared by Rirhandzu Marivate of the CSIR, Cand. Sci. Nat., to inform the Basic Assessment for the expansion of a chicken egg-layer facility that is located on a 4.4 hectare farm on plot 226, Mans Street, Withok Estate, Brakpan, Gauteng (Figure 1). The study was conducted to investigate the potential impacts on the ecology and biodiversity of the proposed development.

Lewin AgriBusiness' property is currently zoned for agriculture. Lewin AgriBusiness currently has a 5000 chicken egg-layer facility on site and proposes to expand the facility by adding another layer house. The expansion will increase the number of chickens in the existing house to 20 000 and an additional 20 000 in the new chicken house (a total of 40 000) that will produce 2 750 000 eggs annually.

The existing chicken facility has a footprint of approximately 1.5 hectares and consists of the following:

- 1x 20 000 capacity layer house (with a footprint of 9.5 m x 45 m)
- 1 x Ablution Facility
- 1 x Office
- 1 x Vegetable garden (with footprint of 90 m x 90 m)
- 1 x Private Residence (with a foot print of 40 m x 25 m)
- 1 x Borehole – water capacity: 7 500 L (2 500 L for chicken facility; 5 000 L general domestic use)

Lewin AgriBusiness proposes to construct the following additional facilities with a total footprint of approximately 570 m².

- 1 x 20 000 capacity layer house (with a footprint of 9.5 m x 45 m = 427.5 m^2)
- 1 x Waste storage site (footprint of 7m x 20 m = 140 m^2).

The focus of this study is the ecological impact of the additional 570 m² development on the site. The layout of the proposed development is provided in Figure 2.

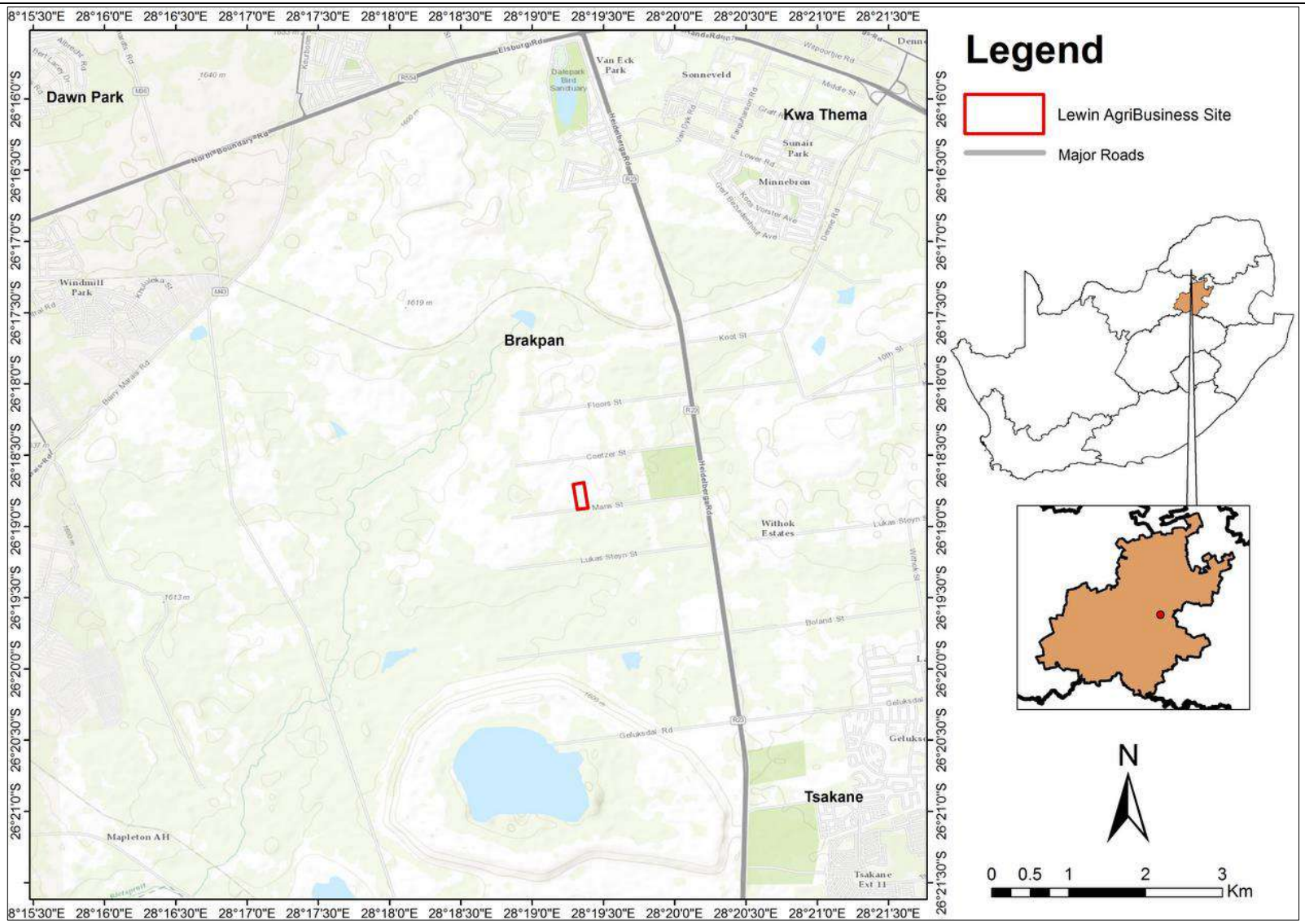


Figure 1: Location of the Lewin AgriBusiness property in Withok Estate, Brakpan, Ekurhuleni District Municipality, Gauteng Province. Source: Chief Surveyor General topographical map coverage at scale of 1: 40 000.

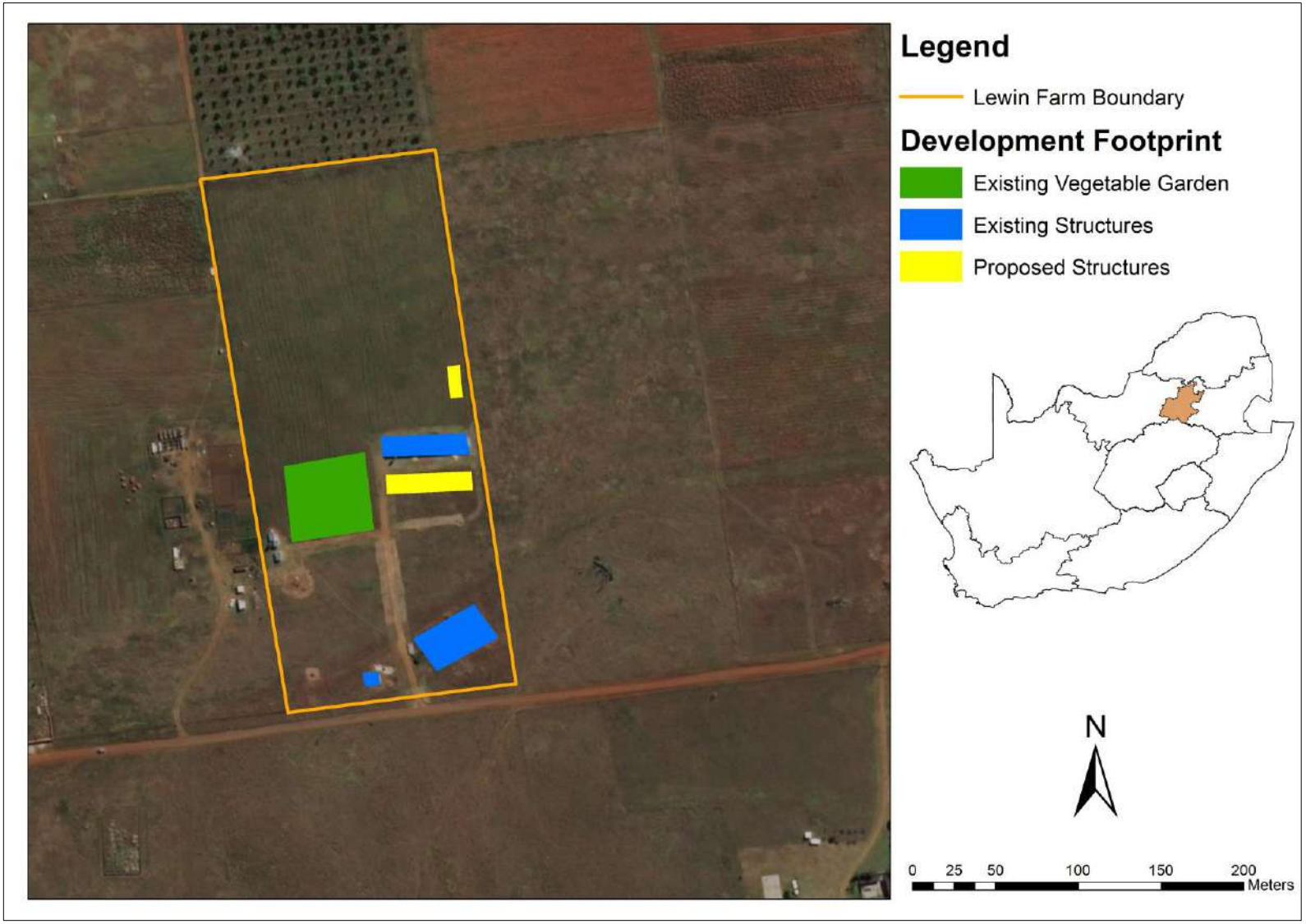


Figure 2: Layout of proposed expansion of chicken egg layer facility. Source: Google Earth Imagery, 2018.

2. SCOPE OF THIS ECOLOGICAL STUDY

The objective of the study was to identify the potential impacts of the proposed expansion of the chicken layer facility on the ecology and biodiversity of the proposed site and surrounding habitat. The study investigated the terrestrial flora and fauna features, which may be impacted by the proposed project as well as habitat diversity and quality on the study site, based mostly on available datasets such as Red List Species and Critical Biodiversity Areas. A site visit was then undertaken to verify the results of the environmental screening desktop analysis and recorded data on floral and faunal species present on the site.

The specific outcomes in terms of this ecology specialist report are to:

- Determine the status and composition of faunal and floral habitats on the proposed site
- Identify any Species of Conservation Concern occurring on the study site
- Identify sensitive landscapes including rocky ridges, wetlands, and any other ecologically important features, if present
- Identify and assess all significant environmental impacts that the proposed development may have on the ecology of the study site, including species of conservation concern
- Develop mitigation measures and management actions to be implemented in order to prevent or remediate the negative impacts to acceptable levels.

These outcomes are provided at a level of detail appropriate to assessing the potential impacts of the proposed expansion of the chicken layer facility on the receiving environment, as required under the EIA Regulations.

3. METHODOLOGY

This ecological assessment was conducted in two phases:

1. A preliminary desktop study was done using publicly available datasets and satellite imagery (e.g. Google Earth). This preliminary screening was aimed at defining a baseline of the proposed site (e.g. biome, vegetation type, species of Conservation Concern), identifying any potential fatal flaws and determine the key features to ground-truth during the site visit. The following databases were consulted during the desktop study:
    - South African National Biodiversity Institute (SANBI) New Plants of Southern Africa (POSA) database (2017) obtained from Botanical Database of Southern Africa (BODATSA), which contains the National Herbarium Pretoria (PRE) Computerised Information System (PRECIS);
    - South African National Biodiversity Institute (SANBI) Threatened Species Programme (TSP, 2017);
    - Gauteng Conservation Plan Version 3.3 (C-Plan, 2011);

- Mucina and Rutherford (2006);
- National Biodiversity Assessment (NBA, 2011);
- Animal Demographic Unit, Virtual Museum (ADU, 2018), including online species distribution data within QDS 2628AD from:
    - MammalMAP (2018).
    - ReptileMAP (2018).
    - FrogMAP (2018).
    - LepiMap (2018) for butterflies.
    - OdonataMAP (2018) for dragonflies and damselflies.
    - ScorpionMAP (2018).
- Birdlife South Africa datasets and guidelines including sourcing frompentad 2615_2815 of the South African Bird Atlas Project (SABAP2, 2018); and
- Most recent Red data List (International Union for Conservation of Nature, 2017), as well as regional red data information, the Gauteng Red List and Orange List Plant Species (GDARD, 2017) and Pretoria National Herbarium Computer Information Systems (PRECIS, 2009).

2. A site visit was then undertaken in accordance with GDARD Biodiversity Study Guidelines (2014) on the 09 November 2017, aiming at verifying the desktop study results. Several Vegetation sampling points were performed on site as illustrated in Figure 3.

Please refer to Appendix 4 of this report for the methodologies relating to the impact assessment and development of mitigation measures.

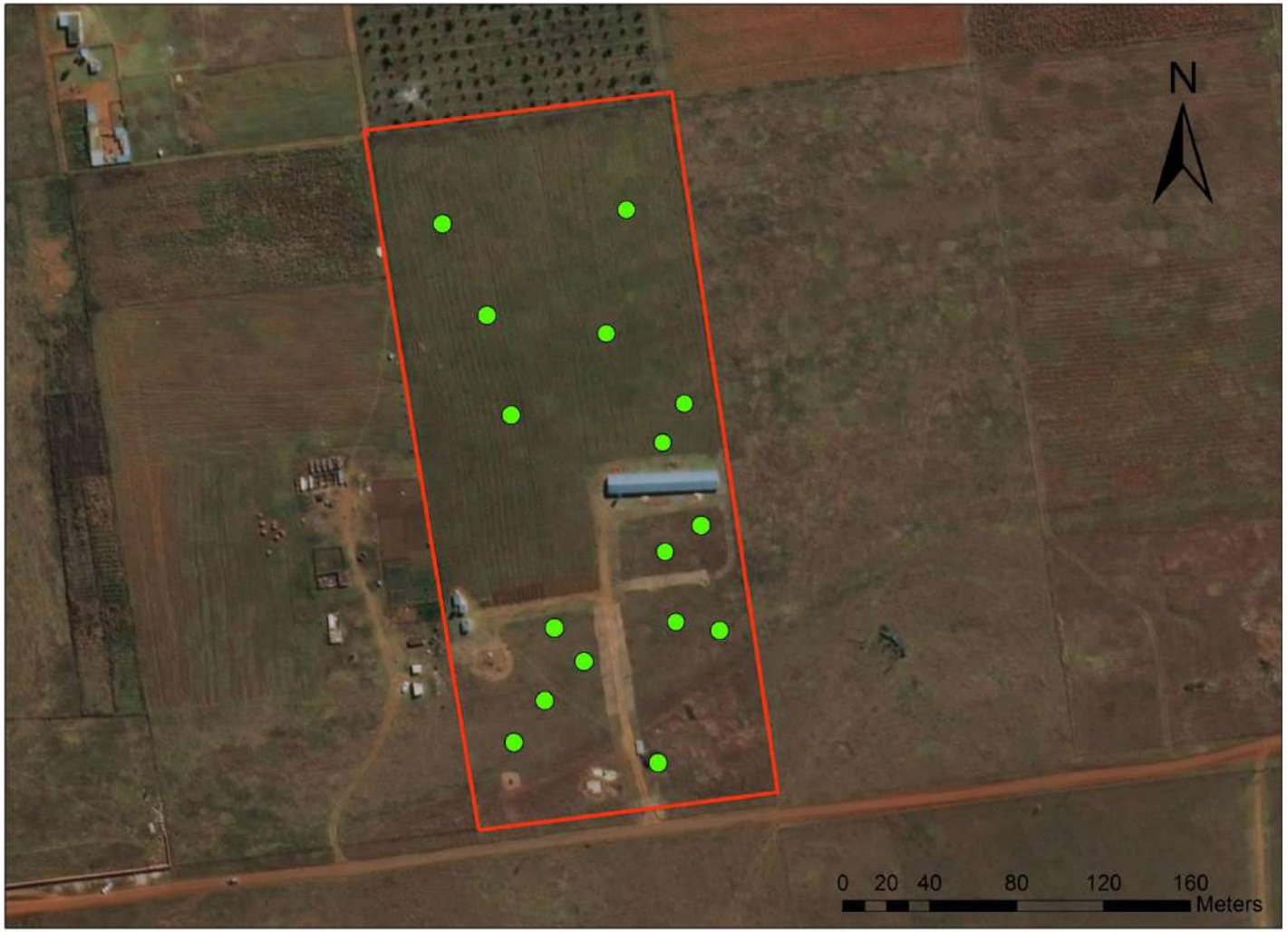


Figure 3: Vegetation sampling points from survey conducted on 9 November 2017. Source: Google Earth, 2018.

4. ASSUMPTIONS AND LIMITATIONS

The following assumptions and limitations are applicable to this study:

- The ecological assessment was conducted within the boundaries of the proposed project area, and excluded the neighbouring and adjacent properties. These were, however, considered as part of the desktop assessment.
- Most of the floral and faunal communities have been considered and assessed accurately; however, some aspects may have been unknowingly overlooked due to the dynamic and seasonal nature of ecosystems.
- The increased level of surrounding anthropogenic activities and the nature and behaviour of most faunal taxa may have affected the number of species that were observed during the site visit. The site observations were also supplemented by information obtained from literature/desktop study where necessary.
- The data presented in this report are based on a single site visit, undertaken in summer on 09 November 2017 by Rirhandzu Marivate and Babalwa Mqokeli of the CSIR.
- A more accurate assessment would require that assessments take place in all seasons of the year. However, on-site data was supplemented with all available desktop data. Nonetheless, given the planning context of the proposed development and findings from the databases accessed and the site visit, the level of information sourced is considered appropriate to inform the decision-making on this proposed development with a footprint of 570 m^2.
- No formal consultation process was undertaken as part of the ecology study, apart from consulting with the project development/ land owner as well as the process undertaken as part of the formal Basic Assessment process (CSIR, 2018: CSIR Report Reference: CSIR/IU/EMS/IR/2017/0005/A).
- Due to the limited time spent on site and the date of the site visit, the lack of detection of species on site does not mean that the species is not present at the site. Furthermore, targeted searching for list of taxa compiled during desktop assessment was not done. Another site visit at a different time of the year e.g. during or following the summer rains could lead to the identification of other faunal and floral species and result in additional observations for the site.
- Extreme wind conditions were experienced during the site visit, and may contribute to the low occurrence of species.
- The site is situated near wetlands, which are over 500 m away from the site boundary. A wetland assessment was not conducted, but the importance of the wetland habitats for species of Conservation Concern and their proximity to the site were taken into account.

5. DESKTOP ASSESSMENT FINDINGS

5.1. Baseline of the proposed site

- **Climate**

The study site is situated in a summer rainfall region with a mean annual rainfall of approximately 630 mm to 720 mm (World Weather Online, 2018). As illustrated in Figure 4, about 80% of the rainfall occurs from October to April. The average midday temperatures range from 16.6°C in June to 26.3°C in January (Figure 5). During winter, the temperature drops to 0.2°C on average during the night. The overall mean annual temperature is 15°C, with the climate transitioning between cool-temperate and warm-temperate. Winters are dry with frequent frost that occurs from mid-April to September. Summers are mild with temperatures that are seldom above 30°C (Mucina & Rutherford, 2006).

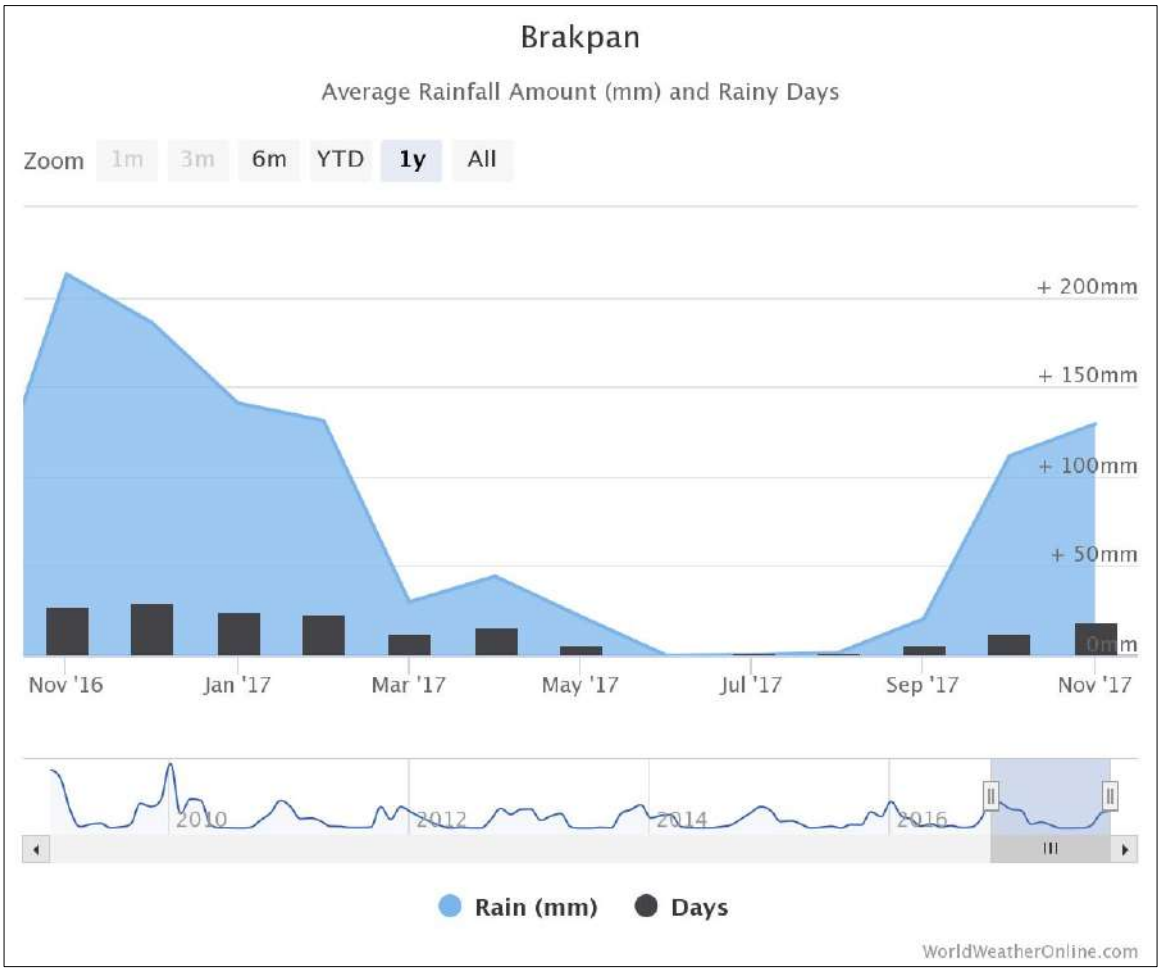


Figure 4: Average rainfall in mm. Source: World Weather Online, 2018.

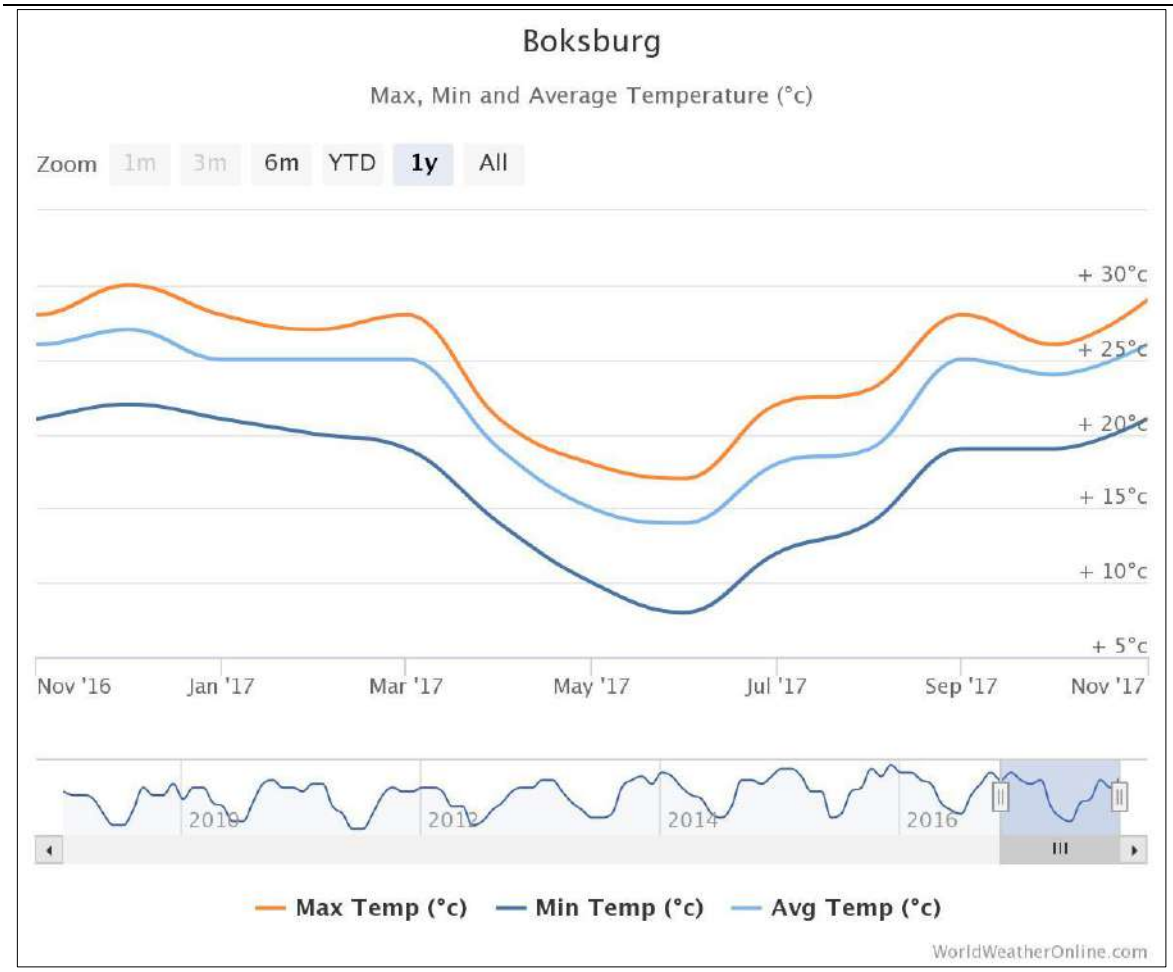


Figure 5: Average temperature in degree Celsius, Source: World Weather Online, 2018.

- **Geology, Soils and Topography**

The Ekurhuleni region is situated on a transition zone between the formations of a large granite batholith on the western border to the formations of the Witwatersrand and Transvaal Supergroups that is dominated by dolomites overlain by younger sediments of the Karoo Supergroup. The dominant formation of Withok Estates is that of dolomite (EMM Biodiversity Report, 2008).The geology of Withok Estates is quartzite and shale that belong to the Transvaal Supergroup overlain by sedimentary rocks of the Madzaringwe Formation of the Ecca Group (Karoo Supergroup) (Figure 6), (Council for Geosciences, 2008). The soils in the region are classed as red or yellow structureless soils with a plinthic horizon and are freely drained. The topography of the area is classified as flat to slightly undulating plains with pans and low hills (EMM Biodiversity Report, 2008; Mucina & Rutherford, 2006).

- **Hydrology**

The sub-surface hydrology of the region is characterised and dominated by dolomite of the Chuniespoort Group (Transvaal Supergroup) and tillites of the Dwyka Group (Karoo Supergroup), both of which carry water (Barnard, 2000). Various geological structures, such as the faults, fissures and fracture zones, and contact zones of intrusion such as dykes and sills dictate the occurrence of groundwater. The region is dominated by Karst, Intergranular and Fractured Aquifers. The Karst Aquifer is the most important aquifer type in South Africa (Kafri, et al., 1985). These aquifers are infiltrated by rainwater containing weak carbonic acid that dissolves the dolomites resulting in caves and cavities that may facilitate the formation of sinkholes. Sinkholes are more likely if the water from these cavities is extracted through boreholes. Groundwater from the Dwyka Group in the area is generally suitable for any use, but the groundwater yield from aquifers in this formation is low. Mining activities in the area threaten groundwater quality from acid water pollution.

The Surface hydrology of the region consists of drainage systems and other water bodies. The Blesbokspruit and Rietspruit rivers are located near the development site. The Blesbokspruit originates from the north of Benoni and Daveyton and flows southwards through Springs and Nigel towards the Vaal River (Barnard, 2000). A section of the Blesbokspruit has been accepted as a wetland under the Ramsar Convention. This catchment includes the Marievale Nature Reserve, while the eastern part consists of extensive natural wetlands. The western part of the catchment is highly modified by agricultural activities and human settlements (EMM Biodiversity Report, 2008). The Rietspruit river originates south-west of Benoni and flows southwards to join the Klip River. These rivers are all polluted from farming, human settlements, and industry activities (Barnard, 2000).

Lastly, there is a prevalence of a large number of pans in the region that are directly linked to the flat topography. Most pans found in the Ekurhuleni area are surrounded by urban areas or agriculture.

The development site falls outside both the Rietspruit and Blesbokspruit catchment areas. Instead, the site fall within a different subquatanary catchment and drains southwards towards an unnamed river located approximately 1 km south of the site boundary. This unnamed river flows from the east to the west to join Rietspruit further west. Furthermore, a small pan is located approximately 300 m south of the site boundary.

- **Vegetation**

The study area is situated in the Grassland Biome of Southern Africa. Summer rainfall combined with dry winters and frost, with marked diurnal temperature variations, are unfavourable to tree growth. Grasslands mainly comprise grasses and plants with perennial underground storage organs, such as bulbs and tubers, with few trees. The Grassland Biome consists of various different vegetation types. According to the most recent vegetation map (Mucina & Rutherford, 2006), the site falls within the Tsakane Clay Grassland (Figure 7). The distribution of the grassland includes Gauteng and Mpumalanga Provinces and occurs in patches extending in a narrow band from Soweto to Springs, broadening southwards to Nigel and from there towards Vereeniging, as well as north of the Vaal Dam and between Balfour and Standerton (including Willemsdal) at altitudes of 1480 to 1680 m. The vegetation is short, dense grassland dominated by a mixture of common Highveld grasses such as *Themeda triandra*, *Heteropogon contortus*, *Elionurus muticus* and a number of *Eragrostis* species. Most prominent forbs are of the families Asteraceae, Rubiaceae, Malvaceae, Lamiaceae and

Fabaceae. A disturbance to the grassland can lead to an increase in the abundance of the grasses *Hyparrhenia hirta* and *Eragrostis chloromelas* (Mucina & Rutherford, 2006*)*. Table 1 lists the dominant plant species in the Tsakane Clay Grassland.

The Tsakane Clay Grassland is considered Critically Endangered by the Threatened Ecosystem List (NEMBA, 2011) with the national target to protect at 24%, but only a handful of patches (1.5%) are statutorily conserved (Suikerbosrand, Olifantsvlei, Klipriviersberg, Marievale reserves) or privately conserved (Avalon, Ian P. Coetser, Andros nature reserves). More than 60% of this grassland is transformed by cultivation, urbanisation, mining, dam-building and roads, while large portions of Alberton, Springs, Tsakane and part of Soweto (all south and east of Johannesburg) were built in the area of this vegetation unit. Urbanisation is increasing and further expansion of especially the southern suburbs of Johannesburg and the towns of the East Rand (especially the Brakpan District) will bring further pressure on the remaining vegetation. The grassland has very low remaining extent of 11% across the entire unit (Mucina & Rutherford, 2006), which has probably reduced further since the last information captured ten years prior.

Table 1: Dominant plant species in the Tsakane Clay Grassland vegetation type. Data source: Mucina & Rutherford, 2006.

Growth Form	**Dominant Species**
Low Shrubs	*Anthospermum rigidum subsp. pumilum, Chaetacanthus setiger, Tephrosia capensis var. acutifolia*
Semiparasitic Shrub	*Thesium impeditum.*
Semiparasitic Herb	*Striga asiatica*
Graminoids	*Brachiaria serrata (d), Cynodon dactylon (d), C. hirsutus (d), Digitaria ternata (d), Elionurus muticus (d), Eragrostis chloromelas (d), E. patentipilosa (d), E. plana (d), E. racemosa (d), Heteropogon contortus (d), Hyparrhenia hirta (d), Microchloa caffra (d), Setaria sphacelata (d), Themeda triandra (d), Trachypogon spicatus (d), Abildgaardia ovata, Andropogon schirensis, Cymbopogon caesius, Diheteropogon amplectens, Melinis nerviglumis, Panicum gilvum, Setaria nigrirostris.*
Herbs	*Acanthospermum australe, Ajuga ophrydis, Eriosema salignum, Euryops transvaalensis subsp. transvaalensis, Gerbera viridifolia, Helichrysum nudifolium var. nudifolium, H. rugulosum, Hermannia depressa, Lotononis macrosepala, Nidorella hottentotica, Pentanisia prunelloides subsp. latifolia, Peucedanum caffrum, Rotheca hirsuta, Selago paniculata, Senecio coronatus, S. inornatus, Sonchus nanus, Vernonia oligocephala.*
Geophytic Herbs	*Aspidoglossum ovalifolium, Hypoxis rigidula var. pilosissima*

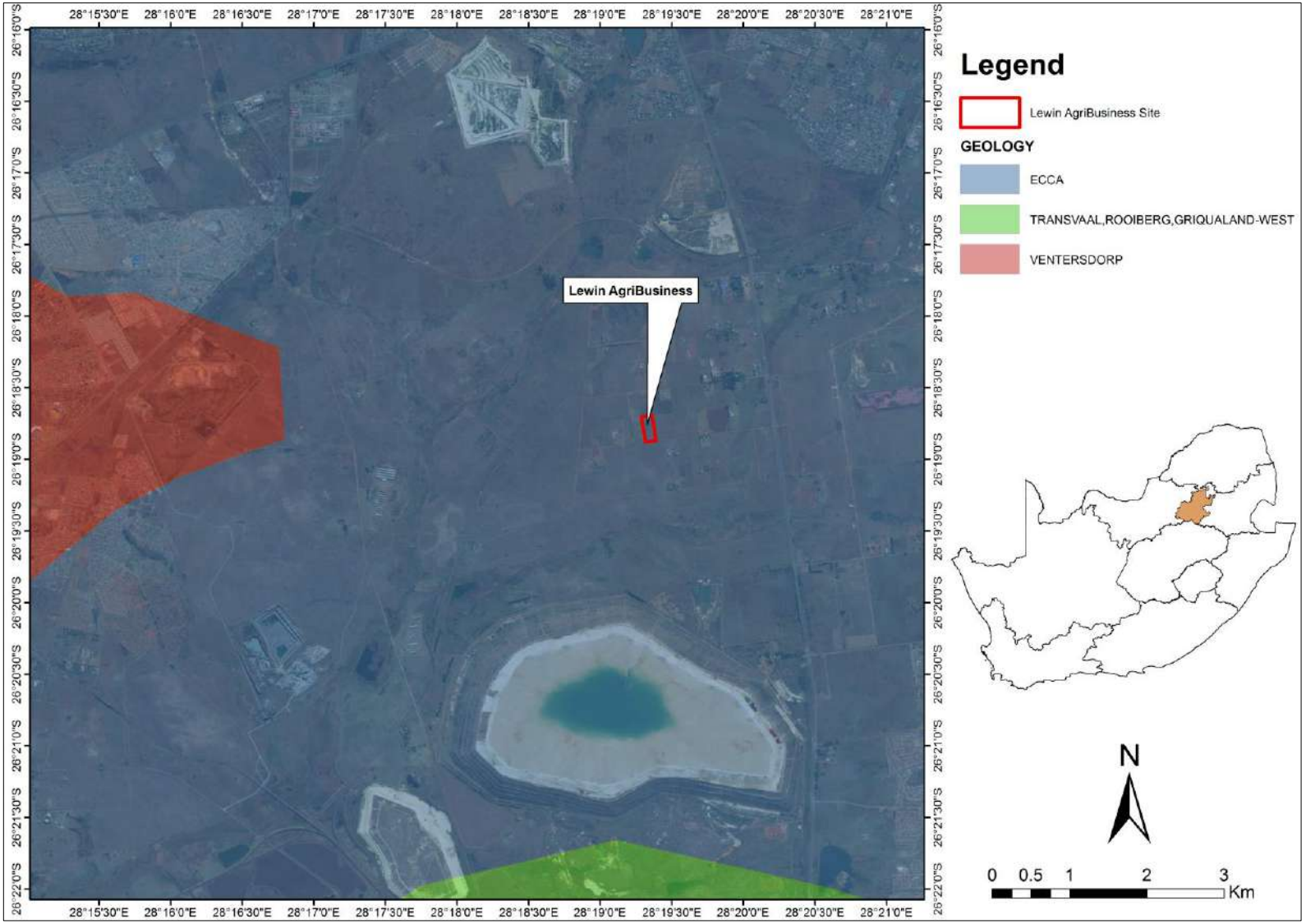


Figure 6: Underlying geology of where the site is located. Data source: Council of Geosciences, 2008.

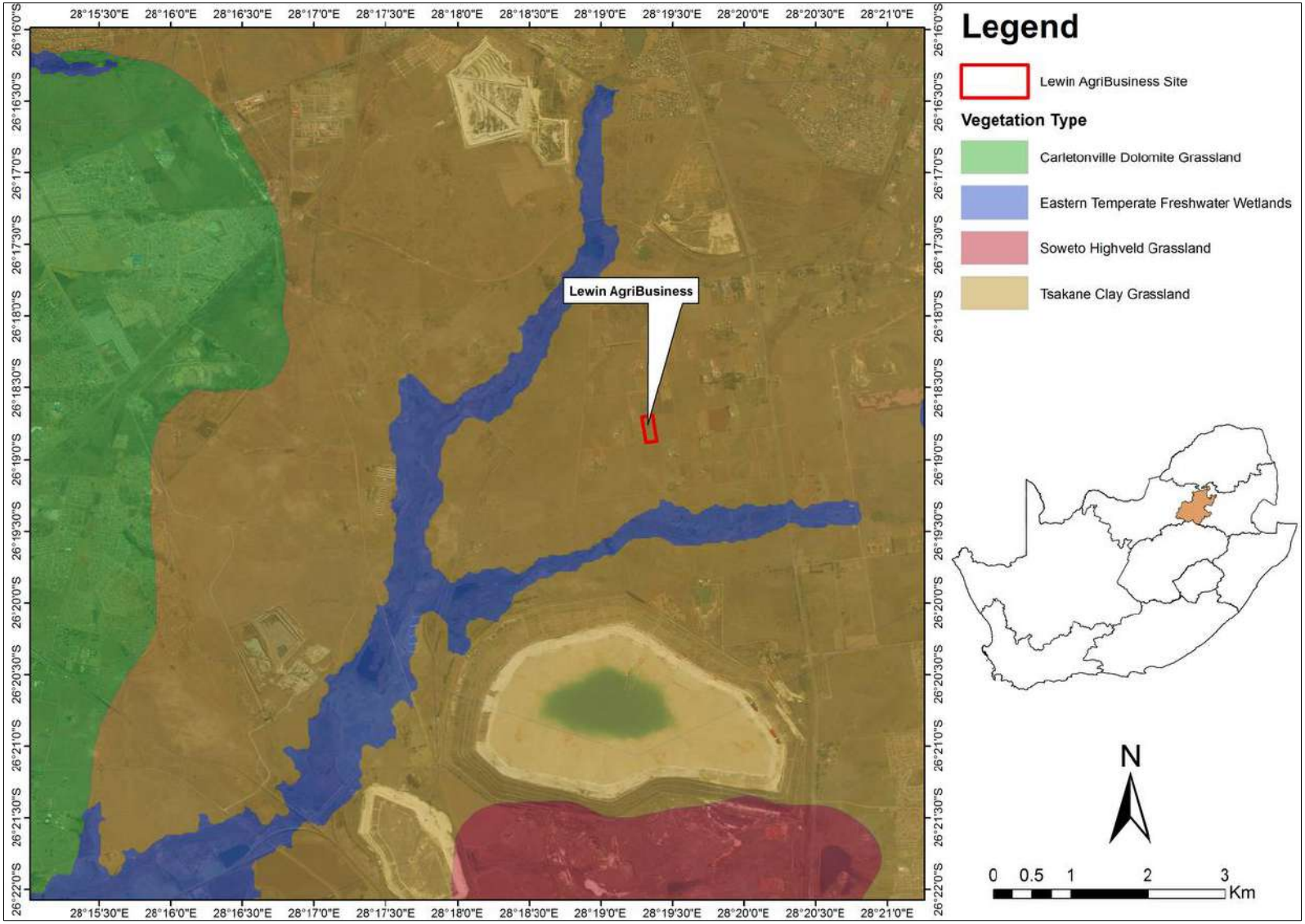


Figure 7: The development site falls within the Tsakane Clay Grassland vegetation type. Data source: SANBI, 2012; Mucina & Rutherford, 2006.

5.2. Literature review

- **Applicable Legislation**

The following legislative requirements were considered during the assessment:

- National Environmental Management Act (Act 107 of 1998) (NEMA).
- National Environmental Management: Biodiversity Act (Act No.10 of 2004) (NEMBA) Regulations (Government Gazette 37885).
- Amended Regulations (Regulation 15) of the Conservation of Agricultural Resources Act (Act 43 of 1983) (CARA).
- NEMBA: Alien and Invasive Species Regulations (2014) (Government Gazette 37885).
- NEMBA: Threatened or Protected Species Regulations (2015) (Government Gazette 38600).
- NEMBA: National List of Ecosystems that are Threatened and in need of Protection (2011) (Government Gazette 34809).

The following documentation was also considered:

- GDARD Requirements for Biodiversity Assessment Version 3.3 (GDARD, 2014).
- Gauteng Conservation Plan Version 3.3 (C-Plan 3.3) (GDARD, 2011).
- Ekurhuleni Metropolitan Spatial Development Framework (Ekurhuleni MSDF, 2015).
- Ekurhuleni Metropolitan Municipality Biodiversity Report (EMM Biodiversity Report, 2008).
- Ekurhuleni Metropolitan Municipality Wetland Report (Fisher, 2017).

- **International Areas of conservation significance**

- *Ramsar Site*. The Blesbokspruit Ramsar Site is situated approximately 16km east of the proposed development site (Ramsar, 1995).
- *World Heritage Site.* There are no World Heritage Sites in the region (within 20 km).
- *Important Bird Areas (IBAs*).
    - The Blesbokspruit Ramsar Site consists of the Marievale Bird Sanctuary, which is also considered part of the Blesbokspruit IBA. The IBA is roughly 14km away from the proposed development site (BirdLife, 2015).
    - Suikerbosrand Nature Reserve is an IBA and is fully protected. The nature reserve is located approximately 12 km south of the development site.

The site does not fall into any proclaimed protected area.

- **Protected Areas**

As stated in the above section, the proposed development site is situated approximately 16km east from Marievale Bird Sanctuary, which is a Provincial Nature Reserve. Habitats in this reserve include shallow open water, reedbeds and grassland, which collectively support more than 240 bird species. These include rare, threatened and protected bird species such as, Black-winged Pratincole, Black-tailed Godwit, Slaty Egret, Yellow Wagtail, as well as Baird's, Pectoral and Buff-breasted sandpipers, and at times Greater and Lesser Flamingos (www.gauteng.net).

Suikerbosrand Provincial Nature Reserve is a protected area situated approximately 12 km south from the project site. This reserve has extensive flora and fauna with over 200 species of birds found. The vegetation ranges from open grassland, wooded gorge, *Acacia* woodland, marshland and rare Bankenveld grassland (www.gauteng.net).

Rondebult Bird Sanctuary is a Local Nature Reserve located approximately 10 km north-west from the development site and consists of a number of pans and vleis. The local reserve hosts mostly water birds (www.birdlife.org.za).

The Korsman Bird Sanctuary is situated in the Westdene Pan and approximately 13 km north of the site and is identified as an important bird area in terms of conservation within the Ekurhuleni Metropol (Fisher, 2017).

Figure 8 shows the location of the development site relative to the Protected Areas.

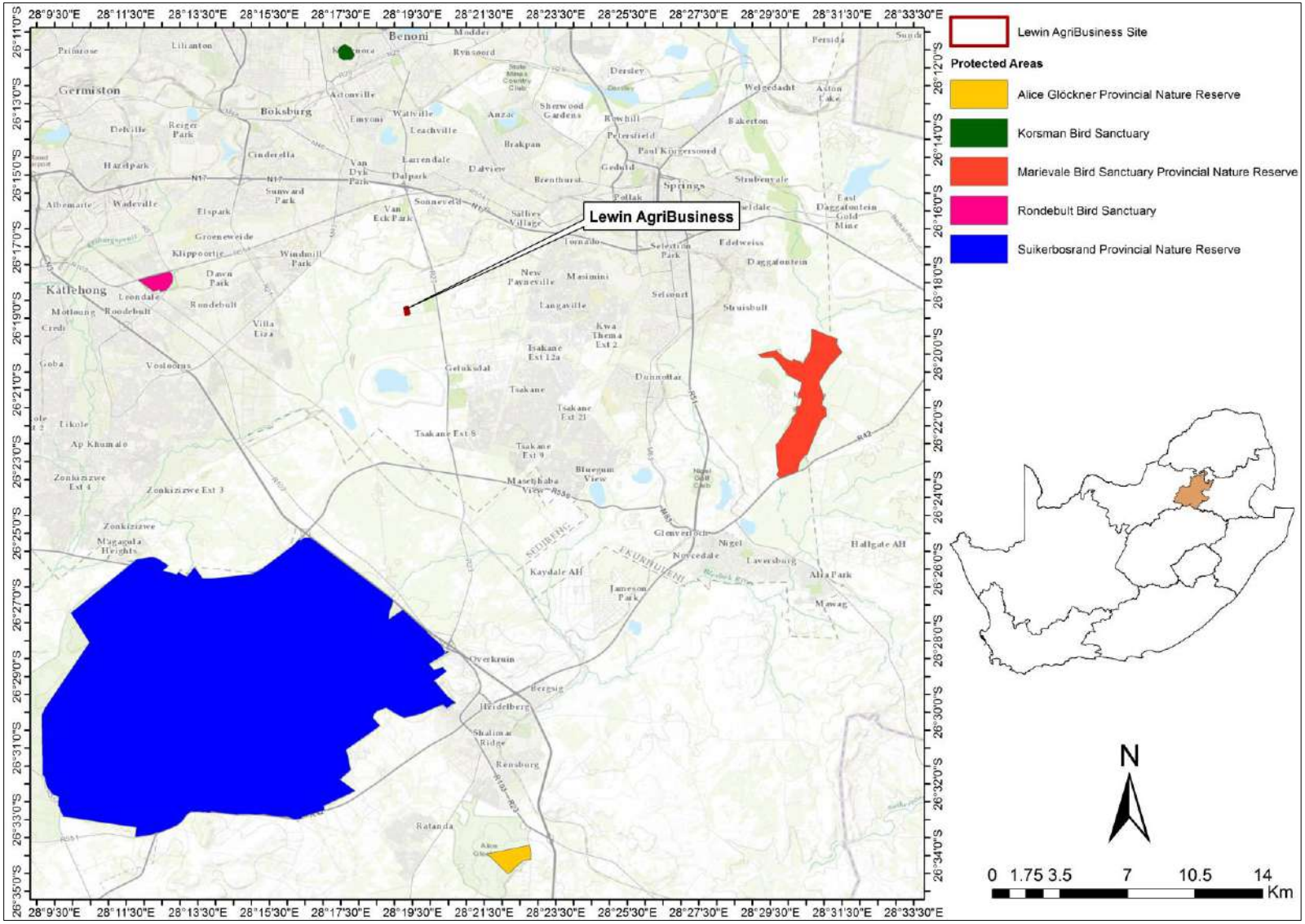


Figure 8: Proximity of Lewin project site relative to Protected Areas. Data source: SANParks, 2004.

- **Listed Terrestrial Priority Areas & Threatened Ecosystems**

NEMBA provides for the listing of Threatened or Protected ecosystems. These ecosystems are grouped into Critically Endangered (CR), Endangered (EN), Vulnerable (VU) and Protected Ecosystems in accordance with the National Environmental Management: Biodiversity Act (Government Gazette 34809, Government Notice 1002, 9 December 2011). The purpose of listing threatened ecosystems is primarily to reduce the rate of ecosystem and species extinction. The project falls within Klipriver Highveld Grassland, which includes the Tsakane Clay Grassland that is shown in Figure 9 and discussed above in the section on vegetation. The Klipriver Highveld Grassland ecosystem is found in Grasmere, Alberton and Springs (in QDS 2627BD, 2628AC, and 2628AD respectively). This grassland ecosystem is delineated by the Klipriver and associated wetlands and non-perennial rivers, together with the Klipriviersberg ridge system and associated drainage lines. The ecosystem is listed as Critically Endangered as the remaining natural habitat is less than 62 % of its original extent (Figure 9). Any remaining natural vegetation is thus considered to be of high conservation importance, with only 1% being protected in Klipriviersberg Nature Reserve and Rondebult Bird Sanctuary (SANBI & DEAT, 2009).

The key features of the Klipriver Highveld Grassland include (SANBI & DEAT, 2009):

- Red or Orange Listed plants for *example Cineraria longipes, Delosperma purpureum, Delosperma leendertziae* and *Trachyandra erythrorrhiza (This vegetation is not likely to occur on development site)*
- Red or Orange Listed birds for example African Marsh-Harrier, African Grass-Owl, Greater Flamingo, and Melodious Lark; *(All but the Melodious Lark are not likely to occur on the development site; as it prefers open areas with short grasses, which are present on site).*
- Red or Orange Listed or priority invertebrates for example the Roodepoort Copper Butterfly (not likely to occur), Marsh sylph *(not likely to occur), Orachrysops mijburghi (likely to occur)*, and Golden Starburst Baboon Spider *(likely to occur, no burrows were discovers on development site).*
- Six vegetation types including Andesite Mountain Bushveld, Carletonville Dolomite Grassland, Eastern Temperate Freshwater Wetlands, Gauteng Shale Mountain Bushveld, Soweto Highveld Grassland and Tsakane Clay Grassland*;(The development site falls within the Tsakane Clay Grassland)*
- Rivers, wetlands and pans are key features in the ecosystem including the Angelo Pan, Blesboklaagte, Bloubospruit, Elsburgspruit, Hugenote Spruit, Klipriver, Natalspruit, Rietspruit, Withokspruit, and various other unnamed wetlands and pans; *(The site does not belong to any of the named catchment systems, but a pan is located*)

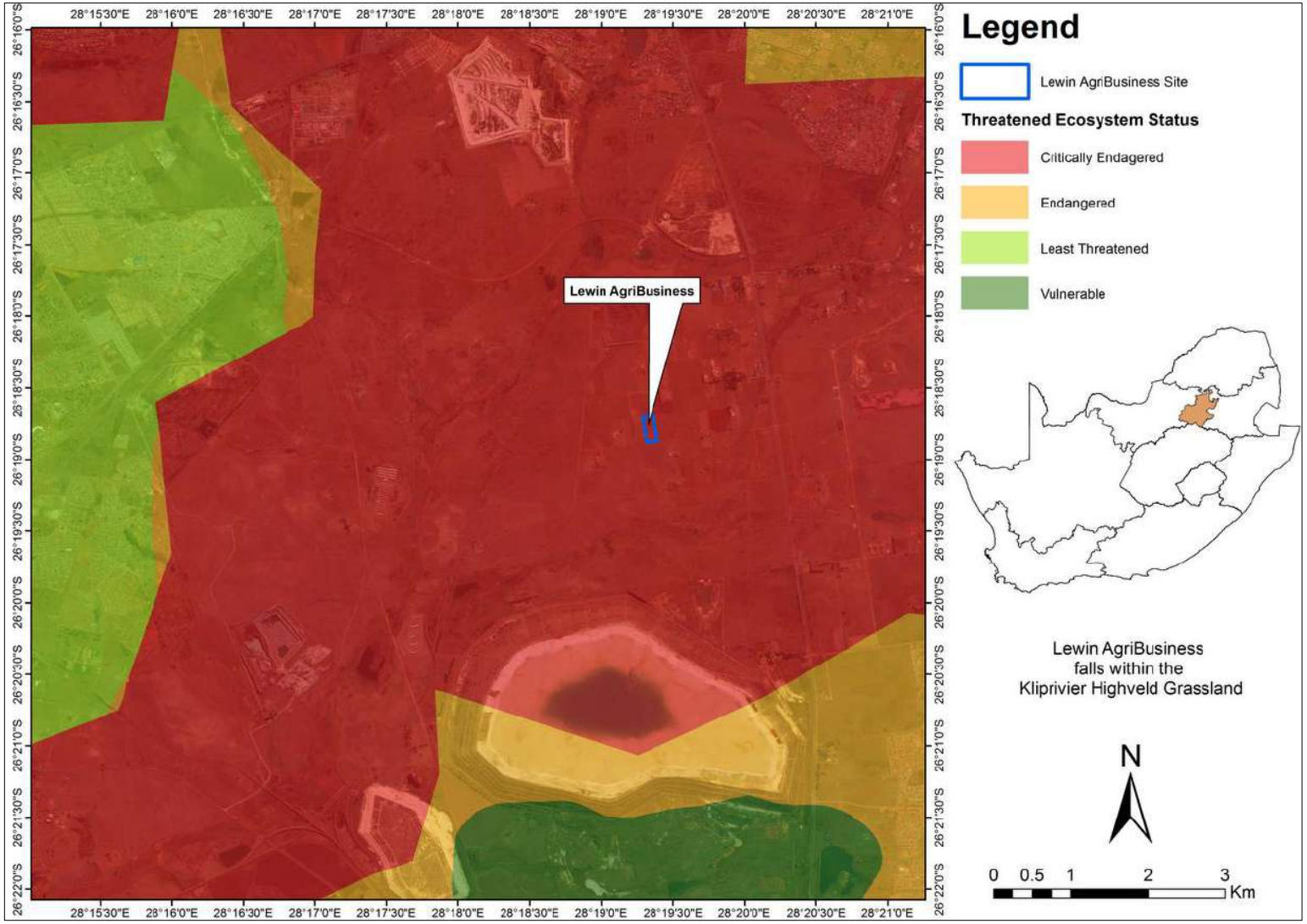


Figure 9: Regional location of the 4.4 hectare site within the original extent of the Klipriver Highveld Grassland ecosystem, which includes the Tsakane Clay Grassland vegetation unit Data source: SANBI, 2011.

- **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 site does not fall within any classified NFEPA river or wetland areas (Figure 10). The Blesbokspruit proper (approx. 16 km east of the site), Rietspruit river (approximately. 2 km from site), an unchannelled valley-bottom wetland approximately 5 km south of the site, and a channelled valley-bottom wetland approximately 2 km north-west of the site. The drainage of the valley-bottom wetland is north-easterly. The development site, however, does not fall within the catchment areas of the above mentioned wetland areas, but instead it falls within a drainage/catchment system an unnamed spruit located approximately 1 km south of the site; this unnamed spruit.

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

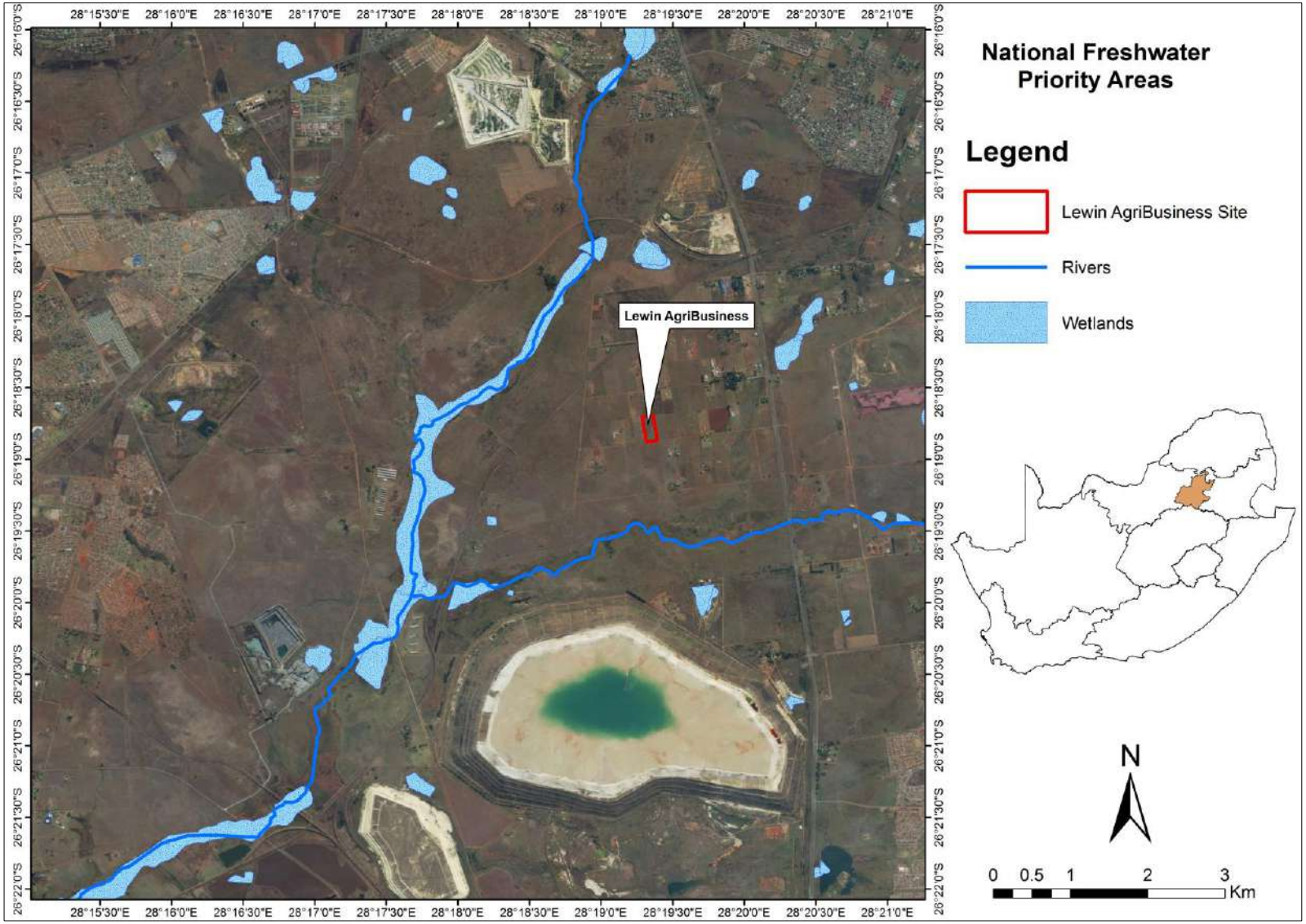


Figure 10: Location of the site in relation to the regional Freshwater Ecosystem Priority Areas. Data source: CSIR, 2011.

- **Gauteng Conservation Plan**

The Gauteng Conservation Plan (Version 3.3) (GDARD, 2011), classifies areas within the province on the basis of its contribution to reach the conservation targets within the province. Areas of conservation importance are classified as Critical Biodiversity Areas (CBAs) that should be conserved and Ecological Support Areas (ESAs) that are important for the maintenance of ecosystem function. CBAs are either "irreplaceable" and must be conserved or "important" to reach the conservation targets. They were classified based on the presence of primary vegetation as well as threatened flora and fauna species (GDARD, 2017). Ecological Support Areas (ESAs) were set aside to ensure sustainability in the long term. ESAs can include buffered wetlands, open natural semi-natural vegetation and even cultivated areas. ESAs provide vital connections between areas of high or critical biodiversity importance and are therefore not necessarily good condition or primary vegetation. In addition, areas formally protected are also indicated.

The development site does not fall within any CBAs or ESAs (Figure 11).

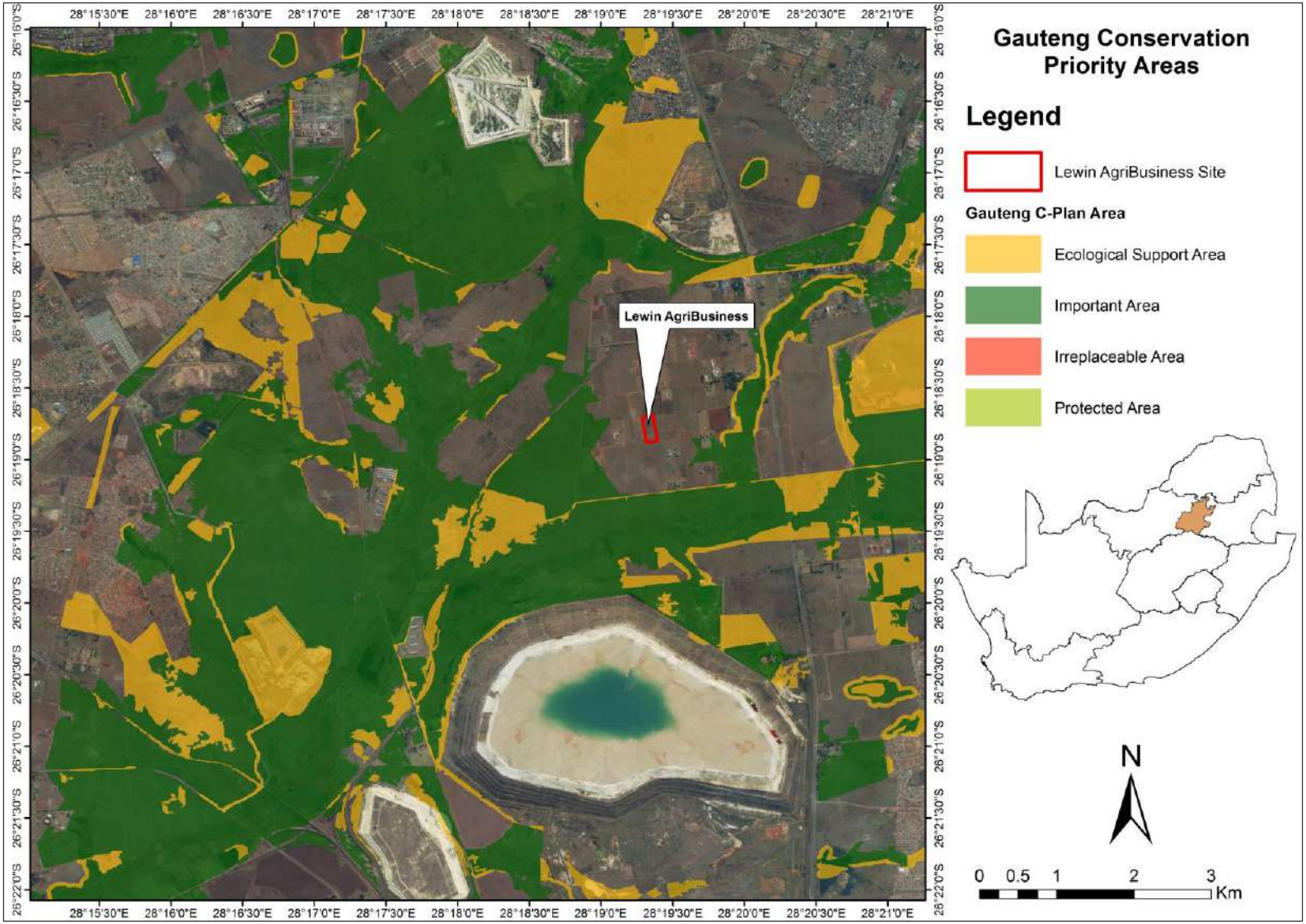


Figure 11: Location of the site in relation to the Gauteng C-Plan Areas. Data source: GDARD, 2011.

- **Species of Conservation Concern**

Threatened or Protected Plant Species (ToPs)

Chapter 4, Part 2 of NEMBA, Threatened or Protected Species (ToPS) Regulations provides for listing of flora and fauna species as Threatened or Protected. If any species is listed as Threatened, it must be further classified as Critically Endangered (CR), Endangered (E), Vulnerable (VU) or Protected (PT). These species are commonly referred to as ToPS listed. Certain activities, known as 'Restricted Activities', are regulated on listed species using permits by a special set of regulations published under the Act. Restricted activities regulated under the Act are keeping, moving, having in possession, importing and exporting, and selling. The status of the species for flora, mammals, birds, reptiles, frogs, butterflies and scorpions as listed in ToPS, are provided for the above mentioned fauna within QDS 2628AD and listed within their respective sections.

Red Listed species

South Africa has also listed species of Conservation Concern for the purpose of informing conservation decision-making processes and includes all plants that are Threatened, Extinct in the wild, Data Deficient, Near Threatened, Critically Rare, Rare and Declining (Figure 12). These species are also referred to as Red or Orange Listed. The Red List status of flora and faunal species that fall within QDS 2628AD and identified within the development site are provided in the respective sections.

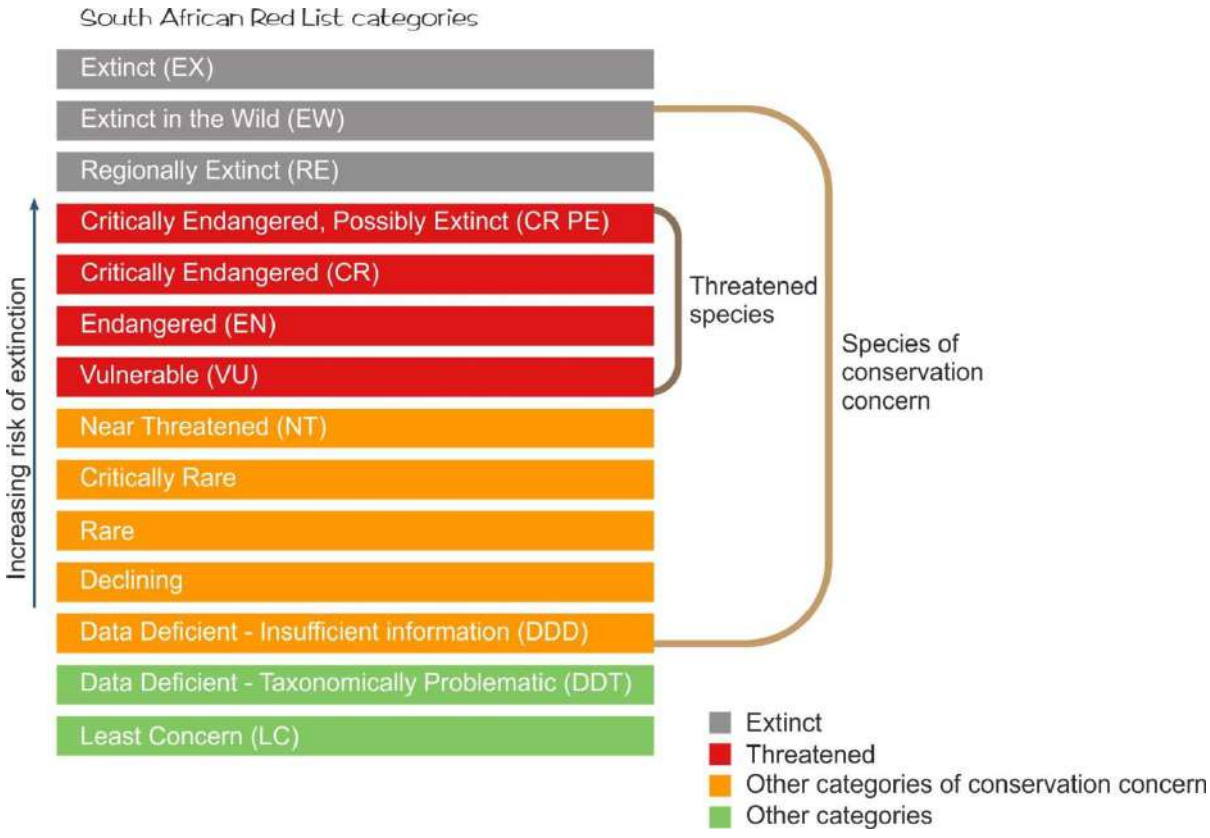


Figure 12: Threatened species and species of Conservation Concern. Diagram source: http://redlist.sanbi.org/redcat.php.

- **Alien Invasive Plant Species**

The list of Alien Invasive Species was published in terms of NEMBA in the Government Gazette No. 37320 of February 2014, as General Notice No. 78. The Alien and Invasive Species Regulations were published in the Government Gazette No. 37886, of 1 August 2014. The legislation calls for the removal and / or control of alien invasive plant species (Category 1 species). Declared weeds and invasive plant species tend to replace and dominate the tree and herbaceous layers of natural ecosystems; and in some cases exclude native plant species because of their superior competitive capabilities. These alien and invasive species transform the composition, structure and function of the natural ecosystems. It is of high importance that these plants are controlled and eradicated (Henderson, 2001).

In addition, unless authorised thereto in terms of the National Water Act, 1998 (Act No. 36 of 1998), no land user shall allow Category 2 plants to occur within 30 meters of the 1:50 year flood line of a river, stream, spring, natural channel in which water flows regularly or intermittently, lake, dam or wetland. Category 3 plants are also prohibited from occurring within close proximity to a watercourse.

Below is a brief description of the three categories in terms of NEMBA:

- *Category 1a*: Invasive species requiring compulsory control. Remove and destroy. Any specimens of Category 1a listed species need, by law, to be eradicated from the environment. No permits will be issued.
- *Category 1b*: Invasive species requiring compulsory control as part of an invasive species control programme. Remove and destroy. These plants are deemed to have such a high invasive potential that infestations can qualify to be placed under a government sponsored invasive species management programme. No permits will be issued.
- *Category 2*: Invasive species regulated by area. A demarcation permit is required to import, possess, grow, breed, move, sell, buy or accept as a gift any plants listed as Category 2 plants. No permits will be issued for Category 2 plants to exist in riparian zones.
- *Category 3*: Invasive species regulated by activity. An individual plant permit is required to undertake any of the following restricted activities (import, possess, grow, breed, move, sell, buy or accept as a gift) involving a Category 3 species. No permits will be issued for Category 3 plants to exist in riparian zones.

6. FIELD ASSESSMENT FINDINGS

6.1. Land use and existing impacts

The site is relatively flat, with the bottom half of the property dominated by thick tufted grasses, while the area above the chicken facility has been tilled and consists of mainly herbaceous vegetation (Figure 13). As mentioned previously, the farm has existing infrastructure that includes one chicken layer house, farm office, a private farm house, toilets & shed, with a small vegetable garden (Figure 14). The development of the existing chicken layer facility and other activities commenced in 2016 (Figures 15 & 16). Currently, domestic waste is kept in municipal waste bins and is collected weekly. Chicken waste, mainly in the form of chicken manure is sold as fertilizer, while some of the manure is used for the existing vegetable garden.

Withok and its surrounding properties were originally commercial farms that focused on crop production and raising livestock. These farms were later sub-divided into smaller units or small holdings which now support a wider range of businesses and agricultural activities (Ekurhuleni MSDF, 2015). This is supported by the available historical imagery (Google Earth, from the previous 16 years), which shows the greater Withok Estates area transition from large scale cultivation to small scale farming practices (Figure 15).The site has been zoned for agriculture (Ekurhuleni MSDF, 2015). The title deed was transferred to Lewin AgriBusiness in 2016. The small enterprise is supported by the Gauteng Department of Agriculture & Rural Development (GDARD) with technical and infrastructure support. GDARD has assisted Lewin AgriBusiness by constructing the chicken layer facility and providing the start-up 5000 chickens (Lewin, 2016).

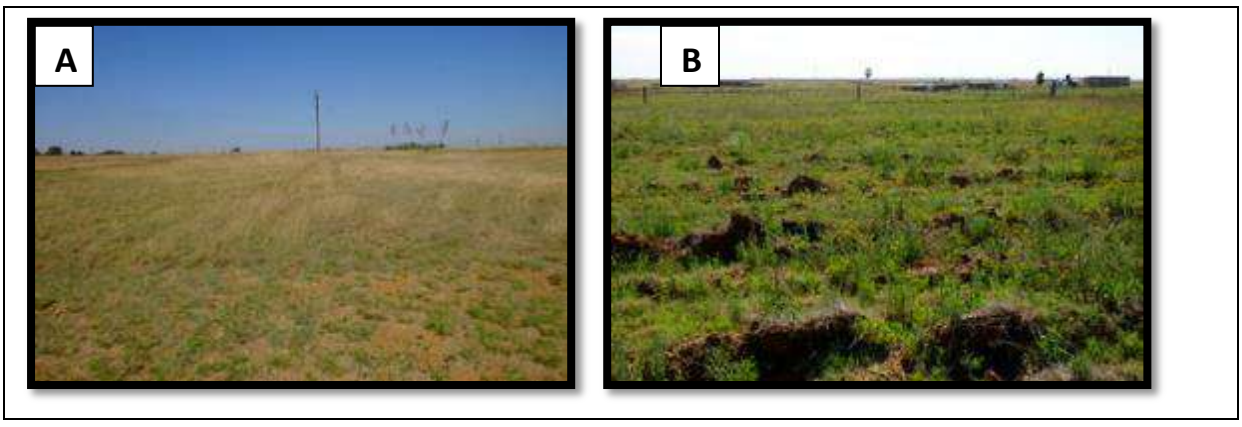


Figure 13: Vegetation units present on Lewin AgriBusiness' property. A) Grass unit B) Transformed herbaceous unit. Photo credit: Rirhandzu Marivate (2017).

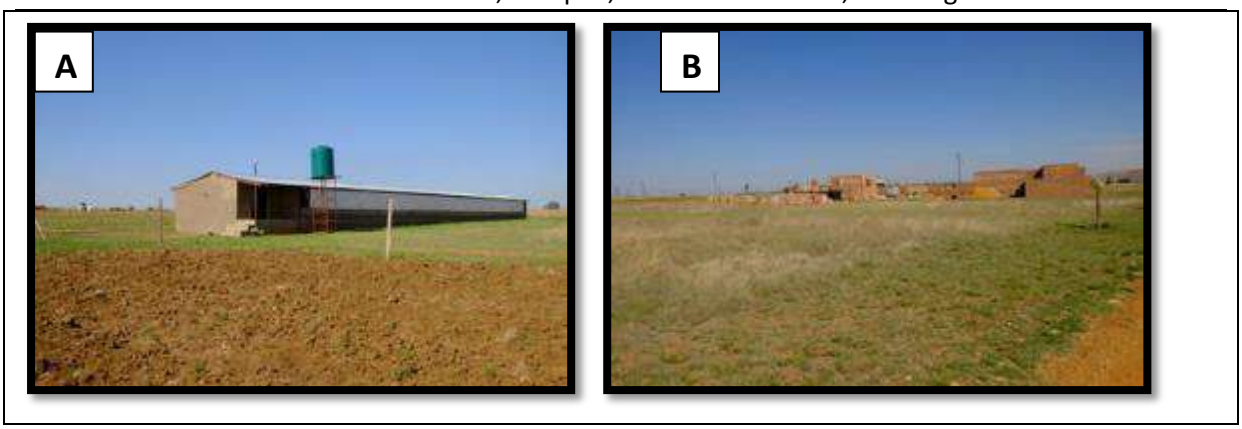


Figure 14: Current land use activities on site. A) Small vegetable garden and Chicken Layer House B) Farm house under construction. Photo credit: Rirhandzu Marivate (2017).

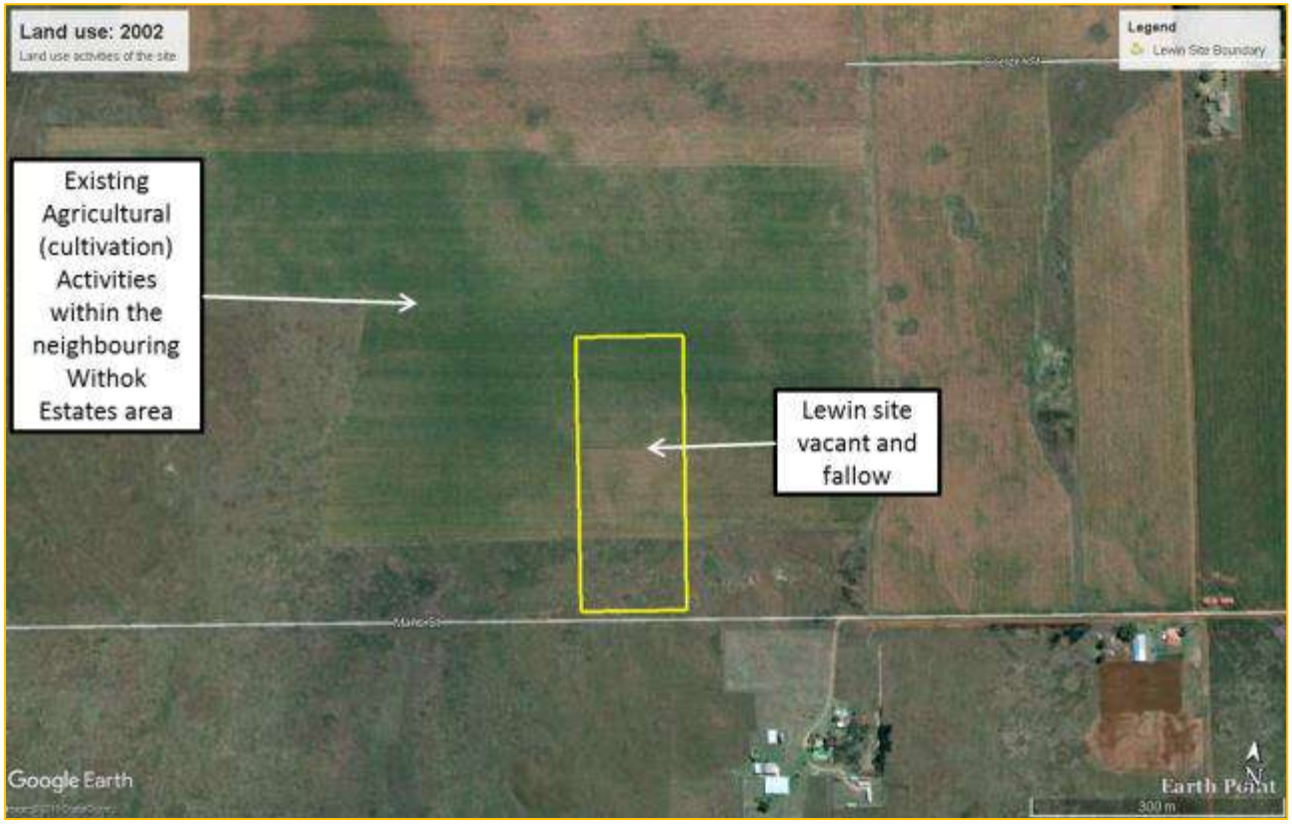


Figure 15: Aerial Image of the site in the year 2002 (Source: Google Earth, 2018)

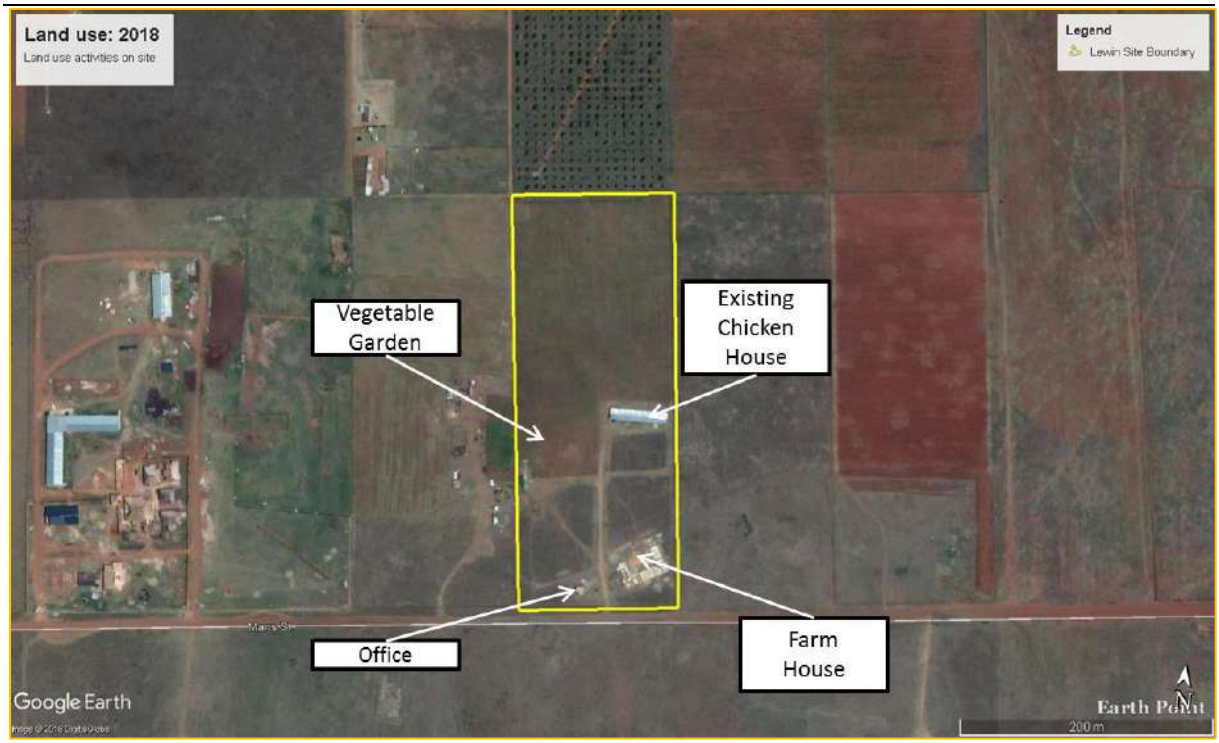


Figure 16: Aerial image of the site indicating land use activities in the year 2018 (Source: Google Earth, 2018)

6.2. Vegetation Communities/Habitats

SANBI collates floral data within southern Africa and updates their database system called the National Herbarium Pretoria (PRE) Computerised Information System (PRECIS). This database is captured according to the quarter degree squares (QDSs), and referred to as the Plants of Southern Africa (POSA) database. The study site falls under QDS 2628AD. 525 different plant species have been recorded within the QDS. Note that the data from this database has not been revised since 2012 and can only be used as a general guide in understanding the species of the area.

According to the POSA database, the dominant families are Asteraceae, Poaceae, and Fabaceae, representing 33.6 % of the families recorded within the QDS (Table 1). The structural representation of the site, with graminoids and herbaceous plants being most dominant, followed by low shrubs, represents a typical grassland habitat. A list of all plant species observed on site in provide in Appendix 1. The regional Tsakane Clay Grassland vegetation type is Endangered. The identified in situ floral communities are transformed.

Table 2: Dominant floral families obtained from the POSA website for QDS 2628AD. Data Source: POSA, 2016.

Important Families	No. of Species	Growth Forms	%Total Spp
Asteraceae	77	Herbs	14.9
Poaceae	56	Graminoids	10.9
Fabaceae	40	Herbs	7.8

Important Families	No. of Species	Growth Forms	%Total Spp
Apocynaceae	30	Herbs	5.8
Rubiaceae	18	Herbs, Shrub	3.5
Cyperaceae	17	Herbs	3.3
Polygonaceae	15	Herbs	2.9
Malvaceae	13	Herbs	2.5
Hyacinthaceae	12	Geophytes	2.3
Scrophulariaceae	12	Dwarf shrub	2.3

6.2.1. Vegetation recorded on site

During the site visit it was observed that a large portion of the site was transformed vegetation from the reference state of the Tsakane Clay Grassland vegetation type. The site visit occurred just after a period of heavy rainfall, and many plants species were out in bloom. Two distinct vegetation communities can be identified within the site, i.e. Disturbed Grassland and Herbaceous Alien Weeds (Figure 17 & 18); the other vegetation feature is the vegetable garden, and can be considered Transformed: Subsistence Farming, and part of the developed area of the site.

Eragrostis Disturbed Grassland

Herbaceous Alien Weeds

Transformed: Subsistence Farming

Figure 17: Photographs of the different transformed habitats within Lewin's project site. Photo credit: Rirhandzu Marivate (2017).

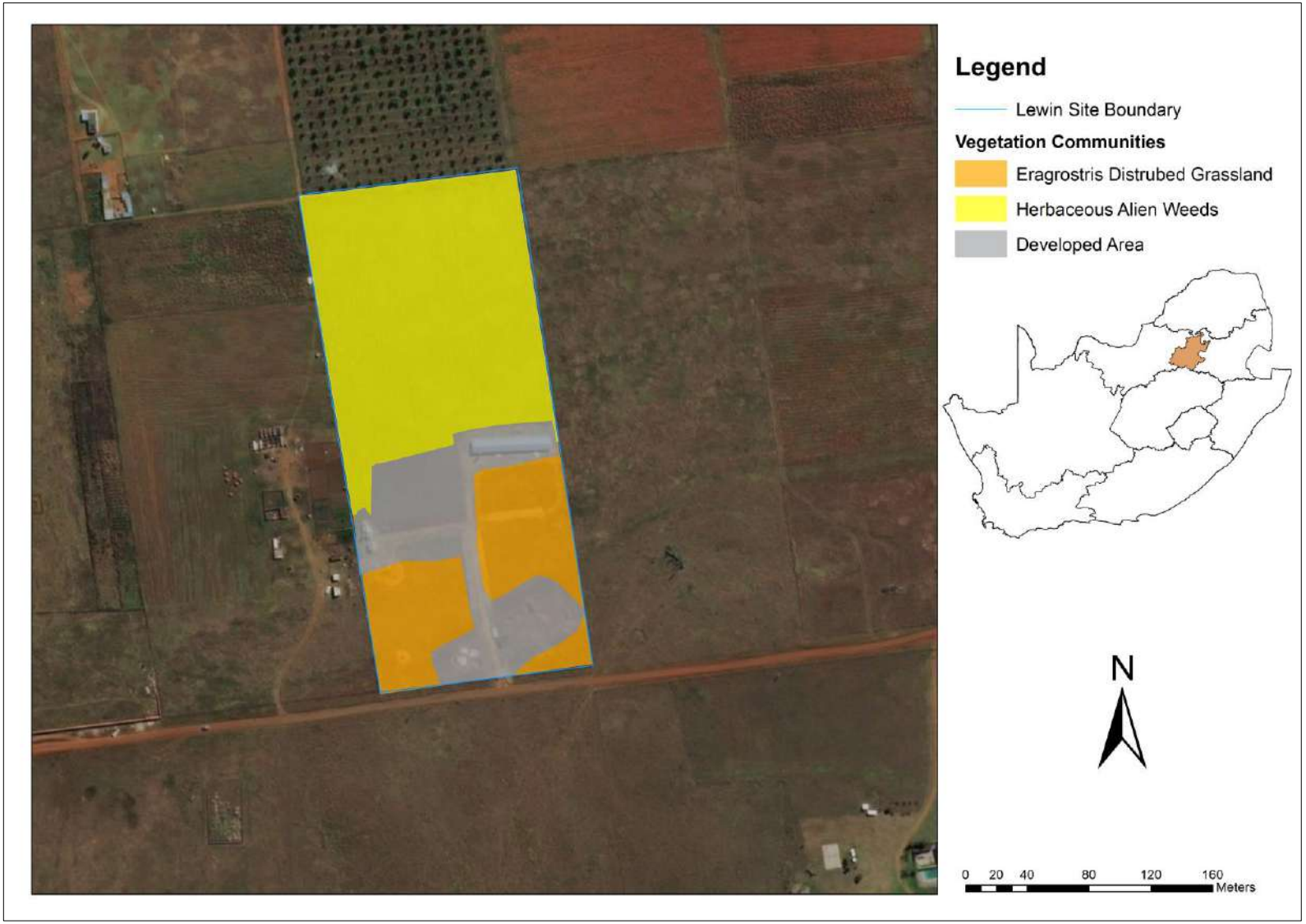


Figure 18: Vegetation units identified on the Lewin AgriBusiness project site. Data Source: Google Earth, 2018.

A brief description of the Disturbed Grassland and the Herbaceous Alien Bushclumps is provided below, and examples of plants that occur on site are shown in Figure 19.

Eragrostis Disturbed Grassland

The grassland community is found south of the property below the vegetable garden and chicken house, and is dominated by *Eragrostis spp*. The grassland appears to be transformed and has some established footpaths, while some of it has been cleared for a gravel road and the construction of the farm house and the office at the south most part of the property. Furthermore, a portion of the vegetation (below the existing chicken house) will be cleared for the construction of the proposed second chicken house. Species within the *Eragrostis* Disturbed Grassland community are listed in Table 3. None of the plant species identified are threatened.

Table 3*: List of flora species identified in the Eragrostis Disturbed Grassland Community*

Family	Species Name	Growth Form
Apocynaceae	*Gomphocarpus fruticosa*	Herb
Asteraceae	*Arctotis arctotoides*	Herb
Asteraceae	*Cotula anthemoides*	Herb
Asteraceae	*Felicia muricata*	Shrub
Scrophulariaceae	*Jamesbrittenia sp*	Shrub
Onagraceae	*Oenothera rosea*	Herb
Asteraceae	*cf Senecio erubescens*	Herb
Commelinaceae	*Commelina benghalensis*	Herb
Asteraceae	*Helichrysum rugulosum*	Herb
Scrophulariaceae	*Nemesia fruticans*	Dwarf shrub
Plantaginaceae	*Plantago lanceolata*	Herb
Asteraceae	*Sonchus dregeanus*	Herb
Cactaceae	*Opuntia ficus-indica*	Succulent Shrub
Poaceae	*Eragrostis curvula*	Graminoid

Herbaceous Alien Weeds

North of the property, above the vegetable garden and existing chicken house is a transformed habitat that has been previously cultivated (can be considered fallow fields), and has become dominated by herbaceous alien vegetation, such as *Argemone ochroleuca*. The plant species occurring in the Herbaceous Alien Weeds vegetation unit are listed in Table 4:

Table 4: List of flora species identified within the Herbaceous Alien Weeds vegetation unit

Family	Species Name	Growth Form
Papaveraceae	*Argemone ochruleuca*	Herb
Asteraceae	*Helichrysum sp*	Herb
Plantaginaceae	*Plantago lanceolata*	Herb
Onagraceae	*Oenothera rosea*	Herb
Solanaceae	*Physalis angulata*	Herb
Asteraceae	*Senecio ilicifolius*	Herb, Shrub
Verbenaceae	*Verbena bonariensis*	Herb

Family	Species Name	Growth Form
Onagraceae	*Oenothera indecora*	Herb

Arctotis arctotoides

Felicia muricata

Plantago lancelata

Senecio ilicifolius

Figure 19: Example of plant species found on site. Photo credit: Rirhandzu Marivate (2017).

The Threatened Species Programme of the South African National Biodiversity Institute (SANBI) published the Red List of South African Plants (Raimondo *et al*, 2009), with an online database that is updated regularly and provides information of the national conservation status of South African indigenous plants. Table 5 provides a list of all listed plants as recorded in POSA (2018) in QDS 2628AD.

Table 5: Listed plants of Conservation Concern recorded in QDS 2628AD. Data Source: POSA, 2012.

Family	Species	Threat status	Growth forms
AQUIFOLIACEAE	*Ilex mitis (L.) Radlk. var. mitis*	Declining	Shrub, tree
ASTERACEAE	*Cineraria longipes S.Moore*	VU	Dwarf shrub, herb
CRASSULACEAE	*Adromischus umbraticola C.A.Sm. subsp. umbraticola*	NT	Succulent

Ilex mitis is a tree species that grows on the banks of rivers and streams and moist spots in woods and forest areas (Helme & Raimondo, 2006); *Cineria longipes* grows on hills, amongst rocks and along seeplines (Helme & Raimondo, 2006); while *Adromischus umbraticola* grows on south-facing rock crevices on rocky ridges (Helme & Raimondo, 2006). None of these plant species are expected to occur on the development site due to their specific habitat requirements.

Alien plant species were also identified on site. Category 1 alien plant species identified on the study site are the Sweet Prickly Pear, White-flowered Mexican Poppy, Large Thorn Apple and Wild Verbena; they are listed below in Table 6 and shown in Figure 21. According to the regulations, a person who has under his or her control a category 1b listed invasive species must immediately:

(a) notify the competent authority in writing

(b) take steps to manage the listed invasive species in compliance with

(i) section 75 of the Act;

(ii) the relevant invasive species management programme developed in terms of regulation 4; and

(iii) any directive issued in terms of section 73(3) of the Act.

Table 6: Invasive species recorded on or adjacent to the site. Data source: DEA, 2016.

Species	Common Name	NEMBA Category
Opuntia ficus-indica	Sweet Prickly Pear	Category 1b
Argemone ochroleuca	White-flowered Mexican poppy	Category 1b
Datura ferox	Large thorn apple	Category 1b
Verbena bonariensis	Wild verbena	Category 1b

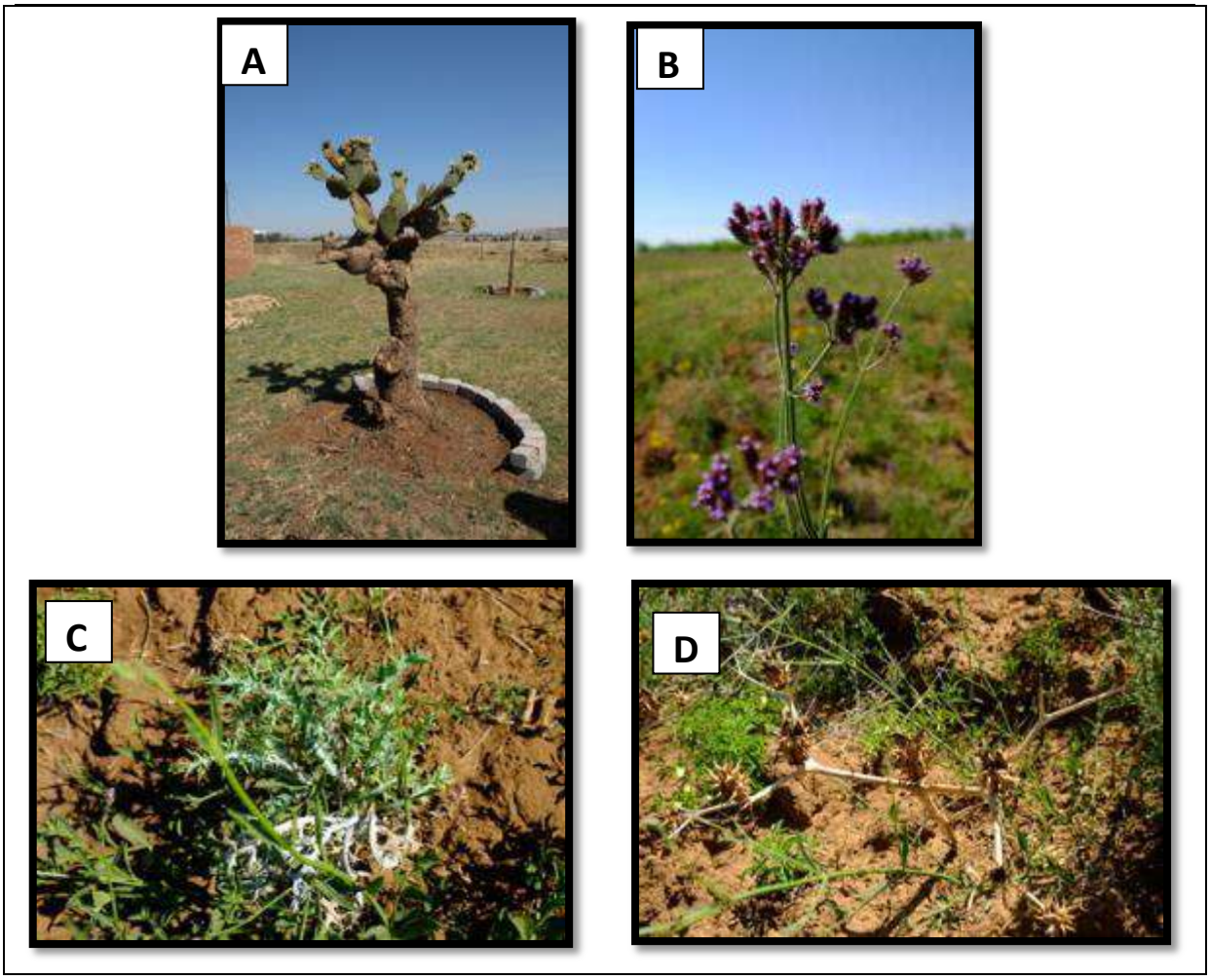


Figure 20: Alien invasive species found on site. A) *Opuntia ficus-indica*, B) *Verbena bonariensis* C) *Argemone ochroleuca D) Datura ferox.* Photo credit: Rirhandzu Marivate (2017).

6.3. Fauna

The following section provides information on mammal, bird, reptile, frog, butterfly, odonatan and scorpion species (including those that are threatened) that are considered likely to occur in the area or near the development site. Table 7 below provides a summary of each major fauna group, and the number of recorded species per group in QDS 2628AD with information retained from the Animal Demographic Unit (ADU) virtual museum database, and field observations. Appendix 2 provides a list of all recorded fauna species occurring in QDS 2628AD. Note that the ADU is only used as a reference guidleline and there are potentially more species that could occur on site.

Table 7: Number of species occurring per fauna taxon in QDS 2628AD. Data source: ADU, 2018.

Taxon	Approximate No of Species
Mammals	25
Birds	274
Reptiles	26
Frogs	10
Butterflies	259

Odonata	4
Scorpions	1

6.3.1. Mammals

According to Mammal MAP (2018), approximately 25 mammal species are considered highly likely to occur in the region of the study site and mostly represent rodents, insectivores, carnivores and bats. A species observed on site was the Four-Striped Grass Rat found within mats of grasses. Other terrestrial mammals that are likely to occur on site include the Multimammate Mouse because of the observed habitat such as burrows (Figure 22) Only one species of conservation concern recorded in QDS 2628 AD is listed; The Welwitsch's Hairy Bat (*Myotis welwitschii)*, is Near Threatened but it is highly unlikely to occur on the development site, as it prefers caves and dense vegetation (IUCN, 2017).

6.3.2. Birds

The proximity of the site to the Marievale Bird Sanctuary, Suikerbosrand Provincial Nature Reserve, Rondebult Bird Sanctuary, Korsman Bird Sanctuary and to the NFEPA wetlands mean that the regional avian diversity is high. Approximately 324 bird species are listed for QDS 2628AD. Appendix 3 provides the 274 bird species that have been recorded in pentad 2615_2815 (SABAP2, 2018). However, only a moderate-low local diversity of avifauna is expected to occur on site given its disturbed state. Seven bird species were recorded at the time site visit in November 2017 and the information is provided in Table 8. Note that this is a considerable under-representation of the actual number of bird species that are likely to occur because of previously mentioned limitations, including extreme wind conditions on the day of the site visit. The bird species that were recorded during the site visit represent common, widespread birds such as doves, shrikes, swallows, swifts, etc. that are known to occur in the site region. These birds are more tolerant of crop cultivation, human settlement, livestock grazing and other human-induced activities.

Table 8: Local bird species that were observed on site. Data Source: Taylor, et al. 2015).

Scientific Name	**Common Name**	**Red List Status (Taylor, et al. 2015)**
Ploceus velatus	Southern Masked Weaver	Least Concern
Hirundo rustica	Barn Swallow	Least Concern
Apus apus	Common Swift	Least Concern
Acridotheres tristis	Common Myna	Invasive Alien
Streptopelia senegalensis	Laughing Dove	Least Concern
Apus barbatus	African Black Swift	Least Concern
Lamprotornis bicolor	Pied Starling	Least Concern

Several threatened or nationally protected bird have been recorded to date in QDS 2628AD (SABAP2 2018), are listed in Table 9 below. The Macao Duck, Greater and Lesser Flamingo prefer water habitats;; Verreaux's Eagle occurs in dry, rocky environments; Black Harrier, prefers to nest on the ground on tall vegetation; the Black-winged Pratincole is an open grassland bird and often seen near water; Pink-backed Pelican is found in a range of aquatic habitats, and prefers backwaters with shallow water. These species are unlikely to occur on the development site, as habitat conditions are not present. The Pallied Harrier and the White bellied Korhaan prefers open grasslands and nest on the ground, the Secretary bird prefers open grassland and next in Acacia trees at night. These bird species have a moderate likelihood of occurring on site.

Table 9: List of threatened and nationally protected bird species recorded in QDS 2628AD. Data Source: SABAP, 2018; Birdlife SA, 2018.

Scientific Name	Common Name	Red List Status (Taylor, et al. 2015)	No. of Observations from, QDS (Rep Rate %)[1]	Likelihood of Occurrence (LoO)[2]
Oxyura maccoa	Duck, Maccoa	Near Threatened	2.3	3
Aquila verreauxii	Eagle, Verreaux's	Vulnerable	0.3	3
Phoenicopterus ruber	Flamingo, Greater	Near Threatened	7.5	3
Phoenicopterus minor	Flamingo, Lesser	Near Threatened	2.3	3
Circus maurus	Harrier, Black	Endangered	0.8	3
Circus macrourus	Harrier, Pallid	Near Threatened	1.0	2
Eupodotis senegalensis	Korhaan, White bellied	Least Concern	0.5	2
Pelecanus rufescens	Pelican, Pink-Backed	Vulnerable	0.3	3
Glareola nordmanni	Pratincole, Black-winged	Near Threatened	2.8	3
Sagittarius serpentarius	Secretarybird	Vulnerable	11.3	2

6.3.3. Reptiles

Twenty six species of reptile species are considered highly likely or likely to occur in or near the development site according to information retrieved from ReptileMAP (2018) (see Appendix 1) for QDS 2628AD and represent mainly snakes and lizards. The most likely reptile species to occur include Rinkhals, Speckled Rock Skink followed by the Rhombic Egg-Eater, Spotted Grass Snake, Aurora House Snake, Transvaal Gecko and the Cape Gecko as indicated in Table 9, because of the presence of burrows, termitaria, and existing buildings. Burrows such as the one in Figure 22 observed on site may be habitat for some potentially occurring reptile species. Table 10 provides a list of the reptiles observes in QDS 2628AD and the likelihood of occurrence in the development site. There are no recorded conservation important reptile species that are recorded in ReptileMAP (2018) within the QDS or on the project site.

[1] The rate at which the species had been reported in the QDS to date.
[2] Likelihood of Occurrence: LoO; 1 = High, 2=Moderate, 3=Low

Figure 21: Animal burrow observed in the Herbaceous Alien Bushclumps during the site visit. Photo credit: Rirhandzu Marivate (2017).

Table 10: Reptiles recorded within QDS 2628AD where the development site is located. Data Source: ReptileMAP, 2018; Bates, et al. 2014.

Family	Scientific Name	Common Name	Red List Status (Bates, et al., 2014)	Habitat (Bates, et al., 2014)	LoO
Agamidae	*Agama atra*	Southern Rock Agama	Least Concern	Found in variety of rocky habitats. Shelters in rock crevices and under rocks	3
Colubridae	*Dasypeltis scabra*	Rhombic Egg-eater	Least Concern	Found in deserted termitaria, under rocks, in rock crevices, under bark of trees and in rotting logs.	1
Colubridae	*Crotaphopeltis hotamboeia*	Red-lipped Snake	Least Concern	Found in marshy areas in lowland forests, moist savannas, grasslands and fynbos	3
Cordylidae	*Pseudocordylus melanotus melanotus*	Common Crag Lizard	Least Concern	Found on rock outcrops in montane and Highveld grassland. Shelters in narrow crevices between rocks.	3
Elapidae	*Hemachatus haemachatus*	Rinkhals	Least Concern	Limited to open grassland, rocky outcrops and margins of wetlands. Sometimes common in localities and peri-urban areas.	1
Gekkonidae	*Pachydactylus affinis*	Transvaal Gecko	Least Concern	Found in rocky outcrops, occasionally also in moribund termitaria or buildings in grassland and savanna biomes.	1
Gekkonidae	*Pachydactylus capensis*	Cape Gecko	Least Concern	Occurs in a wide range of mostly open habitat types, wherever there are appropriate refugia (rocks, disused termitaria, logs, logs, debris, building materials).	1
Gerrhosauridae	*Gerrhosaurus flavigularis*	Yellow-throated Plated Lizard	Least Concern	Found on rocky hillsides, and sandy flats where they shelter in burrows in the soil and sometimes under rocks, forage between grass tussocks and in leaf litter at base of bushes.	3
Lamprophiidae	*Psammophylax rhombeatus rhombeatus*	Spotted Grass Snake	Least Concern	It shelters under rocks on soils, in rock crevices, old termitaria and holes in the ground.	1

Family	Scientific Name	Common Name	Red List Status (Bates, et al., 2014)	Habitat (Bates, et al., 2014)	LoO
Lamprophiidae	*Lamprophsi aurora*	Aurora House Snake	Least Concern	Often found near streams, under rocks and some times in old termitaria.	2
Scincidae	*Trachylepis punctatissima*	Speckled Rock Skink	Least Concern	Found in rupicolous and/or semi-arboreal, in rocky outcrops, trees and houses, and largely along the escarpment and on the Highveld.	1

6.3.4. Frogs

Approximately ten frog species have been recorded in QDS 2628AD, according to FrogMAP (2018), listed in Table 11 below; other species may occur but have not been captured within the national dataset. The study site is found in proximity to wetlands that hold conservation importance, and on a national scale the wetlands are protected. These particular wetlands are found outside of the 500m buffer, the regions topography, however contains many pans, and there is a pan within 500 m south of the site boundary. This pan may be habitat for a number of frog species, and most importantly the Giant Bullfrog, a species considered, Near Threatened. The Giant Bullfrog prefers to bury themselves within several hundred meters away from shallow, seasonal wetland areas with grassy vegetation that serve as their breeding grounds (Yetman & Ferguson, 2011). Some hardier toad species such as the Raucous and Guttural toads, and the Common Caco are more likely to be present on the site, for foraging and over wintering, as they are adapted to disturbed areas and are likely to seek refuge under logs, matted grasses, and termitaria (FrogMAP, 2018). Table 11 provides a list of frog species that have been recorded in QDS 2628 AD.

Table 11: Frog species that have been recorded in QDS 2628AD. Data Source: Minter, et al., 2014, IUCN, 2017.

Family	Scientific Name	Common Name	Red List Status (Minter, et al., 2004)	Habitat (Minter, et al., 2004)	LoO
Bufonidae	*Schismaderma carens*	Red Toad	Least Concern	Found in a variety of vegetation types, particularly in the Savanna biome, and often found in Grassland vegetation. Preferred breeding in deep, muddy pools or dams.	2
Bufonidae	*Sclerophrys capensis*	Raucous Toad	Least Concern	Abundant in artificial grasslands of agricultural areas and frequently encountered at breeding sites around farm dams, large ponds and pools along slow-flowing streams,	1
Bufonidae	*Sclerophrys gutturalis*	Guttural Toad	Least Concern	Found in termitaria and in the burrows of large lizard. They shelter under logs, rocks and other object in day time. As well as drain-pipes and gutters, burrows or in holes excavated in soft ground.	1
Hyperoliidae	*Kassina senegalensis*	Bubbling Kassina	Least Concern	Found in a variety of vegetation types in the Savanna and Grassland biomes, while breed in temporary and permanent water bodies that include well vegetated shallow pans, vleis, marshes and deep dams.	3

Family	Scientific Name	Common Name	Red List Status (Minter, et al., 2004)	Habitat (Minter, et al., 2004)	LoO
Pipidae	*Xenopus laevis*	Common Platanna	Least Concern	Inhabits all biomes in South Africa, in streams, rivers and pools. Also found in man-made water bodies such as farm dams, ponds, sewage purification works and fish farms.	3
Pyxicephalidae	*Amietia delalandii*	Delalande's River Frog	Least Concern	N/A	3
Pyxicephalidae	*Amietia fuscigula*	Cape River Frog	Least Concern	Associated with permanent springs, ponds and farm dams in dry northwest, while occur along most well-vegetated waterways elsewhere.	3
Pyxicephalidae	*Cacosternum boettgeri*	Common Caco	Least Concern	Prefers open areas with short vegetation, especially abundant in grassy areas. Known to tolerate drier habitats, but also occurs in high rainfall areas. Breeds in almost any small, temporary water body, such as pools in in undulated grasslands, culverts and other rain filled depressions	1
Pyxicephalidae	*Pyxicephalus adspersus*	Giant Bull Frog	Near Threatened	They prefer sandy soils, but sometimes inhabit clay soils. Breeding occurs in seasonal, shallow, grassy pans in flat, open areas; sometimes use non-permanent vleis and shallow water on the margins of waterholes and dams.	2
Pyxicephalidae	*Tomopterna cryptotis*	Tremelo Sand Frog	Least Concern	Found in various vegetation types in the Savanna and Grassland biomes. Breed in shallow, standing water at the edges of dams, pans and small bodies of water such as roadside puddles.	2

6.3.5. *Butterflies*

Based on LepiMAP (2018), 259 species of butterfly have been recorded in QDS 2628AD. Most of the butterflies recorded are most likely to occur or at least pass through the site. Four butterfly species were encountered during the site visit (see Table 12), all of which have previously been recorded in QDS 2628AD.

Table 12: Local butterfly species encountered during the site visit. Data Source: Mecenero, et al. 2013.

Common Name	Scientific Name
Blue Pansy	*Junonia oenone oenone*
Painted Lady	*Vanessa cardui*
Common Dotted Border	*Mylothris agathina*
Danaid Eggfly	*Hypolimnas misippus*

Many of the observed butterfly species and most of the potentially occurring butterfly species are common and widespread. A list of recorded butterfly species in QDS 2628AD is provided in Appendix 1 (LepiMAP, 2018). However, there are a number of species of conservation concern are known to occur in the region, these species are *Aloeides dentatis* (Roodepoort copper) and *Chrysiritis aureus* (Heidelberg copper) both are considered Endangered (Mecenero, *et al.* 2013). These two species occur in open grassland areas and have a moderate likelihood of occurring on the development site.

Aloeides dentatis' flight peak is between October and December, while *Chrysiritis aureus*, peaks between December and March.

6.3.6. Odonata

The OdonataMAP (2018) indicates that approximately 4 species have been recorded within the above mentioned QDS 2628AD to date, while many more are likely to occur (Table 13). No dragonfly or damselfly species were observed during the site investigation (may be due to the extreme wind conditions). Additionally, odonata species are likely to occur in riparian and wetland areas, while some also do occur away from water. The site occurs in close proximity to rivers and wetlands (over 500 m from site), and a pan within 500m of the site boundary. The species recorded in QDS 2628AD have a moderate likelihood of occurring on the development site, because of its proximity to the above mentioned water bodies. Furthermore, the Wandering Glider and the Julia Skimmer, have been observed to occur in open areas between bushes and trees (former), and along roadsides and in gardens and hedgerows (latter) (Samways & Simaika, 2016). No potentially occurring odonatan species has a threatened or protected status.

Table 13: Odonata (dragonfly and damselfly) species recorded in QDS 2628AD. Data Source: OdonataMAP, 2018.

Scientific Name	Common Name	Red List Status (Samways, 2006)	Habitat (Samways & Simaika, 2016)	LoO
Pantala flavescens	Wandering Glider	Least Concern	Occurs throughout South Africa. Breeds in warm, shallow, grassy, temporary pools. Wheels and glides individually and in groups in bushy areas. It flies in open areas between bushes and trees, along roadsides and in gardens.	2
Africallagma glaucum	Swamp Bluet	Least Concern	Found in most parts of South Africa. Inhabits various types of still waters including pools, dams and quiet reaches of streams and rivers where there are swampy areas with lush, short grasses and sedges.	2
Pseudagrion citricola	Yellow-faced Sprite	Least Concern	Widespread in South Africa; Occurs along sluggish streams and rivers and sometimes seen at dams and pool with banks of tall grasses, rushes and herbs	2
Orthetrum julia	Julia Skimmer	Least Concern	Found in most part of South Africa. Occurs in dappled shade in thick bush or forest over pools or still reaches of rivers. Can often be found in gardens and along hedgerows. Females commonly enter houses.	2

6.3.7. Scorpions

One scorpion species has been recorded in QDS 2628AD, where the study site falls (ScorpionMAP, 2018), namely *Pseudolychas ochraceus* (Plain Pigmy-thicktail). This species may occur on the project site, because of the present habitat conditions that exist such as rocks and logs; this species is also known to come into buildings or houses for moisture. Other species that have not been observed may occur on site, including *Uroplectes triangulifer* (Bark scorpion) and Opistophthalmus pugnax

(Pugnacious burrowing scorpion), which can be found under rocks and other subsurface debris. The potentially occurring scorpion species does not have a threatened or protected status.

7. LOCAL AREAS OF CONSERVATION SIGNIFICANCE

The sites natural sensitivity can be mapped in terms of its conservation significance. The mapping is based on ecological sensitivity, the extent of disturbance, the presence of conservation important species, and conservation value (adapted from Natural Scientific Services, 2017). In terms of the Gauteng Conservation Plan (C-Plan), the site is not designated for biodiversity management and conservation.

Areas within the development site are ranked on biodiversity conservation significance and scored as indicated below. The scoring was determined by the information that is available for the area and the site visit. Based on the findings from all the information available, a map indicating the relative conservation significance of areas within the development site is presented in Figure 23. The rating Includes.

Moderate rated areas include:

- *Eragrostis* Disturbed Grassland, which is contains some transformation, but still contains indigenous floral species. – Also fragmented by roads etc.

Moderate-low areas include:

- Herbaceous Alien Weeds (fallow fields, alien and invasive vegetation, refuge for small mammals, reptile species).

Low rated areas include:

- Infrastructure
- Areas stripped of vegetation

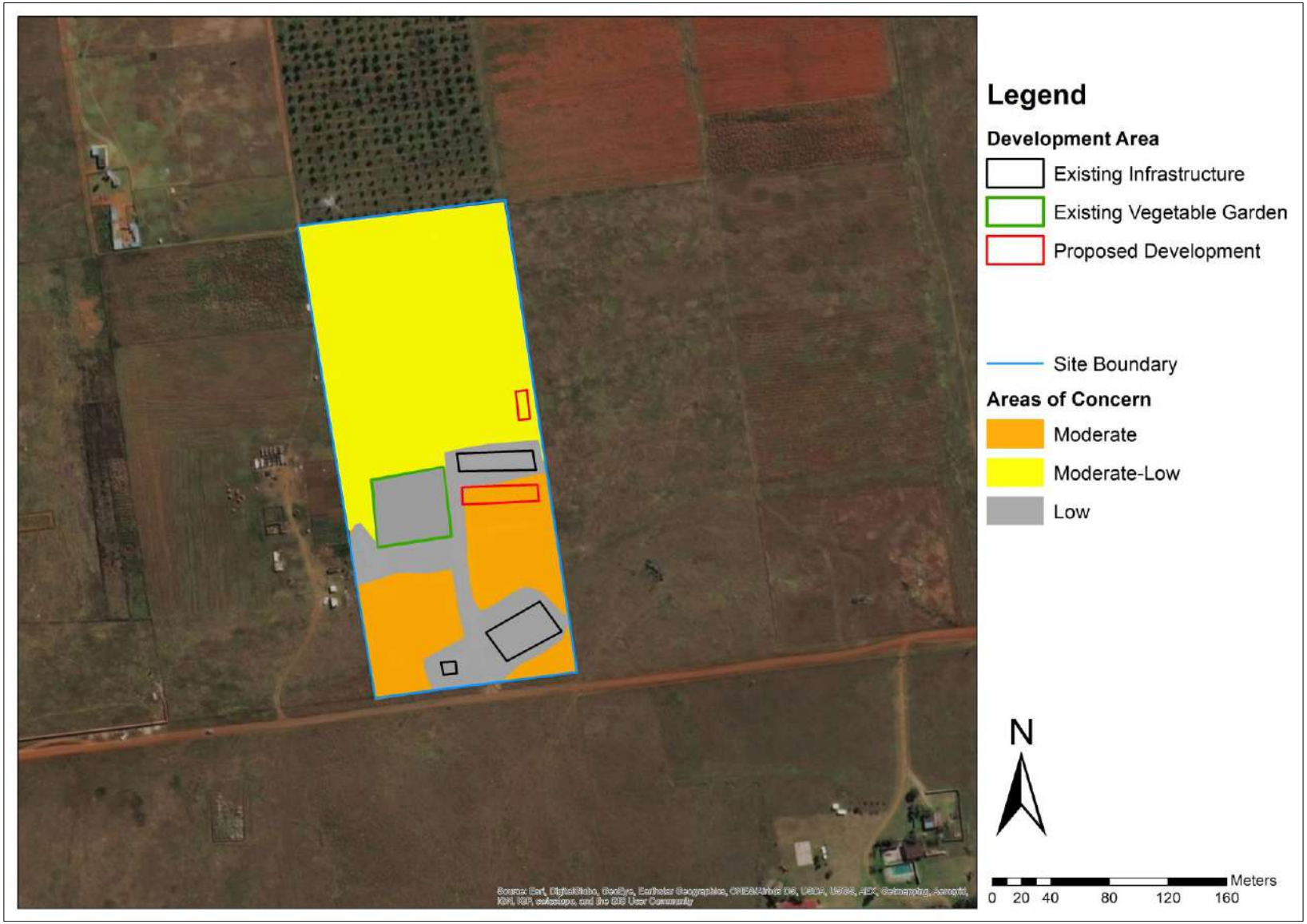


Figure 22: Environmental sensitivity of the Lewin AgriBusiness project site. Data source: CSIR, 2017, Google Images, 2018.

8. IMPACT ASSESSMENT AND MANAGEMENT ACTIONS

This section provides an assessment of the predicted impacts of the proposed expansion of the chicken layer facility on the local ecology, including mitigation and monitoring actions. The approach and terminology used for the impact assessment are provided in Appendix 4.

Based on the brief scan of the site, the following potential impacts and management actions were identified, with detailed impact assessments provided in Tables 14, 15 & 16:

Construction phase:

1. **IMPACT: Loss of terrestrial vegetation and faunal habitat resulting from clearing of the project footprint**

The development of one chicken house (footprint of 9.5 m x 45 m) and a waste storage site (footprint of 7m x 20m) will cover a total area of approximately 568 m^2 on a 4.4 hectare plot. There is an existing chicken house, vegetable garden, transformed vegetation and alien vegetation on site. The habitat being lost has been identified to be of moderate conservation value (refer to section 7). Taking into consideration these factors, and that the area is zoned for agriculture, the impact of the project footprint on ecology is predicated to be of Medium significance.

MANAGEMENT ACTIONS:

Avoid the unnecessary loss of remaining vegetation and faunal habitats and promote the re-establishment of indigenous vegetation in disturbed areas.

- Relocate the proposed chicken house to the north of the existing facility, to the lower environmentally sensitive Herbaceous Alien Weeds vegetation (see figure 24).
- Ensure that construction areas are well demarcated and restrict clearing of vegetation to minimize loss of vegetation and faunal habitats.
- Replant indigenous Highveld grassland vegetation in disturbed areas.
- If any indigenous fauna are on site during construction activities, relocate them to the nearest natural area.

2. **IMPACT: Construction activities and vehicles impact on the occurrence and spread of alien plant species**

The proposed project may increase the existing occurrence of alien plant species on site as a result of soil disturbances for the construction of the chicken house, more importantly the construction of the waste storage facility within the herbaceous alien bushclump vegetation. The spread of alien plant species may also be caused by the introduction of alien seeds associated with the movement of vehicles and materials during the construction phase. Given the context of the project in an

agricultural area, the existing transformed nature of the site, the existing chicken facility and the small footprint of excavations, the predicted impact of construction of additional chicken houses in increasing occurrence of alien plants is predicted to be Medium significance.

MANAGEMENT ACTIONS:

Minimize the introduction and spread of invasive alien species during construction.

- By law, ensure that all Category 1b alien vegetation is removed and disposed of in the correct manner prior to construction.
- Limit or regulate access by vehicles to the construction site and ensure that all material entering the construction site is from reputable sources. Certain companies provide guarantees for weed free building sand etc.
- Keep construction activities neat and tidy.

3. **IMPACT: Dust and erosion caused by construction activities on the environment**

Construction activities are likely to increase bare ground, dust and the land's susceptibility to erosion The vegetation structure and reduction in plant growth are likely to be impacted by dust that could cover leaves and affects the level of photosynthesis and evapo-transpiration. The decrease in quality of plants and change in habitat can affect fauna species that are dependent on the vegetation. Topsoil may be removed and disturbed by vehicles, leaving some soils exposed to erosion by surface water and wind. Taking into consideration that only a small portion of the property will be developed (approx. 0.5 ha of 4.4 ha), furthermore, the land in the site is relatively flat, the impact of construction vehicles, and digging of the ground on the immediate environment is predicted to be of Low significance.

MANAGEMENT ACTIONS:

Minimize dust and erosion by implementing effective measures to control dust erosion, such as limiting the number of vehicles, people and materials to the construction site.

- Ensure vehicles and construction workers are limited to designated areas.
- Implement erosion protection measures on site that reduce erosion such as re-vegetate areas that will not be developed; have designated zones for construction materials; bunding soil stockpiles.
- Implement dust control measures such as adding mulch, and/ or periodically wetting the bare ground.

4. **IMPACT: Faunal Sensory disturbance as a result of construction activities (incl. moving vehicles)**

The increase in noise and light pollution at night will be a sensory disturbance and may result in fauna such as small mammals vacating the area, at least temporarily during construction phase. The property has a low diversity of fauna; furthermore, the fauna that is found on site are somewhat used to human disturbances. The impact of construction activities on the fauna communities is predicted to be of Low significance.

MANAGEMENT ACTIONS:

Reduce the duration of construction activities, reducing noise and light pollution that cause sensory disturbance on fauna.

- Commence construction in winter in order to reduce the risk of disturbing active (including migratory) animals.
- Limit construction activities to day time hours.
- Minimize or eliminate security and construction lights in order to reduce disturbance of any nocturnal fauna.

5. **IMPACT: Loss of wetland resources from construction activities**

Construction activities of the proposed chicken house will occur within 500 m of the Pan south of the development site. The construction may have an impact on the sensitive habitats and floral and faunal species that may occur. The impact of the construction activities on the wetland resources is predicted to be of Medium significance.

MANAGEMENT ACTIONS:

Relocate the proposed chicken house north of the existing facility

- Ensure that the development planning is realigned to areas that avoid wetland and associated wetland areas (i.e. Pan south of the site boundary).
- Relocated the proposed chicken house to the north of the existing infrastructure (outside 500 m of the pan).
- No construction should be planned within the sensitive environment.
- A storm water management plan must be developed prior to the construction of the facility.

Operations phase:

1. **IMPACT: Sensory disturbance on the fauna as a result of noise and light from the chicken houses**

The fauna on site will be affected by an increased level of noise from the additional 35 000 chickens, light from the additional chicken layer facility. Taking into consideration that the development footprint of the chicken layer facility will be contained to a small area of the site, the impact of light is predicted to be of Low significance. The addition of 35 000 chickens within a limited amount of space may contribute towards the welfare of the chickens themselves. The significant increase in the

number of chickens means a significant increase in noise levels, which may reduce the growth rate and egg-laying rate of the hens (Broucek, 2014).The additional chickens will noticeably increase the noise levels and the noise impact is predicted to be of Medium Significance. The overall impact of noise, dust and light is predicated to be of Medium to Low.

MANAGEMENT ACTIONS:

Minimize sensory disturbance of fauna by minimizing essential lighting, noise, and preventing unnecessary light and noise pollution, especially on nocturnal animals.

- Ensure that proper design, housing and management of the chicken egg layer facility are implemented in order to ensure good animal well-being. The project design, technology and operations should make use of the Agricultural Technical Support of the South African Poultry Association (SAPA). Ensure that the SAPA Code of Practice for Pullet Rearing and Table Egg Production and the South African National Standards (SANS) for animal welfare are adhered to.
- Reduce the essential lighting by ensuring that all outdoor lights are fitted with caps or that they are angled downwards
- Ensure that Ultraviolet filtered lights are installed so that warmer, long-wavelength light is emitted to reduce insect attraction.
- Ensure that the machinery and ventilation systems emit a low noise.
- Activities that will generate the most noise should be limited to during the day.

2. IMPACT: Contamination of the environment as a result of handling of chicken waste

Various contaminants are present in chicken waste that include nutrients, pathogens, veterinary pharmaceuticals (such as antibiotics), and naturally excreted hormones. Improper management and disposal of carcasses as well as access fodder, chemicals such as pesticides and any other operational waste may cause contamination of the local soils. Taking into consideration that the chicken facility will implement the recommended protocol (NEM:WA, 2008) to handle chicken waste and chemicals, the impact of contaminants on the surrounding environment is predicted to be of Medium significance.

MANAGEMENT ACTIONS:

Environmental contamination can be avoided by ensuring that excrement, carcasses, feed, and other operational waste and hazardous materials are appropriately and effectively contained and disposed of without detriment to the environment. Furthermore, that there is appropriate control measures in place for any contamination event.

- Ensure that the facility design and its operations adhere to the best practice norms and standards and that the South African National Standard (SANS) for the care and use of animal waste.

- Adhere to best practice chicken husbandry and waste disposal norms as outlined in the NEM:WA (Act 59 of 2008).
- Waste must be stored in designated areas for storage. Clearly demarcate appropriate storage for different types of waste.
- Ensure regular removal of waste on site is done and ensure that all waste is disposed of at an appropriate licensed waste facility. This can be done by requesting receipts from the facility for each delivery.
- Ensure that there are waste management and emergency procedures in place for accidental contamination of the surrounding environment.
- Ensure training of staff is done to handle hazardous substances and for other waste management and emergency procedures.

3. **IMPACT: Increase in animal pests as a result of inappropriate handling of chicken waste and poor hygiene conditions.**

Incorrect management of the facility could result in the increased breeding of invertebrate pest species. Poor waste management also attracts vertebrate pests including rodents, and certain bird species. The increase of pests may have an adverse effect on the indigenous fauna with increase competition, predations, and the transmission of diseases. Taking into consideration that the chicken facility will implement the recommended protocol on handling waste and pest control the impact of diseases on the remaining fauna is predicted to be of Medium significance.

MANAGEMENT ACTIONS:

Ensure that effective pest control measures are put in place in order to prevent attraction of pest and animals.

- Adequate ventilation is required to keep floors, bedding and fodder dry
- Clean floors regularly and prevent unwanted animal access to the fodder.
- Regularly clean the facility to minimize the influx of pests.
- Inspect and clear litter and waste from the site. Ensure that the areas surrounding the chicken facility are free of spilled manure and litter.
- Regular mowing of areas around the facility required to reduce prevalence if insects.
- Ensure effective sanitation and rodent proofing and humane extermination of rodents. It is strongly recommended that poisons are avoided!

- Ensure that appropriate and humane pest control measures are put in place and are restricted to problematic areas, and ensure these measures are taxon-specific, in order to avoid unnecessary extermination of non-pest fauna.

4. **IMPACT: Transmission of diseases as a result of poor chicken waste management and/or prevalence of pests leading to a change in population of native fauna**

Diseases could be transmitted either directly from chickens and their excrement, or indirectly from an increased prevalence of pests, which could in turn adversely affect the population dynamics of native fauna in the surrounding area. Taking into consideration that the chicken facility will implement the recommended protocol on handling waste and pest control the impact of diseases on the remaining fauna is predicted to be of Medium significance.

MANAGEMENT ACTIONS:

Avoid transmission of diseases to remaining fauna.

- 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.
- Chicken mortalities must be identified and removed immediately from the facility. The source of these deaths must immediately be investigated.
- Train workers to effectively handle sick and dead animals.
- Ensure that there are appropriate control measures in place for any contamination event.

5. **IMPACT: Altered burning from vehicles, human activity and built infrastructure.**

Fires may occur from uncontrolled human activity and accidents from the activities within the chicken houses as well as vehicles on site and affect the surrounding vegetation and fauna habitat. Taking into consideration that the management of the poultry enterprise will implement fire management protocols the impact of fire on the environment is predicted to be of Low significance.

MANAGEMENT ACTIONS:

Avoid fires on site.

- Implement and train farm workers on the fire plan and emergency protocols regularly.
- Create and maintain a fire break between the development and the surrounding environment.
- Develop a space for safe storage of flammable material on site.

- Ensure that the appropriate measures are implemented in case of any accidental fires.

Decommissioning phase:

1. **IMPACT: Loss of fauna and flora from decommissioning and removal of facilities on site.**

The decommissioning of the site will need to be done according to the legislated requirements at the time. At this stage, the end use of the site after the chicken farming is unknown. Decommissioning could lead to increased dust and potential erosion if the land is left bare, and could lead to temporary sensory disturbance of fauna. Additionally, decommissioning could lead to the increase of alien plant species. If the natural vegetation was re-established after the chicken farming has ceased, this could have a positive impact on the ecology. Rehabilitation would include leveling the ground; adding top soil and planting indigenous vegetation to re-establish the floral communities and to stabilize and prevent erosion. This will also assist in reducing the likelihood of establishment alien plants species. However, it is recognised that the site is located in an agricultural area. Taking into consideration that decommissioning activities will occur within an agricultural surrounding area, and the small number of fauna that will still be remaining on site, the impact of removing the chicken facility on the immediate and surrounding environment is predicted to be of positive Medium significance.

MANAGEMENT ACTIONS:

Promote the re-establishment of indigenous vegetation in disturbed areas and minimize introduction and spread of invasive alien vegetation.

- Plant only locally indigenous flora if landscaping is required.
- Remove all building rubble and waste off site to registered dump sites
- Monitor alien invasives and control when necessary on a weekly basis during decommissioning
- Manually remove all Category 1 alien species in order to minimize soil disturbance as far as possible.

Table 14: Impact assessment of predicted impacts during the Construction Phase

Impact Description	Mitigation	Spatial Extent	Intensity	Duration	Reversibility	Irreplaceability	Probability	Significance		Status	Ranking of Impact	Confidence
								Without Mitigation	*With Mitigation*			
Impact of project footprint on transformed vegetation and faunal habitat												
From clearing of vegetation, increased vehicle activity, and proliferation of alien flora	Avoid unnecessary loss of vegetation and faunal habitats; relocate indigenous fauna to natural areas in the neighbouring vicinity; promote re-establishment of indigenous vegetation in disturbed areas	Local (<2km)	Low	Long Term	High	Low	Probable	Medium	Low	Negative	5	High
Impact of construction activities (including movement of vehicles) on occurrence and spread of alien plant species												
The proposed project may increase the existing occurrence alien grasses and herbaceous plants on site as a result of soil disturbance for foundations for the chicken house and waste storage site, as well as the introduction of alien seed with the movement of vehicles and materials	Minimize the introduction and proliferation of invasive alien species during construction by limiting and regulating access by potential vectors of alien flora and maintaining a tidy construction site. Don't plant any non-native flora.	Local	Low	Temporary	High	Low	Probable	Medium	Very low	Negative	4	High

Impact of dust and erosion caused by construction activities on ecology on the site												
Construction activities are likely to increase bare ground, dust and the land's susceptibility to erosion	Minimise dust and erosion by implementing effective measures to control dust erosion, such as limiting vehicles, people and materials to the construction site.	Local	Low	Temporary	High	Low	Probable	Low	Low	Negative	4	High
Impact of sensory disturbance as a result of construction activities (incl. vehicles) on fauna												
The increase in noise and light pollution will be a sensory disturbance and may result in fauna vacating the area, at least temporarily during construction phase.	The duration of construction activities, reducing noise and light pollution can reduce sensory disturbance on fauna.	Local	Low	Temporary	High	Low	Probable	Low	Low	Negative	4	High
Impact on wetland resources as a result of construction activities												
Construction of the facility within 500m of the pan south of the site is likely to impact on the floral and faunal habitat.	Relocate the proposed chicken house north of the existing facility outside of the 500m buffer zone of the pan	Local	Medium	Long Term	High	Medium	Probable	Medium	Low	Negative	4	High

Table 15: Impact assessment of predicted impacts during the Operations Phase

Impact Description	Mitigation	Spatial Extent	Intensity	Duration	Reversibility	Irreplaceability	Probability	Significance		Status	Ranking of Impact	Confidence
								Without Mitigation	*With Mitigation*			
Impact on the fauna as a result of noise, lights and dust from the chicken houses leading to sensory disturbance												
Noise generated by the chickens, and lights turned on at night from chicken houses may have an impact on the fauna in the environment.	Minimise sensory disturbance of fauna by minimizing essential lighting, noise, and preventing unnecessary light and noise pollution, especially on nocturnal animals.	Local	Low	Long-term	High	Low	Probable	Medium	Low	Negative	3	High
Impact from poor handling of chicken waste on leading to contaminating the surrounding environment												
Improper management and disposal of carcasses as well as excess fodder, chemicals such as pesticides and any other operational waste may cause contamination of the local soils, nearby seeplines and groundwater.	Environmental contamination can be avoided by ensuring that excrement, carcasses, feed, and other operational waste and hazardous materials are appropriately and effectively contained and disposed of without detriment to the environment.	Regional	Low	Long-term	High	Low	Highly Probable	Medium	Low	Negative	4	High

Impact of animal pests as a result of inappropriate handling of chicken waste and poor hygiene conditions in handling the chickens that can lead to increased breeding of animal pest.												
Poor management of chicken excrement and excess fodder may increase breeding of invertebrate pests. Poor waste management and hygiene practices may also attract vertebrate pests. And may adversely affect the local/ indigenous fauna.	Ensure that effective pest control is implemented, and does not affect non-target animals by controlling access and proliferation of pests as far as possible.	Local	Low	Long-term	High	Low	Highly Probable	Medium	Low	Negative	5	High
Impact of diseases as a result of poor chicken waste management and/or prevalence of pests that can lead to a change in population of native fauna												
Diseases could be transmitted either directly from chickens and their excrement, or indirectly from an increased prevalence of pests, which could in turn adversely affect the population dynamics of native fauna in the surrounding area.	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.	Local	Low	Long-term	High	Low	Probable	Medium	Low	Negative	4	High
Impact of fires on the surrounding environment as a result of accidents caused by human activities, vehicles and built infrastructure												
Altered burning could occur from, human activity and operations of vehicles	Avoid and minimise fires on site.	Local	Low	Short-term	High	Low	Probable	Low	Low	Negative	4	High

and on site built infrastructure												

Table 16: Impact assessment of predicted impacts during the Decommissioning Phase

Impact Description	Mitigation	Spatial Extent	Intensity	Duration	Reversibility	Irreplaceability	Probability	Significance		Status	Ranking of Impact	Confidence
								Without Mitigation	*With Mitigation*			
Impact on fauna and flora from decommissioning and removal of facilities on site.												
Decommissioning could lead to increased dust and potential erosion if land is left bare, and could lead to sensory disturbance of fauna.	Promote the re-establishment of indigenous vegetation in disturbed areas and minimize introduction and spread of invasive alien vegetation.	Local (<2km)	Low	Temporary	High	Low	Probable	Medium	Medium	Positive	4	High

9. FINDINGS, POTENTIAL IMPLICATIONS AND SPECIALIST OPINION

The Lewin Agribusiness 4.4 hectare plot does not have any regionally or locally important topographical or ecological features. The site has been transformed by existing infrastructure, human activity, alien invasive vegetation, and cultivation. The following is a summary of the findings and potential implications of the proposed expansion of the chicken layer facility on the ecology of the site and local area:

Species richness: The small size of the development, relative to the size of the plot, and the current disturbed nature of the plot, mean that the floral habitats have been transformed. Native fauna species have been displaced from previous land use activities; furthermore, some faunal species will be displaced from expansion activities, while others may be introduced. The resulting species richness is low.

Conservation Important species: There is a low likelihood of Conservation Important species occurring on site.

Conservation Important Areas: The project falls in the Tsakane Clay Grassland vegetation unit, which is considered to be Endangered as determined by Mucina & Rutherford, in 2006, and the Klipriver Highveld Grassland Ecosystem which is listed nationally as Critically Endangered.

Habitat quality and extent: The site has been transformed and fragmented through fencing, roads, previous and current cultivation, invasive alien plants, and human activities.

Impact on species richness and conservation: The expansion of the chicken layer facility will have a small, permanent footprint. Given the current transformed nature of the site, it is predicted that further impacts on the surrounding ecology will be minimal. However, if management measures are not adhered to, contamination and degradation of the surrounding areas could occur.

Connectivity: The proposed development will have minimal effect on the ecological connectivity of the area.

Management Recommendation: If any native fauna species are encountered or exposed during construction, they should be removed and relocated to preferable natural areas**.** Category 1 Alien and invasive plants must be removed and disposed of in the correct manner. Re-establish indigenous vegetation in disturbed areas when the development is operational. The layout of the proposed chicken house should be revised and moved to an area of Low environmental sensitivity. A revised layout has been proposed in Figure 24 below.

General opinion: From an ecological perspective, there is no objection against the proposed development provided all mitigation measures are implemented.

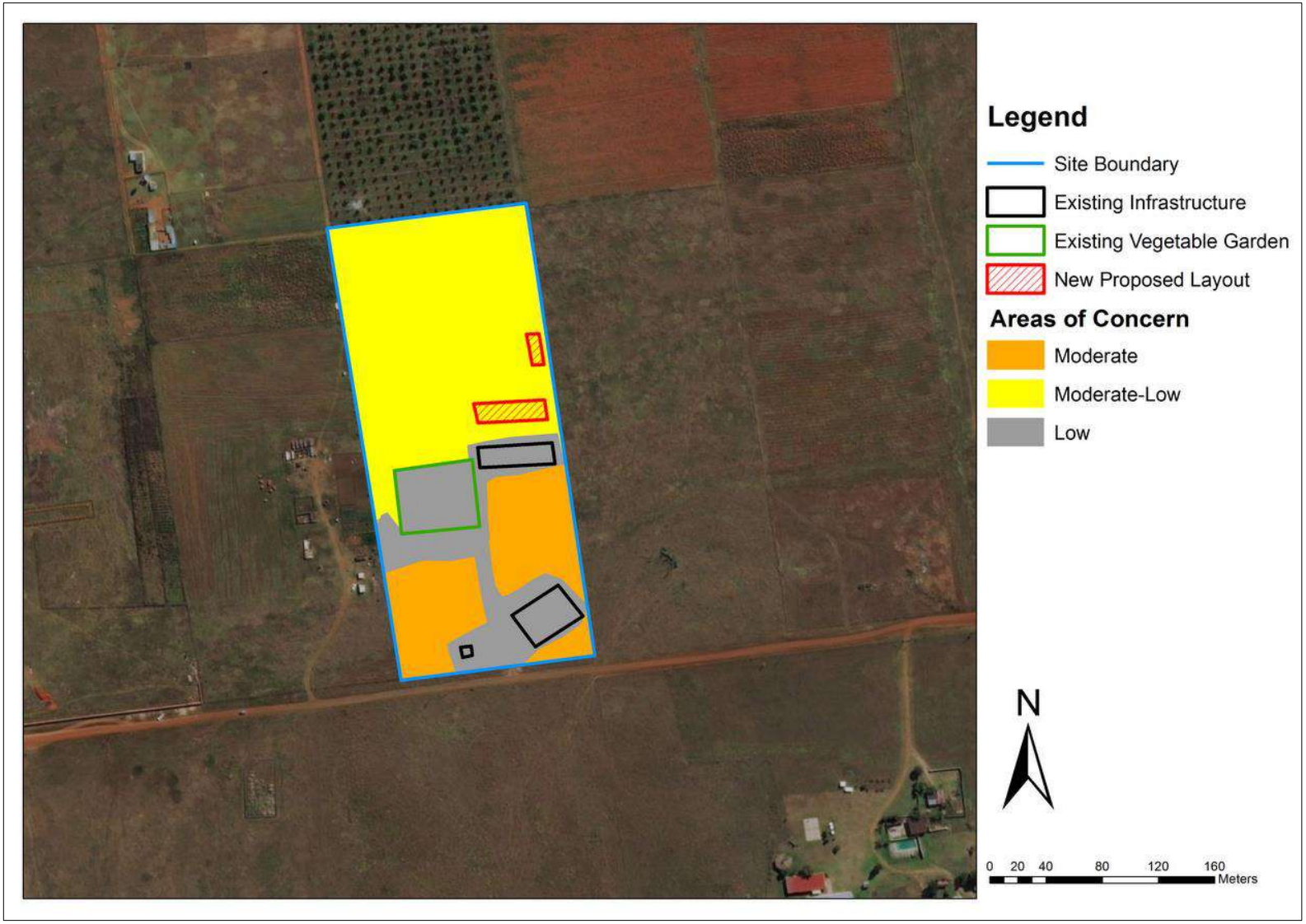


Figure 24: Proposed new layout for Lewin AgriBusiness within environmental sensitivities. Data Source: CSIR, 2017; Google Images, 2018

10.CONCLUSION

The construction and operation of a chicken egg layer facility with a total footprint of 570 m^2 could have a negative impact on the ecology of the area. The development of the facility may cause habitat change which may further result in secondary ecological impacts. The proposed chicken egg layer facility will be constructed on transformed grassland, which is has a moderate-low environmental sensitivity. It is, therefore recommended that the facility be moved to the previously cultivated land that is transformed and infested with alien invasive vegetation. This unit was rated with a low environmental sensitivity.

It must be mentioned that the development site is situated within 500m of a pan and a seepage area of a wetland, and therefore it is imperative that all mitigation measures, specifically with regards to contamination, be adhered to.

Furthermore, with the implementation of the mitigation measures outlined in the report, the significance of ecological impacts on site can be reduced to Low. Based on the site visit and the information that was available to date, it is the opinion of the CSIR specialist that there are no fatal flaws to the project. If all the recommended mitigation measures are implemented, the CSIR specialist has no objection to the project going forward.

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Appendix 1 Fauna (excluding birds) that have been recorded in QDS 2628AD.

Mammals

Family	Scientific Name	Common Name	Red List Status	No of Observations on QDS	No of Observation on Site	LoO[3]
Bathyergidae	*Cryptomys hottentotus*	Southern African Mole-rat	Least Concern	4	0	3
Bovidae	*Alcelaphus buselaphus*	Hartebeest	Not listed	18	0	3
Bovidae	*Antidorcas marsupialis*	Springbok	Least Concern	2	0	3
Bovidae	*Connochaetes gnou*	Black Wildebeest	Least Concern	15	0	3
Bovidae	*Damaliscus pygargus phillipsi*	Blesbok	Least Concern	18	0	3
Bovidae	*Raphicerus campestris*	Steenbok	Least Concern	20	0	3
Bovidae	*Redunca arundinum*	Southern Reedbuck	Least Concern	3	0	3
Bovidae	*Sylvicapra grimmia*	Bush Duiker	Least Concern	1	0	3
Bovidae	*Tragelaphus oryx*	Common Eland	Least Concern	11	0	3
Canidae	*Canis mesomelas*	Black-backed Jackal	Least Concern	12	0	3
Emballonuridae	*Taphozous mauritianus*	Mauritian Tomb Bat	Least Concern	4	0	3
Equidae	*Equus quagga*	Plains Zebra	Not listed	18	0	3
Hystricidae	*Hystrix africaeustralis*	Cape Porcupine	Least Concern	6	0	3
Leporidae	*Lepus saxatilis*	Scrub Hare	Least Concern	10	0	2
Muridae	*Aethomys namaquensis*	Namaqua Rock Mouse	Least Concern	142	0	1
Muridae	*Gerbilliscus leucogaster*	Bushveld Gerbil	Data Deficient	2	0	3
Muridae	*Mastomys spp*	Multimammate Mice	Not listed	182	0	1
Muridae	*Mus minutoides*	Southern African Pygmy Mouse	Least Concern	4	0	3
Muridae	*Otomys auratus*	Southern African Vlei Rat	Not listed	18	0	2
Muridae	*Rhabdomys pumilio*	Xeric Four-striped Grass Rat	Least Concern	730	0	1
Mustelidae	*Aonyx capensis*	African Clawless Otter	Least Concern	2	0	3
Mustelidae	*Poecilogale albinucha*	African Striped Weasel	Data deficient	1	0	3
Soricidae	*Crocidura mariquensis*	Swamp Musk Shrew	Data Deficient	2	0	3
Soricidae	*Myosorex varius*	Forest Shrew	Data Deficient	1	0	3
Vespertilionidae	*Myotis welwitschii*	Welwitsch's Myotis	Near Threatened	2	0	3

[3] Likelihood of Occurrence: LoO; 1 = High, 2=Moderate, 3=Low

Why was this species rated with a moderate LoO when the nearest wetland is "far" away - Southern African Vlei Rat

Jackal Rating too low – and Namaqua Rock Mice too High . Disagree with many of the LoO ratings. Seems that a basic understanding of each species' habitat requirements is missing.

Why are certain common bat species not listed?

Frogs

Family	Scientific Name	Common Name	Redlist Status	No of Observations on QDS	No of Observation on Site	LoO
Bufonidae	*Schismaderma carens*	Red Toad	Least Concern	1	0	2
Bufonidae	*Sclerophrys capensis*	Raucous Toad	Least Concern	1	0	1
Bufonidae	*Sclerophrys gutturalis*	Guttural Toad	Least Concern	6	0	1
Hyperoliidae	*Kassina senegalensis*	Bubbling Kassina	Least Concern	6	0	3
Pipidae	*Xenopus laevis*	Common Platanna	Least Concern	2	0	3
Pyxicephalidae	*Amietia delalandii*	Delalande's River Frog	Least Concern	5	0	3
Pyxicephalidae	*Amietia fuscigula*	Cape River Frog	Least Concern	2	0	3
Pyxicephalidae	*Cacosternum boettgeri*	Common Caco	Least Concern	7	0	1
Pyxicephalidae	*Pyxicephalus adspersus*	Giant Bull Frog	Near Threatened	1	0	2
Pyxicephalidae	*Tomopterna cryptotis*	Tremelo Sand Frog	Least Concern	5	0	2

Reptiles

Family	Scientific Name	Common Name	Redlist Status	No of Observations on QDS	No of Observation on Site	LoO
Agamidae	*Agama aculeata*	Distant's Ground Agama	Least Concern	1	0	3
Agamidae	*Agama atra*	Southern Rock Agama	Least Concern	4	0	2
Colubridae	*Crotaphopeltis hotamboeia*	Red-lipped Snake	Least Concern	1	0	3
Colubridae	*Dasypeltis scabra*	Rhombic Egg-eater	Least Concern	3	0	3
Cordylidae	*Cordylus vittifer*	Common Girdled Lizard	Least Concern	1	0	3
Cordylidae	*Pseudocordylus melanotus melanotus*	Common Crag Lizard	Least Concern	5	0	2
Elapidae	*Hemachatus haemachatus*	Rinkhals	Least Concern	3	0	3
Gekkonidae	*Pachydactylus affinis*	Transvaal Gecko	Least Concern	3	0	3

Family	Scientific Name	Common Name	Redlist Status	No of Observations on QDS	No of Observation on Site	LoO
Gekkonidae	*Pachydactylus capensis*	Cape Gecko	Least Concern	3	0	3
Gerrhosauridae	*Gerrhosaurus flavigularis*	Yellow-throated Plated Lizard	Least Concern	5	0	2
Lacertidae	*Nucras lalandii*	Delalande's Sandveld Lizard	Least Concern	1	0	3
Lamprophiidae	*Aparallactus capensis*	Black-headed Centipede-eater	Least Concern	1	0	3
Lamprophiidae	*Boaedon capensis*	Brown House Snake	Least Concern	2	0	3
Lamprophiidae	*Lamprophis aurora*	Aurora House Snake	Least Concern	2	0	3
Lamprophiidae	*Lycodonomorphus rufulus*	Brown Water Snake	Least Concern	1	0	3
Lamprophiidae	*Lycophidion capense capense*	Cape Wolf Snake	Least Concern	1	0	3
Lamprophiidae	*Prosymna sundevallii*	Sundevall's Shovel-snout	Least Concern	1	0	3
Lamprophiidae	*Psammophis crucifer*	Cross-marked Grass Snake	Least Concern	2	0	3
Lamprophiidae	*Psammophylax rhombeatus rhombeatus*	Spotted Grass Snake	Least Concern	4	0	2
Lamprophiidae	*Pseudaspis cana*	Mole Snake	Least Concern	1	0	3
Leptotyphlopidae	*Leptotyphlops scutifrons conjuctus*	Eastern Thread Snake	Not listed	2	0	3
Scincidae	*Panaspis wahlbergii*	Wahlberg's Snake-eyed Skink	Least Concern	1	0	3
Scincidae	*Trachylepis punctatissima*	Speckled Rock Skink	Least Concern	3	0	3
Scincidae	*Trachylepis varia*	Variable Skink	Least Concern	1	0	3
Viperidae	*Bitis arietans arietans*	Puff Adder	Least Concern	2	0	3
Viperidae	*Causus rhombeatus*	Rhombic Night Adder	Least Concern	1	0	3

Butterflies

Family	Genus	species	Red List Status	No of Observations on QDS 2628AD	No of Observation on Site	LoO
HESPERIIDAE	*Coeliades*	*forestan*	Least Concern	1	0	3
HESPERIIDAE	*Coeliades*	*pisistratus*	Least Concern	1	0	3
HESPERIIDAE	*Eretis*	*umbra*	Least Concern	1	0	3
HESPERIIDAE	*Kedestes*	*barberae*	Least Concern	4	0	3
HESPERIIDAE	*Metisella*	*meninx*	Least Concern	4	0	3
HESPERIIDAE	*Spialia*	*asterodia*	Least Concern	6	0	3
HESPERIIDAE	*Spialia*	*ferax*	Least Concern	3	0	3
HESPERIIDAE	*Spialia*	*mafa*	Least Concern	5	0	3
HESPERIIDAE	*Tsitana*	*tsita*	Least Concern	4	0	3

LYCAENIDAE	*Actizera*	*lucida*	Least Concern	3	0	3
LYCAENIDAE	*Aloeides*	*dentatis*	Endangered	6	0	3
LYCAENIDAE	*Aloeides*	*henningi*	Least Concern	2	0	3
LYCAENIDAE	*Aloeides*	*molomo*	Least Concern	3	0	3
LYCAENIDAE	*Aloeides*	*taikosama*	Least Concern	1	0	3
LYCAENIDAE	*Aloeides*	*trimeni*	Least Concern	1	0	3
LYCAENIDAE	*Anthene*	*definita*	Least Concern	2	0	3
LYCAENIDAE	*Anthene*	*livida*	Least Concern	6	0	3
LYCAENIDAE	*Azanus*	*jesous*	Least Concern	1	0	3
LYCAENIDAE	*Azanus*	*moriqua*	Least Concern	1	0	3
LYCAENIDAE	*Azanus*	*ubaldus*	Least Concern	1	0	3
LYCAENIDAE	*Cacyreus*	*virilis*	Least Concern	1	0	3
LYCAENIDAE	*Chilades*	*trochylus*	Least Concern	4	0	3
LYCAENIDAE	*Chrysoritis*	*aureus*	Endangered	70	0	2
LYCAENIDAE	*Cigaritis*	*ella*	Least Concern	2	0	3
LYCAENIDAE	*Cigaritis*	*mozambica*	Least Concern	4	0	3
LYCAENIDAE	*Cigaritis*	*natalensis*	Least Concern	15	0	2
LYCAENIDAE	*Cupidopsis*	*cissus*	Least Concern	5	0	3
LYCAENIDAE	*Eicochrysops*	*messapus*	Least Concern	6	0	3
LYCAENIDAE	*Lampides*	*boeticus*	Least Concern	13	0	2
LYCAENIDAE	*Lepidochrysops*	*ketsi*	Least Concern	2	0	3
LYCAENIDAE	*Lepidochrysops*	*patricia*	Least Concern	8	0	3
LYCAENIDAE	*Lepidochrysops*	*plebeia*	Least Concern	1	0	3
LYCAENIDAE	*Lepidochrysops*	*tantalus*	Least Concern	1	0	3
LYCAENIDAE	*Leptomyrina*	*henningi*	Least Concern	2	0	3
LYCAENIDAE	*Leptotes*	*pirithous*	Least Concern	7	0	3
LYCAENIDAE	*Orachrysops*	*lacrimosa*	Least Concern	2	0	3
LYCAENIDAE	*Orachrysops*	*mijburghi*	Endangered	3	0	3
LYCAENIDAE	*Tarucus*	*sybaris*	Least Concern	5	0	3
LYCAENIDAE	*Tuxentius*	*melaena*	Least Concern	1	0	3
LYCAENIDAE	*Uranothauma*	*nubifer*	Least Concern	3	0	3
LYCAENIDAE	*Zintha*	*hintza*	Least Concern	2	0	3
LYCAENIDAE	*Zizeeria*	*knysna*	Least Concern	1	0	3
LYCAENIDAE	*Zizula*	*hylax*	Least Concern	1	0	3
NYMPHALIDAE	*Acraea*	*aglaonice*	Least Concern	10	0	2
NYMPHALIDAE	*Acraea*	*horta*	Least Concern	1	0	3
NYMPHALIDAE	*Acraea*	*neobule*	Least Concern	3	0	3
NYMPHALIDAE	*Byblia*	*ilithyia*	Least Concern	6	0	3
NYMPHALIDAE	*Catacroptera*	*cloanthe*	Least Concern	13	0	2
NYMPHALIDAE	*Danaus*	*chrysippus*	Least Concern	13	0	2
NYMPHALIDAE	*Hypolimnas*	*misippus*	Least Concern	8	1	1
NYMPHALIDAE	*Junonia*	*hierta*	Least Concern	12	0	2
NYMPHALIDAE	*Junonia*	*oenone*	Least Concern	1	1	1
NYMPHALIDAE	*Junonia*	*orithya*	Least Concern	5	0	3
NYMPHALIDAE	*Paternympha*	*narycia*	Least Concern	6	0	3
NYMPHALIDAE	*Precis*	*archesia*	Least Concern	7	0	3
NYMPHALIDAE	*Precis*	*octavia*	Least Concern	1	0	3
NYMPHALIDAE	*Stygionympha*	*wichgrafi*	Least Concern	2	0	3

NYMPHALIDAE	*Telchinia*	*rahira*	Least Concern	10	0	2
NYMPHALIDAE	*Vanessa*	*cardui*	Least Concern	6	1	1
PAPILIONIDAE	*Papilio*	*demodocus*	Least Concern	10	0	2
PIERIDAE	*Belenois*	*aurota*	Least Concern	11	0	2
PIERIDAE	*Belenois*	*creona*	Least Concern	1	0	3
PIERIDAE	*Catopsilia*	*florella*	Least Concern	6	0	3
PIERIDAE	*Colias*	*electo*	Least Concern	5	0	3
PIERIDAE	*Colotis*	*antevippe*	Least Concern	1	0	3
PIERIDAE	*Colotis*	*euippe*	Least Concern	1	0	3
PIERIDAE	*Eurema*	*brigitta*	Least Concern	9	0	3
PIERIDAE	*Eurema*	*hecabe*	Least Concern	3	0	3
PIERIDAE	*Mylothris*	*agathina*	Least Concern	1	1	1
PIERIDAE	*Pontia*	*helice*	Least Concern	11	0	3
PIERIDAE	*Teracolus*	*eris*	Least Concern	1	0	3
PIERIDAE	*Teracolus*	*subfasciatus*	Least Concern	3	0	3

Odonata

Family	Scientific Name	Common Name	Red List Status	No of Observations on QDS	No of Observation on Site	LoO
Coenagrionidae	*Africallagma glaucum*	Swamp Bluet	Not Listed	1	0	3
Coenagrionidae	*Pseudagrion citricola*	Yellow-faced Sprite	Not Listed	1	0	3
Libellulidae	*Pantala flavescens*	Wandering Glider	Not Listed	3	0	2
Libellulidae	*Orthetrum julia*	Julia Skimmer	Not Listed	1	0	3

Scorpions

Family	Scientific Name	Common Name	Redlist Status	No of Observations on QDS	No of Observation on Site	LoO
Buthidae	*Pseudolychas ochraceus*	Plain Pigmy-thicktail	Not Listed	1	0	2

Appendix 2 Birds that have been recorded in pentad (SABAP2 2018)

Scientific Name	Common Name	Red List Status	Reporting Rate on pentad 2615_2815	No of Observation on Site	LoO
Apalis thoracica	Apalis, Bar-throated	Not Listed	1.8	0	3
Recurvirostra avosetta	Avocet, Pied	Not Listed	7.2	0	3
Turdoides jardineii	Babbler, Arrow-marked	Not Listed	1.3	0	3
Tricholaema leucomelas	Barbet, Acacia Pied	Not Listed	2.6	0	3

Lybius torquatus	Barbet, Black-collared	Not Listed	19.3	0	3
Trachyphonus vaillantii	Barbet, Crested	Not Listed	26.5	0	2
Batis molitor	Batis, Chinspot	Not Listed	0.3	0	3
Merops apiaster	Bee-eater, European	Not Listed	0.3	0	3
Euplectes orix	Bishop, Southern Red	Not Listed	77.6	0	1
Euplectes capensis	Bishop, Yellow	Not Listed	0.8	0	3
Euplectes afer	Bishop, Yellow-crowned	Not Listed	36.1	0	2
Ixobrychus minutus	Bittern, Little	Not Listed	1.3	0	3
Telophorus zeylonus	Bokmakierie,	Not Listed	10.1	0	3
Laniarius ferrugineus	Boubou, Southern	Not Listed	0.3	0	3
Nilaus afer	Brubru, Brubru	Not Listed	0.3	0	3
Pycnonotus nigricans	Bulbul, African Red-eyed	Not Listed	9.5	0	3
Pycnonotus tricolor	Bulbul, Dark-capped	Not Listed	39.4	0	2
Emberiza capensis	Bunting, Cape	Not Listed	1.5	0	3
Emberiza tahapisi	Bunting, Cinnamon-breasted	Not Listed	3.9	0	3
Turnix sylvaticus	Buttonquail, Kurrichane	Not Listed	0.3	0	3
Buteo rufofuscus	Buzzard, Jackal	Not Listed	2.8	0	3
Buteo vulpinus	Buzzard, Steppe	Not Listed	5.2	0	3
Crithagra atrogularis	Canary, Black-throated	Not Listed	41.2	0	1
Serinus canicollis	Canary, Cape	Not Listed	2.6	0	3
Crithagra flaviventris	Canary, Yellow	Not Listed	16.2	0	3
Crithagra mozambicus	Canary, Yellow-fronted	Not Listed	7.2	0	3
Myrmecocichla formicivora	Chat, Anteating	Not Listed	23.7	0	2
Cercomela familiaris	Chat, Familiar	Not Listed	2.8	0	3
Cisticola textrix	Cisticola, Cloud	Not Listed	33.8	0	2
Cisticola aridulus	Cisticola, Desert	Not Listed	6.7	0	3
Cisticola aberrans	Cisticola, Lazy	Not Listed	0.5	0	3
Cisticola tinniens	Cisticola, Levaillant's	Not Listed	71.4	0	1
Cisticola cinnamomeus	Cisticola, Pale-crowned	Not Listed	1.8	0	3
Cisticola lais	Cisticola, Wailing	Not Listed	4.1	0	3
Cisticola ayresii	Cisticola, Wing-snapping	Not Listed	10.1	0	3
Cisticola juncidis	Cisticola, Zitting	Not Listed	48.7	0	2
Thamnolaea cinnamomeiventris	Cliff-chat, Mocking	Not Listed	2.6	0	3
Hirundo spilodera	Cliff-swallow, South African	Not Listed	27.8	0	3
Fulica cristata	Coot, Red-knobbed	Not Listed	71.1	0	1
Phalacrocorax africanus	Cormorant, Reed	Not Listed	47.7	0	1
Phalacrocorax carbo	Cormorant, White-breasted	Not Listed	13.9	0	3
Centropus burchellii	Coucal, Burchell's	Not Listed	2.1	0	3
Amaurornis flavirostris	Crake, Black	Not Listed	5.9	0	3
Corvus albus	Crow, Pied	Not Listed	9.3	0	3
Chrysococcyx caprius	Cuckoo, Diderick	Not Listed	28.4	0	3
Cuculus solitarius	Cuckoo, Red-chested	Not Listed	2.3	0	3
Campephaga flava	Cuckoo-shrike, Black	Not Listed	0.3	0	3
Anhinga rufa	Darter, African	Not Listed	11.3	0	3
Streptopelia	Dove, Laughing	Not Listed	85.6	1	1

senegalensis					
Oena capensis	Dove, Namaqua	Not Listed	1.3	0	3
Streptopelia semitorquata	Dove, Red-eyed	Not Listed	69.6	0	1
Columba livia	Dove, Rock	Not Listed	22.7	0	2
Anas sparsa	Duck, African Black	Not Listed	5.4	0	3
Dendrocygna bicolor	Duck, Fulvous	Not Listed	4.9	0	3
Anas hybrid	Duck, Hybrid Mallard	Not Listed	0.3	0	3
Oxyura maccoa	Duck, Maccoa	Near Threatened	2.3	0	3
Anas platyrhynchos	Duck, Mallard	Not Listed	3.4	0	3
Thalassornis leuconotus	Duck, White-backed	Not Listed	10.6	0	3
Dendrocygna viduata	Duck, White-faced	Not Listed	25.3	0	2
Anas undulata	Duck, Yellow-billed	Not Listed	62.1	0	1
Lophaetus occipitalis	Eagle, Long-crested	Not Listed	0.3	0	3
Polemaetus bellicosus	Eagle, Martial	Endangered	0.3	0	3
Aquila verreauxii	Eagle, Verreaux's	Vulnerable	0.3	0	3
Bubo africanus	Eagle-owl, Spotted	Not Listed	1.0	0	3
Bubulcus ibis	Egret, Cattle	Not Listed	58.8	0	1
Egretta alba	Egret, Great	Not Listed	9.5	0	3
Egretta garzetta	Egret, Little	Not Listed	11.9	0	3
Egretta intermedia	Egret, Yellow-billed	Not Listed	5.2	0	3
Falco amurensis	Falcon, Amur	Not Listed	30.9	0	2
Falco biarmicus	Falcon, Lanner	Not Listed	1.0	0	3
Falco peregrinus	Falcon, Peregrine	Not Listed	0.3	0	3
Falco vespertinus	Falcon, Red-footed	Not Listed	0.5	0	3
Anomalospiza imberbis	Finch, Cuckoo	Not Listed	1.8	0	3
Amadina erythrocephala	Finch, Red-headed	Not Listed	19.8	0	3
Lagonosticta rubricata	Firefinch, African	Not Listed	0.3	0	3
Lanius collaris	Fiscal, Common (Southern)	Not Listed	78.1	0	1
Haliaeetus vocifer	Fish-eagle, African	Not Listed	0.5	0	3
Phoenicopterus ruber	Flamingo, Greater	Near Threatened	7.5	0	3
Phoenicopterus minor	Flamingo, Lesser	Near Threatened	2.3	0	3
Sarothrura rufa	Flufftail, Red-chested	Not Listed	1.5	0	3
Stenostira scita	Flycatcher, Fairy	Not Listed	0.8	0	3
Sigelus silens	Flycatcher, Fiscal	Not Listed	14.2	0	3
Muscicapa striata	Flycatcher, Spotted	Not Listed	1.0	0	3
Scleroptila africanus	Francolin, Grey-winged	Not Listed	0.3	0	3
Scleroptila levaillantoides	Francolin, Orange River	Not Listed	19.6	0	3
Scleroptila levaillantii	Francolin, Red-winged	Not Listed	0.5	0	3
Corythaixoides concolor	Go-away-bird, Grey	Not Listed	8.0	0	3
Anser anser	Goose, Domestic	Not Listed	4.1	0	3
Alopochen aegyptiacus	Goose, Egyptian	Not Listed	46.1	0	2
Plectropterus gambensis	Goose, Spur-winged	Not Listed	29.1	0	3
Sphenoeacus afer	Grassbird, Cape	Not Listed	1.3	0	3
Tyto capensis	Grass-owl, African	Not Listed	5.7	0	3
Podiceps nigricollis	Grebe, Black-necked	Not Listed	0.8	0	3

Podiceps cristatus	Grebe, Great Crested	Not Listed	11.3	0	3
Tachybaptus ruficollis	Grebe, Little	Not Listed	42.3	0	1
Tringa nebularia	Greenshank, Common	Not Listed	5.4	0	3
Numida meleagris	Guineafowl, Helmeted	Not Listed	50.8	0	1
Larus cirrocephalus	Gull, Grey-headed	Not Listed	30.2	0	2
Scopus umbretta	Hamerkop, Hamerkop	Not Listed	3.6	0	3
Circus maurus	Harrier, Black	Endangered	0.8	0	3
Circus pygargus	Harrier, Montagu's	Not Listed	2.3	0	3
Circus macrourus	Harrier, Pallid	Near Threatened	1.0	0	3
Polyboroides typus	Harrier-Hawk, African	Not Listed	0.5	0	3
Egretta ardesiaca	Heron, Black	Not Listed	3.1	0	3
Ardea melanocephala	Heron, Black-headed	Not Listed	62.1	0	1
Ardea goliath	Heron, Goliath	Not Listed	3.6	0	3
Butorides striata	Heron, Green-backed	Not Listed	0.3	0	3
Ardea cinerea	Heron, Grey	Not Listed	22.4	0	2
Ardea purpurea	Heron, Purple	Not Listed	8.5	0	3
Ardeola ralloides	Heron, Squacco	Not Listed	6.7	0	3
Prodotiscus regulus	Honeybird, Brown-backed	Not Listed	0.3	0	3
Indicator indicator	Honeyguide, Greater	Not Listed	1.0	0	3
Upupa africana	Hoopoe, African	Not Listed	22.7	0	2
Delichon urbicum	House-martin, Common	Not Listed	2.1	0	3
Threskiornis aethiopicus	Ibis, African Sacred	Not Listed	58.8	0	1
Plegadis falcinellus	Ibis, Glossy	Not Listed	47.4	0	1
Bostrychia hagedash	Ibis, Hadeda	Not Listed	80.2	0	1
Actophilornis africanus	Jacana, African	Not Listed	0.5	0	3
Falco rupicoloides	Kestrel, Greater	Not Listed	2.6	0	3
Falco naumanni	Kestrel, Lesser	Not Listed	0.5	0	3
Falco rupicolus	Kestrel, Rock	Not Listed	4.9	0	3
Megaceryle maximus	Kingfisher, Giant	Not Listed	3.1	0	3
Alcedo cristata	Kingfisher, Malachite	Not Listed	2.8	0	3
Ceryle rudis	Kingfisher, Pied	Not Listed	5.4	0	3
Halcyon senegalensis	Kingfisher, Woodland	Not Listed	0.3	0	3
Elanus caeruleus	Kite, Black-shouldered	Not Listed	70.6	0	1
Milvus aegyptius	Kite, Yellow-billed	Not Listed	0.3	0	3
Eupodotis caerulescens	Korhaan, Blue	Least Concern	0.5	0	3
Afrotis afraoides	Korhaan, Northern Black	Not Listed	27.8	0	2
Eupodotis senegalensis	Korhaan, White-bellied	Not Listed	0.3	0	3
Vanellus senegallus	Lapwing, African Wattled	Not Listed	30.4	0	2
Vanellus armatus	Lapwing, Blacksmith	Not Listed	88.4	0	1
Vanellus coronatus	Lapwing, Crowned	Not Listed	77.1	0	1
Mirafra fasciolata	Lark, Eastern Clapper	Not Listed	4.4	0	3
Certhilauda semitorquata	Lark, Eastern Long-billed	Not Listed	0.8	0	3
Mirafra cheniana	Lark, Melodious	Least Concern	10.1	0	3
Spizocorys conirostris	Lark, Pink-billed	Not Listed	5.7	0	3
Calandrella cinerea	Lark, Red-capped	Not Listed	31.4	0	2
Mirafra africana	Lark, Rufous-naped	Not Listed	29.4	0	2
Calendulauda sabota	Lark, Sabota	Not Listed	0.5	0	3

Chersomanes albofasciata	Lark, Spike-heeled	Not Listed	30.4	0	2
Macronyx capensis	Longclaw, Cape	Not Listed	73.7	0	1
Lonchura cucullatus	Mannikin, Bronze	Not Listed	0.5	0	3
Circus ranivorus	Marsh-harrier, African	Not Listed	3.6	0	3
Riparia cincta	Martin, Banded	Not Listed	8.8	0	3
Riparia paludicola	Martin, Brown-throated	Not Listed	30.7	0	2
Hirundo fuligula	Martin, Rock	Not Listed	4.1	0	3
Riparia riparia	Martin, Sand	Not Listed	3.6	0	3
Ploceus velatus	Masked-weaver, Southern	Not Listed	87.9	0	1
Gallinula chloropus	Moorhen, Common	Not Listed	30.7	0	3
Gallinula angulata	Moorhen, Lesser	Not Listed	0.3	0	3
Urocolius indicus	Mousebird, Red-faced	Not Listed	22.7	0	2
Colius striatus	Mousebird, Speckled	Not Listed	18.0	0	3
Acridotheres tristis	Myna, Common	Not Listed	62.9	1	1
Cisticola fulvicapilla	Neddicky, Neddicky	Not Listed	11.9	0	3
Nycticorax nycticorax	Night-Heron, Black-crowned	Not Listed	1.8	0	3
Columba arquatrix	Olive-pigeon, African	Not Listed	2.8	0	3
Oriolus larvatus	Oriole, Black-headed	Not Listed	1.3	0	3
Struthio camelus	Ostrich, Common	Not Listed	0.8	0	3
Tyto alba	Owl, Barn	Not Listed	0.8	0	3
Asio capensis	Owl, Marsh	Not Listed	17.8	0	3
Cypsiurus parvus	Palm-swift, African	Not Listed	21.6	0	2
Terpsiphone viridis	Paradise-flycatcher, African	Not Listed	0.5	0	3
Vidua paradisaea	Paradise-whydah, Long-tailed	Not Listed	0.5	0	3
Poicephalus meyeri	Parrot, Meyer's	Not Listed	1.0	0	3
Pavo cristatus	Peacock, Common	Not Listed	0.5	0	3
Pelecanus onocrotalus	Pelican, Great White	Vulnerable	0.3	0	3
Petronia superciliaris	Petronia, Yellow-throated	Not Listed	0.3	0	3
Columba guinea	Pigeon, Speckled	Not Listed	64.7	0	1
Anthus cinnamomeus	Pipit, African	Not Listed	54.1	0	1
Anthus vaalensis	Pipit, Buffy	Not Listed	0.3	0	3
Anthus similis	Pipit, Long-billed	Not Listed	2.1	0	3
Anthus leucophrys	Pipit, Plain-backed	Not Listed	2.3	0	3
Anthus chloris	Pipit, Yellow-breasted	Vulnerable	0.3	0	3
Charadrius hiaticula	Plover, Common Ringed	Not Listed	0.5	0	3
Charadrius pecuarius	Plover, Kittlitz's	Not Listed	2.1	0	3
Charadrius tricollaris	Plover, Three-banded	Not Listed	24.0	0	3
Netta erythrophthalma	Pochard, Southern	Not Listed	9.8	0	3
Glareola nordmanni	Pratincole, Black-winged	Near Threatened	2.8	0	3
Prinia flavicans	Prinia, Black-chested	Not Listed	21.4	0	2
Prinia subflava	Prinia, Tawny-flanked	Not Listed	9.3	0	3
Coturnix coturnix	Quail, Common	Not Listed	8.8	0	3
Ortygospiza atricollis	Quailfinch, African	Not Listed	22.7	0	2
Quelea quelea	Quelea, Red-billed	Not Listed	25.3	0	2
Rallus caerulescens	Rail, African	Not Listed	3.9	0	3
Acrocephalus baeticatus	Reed-warbler, African	Not Listed	9.0	0	3

Acrocephalus arundinaceus	Reed-warbler, Great	Not Listed	1.8	0	3
Cossypha caffra	Robin-chat, Cape	Not Listed	25.8	0	2
Monticola rupestris	Rock-thrush, Cape	Not Listed	1.8	0	3
Monticola explorator	Rock-thrush, Sentinel	Not Listed	2.8	0	3
Coracias caudatus	Roller, Lilac-breasted	Not Listed	0.3	0	3
Philomachus pugnax	Ruff, Ruff	Not Listed	7.5	0	3
Bradypterus baboecala	Rush-warbler, Little	Not Listed	6.4	0	3
Actitis hypoleucos	Sandpiper, Common	Not Listed	3.1	0	3
Calidris ferruginea	Sandpiper, Curlew	Not Listed	2.8	0	3
Tringa stagnatilis	Sandpiper, Marsh	Not Listed	2.8	0	3
Tringa glareola	Sandpiper, Wood	Not Listed	7.0	0	3
Rhinopomastus cyanomelas	Scimitarbill, Common	Not Listed	0.8	0	3
Cercotrichas paena	Scrub-robin, Kalahari	Not Listed	0.8	0	3
Sagittarius serpentarius	Secretarybird, Secretarybird	Vulnerable	11.3	0	3
Crithagra gularis	Seedeater, Streaky-headed	Not Listed	1.8	0	3
Tadorna cana	Shelduck, South African	Not Listed	5.9	0	3
Accipiter badius	Shikra, Shikra	Not Listed	0.3	0	3
Anas smithii	Shoveler, Cape	Not Listed	13.4	0	3
Lanius minor	Shrike, Lesser Grey	Not Listed	1.3	0	3
Lanius collurio	Shrike, Red-backed	Not Listed	1.5	0	3
Circaetus pectoralis	Snake-eagle, Black-chested	Not Listed	3.9	0	3
Gallinago nigripennis	Snipe, African	Not Listed	26.8	0	3
Passer melanurus	Sparrow, Cape	Not Listed	71.9	0	1
Passer domesticus	Sparrow, House	Not Listed	40.5	0	1
Passer diffusus	Sparrow, Southern Grey-headed	Not Listed	10.1	0	3
Accipiter minullus	Sparrowhawk, Little	Not Listed	0.3	0	3
Eremopterix leucotis	Sparrowlark, Chestnut-backed	Not Listed	0.3	0	3
Plocepasser mahali	Sparrow-weaver, White-browed	Not Listed	17.5	0	3
Platalea alba	Spoonbill, African	Not Listed	12.6	0	3
Pternistis swainsonii	Spurfowl, Swainson's	Not Listed	48.2	0	1
Lamprotornis nitens	Starling, Cape Glossy	Not Listed	33.2	0	2
Spreo bicolor	Starling, Pied	Not Listed	19.1	0	3
Onychognathus morio	Starling, Red-winged	Not Listed	1.8	0	3
Creatophora cinerea	Starling, Wattled	Not Listed	11.9	0	3
Himantopus himantopus	Stilt, Black-winged	Not Listed	16.5	0	3
Calidris minuta	Stint, Little	Not Listed	5.9	0	3
Saxicola torquatus	Stonechat, African	Not Listed	75.8	0	1
Leptoptilos crumeniferus	Stork, Marabou	Near Threatened	0.5	0	3
Ciconia ciconia	Stork, White	Not Listed	10.1	0	3
Mycteria ibis	Stork, Yellow-billed	Not Listed	1.8	0	3
Chalcomitra amethystina	Sunbird, Amethyst	Not Listed	2.6	0	3
Nectarinia famosa	Sunbird, Malachite	Not Listed	2.1	0	3

Cinnyris talatala	Sunbird, White-bellied	Not Listed	9.0	0	3
Hirundo rustica	Swallow, Barn	Not Listed	46.9	1	1
Hirundo cucullata	Swallow, Greater Striped	Not Listed	45.6	0	1
Hirundo abyssinica	Swallow, Lesser Striped	Not Listed	3.4	0	3
Hirundo dimidiata	Swallow, Pearl-breasted	Not Listed	0.3	0	3
Hirundo albigularis	Swallow, White-throated	Not Listed	30.9	0	2
Porphyrio madagascariensis	Swamphen, African Purple	Not Listed	10.6	0	3
Acrocephalus gracilirostris	Swamp-warbler, Lesser	Not Listed	22.2	0	3
Cygnus atratus	Swan, Black	Not Listed	0.5	0	3
Cygnus olor	Swan, Mute	Not Listed	0.3	0	3
Apus barbatus	Swift, African Black	Not Listed	0.8	0	3
Tachymarptis melba	Swift, Alpine	Not Listed	0.3	0	3
Apus apus	Swift, Common	Not Listed	0.3	1	1
Apus horus	Swift, Horus	Not Listed	3.4	0	3
Apus affinis	Swift, Little	Not Listed	27.8	0	2
Apus caffer	Swift, White-rumped	Not Listed	46.4	0	1
Anas capensis	Teal, Cape	Not Listed	6.4	0	3
Anas hottentota	Teal, Hottentot	Not Listed	9.0	0	3
Anas erythrorhyncha	Teal, Red-billed	Not Listed	24.2	0	2
Chlidonias hybrida	Tern, Whiskered	Not Listed	17.8	0	3
Chlidonias leucopterus	Tern, White-winged	Not Listed	6.2	0	3
Burhinus capensis	Thick-knee, Spotted	Not Listed	16.5	0	3
Turdus smithi	Thrush, Karoo	Not Listed	28.1	0	2
Parisoma subcaeruleum	Tit-babbler, Chestnut-vented	Not Listed	0.5	0	3
Streptopelia capicola	Turtle-dove, Cape	Not Listed	91.8	0	1
Motacilla capensis	Wagtail, Cape	Not Listed	63.1	0	1
Motacilla flava	Wagtail, Yellow	Not Listed	0.3	0	3
Sylvia borin	Warbler, Garden	Not Listed	0.3	0	3
Acrocephalus schoenobaenus	Warbler, Sedge	Not Listed	0.5	0	3
Phylloscopus trochilus	Warbler, Willow	Not Listed	0.5	0	3
Estrilda astrild	Waxbill, Common	Not Listed	39.2	0	2
Amandava subflava	Waxbill, Orange-breasted	Not Listed	25.8	0	2
Ploceus capensis	Weaver, Cape	Not Listed	1.8	0	3
Amblyospiza albifrons	Weaver, Thick-billed	Not Listed	8.2	0	3
Ploceus cucullatus	Weaver, Village	Not Listed	0.3	0	3
Oenanthe pileata	Wheatear, Capped	Not Listed	39.9	0	2
Oenanthe monticola	Wheatear, Mountain	Not Listed	19.6	0	3
Zosterops virens	White-eye, Cape	Not Listed	21.1	0	2
Vidua macroura	Whydah, Pin-tailed	Not Listed	46.9	0	1
Euplectes axillaris	Widowbird, Fan-tailed	Not Listed	18.0	0	3
Euplectes progne	Widowbird, Long-tailed	Not Listed	83.8	0	1
Euplectes ardens	Widowbird, Red-collared	Not Listed	26.3	0	2
Euplectes albonotatus	Widowbird, White-winged	Not Listed	24.0	0	2
Phoeniculus purpureus	Wood-hoopoe, Green	Not Listed	14.4	0	3
Dendropicos fuscescens	Woodpecker, Cardinal	Not Listed	0.3	0	3
Jynx ruficollis	Wryneck, Red-throated	Not Listed	14.9	0	3

Appendix 3 Approach and terminology used for the impact assessment

The identification of potential impacts should include impacts that may occur during the construction and operational phases of the activity. The assessment of impacts is to include direct, indirect as well as cumulative impacts.

In order to identify potential impacts (both positive and negative) it is important that the nature of the proposed activity is well understood so that the impacts associated with the activity can be understood. The process of identification and assessment of impacts will include:

Determine the current environmental conditions in sufficient detail so that there is a baseline against which impacts can be identified and measured;

Determine future changes to the environment that will occur if the activity does not proceed;

An understanding of the activity in sufficient detail to understand its consequences; and

The identification of significant impacts which are likely to occur if the activity is undertaken.

As per DEA *Guideline 5: Assessment of Alternatives and Impacts* the following methodology is to be applied to the prediction and assessment of impacts. Potential impacts should be rated in terms of the direct, indirect and cumulative:

- **Direct impacts** are impacts that are caused directly by the activity and generally occur at the same time and at the place of the activity. These impacts are usually associated with the construction, operation or maintenance of an activity and are generally obvious and quantifiable.
- **Indirect impacts** of an activity are indirect or induced changes that may occur as a result of the activity. These types of impacts include all the potential impacts that do not manifest immediately when the activity is undertaken or which occur at a different place as a result of the activity.
- **Cumulative impacts** are impacts that result from the incremental impact of the proposed activity on a common resource when added to the impacts of other past, present or reasonably foreseeable future activities. Cumulative impacts can occur from the collective impacts of individual minor actions over a period of time and can include both direct and indirect impacts.
- **Spatial extent** – The size of the area that will be affected by the impact:
    - Site specific;

- Local
- Regional (within 30 km of site); or
- National.

- **Intensity** –The anticipated severity of the impact:
  - High (severe alteration of natural systems, patterns or processes);
  - Medium (notable alteration of natural systems, patterns or processes; or
  - Low (negligible alteration of natural systems, patterns or processes).
- **Duration** –The timeframe during which the impact will be experienced:
  - Temporary (less than 1 year);
  - Short term (1 to 6 years);
  - Medium term (6 to 15 years);
  - Long term (the impact will only cease after the operational life of the activity); or
  - Permanent (mitigation will not occur in such a way or in such a time span that the impact can be considered transient).
- **Reversibility of impacts -**
  - High reversibility of impacts (impact is highly reversible at end of project life);
  - Moderate reversibility of impacts;
  - Low reversibility of impacts; or
  - Impacts are non- reversible (impact is permanent).
- **Irreplaceability of resource loss caused by impacts –**
  - High irreplaceability of resources (project will destroy unique resources that cannot be replaced);
  - Moderate irreplaceability of resources;
  - Low irreplaceability of resources; or
  - Resources are replaceable (the affected resource is easy to replace/ rehabilitate.

Using the criteria above, the impacts will further be assessed in terms of the following:

- **Probability** – The probability of the impact occurring:
    - Improbable (little or no chance of occurring);
    - Probable (<50% chance of occurring);
    - Highly probable (50 – 90% chance of occurring); or
    - Definite (>90% chance of occurring).
- **Significance** – Will the impact cause a notable alteration of the environment?
    - Low to very 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);
    - Medium (the impact will result in moderate alteration of the environment and can be reduced or avoided by implementing the appropriate mitigation measures, and will only have an influence on the decision-making if not mitigated); or
    - High (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).
- **Status** - Whether the impact on the overall environment (social, biophysical and economic) will be:
    - Positive - environment overall will benefit from the impact;
    - Negative - environment overall will be adversely affected by the impact; or
    - Neutral - environment overall will not be affected.
- **Confidence** – The degree of confidence in predictions based on available information and specialist knowledge:
    - Low;
    - Medium; or
    - High.

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

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

Furthermore, the following must be considered:

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

Management Actions:

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

Monitoring:

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

Cumulative Impact:

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

Mitigation:

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

Table 1 below is to be used by specialist for the rating of impacts

Table 1: Description and ratings of different Impact Criteria [*Rating (Score)*]

Criteria	**Description**				
Nature (A brief written statement of the environment aspect being impacted upon by a particular activity or action.)	*Direct*	*Indirect*	*Cumulative*		
Status (The perceived effect of the impact on the affected area.)	*Negative*	*Positive*	*Neutral*		
Spatial Extent	*National (4):* The Whole of South Africa	*Regional (3):* Provincial and Parts of neighbouring provinces	*Local (2):* Within a radius of 2 km of the construction site	*Site (1):* Within the construction site	
Duration	*Permanent:* This impact is irreversible. Mitigation will not occur in such a way Or in such a time span that the impact can be	*Long term (>15 years):* The impacts will cease after the operational life of the activity. The impact is reversible with the implementation of appropriate mitigation and management actions.	*Medium Term (6 to 15 years):* The impact is reversible with the implementation of appropriate mitigation and management actions.	*Short term (2 to 6 years):* This impact is reversible.	*Temporary (less than 2 years):* or period of the construction period. The impact is fully reversible.

	considered transient.				
Potential Impact Intensity (Negative)	*Very High/Fatal Flaw (16):* Potential to severely impact human health, or lead to loss of species	*High (8):* potential to reduce fauna/flora population or to lead to severe reduction/alteration of natural process, loss of livelihood/severe impact on quality of life, individual economic loss	*Medium (4):* Potential to reduce environmental quality; air, soil, water. Potential loss of habitat, loss of heritage, reduce amenity	*Medium-Low (2):* Nuisance	*Low (1):* Negative change, with no other consequence
Potential Impact Intensity (Positive)	*High (8):* Potential Net improvement in human welfare	*Medium (4):* Potential to improve environmental quality; air, soil, water. Improved livelihoods	*Medium-Low(2):* Potential to lead to Economic Development	*Low (1):* Potential positive change- with no other consequences	
Reversibility	*Irreversible*	*High*	*Moderate*	*Low*	
Irreplaceability of Impact Resource	*High*	*Moderate*	*Low*	*Replaceable*	
Probability	*Definite (1):* >90% chance of occurring	*Highly Probable (0.5):* 50-90% chance of occurring	*Probable (0.25):* 10-25% chance of occurring	*Improbable (0.1):* Little or no chance of occurring < 10%)	
Rating of Overall Impact Significance	*Fatally flawed (18-26):* The project cannot be authorised unless major changes to the engineering design are carried out to reduce the significance rating	*High (10-17):* The impacts will result in major alterations to the environment even with the implementation on the appropriate mitigation measures and will have an influence on decision-making.	*Medium (5-9):* 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	*Low (<5):* The Impact may result in moderate alteration of the environment and can be reduced or avoided by implementing appropriate mitigation measures, and will not have an influence of decision-making.	

Overall impact significance is calculated as:

Impact significance = Impact magnitude X Impact probability, where:

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

Other aspects to be taken into consideration in the assessment of impact significance are:

- Impacts will be evaluated for the construction and operation phases of the development. The assessment of impacts for the decommissioning phase will be brief, as there is limited understanding at this stage of what this might entail. The relevant rehabilitation guidelines and legal requirements applicable at the time will need to be applied;
- The impact evaluation will, where possible, take into consideration the cumulative effects associated with this and other facilities/projects which are either developed or in the process of being developed in the local area; and
- The impact assessment will attempt to quantify the magnitude of potential impacts (direct and cumulative effects) and outline the rationale used. Where appropriate, national standards are to be used as a measure of the level of impact.
- Impacts should be assessed for all layouts and project components.

IMPORTANT: Impacts should be described both before and after the proposed mitigation and management measures have been implemented. The assessment of the potential impact "before mitigation" should take into consideration all management actions that are already part of the project design (which are a given). The assessment of the potential impact "after mitigation" should take into consideration any additional management actions proposed by the specialist, to minimise negative or enhance positive impacts.

Appendix 4 Curriculum Vitae of Rirhandzu Marivate

CURRICULUM VITAE: RIRHANDZU MARIVATE

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Professional Registration:	Cand. Sci. Nat. Environmental Sciences – Reg Number: 100147/14
Date of Birth:	23 February 1989
Nationality:	South African

BIOSKETCH

Rirhandzu holds a Bachelor degree in Zoology & Geology, Honours in Ecology, Environment and Conservation from the University of the Witwatersrand; and has environmental research experience with the University of Cape Town. The research focus has been within the domain of socioecology, looking at investigating local ecological knowledge of stakeholders on the provisioning of freshwater resources and its impacts on the management for of the Berg river in the Western Cape, South Africa. The research looked at how perception on resource utilisation affects management priorities, and creating a matrix of perceptions would be used a tool for better decision making within the Berg River Catchment Management Areas. Rirhandzu is currently studying towards her Master in Philosophy in Sustainable Development at the University of Stellenbosch. Here current research interest is looking at environmental planning and management within municipalities and how to optimise green spaces by including ecosystem goods and services to build resilience within those municipalities.

Since 2014, Rirhandzu has worked at the Council for Scientific and Industrial Research (CSIR) as an Environmental Assessment Practitioner (EAP) Intern within the Environmental Management Services (EMS) group, and from 2015 as a Junior Environmental Practitioner for the same group. Her duties include Assistance to other EAPs within EMS in their projects; Research in environmental assessment topics (e.g. indications, best practice, legislation); Report writing and project management; Participating in various forms of environmental assessments (BAs, EIAs, SEAs); consultation with stakeholders and public meetings; and Project administration (e.g. contracting and invoicing). She is particularly involved with the Special Needs and Skills Development (SNSD) Programme, which looks at assisting Community Trusts, Small, Micro to Medium Enterprises, with environmental services. She has also been involved with the Monitoring and Evaluation of the National Strategy for Sustainable Development by the Department of Environmental Affairs (DEA). Rirhandzu has established good client relationships and partnerships with the Land Bank, Department of Agriculture, Forestry and Fisheries (DAFF), and Department of Mineral Resources (DMR) through the SNSD Programme. She is involved as a stakeholder in the continuous consultations for the Development of Environmental Indices in response to the National Development Plan (NDP), led by the DEA.

Rirhandzu further involved with the Applied Centre for Climate and Earth Systems Sciences (ACCESS- NRE) as a national representative for the Student NEC and as a member of their Advisory Board for their Habitable Planet Programme. The HPW programme aims to educate undergraduate and high school learners in environmental and earth systems sciences, with the goal of encouraging them to pursue science careers.

EXPERIENCE

Completion Date	Project description	Role	Client
2014 (in progress)	**Special Needs and Skills Development Programme:** Programme management and conducting of Basic Assessments for disadvantaged communities/businesses/enterprises	**Project Manager;** Stakeholder Co-ordination; Project Support; Mentorship; Ecological Input	National Department of Environmental Affairs (DEA), South Africa
2013- 2014	**Monitoring and Evaluation** for the National Strategy for Sustainable Development and Action Plan.	**Project Member;** Stakeholder engagement, Researcher, Report Writing	National Department of Environmental Affairs (DEA), South Africa
2013-2015	**Strategic Environmental Assessment (SEA)** for wind and solar PV energy in South Africa.	Data Management	National Department of Environmental Affairs (DEA), South Africa

Completion Date	Project description	Role	Client
2014-2016	**Strategic Environmental Assessment (SEA)** for Electricity Grid Infrastructure (EGI).	Stakeholder Engagement	National Department of Environmental Affairs (DEA), South Africa
2014	**Screening Study (SS)** for the Development of Biochar and Composting Facilities to support land restoration near the proposed Ntambelanga Dam, Umzimvubu Catchment, Eastern Cape.	**Project Manager,** Project Research & Report Writing	National Department of Environmental Affairs (DEA), South Africa
2015	**Environmental Screening Study (ESS)** for projects undertaken in the Amatikulu Aquaculture Development Zone, KwaZulu-Natal.	**Project Manager,** Project Research & Report Writing	National Department of Agriculture, Forestry & Fisheries (DAFF), S Africa
2015-2016	**Development of Sustainability Indicators** for the National Integrated State of the Environment Report for Namibia.	**Project Manager**, Project Research & Report Writing	Ministry of Environment and Tourism (MET), Namibia
2016	**Basic Assessment** for the development of a 5.5ha pig production facility and a 2.5 ha chicken broiler facility on Farm Rietvalei, Portion 1 & 6, near Delmas, Mpumalanga.	**Project Manager**	Mokate Estates (Pty) Ltd
2016	**Basic Assessment** for the development of a 0.6 hectare Chicken Layer Facility on a 7.8 hectare farm in Mashau-Bodwe Village, Makhado District, Limpopo.	**Project Manager**	Wanga Poultry (Pty) Ltd
2016	**Sustainable Development Appraisal for Gold Standard** on a microprogramme of the NOVA Brickstar Wood Stove in the Mahlaba Area, Limpopo.	**Project Member**, Project Researcher, Translator	Gold Standard Foundation
2017 (In Progress)	**Sustainable Development Goal Lab** on "Mainstreaming resilience into climate change adaptation and disaster risk planning."	**Project Member**	Future Earth; Stockholm Resilience Centre; University of Tokyo
2017 (In progress)	**Basic Assessment** for the proposed development of a leisure and cultural village on Farm Moiloa 412-JO, Dinokana Village, North West.	**Project Manager**	Makadima Leisure & Cultural Village 101 (Pty) Ltd
2017 (In progress)	**Basic Assessment** for the expansion of a Chicken Layer Facility on a 4.4 hectare farm on plot 226 Withok Estate, Brakpan, Ekurhuleni District, Gauteng	**Project Manager**	Lewin AgriBusiness (Pty) Ltd
2017 (In progress)	**Basic Assessment** for the expansion of a Chicken Broiler Facility on a 2.57 hectare farm on plot 62, Mapleton, Ekurhuleni District, Gauteng.	**Project Manager**	Mthunzi Chicken Supplier (Pty) Ltd

PAST EMPLOYMENT RECORD

- **2014-2015** CSIR Environmental Management Services (EMS) Environmental Scientist and Assessment Practitioner (Intern).
- **2011-2013** UCT Environmental & Geographical Science Department (N Methner; K Vickery) Researcher & Teaching Assistant
- **2010** WITS School of Animal Plant & Environmental Sciences (Prof K Balkwill) Teaching Assistant.
- **2009** ESKOM Generation Environmental Management (D Herbst) Environmental Officer (Intern).
- **2009** WITS School of Geosciences (Dr G Drennan; Dr M Evans) Teaching & Field Assistant.
- **2008** WITS School of Animal Plant & Environmental Sciences (T Gardiner; Dr W Twine) Environmental Control & Field Assistant.
- **2008** Jane Goodall Institute (Dr L Duncan) Field Assistant.

QUALIFICATIONS

- **2010 University of the Witwatersrand (Wits) BSc Honours (Ecology, Environment and Conservation)**
  Coursework: Approaches to Science, Experimental Design and Biostatistics, Introduction to Statistics Computer programme R, Introduction to Geographic Information Systems, Global Change: Impact on Soils, Plants and the Environment, Ecological Engineering and Phytoremediation, Ethnoecology.
  Thesis: Species Composition and Population Structure of Trees Protected in Cultivated Fields of Rural Villages in the Bushbuckridge Region, Mpumalanga Province (Supervisors: Dr Wayne Twine, Prof Ed Witkowski)
- **2006 – 2009 University of the Witwatersrand (Wits) BSc (Zoology & Ecology)**
  Senior Courses: Research Report Writing; Exploration and Environmental Geochemistry; Introduction to Palaeoclimatology; Environmental Geomorphology; Diversity, Ecology and Economic Importance of Algae; Functional

Ecology in Changing Environments; Ecological Communities and Biodiversity Conservation; Structural Geology; Igneous Petrology; Physics of the Earth and Plate Tectonics; Ore Petrology and Mineralisation Processes

SHORT-COURSES, CONFERENCES AND WORKSHOPS

- 2017 Ecosystem-Based Adaptation: Developing Capacity for Implementation, SANBI, Pretoria National Botanical Gardens, June 2017.
- 2015 Practical Adaptation for vulnerable communities by Adaptation Network, Kirstenbosch Botanical Gardens, Cape Town, August 2015.
- 2015 International Association for Impact Assessors South Africa (IAIAsa) National Annual Conference, August 2016, KZN.
- 2015 Sharpening the Tool: New Techniques & Methods in Environmental Impact Assessments, SE Solutions, Stellenbosch, Western Cape
- 2014 CiLLA Project Management I Course on July 2014 at CSIR Stellenbosch
- 2014 International Association for Impact Assessors South Africa (IAIAsa) Air Quality Management (AQM) Workshop on June 2014 in Western Cape
- 2014 South African Environmental Observation Network (SAEON) Graduate Student Network (GSN) Annual Conference September 2014, Eastern Cape.
- 2014 IAIAsa National Conference from August 2014 at Midrand, Gauteng
- 2014 African Student Energy (ASE) Annual Summit Cape Peninsula University of Technology June 2014, Western Cape
- 2014 International Association for Impact Association South Africa (IAIAsa) New National Environmental Management Act (NEMA) regulations March 2014 Western Cape
- 2014 Applied Centre for Climate and Earth Systems Sciences (ACCESS) facilitation for teacher training January 2014,WC.
- 2012 International Conference for Freshwater Governance for Sustainable Development November 2012, KwaZulu-Natal
- 2012 Society of South African Geographers (SSAG) Annual Conference at University of Cape Town June 2012, Western Cape
- 2011 Applied Centre for Climate and Earth System Sciences (ACCESS) teacher training, Western Cape
- 2011 BlueBuck Environmental Network Annual Summit at Rhodes University, Eastern Cape
- 2010 Biodiversity and People Mini-Symposium, University of the Witwatersrand, October 2010, Mpumalanga

LANGUAGES

	Speaking	Reading	Writing
Setswana	Excellent	Excellent	Excellent
Xitsonga	Excellent	Excellent	Excellent
English	Excellent	Excellent	Excellent

PROFESSIONAL REGISTRATIONS

- IAIA: Member of International Association of Impact Assessment South Africa (IAIAsa) since 5 February 2014.
- SACNASP: Registered as Candidate Natural Scientist with South African Council for Natural Scientific Professions (SACNASP) since July 2014. Registration number: 100147/14

Appendix 5 Letter of confirmation of External Review.

Attention: Rirhandzu Marivate / Minnelise Levendal
CSIR- Environmental Management Services
Implementation Unit
Tel: 021-888-2432
email: rmarivate@csir.co.za

27 July 2018
Our Ref: 2392

NSS

Dear Rirhandzu and Minnelise

ECOLOGICAL REVIEW FOR THE SPECIAL SKILLS DEVELOPMENT PROJECT – LEWIN AGRIBUSINESS FARM, GAUTENG

Natural Scientific Services CC
2003/077331/23
64A Coleraine Drive
Riverclub Ext 7
Sandton
2191
Tel: +27 (0) 11 787 7400
Fax: +27 (0) 11 784 7599
Email: post@nss-sa.co.za
Members:
Kathy Taggart - PrSciNat / MSc (WITS)
Susan Abell - PrSciNat / MSc (WITS)

As requested by the CSIR- Environmental Management Services, NSS was appointed for the review of a number of terrestrial ecological scans that the CSIR has been involved in. This included the Lewin Agribusiness Chicken Laying Facility Project in Ekurhuleni, Gauteng.

NSS conducted two detailed reviews on the Igwazi Ecological Scan report. The draft versions were submitted to NSS for review on 19 February 2018 and 14 March 2018. The NSS team members that conducted the review are highlighted in **Table 1** below.

Table 1. NSS Review Team

Team Member	Qualifications
Susan Abell Senior Ecologist & Vegetation Specialist	• *PrSciNat* Registered (400116/05) -Ecology and Environmental Science • MSc – Resource Conservation Biology
Tyron Clark Faunal Specialist	• BSc Honours- Zoology • MSc in progress

Through the review process, NSS noted that due to the small extent of the site and its anthropogenically transformed state, the approach and methodologies followed were sufficient for the purpose of the project. Therefore no further site visits addressing the ecology of the site are warranted. All comments and corrections made in the second review by NSS (dated 7 July 2018) were discussed telephonically between Rirhandzu Marivate (CSIR) and Susan Abell (NSS) on 16 July 2018. If all comments made in the review process have been addressed, then it is NSS's opinion that the report is consistent with the requirements set out in Appendix 6 of GN R326 Environmental Impact Assessment (EIA) Regulations, 7 April 2017.

Yours Sincerely,

Susan Abell
Natural Scientific Services

HERITAGE IMPACT ASSESSMENT

(REQUIRED UNDER SECTION 38(8) OF THE NHRA (No. 25 OF 1999)

FOR THE PROPOSED LEWIN CHICKEN LAYER FACILITY, GAUTENG PROVINCE

Type of development:

Agricultural Development

Client:

CSIR

Client info:

Rirhandzu Marivate

E – mail: rmarivate@csir.co.za

Developer: Lewin Agribusiness (Pty) Ltd

HCAC - Heritage Consultants

Private Bag X 1049

Suite 34

Modimolle

0510

Tel: 082 373 8491

Fax: 086 691 6461

E-Mail: jaco.heritage@gmail.com

Report Author:

Mr. J. van der Walt

Project Reference:

HCAC Project number 217117

Report date:

November 2017

APPROVAL PAGE

Project Name	**Lewin Chicken Layer Facility**
Report Title	Heritage Impact Assessment Lewin Chicken Layer Facility
Authority Reference Number	**11201**
Report Status	Final Report
Applicant Name	Lewin AgriBusiness (Pty) Ltd

	Name	Signature	Qualifications and Certifications	Date
Document Compilation	Jaco van der Walt		MA Archaeology ASAPA #159	November 2017
	Marko Hutten		BA Hons Archaeology	November 2017

DOCUMENT PROGRESS

Distribution List

Date	Report Reference Number	Document Distribution	Number of Copies
28 November 2017	217116	CSIR	Electronic Copy

Amendments on Document

Date	Report Reference Number	Description of Amendment

INDEMNITY AND CONDITIONS RELATING TO THIS REPORT

The findings, results, observations, conclusions and recommendations given in this report are based on the author's best scientific and professional knowledge as well as available information. The report is based on survey and assessment techniques which are limited by time and budgetary constraints relevant to the type and level of investigation undertaken and HCAC reserves the right to modify aspects of the report including the recommendations if and when new information becomes available from ongoing research or further work in this field, or pertaining to this investigation.

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The client, on acceptance of any submission by HCAC and on condition that the client pays to HCAC the full price for the work as agreed, shall be entitled to use for its own benefit:

- The results of the project;
- The technology described in any report; and
- Recommendations delivered to the client.

Should the applicant wish to utilise any part of, or the entire report, for a project other than the subject project, permission must be obtained from HCAC to do so. This will ensure validation of the suitability and relevance of this report on an alternative project.

REPORT OUTLINE

Appendix 6 of the GNR 326 EIA Regulations published on 7 April 2017 provides the requirements for specialist reports undertaken as part of the environmental authorisation process. In line with this, Table 1 provides an overview of Appendix 6 together with information on how these requirements have been met.

Table 1. Specialist Report Requirements.

Requirement from Appendix 6 of GN 326 EIA Regulation 2017	Chapter
(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	Section a Section 12
(b) Declaration that the specialist is independent in a form as may be specified by the competent authority	*Declaration of Independence*
(c) Indication of the scope of, and the purpose for which, the report was prepared	Section 1
(cA)an indication of the quality and age of base data used for the specialist report	Section 3.4 and 7.1.
(cB) a description of existing impacts on the site, cumulative impacts of the proposed development and levels of acceptable change;	9
(d) Duration, Date and season of the site investigation and the relevance of the season to the outcome of the assessment	Section 3.4
(e) Description of the methodology adopted in preparing the report or carrying out the specialised process inclusive of equipment and modelling used	Section 3
(f) details of an assessment of the specific identified sensitivity of the site related to the proposed activity or activities and its associated structures and infrastructure, inclusive of a site plan identifying site alternatives;	Section 8 and 9
(g) Identification of any areas to be avoided, including buffers	Section 8 and 9
(h) 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 8
(I) Description of any assumptions made and any uncertainties or gaps in knowledge	Section 3.7
(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** or activities;	Section 9
(k) Mitigation measures for inclusion in the EMPr	Section 9
(I) Conditions for inclusion in the environmental authorisation	Section 9
(m) Monitoring requirements for inclusion in the EMPr or environmental authorisation	Section 9
(n) Reasoned opinion - (i) as to whether the proposed activity, activities or portions thereof should be authorised; (iA) regarding the acceptability of the proposed activity or activities; and (ii) if the opinion is that the proposed activity, activities or portions thereof should be authorised, any avoidance, management and mitigation measures that should be included in the EMPr, and where applicable, the closure plan	Section 9.2
(o) Description of any consultation process that was undertaken during the course of preparing the specialist report	Section 6
(p) A summary and copies of any comments received during any consultation process and where applicable all responses thereto; and	Refer to BA report
(q) Any other information requested by the competent authority	Section 10

Executive Summary

Lewin Agribusiness (Pty) Ltd and the CSIR are conducting a Basic Assessment for the Lewin Chicken Layer Facility on Plot 226, Withok Estates, Brakpan, Benoni, Gauteng Province. HCAC was appointed to conduct a Heritage Impact Assessment to determine the presence of cultural heritage sites and the impact of the proposed development on these non-renewable resources. The study area was assessed both on desktop level and by a field survey. The field survey was conducted as a non-intrusive pedestrian survey to cover the extent of Plot 226 as development plans are not available at this stage.

No archaeological sites or material of significance was recorded during the survey. A paleontological desktop study was conducted by Rossouw (2017) that concluded: "*Potential impact on palaeontological remains within the development footprint is considered to be negligible and it is recommended that the planned development is exempt from a full Phase 1 Palaeontological Impact Assessment*.". No further mitigation prior to construction is recommended in terms of the archaeological and paleontological components of Section 35 for the proposed development to proceed.

In terms of the built environment of the area (Section 34), no standing structures older than 60 years occur within the study areas. In terms of Section 36 of the Act no burial sites were recorded. If any graves are located in future they should ideally be preserved *in-situ* or alternatively relocated according to existing legislation. No public monuments are located within or close to the study area. The area is rural in character and the proposed project is in line with the current land use and will not impact negatively on significant cultural landscapes or viewscapes. During the public participation process conducted for the project no heritage concerns was raised.

Due to the lack of significant heritage resources in the study area the impact of the proposed project on heritage resources is considered low and it is recommended that the proposed project can commence on the condition that the following recommendations are implemented as part of the EMPr and based on approval from SAHRA:

- Implementation of a chance find procedure.

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Declaration of Independence

Specialist Name	Jaco van der Walt
Declaration of Independence	I declare, as a specialist appointed in terms of the National Environmental Management Act (Act No 108 of 1998) and the associated 2014 Environmental Impact Assessment (EIA) Regulations, that I: • I act as the 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; • 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 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; • 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 24F of the Act.
Signature	
Date	28/11/2017

a) Expertise of the specialist

Jaco van der Walt has been practising as a CRM archaeologist for 15 years. He obtained an MA degree in Archaeology from the University of the Witwatersrand focussing on the Iron Age in 2012 and is a PhD candidate at the University of Johannesburg focussing on Stone Age Archaeology with specific interest in the Middle Stone Age (MSA) and Later Stone Age (LSA). Jaco is an accredited member of ASAPA (#159) and have conducted more than 500 impact assessments in Limpopo, Mpumalanga, North West, Free State, Gauteng, KZN as well as he Northern and Eastern Cape Provinces in South Africa.

Jaco has worked on various international projects in Zimbabwe, Botswana, Mozambique, Lesotho, DRC Zambia and Tanzania. Through this he has a sound understanding of the IFC Performance Standard requirements, with specific reference to Performance Standard 8 – Cultural Heritage.

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

ABBREVIATIONS

AIA: Archaeological Impact Assessment
ASAPA: Association of South African Professional Archaeologists
BGG Burial Ground and Graves
BIA: Basic Impact Assessment
CFPs: Chance Find Procedures
CMP: Conservation Management Plan
CRR: Comments and Response Report
CRM: Cultural Resource Management
DEA: Department of Environmental Affairs
EA: Environmental Authorisation
EAP: Environmental Assessment Practitioner
ECO: Environmental Control Officer
EIA: Environmental Impact Assessment*
EIA: Early Iron Age*
EIA Practitioner: Environmental Impact Assessment Practitioner
EMP: Environmental Management Programme
ESA: Early Stone Age
ESIA: Environmental and Social Impact Assessment
GIS Geographical Information System
GPS: Global Positioning System
GRP Grave Relocation Plan
HIA: Heritage Impact Assessment
LIA: Late Iron Age
LSA: Late Stone Age
MEC: Member of the Executive Council
MIA: Middle Iron Age
MPRDA: Mineral and Petroleum Resources Development Act
MSA: Middle Stone Age
NEMA National Environmental Management Act, 1998 (Act No. 107 of 1998)
NHRA National Heritage Resources Act, 1999 (Act No. 25 of 1999)
NID Notification of Intent to Develop
NoK Next-of-Kin
PRHA: Provincial Heritage Resource Agency
SADC: Southern African Development Community
SAHRA: South African Heritage Resources Agency

**Although EIA refers to both Environmental Impact Assessment and the Early Iron Age both are internationally accepted abbreviations and must be read and interpreted in the context it is used.*

GLOSSARY

Archaeological site (remains of human activity over 100 years old)
Early Stone Age (~ 2.6 million to 250 000 years ago)
Middle Stone Age (~ 250 000 to 40-25 000 years ago)
Later Stone Age (~ 40-25 000, to recently, 100 years ago)
The Iron Age (~ AD 400 to 1840)
Historic (~ AD 1840 to 1950)
Historic building (over 60 years old)

1 Introduction and Terms of Reference:

Heritage Contracts and Archaeological Consulting CC (**HCAC)** has been contracted by the CSIR to conduct a heritage impact assessment of the proposed Lewin Chicken Layer Facility. The report forms part of the Basic Assessment Report (BAR) and Environmental Management Programme Report (EMPR) for the development.

The aim of the study is to survey the proposed development footprint to identify cultural heritage sites, document, and assess their importance within local, provincial and national context. It serves to assess the impact of the proposed project on non-renewable heritage resources, and to submit appropriate recommendations with regard to the responsible cultural resources management measures that might be required to assist the developer in managing the discovered heritage resources in a responsible manner. It is also conducted to protect, preserve, and develop such resources within the framework provided by the National Heritage Resources Act of 1999 (Act No 25 of 1999). The report outlines the approach and methodology utilized before and during the survey, which includes: Phase 1, review of relevant literature; Phase 2, the physical surveying of the area on foot and by vehicle; Phase 3, reporting the outcome of the study.

During the survey, no heritage sites were identified. General site conditions and features on sites were recorded by means of photographs, GPS locations, and site descriptions. Possible impacts were identified and mitigation measures are proposed in the following report. SAHRA as a commenting authority under section 38(8) of the National Heritage Resources Act, 1999 (Act No. 25 of 1999) require all environmental documents, complied in support of an Environmental Authorisation application as defined by NEMA EIA Regulations section 40 (1) and (2), to be submitted to SAHRA. As such the Basic Assessment report and its appendices must be submitted to the case as well as the EMPr, once it's completed by the Environmental Assessment Practitioner (EAP).

1.1 Terms of Reference

Field study

Conduct a field study to: (a) locate, identify, record, photograph and describe sites of archaeological, historical or cultural interest; b) record GPS points of sites/areas identified as significant areas; c) determine the levels of significance of the various types of heritage resources affected by the proposed development.

Reporting

Report on the identification of anticipated and cumulative impacts the operational units of the proposed project activity may have on the identified heritage resources for all 3 phases of the project; i.e., construction, operation and decommissioning phases. Consider alternatives, should any significant sites be impacted adversely by the proposed project. Ensure that all studies and results comply with the relevant legislation, SAHRA minimum standards and the code of ethics and guidelines of ASAPA.

To assist the developer in managing the discovered heritage resources in a responsible manner, and to protect, preserve, and develop them within the framework provided by the National Heritage Resources Act of 1999 (Act No 25 of 1999).

Table 2: Project Description

Size of farm and portions	4,4 Hectares on Plot 226 Mans Street, Withok Estates, Brakpan, Benoni
Magisterial District	Ekhuruleni Municipality
1: 50 000 map sheet number	1:50 000 topographical map 2628AD Springs 1:250 000 geological map 2628 East Rand
Central co-ordinate of the development	26°18' 47.16"S; 28°19' 20.28"E

Table 3: Infrastructure and project activities

Type of development	Chicken Layer Facility
Project size	4,4, hectares
Project Components	**Current Infrastructure** • 1x 5 000 capacity layer house • 2 x row of chicken cages (2 500 each row) • 1 x Toilet • 1 x Borehole – water capacity: 7 500 L (2 500 L for chicken facility; 5 000 L general domestic use) **Proposed Development Expansion** • 1 x 5000 capacity layer house • 2 x row (2 500 capacity each row) chicken cage.

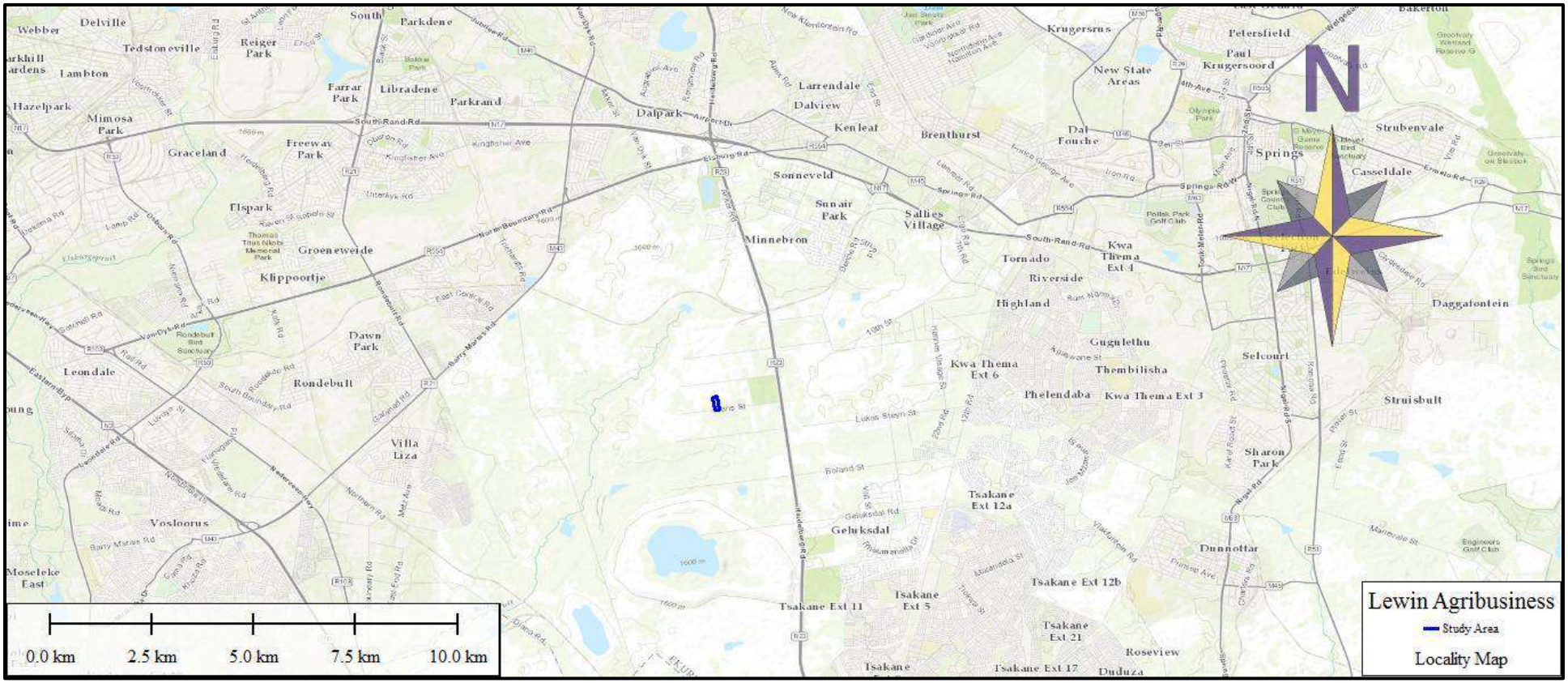

Figure 1. Locality map of the larger area indicating the study area in blue.

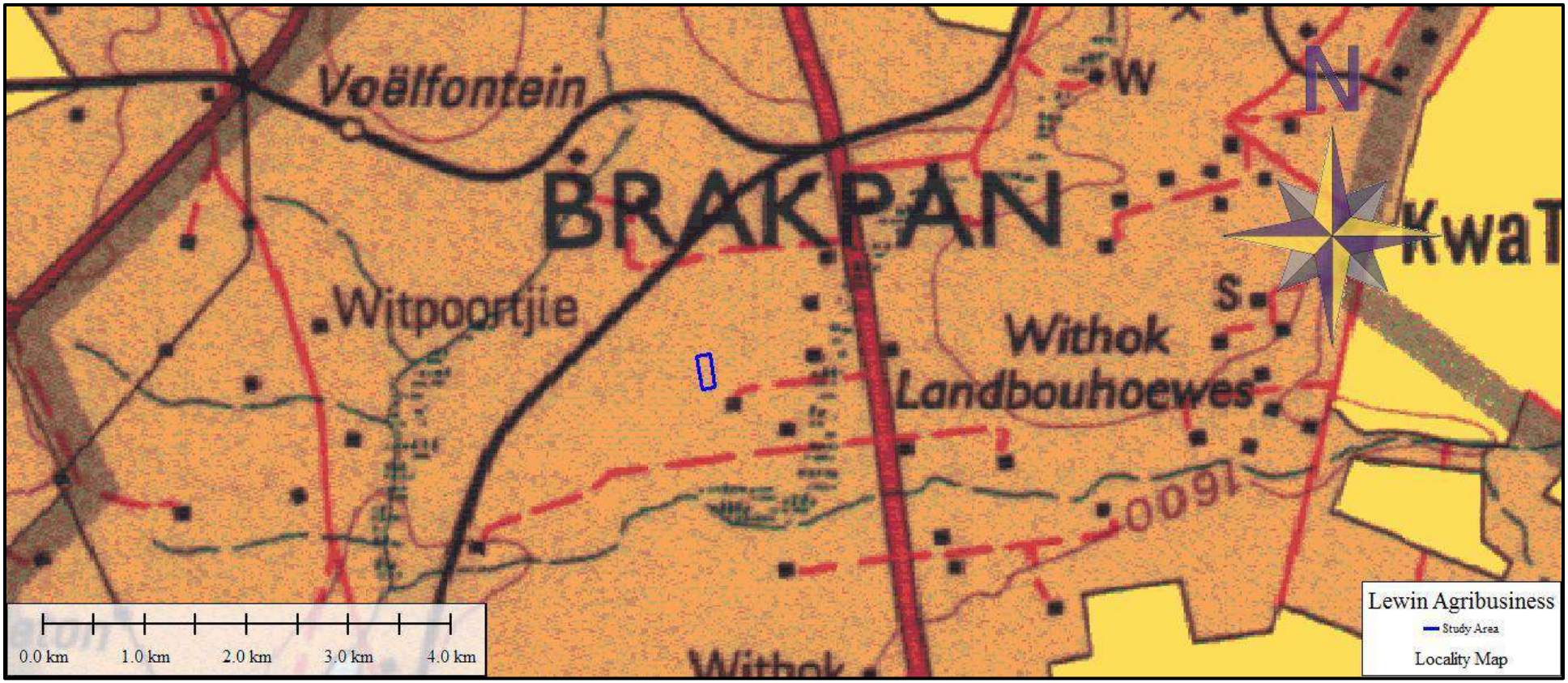

Figure 2. Provincial locality map (1: 250 000 topographical map)

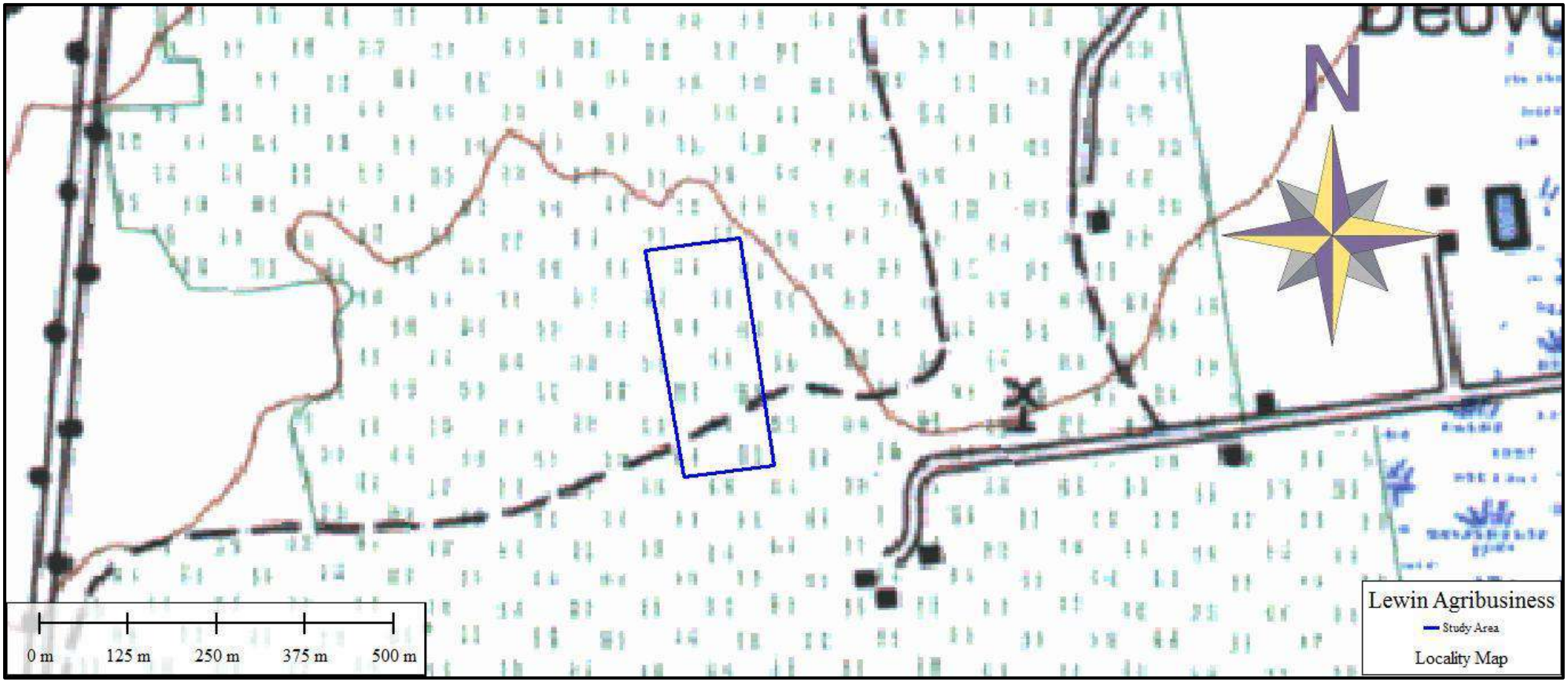

Figure 3: Regional locality map (1:50 000 topographical map).

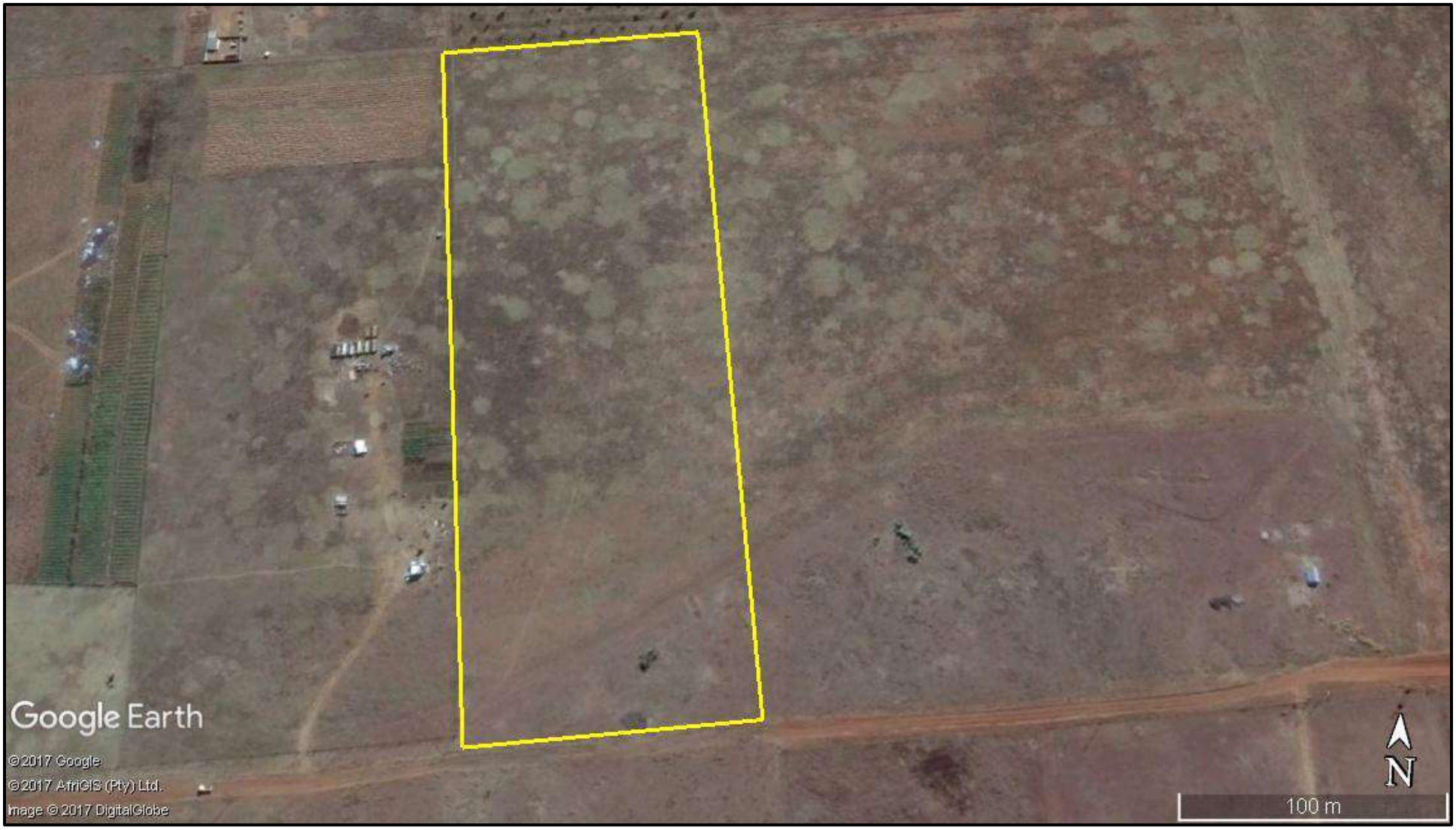

Figure 4. Satellite image indicating the development footprint (Google Earth 2016).

2 Legislative Requirements

The HIA, as a specialist sub-section of the EIA, is required under the following legislation:

- National Heritage Resources Act (NHRA), Act No. 25 of 1999)
- National Environmental Management Act (NEMA), Act No. 107 of 1998 - Section 23(2)(b)
- Mineral and Petroleum Resources Development Act (MPRDA), Act No. 28 of 2002 - Section 39(3)(b)(iii)

A Phase 1 HIA is a pre-requisite for development in South Africa as prescribed by SAHRA and stipulated by legislation. The overall purpose of heritage specialist input is to:

- Identify any heritage resources, which may be affected;
- Assess the nature and degree of significance of such resources;
- Establish heritage informants/constraints to guide the development process through establishing thresholds of impact significance;
- Assess the negative and positive impact of the development on these resources; and
- Make recommendations for the appropriate heritage management of these impacts.

The HIA should be submitted, as part of the impact assessment report or EMPr, to the PHRA if established in the province or to SAHRA. SAHRA will ultimately be responsible for the professional evaluation of Phase 1 AIA reports upon which review comments will be issued. 'Best practice' requires Phase 1 AIA reports and additional development information, as per the impact assessment report and/or EMPr, to be submitted in duplicate to SAHRA after completion of the study. SAHRA accepts Phase 1 AIA reports authored by professional archaeologists, accredited with ASAPA or with a proven ability to do archaeological work.

Minimum accreditation requirements include an Honours degree in archaeology or related discipline and 3 years post-university CRM experience (field supervisor level). Minimum standards for reports, site documentation and descriptions are set by ASAPA in collaboration with SAHRA. ASAPA is based in South Africa, representing professional archaeology in the SADC region. ASAPA is primarily involved in the overseeing of ethical practice and standards regarding the archaeological profession. Membership is based on proposal and secondment by other professional members.

Phase 1 AIA's are primarily concerned with the location and identification of heritage sites situated within a proposed development area. Identified sites should be assessed according to their significance. Relevant conservation or Phase 2 mitigation recommendations should be made. Recommendations are subject to evaluation by SAHRA.

Conservation or Phase 2 mitigation recommendations, as approved by SAHRA, are to be used as guidelines in the developer's decision-making process.

Phase 2 archaeological projects are primarily based on salvage/mitigation excavations preceding development destruction or impact on a site. Phase 2 excavations can only be conducted with a permit, issued by SAHRA to the appointed archaeologist. Permit conditions are prescribed by SAHRA and includes (as minimum requirements) reporting back strategies to SAHRA and deposition of excavated material at an accredited repository.

In the event of a site conservation option being preferred by the developer, a site management plan, prepared by a professional archaeologist and approved by SAHRA, will suffice as minimum requirement.

After mitigation of a site, a destruction permit must be applied for with SAHRA by the applicant before development may proceed.

Human remains older than 60 years are protected by the National Heritage Resources Act, with reference to Section 36. Graves older than 60 years, but younger than 100 years fall under Section 36 of Act 25 of 1999 (National Heritage Resources Act), as well as the Human Tissues Act (Act 65 of 1983), and are the jurisdiction of SAHRA. The procedure for Consultation Regarding Burial Grounds and Graves (Section 36[5]) of Act 25 of 1999) is applicable to graves older than 60 years that are situated outside a formal cemetery administrated by a local authority. Graves in this age category, located inside a formal cemetery administrated by a local authority, require the same authorisation as set out for graves younger than 60 years, in addition to SAHRA authorisation. If the grave is not situated inside a formal cemetery, but is to be relocated to one, permission from the local authority is required and all regulations, laws and by-laws, set by the cemetery authority, must be adhered to.

Human remains that are less than 60 years old are protected under Section 2(1) of the Removal of Graves and Dead Bodies Ordinance (Ordinance No. 7 of 1925), as well as the Human Tissues Act (Act 65 of 1983), and are the jurisdiction of the National Department of Health and the relevant Provincial Department of Health and must be submitted for final approval to the office of the relevant Provincial Premier. This function is usually delegated to the Provincial MEC for Local Government and Planning; or in some cases, the MEC for Housing and Welfare. Authorisation for exhumation and reinternment must also be obtained from the relevant local or regional council where the grave is situated, as well as the relevant local or regional council to where the grave is being relocated. All local and regional provisions, laws and by-laws must also be adhered to. To handle and transport human remains, the institution conducting the relocation should be authorised under Section 24 of Act 65 of 1983 (Human Tissues Act).

3 METHODOLOGY

3.1 Literature Review

A brief survey of available literature was conducted to extract data and information on the area in question to provide general heritage context into which the development would be set. This literature search included published material, unpublished commercial reports and online material, including reports sourced from the South African Heritage Resources Information System (SAHRIS).

3.2 Genealogical Society and Google Earth Monuments

Google Earth and 1:50 000 maps of the area were utilised to identify possible places where sites of heritage significance might be located; these locations were marked and visited during the field work phase. The database of the Genealogical Society was consulted to collect data on any known graves in the area.

3.3 Public Consultation and Stakeholder Engagement:

Stakeholder engagement is a key component of any BAR process, it involves stakeholders interested in, or affected by the proposed development. Stakeholders are provided with an opportunity to raise issues of concern (for the purposes of this report only heritage related issues will be included). The aim of the public consultation process was to capture and address any issues raised by community members and other stakeholders during key stakeholder and public meetings. The process involved:

- Placement of advertisements and site notices
- Stakeholder notification (through the dissemination of information and meeting invitations);
- Stakeholder meetings undertaken with I&APs;
- Authority Consultation
- The compilation of a Basic Assessment Report (BAR).

Please refer to section 6 for more detail.

3.4 Site Investigation

Conduct a field study to: a) systematically survey the proposed project area to locate, identify, record, photograph and describe sites of archaeological, historical or cultural interest; b) record GPS points of sites/areas identified as significant areas; c) determine the levels of significance of the various types of heritage resources recorded in the project area.

Table 4: Site Investigation Details

	Site Investigation
Date	7 November 2017
Season	Summer. The development footprint was adequately surveyed to record the presence of heritage sites (Figure 5).

Figure 5: Track logs of the survey in black.

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3.5 Site Significance and Field Rating

Section 3 of the NHRA distinguishes nine criteria for places and objects to qualify as 'part of the national estate' if they have cultural significance or other special value. These criteria are:

- Its importance in/to the community, or pattern of South Africa's history;
- Its possession of uncommon, rare or endangered aspects of South Africa's natural or cultural heritage;
- Its potential to yield information that will contribute to an understanding of South Africa's natural or cultural heritage;
- Its importance in demonstrating the principal characteristics of a particular class of South Africa's natural or cultural places or objects;
- Its importance in exhibiting particular aesthetic characteristics valued by a community or cultural group;
- Its importance in demonstrating a high degree of creative or technical achievement at a particular period;
- Its strong or special association with a particular community or cultural group for social, cultural or spiritual reasons;
- Its strong or special association with the life or work of a person, group or organisation of importance in the history of South Africa;
- Sites of significance relating to the history of slavery in South Africa.

The presence and distribution of heritage resources define a 'heritage landscape'. In this landscape, every site is relevant. In addition, because heritage resources are non-renewable, heritage surveys need to investigate an entire project area, or a representative sample, depending on the nature of the project. In the case of the proposed project the local extent of its impact necessitates a representative sample and only the footprint of the areas demarcated for development were surveyed. In all initial investigations, however, the specialists are responsible only for the identification of resources visible on the surface. This section describes the evaluation criteria used for determining the significance of archaeological and heritage sites. The following criteria were used to establish site significance with cognisance of Section 3 of the NHRA:

- The unique nature of a site;
- The integrity of the archaeological/cultural heritage deposits;
- The wider historic, archaeological and geographic context of the site;
- The location of the site in relation to other similar sites or features;
- The depth of the archaeological deposit (when it can be determined/is known);
- The preservation condition of the sites; and
- Potential to answer present research questions.

In addition to this criteria field ratings prescribed by SAHRA (2006), and acknowledged by ASAPA for the SADC region, were used for the purpose of this report. The recommendations for each site should be read in conjunction with section 10 of this report.

FIELD RATING	***GRADE***	***SIGNIFICANCE***	***RECOMMENDED MITIGATION***
National Significance (NS)	Grade 1	-	Conservation; national site nomination
Provincial Significance (PS)	Grade 2	-	Conservation; provincial site nomination
Local Significance (LS)	Grade 3A	High significance	Conservation; mitigation not advised
Local Significance (LS)	Grade 3B	High significance	Mitigation (part of site should be retained)
Generally Protected A (GP.A)	-	High/medium significance	Mitigation before destruction
Generally Protected B (GP.B)	-	Medium significance	Recording before destruction
Generally Protected C (GP.C)	-	Low significance	Destruction

3.6 Impact Assessment Methodology

The criteria below are used to establish the impact rating on sites:

- The **nature**, which shall include a description of what causes the effect, what will be affected and how it will be affected.
- The **extent**, wherein it will be indicated whether the impact will be local (limited to the immediate area or site of development) or regional, and a value between 1 and 5 will be assigned as appropriate (with 1 being low and 5 being high):
- The **duration**, wherein it will be indicated whether:
  - the lifetime of the impact will be of a very short duration (0-1 years), assigned a score of 1;
  - the lifetime of the impact will be of a short duration (2-5 years), assigned a score of 2;
  - medium-term (5-15 years), assigned a score of 3;
  - long term (> 15 years), assigned a score of 4; or
  - permanent, assigned a score of 5;
  - The **magnitude**, quantified on a scale from 0-10 where; 0 is small and will have no effect on the environment, 2 is minor and will not result in an impact on processes, 4 is low and will cause a slight impact on processes, 6 is moderate and will result in processes continuing but in a modified way, 8 is high (processes are altered to the extent that they temporarily cease), and 10 is very high and results in complete destruction of patterns and permanent cessation of processes.
  - The **probability of occurrence**, which shall describe the likelihood of the impact actually occurring. Probability will be estimated on a scale of 1-5 where; 1 is very improbable (probably will not happen), 2 is improbable (some possibility, but low likelihood), 3 is probable (distinct possibility), 4 is highly probable (most likely) and 5 is definite (impact will occur regardless of any prevention measures).
  - The **significance**, which shall be determined through a synthesis of the characteristics described above and can be assessed as low, medium or high; and
  - the **status**, which will be described as either positive, negative or neutral.
  - the degree to which the impact can be reversed.
  - the degree to which the impact may cause irreplaceable loss of resources.
  - the *degree* to which the impact can be mitigated.

The **significance** is calculated by combining the criteria in the following formula:

S=(E+D+M)P

S = Significance weighting

E = Extent

D = Duration

M = Magnitude

P = Probability

The **significance weightings** for each potential impact are as follows:

- < 30 points: Low (i.e., where this impact would not have a direct influence on the decision to develop in the area),
- 30-60 points: Medium (i.e., where the impact could influence the decision to develop in the area unless it is effectively mitigated),
- 60 points: High (i.e., where the impact must have an influence on the decision process to develop in the area).

3.7 Limitations and Constraints of the study

The authors acknowledge that the brief literature review is not exhaustive on the literature of the area. Due to the subsurface nature of archaeological artefacts, the possibility exists that some features or artefacts may not have been discovered/recorded during the survey and the possible occurrence of unmarked graves and other cultural material cannot be excluded. Similarly, the depth of the deposit of heritage sites cannot be accurately determined due its subsurface nature. This report only deals with the footprint area of the proposed development and consisted of non-intrusive surface surveys. This study did not assess the impact on medicinal plants and intangible heritage as it is assumed that these components would have been highlighted through the public consultation process if relevant. It is possible that new information could come to light in future, which might change the results of this Impact Assessment.

4 Description of Socio Economic Environmental

The 2012 – 2013 Integrated Development Plan highlighted the following Socio-Economic issues in the Ekhuruleni Metropolitan Municipality, the poverty rate was at 28.3% and the unemployment rate was at 30.7%. Reports also suggest that only 8% of Ekurhuleni's population has a post-matric qualification. This suggests a mismatch between the demand for labour and the skills available in the economy. Basic services such as water and sanitation as well as the provision of housing will provide much needed improvement of conditions as well as create employment opportunities.

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5 Description of the Physical Environment

The Expansion of a Chicken Layer Facility and associated infrastructure is proposed on Plot 226, Withok Estate near Brakpan. It is situated in the City of Ekurhuleni Metropolitan Municipality within the Gauteng Province. It is situated approximately 8km south-west of Brakpan along Mans Street within the Withok Estate.

The original farm Withok and surrounding properties were at first commercial farms with their main focus on crop production and the raising of live-stock. Most of these farms were later sub-divided into smaller units or small holdings which support a wider range of businesses and agricultural activities.

The prevailing vegetation type and landscape features of the area form part of the Tsakane Clay Grassland. It is described as flat to slightly undulating plains and low hills. The vegetation is a short, dense grassland dominated by a mixture of common Highveld grasses such as *Themeda triandra* (Red grass), *Heteropogon contortus* (Spear grass), *Elionurus muticus* (Wire grass) and a number of *Eragrostis* species. Most prominent forbs are of the families *Asteraceae, Rubiaceae, Malvceae, Lamiaceae* and *Fabaceae*. Disturbance leads to an increase in the abundance of the grasses *Hyparrhenia hirta* (Thatching grass) and *Eragrostis chloromelas* (Curly leaf grass) (Mucina & Rutherford, 2006).

The study area is situated approximately 1,5km west of the Heidelberg Road (R23) from Heidelberg to Brakpan. The property measures approximately 4.4ha in size and is situated adjacent and on the northern side of Mans Street within the Withok Estate. Mans Street forms the southern boundary of the site. The proposed site is situated amongst and is bordered with properties with the same rural and agricultural intent on all the other sides. A small orchard is situated on the northern side of the study area. The proposed site slopes gently down from the north to the south.

Figure 6. General Site conditions – existing chicken house.

Figure 7. General site conditions.

Figure 8. General site conditions.

Figure 9. General site conditions – existing structures.

6 Results of Public Consultation and Stakeholder Engagement:

6.1.1 Stakeholder Identification

Adjacent landowners and the public at large were informed of the proposed activity as part of the BA process. Site notices and advertisements notifying interested and affected parties were placed at strategic points and in local newspapers as part of the process.

7 Literature / Background Study:

7.1 Literature Review

The following reports were conducted in the general vicinity of the study area and were consulted for this report:

Author	Year	Project	Findings
Van Schalkwyk, J.	1995	A Survey Of Cultural Resources Along The Proposed Pwv 16 Road Corridor, Brakpan District	No Sites were identified
Huffman, TN and Van der Merwe, HD.	1995	Archaeological Survey of Withoekspruit, Brakpan	Stone Age finds and historical sites
Van Schalkwyk, J.	2005	HIA Leeuwpan	No Sites
Huffman, T.N	2005	Archaeological Assessment of the Thubelisha, Boksburg	Stone Age finds and historical sites
Van der Walt, J.	2008	Archaeological Impact Assessment For The Proposed Simunye Primary School, Simunye Extension 2, Gauteng Province	No sites were identified.
Gaigher, S.	2015	Heritage Impact Assessment for the Proposed Van Dyk Park Mixed Housing Project Development	Historic Structures.

7.1.1 Genealogical Society and Google Earth Monuments

No known grave sites are indicated in the study area.

7.2 General History of the area

7.2.1 Archaeology of the area

The archaeological record for the greater study area consists of the Stone Age and Iron Age.

7.2.1.1 Stone Age

The Stone Age can be divided in three main phases as follows;

- Later Stone Age; associated with Khoi and San societies and their immediate predecessors. Recently to ~30 thousand years ago
- Middle Stone Age; associated with Homo sapiens and archaic modern humans. 30-300 thousand years ago.
- Earlier Stone Age; associated with early Homo groups such as Homo habilis and Homo erectus. 400 000-> 2 million years ago.

Although there are no well-known Stone Age sites located on or around the study area there is evidence of the use of the larger area by Stone Age communities for example along the Kliprivier where ESA and MSA tools where recorded. LSA material is recorded along ridges to the south of the current study area (Huffman 2008). Petroglyphs occur at Redan as well as along the Vaal River (Berg 1999).

7.2.1.2 The Iron Age

The Iron Age as a whole represents the spread of Bantu speaking people and includes both the pre-Historic and Historic periods. It can be divided into three distinct periods:

- The Early Iron Age: Most of the first millennium AD.
- The Middle Iron Age: 10th to 13th centuries AD
- The Late Iron Age: 14th century to colonial period.

The Iron Age is characterised by the ability of these early people to manipulate and work Iron ore into implements that assisted them in creating a favourable environment to make a better living. Extensive Stone walled sites are recorded at Klipriviers Berg Nature reserve belonging to the Late Iron Age period. A large body of research is available on this area. These sites (Taylor's Type N, Mason's Class 2 & 5) are now collectively referred to as Klipriviersberg (Huffman 2007).

These settlements are complex in that aggregated settlements are common, the outer wall sometimes includes scallops to mark back courtyards, there are more small stock kraals, and straight walls separate households in the residential zone. These sites dates to the 18th and 19th centuries and was built by people in the Fokeng cluster.
In this area the Klipriviersberg walling would have ended at about AD 1823, when Mzilikazi entered the area (Rasmussen 1978). This settlement type may have lasted longer in other areas because of the positive interaction between Fokeng and Mzilikazi.

7.3 Historical Information

Brakpan was first named in 1886, and grew rapidly after the discovery of coal (in 1888) and gold (in 1905). Brakpan officially became a town in 1919.

7.3.1 Anglo-Boer War

The Anglo-Boer War was the greatest conflict that had taken place in South Africa up to date. One Skirmish is listed fort the Brakpan area on the Farm Hartebeesfontein on 18th February 1901 (http://www.boerenbrit.com/archives/9658)

7.3.1. Cultural Landscape

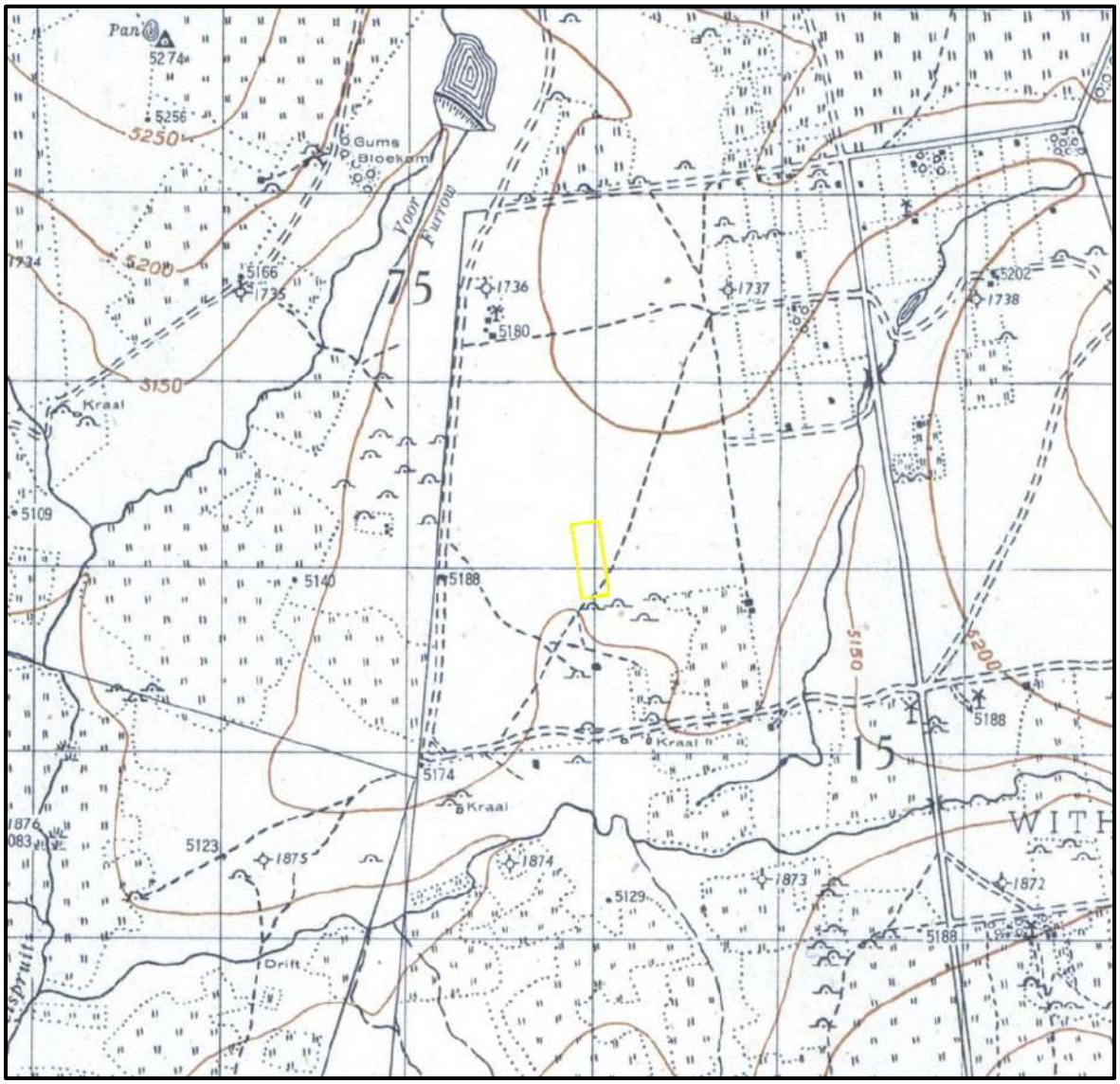

Figure 10. 1944 Topographical map of the site under investigation. The approximate study area is indicated with a yellow border. A track / hiking trail went through the south eastern part of the study area. A number of traditional huts / kraals can be seen to the south of the site, and one can see cultivated lands to the south east. (Topographical Map 1944)

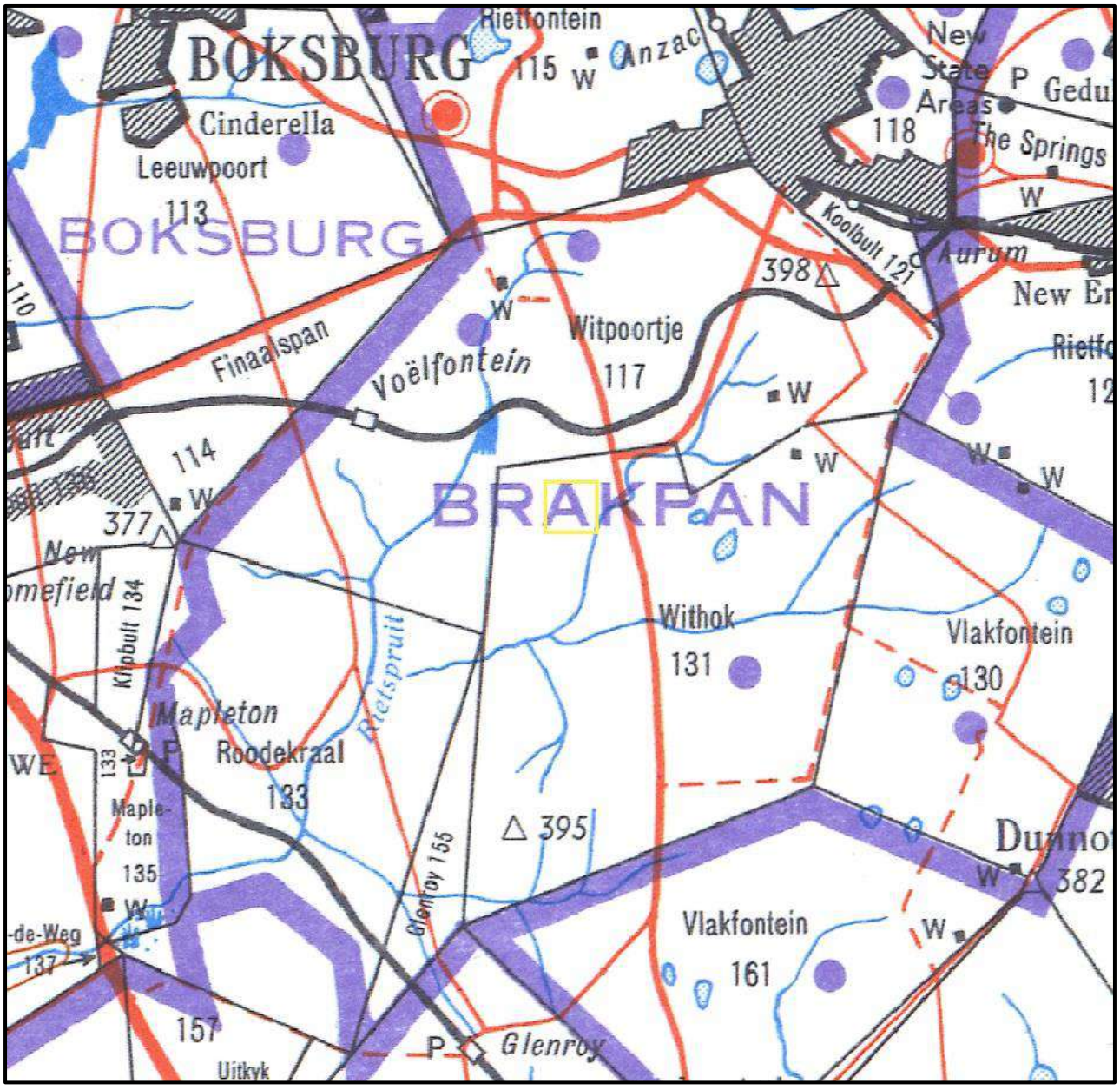

Figure 11. 1957 Topographical map of the site under investigation. The approximate study area is indicated with a yellow border. This is a 1:250 000 topographical map, and therefore does not show much detail. No sites of importance are indicated in the area of the site under investigation. (Topographical Map 1957)

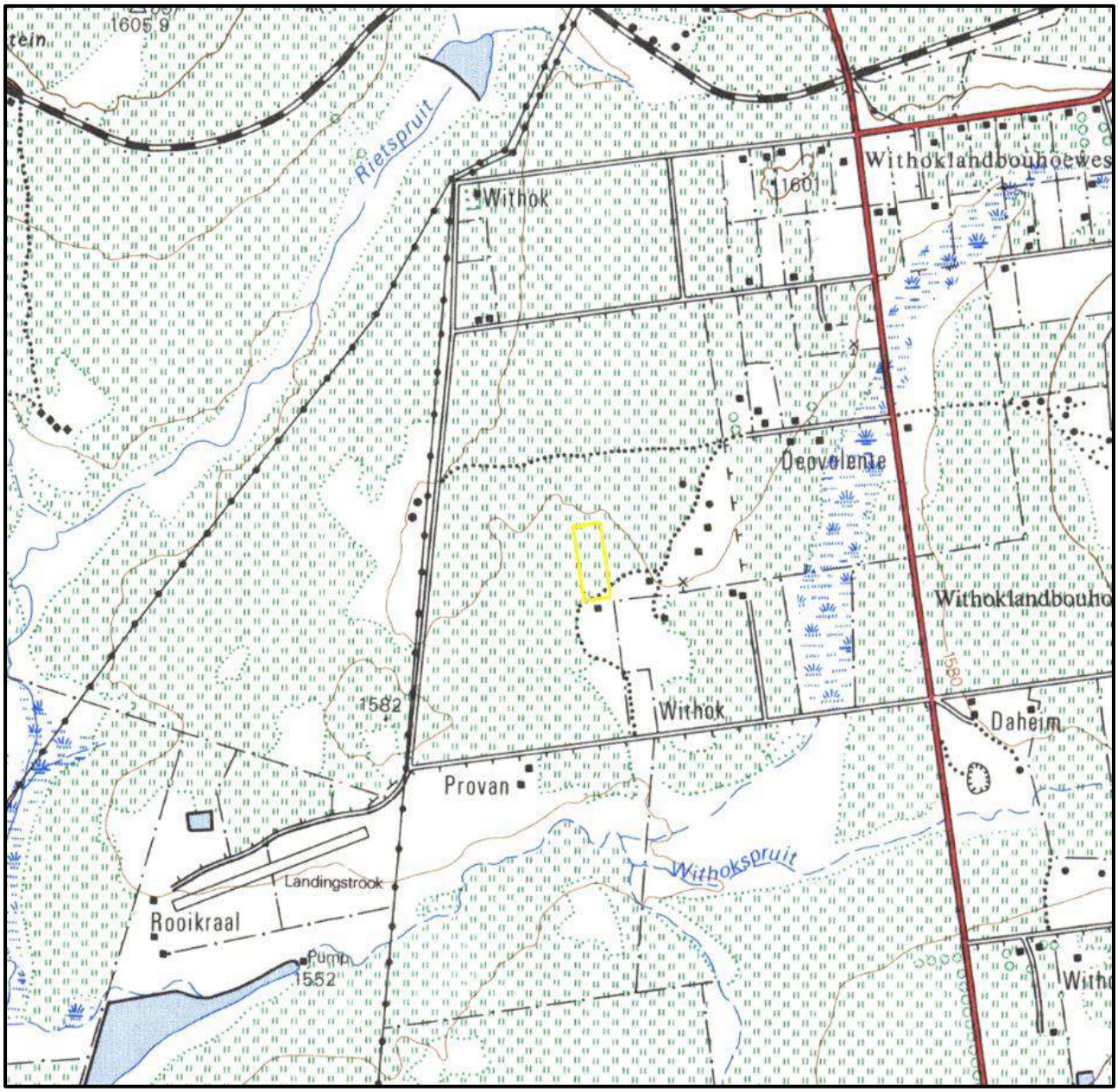

Figure 12. 1976 Topographical map of the site under investigation. The approximate study area is indicated with a yellow border. A track or hiking trail still went through the south eastern part of the study area. The site formed part of an area that was used as cultivated lands. A building can be seen directly to the south of the site, and more buildings are visible to the east. Squares represent European style buildings, and round dots represent traditional huts. (Topographical Map 1976)

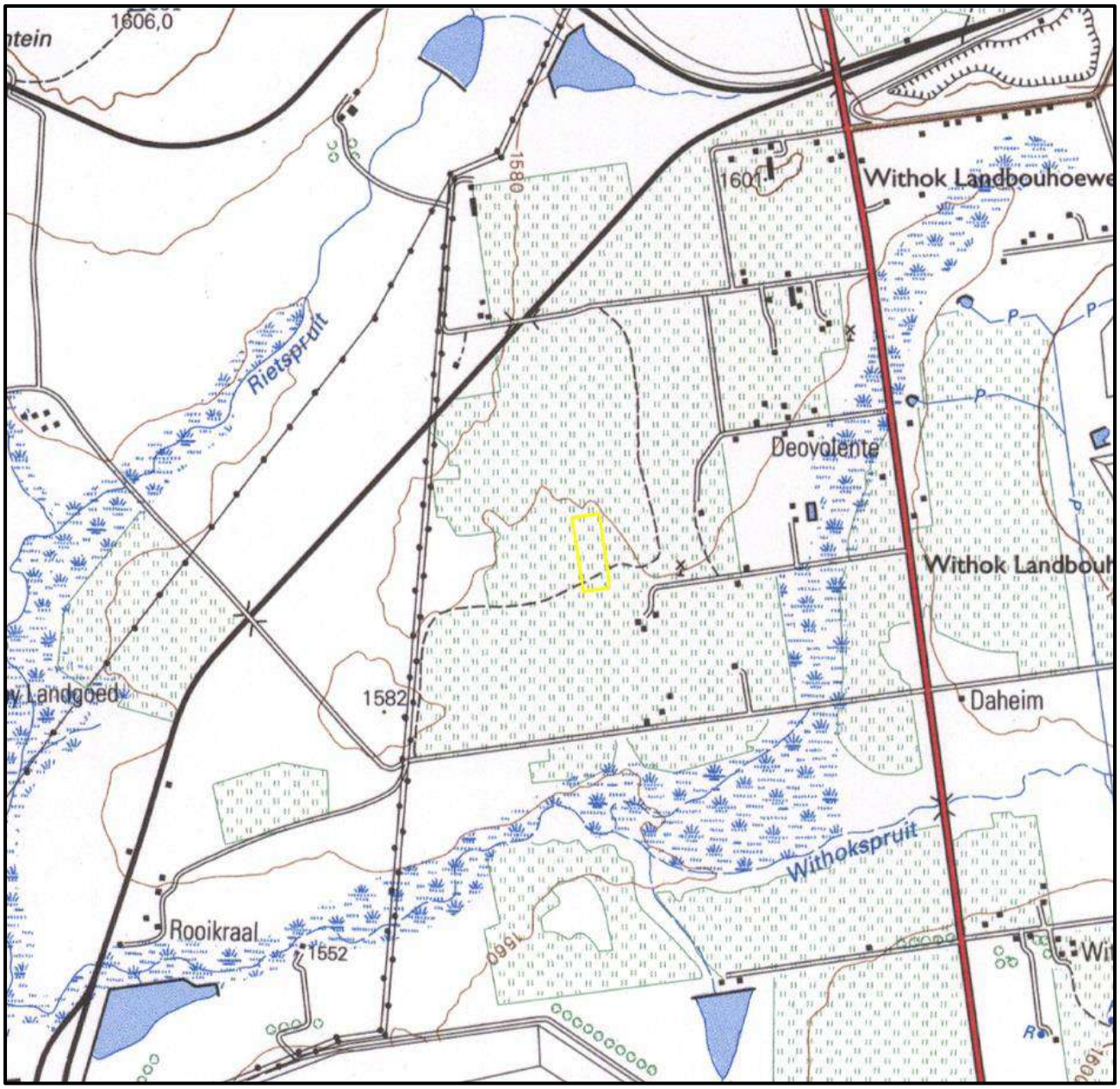

Figure 13. 1995 Topographical map of the site under investigation. The approximate study area is indicated with a yellow border. A track or hiking trail went through the southern part of the study area. The site formed part of an area that was used as cultivated lands. (Topographical Map 1995)

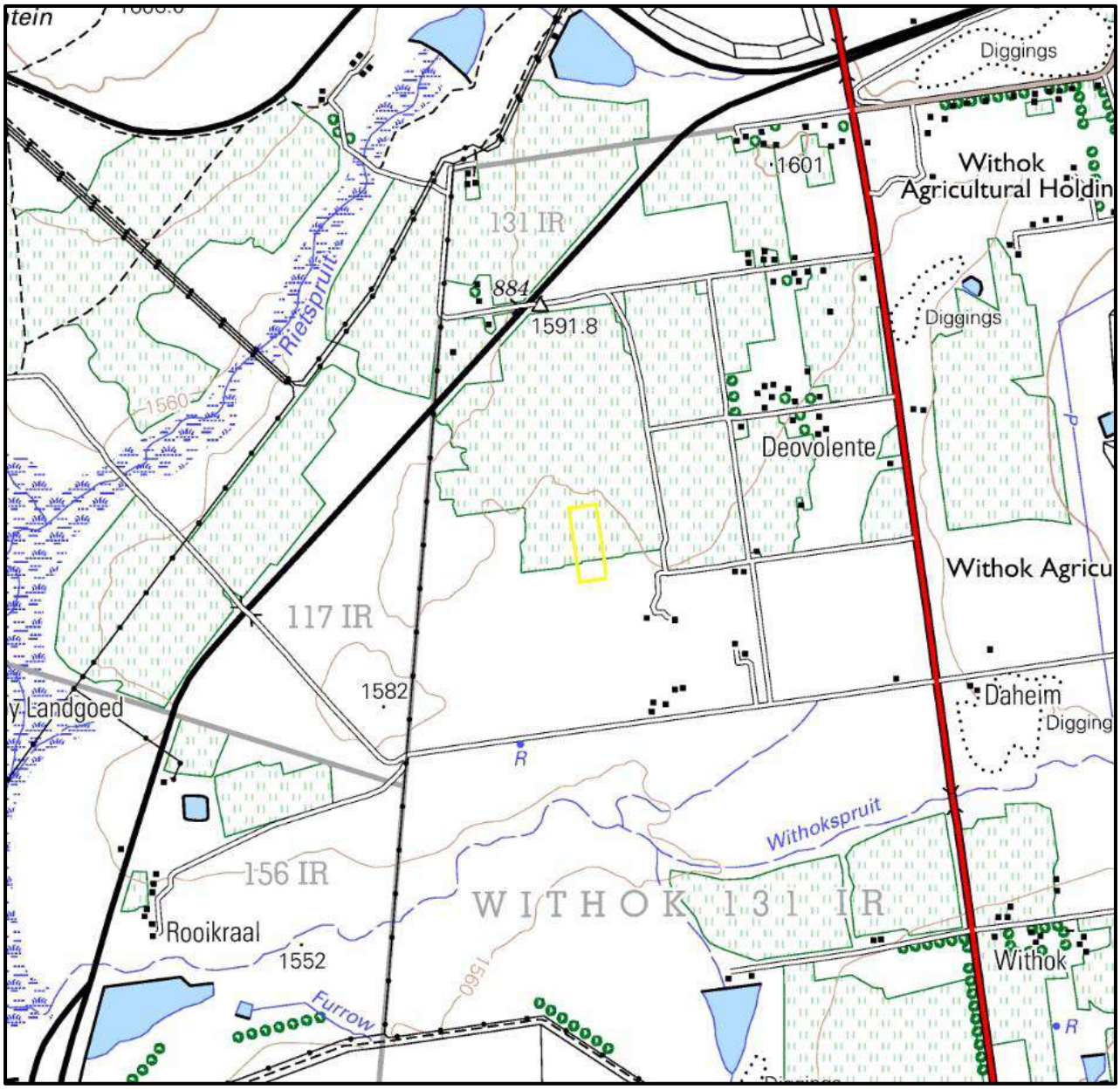

Figure 14. 2002 Topographical map of the site under investigation. The approximate study area is indicated with a yellow border. The site formed part of an area that was used as cultivated lands. (Topographical Map 2002)

Figure 15. 2017 Google Earth image showing the study area in relation to Vosloorus, the R23, Brakpan, Springs, Duduza and other sites. (Google Earth 2017)

8 Findings of the Survey

It is important to note that only Plot 226 was surveyed. The study area was surveyed over a period of 1 day.

The previous farming activities are still evident as most of the property is still devoid of trees as it was cleared for fields to be ploughed and planted. These old fields are now covered with a lush presence of various grass types. The proposed site was disturbed by the previous agricultural activities which destroyed a part of the natural vegetation, but the grasslands still remained throughout most of the region and the property.

The property is fenced off with a high fence all around it. A power line is situated along the eastern boundary fence of the property. The land owners, Mr. Lesego Senokwane and his wife, are currently residing in a small house in the south-western corner of the property. They are constructing a new and much bigger house in the south-eastern corner of the property.

A newly constructed Chicken Layer Facility is situated at the eastern central part of the site. This is the facility that will be expanded. A small garden is situated next to the Chicken Layer Facility, and some labour accommodation and a water tank is situated right next to the garden. A municipal pipe line system is situated on the southern side of this garden as well. A small track leads up from the entrance gate up to the Chicken Layer Facility.

The northern half of the property was ploughed and was intended to be planted. The land owner, Mr. Lesego Senokwane, was interviewed during the site visit. He indicated that he didn't know about any graves or heritage sites within the indicated study area. Most of the property was previously disturbed or is currently being disturbed due to the ongoing agricultural activities. No sites or finds of heritage value or significance were identified within the investigated area.

8.1 Built Environment (Section 34 of the NHRA)

No standing structures older than 60 years occur in the study area.

8.2 Archaeological and palaeontological resources (Section 35 of the NHRA)

No archaeological sites or material was recorded during the survey. Therefore, no further mitigation prior to construction is recommended in terms of the archaeological component of Section 35 of the NHRA for the proposed development to proceed.

Rossouw (2017) conducted an independent paleontological study and concluded that: " *The site is underlain by palaeontologically insignificant volcanic rocks of the Karoo Dolerite Suite, capped by degraded and geologically recent residual soils. Potential impact on palaeontological remains within the development footprint is considered to be negligible and it is recommended that the planned development is exempt from a full Phase 1 Palaeontological Impact Assessment ".*

8.3 Burial Grounds and Graves (Section 36 of the NHRA)

In terms of Section 36 of the Act no burial sites were recorded.

8.4 Cultural Landscapes, Intangible and Living Heritage.

Long term impact on the cultural landscape is considered to be low as the surrounding area is rural in character with some road developments. Visual impacts to scenic routes and sense of place are also considered to be low as the development is in line with the rural character of the area.

8.5 Battlefields and Concentration Camps

There are no battlefields or concentration camp sites in the study area.

8.6 Potential Impact

The chances of impacting unknown archaeological sites in the study area is considered to be negligible. Any direct impacts that did occur would be during the construction phase only and would be of very low significance. Cumulative impacts occur from the combination of effects of various impacts on heritage resources. The importance of identifying and assessing cumulative impacts is that the whole is greater than the sum of its parts. In the case of the development, it will, with the recommended mitigation measures and management actions, not impact any heritage resources directly. However, this and other projects in the area could have an indirect impact on the larger heritage landscape. The lack of any heritage resources in the immediate area and the extensive existing development surrounding the study area minimises additional impact on the landscape.

8.6.1 Pre-Construction phase:

It is assumed that the pre-construction phase involves the removal of topsoil and vegetation as well as the establishment of infrastructure needed for the construction phase. These activities can have a negative and irreversible impact on heritage sites. Impacts include destruction or partial destruction of non-renewable heritage resources.

8.6.2 Construction Phase

During this phase, the impacts and effects are similar in nature but more extensive than the pre-construction phase. These activities can have a negative and irreversible impact on heritage sites. Impacts include destruction or partial destruction of non-renewable heritage resources.

8.6.3 Operation Phase:

No impact is envisaged during this phase.

Table 5. Impact Assessment table.

Nature: During the construction phase activities resulting in disturbance of surfaces and/or sub-surfaces may destroy, damage, alter, or remove from its original position archaeological material or objects.		
	Without mitigation	**With mitigation (Preservation/ excavation of site)**
Extent	Local (1)	Local (1)
Duration	Permanent (5)	Permanent (5)
Magnitude	Low (2)	Low (2)
Probability	Not probable (2)	Not probable (2)
Significance	**16 (Low)**	**16 (Low)**
Status (positive or negative)	Negative	Negative
Reversibility	Not reversible	Not reversible
Irreplaceable loss of resources?	No resources were recorded	No resources were recorded.
Can impacts be mitigated?	Yes, a chance find procedure should be implemented.	Yes
Mitigation: Due to the lack of apparent significant archaeological resources no further mitigation is required prior to construction.		
Cumulative impacts: Since no heritage significant resources occur in the study area cumulative impacts are considered to be low.		
Residual Impacts: If sites are destroyed this results in the depletion of archaeological record of the area. However, if sites are recorded and preserved or mitigated this adds to the record of the area.		

9 Conclusion and recommendations

HCAC was appointed to conduct a Heritage Impact Assessment for the Lewin Chicken Layer Facility. During the survey, no archaeological sites or material was recorded. A paleontological desktop study was conducted by Rossouw (2017) that concluded: *The site is underlain by palaeontologically insignificant volcanic rocks of the Karoo Dolerite Suite, capped by degraded and geologically recent residual soils). Potential impact on palaeontological remains within the development footprint is considered to be negligible and it is recommended that the planned development is exempt from a full Phase 1 Palaeontological Impact Assessment*.". No further mitigation prior to construction is recommended in terms of the archaeological and paleontological components of Section 35 for the proposed development to proceed.

In terms of the built environment of the area (Section 34), no standing structures older than 60 years occur within the study area. In terms of Section 36 of the Act no burial sites were recorded. If any graves are located in future they should ideally be preserved *in-situ* or alternatively relocated according to existing legislation. No public monuments are located within or close to the study area. The area is rural in character and the proposed project is in line with the current land use and will not impact negatively on significant cultural landscapes or viewscapes. During the public participation process conducted for the project no heritage concerns was raised.

Due to the lack of significant heritage resources in the study area the impact of the proposed project on heritage resources is considered low and it is recommended that the proposed project can commence on the condition that the following chance find procedure are implemented as part of the EMPr and based on approval from SAHRA

9.1. Chance Find Procedures

The possibility of the occurrence of subsurface finds cannot be excluded. Therefore, if during construction any possible finds such as stone tool scatters, artefacts or bone and fossil remains are made, the operations must be stopped and a qualified archaeologist must be contacted for an assessment of the find and therefor chance find procedures should be put in place as part of the EMP. A short summary of chance find procedures is discussed below.

This procedure applies to the developer's permanent employees, its subsidiaries, contractors and subcontractors, and service providers. The aim of this procedure is to establish monitoring and reporting procedures to ensure compliance with this policy and its associated procedures. Construction crews must be properly inducted to ensure they are fully aware of the procedures regarding chance finds as discussed below.

- If during the pre-construction phase, construction, operations or closure phases of this project, any person employed by the developer, one of its subsidiaries, contractors and subcontractors, or service provider, finds any artefact of cultural significance or heritage site, this person must cease work at the site of the find and report this find to their immediate supervisor, and through their supervisor to the senior on-site manager.
- It is the responsibility of the senior on-site Manager to make an initial assessment of the extent of the find, and confirm the extent of the work stoppage in that area.
- The senior on-site Manager will inform the ECO of the chance find and its immediate impact on operations. The ECO will then contact a professional archaeologist for an assessment of the finds who will notify the SAHRA.

9.2 Reasoned Opinion

The impact of the proposed project on heritage resources is considered low and no further pre-construction mitigation in terms of archaeological resources is required based on approval from SAHRA. Furthermore, the socio-economic benefits also outweigh the possible impacts of the development if the correct mitigation measures (i.e. chance find procedure) are implemented for the project.

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11. Appendices:

Curriculum Vitae of Specialist

Jaco van der Walt
Archaeologist

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Education:

Particulars of degrees/diplomas and/or other qualifications:

Name of University or Institution:		University of Pretoria
Degree obtained	**:**	BA Heritage Tourism & Archaeology
Year of graduation	**:**	2001
Name of University or Institution:		University of the Witwatersrand
Degree obtained	**:**	BA Hons Archaeology
Year of graduation	**:**	2002
Name of University or Institution	**:**	University of the Witwatersrand
Degree Obtained	**:**	MA (Archaeology)
Year of Graduation	:	2012
Name of University or Institution	**:**	University of Johannesburg
Degree	**:**	PhD
Year	:	Currently Enrolled

EMPLOYMENT HISTORY:

2011 – Present:	**Owner – HCAC (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.

SELECTED PROJECTS INCLUDE:

Archaeological Impact Assessments (Phase 1)

Heritage Impact Assessment Proposed Discharge Of Treated Mine Water Via The Wonderfontein Spruit Receiving Water Body Specialist as part of team conducting an Archaeological Assessment for the Mmamabula mining project and power supply, Botswana

Archaeological Impact Assessment Mmamethlake Landfill

Archaeological Impact Assessment Libangeni Landfill

Linear Developments

Archaeological Impact Assessment Link Northern Waterline Project At The Suikerbosrand Nature Reserve

Archaeological Impact Assessment Medupi – Spitskop Power Line,

Archaeological Impact Assessment Nelspruit Road Development

Renewable Energy developments

Archaeological Impact Assessment Karoshoek Solar Project

Grave Relocation Projects

Relocation of graves and site monitoring at Chloorkop as well as permit application and liaison with local authorities and social processes with local stakeholders, Gauteng Province.

Relocation of the grave of Rifle Man Maritz as well as permit application and liaison with local authorities and social processes with local stakeholders, Ndumo, Kwa Zulu Natal.

Relocation of the Magolwane graves for the office of the premier, Kwa Zulu Natal

Relocation of the OSuthu Royal Graves office of the premier, Kwa Zulu Natal

Phase 2 Mitigation Projects

Field Director for the Archaeological Mitigation For Booysendal Platinum Mine, Steelpoort, Limpopo Province. Principle investigator Prof. T. Huffman

Monitoring of heritage sites affected by the ARUP Transnet Multipurpose Pipeline under directorship of Gavin Anderson.

Field Director for the Phase 2 mapping of a late Iron Age site located on the farm Kameelbult, Zeerust, North West Province. Under directorship of Prof T. Huffman.

Field Director for the Phase 2 surface sampling of Stone Age sites effected by the Medupi – Spitskop Power Line, Limpopo Province

Heritage management projects

Platreef Mitigation project – mitigation of heritage sites and compilation of conservation management plan.

MEMBERSHIP OF PROFESSIONAL ASSOCIATIONS:

- 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)

PUBLICATIONS AND PRESENTATIONS

- A Culture Historical Interpretation, Aimed at Site Visitors, of the Exposed Eastern Profile of K8 on the Southern terrace at Mapungubwe.
  - J van der Walt, A Meyer, WC Nienaber
  - Poster presented at Faculty day, Faculty of Medicine University of Pretoria 2003
- 'n Reddingsondersoek na Anglo-Boereoorlog-ammunisie, gevind by Ifafi, Noordwes-Provinsie. South-African Journal for Cultural History 16(1) June 2002, with A. van Vollenhoven as co-writer.
- Fieldwork Report: Mapungubwe Stabilization Project.
  - WC Nienaber, M Hutten, S Gaigher, J van der Walt
  - Paper read at the Southern African Association of Archaeologists Biennial Conference 2004
- A War Uncovered: Human Remains from Thabantšho Hill (South Africa), 10 May 1864.
  - M. Steyn, WS Boshoff, WC Nienaber, J van der Walt
  - Paper read at the 12th Congress of the Pan-African Archaeological Association for Prehistory and Related Studies 2005
- Field Report on the mitigation measures conducted on the farm Bokfontein, Brits, North West Province .
  - J van der Walt, P Birkholtz, W. Fourie
  - Paper read at the Southern African Association of Archaeologists Biennial Conference 2007
- Field report on the mitigation measures employed at Early Farmer sites threatened by development in the Greater Sekhukhune area, Limpopo Province. J van der Walt
  - Paper read at the Southern African Association of Archaeologists Biennial Conference 2008
- Ceramic analysis of an Early Iron Age Site with vitrified dung, Limpopo Province South Africa.
  - J van der Walt. Poster presented at SAFA, Frankfurt Germany 2008

- Bantu Speaker Rock Engravings in the Schoemanskloof Valley, Lydenburg District, Mpumalanga (*In Prep)*
    - J van der Walt and J.P Celliers
- Sterkspruit: Micro-layout of late Iron Age stone walling, Lydenburg, Mpumalanga. W. Fourie and J van der Walt. A Poster presented at the Southern African Association of Archaeologists Biennial Conference 2011
- Detailed mapping of LIA stone-walled settlements' in Lydenburg, Mpumalanga. J van der Walt and J.P Celliers
    - Paper read at the Southern African Association of Archaeologists Biennial Conference 2011
- Bantu-Speaker Rock engravings in the Schoemanskloof Valley, Lydenburg District, Mpumalanga. J.P Celliers and J van der Walt
    - Paper read at the Southern African Association of Archaeologists Biennial Conference 2011
- Pleistocene hominin land use on the western trans-Vaal Highveld ecoregion, South Africa, Jaco van der Walt.
    - J van der Walt. Poster presented at SAFA, Toulouse, France. Biennial Conference 2016

REFERENCES:

1. Prof Marlize 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

BASIC ASSESSMENT REPORT

Appendix H:

Environmental Management Programme

CONTENTS

TABLES

1 INTRODUCTION

This Environmental Management Programme (EMPr) is prepared as part of the requirements of the National Environmental Management Act (NEMA) EIA Regulations published in GNR 327, 326, 325 and 324 on the 4 December 2014 Government Gazette Number 40772, as amended on 7 April 2017. The EMPr is to be submitted to the Gauteng Department of Agriculture and Rural Development (GDARD) as part of the Application for Environmental Authorisation for the proposed Lewin AgriBusiness (Pty) Ltd Chicken Layer Facility, Plot 226, Mans Street, Withok Estate, Brakpan , Gauteng.

This EMPr is being made available for a 30-day review period, as part of the Draft Basic Assessment (BA) Report. Comments received from stakeholders during the aforementioned review period will be incorporated into the EMPr, where applicable. Following the incorporation of comments from stakeholders, this EMPr is intended as a "living" document and should continue to be updated regularly, as needed.

1.1 Project Description

Lewin AfriBusiness (Pty) Ltd (hereafter, Lewin AgriBusiness), is a small scale commercial farming enterprise registered plot 226, Mans Street, Withok Estate, Brakpan, Gauteng. The property falls within Regiond D of the Ekurhuleni Metropolitan Municipality and falls on an urban edge. The site is currently zoned for agricultural use (Ekurhuleni MSDF, 2015).

The proposed project is aimed at providing "sustainable" products (i.e. broiler chickens) and ecologically responsible practices will be incorporated into the life cycle of the development.

The layout plan of the preferred alternative has been developed based on the outcome of the specialist study and sensitivity mapping. The total development footprint would thus be 570 m². This will be broken down into the following:

Current infrastructure on site

Currently, the existing chicken facility has a footprint of 1.5 ha and consists of the following infrastructure:

- 1x 20 000 capacity layer house (with a footprint of 9.5 m x 45 m)
- 1 x Ablution Facility
- 1 x Office
- 1 x Vegetable garden (with footprint of 90 m x 90 m)
- 1 x Private Residence (with a foot print of 40 m x 25 m)
- 1 x Borehole – water capacity: 7 500 L (2 500 L for chicken facility; 5 000 L general domestic use)

Proposed expansion (pertinent to this application)

Lewin AgriBusiness proposes to construct the following additional facilities with a total footprint of 570m² (Figure 2 below):

- 1 x 20 000 capacity layer house (with a footprint of 9.5 m x 45 m = 427.5 m^2)
- 1 x Waste storage site (footprint of 7m x 20 m = 140 m^2).

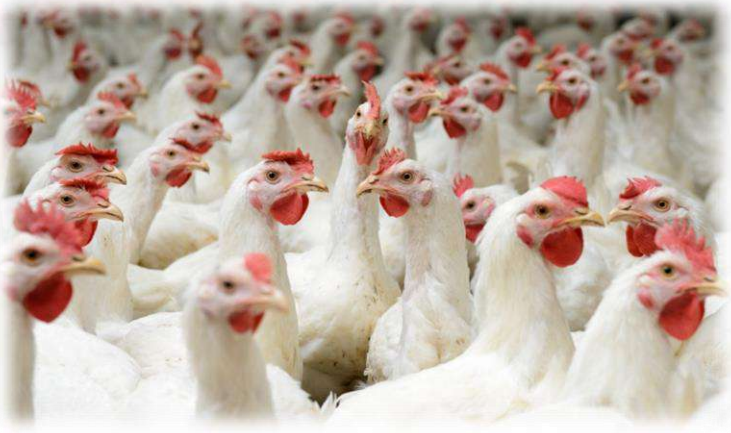
A borehole exists on site for water provision for the proposed project. Power has been sourced from Eskom for the existing facility. Access roads to and on the site are already in existence.

1.2 Authors of the EMPr

This EMPr has been compiled by the Environmental Assessment Practitioners and the various specialists on the team (as indicated in Table 1). The details and expertise of the Environmental Assessment Practitioner and the specialists are provided in Appendices I of the Draft BA Report, respectively.

Table 1: EIA Team

Environmental Assessment Practitioner			
Name	**Organisation**	**Role**	**Qualification/Expertise**
Paul Lochner	CSIR	Reviewer	BSc Civil Engineering MPhil Environmental Science
Minnelise Levendal	CSIR	Project Leader	MSc Environmental Science
Rirhandzu Marivate	CSIR	Project Manager	BSc Hons (Ecology, Environment, & Conservation)
Specialist Team			
Name	**Organisation**	**Role/Specialist Study**	**Qualification/Expertise**
Rirhandzu Marivate	CSIR	Ecological Specialist	BSc Hons (Environmental Science)
Susan Abell	NSS	External peer review of the Ecological Specialist Study	M.Sc. Resource Conservation Biology (WITS). PrSciNat Registered (400116/05) – Ecology & Environmental Science.



2 APPROACH TO PREPARING THE EMPR

2.1 Compliance with Relevant Legislation

In terms of legal requirements, a crucial objective of the EMPr is to satisfy the requirements of National Environmental Management Act (NEMA) EIA Regulations published in GNR 327, 326, 325 and 324 on the 4 December 2014 Government Gazette Number 40772, as amended on 7 April 2017. These regulations regulate and prescribe the content of the EMPr and specify the type of supporting information that must accompany the submission of the report to the authorities. An overview of where the requirements are addressed in this EMPr is presented in Table 2.

Table 2: Compliance with Section 33 of the EIA Regulations 2014 and Section 24N of the National Environmental Management Act (Act No. 107 of 1998)

Requirements of Section 24N of NEMA	Where it is included in this EMPr?
2) The environmental management programme must contain- a) information on any proposed management, mitigation, protection or remedial measures that will be undertaken to address the environmental impacts that have been identified in a report contemplated in subsection 24(1A), including environmental impacts or objectives in respect of: (i) planning and design; (ii) pre-construction and construction activities; (iii) the operation or undertaking of the activity in question; (iv) the rehabilitation of the environment; and (v) (v) closure, if applicable;	Section 4 to 7 and the columns detailing the impact description, mitigation and management objectives, and mitigation and management actions.
b) details of- (i) the person who prepared the environmental management programme; and (ii) the expertise of that person to prepare an environmental management programme;	Appendices I of the Draft BA Report to which this EMPr is attached.
c) a detailed description of the aspects of the activity that are covered by the environmental management programme;	Section 1
d) information identifying the persons who will be responsible for the implementation of the measures contemplated in paragraph (a);	Columns in Section 4 to 7 of the EMPr regarding the monitoring responsibility, including the requirements for monitoring and reporting on compliance and the responsible parties noted in Section 3.
e) information in respect of the mechanisms proposed for monitoring compliance with the environmental management programme and for reporting on the compliance;	The columns detailing the mitigation and management actions, and the monitoring methodology, frequency and responsibility in Sections 4 to 7 of this EMPr.
f) as far as is reasonably practicable, measures to rehabilitate the environment affected by the undertaking of any listed activity or specified activity to its natural or predetermined state or to a land use which conforms to the generally accepted principle of sustainable development; and	Sections 4 to 7 of this EMPr, as applicable to the post-construction, rehabilitation phase and the decommissioning phase.

Requirements of Section 24N of NEMA	Where it is included in this EMPr?
g) a description of the manner in which it intends to- (i) modify, remedy, control or stop any action, activity or process which causes pollution or environmental degradation; (ii) remedy the cause of pollution or degradation and migration of pollutants; and (iii) comply with any prescribed environmental management standards or practices.	The columns detailing the mitigation and management objectives, mitigation and management actions, and the monitoring methodology, frequency and responsibility in Sections 4 to 7 of this EMPr.
3) The environmental management programme must, where appropriate- a) set out time periods within which the measures contemplated in the environmental management programme must be implemented; b) contain measures regulating responsibilities for any environmental damage, pollution, pumping and treatment of polluted or extraneous water or ecological degradation which may occur inside and outside the boundaries of the operations in question; and c) develop 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.	The columns detailing the mitigation and management actions, and the monitoring methodology, frequency and responsibility in Sections 4 to 7 of this EMPr.
5) The Minister, the Minister responsible for mineral resources or an MEC may call for additional information and may direct that the environmental management programme in question must be adjusted in such a way as the Minister, the Minister responsible for mineral resources or the MEC may require.	Not applicable at this stage.
6) The Minister, the Minister responsible for mineral resources or an MEC may at any time after he or she has approved an application for an environmental authorisation approve an amended environmental management programme.	Not applicable at this stage.
7) The holder and any person issued with an environmental authorisation- a) must at all times give effect to the general objectives of integrated environmental management laid down in section 23; b) must consider, investigate, assess and communicate the impact of his or her prospecting or mining on the environment; c) must manage all environmental impacts (i) in accordance with his or her approved environmental management programme, where appropriate; and (ii) as an integral part of the prospecting or mining, exploration or production operation, unless the Minister responsible for mineral resources directs otherwise; d) must monitor and audit compliance with the requirements of the environmental management programme; e) must, as far as is reasonably practicable, rehabilitate the environment affected by the prospecting or mining operations to its natural or predetermined state or to a land use which conforms to the generally accepted principle of sustainable development; and	Throughout the EMPr

Requirements of Section 24N of NEMA	Where it is included in this EMPr?
f) is responsible for any environmental damage, pollution, pumping and treatment of polluted or extraneous water or ecological degradation as a result of his or her operations to which such right, permit or environmental authorisation relates.	
8) Notwithstanding the Companies Act, 2008 (Act No. 71 of 2008), or the Close Corporations Act, 1984 (Act No. 69 of 1984), the directors of a company or members of a close corporation are jointly and severally liable for any negative impact on the environment, whether advertently or inadvertently caused by the company or close corporation which they represent, including damage, degradation or pollution.	Section 3 details the responsibility of the Project Applicant.

2.2 Content of the Draft EMPr

The EMPr includes the findings and recommendations of the BA Process and specialist studies. However, the EMPr is considered a "live" document and must be updated with additional information or actions during the design, construction, operational and decommissioning phases if applicable.

The EMPr follows an approach of identifying over-arching 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 associated objectives, actions, responsibilities and monitoring requirements.

The management plans for the design, construction, operation and decommissioning phases 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.

2.3 Goal of Environmental Management

The overall goal for environmental management for the proposed Lewin AgriBusiness project is to construct and operate the project in a manner that:

- Minimises the ecological footprint of the project on the local environment;
- Facilitates harmonious co-existence between the project and other land uses in the area; and
- Contributes to the environmental baseline and understanding of environmental impacts of broiler facilities in a South African context.

3 ROLES AND RESPONSIBILITIES

For the purposes of the EMPr, the generic roles that need to be defined are those of the:

- Project Developer;
- Environmental Control Officer;
- Environmental Health and Safety (EHS) Manager;
- Construction Manager (Lead Contractor or Engineering Consultant); and

It is acknowledged that 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. It is expected that this will be appropriately defined at a later stage.

3.1 Project Developer

The Project Developer (i.e. Lewin AgriBusiness) is the 'owner' of the project and as such is responsible for ensuring that the conditions of the Environmental Authorisation issued in terms of NEMA (should the project receive such authorisation) are fully satisfied, as well as ensuring that any other necessary permits or licenses are obtained and complied with. It is expected that the Project Developer will appoint the Environmental Control Officer, EHS Manager and Construction Manager

3.2 Environmental Control Officer

An independent Environmental Control Officer (ECO) must be appointed to monitor the compliance of the proposed project with the conditions of Environmental Authorisation (should such authorisation be granted by GDARD) during the construction phase (and possibly the operational phase, depending on the requirements of GDARD). The ECO must also monitor compliance of the proposed project with environmental legislation and recommendations of the EMPr.

The ECO will be responsible for preparing the Final EMPr based on the Draft EMPr, as well as updating the EMPr as and when necessary, and compiling a monitoring checklist based on the EMPr. The roles and responsibilities of the ECO should include the following:

- The ECO must undertake periodic environmental audits during the relevant phases of the proposed project in order to monitor and record environmental impacts and non-conformances. It is recommended that weekly or bi-weekly environmental audits be undertaken by the ECO during the construction phase.
- Environmental compliance reports must be submitted by the ECO to the Competent Authority (i.e.GDARD) on a regular basis (i.e. monthly during the construction phase or as stipulated by the GDARD).
- The ECO must maintain a diary of site visits and audits, a copy of the Environmental Authorisation (should such authorisation be granted by GDARD) and relevant permits for reference purposes, a non-conformance register, a public complaint register, and a copy of previous environmental audits undertaken.
- Prior to the commencement of construction, the ECO must meet on site with the Construction Manager to confirm the construction procedure and designated construction areas.

3.3 EHS Manager

It is important to note that the EHS Manager will be appointed to fulfill the roles of the Environmental Officer during the construction phase and the Environmental Manager during the operational phase. A generic term has therefore been assigned to this sector of roles and responsibilities. The responsibility of the EHS Manager include overseeing the implementation of the EMPr during the construction and operational phases, monitoring environmental impacts, record-keeping and updating of the EMPr as and when necessary. The EHS Manager is also responsible for monitoring compliance with the conditions of the Environmental Authorisation that may be issued to Lewin AgriBusiness.

The lead contractor and sub-contractors may have their own Environmental Officers, or designate Environmental Officer functions to certain personnel.

During construction, the EHS Manager will be responsible for the following:

- Meeting on site with the Construction Manager prior to the commencement of construction activities to confirm the construction procedure and designated activity zones.
- Daily or weekly monitoring of site activities during construction to ensure adherence to the specifications contained in the EMPr and Environmental Authorisation (should such authorisation be granted by GDARD), using a monitoring checklist that is to be prepared at the start of the construction phase.
- Preparation of the monitoring report based on the daily or weekly site visit.
- Reporting of any non-conformances within 48 hours of identification of such non-conformance to the relevant agents.
- Conducting an environmental inspection on completion of the construction period and 'signing off' the construction process with the Construction Manager.

During operation, the EHS Manager will be responsible for:

- Overseeing the implementation of the EMPr and monitoring programmes for the operation phase.
- Reviewing the findings of the monitoring and highlight concerns to management and TNPA where necessary.
- Ensuring compliance with the Environmental Authorisation conditions.
- Ensuring that the necessary environmental monitoring takes place as specified in the EMPr.
- Updating the EMPr and ensuring that records are kept of all monitoring activities and results.

During decommissioning, the EHS Manager will be responsible for:

- Overseeing the implementation of the EMPr for the decommissioning phase; and
- Conducting an environmental inspection on completion of decommissioning and 'signing off' the site rehabilitation process.

At the time of preparing this EMPr, the EHS Manager appointment is still to be made by the proponent. The appointment is dependent upon the project proceeding to the construction phase.

Construction Manager (Lead Contractor or Engineering Consultant)

The lead contractor will be responsible for the following:

- Overall construction programme, project delivery and quality control for the construction of the facility.

- Overseeing compliance with the Health, Safety and Environmental Responsibilities specific to the project construction.
- Promoting total job safety and environmental awareness by employees, contractors and sub-contractors and stress to all employees and contractors and sub-contractors the importance that the project proponent attaches to safety and the environment.
- Ensuring that each subcontractor employ an Environmental Officer (or have a designated Environmental Officer function) to monitor and report on the daily activities on-site during the construction period.
- Ensuring that safe, environmentally acceptable working methods and practices are implemented and that sufficient plant and equipment is made available, is properly operated and maintained in order to facilitate proper access and enable any operation to be carried out safely.
- Meeting on site with the EHS Manager prior to the commencement of construction activities to confirm the construction procedure and designated activity zones.
- Ensuring that all appointed contractors and sub-contractors are aware of this EMPr and their responsibilities in relation to the programme.
- Ensuring that all appointed contractors and sub-contractors repair, at their own cost, any environmental damage as a result of a contravention of the specifications contained in the EMPr, to the satisfaction of the EHS Manager.

At the time of preparing this EMPr, the appointment of a lead contractor has not been made and will depend on the project proceeding to the construction phase.

4 MANAGEMENT PLAN FOR DESIGN/CONSTRUCTION PHASE

Impact	Management Objectives	Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
A. Alien Vegetation Management					
4.1. Removal of alien invasive vegetation from the proposed project area.	Ensure the correct removal of alien invasive vegetation from the proposed project area and prevent the establishment and spread of alien invasive plants due to the project activities.	4.1.1. The planted alien invasive vegetation should be removed immediately (in line with relevant municipal and provincial procedures, guidelines and recommendations) and disposed of at a licenced waste disposal facility.	Monitor the removal of the alien invasive vegetation.	During the removal process	ECO
4.2. Increased Risk of Alien Plant Invasion	Reduce the establishment and spread of alien invasive plants due to the project activities.	4.2.1. Ensure compliance with relevant Environmental Specifications for the control and removal of these species. 4.2.2. All stockpiled material must be maintained and kept clear of weeds and alien vegetation growth by undertaking regular weeding and control methods.	Monitor the presence of alien invasive plants during the construction phase.	Weekly	ECO
B. Indigenous Vegetation and Faunal Management					
4.3. Loss of endangered or medicinally important plant	To minimise loss of important or medicinally important plant species in accordance with law	4.3.1. Adhere to law and best practice guidelines regarding the displacement	Guidance from a suitably qualified vegetation specialist or horticulturist regarding the	During construction.	Contractor or Specialist

Impact	Management Objectives	Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
species	and best practice and encourage rehabilitation	of CI and medicinally important floral species.	collection, propagation/storage and transplantation of plants is advised.		
4.4. Mortality of fauna in surrounding areas	To reduce mortality rates and continued displacement of fauna in surrounding areas	4.4.1. Adhere to law and best practice guidelines regarding the displacement and relocation of CI fauna 4.4.2. Appropriately deal with fauna encountered on site. 4.4.3. Time construction activities to minimise faunal mortality 4.4.4. Limit indiscriminate killing, persecution or hunting of fauna.	• Prior to construction commission a suitably qualified ecologist to remove and relocate species to suitable surrounding habitats.. • Construction activities should be timed to start (and preferably end) during winter, when activity levels and the presence of breeding and migratory species are lowest. Bullfrogs are, however a concern in this regard as overwintering individuals may be unearthed during construction activities. • Ensure policies and procedures are in place regarding the handling and removal of fauna encountered on site. • Ensure that staff are trained and properly equipped to safely handle fauna or that the services of a trained professional are	Weekly	Project Developer and Specialist

Impact	Management Objectives	Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
			readily available on call. • Construction activities should be timed to start (and preferably end) during winter, when activity levels and the presence of breeding and migratory species are lowest. Bullfrogs are, however a concern in this regard as overwintering individuals may be unearthed during construction activities. • Check open trenches for trapped animals (e.g. bullfrogs, hedgehogs and snakes), which should be carefully caught and relocated according to the specifications of a relevant specialist. • Prohibit the introduction of domestic animals such as dogs and cats. • Educate staff on prohibited actions involving the utilisation of wildlife (i.e. poaching / harvesting) through training and notices. • Routinely walk fence lines		

Impact	Management Objectives	Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
			to remove snares.		
4.5. Sensory disturbance of faunal communities	Minimise sensory disturbance surrounding faunal communities	4.5.1. Appropriately time construction activities to minimise sensory disturbance to fauna.	Commence (and preferably complete) construction during winter, when the risk of disturbing active (including breeding and migratory) animals, should be least.	Daily	Project Developer EHS Manager
		4.5.2. Limit disturbances caused by noise	Noise should also be minimised throughout construction to limit the impact on sensitive fauna such as owls and large terrestrial birds.	Daily	Project Developer EHS Manager
		4.5.3. Limit disturbances caused by light	Limit construction activities to day time hours and Minimize or eliminate security and construction lighting, to reduce the disturbance of nocturnal fauna.	Daily	Project Developer EHS Manager
C. Wetland Impacts					
4.6. Construction of the facility within 500m of the pan south of the site is likely to impact on the floral and faunal habitat.	Relocate the proposed chicken house north of the existing facility outside of the 500m buffer zone of the pan.	4.6.1. Ensure that the development planning is realigned to areas that avoid wetland and associated wetland areas (i.e. Pan south of the site boundary).	Lewin AgriBusiness to ensure proposed development adheres to the proposed mitigation measures of this EMPr.	Pre-construction	Project Developer, Contractor
		4.6.2. Relocated the proposed chicken house to the north of the existing infrastructure (outside 500 m of the pan).		Pre-construction	

Impact	Management Objectives	Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
		4.6.3. No construction should be planned within the sensitive environment.		Pre-construction	
		4.6.4. A storm water management plan must be developed prior to the construction of the facility.		Pre-construction	
D. Noise Impacts					
4.7. Potential noise impact from operations during the construction phase.	Prevent unnecessary impacts on the surrounding environment by ensuring that the piling noise is mitigated.	4.7.1. All operations should be conducted during daytime only (i.e. 06:00 – 22:00, as defined in South African National Standards (SANS) 10103).	Construction times to be monitored and managed (as well as included in the tender contract).	Daily	Contractor and EHS Manager
E. Visual Impacts					
4.8. 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.	4.8.1. The Contractor should maintain good housekeeping on site to avoid litter and minimise waste. Ensure that rubble and litter are appropriately stored and regularly removed from site to a licenced waste disposal facility. 4.8.2. Dust generation must be kept at a minimum. 4.8.3. Night lighting of construction sites must be minimised within	Rubble/litter/waste removal and disposal to be monitored throughout construction. Complaints about night lights should be investigated and documented in a register.	Weekly or bi-weekly	Contractor and ECO

Impact	Management Objectives	Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
		requirements of safety and efficiency.			
F. Traffic Impacts					
4.9. Impact of construction vehicles on the road network and parking of construction vehicles on public roads when not in use.	Prevent unnecessary impacts on the surrounding road network by supplying parking for construction vehicles on site.	4.9.1. Accommodate all construction vehicles on site during the construction phase.	Monitor that no construction vehicles park on the outlying roads. Record and report non-compliance.	Daily during construction.	Contractor and EHS Manager
G. Safety, Health and Environment					
4.10. 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).	Reduce the potential noise impacts on the construction workers.	4.10.1. Construction personnel must wear proper hearing protection, which should be specified as part of the Construction Phase Risk Assessment carried out by the Contractor. 4.10.2. The Contractor must ensure that all construction personnel are provided with adequate Personal Protective Equipment (PPE) for use where appropriate.	Inspections to be carried out during the construction phase to enforce the use of hearing protection by construction personnel. This must also be written into the safety requirements of the Contract.	Throughout the construction phase (i.e. weekly).	ECO and Contractor
4.11. Potential health injuries to construction personnel as a	Prevent respiratory illnesses caused to the construction personnel.	4.11.1. The Contractor must ensure that all construction personnel are provided with adequate PPE (such as	• Inspections to be carried out during the construction phase to enforce the use of respiratory protection by	Throughout the construction phase (i.e. weekly).	ECO and Contractor

Impact	Management Objectives	Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
result of construction work (i.e. welding fumes, dust and smoke etc.).		dust masks) for use where appropriate.	construction personnel. This must also be written into the safety requirements of the Contract.		
4.12. Potential impact on the safety of construction workers due to construction activities (such as welding, cutting, use of hot metals, working at heights, lifting of heavy items etc.).	Prevention of injuries to and fatalities of construction personnel during the construction phase.	4.12.1. Ensure that skilled, licenced and competent Contractors, riggers and crane operators are appointed during the construction phase, along with the use of certified equipment and scaffolding. 4.12.2. Ensure that roads are not closed during construction, which may restrict access for emergency services.	Monitor activities and record and report non-compliance by undertaking inspections.	Throughout the construction phase (i.e. weekly).	Project Developer, ECO and Contractor
4.13. Pollution of water and ground as a result of spillages, generation of building rubble and waste scrap material.	Prevent unnecessary pollution impacts on the surrounding environment.	4.13.1. The construction site should be cleaned regularly and all construction waste (i.e. concrete, steel, rubble, packaging material etc.) must be removed from site and disposed at a licenced waste disposal facility by an approved waste Contractor. Waste disposal slips or waybills should be kept on file for auditing purposes as proof of	Monitor activities and record and report non-compliance by undertaking inspections.	Throughout the construction phase.	Project Developer, ECO and Contractor

Impact	Management Objectives	Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
		disposal.			
H. Heritage Resources (Archaeology and Palaeontology)					
4.14. Impact on Archaeology and Palaeontology	Prevent damage and destruction to fossils, artefacts and materials of heritage significance.	4.14.1. Carry out general monitoring of excavations for potential fossil heritage, artefacts and material of heritage importance.	Monitor excavations and construction activities for archaeological and palaeontological materials.	Daily during excavation work.	Contractor and ECO
		4.14.2. All work must cease immediately, if any human remains and/or other archaeological, palaeontological and historical material are uncovered. Such material, if exposed, must be reported to the nearest museum, archaeologist/ palaeontologist and to the PHRAG (or the South African Police Services), so that a systematic and professional investigation can be undertaken. Sufficient time should be allowed to remove/collect such material before construction re-commences.	Monitor excavations and construction activities for archaeological and palaeontological materials and report the finds accordingly. Contact PHRAG/SAHRA and the identified palaeontologist/ archaeologist if any heritage features are uncovered.	As required/necessary during construction.	Contractor and ECO
I. Water Conservation					
4.15. Impact on the	Reduce water usage during	4.15.1. Water conservation to be	Monitor via site audits and	Monthly	EHS Manager and

Impact	Management Objectives	Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
regional water balance as a result of increased water usage.	construction.	practiced in line with Energy Saving Policies as follows: • Cleaning methods utilised for cleaning vehicles, floors, etc. should aim to minimise water use (e.g. sweep before wash-down). • Ensure that regular audits of water systems are conducted to identify possible water leakages.	record non-compliance and incidents.		ECO
		4.15.2. Carry out environmental awareness training with a discussion on water usage and conservation.	Conduct training for all construction personnel.	• Once-off during construction and ensure that all new staff are inducted.	EHS Manager, ECO and Contractor
J. Spill Contingency, Management and Handling of Chemicals/Dangerous Goods					
4.16. Potential spillage of effluent (from portable sanitation facilities for construction personnel).	Reduce the spillage of domestic effluent and the impact thereof on the environment.	4.16.1. Ensure that normal sewage management practices are implemented during construction such as regularly emptying toilets and ensuring safe transport and disposal of sewage.	Monitor via site audits and record non-compliance and incidents (including incidents that nearly occur).	Monthly	EHS Manager and ECO

Impact	Management Objectives	Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
		4.16.2. Ensure that all domestic effluent/waste water is disposed safely at an appropriate, licenced facility by an appointed (suitable) service provider. Ensure that no discharge of waste water to the land surface is permitted. Proof of disposal (i.e. waybills) must be kept on file.	Monitor via site audits and record non-compliance and incidents. EHS Manager to audit disposal slips.	Monthly	EHS Manager and ECO
		4.16.3. Ensure that the toilet/sanitation facilities are maintained in a clean, orderly and sanitary condition.	Monitor via site audits and record non-compliance and incidents.	Daily	EHS Manager and Contractor
4.17. Contamination of soil and groundwater through spillage of concrete and cement.	To control concrete and cement batching activities in order to prevent spillages and concomitant contamination of soil, groundwater and the marine environment.	4.17.1. If any concrete mixing takes placed on site, this must be carried out on an impermeable surface (such as on boards or plastic sheeting and/or within a bunded area with an impermeable surface).	Monitor the handling and storage of sand, stone and cement as instructed.	Daily	Project Developer, Contractor and EHS Manager
		4.17.2. Concrete mixing areas must be fitted with a containment facility for the collection of cement-laden water. This facility must be impervious to prevent soil and groundwater			

Impact	Management Objectives	Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
		contamination.			
		4.17.3. Bagged cement must be stored in an appropriate facility and at least 10 m away from any water courses, gullies and drains.			
		4.17.4. A washout facility must be provided for washing of concrete associated equipment. Water used for washing must be restricted.			
		4.17.5. Hardened concrete from the washout facility or concrete mixer can either be reused or disposed of at an appropriate licenced disposal facility.			
		4.17.6. Empty cement bags must be secured with adequate binding material if these will be temporarily stored on site. Sand and aggregates containing cement must be kept damp to prevent the generation of dust.			
		4.17.7. Any excess sand, stone and cement must be removed from site at the completion of the construction period and disposed at a			

Impact	Management Objectives	Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
		registered disposal facility.			
K. Waste Water Management					
4.18. Pollution caused by spillage or discharge of construction waste water into the surrounding environment.	Reduce construction waste water discharge into the environment and the resulting impact.	4.18.1. Implement proper construction site management actions such as the installation of containment structures, good on-site housekeeping (regular sweeping of roadways and work areas, reporting systems and environmental awareness training), and spillage management.	Monitor via site audits and record non-compliance and incidents.	Monthly	EHS Manager
		4.18.2. 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.	Inspection of the temporary waste storage area.	Weekly	Contractor
		4.18.3. Should the on-site storage of general waste and hazardous waste exceed 100 m^3 and 80 m^3 respectively, then the National Norms and		Weekly	Contractor, EHS Manager and ECO

Impact	Management Objectives	Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
		Standards for the Storage of Waste (published on 29 November 2013 under Government Notice 926) must be adhered to.			
		4.18.4. Ensure that the construction site is kept clean at all times and that construction personnel are made aware of correct waste disposal methods.	Conduct training for all construction personnel.	Once-off during construction and ensure that all new staff are inducted. Discuss weekly during HSSE meetings	Contractor, EHS Manager
		4.18.5. 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.	Monitor waste generation and collection throughout the construction phase.	Daily	Contractor
		4.18.6. No solid waste may be burned or buried on site.	Monitor via site audits and record non-compliance and incidents.	Daily	Contractor
		4.18.7. Segregation of hazardous waste from general waste to be in place.	On-site inspection of waste segregation.	Weekly	Contractor
L. Stormwater Management					
4.19. Pollution of the surrounding environment as a	Reduce the contamination of stormwater.	4.19.1. The appointed Contractor should compile a Method Statement for Stormwater	Compile Method Statement	Once off (and thereafter updated as required).	Contractor

Impact	Management Objectives	Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
result of contamination of stormwater. Contamination could result from chemicals, oils, fuels, sewage, solid waste, litter etc.		Management during the construction phase.			
		4.19.2. Provide secure storage for oil, chemicals and other waste materials in order to prevent contamination of stormwater runoff.	Monitor the bunding and containment structures.	Weekly	EHS Manager
		4.19.3. Construct and install appropriate and effective stormwater infrastructure; including cut-off drains on the perimeter of the property to aid in capturing and preventing any contaminants from entering the City of Ekurhuleni stormwater system or the surrounding environment	Implement Method Statement for Stormwater; Construct storm water infrastructure.	Once Off	Contractor
		4.19.4. Regular inspections of stormwater infrastructure should be undertaken to ensure that it is kept clear of all debris and weeds.	Monitor via site audits and record non-compliance and incidents (i.e. by implementing walk through inspections).	Weekly	Contractor, EHS Manager and ECO
M. Waste Management					
4.20. Pollution of the surrounding environment as a result of the handling,	Reduce soil and groundwater contamination as a result of incorrect storage, handling and disposal of general and hazardous waste.	4.20.1. General waste and hazardous waste should be stored temporarily on site in suitable (and correctly labelled) waste collection	Inspection of the temporary waste storage area.	Daily	EHS Manager

Impact	Management Objectives	Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
temporary storage and disposal of solid waste (general and hazardous).		bins and skips (or similar). Waste collection bins and skips should be covered with suitable material, where appropriate.			
		4.20.2. Should the on-site storage of general waste and hazardous waste exceed 100 m^3 and 80 m^3 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.			
		4.20.3. Ensure that the construction site is kept clean at all times and that construction personnel are made aware of correct waste disposal methods.	Conduct training for all construction personnel.	• Once-off during construction and ensure that all new staff are inducted. • Discuss weekly during HSSE meetings.	EHS Manager, ECO and Contractor
		4.20.4. 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.	Monitor waste generation and collection throughout the construction phase.	Daily	EHS Manager and Contractor

Impact	Management Objectives	Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
		4.20.5. No solid waste may be burned or buried on site.	Monitor via site audits and record non-compliance and incidents.	Daily	EHS Manager
		4.20.6. Segregation of hazardous waste from general waste to be in place.	On-site inspection of waste segregation.	Weekly	EHS Manager
N. Air Quality Management					
4.21. Air Quality Impact: 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.	4.21.1. Ensure that cleared (excavated) areas and unpaved surfaces are sprayed with water (obtained from an approved source) to minimise dust generation. Approved soil stabilisers may be utilised to limit dust generation.	• Monitor dust suppression mechanisms and record non-compliances.	• During complaints/incidents	EHS Manager, ECO and Contractor
O. Socio-Economic Management					
4.22. Employment creation and skills development opportunities during the construction phase.	Maximise local employment and local business opportunities to promote and improve the local economy.	4.22.1. Enhance the use of local labour and local skills as far as reasonably possible.	Maximise local employment for unskilled labour and provincial/ national skilled labour.	During the construction phase.	Contractor and ECO
		4.22.2. Where the required skills do not occur locally, and where appropriate and applicable, ensure that relevant local individuals are trained.			

Impact	Management Objectives	Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
		4.22.3. Ensure that goods and services are sourced from the local and regional economy as far as reasonably possible.			
P. Environmental Awareness and Site Camp Establishment					
4.23. Increased energy consumption during the construction phase.	Reduce energy consumption where possible.	4.23.1. Encourage the use of energy saving equipment at the construction camp site (such as low voltage lights and low pressure taps) and promote recycling. Construction personnel must be made aware of energy conservation practices as part of the environmental awareness training programme.	• Contractor to monitor energy usage via site investigations. • Conduct training for all construction personnel.	• Monthly	• Contractor • EHS Manager, ECO and Contractor
4.24. Inappropriate planning of site camp establishment.	Ensure that environmental issues are taken into consideration in the planning for site establishment.	4.24.1. Ensure that the site establishment is designed and carried out in line with the requirements of relevant specifications and the landowner.	Monitor compliance and record non-compliance and incidents.	Before construction	EHS Manager
4.25. Soil erosion in the surrounding environment	To limit dust and erosion	4.25.1. Implement effective measures to control dust and erosion	• Commence (and preferably complete) construction during winter, when the risk of erosion should be least.	During construction	EHS Manager and Project Developer

Impact	Management Objectives	Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
			• Erosion protection measures must be implemented on the site to reduce erosion and sedimentation of the receiving environment. Measures could include bunding around soil stockpiles; and vegetation of areas not to be developed. • Adequate dust control strategies should be applied to minimise dust deposition, for example: Periodic spraying of the entrance road and environmentally-friendly dust control measures (e.g. mulching and wetting) where and when dust is problematic		

5 MANAGEMENT PLAN FOR OPERATIONAL PHASE

Impact	Management Objectives	Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
A. Alien Vegetation Management					
5.1. Potential re-establishment of alien plants on site.	Ensure the correct removal of alien invasive vegetation from the proposed project area and prevent the establishment and spread of alien invasive plants.	5.1.1. Alien invasive vegetation should be removed immediately (in line with relevant municipal and provincial procedures, guidelines and recommendations) and disposed of at a licenced waste disposal facility.	Monitor the removal of the alien invasive vegetation. An Invasive species control plan should be actively implemented within the study area and Open Space system for at least 12 months (every 3 months).	During the removal process and for at least 12 months (every 3 months).	EHS Manager
B. Noise Impacts					
5.2. Potential noise impact from 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.	5.2.1. All drivers of the road tankers should receive training regarding the use of air brakes.	Training of drivers	During induction of drivers to site rules.	Project Developer
C. Visual Impacts					
5.3. Potential impact of night lighting of the development on the nightscape	Prevent night lights from impacting on surrounding visual receptors by minimizing glare and light spill.	5.3.1. Outside and security lights must use light fixtures that shield the light and focus	Complaints referring to lighting at night should be documented, investigated and resolved.	When complaints are received.	Project Developer

Impact	Management Objectives	Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
of the surrounding landscape.		illumination onto specific areas as required. 5.3.2. Elevated lights should be avoided, or carefully shielded to minimise glare.			
D. Traffic Impacts					
5.4. Impact of extra vehicles during the operational phase.	Prevent unnecessary or excessive heavy vehicles.	5.4.1. Implement good logistics planning during the operational phase.	Compile a scheduled loading time programme to minimise potential delay in loading.	Permanent over the lifespan of layer facility.	Project Developer
E. Safety, Health and Environment					
5.5. Pollution of water and the ground as a result of potential spills of the stored product.	Prevent unnecessary pollution impacts on the surrounding environment.	5.5.1. Scheduled inspections should be implemented in order to assure and verify the integrity of hoses, piping and storage and septic tanks.	Carry out thorough inspections of piping, loading hoses, and bunding for leaks, using a checklist.	Daily	Project Developer
		5.5.2. The operating personnel should undergo proper training to prevent pollution incidents.	Proof of attendance to training sessions to be kept on file on site.	Once off (and thereafter as required for new operating personnel).	Project Developer.
		5.5.3. Ensure that excrement, carcasses, feed, and other operational waste	Adhere to best practice broiler management and waste disposal norms.	Throughout Operation	Project Developer

Impact	Management Objectives	Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
		and hazardous materials are appropriately and effectively contained and disposed of without detriment to the environment.	Ensure that if vehicles, equipment or visiting personnel are to be decontaminated make sure this is done in a designated area that can effectively contain excess disinfectants / biocides / surfactants.		
5.6. Atmospheric pollution due to fumes	Prevent unnecessary air pollution impacts as a result of the operational procedures.	5.6.1. Portable fire extinguishers and fire water hydrants (i.e. appropriate fire-fighting equipment) should be provided at the facility as required.	• Assurance of functionality of fire extinguishers via inspections and certification by an accredited fire service company. • Comply with the permit to work system.	• Annually	Project Developer
5.7. 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.	5.7.1. Operational personnel must wear basic PPE (i.e. gloves) as necessary during the operational phase.	• Medical investigations or surveillance to be undertaken for the operating personnel. • Keep a register of the medical records for the operating personnel.	• Once-off for every operating person. • Once every five years for the life of the installation.	Project Developer
5.8. 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.	5.8.1. Portable fire extinguishers and fire water hydrants (i.e. appropriate fire-fighting equipment) should be provided at the facilty as required.	• Draw up a schedule for inspections and maintenance. • Assurance of functionality of fire extinguishers via	• Once initially and revise as reliability of equipment is assessed. • Annually • Annually	Project Developer

Impact	Management Objectives	Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
			inspections and certification by an accredited fire service company. • Draw up a schedule of safety audits.	• Annually	
5.9. Increase in pest invertebrates, spread of disease and mortality of chickens.	Highly localized pest invertebrate control that does not affect non-target populations or taxa	5.9.1. Detect and control pest infestations before they become a problem through frequent and careful cleaning, monitoring and control.	• Rinse floors regularly • Provide sufficient ventilation and airflow to keep the chicken house (floors, bedding, fodder) as dry as possible. • Check to see that fan louvers are properly working and close completely when the fan is not running. • Properly screed concrete floors to effectively seal all cracks and limit the pooling of effluent on site. • Use appropriately sloped and slated floors to facilitate drainage • Clean up excess fodder regularly from under troughs and feed bins • Effectively drain storm	As necessary	EHS Manager and Project Developer

Impact	Management Objectives	Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
			water from around chicken houses • Keep areas surrounding chicken houses 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 grass and weeds mowed to 5cm or less immediately around the facilities, to prevent insect growth • Electrocution devices are available to kill flies, while other mechanical devices include traps, sticky tapes or baited traps.		
		5.9.2. Detect pest infestations before they become a problem through frequent and careful monitoring.	• Manage and prevent access to fodder, especially feed wastage around the houses, feeders. • Control rodents through effective sanitation, rodent proofing and killing. • Glue boards and traps	As necessary	EHS Manager and Project Developer

Impact	Management Objectives	Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
			can be used in small areas, but in larger areas (over 12,000 sq ft) baits are more practical. • Rodenticides are not advised. • The most effective control for indigenous birds is screening production house air inlets and open windows with 2x2cm wire mesh.		
6.10 Increase in odour to surrounding residents from facility	Ensure the odours from the facility to not have a detrimental effect on nearby residents/operations.	5.9.3. Maintain good waste management practices. 5.9.4. Ensure the design of the facility compensates for good ventilation and cleanliness. 5.9.5. Monitor odours regularly by conducting assessments.	• Rinse floors regularly • Provide sufficient ventilation and airflow to keep the chicken house (floors, bedding, fodder) as dry as possible. • Check to see that fan louvers are properly working and close completely when the fan is not running. • Properly screed concrete floors to effectively seal all cracks and limit the pooling of effluent on site. • Use appropriately sloped and slated floors to	As necessary	EHS Manager and Project Developer

Impact	Management Objectives	Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
			facilitate drainage • Clean up excess fodder regularly from under troughs and feed bins • Effectively drain storm water from around chicken houses • Keep areas surrounding chicken houses free of spilled manure and litter • Remove all trash, and sources of feed and water for pests from the outside perimeter of the facilities. • Maintain the cleanliness of the facility by removing waste efficiently and effectively.		
6.11 Increase in nuisance flies	Ensure the fly increase is managed and kept to an acceptable level	5.9.6. Maintain good waste management practices. 5.9.7. Ensure the design of the facility compensates for good ventilation and cleanliness. 5.9.8. Monitor odours regularly by conducting assessments.	• Manage and prevent access to fodder, especially feed wastage around the houses, feeders. • Keep areas surrounding chicken houses free of spilled manure and litter. • Rinse floors regularly • Provide sufficient ventilation and airflow.	As necessary	EHS Manager and Project Developer

Impact	Management Objectives	Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
			• Ensure odours are managed (6.10).		
F. Water Conservation					
5.10. Impact on the regional water balance as a result of increased water usage.	Reduce water usage during operations.	5.10.1. Water conservation to be practiced in line with Energy Saving Policies as follows: - Cleaning methods utilised for cleaning vehicles, floors, the chicken houses etc. should aim to minimise water use (e.g. sweep before wash-down). - Ensure that regular audits of water systems are conducted to identify possible water leakages.	Record water usage, conduct audits and record non-compliance and incidents.	Monthly	Project Developer
G. Spill Contingency, Management and Handling of Chemicals/Dangerous Goods					
5.11. Potential spillage of domestic effluent from the sewer as a result of the operation.	Reduce the spillage of domestic effluent and the impact thereof on the environment.	5.11.1. A maintenance plan for the management of the sewer pipes in cases of emergency should be developed.	Compile sewer maintenance plan.	Once off (and thereafter updated as required during the operational phase).	Project Developer
5.12. Potential spillage of chicken effluent.	Reduce likelihood of spillage of chicken effluent.	5.12.1. Proper management of fertilizer separation and transportation of waste should be maintained.	Adhere to waste removal from chicken houses and effluent separation best practice.	Once off (and thereafter updated as required during the operational phase).	Project Developer
5.13. Human Health	Reduce effects on human	5.13.1. Develop a sound	Compile plan and train	Once off (and	Project Developer

Impact	Management Objectives	Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
effects due to emergency on site	health and/or death by having a thorough emergency preparedness plan in place and trained staff to execute this plan.	evacuation and emergency preparedness plan in the event of explosions, fire etc.	personnel to execute this plan in the event of an emergency. Actions in plan could include: - Proper escape routes according to the design on the facility once it is operational. - Proper use of fire extinguishers etc. - Protocol to be followed in the event of explosions etc. - Protocol to be followed in the event of a death or injury to an employee.	thereafter updated as required during the operational phase).	
H. Stormwater Management					
5.14. Increased stormwater discharge into the surrounding environment.	Reduce the impact of increased stormwater discharge to the environment.	5.14.1. A suitable stormwater/ surface water quality monitoring programme should be established and implemented.	Implement surface water quality monitoring programme, based on consultation with the landowner	As agreed during the operational phase.	Project Developer
		5.14.2. Regular inspections of stormwater infrastructure should be undertaken to ensure that it is kept clear of all debris and weeds.	Undertake regular inspections of the stormwater infrastructure (i.e. by implementing walk through inspections).	Weekly/Monthly	Farm Manager and EHS Manager
I. Waste Management					

Impact	Management Objectives	Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
5.15. 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.	5.15.1. Sufficient waste collection bins and skips (or similar) should be provided. Waste collection bins and skips should be covered with suitable material and correctly labelled.	Monitor waste generation and collection throughout the operational phase.	Weekly	EHS Manager
		5.15.2. Segregation of hazardous waste from general waste to be in place.	On-site inspection of waste segregation.	Weekly	EHS Manager
		5.15.3. Ensure that the facility is kept clean at all times and that operational personnel are made aware of correct waste disposal methods.	• Conduct training for all operational personnel. • Monitor the state of facility via site audits and record non-compliance and incidents.	• Once-off during operations and ensure that all new staff are inducted. Carry out discussions during HSSE meetings as well. • Daily	EHS Manager
		5.15.4. No solid waste may be burned or buried on site.	Monitor via site audits and record non-compliance and incidents.	Daily	EHS Manager
		5.15.5. Ensure that chicken manure is collected and temporarily stored in compost bins before being sent out/sold for composting and application	Ensure adequate management of waste so that flies are not a problem. Protect the compost bins are from vermin and scavengers.	Daily	EHS Manager/Farm Manager

Impact	Management Objectives	Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
		5.15.6. Waste amounts shall be recorded on a monthly basis.	Waste amounts to be documented.	Monthly	EHS Manager/ Farm Manager
J. Air Quality Management					
5.16. Emissions from staff vehicles and road tankers	Reduce odours during the operational phase.	5.16.1. Ensure that the proposed project is operated in such a manner whereby potential odours are minimised.	• Monitor via site audits and record non-compliance and incidents. • Complaints about odours should be investigated and documented in a register.	• Daily • When complaints are made.	EHS Manager
5.17. 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 from an appropriate floral specialist, and diligently implemented. Annual wild fires should be strictly prohibited.	5.17.1. Ensure that all flammable materials are monitored and kept in a safe storage.	• 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	• Throughout Operation	Project Developer and ECO, EHS Manager.
		5.17.2. Ensure that the development has firebreaks	• Maintain an effective fire break between the development area and the surrounding natural environment		

Impact	Management Objectives	Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
		5.17.3. Develop sound emergency procedures and preparedness plan in the event of explosions, fires. Etc.	• Educate workers about the plan and emergency procedures with regular training and notices		
K. Socio-Economic Management					
5.18. Employment creation and skills development opportunities during the operational phase.	Maximise local employment and local business opportunities to promote and improve the local economy.	5.18.1. Enhance the use of local labour and local skills as far as reasonably possible.	Maximise local employment for unskilled labour and provincial/ national skilled labour.	During the operational phase.	Project Developer
		5.18.2. Where the required skills do not occur locally, and where appropriate and applicable, ensure that relevant local individuals are trained.			
		5.18.3. Ensure that goods and services are sourced from the local and regional economy as far as reasonably possible.			
5.19. Increase in pork and fresh produce in the local Rooiwal/Onderste	Maximise positive impacts through ensuring produce is sold to local markets	5.19.1. Ensure that the proposed project has secured local buyers.	Seek out local markets & secure formal trade agreements.	Monthly	Project developer

Impact	Management Objectives	Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
poort area					
L. Environmental Awareness and Site Management					
5.20. Increased energy consumption during the operational phase.	Reduce energy consumption where possible.	5.20.1. Encourage the use of energy saving equipment (such as low voltage lights and low pressure taps) and promote recycling. Operational personnel must be made aware of energy conservation practices as part of the environmental awareness training programme.	Monitor energy usage via site investigations. Conduct training for all operational personnel.	Monthly	EHS Manager
5.21. Inappropriate behaviour of site staff during the operational phase.	Prevent unnecessary impacts on the surrounding environment by ensuring that staff are aware of the requirements of the EMPr.	5.21.1. Designate smoking areas where the fire hazard could be regarded as insignificant.	Adhoc checks to ensure workers are smoking only in designated areas.	Daily	EHS Manager
		5.21.2. Open fires must be prohibited. Appropriate fire safety training should also be provided to staff that are to be on site for the duration of the operational phase.			
		5.21.3. Fire-fighting equipment must be made available			

Impact	Management Objectives	Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
		at various appropriate locations.			

6 MANAGEMENT PLAN FOR DECOMMISSIONING PHASE

Impact	Management Objectives	Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
A. Visual Impacts					
6.1. 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.	6.1.1. Ensure that rubble and litter are appropriately stored and regularly removed from site to a licenced waste disposal facility. 6.1.2. Dust generation must be kept at a minimum. 6.1.3. Night lighting of work (decommissioning) sites must be minimized within requirements of safety and efficiency.	Rubble/litter/waste removal and disposal to be monitored throughout decommissioning. Complaints about night lights should be investigated and documented in a register.	Weekly or bi-weekly	Contractor and ECO
B. Safety, Health and Environment					
6.2. Noise generation from demolition activities (e.g. grinding, steel falling, use of angle grinders) during the decommissioning phase.	Reduce the potential noise impacts on the decommissioning personnel.	6.2.1. Decommissioning personnel must wear proper hearing protection, which should be specified as part of the Decommissioning Phase Risk Assessment carried out by the Contractor. 6.2.2. The Contractor must ensure that all decommissioning personnel are provided with adequate PPE for use where appropriate.	Inspections to be carried out during the decommissioning phase to enforce the use of hearing protection by decommissioning personnel. A checklist should be generated in this regard to ensure adherence to the safety requirements. This must also be written into the	Throughout the decommissioning phase.	ECO and Contractor

Impact	Management Objectives	Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
			safety requirements of the Contract.		
6.3. Potential health injuries to demolition staff during the decommissioning phase.	Prevent respiratory illnesses caused to the decommissioning personnel.	6.3.1. The Contractor must ensure that all decommissioning personnel are provided with adequate PPE (such as dust masks) for use where appropriate. 6.3.2. The Contractor must prescribe, to decommissioning personnel, what is required by the OTGC permit to work system.	Inspections to be carried out during the decommissioning phase to enforce the use of respiratory protection by decommissioning personnel. This must also be written into the safety requirements of the Contract.	Throughout the decommissioning phase.	ECO and Contractor
6.4. Heavy traffic, congestion and potential for collisions.	Prevention of injuries, fatalities, and damage to equipment and vehicles during the decommissioning phase.	6.4.1. Suitable parking areas should be created and designated for trucks and vehicles. 6.4.2. A supervisor should be appointed to co-ordinate the traffic during the decommissioning phase. 6.4.3. Road barricading should be undertaken where required and road safety signs should be adequately installed at strategic points within the site.	Monitor activities and record and report non-compliance by undertaking inspections.	Throughout the decommissioning phase.	Project Developer ECO and Contractor
6.5. Pollution of the surrounding groundwater as a result of spillages, generation of building rubble and	Prevent unnecessary pollution impacts on the surrounding environment.	6.5.1. The site should be cleaned regularly and all demolition waste (i.e. concrete, steel, rubble, packaging material etc.) must be removed from	Monitor activities and record and report non-compliance by undertaking inspections.	Throughout the decommissioning phase.	Project Developer, ECO and Contractor

Impact	Management Objectives	Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
waste scrap material.		site and disposed at a licenced waste disposal facility by an approved Contractor. Waste disposal slips or waybills should be kept on file for auditing purposes as proof of disposal. 6.5.2. All liquid wastes (i.e. used oil, paints, lubricating compounds and grease etc.) must be removed from site and disposed at a licenced hazardous waste disposal facility by an approved waste Contractor. Waste disposal slips or waybills should be kept on file for auditing purposes as proof of disposal.			
C. Water Conservation					
6.6. Increased water usage during the decommissioning phase.	Reduce water usage during decommissioning processes.	6.6.1. Water conservation to be practiced in line with Energy Saving Policies as follows: - Cleaning methods utilised for cleaning vehicles, floors, etc. should aim to minimise water use (e.g. sweep before wash-down). - Ensure that regular audits of water systems are conducted to identify possible water leakages.	Monitor via site audits and record non-compliance and incidents.	Monthly	EHS Manager and ECO
		6.6.2. Carry out environmental	Conduct training for all	As and when	EHS Manager,

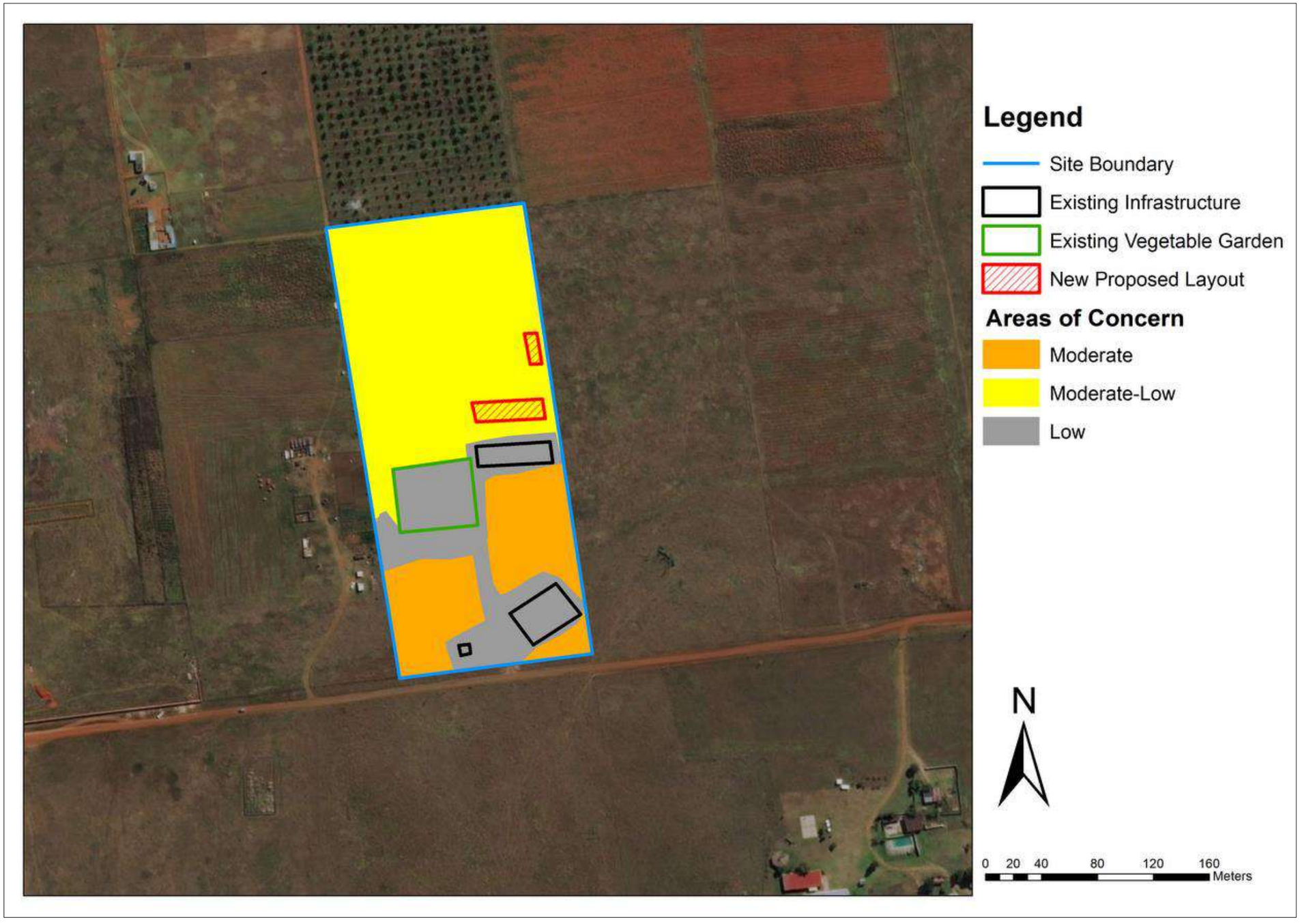
Impact	Management Objectives	Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
		awareness training with a discussion on water usage and conservation.	decommissioning personnel.	necessary during decommissioning and ensure that all new staff are inducted.	ECO and Contractor
D. Spill Contingency, Management and Handling of Chemicals/Dangerous Goods					
6.7. 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.	6.7.1. Ensure that normal sewage management practices are implemented during decommissioning such as regularly emptying toilets and ensuring safe transport and disposal of sewage.	EHS Manager to monitor via site audits and record non-compliance and incidents (including incidents that nearly occur).	Monthly	EHS Manager and ECO
		6.7.2. Ensure that the toilet/sanitation facilities are maintained in a clean, orderly and sanitary condition.	Monitor via site audits and record non-compliance and incidents.	Daily	EHS Manager and Contractor
E. Stormwater Management					
6.8. 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.	6.8.1. The appointed Contractor should compile a Method Statement for Stormwater Management during the decommissioning phase.	Compile Method Statement	Once off (and thereafter updated as required).	Contractor
		6.8.2. Provide secure storage for oil, chemicals and other waste materials in order to prevent contamination of stormwater runoff.	Monitor the bunding and containment structures.	Weekly	EHS Manager

Impact	Management Objectives	Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
F. Waste Management					
6.9. 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.	6.9.1. Carry out management actions for the decommissioning phase.	Carry out monitoring for the decommissioning phase.	Carry out monitoring for the decommissioning phase.	Project Developer and EHS Manager
G. Air Quality Management					
6.10. Air Quality Impact: Emissions from decommissioning vehicles and generation of dust as a result of earthworks and demolition	Reduce dust emissions during decommissioning activities.	6.10.1. Carry out management actions for the decommissioning phase.	Carry out monitoring for the decommissioning phase.	Carry out monitoring for the decommissioning phase.	Project Developer and EHS Manager
H. Fauna and Flora					
6.11. Introduction and proliferation of alien species	Minimize introduction and effective control of alien species	6.11.1. By law, remove and dispose of Category 1b alien species on site. All Category 2 species that remain on site must require a permit.	Mechanical removal of these species is recommended. However, the removal must be carefully performed so as to not excessively disturb the soil layer.	Throughout the decommissioning phase.	Project Developer and EHS Manager
6.12. Sensory disturbances on Fauna	Minimise sensory disturbance surrounding faunal communities during decommissioning	6.12.1. Appropriately time demolition / rehabilitation activities to minimise sensory disturbance to fauna.	Commence (and preferably complete) demolition / rehabilitation during winter, when the risk of disturbing active (including breeding and	Throughout the decommissioning phase.	Project Developer and EHS Manager

Impact	Management Objectives	Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
			migratory) animals, should be least.		

Lewin AgriBusiness (Pty) Ltd Management has to appoint an independent Environmental Control Officer whose duty is to also implement an effective environmental awareness plan aimed to educate workers and contractors in terms of the biodiversity on site, environmental risks associated with the proposed development and land management of the site. Training and/or awareness should be raised and effectively communicated prior to the commencement of the construction phase. Training sessions should incorporate the management plans addressed in this EMPr as well as any new information and documentation provided by the ECO, as well as that of the Environmental Health & Safety Officer. The ECO would be the most suitable person to conduct these training sessions, identifying sensitive environments as well as all the risks and impacts, such as effluence, associated with the chicken broiler and the methods in which to deal with the impacts in order to avoid environmental degradation. Training sessions can be monitored by providing an attendance register indicating the workers that received training as well as evidence of the training and/or awareness received. These sessions would also need to be carried out throughout the operational phase of the chicken broiler, at least once a year, or as new information becomes available.

7 APPENDIX A – PROPOSED LAYOUT OF PROPOSED PROJECT OVERLAIN ON A SENSITIVITY MAP



BASIC ASSESSMENT REPORT

Appendix I: Other information

CONTENTS

I-1: CV's of the project team: Minnelise Levendal (Project Leader)

CSIR
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South Africa

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Fax: +27 21 888 2693
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CURRICULUM VITAE OF MINNELISE LEVENDAL – PROJECT LEADER

Name of firm	CSIR
Name of staff	Minnelise Levendal
Profession	Environmental Assessment and Management
Position in firm	Project Manager
Years' experience	8 years
Nationality	South African
Languages	Afrikaans and English

CONTACT DETAILS:

Postal Address:	P O Box 320, Stellenbosch, 7599
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.

EDUCATION

▪ M.Sc. (Botany)	Stellenbosch University	1998
▪ B.Sc. (Hons.) (Botany)	University of the Western Cape	1994
▪ B.Sc. (Education)	University of the Western Cape	1993

MEMBERSHIPS:

- International Association for Impact Assessment (IAIA), Western Cape (member of their steering committee from 2001-2003)
- IUCN Commission on Education and Communication (CEC); World Conservation Learning Network (WCLN)
- American Association for the Advancement of Science (AAAS)
- Society of Conservation Biology (SCB)

EMPLOYMENT RECORD:

- **1995:** Peninsula Technicon. Lecturer in the Horticulture Department.
- **1996:** University of the Western Cape. Lecturer in the Botany Department.
- **1999:** University of Stellenbosch. Research assistant in the Botany Department (3 months)
- **1999:** Bengurion University (Israel). Research assistant (Working in the Arava valley, Negev – Israel; 2 months). Research undertaken was published (see first publication in publication list)
- **1999-2004:** Assistant Director at the Department of Environmental Affairs and Development Planning (DEA&DP). Work involved assessing Environmental Impact Assessments and Environmental Management Plans; promoting environmental management and sustainable development.
- **2004 to present:** Employed by the CSIR in Stellenbosch:
- September 2004 – May 2008: Biodiversity and Ecosystems Services Group (NRE)
- May 2008 to present: Environmental Management Services Group (EMS)

PROJECT EXPERIENCE RECORD:

The following table presents a list of projects undertaken at the CSIR as well as the role played in each project:

Completion Date	Project description	Role	Client
2011 *(in progress)*	EIA for the proposed Electrawinds Swartberg wind energy project near Moorreesburg in the Western Cape	Project Manager	Electrawinds
2010-2011 *(in progress)*	EIA for the proposed Ubuntu wind energy project, Eastern Cape	Project Manager	WKN Windkraft SA
2010-2011 *(in progress)*	EIA for the proposed Banna ba pifhu wind energy project, Eastern Cape	Project Manager	WKN Windkraft SA
2010-2011	BA for a powerline near Swellendam in the Western Cape	Project Manager	BioTherm Energy (Pty Ltd
2010-2011 *(Environmental Authorisation granted in September 2011)*	EIA for a proposed wind farm near Swellendam in the Western Cape	Project Manager	BioTherm Energy (Pty Ltd
2010 (complete)	Basic Assessment for the erection of two wind monitoring masts near Swellendam and Bredasdorp in the Western Cape	Project Manager	BioTherm Energy (Pty Ltd
2010 (complete)	Basic Assessment for the erection of two wind monitoring masts near Jeffrey's Bay in the Eastern Cape	Project Manager	Windcurrent (Pty Ltd

Completion Date	Project description	Role	Client
2009-2010 (*(Environmental Authorisations granted during 2010)*	Basic Assessment Process for the proposed erection of 10 wind monitoring masts in SA as part of the national wind atlas project	Project Manager	Department of Energy through SANERI; GEF
2010	South Africa's Second National Communication under the United Nations Framework Convention on Climate Change	Project Manager	SANBI
2009 *(Environmental Authorisation granted in 2009)*	Basic Assessment Report for a proposed boundary wall at the Port of Port Elizabeth, Eastern Cape	Project Manager	Transnet Ltd
2008	Developing an Invasive Alien Plant Strategy for the Wild Coast, Eastern Cape	Co-author	Eastern Cape Parks Board
2006-2008	Monitoring and Evaluation of aspects of Biodiversity	Project Leader	Internal project awarded through the Young Researchers Fund
2006	Integrated veldfire management in South Africa. An assessment of current conditions and future approaches.	Co- author	Working on Fire
2004-2005	Biodiversity Strategy and Action Plan Wild Coast, Eastern Cape, SA	Co-author	Wilderness Foundation
2005	Western Cape State of the Environment Report: Biodiversity section. (Year One).	Co- author and Project Manager	Department of Environmental Affairs and Development Planning

PUBLICATIONS:

Bowie, M. (née Levendal) and Ward, D. (2004). Water status of the mistletoe *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 ^{13}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

Language	***Speaking***	***Reading***	***Writing***
English	*Excellent*	*Excellent*	*Excellent*
Afrikaans	*Excellent*	*Excellent*	*Excellent*

Minnelise Levendal

April 2018

I-2 : CV's of the project team: Rirhandzu Marivate (Project Manager)

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7599
South Africa

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Cell : +27 76 183 0642
Fax : +27 21 888 2473
Email : *rmarivate@csir.co.za*

Position in Firm:	Junior Environmental Assessment Practitioner (305759)
Full Name:	Marivate, Rirhandzu Anna
Specialisation:	Environmental & Ecological Science
Professional Registration:	Cand. Sci. Nat. Environmental Sciences – Reg Number: 100147/14
Date of Birth:	23 February 1989
Nationality:	South African

BIOSKETCH

Rirhandzu holds a Bachelor degree in Zoology & Geology, Honours in Ecology, Environment and Conservation from the University of the Witwatersrand; and has environmental research experience with the University of Cape Town. The research focus has been within the domain of socioecology, looking at investigating local ecological knowledge of stakeholders on the provisioning of freshwater resources and its impacts on the management for of the Berg river in the Western Cape, South Africa. The research looked at how perception on resource utilisation affects management priorities, and creating a matrix of perceptions would be used a tool for better decision making within the Berg River Catchment Management Areas. Rirhandzu is currently studying towards her Master in Philosophy in Sustainable Development at the University of Stellenbosch. Here current research interest is looking at environmental planning and management within municipalities and how to optimise green spaces by including ecosystem goods and services to build resilience within those municipalities.

Since 2014, Rirhandzu has worked at the Council for Scientific and Industrial Research (CSIR) as an Environmental Assessment Practitioner (EAP) Intern within the Environmental Management Services (EMS) group, and from 2015 as a Junior Environmental Practitioner for the same group. Her duties include Assistance to other EAPs within EMS in their projects; Research in environmental assessment topics (e.g. indications, best practice, legislation); Report writing and project management; Participating in various forms of environmental assessments (BAs, EIAs, SEAs); consultation with stakeholders and public meetings; and Project administration (e.g. contracting and invoicing). She is particularly involved with the Special Needs and Skills Development (SNSD) Programme, which looks at assisting Community Trusts, Small, Micro to Medium Enterprises, with environmental services. She has also been involved with the Monitoring and Evaluation of the National Strategy for Sustainable Development by the Department of Environmental Affairs (DEA). Rirhandzu has established good client relationships and partnerships with the Land Bank, Department of Agriculture, Forestry and Fisheries (DAFF), and Department of Mineral Resources (DMR) through the SNSD Programme. She is involved as a stakeholder in the continuous consultations for the Development of Environmental Indices in response to the National Development Plan (NDP), led by the DEA.

Rirhandzu further involved with the Applied Centre for Climate and Earth Systems Sciences (ACCESS- NRE) as a national representative for the Student NEC and as a member of their Advisory Board for their Habitable Planet Programme. The HPW programme aims to educate undergraduate and high school learners in environmental and earth systems sciences, with the goal of encouraging them to pursue science careers.

EXPERIENCE

Completion Date	Project description	Role	Client

Completion Date	Project description	Role	Client
2014 (in progress)	**Special Needs and Skills Development Programme:** Programme management and conducting of Basic Assessments for disadvantaged communities/businesses/enterprises	**Project Manager;** Stakeholder Co-ordination; Project Support; Mentorship; Ecological Input	National Department of Environmental Affairs (DEA), South Africa
2013- 2014	**Monitoring and Evaluation** for the National Strategy for Sustainable Development and Action Plan.	**Project Member;** Stakeholder engagement, Researcher, Report Writing	National Department of Environmental Affairs (DEA), South Africa
2013-2015	**Strategic Environmental Assessment (SEA)** for wind and solar PV energy in South Africa.	Data Management	National Department of Environmental Affairs (DEA), South Africa
2014-2016	**Strategic Environmental Assessment (SEA)** for Electricity Grid Infrastructure (EGI).	Stakeholder Engagement	National Department of Environmental Affairs (DEA), South Africa
2014	**Screening Study (SS)** for the Development of Biochar and Composting Facilities to support land restoration near the proposed Ntambelanga Dam, Umzimvubu Catchment, Eastern Cape**.**	**Project Manager,** Project Research & Report Writing	National Department of Environmental Affairs (DEA), South Africa
2015	**Environmental Screening Study (ESS)** for projects undertaken in the Amatikulu Aquaculture Development Zone, KwaZulu-Natal.	**Project Manager,** Project Research & Report Writing	National Department of Agriculture, Forestry & Fisheries (DAFF), S Africa
2015-2016	**Development of Sustainability Indicators** for the National Integrated State of the Environment Report for Namibia.	**Project Manager**, Project Research & Report Writing	Ministry of Environment and Tourism (MET), Namibia
2016	**Basic Assessment** for the development of a 5.5ha pig production facility and a 2.5 ha chicken broiler facility on Farm Rietvalei, Portion 1 & 6, near Delmas, Mpumalanga.	**Project Manager**	Mokate Estates (Pty) Ltd
2016	**Basic Assessment** for the development of a 0.6 hectare Chicken Layer Facility on a 7.8 hectare farm in Mashau-Bodwe Village, Makhado District, Limpopo.	**Project Manager**	Wanga Poultry (Pty) Ltd
2016	**Sustainable Development Appraisal for Gold Standard** on a microprogramme of the NOVA Brickstar Wood Stove in the Mahlaba Area, Limpopo.	**Project Member**, Project Researcher, Translator	Gold Standard Foundation
2017 (In Progress)	**Sustainable Development Goal Lab** on "Mainstreaming resilience into climate change adaptation and disaster risk planning."	**Project Member**	Future Earth; Stockholm Resilience Centre; University of Tokyo
2017 (In progress)	**Basic Assessment** for the proposed development of a leisure and cultural village on Farm Moiloa 412-JO, Dinokana Village, North West.	**Project Manager**	Makadima Leisure & Cultural Village 101 (Pty) Ltd
2017 (In progress)	**Basic Assessment** for the expansion of a Chicken Layer Facility on a 4.4 hectare farm on plot 226 Withok Estate, Brakpan, Ekurhuleni District, Gauteng	**Project Manager**	Lewin AgriBusiness (Pty) Ltd
2017 (In progress)	**Basic Assessment** for the expansion of a Chicken Broiler Facility on a 2.57 hectare farm on plot 62, Mapleton, Ekurhuleni District, Gauteng.	**Project Manager**	Mthunzi Chicken Supplier (Pty) Ltd

PAST EMPLOYMENT RECORD

- **2014-2015** CSIR Environmental Management Services (EMS) Environmental Scientist and Assessment Practitioner (Intern).
- **2011-2013** UCT Environmental & Geographical Science Department (N Methner; K Vickery) Researcher & Teaching Assistant
- **2010** WITS School of Animal Plant & Environmental Sciences (Prof K Balkwill) Teaching Assistant.
- **2009** ESKOM Generation Environmental Management (D Herbst) Environmental Officer (Intern).
- **2009** WITS School of Geosciences (Dr G Drennan; Dr M Evans) Teaching & Field Assistant.
- **2008** WITS School of Animal Plant & Environmental Sciences (T Gardiner; Dr W Twine) Environmental Control & Field Assistant.
- **2008** Jane Goodall Institute (Dr L Duncan) Field Assistant.

QUALIFICATIONS

- **2010 University of the Witwatersrand (Wits) BSc Honours (Ecology, Environment and Conservation)**

Coursework: Approaches to Science, Experimental Design and Biostatistics, Introduction to Statistics Computer programme R, Introduction to Geographic Information Systems, Global Change: Impact on Soils, Plants and the Environment, Ecological Engineering and Phytoremediation, Ethnoecology.
Thesis: Species Composition and Population Structure of Trees Protected in Cultivated Fields of Rural Villages in the Bushbuckridge Region, Mpumalanga Province (Supervisors: Dr Wayne Twine, Prof Ed Witkowski)

- **2006 – 2009 University of the Witwatersrand (Wits) BSc (Zoology & Ecology)**

Senior Courses: Research Report Writing; Exploration and Environmental Geochemistry; Introduction to Palaeoclimatology; Environmental Geomorphology; Diversity, Ecology and Economic Importance of Algae; Functional Ecology in Changing Environments; Ecological Communities and Biodiversity Conservation; Structural Geology; Igneous Petrology; Physics of the Earth and Plate Tectonics; Ore Petrology and Mineralisation Processes

SHORT-COURSES, CONFERENCES AND WORKSHOPS

- 2017 Ecosystem-Based Adaptation: Developing Capacity for Implementation, SANBI, Pretoria National Botanical Gardens, June 2017.
- 2015 Practical Adaptation for vulnerable communities by Adaptation Network, Kirstenbosch Botanical Gardens, Cape Town, August 2015.
- 2015 International Association for Impact Assessors South Africa (IAIAsa) National Annual Conference, August 2016, KZN.
- 2015 Sharpening the Tool: New Techniques & Methods in Environmental Impact Assessments, SE Solutions, Stellenbosch, Western Cape
- 2014 CiLLA Project Management I Course on July 2014 at CSIR Stellenbosch
- 2014 International Association for Impact Assessors South Africa (IAIAsa) Air Quality Management (AQM) Workshop on June 2014 in Western Cape
- 2014 South African Environmental Observation Network (SAEON) Graduate Student Network (GSN) Annual Conference September 2014, Eastern Cape.
- 2014 IAIAsa National Conference from August 2014 at Midrand, Gauteng
- 2014 African Student Energy (ASE) Annual Summit Cape Peninsula University of Technology June 2014, Western Cape
- 2014 International Association for Impact Association South Africa (IAIAsa) New National Environmental Management Act (NEMA) regulations March 2014 Western Cape
- 2014 Applied Centre for Climate and Earth Systems Sciences (ACCESS) facilitation for teacher training January 2014,WC.
- 2012 International Conference for Freshwater Governance for Sustainable Development November 2012, KwaZulu-Natal

- 2012 Society of South African Geographers (SSAG) Annual Conference at University of Cape Town June 2012, Western Cape
- 2011 Applied Centre for Climate and Earth System Sciences (ACCESS) teacher training, Western Cape
- 2011 BlueBuck Environmental Network Annual Summit at Rhodes University, Eastern Cape
- 2010 Biodiversity and People Mini-Symposium, University of the Witwatersrand, October 2010, Mpumalanga

LANGUAGES

	Speaking	Reading	Writing
Setswana	Excellent	Excellent	Excellent
Xitsonga	Excellent	Excellent	Excellent
English	Excellent	Excellent	Excellent

PROFESSIONAL REGISTRATIONS

- IAIA: Member of International Association of Impact Assessment South Africa (IAIAsa) since 5 February 2014.
- SACNASP: Registered as Candidate Natural Scientist with South African Council for Natural Scientific Professions (SACNASP) since July 2014. Registration number: 100147/14

I-3: EAP Declaration

THE INDEPENDENT ENVIRONMENTAL ASSESSMENT PRACTITIONER (EAP)

I, **Rirhandzu Marivate,** as the appointed independent environmental practitioner ("EAP") hereby declare that I:

- act/ed as the independent EAP in this application;
- regard the information contained in this report 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;
- have and will not have no vested interest in the proposed activity proceeding;
- have disclosed, to the applicant and competent authority, any material information that have 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 NEMA, the Environmental Impact Assessment Regulations, 2014 and any specific environmental management Act;
- am fully aware of and meet the responsibilities in terms of NEMA, the Environmental Impact Assessment Regulations, 2014 (specifically in terms of regulation 49B of the Act) and any specific environmental management Act, and that failure to comply with these requirements may constitute and result in disqualification;
- have ensured that information containing all relevant facts in respect of the application 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;
- have ensured that the comments of all interested and affected parties were considered, recorded and submitted to the competent authority in respect of the application;
- have kept a register of all interested and affected parties that participated in the public participation process;
- have provided the competent authority with access to all information at my disposal regarding the application, whether such information is favourable to the applicant or not; and
- am aware that a false declaration is an offence in terms of regulation 49B of the Act.

Signature of the environmental assessment practitioner

Council for Scientific and Industrial Research (CSIR)

Name of company:

13 November 2018

Date