

## 4. PROJECT INFORMATION

### 4.1 PROPOSED ACTIVITY

Proposed development expansion of a sheep feedlot on the Remainder of the farm Groenhof Vredefort RD, Free State Province.

### 4.2 BASIC PROJECT DESCRIPTION

The current facility houses 950 herd of sheep at a density of 1 small stock unit per 17m<sup>2</sup>. The expansion will be to increase the density, which will exceed 8m<sup>2</sup> per small stock unit with an increase in numbers up to 2247 small stock units.

### 4.3 LOCALITY

Turn-off to the farm from the R721(between Vredefort and Kroonstad) is about 27.4 km from the Caltex Filling station in Vredefort. At this turn-off travel 4,4 km on a gravel road (S261) to the next turn-off on your right-hand side. At this turn-off travel 1.5 km on a gravel road (S1274) to the entrance (GPS coords.: -27.271985°S, 27.367214°E) of the farm. Please refer to the Google Earth image below. The detailed locality plan is presented in Appendix 1 of this notice.



### 4.4 CONSIDERATION OF ALTERNATIVE SITES

No feasible alternatives can be considered at this stage. The location and layout are predetermined to fit precisely on-site. Technology wise, only the most current state of the art technology in the sheep industry will be used.

## 5. ENVIRONMENTAL STUDY PROCESS

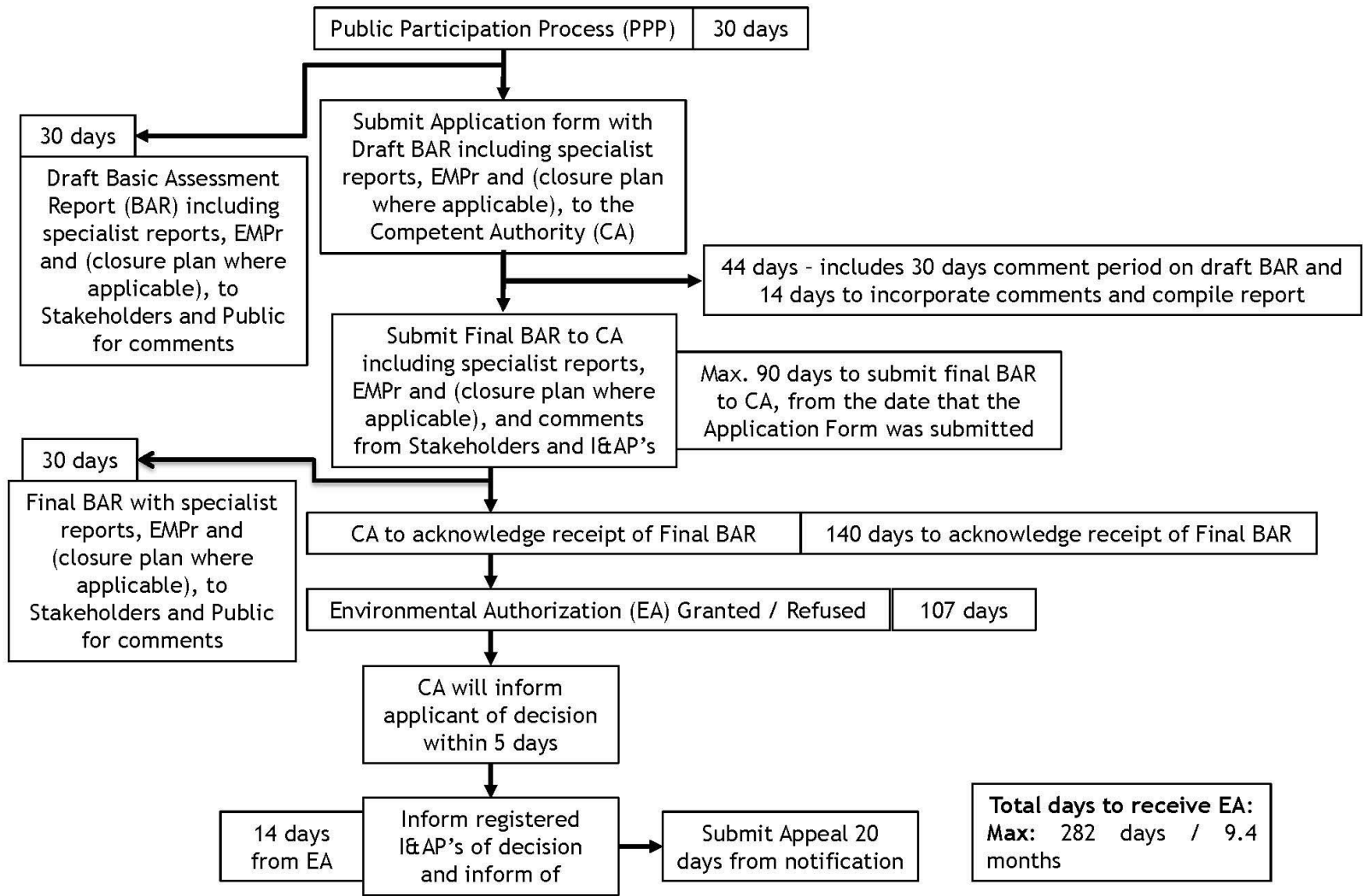
The Environmental Impact Assessment process consists of two main components, namely (i) the technical/biophysical process and (ii) the public participation process.

- The technical process includes, but is not limited to, the following aspects:
  - Terrain investigations;
  - Specialist Studies;
  - The identification and assessment of biophysical elements within the study area;
  - Compilation of an Environmental Impact Assessment Report with Environmental Management Programme.
- The public participation process includes:
  - Compilation of a database of stakeholders and Interested and Affected Parties;
  - Legal notices of the environmental process (press advertisement and on-site);
  - Dissemination of information to stakeholders and I&APs;
  - Identification of environmental, as well as social issues and concerns, as raised by I&APs or other relevant stakeholders, and
  - Addressing all concerns raised by I&APs.

The public participation process is conducted in parallel with the Environmental Impact Assessment process (technical/biophysical process). The public participation process does not aim to promote agreement amongst I&APs or quell possible opposition against a project. The process is made open and transparent to all those involved. Additionally, it is considered important to involve I&APs as early in the Environmental Impact Assessment process as possible, to ensure informed decision-making and effective participation throughout the study.

The Environmental Impact Assessment Process contains the following steps (Basic Assessment):

**The Basic Assessment Process and time frames**



## 6. PRELIMINARY ENVIRONMENTAL RELATED ISSUES IDENTIFIED

The following steps are identified on a preliminary basis:

- Dust generation from construction during construction phase.
- Possible hazardous (Diesel, oil) fluids being spilled during construction phase.
- Removal of vegetation (natural and alien).
- Traffic Safety during construction phase.

## 7. COMMENTS /OBJECTIONS

Kindly submit the attached Registration and Comment Sheet, to register as an Interested and Affected Party, with possible issues and concerns relating to the proposed development, as well as any additional I&APs that you would like to be involved in the process, to the Environmental Consultant (refer to the contact details given above).

The Registration and Comment Sheet should reach us no later than 30 days (excluding public holidays and the period between 15 Dec. and 5 Jan.) from the date of this BID.

We thank you for your interest and for taking the time to read through this document.



REGISTRATION AND COMMENT SHEET:

PROPOSED EXPANSION OF A SHEEP FEEDLOT ON THE FARM GROENHOF, FREE  
STATE PROVINCE

Please complete and return as soon as possible, but no later than 30 October 2022

to:

Mr. Rowan van Tonder, PO Box 40541, Moreleta Park, 0044

Tel: (012) 9974742 | E-mail: rowan@recservices.co.za

---

Title\_\_\_\_\_Initials\_\_\_\_\_Surname\_\_\_\_\_

Organisation/Firm/Position/Nature of Involvement in the project e.g. property  
owner:

\_\_\_\_\_

Street / Physical Address:

\_\_\_\_\_

Postal address:

\_\_\_\_\_

Postal Code: \_\_\_\_\_

Telephone Work: \_\_\_\_\_ Telephone Home: \_\_\_\_\_

Cell phone: \_\_\_\_\_ Fax: \_\_\_\_\_

E-mail: \_\_\_\_\_

COMMENTS:

It would be useful if you could answer the questions below but please feel free to  
provide any comments you would like to raise. Please continue on additional paper  
if required.

1. What are the primary concerns faced by you/ your community/ your organisation  
with regards to the proposed development?

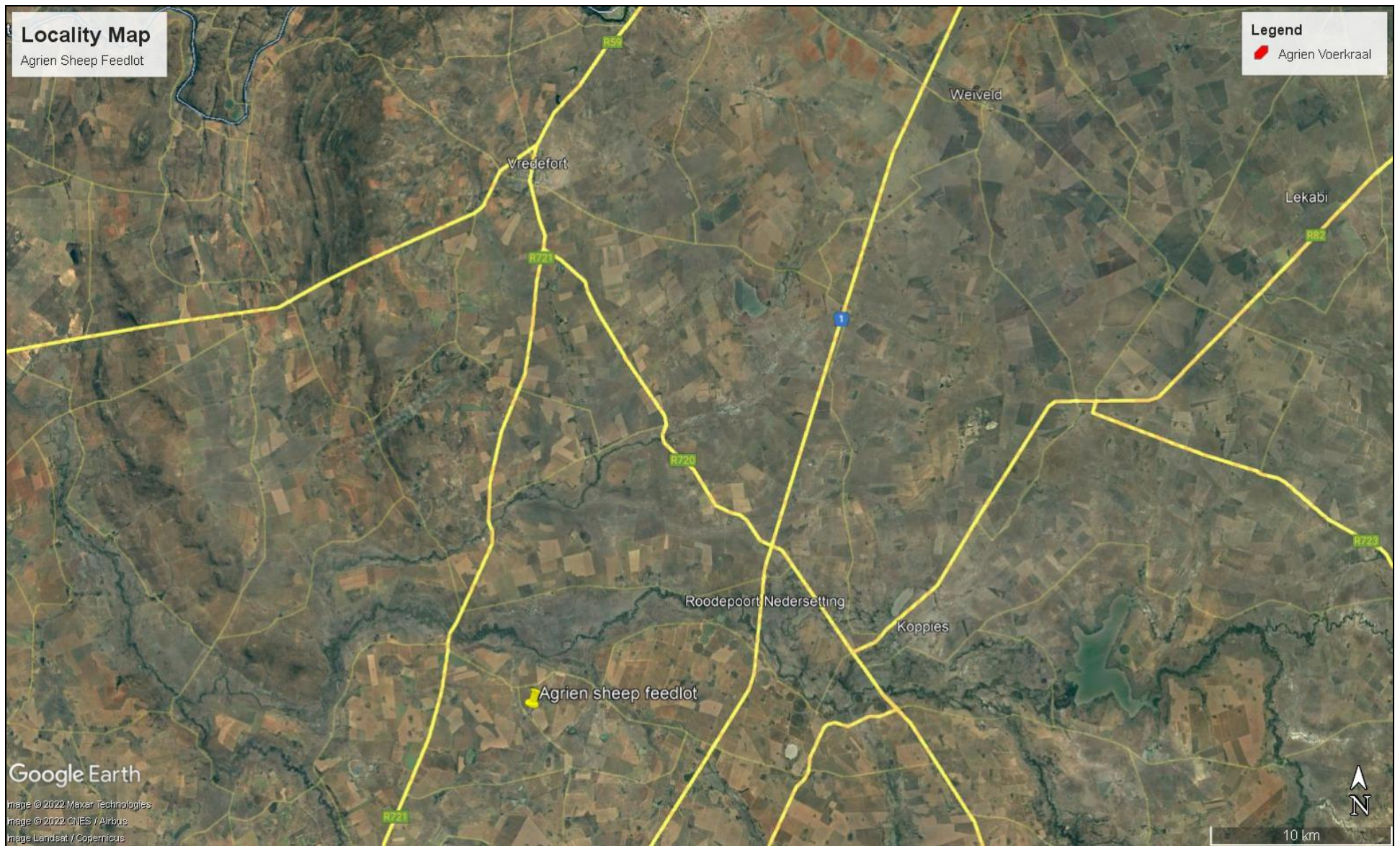
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_





Appendix 1: Locality Maps

NEXT PAGE



## Rowan van Tonder

---

**From:** Nel George <NelG@dws.gov.za>  
**Sent:** Tuesday, October 4, 2022 12:14 PM  
**To:** rowan@recservices.co.za  
**Subject:** FW: Agrien Feedlot: Background Information Document (BID)  
**Attachments:** BID Agrien.doc

Afternoon,

Please register the Department Water and Sanitation as an Interested and Affected party.

Bloem Plaza Building,  
C/o Charlotte Maxeke and East Burger Streets,  
Bloemfontein

Thank you  
George Nel

---

**From:** Grobler Willem (BFN) <GroblerW@dws.gov.za>  
**Sent:** Thursday, 29 September 2022 11:41  
**To:** Nel George <NelG@dws.gov.za>  
**Subject:** FW: Agrien Feedlot: Background Information Document (BID)

George,

For your action if in our catchment.

Thanks

willem

---

**From:** Rowan van Tonder <[rowan@recservices.co.za](mailto:rowan@recservices.co.za)>  
**Sent:** Thursday, 29 September 2022 11:00  
**To:** Grobler Willem (BFN) <[GroblerW@dws.gov.za](mailto:GroblerW@dws.gov.za)>; Khorommbi Konanani Christopher (GAU) <[KhorommbiK@dws.gov.za](mailto:KhorommbiK@dws.gov.za)>  
**Subject:** Agrien Feedlot: Background Information Document (BID)

To Whom It May Concern (DWS),

Find attach the BID for the proposed expansion of a sheep feedlot on the Farm Groenhof, Free State Province.

The public participation process will start on Friday 30 September 2022. If you want to register and give your comments on this application process please see at the back of the BID.

Kind Regards/Groete,



## ROWAN VAN TONDER

Environmental Assessment Practitioner

EAPASA Reg. No.: 2020/2579 | SACNASP(Pri.Sci.Nat): 119204 | B. Sc. Environmental Science | B. Sc. (Hons) Physical Geography | M.Sc. Botany

t: 0129974742 f: 0866190994 c: 0828794218

P.O. Box 40541, Moreleta Park, 0044

2<sup>nd</sup> Floor, Rubenstein Office Park,

566 Rubenstein Drive, Moreleta Park, 0181

† [www.recservices.co.za](http://www.recservices.co.za)

## Rowan van Tonder

---

**From:** Rowan van Tonder <rowan@recservices.co.za>  
**Sent:** Thursday, September 29, 2022 11:01 AM  
**To:** 'Mbatha.npz@sacr.fs.gov.za'  
**Subject:** Agrien Feedlot: Background Information Document (BID)  
**Attachments:** BID Agrien.doc

To Whom It May Concern (FS PHRA),

Find attach the BID for the proposed expansion of a sheep feedlot on the Farm Groenhof, Free State Province.

The public participation process will start on Friday 30 September 2022. If you want to register and give your comments on this application process please see at the back of the BID.

Kind Regards/Groete,



### ROWAN VAN TONDER

Environmental Assessment Practitioner  
EAPASA Reg. No.: 2020/2579 | SACNASP(Pri.Sci.Nat): 119204 | B. Sc. Environmental Science | B. Sc. (Hons) Physical Geography | M.Sc. Botany

t: 0129974742 f: 0866190994 c: 0828794218  
P.O. Box 40541, Moreleta Park, 0044  
2<sup>nd</sup> Floor, Rubenstein Office Park,  
566 Rubenstein Drive, Moreleta Park, 0181  
† [www.recservices.co.za](http://www.recservices.co.za)



## Rowan van Tonder

---

**From:** Rowan van Tonder <rowan@recservices.co.za>  
**Sent:** Thursday, September 29, 2022 11:00 AM  
**To:** 'groblerw@dws.gov.za'; 'khorombik@dws.gov.za'  
**Subject:** Agrien Feedlot: Background Information Document (BID)  
**Attachments:** BID Agrien.doc

To Whom It May Concern (DWS),

Find attach the BID for the proposed expansion of a sheep feedlot on the Farm Groenhof, Free State Province.

The public participation process will start on Friday 30 September 2022. If you want to register and give your comments on this application process please see at the back of the BID.

Kind Regards/Groete,



### ROWAN VAN TONDER

Environmental Assessment Practitioner  
EAPASA Reg. No.: 2020/2579 | SACNASP(Pri.Sci.Nat): 119204 | B. Sc. Environmental Science | B. Sc. (Hons) Physical Geography | M.Sc. Botany

t: 0129974742 f: 0866190994 c: 0828794218  
P.O. Box 40541, Moreleta Park, 0044  
2<sup>nd</sup> Floor, Rubenstein Office Park,  
566 Rubenstein Drive, Moreleta Park, 0181  
† [www.recservices.co.za](http://www.recservices.co.za)

## Rowan van Tonder

---

**From:** Rowan van Tonder <rowan@recservices.co.za>  
**Sent:** Thursday, September 29, 2022 10:58 AM  
**To:** 'custcare@moqhaka.gov.za'; 'emily@moqhaka.gov.za'; 'lerator@moqhaka.gov.za'; 'louis@moqhaka.gov.za'; 'mamollom@moqhaka.gov.za'; 'tokeloq@moqhaka.gov.za'; 'ria@moqhaka.gov.za'; 'rentia@moqhaka.gov.za'; 'micha@moqhaka.gov.za'  
**Subject:** Agrien Feedlot: Background Information Document (BID)  
**Attachments:** BID Agrien.doc

To Whom It May Concern (Cllr. Motloheloa Ellis Mokatsane (Executive Mayor), Mr. Simon Mncedisi Mqwathi (Municipal Manager), Ward Cllr. of Ward 21),

**We could not find any contact details for the Municipal manager or from someone in charge of the Environment for Moqhaka Local Municipality. Please forward this email these persons.**

Find attach the BID for the proposed expansion of a sheep feedlot on the Farm Groenhof, Free State Province.

The public participation process will start on Friday 30 September 2022. If you want to register and give your comments on this application process please see at the back of the BID.

Kind Regards/Groete,



### ROWAN VAN TONDER

Environmental Assessment Practitioner  
EAPASA Reg. No.: 2020/2579 | SACNASP(Pri.Sci.Nat): 119204 | B. Sc. Environmental Science | B. Sc. (Hons) Physical Geography | M.Sc. Botany

t: 0129974742 f: 0866190994 c: 0828794218  
P.O. Box 40541, Moreleta Park, 0044  
2<sup>nd</sup> Floor, Rubenstein Office Park,  
566 Rubenstein Drive, Moreleta Park, 0181  
† [www.recservices.co.za](http://www.recservices.co.za)

## Rowan van Tonder

---

**From:** Rowan van Tonder <rowan@recservices.co.za>  
**Sent:** Thursday, September 29, 2022 10:36 AM  
**To:** 'pclmeyer@gmail.com'  
**Subject:** Agrien Feedlot: Background Information Document (BID)  
**Attachments:** BID Agrien.doc

To Whom It May Concern (Paul Meyer - Bosjesspruit 10, Kroonheuvel 590),

Find attach the BID for the proposed expansion of a sheep feedlot on the Farm Groenhof, Free State Province.

The public participation process will start on Friday 30 September 2022. If you want to register and give your comments on this application process please see at the back of the BID.

Kind Regards/Groete,



### ROWAN VAN TONDER

Environmental Assessment Practitioner  
EAPASA Reg. No.: 2020/2579 | SACNASP(Pri.Sci.Nat): 119204 | B. Sc. Environmental Science | B. Sc. (Hons) Physical Geography | M.Sc. Botany

t: 0129974742 f: 0866190994 c: 0828794218  
P.O. Box 40541, Moreleta Park, 0044  
2<sup>nd</sup> Floor, Rubenstein Office Park,  
566 Rubenstein Drive, Moreleta Park, 0181  
† [www.recservices.co.za](http://www.recservices.co.za)

Appendix E3: Proof of newspaper advertisements

“JWALE KE NAKO YA KOTULO, RE A KUBELETSA”

[www.edtea.fs.gov.za](http://www.edtea.fs.gov.za)



# BETREKKINGS

# N.O.T.I.C.E.S



We need a self motivated individual to fill the following vacancy that exists:

Region: Free State, Parys  
Department: Operations  
Type: Full Time

#### Overall Job Purpose:

You will manage the overall store standards, staff performance and resolve customer queries. You will report directly to the Area Manager.

#### Job Specification

We need a self-motivated individual to fill this vacancy as a Store Manager at our Parys store. In partnering with us, this position offers great growth potential.

#### Minimum Requirements

- Grade 12 or equivalent qualification
- Two years retail management experience, essential
- A team player, with good communication skills
- Attention to detail
- Good customer service skills
- Must be energetic and able to cope with the long hours
- Able to work under pressure
- Ability to manage a retail store across boundaries
- Computer literate
- Knowledgeable in LR

#### Job Description

- Handle daily responsibilities that come with managing a store
- Ensure that the store policies are upheld
- Making sure that effective and efficient customer service is carried out
- Oversee store layout
- Liable for the store admin
- Dealing with customer queries
- Implementing strategies to increase sales
- Maintaining store standards
- Managing staff performance

Interested persons should email a detailed C.V. to [tcs.recruitment@crazystore.co.za](mailto:tcs.recruitment@crazystore.co.za) Please specify the position and store that you are applying for in the "Subject" line. Closing date for all entries will be at end of business on Sunday, 07 October 2022. Correspondence will only be entered into with candidates who reach the short list. Should we not contact you within two weeks from the closing date, please consider your application as unsuccessful.

## KENNISGEWINGS • NOTICES

### PUBLIC NOTICE

#### APPLICATION FOR AN ENVIRONMENTAL AUTHORIZATION FOR THE PROPOSED ACTIVITIES.

NOTICE IS GIVEN FOR THE FOLLOWING APPLICATION:

1) ENVIRONMENTAL AUTHORIZATION APPLICATION FOR MINING.

- **PROponent:** THE APPLICANT IS DAJA SILICA (PTY) LTD.
- **REF. NO:** FS30/5/1/2/2/10074MR
- **PROPERTY DESCRIPTION:** THE PROPOSED MINING AREA IS OVER A CERTAIN PORTION OF THE REMAINDER OF PORTION 1 OF THE FARM WONDERWATER 180, PARYS DISTRICT. THE TOTAL EXTENT OF THE MINING AREA IS 75,4604 HECTARES. (21 SG DIGITAL CODE: F0250000000018000001)
- **LOCATION:** THE PROPERTY IS SITUATED ~8 KM NORTH OF SASOLBURG.
- **PROJECT DESCRIPTION:** THE PURPOSE OF THE APPLICATION IS TO OBTAIN THE REQUIRED AUTHORISATION FROM THE DEPARTMENT TO MINE FOR SAND (GENERAL)
- **ACTIVITY APPLIED FOR:** THE FOLLOWING ACTIVITIES AS LISTED IN TERMS OF NEMA (ACT NO. 107 OF 1998) AS AMENDED AND EIA REGULATIONS, 2014 WAS APPLIED FOR UNDER LISTING NOTICE 1 – GNR 327 OF 2014, ACTIVITY 27 & LISTING NOTICE 2 – GNR 325 OF 2014, ACTIVITY 17
- **MINERALS APPLIED FOR:** SAND (GENERAL)
- **DATE SUBMITTED:** 12 AUGUST 2022
- **STAKEHOLDER INVOLVEMENT:** STAKEHOLDERS ARE INVITED TO REGISTER AS INTERESTED AND AFFECTED PARTIES AND TO PARTICIPATE IN THE APPLICATION PROCESS BY IDENTIFYING ISSUES OF CONCERN AND SUGGESTIONS FOR CONSIDERATION IN THE SCOPING REPORT. I&AP'S CAN CONTACT DERA ENVIRONMENTAL CONSULTANTS FOR ANY FURTHER INFORMATION REQUIRED. PLEASE SUBMIT YOUR WRITTEN COMMENTS BY MAIL, FAX OR E-MAIL IN THIS 30 DAY OF THIS NOTICE TO:  
MRS. ESNA ERASMUS OF DERA ENVIRONMENTAL CONSULTANTS  
PO BOX 6499 E-MAIL: [daame@dera.co.za](mailto:daame@dera.co.za)  
FLAMWOOD CELL: 082 895 3516  
2572 FAX: 018 011 3760

• **DATE OF ADVERTISEMENT:** THURSDAY 29 SEPTEMBER 2022

• **DATE AND VENUE OF PUBLIC MEETING:** MONDAY 10 OCTOBER 2022 AT 9H00 ON SITE COORDINATES: -26.787459 LONG 27.804666 P265

## KENNISGEWINGS • NOTICES



## KENNISGEWINGS • NOTICES

### KENNISGEWING

#### IN DIE BOEDEL VAN WYLE MARGARET CHARLOTTE MAREE

GEBORE: 27 MAART 1950  
IDENTITEITSNOMMER: 500327 0056 08 7  
DATUM VAN AFSTERWE: 21 JULIE 2021  
ADRES: ESTELLE B NR. 2, VENUSSTRAAT 3, PARYS, 9585  
MEESTER SE VERWYSING: 11296/2021

GELIEWE KENNIS TE NEEM DAT DIE EERSTE EN FINALE LIKWIDASIE- EN DISTRIBUSIEREKENING VAN BOGEMELDE BOEDEL BY DIE LANDDROSKANTOOR TE PARYS EN BY DIE MEESTER VAN DIE HOË HOF TE BLOEMFONTEIN TER INSAE SAL LÊ VIR 'N TYDPERK VAN 21 DAE EN WEL VANAF VRYDAG 30 SEPTEMBER 2022.

GETEKEN TE PARYS OP HIERDIE 15DE DAG VAN SEPTEMBER 2022.

EBEN KRIEK INGELYF  
PROKUREURS  
KERKSTRAAT 17  
POSBUS 256  
PARYS, 9585  
VERW.: MNR KRIEK/RLR/M5752 P261

## KENNISGEWINGS • NOTICES

## KENNISGEWINGS • NOTICES

### BOEDELKENNISGEWING

IN DIE BOEDEL VAN WYLE HENDRINA JACOBA PAULINA PRINSLOO, ONGETROUD (WEDUWEE) (GEBORE OP 21 SEPTEMBER 1937 - IDENTITEITSNOMMER 370921 0019 082) IN LEWE 'N PENSIOENARIS EN WOONAGTIG TE HAVEMANNSTRAAT 4, VILJOENSKROON, 9520, WIE OORLEDE IS OP 28STE JULIE 2022 (BOEDELNOMMER: 008099/2022).  
MEESTERSKANTOOR: BLOEMFONTEIN

KREDITEURE EN DEBITEURE IN BOGEMELDE BOEDEL WORD VERSOEK OM HUL VORDERINGE IN TE LEWER EN HUL SKULD TE BETAAL BY DIE EKSEKUTEUR TE ONDERSTAANDE ADRES BINNE 'N TYDPERK VAN 30 (DERTIG) DAE VANAF DATUM VAN PUBLIKASIE HIERVAN.

ADRES: EKSEKUTEUR  
P/A ALEC HILL PROKUREURS  
KROONSTRAAT 1  
POSBUS 466  
VILJOENSKROON, 9520 P257

## KENNISGEWINGS • NOTICES

## KENNISGEWINGS • NOTICES

### DU TOIT MANDELSTAM

#### IN DIE BOEDEL VAN WYLE:

GERTRUIDA ELIZABETH BLIGNAUT  
IDENTITEITSNOMMER: 450612 0064 08 6

GEBORE OP 12 JUNIE 1945 EN OORLEDE OP 1 JUNIE 2021, 'N WEDUWEE, MET LAASTE ADRES TE 8 RUITMESIG WOONSTELLE, ST. JANSTRAAT, PARYS.

BOEDEL NR. 7660/2021  
MEESTER VAN DIE VRYSTAATSE HOË HOF, BLOEMFONTEIN

INGEVOLGE ARTIKEL 35(5) VAN WET 66 VAN 1965 WORD HIERMEE KENNIS GEGEE DAT DUPLIKATE VAN DIE EERSTE- EN FINALE LIKWIDASIE- EN DISTRIBUSIEREKENING IN BOGEMELDE BOEDEL IN DIE KANTORE VAN DIE MEESTER VAN DIE VRYSTAATSE HOË HOF, BLOEMFONTEIN EN DIE LANDDROSKANTOOR TE PARYS GEDURENDE 'N TYDPERK VAN 21 DAE VANAF 30 SEPTEMBER 2022 TER INSAE LÊ VIR ALLE PERSONE WAT DAARBY BELANG HET.

INDIEN BINNE GENOEMDE TYDPERK GEEN BESWARE DAARTEEN BY DIE BETROKKE MEESTER INGEDIEN WORD NIE, GAAN DIE EKSEKUTEUR OOR TOT DIE UITBETALINGS INGEVOLGE GEMELDE REKENING.

GETEKEN TE PARYS OP HEDE DIE 13DE DAG VAN SEPTEMBER 2022.

DU TOIT MANDELSTAM  
DOLFSTRAAT 63  
POSBUS 43  
PARYS  
9585  
TEL. NR.: 056 811 2181  
VERW.: CCB/SS/BW101 P262

## KENNISGEWINGS • NOTICES

## KENNISGEWINGS • NOTICES

### IN DIE BOEDEL VAN WYLE:

AGATHA MARIA NEL  
IDENTITEITSNOMMER: 360331 0028 087

GEBORE OP 31 MAART 1936 EN OORLEDE OP 23 MAART 2021, ONGETROUD, MET LAASTE ADRES TE LOOPSTRAAT 48, PARYS.

BOEDEL NR. 3908/2021  
MEESTER VAN DIE VRYSTAATSE HOË HOF, BLOEMFONTEIN

INGEVOLGE ARTIKEL 35(5) VAN WET 66 VAN 1965 WORD HIERMEE KENNIS GEGEE DAT DUPLIKATE VAN DIE EERSTE- EN FINALE LIKWIDASIE- EN DISTRIBUSIEREKENING IN BOGEMELDE BOEDEL IN DIE KANTORE VAN DIE MEESTER VAN DIE VRYSTAATSE HOË HOF, BLOEMFONTEIN EN DIE LANDDROSKANTOOR TE PARYS GEDURENDE 'N TYDPERK VAN 21 DAE VANAF 30 SEPTEMBER 2022 TER INSAE LÊ VIR ALLE PERSONE WAT DAARBY BELANG HET.

INDIEN BINNE GENOEMDE TYDPERK GEEN BESWARE DAARTEEN BY DIE BETROKKE MEESTER INGEDIEN WORD NIE, GAAN DIE EKSEKUTEUR OOR TOT DIE UITBETALINGS INGEVOLGE GEMELDE REKENING.

GETEKEN TE PARYS OP HEDE DIE 19DE DAG VAN SEPTEMBER 2022.

DU TOIT MANDELSTAM  
DOLFSTRAAT 63  
POSBUS 43  
PARYS  
9585  
TEL. NR.: 056 811 2181  
VERW.: CCB/SS/BW85 P260

## KENNISGEWINGS • NOTICES

## NOTICE OF INTENTION TO SELL BUSINESS ASSET

(SECTION 34(1) OF ACT NUMBER 24 OF 1936)

NOTICE IS HEREBY GIVEN IN TERMS OF SECTION 34(1) OF THE INSOLVENCY ACT 24 OF 1936, AS AMENDED, TO ALL INTERESTED PARTIES AND CREDITORS, THAT MYLIND PROPERTIES CC (REG. NO. 1995/009226/23), INTENDS DISPOSING OF AN IMMOVABLE PROPERTY, FURTHER PARTICULARS AS SET OUT HEREUNDER, THAT FORMS PART OF ITS BUSINESS, WITH EFFECT FROM A DATE NOT LESS THAN 30 (THIRTY) DAYS AND NOT MORE THAN 60 (SIXTY) DAYS AFTER THE PUBLICATION OF THIS NOTICE, TO HENCIL MEAT SUPPLY CC (REG. NO. 2001/053780/23), WHO WILL THEREAFTER INCORPORATE THE SAID IMMOVABLE PROPERTY INTO THEIR OWN BUSINESS.

THE IMMOVABLE PROPERTY BEING:

REMAINING EXTENT OF ERF 61 PARYS, DISTRIK PARYS, PROVINSE VRYSTAAT MEASURING 1249 (ONE THOUSAND TWO HUNDRED AND FOURTY NINE) SQUARE METRES CURRENTLY HELD BY DEED OF TRANSFER T16564/1995 ALSO KNOWN AS 10 KRUIS STREET, PARYS

DATED AT PARYS ON THIS 23RD DAY OF SEPTEMBER 2022

COETZEES INC  
ATTORNEYS FOR THE SELLER  
25 BUITEN STREET, PO BOX 5  
PARYS  
9585  
(REF: MR JP COETZEE(JNR)/ADT/MAT7617) P266

## NOTICE FOR AN ENVIRONMENTAL IMPACT ASSESSMENT PROCESS

PROPOSED EXPANSION OF A SHEEP FEEDLOT ON THE FARM GROENHOF, FREE STATE PROVINCE.

Notice is hereby given in terms of Regulation 41 of the Regulations published in Government Notice 326 of 7 April 2017 - Chapter 6 of the National Environmental Management Act, 1998 (Act no. 107 of 1998), for an application submitted for the following activity:

PROPOSED ACTIVITY:  
NEMA: Government Notice No. R327 of 7 April 2017 (Listing 1): Activity Numbers: 39 (i)(a) NEMA: GN No. R324 of 7 April 2017 (Listing 3): Activity No: 12 b(i).

Notice is also given of a Phase 1 Heritage Impact Assessment to take place in terms of The National Heritage Resources Act (Act 25 of 1999), for Mr. Armand Marx.

PROJECT DESCRIPTION:  
The current facility houses 950 head of sheep at a density of 1 small stock unit per 17m2. The expansion will be to increase the density, which will exceed 8m2 per small stock unit with an increase in numbers up to 2247 small stock units.

PROJECT LOCATION:  
Turn-off to the farm from the R721 (between Vrededorp and Kroonstad) is about 27.4 km from the Gallex Filling station in Vrededorp. At this turn-off travel 4,4 km on a gravel road (S261) to the next turn-off on your right-hand side. At this turn-off travel 1.5 km on a gravel road (S1274) to the entrance (GPS coords.: -27.271985°S, 27.367214°E) of the farm.

APPLICANT:  
Agrien (Pty) Ltd.

ENVIRONMENTAL CONSULTANT:  
REC Services (Pty) Ltd.  
PO Box 40541, Moreleta Park, 0044  
Tel: (012) 997 4742  
Fax: (012) 997 0415  
Email: [rowan@recservices.co.za](mailto:rowan@recservices.co.za)  
Contact Person (s): Rowan van Tonder / Pieter van der Merwe

In order to register as an interested and/or affected party, or to obtain more information on the proposed development, please submit your name, contact details and interest in the matter within 30 days of the date of this press advertisement.

Placement of the site notices: 30 September 2022  
Handing out of background information documents: 30 September 2022

## KENNISGEWINGS • NOTICES

### KENNISGEWING VAN VOORNEME OM BESIGHEIDSBATE TE VERKOOP

(ARTIKEL 34(1) VAN WET NR. 24 VAN 1936)

GELIEWE KENNIS TE NEEM DAT MYLIND PROPERTIES BK (REG. NR. 1995/009226/23), VOORNEMENS IS OM DIE ONDERGEMELDE ONROERENDE EIENDOM, WAT DEEL UITMAAK VAN 'N BESIGHEID, NA VERLOOP VAN 'N TYDPERK VAN 30 (DERTIG) DAE VANAF DATUM VAN LAASTE PUBLIKASIE VAN HIERDIE KENNISGEWING AAN HENCIL MEAT SUPPLY BK, (REG. NR. 2001/053780/23), TE VERVREEM MET INGANDE WAARVAN GENOEMDE HENCIL MEAT SUPPLY BK, (REG. NR. 2001/053780/23) GENOEMDE BESIGHEIDSBATE NAMENS HOMSSELF SAL BEDRYF.

DIE ONROERENDE EIENDOM, SYNDE:

RESTANT VAN ERF 61 PARYS, DISTRIK PARYS, PROVINSE VRYSTAAT  
GROOT 1249 (EEN DUISEND TWEË HONDERD NEGE EN VEERTIG) VIERKANTE METER  
TANS GEHOU KRAGTENS TRANSPORTAKTE T16564/1995  
OOK BEKEND AS KRUISSTRAAT 10, PARYS

GEDATEER TE PARYS OP HIERDIE 23STE DAG VAN SEPTEMBER 2022

COETZEES INC  
PROKUREURS VIR VERKOPER  
BUITENSTRAAT 25, POSBUS 5  
PARYS  
9585  
(VERW: MNR JP COETZEE(JNR)/ADT/MAT7617) P267(A)

## KENNISGEWINGS • NOTICES

## NOTICE

AMENDED FIRST AND FINAL LIQUIDATION AND DISTRIBUTION ACCOUNT IN THE ESTATE OF THE LATE JAN JACOB CHRISTIAAN LUTTIG, IDENTITY NUMBER 310107 5015 08 4, MARRIED OUT OF COMMUNITY OF PROPERTY, WITHOUT THE ACCRUAL SYSTEM, BORN ON THE 7<sup>TH</sup> JANUARY 1931, AND WHO DIED ON THE 16<sup>TH</sup> DECEMBER 2020, OF DELVER MEWS 7, 83 DELVER STREET, PARYS, 9585.

ESTATE NUMBER: 1958/2021

THE AMENDED FIRST AND FINAL LIQUIDATION AND DISTRIBUTION ACCOUNT IN THE ABOVE ESTATE WILL BE OPEN FOR INSPECTION FOR A PERIOD OF 21 (TWENTY ONE) DAYS AS FROM THE 30<sup>TH</sup> SEPTEMBER 2022 AT THE OFFICES OF THE MASTER OF THE FREE STATE HIGH COURT, BLOEMFONTEIN AND THE MAGISTRATE'S OFFICES, PARYS.

SHOULD NO OBJECTION BE LODGED WITH THE MASTER DURING THE PERIOD OF INSPECTION, THE EXECUTOR CONCERNED WILL PROCEED TO MAKE PAYMENTS IN ACCORDANCE THEREWITH.

DATED AT PARYS ON THE 22ND DAY OF SEPTEMBER 2022.

COETZEES INC  
ATTORNEYS FOR EXECUTOR  
25 BUITEN STREET  
P O BOX 5  
PARYS  
9585  
(REF. DR. COETZEE/MP/MAT 6812) P263



AppendixE4: Comments received from I&APs including stakeholders

Appendix E4-1: Communication with I&Aps

“JWALE KE NAKO YA KOTULO, RE A KUBELETSA”

## Rowan van Tonder

---

**From:** Nel George <NelG@dws.gov.za>  
**Sent:** Tuesday, October 4, 2022 12:14 PM  
**To:** rowan@recservices.co.za  
**Subject:** FW: Agrien Feedlot: Background Information Document (BID)  
**Attachments:** BID Agrien.doc

Afternoon,

Please register the Department Water and Sanitation as an Interested and Affected party.

Bloem Plaza Building,  
C/o Charlotte Maxeke and East Burger Streets,  
Bloemfontein

Thank you  
George Nel

---

**From:** Grobler Willem (BFN) <GroblerW@dws.gov.za>  
**Sent:** Thursday, 29 September 2022 11:41  
**To:** Nel George <NelG@dws.gov.za>  
**Subject:** FW: Agrien Feedlot: Background Information Document (BID)

George,

For your action if in our catchment.

Thanks

willem

---

**From:** Rowan van Tonder <[rowan@recservices.co.za](mailto:rowan@recservices.co.za)>  
**Sent:** Thursday, 29 September 2022 11:00  
**To:** Grobler Willem (BFN) <[GroblerW@dws.gov.za](mailto:GroblerW@dws.gov.za)>; Khorommbi Konanani Christopher (GAU) <[KhorommbiK@dws.gov.za](mailto:KhorommbiK@dws.gov.za)>  
**Subject:** Agrien Feedlot: Background Information Document (BID)

To Whom It May Concern (DWS),

Find attach the BID for the proposed expansion of a sheep feedlot on the Farm Groenhof, Free State Province.

The public participation process will start on Friday 30 September 2022. If you want to register and give your comments on this application process please see at the back of the BID.

Kind Regards/Groete,



## ROWAN VAN TONDER

Environmental Assessment Practitioner

EAPASA Reg. No.: 2020/2579 | SACNASP(Pri.Sci.Nat): 119204 | B. Sc. Environmental Science | B. Sc. (Hons) Physical Geography | M.Sc. Botany

t: 0129974742 f: 0866190994 c: 0828794218

P.O. Box 40541, Moreleta Park, 0044

2<sup>nd</sup> Floor, Rubenstein Office Park,

566 Rubenstein Drive, Moreleta Park, 0181

† [www.recservices.co.za](http://www.recservices.co.za)



Appendix E4-2: Comments from stakeholders

None received yet. Expected in response on the BAR for public view.

“JWALE KE NAKO YA KOTULO, RE A KUBELE TSA”

Appendix E5: Comments and response sheet

No comments received.

“JWALE KE NAKO YA KOTULO, RE A KUBELETSA”

Appendix E6: Comments from I&APs on Basic Assessment (BA) Report

Not yet.

“JWALE KE NAKO YA KOTULO, RE A KUBELE TSA”

Appendix E7: Comments from I&APs on amendments to the BA Report

N/A

“JWALE KE NAKO YA KOTULO, RE A KUBELETSA”

“JWALE KE NAKO YA KOTULO, RE A KUBELETSA”

**PROPOSED 3600 SOW UNIT PIGGERY ON PORTIONS OF THE FARMS SAMARIA, DE RUST, REWIESIE AND MARA, FREE STATE PROVINCE.**

**LIST OF STAKEHOLDERS AND I&APS**

State Department	Contact Person	Postal/Physical address
<p>Moqhaka Local Municipality and Ward 21 Councillor</p>	<p>Cllr. Motloheloa Ellis Mokatsane (Executive Mayor)            Mr. Simon Mncedisi Mqwathi (Municipal Manager)            Ward Cllr. of ward 21            Ms Seithati Monyaki</p> <p>Tel: 056 216 9911/9900            Fax: 056 216 9122            E-mail:  <a href="mailto:custcare@moqhaka.gov.za">custcare@moqhaka.gov.za</a>;  <a href="mailto:emily@moqhaka.gov.za">emily@moqhaka.gov.za</a>;  <a href="mailto:lerator@moqhaka.gov.za">lerator@moqhaka.gov.za</a>;  <a href="mailto:louis@moqhaka.gov.za">louis@moqhaka.gov.za</a>;  <a href="mailto:mamollom@moqhaka.gov.za">mamollom@moqhaka.gov.za</a>;  <a href="mailto:tokeloq@moqhaka.gov.za">tokeloq@moqhaka.gov.za</a>;  <a href="mailto:ria@moqhaka.gov.za">ria@moqhaka.gov.za</a>;  <a href="mailto:rentia@moqhaka.gov.za">rentia@moqhaka.gov.za</a>;  <a href="mailto:micha@moqhaka.gov.za">micha@moqhaka.gov.za</a>;  <a href="mailto:monyakis@moqhaka.gov.za">monyakis@moqhaka.gov.za</a></p>	<p>Physical Address:            Hill Street            Kroonstad            9500</p> <p>Postal Address:            PO Box 302            Kroonstad            9500</p>
<p>Department of Water and Sanitation and environmental officer under compliance monitoring and Enforcement</p>	<p>Ms. MD Mashinye            Mr. George Nel            Tel: 051 405 9000            Cell: 066 451 9109            Email:  <a href="mailto:Mashinyem@dws.gov.za">Mashinyem@dws.gov.za</a>  <a href="mailto:NelG@dws.gov.za">NelG@dws.gov.za</a></p>	<p>Department of Water and Sanitation            Free State Provincial Operations            Bloem Plaza Building            2nd Floor            Corner Eastburger and Charlotte Maxeke Streets            BLOEMFONTEIN</p> <p>Postal address:            The Director Regulations, Compliance and Enforcement            Department of Water and Sanitation            PO Box 528            BLOEMFONTEIN            9300</p>
<p>Department of Sport Arts Culture and Recreation - Heritage FS</p>	<p>Ntando PZ Mbatha            Heritage Coordinator</p>	<p><a href="http://www.sahra.org.za/sahris/about/sahris">www.sahra.org.za/sahris/about/sahris</a></p>

	Tel: 051 410 4750 Fax: 086 401 0431 Cell: 074 945 3255 Email: <a href="mailto:Mbatha.npz@sacr.fs.gov.za">Mbatha.npz@sacr.fs.gov.za</a>	
Vredefort Public Library	Reception Tel: 056 931 0011	c/o Slabbert & Meerholtz Street Vredefort Free State 9595

## Appendix F: Impact Assessment Rating

“JWALE KE NAKO YA KOTULO, RE A KUBELETSA”



## THE METHODOLOGY UTILISED IN THE RATING OF SIGNIFICANCE OF IMPACTS

<p>The <b>Significance</b> of Environmental Impacts is to be assessed by means of the following method: <b>Significance is the product of probability and severity</b>. <b>Probability</b> describes the likelihood of the impact actually occurring, and is rated as follows:</p>			
•	Improbable	-	<p>Low possibility of impact to occur either because of design or historic experience.</p> <p><b>Rating = 2</b></p>
•	Probable	-	<p>Prominent possibility that impact will occur.</p> <p><b>Rating = 3</b></p>
•	Highly probable	-	<p>Most likely that impact will occur.</p> <p><b>Rating = 4</b></p>
•	Definite	-	<p>Impact will occur regardless of any prevention measures</p> <p><b>Rating = 5</b></p>
<p>The severity rating is calculated from the factors given to intensity and duration. <b>Intensity and duration factors are awarded to each impact, as described below.</b></p> <p>The <b>Intensity factor</b> is awarded to each impact according to the following method:</p>			
•	Low intensity	-	<p>Nature and/or man-made functions not affected and a minor impact may occur.</p> <p><b>Factor 1</b></p>
•	Moderate intensity	-	<p>Environment affected but natural functions and processes can continue though often in a slightly altered manner.</p> <p><b>Factor 2</b></p>
•	High intensity	-	<p>Environment affected to the extent that natural functions are altered to the extent that it will temporarily or permanently cease.</p> <p><b>Factor 3</b></p>
<p>Duration is assessed and a <i>factor</i> awarded in accordance with the following:</p>			

•	Short term	-	≤ 1 to 5 years  Factor 2
•	Moderate term	-	5 - 15 years  Factor 3
•	Long term	-	Impact will only cease after the operational life of the activity, either because of natural process or by human intervention.  Factor 4
•	Permanent	-	Mitigation, either by natural process or by human intervention, will not occur in such a way or in such a time span that the impact can be considered transient.  Factor 5

The severity rating is obtained from calculating a severity factor, and comparing the severity factor to the rating in the table below, for example:

The Severity factor	Intensity factor X Duration factor $2 \times 3 = 6$
---------------------	--

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

	FACTOR
Low Severity (Rating 2)	Calculated values 2 to 4
Moderate Severity (Rating 3)	Calculated values 5 to 8
High Severity (Rating 4)	Calculated values 9 to 12
Very High Severity (Rating 5)	Calculated values 13 to 16 and more
Severity factors below 3 indicate no impact	

A Significance Rating is calculated by multiplying the Severity Rating with the Probability Rating:  
The significance rating should influence the development project as described below:

•	Low significance (calculated Significance Rating 4 to 6)	
	-	Positive impact and negative impacts of low significance should have no influence on the proposed development project

•	Moderate significance (calculated Significance Rating $\geq 7$ to 12)		
		-	Positive impact  Should indicate that the proposed project should be approved
			Negative impact: Should be mitigated or mitigation measures should be formulated before the proposed project can be approved
•	High significance (calculated Significance Rating $\geq 13$ to 18)		
		-	Positive impact: Should points towards a decision for the project to be approved and should be enhanced in final design
			Negative impact: Should weigh towards a decision to terminate proposal, or mitigation should be formulated and performed to reduce significance to at least low significance rating.
•	Very High significance (calculated Significance Rating $\geq 19$ to 25 and more)		

## Appendix G: Environmental Management Programme (EMPr)

---

“JWALE KE NAKO YA KOTULO, RE A KUBELETSA”

**PROPOSED EXPANSION OF A SHEEP FEEDLOT ON THE REMAINDER OF  
THE FARM GROENHOF VREDEFORT RD, FREE STATE PROVINCE**

**ENVIRONMENTAL MANAGEMENT PROGRAMME**

**Prepared for:** Free State Department of Economic, Small Business Development,  
Tourism and Environmental Affairs  
Attention: Grace Mkhosana,  
Environmental Management Directorate  
DESTEA  
Private Bag X 20801  
Bloemfontein  
9300

**On behalf of:** Soetvelde Voere (Pty) Ltd.  
Mr Werner van Tonder  
PO Box 364  
Vereeniging  
1930

**Author:** Rowan van Tonder & Pieter van der Merwe

**Date:** 10 January 2023

## COPYRIGHT WARNING

This document is privileged and confidential in nature and unauthorised dissemination or copying is prohibited. This document will be updated as required. Rock Environmental Consulting (Pty) Ltd claims protection of this information in terms of the Promotion of Access to Information Act, 2002 (Act 2 of 2002) and without limiting this claim, especially the protection afforded by Chapter 4.

## ENVIRONMENTAL ASSESSMENT PRACTITIONER (EAP) AND EXPERTISE

- EAP: P.N. van der Merwe (Director)**
- Expertise: Environmental Impact Assessments in Land-use and Infrastructure Development.
  - Years of experience: 30. Qualifications: B.Sc. Hons. Environmental Management PU for CHE.
- EAP: Rowan van Tonder (Senior consultant)**
- Expertise: Currently involved with various applications for activities under the National Environmental Management Act (NEMA) (Act 107 of 1998), Mineral and Petroleum Resources Development Act 2002 (Act No. 28 of 2002), and National Environmental Management: Waste Act, 2008 (Act 59 of 2008).
  - Years of experience: 15. Qualifications: M.Sc. Botany (Conservation Management), B.Sc. Hons. Physical Geography - Environmental Management at TUKS. (For Extended Details, See Appendix 6 - EAP CV).
  - Registrations: SACNASP (Pri.Sci.Nat): 119204
  - EAPASA Reg. No.: 2020/2579

### GENERAL TERMS AND ABBREVIATIONS:

<b>Audit</b>	Regular inspection and verification of implementation of the EMPr
<b>Bund</b>	A sealed enclosure under or around a storage facility to contain any spillage
<b>Batch plant</b>	Concrete or plaster mixing facility and associated equipment and materials
<b>Contractor</b>	Principal persons or company undertaking the construction of the development
<b>Development site</b>	Boundary and extent of development works and infrastructure
<b>Engineer</b>	Person who represents the client and is responsible for enforcing the technical and contractual requirements of the project
<b>ECO</b>	Environmental Control Officer: - Person tasked with monitoring implementation of the EMPr during construction
<b>Emergency situation</b>	An incident, which potentially has the ability to significantly impact on the environment, and which could cause irreparable damage to sensitive environmental features. Typical situations amongst others are: <ul style="list-style-type: none"> <li>• Large spills of petroleum products and lubricants on site,</li> <li>• Potential damage, erosion and slumping of unstable slopes,</li> <li>• Indiscriminate dumping of construction waste on site, and accessing exclusion zones</li> </ul>
<b>RE/PM</b>	Resident Engineer/Project Manager: Person representing the Engineer on site

<b>BAR</b>	Basic Assessment Report
<b>DWS</b>	Department of Water and Sanitation
<b>EAP</b>	Environmental Assessment Practitioner
<b>EMPr</b>	Environmental Management Program
<b>DESTEA</b>	Free State Department of Economic, Small Business Development, Tourism and Environmental Affairs
<b>NEMA</b>	National Environmental Management Act, 1998 (Act 107 of 1998)

## TABLE OF CONTENTS

<b>1. INTRODUCTION.....</b>	<b>7</b>
<b>2. PROJECT DESCRIPTION .....</b>	<b>8</b>
<b>3. DESCRIPTION OF THE ENVIRONMENTAL ASPECTS OF THE ACTIVITY .....</b>	<b>14</b>
<b>4. SENSITIVITY MAP.....</b>	<b>24</b>
<b>5. DESCRIPTION OF THE IMPACT MANAGEMENT OBJECTIVES FOR ALL PHASES OF THE DEVELOPMENT.....</b>	<b>26</b>
5.1 RECOMMENDATIONS APPLICABLE TO ANY FUTURE PLANNING AND DESIGN STAGE: .....	26
5.1.1 Contamination of surface water/soil through storm water run-off from hard or paved surfaces .....	26
5.1.2 Visual and aesthetic impacts of the building structure .....	27
5.1.3 Waste management on site.....	27
5.2 IMPACT MITIGATION DURING THE CONSTRUCTION PHASE: .....	28
5.2.1 Management of impacts on vegetation cover and faunal habitats .....	28
5.2.2 Soil stability and storm water management .....	29
5.2.2.1 Clean stormwater runoff.....	31
5.2.2.2 Feedlot pen configuration and drainage.....	31
5.2.2.3 Sedimentation system.....	32
5.2.2.4 Evaporation pond .....	33
5.2.2.5 Manure stockpiling and composting .....	34
5.2.3 Visual and aesthetic quality.....	35
5.2.4 Stockpiles and general storage of building material and equipment.....	35
5.2.5 Community or public safety.....	37
5.2.6 Waste disposal and management.....	37
5.2.7 Dust suppression .....	39
5.2.8 Noise.....	39
5.2.9 Vehicle Maintenance and Fuel Storage .....	40



5.2.10	Archaeology and Cultural Sites .....	40
5.2.11	Construction camp establishment (if used) .....	41
5.2.12	General rehabilitation of the construction site .....	42
5.2.13	Stockpile Areas .....	42
5.2.14	Rehabilitation of Construction Camps .....	42
5.2.15	Re-vegetation Process .....	43
5.3	OPERATIONAL PHASE: .....	44
5.3.1	Waste Management of domestic solid waste .....	44
5.3.2	Waste management of sheep manure from feedlot .....	44
5.3.2.1	Pen cleaning .....	45
5.3.2.1.1	<i>The manure pad</i> .....	45
5.3.2.1.2	<i>Principles of pen cleaning</i> .....	46
5.3.2.1.3	<i>Pen cleaning equipment</i> .....	47
5.3.3	Waste management of mortalities .....	48
5.3.4	Water usage .....	50
5.3.5	Management of odour, dust and flies .....	50
5.3.5.1	Odour control .....	51
5.3.5.2	Dust control .....	53
5.3.5.3	Fly control .....	54
5.3.6	Noise impact management .....	56
5.3.7	Compliance to standards .....	57
5.3.8	General provisions .....	57
5.3.9	Utilisation of manure, compost, and effluent .....	57
5.3.9.1	Environmental protection for utilisation areas .....	57
5.3.9.1.1	<i>Selecting a utilisation area</i> .....	58
5.3.9.1.2	<i>Management practices that protect the environment</i> .....	59
5.3.9.2	Manure and compost spreading .....	59
5.3.9.2.1	<i>Manure and compost utilisation practices</i> .....	59
5.3.9.2.2	<i>Timing of manure and compost spreading</i> .....	59
5.3.9.2.3	<i>Manure and compost spreaders</i> .....	61
5.3.9.2.4	<i>Off-site use of manure and compost</i> .....	62
5.3.9.2.5	<i>Manure transport</i> .....	62
5.3.9.2.6	<i>Utilisation of carcass compost</i> .....	62
5.3.9.3	Effluent irrigation .....	62
5.3.9.3.1	<i>Effluent utilisation practices</i> .....	62
5.3.9.3.2	<i>Timing of effluent irrigation</i> .....	63
5.3.9.3.3	<i>Practical effluent irrigation</i> .....	63

---

5.3.10 Disease/Biosecurity management in general.....	64
5.3.10.1 Develop a biosecurity resource group .....	65
5.3.10.1.1 Isolation.....	65
5.3.10.1.2 Traffic control.....	66
5.3.10.1.3 Sanitation.....	67
5.3.10.2 Good Management Practices (GMP) for Controlling Infectious Diseases .....	67
5.3.10.3 Biosecurity GMP Checklists.....	67
5.4 CLOSURE PHASE .....	74
<b>6. PROPOSED MECHANISMS FOR MONITORING .....</b>	<b>75</b>
<b>7. ENVIRONMENTAL AWARENESS PLAN .....</b>	<b>77</b>
7.1 TRAINING PROGRAMMES:.....	77
7.2 MONITORING OF AWARENESS.....	78
<b>8. A TABULAR VERSION OF ENVIRONMENTAL ASPECTS, IMPACTS, MITIGATION AND PERSONS RESPONSIBLE.....</b>	<b>79</b>
<b>9. COMPLYING, REMEDYING, AND CONTROLLING ENVIRONMENTAL POLLUTION INCIDENTS AND CAUSES.....</b>	<b>98</b>
<b>10. SPECIALISTS CONCLUSION AND RECOMMENDATIONS .....</b>	<b>98</b>
10.1 VEGETATION SPECIALIST .....	98
10.2 HERITAGE SPECIALIST.....	100

## 1. INTRODUCTION

This Environmental Management Programme (EMPr) describes impact mitigation measures to be implemented during any future construction and operation phases of the current feedlot facilities on the Remainder of the farm Groenhof Vredefort RD, Free State Province (known as the 'Development' from here on).

The careful implementation and management of activities on site, during the entire process of project construction and operation, is vitally important. Focus should be placed on the activities to occur on the site of the development; however, consideration of the adjacent environment (socially and ecologically) is equally important. The mitigation measures represented in this EMPr should not be seen as static measures, but rather as methodologies that can be updated and improved during implementation, as and when site conditions become clearer. However, this EMPr sufficiently serves to provide the most practicable methods to promote sound environmental management during the construction and operational phases of the development.

The measures and principles are provided to assist placing impacts identified in another perspective - more towards the firm potential of mitigating the impacts during the development and implementation of the project. But this, as already mentioned, also implies that during the course of the project certain adaptations can be made or will be eminent during the construction implementation period. These adaptations will be the result of the EMPr monitoring exercise that is planned to take place during the construction period. The EMPr subsequently is an on-site working and dynamic document.

This section of the report provides recommendations on matters relating to the impact of the development on the physical environment, the biological environment and the social environment (of the site and study area) by describing mitigation measures that are to be implemented.

## 2. PROJECT DESCRIPTION

Proposed development expansion of a sheep feedlot on the Remainder of the farm Groenhof 240 Vredefort RD, Free State Province.

### BASIC PROJECT DESCRIPTION

The current facility houses 950 herd of sheep at a density of 1 small stock unit per 17m<sup>2</sup>. The expansion will be to increase the density, which will exceed 8m<sup>2</sup> per small stock unit with an increase in numbers up to 2247 small stock units. The current footprint of the existing site is 1.5Ha. The farm portion is 189.4Ha. There are and will be 5 pens with 420 lambs per pen.

The standard cycle for a sheep kraal / feedlot is that 420 lambs are bought from an existing company at about 32kg per lamb and it must be at an age of about 3 to 4 months. The price is market related and the lambs are bought on live weight.

The lambs are dropped into receiving camps and sorted. They are then fed on natural pasture and feed from about 3 weeks which consist of 18m<sup>2</sup> per lamb available. In this adaption phase all lambs are processed against any illness and infections. The feedlot will make use of a local veterinarian that will make suggestions on what the lambs may need to attain a high level of health so that any mortalities can be prevented.

After phase 1, phase 2 will commence for the next 5 weeks. The feed composition is adapted, and the lambs are weighed daily to see if there is any increase or decrease in weight. If needed, lambs that does not show growth will be placed back onto natural pasture. Lambs are shaved in phase 2.

At phase 3, lambs are fed "ADLIP". All the feeding troughs are kept full, and they are not limited by the amount of feed intake. Phase 3 will continue for 2 weeks. Lambs are weighed at each phase change. When the lambs reach a weight of 50kg, it will then be marketed. The whole process takes a total of 62 days.

The aim is to feed the lambs in a timeframe that is profitable, against what percentage meat it will produce per carcass and the total feed it consumes.

The feedlot gets its water from a borehole that is pumped into a holding tank that then distributed it to the different pens. Lambs of about 32kg drink about 2 to 6 litres per day in summer and 1 to 3 litres per day in winter. Thus for 2400 lambs in summer they will consume between 4800 to 14400 litres per day and between 2400 to 7200 litres per day in winter.

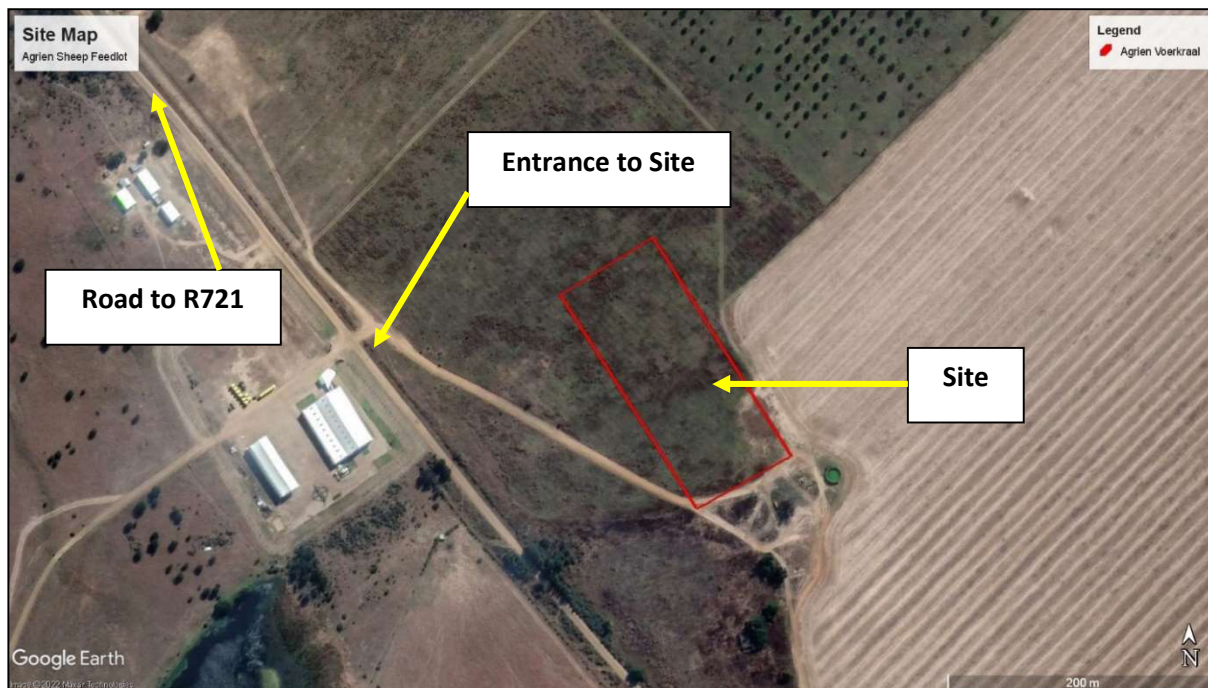
Power is supplied by Eskom, with a generator as a backup.

All the manure are distributed onto natural pastures and cropland on the farm.

All mortalities are investigated for the cause and symptoms. It is then buried in the natural pastures so that the soil can benefit from these carcasses. The mortality rate is usually less than 1%.

#### LOCALITY

Turn-off to the farm from the R721 (between Vredefort and Kroonstad) is about 27.4 km from the Caltex Filling station in Vredefort. At this turn-off travel 4,4 km on a gravel road (S261) to the next turn-off on your right-hand side. At this turn-off travel 1.5 km on a gravel road (S1274) to the entrance (GPS coords.: -27.271985°S, 27.367214°E) of the farm. Please refer to the Google Earth image below.



**Photos of current sheep feedlot:**


















**3. DESCRIPTION OF THE ENVIRONMENTAL ASPECTS OF THE ACTIVITY**

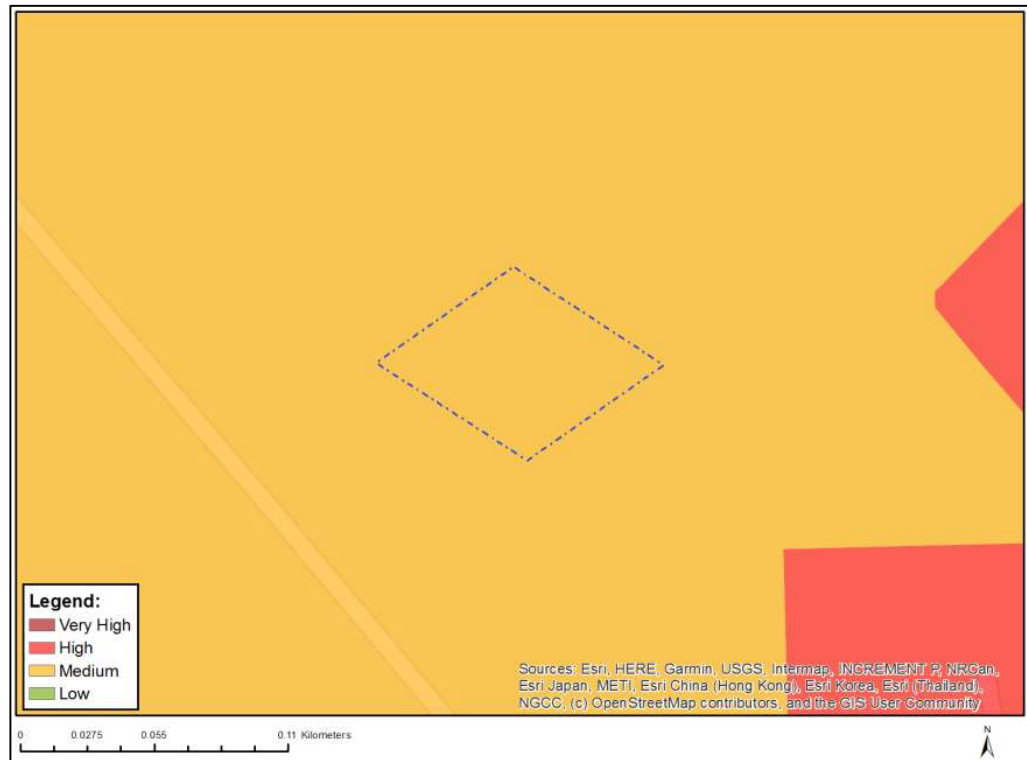
Environmental Aspects	Development
Geology	The study area is located within the Central Karoo Basin. The thickness of the Karoo sediments increases gradually from the pre-Karoo bedrock outcropping at the Vredefort and close to the Lesotho border reaches over 2000 m. The age of the sediments decreases in the southerly direction.

	<p>The Volksrust Formation is a predominantly argillaceous unit, which interfingers with the overlying Beaufort Group and underlying Vryheid Formation.</p> <p>The Vredefort dome, a prominent, ~80 km wide, structural and geophysical feature, is found just north of the study area. It is surrounded by a 50-70 km wide rim synclinorium, which encompasses much of the gold-rich Witwatersrand basin. The dome consists of an ~40 km wide, early Archean crystalline basement core, which is enclosed by a 15-20 km wide collar of late Archean to Paleoproterozoic supracrustal strata. These supracrustal rocks, belong to (from the oldest to the youngest) the Dominion Group and the Witwatersrand, Ventersdorp, and Transvaal Supergroups. In the western, eastern, and northern sectors, the collar strata are generally subvertical to overturned, while in the south-eastern sector the collar strata dip 30°-40° SE. Crystalline basement lithologies in the core of the dome comprise predominantly polydeformed Archean migmatitic gneisses.</p> <p>In the south-eastern sector, a greenstone sequence of sheared metavolcanics and subordinate mafic-intermediate tuffaceous units is exposed as an inlier within Phanerozoic sediments and dolerite sills of the Karoo Supergroup. Much of the south-eastern part of the dome is obscured beneath these sediments and sills.</p> <p>According to the 1:250 000 geological map series 2726 Kroonstad (Council for Geoscience, 2000) the site is underlain by mainly mudstone, siltstone and shale of the Volksrust Formation (Pvo), forming part of the Ecca Group of the Karoo Supergroup. Along the non-perennial tributaries, quarterly deposited alluvium is found. Intrusive dolerite bodies are found in the area.</p> <p><u>Impacts:</u>                  Possible blasting/drilling of geology to accommodate foundations of the development.</p>
<b>Topography</b>	No Sensitive features near the site.

	 <p>The ‘terrain type’ of the area is classified as a level plains with some relief. The wider terrain contains some distinct topographical sections, namely:</p> <ul style="list-style-type: none"> <li>▪ There are no natural aquatic ecosystems on-site. A small dam exists 335m to the west southwest of the Site.</li> <li>▪ The topography slopes in an east-west direction and has a fall of 5m over a 500m distance. Ave. Slope is 1.0%.</li> <li>▪ Cropland/pastures are found west, northwest, north, east, southeast, and south from the site.</li> <li>▪ There are farm structures directly west of the site.</li> </ul> <p>The area has a low slope. The site falls within the Renoster system (downstream from Koppies dam) Quaternary catchment area (C70F catchment).</p> <p><u>Impacts:</u>                  Possible blasting/drilling of geology to accommodate foundations may alter the topography slightly.</p>
<p><b>Soil, Land Capability and Land Use</b></p>	<p>The land potential, and specifically the agricultural potential of a site, is determined by the combination of climate, soil conditions and slope prevailing in that region or site, resulting in the classification of areas with similar agricultural land potential. These land potential classes range from “High Potential” to “Low Potential”. The Agricultural Geo-Referenced Information System (AGIS) has mapped the agricultural potential of SA. Using this mapping</p>



shapefiles, it can be seen that the site as well as areas towards the north, east, and south; the agricultural potential is classified as **Moderate/Medium** potential.



The site is currently zoned as “Agricultural”. This allows the property to be used for agricultural buildings and agricultural land.

The land uses are:

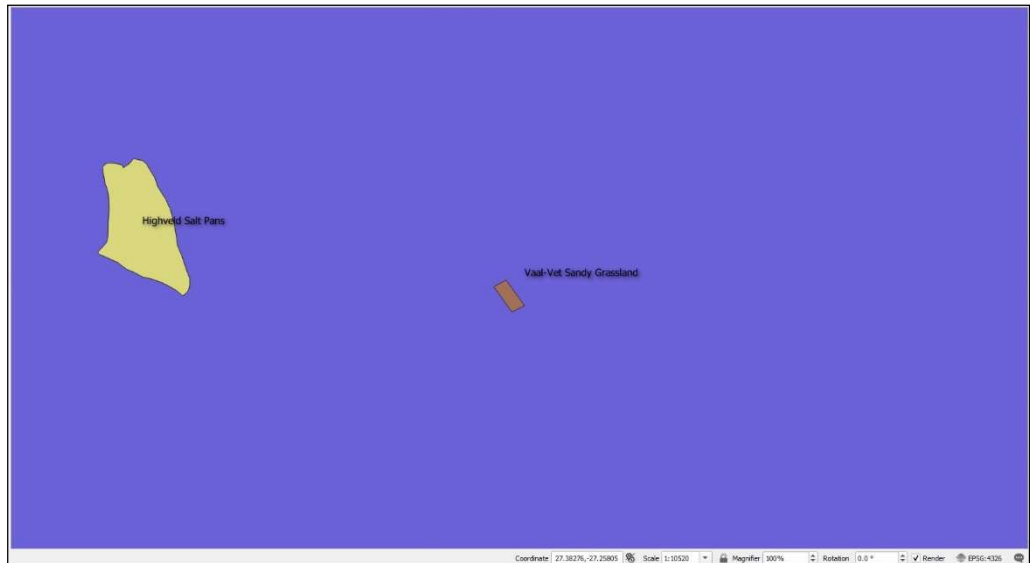
- Agricultural

Impacts:

- Soil compaction.
- Possible soil erosion due to removed vegetation.
- Surface disturbance and topsoil removal.

<p><b>Flora</b></p>	<p>The study area is situated in the Vaal-Vet Sandy Grassland ecosystem. It is Plains-dominated landscape with some scattered, slightly irregular undulating plains and hills. Mainly low-tussock grasslands with an abundant karroid element. Dominance of <i>Themeda triandra</i> is an important feature of this vegetation unit. Locally low cover of <i>T. triandra</i> and the associated increase</p>
---------------------	--

in *Elionurus muticus*, *Cymbopogon pospischilii* and *Aristida congesta* is attributed to heavy grazing and/or erratic rainfall.



#### Ecosystem of the study area.

A Threatened species and Species of Conservation Concern list for the Grids 2727AD was obtained from the Plants of South Africa (POSA) database on the South African National Biodiversity Institute (SANBI) website. Threatened species are those that are *facing high risk of extinction, indicated by the categories Critically Endangered, Endangered and Vulnerable*. Species of Conservation Concern include the Threatened Species, but additionally contain the categories Near Threatened, Data Deficient, Critically Rare, Rare and Declining. This is in accordance with the new Red List for South African Plants (Raimondo *et al.* 2009). However, the POSA list is based on herbarium specimens housed in the National Herbarium of SANBI; therefore, many plant species that do occur in the area are not listed.

The following possible red data plant species (by the categories Critically Endangered, Endangered and Vulnerable) could occur in the areas surrounding the study area (according to the POSA database for grid 2727AD):

*None.*

#### Impacts:

Stripping of surface vegetation during construction.

<b>Fauna</b>	<p>The study area is stretched over a relatively small area. No Red Data Book Species were encountered.</p> <p>Possible smaller mammals that would commonly occur in the wider surrounding area are: Southern African Mole-rat (<i>Cryptomys hottentotus</i>) and Scrub Hare (<i>Lepus saxatilis</i>). No Red Data Book species were recorded. There are also no records of red data (Critically Endangered, Endangered and Vulnerable) mammals for the wider area (2727AD).</p> <p>Avifauna</p> <p>According to available literature, approximately 168 bird species occur in the Lindley quarter degree grid cell (2727AD). The following Red Data species were recorded on site or flying over the site:</p> <p>None.</p> <p>According to Barnes (2000) and South African Bird Atlas Project 2, the following bird species are threatened in the wider area, with a regional red-list status of Vulnerable, Endangered or Critically Endangered:</p> <p>List of possible red date avifauna found in a wider region of the site:</p> <table border="1" data-bbox="411 1249 1270 1727"> <thead> <tr> <th>SCIENTIFIC NAME</th> <th>COMMON NAME</th> </tr> </thead> <tbody> <tr> <td><i>Neotis denhami</i></td> <td>Denham's bustard</td> </tr> <tr> <td><i>Balearica regulorum</i></td> <td>Grey Crowned Crane</td> </tr> <tr> <td><i>Polemaetus bellicosus</i></td> <td>Martial Eagle</td> </tr> <tr> <td><i>Falco biarmicus</i></td> <td>Lanner Falcon</td> </tr> <tr> <td><i>Circus maurus</i></td> <td>Black Harrier</td> </tr> <tr> <td><i>Geronticus calvus</i></td> <td>Southern Bald Ibis</td> </tr> <tr> <td><i>Mycteria ibis</i></td> <td>Yellow-billed Stork</td> </tr> <tr> <td><i>Sagittarius serpentarius</i></td> <td>Secretarybird</td> </tr> </tbody> </table> <p>No Red Data species was recorded. And no amphibians or reptiles were encountered on site. This might be due to the lack of suitable or specialised searching techniques that is required, as well as the history of anthropogenic activities on site.</p>	SCIENTIFIC NAME	COMMON NAME	<i>Neotis denhami</i>	Denham's bustard	<i>Balearica regulorum</i>	Grey Crowned Crane	<i>Polemaetus bellicosus</i>	Martial Eagle	<i>Falco biarmicus</i>	Lanner Falcon	<i>Circus maurus</i>	Black Harrier	<i>Geronticus calvus</i>	Southern Bald Ibis	<i>Mycteria ibis</i>	Yellow-billed Stork	<i>Sagittarius serpentarius</i>	Secretarybird
SCIENTIFIC NAME	COMMON NAME																		
<i>Neotis denhami</i>	Denham's bustard																		
<i>Balearica regulorum</i>	Grey Crowned Crane																		
<i>Polemaetus bellicosus</i>	Martial Eagle																		
<i>Falco biarmicus</i>	Lanner Falcon																		
<i>Circus maurus</i>	Black Harrier																		
<i>Geronticus calvus</i>	Southern Bald Ibis																		
<i>Mycteria ibis</i>	Yellow-billed Stork																		
<i>Sagittarius serpentarius</i>	Secretarybird																		

	<p>List of herpetofauna possibly on site or rather in the wider area:</p> <table border="1" data-bbox="416 338 1390 607"> <thead> <tr> <th data-bbox="416 338 935 394">SCIENTIFIC NAME</th> <th data-bbox="935 338 1390 394">COMMON NAME</th> </tr> </thead> <tbody> <tr> <td data-bbox="416 394 935 450"><i>Kassina senegalensis</i></td> <td data-bbox="935 394 1390 450">Bubbling Kassina</td> </tr> <tr> <td data-bbox="416 450 935 506"><i>Amietia delalandii</i></td> <td data-bbox="935 450 1390 506">Delalande's River Frog</td> </tr> <tr> <td data-bbox="416 506 935 562"><i>Cacosternum boettgeri</i></td> <td data-bbox="935 506 1390 562">Common Caco</td> </tr> <tr> <td data-bbox="416 562 935 607"><i>Agama atra</i></td> <td data-bbox="935 562 1390 607">Southern Rock Agama</td> </tr> </tbody> </table> <p><u>Impacts:</u></p> <ul style="list-style-type: none"> <li>• Removal of surface vegetation thereby depleting food sources.</li> <li>• Human presence resulting in emigration of animals.</li> <li>• The disturbances of the nearby vegetation cover and natural habitat will have a limited impact on the wildlife. However, it should be viewed against the background of the disturbances by human movement and activities through the area.</li> </ul>	SCIENTIFIC NAME	COMMON NAME	<i>Kassina senegalensis</i>	Bubbling Kassina	<i>Amietia delalandii</i>	Delalande's River Frog	<i>Cacosternum boettgeri</i>	Common Caco	<i>Agama atra</i>	Southern Rock Agama
SCIENTIFIC NAME	COMMON NAME										
<i>Kassina senegalensis</i>	Bubbling Kassina										
<i>Amietia delalandii</i>	Delalande's River Frog										
<i>Cacosternum boettgeri</i>	Common Caco										
<i>Agama atra</i>	Southern Rock Agama										
<p><b>Surface Water</b></p>	<p>See 'Topography' above,</p> <p><u>Impacts:</u></p> <p>Poorly implemented storm water system will result in increased surface run-off volume and speed, which could lead to the creation of erosion gullies. Storm water must be allowed to spread out gradually over a large surface area to protect the soil surface against erosion. Inadequate designed storm water outlets can lead to flooding of the road surface, adding unnecessary volume to any retention ponds (if any) which is dangerous.</p>										
<p><b>Ground Water</b></p>	<p>There is a borehole on the farm of which is sufficient to run the entire operation.</p> <p><u>Impacts:</u></p> <p>Low potential environmental impact predicted.</p> <p>Temporary toilets (chemical) left unmanaged can leak raw sewage and effluent into the soil, surface and even ground water sources, during the construction phase.</p>										
<p><b>Air Quality</b></p>	<p>Dust will be generated by vehicular movements on site, the construction &amp; operational phase.</p>										



	<p><u>Impacts:</u></p> <p>Low potential environmental impact.</p> <p>During the construction phase; dust could cause problems for nearby human settlements. During the construction phase the air quality will be the same as it currently is.</p>
<b>Noise</b>	<p>Noise generation by operating air compressors, excavators and other heavy machinery. Noise is also generated by the construction workers, farm worker and sheep.</p> <p><u>Impacts:</u></p> <p>Low potential environmental impact.</p> <p>Noise from the farm traffic and sheep will be an inconvenience to a certain extent for some existing properties nearby.</p>
<b>Visual</b>	<p>Visual and aesthetic elements are important. This development will alter the visual landscape from agriculture fields/natural veld to a little bit more built-up.</p> <p><u>Impacts:</u></p> <p>No significant impact. This is all agricultural land, and the development is also agricultural.</p> <p>Waste, such as building rubble and empty cement bags can be a negative visual impact if not collected and disposed of correctly.</p>
<b>Sensitive Landscapes</b>	<p>No 'Sensitive' landscapes identified on-site:</p> <ul style="list-style-type: none"> <li>• See 'Topography' above.</li> </ul> <p><u>Impacts:</u></p> <p>Low negative significant impact.</p> <p>Human presence resulting in possible emigration of animals.</p> <p>The movement of water to drainage lines further afield could be altered by future construction activities.</p>
<b>Sites of Archaeological</b>	<p>During the site investigations, focus was also placed on the presence of any stone-built structure, ruins, grave sites, complete built structures and the presence of artefacts. Based on preliminary observations no such features</p>

<p><b>and Cultural Interest</b></p>	<p>occur within the area of development. It is therefore not identified as an issue at this stage.</p> <p>The site does not contain any surface archaeological deposits; a possible reason is previous infra-structure development and farming activities in the greater study area.</p> <p>The possibility of sub-surface findings always exists and should be taken into consideration.</p> <p>If sub-surface archaeological material is discovered work must stop and a heritage practitioner preferably an archaeologist contacted to assess the find and make recommendations.</p> <p>The site does not contain any marked graves or burial grounds. The possibility of graves not visible to the human eye always exists and this should be taken into consideration.</p> <p>It is important to note that all graves and cemeteries are of high significance and are protected by various laws. Legislation with regard to graves includes the National Heritage Resources Act (Act 25 of 1999) whenever graves are 60 years and older. Other legislation with regard to graves includes those when graves are exhumed and relocated, namely the Ordinance on Exhumations (no 12 of 1980) and the Human Tissues Act (Act 65 of 1983 as amended).</p> <p>If sub-surface graves are discovered work should stop and a professional preferably an archaeologist contacted to assess the age of the grave/graves and to advice on the way forward.</p> <p><u>Impacts:</u>                  No significant impact.</p>
<p><b>Socio-economic</b></p>	<p>This development will have a positive impact on the regional socio-economic structure through its support of the development industry, better local</p>

	<p>services support, job creation and the skills development of its employees and local community.</p> <p>This fully integrated development offers the shareholders the opportunity to assist in local upliftment through the following:</p> <ul style="list-style-type: none"> <li>• Involvement of local contractors,</li> <li>• Job opportunities,</li> <li>• Skills training and development,</li> <li>• Social upliftment</li> </ul> <p><u>Impacts:</u></p> <p>Positive impact on the regional socio-economic structure through its support to the community, like:</p> <p>Job opportunities during the construction phase.</p> <p>Local economic boost.</p>
<p><b>Interested and Affected Parties</b></p>	<p>Comments received.</p> <p>Issues stemming from this development:</p> <p>Please see Comment and Response Report;</p>
<p><b>Cumulative</b></p>	<p>The cumulative impact of the development on the social environment is positive. More job possibilities and economic boost for the local area.</p> <p>Seen at a wider scale the additional developments are not physically connected, but the removal of vegetation cover, such that the soil surface is exposed, may lead to increased soil erosion in the area and loss of habitat.</p>

## 4. SENSITIVITY MAP

The following sensitivity maps are available:

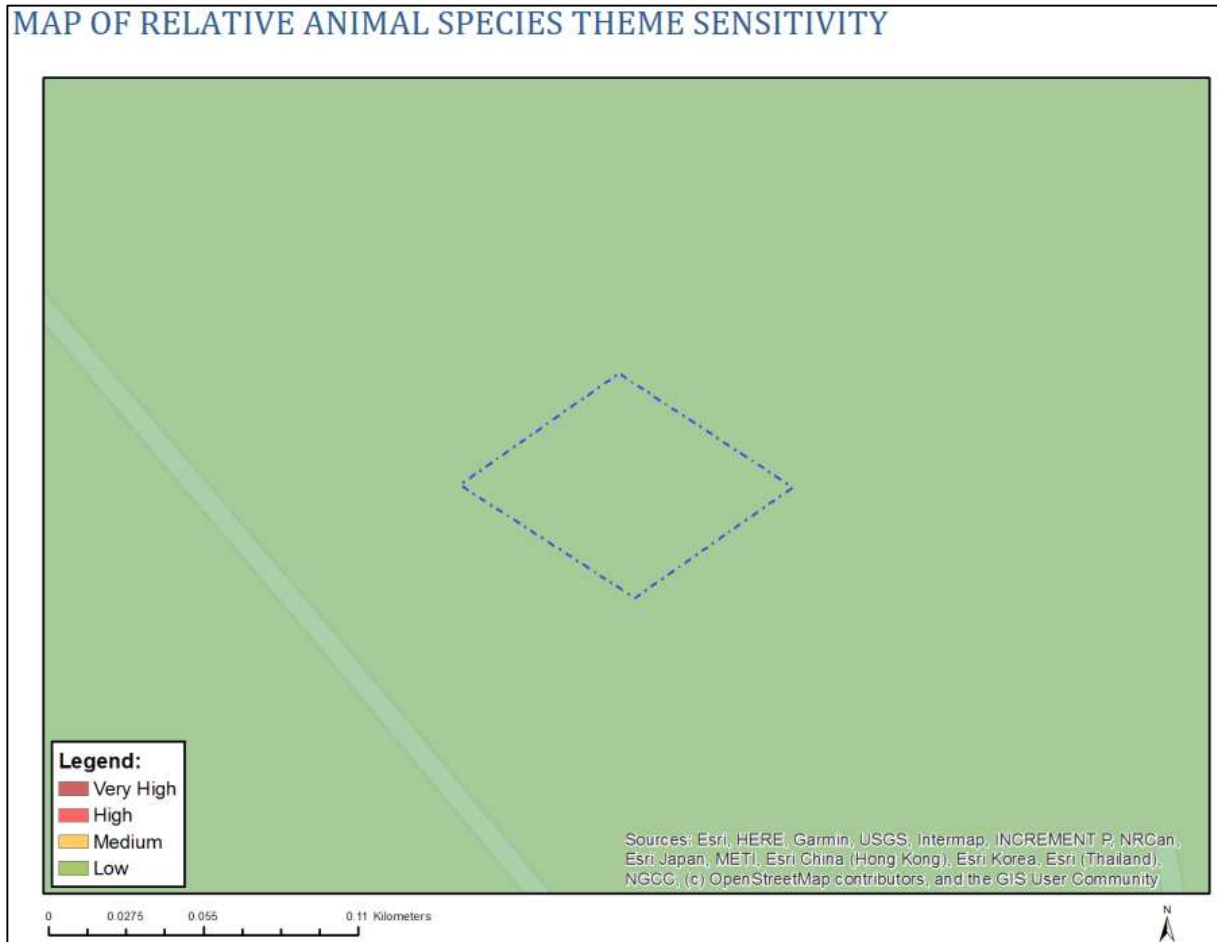
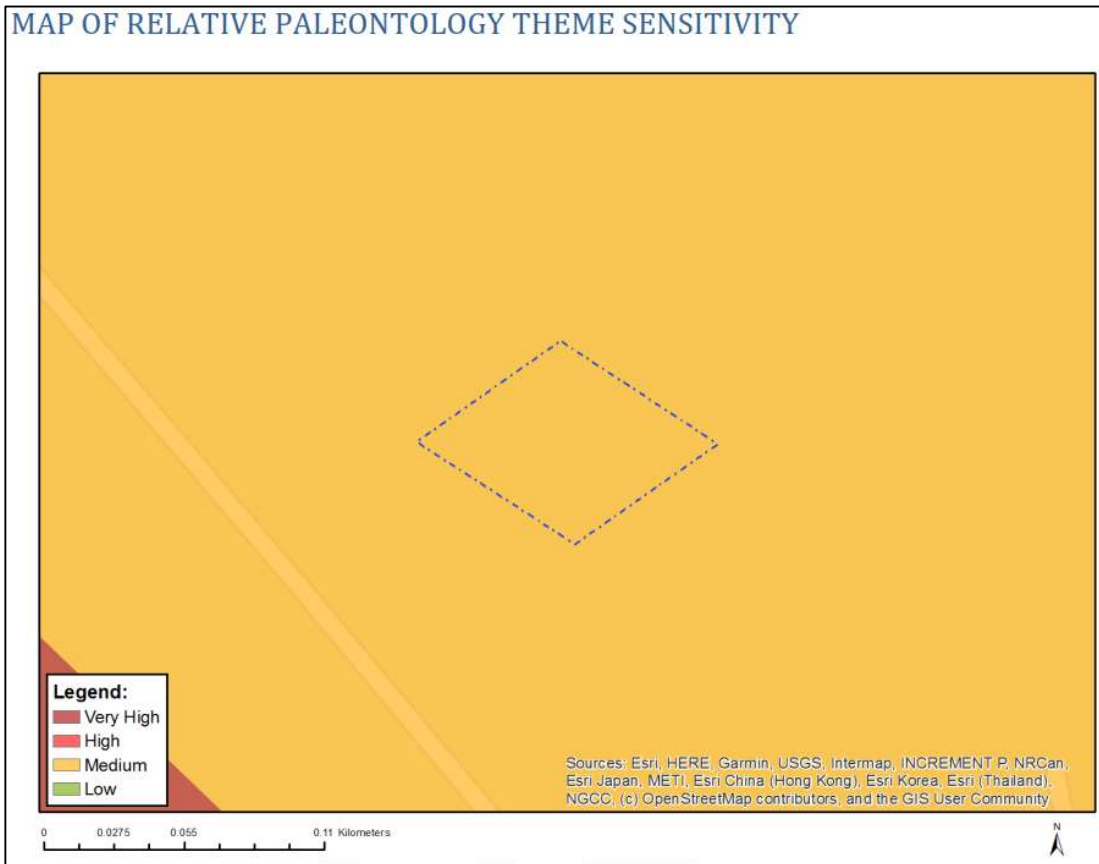




Figure 7: Sensitivity Map



## 5. DESCRIPTION OF THE IMPACT MANAGEMENT OBJECTIVES FOR ALL PHASES OF THE DEVELOPMENT

### 5.1 Recommendations applicable to any future planning and design stage:

Time frame: 1 Month

There are a number of potential impacts that can be mitigated through careful design of technical/physical project components. The following design components are relevant in this regard:

- Address the potential contamination of surface run-off and soil through storm water drainage;
- Ensuring effective effluent management - to prevent potential contamination of soil and groundwater resources, as a result of insufficient or incorrect waste management systems by point source pollution;
- Visual and aesthetic impacts of the development on the surrounding environment - landscaping will be an important component in this regard, as will the type and intensity of lighting used; and
- Waste management on site, including handling, storage and collection of solid waste and disposal of liquid waste.

#### 5.1.1 Contamination of surface water/soil through storm water run-off from hard or paved surfaces

It is recommended that the storm water management system, leading from the hard surfaces or from outside the footprint be designed in such a manner that no direct link or piping be established into a natural drainage course.

Other precautions to be implemented in order to prevent storm water pollution are:

- Cover any wastes that are likely to wash away or contaminate storm water;
- Build a bund/berm around waste storage area/pens to stop overflow into storm water;
- Storm water outflows will not enter directly into a drainage line;
- Energy dissipaters (gabions/grass bales etc.) should be installed at all potential large flow volume areas, especially during the construction phase where large areas will be open soil;

- Natural storm water must not be piped other than in areas where it runs perpendicularly cross a roadway;

#### 5.1.2 Visual and aesthetic impacts of the building structure

The development is built far from any recreational and business entities, which should not be unattractive and undesirable in to such an environment. The development, however, is situated in an agricultural setting. However, the character of the site and its location (rural/agricultural area) makes the development acceptable and compatible with the aesthetics of the study area. Nevertheless, careful attention will be placed on various design elements associated with the development, including attention to aspects that will enhance the aesthetic quality of a feedlot, such as landscaping.

Poor maintenance of the facility will affect the visual and aesthetic quality of the area. Therefore, general building maintenance on a regular basis will form a crucial component of the operational phase of the development. Generally, feedlots have similar layouts, formats, and appearances. Therefore, to pay special attention to “blending” the development to the environment is not a practical exercise. In terms of the level and nature of night illumination, carefully placed and downward shining lights are recommended to reduce this impact sufficiently. No high floodlights should be installed on the site.

#### 5.1.3 Waste management on site

Poorly designed waste collection/storage facilities have a significantly negative impact in terms of surface pollution, possible water pollution and negative impacts on the visual quality of an area. Therefore, practical design and efficiency is essential in this regard. The location of the refuse areas/waste collection area must be carefully planned and located so as not to cause a visual nuisance, as wind-blown refuse is often a problem. It is suggested that large black bins, which are secured in place, are distributed frequently at strategic locations across the site to discourage littering. The dustbins should be secured to prevent them from being knocked over or carried away. The lids should also be suspended permanently above the dustbins, to ensure that the waste disposed of is efficiently contained. The waste from these bins should be collected on a weekly basis and stored in a refuse collection yard (which should be contained within a walled fence), until such a time that a certified/registered contractor collects the waste - on a weekly basis - to be disposed of at a registered waste disposal site or when the farmer see fit to do it himself.

**Implementation responsibility:** The site engineer / applicant will be responsible for the implementation of the above measures as an on-going process during construction phase.

## 5.2 Impact mitigation during the construction phase:

### Timeframe: 5 Months

The following recommendations are proposed to assist as basic environmental management steps and to be implemented during the construction phase of the project:

The construction stage of the development will cause minor impacts on the biophysical and social environment. Although these impacts are short-term and low significance in nature, it still is essential to address them as sufficiently as possible.

The following elements must be considered and addressed when the construction stage of the development commences:

- The locality of the construction camp and site offices (if used). Limited accommodation will be provided for construction workers. Staff will be limited to security personnel after normal working hours.
- The locality of stockpile areas must be confirmed and discussed with the appointed contractor before construction activities commence.
- Specified areas of access and movement by construction vehicles during the construction period are essential.

#### 5.2.1 Management of impacts on vegetation cover and faunal habitats

Clearing/removal of the existing vegetation for the construction of the buildings will be necessary, however, due to the non-indigenous vegetation and size of the site, the significance of this impact is rated as low.

The propagation of exotic species and weeds will need to be controlled during the construction phase, as there are many activities on site that could lead to the establishment of weeds - including compaction of the soil by heavy machinery, construction waste, stockpile areas etc. Weed species should be removed on a four-week basis.



Weed species should be removed on a four-week basis. The site will not be paved, and a large portion will be landscaped / maintained. It is recommended that only indigenous species be used in the landscaping process (if implemented), and that trees are incorporated into the landscaping design on the boundary of the feedlot.

No specific mitigation measures are deemed necessary with regards to mitigating the impact of the development on the faunal component, because the area is small and disturbed. No mammal species were detected on the site. Avifaunal species were plenty in the indigenous vegetation areas around the site.

**Implementation responsibility:** The main contractor will be responsible for the implementation of the above measures as an on-going process during construction phase.

#### 5.2.2 Soil stability and storm water management

If construction is to take place during the summer months, the terrain could be susceptible to sheet and gully erosion because of the angle of the terrain. However, if additional access routes are required (at this stage such a requirement is highly unlikely), the physical layout of the access routes should follow the contours of the site wherever possible.

Aspects that typically impact on soil conditions are blasting activities, excavations for the founding of foundations, establishment of stockpile areas, removal and/or clearance of vegetation, movement of construction vehicles, and maintenance of construction vehicles, construction camp establishment and sanitation provision to workers during the construction period. Therefore, the following recommendations pertaining to soil conservation practices are made:

- Topsoil should be stockpiled separately from subsoil. The height of the stockpiles may not exceed 2.5 m and the stockpiles should not be stored for more than a one-year period.
- Topsoil must be stripped from all areas, where construction activities are going to take place, to be re-used in landscaping the site.
- If any blasting activities occur on site, the blasted rocks and heavy rock material must be transported to an external venue. These rocks are not allowed to rest on site. If the rocks are left on site, the soil will be greatly compacted, which will promote the growth of weeds.

- Any excess overburden material that is generated may not be dumped in a random manner. Dumping sites should be predefined, agreed upon and adhered to.
- Any embankments created adjacent to the roads, or any drainage lines must be stabilised during construction and re-habilitated afterwards.
- Generally, surface water must be prevented from damming or creating gully erosion. This can be achieved by placing sandbags along the boundaries of steep working areas where higher intensity surface run-off may occur.
- All rills and erosion channels developing during the construction period or during the operational and maintenance period should be backfilled and consolidated immediately.
- The movement and maintenance of construction vehicles may only take place in pre-determined and delineated areas. Only planned and formal routes for hauling of material should be used.
- Soil contamination during construction vehicle maintenance or because of fuel storage on site is easily prevented, but in the event of such an accident, the spill should immediately be cleaned up by absorbing the worst of the fluid with saw dust and then disposing of the saw dust and the first bit of the soil layer.
- Fuel storage areas should be bounded effectively, and all applicable safety standards must be adhered to.

In terms of the stability of excavations, it is strongly recommended that all excavations exceeding 1.5 m should have proper sidewall protection to ensure the safety of workers. Seepage may result in the destabilising of the soils above the seepage and special precautions may be required. The contractor is responsible for the implementation of suitably designed support systems. Constructed embankments exceeding 1.5 m, or as deemed necessary by the design engineer, can be stabilised/protected by means of retaining walls. Embankments should be adequately compacted and protected from erosion.

The development site is sloped; however, abnormal transportation of sediment during construction activities is possible. The following management measures must be implemented during construction. Abnormal soil erosion plays an important role in the siltation of watercourses and the loss of valuable topsoil.

**The following suitable storm water management and mitigation measures may therefore be necessary:**

A key aspect in the design of any feedlot is effective stormwater runoff management. Inadequate provision for the management of stormwater and feedlot pen run off can pose environmental and health risks to onsite employees, surrounding communities and the animals themselves. Stormwater and feedlot pen run off can be adequately managed with a well-designed drainage system. The key components in the design of an adequate drainage system include:

- ⇒ Clean stormwater runoff
- ⇒ Feedlot pen configuration and drainage
- ⇒ Sedimentation system
- ⇒ Evaporation pond
- ⇒ Manure stockpiling and composting

#### 5.2.2.1 Clean stormwater runoff

Clean stormwater runoff is described as upslope stormwater that results for rainfall events but has not come into contact with the feedlot footprint. In order to address clean stormwater runoff, a stormwater berm should be constructed along the eastern boundary of the feedlot footprint and will divert stormwater towards to western side of the development. This stormwater runoff will not be contaminated by any animal waste that is generated by the feedlot and will therefore not require any further treatment.

#### 5.2.2.2 Feedlot pen configuration and drainage

The current design has been chosen due to the natural slope of the feedlot site. In order to ensure optimal feedlot pen runoff, the ideal slope should be 3%, and it is 1%. A slope between 2.5% and 4% will ensure that runoff is not so rapid that it removed excessive amounts of manure from the feedlot pens.

Using the results from the slope analysis on Google Earth, the feedlot pens can utilise the 1% slope to allow feedlot runoff to be directed into a catch drain that should run along the western boundary of the site. The runoff from the catch drain can then be directed to a possible sedimentation pond in the west corner of the site.

In order to minimise the risk of groundwater contamination, the feedlot drainage canal will be lined with a synthetic liner and poured with concrete.

The surface of the feedlot pens should be constructed out of compacted clay and other suitable compactible soils to prevent the contamination of any possible groundwater sources.

In order to ensure that the feedlot drainage operates sufficiently, the following need to be considered in the design:

- ⇒ Drainage canals that have sufficient capacity to avoid overflow in “normal” rainfall and maintenance conditions.
- ⇒ Drainage canals must not be impeded by excessive sedimentation of vegetation growth.
- ⇒ Significant scouring of drainage canals must not occur.

The following monitoring recommendations must take place to ensure that the feedlot drainage system continues to work effectively:

- ⇒ Visual monitoring of sediment depth and vegetation growth in the drainage canal.
- ⇒ Visual monitoring of scouring and damage to the drainage canals during maintenance operations.
- ⇒ Records must be kept of the date of cleaning operations and of any repairs or maintenance.

#### 5.2.2.3 Sedimentation system

The sedimentation pond will remove at least 50% of the settleable fraction of the solids that are part of the feedlot pen runoff. The solids consist primarily of manure derived from the surface of the feedlot pens.

The purpose of the sedimentation pond is to prevent build-up of organic matter and sludge build up in the evaporation pond. This will help to reduce odour emission. The sedimentation pond will need to be cleaned out every 3-5 years. Due to the infrequent cleaning required, the sedimentation pond will be deep, approximately 2 meters. The sedimentation pond will have to be lined with a synthetic liner as well as compacted clay in order to minimise the risk of groundwater contaminations.

In order to ensure that the sedimentation system operates sufficiently, the following need to be considered in the design:

- ⇒ The sedimentation pond will be desludged every 3-5 years, assuming that desludging will occur when the sludge occupies a maximum of 10% of the design capacity of the pond.
- ⇒ Sedimentation pond must be cleaned of solids before the sludge occupies 60% of the design capacity of the pond.

The following monitoring recommendations must take place to ensure that the sedimentation system continues to work effectively:

- ⇒ Visual monitoring of sediment depth in the sedimentation pond following rainfall events to determine depth of deposited material.
- ⇒ Regular visual inspection of damage to and condition of the sedimentation pond lining.
- ⇒ Quarterly inspections of the sedimentation pond wall structures, paying close attention to structural problems such as cracking and slumping. The date of inspections and significant outcomes of the inspections must be recorded.
- ⇒ Records must be kept of dates of cleaning activities and any repairs or maintenance.

#### 5.2.2.4 Evaporation Pond

The holding pond should be located immediately below the sedimentation pond and aims to capture and store the runoff from the feedlot pens prior to the runoff going through an evaporation and composting process. To minimise the risk of contamination of groundwater, the evaporation pond will have to be lined with a synthetic liner and compacted clay. The clay liner will be approximately 300mm thick.

In order to ensure that the evaporation pond operates sufficiently, the following need to be considered in the design:

- ⇒ Spill frequency must not exceed an average of one in 20 years.
- ⇒ Biological activity in the evaporation pond must provide for the rapid stabilisation of the pond contents following significant inflow and odour emissions must remain within acceptable limits so as not to affect surrounding communities.
- ⇒ Any potential groundwater must not be contaminated by seepage from the evaporation pond.
- ⇒ No catastrophic failure of pond walls must take place.

The following monitoring recommendations must take place to ensure that the evaporation pond continues to work effectively:

- ⇒ Ant spills must be recorded and reported.
- ⇒ Downstream surface water sources must be tested and analysed when spill constituents enter a water source.
- ⇒ Any desludging, cleaning and maintenance activities must be recorded.
- ⇒ Water quality in any surrounding boreholes must be tested and monitored.
- ⇒ Quarterly inspections of the evaporation pond walls must be carried out and any structural problems, such as cracking and slumping, must be noted. The date of inspections and any significant outcomes must be recorded.

#### 5.2.2.5 Manure stockpiling and composting

The solids removed from the regular feedlot pen manure removal, sedimentation pond and evaporation pond should be stockpiled on a bunded slab. The solids should be composted, used back into cropland and pastures, or sold to surrounding communities.

In addition to the above, the following restrictions will be enforced:

- No borrow pit or quarry will be opened on site, larger than 2500m<sup>2</sup>. All imported material will be obtained from commercial borrow pits or quarries.
- The footprint of the various structures will be staked out prior to commencement of construction activities.
- No moving or removal of stones, plants or any other natural specimens will be allowed outside the staked construction area.

The construction of engineering services including any water, sewerage and underground electricity lines will require trenching and backfilling as per the engineering design. Where possible, all excavations of trenches shall be done by hand to limit the impact of excavators on site.

The following will be applicable where excavation done by hand is conducted:

- Excavated material from the trenches along the roads and construction area will be placed on the road surface or as close as possible to the construction area and will not be allowed to be stockpiled in a nearby veld or adjacent vegetation.
- Trenches will only be as deep as required and be backfilled as soon as possible.

- The contractor will check all open trenches every morning for trapped animals.
- All open trenches will be demarcated clearly with danger tape, or as otherwise instructed by the Engineer.

The top 150 mm of backfilling will not be compacted and will comprise topsoil stripped from the area prior to opening of the trench.

**Implementation responsibility:** The main contractor and project engineer will be responsible for the implementation of the above measures as an on-going process during construction phase.

### 5.2.3 Visual and aesthetic quality

Currently the study area comprises mostly disturbed/degraded vegetation and cropland. The visual quality of the area may be negatively affected, considering that the development is an above-ground level development. However, to reduce the visibility of the structures, the following techniques should be implemented:

- Directional lighting is advised. Security lights should face away from neighbouring properties.
- Replacement of topsoil where necessary.
- Construction vehicles are not permitted to turn/drive into areas that are not designated for this purpose.
- No additional access routes may be established in the vicinity of any area where construction action is taking place.

**Implementation responsibility:** The site engineer will be responsible for the implementation of the above measures as an on-going process during construction phase. Hydro-seeding can be done by a contractor in this field.

### 5.2.4 Stockpiles and general storage of building material and equipment

Special care must be exercised when selecting the location of temporary material storage areas.

- Any excess soil or overburden material must be stockpiled to reduce visibility.
- Excess material that is not used during construction activities should be removed from the site to be used by other users in the construction industry.



- It is essential to place enough sandbags along the toe line of any loose material stockpiled and for the storage of building material.
- In the event of soil and overburden being removed from its locality, it should be stockpiled in a suitable place where, if possible, surfaces are already disturbed and where the natural vegetation will not be covered by this material to a significant extent.
- Overburden or stock-piled material must only be stockpiled temporarily. No soil may be left exposed after construction activities have ceased.
- In the event of soil and overburden being removed from its locality, it must be suitably stockpiled away from any drainage ways.
- Overburden soil can alternatively be re-used in landscaping depending on the need.
- No material must in any event be dumped in any place in the surrounding region. Written proof of disposal at a waste disposal site must be given to the applicant and site manager on every load of construction waste removed from the site.
- No vehicle and equipment parking areas may be established within 20m of any natural drainage ways.

All stockpile areas should be ripped and ploughed at the end of the construction period to loosen soil surfaces for the natural propagation of vegetation and/or to allow for landscaping of the area. The same applies to other temporarily disturbed areas on site, which are vulnerable to the propagation of unwanted species (weeds). It is important that the contractor implements weed control through physical and/or approved chemical eradication methods. Only registered herbicides should be used to curb this problem.

The temporary storage of construction material and especially fuel must be carefully monitored by the site engineer to prevent the risk of accidental spillage or disposal of any such material that will contaminate soil surfaces, surface, and subsurface water. All liquid material must, where applicable, be stored on solid concrete surfaces and must be surrounded by bunds. Bunding is also applicable to fuel and mechanical oil storage areas. Bunding walls should not be less than 30 cm high. Bunding walls must be able to contain 110% of the “unit’s” capacity stored within it. Storage containers must be inspected regularly to prevent leaks that could contaminate the site.

**Implementation responsibility:** The main contractor will be responsible for the implementation of the above measures as an on-going process during construction phase.

#### 5.2.5 Community or public safety

The study area is situated in a rural area. Large construction vehicles, including trucks and other heavy machinery, will impact on road safety circumstances on the roads they use, and it is the duty of the contractor to ensure that safety measures are implemented and adhered to.

The safety of the community throughout the construction period is of utmost importance. As road safety awareness is imperative, the following important actions must be noted that will assist in the management of safety during the construction phase where necessary:

- Adequate and correct caution signage and road marking during construction in accordance with the requirements of the South African Road Traffic Signs Manual and the CSRA / CUTA Road Signs Note 13. (Workers with red flags, visible workers and vehicles etc.)
- No soiling of road surfaces, causing accidents.
- A maximum of fifteen workers (if any) may be housed on-site, mainly to guard material and machinery. This will assist in managing and maintaining safety and security at appropriate levels.
- Names and identification numbers of each worker housed on-site must be provided by the contractor.

**Implementation responsibility:** The main contractor will be responsible for the implementation of the above measures as an on-going process during construction phase.

#### 5.2.6 Waste disposal and management

It is crucial to implement strict and effective waste control and waste management procedures during the construction phase. No littering by any personnel is permissible. The site manager/contractor should conduct regular site clean-ups to keep the site litter free - as litter is not only aesthetically displeasing, but it is also harmful to the environment. All domestic solid waste produced must be disposed of in waste bins situated on site. The bins should be emptied into a covered skip (for storage) on a regular basis, until its collection and removal to a municipal waste disposal site (preferably on a weekly or bi-weekly basis).

No liquid waste material should be disposed of on or near the site during construction, or in any non-designated areas. A firm arrangement must be made to place chemical toilets on the construction site (within the construction camp to be erected). A sufficient number of chemical toilets need to be provided; in the range of 1 per every 8 workers. These toilets must be well maintained and inspected on a daily basis to ensure that they are clean and functioning properly. The toilets must be within walking distance from the work areas. No person is allowed to use any area, other than the chemical toilets provided, as a toilet. No washing of people and/or goods should take place on cleared surfaces, as this water should not be allowed to drain into any of the adjacent storm water canals.

In the event of accidental spillage of liquid substances, like paints and resins, it is important to implement the correct emergency procedures and cleaning-up operations. Pollution of surfaces should be limited at all costs.

The generation of construction waste occurs at every site under development and construction. Due to the costs involved in the disposal of this material at municipal or other licensed waste sites, the contractor or sub-contractor may be tempted to illegally dump waste at concealed locations to save on costs. Therefore, strict control is required from the main contractor on site to control this issue. Proof of disposal of waste material at a registered waste disposal site must be shown after off-loading of each waste load, which should then be logged or registered for control purposes. Control measures in terms of the National Building Regulations and standard requirements laid down by the local authority, with regards to spillage and waste disposal, must strictly be adhered to.

General waste disposal management involves the collection of construction waste at a central collection facility, which should be pre-arranged and implemented. This should include making points available for solid as well as liquid waste - including mechanical fluids disposed of during vehicle maintenance.

The site should be designed in such a manner that hazardous wastes are not located near the permitted fire making area. These areas shall be predetermined and located in areas that are already disturbed. This area should be on a concrete base to avoid any possible seepage into the soil. All hazardous waste must be stored in sealed and suitably marked containers for removal to a hazardous waste landfill site by the contractor on a bi-weekly

basis. Hazardous waste could include used oils and fluorescent light tubes, as examples. The contractor should refer to the relevant SANS 10228 guidelines (Identification and Classification of Dangerous Goods for Transport - Table 6: Minimum Requirements for Waste Classification) for the classification of hazardous waste.

**Implementation responsibility:** The resident engineer and contractor will be responsible for the implementation of the above measures as an on-going process during construction phase. Removal of waste from the terrain will be the responsibility of a certified waste contractor.

#### 5.2.7 Dust suppression

During the initial construction phase, it is anticipated that the generation of dust may occur. The management of dust generation during construction is of particular importance. Therefore, dust suppression, as a normal daily practice, is essential. This can be achieved by:

- Watering and compacting of exposed surfaces where dust is generated. This must be conducted and strictly monitored. Such surfaces also include construction areas and unpaved access roads as part of the construction site.
- On rainy days this should obviously not be implemented to avoid access mud generation and water accumulation.
- In dry hot weather conditions water spraying must be applied twice a day on surfaces.

**Implementation responsibility:** The main contractor will be responsible for the implementation of the above measures as an on-going process during construction phase.

#### 5.2.8 Noise

Another important aspect is the control of noise pollution. This is achieved by implementing the following measures:

- Ensuring that machinery and trucks are well-oiled and maintained; this will make less noise than poorly serviced construction equipment.
- Silencers can be fitted to exhausts of heavy vehicles to limit the noise they produce.
- Lastly, construction hours should be confined to daylight hours of a normal working day, specifically from 7 am to 5 pm in the summer and 7.30 am to 5 pm in the winter.
- No activities should take place on Saturdays after 14:00 and no actions must take place on Sundays.

**Implementation responsibility:** The main contractor will be responsible for the implementation of the above measures as an on-going process during construction phase.

#### 5.2.9 Vehicle Maintenance and Fuel Storage

- Lubricants and mechanical oils or mechanical fluids must be collected in separate containers or drums to be collected by waste contractors for disposal at hazardous waste sites.
- Used oils that can be refined must be made available to companies for collection.
- These containers must not be placed near any drainage ways.
- In the event of construction vehicle breakdowns or during routine maintenance checks, care must be taken to avoid oil, grease, or any mechanical fluid spills within the study area. Vehicles may not be serviced in or adjacent to the road reserve of the study area, thus servicing must be limited to the designated areas or workshops.
- No temporary fuel storage tanks or containers may be erected near drainage courses and refueling must be done by means of a fuel bowser.
- Fuel storage areas must be bunded effectively and all applicable safety standards must be adhered to. The bunded area around the fuel storage areas should be able to contain 110% of the volume of the fuel container inside it.
- All fuel storage areas must be fenced and secured.

**Implementation responsibility:** The main contractor will be responsible for the implementation of the above measures as an on-going process during construction phase.

#### 5.2.10 Archaeology and Cultural Sites

- Should archaeological objects of any nature (including fossils, graves or remains of structures) be found, the developer will stop all construction activity, and notify REC immediately. The Provincial Heritage Resources Agency (PHRA) will be consulted for further investigation and clarification.
- All finds of human remains must be reported to the nearest police station.
- Human remains or any burial ground or part thereof that are deemed to be of cultural significance may not be destroyed, damaged, altered, exhumed, or removed from their original positions without a permit from the PHRA.
- Work in areas where artefacts are found must cease immediately.

- Under no circumstances must the Contractor, his/her employees, his/her sub-contractors, or his/her sub-contractors' employees remove, destroy or interfere with archaeological artefacts. Any person who causes intentional damage to archaeological or historical sites and/or artefacts could be penalised or legally prosecuted in terms of the National Heritage Resources Act, 25 of 1999.
- A fence at least 2 m outside the extremities of the site must be erected to protect archaeological sites.
- All known and identified archaeological and historical sites must be left untouched.
- Work in the area can only be resumed once the site has been completely investigated. The Project Manager will inform the Contractor when work can resume.

**Implementation responsibility:** The main contractor will be responsible for the implementation of the above measures as an on-going process during construction phase.

#### 5.2.11 Construction camp establishment (if used)

- Workers that are allowed to live on-site should be kept to minimal numbers. Those workers present at night should be on site only to look after construction equipment and to take register of the workers present on site to eliminate crime in the area.
- Any temporary structures will be soundly built and will not pose a danger to personnel.
- The contractor must supply cooking facilities (preferably gas) if labourers are to be housed at the site.
- No fires will be permitted outside the construction camp and adequate firefighting equipment, which complies with fire and safety regulations, must be available at the construction camp site at all times (at least one all-purpose 12,5 kg extinguisher)
- Chemical toilets to be supplied at the construction camp for labourers accommodated on site. They may also use existing facilities on site.
- Welding, gas cutting or cutting of metal will only be permitted inside the construction camp.
- The contractor will supply 210 litre drums at the construction camp, as well as at the construction site, for the storage of domestic waste.
- Recyclable waste including glass, paper and plastic shall be separated at the construction camp, stored, and recycled (where economically feasible).

- Waste must be removed on a weekly basis to a registered waste disposal facility, or through the utilisation of existing municipal waste removal systems.
- As far as possible, local labour should be employed during the construction period.

**Implementation responsibility:** The main contractor will be responsible for the implementation of the above measures as an on-going process during construction phase.

#### 5.2.12 General rehabilitation of the construction site

It is important that rehabilitation will commence as soon as feasible on each of the construction areas to run concurrent with the construction phase and not to be left until completion of the works. This will increase the chances of successful rehabilitation.

All areas disturbed by development activities will be rehabilitated on completion of the construction phase. The following general procedure will be followed:

- Removal of all construction facilities and materials from site, cleaning up of any remaining oil or other spills and removal of all construction waste from site.
- Shaping of the disturbed areas to blend with the surrounding landscape.
- Placing of topsoil on all disturbed areas (minimum depth 150 mm).
- Organic fertilizers must be added to the topsoil prior to seeding (if required).
- Re-vegetation of all areas where topsoil is placed using a mixture of indigenous grasses and bushes.
- Maintenance of these areas until an acceptable cover has been established. Acceptable cover shall mean 75% ground cover with no gaps exceeding 500 mm. Maintenance may include watering, mowing, and weeding as well as preventing the development of erosion channels or, backfilling where they have occurred.

#### 5.2.13 Stockpile Areas

Once stockpiles have been removed the ground surface is to be inspected for compaction. Should it be required, the surface is then to be ripped and the prescribed re-vegetation process followed.

#### 5.2.14 Rehabilitation of Construction Camps

Rehabilitation will be necessary in the following areas:

- Concrete and compacted earth platforms.



- Removal of fuel storage tanks.
- Removal of chemical toilets.
- Access roads running into and through the camps.

Concrete platforms will need to be broken up and rubble removed. The prescribed re-vegetation process must then be followed.

#### 5.2.15 Re-vegetation Process

The basic re-vegetation steps which will be implemented where and if required are detailed below:

Step 1: Prepare the area to be re-vegetated for top-soiling - this may require soil ripping, scarifying and/or digging of steps or terraces. The scarification should take place to a minimum depth of 150 mm. If ridges are formed, they should be approximately 100 mm high and 400 mm wide.

Step 2: Stockpiled topsoil must be placed on areas to be re-vegetated to a minimum depth of 100 mm, spread when dry by means of hand raking or mechanical means to a uniform thickness.

Step 3: If required when sodding or hydro seeding, appropriate organic fertilisers must be applied and worked into the soil to a minimum depth of 150 mm.

Step 4: Fresh, good quality seed - which is certified by the supplier and free from contamination by seeds of other species - can be used for the re-vegetation process, although seed harvested from site is preferable. The rehabilitation grass seed mix will be seeded at a minimum density of 30 kg/ha, utilising a mixture of suitable species. The mixture must also always include at least one legume species.

Step 5: Mulch should be applied to protect the seeded area from erosion. The mulch should be composed of straw or other cellulose-rich material and free of undesirable seeds. The mulch must not be excessively fresh and green or in an advanced state of decomposition as it could smother growth. It must be applied to a depth and density that will prevent erosion by wind and water, but not completely block out the access of sunlight to the soil or prevent penetration by young plants.

Step 6: Re-vegetated areas are to be enclosed within an erected safety barrier to prevent excessive trampling and any other factors that might cause erosion or compaction. No road building equipment, trucks or other heavy equipment will be permitted onto re-vegetated areas.

Step 7: Re-vegetated areas must be irrigated on a regular basis, or as required.

Step 8: An appropriate maintenance and monitoring program must be implemented. This program will include monitoring of the success of seed germination, growth of the plants, removal of invasive weeds, replanting of areas where re-vegetation has not been successful once the cause of the inhibiting factor has been identified and remedied, and repair of any funnels or erosion channels.

### **5.3 Operational phase:**

**Timeframe: 30 years plus**

**Responsibility:** The applicant will be responsible for the implementation of the measures as an on-going process during operational phase.

Mitigation of impacts during the operational phase is of great importance, as there are long-term issues that are of relevance.

#### **5.3.1 Waste Management of domestic solid waste**

- General waste generated during the operation of the feedlot must be collected in waste bins that are emptied on a regular basis into a central waste collection facility.
- General waste is to be collected on a regular basis to be emptied at the nearest municipal solid waste disposal site. The products that will typically be generated are general refuse such as empty food cans, leftover foods, paper, plastic and bottles.
- Recycling is always desirable and if the separation of waste can be encouraged and implemented, this would be highly beneficial.

#### **5.3.2 Waste management of manure from feedlot**

The main waste product of a feedlot is manure. To maintain good conditions for workers and to ensure sound environmental performance, manure must be removed from feedlot pens

regularly. Some feedlots use bedding and this, along with small amounts of spoilt feed thrown into the pen during bunk cleaning, is removed with manure during pen cleaning. Thus, manure handling becomes a major ongoing part of feedlot management.

#### 5.3.2.1 Pen cleaning

Pens must be cleaned regularly to:

- optimise performance and welfare.
- present animals for pre-slaughter inspection in a clean condition.
- provide a safe work environment for staff (particularly pen riders).
- minimise odour levels.
- minimise dust during hot, dry conditions.
- promote good pen drainage.
- promote good integrity of the pen surface.
- minimise costs of pen maintenance.

Frequent, regular pen cleaning reduces the average depth of manure over the pens, promoting more rapid pen drying. Odour emissions from wet feedlot manure can be 50-100 times higher than from dry manure and the odour is more offensive. Even a small area of wet manure, such as a pothole, can be a significant source of odour. Regular pen inspection allows low spots to be identified early and repaired.

Muddy, odorous conditions do not provide a pleasant, safe working environment for pen riders and others working within the feedlot.

Weight gains can be reduced by 30-40% and feed conversion rates increased by 20-35% when are kept on deep manure. Wet, muddy conditions also adversely affect animal health, with increased incidence of foot problems such as foot abscesses.

##### 5.3.2.1.1 *The manure pad*

As manure deposited on the floor of feedlot pens dries and is compacted by the action of hooves, it typically forms layers. The lowest layer may be an 'interface' layer - a compacted, moist plastic mixture of manure and soil - which has low permeability and can reduce nutrient leaching through the feedlot pen. If there is no interface layer, the manure layer

overlies the feedlot base directly as a moist and plastic layer, sometimes with a crust on the surface.

The thickness of the manure layer depends upon the manure deposition rate, the pen cleaning frequency, weather conditions and other factors. Under dry conditions, about 20 mm of manure accumulates across the pens after 25 days, gradually increasing to about 30 mm after 75 days and to around 35 mm after 100 days. When the dry compact manure pack is moistened by rainfall, it may double in depth.

#### *5.3.2.1.2 Principles of pen cleaning*

Feedlot pens should be cleaned at least every 13 weeks. Ideally, pen cleaning should occur when the manure is moist (but not wet). Moist manure is more easily removed in a good even cut for a smooth pen surface. However, pens should be cleaned regularly even when conditions are not ideal.

If a manure-soil interface layer will be retained, it is necessary to determine the depth of manure covering it. In moist manure, a screwdriver pushed into the pad will encounter increased resistance at the interface layer. The difference is less distinct if the manure is hard and dry, and it may be necessary to dig into the pad to confirm the depth to interface.

The depth of manure and its moisture content will vary over the pen; for example, manure will accumulate and may be wetter under shade. During cleaning, care needs to be taken to prevent machinery from cutting too deep in different parts of the pen. If the manure is too hard, pen cleaning can be deferred until the manure moisture content increases.

Because of climatic conditions some feedlots do clean all manure from the feedlot floor. But this may include large amounts of soil or rock resulting in more material for processing, including manure screening. It may also increase pen maintenance needs and result in more wear and tear on manure handling equipment.

Attention to detail during pen cleaning is important to control odour since even small areas of wet manure can emit significant odour. Every time pens are cleaned, manure that has accumulated under fencelines, along the sides of feedbunks and water troughs and along aprons should also be removed. Cleaning under the bottom fenceline more frequently will also promote good pen drainage and fly control.

Manure can be temporarily mounded in the pens before stockpiling and composting, but never in drains or alleys.

Temporary mounding of manure in the pen may increase management flexibility because:

- decomposition reduces the mass of manure to be removed from the pen.
- pens can be cleaned as required and more regularly.
- the manure mound can be removed from the pen at a convenient time.

Mounds should be removed when conditions allow but also when:

- they become too high for machinery to practically and safely drive over them.
- they become a hazard to the welfare of sheep.
- they begin to disintegrate under dry conditions.
- manure haulage equipment becomes available.

To form stable mounds, the manure needs to be moist enough to be well compacted so that it can support the weight of sheep and also to exclude air. Mounds should be shaped so they shed runoff and located so as not to interfere with pen drainage. In unshaded pens, they should be situated in the centre of the pen with their long axis running down the slope. In pens with shade over the centre or top third of the pen, they should be located downslope of the shade structure.

#### *5.3.2.1.3 Pen cleaning equipment*

Equipment that can be used for pen cleaning includes:

- Tractor-drawn box scrapers - box scrapers are widely used in medium to large feedlots in conjunction with wheel loaders. These scrapers provide good depth control, a smooth pen finish, a single manure removal and mounding operation and a fast rate of manure removal. However, they are less effective in wet conditions when an excavator may need to be used instead.
- Wheel loaders - wheel loaders are widely used in medium and large feedlots for removing mounded manure from the pen. While they can also be used to quickly clean the pens, they often produce a rough surface finish and may damage the interface layer. Buckets should be fitted with small teeth to minimise damage to the pen surface.

- Excavators - excavators can efficiently remove manure, particularly under wet conditions, but need to be used carefully as it can be difficult to achieve good depth control and a smooth finish. They are efficient at transferring mounded manure into trucks.
- Skid-steer bobcats - bobcats can be used to tidy up small areas.
- Under-fence pushers - mounted on tractors, front-end loaders or bobcats, under-fence pushers are commonly used for removing manure from under fencelines, around shade posts and water troughs; and manure and spilt feed from feed bunk aprons.
- Slider blade - mounted on a skid steer bobcat, the slider blade can be used in place of an under-fence pusher but can also clean drains and lanes.
- Graders - graders are suitable only for cleaning large pens; they provide good depth control and a smooth finish.

### 5.3.3 Waste management of mortalities

Increased public concern for the environment and resulting stricter regulations governing the disposal of mortalities present new challenges. The usual way of dealing with carcasses in the past was by burial or incineration. Buried animals can contaminate ground water and smoke from incineration contaminates the air. In most cases currently carcasses are disposed of on the farm itself, thereby promoting bio-security and the prevention of collection trucks entering the farm grounds.

Composting (as an alternative) is an inexpensive and environmentally friendly way to dispose of carcasses.

*A different technique regularly used in the US is (that is also be implemented in RSA):*

Mortality composting is begun by placing a 30 cm layer of cover material (wood shavings) in the bottom of the bin (a bin is built from treated wood, concrete or bales of hay, over a concrete floor with a tin roof) (please refer to the attached articles for drawings and images). Decaying carcasses release excess moisture, so a thick absorptive base layer (wood shavings) plays an important role in preventing release of excess liquid. Carcasses placed in the composting bins should not touch each other and should be at least 22.5 to 30 cm from bin walls. Too many carcasses in one spot leads to localized wet spots and poor decay. Carcasses that are too close to the cool exterior side walls of the bin will decay slowly and

are less likely to be exposed to the high temperatures necessary to kill disease-causing microorganisms.

After a layer of carcasses has been placed in the bin, according to the article, 15 to 22.5 cm of cover material must be added. Complete coverage is essential to avoid problems with insects, rodents, and scavengers. Daily layering of new carcasses and cover material continues until the bin is filled to a depth of about 1.6 m. In some instances, it may help to segregate large and small carcasses in separate bins. This allows smaller carcasses to move through the treatment process quickly, minimizing the amount of bin space tied up in lengthy treatment cycles. To ensure continuous coverage throughout the composting cycle the article refers to the fact that it may be necessary to add cover material from time to time as material within the bins settles. This is particularly true when large carcasses are composted. In a properly operating facility, new material added to bins reaches temperatures of 50 to 65°C within 24 to 48 hours. Internal temperatures can be monitored with a long stemmed (90- to 120-cm) composting thermometer.

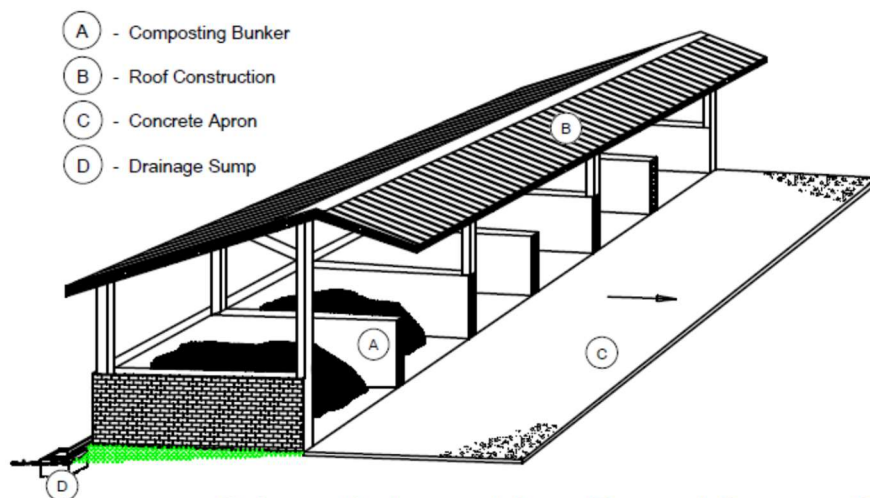
For an accurate picture of internal conditions, probe the bin at several locations. It is normal to find hot and cool spots within the same bin, so a single temperature measurement can be misleading. If a bin fails to heat up, too much or too little moisture is the most common cause. It may be necessary to unload the bin and mix-in compost from an active (hot) bin to remedy the problem. After a bin is completely filled, it must undergo a primary heating cycle of 60 to 90 days. The length of the primary heating cycle will vary with the size of carcasses placed in the bin. For farrowing house and nursery losses, an initial heating cycle of as little as 30 days may be adequate. If the bin is filled with larger market-weight animals or breeding stock, primary heating cycles as long as 6 months may be necessary.

Following the primary heating cycle, the partially composted carcasses are removed from the primary bin and placed in a secondary bin. The mechanical action of moving the compost breaks up the pile, redistributes excess moisture, and introduces a new oxygen supply. Once this takes place, a secondary heating cycle occurs, accompanied by further decomposition.

By the end of a 60- to 90-day secondary heating cycle, even large carcasses of breeding stock are normally reduced to a few large bones that are free of soft tissues which cause odours or attract insects and predators.



An example of the composting facility below:



Schematic Lay-out for a Fenced Carcase Composting Facility

#### 5.3.4 Water usage

- |   |  |
|---|--|
| <ul style="list-style-type: none"><li>• The water used that is supplied from the onsite bore hole should be carefully managed to ensure that water extraction does not exceed the maximum amount allowable as indicated on the water licence application.</li><li>• The water to the houses should be under constant pressure to ensure sufficient water supply to the feedlot.</li></ul> |  |
|---|--|

#### 5.3.5 Management of odour, dust and flies

Odour, dust and flies can cause conflict with neighbours, create an unpleasant workplace and affect performance and staff welfare.

Odour at feedlots is mainly the result of anaerobic breakdown of organic matter, primarily in manure but also in waste feed. While good siting and feedlot design (particularly drainage) are vital in minimising odour, good hygiene and waste management are also imperative.

Odour release sites at a feedlot can include:

- pens and handling facilities.
- drainage systems including sedimentation tank or basin and effluent holding pond.
- feed storage and preparation areas and silage pits.
- manure and effluent utilisation areas.

Two days after wetting, odour emissions from wet feedlot manure can be 50-100 times higher than those from dry pads and the odour is more offensive. Even a relatively small area of wet manure could be a significant odour source.

Pad temperature and moisture content are the most important factors influencing odour emissions from the pen (Nicholas et al. 2004). However, the depth of manure influences the rate of pad drying and hence the length of time over which higher odour levels persist.

Odour emission rates for sedimentation basins are generally greater than those from holding ponds. Pond rates under stable conditions are generally very low, but they can suddenly increase greatly after a significant inflow.

Odour from manure stockpiles, compost piles and silage pits are similar to those of feedlot pads. The character of odour from these sources seems to be less offensive than those from pads and ponds.

To minimise odours, limit the depth of manure over the pad, maintain an even feedlot surface and use practices that facilitate rapid drying of manure. Odour is reduced by cleaning pens frequently, and regularly removing:

- manure or waste feed that has accumulated under fencelines and may impede drainage.
- manure that accumulates along feedbunks, water troughs and aprons.
- manure that settles in the drains, settling pit or sedimentation basin after rainfall.

As manure stockpiling areas can be a source of odour under wet conditions, good drainage from the windrows themselves and the pad is important.

#### 5.3.5.1 Odour control

Areas or activities where there are opportunities to control odours include:

- pen cleaning
- cleaning of drains and sedimentation tanks and basins
- pond desludging
- manure screening

- manure spreading
- effluent irrigation
- disposal of mortalities.

As there is some flexibility in the timing of these activities, it is useful to have a basic understanding of atmospheric conditions that can disperse odours. Atmospheric conditions and their effects on odour dispersal are:

- Unstable atmosphere - typically the atmosphere is unstable on a warm sunny day when hot eddies of air rise from the land surface and cause significant mixing of the atmosphere. Odours are rapidly dispersed and carried upwards, quickly reducing odour intensity away from the feedlot. Because these conditions promote rapid dispersion, they are ideal for carrying out most odour-generating activities.
- Stable atmosphere - occurs on cold, still clear nights when the air at the land surface stays cool and remains trapped below an inversion layer. Little atmospheric mixing occurs below this layer and there is little dispersal of odours. Odours remain at relatively high intensity at some distance from the feedlot. These conditions are unsuitable for undertaking activities that will generate significant odour.
- Neutral atmosphere - occurs on heavy overcast days and odour dispersion is only moderate.

Effluent and manure utilisation should occur only when the prevailing weather conditions are unlikely to result in odour and dust nuisance for nearby residents. Consider the wind direction and strength, the time of day and the atmospheric stability. A plan showing the location of all nearby neighbours and a simple wind vane will help to show which neighbours are at risk of odour nuisance from effluent or manure utilisation on particular fields. It is also useful to understand the relative sensitivities of different neighbours to odour.

It can be worthwhile to develop an annual utilisation plan that takes into account seasonal wind directions, rainfall patterns and crops grown. Different paddocks might be selected for utilisation at different times of the year depending on risk.

To reduce odour nuisance to neighbours, spread manure or irrigate effluent:

- frequently to minimise events with large odour generation
- evenly

- in the morning when the air is warming rather than late in the afternoon
- as close to the ground as possible, particularly for spray irrigated effluent
- then as soon as possible harrow, disc or chisel plough to incorporate manure into the soil
- spray effluent as close to the ground as possible and avoid high-pressure guns.

But do not spread (or irrigate):

- if the wind is blowing towards a neighbour
- if rain or heavy cloud are expected - use weather forecasts
- just before weekends or public holidays, particularly if close to a public area
- very dry manure that will result in dust being blown towards neighbours.

Also:

- Eliminate all wet patches in drains and yards
- Avoid stockpiling wet manure as this produces very strong odours, even after spreading
- Train all staff in the mechanics and importance of odour dispersion
- Undertake public relations exercises - advise neighbours before spreading manure or irrigating effluent, even if winds will not blow towards them.

#### 5.3.5.2 Dust control

Dust in feedlot pens should be controlled for the comfort and safety of sheep and workers, and to avoid impacting amenity. The health effects of dust depend on their concentration, size distribution, composition and persistence. Large dust particles (>10 µm) are typically responsible for adverse aesthetic impacts (e.g., soiling and discolouration) rather than health concerns. Finer dust particles are strongly linked to respiratory symptoms; these fine particles can remain suspended in the atmosphere for days and travel long distances.

Dust concentrations can be high downwind of feedlots, with a peak concentration typically seen around sunset with increased movement and stable atmospheric conditions at that time. However, nuisance dust from the feedlot is unlikely to travel far enough to cause nuisance above that from other agricultural activities.

Control dust by minimising the depth of manure over the pad, by managing the moisture content of pad manure and by watering roads and lanes. For most feedlots, dust will need to be controlled only periodically.

Temporarily increasing the stocking density is one way to add moisture to the feedlot pad as it increases the rate of urine and faeces added to a given area. However, the capacity to vary stocking density may be limited by the conditions of the feedlot's licence or permit.

Mobile water tankers are useful for controlling dust on roads and lanes. Controlling dust loss reduces the exposure of sharp gravel so watering roads may provide an additional benefit through reduced wear and tear on tyres. Typically, tanker sizes range from 20,000-25,000 L up to 40,000 L capacity. These tankers should be fitted with 30-90 kW pumps to supply a discharge rate of 2,000-10,000 L/min. Depending on the design of the tanker nozzles, water can be spread in a band 2-24 m wide (Sweeten and Lott 1994). The main determinant of tanker efficiency is turnaround time for loading and travel between the load and spreading points. In large feedlots, this can be minimised by providing multiple fill-up points. Roads can also be sealed to eliminate dust from this source.

Amending feedlot pad surfaces with wood chips might cushion hoof impact that causes dust and reduce dust directly by decreasing evaporation from the pad.

Since pen cleaning disturbs pad manure and creates dust, it should be avoided when the manure is very dry. However, the pens still need to be cleaned at an acceptable frequency.

Spreading dry manure can generate significant dust and should be avoided, especially under windy conditions.

#### 5.3.5.3 Fly control

Feedlot operators consider flies to be a nuisance. The most important impacts (Vrech et al. 2004) are:

- ⇒ poorer working conditions
- ⇒ risk to human health
- ⇒ spoilage of feed
- ⇒ poorer animal welfare
- ⇒ potential for chemical residues

- ⇒ production losses.

Of the major fly species found at feedlots, only house flies and stable flies breed at the feedlot; other species predominantly breed elsewhere. Flies breed in a number of relatively small areas, the most common being manure, vegetation and moist areas e.g., in hospital and induction areas, under fence-line manure, drains, silage pits and heavily grassed areas adjacent to the feedlot.

Pen cleaning has a short-lived effect on fly breeding since manure quickly builds up under fences after cleaning. Because this manure is not trampled by the sheep it provides a good larvae habitat. Most feedlots use fly control including baits, insecticide sprays and traps. Fly baits have limited effectiveness as they attract and kill only adult house flies. There are also resistance issues with these. On the whole, insecticidal treatments have limited effectiveness.

Integrated pest management (IPM) systems that incorporate mechanical, physical, biological and chemical controls are likely to be most effective.

The RULES developed for control of nuisance flies at a feedlot site (based on Urech et al. 2004) are:

- Reduce fly breeding sites through
  - good manure management: clean under fencelines, sedimentation basins, drains, hospital pens and manure stockpiles.
  - clean up feed spilled near the bunks, hospital pens, stables and feed mill.
  - good feedstuff storage - some ingredients, such as molasses and silage, attract more flies. Clean up spills and keep silage well covered.
  - appropriate mortalities management - compost and cover completely.
  - maintaining the feedlot troughs, drains, sedimentation basins and vegetation management by mowing or slashing around the feedlot complex, particularly areas adjacent to drains and pens.
- Using insecticides selectively
  - rotate chemical groups
  - target insecticide use towards hot spots
  - use residual adulticides, particularly on resting sites rather than manure
  - use larvicides that will not affect beneficial insects

- use baits for house flies with rotation between chemical groups.
- Lot feeding design principles, including
  - suitable pen foundation and slope
  - good feed bunk and water trough design
  - fence design that allows for easy cleaning
  - good construction of drains, sedimentation systems and effluent holding ponds
  - well-designed manure stockpile and composting area.
- Enhancing populations of biological control agents through
  - biological control agents, such as parasitic wasps, predatory mites and entomopathogenic fungi, that can play an important role in killing larvae and flies; further development is needed
  - sustaining target parasite and predator populations through appropriate management
  - boosting parasite populations through strategic releases.
- Systematically monitor fly populations by
  - scouting adults and larvae to determine population thresholds
  - using traps for adults; larval density ratings for immatures
  - observing animals.

### 5.3.6 Noise impact management

The location of the development is adjacent to other farming practises. The significance of the noise impact associated with the development during the operational phase of the feedlot is low negative. Noise will be generated by the movement of vehicles such as delivery and pick-up trucks within the feedlot and the opening and closing of the security gate entrance. The following noise impact mitigation measures can be implemented:

⇒ The security gate entrance should be well-oiled at all times to prevent excessive noise.	
⇒ Speed limits should be enforced within the complex (speed bumps are one way of ensuring this), not only in terms of reducing noise levels, but also to ensure the safety of workers on the Feedlot.	
⇒ Deliveries and pick-ups with large trucks should be limited to twice a week on predetermined days of the week.	



⇒ Intentional disturbances to the sheep should be avoided to keep them calm, therefore making less noise.	
---	--

### 5.3.7 Compliance to standards

Compliance to all relevant regulatory standards and codes of practice is essential. An assurance that the development will comply with the relevant regulatory standards and codes of practice will be enforced by the Environmental Authorization to be issued by the Dept., providing that authorisation for the development is granted and also in terms of NHBRC guidelines, to which all building and services will comply.

Standards for Feedlots should be adhered and complied to.

<b>Implementation responsibility:</b> The applicant will be responsible for the implementation of the above measures as an on-going process during operational phase.
---

### 5.3.8 General provisions

Disposal of hazardous waste should be separately handled from domestic waste. This will help to prevent water and soil pollution. Hazardous waste includes substances such as paint, chemicals, razorblades, needles etc.

<b>Implementation responsibility:</b> The applicant will be responsible for the implementation of the above measures as an on-going process during operational phase. The applicant expressed his willingness to participate in this regard.
--

### 5.3.9 Utilisation of manure, compost, and effluent

Feedlot manure, compost and effluent can be valuable sources of nutrients and organic matter for improving soil fertility, structure, waterholding capacity and crop or pasture production. Careful management is needed to gain the most benefit from their utilisation while protecting environment and preventing impacts to neighbours.

While manure and compost may be spread off-site, effluent is less readily transportable, and its utilisation generally occurs on-site.

#### 5.3.9.1 Environmental protection for utilisation areas

Application of effluent and manure to land may pose a risk to the environment through:

- excessive nutrients or nutrient imbalances in soils
- loss of nutrients to surface waters through runoff
- nutrient leaching through soils into groundwater.

The risk of nutrient loss from utilisation areas can be prevented or mitigated by selecting areas that provide suitable land and buffers to sensitive sites, by using appropriate spreading or irrigation practices, and by regularly monitoring soil nutrient levels and responding appropriately.

Amenity can be protected from odour and dust by careful application practices and timing of utilisation, and by maintaining adequate separation distances to nearby sensitive land uses.

#### *5.3.9.1.1 Selecting a utilisation area*

When selecting a new utilisation area or assessing the viability of an existing utilisation area, the following should be considered:

- Nutrients are most efficiently removed by growing a high yielding crop that is harvested and transported from the site. Thus, the area should either be able to produce dryland crops reliably or should be irrigated.
- Select areas with good agricultural soils (e.g., adequate nutrients, plant available water capacity) with no serious limitations to plant growth (e.g., no subsoil constraints, not prone to salinity, waterlogging or flooding). The land should have a suitable topography for cropping (not steeply sloping).
- The utilisation area needs to be large enough to spread the nutrients in the wastes at sustainable levels. While it may be possible to use land with some significant limitations, this will require increased land area and/or management.
- Grazing removes nutrients at a slow rate and is not a preferred land use for utilisation areas. In addition, the recommended withholding period between effluent irrigation or manure spreading and grazing by stock is 21 days.
- Provide buffers between utilisation areas and watercourses, and unprotected aquifers (e.g., shallow water table covered by permeable soil).
- Provide adequate separation distances to nearby sensitive uses. Distance between utilisation areas and sensitive land uses such as residences and public amenity areas allows odour to disperse and reduces the likelihood of odour nuisance.

#### 5.3.9.1.2 Management practices that protect the environment

Good management of manure spreading, or irrigation is necessary to protect the environment. The following principles should be adopted:

- Apply the wastes at rates that are sustainable considering the nutrients, salts and organic matter of the waste stream, soil nutrient status, land use and expected yields and climatic conditions of the site. Supplementary irrigation helps ensure the crops grow and fully utilise the applied effluent.
- Do not spread or irrigate wastes if the soil is very wet or if heavy rainfall is imminent. This may promote increased drainage or runoff which can pose a pollution risk to groundwater and surface water.
- Control the effluent irrigation rate to prevent runoff.
- Spread manure and effluent evenly.
- Incorporate spread manure into the soil to a shallow depth.
- Monitor soil conditions on an ongoing basis.
- Record nutrient application rates and nutrient removal rates. This helps in understanding the ongoing suitability of utilisation areas and the likelihood of nutrient losses.
- Protect amenity by careful application and timing of utilisation.

#### 5.3.9.2 Manure and compost spreading

##### 5.3.9.2.1 Manure and compost utilisation practices

Most of the larger feedlots send at least part of their manure off-site. The spreading rates used on-farm by these feedlots are highly variable, ranging from less than 5 t/ha to more than 30 t/ha. Manure is mainly spread on land used to grow hay, silage or grain crops (O’Keefe et al. 2011).

Most of the smaller feedlots spread manure on their own or nearby land, typically at rates of up to 5 t/ha.

##### 5.3.9.2.2 Timing of manure and compost spreading

The ideal timing of manure applications depends on factors including:

- crop or pasture needs
- manure or compost maturity

- timing of other management events (cultivation to incorporate manure)
- field conditions (soil moisture)
- wind conditions.

On soils with low background nutrient levels, spreading manure just before sowing may result in crops that are less vigorous and lower yielding than those grown using inorganic fertilisers. This can occur because the nutrients in the manure are less available for immediate uptake by the plant roots. Nitrogen and phosphorus are present in manure and compost in both inorganic and organic forms; the latter have to be mineralised into inorganic forms to be available to the plants. Most potassium in manure is in the inorganic form and ready for uptake.

Applying manure 4-6 months before the crop is established allows nutrients to mineralise from their organic matter and reduces the risk of nitrogen draw-down, which may occur after aged manure is spread. However, nitrogen losses can increase if manure is applied too far ahead of crop planting, particularly if there is minimal incorporation of the manure. Nutrient availability is likely to be less of a concern if the manure is well-aged or composted before spreading, particularly if the soil has reasonable background nutrient levels.

Accessibility of manure nutrients to plant roots can also be an issue. In modern broadacre cropping systems, manure is generally broadcast before the crop is sown using low disturbance, no till (e.g., knife points and press wheels) or zero till (e.g., disc seed systems) seeding equipment. This results in little incorporation of manure at planting and minimal manure in the seed row close to the tiny roots of germinating crop seedlings. Minimal manure incorporation can also result in increased nitrogen losses. Thus, spreading manure as close as possible to planting is sometimes recommended to allow the crop to take up rapidly mineralised nitrogen as it becomes available. In many cases poor crop vigour is phosphorus-related.

The problems described above can be overcome by spreading manure annually or using a 'starter' application of inorganic phosphorus fertiliser with the manure just before planting. Depending on the background phosphorus levels in the soil, the fertiliser rates may be significantly lower than conventional application rates. The levels of available nutrients in paddocks planned for manure or compost spreading should be tested. Recent improvements in soil testing technologies such as DGT (Diffuse Gradients in Thin Films) tests have increased

confidence in making decisions on whether inorganic fertiliser should be applied in conjunction with manure applications.

If the paddocks are to be ploughed for sowing, spreading manure beforehand will allow it to be incorporated into the soil. If possible, manure should be spread when the soil is not too wet to limit compaction.

Manure spreading should be avoided under windy conditions especially if the wind is blowing towards nearby houses or public use areas.

To protect grazing livestock from risk of pathogens a withholding period of 21 days applies to paddocks that have been spread with manure or compost.

#### *5.3.9.2.3 Manure and compost spreaders*

There is a wide range of manure spreaders. The amount of manure for spreading the quality of the manure and the proposed spreading rate all determine which spreader will be most suitable. The cost and efficiency of manure spreading influences the value of manure as a fertiliser.

Purpose-built manure spreaders are typically categorised as rear or side discharge systems with capacities of 1-20 t. Rear discharge spreaders are usually equipped with a moving conveyor belt, moving floor chain or hydraulic push door that transfers manure to horizontal or vertical beaters, or spinning discs. Side discharge systems use a horizontal auger to transfer manure to the spinning discs or beaters. Both discharge systems can be self-propelled (i.e., mounted on a truck or tractor chassis) or towed behind a tractor as an independent unit.

Conventional fertiliser spreaders typically use a rear door to control the rate of fertiliser falling onto the spinning discs (to ensure accurate, uniform application rates). Chunks of manure can become trapped in the rear door and prevent manure from being uniformly spread over land. Hence, conventional fertiliser spreaders are not suited to applying unscreened manure.

The best coverage is often achieved by belt or moving floor-fed horizontal disc spinners with screened or composted manure. Belt-fed spreaders are less effective with inconsistent

manure. While side-delivery spreaders use more power, they are suitable for all manure. Horizontal beater spreaders also suit all manure but spread at higher rates.

The uniformity and time efficiency of manure application is highly dependent on manure physical properties. Manure with a low moisture content (<35% moisture) that has been either composted and/or screened can be effectively applied using a spreader with either beaters or spinning discs but inconsistent, lumpy manure can be effectively applied only using a spreader with beaters.

Operator efficiency influences where manure is spread on the paddock and at what rate. This is especially relevant for spreaders where operation speed influences the rate applied. Consistent spacings between spreader passes are important for covering the whole paddock evenly. GPS guidance aids the accuracy and efficiency of the spreading operation, reducing overlap and missed areas, compared to estimation by the operator.

#### *5.3.9.2.4 Off-site use of manure and compost*

Many feedlots provide at least part of their manure or compost to off-site buyers. Duty of care: manure utilisation can be provided to people buying manure to ensure they are aware of their duty of care.

#### *5.3.9.2.5 Manure transport*

To avoid manure spillage and associated odour or dust concerns, loads of manure being transported along public roads should always be covered.

#### *5.3.9.2.6 Utilisation of carcass compost*

The principles for utilising carcass compost are generally the same as those for manure or compost. Since carcass compost contains material of animal origin, it should not be spread on land that is being grazed.

### **5.3.9.3 Effluent irrigation**

#### *5.3.9.3.1 Effluent utilisation practices*

Most larger feedlots irrigate some effluent, generally using spray irrigation systems; some use surface irrigation. Effluent is mostly used to grow hay or silage crops although it is also used to produce grain.

#### 5.3.9.3.2 Timing of effluent irrigation

The timing of effluent irrigation will often be driven by the need to empty effluent ponds so that they are ready to receive future runoff. To reduce pathogen levels, effluent should be stored in the holding pond for at least a month before irrigating and then used to meet crop water demands like other irrigation. If a terminal pond is used to capture runoff from an effluent irrigation area this water should be irrigated back onto the land as soon as practical after any significant inflow.

Effluent applications should never raise the soil moisture content above field capacity and the application rate must be controlled to ensure runoff does not occur. Effluent should not be irrigated under heavy cloud, if rain is forecast or on windy days.

Effluent should not be irrigated in the four weeks before harvest on human food crops that will be eaten raw or with minimal processing. To protect grazing livestock from pathogen risks, a withholding period of 21 days after effluent irrigation is recommended.

#### 5.3.9.3.3 Practical effluent irrigation

A range of different effluent irrigation methods is available. The most suitable methods will depend on the following factors:

- effluent composition
- topography - slope and uniformity
- crop type - cultivation requirements, value, required accuracy and uniformity of application
- soils - permeability, sealing characteristics, water holding capacity, variability
- costs - capital, labour and energy
- physical shape of the utilisation area - fences, drainage lines, other infrastructure
- prevailing seasonal conditions.

The salt content of effluent may be a constraint and cause leaf burn, yield reduction and degradation of some soils and crop types. Sustainable effluent irrigation rates may need to be very low to manage the salt load. Management options could include using a low-pressure spray or drip system, effluent dilution with clean water, or following effluent with irrigation with clean water.



Some form of sprinkler irrigation is generally preferred to flood irrigation because:

- there is reduced potential for runoff and subsequent collection problems
- it can provide greater uniformity of application
- it can be used on soils with high infiltration rates (e.g., >10 mm/hr)
- it can accurately apply smaller quantities more regularly to more closely balance crop or pasture water requirements and utilise more effluent.

Travelling drip irrigation may also be an option. Small travelling irrigators generally operate at higher pressures to pivot and lateral move irrigators which means a higher operating cost per unit of water applied.

For irrigation of resuspended sludge or other effluent with a high solids concentration system, the irrigation system requires high pressure main lines to prevent settling in the pipeline, capacity for clean water flushing along the pipeline and large aperture spray nozzles.

In some cases, terminal ponds may be positioned below utilisation areas to capture the initial and possibly heavily polluted runoff from storm events and runoff from flood irrigation. Captured runoff should be re-irrigated onto the utilisation area when the soil has a suitable moisture content.

#### 5.3.10 Disease/Biosecurity management in general

The goal of biosecurity is to stop transmission of disease-causing agents by preventing, minimizing or controlling cross-contamination of body fluids (faeces, urine, saliva, etc.) between animals, animals to feed and animals to equipment that may directly or indirectly contact animals. Biosecurity management practices are designed to prevent the spread of disease by minimizing the movement of biologic organisms and their vectors (viruses, bacteria, rodents, flies, etc.) onto and within your operation. Biosecurity can be very difficult to maintain because the interrelationships between management, biologic organisms and biosecurity are very complex. While developing and maintaining biosecurity is difficult, it is the cheapest, most effective means of disease control available, and no disease prevention program will work without it.

Infectious diseases can be spread between operations by:

- the introduction of diseased sheep or healthy sheep incubating disease;
- introduction of healthy sheep who have recovered from disease but are now carriers;
- vehicles, equipment, clothing and shoes of visitors or employees who move between herds;
- contact with inanimate objects that are contaminated with disease organisms;
- carcasses of dead sheep that have not been disposed of properly;
- feedstuffs, especially high-risk feedstuff which could be contaminated with faeces,
- impure water (surface drainage water, etc.);
- manure handling and aerosolized manure and dust; and
- non-livestock (horses, dogs, cats, wildlife, rodents, birds and insects).

#### 5.3.10.1 Develop a biosecurity resource group

The first step is to develop a Biosecurity Resource Group/Team. The group should include people important to the success of your operation such as your operation supervisors, veterinarian, nutritionist, extension specialist, suppliers and others who may have special knowledge in control of biologic organisms. Generally, beef operations have been open to vehicle traffic and visitors. Of all the possible breakdowns in biosecurity, the introduction of new sheep and traffic pose the greatest risks to sheep health. Properly managing these two factors should be a top priority in your operation. Biosecurity plans should be developed to meet the specific needs of each operation.

Biosecurity has three major components:

- isolation,
- traffic control, and
- sanitation.

When effectively managed these components meet the principal biosecurity objective of preventing or minimizing cross-contamination of body fluids (faeces, urine, saliva, respiratory secretions, etc.) between animals, animals to feed and animals to equipment.

##### 5.3.10.1.1 Isolation

Isolation prevents contact between animals within a controlled environment. The most important step in disease control is to minimize commingling and movement of sheep. This includes all new purchases as well as commingling between established groups of sheep.

Even in operations that have high turnover, such as feedlots, keeping feeding groups from mixing is an important biosecurity measure. Isolate feedlot hospital sheep and return them to their home pen as soon as possible. Long-acting therapies have improved our ability to minimize movement of infectious organisms between groups. An important biosecurity action on ranches is to separate sheep by age and/or production groups. Facilities should be cleaned and disinfected appropriately between groups. Visit with your veterinarian about specific isolation management procedures and how they can be applied to control targeted diseases.

#### *5.3.10.1.2 Traffic control*

Traffic control includes traffic onto your operation and traffic patterns within your operation. It is important to understand traffic includes more than vehicles. All animals and people must be considered. Animals other than sheep include dogs, cats, horses, wildlife, rodents and birds. The degree of control will be dictated by the biology and ecology of the infectious organism being addressed, and the control must be equally applied.

Stopping a truck hauling sheep from driving onto your operation as a biosecurity measure for controlling Bovine Viral Diarrhea (BVD) may not be beneficial since the virus is spread from animal to animal. Buying sheep from herds that have a verifiable quality vaccination program would be more important in maximizing biosecurity. However, it would be important for the truck to have been adequately cleaned before hauling the sheep. Traffic control can be built into the facilities design. An example would be placing sheep loading facilities on the perimeter of the operation.

Traffic control within the operation should be designed to stop or minimize contamination of sheep, feed, feed handling equipment and equipment used on sheep. Pit silos should not be accessible from nonfeed handling equipment such as loaders used outside the feeding area or vehicles that travel outside the feed mixing and handling facility. No one (manager, nutritionist, veterinarian, banker – no one) should be allowed to drive onto the surface of a trench silo. The only equipment allowed should be the loader used for handling the feedstuff. In large pits, it may be acceptable to allow feed trucks to enter, provided they are loaded at least 100 feet away from the working face of the stored feed. If possible, separate equipment should be used for handling feedstuffs and manure.

Vehicles and employees should not travel from the dead sheep area without cleaning and disinfecting. The dead animal removal area should be placed in a location that allows rendering trucks access without cross-contaminating healthy sheep. Vehicle cleaning areas are becoming more common in commercial feedlots. Unfortunately, they are frequently used only for trucks and heavy equipment. Management should consider extending a decontamination policy to other vehicles (especially tires) that are used across biosecurity control areas on the operation. Ask your biosecurity resource team to help you evaluate traffic control on your operation.

#### 5.3.10.1.3 Sanitation

Sanitation addresses the disinfection of materials, people and equipment entering the operation and the cleanliness of the people and equipment on the operation.

The main objective of sanitation is to prevent faecal contaminates from entering the oral cavity of sheep (faecal - oral cross contamination). Equipment used which may contact sheep's oral cavity or sheep feed should be a special target. The first step in sanitation is to remove organic matter, especially faeces. Blood, saliva, and urine from sick or dead sheep should also be targeted. All equipment that handles feed or is introduced into the mouth of sheep should be cleaned, including disinfection as appropriate, before use. Loaders used for manure or dead sheep handling must be cleaned thoroughly before using for feedstuff. It would be best to use different equipment. Minimize the use of oral equipment and instruments such as balling guns, drench equipment and tubes. If used at processing and treatment, thoroughly clean and disinfect between animals. Store cleaned equipment in clean, dry areas. Avoid storage in tanks or containers containing disinfectants because most disinfectants are neutralized by organic material. Disease transmission is commonly traced to the use of those storage tanks.

#### 5.3.10.2 Good Management Practices (GMP) for Controlling Infectious Diseases

Develop a biosecurity plan and commit to its implementation. Committing to a biosecurity plan is a vital step toward controlling of infectious disease. Keeping pathogens out of a herd improves production efficiency, lowers costs and reduces risks to employees and family.

#### 5.3.10.3 Biosecurity GMP Checklists

Review the checklists below and discuss each item with your veterinarian to decide what is applicable. Ask your veterinarian to rank the biosecurity importance of each item (0 = not

important, 5 = very important). Check Y (yes) or N (no) if the biosecurity item is being addressed.

### General Good Management Practice (GMP) Checklist

- Notes*                      *Rank importance of each GMPs in biosecurity and note if being addressed:*
- \_\_\_\_\_ Meet all of the Beef Quality Assurance Good Management Practices and Guidelines.
- \_\_\_\_\_ Understand it is more profitable to prevent problems than to correct problems.
- \_\_\_\_\_ Agree that doing things right the first time is a critical part of biosecurity.
- \_\_\_\_\_ Biosecurity requires some method of sheep identification. An identification system in place.
- \_\_\_\_\_ Can readily track and validate management practices used on my sheep.

### GMP Checklist for Sanitation

- Notes*                      *Rank importance of each sanitation measure in biosecurity and note if being addressed:*
- \_\_\_\_\_ Attempt to prevent manure contamination of feed and equipment used orally.
- \_\_\_\_\_ Clean equipment used orally between animals.
- \_\_\_\_\_ Attempt to prevent cross contamination between healthy and sick/dead sheep.
- \_\_\_\_\_ Regularly evaluate the activities on my operation to assess the potential for contaminating sheep.

\_\_\_\_\_ If manure accidentally contaminates feed or water, an immediate remedy is provided.

### GMP Checklist for Equipment

*Notes* Rank importance of each equipment item in biosecurity and note if being addressed:

\_\_\_\_\_ Use different equipment to feed and to clean pens or completely clean between use.

\_\_\_\_\_ Never step in the feed bunk.

\_\_\_\_\_ Never leave manure-hauling equipment in pens with different groups of animals.

\_\_\_\_\_ Clean contaminated vehicles and equipment before use around healthy sheep.

\_\_\_\_\_ Routinely clean and disinfect feeding equipment and sheep handling equipment.

\_\_\_\_\_ Routinely clean and disinfect equipment used to medicate sheep.

### GMP Checklist for Disease Containment

*Notes* Rank importance of each disease containment item in biosecurity and note if being addressed:

\_\_\_\_\_ Facilities provide a clean area for restraint, treatment and isolation of sick sheep.

\_\_\_\_\_ Facilities prevent cross contamination of water, manure, feed, or equipment between groups.

\_\_\_\_\_ Have a plan to manage group size, age distribution, and animal flow to reduce risk of disease.

- \_\_\_\_\_ Handle highest health status animals first (young calves, healthy older sheep and sick animals last).
- \_\_\_\_\_ Everyone uses strict sanitation practices
- \_\_\_\_\_ All animals that die are examined by a veterinarian (necropsy).
- \_\_\_\_\_ Veterinarian collects blood samples from all cows that abort.
- \_\_\_\_\_ Have visitors observe our strict sanitation practices.
- \_\_\_\_\_ Clean contaminated vehicles and equipment before use around healthy sheep.

### **GMP Checklist for Preventing Infectious Disease from Entering All Operations**

*Notes Rank importance of each disease entry item in biosecurity and note if being addressed:*

- \_\_\_\_\_ Know the health history of the herds from which sheep are purchased.
- \_\_\_\_\_ Know the health status of animals brought into my operation.
- \_\_\_\_\_ My veterinarian talks to the seller's veterinarian prior to buying animals.
- \_\_\_\_\_ Never bring in animals without knowing their vaccination history.
- \_\_\_\_\_ Never buy animals from a herd that has mixed origin sheep.
- \_\_\_\_\_ Transport animals in clean vehicles.
- \_\_\_\_\_ Have a control program for outside animals which could spread disease (rodents, etc.).
- \_\_\_\_\_ Loading area is located at the perimeter of the operation.
- \_\_\_\_\_ Dead animal pickup area located so rendering trucks do not contaminate my operation.

\_\_\_\_\_ Limit people's access to my sheep pens, feed mixing and storage area, and treatment area.

\_\_\_\_\_ Keep a record of visitors to my operation.

### **GMP Checklist for Strategic Vaccine Use**

*Notes Rank importance of each strategic vaccine item in biosecurity and note if being addressed:*

\_\_\_\_\_ Have a written strategic vaccination plan for my operation.

\_\_\_\_\_ Know when and how to use the vaccines listed in the vaccination plan for my herd.

\_\_\_\_\_ Discuss the vaccination history of all sheep purchased before the sheep enter my operation.

### **GMP Checklist for controlling Salmonella**

*Notes Rank importance of each Salmonella control item in biosecurity and note if being addressed:*

\_\_\_\_\_ Realize that my family and employees can be infected with salmonella from sheep.

\_\_\_\_\_ Isolate sick sheep in hospital area and prevent cross contamination.

\_\_\_\_\_ Discuss proper antibiotic use with my veterinarian.

\_\_\_\_\_ Clean all instruments and equipment used on sick sheep between sheep.

\_\_\_\_\_ Provide dry, clean, disinfected calf and maternity pens.

\_\_\_\_\_ Test purchased feed for salmonella once per year.

\_\_\_\_\_ Restrict birds, cats, rodents and stray animals from access to my operation's animal feed and water.



\_\_\_\_\_ Do not allow rendering trucks to access feed or animal areas.

**PERSONNEL (INCLUDING FAMILY MEMBERS, EMPLOYEES, VISITORS)** People who handle animals should be limited to those with clean clothing, clean footwear, and clean hands. This can also protect people from zoonotic diseases that animals can spread to people.

YES	NO	
<input type="checkbox"/>	<input type="checkbox"/>	Do you limit who has contact with your animals?
<input type="checkbox"/>	<input type="checkbox"/>	Do you ask all people handling animals to sign in and disclose their last known livestock contact?
<input type="checkbox"/>	<input type="checkbox"/>	Do you restrict people who have traveled internationally from entering your operation?
<input type="checkbox"/>	<input type="checkbox"/>	Do you provide/require clean footwear for people entering animal areas?
<input type="checkbox"/>	<input type="checkbox"/>	Do you provide gloves or a handwashing station with running water, soap, and towels for animal handlers?
<input type="checkbox"/>	<input type="checkbox"/>	Do you provide/require clean clothing for people entering animal areas?

#### ANIMAL MOVEMENT

Animals moving on and off your property can introduce and spread disease if biosecurity steps are not taken.

YES	NO	
<input type="checkbox"/>	<input type="checkbox"/>	Are your livestock individually identified?
<input type="checkbox"/>	<input type="checkbox"/>	Do you record all animal movement on and off the premises?
<input type="checkbox"/>	<input type="checkbox"/>	Do you buy animals only from places with similar or stricter biosecurity programs?
<input type="checkbox"/>	<input type="checkbox"/>	Are new or returning animals separated (quarantined) from all other livestock for 21-30 days before mixing with your home flock?
<input type="checkbox"/>	<input type="checkbox"/>	Is separate feed and water equipment used for new or returning animals?
<input type="checkbox"/>	<input type="checkbox"/>	Are sheep from outside sources tested for common diseases before mixing with the home flock?
<input type="checkbox"/>	<input type="checkbox"/>	Do you have an emergency plan to care for your animals in the event of a natural disaster or other event that could stop animal and supply movement?

#### ANIMAL PRODUCTS

Animal products (semen, embryos, milk) can also introduce disease if biosecurity steps are not taken.

YES	NO	
<input type="checkbox"/>	<input type="checkbox"/>	Do you purchase semen/embryos from operations with similar or stricter biosecurity programs?
<input type="checkbox"/>	<input type="checkbox"/>	Do you record all semen/embryo movement on and off the premises?
<input type="checkbox"/>	<input type="checkbox"/>	Do you limit purchases of colostrum/milk to pasteurized sources?

#### CARCASS DISPOSAL

Farms and ranches lose animals due to disease. Dead animals should be disposed of to prevent exposure to live animals. Carcass disposal may include burial, burning, composting, landfill, or rendering. Local and state rules on carcass disposal must be followed.

YES	NO	
<input type="checkbox"/>	<input type="checkbox"/>	Do you know the approved options to dispose of carcasses in your area?
<input type="checkbox"/>	<input type="checkbox"/>	Are rendering trucks or other vehicles that haul dead animals to a common disposal site restricted from entering your property?
<input type="checkbox"/>	<input type="checkbox"/>	Are dead animals disposed of in a way that prevents the attraction of wildlife, rodents, and other scavengers?

#### MANURE MANAGEMENT

Manure can be good for the soil but can also contain disease causing germs. Safe handling can help prevent animal and human disease. Local and state rules on manure disposal must be followed.

YES	NO	
<input type="checkbox"/>	<input type="checkbox"/>	Is animal housing regularly maintained to prevent manure buildup?
<input type="checkbox"/>	<input type="checkbox"/>	Is manure removed and stored to prevent exposing young animals to disease agents?

#### RODENT, WILDLIFE, AND OTHER ANIMAL CONTROL

Wildlife, rodents, birds, and other animals like cats and dogs can carry disease on their fur, feet, feathers, or faeces. Keeping these animals away from animal areas takes effort.

YES	NO	
<input type="checkbox"/>	<input type="checkbox"/>	Do you have an on-farm person or professional company place and monitor rodent/pest bait use according to label directions?
<input type="checkbox"/>	<input type="checkbox"/>	Are steps taken to minimize bird and rodent nesting around your operation?
<input type="checkbox"/>	<input type="checkbox"/>	Is trash removed often?
<input type="checkbox"/>	<input type="checkbox"/>	Are roaming dogs and cats prevented from roaming between operations?

## FEED AND WATER

Feed and water are essential for animal health. Proper handling is important to prevent contamination.

YES	NO	
<input type="checkbox"/>	<input type="checkbox"/>	Is fresh, clean water available to all animals throughout the day?
<input type="checkbox"/>	<input type="checkbox"/>	Are waterers and the areas around them regularly cleaned, and debris removed?
<input type="checkbox"/>	<input type="checkbox"/>	Do you have a plan to provide water to livestock if it becomes unfit to drink?
<input type="checkbox"/>	<input type="checkbox"/>	Do you purchase feed only from reputable sources with a quality control program?
<input type="checkbox"/>	<input type="checkbox"/>	Is grain and feed delivered, stored, mixed, and fed in a manner that minimizes contamination?
<input type="checkbox"/>	<input type="checkbox"/>	Are feed spills cleaned up immediately?
<input type="checkbox"/>	<input type="checkbox"/>	If the same equipment is used for feed and manure handling, is it thoroughly cleaned and disinfected before used for feeding?
<input type="checkbox"/>	<input type="checkbox"/>	Are feeders and the areas around them regularly cleaned, and debris removed?

**The client must contact a veterinary practice to help manage and implement a biosecurity plan for the feedlot and also do monthly inspections as part of the biosecurity plan.**

### 5.4 Closure phase

**Timeframe: 5 months**

**Responsibility:** The applicant will be responsible for the implementation of the measures as an on-going process during closure phase.

- The physical and chemical stability of the remaining structures on site should be appropriately secured.
- The site should be securely fenced off and all remaining structures securely locked up.
- The physical integrity of the remaining structures on site should under no circumstances be allowed to deteriorate to an extent that makes the site visually unpleasant.
-

## 6. PROPOSED MECHANISMS FOR MONITORING

It is recommended by the Environmental Practitioner that an Environmental Control Officer (ECO) be appointed by the applicant. The ECO will be the person involved with the development of the project and also be responsible for the monitoring of the implementation of the EMPr. It may be different parties during the different phases of the project.

- This person may be appointed by the appointed engineer or indirectly by the applicant/client. It must, however, be a person with adequate technical and environmental knowledge to understand and implement this management programme.
- The ECO may not be someone appointed by the contractor.
- The ECO must report to the applicant on a regular basis or frequency.
- The ECO has the authority to stop works during construction if in his opinion there is a serious threat to, or impact on the environment caused directly from the construction operations. This authority is to be limited to emergency situations (see definitions) where consultation with the engineer or developer is not immediately possible. In all such work stoppage situations the ECO is to inform the engineer and developer of the reasons for the stoppage as soon as possible.
- Upon failure by the contractor or his employees to show adequate consideration to the environmental aspects of this contract, the ECO may recommend to the engineer to have the contractor's representative, or any employee(s) removed from the site or work suspended until the matter is remedied. No extension of time will be considered in the case of such suspensions and all costs will be borne by the contractor.

Monitoring will be done on monthly, weekly or quarterly basis and a report will be submitted to the relevant authority for checking compliance with the EMPr. This report will give a point scale of implementation measures. This may be the construction site manager, contractor, safety officer, and engineer.

### CONSTRUCTION PHASE

MONITORING TYPE	FREQUENCY			
	DAILY	WEEKLY	MONTHLY	QUARTERLY
WEED ERADICATION			X	
EROSION CONTROL			X	
WASTE MANAGEMENT		X		
DUST CONTROL	X			
NOISE MONITORING	X			
SAFETY	X			
BOREHOLE				X
HAZARDOUS SUBSTANCE			X	

Compliance with the EMPr was rated according to the system detailed below:

SCORE	COMPLIANCE RATING	DEFINITION
5	Full Compliance	All requirements and conditions have been addressed or met.
4	Substantial Compliance	Between 75 and 100% met
3	Broad Compliance	Between 50 and 75% met
2	Partial Non-Compliance	Between 25 and 50% met
1	Non-Compliance	Less than 25% met
0	Major Non-Compliance	None of the requirements and conditions has been addressed or met.

Outlined below are a number of steps, relating to increasing severity of environmental problems, which will be implemented. The principle is to keep as many issues within the first few steps as possible.

**Step 1:** The ECO discusses the problem with the contractor or guilty party, and they work out a solution together. The ECO records the discussion and the solution implemented. This detection together with the solution will be included in the monthly monitoring report.

**Step 2:** The ECO observes a more serious infringement, and notifies the guilty party in writing, with a deadline by which the problem must be rectified. All costs will be borne by the contractor. This incident will be included in the monthly monitoring report.

**Step 3:** The ECO shall order the contractor to suspend part, or all, the works. The suspension will be enforced until such time as the offending party(ies), procedure or equipment is corrected and/or remedial measures put in place if required. No extension of time will be granted for such delays and all cost will be borne by the contractor. The Department of Environmental Affairs shall be involved, and penalties will be allocated. In this time the department can decide to submit a pre compliance notice and has authority to withdraw the Record of Decision.

## 7. ENVIRONMENTAL AWARENESS PLAN

### 7.1 Training programmes:

1. Occupational Health and Safety (OHS) - Done internally by Health of Officer.
2. Personal Protection Equipment (PPE) - Done internally by Safety Officer.
3. Environmental training
  - a. program 1 - Introduction to Environment, Ecosystems and Habitats. Including symbiotic interactions.
  - b. program 2 - Environmental Degradation, Soil, Air, Noise, Water and Ground water Pollution. Erosion.

Programmes 1 and 2, the OHS and PPE training is something that is done either annually or bi-annually depending on the need identified by management of the development. The environmental training and awareness will be implemented a.s.a.p. before the construction phase begins. Management will also arrange for training bi-annually for 2-to-4-hour sessions at a time. Training will either be done internally or externally. Internal training will be done by the Environmental Management Department and externally training providers will be sourced as approved by the owner of the site.

## **7.2 Monitoring of awareness**

Bi-monthly Health and Safety meetings are held where relevant issues regarding health, safety and environment are discussed, and feedback is given. Environmental awareness should be incorporated into the compulsory 'Toolbox talks' that include health and safety issues. These should be done on a monthly basis.



**8. A TABULAR VERSION OF ENVIRONMENTAL ASPECTS, IMPACTS, MITIGATION AND PERSONS RESPONSIBLE**

ENVIRONMENTAL ASPECT AND PROJECT STAGE	ENVIRONMENTAL COMPONENT THAT MAY BE AFFECTED	LOCALITY / APPLICABLE ZONE OF THE IMPACT	NATURE AND DESCRIPTION OF THE IMPACT/ISSUE BEFORE MITIGATION	NATURE OF THE IMPACT/ISSUE AFTER MITIGATION
Vegetation clearance for the footprint of the proposed development(C). Clearance of vegetation in the establishment of infrastructure (C)	Soil layers, soil surface, indigenous vegetation cover.	On-site for each site.	<p>The removal of vegetation cover, such that the soil surface is exposed, may lead to increased soil erosion in certain areas. The existing vegetation will be permanently removed to accommodate the footprint of the development. Where the removal of surface vegetation is of a temporary nature only, the establishment of weeds is a threat. The topsoil layer is required to rehabilitate the area (i.e., for landscaping the area).</p> <p>Probability = 3 (improbable)                      Intensity = 2 (low intensity)                      Duration = 2 (short term)                      Severity = 2x2=4 (rating 2)                      Significance = 3x2=6</p>	<p>It is advisable that only vegetation be removed where and when it is necessary. After removal of vegetation, landscaping needs to be incorporated by re-establishing natural grassland/vegetation where appropriate. No red data plant species were recorded during the site visits conducted.</p> <p>Probability = 3 (improbable)                      Intensity = 2 (low intensity)                      Duration = 2 (short term)                      Severity = 2x2=4 (rating 2)                      Significance = 3x2=6</p> <p>This impact is of negative <b>low significance</b></p>



ENVIRONMENTAL ASPECT AND PROJECT STAGE	ENVIRONMENTAL COMPONENT THAT MAY BE AFFECTED	LOCALITY / APPLICABLE ZONE OF THE IMPACT	NATURE AND DESCRIPTION OF THE IMPACT/ISSUE BEFORE MITIGATION	NATURE OF THE IMPACT/ISSUE AFTER MITIGATION
			This impact is of negative <b>low significance</b>	
Stockpiling of excavated material (C)	Soil and vegetation cover.	Precise location still to be determined; the impacts on soil and vegetation will occur wherever stockpiles are established. Wherever possible, the stockpiles should be placed in non-sensitive areas.	<p>Stockpiles cause compaction of the soil, which promotes the establishment of weed species. The establishment of weeds greatly reduces the pristine quality of the natural vegetation on site. Stockpiles should not be situated within 200 m from any water bodies or water courses, as sedimentation transport into such systems is undesirable.</p> <p>Probability = 3 (probable) Intensity = 2 (low intensity) Duration = 4 (long term) Severity = 2x4=8 (rating 3) Significance = 3x3=9</p> <p>This impact is of negative <b>moderate significance</b></p>	<p>Stockpiles must not exceed 2 metres in height. Stockpiles must be used for filling material as the re use of stockpiles cannot be done on the development. By using the stockpiles as filling material for the sides, vegetation growth can be promoted by the seeds still contained in the topsoil layer.</p> <p>Probability = 3 (improbable) Intensity = 2 (low intensity) Duration = 2 (short term) Severity = 2x2=4 (rating 2) Significance = 3x2=6</p> <p>This impact is of negative <b>low significance</b></p>
Stockpiling building materials (C)	Soil and vegetation cover.	The impact is of a localized nature.	Stockpiles will need to be established for the storage of aggregate, bricks and	Building material stockpiles must not be stockpiles within any of the riparian

ENVIRONMENTAL ASPECT AND PROJECT STAGE	ENVIRONMENTAL COMPONENT THAT MAY BE AFFECTED	LOCALITY / APPLICABLE ZONE OF THE IMPACT	NATURE AND DESCRIPTION OF THE IMPACT/ISSUE BEFORE MITIGATION	NATURE OF THE IMPACT/ISSUE AFTER MITIGATION
			<p>cement. As mentioned, stockpiles cause compaction of the soil surface, which leads to the growth of unwanted weed species.</p> <p>Probability = 3 (probable)                      Intensity = 2 (low intensity)                      Duration = 4 (long term)                      Severity = 2x4=8 (rating 3)                      Significance = 3x3=9</p> <p>This impact is of negative moderate significance</p>	<p>areas. Any alien vegetation that established itself because of disturbance need to be eradicated.</p> <p>Probability = 3 (improbable)                      Intensity = 2 (low intensity)                      Duration = 2 (short term)                      Severity = 2x2=4 (rating 2)                      Significance = 3x2=6</p> <p>This impact is of negative low significance</p>
<p>Installation and operation of <u>temporary sewerage systems</u> for construction workers.</p>	<p>Soil layers, vegetation cover and groundwater.</p>	<p>Very localised and of a temporary nature.</p>	<p>The placement of chemical toilet systems and the servicing thereof will not have an impact on the environment, if operated according to requirements. Temporary toilets left unmanaged can leak raw sewage and effluent into the soil, surface and even ground water sources. <span style="color: red;">▲</span></p> <p>Probability = 4 (highly probable)</p>	<p>Temporary toilets need to be managed and serviced on a regular service schedule. This schedule has to be recorded and controlled by the contractor on site. Regular disposal of waste needs to be done by a contracted disposal company. No temporary toilets will be allowed within 100 metres from any of the drainage lines.</p>

ENVIRONMENTAL ASPECT AND PROJECT STAGE	ENVIRONMENTAL COMPONENT THAT MAY BE AFFECTED	LOCALITY / APPLICABLE ZONE OF THE IMPACT	NATURE AND DESCRIPTION OF THE IMPACT/ISSUE BEFORE MITIGATION	NATURE OF THE IMPACT/ISSUE AFTER MITIGATION
			<p>Intensity = 4 (moderate intensity) Duration = 4 (long term) Severity = 4x4=16 (rating 4) Significance = 4x4=16 This impact is of negative <b>high significance</b> before mitigation.</p>	<p>Probability = 3 (improbable) Intensity = 2 (low intensity) Duration = 2 (short term) Severity = 2x2=4 (rating 2) Significance= 3x2=6 This impact is of negative <b>low significance</b></p>
Provisions for storm water i.e. storm water drainage (C)	Soil surfaces, vegetation cover and drainage patterns.	Areas where surface water run-off is collected i.e., like from compacted surfaces, gutters and structures, as well as road surfaces. As well as diverting stormwater around the feedlot itself.	<p>Poorly implemented storm water outlets will result in increased surface run-off volume and speed, which could lead to the creation of erosion gullies. Storm water must be allowed to spread out gradually over a large surface area to protect the soil surface against erosion. Inadequate designed storm water outlets can lead to flooding of the road surface which is dangerous.</p> <p>Probability = 3 (probable) Intensity = 2 (low intensity)</p>	<p>Storm water outlet designs have to be done and construction undertaken within the correct design documents from the civil engineer. Vegetation cover needs to be established on bare soil areas to prevent erosion due to storm water.</p> <p>Probability = 3 (improbable) Intensity = 2 (low intensity) Duration = 2 (short term) Severity = 2x2=4 (rating 2) Significance = 3x2=6</p>

ENVIRONMENTAL ASPECT AND PROJECT STAGE	ENVIRONMENTAL COMPONENT THAT MAY BE AFFECTED	LOCALITY / APPLICABLE ZONE OF THE IMPACT	NATURE AND DESCRIPTION OF THE IMPACT/ISSUE BEFORE MITIGATION	NATURE OF THE IMPACT/ISSUE AFTER MITIGATION
			Duration = 4 (long term) Severity = 2x4=8 (rating 3) Significance = 3x3=9 This impact is of negative moderate significance	This impact is of negative low significance
Maintenance of storm water management systems (O)	Soil surfaces, drainage patterns and surface water.	In all areas where storm water management systems have to be created.	Storm water management will particularly be important with careful design eminent at the crossing of any natural drainage ways. Storm water outlets can get blocked due to debris and other substances that are washed from the hard surfaces. This includes siltation due to soil erosion.  Probability = 3 (probable) Intensity = 2 (low intensity) Duration = 4 (long term) Severity = 2x4=8 (rating 3) Significance = 3x3=9 This impact is of negative moderate significance	Maintenance of storm water outlets is required to ensure that they don't get blocked (i.e. no longer fulfil their function) or result in erosion. The custodian of the development has to perform regular checks and maintenance.  Probability = 3 (improbable) Intensity = 2 (low intensity) Duration = 2 (short term) Severity = 2x2=4 (rating 2) Significance = 3x2=6 This impact is of negative low significance

ENVIRONMENTAL ASPECT AND PROJECT STAGE	ENVIRONMENTAL COMPONENT THAT MAY BE AFFECTED	LOCALITY / APPLICABLE ZONE OF THE IMPACT	NATURE AND DESCRIPTION OF THE IMPACT/ISSUE BEFORE MITIGATION	NATURE OF THE IMPACT/ISSUE AFTER MITIGATION
Excavations in general	Potential impact on elements of cultural or heritage importance.	Localised if these may occur	<p>No indication of such impacts. But this will be confirmed in the Heritage report. It is possible that historically important items or graves could be uncovered if construction commences.</p> <p><b>Probability = 3 (probable)</b>  <b>Intensity = 2 (low intensity)</b>  <b>Duration = 4 (long term)</b>  <b>Severity = 2x4=8 (rating 3)</b>  <b>Significance = 3x3=9</b></p> <p>This impact is of negative <b>moderate significance</b></p>	<p>If any artefacts, graves or articles of historical importance are found during construction, the construction activities have to be stopped and the area fenced off. A heritage consultant will have to be appointed to take any further related steps such as relocation.</p> <p><b>Probability = 3 (improbable)</b>  <b>Intensity = 2 (low intensity)</b>  <b>Duration = 2 (short term)</b>  <b>Severity = 2x2=4 (rating 2)</b>  <b>Significance = 3x2=6</b></p> <p>This impact is of negative <b>low significance</b></p>
Generation of construction waste (C)	Soil, vegetation, aesthetic quality of the site and surface water run-off, water and ground water resources.	All construction sites and directly adjacent areas.	Waste, such as building rubble and empty cement bags can be a negative visual impact if not collected and disposed of correctly. Further to littering the site and adjacent areas, poor control and illegal dumping of construction waste can pollute	Building rubble has to be collected at a centralized area and preferably in skip waste bins. No illegal dumping may be allowed in the construction phase, and this will have to be checked and

ENVIRONMENTAL ASPECT AND PROJECT STAGE	ENVIRONMENTAL COMPONENT THAT MAY BE AFFECTED	LOCALITY / APPLICABLE ZONE OF THE IMPACT	NATURE AND DESCRIPTION OF THE IMPACT/ISSUE BEFORE MITIGATION	NATURE OF THE IMPACT/ISSUE AFTER MITIGATION
			<p>surface water run-off, as well as lead to the promotion of weed species. <b>Δ</b></p> <p>Probability = 4 (highly probable) Intensity = 4 (moderate intensity) Duration = 4 (long term) Severity = 4x4=16 (rating 4) Significance = 4x4=16</p> <p>This impact is of negative <b>high significance</b> before mitigation.</p>	<p>monitored by the appointed Environmental Control Officer.</p> <p>Probability = 3 (improbable) Intensity = 2 (low intensity) Duration = 2 (short term) Severity = 2x2=4 (rating 2) Significance = 3x2=6</p> <p>This impact is of negative <b>low significance</b></p>
Site & Road maintenance (O)	Vegetation and soil surface conditions, as well as social well-being of the residents of the area.	The site needs to be maintained.	<p>Poorly maintained storm water drainage structure will cause abnormal soil erosion at outlets. Therefore, site &amp; road maintenance is essential.</p> <p>Probability = 3 (probable) Intensity = 2 (low intensity) Duration = 4 (long term) Severity = 2x4=8 (rating 3) Significance = 3x3=9</p>	<p>Site &amp; road maintenance is essential and is the responsibility of the property owner in the operational phase.</p> <p>Probability = 3 (improbable) Intensity = 2 (low intensity) Duration = 2 (short term) Severity = 2x2=4 (rating 2) Significance = 3x2=6</p> <p>This impact is of negative <b>low significance</b></p>

ENVIRONMENTAL ASPECT AND PROJECT STAGE	ENVIRONMENTAL COMPONENT THAT MAY BE AFFECTED	LOCALITY / APPLICABLE ZONE OF THE IMPACT	NATURE AND DESCRIPTION OF THE IMPACT/ISSUE BEFORE MITIGATION	NATURE OF THE IMPACT/ISSUE AFTER MITIGATION
			This impact is of negative <b>moderate significance</b>	
Collection and disposal of solid construction waste (C)	Aesthetic quality, surface water run-off, subsurface and groundwater quality, vegetation and fauna.	The site and directly adjacent areas.	<p>Poor waste collection and handling will pollute the environment (affecting fauna, groundwater, surface water and aesthetic environment).</p> <p>Probability = 3 (probable) Intensity = 2 (low intensity) Duration = 4 (long term) Severity = 2x4=8 (rating 3) Significance = 3x3=9</p> <p>This impact is of negative <b>moderate significance</b></p>	<p>No illegal dumping of domestic and construction related waste should be tolerated. Domestic construction waste has to be collected into central waste skip disposal units.</p> <p>Probability = 3 (improbable) Intensity = 2 (low intensity) Duration = 2 (short term) Severity = 2x2=4 (rating 2) Significance = 3x2=6</p> <p>This impact is of negative <b>low significance</b></p>
Traffic movement (C)(O)	Noise levels around the development due to the movement of additional traffic.	Noise impact of a local nature along the development. Closer community.	<p>The movement of traffic (during construction and operation) around the development will have an impact on the ambient or prevailing noise levels.</p> <p>Probability = 3 (probable)</p>	<p>Noise mitigation measures are required in order to keep the noise generated by construction activities as low as possible - given the site's relatively close proximity to some residential areas. This can be achieved by ensuring that only</p>

ENVIRONMENTAL ASPECT AND PROJECT STAGE	ENVIRONMENTAL COMPONENT THAT MAY BE AFFECTED	LOCALITY / APPLICABLE ZONE OF THE IMPACT	NATURE AND DESCRIPTION OF THE IMPACT/ISSUE BEFORE MITIGATION	NATURE OF THE IMPACT/ISSUE AFTER MITIGATION
			<p>Intensity = 2 (low intensity)                      Duration = 4 (long term)                      Severity = 2x4=8 (rating 3)                      Significance = 3x3=9                      This impact is of negative <b>moderate significance</b></p>	<p>well-oiled, well-maintained machinery is used, as such machinery will produce less noise than poorly serviced machinery. For example, poor maintenance of exhaust systems will produce unnecessary noise pollution. Furthermore, working hours for construction should be limited to between 07h00 and 17h00 on weekdays, as construction outside of these time frames will be a nuisance to adjacent dwellers. On operational phase the general business day noise will be the same as for the surrounding developments.</p> <p>Probability = 3 (improbable)                      Intensity = 2 (low intensity)                      Duration = 2 (short term)                      Severity = 2x2=4 (rating 2)                      Significance = 3x2=6</p>



ENVIRONMENTAL ASPECT AND PROJECT STAGE	ENVIRONMENTAL COMPONENT THAT MAY BE AFFECTED	LOCALITY / APPLICABLE ZONE OF THE IMPACT	NATURE AND DESCRIPTION OF THE IMPACT/ISSUE BEFORE MITIGATION	NATURE OF THE IMPACT/ISSUE AFTER MITIGATION
				This impact is of negative <b>low significance</b>
Temporary employment created during the construction phases of the proposed development(C)	Social aspects	All sites where construction related activities are to take place.	There will be <b>positive</b> impacts in terms of social upliftment and job creation within the broader region.	
Transportation of workers to and from the development site (C)	Air quality, soil surface and social aspects (including traffic and worker safety).	The road safety of the region. A local issue.	<p>Vehicles used to transport workers can be overloaded; worker safety is of utmost importance. Vehicles used to transport workers which exceed the speed limit are dangerous.</p> <p>Probability = 3 (probable) Intensity = 2 (low intensity) Duration = 4 (long term) Severity = 2x4=8 (rating 3) Significance = 3x3=9</p> <p>This impact is of negative <b>moderate significance</b></p>	<p>Traffic safety measures have to be implemented by the contractor. Correct signage and safety clothing needs to be in place. Construction workers need to be transported to and from the site on a safe manner.</p> <p>Probability = 3 (improbable) Intensity = 2 (low intensity) Duration = 2 (short term) Severity = 2x2=4 (rating 2) Significance = 3x2=6</p> <p>This impact is of negative <b>low significance</b></p>

ENVIRONMENTAL ASPECT AND PROJECT STAGE	ENVIRONMENTAL COMPONENT THAT MAY BE AFFECTED	LOCALITY / APPLICABLE ZONE OF THE IMPACT	NATURE AND DESCRIPTION OF THE IMPACT/ISSUE BEFORE MITIGATION	NATURE OF THE IMPACT/ISSUE AFTER MITIGATION
Construction camp establishment (C)	Aesthetic impacts, social aspects, subsurface and groundwater quality, generation of domestic waste, vegetation removal, soil surface compaction and faunal impacts.	Location still to be determined.	<p>The generation of domestic waste, as well as the provision of sewage facilities, within the construction camp could potentially impact on the aesthetics of the site as well as the quality of subsurface and groundwater if not properly managed and implemented. The removal of sections of natural vegetation would most likely be needed for the establishment of the camp, and soil surfaces would become compacted as a result of activities within the camp.</p> <p>Probability = 3 (probable)                      Intensity = 2 (low intensity)                      Duration = 4 (long term)                      Severity = 2x4=8 (rating 3)                      Significance = 3x3=9</p> <p>This impact is of negative moderate significance</p>	<p>Proper management of any temporary toilets need to be undertaken on a strict schedule. The construction camp must be more than 100 metres away from any water bodies. Construction camps</p> <p>Probability = 3 (improbable)                      Intensity = 2 (low intensity)                      Duration = 2 (short term)                      Severity = 2x2=4 (rating 2)                      Significance = 3x2=6</p> <p>This impact is of negative low significance</p>

ENVIRONMENTAL ASPECT AND PROJECT STAGE	ENVIRONMENTAL COMPONENT THAT MAY BE AFFECTED	LOCALITY / APPLICABLE ZONE OF THE IMPACT	NATURE AND DESCRIPTION OF THE IMPACT/ISSUE BEFORE MITIGATION	NATURE OF THE IMPACT/ISSUE AFTER MITIGATION
Housing of workers during construction (C)	Aesthetic character, soil and vegetation, surface water quality and social aspects.	The possibility of housing construction workers on site.	<p>The establishment of housing for workers will have a localised impact on the soil and vegetation cover of the chosen site, as well as potentially having a negative impact on the quality of surface water - as a result of domestic waste, and sanitation facilities for example, if these are not properly addressed. Safety is also a concern to residence and stay of workers on site should not be encouraged.</p> <p>Probability = 3 (probable) Intensity = 2 (low intensity) Duration = 4 (long term) Severity = 2x4=8 (rating 3) Significance = 3x3=9 This impact is of negative moderate significance</p>	<p>Housing of workers on site, at the construction camp, is a possibility. Preferably only security should look after equipment at night-time hours. If workers are housed near residential areas, it could create a safety concern.</p> <p>Probability = 3 (improbable) Intensity = 2 (low intensity) Duration = 2 (short term) Severity = 2x2=4 (rating 2) Significance = 3x2=6 This impact is of negative low significance</p>
Sanitation provision to workers during the working day (C)	Subsurface soil, surface water and subsurface water quality.	Insufficient chemical toilets will have a health impact locally.	Insufficient chemical toilets will have a health impact. Subsurface soil contamination and contamination of	Sufficient chemical toilets should be provided for workers, in the range of 1 per every 8 workers, within walking



ENVIRONMENTAL ASPECT AND PROJECT STAGE	ENVIRONMENTAL COMPONENT THAT MAY BE AFFECTED	LOCALITY / APPLICABLE ZONE OF THE IMPACT	NATURE AND DESCRIPTION OF THE IMPACT/ISSUE BEFORE MITIGATION	NATURE OF THE IMPACT/ISSUE AFTER MITIGATION
			<p>surface/subsurface water quality could occur if the ablution facilities provided are not according to standard. A temporary impact is possible; however, it can easily be prevented.</p> <p><b>Probability = 3 (probable)</b>  <b>Intensity = 2 (low intensity)</b>  <b>Duration = 4 (long term)</b>  <b>Severity = 2x4=8 (rating 3)</b>  <b>Significance = 3x3=9</b>                      This impact is of negative <b>moderate significance</b></p>	<p>distance of all construction activities. These toilets must be well maintained and inspected on a daily basis to ensure that they are clean and functioning properly. No washing of people and/or goods should take place on cleared surfaces, as this water should not be allowed to drain into any adjacent storm water canals or drainage lines.</p> <p><b>Probability = 3 (improbable)</b>  <b>Intensity = 2 (low intensity)</b>  <b>Duration = 2 (short term)</b>  <b>Severity = 2x2=4 (rating 2)</b>  <b>Significance = 3x2=6</b>                      This impact is of negative <b>low significance</b></p>
Movement of construction vehicles on site (C)	Air quality, soil and vegetation cover.	Potential impacts may be eminent over a wide area if not carefully	Movement will cause limited or localised disturbances and temporary soil compaction, which promotes the establishment of weed species. Dust will	Alien plant species need to be controlled and it must be ensured that weeds are removed. Dust depression measures such

ENVIRONMENTAL ASPECT AND PROJECT STAGE	ENVIRONMENTAL COMPONENT THAT MAY BE AFFECTED	LOCALITY / APPLICABLE ZONE OF THE IMPACT	NATURE AND DESCRIPTION OF THE IMPACT/ISSUE BEFORE MITIGATION	NATURE OF THE IMPACT/ISSUE AFTER MITIGATION
		managed and restricted.	<p>be generated by vehicular movements on site.</p> <p>Probability = 3 (probable) Intensity = 2 (low intensity) Duration = 4 (long term) Severity = 2x4=8 (rating 3) Significance = 3x3=9</p> <p>This impact is of negative moderate significance</p>	<p>as watering the bare surfaces need to be implemented.</p> <p>Probability = 3 (improbable) Intensity = 2 (low intensity) Duration = 2 (short term) Severity = 2x2=4 (rating 2) Significance = 3x2=6</p> <p>This impact is of negative low significance</p>
Maintenance of construction vehicles (C)	Soil, vegetation and surface water.	Within the construction camp(s).	<p>In the event of on-site repairs and servicing, soil surfaces, vegetation, and run-off may be locally contaminated. Spillage of fuel through faulty bowser is a possibility, if not controlled. It is anticipated that fuel storage facilities will occur on the site. If poorly installed or managed, it will cause pollution.</p> <p>Probability = 3 (probable) Intensity = 2 (low intensity)</p>	<p>The construction camp has to be identified and communicated to the ECO as soon as its position is available. Any fuel depot areas have to be bunded and where fuel hoses will operate, absorbing gravel needs to be provided. This area can also be lined with a small piece of plastic below the gravel. As soon as any spillages occur, the gravel has to be collected and disposed of as hazardous waste.</p>

ENVIRONMENTAL ASPECT AND PROJECT STAGE	ENVIRONMENTAL COMPONENT THAT MAY BE AFFECTED	LOCALITY / APPLICABLE ZONE OF THE IMPACT	NATURE AND DESCRIPTION OF THE IMPACT/ISSUE BEFORE MITIGATION	NATURE OF THE IMPACT/ISSUE AFTER MITIGATION
			Duration = 4 (long term) Severity = 2x4=8 (rating 3) Significance = 3x3=9 This impact is of negative <b>moderate significance</b>	Probability = 3 (improbable) Intensity = 2 (low intensity) Duration = 2 (short term) Severity = 2x2=4 (rating 2) Significance = 3x2=6 This impact is of negative <b>low significance</b>
Traffic safety on the main roads (C and O)	Social aspects.	At all places where there will be interaction with the local traffic along existing routes as well as traffic moving through the area.	Motorists using the main roads and alternative roads may be negatively impacted on by slow moving construction vehicles. <b>Δ</b>  Probability = 4 (highly probable) Intensity = 4 (moderate intensity) Duration = 4 (long term) Severity = 4x4=16 (rating 4) Significance = 4x4=16 This impact is of negative <b>high significance</b> before mitigation.	Traffic safety measures have to be implemented to ensure that the general public is safe. Adequate traffic signage has to be implemented where any heavy vehicles will cross the main roads. Adequate clothing that is visible should be provided to the workers.  Probability = 3 (probable) Intensity = 2 (low intensity) Duration = 4 (long term) Severity = 2x4=8 (rating 3) Significance = 3x3=9

ENVIRONMENTAL ASPECT AND PROJECT STAGE	ENVIRONMENTAL COMPONENT THAT MAY BE AFFECTED	LOCALITY / APPLICABLE ZONE OF THE IMPACT	NATURE AND DESCRIPTION OF THE IMPACT/ISSUE BEFORE MITIGATION	NATURE OF THE IMPACT/ISSUE AFTER MITIGATION
				This impact is of negative <b>moderate significance</b>
Noise generation by operating air compressors, excavators and other heavy machinery. Noise is also generated by the construction workers (C)	Impacts on faunal surrounding landowners.	Areas on and surrounding site at which construction activities take place.	Excessive noise levels on site may negatively impact upon the behaviour and movements of site fauna. Surrounding landowners may also potentially be negatively impacted upon by excessive noise levels on site during construction. <b>Δ</b>  Probability = 4 (highly probable) Intensity = 4 (moderate intensity) Duration = 4 (long term) Severity = 4x4=16 (rating 4) Significance= 4x4=16 This impact is of negative <b>high significance</b> before mitigation.	Noise mitigation measures are required in order to keep the noise generated by construction activities as low as possible - given the site's relatively close proximity to some residential areas. This can be achieved by ensuring that only well-oiled, well-maintained machinery is used, as such machinery will produce less noise than poorly serviced machinery. For example, poor maintenance of exhaust systems will produce unnecessary noise pollution. Furthermore, working hours for construction should be limited to between 07h00 and 17h00 on weekdays, as construction outside of these time frames will be a nuisance to adjacent dwellers.



ENVIRONMENTAL ASPECT AND PROJECT STAGE	ENVIRONMENTAL COMPONENT THAT MAY BE AFFECTED	LOCALITY / APPLICABLE ZONE OF THE IMPACT	NATURE AND DESCRIPTION OF THE IMPACT/ISSUE BEFORE MITIGATION	NATURE OF THE IMPACT/ISSUE AFTER MITIGATION
				Probability = 3 (probable) Intensity = 2 (low intensity) Duration = 4 (long term) Severity = 2x4=8 (rating 3) Significance = 3x3=9 This impact is of negative <b>moderate significance</b>
Heritage (C)	Heritage or historical components	Nothing near the site.	The proposed development for each site is to be conducted not close to any possible cultural historical elements.  Probability = 3 (improbable) Intensity = 2 (low intensity) Duration = 2 (short term) Severity = 2x2=4 (rating 2) Significance = 3x2=6 This impact is of negative <b>low significance</b>	If any areas of historical significance are discovered during construction, work should be stopped, and a cultural specialist should investigate the site. The first contact can be made with the EAP on site.  Probability = 3 (improbable) Intensity = 2 (low intensity) Duration = 2 (short term) Severity = 2x2=4 (rating 2) Significance = 3x2=6 This impact is of negative <b>low significance</b>



ENVIRONMENTAL ASPECT AND PROJECT STAGE	ENVIRONMENTAL COMPONENT THAT MAY BE AFFECTED	LOCALITY / APPLICABLE ZONE OF THE IMPACT	NATURE AND DESCRIPTION OF THE IMPACT/ISSUE BEFORE MITIGATION	NATURE OF THE IMPACT/ISSUE AFTER MITIGATION
Impact on the wetland (C) (O)	Water quality, and soil	The is a dam and drainage line 335m southwest of the site. Although it is very small area.	<p>Possible impacts on the wetland/drainage lines could be caused by the construction activities, as well as possible siltation into the wetland.</p> <p><b>Probability = 3 (probable)</b>  <b>Intensity = 2 (low intensity)</b>  <b>Duration = 4 (long term)</b>  <b>Severity = 2x4=8 (rating 3)</b>  <b>Significance = 3x3=9</b></p> <p>This impact is of negative <b>moderate significance</b></p>	<p>Although the wetland/drainage lines areas are not inside the footprint of each site. If construction and operation activities stick to their designated areas, then very little to no impact should occur to the wetland system.</p> <p><b>Probability = 3 (improbable)</b>  <b>Intensity = 2 (low intensity)</b>  <b>Duration = 2 (short term)</b>  <b>Severity = 2x2=4 (rating 2)</b>  <b>Significance = 3x2=6</b></p> <p>This impact is of negative <b>low significance</b></p>
Movement and survival of Animal species	Fauna of the site	Within the site	<p>The construction will have an effect on the animals present within the site. These impacts will include habitat destruction. It will also limit movement of species through the site.</p> <p><b>Probability = 3 (probable)</b></p>	<p>Specialist studies will determine an overview of the habitat present on-site. No red data fauna and flora have been recorded during the EAP's site visit.</p> <p><b>Probability = 3 (improbable)</b>  <b>Intensity = 2 (low intensity)</b></p>

ENVIRONMENTAL ASPECT AND PROJECT STAGE	ENVIRONMENTAL COMPONENT THAT MAY BE AFFECTED	LOCALITY / APPLICABLE ZONE OF THE IMPACT	NATURE AND DESCRIPTION OF THE IMPACT/ISSUE BEFORE MITIGATION	NATURE OF THE IMPACT/ISSUE AFTER MITIGATION
			Intensity = 2 (low intensity) Duration = 4 (long term) Severity = 2x4=8 (rating 3) Significance = 3x3=9 This impact is of negative moderate significance	Duration = 2 (short term) Severity = 2x2=4 (rating 2) Significance = 3x2=6 This impact is of negative low significance
Construction of the proposed development on red data animals	Animals	On-site	The construction of the proposed development will influence animal life and habitat. No red data species were recorded during the site visits.  Probability = 3 (probable) Intensity = 2 (low intensity) Duration = 4 (long term) Severity = 2x4=8 (rating 3) Significance= 3x3=9 This impact is of negative moderate significance	Although habitat will be lost, proper rehabilitation of the site, not used, could lessen the severity of the impact.  Probability = 3 (improbable) Intensity = 2 (low intensity) Duration = 2 (short term) Severity = 2x2=4 (rating 2) Significance = 3x2=6 This impact is of negative low significance

## **9. COMPLYING, REMEDYING, AND CONTROLLING ENVIRONMENTAL POLLUTION INCIDENTS AND CAUSES**

If there is an environmental incident, like oil or diesel spills, or any other form of pollution during the construction phase then the applicant/contractor/engineer should consult with the appointed Environmental Control Officer (ECO) for the project. The ECO should then respond immediately on the incident at hand with the appropriate mitigation measure as practically as possible.

An environmental awareness plan should be communicated to the workers and contractors via a training session before the construction phase starts. All risks should be put forward in terms of pollution and environmental degradation. The environmental awareness plan can be compiled by the ECO or environmental practitioner for the training session before the construction phase.

## **10. SPECIALISTS CONCLUSION AND RECOMMENDATIONS**

### **10.1 Vegetation specialist**

KEMS Pty Ltd was commissioned to undertake a Compliance statement for terrestrial biodiversity and plant species for the developed of a sheep feedlot on the remainder of the Farm Groenhof 240. The site consists of an existing legal feedlot under the EIA regulation thresholds. The applicant plans to expand on the existing feedlot. The expansion will be into existing cultivated areas.

Regional GIS maps indicated the site to be located within the Vaal-Vet Sandy Grassland vegetation that has a conservation status of "Endangered". The vegetation type was adopted into the List of Threatened Ecosystems in need of protection (GN 1002) as endangered. The study site did also not fall into any CBA areas in terms of the Free State CBA maps. The National Biodiversity Assessment of 2018 indicates the site as transformed.

The site assessment confirmed that the proposed expansion would fall within cultivated areas and that no Natural vegetation remains on site associated with the endangered Ecosystem.

An impact Assessment was undertaken for the site and only one impact was identified that needed attention. The establishment of Alien and Invasive Plant species must be monitored and controlled.

A total of 4 plants were identified on and around the site that is listed in the Alien and Invasive Species Regulations of 2014 (NEMBA) which needs management.

- 2 NEMBA Category 2 plant was recorded and must be controlled.
- 2 NEMBA Category 2 plants were identified and must be controlled.
- No prohibited species were recorded on or around the site.

The sensitivity assessment was undertaken as per Section 2.6 of the vegetation report. There is no more habitat remaining and a Low sensitivity rating was awarded to the site.

The following recommendations are made with regards to the proposed development:

Mitigation measures for Impact on Natural vegetation:

- Unnecessary impacts on surrounding natural vegetation must be avoided. Only the direct site and associated access roads may be impacted upon.
- Any spillages of hydrocarbon materials must be prevented from reaching floodplains and runoff areas to avoid contamination of soils and in effect, vegetation.

Mitigation measures for Loss of individual or threatened plants:

- Any on site recordings of plants with distinctive character should first be confirmed before trampling or removal of such plants. Most red or orange data plants are distinctive from normal vegetation.
- The site is transformed due to cultivation and no mitigation can be suggested.

Mitigation measures for establishment and spread of declared weeds and alien invader plants:

- Any alien plants must be immediately controlled.

- An on-going monitoring programme should be implemented to detect and quantify any aliens that may become established and provide information for the management of aliens.
- All disturbed areas must be monitored for the establishment of invasive plant species.

## 10.2 Heritage specialist

Specific Categories Investigated As Per Section 3 (1) And (2) Of The National Heritage Resources Act, 1999 (Act No. 25 Of 1999):

1. Does the site/s provide the context for a wider number of places, buildings, structures and equipment of cultural significance?

The study area does not provide context for a wider number of places, buildings, structures and equipment of cultural significance. The reason being the non-existence of heritage structures in the study area.

2. Does the site/s contain places to which oral traditions are attached or which are associated with living heritage?

Places to which oral traditions are attached or associated with living heritage are usually found in conjunction with traditional settlements and villages which still practise age old traditions. None of these are evident near or on the proposed site.

3. Does the site/s contain historical settlements?

No historical settlements are located on or near the proposed site.

4. Does the site/s contain landscapes and natural features of cultural significance?

The site and greater study area does not contain landscapes and natural features of cultural significance.

5. Does the site/s contain geological sites of cultural importance?

Geological sites of cultural importance include meteorite sites (Tswaing Crater and Vredefort Dome), fossil sites (Karoo and Krugersdorp area), important mountain ranges or ridges (Magaliesburg, Drakensberg etc.). The proposed site is not located in an area known for sites of this importance.

6. Does the site/s contain a wide range of archaeological sites?

The site and areas surrounding the site do not contain any surface archaeological deposits, a possible reason is previous the continuation of infrastructure development in the study area.

The possibility of sub-surface findings always exists and should be taken into consideration.

If sub-surface archaeological material is discovered work must stop and a heritage practitioner preferably an archaeologist contacted to assess the find and make recommendations.

7. Does the site/s contain any marked graves and burial grounds?

The site does not contain marked graves or burial grounds.

The possibility of graves not visible to the human eye always exists and this should be taken into consideration. It is important to note that all graves and cemeteries are of high significance and are protected by various laws. Legislation with regard to graves includes the National Heritage Resources Act (Act 25 of 1999) whenever graves are 60 years and older. Other legislation with regard to graves includes those when graves are exhumed and relocated, namely the Ordinance on Exhumations (no 12 of 1980) and the Human Tissues Act (Act 65 of 1983 as amended).

If sub-surface graves are discovered work should stop and a professional preferably an archaeologist contacted to assess the age of the grave/graves and to advice on the way forward.

8. Does the site/s contain aspects that relate to the history of slavery?

No evidence of the above evident on the site earmarked for development.

9. Can the place be considered as a place that is important to the community or in the pattern of South African history?

In primary and secondary sources, the proposed site is not described as important to the community or in the pattern of South African history.

10. Does the site/s embody the quality of a place possessing uncommon or rare endangered aspects of South Africa's natural and cultural heritage?

The proposed site does not possess uncommon, rare or endangered aspects of South Africa's natural and cultural heritage. These sites are usually regarded as Grade 1 or World Heritage Sites.

11. Does the site/s demonstrate the principal characteristics of South Africa's natural or cultural places?

The proposed site does not demonstrate the principal characteristics of South Africa's natural or cultural places. These characteristics are usually associated with aesthetic significance.

12. Does the site/s exhibit particular aesthetic characteristics valued by the community or cultural groups?

This part of the greater study area does not exhibit particular aesthetic characteristics valued by the community or cultural groups. The reason being the low density of heritage buildings and structures located in the greater study area.

13. Does the site/s contain elements, which are important in demonstrating a high degree of creative technical achievement?

The site does not contain elements which are important in demonstrating a high degree of creative technical achievement. Reason being none of the above are evident on site.

14. Does the site/s have strong and special associations with particular communities and cultural groups for social, cultural and spiritual reasons?

The proposed site does not have a strong or special association with particular communities and cultural groups for social, cultural and spiritual reasons. No comment in this regard was received during the Public Participation Process (PPP).

15. Does the site/s have a strong and special association with the life or work of a person, group or organisation?

No indication of the above could be found in primary and secondary research sources.

## DISCUSSION

The chances of identifying heritage sites are extremely slim as the area is already disturbed. Resultantly all possible signs of heritage resources would have been demolished.

## RECOMMENDATIONS

- In terms of heritage the area is already disturbed and will not yield heritage items or sites, thus the commencement will have no impact on heritage resources;
- The discovery of subsurface archaeological and/or historical material as well as graves must be taken into account. See 6 and 7; and
- Submit this report as a Section 38 application to the relevant heritage authority for approval/comment.



## Appendix H: Details of EAP and expertise

---

Attached

“JWALE KE NAKO YA KOTULO, RE A KUBELETSA”

# Curriculum Vitae

## Contact Details

---

Cell: 082 879 4218

E-mail: [rowan.vantonde@gmail.com](mailto:rowan.vantonde@gmail.com)

## Rowan Conrad van Tonder

### Personal Information

Date of Birth: 21 May 1981

Marital status: Married

Gender: Male

Nationality: South African

Age: 41

Place of Birth: Polokwane/Pietersburg

ID Number: 810521 5099 085

### EAPASA Reg. No.

2020/2579

### SACNASP

Pr.Sci.Nat. Reg. No.: 119204

### MASTERS DEGREE

M.Sc. Botany (University of Limpopo) - Conservation Management

### Dissertation

THE BIOLOGY, ECOLOGY AND CONSERVATION OF *EUPHORBIA GROENEWALDII* AN ENDANGERED SUCCULENT OF THE LIMPOPO PROVINCE

### HONOURS DEGREE

B. Sc. Physical Geography (Environmental Sciences)

### Subjects

Research Project 702

Honours Presentations 703

Geography: Its Evolution 710

Southern African Geomorphology / Arid Environments 782 / 795

Environmental Impact & Auditing 785

Environmental Change 789

B. Sc. Environmental Sciences

**DEGREE**

High School Education    Pietersburg High School

Highest Grade Passed    Grade 12

Subjects

Afrikaans	HG
English	HG
Accountancy	HG
Physical Science	HG
Mathematics	HG
Computer Science	HG

Languages

Home Language: Afrikaans  
Other Language: English

Accreditations and Licenses    Driver's Licence: Sedan + Tractor (CODE 8)

**Licenses****EMPLOYMENT RECORD/HISTORY**

<b>NOVEMBER 2011 - PRESENT</b>	<b>KEMS (Pty) Ltd.</b>
POSITION	Avifaunal Specialist
DUTIES	<ul style="list-style-type: none"> <li>• Avifaunal Impact Assessments</li> <li>• Avifaunal habitat scans</li> <li>• Red data species detection</li> <li>• Avifaunal habitat sensitivity mapping</li> </ul>
<b>MARCH 2008 - PRESENT</b>	<b>REC Services (Pty) Ltd.</b>
POSITION	<ul style="list-style-type: none"> <li>• Environmental Consultant / Assessment Practitioner</li> <li>• Environmental Control Officer</li> <li>• Projects Coordinator</li> </ul>
DUTIES	<ul style="list-style-type: none"> <li>• Project coordination</li> <li>• Environmental Impact Assessments &amp; ECO</li> <li>• EIA Reports compilation &amp; review</li> <li>• Environmental Management Programmes &amp; Plans</li> <li>• Terrain assessments or field work</li> <li>• Public Participation processes</li> <li>• Prospecting -, Mining Right &amp; Permit applications</li> <li>• Mine Closure applications</li> <li>• Wastewater treatment works licensing</li> <li>• Environmental Management Systems</li> <li>• Integrated Environmental Management Plans</li> <li>• Risk Management and Assessments</li> </ul>
<b>SEPT. 2005 - FEB. 2007</b>	<b>UNIVERSITY OF LIMPOPO</b>
POSITION	Research Assistant
DUTIES	<ul style="list-style-type: none"> <li>• Field work on the breeding biology of birds (Arid Zone) and the spatial distribution of Copepods (parasites) on Sharks (<i>Symbiotic Siphonostomatoids</i>)</li> </ul>

## EXPERIENCE RECORD

At KEMS/on my own (since 2011) i.e. 10 years' experience:

### AVIFAUNAL IMPACT ASSESSMENT

1. November 2011: African Grass-Owl (*Tyto capensis*) Habitat Assessment of Portion 7 (a portion of portion 5) of the farm RUSTFONTEIN 488-JR.
  - o Report verified/reviewed by: Prof D. Engelbrecht. Pr. Sci. Nat.
2. March 2012: Avifaunal Impact Assessment with the special reference to the African Grass-Owl (*Tyto capensis*) of Portion 432 (a portion of Portion 204) of the farm ZWAVELPOORT 373-JR.
  - o Report verified/reviewed by: Prof D. Engelbrecht. Pr. Sci. Nat.
3. Avifaunal Impact Assessment with special reference to the possible occurrence of the African Grass-Owl (*Tyto capensis*) on a portion of the remaining extend of portion 1 of the farm PUTFONTEIN 26 IR and a portion of the remaining extend of portion 3 of the farm KNOPPIESFONTEIN 23 IR.
  - o Report verified/reviewed by: Prof D. Engelbrecht. Pr. Sci. Nat.
4. April 2012: Avifaunal Impact Assessment with the reference on the African Grass-Owl (*Tyto capensis*) on Portion 1 and Portion 12 (a portion of Portion 6) of the farm TWEEFONTEIN 413-JR.
  - o Report verified/reviewed by: Prof D. Engelbrecht. Pr. Sci. Nat.
5. May 2013: Avifaunal Impact Assessment on THE FARM BOVENSTE OOG VAN MOOIRIVIER 271-IQ.
  - o Report verified/reviewed by: Prof D. Engelbrecht. Pr. Sci. Nat.
6. November 2013: Avifaunal Impact Assessment with the reference to the Secretarybird (*Sagittarius serpentarius*) on PORTION 66 OF THE FARM KLIPDRIFT 90-JR.
  - o Report verified/reviewed by: Prof D. Engelbrecht. Pr. Sci. Nat.
7. November 2013: Avifaunal Impact Assessment with the reference to the Secretarybird (*Sagittarius serpentarius*) on PORTION 64 OF THE FARM KLIPDRIFT 90-JR.
  - o Report verified/reviewed by: Prof D. Engelbrecht. Pr. Sci. Nat.
8. December 2013: Avifaunal Red Data and Habitat Availability Scan on A PORTION OF PORTION 247 OF THE FARM ZWARTKOP 356-JR.
  - o Report verified/reviewed by: Mr. J. Grosel. Pr. Sci. Nat.
9. February 2014: Avifaunal Impact Assessment with special reference to the African Grass-Owl (*Tyto capensis*) and the African Marsh-Harrier (*Circus ranivorus*) on PORTION 116 ON THE FARM WITHOK 131-JR.
  - o Report verified/reviewed by: Mr. J. Grosel. Pr. Sci. Nat.
10. May 2014: Avifaunal Red Data and Habitat Availability Scan on PORTION 8 OF THE FARM HONIINGNESTKRANS 269-JR.
11. October 2014: Avifaunal Impact Assessment with the reference to the African Grass-Owl (*Tyto capensis*) and the African Marsh-Harrier (*Circus ranivorus*) on HOLDINGS 400 (PORTION 1) ON THE FARM WITHOK 131-JR.
  - o Report verified/reviewed by: Prof D. Engelbrecht. Pr. Sci. Nat.
12. March 2016: Avifaunal Impact Assessment with special reference to the African Grass-Owl (*Tyto capensis*) and the Secretarybird (*Sagittarius serpentarius*) on PORTION 48 ON THE FARM BRONKHORSTFONTEIN 329 IQ.
  - o Report verified/reviewed by: Mr. J. Grosel. Pr. Sci. Nat.
13. July 2016: Avifaunal Impact Assessment with special reference to the African Grass-Owl (*Tyto capensis*) on Remainder of Portion 102 (a portion of Portion 77) of the farm Roodekrans 183-IQ.
  - o Report verified/reviewed by: Mr. J. Grosel. Pr. Sci. Nat.

14. January 2017: Avifaunal Impact Assessment with special reference to the: African Finfoot (*Podica senegalensis*), Half-collared kingfisher (*Alcedo semitorquata*), White-backed night heron (*Gorsachius leuconotus*) on Portions 10, 11, 12, 13, 24 and 74 of the Farm Kruitfontein 511-JQ.
  - o Report verified/reviewed by: Mr. J. Grosel. Pr. Sci. Nat.
15. February 2017: Avifaunal Impact Assessment on the Lefa Colliery Mining Area near Deneysville.
  - o Report verified/reviewed by: Mr. J. Grosel. Pr. Sci. Nat.
16. April 2017: Avifaunal Impact Assessment on the farms of weGrow Farming Enterprises (Pty) Ltd. near Amersfoort, Mpumalanga Province.
  - o Report verified/reviewed by: Mr. J. Grosel. Pr. Sci. Nat.
17. September 2017: Avifaunal Impact Assessment with special reference to the possible occurrence of the African Grass-Owl (*Tyto capensis*) on a portion of the Remaining Extent of Portion 3 Knoppiesfontein 23-IR, Gauteng Province.
  - o Report verified/reviewed by: Mr. A. van den Berg. Pr. Sci. Nat.
18. October 2017: Avifaunal Red Data and Habitat Availability Scan on Portion 221 and the Remainder of Portion 115 of The Willows 340-JR, Gauteng Province.
  - o Report verified/reviewed by: Mr. A. van den Berg. Pr. Sci. Nat.
19. October 2017: Avifaunal Impact Assessment with special reference to the African Grass-Owl (*Tyto capensis*) and the Secretarybird (*Sagittarius serpentarius*) on Portion 49 & 50 of the farm Rooipoort 555-JR, Gauteng Province.
  - o Report verified/reviewed by: Mr. A. van den Berg. Pr. Sci. Nat.
20. November 2017: Avifaunal Impact Assessment on Portions 1 & 9 of the farm Zusterstroom 447-JR, Gauteng Province.
  - o Report verified/reviewed by: Mr. A. van den Berg. Pr. Sci. Nat.
21. November 2017: Avifaunal Red Data and Habitat Availability Scan on Portion 12 of the farm Liefde En Vrede 104-IR, Gauteng Province.
  - o Report verified/reviewed by: Mr. A. van den Berg. Pr. Sci. Nat.
22. December 2017: Avifaunal Impact Assessment of ROAD K6 BETWEEN HONINGNESTKRANS ROAD AND THE MOLOTO ROAD/R573, CITY OF TSHWANE METROPOLITAN MUNICIPALITY, GAUTENG PROVINCE.
  - o Report verified/reviewed by: Mr. A. van den Berg. Pr. Sci. Nat.
23. January 2018: Avifaunal Impact Assessment with special reference to the possible occurrence of the African Grass-Owl (*Tyto capensis*) on a portion of the Remaining Extent of Portion 3 Knoppiesfontein 23-IR, Phase 2, Gauteng Province.
  - o Report verified/reviewed by: Mr. A. van den Berg. Pr. Sci. Nat.
24. February 2018: Avifaunal Impact Assessment with special reference to the Secretarybird (*Sagittarius serpentarius*) on Portions 53, 127, 131, 135, and 158 of the farm Onderstepoort 300-JR.
  - o Report verified/reviewed by: Mr. A. van den Berg. Pr. Sci. Nat.
25. April 2018: Avifaunal Impact Assessment with special focus on: Red Data Species on the farms of No.2 Piggeries (Pty) Ltd., IDA, Eastern Cape Province.
  - o Report verified/reviewed by: Mr. A. van den Berg. Pr. Sci. Nat.
26. September 2018: Avifaunal Impact Assessment with special focus on: African Grass-Owl (*Tyto capensis*) on the farm of Holfontein 71-IR, Por. 49-54 & 61-63, Gauteng Province.
  - o Report verified/reviewed by: Mr. A. van den Berg. Pr. Sci. Nat.
27. September 2018: Avifaunal Impact Assessment with special focus on: African Grass-Owl (*Tyto capensis*) and the Secretarybird (*Sagittarius serpentarius*) on the farm Rooipoort 555-JR Portion 20, Gauteng Province.
  - o Report verified/reviewed by: Mr. A. van den Berg. Pr. Sci. Nat.
28. November 2018: Avifaunal Impact Assessment with special reference on: Avifaunal Red Data Species and Habitat Availability the Access Road leading to the Development on Portions 11, RE/12, RE/13, a ptn. of Ptn. 24 and 74 of the Farm Kruitfontein 511-JQ, Gauteng Province.
  - o Report verified/reviewed by: Mr. A. van den Berg. Pr. Sci. Nat.

29. February 2019: Avifaunal Impact Assessment with special focus on: African Grass-Owl (*Tyto capensis*) in Ekangala B, Gauteng Province.
  - o Report verified/reviewed by: Mr. A. van den Berg. Pr. Sci. Nat.
30. March 2019: Avifaunal Impact Assessment with special focus on: African Grass-Owl (*Tyto capensis*) on the farm of Rondevly 208-IR, Por. 6 (small section), Mpumalanga Province.
  - o SACNASP Reg. No. 119204 (Pri.Sci.Nat.)
31. March 2019: Avifaunal Impact Assessment with special focus on: African Grass-Owl (*Tyto capensis*) & Secretarybird (*Sagittarius serpentarius*) on the farm of Alewynspoort 143-IR, Por. 25, Gauteng Province.
  - o SACNASP Reg. No. 119204 (Pri.Sci.Nat.)
32. May 2019: Avifaunal Impact Assessment with special focus on: African Grass-Owl (*Tyto capensis*) & Secretarybird (*Sagittarius serpentarius*) on the farm of Alewynspoort 143-IR, Por. 25, Gauteng Province.
  - o SACNASP Reg. No. 119204 (Pri.Sci.Nat.)
33. June 2019: Avifaunal Impact Assessment with special focus on: African Grass-Owl (*Tyto capensis*) on the farm of Rondevly 208-IR, Por. 6 & 8, Mpumalanga Province.
  - o SACNASP Reg. No. 119204 (Pri.Sci.Nat.)
34. February 2020: Avifaunal Impact Assessment with special focus on: African Grass-Owl (*Tyto capensis*) on the farm Mooiplaats 367-JR, Por. 331, Gauteng Province.
  - o SACNASP Reg. No. 119204 (Pri.Sci.Nat.)
35. February 2020: Avifaunal Impact Assessment with special focus on: African Grass-Owl (*Tyto capensis*) & Secretarybird (*Sagittarius serpentarius*) on the farm Boschhoek 385-IR, Por. 30, Gauteng Province.
  - o SACNASP Reg. No. 119204 (Pri.Sci.Nat.)
36. March 2020: Avifaunal Impact Assessment Scan with special focus on: Red Data Species on the farm Molapong 692-KT, Limpopo Province.
  - o SACNASP Reg. No. 119204 (Pri.Sci.Nat.)

At REC Services (since 2008) i.e. 13 years' experience:

Mr. Van Tonder is currently involved with various applications for activities under the National Environmental Management Act (NEMA) (Act 107 of 1998), Mineral and Petroleum Recourses Development Act 2002 (Act No. 28 of 2002), and National Environmental Management: Waste Act, 2008 (Act 59 of 2008).

- Role Played: Environmental Assessment Practitioner (EAP), Consultant, Project Coordinator, as well as Environmental Control Officer at construction phases and yearly environmental audits on operational phases.

## BASIC ASSESSMENT PROCESS

### Industrial / Commercial / Residential Township / Office Developments

Wonderboom Residential Township Development (Pretoria, Gauteng, South Africa). March 2008 - August 2008: ROD. *Environmental Specialist*. Acting as the Environmental Consultant & EAP to the project. This included an application for certain activities under NEMA to the Gauteng Department of Agriculture, Conservation and Environment. The project is a Basic Assessment process. (A Oosthuizen).

Mckay Residential Township Development (Meyerton, Gauteng, South Africa). March 2008 - Cancelled. *Environmental Specialist*. Acting as the Environmental Consultant & EAP to the project. This included an application for certain activities under NEMA to the Gauteng Department of Agriculture, Conservation and Environment. The project is a Basic Assessment process. (Radius Projects (Pty) Ltd).

Proposed Eco-Residential development on Portion 64, Klipkop 396-JR (near Pretoria, Gauteng, South Africa) March 2008 - July 2009: ROD. *Environmental Specialist*. Acting as the Environmental Consultant & EAP to the project. This included an application for certain activities under NEMA to the Gauteng Department of Agriculture, Conservation and Environment. The project is a Basic Assessment process. (Rohirrm Estates (Pty) Ltd.).

Proposed Office Development (Monavoni, Gauteng, South Africa) December 2008 - Cancelled. *Environmental Specialist*. Acting as the Environmental Consultant & EAP to the project. This included an application for certain

activities under NEMA to the Gauteng Department of Agriculture, Conservation and Environment. The project is a Basic Assessment process. (Titanium Builders CC).

Proposed Township Establishment on Holding 50, Spitskop Small Holdings (Bloemfontein, Free State, South Africa) September 2008 - October 2009: ROD. *Environmental Specialist*. Acting as the Environmental Consultant & EAP to the project. This included an application for certain activities under NEMA to the Gauteng Department of Agriculture, Conservation and Environment. The project is a Basic Assessment process. (Mimi Preller).

Proposed Township Establishment on Portion 224 (A Portion of Portion 43) of the Farm Rietfontein 485-Jq (Meerhof Ext. 6) (Hartbeespoort, North-West, South Africa). March 2008 - April 2012: ROD. *Environmental Specialist*. Acting as the Environmental Consultant & EAP to the project. This included an application for certain activities under NEMA to the North-West Department of Agriculture, Conservation and Environment. The project is a Basic Assessment process. (Chestnut Hill Investments 35 (Pty) Ltd.).

Proposed Residential Township (Bronberg Ext. 19) on Portion 4 of Holding 28 Olympus AH (Pretoria East, Gauteng, South Africa). November 2008 - October 2009: ROD. *Environmental Specialist*. Acting as the Environmental Consultant & EAP to the project. This included an application for certain activities under NEMA to the Gauteng Department of Agriculture, Conservation and Environment. The project is a Basic Assessment process. (J & O Beleggings Trust (Pty) Ltd).

Proposed Residential Development on a part of Portion A, Ga-Segonyana Municipality, Kuruman, Northern Cape Province, South Africa. Augustus 2013 - March 2015: ROD. *Environmental Specialist*. Acting as the Environmental Consultant & EAP to the project. This included an application for certain activities under NEMA to the Northern Cape Department of Environment & Nature Conservation. The project is a Basic Assessment process. (Ellecon Developments CC).

Proposed Low Impact Industrial Development on the Remainder of Portion 120 of the Farm Winkelhaak 135-IS, in Kinross within the Jurisdiction of Govan Mbeki Local Municipality: Mpumalanga Province, South Africa. March 2016 - July 2017: ROD. *Environmental Specialist*. Acting as the Environmental Consultant & EAP to the project. This included an application for certain activities under NEMA to the Mpumalanga Department of Agriculture, Rural Development, Land & Environmental Affairs. The project is a Basic Assessment process. (Afgri Operations (Pty) Ltd.).

Proposed Township Development on Portion 131 (a portion of Portion 2) of the Farm Zevenfontein 407-JR, Gauteng Province, South Africa. February 2017 - April 2018: ROD. *Environmental Specialist*. Acting as the Environmental Consultant & EAP to the project. This included an application for certain activities under NEMA to the Gauteng Department of Agriculture, and Rural Development. The project is a Basic Assessment process. (Silverlakes Trading 511 (Pty) Ltd.).

Proposed Transport 1 Type Development on Portion 1 & 22 of Knoetze Kama 234/George RD and Portions 35, 52 & 68 of Gwayang 208/George RD, Western Cape Province, South Africa. December 2018 -present: on hold. *Environmental Specialist*. Acting as the Environmental Consultant & EAP to the project. This included an application for certain activities under NEMA to the Western Cape Government Environmental Affairs and Development Planning. The project is a Basic Assessment process. (Airports Company South Africa).

#### Smaller Developments

Guest House / Boutique Hotel, Restaurant and Hydro Health Spa Establishment (Broederstroom, North-West, South Africa). January 2011 - August 2015: ROD. *Environmental Specialist*. Acting as the Environmental Consultant & EAP to the project. This included an application for certain activities under NEMA to the North-West Department of Agriculture, Conservation and Environment. The project is a Basic Assessment process. (Duelco Investments 34 (Pty) Ltd).

Nursery and a Tea Garden / Coffee Shop Establishment (Broederstroom, North-West, South Africa). March 2008 - Cancelled. *Environmental Specialist*. Acting as the Environmental Consultant & EAP to the project. This included an application for certain activities under NEMA to the North-West Department of Agriculture, Conservation and Environment. The project is a Basic Assessment process. (Gary Pahl and Lynn Rene Pahl).

The proposed establishment of sport, conference and accommodation facilities on portion 50, 75 and 129 on the farm Donkerhoek 365-JR (Pretoria, Gauteng, South Africa) March 2008 - Cancelled. *Environmental*

*Specialist*. Acting as the Environmental Consultant & EAP to the project. This included an application for certain activities under NEMA to the Gauteng Department of Agriculture, Conservation and Environment. The project is a Basic Assessment process. (Magnum Archery Pietersburg cc 1998/037486/23 Plot 129 Donkerhoek; Magnum Archery Potgietersrus cc 1998/036957/23 Plot 50 donkerhoek; Magnum Archery Bowhunting Academy cc 1998/036862/23 Plot 75 Donkerhoek).

Proposed Development of a Caravan Park and Camping Facilities on Portion 68 (a portion of Portion 50) of the Farm Leeuwkloof 285-JR, in The Dinokeng Game Reserve within the City Of Tshwane Metropolitan Municipality, Gauteng Province, South Africa. July 2016 - August 2017: ROD. *Environmental Specialist*. Acting as the Environmental Consultant & EAP to the project. This included an application for certain activities under NEMA to the Gauteng Department of Agriculture and Rural Development. The project is a Basic Assessment process. (Living Waters Properties (Pty) Ltd.).

Proposed Development (Church and access road) on Portions 11, Re/12, Re/13, A Ptn. of Ptn. 24 and 74 f the Farm Kruitfontein 511-JQ, Gauteng Province, South Africa. January 2018 - present: ??. *Environmental Specialist*. Acting as the Environmental Consultant & EAP to the project. This included an application for certain activities under NEMA to the Gauteng Department of Agriculture and Rural Development. The project is a Basic Assessment process. (Catholic Archdiocese of Johannesburg Property).

### Filling Stations

Proposed Development of a Filling Station on Portion 4 of Erf 1254 In Mankweng C within Polokwane Local Municipality of Capricorn District (Mankweng, Limpopo Province, South Africa) February 2012 - March 2013: ROD. *Environmental Specialist*. Acting as the Environmental Consultant & EAP to the project. This included an application for certain activities under NEMA to the Gauteng Department of Economic Development, Environment and Tourism. The project is a Basic Assessment process. (Organic Coral Investments).

Proposed Storage Tanks for the Purpose of a Filling Station on Remainder of Portion 247 of the Farm Zwartkop 356-JR, City Of Tshwane Metropolitan Municipality, Gauteng Province, South Africa. December 2012 - February 2015: ROD. *Environmental Specialist*. Acting as the Environmental Consultant & EAP to the project. This included an application for certain activities under NEMA to the Gauteng Department of Agriculture and Rural Development. The project is a Basic Assessment process. (Factobase Trading Enterprise (Pty) Ltd.).

The Development of a Filling Station with Underground Tanks (5 X 23 000ℓ) of a Total Capacity of 115 Cubic Metres at Letlhabile Block A, Situated on a portion of Erven 1401 and 1404, Madibeng Local Municipality, North West Province, South Africa. January 2013 - June 2016: ROD. *Environmental Specialist*. Acting as the Environmental Consultant & EAP to the project. This included an application for certain activities under NEMA to the North West Department of Rural Environment & Agriculture Development. The project is a Basic Assessment process. (Mzisi Oil (Pty) Ltd.).

Proposed Filling Station on Erf 1649, Capital Park Extention 1, City of Tshwane Metropolitan Municipality, Gauteng Province, South Africa. March 2014 - October 2014: ROD. *Environmental Specialist*. Acting as the Environmental Consultant to the project. This included an application for certain activities under NEMA to the Gauteng Department of Agriculture and Rural Development. The project is a Basic Assessment process. (Ms. Bibi Fatima Dada).

Proposed Development of a Filling Station on the Ruth First Drive and Umkhangele Street Intersection, Soshanguve South (ZZ), City of Tshwane Metropolitan Municipality, Gauteng Province, South Africa. June 2016 - April 2017: ROD. *Environmental Specialist*. Acting as the Environmental Consultant & EAP to the project. This included an application for certain activities under NEMA to the Gauteng Department of Agriculture and Rural Development. The project is a Basic Assessment process. (SAFDEV SSDC (Pty) Ltd.).

Proposed Development of a Filling Station on the Remaining Extent of the Farm Trafalie 63/Beaufort West RD, in the Three Sisters Area, Western Cape Province, South Africa. July 2019 - present: ??. *Environmental Specialist*. Acting as the Environmental Consultant & EAP to the project. This included an application for certain activities under NEMA to the Western Cape Government Environmental Affairs and Development Planning. The project is a Basic Assessment process. (Paternoster Development CC).



### Stormwater Structures

Stormwater channel in Winterveld, Soshanguve (Pretoria, Gauteng, South Africa) March 2008 - Cancelled. *Environmental Specialist*. Acting as the Environmental Consultant & EAP to the project. This included an application for certain activities under NEMA to the Gauteng Department of Agriculture, Conservation and Environment. The project is a Basic Assessment process. (City of Tshwane Metropolitan Municipality).

### Subdivisions

Subdivision on the Farm Kleinfontein (Bronkhortspruit, Gauteng, South Africa) March 2008 - August 2008: ROD. *Environmental Specialist*. Acting as the Environmental Consultant & EAP to the project. This included an application for certain activities under NEMA to the Gauteng Department of Agriculture, Conservation and Environment. The project is a Basic Assessment process. (Evening Shade Properties (Pty) Ltd).

Subdivision on the Farm Mooiplaats Portion 10 (Pretoria, Gauteng, South Africa) March 2008 - January 2009: ROD. *Environmental Specialist*. Acting as the Environmental Consultant & EAP to the project. This included an application for certain activities under NEMA to the Gauteng Department of Agriculture, Conservation and Environment. The project is a Basic Assessment process. (J & O Beleggings Trust 8760/06).

Subdivision on the Farm Mooiplaats Portion 12 (Pretoria, Gauteng, South Africa) March 2008 - January 2009: ROD. *Environmental Specialist*. Acting as the Environmental Consultant & EAP to the project. This included an application for certain activities under NEMA to the Gauteng Department of Agriculture, Conservation and Environment. The project is a Basic Assessment process. (Dr. G Meyer).

Subdivision on the Farm Mooiplaats Portion 278 (Pretoria, Gauteng, South Africa) March 2008 - August 2008: ROD. *Environmental Specialist*. Acting as the Environmental Consultant & EAP to the project. This included an application for certain activities under NEMA to the Gauteng Department of Agriculture, Conservation and Environment. The project is a Basic Assessment process. (Dr. L.B. Wolfaardt).

Subdivision on the Farm Zwavelpoort Portion 77/78 (Pretoria, Gauteng, South Africa) March 2008 - Cancelled. *Environmental Specialist*. Acting as the Environmental Consultant & EAP to the project. This included an application for certain activities under NEMA to the Gauteng Department of Agriculture, Conservation and Environment. The project is a Basic Assessment process. (Salestalk 154 (Pty) Ltd.).

Subdivision on the Farm Mooiplaats Portion 106 (Pretoria, Gauteng, South Africa) March 2008 - Cancelled. *Environmental Specialist*. Acting as the Environmental Consultant & EAP to the project. This included an application for certain activities under NEMA to the Gauteng Department of Agriculture, Conservation and Environment. The project is a Basic Assessment process. (Solar Spetrum Trading 64 (Pty) Ltd.).

Subdivision on the Farm Mooiplaats Portion 196 (Pretoria, Gauteng, South Africa) March 2008 - August 2008: ROD. *Environmental Specialist*. Acting as the Environmental Consultant & EAP to the project. This included an application for certain activities under NEMA to the Gauteng Department of Agriculture, Conservation and Environment. The project is a Basic Assessment process. (Swallow Valley Farm (Pty) Ltd.).

Subdivision on the Farm Mooiplaats Portion 198 (Pretoria, Gauteng, South Africa) March 2008 - October 2009: Authorization Denied. *Environmental Specialist*. Acting as the Environmental Consultant & EAP to the project. This included an application for certain activities under NEMA to the Gauteng Department of Agriculture, Conservation and Environment. The project is a Basic Assessment process. (Andre van der Merwe).

### Sewage Works

Proposed Upgrading of the Sewage Works at Macadamia Patrol Base (Komatipoort, Mpumalanga, South Africa) March 2008 - Cancelled. *Environmental Specialist*. Acting as the Environmental Consultant & EAP to the project. This included an application for certain activities under NEMA to the Mpumalanga Department of Agriculture and Land Administration. The project is a Basic Assessment process. (Ruwacon (Pty) Ltd).

### Roads & Pipelines

Nkomazi Service Access Road (Malelane, Mpumalanga, South Africa) August 2008 - March 2009: ROD. *Environmental Specialist*. Acting as the Environmental Consultant & EAP to the project. This included an application for certain activities under NEMA to the Mpumalanga Department of Agriculture and Land Administration. The project is a Basic Assessment process. (Topcoats Investments (Pty) Ltd).

K71 Phase 2 road upgrade (Centurion, Gauteng, South Africa) October 2008 – November 2009: ROD. *Environmental Specialist*. Acting as the Environmental Consultant & EAP to the project. This included an application for certain activities under NEMA to the Gauteng Department of Agriculture, Conservation and Environment. The project is a Basic Assessment process. (Gauteng Dept. of Public Transport, Roads and Works).

Proposed Construction of a Water Pipeline Across The Sandrivier (SAPS Base Kruger National Park, Mpumalanga, South Africa) March 2008 – Cancelled. *Environmental Specialist*. Acting as the Environmental Consultant & EAP to the project. This included an application for certain activities under NEMA to the Dept. of Environmental Affairs and Tourism. The project is a Basic Assessment process. (Ruwacon (Pty) Ltd).

### Farming Sector

Boekenhoutskloof Por. 9: Egg production facility (near Moloto, Gauteng, South Africa) July 2010 – Project cancelled. *Environmental Specialist*. Acting as the Environmental Consultant & EAP to the project. This included an application for certain activities under NEMA to the Gauteng Department of Agriculture and Rural Development. The project is a Basic Assessment process. (Adonai Farm Lodge (Pty) Ltd.).

Elandsfontein Por. 5: Development of a livestock feedlot for Mount Carmel farms (near Bapsfontein, Gauteng, South Africa) September 2011 – Cancelled. *Environmental Specialist*. Acting as the Environmental Consultant & EAP to the project. This included an application for certain activities under NEMA to the Gauteng Department of Agriculture and Rural Development. The project is a Basic Assessment process. (Mount Carmel Farms).

Elandsfontein Por. 109: Egg production facility (near Bapsfontein, Gauteng, South Africa) March 2011 – June 2012: ROD. *Environmental Specialist*. Acting as the Environmental Consultant & EAP to the project. This included an application for certain activities under NEMA to the Gauteng Department of Agriculture and Rural Development. The project is a Basic Assessment process. (Gert van Wyk Ondernemings (Pty) Ltd.).

Elandsfontein Por. 120: Chicken broiler facility (near Bapsfontein, Gauteng, South Africa) March 2011 – December 2013: ROD. *Environmental Specialist*. Acting as the Environmental Consultant & EAP to the project. This included an application for certain activities under NEMA to the Gauteng Department of Agriculture and Rural Development. The project is a Basic Assessment process. (For Real Chicks (Pty) Ltd.).

Proposed development of a Piggery (400 Sow Unit) on Portion 1 of the Farm Waaikraal 556 JR, Sivuyile Phambili, Delmas Local Municipality, Mpumalanga Province, South Africa. March 2013 – December 2013: ROD. *Environmental Specialist*. Acting as the Environmental Consultant & EAP to the project. This included an application for certain activities under NEMA to the Gauteng Department of Agriculture and Rural Development. The project is a Basic Assessment process. (Sivuyile Phambili Trading).

Proposed Upgrading and Development of Facilities at Longside Pig Farm For No 2 Piggeries on Portion 24 of the Farm Uitzicht Alias Rietvalei 314-JR, City Of Tshwane Metropolitan Municipality, Gauteng Province, South Africa. November 2015 – September 2016: ROD. *Environmental Specialist*. Acting as the Environmental Consultant & EAP to the project. This included an application for certain activities under NEMA to the Gauteng Department of Agriculture and Rural Development. The project is a Basic Assessment process. (No. 2 Piggeries Longside).

The Establishment of 4800 Sow Piggery on the Remaining Extent of the Farm Steynburg 7803-GS, located in Okhahlamba Local Municipality within Uthukela District (DC23), KZN, South Africa. June 2016 – May 2017: ROD. *Environmental Specialist*. Acting as the Environmental Consultant & EAP to the project. This included an application for certain activities under NEMA to the Gauteng Department of Agriculture and Rural Development. The project is a Basic Assessment process. (Steynsburg Pork and Abattoir (Pty) Ltd).

Proposed Upgrading and Expansion of Facilities at Steenwyk Piggery, Welkom, Free State Province, South Africa. October 2016 – August 2017: ROD. *Environmental Specialist*. Acting as the Environmental Consultant & EAP to the project. This included an application for certain activities under NEMA to the Free State Department of Economic, Small Business Development, Tourism and Environmental Affairs. The project is a Basic Assessment process. (Number Two Piggeries (Pty) Ltd. Steenwyk).

Proposed 9600 Sow Unit Piggery and an Abattoir to be Established 20 Km East of Amersfoort, Mpumalanga Province, South Africa. April 2017 – June 2018: ROD. *Environmental Specialist*. Acting as the Environmental Consultant & EAP to the project. This included an application for certain activities under NEMA to the Mpumalanga Department of Agriculture, Rural Development, Land & Environmental Affairs. The project is a Basic Assessment process. (weGrow Farming Enterprises (Pty) Ltd.).

Proposed Construction of Two New Grower Houses and One New Weaner House on the Farm Banksloot 147-JS Por. 2, Near Roosenekal, Limpopo Province, South Africa. October 2017 – present: ??. *Environmental Specialist*. Acting as the Environmental Consultant & EAP to the project. This included an application for certain activities

under NEMA to the Limpopo Department of Economic Development, Environmental and Tourism. The project is a Basic Assessment process. (Evilox 422).

Proposed 300 Sow Unit on Portion 3 of the Farm Vlaklaagte 233-IS, Mpumalanga Province, South Africa. October 2017 - November 2018: ROD. *Environmental Specialist*. Acting as the Environmental Consultant & EAP to the project. This included an application for certain activities under NEMA to the Mpumalanga Department of Agriculture, Rural Development, Land & Environmental Affairs. The project is a Basic Assessment process. (Janlizmar (Pty) Ltd.).

Proposed 4800 Sow Unit Piggery to be Established on Several Farm Portions in the Ida Area, Eastern Cape Province, South Africa. March 2018 - December 2018: ROD. *Environmental Specialist*. Acting as the Environmental Consultant & EAP to the project. This included an application for certain activities under NEMA to the Eastern Cape Department of Economic Development, Environmental Affairs & Tourism. The project is a Basic Assessment process. (No. 2 Piggeries (Pty) Ltd.).

Proposed Development of a Brooding Unit For Layer Rearing on Portions 28 of the Farm Stompiesfontein 273-IR, Mpumalanga Province, South Africa. May 2018 - December 2018: ROD. *Environmental Specialist*. Acting as the Environmental Consultant & EAP to the project. This included an application for certain activities under NEMA to the Mpumalanga Department of Agriculture, Rural Development, Land & Environmental Affairs. The project is a Basic Assessment process. (Rossouw Pluimvee Eiers (Pty) Ltd.).

Proposed Development of an Egg Laying Unit on the Farm New Hope, Near Hennenman, Welkom, Free State Province, South Africa. November 2018 - present: ??. *Environmental Specialist*. Acting as the Environmental Consultant & EAP to the project. This included an application for certain activities under NEMA to the Free State Department of Economic, Small Business Development, Tourism and Environmental Affairs. The project is a Basic Assessment process. (Number Two Piggeries (Pty) Ltd. Steenwyk).

#### Underground Storage Structures

Construction of underground tanks for Continental Inks(Durban, KZN, South Africa) February 2011 - June 2011: ROD. *Environmental Specialist*. Acting as the Environmental Consultant & EAP to the project. This included an application for certain activities under NEMA to the KZN Department of Agriculture, Environmental Affairs and Rural Development. The project is a Basic Assessment process. (Continental Inks).

#### Cemeteries

Proposed Memorial Park Development on Portion 45 of the Farm Beynespoort 335 JR, City of Tshwane Metropolitan Municipality, Gauteng Province, South Africa. January 2017 - January 2018: ROD. *Environmental Specialist*. Acting as the Environmental Consultant & EAP to the project. This included an application for certain activities under NEMA to the Gauteng Department of Agriculture and Rural Development. The project is a Basic Assessment process. (T/A Crest Property Investments.).

#### NEM WA PROCESS - Waste management license

Upgrade of the Wastewater Treatment Works at Waterval Prison (Waterval, KwaZulu-Natal, South Africa). April 2011 - November 2011: ROD. *Environmental Specialist*. Acting as the Environmental Consultant & EAP to the project. This included an application for certain activities under NEM WA to the Dept. of Environmental Affairs. The project was a Basic Assessment process. (Dept. of Public Works).

Geluk Prison waste water treatment works & bulk water supply, repair, maintenance and operation (Bethal, Mpumalanga, South Africa). October 2011 - Cancelled. *Environmental Specialist*. Acting as the Environmental Consultant & EAP to the project. This included an application for certain activities under NEM WA to the Dept. of Environmental Affairs. The project was a full EIA process. (Dept. of Public Works).

Chicken manure storage facility (cement slabs) and mortality pits on portion 109, a portion of portion 66 of the farm ELANDSFONTEIN 412-JR (Elandsfontein, Gauteng, South Africa). January 2012 -June 2012: ROD. *Environmental Specialist*. Acting as the Environmental Consultant & EAP to the project. This included an application for certain activities under NEM WA to the Gauteng Dept. of Agriculture and Rural Development. The project was a Basic Assessment process. (Gert van Wyk Ondernemings (EDMS) BPK).

Establishment of a dairy farm (Estina Mohoma Mobung Dairy) near the town of Vrede (Vrede, Free State, South Africa). January 2013 - June 2013: ROD. *Environmental Specialist*. Acting as the Environmental Consultant & EAP to the project. This included an application for certain activities under NEM WA to the Dept. of Environmental

Affairs. The project is a full EIA process. (Estina (PTY) Ltd.).

Development of a piggery for MANALLEEN Boerdery CC. The treatment of pig slurry. (Hoopstad, Free State, South Africa). July 2011 - Cancelled. *Environmental Specialist*. Acting as the Environmental Consultant & EAP to the project. This included an application for certain activities under NEM WA to the Dept. of Environmental Affairs. The project was a Basic Assessment process. (Manalleen Boerdery CC).

Proposed Bioconversion Facility to be Developed on a Section of Portion 5 of The Farm Rietvallei 377-JR, City of Tshwane Metropolitan Municipality, Gauteng Province, South Africa. August 2018 - present: ??. *Environmental Specialist*. Acting as the Environmental Consultant & EAP to the project. This included an application for certain activities under NEM WA to the Gauteng Department of Agriculture and Rural Development. The project is a Basic Assessment process. (Aegis Environmental (Pty) Ltd.).

## FULL EIA PROCESS

### Residential Township Establishments

Residential Township Establishment on the Farm Rooikopjes (Rayton, Gauteng, South Africa). March 2008 - Cancelled. *Environmental Specialist*. Acting as the Environmental Consultant & EAP to the project. This included an application for certain activities under NEMA to the Gauteng Department of Agriculture, Conservation and Environment. The project is a full EIA process. (Angel Five Developers (Pty) Ltd).

Bestwood Residential Development (Kathu, Northern Cape, South Africa). March 2008 - November 2008: ROD. *Environmental Specialist*. Acting as the Environmental Consultant & EAP to the project. This included an application for certain activities under NEMA to the Northern Cape Department of Tourism, Environment and Conservation. The project is a full EIA process. (Katu Property Developers (Pty) Ltd).

Proposed Development of Phase 2 of Cashan Ext 8 (Rustenburg, North-West, South Africa). March 2008 - November 2010: Authorisation denied. *Environmental Specialist*. Acting as the Environmental Consultant & EAP to the project. This included an application for certain activities under NEMA to the North-West Department of Agriculture, Conservation and Environment. The project is a full EIA process. (Burrie Smit Ontwikelaars (Pty) Ltd.)

### Sewage Treatment Systems

Upgrading of the sewage treatment system, Beitbridge (Beibridge, Limpopo, South Africa) May 2008 - June 2009: ROD. *Environmental Specialist*. Acting as the Environmental Consultant & EAP to the project. This included an application for certain activities under NEMA to the Limpopo Department of Economic Development, Environment and Tourism. The project is a full EIA process. (VIRTUAL BURO).

### Underground Storage Structures

Construction of structures & infrastructure for the underground storage of a dangerous goods (Edenvale, Gauteng, South Africa) March 2008 - June 2009: ROD. *Environmental Specialist*. Acting as the Environmental Consultant & EAP to the project. This included an application for certain activities under NEMA to the Gauteng Department of Agriculture, Conservation and Environment. The project is a full EIA process. (Hi-Tech Inks).

### Roads

K86 road construction (Daveyton, Gauteng, South Africa) August 2008 - July 2011: ROD. *Environmental Specialist*. Acting as the Environmental Consultant & EAP to the project. This included an application for certain activities under NEMA to the Gauteng Department of Agriculture, Conservation and Environment. The project is a full EIA process. (Ekurhuleni Metropolitan Municipality).

Proposed Construction of The Phokeng Western Bypass Road (Phokeng, Northwest Province, South Africa) March 2008 - October 2008: Consulted on. *Environmental Specialist*. Acting as the Environmental Consultant & EAP to the project. This included an application for certain activities under NEMA to the Northwest Department of

Agriculture, Conservation and Environment. The project is a full EIA process. (North West Department of Transport, Roads and Community Safety)

Proposed Widening of the N4 along Section 5b between Belfast (Km 29.8) and Cross Roads (Km 58.76), the Proposed Interchange at Milly's Filling Station and the Proposed Interchange at Machadodorp, Maputo Development Corridor in Emakhazeni Local Municipality, Mpumalanga Province, South Africa. July 2015 - September 2016: ROD. *Environmental Specialist*. Acting as the Environmental Consultant & EAP to the project. This included an application for certain activities under NEMA to the Dept. of Environmental Affairs. The project is a full EIA process. (South African National Roads Agency Limited).

Proposed Construction of Road K6 Between the future planned Road K207 (Known as Honingnestkrans Road/D1931) and the existing Road K139 (Known as the Moloto Road/R573), City of Tshwane Metropolitan Municipality, Gauteng Province, South Africa. May 2017 - April 2018: Unresolved. *Environmental Specialist*. Acting as the Environmental Consultant & EAP to the project. This included an application for certain activities under NEMA to the Dept. of Environmental Affairs. The project is a full EIA process. (Gauteng Province Department of Roads and Transport).

#### Solar Farms

Bestwood Residential Development's Solar farm (Kathu, Northern Cape, South Africa). June 2010 - Cancelled. *Environmental Specialist*. Acting as the Environmental Consultant & EAP to the project. This included an application for certain activities under NEMA to the Northern Cape Department of Tourism, Environment and Conservation. The project is a full EIA process. (Kathu Property Developers (Pty) Ltd).

#### Filling Stations

Proposed Construction of A Filling Station on Portion 356 (A Portion of Portion 44) of the Farm GROOTVLEI 272-JR (Petronella, Gauteng, South Africa) October 2009 - June 2011: ROD. *Environmental Specialist*. Acting as the Environmental Consultant & EAP to the project. This included an application for certain activities under NEMA to the Gauteng Department of Agriculture, Conservation and Environment. The project is a full EIA process. (Organic Coral Investments).

Proposed Construction of A Filling Station on Portion 479 (A Portion of Portion 316) of the Farm ZWAVELPOORT 373-JR (Pretoria East, Gauteng, South Africa) October 2009 - November 2011: ROD. *Environmental Specialist*. Acting as the Environmental Consultant & EAP to the project. This included an application for certain activities under NEMA to the Gauteng Department of Agriculture, Conservation and Environment. The project is a full EIA process. (Organic Coral Investments).

#### Industrial and Commercial

Proposed light industrial development on the Remainder of Portion 28 of the farm WITFONTEIN 15-IR (Springs, Gauteng, South Africa). August 2013 - March 2015: ROD. *Environmental Specialist*. Acting as the Environmental Consultant & EAP to the project. This included an application for certain activities under NEMA to the Gauteng Department of Agriculture and Rural Development. The project is a full EIA process. (Witfontein X28 (PTY) LTD).

### **MINING RIGHT APPLICATIONS**

Mining Right Application for Bon Accord Mine Quarry (Pretoria, Gauteng, South Africa). March 2008 - July 2009: ROD. *Environmental Specialist*. Acting as the Environmental Consultant & EAP to the project. This included an application for certain activities under MPRDA read with NEMA to the Gauteng Department of Minerals and Energy. (City of Tshwane Metropolitan Municipality).

Mining Right Application for Stellenberg Quarry (Pretoria, Gauteng, South Africa). February 2009 - April 2010: ROD. *Environmental Specialist*. Acting as the Environmental Consultant & EAP to the project. This included an application for certain activities under MPRDA read with NEMA to the Gauteng Department of Minerals and Energy. (City of Tshwane Metropolitan Municipality).

Mining Right Application for Mabopane Quarry (Mabopane, Gauteng, South Africa). February 2011 - On-hold. *Environmental Specialist*. Acting as the Environmental Consultant & EAP to the project. This included an

application for certain activities under MPRDA read with NEMA to the Gauteng Department of Minerals and Energy. (City of Tshwane Metropolitan Municipality).

Mining Right Application for Rietgat Quarry (Mabopane, Gauteng, South Africa). February 2009 - January 2011: ROD. *Environmental Specialist*. Acting as the Environmental Consultant & EAP to the project. This included an application for certain activities under MPRDA read with NEMA to the Gauteng Department of Minerals and Energy. (V & V Consulting Engineers).

Mining Right Closure Application for Mamelodi Quarry (Mamelodi, Gauteng, South Africa). February 2010 - On-hold. *Environmental Specialist*. Acting as the Environmental Consultant & EAP to the project. This included an application for certain activities under MPRDA read with NEMA to the Gauteng Department of Minerals and Energy. (City of Tshwane Metropolitan Municipality).

Mining Right Application for Stinkwater Quarry (near Mokone, Gauteng, South Africa). September 2010 - On-hold. *Environmental Specialist*. Acting as the Environmental Consultant & EAP to the project. This included an application for certain activities under MPRDA read with NEMA to the Gauteng Department of Minerals and Energy. (City of Tshwane Metropolitan Municipality).

Mining Right Application on a portion of Portion 8 of the Farm Honingnestkrans 269 JR, in The Magisterial District of Pretoria, Gauteng, South Africa. April 2011 - rejected. *Environmental Specialist*. Acting as the Environmental Consultant & EAP to the project. This included an application for certain activities under MPRDA read with NEMA to the Gauteng Department of Mineral Resources. (Zentralox (Pty) Ltd.).

## PROSPECTING RIGHT APPLICATIONS

List of successful prospecting right applications launched with DMR:

- Prospecting Rights done for INSA Coal (Pty) Ltd. in the Mpumalanga, Gauteng and Kwa-Zulu Natal area. The following codes and farm names are shown per application. Acting as the Environmental Consultant & EAP to each project.:
  - Mooimeisiesfontein
  - Katspruit
  - Groothoek
  - IC 1580
  - IC 1605
  - IC 1590
  - IC 1580
  - IC 1595
  - IC 1610
  - IC 1680
  - IC 1655
  - IC 1685
  - IC 1675
  - IC 1070
  - IC 1730
  - IN 1715
  - IC 1670
  - IC 1665
  - IC 050
  - IC 920
  - IC 960
  - IC 660

## S24G APPLICATIONS

Golf Course Development (Swartberg, Limpopo, South Africa). June 2009 - 2010: Completed. *Environmental Specialist*. Acting as the Environmental Consultant & EAP to the project. This included a 24G application for certain

activities under NEMA to the Limpopo Department of Economic Development, Environment and Tourism. The project is a section 24G application process. (Night Fire Investment 163 (Pty) Ltd.).

Potlog Storage and Workshop (Bapsfontein, Gauteng, South Africa). May 2010 - January 2011: Completed. *Environmental Specialist*. Acting as the Environmental Consultant & EAP to the project. This included a 24G application for certain activities under NEMA to the Gauteng Department of Agriculture, and Rural Development. The project is a section 24 G application process. (Amoretta Investments CC).

Unlawful Construction of a Racing Track on Plot 25, Varkfontein (Bapsfontein, Gauteng, South Africa). September 2010 - September 2012: unresolved. *Environmental Specialist*. Acting as the Environmental Consultant & EAP to the project. This included a 24G application for certain activities under NEMA to the Gauteng Department of Agriculture, and Rural Development. The project is a section 24G application process. (Darting Trading 89 (Prop) Ltd.).

Unlawful Construction of a Lapa and infilling of s water stream at Erf 228, Por. 227 of the farm Zwartkop, Hennospark, Gauteng, South Africa. March 2013 - unresolved. *Environmental Specialist*. Acting as the Environmental Consultant & EAP to the project. This included a 24G application for certain activities under NEMA to the Gauteng Department of Agriculture, and Rural Development. The project is a section 24G application process. (Christoffel de Witt Oosthuizen).

Unlawful Construction of a Resort and Associated Facilities within a Sensitive Area at Portion 66 of the Farm Klipdrift 90-JR, City of Tshwane Metropolitan Municipality, Gauteng Province, South Africa. October 2013 - March 2015: Completed. *Environmental Specialist*. Acting as the Environmental Consultant & EAP to the project. This included a 24G application for certain activities under NEMA to the Gauteng Department of Agriculture, and Rural Development. The project is a section 24G application process. (Radium Engineering).

The Illegal Commencement/Continuation of a Listed Activity (Construction of Tourism Accommodation Facilities) on Portion 64 (a portion of Portion 62 of the Farm Klipdrift 90-JR, City of Tshwane Metropolitan Municipality, Gauteng Province, South Africa. October 2014 - February 2017: Completed. *Environmental Specialist*. Acting as the Environmental Consultant & EAP to the project. This included a 24G application for certain activities under NEMA to the Gauteng Department of Agriculture, and Rural Development. The project is a section 24G application process. (Radium Engineering).

Unlawful Construction of Tourism Accommodation Facilities (Camping Site) on Portion 26 of the Farm Welgevonden 93-JR, City of Tshwane Metropolitan Municipality, Gauteng Province, South Africa. April 2017 - March 2018: Completed. *Environmental Specialist*. Acting as the Environmental Consultant & EAP to the project. This included a 24G application for certain activities under NEMA to the Gauteng Department of Agriculture, and Rural Development. The project is a section 24G application process. (Alwyn Nieuwoudt & Associates - Architects in Association).

Unlawful Commencement or Continuation of Listed Activities in Terms of Section 24G of the National Environmental Management Act (No 107 of 1998) on Portions 53 & 54 of the Farm Zandfontein 386 JQ, North West Province, South Africa. May 2018 - November 2018: Completed. *Environmental Specialist*. Acting as the Environmental Consultant & EAP to the project. This included a 24G application for certain activities under NEMA to the North West Department of Rural Environment and Agricultural Development. The project is a section 24G application process. (Rica Meats (Pty) Ltd.).

Unlawful Commencement or Continuation of Listed Activities in Terms of Section 24G of the National Environmental Management Act (No 107 of 1998) on Portion 25 of the Farm Alewynspoort 145 IR, Gauteng Province, South Africa. May 2019 - on-going. *Environmental Specialist*. Acting as the Environmental Consultant & EAP to the project. This included a 24G application for certain activities under NEMA to the Gauteng Department of Agriculture, and Rural Development. The project is a section 24G application process. (The Christian Alliance Education Association Trust).

Unlawful Commencement or Continuation of Listed Activities in Terms of Section 24G of the National Environmental Management Act (No 107 of 1998) on the Remaining Extent of Portion 20 of the Farm Vastfontein 271 JR, Gauteng Province, South Africa. January 2019 - on-going. *Environmental Specialist*. Acting as the Environmental Consultant & EAP to the project. This included a 24G application for certain activities under NEMA to the Gauteng Department of Agriculture, and Rural Development. The project is a section 24G application



process. (Louis Johannes Cilliers).

Unlawful Commencement or Continuation of Listed Activities in Terms of Section 24G of the National Environmental Management Act (No 107 of 1998) on the Remaining Extent of Portion 122 of the Farm Donkerhoek 365 JR, Gauteng Province, South Africa. June 2019 - on-going. *Environmental Specialist*. Acting as the Environmental Consultant & EAP to the project. This included a 24G application for certain activities under NEMA to the Gauteng Department of Agriculture, and Rural Development. The project is a section 24G application process. (Plurivert Investments (Pty) Ltd.).

## **ENVIRONMENTAL AUDITS**

Composting on Portion 194 of The Farm Rietfontein 115 IR, Gauteng Province, South Africa. July 2015 - present. *Environmental Specialist*. Acting as the External Environmental Auditor on the project. This included regulating and upholding of the Environmental Management Program and Authorisation. (Petrus Johannes Bardenhorst).

The Construction and Operation of 14 Pig Grower Houses Each with Approximately 600 Pigs including the Water Storage Tanks, Offices with Ablution Facilities and Piggery Effluent and Manure Handling Pond, Portion 1 of the Farm Dorstfontein 553-JR, Gauteng Province, South Africa. August 2015 - present. *Environmental Specialist*. Acting as the External Environmental Auditor on the project. This included regulating and upholding of the Environmental Management Program and Authorisation. (Topigs South Africa).

The Operation of 4 Pig Grower Houses with 16 Rooms, each with Approximately 450 Piglets including the Water Storage Tanks, Offices with Ablution Facilities and Piggery Effluent and Manure Handling Pond, Portion 0 (Remaining Extent) of the Farm Merino 641-IR, Mpumalanga Province, South Africa. November 2017 - present. *Environmental Specialist*. Acting as the External Environmental Auditor on the project. This included regulating and upholding of the Environmental Management Program and Authorisation. (Topigs South Africa).

The Operation of the Grower, Sow Farming and Artificial Insemination Units on Portion 1. 9, 10 and 11 of the Farm Rietfontein 645, Mpumalanga Province, South Africa. November 2017 - present. *Environmental Specialist*. Acting as the External Environmental Auditor on the project. This included regulating and upholding of the Environmental Management Program and Authorisation. (Topigs South Africa).

The Construction and Installation of the Above-Ground Tanks, with associated Infrastructure, at the Premises of Eagle Ink Systems, Westmead, Kwazulu Natal, South Africa. February 2018 - June 2018. *Environmental Specialist*. Acting as the External Environmental Auditor on the project. This included regulating and upholding of the Environmental Management Program and Authorisation. (Flint Group SA (Pty) Ltd.).

The Extension of the Egg Production Facility on Portion 207 of the Farm Roodeplaats 293-JR, Gauteng Province, South Africa. November 2018. *Environmental Specialist*. Acting as the External Environmental Auditor on the project. This included regulating and upholding of the Environmental Management Program and Authorisation. (Nokeng Eiers CC).

## **ENVIRONMENTAL MONITORING**

Environmental Monitoring of Kameeldrift 298 JR portion 9, etc residential development (Pretoria, Gauteng, South Africa) March 2008 - July 2008. *Environmental Specialist*. Acting as the Environmental Control Officer on the project. This included regulating and upholding of the Environmental Management Plan on site on a monthly basis. (Lebra Developments (Pty) Ltd.).

Environmental Monitoring of Serengeti Estates (Benoni, Gauteng, South Africa) March 2008 - present. *Environmental Specialist*. Acting as the Environmental Control Officer on the project. This included regulating and upholding of the Environmental Management Plan on site on a monthly basis. (African Kingdom Holdings (Pty) Ltd.).

Environmental Monitoring of the implementation of water pipes to a rural settlement (Mmakau, Gauteng, South Africa) March 2008 - September 2008. *Environmental Specialist*. Acting as the Environmental Control Officer on the project. This included regulating and upholding of the Environmental Management Plan on site on a monthly basis. (Bigen Africa Consulting Engineers).



Environmental Monitoring of the construction of road K71 (Centurion, Gauteng, South Africa) March 2008 - May 2010. *Environmental Specialist*. Acting as the Environmental Control Officer on the project. This included regulating and upholding of the Environmental Management Plan on site on a monthly basis. (Patula Construction (Pty) Ltd.).

Environmental Monitoring of the fence construction of Bryntirion Estate (Pretoria, Gauteng, South Africa) April 2008 - August 2010. *Environmental Specialist*. Acting as the Environmental Control Officer on the project. This included regulating and upholding of the Environmental Management Plan on site on a monthly basis. (Khalema (Pty) Ltd.).

Environmental Monitoring of the Nkomazi Filling Stations (Malelane, Mpumalanga, South Africa) July 2008 - March 2009. *Environmental Specialist*. Acting as the Environmental Control Officer on the project. This included regulating and upholding of the Environmental Management Plan on site on a monthly basis. (Topcoats Investments (Pty) Ltd.).

Environmental Monitoring of The Kingdom Resort (near Pilansberg, North West, South Africa) January 2009 - present. *Environmental Specialist*. Acting as the Environmental Control Officer on the project. This included regulating and upholding of the Environmental Management Plan on site on a monthly basis. (Ian Hayes-Hill).

Environmental Monitoring of the Nkomazi Filling Stations Access Road (Malelane, Mpumalanga, South Africa) June 2009 - September 2009. *Environmental Specialist*. Acting as the Environmental Control Officer on the project. This included regulating and upholding of the Environmental Management Plan on site on a monthly basis. (Topcoats Investments (Pty) Ltd.).

Environmental Monitoring of the Construction of road K29 (Cosmo City, Gauteng, South Africa) March 2009 - April 2009. *Environmental Specialist*. Acting as the Environmental Control Officer on the project. This included regulating and upholding of the Environmental Management Plan on site on a monthly basis. (VIAPLAN CONSULTING ENGINEERS INC (Pty) Ltd.).

Environmental Monitoring of the Construction of the Phokeng Western By-pass Road. (Rustenburg, North-West, South Africa) February 2009 - July 2010. *Environmental Specialist*. Acting as the Environmental Control Officer on the project. This included regulating and upholding of the Environmental Management Plan on site on a monthly basis. (Africon (Pty) Ltd.).

Environmental Monitoring of the Construction of the Katlehong Northern Access Road. (Katlehong, Gauteng, South Africa) June 2009 - June 2010. *Environmental Specialist*. Acting as the Environmental Control Officer on the project. This included regulating and upholding of the Environmental Management Plan on site on a monthly basis. (V&V Consulting Engineers (Pty) Ltd.).

Environmental Monitoring of the Beit Bridge Port of Entry: Upgrading of the Wastewater Treatment Works. (Beit Bridge, Limpopo, South Africa) September 2009 - June 2011. *Environmental Specialist*. Acting as the Environmental Control Officer on the project. This included regulating and upholding of the Environmental Management Plan on site on a monthly basis. (New Heights 66 (Pty) Ltd.).

Environmental Monitoring of the construction of road K71 ph.2 (Centurion, Gauteng, South Africa) February 2011 - March 2013. *Environmental Specialist*. Acting as the Environmental Control Officer on the project. This included regulating and upholding of the Environmental Management Plan on site on a monthly basis. (Vela VKE (Pty) Ltd.).

Environmental Monitoring of the construction of a Piggery (Meisjesvlei, Limpopo, South Africa) July 2010 - June 2012. *Environmental Specialist*. Acting as the Environmental Control Officer on the project. This included regulating and upholding of the Environmental Management Plan on site on a monthly basis. (Walt Landgoed (Pty) Ltd.).

Environmental Monitoring of the construction of a Cemetery (Kempton Park, Gauteng, South Africa) September 2010 - April 2011. *Environmental Specialist*. Acting as the Environmental Control Officer on the project. This included regulating and upholding of the Environmental Management Plan on site on a monthly basis. (Ekurhuleni Municipality).

Environmental Monitoring of the construction of the Bestwood Residential Development (Kathu, Northern Cape, South Africa) October 2010 - October 2012. *Environmental Specialist*. Acting as the Environmental Control Officer on the project. This included regulating and upholding of the Environmental Management Plan on site on a monthly basis. (Kathu Property Developers (Pty) Ltd.).

Environmental Monitoring of the construction of Fibre Optic Cable from Pretoria to Empangeni (Across Provinces, South Africa) September 2010 – February 2011. *Environmental Specialist*. Acting as the Environmental Control Officer on the project. This included regulating and upholding of the Environmental Management Plan on site on a monthly basis. (Plessey (Pty) Ltd.).

Environmental Monitoring of Serengeti Golf and Wildlife Estate Curro School (Benoni, Gauteng, South Africa) July 2011 – July 2015. *Environmental Specialist*. Acting as the Environmental Control Officer on the project. This included regulating and upholding of the Environmental Management Plan on site on a monthly basis. (MNK Projects (Pty) Ltd.).

Environmental Monitoring of the construction of a Piggery (Vaalwater, Limpopo, South Africa) June 2011 – May 2012. *Environmental Specialist*. Acting as the Environmental Control Officer on the project. This included regulating and upholding of the Environmental Management Plan on site on a monthly basis. (Vus'ithemba Project Solutions CC).

Environmental Monitoring of the construction of road K57 P1-1 (Tedderfield AH, Gauteng, South Africa) February 2012 – July 2013. *Environmental Specialist*. Acting as the Environmental Control Officer on the project. This included regulating and upholding of the Environmental Management Plan on site on a monthly basis. (Aganang Consulting Engineers (Pty) Ltd.).

Environmental Monitoring of the construction of road K57 Ph.1b (Eikenhof/Walkerville, Gauteng, South Africa) November 2013 – September 2016. *Environmental Specialist*. Acting as the Environmental Control Officer on the project. This included regulating and upholding of the Environmental Management Plan on site on a monthly basis. (Aganang Consulting Engineers (Pty) Ltd.).

Environmental Monitoring of the widening of the existing Cross-Section of Road N14 from the intersection at Road P116-3 and Road P28-1 (Carltonville, Gauteng, South Africa) April 2012 – August 2013. *Environmental Specialist*. Acting as the Environmental Control Officer on the project. This included regulating and upholding of the Environmental Management Plan on site on a monthly basis. (Aurecon South Africa (Pty) Ltd.).

Environmental Monitoring of the construction of the upgrade of the Wastewater Treatment Works at Waterval Prison (Waterval, KwaZulu-Natal, South Africa). Feb 2012 – January 2013. *Environmental Specialist*. Acting as the Environmental Control Officer on the project. This included regulating and upholding of the Environmental Management Plan on site on a monthly basis. (Dept. of Public Works).

Environmental Monitoring of the construction of a Filling Station on Erf 1802, Northam Extension 6, Limpopo, South Africa. April 2014 – June 2015. *Environmental Specialist*. Acting as the Environmental Control Officer on the project. This included regulating and upholding of the Environmental Management Program and Authorisation on site on a monthly basis. (MPJF Investments CC).

Environmental Monitoring of the Kwa-Guqa Filling Stations (Kwa-Guqa, Mpumalanga, South Africa) November 2015 – June 2016. *Environmental Specialist*. Acting as the Environmental Control Officer on the project. This included regulating and upholding of the Environmental Management Plan on site on a monthly basis. (CC Hardware and Cycle (Pty) Ltd. T/A Lenasia Builders & Project Developers.).

Environmental Monitoring of the construction of a Filling Station on Portion 356 (a portion of Portion 44) of the Farm Grootvlei 272-JR, Gauteng, South Africa. February 2018 – May 2019. *Environmental Specialist*. Acting as the Environmental Control Officer on the project. This included regulating and upholding of the Environmental Management Program and Authorisation on site on a monthly basis. (Organic Coral Investments).

Environmental Monitoring of the construction of a Filling Station on Erven 43 Crown Ext.2, City of Johannesburg Municipality, Gauteng, South Africa. March 2016 – April 2017. *Environmental Specialist*. Acting as the Environmental Control Officer on the project. This included regulating and upholding of the Environmental Management Program and Authorisation on site on a monthly basis. (CC Hardware and Cycle (Pty) Ltd. T/A Lenasia Builders & Project Developers).

Environmental Monitoring of the Piggery Construction Phase on Portion 1 of the Farm Leeuwkuil 500 KR, Limpopo, South Africa. June 2018 – November 2018. *Environmental Specialist*. Acting as the Environmental Control Officer on the project. This included regulating and upholding of the Environmental Management Program and Authorisation on site on a monthly basis. (Walt Landgoed (Pty) Ltd.).

Environmental Monitoring of the Construction of a Piggery Sow Unit Facility on Remainder of Portion 2 of the Farm Biesjeskuil 143-JR, Limpopo, South Africa. November 2018 – present. *Environmental Specialist*. Acting as

the Environmental Control Officer on the project. This included regulating and upholdment of the Environmental Management Program and Authorisation on site on a monthly basis. (Walt Landgoed (Pty) Ltd.).

Environmental Monitoring of the Construction of Various Road-over-spruit culvert Bridges in Soshanguve HH - RTD01-2016/17 - TIDC012, Gauteng, South Africa. March 2019 - present. *Environmental Specialist*. Acting as the Environmental Control Officer on the project. This included regulating and upholdment of the Environmental Management Program and Authorisation on site on a monthly basis. (Kabe Consulting Engineers (Pty) Ltd.).

Environmental Monitoring of the Construction of the Piggery on Zoetfontein 4-HT Remainder, Zoetfontein 4-HT Portion 2, & Kleinfontein 3-HT Portion 3, Mpumalanga, South Africa. March 2019 - present. *Environmental Specialist*. Acting as the Environmental Control Officer on the project. This included regulating and upholdment of the Environmental Management Program and Authorisation on site on a monthly basis. (weGrow Farming Enterprises (Pty) Ltd.).

Environmental Monitoring of the Construction of the Piggery on Cayley Mountain Lodge, Kwa-Zulu Natal, South Africa. March 2019 - present. *Environmental Specialist*. Acting as the Environmental Control Officer on the project. This included regulating and upholdment of the Environmental Management Program and Authorisation on site on a monthly basis. (The Holiday Club (Pty) Ltd.).

Environmental Monitoring of the Construction phase on Portion 3 of the Farm Aylestone 591 JT Macadamia Nut Orchard Establishment, Mpumalanga, South Africa. June 2019. *Environmental Specialist*. Acting as the Environmental Control Officer on the project. This included regulating and upholdment of the Environmental Management Program and Authorisation on site on a monthly basis. (D. Hoffman).

Environmental Monitoring of the Construction phase on Portion 4 of the Farm Aylestone 591 JT Macadamia Nut Orchard Establishment, Mpumalanga, South Africa. June 2019. *Environmental Specialist*. Acting as the Environmental Control Officer on the project. This included regulating and upholdment of the Environmental Management Program and Authorisation on site on a monthly basis. (J. Hoffman).

Environmental Monitoring of the Construction of the Abattoir on Portion 0 of Erf 119 in Industriqwa IA, Harrismith, within the Jurisdiction of Maluti-A-Phofung Local Municipality, Free State, South Africa. June 2019 - present. *Environmental Specialist*. Acting as the Environmental Control Officer on the project. This included regulating and upholdment of the Environmental Management Program and Authorisation on site on a monthly basis. (Steysburg Pork and Abattoir (Pty) Ltd.).

## Appendix I: Specialist's declaration of interest

---

Attached

“JWALE KE NAKO YA KOTULO, RE A KUBELETSA”

**DETAILS OF SPECIALIST AND DECLARATION OF INTEREST**

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

Application for environmental authorisation integrated environmental authorisation and waste management licence in terms of the-

- (1) National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended and the Environmental Impact Assessment Regulations, 2014; and
- (2) National Environmental Management Act: Waste Act, 2008 (Act No. 59 of 2008) and Government Notice 921, 2013

**PROJECT TITLE**

PROPOSED EXPANSION OF A SHEEP FEEDLOT ON THE REMAINDER OF THE FARM GROENHOF VREDEFORT RD, FREE STATE PROVINCE.
--

Specialist:	KEMS		
Contact person:	Arno van den Berg		
Postal address:	Postnet Suite 65, Private Bag X2, Raslouw		
Postal code:	0109	Cell:	0825707072
Telephone:	0825707072	Fax:	
E-mail:	amo@kems.org.za		
Professional affiliation(s) (if any)	SACNASP Registered Pr. Sci. Nat Environmental Sciences		

Project Consultant:	REC Services (Pty) Ltd.		
Contact person:	Rowan van Tonder		
Postal address:	PO Box 40541, Moreleta Village		
Postal code:	0044	Cell:	082 412 7571
Telephone:	012 997 4742	Fax:	012 997 0415
E-mail:	rowan@recservices.co.za		

**ENVIRONMENTAL MANAGEMENT**

Private Bag X20801 Bloemfontein 9300  
Tel: 051-400 4817/19  
Fax: 051-400 4842/11  
E-mail: [sellom@deea.fs.gov.za](mailto:sellom@deea.fs.gov.za)



**destea**

department of  
economic, small business development,  
tourism and environmental affairs  
FREE STATE PROVINCE

4.2 The specialist appointed in terms of the Regulations\_

I, Arno van den Berg , declare that --

General declaration:

- I act as the independent specialist in this application: PROPOSED 3600 SOW UNIT PIGGERY ON PORTIONS OF THE FARMS SAMARIA, DE RUST, REWIESIE AND MARA, FREE STATE PROVINCE;
- 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.

Signature of the specialist:

KEMS Pty Ltd

Name of company (if applicable):

24 November 2022

Date:

**ENVIRONMENTAL MANAGEMENT**

Private Bag X20801 Tel: 051-400 4817/19

Bloemfontein Fax: 051-400 4842/11

9300

E-mail: [sellom@dteea.fs.gov.za](mailto:sellom@dteea.fs.gov.za)

## Appendix J: Additional Information

---

- Screening Tool Report.

“JWALE KE NAKO YA KOTULO, RE A KUBELETSA”

**SCREENING REPORT FOR AN ENVIRONMENTAL AUTHORIZATION AS  
REQUIRED BY THE 2014 EIA REGULATIONS – PROPOSED SITE  
ENVIRONMENTAL SENSITIVITY**

**EIA Reference number:** TBA

**Project name:** Agrien Sheep Feedlot

**Project title:** PROPOSED EXPANSION OF A SHEEP FEEDLOT ON THE FARM GROENHOF, FREE STATE PROVINCE

**Date screening report generated:** 26/09/2022 11:05:19

**Applicant:** Agrien (Pty) Ltd.

**Compiler:** REC Services (Pty) Ltd.

**Compiler signature:**

  
.....

**Application Category:** Agriculture\_Forestry\_Fisheries|Animal Production

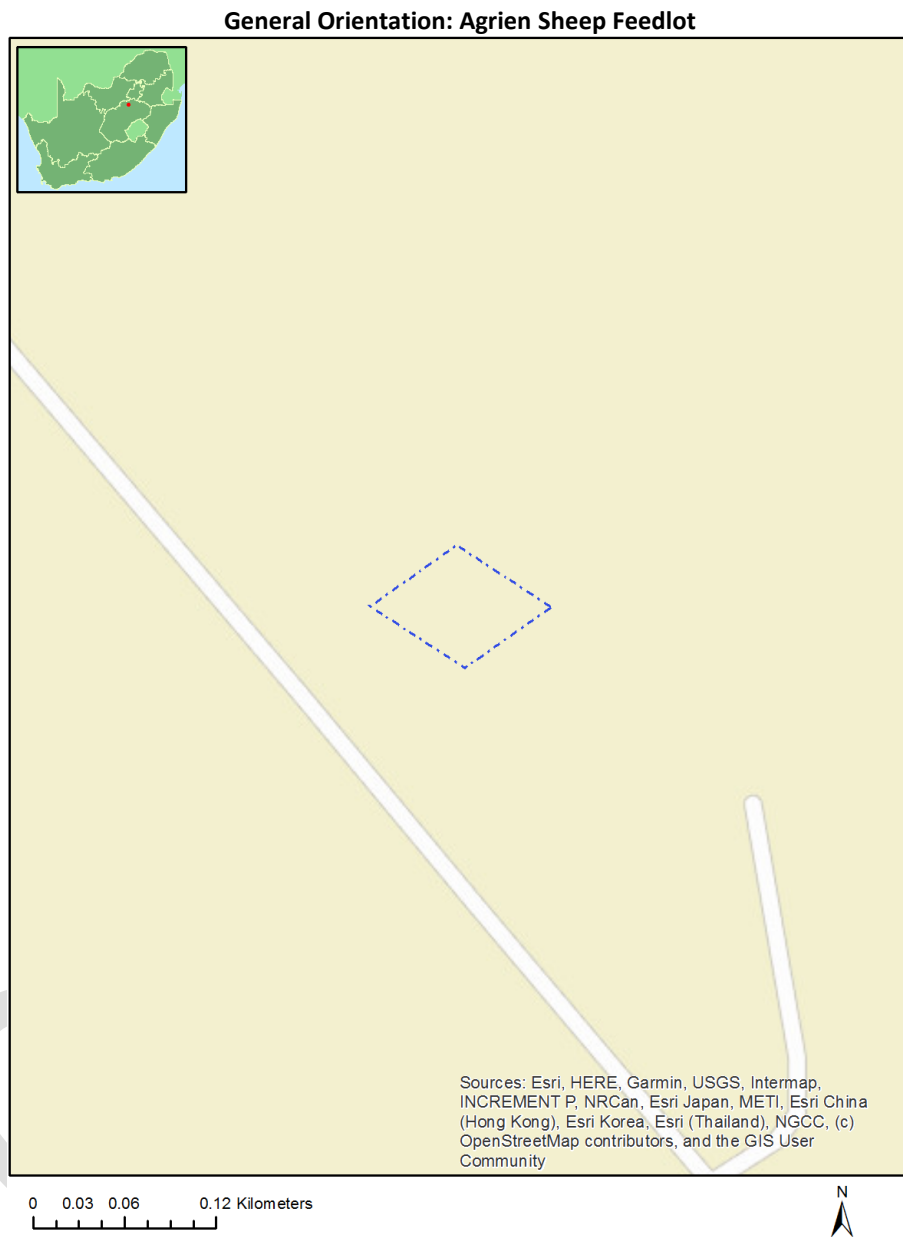


## Table of Contents

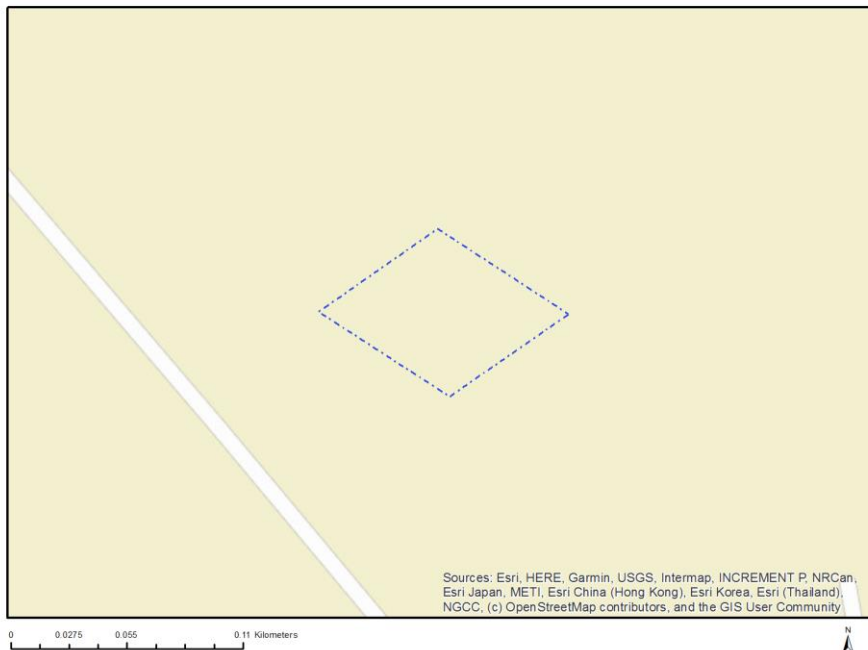
Proposed Project Location .....	3
Orientation map 1: General location .....	3
Map of proposed site and relevant area(s) .....	4
Cadastral details of the proposed site .....	4
Wind and Solar developments with an approved Environmental Authorisation or applications under consideration within 30 km of the proposed area .....	4
Environmental Management Frameworks relevant to the application .....	5
Environmental screening results and assessment outcomes .....	5
Relevant development incentives, restrictions, exclusions or prohibitions .....	5
Map indicating proposed development footprint within applicable development incentive, restriction, exclusion or prohibition zones .....	6
Proposed Development Area Environmental Sensitivity .....	6
Specialist assessments identified .....	7
Results of the environmental sensitivity of the proposed area .....	9
MAP OF RELATIVE AGRICULTURE THEME SENSITIVITY .....	9
MAP OF RELATIVE ANIMAL SPECIES THEME SENSITIVITY .....	10
MAP OF RELATIVE AQUATIC BIODIVERSITY THEME SENSITIVITY .....	11
MAP OF RELATIVE ARCHAEOLOGICAL AND CULTURAL HERITAGE THEME SENSITIVITY .....	12
MAP OF RELATIVE CIVIL AVIATION THEME SENSITIVITY .....	13
MAP OF RELATIVE DEFENCE THEME SENSITIVITY .....	14
MAP OF RELATIVE PALEONTOLOGY THEME SENSITIVITY .....	15
MAP OF RELATIVE PLANT SPECIES THEME SENSITIVITY .....	16
MAP OF RELATIVE TERRESTRIAL BIODIVERSITY THEME SENSITIVITY .....	17

# Proposed Project Location

## Orientation map 1: General location



## Map of proposed site and relevant area(s)



## Cadastral details of the proposed site

Property details:

No	Farm Name	Farm/ Erf No	Portion	Latitude	Longitude	Property Type
1	GROENHOF	240	0	27°16'29.36S	27°22'6.59E	Farm
2	GROENHOF	240	0	27°15'47.76S	27°21'57.73E	Farm Portion

Development footprint<sup>1</sup> vertices:

No development footprint(s) specified.

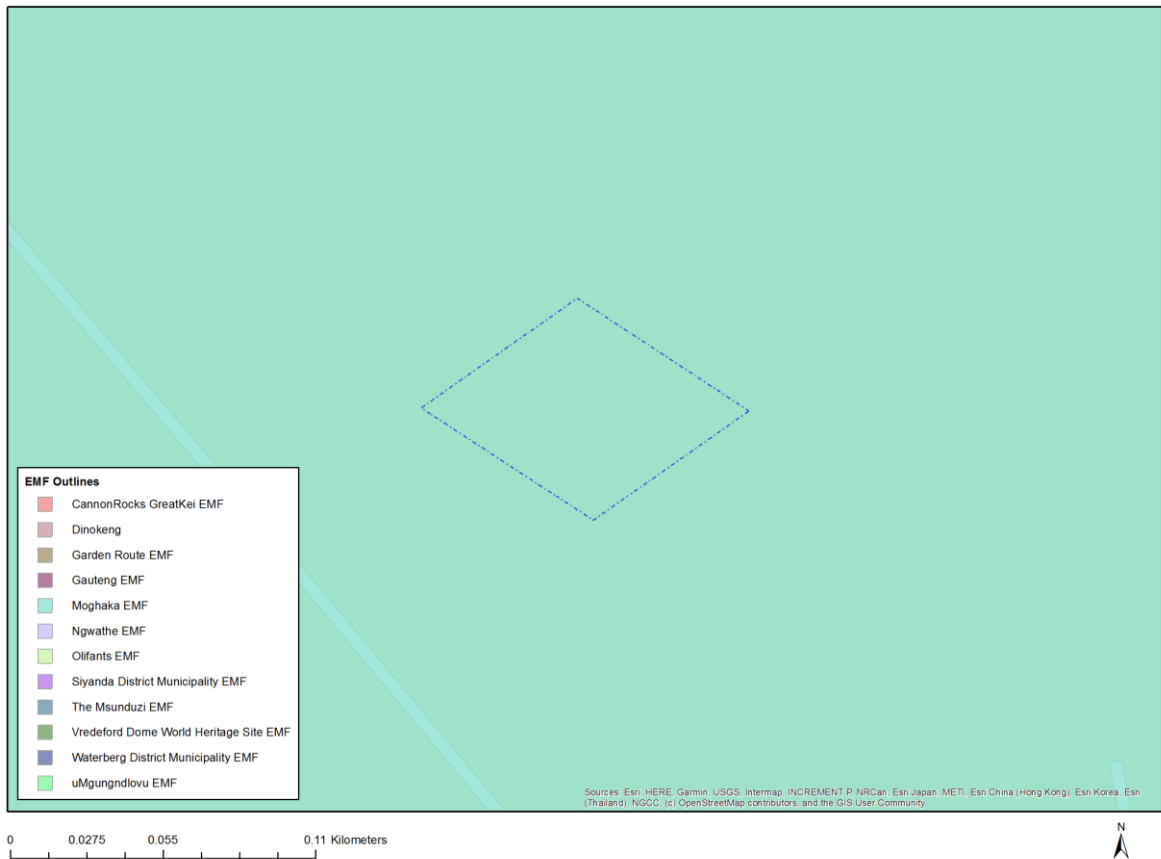
## Wind and Solar developments with an approved Environmental Authorisation or applications under consideration within 30 km of the proposed area

No nearby wind or solar developments found.

---

<sup>1</sup> "development footprint", means the area within the site on which the development will take place and includes all ancillary developments for example roads, power lines, boundary walls, paving etc. which require vegetation clearance or which will be disturbed and for which the application has been submitted.

## Environmental Management Frameworks relevant to the application



Environmental Management Framework	LINK
Moghaka EMF	<a href="https://screening.environment.gov.za/ScreeningDownloads/EMF/Moghaka_LM_EMF_-_Final_EMF_Report_Rev2013-06.pdf">https://screening.environment.gov.za/ScreeningDownloads/EMF/Moghaka_LM_EMF - Final EMF Report Rev2013-06.pdf</a>

## Environmental screening results and assessment outcomes

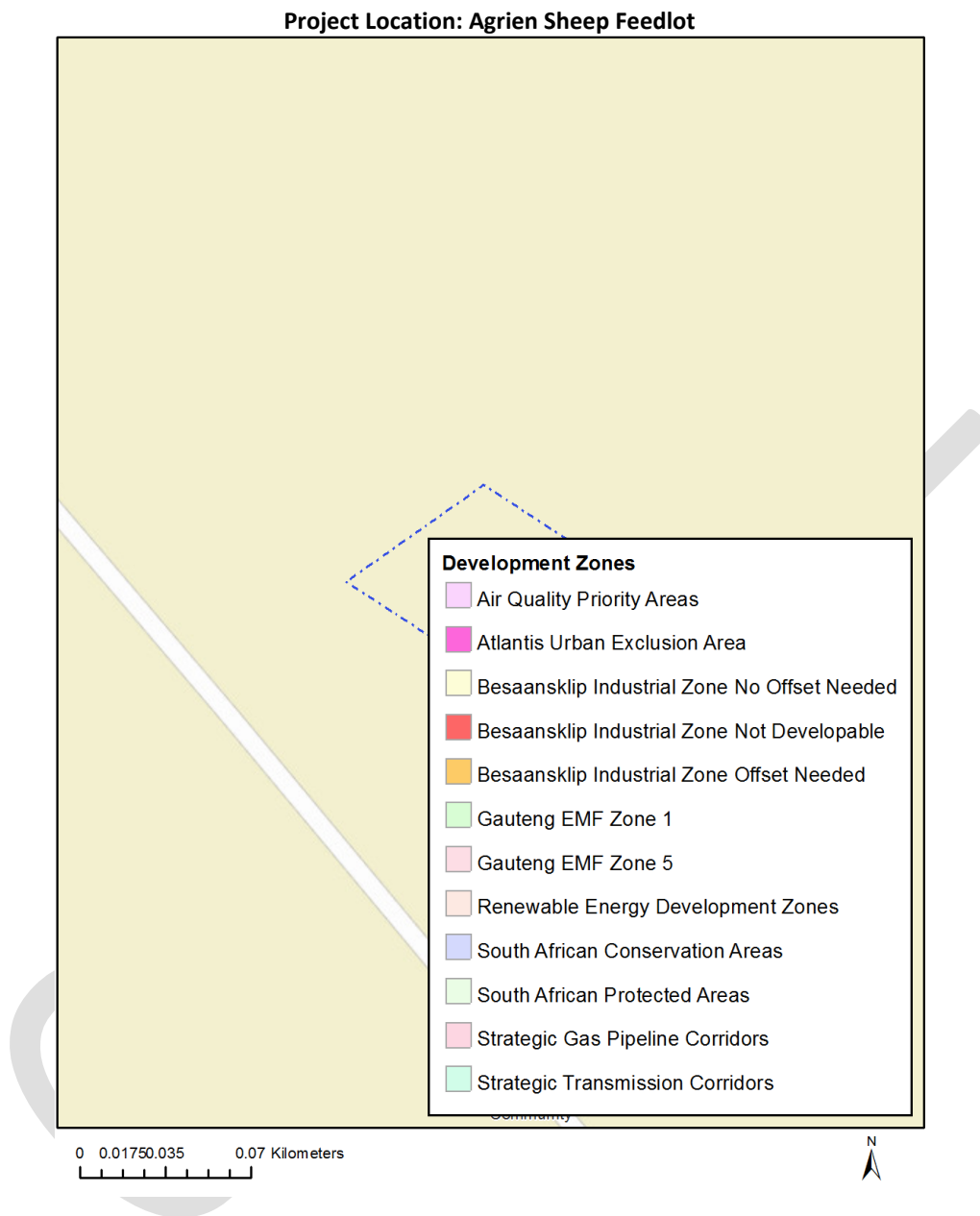
The following sections contain a summary of any development incentives, restrictions, exclusions or prohibitions that apply to the proposed development site as well as the most environmental sensitive features on the site based on the site sensitivity screening results for the application classification that was selected. The application classification selected for this report is: **Agriculture\_Forestry\_Fisheries|Animal Production.**

### Relevant development incentives, restrictions, exclusions or prohibitions

The following development incentives, restrictions, exclusions or prohibitions and their implications that apply to this site are indicated below.

No intersection with any development zones found.

Map indicating proposed development footprint within applicable development incentive, restriction, exclusion or prohibition zones



**Proposed Development Area Environmental Sensitivity**

The following summary of the development site environmental sensitivities is identified. Only the highest environmental sensitivity is indicated. The footprint environmental sensitivities for the proposed development footprint as identified, are indicative only and must be verified on site by a suitably qualified person before the specialist assessments identified below can be confirmed.

Theme	Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
Agriculture Theme			X	
Animal Species Theme				X

Aquatic Biodiversity Theme				X
Archaeological and Cultural Heritage Theme				X
Civil Aviation Theme			X	
Defence Theme				X
Paleontology Theme			X	
Plant Species Theme				X
Terrestrial Biodiversity Theme	X			

### Specialist assessments identified

Based on the selected classification, and the environmental sensitivities of the proposed development footprint, the following list of specialist assessments have been identified for inclusion in the assessment report. It is the responsibility of the EAP to confirm this list and to motivate in the assessment report, the reason for not including any of the identified specialist study including the provision of photographic evidence of the site situation.

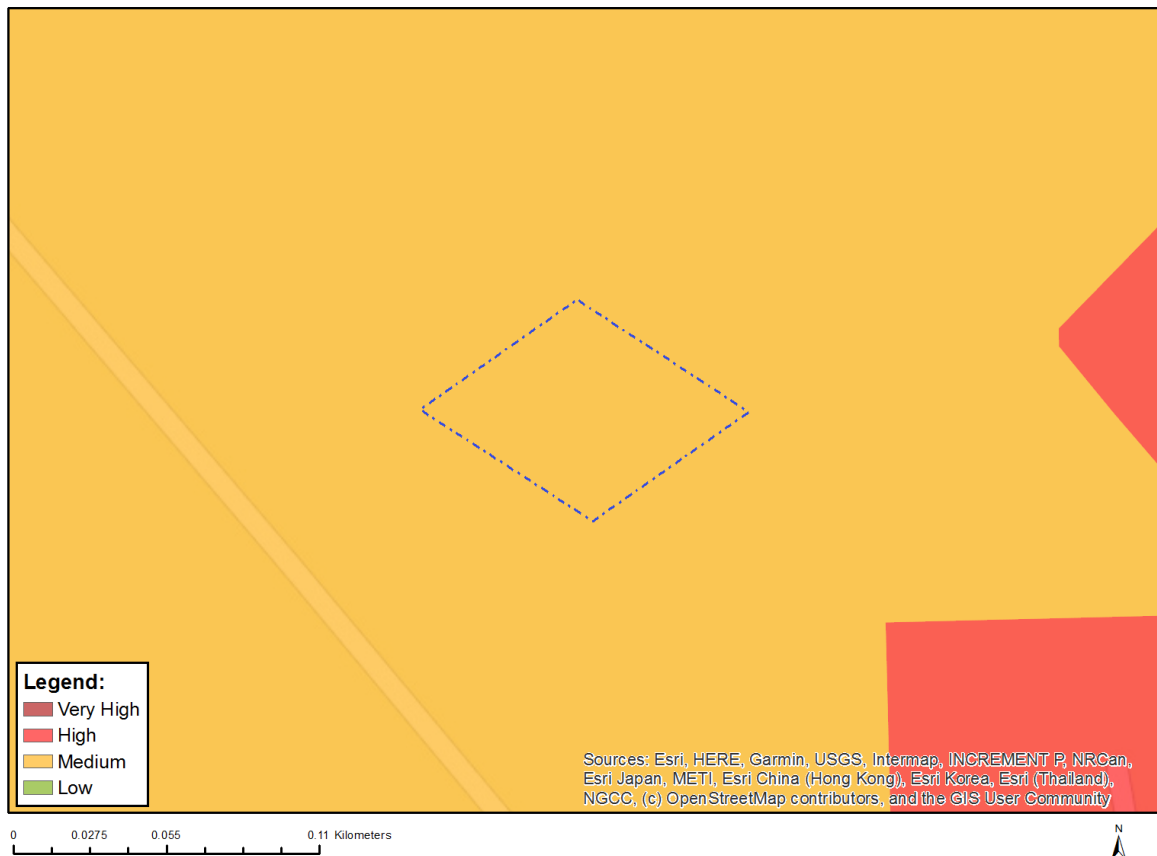
<b>No</b>	<b>Specialist assessment</b>	<b>Assessment Protocol</b>
1	Landscape/Visual Impact Assessment	<a href="https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols/Gazetted_General_Requirement_Assessment_Protocols.pdf">https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols/Gazetted_General_Requirement_Assessment_Protocols.pdf</a>
2	Archaeological and Cultural Heritage Impact Assessment	<a href="https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols/Gazetted_General_Requirement_Assessment_Protocols.pdf">https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols/Gazetted_General_Requirement_Assessment_Protocols.pdf</a>
3	Palaeontology Impact Assessment	<a href="https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols/Gazetted_General_Requirement_Assessment_Protocols.pdf">https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols/Gazetted_General_Requirement_Assessment_Protocols.pdf</a>
4	Terrestrial Biodiversity Impact Assessment	<a href="https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols/Gazetted_Terrestrial_Biodiversity_Assessment_Protocols.pdf">https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols/Gazetted_Terrestrial_Biodiversity_Assessment_Protocols.pdf</a>
5	Aquatic Biodiversity Impact Assessment	<a href="https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols/Gazetted_Aquatic_Biodiversity_Assessment_Protocols.pdf">https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols/Gazetted_Aquatic_Biodiversity_Assessment_Protocols.pdf</a>
6	Hydrology Assessment	<a href="https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols/Gazetted_General_Requirement_Assessment_Protocols.pdf">https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols/Gazetted_General_Requirement_Assessment_Protocols.pdf</a>
7	Traffic Impact Assessment	<a href="https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols/Gazetted_General_Requirement_Assessment_Protocols.pdf">https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols/Gazetted_General_Requirement_Assessment_Protocols.pdf</a>

	ent	
8	Socio-Economic Assessment	<a href="https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols/Gazetted_General_Requirement_Assessment_Protocols.pdf">https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols/Gazetted_General_Requirement_Assessment_Protocols.pdf</a>
9	Ambient Air Quality Impact Assessment	<a href="https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols/Gazetted_General_Requirement_Assessment_Protocols.pdf">https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols/Gazetted_General_Requirement_Assessment_Protocols.pdf</a>
10	Plant Species Assessment	<a href="https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols/Gazetted_Plant_Species_Assessment_Protocols.pdf">https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols/Gazetted_Plant_Species_Assessment_Protocols.pdf</a>
11	Animal Species Assessment	<a href="https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols/Gazetted_Animal_Species_Assessment_Protocols.pdf">https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols/Gazetted_Animal_Species_Assessment_Protocols.pdf</a>

## Results of the environmental sensitivity of the proposed area.

The following section represents the results of the screening for environmental sensitivity of the proposed site for relevant environmental themes associated with the project classification. It is the duty of the EAP to ensure that the environmental themes provided by the screening tool are comprehensive and complete for the project. Refer to the disclaimer.

### MAP OF RELATIVE AGRICULTURE THEME SENSITIVITY



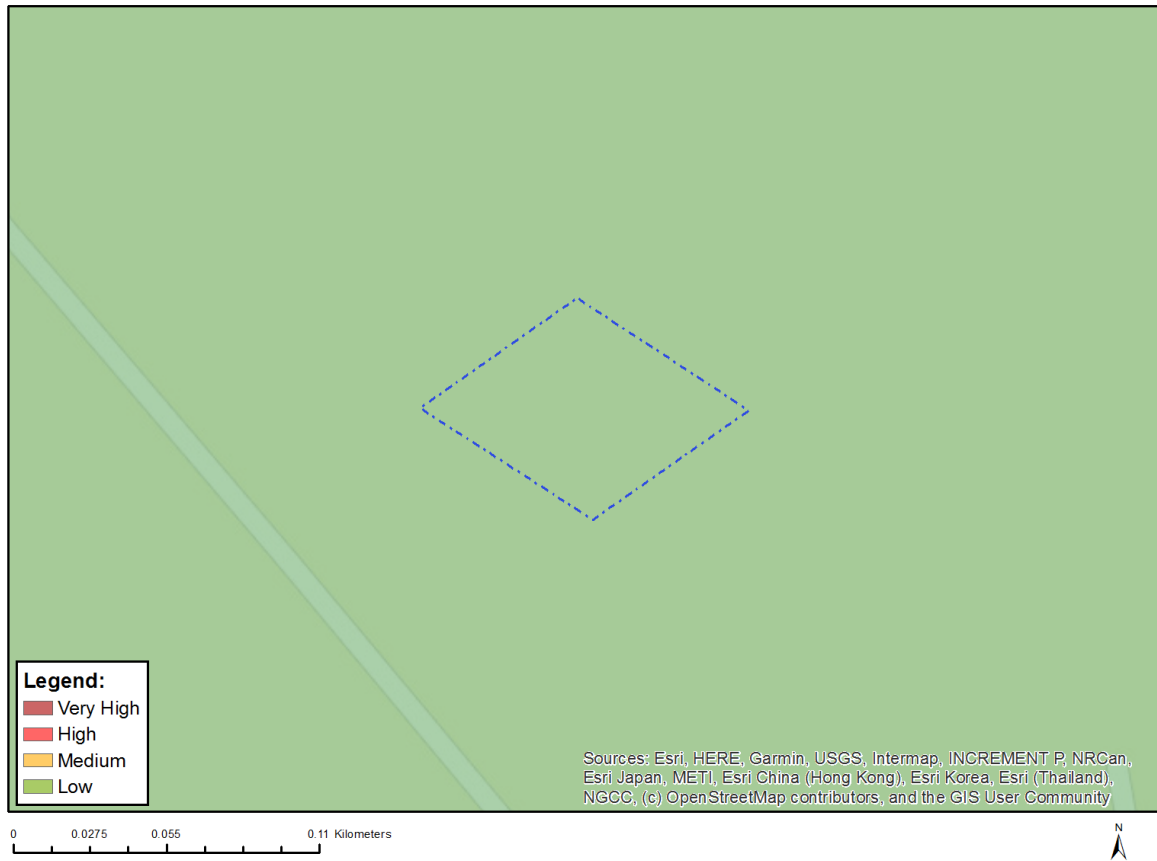
Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
		X	

#### Sensitivity Features:

Sensitivity	Feature(s)
Medium	Land capability;06. Low-Moderate/07. Low-Moderate/08. Moderate



## MAP OF RELATIVE ANIMAL SPECIES THEME SENSITIVITY



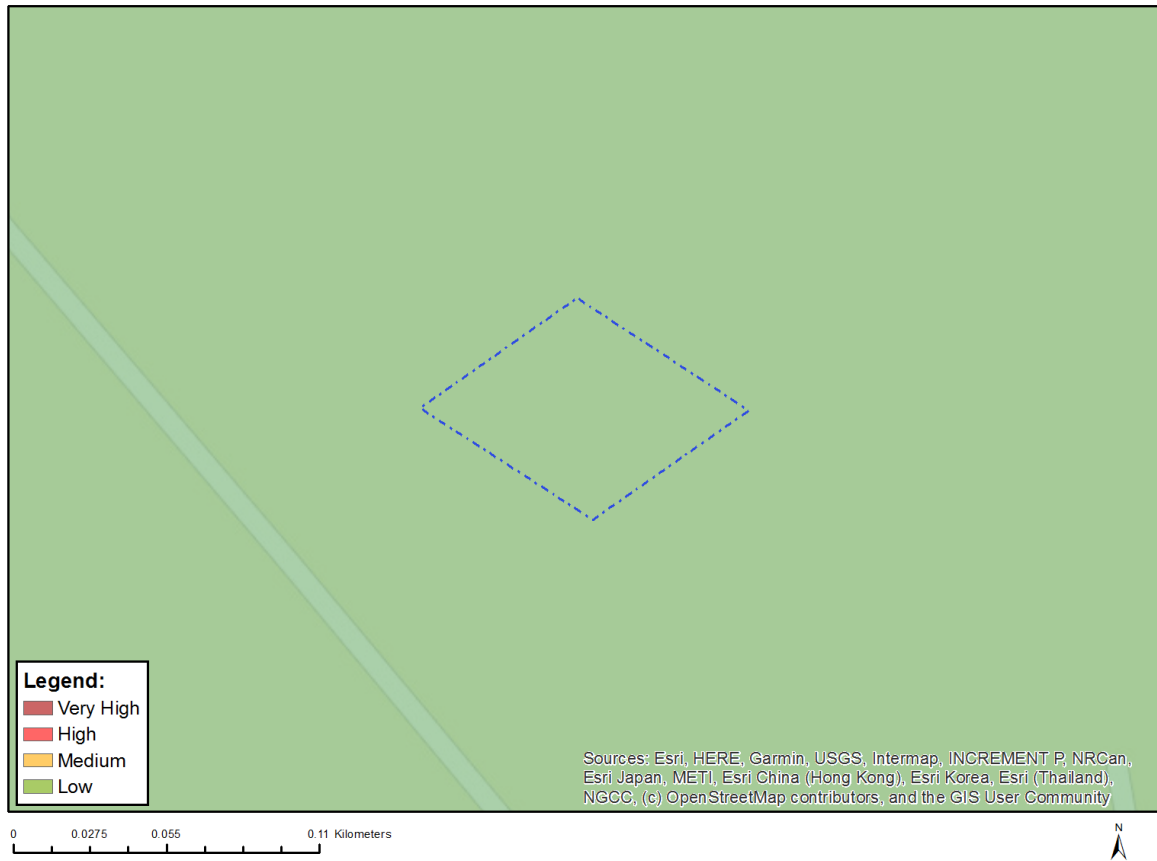
Where only a sensitive plant unique number or sensitive animal unique number is provided in the screening report and an assessment is required, the environmental assessment practitioner (EAP) or specialist is required to email SANBI at [eiadatarequests@sanbi.org.za](mailto:eiadatarequests@sanbi.org.za) listing all sensitive species with their unique identifiers for which information is required. The name has been withheld as the species may be prone to illegal harvesting and must be protected. SANBI will release the actual species name after the details of the EAP or specialist have been documented.

Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
			X

### Sensitivity Features:

Sensitivity	Feature(s)
Low	Subject to confirmation

## MAP OF RELATIVE AQUATIC BIODIVERSITY THEME SENSITIVITY

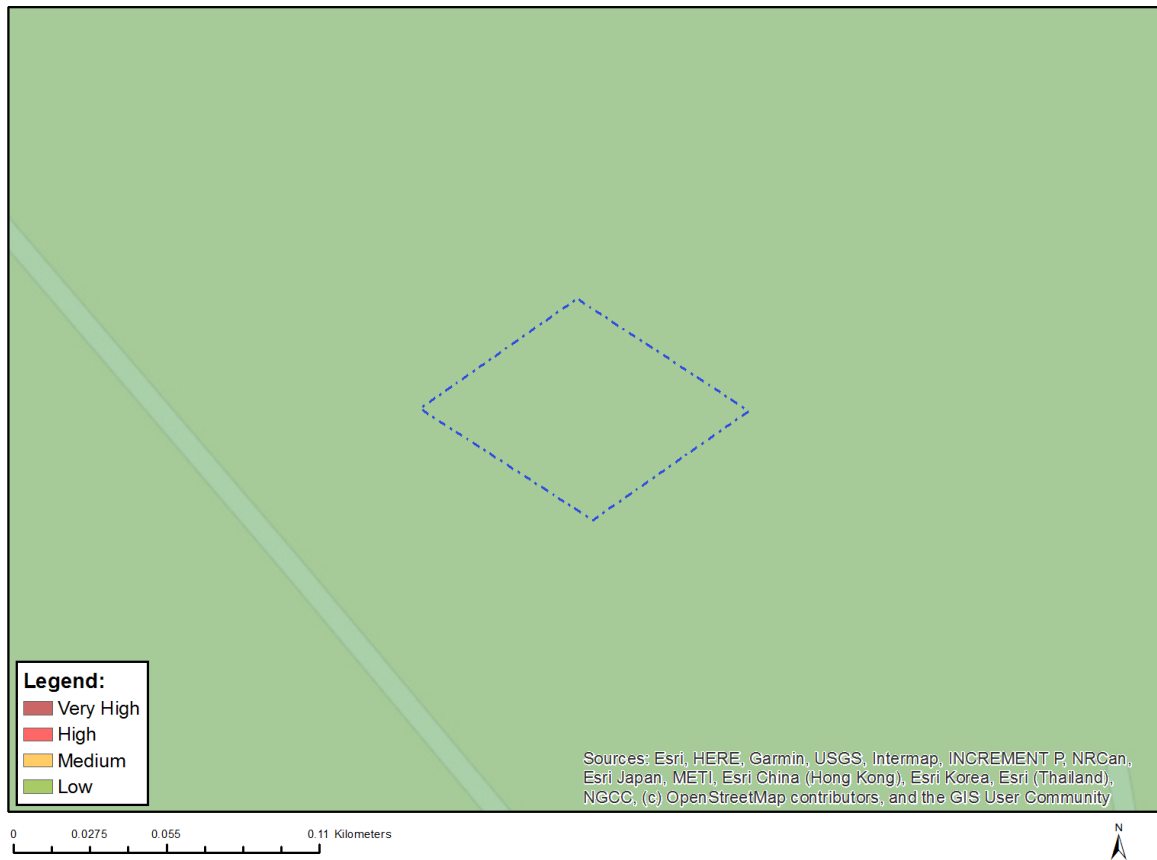


Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
			X

### Sensitivity Features:

Sensitivity	Feature(s)
Low	Low sensitivity

# MAP OF RELATIVE ARCHAEOLOGICAL AND CULTURAL HERITAGE THEME SENSITIVITY

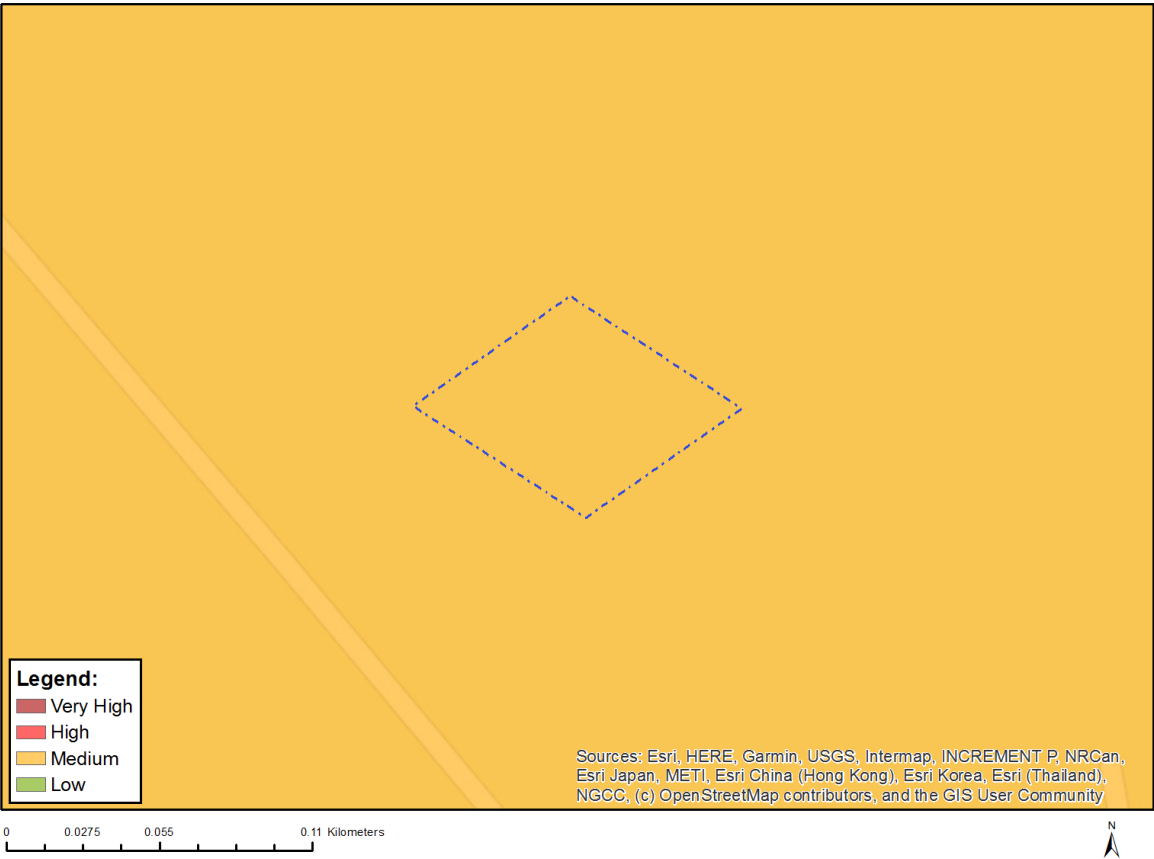


Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
			X

## Sensitivity Features:

Sensitivity	Feature(s)
Low	Low sensitivity

# MAP OF RELATIVE CIVIL AVIATION THEME SENSITIVITY

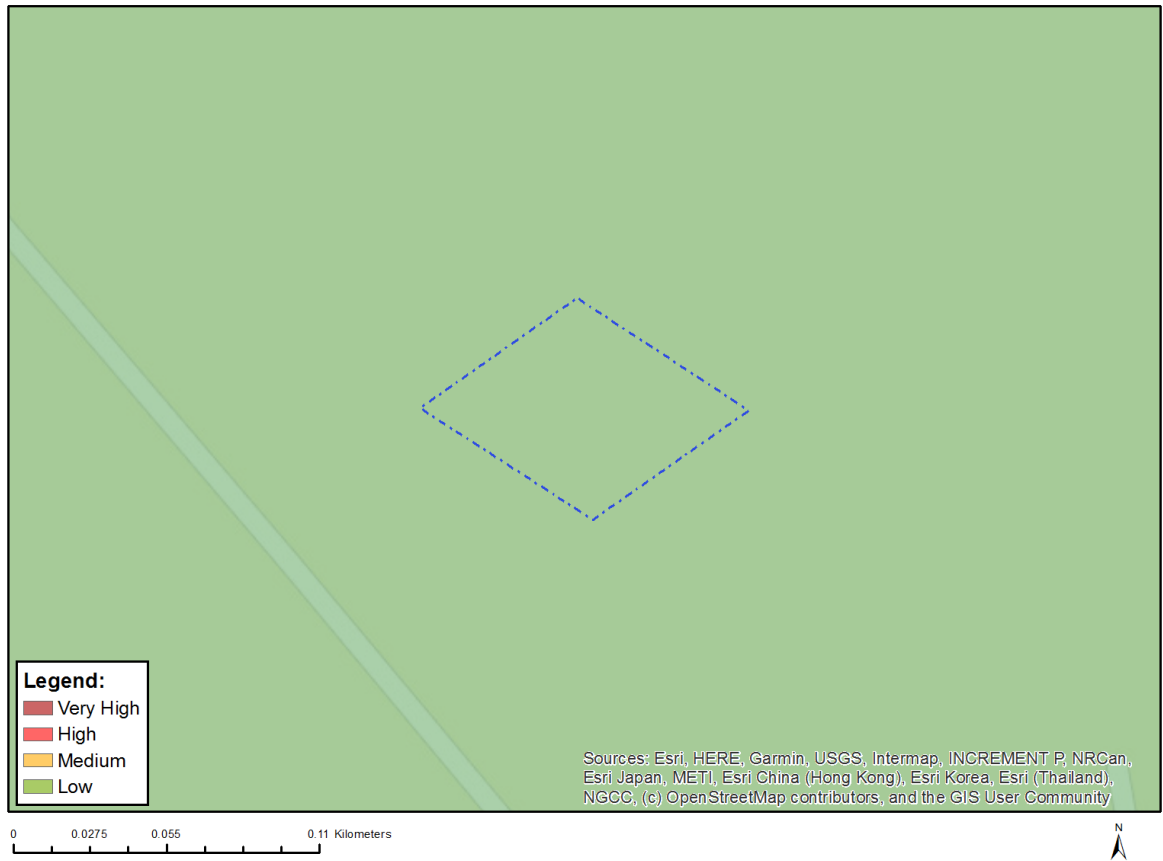


Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
		X	

**Sensitivity Features:**

Sensitivity	Feature(s)
Medium	Between 8 and 15 km of other civil aviation aerodrome

# MAP OF RELATIVE DEFENCE THEME SENSITIVITY

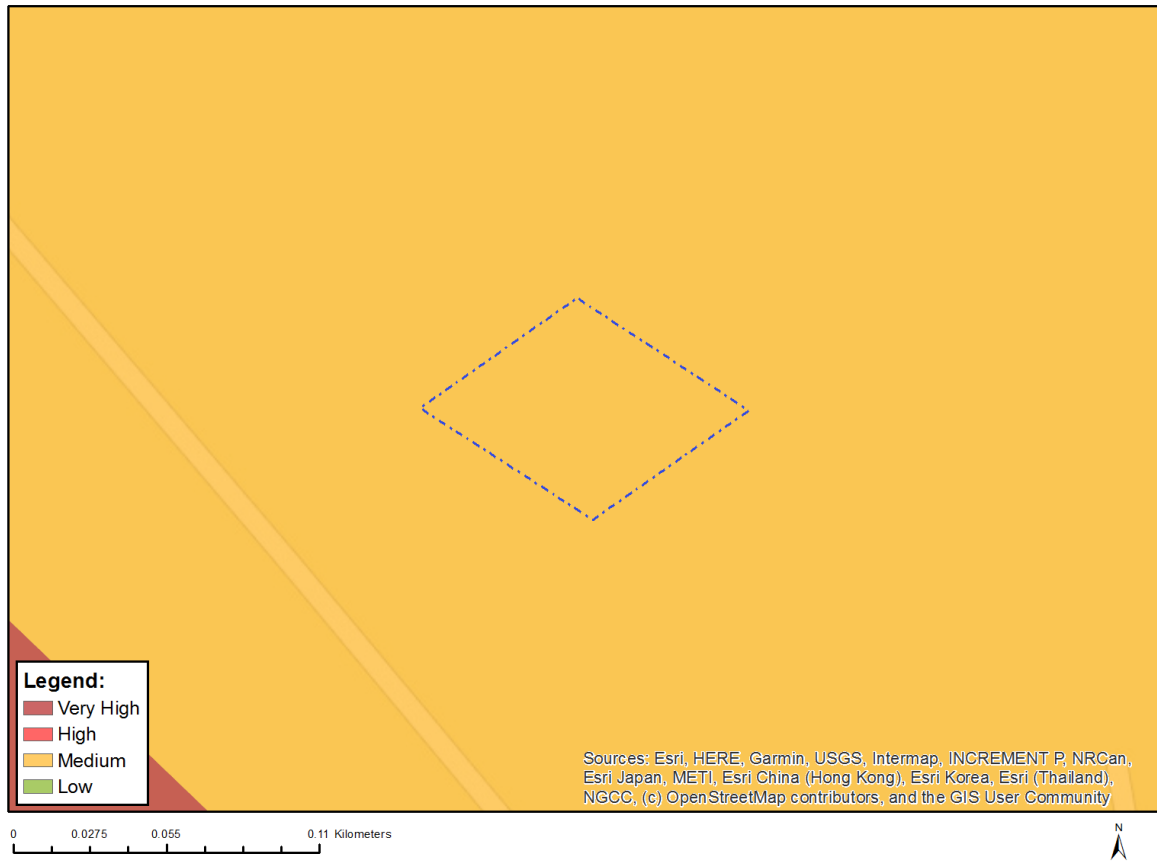


Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
			X

## Sensitivity Features:

Sensitivity	Feature(s)
Low	Low Sensitivity

## MAP OF RELATIVE PALEONTOLOGY THEME SENSITIVITY

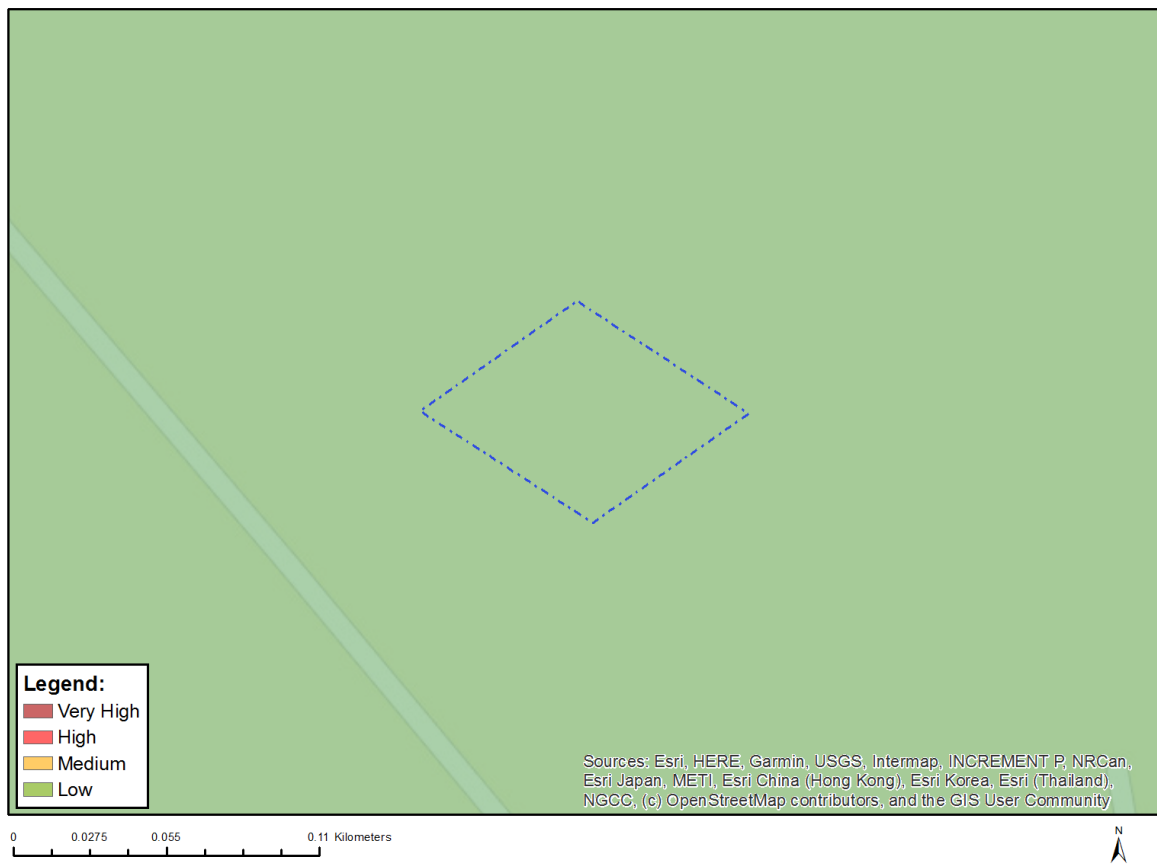


Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
		X	

### Sensitivity Features:

Sensitivity	Feature(s)
Medium	Features with a Medium paleontological sensitivity

## MAP OF RELATIVE PLANT SPECIES THEME SENSITIVITY



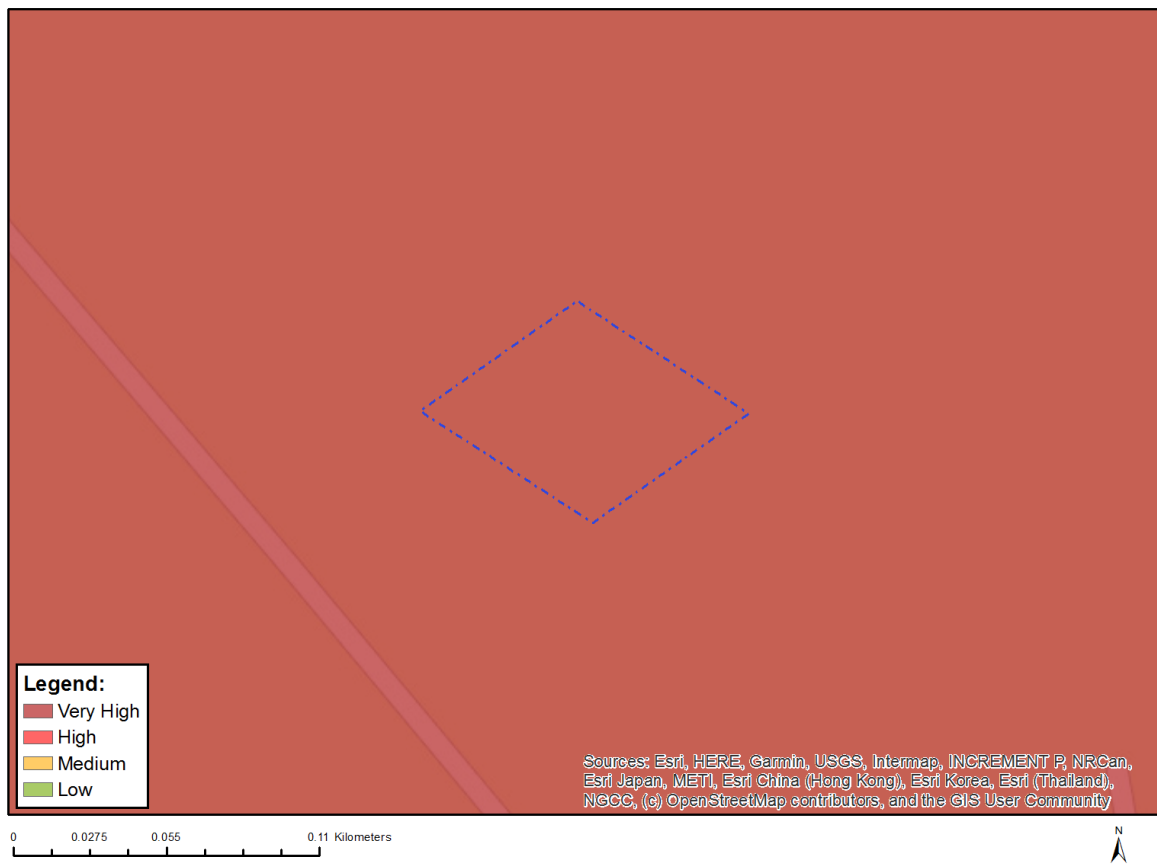
Where only a sensitive plant unique number or sensitive animal unique number is provided in the screening report and an assessment is required, the environmental assessment practitioner (EAP) or specialist is required to email SANBI at [eiadatarequests@sanbi.org.za](mailto:eiadatarequests@sanbi.org.za) listing all sensitive species with their unique identifiers for which information is required. The name has been withheld as the species may be prone to illegal harvesting and must be protected. SANBI will release the actual species name after the details of the EAP or specialist have been documented.

Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
			X

### Sensitivity Features:

Sensitivity	Feature(s)
Low	Low Sensitivity

## MAP OF RELATIVE TERRESTRIAL BIODIVERSITY THEME SENSITIVITY



Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
X			

### Sensitivity Features:

Sensitivity	Feature(s)
Very High	Endangered ecosystem