

Table 15: The threat ratings from the wetland buffer model for the proposed feedlot

Threat Posed by the proposed land use / activity		Specialist Threat Rating	Refined Threat Class	Specialist justification for refined threat ratings.
Construction Phase	1. Alteration to surface runoff flow volumes	Very Low	Very Low	
	2. Alteration of patterns of flows (increased flood peaks)	Low	Low	
	3. Increase in sediment inputs & turbidity	Very High	High	The construction should take place during the dry season (as much as possible). The disturbance footprint should be limited, Silt traps should be installed, and stripping should take place in a phased approach. Storm water should be managed properly.
	4. Increased nutrient inputs	Very Low	Very Low	
	5. Inputs of toxic organic contaminants	Very Low	Very Low	
	6. Inputs of toxic heavy metal contaminants	Low	Low	
	7. Alteration of acidity (pH)	N/A	N/A	
	8. Increased inputs of salts (salinization)	N/A	N/A	
	9. Change (elevation) of water temperature	Very Low	Very Low	
	10. Pathogen inputs (i.e. disease-causing organisms)	Low	Low	
Operational Phase	1. Alteration to flow volumes	Moderate	Moderate	No mitigation measures are expected to decrease this threat rating.
	2. Alteration of patterns of flows (increased flood peaks)	Very High	Very High	No mitigation measures are expected to decrease this threat rating.
	3. Increase in sediment inputs & turbidity	Moderate	Moderate	No mitigation measures are expected to decrease this threat rating.
	4. Increased nutrient inputs	Moderate	Low	Engineering measures should be incorporated to trap sediment and polish water. Storm water attenuation structures should be part of the layout. Permeable materials (i.e. paving) should be used where ever possible.
	5. Inputs of toxic organic contaminants	High	Low	Proper storm water structures should be implemented accompanied by relevant waste material structures. Any contaminants that may be present within the feedlot facilities should be removed and safely washed away via these structures,



Kranspoort Feedlot Facility

				subsequently diverting the diluted contaminants away from the wetland. Spill kits should be present on site in case of emergency.
6. Inputs of toxic heavy metal contaminants	Low	Low		
7. Alteration of acidity (pH)	Low	Low		
8. Increased inputs of salts (salinization)	High	Low		Proper storm water structures should be implemented accompanied by relevant waste material structures. Any contaminants that may be present within the feedlot facilities should be removed and safely washed away via these structures, subsequently diverting the diluted contaminants away from the wetland. Spill kits should be present on site in case of emergency.
9. Change (elevation) of water temperature	Low	Low		
10. Pathogen inputs (i.e. disease-causing organisms)	Moderate	Low		Proper storm water structures should be implemented accompanied by relevant waste material structures. Any contaminants that may be present within the feedlot facilities should be removed and safely washed away via these structures, subsequently diverting the diluted contaminants away from the wetland.



8 Risk Assessment

The impact assessment considered both direct and indirect impacts, if any, to the wetland system. The area to be developed will mainly consists out of a feedlot facility. Findings from the DWS aspect and impact register / risk assessment are provided in Table 16 to Table 17.

Table 16: Impacts assessed for the proposed project

Impact	Aspect
Impeding the flow of water (predominantly sub-surface). Direct loss of wetlands. Los of water sources to the nearby watercourses.	Removal of vegetation
	Construction of feedlots
	Excavations for foundations and servitudes
	Clearing of areas for infrastructure
	Hardening of surface areas
	Management of storm water
	Drainage pattern changes
	Site office, laydown and storage areas
	Operation of equipment and machinery
	Vehicle activity
	Domestic and industrial waste
	Storage of chemicals, mixes and fuel
	Spills and leaks
Complete loss of wetland and the cut-off of sub-surface flows	Increase in hardened surfaces
	Drainage patterns change
	Run-off of cattle faeces
	Storm water management
	Compaction of wetland areas
Traffic / vehicle activity	



Table 17: DWS Risk Impact Matrix for site Alternative 1

Impact	Aspect	Flow Regime	Water Quality	Habitat	Biota	Severity	Spatial scale	Duration	Consequence
Construction Phase									
Impeding the flow of water (predominantly sub-surface). Direct loss of wetlands. Los of water sources to the nearby watercourses.	Removal of vegetation	2	2	2	2	2	2	2	6
	Excavations for foundations and servitudes	2	2	2	2	2	3	2	7
	Clearing of areas for infrastructure	2	2	2	2	2	3	2	7
	Hardening of surface areas	2	2	2	2	2	3	2	7
	Management of storm water	2	2	2	2	2	2	2	6
	Drainage pattern changes	2	2	2	2	2	2	2	6
	Site office, laydown and storage areas	2	2	2	2	2	3	2	7
	Operation of equipment and machinery	2	2	2	2	2	2	2	6
	Vehicle activity	2	2	2	2	2	2	2	6
	Domestic and industrial waste	2	3	2	2	2,25	2	2	6,25
	Storage of chemicals, mixes and fuel	2	3	2	2	2,25	2	2	6,25
	Spills and leaks	2	3	2	2	2,25	2	2	6,25
Operational Phase									
Complete loss of wetland and the cut-off of sub-surface flows	Increased in hardened surfaces	2	2	2	2	2	3	4	9
	Drainage patterns change	2	2	2	2	2	2	4	8
	Run-off of cattle faeces	1	5	2	2	2,5	3	3	8,5
	Storm water management	2	3	2	2	2,25	2	4	8,25
	Compacting wetland areas	2	2	2	2	2	3	4	9
	Traffic / vehicle activity	3	2	2	2	2,25	3	4	9,25



Table 18: DWS Risk Impact Matrix for the preferred site as well as site Alternative 2

Impact	Aspect	Flow Regime	Water Quality	Habitat	Biota	Severity	Spatial scale	Duration	Consequence
Construction Phase									
Impeding the flow of water (predominantly sub-surface). Direct loss of wetlands. Los of water sources to the nearby watercourses.	Removal of vegetation	2	2	2	2	2	2	2	6
	Excavations for foundations and servitudes	5	2	2	2	2,75	3	2	7,75
	Clearing of areas for infrastructure	5	2	2	2	2,75	3	2	7,75
	Hardening of surface areas	4	2	2	2	2,5	3	2	7,5
	Management of storm water	2	2	2	2	2	2	2	6
	Drainage pattern changes	2	2	2	2	2	2	2	6
	Site office, laydown and storage areas	5	2	2	2	2,75	3	2	7,75
	Operation of equipment and machinery	3	2	2	2	2,25	2	2	6,25
	Vehicle activity	4	2	2	2	2,5	2	2	6,5
	Domestic and industrial waste	2	3	2	2	2,25	2	2	6,25
	Storage of chemicals, mixes and fuel	2	3	2	2	2,25	2	2	6,25
	Spills and leaks	2	3	2	2	2,25	2	2	6,25
Operational Phase									
Complete loss of wetland and the cut-off of sub-surface flows	Increased in hardened surfaces	5	2	2	2	2,75	3	4	9,75
	Drainage patterns change	2	2	2	2	2	2	4	8
	Run-off of cattle faeces	1	5	2	2	2,5	3	3	8,5
	Storm water management	4	3	2	2	2,75	2	4	8,75
	Compacting wetland areas	5	2	2	2	2,75	4	4	10,75
	Traffic / vehicle activity	4	2	2	2	2,5	3	4	9,5



Table 19: DWS Risk Impact Matrix for site Alternative 1

Impacts	Aspect	Frequency of activity	Frequency of impact	Legal Issues	Detection	Likelihood	Sig.	Without Mitigation	With Mitigation
Construction Phase									
Impeding the flow of water (predominantly sub-surface). Direct loss of wetlands. Los of water sources to the nearby watercourses.	Removal of vegetation	1	1	0	1	3	18	Low	Low
	Excavations for foundations and servitudes	1	2	5	3	11	77	Moderate	Low
	Clearing of areas for infrastructure	1	2	5	3	11	77	Moderate	Low
	Hardening of surface areas	2	2	0	2	6	42	Low	Low
	Management of storm water	2	2	0	1	5	30	Low	Low
	Drainage pattern changes	1	1	0	2	4	24	Low	Low
	Site office, laydown and storage areas	1	3	5	3	12	84	Moderate	Low
	Operation of equipment and machinery	1	2	5	1	9	54	Low	Low
	Vehicle activity	1	3	5	1	10	60	Moderate	Low
	Domestic and industrial waste	1	2	5	2	10	62,5	Moderate	Low
	Storage of chemicals, mixes and fuel	1	2	5	2	10	62,5	Moderate	Low
	Spills and leaks	1	2	5	1	9	56,25	Moderate	Low
Operational Phase									
Complete loss of wetland and the cut-off of sub-surface flows	Increased in hardened surfaces	4	2	0	3	9	81	Moderate	Low
	Drainage patterns change	4	2	5	2	13	104	Moderate	Low
	Run-off of cattle faeces	3	2	0	3	8	66	Moderate	Low
	Storm water management	3	2	0	2	7	57,75	Moderate	Low
	Compaction of wetland areas	4	2	5	3	14	126	Moderate	Low
	Traffic / vehicle activity	3	2	5	2	12	111	Moderate	Low

(*) denotes - In accordance with General Notice 509 "Risk is determined after considering all listed control / mitigation measures. Borderline Low / Moderate risk scores can be manually adapted downwards up to a maximum of 25 points (from a score of 80) subject to listing of additional mitigation measures detailed below."



Table 20: DWS Risk Impact Matrix for the preferred site as well as Alternative 2

Impact	Aspect	Frequency of activity	Frequency of impact	Legal Issues	Detection	Likelihood	Sig.	Without Mitigation	With Mitigation
Construction Phase									
Impeding the flow of water (predominantly sub-surface).	Removal of vegetation	1	1	0	1	3	18	Low	Low
	Excavations for foundations and servitudes	1	3	5	3	12	93	Moderate	Moderate
	Clearing of areas for infrastructure	1	3	5	3	12	93	Moderate	Moderate
	Hardening of surface areas	2	2	0	2	6	45	Low	Low
	Management of storm water	2	2	0	1	5	30	Low	Low
	Drainage pattern changes	1	1	0	2	4	24	Low	Low
Direct loss of wetlands. Los of water sources to the nearby watercourses.	Site office, laydown and storage areas	1	3	5	3	12	93	Moderate	Moderate
	Operation of equipment and machinery	1	2	5	1	9	56,25	Moderate	Moderate
	Vehicle activity	1	3	5	1	10	65	Moderate	Moderate
	Domestic and industrial waste	1	2	5	2	10	62,5	Moderate	Moderate
	Storage of chemicals, mixes and fuel	1	2	5	2	10	62,5	Moderate	Moderate
Spills and leaks	1	2	5	1	9	56,25	Moderate	Moderate	
Operational Phase									
Complete loss of wetland and the cut-off of sub-surface flows	Increased in hardened surfaces	4	4	0	3	11	107,25	Moderate	Moderate
	Drainage patterns change	4	4	5	2	15	120	Moderate	Moderate
	Run-off of cattle faeces	3	3	0	3	9	78,75	Moderate	Low
	Storm water management	3	3	0	2	8	70	Moderate	Moderate
	Compaction of wetland areas	4	4	5	3	16	172	High	High
	Traffic / vehicle activity	3	3	5	2	13	123,5	Moderate	Moderate

(*) denotes - In accordance with General Notice 509 "Risk is determined after considering all listed control / mitigation measures. Borderline Low / Moderate risk scores can be manually adapted downwards up to a maximum of 25 points (from a score of 80) subject to listing of additional mitigation measures detailed below."



For the preferred site as well as site Alternative 2, all of the aspects determined to pose risks during the construction phase have Moderate risk ratings with no possibility of decreasing any of these risks by means of mitigation measures. Various aspects are expected to pose Moderate to High risks for these sites during the operational phase as well with the only aspect expecting to decrease in risk significance with the successful application of mitigation being that of “Run-off of cattle faeces”. The reason why so little decrease in risks is expected even with the application of relevant mitigation measures can be explained by the locality of these two sites in relation to the delineated wetland area. The seep located on site will be directly impeded by these two sites which will cause loss to the relevant wetland area. Therefore, even with the successful application of any possible mitigation measures, the risk is still expected to be Moderate. However, if the layout of the “Preferred Site” is adjusted in such a way that the delineated buffer zones are respected, these risks are expected to decrease to “low” ratings similar to that described for “Site Alternative 1”. The layout of this site will then be outside of the wetland’s buffer zones which ultimately limits impacts associated with the proposed activity. Recommendations for the adjustment of this layout has been described in “Section 8.2, Recommendations”.

For “Site Alternative 1”, all of the aspects expected to pose Moderate risks during the construction and operational phase is expected to drop to Low given that the relevant mitigation measures have successfully been applied. The reason for the uncomplicated decrease in risk can also be explained by the locality of this site in relation to the wetland. The wetland is in excess of 350m and is not expected to have any direct risks or indirect risks given the successful implementation of recommended mitigation measures.

8.1 Mitigation Measures

The following mitigation measures are provided:

- The recommended buffer zones should be strictly adhered to. Any aspect of the proposed surface infrastructure that impedes on the wetlands, drainage lines or their buffers should be relocated;
- Construction areas should be demarcated, and wetland areas marked as “restricted” in order to prevent the unnecessary impact too and loss of these systems;
- During the construction phase vehicles and machinery must make use of existing access routes, before adjacent areas are considered for access;
- Laydown yards, camps and storage areas must be beyond the wetland areas and associated buffers where applicable;
- During construction contractors used for the project must have spill kits available to ensure that any fuel or oil spills are clean-up and discarded correctly;
- Storm water channels and preferential flow paths should be delineated, filled with aggregate and/or logs (branches included) to dissipate and slow flows limiting erosion;
- A suitable storm water management plan must for formulated for the project. The plan must ensure that clean and dirty water are separated, that only clean water is diverted



into the wetlands (where required) and that the discharge of water will not result in scouring and erosion of the receiving systems;

- The storm water management plan should incorporate “soft” engineering measures as much as possible, limiting the use of artificial materials. These measures may include grassy swales, bio-retention ponds / depressions filled with aquatic vegetation or the use of vegetation to dissipate flows at discharge locations;
- As much material must be pre-fabricated and then transported to site to avoid the risks of contamination associated with mixing, pouring and the storage of chemicals and compounds on site;
- Prevent uncontrolled access of vehicles through the wetlands that can cause a significant adverse impact on the hydrology and alluvial soil structure of these areas;
- All chemicals and toxicants during construction and operation must be stored in bunded areas;
- All machinery and equipment should be inspected regularly for faults and possible leaks, these should be serviced off-site;
- All contractors and employees should undergo induction which is to include a component of environmental awareness. The induction is to include aspects such as the need to avoid littering, the reporting and cleaning of spills and leaks and general good “housekeeping”;
- Adequate sanitary facilities and ablutions on the servitude must be provided for all personnel throughout the project area. Use of these facilities must be enforced (these facilities must be kept clean so that they are a desired alternative to the surrounding vegetation);
- Have action plans on site, and training for contractors and employees in the event of spills, leaks and other impacts to the aquatic systems;
- All removed soil and material must not be stockpiled within the system. Stockpiling should take place outside of the buffer areas. All stockpiles must be protected from erosion, stored on flat areas where run-off will be minimised, and be surrounded by bunds;
- Temporary and permanent erosion control methods may include silt fences, flotation silt curtains, retention basins, detention ponds, interceptor ditches, seeding and sodding, riprap of exposed embankments, erosion mats, and mulching;
- Any exposed earth should be rehabilitated promptly by planting suitable vegetation (vigorous indigenous grasses) to protect the exposed soil;
- No dumping of construction material on-site may take place;
- All waste generated on-site during construction must be adequately managed. Separation and recycling of different waste materials should be supported; and



- An alien invasive plant management plan needs to be compiled and implemented prior to construction to control and prevent the spread of invasive aliens.

8.1.1 Mitigation Measures for Operation of the Feedlot

Operational mitigation measures have been adopted from the Guideline Manual for the Development of Abattoirs and Other Waste of Animal Origin by GDARD (2009). The following abattoir and feedlot specific mitigation measures are provided (GDARD, 2009):

- Large amounts of water is used for hygiene reasons in animal processing operations, producing large amounts of wastewater that must be treated. Effective primary treatment before secondary treatment must be incorporated to increase the overall effectiveness and efficiency of wastewater treatment systems, as it is cheaper to physically remove the fat and solids than to treat later in secondary and tertiary treatment facilities;
- Various pond systems must be used for secondary treatment of abattoir effluent which include anaerobic or settling ponds, septic tanks, amongst others;
- The handling of effluent from the abattoir must be disposed of in a sustainable manner with the separation of different materials and use of suitable disposal facilities;
- Effluent disposal should progress towards predetermined water quality (Agricultural – DWAF, 1996) and waste management objectives;
- Grease and solid traps with suitable grease removal facilities should be installed upstream of major collection sumps;
- Blood should not be dumped informally;
- There should be a full examination of process by-products and wastes to identify options for waste minimisation. In some cases, substituting raw material may lead to changes in the process. Often, re-using or recycling by-products reduces waste production. Recovering valuable materials from waste streams can be economically and environmentally sensible;
- Techniques and procedures to integrate all waste management options must be adopted wherever possible. A beneficial re-use strategy should be initiated after the waste management strategy;
- Cleaner production and waste minimisation aims directly at the source of the waste generation and attempts to eliminate waste before it is produced, or to reduce the amount generated. Wastes should be disposed of only after all preventive and minimisation measures have been taken;
- Using high pressure water hoses for washing waste will minimise the amount and therefore the cost of water used;
- Opportunities for recycling exist and operators should nominate a staff member to supervise the recycling schemes;



- Abattoirs can make use of local hospital incinerators to burn carcasses although this may prove costly. Mortality pits (ottway pit) are recommended only if they are adequately lined to prevent ground water contamination;
- Final flow from septic tanks should be discharged to a municipal sewer line and not to the natural environment;
- Condemned meat products that have been trimmed free of transmittable pathogens can be sold as animal food to zoos or similar;
- Storm water can become contaminated when it comes into contact with animal holding pens, sludge stockpiles and treated wastewater irrigation areas. This contaminated storm water can have detrimental environmental effects on surrounding ecosystems and should be kept from making contact with such areas;
- Clean storm water must be kept away from the contaminated areas and directed to the storm water drainage system;
- The manure storage and lagoon areas should have containment walls to keep the manure from washing into the river;
- The effluent treatment area, manure lagoon area and burial trench should be moved out and away from the drainage line;
- Buffer zones are particularly important as measures to separate conflicting land uses and to minimise any harmful effects of new developments in environmentally sensitive areas. The buffer zone prescribed in the wetland report must be adhered to;
- All construction and operation activities should be kept outside of buffer zones;
- No livestock may be allowed from within the river channel as they cause excessive erosion and bank collapse through trampling of vegetation and soils; and
- Livestock should be confined to designated areas.

8.2 Recommendations

8.2.1 General recommendations

The following recommendations are provided for the project:

- It is recommended that the wetland and associated buffer areas be avoided. Should this not be feasible, it is recommended that design alternatives and location options be considered in order to reduce the extent of wetland area to be lost (Figure 17); and
- In the event that the proposed development will result in the loss of wetland area, it is recommended that a wetland offset strategy be compiled for the project, encompassing adjacent and future developments in the larger area.



- The status and functioning of the recommended buffer area can be improved through a dedicated vegetation strategy and a landscape management plan, which should include soft engineering approaches.
- An integrated alien plant control program (as per the AIS Regulations) should be developed for the buffer and other open spaces within the property, including delineated water resources.
- Make use of preventative construction techniques (source controls), such as to limit the amount of impervious material near watercourses as far as possible, and to demarcate setbacks from the watercourse in the form of a buffer zone with a natural vegetation cover.
- Consider green engineering measures such as water polishing or naturally vegetated attenuation ponds to improve water quality. Other structural control measures include grass swales, infiltration trenches and basins, wet ponds, and constructed wetlands.
- Discharged storm water must be released in a controlled manner with a diffuse flow pattern and be accompanied by energy dissipating interventions to prevent erosion.

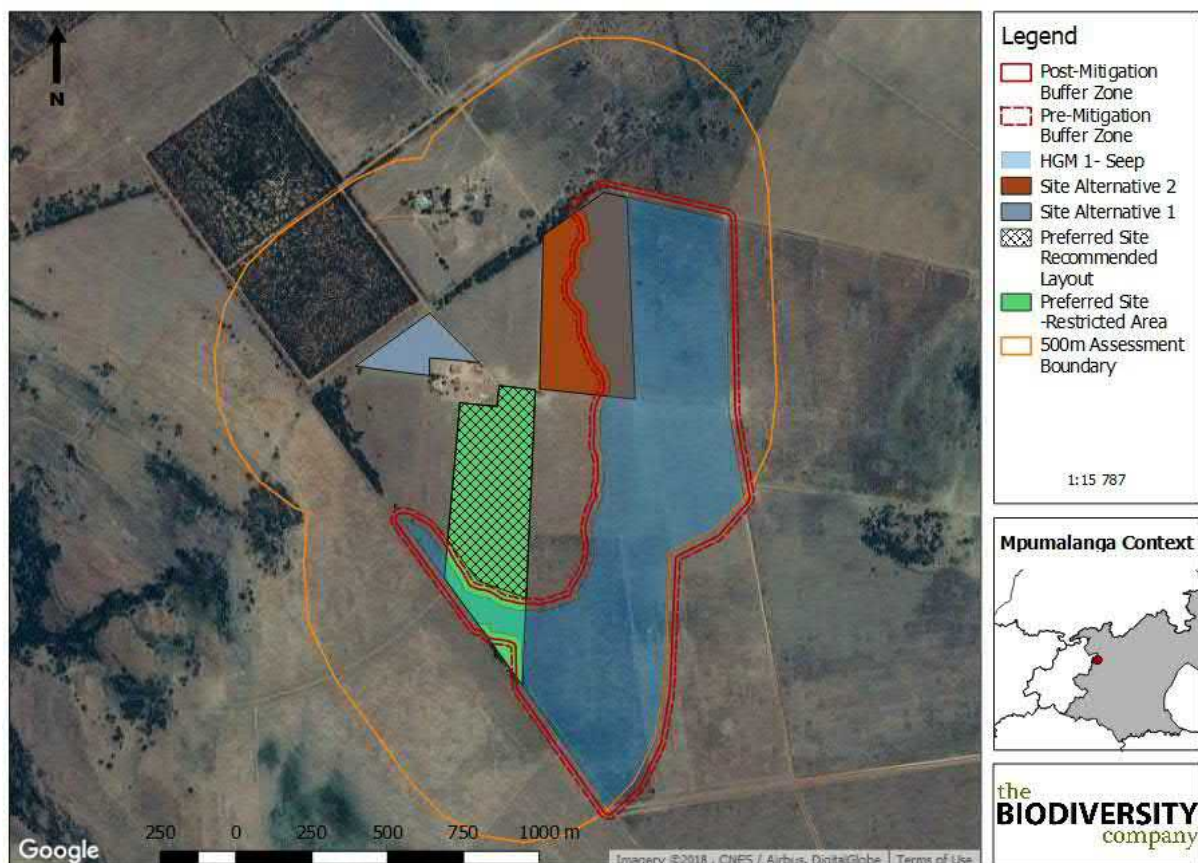


Figure 17: Recommended layout of the "Preferred Site"

Adjustments to the layout of the "Preferred Site" is required before commencing with the proposed activity. Figure 17 illustrates the portion of the "preferred site" that is safe to construct and operate in if mitigation is successfully applied. It of the utmost importance that the



restricted portion be avoided at all times to minimise impacts to such an extent that the proposed activity can commence.

The southern part of the “preferred layout” is restricted, leaving only the northern part assigned a texture to the polygon (Figure 17) to be developed. Only the “preferred site’s” recommended portion and “site alternative 1” are suitable for the proposed activity given the site’s location in comparison to the recommended buffer zones. Concerns have been raised regarding the feasibility of “site alternative 1” given its size and therefore adjustments have been made to the “preferred site” to ensure that impacts associated with this site are limited. The recommended portion of the “preferred site” has a surface of 15,5 ha compared to 3,72 ha of “site alternative 1”.

9 Impact Statement

Table 21 illustrates the significance ratings for the proposed activity relevant to various impacts expected to pose threats during the construction phase whereas that of the operational phase is illustrated in Table 22. The significance for all of the mentioned impacts during the construction and operational phases are expected to decrease significantly after the implementation of relevant mitigation measures. The highest significance rating after application is “Medium” whereas that prior to mitigation is expected to be “High”. This phenomenon emphasises the need for mitigation and specifically adhering to the recommended buffer zones.

It is the opinion of the specialist that the proposed activity continue only if the recommended buffer zones are respected and stayed clear of and that all recommended mitigation measures are applied with success. Since the “Preferred Site” is the main preference for the proposed activity, changes to the layout of the site needs to be made to accommodate the buffer zones. Recommendations on behalf of these adjustments are described in “Section 8.2, Recommendations”.

Table 21: Impact assessment for the proposed feedlot during the construction phase

Impact	Pre-Mitigation		Post-Mitigation	
	Significance Rating	Significance	Significance Rating	Significance
Removal of vegetation	24	Low	12	Low
Excavations for foundations and servitudes	80	High	52	Medium
Clearing of areas for infrastructure	75	High	48	Medium
Hardening of surface areas	64	High	39	Medium
Management of storm water	30	Medium	16	Low
Drainage pattern changes	85	High	52	Medium
Site office, laydown and storage areas	60	Medium	36	Medium



Operation of equipment and machinery	30	Medium	16	Low
Vehicle activity	30	Medium	16	Low
Domestic and industrial waste	14	Low	12	Low
Storage of chemicals, mixes and fuel	14	Low	12	Low
Spills and leaks	14	Low	12	Low

Table 22: Impact assessment for the proposed feedlot during the operational phase

Impact	Pre-Mitigation		Post-Mitigation	
	Significance Rating	Significance	Significance Rating	Significance
Increased in hardened surfaces	64	High	42	Medium
Drainage patterns change	85	High	56	Medium
Run-off of cattle faeces	30	Medium	16	Low
Storm water management	30	Medium	16	Low
Compacting wetland areas	80	High	52	Medium
Traffic / vehicle activity	30	Medium	16	Low

10 Conclusion

No Freshwater Ecological Priority Areas (NFEPA) wetlands were identified within the 500m assessment buffer of the project area. One wetland type was identified within the 500m project assessment boundary, namely an isolated hillslope seep. One hydro-geomorphic (HGM) unit was considered relevant to this study.

The hydrology component for this wetland has been rated as Largely Natural (B). The geomorphology component has been scored an Unmodified/Natural (A) rating with the vegetation aspect being rated Moderately Modified (C). The overall PES score for this wetland has been scored Largely Natural. Various EcoServices has been rated as High or Very high, namely streamflow regulation, phosphate assimilation, nitrate assimilation, toxicant assimilation and erosion control.

Pre-mitigation buffer zones of 34m and 18m have been calculated for the proposed alternative sites during the construction and operational phases respectively. After the successful implementation of the recommended mitigation measures however, these buffer zones are expected to decrease to 20m and 15m for the construction and operational phases respectively.

Various Moderate risks are expected for site Alternative 1 during the construction- and operational phase. However, with the successful application of recommended mitigation



measures, all of these risks are expected to drop to Low. For the preferred site and site Alternative 2 however, very little decrease in risks are expected by means of mitigation.

Therefore, it is the specialist's opinion that the proposed feedlot facility proceeds. It is however vital that only the recommended portion of the "Preferred Site" and "Site Alternative 1" be selected for the proposed activity given its distance from the delineated wetlands. Only by adhering to these buffer zones and the recommended mitigation measures can the proposed activity proceed.



11 References

Avenant, P. 2015. Report on the national Bankrupt Bush (*Seriphium plumosum*) survey (2010-2012). Department of Agriculture, Forestry & Fisheries.

Department of Water Affairs and Forestry (DWAf) 2005. Final draft: A practical field procedure for identification and delineation of wetlands and Riparian areas.

Haigh, L., Illger, P., Wilmot, J., Buckle, J., Kotze, D. & Ellery, F. 2010. The wetland rehabilitation project in the Kromme River Wetlands, Eastern Cape- part 4.

Kotze DC, Marneweck GC, Batchelor AL, Lindley DC, Collins NB. 2009. A Technique for rapidly assessing ecosystem services supplied by wetlands. Mondi Wetland Project.

Land Type Survey Staff. (1972 - 2006). Land Types of South Africa: Digital Map (1:250 000 Scale) and Soil Inventory Databases. Pretoria: ARC-Institute for Soil, Climate, and Water.

Macfarlane DM, Bredin IP, Adams JB, Zungu MM, Bate GC, Dickens CWS. 2014. Preliminary guideline for the determination of buffer zones for rivers, wetlands and estuaries. Final Consolidated Report. WRC Report No TT 610/14, Water Research Commission, Pretoria.

Macfarlane DM, Kotze DC, Ellery WN, Walters D, Koopman V, Goodman P, Goge C. 2008. A technique for rapidly assessing wetland health: WET-Health.

Mucina, L. and Rutherford, M.C. (Eds.) 2006. The vegetation of South Africa, Lesotho and Swaziland. Strelizia 19. South African National Biodiversity Institute, Pretoria South African.

Nel JL, Murray KM, Maherry AM, Petersen CP, Roux DJ, Driver A, Hill L, Van Deventer H, Funke N, Swartz ER, Smith-Adao LB, Mbona N, Downsborough L and Nienaber S. 2011. Technical Report for the National Freshwater Ecosystem Priority Areas project. WRC Report No. K5/1801.

Ollis DJ, Snaddon CD, Job NM, and Mbona N. 2013. Classification System for Wetlands and other Aquatic Ecosystems in South Africa. User Manual: Inland Systems. SANBI Biodiversity Series 22. South African Biodiversity Institute, Pretoria.

South African National Biodiversity Institute (SANBI). 2009. Further Development of a Proposed National Wetland Classification System for South Africa. Primary Project Report. Prepared by the Freshwater Consulting Group (FCG) for the South African National Biodiversity Institute (SANBI).



F-3 BIODIVERSITY ASSESSMENT



Biodiversity Assessment for the proposed Kranspoort Feedlot Facility

Mpumalanga Province

February 2018

REFERENCE

WSP – Biodiversity Assessment

CLIENT



Prepared for:

WSP (Pty) Ltd

Liaan Pretorius

T +27 11 361 1394

M +27 72 735 3075

Prepared by:

The Biodiversity Company

420 Vale Ave. Ferndale, 2194

Cell: +27 81 319 1225




Fax: +27 86 527 1965

info@thebiodiversitycompany.com

www.thebiodiversitycompany.com



Kranspoort Feedlot

Report Name	Biodiversity Assessment for the proposed Kranspoort Feedlot Facility
Reference	WSP – Biodiversity Assessment
Submitted to	WSP (Pty) Ltd
Report Reviewer (Fauna)	<p>Andrew Husted </p> <p>Andrew Husted is Pr Sci Nat registered (400085/15) in the field of aquatic and wetland science. Andrew is an aquatic and biodiversity specialist with 16 years of experience in the environmental consulting field.</p>
Report Writer (Herpetofauna)	<p>Michael Adams </p> <p>Michael Adams is Cert Sci Nat registered and is an experienced natural scientist with a specialisation in herpetofauna. He has over 10 years of experience working with reptiles and amphibians as a consultant and through various conservation initiatives.</p>
Report Contributor (Botany and Fauna)	<p>Martinus Erasmus </p> <p>Martinus Erasmus obtained his B-Tech degree in Nature Conservation in 2016 at the Tshwane University of Technology. Martinus has been conducting basic assessments and assisting specialists in field during his studies since 2015.</p>
Declaration	<p>The Biodiversity Company and its associates operate as independent consultants under the auspice of the South African Council for Natural Scientific Professions. We declare that we have no affiliation with or vested financial interests in the proponent, other than for work performed under the Environmental Impact Assessment Regulations, 2017. We have no conflicting interests in the undertaking of this activity and have no interests in secondary developments resulting from the authorisation of this project. We have no vested interest in the project, other than to provide a professional service within the constraints of the project (timing, time and budget) based on the principals of science.</p>



EXECUTIVE SUMMARY

The completion of a comprehensive desktop study, in conjunction with the detailed results from the surveys mean that there is a high confidence in the information provided. The surveys which were completed, and the corresponding studies resulted in good site coverage, assessing the major habitats and ecosystems, obtaining a general species (fauna and flora) overview and observing the major current impacts.

It is clear from the regional ecological overview, as well as the baseline data collected to date that the Project area has been altered (historically and currently) predominantly by agricultural land use. It is further evident that the remaining natural habitats have been impacted on as a result of poor grazing practices. The development of the general area, and the increase in agricultural operations and supporting activities have also contributed to the altered ecological status and functioning of the systems.

Careful consideration must be afforded each of the mitigation measures provided herein. In the event that environmental authorisation is issued for this project, proven ecological (or environmental) controls and mitigation measures must be entrenched in the management framework.

The following further conclusions were reached based on the results of this assessment:

- Much of the Project area is identified as being heavily modified or transformed from its natural state;
- Based on the National Biodiversity Assessment (NBA, 2012) the Project area overlaps entirely with ecosystems that are listed as Endangered (EN). The Project area is also within a few kilometres of ecosystems which are listed as Critically Endangered;
- The majority of the terrestrial ecosystems associated with the development are rated as *not protected*;
- Based on the SANBI (2010) Protected Areas Map and the National Protected Areas Expansion Strategy (NPAES) the Project area does not overlap with any formally or informally protected area;
- The Project area is situated within one vegetation type, namely the Rand Highveld Grassland, which is classified as Endangered according to Mucina & Rutherford (2006);
- A total of forty (40) tree, shrub and herbaceous plant species were recorded in the proposed Project area during the January 2018 field assessment (Table 4);
- Seven (7) category 1b invasive species were recorded at the site and must therefore be removed by implementing an alien invasive plant management programme;
- In terms of the three proposed areas for the development of the feedlot, all three areas are judged as having low sensitivity ratings due to previous disturbances. Alternative sites 1 and 2 are marginally more degraded than the preferred site option. The preferred site option was previously cultivated but there are signs that the area has been rehabilitated and possibly re-planted. Furthermore, this area is the least disturbed



Kranspoort Feedlot

due to grazing pressure and a higher number of plant species are present in this section; and

- All three site options are acceptable for the development, but as per the SoW it is the opinion of the specialists that based on the sensitivity mapping, alternative site 1 is the most disturbed site and therefore most recommended for development of the feedlot. Alternative site 2 is the second most preferred site for the feedlot development, while the original ('preferred') site is the least recommended for this development.

Impact Statement

An impact statement is required as per the NEMA regulations with regards to the proposed development.

Considering the above-mentioned conclusions, it is the opinion of the specialist that the project be favourably considered but that the mitigation measures should be strictly adhered to and enforced. Furthermore, it is the specialist's opinion that the development is permissible at all three sites outlined in the SoW but that the development should preferably occur at alternative site 1.



DECLARATION

I, Michael Adams, declare that:

- I act as the independent specialist in this application;
- I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant;
- I declare that there are no circumstances that may compromise my objectivity in performing such work;
- I have expertise in conducting the specialist report relevant to this application, including knowledge of the Act, regulations and any guidelines that have relevance to the proposed activity;
- I will comply with the Act, regulations and all other applicable legislation;
- I have no, and will not engage in, conflicting interests in the undertaking of the activity;
- I undertake to disclose to the applicant and the competent authority all material information in my possession that reasonably has or may have the potential of influencing any decision to be taken with respect to the application by the competent authority; and the objectivity of any report, plan or document to be prepared by myself for submission to the competent authority;
- All the particulars furnished by me in this form are true and correct; and
- I realise that a false declaration is an offence in terms of Regulation 71 and is punishable in terms of Section 24F of the Act.



Michael Adams

Terrestrial Ecologist

The Biodiversity Company

18th February 2018



Table of Contents

1	Introduction	1
1.1	Project Background.....	1
2	Project Area	1
3	Scope of Work	3
4	Limitations.....	3
5	Methodologies	4
5.1	Geographic Information Systems (GIS) Mapping	4
5.2	Botanical Assessment.....	4
5.2.1	Literature study.....	5
5.3	Fieldwork	5
5.4	Faunal Assessment (Mammals & Avifauna).....	6
6	Key Legislative Requirements.....	6
6.1	Mpumalanga Parks Board Act 6 of 1995.....	8
6.2	Mpumalanga Conservation Act, 1998 (Act 10 of 1998)	8
6.3	Mpumalanga Tourism and Parks Agency Act, No 5 of 2005	8
6.4	Mpumalanga Conservation Plan	8
6.5	Mpumalanga Biodiversity Sector Plan (MBSP)	8
6.6	National Biodiversity Assessment (NBA).....	9
6.7	MTPA Guidelines for Biodiversity Assessment.....	9
7	Study Approach	9
7.1	Field Survey.....	9
8	General Land Use.....	9
8.1	The Mpumalanga Biodiversity Sector Plan (MBSP)	10
8.2	Project area in relation to the MBSP	11
8.3	Project area in relation to the NBA	11
8.3.1	Ecosystem Threat Status.....	11
8.3.2	Ecosystem Protection Level.....	12
8.4	Project Area in relation to Protected Areas	13
8.5	National Freshwater Ecosystem Priority Area (NFEPA) Status	14
8.6	The MBSP Freshwater Assessment	15

www.thebiodiversitycompany.com

info@thebiodiversitycompany.com



Kranspoort Feedlot

9	Results & Discussion	16
9.1	Desktop Assessment	16
9.1.1	Vegetation Assessment	16
9.1.2	Vegetation Types	17
9.1.3	Rand Highveld Grassland	17
9.1.4	Important Plant Taxa	17
9.1.5	Faunal Assessment	19
10	Field Survey	27
10.1	Site Coverage	27
10.1.1	Vegetation Assessment	27
10.2	Alien and Invasive Plants	29
10.3	Faunal Assessment	30
10.3.1	Avifauna	30
10.3.2	Mammals	32
10.3.3	Herpetofauna (Reptiles & Amphibians)	33
10.4	Habitat Sensitivity	33
11	Impact Assessment	35
11.1	Methodology	35
11.2	Existing Impacts	36
12	Impact Assessment Results	37
12.1.1	Construction Phase	37
12.1.2	Operational Phase	37
12.1.3	Closure / Rehabilitation Phase	38
12.2	Assessment of Significance	41
12.3	Mitigation Measure Objectives	41
12.3.1	Mitigation Measures for Impacts on Vegetation Communities	41
12.3.2	Mitigation Measures for Impacts on Faunal Communities	42
12.3.3	Mitigation Measures for Operation of the Feedlot	43
13	Conclusion	44
14	Impact Statement	45
15	References	47



Tables

Table 1: Plant Species of Conservation Concern (SCC) expected to occur in the project area (BODATSA-POSA, 2016)	19
Table 2: List of bird species of regional or global conservation importance that are expected to occur in pentads 2530_2855, 2530_2890, 2530_2905, 2535_2855, 2535_2900, 2535_2905, 2540_2855, 2540_2900, 2540_2905 (SABAP2, 2017, ESKOM, 2014; IUCN, 2017)	20
Table 3: List of mammal species of conservation concern that may occur in the project area as well as their global and regional conservation statuses (IUCN, 2017; SANBI, 2016)	24
Table 4: Trees, shrubs and weeds recorded at the proposed project area (species name in red are listed species)	28
Table 5: A list of avifaunal species recorded for the Project area	31
Table 6: Mammals recorded in the project area during the January 2018 survey	32
Table 7: A list of herpetofauna recorded in the Project area	33
Table 8: Likelihood descriptors	35
Table 9: Consequence Descriptors	35
Table 10: Significance Rating Matrix	36
Table 11: Assessment of significance of potential construction impacts on vegetation and faunal communities associated with the proposed feedlot development pre- and post-mitigation.	39
Table 12: Assessment of significance of potential operational impacts on vegetation and faunal communities associated with the proposed feedlot development pre- and post- mitigation.	40

Figures

Figure 1: The proposed Kranspoort Project area	2
Figure 2: Kranspoort Feedlot Project area superimposed on the MBSP Terrestrial Critical Biodiversity Areas (CBA) map (MBSP, 2014)	11
Figure 3: Kranspoort Project area showing the ecosystem threat status of the associated terrestrial ecosystems (NBA, 2012)	12
Figure 4: Kranspoort Project area showing the level of protection of terrestrial ecosystems (NBA, 2012)	13
Figure 5: Formally protected areas in relation to the Project area (BGIS, 2017)	14
Figure 6: The Project area in relation to the National Freshwater Ecosystem Priority Areas	15
Figure 7: The Kranspoort Project area in relation to the MBSP Freshwater Assessment	16



Kranspoort Feedlot

Figure 8: Project area showing the vegetation type based on the Vegetation Map of South Africa, Lesotho & Swaziland (BGIS,2017) 17

Figure 9:Map showing the grid drawn in order to compile an expected species list (BODATSA-POSA, 2016)..... 19

Figure 10: The primary vegetation areas identified during the fieldwork including historic land-use practices..... 28

Figure 11: One of the avifaunal species recorded during the survey: Long-tailed Widowbird (Euplectes progne)..... 32

Figure 12: One of the amphibians recorded during the survey: a Guttural Toad (Sclerophrys gutturalis) 33

Figure 13: Habitat sensitivity within the Kranspoort Project area as delineated by specialists during the field survey 34

Figure 14:Some of the identified existing impacts within the project area: A), B) and D) extensive grazing and trampling due to livestock, and C) alien invasive species..... 37



1 Introduction

The Biodiversity Company (TBC) was appointed by WSP (Pty) Ltd (WSP) to conduct a biodiversity baseline and impact (risk) assessment for a proposed Feedlot Facility in Kranspoort, Mpumalanga. The Department of Rural Development and Land Reform are proposing the feedlot facility on portion 7 of portion 5 in the Kranspoort Allias Block 225 within the Thembisile Local Municipality. The study will be completed to meet the requirements of a Basic Assessment (BA) authorisation process.

A wet season terrestrial biodiversity survey was conducted in late January 2018 and was conducted by two terrestrial ecologists. The survey was focused primarily on those areas which were most likely to be impacted upon by the proposed development. Furthermore, identification and description of any sensitive receptors were recorded across the Project area, and the manner in which these sensitive receptors may be affected by the activity was also investigated.

This report, after taking into consideration the findings and recommendations provided by the specialist herein, should inform and guide the Environmental Assessment Practitioner (EAP) and regulatory authorities, enabling informed decision making, as to the ecological viability of the proposed project.

1.1 Project Background

The original Project area was defined as 644 hectares in extent, however the actual land area which is to be impacted upon by the proposed development is approximately 11 ha. Within the overall project area, one portion is proposed as the primary option for development with a further two portions being demarcated as alternative sites (alternative one and alternative two). Both alternative sites are less than 11 ha in extent.

The project site is an existing farm and it is currently being transferred to a new owner. One of the proposed sites within the overall project area is a smaller camp (6 hectares) which was previously cultivated with sorghum.

Based on information provided by WSP, the following supporting infrastructure will be built:

- Offices, workshops, ablutions and storerooms;
- Feedlot perimeter fence and some internal roads;
- Manure storage areas and weighbridge;
- Residential area and trees for wind-breaks;
- Drainage canals (internally and externally); and

Veterinary facility and silage bunkers

2 Project Area

The proposed Kranspoort Feedlot is located approximately 29.2 km north-west of eMalaheni, on portion 7 of portion 5 in the Kranspoort Allias Block 225 within the Thembisile Local Municipality, in the Mpumalanga Province, South Africa (Figure 1). The area surrounding the project area consists predominantly of agricultural fields and a large protected area (Zemvelo Game Park) to the west of the proposed project area.

www.thebiodiversitycompany.com

info@thebiodiversitycompany.com





Figure 1: The proposed Kranspoort Project area



3 Scope of Work

TBC was commissioned by WSP to conduct a biodiversity baseline and impact (risk) assessment for the proposed Kranspoort Feedlot. The Terms of Reference (ToR) included the following:

- Desktop description of the baseline receiving environment specific to the field of expertise (general surrounding as well as site specific environment);
- Identification and description of any sensitive receptors in terms of relevant specialist disciplines (fauna and flora) that occur in the study area, and the manner in which these sensitive receptors may be affected by the activity;
- Site visit to verify desktop information;
- Screening to identify any critical issues (potential fatal flaws) that may result in project delays or rejection of the application; and
- Compile summary specialist reports, including the following:
 - Botany;
 - Fauna (mammals and avifauna); and
 - Herpetology (reptiles and amphibians).

4 Limitations

The following limitations should be noted for the study:

- As per the scope of work, the fieldwork component of the assessment comprised one assessment only, that was conducted during the wet season. This study has not assessed any temporal trends for the respective seasons;
- The assessments were conducted on those portions of the Project area as originally defined by the client, any changes in the project boundary subsequent to this may negatively impact the robustness of this report;
- No detailed activity list for the proposed project was provided and therefore the risk assessment has been completed based on presumptions for standard feedlot construction and operation;
- The impact assessment was completed for the proposed feedlot areas and supporting infrastructure for the Project area only, as provided by the client (including two alternative sites). The impact assessment has considered these layouts to be final, and have not considered the No Go alternative; and
- Despite these limitations, a comprehensive desktop study was conducted, in conjunction with the detailed results from the surveys, and as such there is a high confidence in the information provided.



5 Methodologies

5.1 Geographic Information Systems (GIS) Mapping

A National Aeronautics and Space Administration (NASA) Shuttle Radar Topography Mission (SRTM) (V3.0, 1 arcsec resolution) Digital Elevation Model (DEM) was obtained from the United States Geological Survey (USGS) Earth Explorer website. Basic terrain analysis was performed on this DEM using the SAGA GIS software that encompassed a slope, landforms and channel network analyses in order to detect ridges, potential landscape depressions and drainage lines respectively.

Additional existing data layers were incorporated into a GIS to establish how the proposed the project interacts with these important entities. Emphasis was placed around the following spatial datasets:

- Vegetation Map of South Africa, Lesotho and Swaziland (Mucina et al., 2007);
- Mpumalanga Biodiversity Sector Plan (MBSP) Terrestrial Assessment 2014 (MTPA, 2014);
- MBSP Landcover 2010 (MTPA, 2010);
- Department of Environmental Affairs (DEA) National Landcover 2015 (DEA, 2015); and

Field surveys were conducted to confirm the presence of species identified in the desktop assessment. The specialist disciplines were completed for this study:

- Botanical;
- Fauna (mammals and avifauna); and
- Herpetology (reptiles and amphibians);

Brief descriptions of the standardised methodologies applied in each of the specialist disciplines are provided below. More detailed descriptions of survey methodologies are available upon request.

5.2 Botanical Assessment

The botanical study encompassed an assessment of all the vegetation units and habitat types within the Project area. The focus was on a full assessment of habitat types as well as identification for any red-data species within the known distribution of the Project area. The methodology included the following survey techniques:

- Braun Blanquet (if applicable) phytosociological and quantification assessment and delineation of habitats; and
- Timed meanders;
- Sensitivity analysis based on structural and species diversity; and
- Identification of floral red-data species.



5.2.1 Literature study

A literature review was conducted as part of the desktop study to identify the potential habitats present within the Project area. The SANBI provides an electronic database system, namely the Botanical Database of Southern Africa (BODATSA), to access distribution records on southern African plants. This is a new database which replaces the old Plants of Southern Africa (POSA) database. The POSA database provided distribution data of flora at the quarter degree square (QDS) resolution.

The Red List of South African Plants website (SANBI, 2016) was utilized to provide the most current account of the national status of flora. Relevant field guides and texts consulted for identification purposes in the field during the surveys included the following:

- Field Guide to the Wild Flowers of the Highveld (Van Wyk & Malan, 1997);
- A field guide to wild flowers (Pooley, 1998);
- Guide to grasses of Southern Africa (Van Oudtshoorn, 1999);
- Orchids of South Africa (Johnson & Bytebier, 2015);
- Guide to the Aloes of South Africa (Van Wyk & Smith, 2014);
- Medicinal Plants of South Africa (Van Wyk et al., 2013);
- Freshwater Life: A field guide to the plants and animals of southern Africa (Griffiths & Day, 2016); and
- Identification guide to southern African grasses. An identification manual with keys, descriptions and distributions. (Fish et al., 2015).

Additional information regarding ecosystems, vegetation types, and species of conservation concern (SCC) included the following sources:

- The Vegetation of South Africa, Lesotho and Swaziland (Mucina & Rutherford, 2011);
- Grassland Ecosystem Guidelines: landscape interpretation for planners and managers (SANBI, 2013); and
- Red List of South African Plants (Raimondo et al., 2009; SANBI, 2016).

5.3 Fieldwork

The fieldwork and sample sites were placed within targeted areas (i.e. the proposed Project area and the two alternative sites) perceived as ecologically sensitive based on the preliminary interpretation of satellite imagery and GIS analysis (which included the latest applicable biodiversity datasets) available prior to the fieldwork. The focus of the fieldwork was therefore to maximise coverage and navigate to each target site in the field in order to perform a rapid vegetation and ecological assessment at each sample site. Emphasis was placed on sensitive habitats, especially those overlapping with the proposed Feedlot development.

At each sample site notes were made regarding current impacts (e.g. livestock grazing, erosion etc.), subjective recording of dominant vegetation species and any sensitive features (e.g. wetlands, outcrops etc.). In addition, opportunistic observations were made while navigating through the Project area. Effort was made to cover all the different habitat types



within the limits of time and access. The geographic location of sample sites and site coverage are shown under the Results section.

5.4 Faunal Assessment (Mammals & Avifauna)

The faunal desktop assessment included the following:

- Compilation of expected species lists;
- Compilation of identified species lists;
- Identification of any Red Data or species of conservation concern (SCC) present or potentially occurring in the area; and
- Emphasis was placed on the probability of occurrence of species of provincial, national and international conservation importance.

The field survey component of the study utilised a variety of sampling techniques including, but not limited to, the following:

- Visual observations;
- Avifauna sampling techniques;
- Identification of tracks and signs; and
- Utilization of local knowledge.

6 Key Legislative Requirements

The legislation, policies and guidelines listed below are applicable to the current project in terms of biodiversity and ecological support systems. The list below, although extensive, may not be complete and other legislation, policies and guidelines may apply in addition to those listed below.

Explanation of certain documents or organisations is provided where these have a high degree of relevance to the project and/or are referred to in this assessment.

International Legislation and Policy

- Convention on Biological Diversity (Rio de Janeiro, 1992);
- The Ramsar Convention (on wetlands of international importance);
- The Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). CITES is an international agreement between governments. Its aim is to ensure that international trade in specimens of wild animals and plants does not threaten their survival; and
- The IUCN (World Conservation Union). The IUCN's mission is to influence, encourage and assist societies throughout the world to conserve the integrity and diversity of nature and to ensure that any use of natural resources is equitable and ecologically sustainable.

National Level



- Constitution of the Republic of South Africa (Act 108 of 1996). The Bill of Rights, in the Constitution of South Africa states that everyone has a right to a nonthreatening environment and requires that reasonable measures be applied to protect the environment. This protection encompasses preventing pollution and promoting conservation and environmentally sustainable development;
- The National Environmental Management Act (NEMA) No. 107 of 1998: Environmental Impact Assessment Regulations, 2014. Specifically, the requirements of the specialist report as per the requirements of Appendix 6;
- The National Environmental Management: Biodiversity Act (NEM:BA) No. 10 of 2004: specifically, the management and conservation of biological diversity within the RSA and of the components of such biological diversity;
- National Environmental Management: Biodiversity Act, 2004: Threatened and Protected Species Regulations;
- National Environmental Management: Protected Areas Act, 2003 (Act 57 of 2003);
- National Environmental Management: Waste Act, 2008 (Act 59 of 2008);
- National Water Act, 1998 (Act 36 of 1998);
- National Veld and Forest Fire Act (101 of 1998);
- Environmental Conservation Act, 1989 (ECA), (Act no. 73 of 1989);
- National Forests Act, 1998 (Act 84 of 1998), specifically with reference to Protected Tree species;
- National Heritage Resources Act, 1999 (Act 25 of 1999);
- Conservation of Agricultural Resources Act, 1983 (Act 43 of 1983); and
- Sustainable Utilisation of Agricultural Resources (Draft Legislation).

National Policy and Guidelines

- South Africa's National Biodiversity Strategy and Action Plan (NBSAP);
- National Spatial Biodiversity Assessment (NSBA); and
- National Freshwater Ecosystem Priority Areas (NFEPA's).

Provincial and Municipal Level

In addition to national legislation, South Africa's nine provinces have their own provincial biodiversity legislation, as nature conservation is a concurrent function of national and provincial government in terms of the Constitution (Act 108 of 1996).

The Provincial Department responsible for environmental matters in Mpumalanga is the Mpumalanga Department of Economic Development, Environment and Tourism (MDEDET). Relevant provincial legislation includes, but is not limited to:



6.1 Mpumalanga Parks Board Act 6 of 1995

- The Mpumalanga Parks Board was established in terms of the Mpumalanga Parks Board Act 6 of 1995 as amended. The objectives of this Act are inter alia as follows:
 - To provide effective conservation management of natural resources of the Mpumalanga Province;
 - To promote the creation of economic and employment opportunities in pursuit of nature conservation and biodiversity;
 - To ensure that natural systems, biodiversity and ecological functions and processes in the Mpumalanga Province are maintained;
 - To determine and enforce limits to sustainable utilization of natural resources;
 - To contribute to the advancement of scientific knowledge, and facilitate technology transfer in respect of conservation; and
 - Provide information and extension services to the public on conservation management, problem species, legal aspects of conservation and other conservation matters.

6.2 Mpumalanga Conservation Act, 1998 (Act 10 of 1998)

The aim of this Act is to consolidate and amend the laws relating to nature conservation within the Province and to provide for matters connected therewith.

6.3 Mpumalanga Tourism and Parks Agency Act, No 5 of 2005

This act provides for the establishment of the Mpumalanga Tourism and Parks Agency (MTPA) and for the management thereof by a Board; to provide for the sustainable development and improvement of the tourism industry in Mpumalanga; to provide for conservation management of the natural resources of Mpumalanga; to confer powers and functions upon the Agency; to provide for the registration of certain persons and entities directly involved in tourism; to provide for transitional arrangements; and to provide for matters incidental thereto.

6.4 Mpumalanga Conservation Plan

Mpumalanga's Conservation Plan Version 2 (C-Plan 2) database (MPSB, 2006), is intended to guide conservation and land-use decisions in support of sustainable development at a strategic level, have been identified. The C-Plan 2 maps the distribution of the Province's known biodiversity into categories according to ecological and biodiversity importance and their contribution to meeting the quantitative targets set for each biodiversity feature.

6.5 Mpumalanga Biodiversity Sector Plan (MBSP)

In 2006 the MTPA and the Department of Agriculture and Land Administration (DALA) initiated the development of the Mpumalanga Biodiversity Conservation Plan (MBCP). As the first such plan produced for the Province, it was intended to guide conservation and land-use decisions in support of sustainable development. The MBCP provided a spatial framework that supported land-use planning and helped to streamline and monitor environmental decision-making (Ferrar & Lotter, 2007).



Since 2007 several technical advances and land use changes necessitated the need for an update of the MBCP. The updated product is called the Mpumalanga Biodiversity Sector Plan (MBSP) and builds on the successes of the MBCP but incorporates improvements in science, technology and data, to provide a more comprehensive assessment of the biodiversity of the terrestrial and freshwater environment in Mpumalanga (MTPA, 2014).

6.6 National Biodiversity Assessment (NBA)

The National Biodiversity Assessment (NBA) was completed as a collaboration between the South African National Biodiversity Institute (SANBI), the Department of Environmental Affairs (DEA) and other stakeholders, including scientists and biodiversity management experts throughout the country over a three-year period (Driver at al., 2012).

The purpose of the NBA is to assess the state of South Africa's biodiversity with a view to understanding trends over time and informing policy and decision-making across a range of sectors (Driver at al., 2012).

6.7 MTPA Guidelines for Biodiversity Assessment

To promote national uniform standards in Environmental Management Plans (EMP's) the Mpumalanga Tourism and Parks Agency (MTPA) have set minimum standards that need to be conformed to in terms of Biodiversity Assessments for development applications. These guidelines cover flora, fauna, aquatic and wetland systems.

7 Study Approach

This draft biodiversity baseline and impact assessment report has been compiled in accordance with the accepted SoW and does not incorporate the findings and recommendations from other specialist studies conducted for the project.

All specialist studies were initiated on the basis of the conceptual layout plan indicating the proposed Feedlot development areas and associated infrastructure, as provided by WSP.

7.1 Field Survey

A field survey was conducted on the 30th January 2018 by two (2) terrestrial ecologists where the floral and faunal communities in the project area were assessed. The project area was ground-truthed on foot, which included spot checks in pre-selected areas to validate desktop data. Photographs were recorded during the site visit.

The fieldwork attempted to classify the fauna, flora and habitats, with emphasis on recording the actual and potential presence of Red Data species (also referred to as Red-Listed and Orange-Listed species), which are species of conservation concern in South African (either classified as threatened by the IUCN (2017), protected by NEMBA (2014) or any other legislation applicable provincially or nationally).

8 General Land Use

The dominant land use of the surrounding area is cultivated land/agriculture. Natural vegetation is utilized for livestock grazing predominately by cattle. Subsistence farming also occurs in the nearby vicinity. A portion of the project area also includes existing agricultural buildings and dwellings. Certain portions of the project area were previously utilised for agricultural farming practices.



8.1 The Mpumalanga Biodiversity Sector Plan (MBSP)

The key output of a systematic biodiversity plan is a map of biodiversity priority areas (MTPA, 2014). The MBSP CBA map delineates Critical Biodiversity Areas (CBAs), Ecological Support Areas (ESAs), Other Natural Areas (ONAs), Protected Areas (PAs), and areas that have been irreversibly modified from their natural state (MTPA, 2014). The MBSP uses the following terms to categorise the various land used types according to their biodiversity and environmental importance:

- Critical Biodiversity Area – Irreplaceable (CBA: Irreplaceable);
- Critical Biodiversity Area – Optimal (CBA: Optimal);
- Ecological Support Area (ESA);
- Other Natural Area (ONA);
- Protected Area (PA); and
- Moderately or Heavily Modified Areas (MMA's or HMA's).

Critical Biodiversity Areas (CBAs) are terrestrial and aquatic areas of the landscape that need to be maintained in a natural or near-natural state to ensure the continued existence and functioning of species and ecosystems and the delivery of ecosystem services. CBAs are areas of high biodiversity value and need to be kept in a natural state, with no further loss of habitat or species (MTPA, 2014). Thus, if these areas are not maintained in a natural or near natural state then biodiversity targets cannot be met. Maintaining an area in a natural state can include a variety of biodiversity compatible land uses and resource uses (SANBI-BGIS, 2017).

Critical Biodiversity Areas (CBAs) are areas of high biodiversity value and need to be kept in a natural state, with no further loss of habitat or species (MTPA, 2014). These areas are therefore incompatible with mining developments.

The Mpumalanga Biodiversity Sector Plan (MBSP) specifies two different CBA areas, Irreplaceable CBA's and Optimal CBA's. Irreplaceable CBA's include: (1) areas required to meet targets and with irreplaceability biodiversity values of more than 80%; (2) critical linkages or pinch-points in the landscape that must remain natural; or (3) critically Endangered ecosystems (MTPA, 2014).

Ecological Support Areas (ESAs) are not essential for meeting biodiversity targets but play an important role in supporting the ecological functioning of Critical Biodiversity Areas and/or in delivering ecosystem services. Critical Biodiversity Areas and Ecological Support Areas may be terrestrial or aquatic (SANBI-BGIS, 2017).

Other Natural Areas (ONAs) consist of all those areas in good or fair ecological condition that fall outside the protected area network and have not been identified as CBAs or ESAs. A biodiversity sector plan or bioregional plan must not specify the desired state/management objectives for ONAs or provide land-use guidelines for ONAs (SANBI-BGIS, 2017).

Moderately or Heavily Modified Areas (sometimes called 'transformed' areas) are areas that have been heavily modified by human activity so that they are by-and-large no longer natural, and do not contribute to biodiversity targets (MTPA, 2014). Some of these areas may



Kranspoort Feedlot

still provide limited biodiversity and ecological infrastructural functions but, their biodiversity value has been significantly, and in many cases irreversibly, compromised.

8.2 Project area in relation to the MBSP

Figure 2 shows the Kranspoort Feedlot development area superimposed on the MBSP Terrestrial CBA map. Based on this, the proposed Feedlot development areas will potentially overlap with:

- Heavily Modified Areas (HMA); and
- Moderately Modified Areas (Old Lands).

Based on this desktop information, much of the Project area is identified as being heavily or moderately modified (Figure 2).

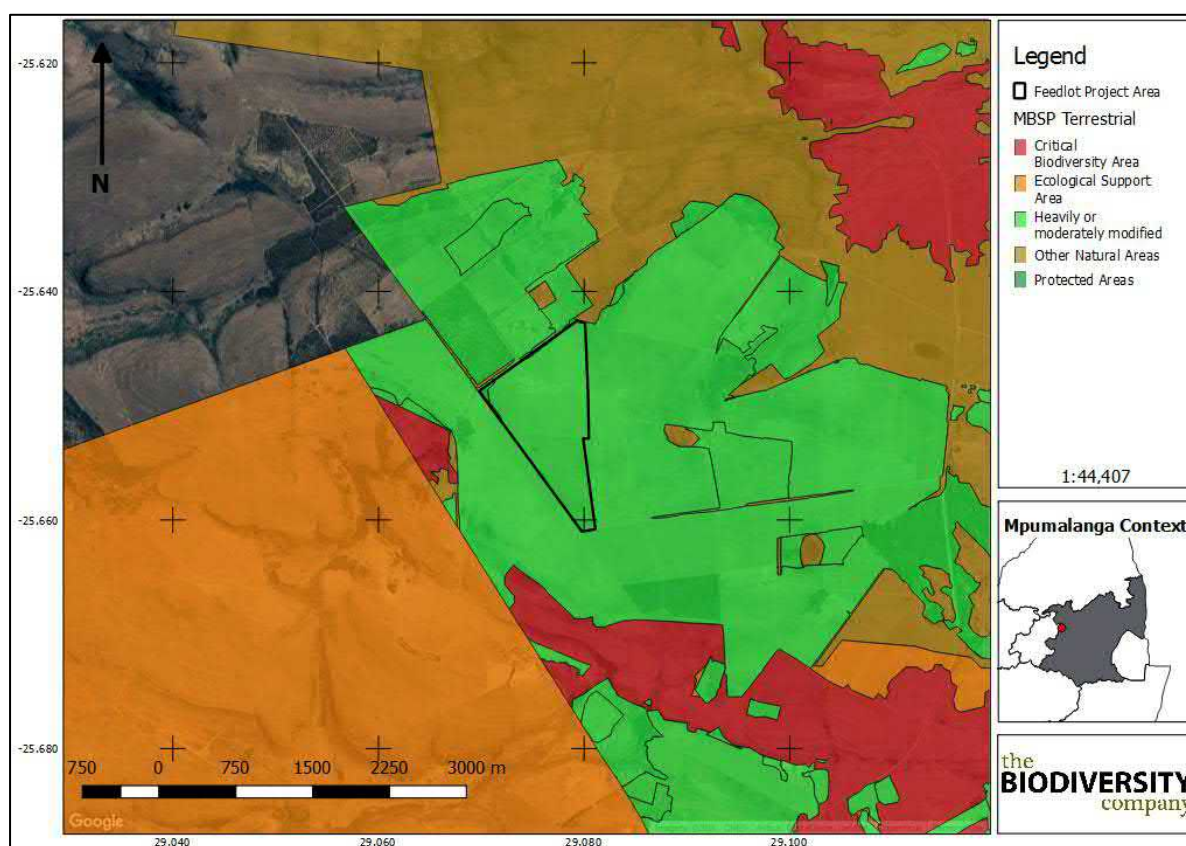


Figure 2: Kranspoort Feedlot Project area superimposed on the MBSP Terrestrial Critical Biodiversity Areas (CBA) map (MBSP, 2014)

8.3 Project area in relation to the NBA

The two headline indicators assessed in the NBA are ecosystem threat status and ecosystem protection level (Driver at al., 2012). Each of these indicators are discussed below as they relate to the proposed Kranspoort feedlot development.

8.3.1 Ecosystem Threat Status

Ecosystem threat status outlines the degree to which ecosystems are still intact or alternatively losing vital aspects of their structure, function and composition, on which their ability to provide ecosystem services ultimately depends (Driver at al., 2012).



Kranspoort Feedlot

Ecosystem types are categorised as Critically Endangered (CR), Endangered (EN), Vulnerable (VU) or Least Threatened (LT), based on the proportion of each ecosystem type that remains in good ecological condition (Driver at al., 2012).

The Project area was superimposed on the terrestrial ecosystem threat status (Figure 3). As seen in Figure 3 the Project area overlaps entirely with ecosystems that are listed as Endangered(EN).

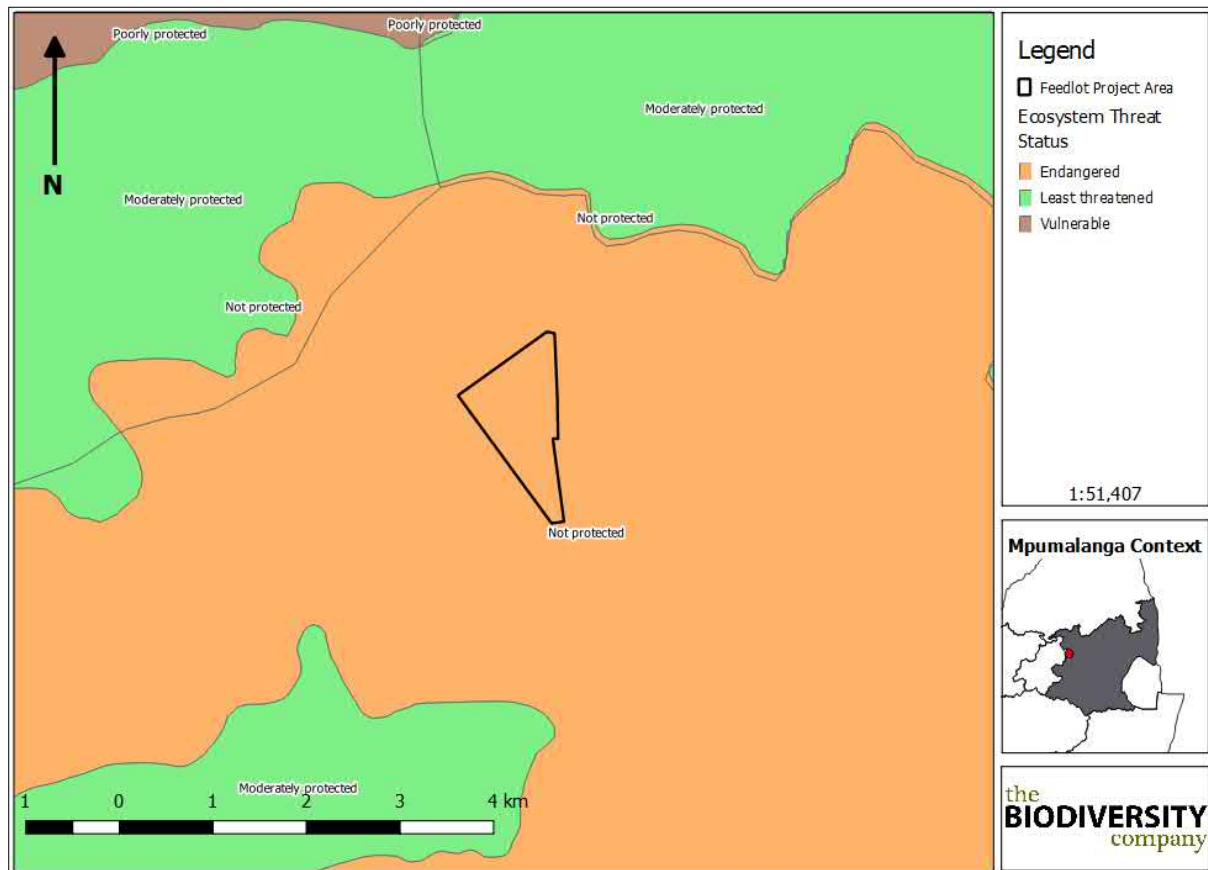


Figure 3: Kranspoort Project area showing the ecosystem threat status of the associated terrestrial ecosystems (NBA, 2012)

8.3.2 Ecosystem Protection Level

Ecosystem protection level tells us whether ecosystems are adequately protected or under-protected. Ecosystem types are categorised as not protected, poorly protected, moderately protected or well protected, based on the proportion of each ecosystem type that occurs within a protected area recognised in the Protected Areas Act (Driver at al., 2012).

The Kranspoort Feedlot development was superimposed on the ecosystem protection level map to assess the protection status of terrestrial ecosystems associated with the development (Figure 4). Based on Figure 4 all of the terrestrial ecosystems associated with the development are rated as *not protected*.



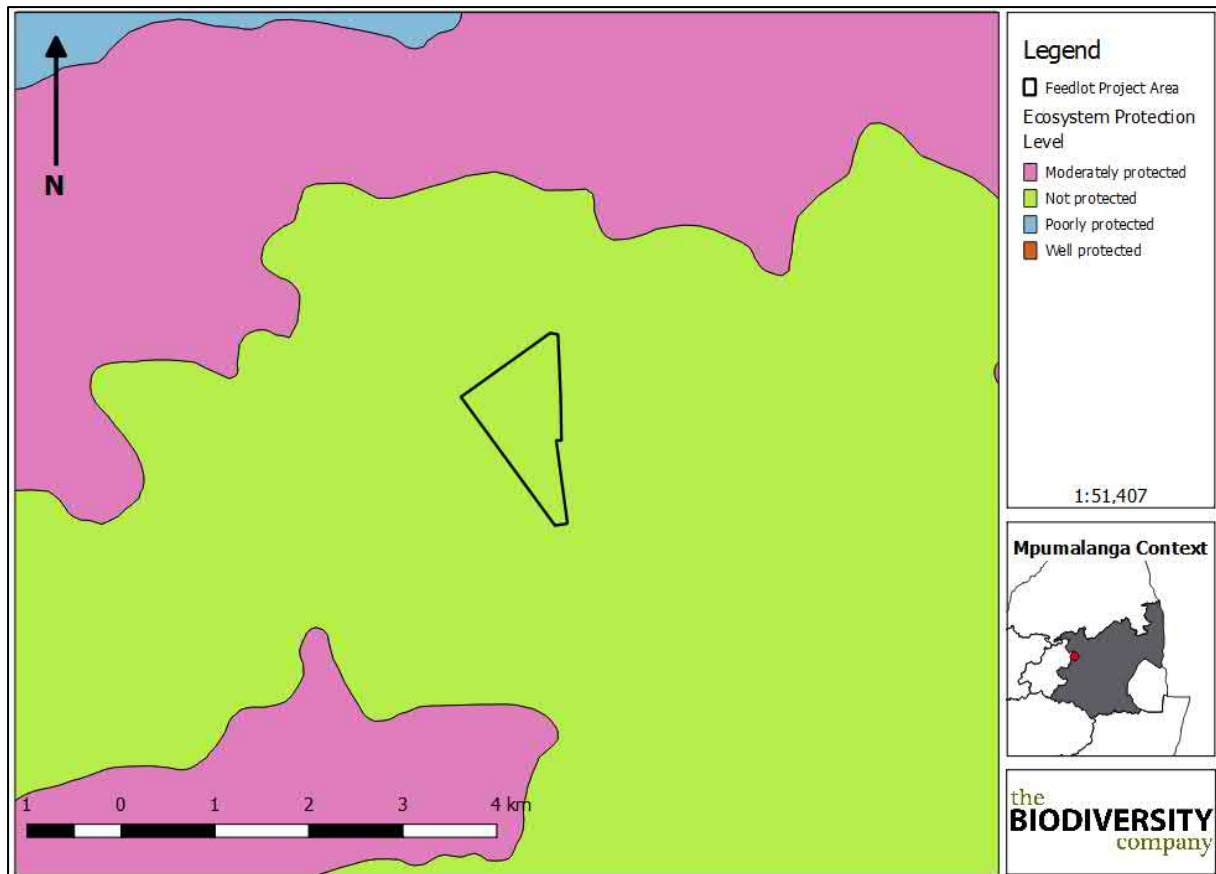


Figure 4: Kranspoort Project area showing the level of protection of terrestrial ecosystems (NBA, 2012)

8.4 Project Area in relation to Protected Areas

Figure 5 shows the location of formally protected areas in relation to the Project area. Formally protected areas refer to areas protected either by national or provincial legislation.

Based on the SANBI (2010) Protected Areas Map and the National Protected Areas Expansion Strategy (NPAES) the Project area does not overlap with any formally or informally protected area (Figure 5). The closest protected area is the Zemvelo Game Park which is situated approximately 5.4 km west of the Project area (Figure 5).

Based on the above information and the location of the proposed development, the proposed Kranspoort Feedlot development is not expected to have an impact on any formally or informally protected areas.



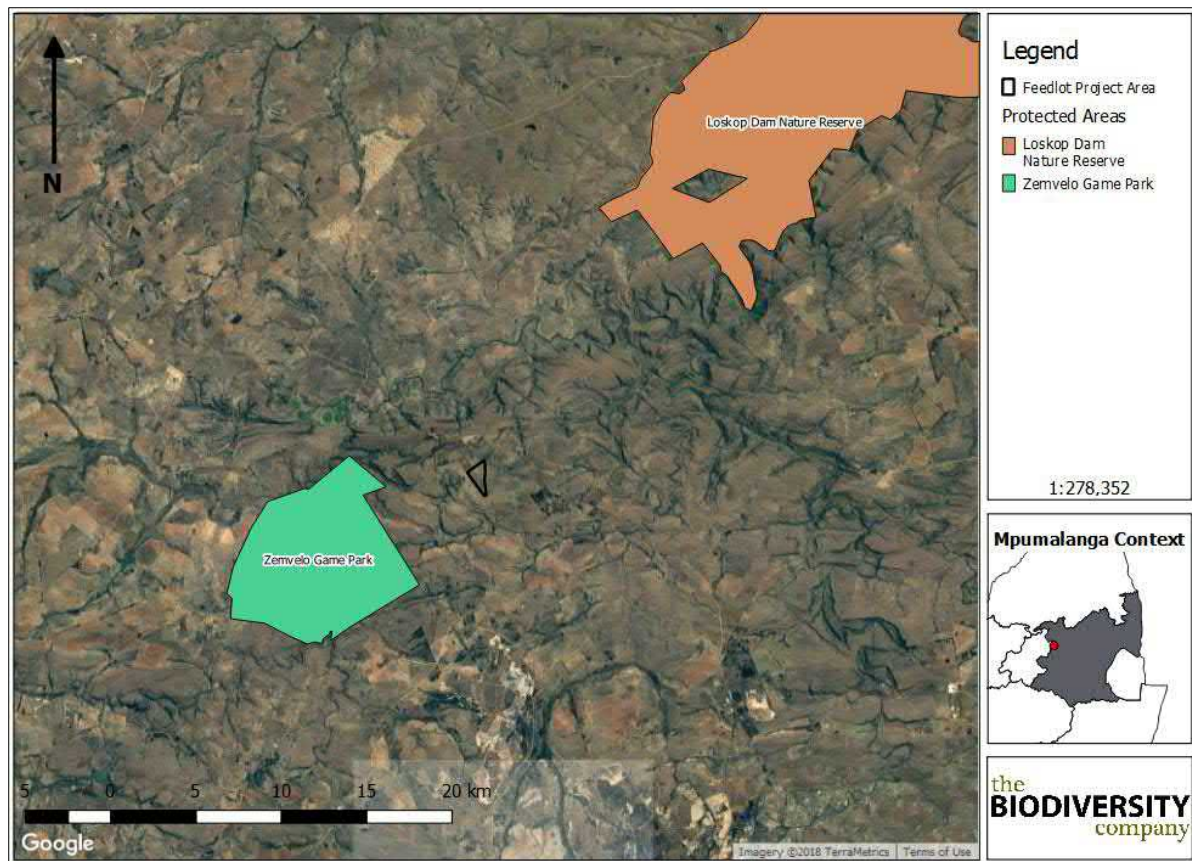


Figure 5: Formally protected areas in relation to the Project area (BGIS,2017)

8.5 National Freshwater Ecosystem Priority Area (NFEP) Status

In an attempt to better conserve aquatic ecosystems, South Africa has recently categorised its river systems according to set ecological criteria (i.e. ecosystem representation, water yield, connectivity, unique features, and threatened taxa) to identify Freshwater Ecosystem Priority Areas (FEPAs) (Driver et al. 2011). The FEPAs are intended to be conservation support tools and envisioned to guide the effective implementation of measures to achieve the National Environment Management Biodiversity Act (NEM:BA) biodiversity goals (Nel et al. 2011).

Figure 6 shows the location of the Project area in relation to wetland and river FEPAs. Based on this information, the Project area does not overlap with any known NFEP wetland areas or rivers. However, the results of an independent wetland study conducted may prove otherwise and the results of that report must be consulted in this regard.



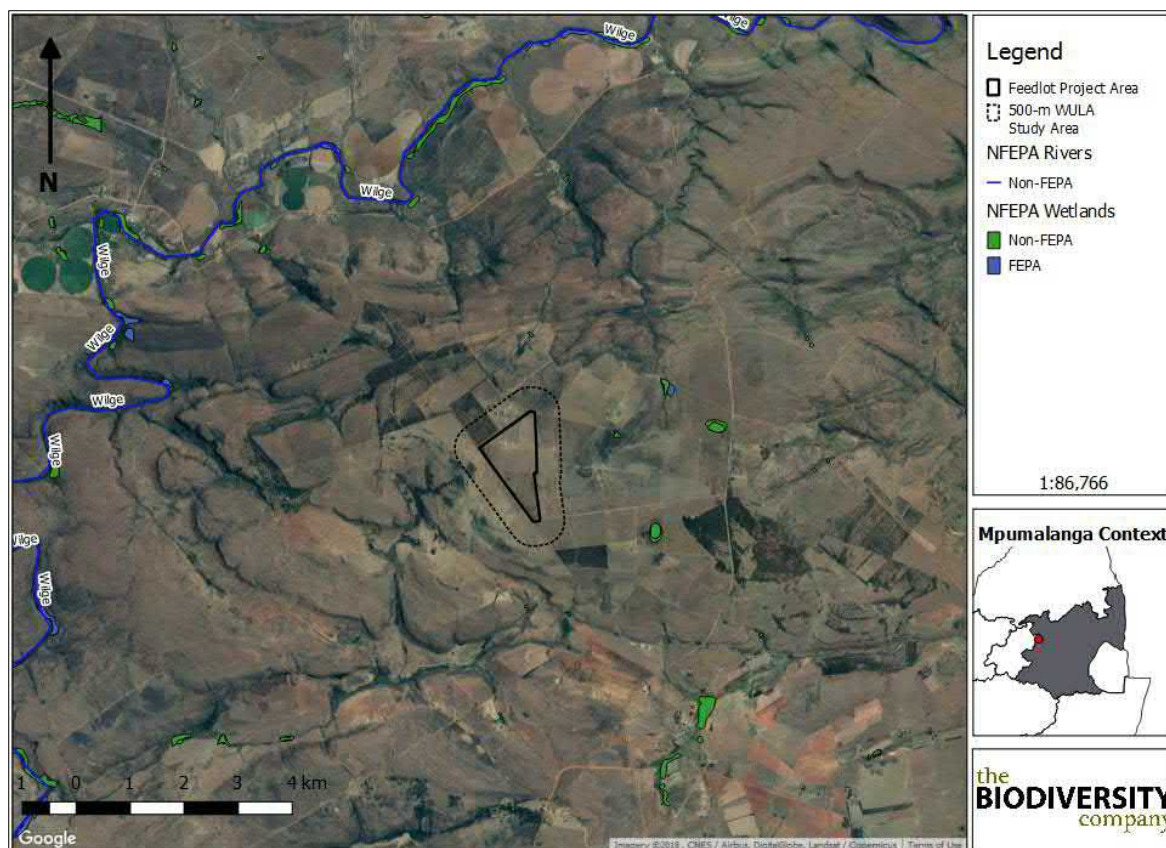


Figure 6: The Project area in relation to the National Freshwater Ecosystem Priority Areas

8.6 The MBSP Freshwater Assessment

The MBSP Freshwater Assessment outlines priority areas for freshwater biodiversity in Mpumalanga. The resulting features are predominantly derived from the NFEPA products, layers include CBA Rivers (based on FEPA and free-flowing rivers), CBA Wetlands (based on FEPA wetlands), CBA Aquatic species (Odonata & crab taxa of conservation concern only), ESA Wetland Clusters (FEPA wetland clusters), and ESA Wetlands (all other non-FEPA wetlands). The MTPA created an updated land-cover using SPOT 2010 imagery. This data, together with high-resolution aerial imagery, was used to update and clean some of the features (MTPA et al., Freshwater Assessment, 2011).

The Project area in relation to the MBSP Freshwater Assessment overlaps almost entirely with areas that are demarcated as Heavily Modified (Figure 7).



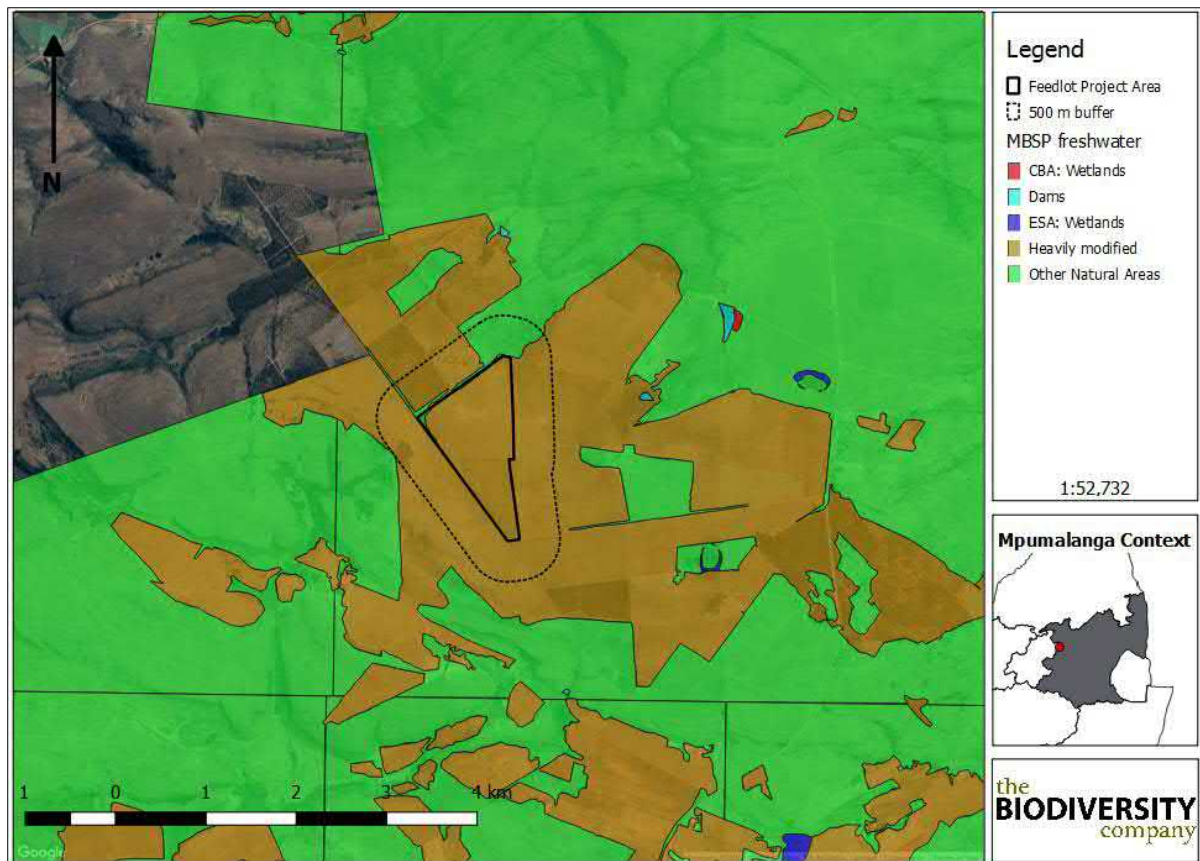


Figure 7: The Kranspoort Project area in relation to the MBSP Freshwater Assessment

9 Results & Discussion

9.1 Desktop Assessment

9.1.1 Vegetation Assessment

The Kranspoort Feedlot Project area is situated within the grassland biome. This biome is centrally located in southern Africa, and adjoins all except the desert, fynbos and succulent Karoo biomes (Mucina & Rutherford, 2006). Major macroclimatic traits that characterise the grassland biome include:

- a) Seasonal precipitation; and
- b) The minimum temperatures in winter (Mucina & Rutherford, 2006).

The grassland biome is found chiefly on the high central plateau of South Africa, and the inland areas of KwaZulu-Natal and the Eastern Cape. The topography is mainly flat and rolling but includes the escarpment itself. Altitude varies from near sea level to 2 850 m above sea level.

Grasslands are dominated by a single layer of grasses. The amount of cover depends on rainfall and the degree of grazing. The grassland biome experiences summer rainfall and dry winters with frost (and fire), which are unfavourable for tree growth. Thus, trees are typically absent, except in a few localized habitats. Geophytes (bulbs) are often abundant. Frosts, fire and grazing maintain the grass dominance and prevent the establishment of trees.



9.1.2 Vegetation Types

The grassland biome comprises many different vegetation types. The Project area is situated within one vegetation type, namely the Rand Highveld Grassland, according to Mucina & Rutherford (2006) (Figure 8).

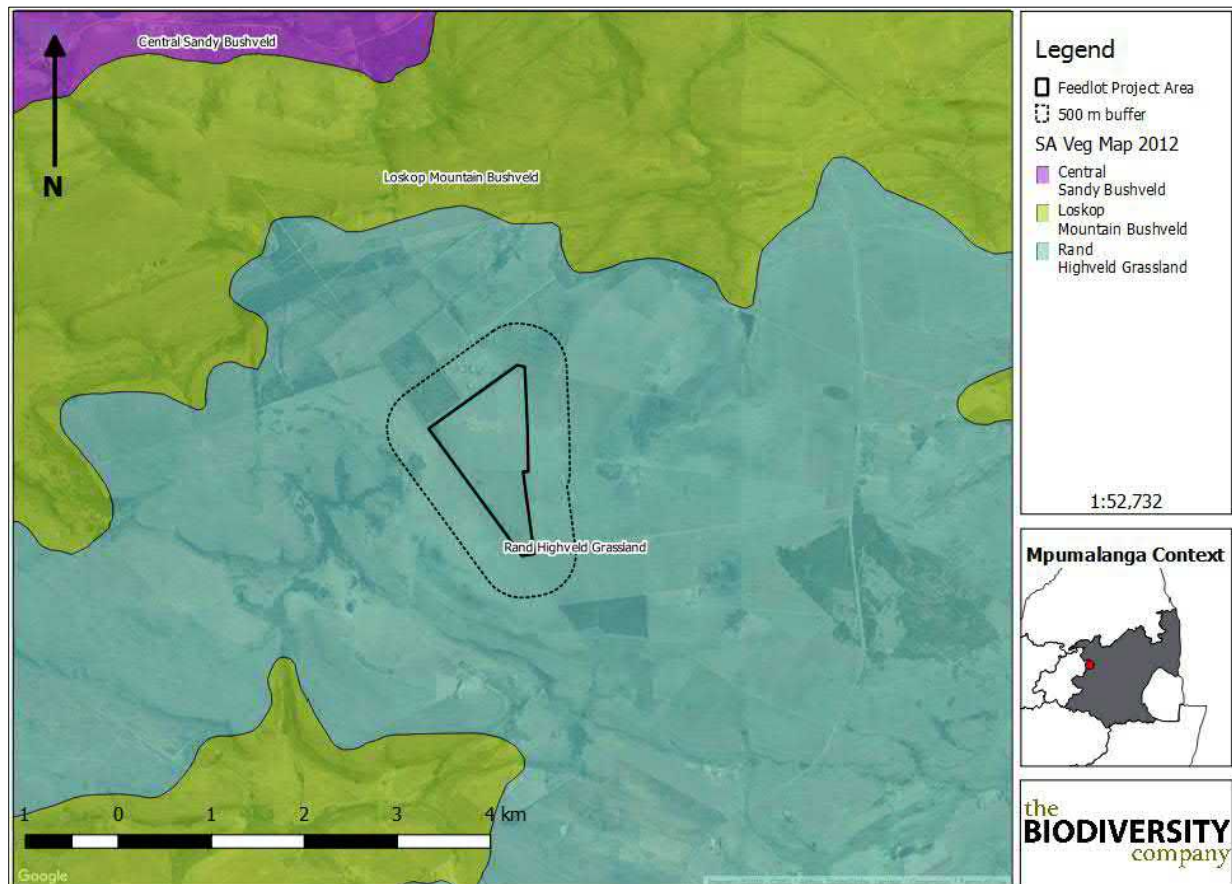


Figure 8: Project area showing the vegetation type based on the Vegetation Map of South Africa, Lesotho & Swaziland (BGIS, 2017)

9.1.3 Rand Highveld Grassland

This vegetation type occurs on highly variable landscapes with extensive sloping plains and a series of ridges slightly elevated over undulating surrounding plains. The vegetation is species-rich, wiry, sour grassland alternating with low, sour shrubland on rocky outcrops and steeper slopes. This vegetation type can be found in Gauteng, North-West, Free State and Mpumalanga Provinces, between rocky ridges from Pretoria to Witbank, extending onto ridges in the Stoffberg and Roosenekal regions as well as west of Krugersdorp centred in the vicinity of Derby and Potchefstroom, extending southwards and north-eastwards from there (Mucina & Rutherford, 2006).

9.1.4 Important Plant Taxa

Important plant taxa are those species that have a high abundance, a frequent occurrence or are prominent in the landscape within a particular vegetation type (Mucina & Rutherford, 2006).

The following species are important in the **Rand Highveld Grassland** vegetation type:



Graminoids: *Ctenium concinnum*, *Cynodon dactylon*, *Digitaria monodactyla*, *Diheteropogon amplectens*, *Eragrostis chloromelas*, *Heteropogon contortus*, *Loudetia simplex*, *Monocymbium ceresiiforme*, *Panicum natalense*, *Schizachyrium sanguineum*, *Setaria sphacelata*, *Themeda triandra*, *Trachypogon spicatus*, *Tristachya biseriata*, *T. rehmannii*, *Andropogon schirensis*, *Aristida aequiglumis*, *A. congesta*, *A. junciformis* subsp. *galpinii*, *Bewisia biflora*, *Brachiaria nigropedata*, *B. serrata*, *Bulbostylis burchellii*, *Cymbopogon caesius*, *Digitaria tricholaenoides*, *Elionurus muticus*, *Eragrostis capensis*, *E. curvula*, *E. gummiflua*, *E. plana*, *E. racemosa*, *Hyparrhenia hirta*, *Melinis nerviglumis*, *M. repens* subsp. *repens*, *Microchloa caffra*, *Setaria nigrirostris*, *Sporobolus pectinatus*, *Trichoneura grandiglumis*, *Urelytrum agropyroides*, (Mucina & Rutherford, 2006).

Herbs: *Acanthospermum australe*, *Justicia anagalloides*, *Pollichia campestris*, *Acalypha angustata*, *Chamaecrista mimosoides*, *Dicoma anomala*, *Helichrysum caespititium*, *H. nudifolium* var. *nudifolium*, *H. rugulosum*, *Ipomoea crassipes*, *Kohautia amatymbica*, *Lactuca inermis*, *Macladium zeyheri* subsp. *argyrophylum*, *Nidorella hottentotica*, *Oldenlandia herbacea*, *Rotheca hirsuta*, *Selago densiflora*, *Senecio coronatus*, *Sonchus dregeanus*, *Vernonia oligocephala*, *Xerophyta retinervis* (Mucina & Rutherford, 2006).

Geophytic Herbs: *Boophone disticha*, *Cheilanthes hirta*, *Haemanthus humilis* subsp. *humilis*, *Hypoxis rigidula* var. *pilosissima*, *Ledebouria ovatifolia*, *Oxalis corniculata* (Mucina & Rutherford, 2006).

Succulent Herb: *Aloe greatheadii* var. *davyana*.

Low Shrubs: *Anthospermum rigidum* subsp. *pumilum*, *Indigofera comosa*, *Rhus magalismontana*, *Stoebe plumosa*. **Succulent Shrub:** *Lopholaena coriifolia*.

Geoxylic Suffrutex: *Elephantorrhiza elephantina*.

9.1.4.1 Conservation Status

9.1.4.2 Rand Highveld Grassland

According to Mucina & Rutherford (2006), this vegetation type is classified as Endangered. The national target for conservation protection for both these vegetation types is 24%, but only a few patches are protected in statutory reserves (Kwaggavoetpad, Van Riebeeck Park, Bronkhorstspuit, Boskop Dam Nature Reserves) and in private conservation areas (e.g. Doornkop, Zemvelo, Rhenosterpoort and Mpopomeni).

Almost half of this vegetation type has been transformed mostly by cultivation, plantations, urbanisation or dam-building. Cultivation may also have had an impact on an additional portion of the surface area of the unit where old lands are currently classified as grasslands in land-cover classifications and poor land management has led to degradation of significant portions of the remainder of this unit.

9.1.4.3 Plant Species of Conservation Concern

Based on the Plants of Southern Africa (BODATSA-POSA, 2016) database, 151 plant species are expected to occur in the area (Figure 9). The list of expected plant species is provided in Appendix A.

Of the 393-plant species, one (1) species is listed as being a Species of Conservation Concern (SCC) (Table 1).



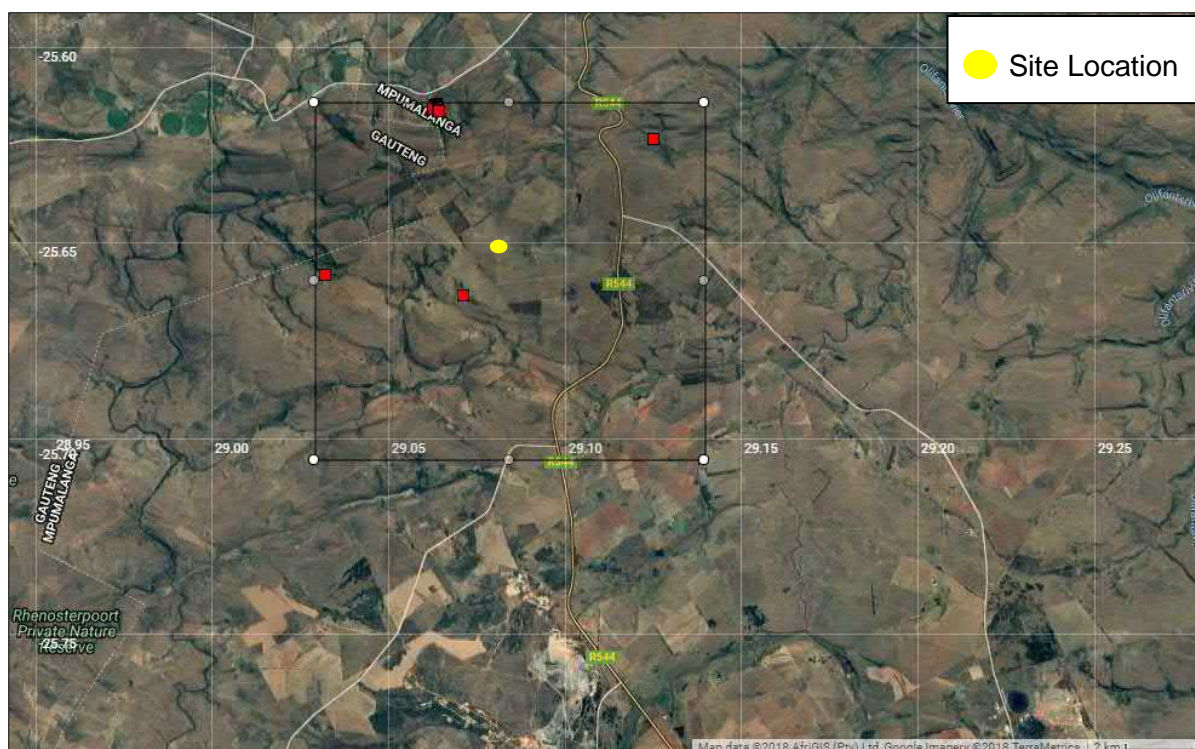


Figure 9: Map showing the grid drawn in order to compile an expected species list (BODATSA-POSA, 2016)

Table 1: Plant Species of Conservation Concern (SCC) expected to occur in the project area (BODATSA-POSA, 2016)

Family	Scientific Name	Author	SANBI listing (2017)	Ecology
Fabaceae	<i>Argyrobium megarrhizum</i>	Bolus	NT	Indigenous; Endemic

Argyrobium megarrhizum is listed as Near-Threatened (NT) according to the Red List of South African Plants (SANBI, 2017) and can be found in the Savanna and Mixed Bushveld. About 20% of this species' range is already transformed, mainly for the cultivation of maize. Subpopulations are currently threatened by overgrazing of communal land and spreading rural settlements. Land degradation, as a result of overgrazing and overburning, is also likely to negatively affect this species' pollinator, Carpenter Bees (Edwards & Raimond, 2007).

9.1.5 Faunal Assessment

9.1.5.1 Avifauna

Based on the South African Bird Atlas Project, Version 2 (SABAP2) database, 406 bird species are expected to occur in the vicinity of the project area (pentads 2530_2855, 2530_2890, 2530_2905, 2535_2855, 2535_2900, 2535_2905, 2540_2855, 2540_2900, 2540_2905). The full list of potential bird species is provided in Appendix B.

Of the expected bird species, twenty-four (24) species (6.3%) are listed as SCC either on a regional (21) or global scale (15) (Table 2).

The SCC include the following:



Kranspoort Feedlot

- One (1) species which is listed as Critically Endangered (CR) on a regional basis;
- Four (4) species that are listed as Endangered (EN) on a regional basis;
- Nine (9) species that are listed as Vulnerable (VU) on a regional basis;
- Nine (9) species that are listed as Near Threatened (NT) on a regional basis (); and

On a global scale, two (2) species are listed as EN, seven (7) species are listed as NT and three (3) species as VU (Table 2).

Table 2: List of bird species of regional or global conservation importance that are expected to occur in pentads 2530_2855, 2530_2890, 2530_2905, 2535_2855, 2535_2900, 2535_2905, 2540_2855, 2540_2900, 2540_2905 (SABAP2, 2017, ESKOM, 2014; IUCN, 2017)

Species	Common name	Conservation Status		Likelihood of Occurrence
		Regional (SANBI, 2016)	IUCN (2017)	
<i>Alcedo semitorquata</i>	Kingfisher, Half-collared	NT	LC	Low
<i>Anthropoides paradiseus</i>	Crane, Blue	NT	VU	Moderate
<i>Aquila verreauxii</i>	Eagle, Verreaux's	VU	LC	Low
<i>Balearica regulorum</i>	Crane, Grey Crowned	EN	EN	Moderate
<i>Bugeranus carunculatus</i>	Crane, Wattled	CR	VU	Moderate
<i>Calidris ferruginea</i>	Sandpiper, Curlew	LC	NT	Low
<i>Ciconia abdimii</i>	Stork, Abdim's	NT	LC	Moderate
<i>Ciconia nigra</i>	Stork, Black	VU	LC	Moderate
<i>Circus macrourus</i>	Harrier, Pallid	NT	NT	Low
<i>Circus ranivorus</i>	Marsh-harrier, African	EN	LC	Low
<i>Coracias garrulus</i>	Roller, European	NT	LC	Low
<i>Eupodotis senegalensis</i>	Korhaan, White-bellied	VU	LC	Moderate
<i>Falco biarmicus</i>	Falcon, Lanner	VU	LC	Moderate
<i>Glareola nordmanni</i>	Pratincole, Black-winged	NT	NT	Low
<i>Mycteria ibis</i>	Stork, Yellow-billed	EN	LC	Moderate
<i>Neotis denhami</i>	Bustard, Denham's	VU	NT	Moderate
<i>Oxyura maccoa</i>	Duck, Maccoa	NT	NT	Low
<i>Phoeniconaias minor</i>	Flamingo, Lesser	NT	NT	Low
<i>Phoenicopterus ruber</i>	Flamingo, Greater	NT	LC	Low
<i>Podica senegalensis</i>	Finfoot, African	VU	LC	Low
<i>Sagittarius serpentarius</i>	Secretarybird	VU	VU	Moderate
<i>Spizocorys fringillaris</i>	Lark, Botha's	EN	EN	Low
<i>Sterna caspia</i>	Tern, Caspian	VU	LC	Low
<i>Tyto capensis</i>	Grass-owl, African	VU	LC	Low

The expected bird SCC are discussed below.

Alcedo semitorquata (Half-collared Kingfisher) is listed as Near Threatened (NT) on a regional scale and occurs across a large range. This species generally prefers narrow rivers, streams, and estuaries with dense vegetation onshore, but it may also move into coastal lagoons and



Kranspoort Feedlot

lakes. It mainly feeds on fish (IUCN, 2017). The possibility of occurrence is low due to the lack of suitable habitat for this species in the project area (i.e. wetlands, dams, vleis or rivers).

Aquila verreauxii (Verreaux's Eagle) is listed as VU on a regional scale and LC on a global scale. This species is locally persecuted where it coincides with livestock farms, but because the species does not take carrion, is little threatened by poisoned carcasses. Where hyraxes are hunted for food and skins, eagle populations have declined (IUCN, 2017). Based on lack of suitable habitat for its preferred prey items – namely hyraxes, the likelihood of occurrence of this species is rated as low.

Anthropoides paradiseus (Blue Crane) is listed as NT on a regional scale and as VU on a global scale, while *Balearica regulorum* (Grey Crowned Crane) is listed as EN both globally and regionally. *Bugeranus carunculatus* (Wattled Crane) is listed as CR regionally and VU globally. Populations of all three of these species have declined, largely owing to direct poisoning, power-line collisions and loss of their grassland breeding habitats owing to afforestation, mining, agriculture and development (IUCN, 2017). These species breed in natural grass and sedge-dominated habitats, preferring secluded grasslands at high elevations where the vegetation is thick and short. Some of the areas adjacent to the project area are disturbed due to cultivation and cattle farming, however some suitable habitat for this species remains (such as the surrounding open fields), therefore the likelihood of occurrence is rated as moderate for both species.

Calidris ferruginea (Curlew Sandpiper) is migratory species which breeds on slightly elevated areas in the lowlands of the high Arctic and may be seen in parts of South Africa during winter. During winter, the species occurs at the coast, but also inland on the muddy edges of marshes, large rivers and lakes (both saline and freshwater), irrigated land, flooded areas, dams and salt pans (IUCN, 2017). The likelihood of occurrence for this species is rated as low due to the lack of suitable habitat for this species in the project area (i.e. wetlands, dams, vleis or rivers).

Ciconia abdimii (Abdim's Stork) is listed as NT on a regional scale and the species is known to be found in open grassland and savanna woodland often near water but also in semi-arid areas, gathering beside pools and water-holes. They tend to roost in trees or cliffs (IUCN, 2017). The likelihood of occurrence for this species is rated as low due to the lack of suitable habitat for this species in the project area (i.e. wetlands, dams, vleis or rivers) and the lack of roosting sites (trees or cliffs).

Ciconia nigra (Black Stork) is native to South Africa, and inhabits old, undisturbed, open forests. They are known to forage in shallow streams, pools, marshes swampy patches, damp meadows, flood-plains, pools in dry riverbeds and occasionally grasslands, especially where there are stands of reeds or long grass (IUCN, 2017). It is unlikely that this species would breed in the project area due to the lack of forested areas, however some suitable foraging habitat remains in the form of the open grasslands and wetland areas, and as such the likelihood of occurrence is rated as moderate.

Circus macrourus (Pallid Harrier) is listed as NT on a regional and global scale, and overwinters in semi-desert, scrub, savanna and wetlands. The species is migratory, with most birds wintering in sub-Saharan Africa or south-east Asia (IUCN, 2017). The species is most likely only to use the area as a migratory route or a temporary overwintering location from August to March, and therefore the likelihood of occurrence is rated as low.



Kranspoort Feedlot

Circus ranivorus (African Marsh Harrier) is listed as EN in South Africa (ESKOM, 2014). This species has an extremely large distributional range in sub-equatorial Africa. South African populations of this species are declining due to the degradation of wetland habitats, loss of habitat through over-grazing and human disturbance and possibly, poisoning owing to over-use of pesticides (IUCN, 2017). This species breeds in wetlands and forages primarily over reeds and lake margins. The likelihood of occurrence for this species is rated as low due to the lack of suitable habitat for this species in the project area (i.e. wetlands, dams, vleis or rivers).

Coracias garrulous (European Roller) overwinters in South Africa primarily in dry wooded savanna and bushy plains (IUCN, 2017). The likelihood that this species will utilise the project area as an overwintering area habitat is low due to the lack of suitable vegetation communities.

Eupodotis senegalensis (White-bellied Korhaan) is Near-endemic to South Africa, occurring from the Limpopo Province and adjacent provinces, south through Swaziland to KwaZulu-Natal and the Eastern Cape. It generally prefers tall, dense sour or mixed grassland, either open or lightly wooded, occasionally moving into cultivated or burnt land (Hockey et al, 2005). There are some suitable habitats for this species in the project area and therefore the likelihood of occurrence was rated as moderate.

Falco biarmicus (Lanner Falcon) is native to South Africa and inhabits a wide variety of habitats, from lowland deserts to forested mountains (IUCN, 2017). They may occur in groups up to 20 individuals but have also been observed solitary. Their diet is mainly composed of small birds such as pigeons and francolins. The likelihood of incidental records of this species in the project area is rated as moderate due to the presence of some natural vegetation and the possible presence of some bird species on which Lanner Falcons may predate.

Glareola nordmanni (Black-winged Pratincole) is a migratory species which is listed as NT both globally and regionally. This species has a very large range, breeding mostly in Europe and Russia, before migrating to southern Africa. Overall population declines of approximately 20% for this species are suspected (IUCN, 2017). This species generally occurs near water and damp meadows, or marshes overgrown with dense grass. Due to its migratory nature, this species will only be present in South Africa for a few months during the year and will not breed locally. The likelihood of occurrence for this species is rated as low due to the lack of suitable habitat for this species in the project area (i.e. wetlands, dams, vleis or rivers).

Mycteria ibis (Yellow-billed Stork) is listed as EN on a regional scale and Least Concern (LC) on a global scale. This species is migratory and has a large distributional range which includes much of sub-Saharan Africa. It is typically associated with freshwater ecosystems, especially wetlands and the margins of lakes and dams (IUCN, 2017). The presence of some patches of open grassland where this species may forage within the project area means that the likelihood of occurrence is regarded as moderate.

Neotis denhami (Denhams Bustard) is listed as VU on a regional scale and NT on a global scale. It occurs in flat, arid, mostly open country such as grassland, karoo, bushveld, thornveld, scrubland and savanna but also including modified habitats such as wheat fields and firebreaks. Collisions with power lines may be a significant threat in parts of the range, particularly South Africa (IUCN, 2007). The habitat at the project site does provide marginally suitable grassland habitat for this species and therefore its likelihood of occurrence is rated as moderate.



Kranspoort Feedlot

Oxyura maccoa (Maccoa Duck) has a large northern and southern range, South Africa is part of its southern distribution. During the species' breeding season, it inhabits small temporary and permanent inland freshwater lakes, preferring those that are shallow and nutrient-rich with extensive emergent vegetation such as reeds (*Phragmites spp.*) and cattails (*Typha spp.*) on which it relies for nesting (IUCN, 2017). The likelihood of occurrence for this species is rated as low due to the lack of suitable habitat for this species in the project area (i.e. wetlands, dams, vleis or rivers).

Phoeniconaias minor (Lesser Flamingo) is listed as NT on a global and regional scale whereas *Phoenicopterus roseus* (Greater Flamingo) is listed as NT on a regional scale only. Both species have similar habitat requirements and the species breed on large undisturbed alkaline and saline lakes, salt pans or coastal lagoons, usually far out from the shore after seasonal rains have provided the flooding necessary to isolate remote breeding sites from terrestrial predators and the soft muddy material for nest building (IUCN, 2017). The likelihood of occurrence for both these species is rated as low due to the lack of suitable habitat for this species in the project area (i.e. wetlands, dams, vleis or rivers).

Podica senegalensis (African Finfoot) occurs in forest and wooded savanna along permanent streams with thick growths of *Syzygium guineense*, along secluded reaches of thickly wooded rivers and on the edges of pools, lakes and dams with well-vegetated banks on the edges of dense papyrus beds far from the shore. It is rarely found away from shoreline vegetation and generally avoids stagnant or fast-flowing water (IUCN, 2017). Due to the lack of suitably dense wetland vegetation within the project area the likelihood of occurrence for this species is rated as low.

Sagittarius serpentarius (Secretary bird) occurs in sub-Saharan Africa and inhabits grasslands, open plains, and lightly wooded savanna. It is also found in agricultural areas and sub-desert (IUCN, 2017). The likelihood of the species occurring in the area is moderate due to some open grassland areas for foraging but due to the proximity of agriculture and farming it is unlikely to be resident in the area.

Spizocorys fringillaris (Botha's Lark) is an endemic grassland bird species which is listed as EN both globally and regionally, with a very restricted distribution centred on south Mpumalanga and the eastern Free State. The global population has been estimated at 1,500-5,000 individuals. Due to the fact that the project area is on the northern edge of this species distribution and the slightly disturbed nature of the site, the likelihood of occurrence for this species is rated as low.

Sterna caspia (Caspian Tern) is native to South Africa and is known to occur in inland freshwater systems such as large rivers, creeks, floodlands, reservoirs and sewage ponds. The likelihood of occurrence for this species is rated as low due to the lack of suitable habitat for this species in the project area (i.e. wetlands, dams, vleis or rivers).

African Grass-owl (*Tyto capensis*) is categorised as VU, with the southern African population numbering less than 5 000 individuals. The presence of dense, tall *Imperata cylindrica* grassland is a requirement for the presence of this species. The species is generally solitary, but it does also occur in pairs, in moist grasslands where it roosts (IUCN, 2017). The species prefers thick grasses around wetlands and rivers which are not present in the area and thus the likelihood of occurrence was rated as low.



9.1.5.2 Mammals

The IUCN Red List Spatial Data (IUCN, 2017) lists 89 mammal species that could be expected to occur within the Project area (Appendix C). Of these species, 13 are medium to large conservation dependant species, such as *Ceratotherium simum* (Southern White Rhinoceros), *Syncerus caffer* (African Buffalo) and *Tragelaphus oryx* (Common Eland) that, in South Africa, are generally restricted to protected areas such as game reserves. These species are not expected to occur in the project area and are removed from the expected SCC list. They are however still included (common name highlighted in red) in Appendix C.

Of the remaining 76 small to medium sized mammal species, thirteen (13) are listed as being of conservation concern on a regional or global basis (Table 3).

The list of potential species includes:

- Three (3) that are listed as Endangered (EN) on a regional basis;
- Three (3) that are listed as Vulnerable (VU) on a regional basis; and
- Seven (7) that are listed as Near Threatened (NT) on a regional scale (Table 3).

On a global scale, one (1) species is listed as EN, one (1) species is listed as VU and two (2) listed as NT (Table 3).

Table 3: List of mammal species of conservation concern that may occur in the project area as well as their global and regional conservation statuses (IUCN, 2017; SANBI, 2016)

Species	Common name	Conservation Status		Likelihood of Occurrence
		Regional (SANBI, 2016)	IUCN (2017)	
<i>Aonyx capensis</i>	Cape Clawless Otter	NT	NT	Low
<i>Atelerix frontalis</i>	Southern African Hedgehog	NT	LC	Moderate
<i>Cloeotis percivali</i>	Short-eared Trident Bat	EN	LC	Moderate
<i>Crocidura maquassiensis</i>	Swamp Musk Shrew	NT	LC	Low
<i>Dasymys incomtus</i>	African Marsh Rat	NT	LC	Low
<i>Felis nigripes</i>	Black-footed Cat	VU	VU	Low
<i>Hydrictis maculicollis</i>	Spotted-necked Otter	VU	NT	Low
<i>Leptailurus serval</i>	Serval	NT	LC	Moderate
<i>Mystromys albicaudatus</i>	White-tailed Rat	VU	EN	Moderate
<i>Ourebia ourebi</i>	Oribi	EN	LC	Low
<i>Pelea capreolus</i>	Grey Rhebok	NT	LC	Low
<i>Poecilogale albinucha</i>	African Striped Weasel	NT	LC	Moderate
<i>Redunca fulvorufula</i>	Mountain Reedbuck	EN	LC	Low

The expected mammal SCC are discussed below.

Aonyx capensis (Cape Clawless Otter) is the most widely distributed otter species in Africa (IUCN, 2017), and is listed as NT regionally. This species is predominantly aquatic, and it is seldom found far from water. The likelihood of occurrence for this species is rated as low



Kranspoort Feedlot

due to the lack of suitable habitat for this species in the project area (i.e. wetlands, dams, vleis or rivers).

Atelerix frontalis (South African Hedgehog) has a relatively tolerance to habitat modification and occurs in a wide variety of semi-arid and sub-temperate habitats (IUCN, 2017). Based on the Red List of Mammals of South Africa, Lesotho and Swaziland (2016), *A. frontalis* populations are decreasing due to the threats of electrocution, veld fires, road collisions, predation from domestic pets and illegal harvesting. Although the species is cryptic and therefore not often seen, there is some suitable habitat in the project area for this species to occur and its likelihood of occurrence is rated as moderate.

Crocidura mariquensis (Swamp Musk Shrew) is listed as NT regionally and has very specific habitat requirements. It occurs in close proximity to open water with a distinct preference for marshy ponds, and riverine and semi-aquatic vegetation such as reed beds (IUCN, 2017). It is considered to be common in suitable habitats. The likelihood of occurrence is for this species is rated as low due to the lack of suitable habitat for this species in the project area (i.e. wetlands, dams, vleis or rivers).

Dasymys incomtus (African Marsh Rat) is listed as NT on a regional scale and LC on a global scale. This species has a wide distributional range that includes Central Africa, East Africa and parts of Southern Africa. This species has been recorded from a wide variety of habitats, including forest and savanna habitats, wetlands and grasslands (IUCN, 2017). The likelihood of occurrence is for this species is rated as low due to the lack of suitable habitat for this species in the project area (i.e. wetlands, dams, vleis or rivers).

Felis nigripes (Black-footed cat) is listed as VU both regionally and globally and is endemic to the arid regions of southern Africa. This species is naturally rare, has cryptic colouring, is small in size and is nocturnal. These factors have contributed to a lack of information on this species (IUCN, 2017). Given that the highest densities of this species have been recorded in the arid central Karoo region of South Africa, the habitat in the project area can be considered to be sub-optimal, the likelihood of occurrence is rated as low.

Hydricteis maculicollis (Spotted-necked Otter) inhabits freshwater habitats where water is unsilted, unpolluted, and rich in small to medium sized fishes (IUCN, 2017). There is suitable habitat for this species within the project area, as well as in the adjacent Witbank Dam. The likelihood of occurrence is for this species is rated as low due to the lack of suitable habitat for this species in the project area (i.e. wetlands, dams, vleis or rivers).

Leptailurus serval (Serval) is listed as NT regionally and occurs widely through sub-Saharan Africa, commonly recorded from most major national parks and reserves (IUCN, 2017). The Serval's status outside reserves is not certain, but they are inconspicuous and may be common in suitable habitat as they are tolerant of farming practices provided there is cover and food available. In sub-Saharan Africa, they are found in habitat with well-watered savanna long-grass environments and are particularly associated with reedbeds and other riparian vegetation types. Some suitable habitat occurs in the project area for this species, such as wetland areas and grasslands. However, there is also evidence of some human-induced disturbance to the project area (such as cattle grazing) and due to these disturbances, the likelihood of occurrence for this species within the project area is rated as moderate.

Mystromys albicaudatus (White-tailed Rat) is listed as Vulnerable (VU) on a regional basis and Endangered (EN) on a global scale. It is relatively widespread across South Africa and



Lesotho; the species is known to occur in shrubland and grassland areas. A major requirement of the species is black loam soils with good vegetation cover. Although the vegetation type is suitable, few, if any, black loam seems to be present on site, and as such the likelihood of occurrence of this species is rated as moderate.

Ourebia ourebi (Oribi) has a patchy distribution throughout Africa and is known to occur in isolated patches in South Africa. Populations are becoming more fragmented as it is gradually eliminated from moderately to densely settled areas (IUCN, 2017). Although suitable habitat exists on the site, the likelihood of occurrence is rated as low due to the proximity of human-induced disturbances on site.

Pelea capreolus (Grey Rhebok) is endemic to a small region in southern Africa, inhabiting montane and plateau grasslands of South Africa, Swaziland, and Lesotho. In South Africa, their distribution is irregular and patchy, and they no longer occur north of the Orange River in the Northern Cape, or in parts of the North-West Province (IUCN, 2017). Grey Rhebok can be found in suitable habitat which has rocky hills, grassy mountain slopes, and montane and plateau grasslands in southern Africa. They are predominantly browsers, and largely water independent, obtaining most of their water requirements from their food. Based on the lack of optimal habitat at the project site and due to the lack of available browse, and the small size of the property, the likelihood of occurrence of this species is rated as low.

Poecilogale albinucha (African Striped Weasel) is usually associated with savanna habitats, although it probably has a wide habitat tolerance (IUCN, 2017). Due to its secretive nature, it is often overlooked in many areas where it does occur. There is sufficient habitat for this species in the project area and the likelihood of occurrence of this species is therefore considered to be moderate.

Redunca fulvorufula (Mountain Reedbuck) is listed as EN both regionally and globally. The South African population has undergone a decline of 61-73% in the last three generations (15 years) (IUCN, 2017). Mountain Reedbuck live on ridges and hillsides in broken rocky country and high-altitude grasslands (often with some tree or bush cover). Due to the absence of this habitat at the project site and some human-induced disturbance, the likelihood of occurrence of this species is rated as low.

9.1.5.3 Herpetofauna (Reptiles & Amphibians)

Based on the IUCN Red List Spatial Data (IUCN, 2017) and the ReptileMap database provided by the Animal Demography Unit (ADU, 2017) 28 reptile species are expected to occur in the project area (Appendix D). One (1) species of conservation concern (*Crocodylus niloticus*) could be present within the project area according to the above-mentioned sources, but *in situ* observations may prove that further SCC may occur.

Crocodylus niloticus (Nile Crocodile) are listed as VU on a regional basis. This species is restricted to areas with permanent water bodies which support enough prey (predominantly fish) for this species to survive. Due to the lack of water bodies present in the project area to support this species the likelihood of this species occurring in the project area is rated as low.

Based on the IUCN Red List Spatial Data (IUCN, 2017) and the AmphibianMap database provided by the Animal Demography Unit (ADU, 2017) 18 amphibian species are expected to occur in the project area (Appendix E). One (1) species of conservation concern, namely the Giant Bullfrog (*Pyxicephalus adspersus*), could be present according to the above-mentioned



sources within the project area, and *in situ* observations may prove there to be other species of conservation concern present.

Pyxicephalus adspersus (Giant Bullfrog) is a species of amphibian which is listed as NT on a regionally basis. This species spends up to 9 months a year hidden underground before emerging after heavy summer rainfall. Due to this reason they are often overlooked during surveys. They only breed in temporary shallow pools and ponds. Much of this species existing habitat has been destroyed due to urban development, mining and agriculture. The project area contains few, if any, wetland areas and open water bodies, and as such the likelihood of occurrence of this species is rated as low.

10 Field Survey

The field survey for the Kranspoort Feedlot project (flora and fauna (mammals, avifauna, amphibians and reptiles)) was conducted on the 30th January 2018. During the survey the floral and faunal communities in the Project area were assessed. The Project area was ground-truthed on foot, which included spot checks in pre-selected areas to validate desktop data. Photographs were recorded during the site visits and some are provided under the Results section in this report. All site photographs are available on request.

10.1 Site Coverage

The fieldwork was conducted during what is generally considered the middle of the wet season for Mpumalanga grassland habitats. This is the ideal season for identifying flowering plants and grasses and is also the period when faunal activity is highest. However, the species recorded to date can by no means be regarded as comprehensive and successive surveys across entire seasons and phenological cycles will greatly supplement the baseline data gathered to date.

10.1.1 Vegetation Assessment

The vegetation assessment concentrated on the areas which still seemed intact in comparison the surrounding areas which have either been mined or used for various agricultural reasons. These areas were then mapped according to the field data (Figure 10).

The areas covered during the fieldwork mainly concentrated on the provided preferred sites as well as the two alternative sites for the development. Due to current land use, which is primarily intensive livestock grazing, most of these areas have been overgrazed and are in a degraded state. Weeds dominate these areas, especially in patches where the grass has been extensively overgrazed. The preferred feedlot development site (southern portion) contained a larger amount of phytomass mainly due to the size of the area which has reduced the grazing pressure in comparison to the other areas, and which creates more refugia for fauna.

The low floral species composition identified during the survey further shows the degraded state of these areas, where almost half of the species recorded consisted of naturalised weeds and/or alien invasive species.



Kranspoort Feedlot

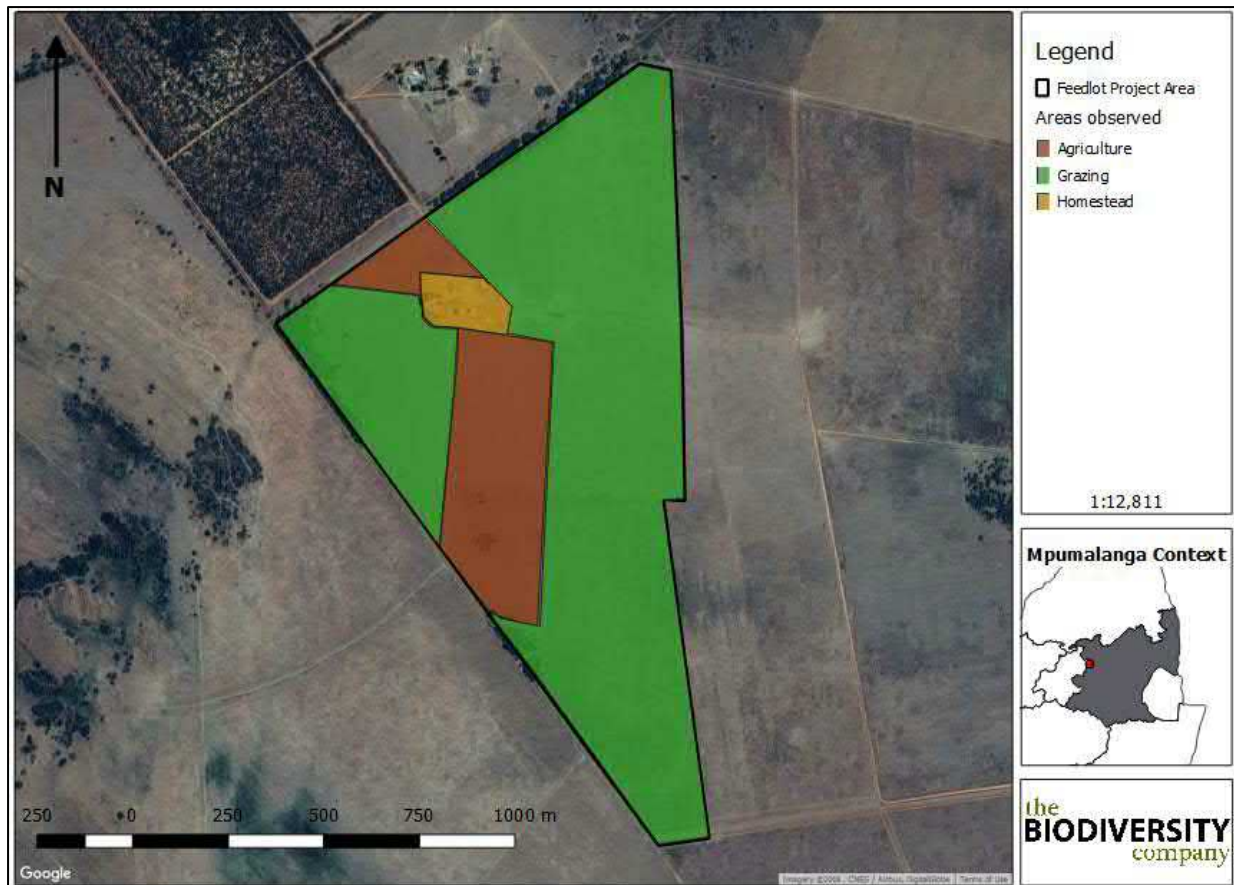


Figure 10: The primary vegetation areas identified during the fieldwork including historic land-use practices

A total of forty (40) tree, shrub and herbaceous plant species were recorded in the Project area during the January 2018 field assessment (Table 4). Alien/Exotic/Invader plant species appear in blue text and NEMBA Category 1 Plant species in green text.

Table 4: Trees, shrubs and weeds recorded at the proposed project area (species name in red are listed species)

Species	Threat status (SANBI, 2017)	SA Endemic	NEMBA Category
<i>Acacia mearnsii</i>			Category 2
<i>Agave americana</i>			Category 2
<i>Aloe greatheadii</i> var. <i>davyana</i>	LC	No	
<i>Andropogon eucomis</i>	LC	No	
<i>Argemone Mexicana</i>			NEMBA Category 1b
<i>Bidens pilosa</i>			Not Indigenous; Naturalised
<i>Cereus jamacaru</i>			NEMBA Category 1b
<i>Cynodon dactylon</i>	LC	No	
<i>Commelina erecta</i>	LC	No	
<i>Diospyros lycoides</i>	LC	No	
<i>Eragrostis chloromelas</i>	LC	No	
<i>Eragrostis curvula</i>	LC	No	
<i>Eragrostis gummiflua</i>	LC	No	



Kranspoort Feedlot

<i>Gomphocarpus fruticosus</i>	LC	No	
<i>Gomphrena celosioides</i>			Not Indigenous; Naturalised
<i>Haplocarpha scaposa</i>	LC	No	
<i>Helichrysum rugulosum</i>			
<i>Heteropogon contortus</i>	LC	No	
<i>Hyparrhenia hirta</i>	LC	No	
<i>Jacaranda mimosifolia</i>			NEMBA Category 1b in Mpumalanga
<i>Lopholaena coriifolia</i>	LC	No	
<i>Melia azedarach</i>			NEMBA Category 1b
<i>Melinis repens</i>	LC	No	
<i>Oenothera rosea</i>			Not Indigenous; Naturalised
<i>Oldenlandia herbacea</i>			
<i>Opuntia ficus-indica</i>			NEMBA Category 1b
<i>Pennisetum clandestinum</i>			NEMBA Category 1b in protected areas and wetlands.
<i>Perotis patens</i>	LC	No	
<i>Pogonarthria squarrosa</i>	LC	No	
<i>Ricinus communis</i>			NEMBA – Category 2
<i>Rumex crispus</i>			Not Indigenous; Naturalised; Invasive
<i>Seriphium plumosum</i>	LC	No	
<i>Schkuria pinnata</i>			Not Indigenous; Naturalised
<i>Solanum panduriforme</i>			
<i>Solanum sisymbriifolium</i>			NEMBA Category 1b
<i>Sonchus asper</i>			Invasive
<i>Sporobolus africanus</i>	LC	No	
<i>Tagetes minuta</i>			Not Indigenous; Naturalised
<i>Trigoneura grandiglumis</i>	LC	No	
<i>Zinnia peruviana</i>			Not Indigenous; Naturalised

10.2 Alien and Invasive Plants

Declared weeds and invader plant species have the tendency to dominate or replace the canopy or herbaceous layer of natural ecosystems, thereby transforming the structure, composition and function of these systems. Therefore, it is important that these plants are controlled and eradicated by means of an eradication and monitoring programme. Some invader plants may also degrade ecosystems through superior competitive capabilities to exclude native plant species.

The National Environmental Management: Biodiversity Act (NEMBA) is the most recent legislation pertaining to alien invasive plant species. In August 2014, the list of Alien Invasive Species was published in terms of the National Environmental Management: Biodiversity Act (Act 10 of 2004) (Government Gazette No 78 of 2014). The Alien and Invasive Species Regulations were published in the Government Gazette No. 37886, 1 August 2014. The legislation calls for the removal and / or control of alien invasive plant species (Category 1 species). In addition, unless authorised thereto in terms of the National Water Act, 1998 (Act No. 36 of 1998), no land user shall allow Category 2 plants to occur within 30 meters of the 1:50 year flood line of a river, stream, spring, natural channel in which water flows regularly or



Kranspoort Feedlot

intermittently, lake, dam or wetland. Category 3 plants are also prohibited from occurring within proximity to a watercourse.

Below is a brief explanation of the three categories in terms of the National Environmental Management: Biodiversity Act (Act 10 of 2004) (NEMBA):

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

Note that according to the regulations, a person who has under his or her control a category 1b listed invasive species must immediately:

- Notify the competent authority in writing
- Take steps to manage the listed invasive species in compliance with:
 - Section 75 of the Act;
 - The relevant invasive species management programme developed in terms of regulation 4; and
 - Any directive issued in terms of section 73(3) of the Act.

Seven (7) category 1b invasive species were recorded at the site and must therefore be removed by implementing an alien invasive plant management programme in compliance of section 75 of the Act as stated above. The NEMBA listed species identified within the project area are marked in green (Table 4).

10.3 Faunal Assessment

The faunal assessment was completed based on the desktop review and the biodiversity surveys which were conducted across the Project area.

10.3.1 Avifauna

Fifty (50) bird species were recorded in the project area during the January 2018 survey based on either direct observations, or the presence of visual tracks & signs (Table 5) (Figure 11).



Kranspoort Feedlot

No bird SCC were recorded during the survey and based on the lack of any pristine habitats encountered in the project area, the likelihood that bird SCC occur there is rated as low.

Table 5: A list of avifaunal species recorded for the Project area

Species	Common Name	Conservation Status	
		Regional (SANBI, 2016)	IUCN (2017)
<i>Lybius torquatus</i>	Barbet, Black-collared	Unlisted	LC
<i>Trachyphonus vaillantii</i>	Barbet, Crested	Unlisted	LC
<i>Euplectes orix</i>	Bishop, Southern Red	Unlisted	LC
<i>Laniarius ferrugineus</i>	Boubou, Southern	Unlisted	LC
<i>Buteo vulpinus</i>	Buzzard, Steppe	Unlisted	Unlisted
<i>Crithagra mozambicus</i>	Canary, Yellow-fronted	Unlisted	LC
<i>Myrmecocichla formicivora</i>	Chat, Anteating	Unlisted	LC
<i>Cercomela familiaris</i>	Chat, Familiar	Unlisted	LC
<i>Centropus burchellii</i>	Coucal, Burchell's	Unlisted	Unlisted
<i>Corvus albus</i>	Crow, Pied	Unlisted	LC
<i>Chrysococcyx caprius</i>	Cuckoo, Diderick	Unlisted	LC
<i>Streptopelia senegalensis</i>	Dove, Laughing	Unlisted	LC
<i>Columba livia</i>	Dove, Rock	Unlisted	LC
<i>Dicrurus adsimilis</i>	Drongo, Fork-tailed	Unlisted	LC
<i>Bubulcus ibis</i>	Egret, Cattle	Unlisted	LC
<i>Egretta alba</i>	Egret, Great	Unlisted	LC
<i>Lagonosticta rhodopareia</i>	Firefinch, Jameson's	Unlisted	LC
<i>Lanius collaris</i>	Fiscal, Common (Southern)	Unlisted	LC
<i>Sigelus silens</i>	Flycatcher, Fiscal	Unlisted	LC
<i>Corythaixoides concolor</i>	Go-away-bird, Grey	Unlisted	LC
<i>Alopochen aegyptiacus</i>	Goose, Egyptian	Unlisted	LC
<i>Sphenoeacus afer</i>	Grassbird, Cape	Unlisted	LC
<i>Numida meleagris</i>	Guineafowl, Helmeted	Unlisted	LC
<i>Plegadis falcinellus</i>	Ibis, Glossy	Unlisted	LC
<i>Bostrychia hagedash</i>	Ibis, Hadedash	Unlisted	LC
<i>Elanus caeruleus</i>	Kite, Black-shouldered	Unlisted	LC
<i>Vanellus senegallus</i>	Lapwing, African Wattled	Unlisted	LC
<i>Vanellus armatus</i>	Lapwing, Blacksmith	Unlisted	LC
<i>Macronyx capensis</i>	Longclaw, Cape	Unlisted	LC
<i>Spermestes cucullatus</i>	Mannikin, Bronze	Unlisted	Unlisted
<i>Acridotheres tristis</i>	Myna, Common	Unlisted	LC
<i>Columba arquatrix</i>	Olive-pigeon, African	Unlisted	LC
<i>Buphagus erythrorhynchus</i>	Oxpecker, Red-billed	Unlisted	Unlisted
<i>Terpsiphone viridis</i>	Paradise-flycatcher, African	Unlisted	LC
<i>Vidua paradisaea</i>	Paradise-whydah, Long-tailed	Unlisted	LC
<i>Prinia subflava</i>	Prinia, Tawny-flanked	Unlisted	LC
<i>Quelea quelea</i>	Quelea, Red-billed	Unlisted	LC
<i>Cossypha caffra</i>	Robin-chat, Cape	Unlisted	LC
<i>Passer domesticus</i>	Sparrow, House	Unlisted	LC



Kranspoort Feedlot

<i>Lamprotornis nitens</i>	Starling, Cape Glossy	Unlisted	LC
<i>Saxicola torquatus</i>	Stonechat, African	Unlisted	LC
<i>Burhinus capensis</i>	Thick-knee, Spotted	Unlisted	LC
<i>Psophocichla litsipsirupa</i>	Thrush, Groundscraper	Unlisted	Unlisted
<i>Streptopelia capicola</i>	Turtle-dove, Cape	Unlisted	LC
<i>Motacilla aguimp</i>	Wagtail, African Pied	Unlisted	LC
<i>Motacilla capensis</i>	Wagtail, Cape	Unlisted	LC
<i>Uraeginthus angolensis</i>	Waxbill, Blue	Unlisted	LC
<i>Ploceus cucullatus</i>	Weaver, Village	Unlisted	LC
<i>Zosterops virens</i>	White-eye, Cape	Unlisted	LC
<i>Euplectes progne</i>	Widowbird, Long-tailed	Unlisted	LC



Figure 11: One of the avifaunal species recorded during the survey: Long-tailed Widowbird (*Euplectes progne*)

10.3.2 Mammals

Overall, mammal diversity in the Project area was low, with only two (2) mammal species being recorded during the January 2018 survey based on either direct observation, or the presence of visual tracks & signs (Table 6). No mammal SCC were recorded, or are expected to occur, in the Project area (Table 6).

Table 6: Mammals recorded in the project area during the January 2018 survey

Species	Common name	Conservation Status	
		Regional (SANBI, 2016)	IUCN (2017)
<i>Cynictis penicillata</i>	Yellow Mongoose	LC	LC



Kranspoort Feedlot

<i>Lepus victoriae</i>	African Savanna Hare	LC	LC
<i>Bos taurus</i>	Domestic Cow	-	-
<i>Capra aegagrus hircus</i>	Domestic Goat	-	-

10.3.3 Herpetofauna (Reptiles & Amphibians)

Five (5) reptile and amphibian species were recorded in the project area during the January 2018 survey (Table 7) (Figure 12). Reptile diversity was considered low in the Project area, most likely due to the disturbed nature of the site and the extent of current grazing and agriculture which has already transformed some of the natural ecosystems.

Table 7: A list of herpetofauna recorded in the Project area

Species	Common Name	South African Endemic	Conservation Status	
			Regional (Eskom, 2016)	Global (IUCN, 2017)
<i>Amietia delalandii</i>	Delalande's River Frog	No	LC	Unlisted
<i>Cacosternum boettgeri</i>	Common Caco	No	LC	LC
<i>Lygodactylus capensis capensis</i>	Common Dwarf Gecko	No	LC	Unlisted
<i>Sclerophrys gutturalis</i>	Guttural Toad	No	LC	LC
<i>Trachylepis varia</i>	Variable Skink	No	LC	LC



Figure 12: One of the amphibians recorded during the survey: a Guttural Toad (*Sclerophrys gutturalis*)

10.4 Habitat Sensitivity

After the results from the field survey were analysed, the various areas within the Project area were mapped based on their ecological sensitivity. Most of the areas were rated as having a low sensitivity because of the transformed nature of the majority of the Project area (Figure 13).





Figure 13: Habitat sensitivity within the Kranspoort Project area as delineated by specialists during the field survey

The major driving forces of these disturbed and degraded areas are anthropogenic; such as livestock and the presence of a large amount of alien and invasive plant species. The previous land use, in certain areas, being agriculture, also contributed to veld retrogression which is unlikely to improve within a few years.

The entire feedlot Project area was rated as having a low sensitivity. For ease of reference, each rating of low sensitivity was given a unique colour in the sensitivity map based on the cause of the sensitivity (i.e. areas that were previously cultivated).

In terms of the three proposed areas for the development of the feedlot, all three areas are judged as having low sensitivity ratings due to previous disturbances. Alternative sites 1 and 2 are marginally more degraded than the preferred site option. The preferred site option was previously cultivated but there are signs that the area has been rehabilitated and possibly replanted. Furthermore, this area is the least disturbed due to grazing pressure and a higher number of plant species are present in this section.

All three site options are acceptable for the development, but as per the SoW it is the opinion of the specialists that based on the sensitivity mapping, alternative site 1 is the most disturbed site and therefore most recommended for development of the feedlot. Alternative site 2 is the second most preferred site for the feedlot development, while the original ('preferred') site is the least recommended for this development.



11 Impact Assessment

The biodiversity impact assessment report includes the following:

- Assess whether proposed activities (Feedlot development) are likely to have significant impacts on biodiversity and specifically species of conservation concern;
- Identify practically implementable mitigation measures to reduce the significance of proposed activities on biodiversity; and
- Assess residual and cumulative impacts after implementation of mitigation measures.

11.1 Methodology

Potential impacts were evaluated against the data captured during the fieldwork to identify relevance to the Project area. The relevant impacts were then subjected to a prescribed impact assessment methodology which is described below.

Impacts were assessed in terms of the construction and operational phases. The operational phase refers to that phase of the project where the construction has been completed and the feedlot development is completed. Due to the nature of this development, the operational phase is assessed as lasting indefinitely and as such there is no closure or post- closure phases in this scenario.

Mitigation measures were only applied to impacts deemed relevant based on the impact analysis. The likelihood and consequence descriptors are presented in Table 8 and Table 9. The significance rating matrix is presented in Table 10.

Table 8: Likelihood descriptors

Probability of impact	Rating
Highly unlikely	1
Possible	2
Likely	3
Highly likely	4
Definite	5
Sensitivity of receiving environment	Rating
Ecology not sensitive/important	1
Ecology with limited sensitivity/importance	2
Ecology moderately sensitive/ /important	3
Ecology highly sensitive /important	4
Ecology critically sensitive /important	5

Table 9: Consequence Descriptors

Severity of impact	Rating
Insignificant / ecosystem structure and function unchanged	1
Small / ecosystem structure and function largely unchanged	2
Significant / ecosystem structure and function moderately altered	3



Kranspoort Feedlot

Great / harmful/ ecosystem structure and function largely altered	4
Disastrous / ecosystem structure and function seriously to critically altered	5
Spatial scope of impact	Rating
Activity specific/ < 5 ha impacted / Linear features affected < 100m	1
Development specific/ within the site boundary / < 100 ha impacted / Linear features affected < 100m	2
Local area/ within 1 km of the site boundary / < 5000ha impacted / Linear features affected < 1000m	3
Regional within 5 km of the site boundary / < 2000ha impacted / Linear features affected < 3000m	4
Entire habitat unit / Entire system/ > 2000ha impacted / Linear features affected > 3000m	5
Duration of impact	Rating
One day to one month: Temporary	1
One month to one year: Short Term	2
One year to five years: Medium Term	3
Life of operation or less than 20 years: Long Term	4
Permanent	5

Table 10: Significance Rating Matrix

LIKELIHOOD (Frequency of activity + Frequency of Impact)	CONSEQUENCE (Severity + Spatial Scope + Duration)														
	0	2	3	4	5	6	7	8	9	10	11	12	13	14	15
2	4	6	8	10	12	14	16	18	20	22	24	26	28	30	Low
3	6	9	12	15	18	21	24	27	30	33	36	39	42	45	
4	8	12	16	20	24	28	32	36	40	44	48	52	56	60	Moderate
5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	Moderately High
6	12	18	24	30	36	42	48	54	60	66	72	78	84	90	
7	14	21	28	35	42	49	56	63	70	77	84	91	98	105	High
8	16	24	32	40	48	56	64	72	80	88	96	104	112	120	
9	18	27	36	45	54	63	72	81	90	99	108	117	126	135	Critical
10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	

11.2 Existing Impacts

Photographs of existing impacts that have had an impact on biodiversity of the Project area are shown in Figure 14 and discussed below.

The following existing impacts were observed in or adjacent to the proposed project area:

- Historic ploughing/tilling of the topsoil layer of the grassland for agricultural purposes;
- Presence of alien invasive species mostly within the degraded areas;



Kranspoort Feedlot

- Presence of livestock (cattle and goats) which not only trample the natural grassland areas but also overgraze the secondary grassland;
- Existing farm house and dwellings;
- Internal fences and camps which limit movement of wildlife and also increase grazing pressure and trampling caused by domestic animals kept in these camps;
- Presence of domestic dogs and cats which pose a threat to native fauna;
- Gravel roads which run along the boundaries of the project area; and
- Compaction of soil in areas that were previously utilised for storage/building.

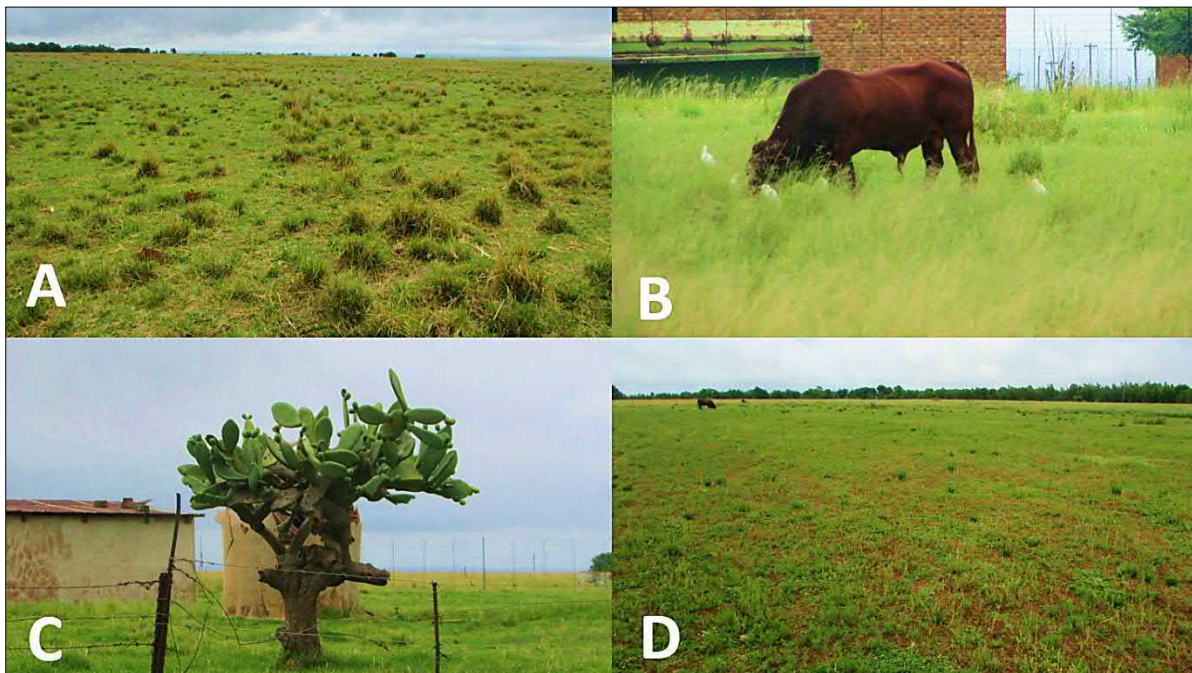


Figure 14: Some of the identified existing impacts within the project area: A), B) and D) extensive grazing and trampling due to livestock, and C) alien invasive species

12 Impact Assessment Results

The results of the impact assessment conducted for the proposed feedlot development are presented below in Table 11 and Table 12

12.1.1 Construction Phase

The following potential impacts were considered on biodiversity:

- Further loss and fragmentation of the vegetation community as well the destruction of a portion of an Endangered vegetation type (NBA, 2012); and
- Displacement, direct mortalities and disturbance of faunal community due to habitat loss and disturbances (such as dust and noise).

12.1.2 Operational Phase

The following potential impacts were considered on biodiversity:



Kranspoort Feedlot

- Continued encroachment and displacement of indigenous vegetation community by alien invasive plant species;
- Continued displacement, direct mortalities and disturbance of faunal community due to habitat loss and disturbances (such as dust and noise); and
- Infringement by humans into the few remaining natural grassland areas, with associated impacts such as poaching, litter and introduction of diseases and feral species such as cats.

12.1.3 Closure / Rehabilitation Phase

Based on the proposed project plan, the life of the project is considered to be indefinite and as such no closure or rehabilitation phase was considered. It is envisaged that the feedlot development, once completed, will exist into perpetuity.



Kranspoort Feedlot

Table 11: Assessment of significance of potential construction impacts on vegetation and faunal communities associated with the proposed feedlot development pre- and post- mitigation.

Impact	Prior to mitigation						Post mitigation					
	Duration of Impact	Spatial Scope	Severity of Impact	Sensitivity of Receiving Environment	Probability of Impact	Significance	Duration of Impact	Spatial Scope	Severity of Impact	Sensitivity of Receiving Environment	Probability of Impact	Significance
Further loss and fragmentation of the vegetation community as well the destruction of a portion of a Vulnerable vegetation type (NBA, 2012).	5	3	3	2	4		5	2	2	2	2	
	Permanent	Local Area	Significant	Ecology with limited sensitivity	Highly likely	Moderate	Permanent	Development specific	Small	Limited sensitivity	Possible	Low
Displacement, direct mortalities and disturbance of faunal community due to habitat loss and disturbances (such as dust and noise).	5	3	3	2	4		5	2	2	2	2	
	Permanent	Local Area	Significant	Ecology with limited sensitivity	Highly likely	Moderate	Permanent	Development specific	Small	Limited sensitivity	Possible	Low



Kranspoort Feedlot

Table 12: Assessment of significance of potential operational impacts on vegetation and faunal communities associated with the proposed feedlot development pre- and post- mitigation.

Impact	Prior to mitigation						Post mitigation					
	Duration of Impact	Spatial Scope	Severity of Impact	Sensitivity of Receiving Environment	Probability of Impact	Significance	Duration of Impact	Spatial Scope	Severity of Impact	Sensitivity of Receiving Environment	Probability of Impact	Significance
Continued encroachment and displacement of indigenous vegetation community by alien invasive plant species.	5	4	3	3	4		2	2	2	2	3	
	Permanent	Regional	Significant	Ecologically Moderately Sensitive	Highly likely	Moderately-high	Short Term	Development Specific	Small	Ecology with limited sensitivity/importance	Likely	Low
Continued displacement, direct mortalities and disturbance of faunal community due to habitat loss and disturbances (such as dust and noise).	5	3	3	3	4		2	2	2	2	3	
	Permanent	Local Area	Significant	Ecologically Moderately Sensitive	Highly likely	Moderate	Short Term	Development Specific	Small	Ecology with limited sensitivity/importance	Likely	Low
Infringement by humans into the few remaining natural grassland areas, with associated impacts such as poaching, litter and introduction of diseases and feral species such as cats.	5	3	3	3	4		2	2	2	2	3	
	Permanent	Local Area	Significant	Ecologically Moderately Sensitive	Highly likely	Moderate	Short Term	Development Specific	Small	Ecology with limited sensitivity/importance	Likely	Low



12.2 Assessment of Significance

From the summary table above (Table 11) it is clear that the overall impact significance for the construction phase ranges from moderately-high to moderate before mitigation, and this changes to a significance of low for all listed activities following the implementation of mitigation measures and recommendations. (Table 11) shows the significance of potential operational impacts associated with the development on floral and faunal communities before and after implementation of mitigation measures during the operational phase only.

As an example, the significance of encroachment of alien invasive plant species on the vegetation community was rated as moderately-high prior to mitigation. Implementation of mitigation measures in the form an alien invasive plant management plan and rehabilitation of project footprint after completion of construction reduced the significance of the impact to low (Table 12)

12.3 Mitigation Measure Objectives

A number of general mitigation measures are recommended for the project as a whole, while more specific measures are detailed in the following sections which relate to impacts to fauna and flora specifically. The mitigation measures supplied below must be read with, and implemented, in conjunction with those mitigation measures recommended in the specialist wetland report. The general focus of mitigation measures must be to reduce the significance of potential impacts (as defined above) associated with the development and thereby to:

- Prevent the further loss and fragmentation of this vegetation community (listed as Vulnerable) within and adjacent to the project site;
- Prevent the loss of the faunal community associated with this vegetation community and any wetland environments;
- Prevent the loss of species of conservation concern which are known to occur within the project area; and
- Limiting the construction area to the defined project areas and only impacting those areas where it is unavoidable to do so otherwise.

12.3.1 Mitigation Measures for Impacts on Vegetation Communities

Recommended mitigation and rehabilitation measures include the following:

- As far as possible, the proposed developments should be placed in areas that have already been disturbed (low sensitivity areas as defined in this report), and no further loss of secondary grassland or wetlands should be permitted;
- It is recommended that areas to be developed be specifically demarcated so that during the construction phase and operational phase, only the demarcated areas be impacted upon. All work areas, offices and access roads must be clearly demarcated from surrounding natural areas and no persons should be allowed to enter these areas under any circumstances;
- Areas of indigenous vegetation, even secondary communities should under no circumstances be fragmented or disturbed further or used as an area for dumping of waste;

- It should be made an offence for any staff to bring any plant species into any portion of the project site, including offices. No plant species whether indigenous or exotic should be brought into the project area, to prevent the spread of exotic or invasive species;
- A qualified environmental control office must be on site when construction begins to identify species that will be directly disturbed and to relocate fauna/flora that are found during construction (this includes all species of flora and fauna such as snakes);
- Dust-reducing mitigation measures must be put in place and must be strictly adhered to. This includes wetting of exposed soft soil surfaces and not conducting activities on windy days which will increase the likelihood of dust being generated;
- Areas of indigenous vegetation should be delineated, and rehabilitation measures implemented in areas where the indigenous community is still present but degraded;
- Areas that are denuded during construction need to be re-vegetated with indigenous vegetation to prevent erosion during flood events. This will also reduce the likelihood of encroachment by alien invasive plant species;
- Any topsoil that is removed during construction must be appropriately removed and stored according to the national and provincial guidelines. This includes on-going maintenance of such topsoil piles so that they can be re-utilised;
- All dumping of waste material, especially bricks and contaminated materials or soils, must be prevented; and
- Compilation of and implementation of an alien vegetation management plan for the entire site, including the surrounding project area.

12.3.2 Mitigation Measures for Impacts on Faunal Communities

Recommended mitigation and rehabilitation measures for faunal community's hinge largely on protecting their habitats and ensuring it remains intact, as well as limited other disturbance factors such as noise and dust. In addition to this the following measures are recommended:

- The primary mitigation measure recommended for the project area is for the development to be undertaken in the location marked as alternative site 1;
- If any faunal species are recorded during construction, activities should temporarily cease, and an appropriate specialist should be consulted to identify the correct course of action. This is applicable to all species, even smaller species such as rodents, reptiles and amphibians;
- Staff should be educated about the sensitivity of faunal species and measures should be put in place to deal with any species that are encountered during the construction process. The intentional killing of any animals including snakes, lizards, birds or other animals should be strictly prohibited;
- The areas outside the defined project area, should be declared a 'no-go' areas during the construction phase and operational phase and all efforts must be made to prevent access to this area from construction workers and machinery;

Kranspoort Feedlot

- All livestock must be kept out of any wetland and grassland areas in order to prevent overgrazing of potential SCC avifauna habitat; and
- No domestic animals are to be allowed in to the project area under any circumstances, especially any dogs and cats. Any and all feral cats which may enter the project area must be removed immediately.

12.3.3 Mitigation Measures for Operation of the Feedlot

Operational mitigation measures have been adopted from the Guideline Manual for the Development of Abattoirs and Other Waste of Animal Origin by GDARD (2009). The following abattoir and feedlot specific mitigation measures are provided (GDARD, 2009):

- Large amounts of water is used for hygiene reasons in animal processing operations, producing large amounts of wastewater that must be treated. Effective primary treatment before secondary treatment must be incorporated to increase the overall effectiveness and efficiency of wastewater treatment systems, as it is cheaper to physically remove the fat and solids than to treat later in secondary and tertiary treatment facilities;
- Various pond systems must be used for secondary treatment of abattoir effluent which include anaerobic or settling ponds, septic tanks, amongst others;
- The handling of effluent from the abattoir must be disposed of in a sustainable manner with the separation of different materials and use of suitable disposal facilities;
- Effluent disposal should progress towards predetermined water quality (Agricultural – DWAF, 1996) and waste management objectives;
- Grease and solid traps with suitable grease removal facilities should be installed upstream of major collection sumps;
- Blood should not be dumped informally;
- There should be a full examination of process by-products and wastes to identify options for waste minimisation. In some cases, substituting raw material may lead to changes in the process. Often, re-using or recycling by-products reduces waste production. Recovering valuable materials from waste streams can be economically and environmentally sensible;
- Techniques and procedures to integrate all waste management options must be adopted wherever possible. A beneficial re-use strategy should be initiated after the waste management strategy;
- Cleaner production and waste minimisation aims directly at the source of the waste generation and attempts to eliminate waste before it is produced, or to reduce the amount generated. Wastes should be disposed of only after all preventive and minimisation measures have been taken;
- Using high pressure water hoses for washing waste will minimise the amount and therefore the cost of water used;

- Opportunities for recycling exist and operators should nominate a staff member to supervise the recycling schemes;
- Abattoirs can make use of local hospital incinerators to burn carcasses although this may prove costly. Mortality pits (ottway pit) are recommended only if they are adequately lined to prevent ground water contamination;
- Final flow from septic tanks should be discharged to a municipal sewer line and not to the natural environment;
- Condemned meat products that have been trimmed free of transmittable pathogens can be sold as animal food to zoos or similar;
- Stormwater can become contaminated when it comes into contact with animal holding pens, sludge stockpiles and treated wastewater irrigation areas. This contaminated stormwater can have detrimental environmental effects on surrounding ecosystems and should be kept from making contact with such areas;
- Clean stormwater must be kept away from the contaminated areas and directed to the stormwater drainage system;
- The manure storage and lagoon areas should have containment walls to keep the manure from washing into the river;
- The effluent treatment area, manure lagoon area and burial trench should be moved out and away from the drainage line;
- Buffer zones are particularly important as measures to separate conflicting land uses and to minimise any harmful effects of new developments in environmentally sensitive areas. The buffer zone prescribed in the wetland report must be adhered to;
- All construction and operation activities should be kept outside of buffer zones;
- No livestock may be allowed from within the river channel as they cause excessive erosion and bank collapse through trampling of vegetation and soils; and
- Livestock should be confined to designated areas.

13 Conclusion

The completion of a comprehensive desktop study, in conjunction with the detailed results from the surveys mean that there is a high confidence in the information provided. The surveys which were completed, and the corresponding studies resulted in good site coverage, assessing the major habitats and ecosystems, obtaining a general species (fauna and flora) overview and observing the major current impacts.

It is clear from the regional ecological overview, as well as the baseline data collected to date that the Project area has been altered (historically and currently) predominantly by agricultural land use. It is further evident that the remaining natural habitats have been impacted on as a result of poor grazing practices. The development of the general area, and the increase in agricultural operations and supporting activities have also contributed to the altered ecological status and functioning of the systems.

Careful consideration must be afforded each of the mitigation measures provided herein. In the event that environmental authorisation is issued for this project, proven ecological (or environmental) controls and mitigation measures must be entrenched in the management framework.

The following further conclusions were reached based on the results of this assessment:

- Much of the Project area is identified as being heavily modified or transformed from its natural state;
- Based on the National Biodiversity Assessment (NBA, 2012) the Project area overlaps entirely with ecosystems that are listed as Endangered (EN). The Project area is also within a few kilometres of ecosystems which are listed as Critically Endangered;
- The majority of the terrestrial ecosystems associated with the development are rated as *not protected*;
- Based on the SANBI (2010) Protected Areas Map and the National Protected Areas Expansion Strategy (NPAES) the Project area does not overlap with any formally or informally protected area;
- The Project area is situated within one vegetation type, namely the Rand Highveld Grassland, which is classified as Endangered according to Mucina & Rutherford (2006);
- A total of forty (40) tree, shrub and herbaceous plant species were recorded in the proposed Project area during the January 2018 field assessment (Table 4);
- Seven (7) category 1b invasive species were recorded at the site and must therefore be removed by implementing an alien invasive plant management programme;
- In terms of the three proposed areas for the development of the feedlot, all three areas are judged as having low sensitivity ratings due to previous disturbances. Alternative sites 1 and 2 are marginally more degraded than the preferred site option. The preferred site option was previously cultivated but there are signs that the area has been rehabilitated and possibly re-planted. Furthermore, this area is the least disturbed due to grazing pressure and a higher number of plant species are present in this section; and
- All three site options are acceptable for the development, but as per the SoW it is the opinion of the specialists that based on the sensitivity mapping, alternative site 1 is the most disturbed site and therefore most recommended for development of the feedlot. Alternative site 2 is the second most preferred site for the feedlot development, while the original ('preferred') site is the least recommended for this development.

14 Impact Statement

An impact statement is required as per the NEMA regulations with regards to the proposed development.

Considering the above-mentioned conclusions, it is the opinion of the specialist that the project be favourably considered but that the mitigation measures should be strictly adhered to and

Kranspoort Feedlot

enforced. Furthermore, it is the specialist's opinion that the development is permissible at all three sites outlined in the SoW but that the development should preferably occur at alternative site 1.

15 References

Animal Demography Unit (2017). Virtual Museum. Accessed on the following date: 2017-10-09.

Bates, M.F., Branch, W.R., Bauer, A.M., Burger, M., Marais, J., Alexander, G.J. & De Villiers, M.S. (EDS). 2014. Atlas and Red List of the Reptiles of South Africa, Lesotho and Swaziland. Suricata 1. South African National Biodiversity Institute, Pretoria, South Africa.

Barbour, M.T., Gerritsen, J. & White, J.S. 1996. Development of a stream condition index (SCI) for Florida. Prepared for Florida Department of Environmental Protection: Tallahassee, Florida.

Bird Atlas Project (SABAP2). 2012. <http://vmus.adu.org.za/>

BirdLife International (2017) Important Bird Areas factsheet: Steenkampsberg. Downloaded from <http://www.birdlife.org> on 11/02/2018.

Botanical Society of South Africa. 2012 Vegetation Map App [Vector] 2012. Available from the Biodiversity GIS website, downloaded on 3rd February 2018.

Burrows, J.E., Lötter, M. & von Staden, L. 2006. *Indigofera hybrida* N.E.Br. National Assessment: Red List of South African Plants version 2017.1. Accessed on 2018/01/15

Department of Water and Sanitation (DWS). 2017. A Desktop Assessment of the Present Ecological State, Ecological Importance and Ecological Sensitivity per Sub Quaternary Reaches for Secondary Catchments in South Africa. Draft. Compiled by RQS-RDM.

Driver A., Sink, K.J., Nel, J.N., Holness, S., Van Niekerk, L., Daniels, F., Jonas, Z., Majiedt, P.A., Harris, L. & Maze, K. 2012. National Biodiversity Assessment 2011: An assessment of South Africa's biodiversity and ecosystems. Synthesis Report. South African National Biodiversity Institute and Department of Environmental Affairs, Pretoria.

Du Preez, L.H. & Carruthers, V. 2009. A complete guide to the frogs of southern Africa. Random House Struik, Cape Town.

DWAF: The Regulations on the National Forests Act of 1998 (Act No. 84 of 1998) – published 29 April 2009 in the Government Gazette under the auspices of the Department of Water Affairs and Forestry (DWAF).

Edwards, T.J. & Raimondo, D. 2007. *Argyrolobium megarrhizum* Bolus. National Assessment: Red List of South African Plants version 2017.1. Accessed on 2018/01/25

FrogMap 2017. The Southern African Frog Atlas Project (SAFAP, now FrogMAP). <http://vmus.adu.org.za> (Accessed in February 2018).

Hockey, P.A.R., Dean, W.R.J. & Ryna, P.G. (eds.) 2005. Roberts – Birds of Southern Africa, VIIth ed. The Trustees of the John Voelker Bird Book Fund, Cape Town.

IUCN, 2017. The IUCN Red List of Threatened Species. Available at www.iucnredlist.org.

Mucina, L. and Rutherford, M.C. (Eds.) 2006. The vegetation of South Africa, Lesotho and Swaziland. Strelizia 19. South African National Biodiversity Institute, Pretoria South African.

Kranspoort Feedlot

POSA, 2017. Plants of South Africa - an online checklist. POSA ver. 3.0. Available at: <http://posa.sanbi.org>.

South African Bird Atlas Project (SABAP2). 2017. Available at <http://vmus.adu.org.za/>

SANBI. 2017. Red List of South African Plants version 2017.1. Downloaded from Redlist.sanbi.org on 2017/10/24.

SANBI. 2017. Technical guidelines for CBA Maps: Guidelines for developing a map of Critical Biodiversity Areas & Ecological Support Areas using systematic biodiversity planning. First Edition (Beta Version), June 2017. Compiled by Driver, A., Holness, S. & Daniels, F. South African National Biodiversity Institute, Pretoria.

SANBI. 2017. NBA 2011 Terrestrial Formal Protected Areas 2012. Downloaded on 03 October 2017.

Skinner J.D. & Chimimba, C.T. 2005. The Mammals of the Southern African Subregion (New Edition). Cambridge University Press. South Africa.

Stuart, C & T. (1994) A field guide to the tracks and signs of Southern, Central East African Wildlife. Struik Nature, Cape Town.

Taylor MR, Peacock F, Wanless RM (eds) 2015. The 2015 Eskom Red Data Book of birds of South Africa, Lesotho and Swaziland. BirdLife South Africa, Johannesburg.

Van Oudtshoorn F. 2004. Gids tot die grasse van Suider-Afrika. Second Edition. Pretoria. Briza Publikasies.

Van Wyk, B and Van Wyk, P. 1997. Field guide to trees of Southern Africa. Cape Town. Struik Publishers.

APPENDIX A: *Flora species expected to occur in the Project area*

Family	Scientific Name	SANBI listing (2017)	Ecology
Moraceae	<i>Ficus salicifolia</i>	LC	Indigenous
Fabaceae	<i>Rhynchosia nitens</i>	LC	Indigenous
Asphodelaceae	<i>Kniphofia ensifolia subsp. ensifolia</i>	LC	Indigenous
Euphorbiaceae	<i>Euphorbia inaequilatera</i>	LC	Indigenous
Santalaceae	<i>Viscum combreticola</i>		Indigenous
Fabaceae	<i>Smithia erubescens</i>	LC	Indigenous
Pteridaceae	<i>Pellaea calomelanos var. calomelanos</i>	LC	Indigenous
Poaceae	<i>Andropogon schirensis</i>	LC	Indigenous
Anacardiaceae	<i>Ozoroa paniculosa var. paniculosa</i>	LC	Indigenous
Geraniaceae	<i>Pelargonium multicaule subsp. subherbaceum</i>	LC	Indigenous; Endemic
Malvaceae	<i>Hermannia lancifolia</i>	LC	Indigenous; Endemic
Juncaceae	<i>Juncus dregeanus</i>		Indigenous
Asteraceae	<i>Euryops transvaalensis subsp. transvaalensis</i>	LC	Indigenous
Aquifoliaceae	<i>Ilex mitis var. mitis</i>	LC	Indigenous
Anacardiaceae	<i>Searsia gracillima var. glaberrima</i>		Indigenous; Endemic
Ricciaceae	<i>Riccia atropurpurea</i>		Indigenous
Molluginaceae	<i>Psammotropha myriantha</i>	LC	Indigenous
Euphorbiaceae	<i>Clusia pulchella var. pulchella</i>	LC	Indigenous
Poaceae	<i>Eragrostis nindensis</i>	LC	Indigenous
Pallaviciniaceae	<i>Symphyogyna brasiliensis</i>		Indigenous
Asteraceae	<i>Conyza chilensis</i>		Not indigenous; Naturalised
Lythraceae	<i>Nesaea cordata</i>	LC	Indigenous
Apocynaceae	<i>Gomphocarpus fruticosus subsp. fruticosus</i>	LC	Indigenous
Hyacinthaceae	<i>Schizocarpus nervosus</i>		Indigenous
Fabaceae	<i>Senegalia caffra</i>	LC	Indigenous
Combretaceae	<i>Combretum molle</i>	LC	Indigenous
Scrophulariaceae	<i>Selago sp.</i>		
Asteraceae	<i>Senecio venosus</i>	LC	Indigenous
Plantaginaceae	<i>Plantago longissima</i>	LC	Indigenous

Kranspoort Feedlot

Araceae	<i>Stylochaeton natalensis</i>	LC	Indigenous
Celastraceae	<i>Gymnosporia tenuispina</i>	LC	Indigenous
Fissidentaceae	<i>Fissidens sp.</i>		
Pteridaceae	<i>Cheilanthes hirta var. hirta</i>	LC	Indigenous
Acanthaceae	<i>Ruellia cordata</i>		Indigenous
Selaginellaceae	<i>Selaginella dregei</i>		Indigenous
Apiaceae	<i>Berula repanda</i>	LC	Indigenous
Myrsinaceae	<i>Myrsine africana</i>	LC	Indigenous
Poaceae	<i>Paspalum scrobiculatum</i>	LC	Indigenous
Poaceae	<i>Triraphis andropogonoides</i>	LC	Indigenous
Poaceae	<i>Digitaria eriantha</i>	LC	Indigenous
Orchidaceae	<i>Satyrium hallackii subsp. ocellatum</i>	LC	Indigenous
Anacardiaceae	<i>Lannea gossweileri subsp. tomentella</i>	LC	Indigenous
Ericaceae	<i>Erica drakensbergensis</i>	LC	Indigenous
Lamiaceae	<i>Leonotis ocymifolia</i>	LC	Indigenous
Anacardiaceae	<i>Searsia dentata</i>		Indigenous
Ricciaceae	<i>Riccia lanceolata</i>		Indigenous
Lamiaceae	<i>Aeollanthus buchnerianus</i>	LC	Indigenous
Malvaceae	<i>Triumfetta sonderi</i>	LC	Indigenous; Endemic
Ochnaceae	<i>Ochna natalitia</i>	LC	Indigenous
Fabaceae	<i>Tephrosia elongata var. elongata</i>	LC	Indigenous
Combretaceae	<i>Combretum erythrophyllum</i>	LC	Indigenous
Stilbaceae	<i>Nuxia congesta</i>	LC	Indigenous
Leucobryaceae	<i>Campylopus robillardiei</i>		Indigenous
Asparagaceae	<i>Asparagus suaveolens</i>	LC	Indigenous
Malpighiaceae	<i>Sphedamnocarpus pruriens subsp. pruriens</i>	LC	Indigenous
Euphorbiaceae	<i>Jatropha sp.</i>		
Euphorbiaceae	<i>Euphorbia cooperi</i>	LC	Indigenous
Asteraceae	<i>Dicoma anomala subsp. anomala</i>	LC	Indigenous
Amaryllidaceae	<i>Haemanthus humilis subsp. humilis</i>	LC	Indigenous
Malvaceae	<i>Grewia flavescens</i>	LC	Indigenous
Asteraceae	<i>Brachylaena rotundata</i>	LC	Indigenous

Kranspoort Feedlot

Malvaceae	<i>Hibiscus calyphyllus</i>	LC	Indigenous
Fabaceae	<i>Rhynchosia monophylla</i>	LC	Indigenous
Rutaceae	<i>Vepris reflexa</i>	LC	Indigenous
Dichapetalaceae	<i>Dichapetalum cymosum</i>	LC	Indigenous
Gleicheniaceae	<i>Gleichenia polypodioides</i>	LC	Indigenous
Hyacinthaceae	<i>Ledebouria revoluta</i>	LC	Indigenous
Sapotaceae	<i>Mimusops zeyheri</i>	LC	Indigenous
Poaceae	<i>Miscanthus junceus</i>	LC	Indigenous
Ebenaceae	<i>Diospyros whyteana</i>		Indigenous
Poaceae	<i>Loudetia simplex</i>	LC	Indigenous
Asteraceae	<i>Gerbera jamesonii</i>	LC	Indigenous
Scrophulariaceae	<i>Melanospermum transvaalense</i>	LC	Indigenous; Endemic
Ricciaceae	<i>Riccia mammifera</i>		Indigenous; Endemic
Cyperaceae	<i>Lipocarpha nana</i>	LC	Indigenous
Moraceae	<i>Ficus sur</i>	LC	Indigenous
Orchidaceae	<i>Orthochilus foliosus</i>		Indigenous
Rubiaceae	<i>Empogona lanceolata</i>		Indigenous; Endemic
Lamiaceae	<i>Plectranthus hadiensis</i> var. <i>hadiensis</i>	LC	Indigenous
Bartramiaceae	<i>Philonotis hastata</i>		Indigenous
Fabaceae	<i>Argyrolobium megarrhizum</i>	NT	Indigenous; Endemic
Urticaceae	<i>Pouzolzia mixta</i> var. <i>mixta</i>		Indigenous
Rubiaceae	<i>Fadogia homblei</i>	LC	Indigenous
Pedaliaceae	<i>Ceratotheca triloba</i>	LC	Indigenous
Moraceae	<i>Ficus abutilifolia</i>	LC	Indigenous
Cyperaceae	<i>Cyperus albostriatus</i>	LC	Indigenous
Poaceae	<i>Sporobolus festivus</i>	LC	Indigenous
Ruscaceae	<i>Eriospermum porphyrovalve</i>	LC	Indigenous
Ranunculaceae	<i>Ranunculus dregei</i>	LC	Indigenous
Asparagaceae	<i>Asparagus angusticladus</i>	LC	Indigenous
Rubiaceae	<i>Pavetta gardeniifolia</i> var. <i>subtomentosa</i>	LC	Indigenous
Asteraceae	<i>Tarchonanthus camphoratus</i>	LC	Indigenous
Commelinaceae	<i>Floscopa glomerata</i>	LC	Indigenous

Kranspoort Feedlot

Celastraceae	<i>Pterocelastrus echinatus</i>	LC	Indigenous
Asteraceae	<i>Helichrysum setosum</i>	LC	Indigenous
Orchidaceae	<i>Habenaria tridens</i>	LC	Indigenous
Anacardiaceae	<i>Searsia zeyheri</i>		Indigenous; Endemic
Geraniaceae	<i>Monsonia attenuata</i>	LC	Indigenous; Endemic
Malvaceae	<i>Hibiscus aethiopicus var. ovatus</i>	LC	Indigenous
Moraceae	<i>Ficus ingens var. ingens</i>		Indigenous
Molluginaceae	<i>Psammotropha mucronata var. foliosa</i>	LC	Indigenous
Poaceae	<i>Elionurus muticus</i>	LC	Indigenous
Moraceae	<i>Ficus thonningii</i>		Indigenous
Euphorbiaceae	<i>Croton gratissimus var. subgratissimus</i>	LC	Indigenous
Phyllanthaceae	<i>Pseudolachnostylis maprouneifolia var. glabra</i>	NE	Indigenous
Rubiaceae	<i>Vangueria madagascariensis</i>	LC	Indigenous
Apocynaceae	<i>Cryptolepis oblongifolia</i>	LC	Indigenous
Commelinaceae	<i>Commelina africana var. lancispatha</i>	LC	Indigenous
Ochnaceae	<i>Ochna pulchra</i>	LC	Indigenous
Ricciaceae	<i>Riccia volkii</i>		Indigenous
Ochnaceae	<i>Ochna pretoriensis</i>	LC	Indigenous
Santalaceae	<i>Viscum rotundifolium</i>		Indigenous
Combretaceae	<i>Combretum zeyheri</i>	LC	Indigenous
Asparagaceae	<i>Asparagus transvaalensis</i>	LC	Indigenous
Commelinaceae	<i>Commelina africana var. krebsiana</i>	LC	Indigenous
Araliaceae	<i>Cussonia transvaalensis</i>		Indigenous; Endemic
Myricaceae	<i>Morella serrata</i>		Indigenous
Crassulaceae	<i>Crassula setulosa var. setulosa</i>	NE	Indigenous
Poaceae	<i>Setaria lindenbergiana</i>	LC	Indigenous
Asteraceae	<i>Conyza scabrada</i>		Indigenous
Salicaceae	<i>Populus alba</i>		Not indigenous; Naturalised; Invasive
Asparagaceae	<i>Asparagus virgatus</i>	LC	Indigenous
Asparagaceae	<i>Asparagus cooperi</i>	LC	Indigenous
Asteraceae	<i>Pseudognaphalium oligandrum</i>	LC	Indigenous

Kranspoort Feedlot

Poaceae	<i>Diheteropogon amplexens</i> var. <i>amplexens</i>	LC	Indigenous
Cyatheaceae	<i>Alsophila dregei</i>	LC	Indigenous
Polygalaceae	<i>Polygala africana</i>	LC	Indigenous
Celastraceae	<i>Maytenus undata</i>	LC	Indigenous
Rhamnaceae	<i>Berchemia zeyheri</i>		Indigenous
Fabaceae	<i>Aeschynomene rehmannii</i> var. <i>rehmannii</i>	LC	Indigenous
Amaryllidaceae	<i>Haemanthus humilis</i> subsp. <i>hirsutus</i>	LC	Indigenous
Exornothecaceae	<i>Exornotheca holstii</i>		Indigenous
Anacardiaceae	<i>Searsia magalismsontana</i> subsp. <i>magalismsontana</i>		Indigenous
Acanthaceae	<i>Dicliptera clinopodia</i>		Indigenous
Acanthaceae	<i>Isoglossa grantii</i>		Indigenous; Endemic
Gentianaceae	<i>Chironia purpurascens</i> subsp. <i>humilis</i>	LC	Indigenous
Rubiaceae	<i>Pavetta lanceolata</i>	LC	Indigenous
Asteraceae	<i>Seriphium plumosum</i>		Indigenous
Apocynaceae	<i>Ancylobotrys capensis</i>	LC	Indigenous
Anacardiaceae	<i>Searsia gerrardii</i>		Indigenous
Acanthaceae	<i>Blepharis subvulbilis</i>		Indigenous
Thymelaeaceae	<i>Lasiosiphon kraussianus</i>		Indigenous
Ophioglossaceae	<i>Ophioglossum costatum</i>	LC	Indigenous
Poaceae	<i>Schizachyrium sanguineum</i>	LC	Indigenous
Fabaceae	<i>Elephantorrhiza elephantina</i>	LC	Indigenous
Bartramiaceae	<i>Philonotis africana</i>		Indigenous
Malvaceae	<i>Dombeya rotundifolia</i> var. <i>rotundifolia</i>	LC	Indigenous
Loganiaceae	<i>Strychnos cocculoides</i>	LC	Indigenous
Iridaceae	<i>Hesperantha coccinea</i>	LC	Indigenous
Molluginaceae	<i>Psammotropha mucronata</i> var. <i>mucronata</i>	LC	Indigenous
Rubiaceae	<i>Afrocanthium gilfillanii</i>	LC	Indigenous

APPENDIX B: Avifaunal species expected to occur in the Project area

Species	Common name	Conservation Status	
		Regional (SANBI, 2016)	IUCN (2017)
<i>Apalis thoracica</i>	Apalis, Bar-throated	Unlisted	LC
<i>Recurvirostra avosetta</i>	Avocet, Pied	Unlisted	LC
<i>Turdoides jardineii</i>	Babbler, Arrow-marked	Unlisted	LC
<i>Tricholaema leucomelas</i>	Barbet, Acacia Pied	Unlisted	LC
<i>Lybius torquatus</i>	Barbet, Black-collared	Unlisted	LC
<i>Trachyphonus vaillantii</i>	Barbet, Crested	Unlisted	LC
<i>Batis molitor</i>	Batis, Chinspot	Unlisted	LC
<i>Merops apiaster</i>	Bee-eater, European	Unlisted	LC
<i>Merops pusillus</i>	Bee-eater, Little	Unlisted	LC
<i>Merops bullockoides</i>	Bee-eater, White-fronted	Unlisted	LC
<i>Euplectes orix</i>	Bishop, Southern Red	Unlisted	LC
<i>Euplectes capensis</i>	Bishop, Yellow	Unlisted	LC
<i>Euplectes afer</i>	Bishop, Yellow-crowned	Unlisted	LC
<i>Ixobrychus minutus</i>	Bittern, Little	Unlisted	LC
<i>Telophorus zeylonus</i>	Bokmakierie, Bokmakierie	Unlisted	LC
<i>Laniarius ferrugineus</i>	Boubou, Southern	Unlisted	LC
<i>Nilaus afer</i>	Brubru, Brubru	Unlisted	LC
<i>Pycnonotus tricolor</i>	Bulbul, Dark-capped	Unlisted	Unlisted
<i>Emberiza capensis</i>	Bunting, Cape	Unlisted	LC
<i>Emberiza tahapisi</i>	Bunting, Cinnamon-breasted	Unlisted	LC
<i>Malaconotus blanchoti</i>	Bush-shrike, Grey-headed	Unlisted	LC
<i>Neotis denhami</i>	Bustard, Denham's	VU	NT
<i>Turnix sylvaticus</i>	Buttonquail, Kurrichane	Unlisted	LC
<i>Buteo rufofuscus</i>	Buzzard, Jackal	Unlisted	LC
<i>Kaupifalco monogrammicus</i>	Buzzard, Lizard	Unlisted	LC
<i>Buteo vulpinus</i>	Buzzard, Steppe	Unlisted	Unlisted
<i>Serinus canicollis</i>	Canary, Cape	Unlisted	LC
<i>Crithagra flaviventris</i>	Canary, Yellow	Unlisted	LC
<i>Crithagra mozambicus</i>	Canary, Yellow-fronted	Unlisted	LC
<i>Myrmecocichla formicivora</i>	Chat, Anteating	Unlisted	LC
<i>Cercomela familiaris</i>	Chat, Familiar	Unlisted	LC
<i>Cisticola textrix</i>	Cisticola, Cloud	Unlisted	LC
<i>Cisticola aridulus</i>	Cisticola, Desert	Unlisted	LC
<i>Cisticola aberrans</i>	Cisticola, Lazy	Unlisted	LC
<i>Cisticola tinniens</i>	Cisticola, Levaillant's	Unlisted	LC
<i>Cisticola chiniana</i>	Cisticola, Rattling	Unlisted	LC
<i>Cisticola lais</i>	Cisticola, Wailing	Unlisted	LC
<i>Cisticola ayresii</i>	Cisticola, Wing-snapping	Unlisted	LC
<i>Cisticola juncidis</i>	Cisticola, Zitting	Unlisted	LC
<i>Thamnolaea cinnamomeiventris</i>	Cliff-chat, Mocking	Unlisted	LC

Kranspoort Feedlot

<i>Hirundo spilodera</i>	Cliff-swallow, South African	Unlisted	LC
<i>Petrochelidon spilodera</i>	Cliff-swallow, South African	Unlisted	LC
<i>Fulica cristata</i>	Coot, Red-knobbed	Unlisted	LC
<i>Phalacrocorax africanus</i>	Cormorant, Reed	Unlisted	Unlisted
<i>Phalacrocorax carbo</i>	Cormorant, White-breasted	Unlisted	LC
<i>Centropus burchellii</i>	Coucal, Burchell's	Unlisted	Unlisted
<i>Centropus superciliosus</i>	Coucal, White-browed	Unlisted	LC
<i>Cursorius temminckii</i>	Cursorer, Temminck's	Unlisted	LC
<i>Amaurornis flavirostris</i>	Crake, Black	Unlisted	LC
<i>Crex crex</i>	Crake, Corn	Unlisted	LC
<i>Anthropoides paradiseus</i>	Crane, Blue	NT	VU
<i>Balearica regulorum</i>	Crane, Grey Crowned	EN	EN
<i>Bugerus carunculatus</i>	Crane, Wattled	CR	VU
<i>Sylvietta rufescens</i>	Crombec, Long-billed	Unlisted	LC
<i>Corvus capensis</i>	Crow, Cape	Unlisted	LC
<i>Corvus albus</i>	Crow, Pied	Unlisted	LC
<i>Cuculus clamosus</i>	Cuckoo, Black	Unlisted	LC
<i>Chrysococcyx caprius</i>	Cuckoo, Diderick	Unlisted	LC
<i>Chrysococcyx klaas</i>	Cuckoo, Klaas's	Unlisted	LC
<i>Cuculus solitarius</i>	Cuckoo, Red-chested	Unlisted	LC
<i>Anhinga rufa</i>	Darter, African	Unlisted	LC
<i>Streptopelia senegalensis</i>	Dove, Laughing	Unlisted	LC
<i>Oena capensis</i>	Dove, Namaqua	Unlisted	LC
<i>Streptopelia semitorquata</i>	Dove, Red-eyed	Unlisted	LC
<i>Columba livia</i>	Dove, Rock	Unlisted	LC
<i>Dicrurus adsimilis</i>	Drongo, Fork-tailed	Unlisted	LC
<i>Anas sparsa</i>	Duck, African Black	Unlisted	LC
<i>Sarkidiornis melanotos</i>	Duck, Comb	Unlisted	LC
<i>Dendrocygna bicolor</i>	Duck, Fulvous	Unlisted	LC
<i>Oxyura maccoa</i>	Duck, Maccoa	NT	NT
<i>Anas platyrhynchos</i>	Duck, Mallard	Unlisted	LC
<i>Thalassornis leuconotus</i>	Duck, White-backed	Unlisted	LC
<i>Dendrocygna viduata</i>	Duck, White-faced	Unlisted	LC
<i>Anas undulata</i>	Duck, Yellow-billed	Unlisted	LC
<i>Lophaelix occipitalis</i>	Eagle, Long-crested	Unlisted	LC
<i>Aquila verreauxii</i>	Eagle, Verreaux's	VU	LC
<i>Bubo capensis</i>	Eagle-owl, Cape	Unlisted	LC
<i>Bubo africanus</i>	Eagle-owl, Spotted	Unlisted	LC
<i>Bubulcus ibis</i>	Egret, Cattle	Unlisted	LC
<i>Egretta alba</i>	Egret, Great	Unlisted	LC
<i>Egretta garzetta</i>	Egret, Little	Unlisted	LC
<i>Egretta intermedia</i>	Egret, Yellow-billed	Unlisted	LC
<i>Eremomela icteropygialis</i>	Eremomela, Yellow-bellied	Unlisted	LC
<i>Falco amurensis</i>	Falcon, Amur	Unlisted	LC

Kranspoort Feedlot

<i>Falco biarmicus</i>	Falcon, Lanner	VU	LC
<i>Falco peregrinus</i>	Falcon, Peregrine	Unlisted	LC
<i>Anomalospiza imberbis</i>	Finch, Cuckoo	Unlisted	LC
<i>Amadina erythrocephala</i>	Finch, Red-headed	Unlisted	LC
<i>Podica senegalensis</i>	Finfoot, African	VU	LC
<i>Lagonosticta rubricata</i>	Firefinch, African	Unlisted	LC
<i>Lagonosticta rhodopareia</i>	Firefinch, Jameson's	Unlisted	LC
<i>Lagonosticta senegala</i>	Firefinch, Red-billed	Unlisted	LC
<i>Lanius collaris</i>	Fiscal, Common (Southern)	Unlisted	LC
<i>Haliaeetus vocifer</i>	Fish-eagle, African	Unlisted	LC
<i>Phoenicopter ruber</i>	Flamingo, Greater	NT	LC
<i>Phoeniconaias minor</i>	Flamingo, Lesser	NT	NT
<i>Sarothrura rufa</i>	Flufftail, Red-chested	Unlisted	LC
<i>Stenostira scita</i>	Flycatcher, Fairy	Unlisted	LC
<i>Sigelus silens</i>	Flycatcher, Fiscal	Unlisted	LC
<i>Bradornis mariquensis</i>	Flycatcher, Marico	Unlisted	LC
<i>Melaenornis pammelaina</i>	Flycatcher, Southern Black	Unlisted	LC
<i>Muscicapa striata</i>	Flycatcher, Spotted	Unlisted	LC
<i>Peliperdix coqui</i>	Francolin, Coqui	Unlisted	LC
<i>Scleroptila levaillantoides</i>	Francolin, Orange River	Unlisted	Unlisted
<i>Scleroptila levaillantii</i>	Francolin, Red-winged	Unlisted	LC
<i>Scleroptila shelleyi</i>	Francolin, Shelley's	Unlisted	LC
<i>Corythaixoides concolor</i>	Go-away-bird, Grey	Unlisted	LC
<i>Alopochen aegyptiacus</i>	Goose, Egyptian	Unlisted	LC
<i>Plectropterus gambensis</i>	Goose, Spur-winged	Unlisted	LC
<i>Melierax gabar</i>	Goshawk, Gabar	Unlisted	LC
<i>Sphenoeacus afer</i>	Grassbird, Cape	Unlisted	LC
<i>Tyto capensis</i>	Grass-owl, African	VU	LC
<i>Podiceps nigricollis</i>	Grebe, Black-necked	Unlisted	LC
<i>Podiceps cristatus</i>	Grebe, Great Crested	Unlisted	LC
<i>Tachybaptus ruficollis</i>	Grebe, Little	Unlisted	LC
<i>Treron calvus</i>	Green-pigeon, African	Unlisted	LC
<i>Tringa nebularia</i>	Greenshank, Common	Unlisted	LC
<i>Numida meleagris</i>	Guinea fowl, Helmeted	Unlisted	LC
<i>Larus cirrocephalus</i>	Gull, Grey-headed	Unlisted	LC
<i>Scopus umbretta</i>	Hamerkop, Hamerkop	Unlisted	LC
<i>Circus macrourus</i>	Harrier, Pallid	NT	NT
<i>Polyboroides typus</i>	Harrier-Hawk, African	Unlisted	LC
<i>Prionops plumatus</i>	Helmet-shrike, White-crested	Unlisted	LC
<i>Egretta ardesiaca</i>	Heron, Black	Unlisted	LC
<i>Ardea melanocephala</i>	Heron, Black-headed	Unlisted	LC
<i>Ardea goliath</i>	Heron, Goliath	Unlisted	LC
<i>Butorides striata</i>	Heron, Green-backed	Unlisted	LC
<i>Ardea cinerea</i>	Heron, Grey	Unlisted	LC

Kranspoort Feedlot

<i>Ardea purpurea</i>	Heron, Purple	Unlisted	LC
<i>Ardeola ralloides</i>	Heron, Squacco	Unlisted	LC
<i>Prodotiscus regulus</i>	Honeybird, Brown-backed	Unlisted	LC
<i>Indicator indicator</i>	Honeyguide, Greater	Unlisted	LC
<i>Indicator minor</i>	Honeyguide, Lesser	Unlisted	LC
<i>Upupa africana</i>	Hoopoe, African	Unlisted	Unlisted
<i>Delichon urbicum</i>	House-martin, Common	Unlisted	LC
<i>Threskiornis aethiopicus</i>	Ibis, African Sacred	Unlisted	LC
<i>Plegadis falcinellus</i>	Ibis, Glossy	Unlisted	LC
<i>Bostrychia hagedash</i>	Ibis, Hadedda	Unlisted	LC
<i>Vidua funerea</i>	Indigobird, Dusky	Unlisted	LC
<i>Vidua chalybeata</i>	Indigobird, Village	Unlisted	LC
<i>Actophilornis africanus</i>	Jacana, African	Unlisted	LC
<i>Falco rupicoloides</i>	Kestrel, Greater	Unlisted	LC
<i>Falco naumanni</i>	Kestrel, Lesser	Unlisted	LC
<i>Falco rupicolus</i>	Kestrel, Rock	Unlisted	Unlisted
<i>Halcyon albiventris</i>	Kingfisher, Brown-hooded	Unlisted	LC
<i>Megaceryle maximus</i>	Kingfisher, Giant	Unlisted	Unlisted
<i>Alcedo semitorquata</i>	Kingfisher, Half-collared	NT	LC
<i>Alcedo cristata</i>	Kingfisher, Malachite	Unlisted	Unlisted
<i>Ceryle rudis</i>	Kingfisher, Pied	Unlisted	LC
<i>Halcyon chelicuti</i>	Kingfisher, Striped	Unlisted	LC
<i>Halcyon senegalensis</i>	Kingfisher, Woodland	Unlisted	LC
<i>Milvus migrans</i>	Kite, Black	Unlisted	LC
<i>Elanus caeruleus</i>	Kite, Black-shouldered	Unlisted	LC
<i>Milvus aegyptius</i>	Kite, Yellow-billed	Unlisted	Unlisted
<i>Eupodotis caerulescens</i>	Korhaan, Blue	LC	NT
<i>Afrotis afraoides</i>	Korhaan, Northern Black	Unlisted	LC
<i>Eupodotis senegalensis</i>	Korhaan, White-bellied	VU	LC
<i>Vanellus senegallus</i>	Lapwing, African Wattled	Unlisted	LC
<i>Vanellus armatus</i>	Lapwing, Blacksmith	Unlisted	LC
<i>Vanellus coronatus</i>	Lapwing, Crowned	Unlisted	LC
<i>Mirafrja marjoriae</i>	Lark, Agulhas Clapper	Unlisted	Unlisted
<i>Spizocorys fringillaris</i>	Lark, Botha's	EN	EN
<i>Mirafrja apiata</i>	Lark, Cape Clapper	Unlisted	LC
<i>Mirafrja fasciolata</i>	Lark, Eastern Clapper	Unlisted	LC
<i>Certhilauda semitorquata</i>	Lark, Eastern Long-billed	Unlisted	LC
<i>Mirafrja rufocinnamomea</i>	Lark, Flappet	Unlisted	LC
<i>Mirafrja cheniana</i>	Lark, Melodious	LC	LC
<i>Spizocorys conirostris</i>	Lark, Pink-billed	Unlisted	LC
<i>Calandrella cinerea</i>	Lark, Red-capped	Unlisted	LC
<i>Mirafrja africana</i>	Lark, Rufous-naped	Unlisted	LC
<i>Calendulauda sabota</i>	Lark, Sabota	Unlisted	LC
<i>Chersomanes albofasciata</i>	Lark, Spike-heeled	Unlisted	LC

Kranspoort Feedlot

<i>Macronyx capensis</i>	Longclaw, Cape	Unlisted	LC
<i>Spermestes cucullatus</i>	Mannikin, Bronze	Unlisted	Unlisted
<i>Circus ranivorus</i>	Marsh-harrier, African	EN	LC
<i>Riparia cincta</i>	Martin, Banded	Unlisted	LC
<i>Riparia paludicola</i>	Martin, Brown-throated	Unlisted	LC
<i>Hirundo fuligula</i>	Martin, Rock	Unlisted	Unlisted
<i>Riparia riparia</i>	Martin, Sand	Unlisted	LC
<i>Gallinula angulata</i>	Moorhen, Lesser	Unlisted	LC
<i>Urocolius indicus</i>	Mousebird, Red-faced	Unlisted	LC
<i>Colius striatus</i>	Mousebird, Speckled	Unlisted	LC
<i>Acridotheres tristis</i>	Myna, Common	Unlisted	LC
<i>Cisticola fulvicapilla</i>	Neddicky, Neddicky	Unlisted	LC
<i>Nycticorax nycticorax</i>	Night-Heron, Black-crowned	Unlisted	LC
<i>Caprimulgus pectoralis</i>	Nightjar, Fiery-necked	Unlisted	LC
<i>Caprimulgus tristigma</i>	Nightjar, Freckled	Unlisted	LC
<i>Caprimulgus rufigena</i>	Nightjar, Rufous-cheeked	Unlisted	LC
<i>Columba arquatrix</i>	Olive-pigeon, African	Unlisted	LC
<i>Oriolus larvatus</i>	Oriole, Black-headed	Unlisted	LC
<i>Oriolus oriolus</i>	Oriole, Eurasian Golden	Unlisted	LC
<i>Pandion haliaetus</i>	Osprey, Osprey	Unlisted	LC
<i>Struthio camelus</i>	Ostrich, Common	Unlisted	LC
<i>Tyto alba</i>	Owl, Barn	Unlisted	LC
<i>Asio capensis</i>	Owl, Marsh	Unlisted	LC
<i>Glaucidium perlatum</i>	Owlet, Pearl-spotted	Unlisted	LC
<i>Buphagus erythrorhynchus</i>	Oxpecker, Red-billed	Unlisted	Unlisted
<i>Cypsiurus parvus</i>	Palm-swift, African	Unlisted	LC
<i>Terpsiphone viridis</i>	Paradise-flycatcher, African	Unlisted	LC
<i>Vidua paradisaea</i>	Paradise-whydah, Long-tailed	Unlisted	LC
<i>Petronia supercilialis</i>	Petronia, Yellow-throated	Unlisted	LC
<i>Columba guinea</i>	Pigeon, Speckled	Unlisted	LC
<i>Anthus cinnamomeus</i>	Pipit, African	Unlisted	LC
<i>Anthus vaalensis</i>	Pipit, Buffy	Unlisted	LC
<i>Anthus caffer</i>	Pipit, Bushveld	Unlisted	LC
<i>Anthus similis</i>	Pipit, Long-billed	Unlisted	LC
<i>Anthus leucophrys</i>	Pipit, Plain-backed	Unlisted	LC
<i>Anthus lineiventris</i>	Pipit, Striped	Unlisted	LC
<i>Charadrius pecuarius</i>	Plover, Kittlitz's	Unlisted	LC
<i>Charadrius tricollaris</i>	Plover, Three-banded	Unlisted	LC
<i>Netta rufina</i>	Pochard, Red-crested	Unlisted	LC
<i>Netta erythrophthalma</i>	Pochard, Southern	Unlisted	LC
<i>Glareola nordmanni</i>	Pratincole, Black-winged	NT	NT
<i>Prinia flavicans</i>	Prinia, Black-chested	Unlisted	LC
<i>Prinia hypoxantha</i>	Prinia, Drakensberg	Unlisted	LC
<i>Prinia subflava</i>	Prinia, Tawny-flanked	Unlisted	LC

Kranspoort Feedlot

<i>Dryoscopus cubla</i>	Puffback, Black-backed	Unlisted	LC
<i>Pytilia melba</i>	Pytilia, Green-winged	Unlisted	LC
<i>Coturnix coturnix</i>	Quail, Common	Unlisted	LC
<i>Coturnix delegorguei</i>	Quail, Harlequin	Unlisted	LC
<i>Ortygospiza atricollis</i>	Quailfinch, African	Unlisted	LC
<i>Quelea quelea</i>	Quelea, Red-billed	Unlisted	LC
<i>Rallus caerulescens</i>	Rail, African	Unlisted	LC
<i>Acrocephalus baeticatus</i>	Reed-warbler, African	Unlisted	Unlisted
<i>Acrocephalus arundinaceus</i>	Reed-warbler, Great	Unlisted	LC
<i>Cossypha caffra</i>	Robin-chat, Cape	Unlisted	LC
<i>Cossypha humeralis</i>	Robin-chat, White-throated	Unlisted	LC
<i>Monticola rupestris</i>	Rock-thrush, Cape	Unlisted	LC
<i>Coracias garrulus</i>	Roller, European	NT	LC
<i>Philomachus pugnax</i>	Ruff, Ruff	Unlisted	LC
<i>Bradypterus baboecala</i>	Rush-warbler, Little	Unlisted	LC
<i>Actitis hypoleucos</i>	Sandpiper, Common	Unlisted	LC
<i>Calidris ferruginea</i>	Sandpiper, Curlew	LC	NT
<i>Tringa stagnatilis</i>	Sandpiper, Marsh	Unlisted	LC
<i>Tringa glareola</i>	Sandpiper, Wood	Unlisted	LC
<i>Rhinopomastus cyanomelas</i>	Scimitarbill, Common	Unlisted	LC
<i>Otus senegalensis</i>	Scops-owl, African	Unlisted	LC
<i>Sagittarius serpentarius</i>	Secretarybird, Secretarybird	VU	VU
<i>Crithagra gularis</i>	Seedeater, Streaky-headed	Unlisted	LC
<i>Tadorna cana</i>	Shelduck, South African	Unlisted	LC
<i>Anas smithii</i>	Shoveler, Cape	Unlisted	LC
<i>Lanius minor</i>	Shrike, Lesser Grey	Unlisted	LC
<i>Lanius collurio</i>	Shrike, Red-backed	Unlisted	LC
<i>Circaetus pectoralis</i>	Snake-eagle, Black-chested	Unlisted	LC
<i>Circaetus cinereus</i>	Snake-eagle, Brown	Unlisted	LC
<i>Gallinago nigripennis</i>	Snipe, African	Unlisted	LC
<i>Ploceus velatus</i>	Southern Masked-weaver, Southern	Unlisted	LC
<i>Passer melanurus</i>	Sparrow, Cape	Unlisted	LC
<i>Passer domesticus</i>	Sparrow, House	Unlisted	LC
<i>Passer griseus</i>	Sparrow, Northern Grey-headed	Unlisted	LC
<i>Passer diffusus</i>	Sparrow, Southern Grey-headed	Unlisted	LC
<i>Accipiter melanoleucus</i>	Sparrowhawk, Black	Unlisted	LC
<i>Eremopterix leucotis</i>	Sparrowlark, Chestnut-backed	Unlisted	LC
<i>Plocepasser mahali</i>	Sparrow-weaver, White-browed	Unlisted	LC
<i>Platalea alba</i>	Spoonbill, African	Unlisted	LC
<i>Pternistis natalensis</i>	Spurfowl, Natal	Unlisted	LC
<i>Pternistis swainsonii</i>	Spurfowl, Swainson's	Unlisted	LC

Kranspoort Feedlot

<i>Lamprotornis nitens</i>	Starling, Cape Glossy	Unlisted	LC
<i>Spreo bicolor</i>	Starling, Pied	Unlisted	Unlisted
<i>Onychognathus morio</i>	Starling, Red-winged	Unlisted	LC
<i>Cinnyricinclus leucogaster</i>	Starling, Violet-backed	Unlisted	LC
<i>Himantopus himantopus</i>	Stilt, Black-winged	Unlisted	LC
<i>Calidris minuta</i>	Stint, Little	LC	LC
<i>Saxicola torquatus</i>	Stonechat, African	Unlisted	LC
<i>Ciconia abdimii</i>	Stork, Abdim's	NT	LC
<i>Ciconia nigra</i>	Stork, Black	VU	LC
<i>Ciconia ciconia</i>	Stork, White	Unlisted	LC
<i>Mycteria ibis</i>	Stork, Yellow-billed	EN	LC
<i>Chalcomitra amethystina</i>	Sunbird, Amethyst	Unlisted	LC
<i>Cinnyris afer</i>	Sunbird, Greater Double-collared	Unlisted	LC
<i>Nectarinia famosa</i>	Sunbird, Malachite	Unlisted	LC
<i>Cinnyris mariquensis</i>	Sunbird, Marico	Unlisted	LC
<i>Chalcomitra senegalensis</i>	Sunbird, Scarlet-chested	Unlisted	LC
<i>Cinnyris talatala</i>	Sunbird, White-bellied	Unlisted	LC
<i>Hirundo rustica</i>	Swallow, Barn	Unlisted	LC
<i>Hirundo cucullata</i>	Swallow, Greater Striped	Unlisted	LC
<i>Hirundo abyssinica</i>	Swallow, Lesser Striped	Unlisted	LC
<i>Hirundo dimidiata</i>	Swallow, Pearl-breasted	Unlisted	LC
<i>Hirundo semirufa</i>	Swallow, Red-breasted	Unlisted	LC
<i>Hirundo albigularis</i>	Swallow, White-throated	Unlisted	LC
<i>Porphyrio madagascariensis</i>	Swamp-hen, African Purple	Unlisted	Unlisted
<i>Acrocephalus gracilirostris</i>	Swamp-warbler, Lesser	Unlisted	LC
<i>Apus barbatus</i>	Swift, African Black	Unlisted	LC
<i>Tachymarptis melba</i>	Swift, Alpine	Unlisted	LC
<i>Apus apus</i>	Swift, Common	Unlisted	LC
<i>Apus horus</i>	Swift, Horus	Unlisted	LC
<i>Apus affinis</i>	Swift, Little	Unlisted	LC
<i>Tchagra senegalus</i>	Tchagra, Black-crowned	Unlisted	LC
<i>Anas capensis</i>	Teal, Cape	Unlisted	LC
<i>Anas hottentota</i>	Teal, Hottentot	Unlisted	LC
<i>Anas erythrorhyncha</i>	Teal, Red-billed	Unlisted	LC
<i>Sterna caspia</i>	Tern, Caspian	VU	LC
<i>Chlidonias hybrida</i>	Tern, Whiskered	Unlisted	LC
<i>Chlidonias leucopterus</i>	Tern, White-winged	Unlisted	LC
<i>Burhinus capensis</i>	Thick-knee, Spotted	Unlisted	LC
<i>Burhinus vermiculatus</i>	Thick-knee, Water	Unlisted	LC
<i>Psophocichla litsipsirupa</i>	Thrush, Groundscraper	Unlisted	Unlisted
<i>Turdus smithi</i>	Thrush, Karoo	Unlisted	LC
<i>Turdus libonyanus</i>	Thrush, Kurrichane	Unlisted	Unlisted
<i>Turdus olivaceus</i>	Thrush, Olive	Unlisted	LC
<i>Pogoniulus chrysoconus</i>	Tinkerbird, Yellow-fronted	Unlisted	LC

www.thebiodiversitycompany.com

info@thebiodiversitycompany.com

Kranspoort Feedlot

<i>Parus niger</i>	Tit, Southern Black	Unlisted	Unlisted
<i>Gallirex porphyreolophus</i>	Turaco, Purple-crested	Unlisted	LC
<i>Streptopelia capicola</i>	Turtle-dove, Cape	Unlisted	LC
<i>Motacilla aguimp</i>	Wagtail, African Pied	Unlisted	LC
<i>Motacilla capensis</i>	Wagtail, Cape	Unlisted	LC
<i>Motacilla clara</i>	Wagtail, Mountain	Unlisted	LC
<i>Sylvia borin</i>	Warbler, Garden	Unlisted	LC
<i>Acrocephalus palustris</i>	Warbler, Marsh	Unlisted	LC
<i>Acrocephalus schoenobaenus</i>	Warbler, Sedge	Unlisted	LC
<i>Phylloscopus trochilus</i>	Warbler, Willow	Unlisted	LC
<i>Estrilda erythronotos</i>	Waxbill, Black-faced	Unlisted	LC
<i>Uraeginthus angolensis</i>	Waxbill, Blue	Unlisted	LC
<i>Estrilda astrild</i>	Waxbill, Common	Unlisted	LC
<i>Amandava subflava</i>	Waxbill, Orange-breasted	Unlisted	Unlisted
<i>Ploceus capensis</i>	Weaver, Cape	Unlisted	LC
<i>Amblyospiza albifrons</i>	Weaver, Thick-billed	Unlisted	LC
<i>Ploceus cucullatus</i>	Weaver, Village	Unlisted	LC
<i>Oenanthe pileata</i>	Wheatear, Capped	Unlisted	LC
<i>Oenanthe monticola</i>	Wheatear, Mountain	Unlisted	LC
<i>Zosterops virens</i>	White-eye, Cape	Unlisted	LC
<i>Zosterops pallidus</i>	White-eye, Orange River	Unlisted	LC
<i>Vidua macroura</i>	Whydah, Pin-tailed	Unlisted	LC
<i>Euplectes axillaris</i>	Widowbird, Fan-tailed	Unlisted	LC
<i>Euplectes progne</i>	Widowbird, Long-tailed	Unlisted	LC
<i>Euplectes ardens</i>	Widowbird, Red-collared	Unlisted	LC
<i>Euplectes albonotatus</i>	Widowbird, White-winged	Unlisted	LC
<i>Turtur chalcospilos</i>	Wood-dove, Emerald-spotted	Unlisted	LC
<i>Phoeniculus purpureus</i>	Wood-hoopoe, Green	Unlisted	LC
<i>Dendropicos fuscescens</i>	Woodpecker, Cardinal	Unlisted	LC
<i>Campethera abingoni</i>	Woodpecker, Golden-tailed	Unlisted	LC
<i>Jynx ruficollis</i>	Wryneck, Red-throated	Unlisted	LC
<i>Apus caffer</i>	Swift, White-rumped	Unlisted	LC

APPENDIX C: Mammals species expected to occur in the Project area

Species	Common name	Conservation Status	
		Regional (SANBI, 2016)	IUCN (2017)
<i>Aethomys ineptus</i>	Tete Veld Rat	LC	LC
<i>Alcelaphus buselaphus</i>	Red Hartebeest	LC	LC
<i>Antidorcas marsupialis</i>	Springbok	LC	LC
<i>Aonyx capensis</i>	Cape Clawless Otter	NT	NT
<i>Atelerix frontalis</i>	Southern African Hedgehog	NT	LC
<i>Atilax paludinosus</i>	Water Mongoose	LC	LC
<i>Canis mesomelas</i>	Black-backed Jackal	LC	LC
<i>Caracal caracal</i>	Caracal	LC	LC
<i>Ceratotherium simum</i>	White Rhinoceros	NT	NT
<i>Cercopithecus pygerythrus</i>	Vervet Monkey	LC	LC
<i>Cloeotis percivali</i>	Short-eared Trident Bat	EN	LC
<i>Connochaetes gnou</i>	Black Wildebeest	LC	LC
<i>Connochaetes taurinus</i>	Blue Wildebeest	LC	LC
<i>Crocidura cyanea</i>	Reddish-grey Musk Shrew	LC	LC
<i>Crocidura maquassiensis</i>	Swamp Musk Shrew	NT	LC
<i>Crocidura silacea</i>	Lesser Grey-brown Musk Shrew	LC	LC
<i>Cryptomys hottentotus</i>	Common Mole-rat	LC	LC
<i>Cynictis penicillata</i>	Yellow Mongoose	LC	LC
<i>Damaliscus pygargus</i>	Blesbok	LC	LC
<i>Dasymys incomtus</i>	African Marsh Rat	NT	LC
<i>Dendromus melanotis</i>	Grey Climbing Mouse	LC	LC
<i>Diceros bicornis</i>	Black Rhinoceros	EN	CR
<i>Eidolon helvum</i>	African Straw-colored Fruit Bat	LC	NT
<i>Elephantulus brachyrhynchus</i>	Short-snouted Sengi	LC	LC
<i>Elephantulus myurus</i>	Eastern Rock Sengi	LC	LC
<i>Eptesicus hottentotus</i>	Long-tailed Serotine Bat	LC	LC
<i>Equus quagga</i>	Plains Zebra	LC	NT
<i>Felis nigripes</i>	Black-footed Cat	VU	VU
<i>Felis silvestris</i>	Wildcat	LC	LC
<i>Galago moholi</i>	Southern Lesser Galago	LC	LC
<i>Genetta genetta</i>	Small-spotted Genet	LC	LC
<i>Genetta maculata</i>	Rusty-spotted Genet	LC	LC
<i>Gerbilliscus brantsii</i>	Highveld Gerbil	LC	LC
<i>Gerbilliscus leucogaster</i>	Bushveld Gerbil	LC	LC
<i>Herpestes sanguineus</i>	Slender Mongoose	LC	LC
<i>Hydrictis maculicollis</i>	Spotted-necked Otter	VU	NT
<i>Hystrix africaeaustralis</i>	Cape Porcupine	LC	LC
<i>Ichneumia albicauda</i>	White-tailed Mongoose	LC	LC
<i>Ictonyx striatus</i>	Striped Polecat	LC	LC
<i>Kerivoula lanosa</i>	Lesser Woolly Bat	LC	LC

Kranspoort Feedlot

<i>Kobus ellipsiprymnus</i>	Waterbuck	LC	LC
<i>Leptailurus serval</i>	Serval	NT	LC
<i>Lepus saxatilis</i>	Scrub Hare	LC	LC
<i>Lepus victoriae</i>	African Savanna Hare	LC	LC
<i>Mastomys coucha</i>	Multimammate Mouse	LC	LC
<i>Mastomys natalensis</i>	Natal Multimammate Mouse	LC	LC
<i>Mellivora capensis</i>	Honey Badger	LC	LC
<i>Micaelamys namaquensis</i>	Namaqua Rock Mouse	LC	LC
<i>Mungos mungo</i>	Banded Mongoose	LC	LC
<i>Mus musculus</i>	House Mouse	Unlisted	LC
<i>Myotis welwitschii</i>	Welwitsch's Hairy Bat	LC	LC
<i>Mystromys albicaudatus</i>	White-tailed Rat	VU	EN
<i>Neoromicia capensis</i>	Cape Serotine Bat	LC	LC
<i>Neoromicia zuluensis</i>	Aloe Bat	LC	LC
<i>Nycteris thebaica</i>	Egyptian Slit-faced Bat	LC	LC
<i>Orycteropus afer</i>	Aardvark	LC	LC
<i>Oryx gazella</i>	Gemsbok	LC	LC
<i>Otomys angoniensis</i>	Angoni Vlei Rat	LC	LC
<i>Otomys irroratus</i>	Vlei Rat (Fynbos type)	LC	LC
<i>Ourebia ourebi</i>	Oribi	EN	LC
<i>Panthera pardus</i>	Leopard	VU	VU
<i>Papio ursinus</i>	Chacma Baboon	LC	LC
<i>Parahyaena brunnea</i>	Brown Hyaena	NT	NT
<i>Pedetes capensis</i>	Springhare	LC	LC
<i>Pelea capreolus</i>	Grey Rhebok	NT	LC
<i>Poecilogale albinucha</i>	African Striped Weasel	NT	LC
<i>Procavia capensis</i>	Rock Hyrax	LC	LC
<i>Pronolagus randensis</i>	Jameson's Red Rock Hare	LC	LC
<i>Pronolagus saundersiae</i>	Hewitt's Red Rock Rabbit	LC	LC
<i>Proteles cristata</i>	Aardwolf	LC	LC
<i>Raphicerus campestris</i>	Steenbok	LC	LC
<i>Rattus rattus</i>	House Rat	Exotic	LC
<i>Redunca fulvorufula</i>	Mountain Reedbuck	EN	LC
<i>Rhabdomys pumilio</i>	Xeric Four-striped Mouse	LC	LC
<i>Rhinolophus clivus</i>	Geoffroy's Horseshoe Bat	LC	LC
<i>Rhinolophus darlingi</i>	Darling's Horseshoe Bat	LC	LC
<i>Saccostomus campestris</i>	Pouched Mouse	LC	LC
<i>Scotophilus dinganii</i>	Yellow House Bat	LC	LC
<i>Steatomys pratensis</i>	Fat Mouse	LC	LC
<i>Suncus varilla</i>	Lesser Dwarf Shrew	LC	LC
<i>Suricata suricatta</i>	Meerkat	LC	LC
<i>Sylvicapra grimmia</i>	Common Duiker	LC	LC
<i>Syncerus caffer</i>	African Buffalo	LC	LC
<i>Taphozous mauritianus</i>	Mauritian Tomb Bat	LC	LC

Kranspoort Feedlot

<i>Thryonomys swinderianus</i>	Greater Cane Rat	LC	LC
<i>Tragelaphus oryx</i>	Common Eland	LC	LC
<i>Tragelaphus strepsiceros</i>	Greater Kudu	LC	LC
<i>Vulpes chama</i>	Cape Fox	LC	LC

APPENDIX D: Reptile species expected to occur within the Project area

Species	Common name	Conservation Status	
		Regional (SANBI, 2016)	IUCN (2017)
<i>Aparallactus capensis</i>	Black-headed Centipede-eater	LC	LC
<i>Acontias gracilicauda</i>	Thin-tailed Legless Skink	LC	LC
<i>Afrotyphlops bibronii</i>	Bibron's Blind Snake	LC	LC
<i>Agama atra</i>	Southern Rock Agama	LC	LC
<i>Aparallactus capensis</i>	Black-headed Centipede-eater	LC	LC
<i>Atractaspis bibronii</i>	Bibron's Stiletto Snake	LC	Unlisted
<i>Boaedon capensis</i>	Brown House Snake	LC	Unlisted
<i>Causus rhombeatus</i>	Rhombic Night Adder	LC	Unlisted
<i>Chamaeleo dilepis</i>	Common Flap-neck Chameleon	LC	LC
<i>Cordylus vittifer</i>	Common Girdled Lizard	LC	LC
<i>Crocodylus niloticus</i>	Nile Crocodile	VU	LC
<i>Dasypeltis scabra</i>	Rhombic Egg-eater	LC	LC
<i>Duberria lutrix</i>	South African Slug-eater	LC	LC
<i>Gerrhosaurus flavigularis</i>	Yellow-throated Plated Lizard	LC	Unlisted
<i>Hemachatus haemachatus</i>	Rinkhals	LC	LC
<i>Hemidactylus mabouia</i>	Common Tropical House Gecko	LC	Unlisted
<i>Lamprophis aurora</i>	Aurora House Snake	LC	LC
<i>Lycodonomorphus inornatus</i>	Olive House Snake	LC	LC
<i>Lycodonomorphus rufulus</i>	Brown Water Snake	LC	Unlisted
<i>Lygodactylus capensis capensis</i>	Common Dwarf Gecko	LC	Unlisted
<i>Pachydactylus affinis</i>	Transvaal Gecko	LC	LC
<i>Pachydactylus vansoni</i>	Van Son's Gecko	LC	LC
<i>Prosymna ambigua</i>	East African Shovel-Snout	LC	LC
<i>Psammophis subtaeniatus</i>	Stripe-bellied Sand Snake	LC	LC
<i>Psammophylax tritaeniatus</i>	Striped Skaapsteker	LC	LC
<i>Stigmochelys pardalis</i>	Leopard Tortoise	LC	LC
<i>Telescopus semiannulatus</i>	Eastern Tiger Snake	LC	Unlisted
<i>Trachylepis punctatissima</i>	Speckled Rock Skink	LC	LC
<i>Trachylepis varia</i>	Variable Skink	LC	LC
<i>Chamaeleo dilepis</i>	Common Flap-neck Chameleon	LC	LC
<i>Crocodylus niloticus</i>	Nile Crocodile	VU	LC
<i>Dasypeltis scabra</i>	Rhombic Egg-eater	LC	LC
<i>Duberria lutrix</i>	South African Slug-eater	LC	LC
<i>Hemachatus haemachatus</i>	Rinkhals	LC	LC
<i>Lamprophis aurora</i>	Aurora House Snake	LC	LC
<i>Lycodonomorphus inornatus</i>	Olive House Snake	LC	LC
<i>Prosymna ambigua</i>	East African Shovel-Snout	LC	LC
<i>Psammophis subtaeniatus</i>	Stripe-bellied Sand Snake	LC	LC
<i>Psammophylax tritaeniatus</i>	Striped Skaapsteker	LC	LC
<i>Trachylepis punctatissima</i>	Speckled Rock Skink	LC	LC

Kranspoort Feedlot

<i>Agama atra</i>	Southern Rock Agama	LC	LC
<i>Boaedon capensis</i>	Brown House Snake	LC	Unlisted
<i>Lycodonomorphus rufulus</i>	Brown Water Snake	LC	Unlisted
<i>Psammophylax rhombeatus</i>	Spotted Grass Snake	LC	Unlisted
<i>Trachylepis varia</i>	Variable Skink	LC	LC

APPENDIX E: *Amphibian species expected to occur within the Project area*

Species	Common name	Conservation Status	
		Regional (SANBI, 2016)	IUCN (2017)
<i>Amietia angolensis</i>	Angola river frog	LC	LC
<i>Amietia delalandii</i>	Delalande's River Frog	LC	Unlisted
<i>Cacosternum boettgeri</i>	Common Caco	LC	LC
<i>Kassina senegalensis</i>	Bubbling Kassina	LC	LC
<i>Phrynobatrachus natalensis</i>	Snoring Puddle Frog	LC	LC
<i>Ptychadena porosissima</i>	Striped Grass Frog	LC	LC
<i>Pyxicephalus adspersus</i>	Giant Bull Frog	NT	LC
<i>Schismaderma carens</i>	Red Toad	LC	LC
<i>Sclerophrys capensis</i>	Raucous Toad	LC	LC
<i>Sclerophrys garmani</i>	Olive Toad	LC	LC
<i>Sclerophrys gutturalis</i>	Guttural Toad	LC	LC
<i>Semnodactylus wealii</i>	Rattling Frog	LC	LC
<i>Strongylopus fasciatus</i>	Striped Stream Frog	LC	LC
<i>Strongylopus grayii</i>	Clicking Stream Frog	LC	LC
<i>Tomopterna cryptotis</i>	Tremelo Sand Frog	LC	LC
<i>Tomopterna natalensis</i>	Natal Sand Frog	LC	LC
<i>Tomopterna tandyi</i>	Tandy's Sand Frog	LC	LC

APPENDIX

G EMPR



DEPARTMENT OF RURAL DEVELOPMENT AND LAND REFORM

PROPOSED ANIMAL FEEDLOT, MPUMALANGA

DRAFT ENVIRONMENTAL MANAGEMENT PROGRAMME

04 JULY 2018

PUBLIC





PROPOSED ANIMAL FEEDLOT, MPUMALANGA DRAFT ENVIRONMENTAL MANAGEMENT PROGRAMME

DEPARTMENT OF RURAL DEVELOPMENT AND
LAND REFORM

TYPE OF DOCUMENT (VERSION)
PUBLIC

PROJECT NO.: 41100804
DATE: JULY 2018

WSP
BUILDING C, KNIGHTSBRIDGE
33 SLOANE STREET
BRYANSTON, 2191
SOUTH AFRICA

T: T +27 11 361 1380
F: +27 11 361 1301
WSP.COM

QUALITY MANAGEMENT

ISSUE/REVISION	FIRST ISSUE	REVISION 1	REVISION 2	REVISION 3
Remarks	Draft EMPR			
Date	July 2018			
Prepared by	Tutayi Chifadza			
Signature				
Checked by	Robert Els			
Signature				
Authorised by	Anri Scheepers			
Signature				
Project number	41100804			
Report number	01			
File reference	W:\000 NEW Projects\41100804 - Feedlot EIA in Kranspoort Mpumalanga\42 ES\2-REPORTS\01-Draft\2.4. EMPr			

SIGNATURES

PREPARED BY

Mr Tutayi Chifadza,
Assistant Consultant

REVIEWED BY

Mrs Anri Scheepers
Senior Associate

This report was prepared by WSP Environmental Proprietary Limited for the account of DEPARTMENT OF RURAL DEVELOPMENT AND LAND REFORM, in accordance with the professional services agreement. The disclosure of any information contained in this report is the sole responsibility of the intended recipient. The material in it reflects WSP Environmental Proprietary Limited's best judgement in light of the information available to it at the time of preparation. Any use which a third party makes of this report, or any reliance on or decisions to be made based on it, are the responsibility of such third parties. WSP Environmental Proprietary Limited accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report. This limitations statement is considered part of this report.

The original of the technology-based document sent herewith has been authenticated and will be retained by WSP for a minimum of ten years. Since the file transmitted is now out of WSP's control and its integrity can no longer be ensured, no guarantee may be given to by any modifications to be made to this document.

PRODUCTION TEAM

DEPARTMENT OF RURAL DEVELOPMENT AND LAND REFORM

Environmental Specialist Todi Netshitangani

Project Manager Xoliswa Ncgobo

WSP

Consultant Tutayi Chifadza

Principal Consultant Anri Scheepers

TABLE OF CONTENTS

1	INTRODUCTION	11
1.1	Background.....	11
1.2	Terms of Reference	12
1.3	Environmental Management Programme Structure	12
1.4	Applicable Documentation	14
2	GOVERNANCE FRAMEWORK	15
3	PROJECT DESCRIPTION	19
3.1	Location of the Proposed Development	19
3.2	Layout and Description	20
3.3	Scope of Proposed Activity Requiring Authorisation	21
3.4	Operational Activities	24
3.5	Decommissioning Activities	26
3.6	Need and Justification	26
4	IMPACT ASSESSMENT	27
5	ENVIRONMENTAL MANAGEMENT OBJECTIVES	29
5.1	Environmental Objectives and Targets.....	29
6	MANAGEMENT PROCEDURES AND ADMINISTRATIVE REQUIREMENTS.....	31
6.1	Organisational Structure and Responsibilities	31
6.2	Environmental Awareness Plan.....	32
6.3	Monitoring	34
6.4	Non-Conformance and Corrective Action	34
6.5	Documentation and Reporting.....	34

7	ENVIRONMENTAL MANAGEMENT PROGRAMME	36
8	CONCLUSION	63

TABLES

TABLE 1-1:	DETAILS OF THE ENVIRONMENTAL ASSESSMENT PRACTITIONER	12
TABLE 1-2:	LEGISLATION REQUIREMENTS AS DETAILED IN APPENDIX 4 OF GNR 326	12
TABLE 2-1:	APPLICABLE LEGISLATION AND POLICIES	15
TABLE 3-1:	CADASTRAL INFORMATION OF THE SITE	20
TABLE 3-2:	WASTE MANAGEMENT OPTIONS	23
TABLE 4-1:	IMPACT SUMMARY	27
TABLE 6-1:	ROLES AND RESPONSIBILITIES	31
TABLE 7-1:	STRUCTURE OF EMPR	36
TABLE 7-2:	ENVIRONMENTAL MANAGEMENT PROGRAMME	37

FIGURES

FIGURE 1-1:	KRANSPOORT 255 JS LOCALITY MAP	11
FIGURE 3-1:	LAYOUT MAP SHOWING THE LOCATION OF THE FARM AND THE PREFERRED SITE	19
FIGURE 3-2:	ACCESSIBILITY TO THE SITE	22

APPENDICES

A	EAP CV
B	EAP DECLARATION OF INTEREST AND UNDERTAKING
C	LAYOUT MAPS
D	EMERGENCY RESPONSE PLAN

GLOSSARY

ACRONYM	MEANING
BA	Basic Assessment
BAR	Basic Assessment Report
DRDLR	Department of Rural Development and Land Reform
EA	Environmental Authorisation
EAP	Environmental Assessment Practitioner
EIA	Environmental Impact Assessment
EIAR	Environmental Impact Assessment Report
EMPr	Environmental Management Programme Report
FPSU	Farmer Production Support Unit
NEMA	National Environmental Management Act
NEM:WA	National Environmental Management: Waste Act
NWA	National Water Act
SAHRA	South African Heritage Resource Agency
SHE	Safety, Health and Environmental
WSP	WSP Environmental (Pty) Ltd

1 INTRODUCTION

1.1 BACKGROUND

The Department of Rural Development and Land Reform (DRDLR) proposes to establish an animal feedlot which will function as a Farmer Production Support Unit (FPSU) on an existing farm Kranspoort 255 JS Blackwood Camp, Portion 7, in Kranspoort, Ward 11, Thembisile Hani Local Municipality, Mpumalanga (hereafter referred to as 'the Farm').

The proposed animal feedlot requires environmental authorisation (EA) in terms of the National Environmental Management Act (Act 107 of 1998), as amended (NEMA) and associated Environmental Impact Assessment (EIA) Regulations, 2014 as amended. WSP Environmental (Pty) Ltd. (WSP) has been appointed by DRDLR to undertake the independent Environmental Assessment Practitioner (EAP) function to facilitate the Basic assessment (BA) process in accordance with the EIA Regulations, 2014, as amended.

The Farm was acquired by Khula Mlimi (Pty) Ltd (hereafter Khula Mlimi), through the Mpumalanga DRDLR, in March 2015. Between 2007 and 2012 the Farm supported subsistence farming practices in the form of cattle and crop farming. In 2012 Khula Mlimi commenced commercial farming activities on the Farm in the form of cattle farming (i.e. Brahman and Bonsmara) and a small-scale feedlot. The Farm currently includes two storage facilities, two farm houses and the small-scale feedlot which currently produces 15 cattle per 4 months' cycle. Khula Mlimi approached DRDLR for financial support in order to operate a large-scale feedlot supporting local cattle farmers. It has been identified that the proposed FPSU may form part of the Nkangala District Agri-Park. **Figure 1-1** provides a locality map of the farm.



Figure 1-1: Kranspoort 255 JS Locality Map

The majority of the farmers in the area are noted to be smallholder farmers (61%). These farmers are either individual farmers or part of a co-operative. Some of the co-operative farmers are also subsistence farmers (26%) with a few head of cattle farmed for the household (i.e. which do not form part of the co-operative's activities). This is common in rural

areas where most farmers start as individual subsistence farmers. Commercial farmers within the local area were identified to make up only 13% of the captured surveys.

1.2 TERMS OF REFERENCE

WSP has been appointed by DRDLR to undertake the independent EAP function to facilitate the BA process in accordance with the EIA Regulations, 2014 as amended. The CV of the EAP is available in **Appendix A**. The EAP declaration of interest and undertaking is included in **Appendix B**. **Table 1-1** details the relevant contact details of the EAP. In order to adequately identify and assess potential environmental impacts, the EAP will be supported by a number of specialists.

Table 1-1: Details of the Environmental Assessment Practitioner

BUSINESS NAME OF EAP:	WSP ENVIRONMENTAL (PTY) LTD
Contact Person:	Tutayi Chifadza
Physical Address:	Building C, Knightsbridge, 33 Sloane Street, Bryanston
Telephone:	011 361 1390
Email:	Tutayi.Chifadza@wsp.com

1.3 ENVIRONMENTAL MANAGEMENT PROGRAMME STRUCTURE

Table 1-2 cross-references the sections within the Environmental Management Programme Report (EMPr) with the legislated requirements as per Appendix 4 of GNR 326.

Table 1-2: Legislation Requirements as Detailed in Appendix 4 of GNR 326

APPENDIX 3	LEGISLATED REQUIREMENTS AS PER THE NEMA GNR 326	RELEVANT SECTION	REPORT
(a)	Details of		
	i) the EAP who compiled the EMPr; and	Section 1.1	Appendix A
	ii) the expertise of the EAP, including a Curriculum Vitae	Section 1.1	Appendix A
(b)	Detailed description of the aspects of the activity that are covered by the EMPr as identified by the project description;	Section 3	
(c)	A map at an appropriate scale which superimposes the proposed activity, its associated structures, and infrastructure on the environmental sensitivities of the preferred site, indicating any areas that any areas that should be avoided, including buffers;	Section 3	Appendix C
(d)	A description of the impact management objectives, including management statements, identifying the impacts and risks that need to be avoided, managed and mitigated as identified through the environmental impact assessment process for all phases of the development including-		

	i) Planning and design;	Section 3
	ii) Pre-construction activities;	Section 4 Section 7
	iii) Construction activities	
	iv) Rehabilitation of the environment after construction and where applicable post closure; and	
	v) Where relevant, operation activities.	
(e)	A description and identification of impact management outcomes required for the aspects contemplated in paragraph (d);	Section 7
(f)	A description of proposed impact management actions, identifying the manner in which the impact management objectives and outcomes contemplated in paragraphs (d) and (e) will be achieved, and must, where applicable, include actions to -	
	i) Avoid, modify, remedy, control or stop any action, activity or process which causes pollution or environmental degradation;	Section 7
	ii) Comply with any prescribed environmental management standards or practices;	
	iii) comply with any applicable provisions of the Act regarding closure, where applicable; and	
	iv) Comply with any provisions of the Act regarding financial provisions for rehabilitation, where applicable	
(g)	The method of monitoring the implementation of the impact management actions contemplated in paragraph (f);	Section 6
(h)	The frequency of monitoring the implementation of the impact management actions contemplated in paragraph (f);	Section 6
(i)	An indication of the persons who will be responsible for the implementation of the impact management actions;	Section 6 Section 7
(j)	The time periods within which the impact management actions contemplated in paragraph (f) must be implemented;	Section 7
(k)	The mechanism for monitoring compliance with the impact management actions contemplated in paragraph (f);	Section 6
(l)	A program for reporting on compliance, taking into account the requirements as prescribed by the Regulations	Section 6
(m)	An environmental awareness plan describing the manner in which-	
	i) The applicant intends to inform his or her employees of any environmental risk which may result from their work; and	Section 6

	ii) Risks must be dealt with in order to avoid pollution or the degradation of the environment; and	
(n)	any specific information that may be required by the competent authority	N/A

1.4 APPLICABLE DOCUMENTATION

The following documents are to be read in conjunction with the EMPr:

- Basic Assessment Report (BAR) for the proposed animal feedlot; and
- Environmental Authorisation issued by the Department of Environmental Affairs (DEA) in terms of the NEMA (still to be issued).

2 GOVERNANCE FRAMEWORK

The South African regulatory framework establishes well-defined requirements and standards for environmental and social management of industrial and civil infrastructure developments. Environmental protection functions are carried out by different authorities at both national and regional levels. The applicable legislation and policies are shown in Table 2-1 below.

Table 2-1: Applicable Legislation and Policies

**APPLICABLE
LEGISLATION AND POLICY DESCRIPTION OF LEGISLATION**

<p>The Constitution of South Africa (No. 108 of 1996)</p>	<p>The Constitution cannot manage environmental resources as a stand-alone piece of legislation hence additional legislation has been promulgated in order to manage the various spheres of both the social and natural environment. Each promulgated Act and associated Regulations are designed to focus on various industries or components of the environment to ensure that the objectives of the Constitution are effectively implemented and upheld in an on-going basis throughout the country. In terms of Section 7, a positive obligation is placed on the State to give effect to the environmental rights.</p>
<p>National Environmental Management Act (No. 107 of 1998)</p>	<p>The National Environmental Management Act (Act 107 of 1998) (NEMA) provides for duty of care and remediation of environmental damage, imposes an obligation on the responsible person (including an owner of land or premises, a person in control of land or premises or a person who has a right to use the land or premises) to take reasonable measures to prevent such pollution or degradation from occurring, continuing or recurring, or, in so far as such harm to the environment is authorised by law or cannot reasonably be avoided or stopped, to minimise and rectify such pollution or degradation of the environment.</p> <p>NEMA, serves as the basis for all environmental frameworks in South Africa. On 4 December 2014 new EIA Regulations (GNR. 982) were promulgated in terms of Chapter 5 of the NEMA. These regulations were amended in April 2017 (GNR. 326). The EIA Regulations contain three listing notices (GNR. 324, 325 and 327) which identify activities that are subject to either a Basic Assessment (BA) or Scoping and EIA in order to obtain an EA. A Basic Assessment must be completed if the proposed project triggers activities listed in GNR. 327 (Listing Notice 1) or GNR. 324 (Listing Notice 3). Activities triggered in GNR. 325 (Listing Notice 2), require a Scoping and EIA process to be undertaken.</p>
<p><i>Listing Notice 1: GNR 327, Activity 4</i></p>	<p><i>The development and related operation of facilities or infrastructure for the concentration of animals for the purpose of commercial production in densities that exceed—</i></p> <ul style="list-style-type: none"> <i>(i) 20 square metres per large stock unit and more than 500 units per facility;</i> <i>(ii) 8 square meters per small stock unit and;</i> <p><i>a. more than 1 000 units per facility excluding pigs.</i></p> <p><i>The proposed facility entails the construction of a cattle feedlot for the red meat abattoir. The feedlot will contain 500 to 1000 cattle. This development will take place in an area of approximately 11 hectares.</i></p>

APPLICABLE

LEGISLATION AND POLICY DESCRIPTION OF LEGISLATION

<p>Listing Notice 1: GNR 327, Activity 12</p>	<p>The development of</p> <p>(ii) infrastructure or structures with a physical footprint of 100 square metres or more;</p> <p>where such development occurs—</p> <p>c) if no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse;</p> <p>The proposed feedlot facility will have a footprint of approximately 11 hectares. The proposed infrastructure will be within 32m of a watercourse.</p>
<p>Listing Notice 1: GNR 327, Activity 27</p>	<p>The clearance of an area of 1 hectare or more but less than 20 hectares of indigenous vegetation.</p> <p>The proposed feedlot facility will have a footprint of approximately 11 hectares and may require the clearance of indigenous vegetation that is more than 1 hectare.</p>
<p>National Water Act (No. 36 of 1998)</p>	<p>National Water Act (Act 36 of 1998) (NWA) aims to ensure that water resources are protected, used, developed, conserved, managed and controlled in a sustainable manner, for the benefit of everyone in South Africa. The preamble to the NWA recognises that the ultimate aim of water resource management is to achieve sustainable use of water for the benefit of all users and that the protection of the quality of water resources is necessary to ensure sustainability of the Nation's water resources in the interests of all water users. Section 19 includes various requirements to prevent and control water pollution. Potential risk to water quality during construction (spills) need to be identified and managed.</p> <p>The construction phase and operational activities of the proposed feedlot facility will require authorisation in terms of Section 21 of the National Water Act. The applicant will need to submit a water use licenses application to the Department of Water and Sanitation (DWS) for the proposed animal feedlot.</p> <p>The NWA also provides for General Authorisations (GA) for certain water uses published by way of notices in the Government Gazette. Several GAs have been published under the NWA. Each specifies the Section 21 water use and the conditions under which such water use must be conducted. Activities listed as GA's will require a Water Use Registration.</p>
<p>Section 21(a) - Taking water from a water resource</p>	<p>It is anticipated that a borehole will be constructed as part of the proposed activity, which will abstract water from water resources on site. The anticipated abstraction volumes are not yet known however, if abstraction volumes exceed the thresholds of a general authorisation a full Water Use License (WUL) will be required.</p>
<p>Section 21(b) - Storing water</p>	<p>Water abstracted from the boreholes will be stored on site in 6 x 10 000L tanks. Furthermore, a 1 500 m³ lagoon is proposed to store water from the cattle pens.</p>
<p>Section 21(c) - Impeding or diverting the flow of water in a watercourse; and</p>	<p>The proposed infrastructure will be within 500m of a wetland.</p>
<p>Section 21(i) - Altering the bed, banks, course or characteristics of a watercourse.</p>	<p>The proposed infrastructure will be within 500m of a wetland.</p>

APPLICABLE

LEGISLATION AND POLICY DESCRIPTION OF LEGISLATION

<p>National Environmental Management: Waste Act (Act No. 59 of 2008)</p>	<p>The National Environmental Management: Waste Act (Act No. 59 of 2008) (NEM:WA) is subsidiary and supporting legislation to NEMA. The NEM:WA is a framework legislation that provides the basis for the regulation of waste management in South Africa. The Act also contains policy elements and gives a mandate for further regulations to be promulgated. Subservient Regulations and Norms and Standards under the NEM:WA include:</p> <ul style="list-style-type: none"> – Waste Classification and Management Regulations (GNR 634 of 2013); – National Norms and Standards for the Assessment of Waste to Landfill Disposal (GNR 635 of 2013); – National Norms and Standards for Disposal of Waste to Landfill (GNR 636 of 2013); – National Norms and Standards for the Storage of Waste (GNR 926 of 2013); – Revised definitions of waste contained in the National Environmental Management Waste Amendment Act 26 of 2014 (GNR 449 of 2014); and – List of activities that have, or are likely to have, a detrimental effect on the environment (GNR 921 of 2013 as amended) – activities which require a Waste Management License (WML) (i.e. WML Regulations). <p>Waste management activities requiring a Waste Management (WML) are identified within GNR 921 of 2013, as amended. A person who wishes to commence, undertake or conduct a waste management activity listed under Category A, must conduct a Basic Assessment process as set out in the EIA Regulations 2014, as amended, as part of a WML application. A person who wishes to commence, undertake or conduct a waste management activity listed under Category B, must conduct a scoping and EIA as set out in the EIA Regulations 2014, as amended.</p> <p>Under the new Waste Management activities, animal manure is not regarded as waste and is defined as “a by-product which is bio-degradable in nature and could further be used for fertilization purpose” and therefore NEM:WA is not triggered thus the proposed facility does not enquire a WML.</p>
<p>National Heritage Resources Act (Act 25 of 1999)</p>	<p>The National Heritage Resources Act (Act 25 of 1999) (NHRA) provides protection of and management of conservation worthy places, areas and objects by heritage authorities, by means of registration and the implementation of certain protections. The South African Heritage Resources Agency (SAHRA) is tasked with protecting heritage resources of national significance.</p> <p>Under Section 38 “(1)...any person who intends to undertake a development categorised as - (a) the construction of a road, wall powerline, canal or other similar form of linear development exceeding 300m in length; and (i) any development or activity exceeding 5000m² in extent...must at the earliest stages of initiating such a development, notify the responsible heritage resources authority and furnish it with details regarding the location, nature and extent of the proposed development. (2) The responsible heritage resources authority must, within 14 days of receipt of a notification in terms of subsection (1) ...notify the person who intends to undertake the development to submit an impact assessment report...or (b) notify the person concerned that this section does not apply”. The proposed development will take place in an area of approximately 11 hectares and include the construction of roads and installation of water networks (i.e. linear activities) exceeding 300m. Therefore, in terms of the NHRA, the proposed development requires a Heritage Impact Assessment (HIA).</p> <p>The proposed site is located on an existing farm where agricultural activities have been conducted over the years. No discovery of heritage resources have been recorded to date. Since this is previously disturbed land, an application for exemption from a Phase One Heritage Impact Assessment (HIA) exclusion from an HIA was done for the proposed facility.</p>

APPLICABLE

LEGISLATION AND POLICY DESCRIPTION OF LEGISLATION

<p>Nkangala District Municipality Integrated Development Plan (2017/18-2021/2022)</p>	<p>The Municipal Systems Act (Act No.32 of 2000) (MSA) requires that local government structures prepare Integrated Development Plans (IDPs). The protection of economically viable ecosystems has become increasingly important in meeting the health, social, cultural and economic needs of urban communities. The approval of this application would not compromise the integrity of Nkangala municipal plans, but rather assist in meeting the national and local objectives to economic growth through the development of equitable and sustainable rural communicates and food security.</p> <p>The Nkangala Municipality is the economic hub of Mpumalanga and is rich in minerals and natural resources. The Districts' economy is dominated by electricity, manufacturing and mining. These sectors are followed by community services, trade, finance, transport, agriculture and construction. Between 2005 and 2015, the agriculture sector experienced the highest positive growth in 2008 with an average growth rate of 18.0%. The agricultural sector experienced the lowest growth for the period during 2006 at -10.9%, while the mining sector reaching its lowest point of growth in 2008 at -3.5%. Both the agriculture and mining sectors are generally characterised by volatility in growth over the period.</p>
<p>Thembisile Hani Local Municipality Integrated Development Plan</p>	<p>According to the Thembisile Hani Local Municipality IDP, a key strategic point noted is to utilise the municipal areas's agricultural potential to the maximum. The agriculture sector is an important economic activity in the Nkangala District, which should be protected and promoted through the development of supplementary activities, such as agri-processing. The municipal area is largely an agriculture suitable are, both for ploughing and stock farming. The agricultural land towards the east of Verena is predominantly utilised by large scale farmers while the agricultural land to the west of Verena in the Thembisile Hani area is utilised by local and emerging farmers. Extensive agriculture, particularly cattle and game farming is the predominant form of farming.</p> <p>A key goal of the IDP, is that rural areas should be developed into sustainable economic entities. Emphasis must be placed on facilitating the change of key rural areas/ settlements into sustainable economic entities. This requires focused development or spatial targeting, directing resources to selected areas/ nodes in response to development opportunities. Key to such an initiative is selecting programmes that reflect the diversity and uniqueness of rural communities, specifically in the agricultural, forestry and tourism industries. These three primary economic sectors are essential to the livelihood of rural areas. Hence, the presence or lack of these sectors largely determine the economic development potential of the area. Specific objectives related to agriculture include:</p> <ul style="list-style-type: none"> – Facilitate the transportation of agricultural products to international markets; – Exploit opportunities to better utilize areas with agricultural potential through infrastructure development (e.g. the establishment of Agri-hubs dams, irrigation schemes, water and sanitation infrastructure); – Enable subsistence agriculture to enter commercial markets through infrastructure development; – Upgrade access roads to irrigation schemes that have potential for expansion; and – Establish good transport linkages between agricultural areas, agro-processing plants and local markets. <p>The Provincial Growth and Development Strategy seeks to find means and ways to better utilise the natural resource base available whilst ensuring that sustainable environmental planning principles are applied.</p>

The proposed feedlot will run through the land parcel outlined in **Table 3-1** within the confines of the farm boundary.

Table 3-1: Cadastral Information of the site

DETAILS REQUIRED AS PER GN.R 326 ANNEX 1 (3)		DETAIL
21 Digit Surveyor General Code of each Cadastral Land Parcel		TOJS00000000025500007
Physical Address and Farm Name		Kranspoort Alias Blackwood Camp, Farm 255, Portion7
Landuse Zoning		Agriculture

3.2 LAYOUT AND DESCRIPTION

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

This site is close to the farmhouses as well as the storage facility intended for storage of feed. The is adjacent to the public access road that is used to gain access to neighbouring farms as well as connect to the R544. The project requires that the site be adjacent to the access road in order to make it easier to load and unload material for the project. This site is currently used for grazing and is mainly populated by grass. There are no trees that will need to be cleared when construction starts.

The reason why this site is preferred over the two alternatives presented below is because it has a size big enough to accommodate the proposed feedlot. It is also downwind of the farmhouses with regards to the general wind direction in the area since the feedlot generates odours. The downside to this site is that although it meets the size requirements, it is at least within 500 m of an underground seep wetland to the east and south of the site.

A generic / conceptual feedlot design is used by the DRDLR to assess potential business cases. Depending on the specific site requirements, different components of the generic design can be adjusted by either removing or adding components from the layout. This design is then laid out on the corresponding piece of land that is big enough to accommodate the design. The proposed conceptual layout is shown in **Appendix C** as an A3 Layout map in order to allow for clearer indication of the different facilities on the site.

The feedlot will have a chain link / diamond mesh fence around the perimeter which is 1.5m high with treated poles planted in the ground at 4m intervals. The feedlot will have a weighbridge next on the gate that is adjacent to the feedlot administration building. The proposed feedlot will have ten feedlot pens that hold 50 cattle each and two hospital pens that hold 50 cattle each. Six 10 000L water tanks are provided to store water supplied from the existing farm borehole. Water supply lines are designed to supply all feedlot and hospital pens while 2m wide drainage canals collect and transport all the waste water from the pens towards the sedimentation pit. The majority of the solids (manure and any other particles) settle at the bottom of the pit before the water is channelled towards the 1 500m³ lined lagoon. A lined overspill dam is adjacent to the lagoon to contain any spillages in the event of heavy flow. The intention is to use the water from the lagoon for irrigation, however, some of it will evaporate into the atmosphere.

Three silage bunkers are included in the facility to store the cattle feed before it is taken to the feed processing unit and supplied to the cattle. A veterinary facility will be constructed on the site to ensure the health of the cattle is maintained and prevent any possible diseases.

3.3 SCOPE OF PROPOSED ACTIVITY REQUIRING AUTHORISATION

3.3.1 EXISTING INFRASTRUCTURE AND BUILDINGS

A mesh fence surrounds the property for security purposes, however, the fence should be upgraded to ensure sufficient security for the envisioned FPSU. The site currently has 11 fenced camps for cattle, however, they are in need of upgrades as the fences are old and damaged. The camps are fitted with limited feed and water troughs. The farm currently has infrastructure for Wi-Fi services available to the FPSU employees as well as local farmers. The following existing buildings are located on the property:

- Two farmhouse (± 150 to 200m^2 each);
- Two storage facilities ($\pm 895\text{m}^2$ and $\pm 470\text{m}^2$ respectively);
- Old ruins of pig pens ($\pm 350\text{m}^2$); and
- Old concentrate dam, which is not functional.

The storage facilities have roofs and are fairly weatherproof, however, they are in need of refurbishments and can be equipped to serve one of the FPSU functions.

3.3.2 OPERATIONAL INFRASTRUCTURE

In order for the feedlot operation to be successful in producing a good quality cattle herd, certain facilities are necessary. In the planning of handling facilities for the feedlot it is important to consider the objectives of the facility. A well-designed handling facility will ensure animals are gathered safely, sorted and controlled. The following are four essential components of a well-designed facility:

SORTING PENS

Cattle are first collected from the farms or feedlot, before they are handled. The size of the sorting pens must be large enough to fit the largest animal. Each animal requires about 2m^2 of space in the sorting pen. In commercial farms or feedlots at least one sorting pen must be in the shade and be supplied with water.

CRUSHING PENS

Crushing pens are used to drive the cattle from the sorting pens to the loading platform. The crushing pens usually have a moveable gate that is used to lead the cattle into the crush. The crushing pen must be designed in a manner that the one side joins up straight (i.e. continuous with the crush). The other side must join up at about 30 degrees with the crush.

WORKING AREA

The working area is the area where the animals are handled and is situated at the end of the crush. The working area contains the following items:

- Neck clamp
- Body clamp
- Scale

LOADING PLATFORM

A loading platform must be designed in a way that the cattle can be loaded efficiently. The height of the loading platform is determined by the height of the transportation vehicle. A height of 1.1 to 1.2 m for trucks is generally accepted.

3.3.3 ACCESSIBILITY

The Farm is directly accessible from the R544 regional road. This bodes well for the proposed FPSU as this road carries large volumes of traffic daily, thus adding to good visibility and exposure to the envisioned FPSU. The Farm entrance is situated on the R544 and a gravel road extends from the entrance towards the existing built infrastructure where the main farming activities take place. The distance of the gravel road from the Farm entrance to the built infrastructure is approximately 5km. The gravel road from the Farm entrance to the built infrastructure can be upgraded to ensure that it is accessible to all modes of transport. **Figure 3-2** shows photos of the entrance to the Farm from the R544, as well as the gravel road on the Farm that leads to the existing built infrastructure.



Figure 3-2: Accessibility to the Site

3.3.4 WATER DEMAND, SUPPLY AND STORAGE

The property has access to water via three boreholes registered to the property. Only two of these boreholes are currently functional. Six 10 000L water tanks will be kept on the site to store and provide water for use on the feedlot. The water will be supplied from the available boreholes. A dam is located on the property and can serve as a secondary water source if equipped with the necessary equipment (pipes and pump). A lagoon will be placed on the site to collect the effluent water from the feedlot. This effluent water will be used to irrigate the palatable grass that will be used as cattle feed.

3.3.5 ELECTRICITY DEMAND AND SUPPLY

The site currently provided with three-phased electricity via a transformer located on the Farm, however, not all the existing buildings are connected to the electricity infrastructure. The electricity infrastructure needs to be serviced and all the relevant buildings should be connected to the three-phased electricity transformer by the electricity supplier.

3.3.6 HANDLING AND STORAGE OF WASTE AND WASTEWATER

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

In order to harness the economic value of manure, to enhance the health of cattle and to reduce the generation of dust, the manure-soil mixture will be removed from the feedlot pens, and thus has necessitated the establishment of a temporary manure storage facility.

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

Manure generated on site will thus be managed through the application of a simple management actions set out as the following:

- Manure generated as a result of animal secretions;
- Manure decomposed or partially decomposed laying on the feedlot interface layer;
- A mixture of biodegraded manure and soil removed mechanically (with the use of a tractor, grader and front end loader);
- The mixture of biodegradable manure and soil is transported via tractor/truck to the temporary storage and composting facility; and
- The manure is temporarily stored in a designated storage facility and/or composting facility.

Waste Management at the FPSU will be undertaken in line with the Environmental Management Programme (EMPr) to consider the correct disposal of fuel, agro-chemicals as well as waste on the site. **Table 3-2** describes the four different waste products that the proposed feedlot will produce, as well as the various options to dispose of them.

Table 3-2: Waste Management Options

WASTE	TYPE OF WASTE	MANAGEMENT OPTIONS
Fuel	Hazardous	<p>Fuel spillages and contamination of water sources, especially an irrigation scheme can have serious consequences, it is important that the FPSU:</p> <ul style="list-style-type: none"> – Contact fuel supplier for disposal options – Ensure storage facilities are maintained and meet industry regulations – Transportation of fuel must be regulated and correctly managed
Agro-chemicals	Hazardous	<p>Agro-chemicals can pollute water sources as well as contaminate food and the surrounding environment, which are often hazardous to humans and animals.</p> <ul style="list-style-type: none"> – Dispose of in secure area per industry regulations – Contact supplier for disposal options – Ensure correct storage and management of chemicals
Office waste	General	<p>Office waste (inorganic matter) can be disposed of as per normal and form part of the municipal waste management system.</p> <ul style="list-style-type: none"> – Ensure waste is stored securely in refuse bins or selected areas – Co-ordinate waste removal with municipal waste management department
Animal carcasses (non-infectious)	General	<p>Animal carcasses from will be taken away to the Witbank Incinerator on the same day the death occurs. This prevents any form of rot and potential infections that can occur from bacteria in the event that they are not taken away from the site.</p>

3.4 OPERATIONAL ACTIVITIES

The operational phase will commence immediately upon the completion of the construction phase. The operational phase will include the receiving, feeding, fattening of cattle, in a healthy manner, to be sold for beef, as well as providing support to farmers, which will be the main operation of the FPSU.

3.4.1 LIVESTOCK

Cattle are firstly introduced to the feedlot after weaning when they are approximately 7 to 9 months of age. The cattle are initially kept on pasture land where backgrounding takes place. Backgrounding is the grouping and adaptation of the cattle prior to entry into the feeding process, which takes up to three months. This practice delivers significant production benefits once the cattle are on feed, which includes the reduction of disease risks, improvement of feed intake and the improvement of socialisation. After backgrounding, the cattle enter the feeding process, in which the cattle's weight is increased from ± 200 kg to up to ± 450 kg. Some cattle may enter the feedlot at a more mature stage after grazing on other farms for several months or years. These more mature animals immediately enter the feeding process.

It is preferred that the animals are still young when entering the feedlot and should also preferably be male, as male show stronger growth rates than females (Agriculture and Rural Development KZN, 2014). The farm currently produces two breeds of cattle, namely Brahman and Bonsmara, however, the feedlot will be open to any breed in its initial years and will be evaluated at a later stage in order to revise the breeds to be accepted into the feedlot.

The cattle remain in the feedlot for a period ranging between 90 and 120 days, which makes up one cycle. In the feedlot's initial year, one cycle will consist of 150 cattle, which will be increased to 350 cattle per cycle in the second year, and 550 cattle per cycle in the third year. The general cost of one healthy weaner is approximately R4 000.

3.4.2 FEED

As mentioned above, the cattle are firstly introduced into the feedlot with backgrounding. It is important that the most palatable grass types are available for the cattle to consume. According to the Agricultural Research Council (2003), the most common palatable grass types found in South Africa include:

- Guinea grass (*Panicum maximum*);
- Couch grass (*Cynodon dactylon*); and
- Buffalo grass (*Urochloa mosambicensis*).

The feeding process entails the feeding of cattle with pre-mixed feeds in order to ensure rapid increase in the animals' weight. Most South African cattle are grain fed, as grain ensures much more tender meat than that of cattle that only graze on pastures. Grain fed cattle also provides lean meat with as little as 1% of fat. Many feedlots mix their own ration of feed (usually a complete feed) made from the most readily available ingredients at the best possible process. Large volumes of feed are usually bought at once (as a complete feed), thus when feed is bought in large volumes, better prices can be negotiated.

The 'Cafeteria feeding system' is another popular feeding system in which the animal selects an increasingly concentrated diet over time, which leads to a greater efficiency of feed utilisation. Two systems that exist in the cafeteria feeding system are: (1) Finisher feed system, and (2) PRAM (Protein-roughage-additive-mineral) system (Agriculture and Rural Development KZN, 2014).

Animals must get sufficient fibre, energy, protein, minerals and vitamins to remain healthy and productive. The following supplementation is required to ensure healthy fed animals:

- Hay
- Silage
- Grain
- Protein blocks/lick

Initially, the cattle should be fed 2kg per head per day, and should then be increased by 1 kg per day until no residues are left. In year 1, in order to feed 150 cattle (one cycle), 300 kg of feed mixture is required per day.

The FPSU will need to supply local livestock farmers with quality feed, as well as provide quality grazing land for the cattle for backgrounding purposes. Training on cattle feeds should be provided at the FPSU.

3.4.3 WATER

A plentiful supply of cool, clean, good-quality water is essential. Water should be in a trough and off the ground. This ensures in keeping the water clean and free of manure and urine. Poor-quality water, which is contaminated by feed, dust, and faeces, leads to a reduction in water intake, which in effect leads to slower rates of gain.

The average daily intake of water for cattle is approximately 50 litres per head per day (USAID, 2008). This calculates to approximately 7 500 litres of water per day for 150 cattle. It is, therefore, important that the farm consist of sustainable water sources, which can provide sufficient clean water for all cattle daily. The proposed feedlot intends to use the existing boreholes to provide water for the activities. The water use licences for these boreholes were reported to be in place, however, they are yet to be provided.

3.4.4 VETERINARY MEDICATION

Crowded accommodation is the main cause of the rapid spread of disease in feedlots. A feedlot manager needs to be aware of the potential danger of these diseases, especially infective diseases such as Infectious Bovine Rhinotracheitis (IBR) which can spread through a feedlot at a very rapid rate and even if mortalities are relatively low. Profits are eroded by depressed animal performance (Department of Agriculture and Rural Development KwaZulu-Natal, 2014).

According to DAFF (2016), the five of the most common health problems that beef producers encounter include:

- Respiratory diseases
- Brucellosis
- External parasites, such as flies, ticks and lice
- Internal parasites, such as roundworms, lungworms and liver flukes

Vaccinations and parasite controls are available for many of the diseases affecting cattle. The choice of remedy and time of application depend on the animal's nutritional level, disease prevalence in the herd, and the region in which the cattle are located. It is advised that local veterinarians should be consulted for a vaccination program according to the conditions existing in the area (DAFF, 2016).

Cattle are vaccinated as calves and are occasionally dipped, dosed and vaccinated during the course of their lives due to various diseases and pests. According to MSD Animal Health (2016), vaccination of cattle should be done for bacterial and viral diseases. Dipping is done to remove fleas, ticks, lice, mites, black flies and screw worms. Finally, dosing should be done on the cattle for to get rid of roundworms, tape worms and flukes.

The FPSU will need to provide training on the various common diseases and pests that can harm the cattle's health. This includes practical training on how to vaccinate, dip and dose cattle. Veterinary services will be available from the FPSU at all times, as well as the necessary medicines.

3.4.5 ESTIMATED FEEDLOT PRODUCTION

The estimated production of beef at the feedlot is based on the following assumptions informed by the Khula Mlimi Business Plan (Golden Oneness Group, 2015); the Department of Agriculture, 2016; the Agricultural Research Council, 2003 and the Department of Agriculture and Rural Development KZN, 2014:

One production cycle consists of 150 cattle in year 1.

- One cycle lasts 90 – 120 days.
- There are three cycles in one year.
- The mortality rate of cattle is approximately 5%.
- The average carcass weight produced per head is 270 kg.

As one production cycle consists of 150 cattle, the total number of cattle for the first year (three cycles) is 450 cattle. With a mortality rate of 5%, it is expected that approximately 428 cattle will be accommodated by the feedlot in year

one. According to the Golden Oneness Group (2015), the number of cattle accommodated on the farm is proposed to increase to 350 per cycle in the second year, and 550 per cycle in the third year.

The average carcass weight that is produced per head is approximately 270 kg. The carcass weight refers to the weight of an animal after being partially butchered, removing all the internal organs and oftentimes the head as well as inedible portions of the tail and legs. In the first year, the feedlot will, therefore, produce approximately 428 cattle, each with an average carcass weight of 270kg, which is 115 560kg in total. Therefore, during the first year of operation, with a total of 428 cattle in the feedlot, it is estimated that 115 tonnes of beef will be produced. With the proposed increase in handling capacity, approximately 269 tonnes of beef is expected to be produced in the second year, and 423 tonnes in the third year.

3.5 DECOMMISSIONING ACTIVITIES

The proposed animal feedlot is to be in operation with no anticipated decommissioning and therefore the likely impacts of decommissioning cannot be accurately predicted at this stage. However, impacts during decommissioning are likely to be similar in nature to those identified for the construction phase and will be managed in cognisance of the applicable legislation. Should decommissioning be required in the future, the EMP is to be amended to account for decommissioning activities in line with the applicable legislation.

3.6 NEED AND JUSTIFICATION

In South Africa, the feedlot sector is the major contributor to the national beef market value chain as between 65% and 75% of slaughtered cattle are from feedlots (DAFF, 2014). From the feedlots, the cattle are distributed to the following markets:

- To meat processors (abattoirs) of which there are currently roughly 500 in South Africa. In addition, some abattoirs have also started to integrate vertically towards the wholesale level.
- Most of the large feedlots in South Africa own their own abattoirs, or at least have some business interest in certain abattoirs.
- Some feedlots have integrated further down the value chain and sell directly to consumers through their own private retail outlets.
- Feedlots also provide for the local market, of which 41% are distributed to auctions; 35% are provided on demand for festivities by local individuals; and 18% are distributed directly to local butchers.

The South African Government launched the Agri-Parks programme in 2015 as one of the cornerstones of rural economic transformation. The vision for the Agri-Parks programme is that farmer-controlled entities will serve as catalysts around which rural industrialisation can take place.

Agri-Parks are designed to be one stop shops for agro-production support, processing, logistics, marketing and training within district municipalities. Government believes that the initiative will contribute to developing 300 000 new small holder farmers and 145 000 jobs in agro-processing. The stated intention is to develop Agri-Parks in each of the 44 district municipalities, with 27 of the poorest district municipalities being prioritised.

The aim of the project is thus to promote the growth of the smallholder sector and create jobs.

4 IMPACT ASSESSMENT

A summary of the identified impacts and corresponding (initial and residual) significance ratings for the proposed development is provided in **Table 4-1** below.

Table 4-1: Impact Summary

No.	Impact Description	Phase	Without Mitigation							With Mitigation						
			Magnitude	Extent	Reversibility	Duration	Probability	Significance	Status	Magnitude	Extent	Reversibility	Duration	Probability	Significance	Status
C1	Generation of Dust and PM	Construction	3	2	3	4	5	45 Medium	(-)	2	1	3	1	4	28 Low	(-)
C2	Noise	Construction	2	1	3	1	4	28 Low	(-)	2	1	1	1	3	15 Low	(-)
C3	Soil Erosion	Construction	2	1	3	2	3	24 Low	(-)	1	1	3	2	2	14 Low	(-)
C4	Change in Flow Volumes	Construction	5	2	5	4	4	64 High	(-)	4	2	4	3	3	39 Medium	(-)
C5	Drainage Pattern Change	Construction	5	2	5	5	5	85 High	(-)	3	2	4	4	4	52 Medium	(-)
C6	Change in Water Quality	Construction	3	2	3	2	3	30 Medium	(-)	2	2	3	2	2	18 Low	(-)
C7	Loss and Fragmentation	Construction	3	3	2	5	4	52 Medium	(-)	2	2	2	5	2	22 Low	(-)
C8	Displacement of Fauna	Construction	3	3	2	5	4	52 Medium	(-)	2	2	2	5	2	22 Low	(-)
C9	Increased Local Traffic	Construction	2	1	3	1	4	28 Low	(-)	2	1	1	1	3	15 Low	(-)
C10	Employee Health and Safety	Construction	4	2	3	4	4	52 Medium	(-)	2	1	3	4	2	20 Low	(-)
C11	Waste	Construction	2	1	3	1	4	28 Low	(-)	2	1	1	1	3	15 Low	(-)
C12	Employment Opportunities	Construction	2	1	3	2	3	24 Low	(+)	2	2	3	2	4	36 Medium	(+)
C13	Damage to Palaeontological Resources	Construction	2	1	3	5	2	22 Low	(-)	1	1	3	1	2	12 Low	(-)
O1	Odour	Operation	3	2	3	1	5	45 Medium	(-)	2	1	3	1	4	28 Low	(-)
O2	Soil Erosion	Operation	2	1	3	4	2	20 Low	(-)	1	1	3	4	1	9 Low	(-)
O3	Change in Flow Volumes	Operation	5	2	5	4	5	80 High	(-)	4	2	3	3	3	48 Medium	(-)
O4	Drainage Pattern Change	Operation	5	2	5	5	5	85 High	(-)	4	2	3	4	4	52 Medium	(-)
O5	Change in Water Quality	Operation	3	2	3	3	3	33 Medium	(-)	2	2	3	2	2	18 Low	(-)
O6	Continued Encroachment and	Operation	3	4	3	5	4	60 Medium	(-)	2	2	2	2	3	24 Low	(-)

No.	Impact Description	Phase	Without Mitigation							With Mitigation						
			Magnitude	Extent	Reversibility	Duration	Probability	Significance	Status	Magnitude	Extent	Reversibility	Duration	Probability	Significance	Status
	Displacement of Flora															
O7	Continued Displacement of Fauna	Operation	3	3	3	5	4	56 Medium	(-)	2	2	2	2	3	24 Low	(-)
O8	Human Infringement on Flora	Operation	3	3	3	5	4	56 Medium	(-)	2	2	2	2	3	24 Low	(-)
O9	Increased Local Traffic	Operation	2	1	3	1	4	28 Low	(-)	2	1	1	1	3	15 Low	(-)
O10	Employee Health and Safety	Operation	4	2	3	4	4	52 Medium	(-)	2	1	3	4	2	20 Low	(-)
O11	Waste	Operation	4	2	3	4	4	52 Medium	(-)	2	1	3	1	3	21 Low	(-)
O12	Employment and Socio-Economic Benefits	Operation	3	2	3	4	3	36 Medium	(+)	4	3	3	4	4	56 Medium	(+)

5 ENVIRONMENTAL MANAGEMENT OBJECTIVES

The EMPr has the following objectives:

- Encourage good management practices through planning and commitment to environmental issues;
- Prevent water wastage;
- Minimise disturbance of the natural environment;
- Prevent or minimise all forms of pollution;
- Promote the reduction, reuse, recycling and recovery of waste;
- Adopt the best practical means available to prevent or minimise adverse environmental impacts;
- Comply with all applicable laws, regulations, standards and guidelines for the protection of the environment;
- Develop waste management practices based on prevention, minimisation, recycling, treatment or disposal of waste;
- Describe all monitoring procedures required to identify impacts on the environment; and
- Train onsite personnel with regard to their environmental obligations.

Please note: This EMPr is a working document and therefore subject to change depending on the requirements of the various project phases. When applicable, these changes are to be approved in accordance with legislative requirements.

5.1 ENVIRONMENTAL OBJECTIVES AND TARGETS

To facilitate compliance to the EMPr, the DRDLR must comply with all relevant legislation and standards and make personnel aware of the requirements of the EMPr as well as the prescribed penalties should a non-conformance be identified during the different phases of the proposed project.

It is recommended that environmental objectives (as outlined in this document) be emphasised to the DRDLR as minimum requirements. Objectives include:

- Encourage good management practices through planning and commitment to environmental issues; and
- Provide rational and practical environmental guidelines to:
 - Minimise disturbance of the natural environment;
 - Minimise odour emissions;
 - Minimise impact of added traffic into the area
 - Ensure surface and groundwater resource protection;
 - Prevent or minimise all forms of pollution;
 - Protect indigenous flora and fauna;
 - Prevent soil erosion;
 - Promote sustainable use of resources;
 - Promote the reduction, reuse, recycling and recovery of waste;
 - Adopt the best practical means available to prevent or minimise adverse environmental impacts;
 - Comply with all applicable laws, regulations, standards and guidelines for the protection of the environment;
 - Develop waste management practices based on prevention, minimisation, recycling, treatment or disposal of waste;

- Describe all monitoring procedures required to identify impacts on the environment;
- Define how the management of the environment is reported and performance evaluated; and
- Train onsite personnel with regard to their environmental obligations.

6 MANAGEMENT PROCEDURES AND ADMINISTRATIVE REQUIREMENTS

6.1 ORGANISATIONAL STRUCTURE AND RESPONSIBILITIES

Formal responsibilities are necessary to ensure that key management measures/procedures are executed. Specific responsibilities of the Project Manager, Site Manager and Environmental Control Officer (ECO) are as defined in Table 6-1.

Table 6-1: Roles and Responsibilities

RESPONSIBLE PERSON	RESPONSIBILITIES
Project Manager	<ul style="list-style-type: none"> – Ensure that the Site Manager and the contractor are aware of all specifications, legal constraints and DRDLR standards and procedures pertaining to the proposed development specifically with regards to environmental and social aspects; – Ensure that all conditions of the EA and EMPr are communicated and adhered to by the Site Manager and its contractor(s); – Employ an independent ECO to monitor the implementation of the EA conditions and the EMPr commitments throughout the proposed development by means of, but not limited to, site inspections and meetings. This should be documented as part of the onsite implementation records; and – Be fully conversant with the BAR for the Proposed Project, the conditions of the licenses and authorisations and of the EMPr.
Site Manager – Main Contractor	<ul style="list-style-type: none"> – Be fully conversant with the BAR, the conditions of the EA and of the EMPr; – Develop method statements; – Provide support to the ECO; – Be fully conversant with all relevant environmental legislation and DRDLR environmental policies and procedures - Ensure compliance thereof; – Have overall responsibility for the implementation of the conditions of the EA and the EMPr; – Ensure that audits are conducted to ensure/assess compliance with the conditions of the EA and the EMPr; – Liaise with the Project Manager or his delegate, the ECO and others on matters concerning the environment; – Prevent actions that will harm or may cause harm to the environment, and take steps to prevent pollution and unnecessary degradation onsite; and – Confine project activities to demarcated areas. – Maintain the following: <ul style="list-style-type: none"> – A site incident register; – A non-conformance register; – A public complaints register; and – A register of audits.

Environmental Control Officer	<ul style="list-style-type: none"> – A suitably qualified ECO who would, on a weekly basis (or as necessary depending on the construction activities), monitor the project compliance with the conditions of the EA and the EMPr; and – The costs of the ECO shall be borne by the DRDLR (proof of appointment must be maintained onsite). <p>Responsibilities of the ECO include:</p> <ul style="list-style-type: none"> – Be fully conversant with the BAR, the conditions of the EA and the EMPr; – Be fully conversant with all relevant environmental legislation – Ensure compliance with environmental policies and procedures - – Ensure that environmental performance audits/inspections are undertaken on a weekly basis by the Site Manager or his/her designated representative to ensure implementation onsite; – Approve method statements; – Remain employed until the completion of the construction activities; – Hand over responsibilities to the operational team, if necessary, or remain appointed for the duration of the operational phase; and – Report all findings identified onsite to the Project Manager. <p>In addition, the ECO will:</p> <ul style="list-style-type: none"> – Convey the contents of the conditions of the EA and the EMPr to the relevant site staff and discuss the contents in detail with the Project Manager and contractor(s); – Undertake regular and comprehensive inspection of the site and surrounding areas in order to monitor compliance with the conditions of the EA and the EMPr; – Take appropriate action if the specifications contained in the EA and the EMPr are not followed; – Monitor and verify that environmental impacts are kept to a minimum, as far as possible; and – Ensure that activities onsite comply with all relevant environmental legislation.
Internal Environmental Manager - Operation	<ul style="list-style-type: none"> – Monitor environmental performance of the facility and its operations; – Ensure all staff remain aware of their responsibilities in terms of reducing environmental impacts.
Contractors, Staff and Service Providers	<ul style="list-style-type: none"> – Complying with DRDLR environmental management specifications; – Be conversant with all conditions of the EA and the EMPr, and ensure compliance thereto; and – Adhering to any environmental instructions issued by the Site Manager/Project Manager on the advice of the ECO.

6.2 ENVIRONMENTAL AWARENESS PLAN

The NEMA requires that an environmental awareness plan be submitted as a part of the EMPr submission. The following methodology will be used to implement and ensure environmental awareness of employees:

- Internal Communication;
- Standard Meetings;
- Induction Training during Construction;
- On-going Training for permanent staff; and
- Providing a Complaints procedure.

6.2.1 INTERNAL COMMUNICATION

Internal Communication of environmental issues to ensure environmental awareness will be done by the following means:

- Meetings;
- Memos;
- Notice boards;
- Briefs;
- Newsletter;
- E-mail;
- Telephone; and
- Induction training.

6.2.2 STANDARD MEETINGS

The Safety, Health and Environmental (SHE) Meetings will be held on a monthly basis by Senior Management. During these meetings discussions will be held regarding raising environmental awareness; identifying potential problems, and discussions regarding any complaints received and corrective actions taken.

All employees can also communicate to Senior Management through their reporting lines or by using complaint forms and incident forms to improve communication.

6.2.3 TRAINING

The following facets to training form part of the Environmental Awareness Plan:

- Environmental awareness training is given at induction when personnel commence employment. Specific environmental awareness induction training will be provided to all construction staff during the construction phase; and
- Environmental competency training will be given to supervisory personnel at the retained processing operations and contractors working at the proposed feedlot.

6.2.4 COMPLAINTS PROCEDURE

Enquiries or complaints should be able to be received from adjacent land-users and / or the community (i.e. stakeholders) through the following channels:

- Telephone number: **013 762 8018**
- Email: **Todi.Netshitangani@drdlr.gov.za**

Community enquiries or complaints must be brought to the attention of the Project Manager/Site Manager and ECO who should ensure corrective action and close-out. As a minimum the following information should be recorded:

- Time, date and nature of enquiry or complaint.
- The means by which the enquiry or complaints was made
- Personal details of the person / party lodging the enquiry or complaint (subject to privacy considerations).
- Actions taken to investigate and close-out the complaint as well as complainant feedback.

All complaints received are to be investigated and a response (even if pending further investigation) to be given to the complainant within 7 days.

Any actions that cannot be managed immediately should be assigned to the appropriate personnel and will become an outstanding action. The action remains outstanding until it is closed off by the Project Manager or Site Manager.

6.3 MONITORING

Construction Phase: The external ECO will undertake monthly audits to ensure compliance with the EMPr and conditions of the EA during the construction activities, and will report to the Site Manager should any non-compliance be identified or corrective action deemed necessary.

Operational Phase: The internal environmental manager will monitor the day-to-day site activities on an ongoing basis and will produce monthly monitoring reports. Monthly monitoring of the waste receiving area, effluent discharge quality and emission abatement equipment will be undertaken.

6.4 NON-CONFORMANCE AND CORRECTIVE ACTION

The auditing of the construction activities may identify non-conformances to the EMPr and conditions of the EA. Non-conformances may also be identified through incidents, emergencies or complaints recorded. In order to correct non-conformances, the source must be determined and corrective actions must be identified and implemented.

6.4.1 COMPLIANCE WITH THE EMPr AND CONDITIONS OF THE AUTHORISATIONS

- A copy of the EMPr and conditions of the EA will be available onsite at all times for the duration of the construction and operational activities;
 - All persons employed by a contractor or their sub-contractors will abide by the requirements of the EMPr and conditions of the EA;
 - Any members of the workforce found to be in breach of any of the specifications contained within the EMPr and conditions of the EA may be ordered by the Site Manager to leave the site. A contractor will not direct a person to undertake any activity which would place them in contravention of the specifications contained within the EMPr and conditions of the EA;
 - Should a contractor be in breach of any of the specifications, the Site Manager will, in writing, instruct the contractor responsible for the incident of non-compliance regarding corrective and/or remedial action required, specify a timeframe for implementation of these actions, implement a penalty and/or indicate that work will be suspended should non-compliance continue;
 - Should non-compliance continue, further written notification will be forwarded to the contractor responsible for the incident of non-compliance outlining the required corrective and/or remedial action, the timeframe for implementation, penalties and/or work will be suspended as specified previously; and
 - Departmental officials will be given access to the property referred to in the EA and EMPr for the purpose of assessing and/or monitoring compliance of the site, at all reasonable times.
-

6.4.2 DUTY OF CARE

Under Section 28 of the NEMA, all personnel involved with the construction and operational activities onsite will be responsible for implementing measures to prevent pollution or degradation of the environment from occurring, continuing or recurring. Failure to comply with the above conditions is a breach of the duty of care. If such harm is unavoidable, steps must be taken to minimise and rectify such pollution or degradation of the environment.

6.5 DOCUMENTATION AND REPORTING

The following documentation must be kept onsite in order to record compliance with the EMPr and conditions of the EA:

- Record of complaints; and
- Record of emergencies and incidents.

The contractor will be required to report on the following:

- Environmental incidents involving contractor/employees and/or the public;
- Environmental complaints and correspondence received from the public; and
- Incidents that cause harm or may cause harm to the environment.

The above records will form an integral part of the ECO's reports and records thereof maintained for the duration of the project. These records will be kept with the EMPr and conditions of the EA, and will be made available for scrutiny if so requested by the engineer or his delegate and the ECO.

The contractor will ensure that the following information is recorded for all environmental complaints/incidents/emergencies:

- Nature of complaint/incident/emergency;
- Causes of complaint/incident/emergency;
- Party/parties responsible for causing complaint/incident/emergency;
- Immediate actions undertaken to stop/reduce/contain the causes of the complaint/incident/ emergency;
- Additional corrective or remedial action taken and/or to be taken to address and to prevent reoccurrence of the complaint/incident/emergency;
- Timeframes and the parties responsible for the implementation of the corrective or remedial actions;
- Procedures to be undertaken and/or penalties to be applied if corrective or remedial actions are not implemented; and
- Copies of all correspondence received regarding complaints/incidents/emergency.

7 ENVIRONMENTAL MANAGEMENT PROGRAMME

This EMPr identifies various actions which are undertaken throughout the construction and operational phases. Not every action will be required during the entire course of activities. Therefore, the actions identified in the EMPr have been given priority timeframes for proposed implementation.

Table 7-1: Structure of EMPr

COLUMN	DESCRIPTION
Activity/Aspect	Highlights the various activities/aspects associated with the project i.e. the contractors' activities that will interact with the environment.
Environmental Measures and Action Plans	Indicates the actions required to prevent and /or minimise the potential impacts on the environment that are associated with the project.
Responsibility	Indicates the party responsible for implementing the environmental measures and action plans laid out in the EMPr. Please note that the Site Manager will have authority to stop works if/as necessary.
Priority Timeframe	Indicates when the actions for the specific aspect must be implemented and/or monitored.

The following assumptions have been made in the development of the environmental specification in this EMPr:

- An environmental file containing the information/documentation required by this EMPr is to remain onsite and to be made available at the request of the auditor or similar monitoring body; and
- For ease of reference, any person(s) employed to assist in the project i.e. contractors, sub-contractor and permanent and temporary staff, will be collectively referred to as 'onsite personnel'.

It should be noted that at this point of the project planning process, the necessity for and timing of the decommissioning phase is unknown. Before decommissioning the DRDLR will need to follow the related legal permitting process in terms of the NEMA and other legislation applicable at the time. The future associated permitting process will further supplement any commitments made within this document.

Table 7-2 outlines the EMPr for the proposed project.

None of the management measures are required to be included in the EA and there are no additional monitoring requirements.

Table 7-2: Environmental Management Programme

ACTIVITY/ASPECT	ENVIRONMENTAL MANAGEMENT AND MITIGATION MEASURE	RESPONSIBLE PERSON	PRIORITY TIMEFRAME
CONTRACTOR LAYDOWN AREA AND SITE ACCESS			
<p><u>Objectives:</u></p> <ul style="list-style-type: none"> – To implement measures to minimise impacts on the environment from the initiation of construction activities through planning, careful site access route selection and implementation of mitigation measures. <p><u>Indicator and Compliance Mechanisms:</u></p> <ul style="list-style-type: none"> – Health, safety, environmental and community incident and complaints management system register. – Close-out on incidents. – Monitoring and audit reports. – Inductions training and register. – Environmental awareness programme/toolbox talks. 			
Project Initiation of Construction Activities	Appoint an ECO to manage and verify compliance with the integrated EA and EMP.	Contractor Project Manager	Once-Off
	Construction areas should be demarcated, and wetland areas marked as “restricted” in order to prevent the unnecessary impact to and loss of these systems. Construction activities remain within the demarcated project footprint.	ECO Contractor Project Manager	Construction
	A Training Needs Analysis must be prepared, and a training plan/programme developed to focus on Environmental, Health and Safety Aspects.	Contractor ECO	Construction Operation

ACTIVITY/ASPECT	ENVIRONMENTAL MANAGEMENT AND MITIGATION MEASURE	RESPONSIBLE PERSON	PRIORITY TIMEFRAME
	Site clearing must be limited to the footprint of the infrastructure requirements.	ECO Contractor Project Manager	Construction
	A site layout plan which indicates site access points; stockpile locations; temporary waste storage areas; and other significant development infrastructure.	ECO Contractor	Construction Operation
	Locate firefighting measures onsite, such as fire extinguishers, and make personnel aware of fire prevention and firefighting measures. Firefighting equipment must be securely placed and inspected monthly.	ECO Contractor	Construction
	Laydown yards, camps and storage areas must be beyond the wetland areas and associated buffers where applicable.	ECO Contractor Project Manager	Construction
VEHICLE, EQUIPMENT AND MACHINERY MANAGEMENT			

ACTIVITY/ASPECT	ENVIRONMENTAL MANAGEMENT AND MITIGATION MEASURE	RESPONSIBLE PERSON	PRIORITY TIMEFRAME
<p><u>Objectives:</u></p> <ul style="list-style-type: none"> – To implement measures to minimise impacts on the environment from poorly maintained equipment, machinery and vehicles onsite. <p><u>Indicator and Compliance Mechanisms:</u></p> <ul style="list-style-type: none"> – Health, safety, environmental and community incident and complaints management system register. – Close-out on incidents. – Monitoring and audit reports. – Transport route delineation. – Compliance with SANS 10228. – Daily equipment, machinery and vehicle checklists. – Incident Classification and Reporting Procedure. 			
Vehicle Maintenance	No major maintenance activities should occur on site.	ECO Contractor Operator	Construction Operation
Operation of Equipment, Machinery and Vehicles	Ensure that the equipment, machinery and vehicles are adequately maintained so as to: <ul style="list-style-type: none"> – Reduce the potential for spillages of oil, diesel, fuel or hydraulic fluid. – Ensure road-worthiness. – Reduce emissions. 	ECO Contractor Operator	Construction Operation
	Vehicles bearing open loads of potentially wind-borne materials must be covered or wet down in order to minimise dust entrainment.	Contractor Operator	Construction Operation

ACTIVITY/ASPECT	ENVIRONMENTAL MANAGEMENT AND MITIGATION MEASURE	RESPONSIBLE PERSON	PRIORITY TIMEFRAME
Traffic Congestion	The movement of vehicles into and out of the site must be managed to ensure the impact on public areas is minimised, such as ensuring that abnormal loads are moved outside of peak traffic hours, and reasonable measures are taken to ensure that public and staff safety is managed adequately.	Contractor Operator	Construction Operation
	Since the access road is narrow, ensure that all vehicles do not park along the road but within the farm boundary; and ensure that all site vehicles limit the idle time on the access road.	Contractor	Operator
	The road network which surrounds the proposed development will have to be correctly maintained in order to support additional movement of vehicles. Transport should be limited to non-peak hours.	Contractor	Construction
FUEL AND CHEMICAL MANAGEMENT			
<u>Objectives:</u>			
– To ensure the correct storage, handling and disposal of fuels and chemicals in order to prevent impacts to the surrounding environment.			
<u>Indicator and Compliance Mechanisms:</u>			
– Maintenance records.			
– Material safety data sheets (MSDS).			
– Health, safety, environmental and community incident and complaints management system register.			
– Chemicals Management Procedure.			
– Monitoring and audit reports.			
– Training records.			

ACTIVITY/ASPECT	ENVIRONMENTAL MANAGEMENT AND MITIGATION MEASURE	RESPONSIBLE PERSON	PRIORITY TIMEFRAME
Fuel and Chemical Management	Develop an Incident Classification and Reporting Procedure for fuel and chemical management including storage, handling and spillages.	ECO Contractor Operator	Construction Operation
	Indicate the location of the fuel and chemical storage area on the layout plans.	Contractor Operator	Construction Operation
	In cases where a surface leak occurs during loading and off-loading activities, the spill material will be cleaned using a spill kit.	Contractor Operator	Operation
	Securely fence and lock the storage areas to accommodate all hazardous substances such as fuel, oils and chemicals. The storage area floor must be an impermeable surface and suitably bunded as per the requirements outlined in SANS 10089-1 (2008).	ECO Contractor Operator	Construction Operation
	Label all liquids (chemicals and hydrocarbons) stored onsite for easy identification. Material safety data sheets (MSDS) for onsite chemicals, hydrocarbon materials and hazardous substances must be readily available. MSDS must include mitigation measures to ameliorate potential environmental impacts which may result from a spill, incorporating health and safety mitigation measures.	Contractor Operator	Construction Operation
	Keep fuels, oils or other chemicals used outside of the bunded area to a minimum and use suitable secondary containment in the form of drip trays.	ECO Contractor Operator	Construction Operation

ACTIVITY/ASPECT	ENVIRONMENTAL MANAGEMENT AND MITIGATION MEASURE	RESPONSIBLE PERSON	PRIORITY TIMEFRAME
Health and Safety	Display “no smoking” and “no naked flame” signs in and around the project area, as well as near the hazardous material store.	ECO Contractor Operator	Construction Operation
WASTE MANAGEMENT			
<p><u>Objectives:</u></p> <ul style="list-style-type: none"> – To ensure the correct handling, storage, transportation and disposal of general waste and hazardous waste. <p><u>Indicator and Compliance Mechanisms:</u></p> <ul style="list-style-type: none"> – Induction training and records. – Waste Management Plan (WMP). – Relevant SANS Codes of Practice. – Waste Manifests (all waste streams), waybills (general waste) and Safety disposal certificates (hazardous waste). – Emergency preparedness and response procedure. – Incident Classification and Reporting Management Procedure. – Health, safety, environmental and community incident and complaints management system register. – Monitoring and audit reports. 			
General Waste Management	General waste generated as a result of construction and operational activities should be managed in accordance with the WMP. The procedure should be reviewed to ensure compliance with legislative amendments.	ECO Contractor Operator	Construction Operation

ACTIVITY/ASPECT	ENVIRONMENTAL MANAGEMENT AND MITIGATION MEASURE	RESPONSIBLE PERSON	PRIORITY TIMEFRAME
	Train and inform all onsite personnel regarding general waste minimisation, management and disposal as per the WMP.	ECO Contractor Operator	Construction Operation
	Prohibit littering and burning of waste onsite. No dumping of construction material on-site may take place	ECO Contractor Operator	Construction Operation
	Place an adequate number of general waste bins around the site during construction and operational activities in order to minimise littering. The bins must be removed from the site on a regular basis for disposal at a registered or licensed disposal facility.	ECO Contractor Operator	Construction Operation
	Retain records of appropriate safety disposal associated with waste removal, transportation and disposal.	ECO Contractor Operator	Construction Operation
	Prohibit the mixing of general waste with hazardous waste. Should general waste be mixed with hazardous waste, it will be considered hazardous waste. See below for managing hazardous waste.	ECO Contractor Operator	Construction Operation
	Recover, recycle and reuse waste where possible.	ECO Contractor Operator	Construction Operation
		LAND REFORM	

ACTIVITY/ASPECT	ENVIRONMENTAL MANAGEMENT AND MITIGATION MEASURE	RESPONSIBLE PERSON	PRIORITY TIMEFRAME
Hazardous Waste Management	Any recyclable material which is considered hazardous is to be collected and transferred by a permitted/trained waste contractor in accordance with the SANS 10228 for transport to the approved recycling/recovery facility.	ECO Contractor Operator	Construction Operation
	Train and inform all onsite personnel regarding hazardous waste minimisation, handling, storage, management and disposal as per the WMP. Personnel must be trained in handling and storage of animal carcasses must before they are taken away for disposal.	ECO Contractor Operator	Construction Operation
	Train site personnel to on safe handling and storage of animal carcasses before they are taken away for disposal.	ECO Operator	Operation
	Ensure that a registered contractor is used to transport as well as dispose the animal carcasses in the most appropriate manner (licensed hazardous landfill site or via incineration).	ECO Contractor Operator	Construction Operation
	Clean areas where hazardous waste spills have occurred and dispose of the hazardous material appropriately. Key personnel must be trained on handling spillages.	ECO Contractor Operator	Construction Operation
	Retain records of appropriate safety disposal certificates associated with hazardous waste removal, transportation and disposal.	ECO Contractor Operator	Construction Operation

ACTIVITY/ASPECT	ENVIRONMENTAL MANAGEMENT AND MITIGATION MEASURE	RESPONSIBLE PERSON	PRIORITY TIMEFRAME
	Manage all liquid hazardous waste spillages as per the EMPr and WMP. Ensure that effluent water is tested before release into the stormwater system.	ECO Contractor Operator	Construction Operation
	The emergency preparedness and response plan should be implemented. The plan should be placed in key locations around the site, visible to all employees.	Contractor Operator	Construction Operation
	Ensure that waste manifest documentation (as per the Waste Classification and Management Regulations – GNR 634) is prepared and maintained for the generation, transportation and disposal of waste	Contractor Operator	Construction Operation
	Report any major spill incidents to the Department within 24 hours of occurrence	ECO Contractor Operator	Construction Operation

FLORA AND FAUNA MANAGEMENT

Objectives:

- To prevent any loss of diversity of indigenous faunal communities and continued encroachment and displacement of indigenous vegetation community by alien invasive plant species, particularly in previously disturbed areas.

Indicator and Compliance Mechanisms:

- Induction training and records.
- Monitoring and audit reports.

ACTIVITY/ASPECT	ENVIRONMENTAL MANAGEMENT AND MITIGATION MEASURE	RESPONSIBLE PERSON	PRIORITY TIMEFRAME
Vegetation Management	Prevent the further loss and fragmentation of the vegetation community (listed as Vulnerable) within and adjacent to the project site.	ECO Contractor	Construction
	Limit the construction area to the defined project areas and only impacting those areas where it is unavoidable to do so otherwise. The proposed developments should be placed in areas that have already been disturbed (low sensitivity areas as defined in this report), and no further loss of secondary grassland or wetlands should be permitted.	ECO Contractor	Operation
	No plant species whether indigenous or exotic should be brought into the project area, to prevent the spread of exotic or invasive species.	ECO Contractor	Post Construction
	A qualified environmental control office must be on site when construction begins to identify species that will be directly disturbed and to relocate flora that are found during construction	ECO Contractor	Construction
	Areas of indigenous vegetation should be delineated, and rehabilitation measures implemented in areas where the indigenous community is still present but degraded. Areas that are denuded during construction need to be re-vegetated with indigenous vegetation to prevent erosion during flood events. This will also reduce the likelihood of encroachment by alien invasive plant species.	ECO Contractor	Construction
	Compile and implement an alien vegetation management plan for the entire site, including the surrounding project area.	ECO Contractor Operator	Construction Operation

ACTIVITY/ASPECT	ENVIRONMENTAL MANAGEMENT AND MITIGATION MEASURE	RESPONSIBLE PERSON	PRIORITY TIMEFRAME
Fauna Management	Prevent the loss of species of conservation concern which are known to occur within the project area.	ECO Contractor	Construction
	Staff should be educated about the sensitivity of faunal species and measures should be put in place to deal with any species that are encountered during the construction process. The intentional killing of any animals including snakes, lizards, birds or other animals should be strictly prohibited. Collect any snakes or animals that are discovered during construction and operation and investigate where to move them. No trapping or snaring of wildlife will be permitted.	ECO Contractor	Construction
	Ideally fences should not restrict the natural migratory movements of certain animals. The site offers limited suitable migratory habitat.	ECO Contractor	Construction
	Limit the construction area to the defined project areas and only impacting those areas where it is unavoidable to do so otherwise.	ECO Contractor	Construction
	All livestock must be kept out of any wetland and grassland areas in order to prevent overgrazing of potential SCC avifauna habitat.	ECO Operator	Operation
	No domestic animals are to be allowed in to the project area under any circumstances, especially any dogs and cats. Any and all feral cats which may enter the project area must be removed immediately.	ECO Operator	Operation
	SOIL AND LAND MANAGEMENT		

ACTIVITY/ASPECT	ENVIRONMENTAL MANAGEMENT AND MITIGATION MEASURE	RESPONSIBLE PERSON	PRIORITY TIMEFRAME
-----------------	---	--------------------	--------------------

<p><u>Objectives:</u></p> <ul style="list-style-type: none"> – To prevent any disturbance, erosion or contamination of soil resources. <p><u>Indicator and Compliance Mechanisms:</u></p> <ul style="list-style-type: none"> – Induction training and records. – WMP. – Incident Classification and Reporting Management Procedure. – Health, safety, environmental and community incident and complaints management system register. – Monitoring and audit reports. – Stormwater Management Plan. 			
Soil and Land Management	All stockpiles must be restricted to designated areas and may not exceed a height of two (2) metres.	ECO Contractor	Construction
	All removed soil and material must not be stockpiled within the system. Stockpiling should take place outside of the buffer areas. All stockpiles must be protected from erosion, stored on flat areas where run-off will be minimised, and be surrounded by bunds.		
	Stormwater control systems, in line with the conceptual Stormwater Management Plan (SWMP) must be implemented within the site and should be managed and maintained to ensure no contamination of soil reserves.	ECO Contractor	Operation
	Implement soil erosion management measures and ensure no erosion gullies are allowed to form within the area under management.	ECO Contractor	Operation

ACTIVITY/ASPECT	ENVIRONMENTAL MANAGEMENT AND MITIGATION MEASURE	RESPONSIBLE PERSON	PRIORITY TIMEFRAME
	Machinery must be regularly checked to ensure hydrocarbon leaks (including fuel and hydraulic fluids) are not occurring. Drip trays must be used where necessary. Fuels and oils must be stored within bunded areas. No repair work may be undertaken on machinery onsite or campsite area.	ECO Contractor Operator	Operation
	Keep spill kits onsite and train personnel to use them appropriately to immediately clean all spills to avoid soil contamination.	ECO Contractor Operator	Operation
	Fuels and chemicals must be stored in adequate storage facilities that are secure, enclosed and bunded.	ECO Contractor Operator	Construction Operation
	Ensure that there are sufficient ablution facilities. If portable toilets can be installed for the construction phase, ensure that they in accordance with Occupational Health and Safety Act, (No 85 of 1993). Site personnel should not use the surrounding land as ablution facilities.	ECO Contractor	Construction Decommissioning
WATER MANAGEMENT			

ACTIVITY/ASPECT	ENVIRONMENTAL MANAGEMENT AND MITIGATION MEASURE	RESPONSIBLE PERSON	PRIORITY TIMEFRAME
-----------------	---	--------------------	--------------------

<p><u>Objectives:</u></p> <ul style="list-style-type: none"> – To implement measures to prevent the contamination on surface and groundwater resources. – To prevent erosion. <p><u>Indicator and Compliance Mechanisms:</u></p> <ul style="list-style-type: none"> – Induction training and records. – Incident Classification and Reporting Management Procedure. – Environmental awareness programme/toolbox talks. – Stormwater Management Plan. 			
Surface Water Management – Stormwater Management	Construction areas should be demarcated, and wetland areas marked as “restricted” in order to prevent the unnecessary impact to and loss of these systems.	ECO Contractor	Construction
	Laydown yards, camps and storage areas must be beyond the wetland areas and associated buffers where applicable.	ECO Contractor Operator	Construction Operation
	Storm water channels and preferential flow paths should be delineated, filled with aggregate and/or logs (branches included) to dissipate and slow flows limiting erosion.	ECO Contractor	Construction
	Prevent uncontrolled access of vehicles through the wetlands that can cause a significant adverse impact on the hydrology and alluvial soil structure of these areas.	ECO Contractor Operator	Construction Operation

ACTIVITY/ASPECT	ENVIRONMENTAL MANAGEMENT AND MITIGATION MEASURE	RESPONSIBLE PERSON	PRIORITY TIMEFRAME
	The recommended buffer zones should be strictly adhered to. Any aspect of the proposed surface infrastructure that impedes on the wetlands, drainage lines or their buffers should be relocated.	ECO Contractor Operator	Construction Operation
	A suitable storm water management plan must for formulated for the project. The plan must ensure that clean and dirty water are separated, that only clean water is diverted into the wetlands (where required) and that the discharge of water will not result in scouring and erosion of the receiving systems	ECO Contractor Operator	Construction Operation
	The storm water management plan should incorporate “soft” engineering measures as much as possible, limiting the use of artificial materials. These measures may include grassy swales, bio-retention ponds / depressions filled with aquatic vegetation or the use of vegetation to dissipate flows at discharge locations.	ECO Contractor Operator	Construction Operation
	All contractors and employees should undergo induction which is to include a component of environmental awareness. The induction is to include aspects such as the need to avoid littering, the reporting and cleaning of spills and leaks and general good “housekeeping”.	ECO Contractor Operator	Construction Operation
	Ensure that there is no storage and handling of materials (i.e. chemicals and waste material) within the designated “clean water areas” to prevent contamination.	ECO Contractor Operator	Construction Operation

ACTIVITY/ASPECT	ENVIRONMENTAL MANAGEMENT AND MITIGATION MEASURE	RESPONSIBLE PERSON	PRIORITY TIMEFRAME
	Channels must be checked monthly and after any major rainfall events to ensure that there are no blockages and that the water will not be restricted in any way. Pavements must be cleaned regularly to remove sediment.	ECO Contractor Operator	Construction Operation
	Spills must be appropriately managed on site using spill kits, including within bunds, where relevant.	ECO Contractor Operator	Construction Operation
	Sediments that accumulate within the stormwater management system must be routinely removed to ensure the design capacity is maintained.	ECO Contractor Operator	Construction Operation
	Maintenance and repair of erosion damage at the culvert's inlet and outlet should be undertaken.	ECO Contractor Operator	Construction Operation
Surface Water Management – Water Quality	Machinery must be regularly checked to ensure hydrocarbon leaks (including fuel and hydraulic fluids) are not occurring. Drip trays must be used where necessary. Fuels and oils must be stored within bunded areas. Parking areas for staff vehicles should ideally be placed on hardstanding to limit the impacts of oil leaks to the environment.	ECO Contractor Operator	Operation
	Acquire spill kits to clean up any hydrocarbon or chemical spills during construction, operation and closure to prevent seepage	ECO Contractor Operator	Operation

ACTIVITY/ASPECT	ENVIRONMENTAL MANAGEMENT AND MITIGATION MEASURE	RESPONSIBLE PERSON	PRIORITY TIMEFRAME
	No repairs may be undertaken on the site.	ECO Contractor Operator	Operation
	Oils, greases, diesel and other chemicals will be stored in the prescribed manner and within bunded areas to prevent surface water contamination.	ECO Contractor Operator	Operation
Groundwater Management	Areas with the potential to contaminate the groundwater must be underlain by hardstanding of suitable integrity.	ECO Contractor Operator	Operation
Fire	Follow the emergency response plan for fire management. Contractors should prove compliance with the emergency response plan.	ECO Contractor Operator	Operation
	Provide suitable fire control measures. No smoking shall be allowed in areas of natural habitat where accidental fires could occur.	ECO Contractor Operator	Operation
	All activities where a threat of potential fire is identified shall comply with minimum fire control regulations.	ECO Contractor Operator	Operation

ACTIVITY/ASPECT	ENVIRONMENTAL MANAGEMENT AND MITIGATION MEASURE	RESPONSIBLE PERSON	PRIORITY TIMEFRAME
-----------------	---	--------------------	--------------------

NOISE MANAGEMENT			
<p><u>Objectives:</u></p> <ul style="list-style-type: none"> – To ensure that noise impacts to the surrounding environment are minimal or mitigated. <p><u>Indicator and Compliance Mechanisms:</u></p> <ul style="list-style-type: none"> – Maintenance records. – Incident reporting system. – Induction training and records. – Health, safety, environmental and community incident and complaints management system register. – Monitoring and audit reports. – Records of Personal Protective Equipment (PPE). – Incident Classification and Reporting Management Procedure. 			
Noise	Fit equipment, machinery and vehicles generating excessive noise with appropriate noise abatement measures, if deemed necessary, and undergo regular maintenance to ensure optimum efficiency during operation.	ECO Contractor Operator	Operation
	Provide a complaints register to report any excessive noise incidents.	ECO Contractor Operator	Operation
	Ensure regular maintenance of equipment to reduce the generation of additional unwanted noise.	Operator	Operation

ACTIVITY/ASPECT	ENVIRONMENTAL MANAGEMENT AND MITIGATION MEASURE	RESPONSIBLE PERSON	PRIORITY TIMEFRAME
SITES OF CULTURAL OR HERITAGE SIGNIFICANCE			
<p><u>Objectives:</u></p> <ul style="list-style-type: none"> – To ensure that sites/artefacts of heritage value are identified and protected. <p><u>Indicator and Compliance Mechanisms:</u></p> <ul style="list-style-type: none"> – Health, safety, environmental and community incident and complaints management system register. – Incident Classification and Reporting Management Procedure. – Monitoring and audit reports. 			
Cultural and/or Heritage Sites and Palaeontology	In the event that an artefact or heritage site be uncovered, work in the vicinity must cease, representatives of the South African Heritage Resources Agency (SAHRA) must be contacted and an archaeological consultant must be appointed to assess the site. Work may only resume, once clearance is given in writing by the archaeological consultant.	ECO Contractor	Construction activities
HEALTH AND SAFETY			

ACTIVITY/ASPECT	ENVIRONMENTAL MANAGEMENT AND MITIGATION MEASURE	RESPONSIBLE PERSON	PRIORITY TIMEFRAME
-----------------	---	--------------------	--------------------

Objectives:

- To ensure communication with members of the public to promote safety awareness.
- To prevent public access to construction sites and storage areas.
- To ensure safety for all onsite personnel.

Indicator and Compliance Mechanisms:

- Induction training and records.
- Health, safety, environmental and community incident and complaints management system register.
- Monitoring and audit reports.
- Incident Classification and Reporting Management Procedure.
- PPE Register.
- Occupational health and safety plan.
- Health and safety protocol.

Note: The proposed project aims to improve the overall SHE status of the site.

Health and Safety	All onsite personnel are required to undergo induction training and regular toolbox talks in order to raise awareness of the conditions contained herein.	ECO Contractor Operator	Operation
	An HSE officer is to be appointed who will monitor safety conditions during construction activities	ECO Contractor Operator	Operation

ACTIVITY/ASPECT	ENVIRONMENTAL MANAGEMENT AND MITIGATION MEASURE	RESPONSIBLE PERSON	PRIORITY TIMEFRAME
	Ensure employees are properly trained to use specific equipment or machinery	ECO Contractor Operator	Operation
	Develop safe work instruction method statements that should be used by employees in completing their tasks	ECO Contractor Operator	Operation
	Provide MSDS for all hazardous substances kept onsite	ECO Contractor Operator	Operation
	All visitors should undergo site induction and be made aware of the risks associated with the site.	ECO Contractor Operator	Operation
	Employees must thoroughly wash their hands with detergents after activities and before eating	ECO Contractor Operator	Operation
	Train all relevant personnel on handling, use and storage of hazardous substances. Train personnel on handling animal carcasses before they are collected by the waste contractor	ECO Contractor Operator	Operation

ACTIVITY/ASPECT	ENVIRONMENTAL MANAGEMENT AND MITIGATION MEASURE	RESPONSIBLE PERSON	PRIORITY TIMEFRAME
	The appointed contractor will be responsible for the development of a comprehensive health and safety protocol which must be adhered to.	Contractor	Construction activities
	Employees must wear appropriate PPE, especially gloves, during their activities on the feedlot to minimise contact with potential pathogens	Contractor Operator	Operation
	Train all onsite personnel handling chemical or hazardous substances in the use of such substances and the environmental, health and safety consequences of incidents.	ECO Contractor Operator	Operation
	Provide onsite personnel with sufficient potable water for drinking.	ECO Contractor Operator	Operation
Public Safety	Restrict public access to the site during all phases of the project.	Contractor Operator	Operation
SOCIO-ECONOMIC ENVIRONMENT			
<p><u>Objectives:</u></p> <ul style="list-style-type: none"> – To ensure that the negative socio-economic impacts are mitigated and managed. – To ensure that the positive socio-economic impacts are enhanced. <p><u>Indicator and Compliance Mechanisms:</u></p> <ul style="list-style-type: none"> – Employment records and community engagement local enterprise development records. 			

ACTIVITY/ASPECT	ENVIRONMENTAL MANAGEMENT AND MITIGATION MEASURE	RESPONSIBLE PERSON	PRIORITY TIMEFRAME
Local Awareness Training	As far as possible, contractors and labour must be sourced locally from within the local communities.	Project Manager Contractor Operator	Construction activities Operation
	Train employees to gain skills they can use in the future.	Project Manager Contractor Operator	Construction Operation
	Consult with local communities to boost local business.	Project Manager Contractor Operator	Construction Operation
AIR QUALITY			

ACTIVITY/ASPECT	ENVIRONMENTAL MANAGEMENT AND MITIGATION MEASURE	RESPONSIBLE PERSON	PRIORITY TIMEFRAME
-----------------	---	--------------------	--------------------

<p><u>Objectives:</u></p> <ul style="list-style-type: none"> – To ensure that air quality impacts to the surrounding area is kept to a minimum or mitigated as far as possible. – To ensure that odour impacts to the surrounding environment are minimal or mitigated <p><u>Indicator and Compliance Mechanisms:</u></p> <ul style="list-style-type: none"> – Maintenance records. – Incident reporting system. – Induction training and records. – Health, safety, environmental and community incident and complaints management system register. – Monitoring and audit reports. – Odour Management Plan. – Air Quality Impact Assessment. – Records of Personal Protective Equipment (PPE). 			
Dust, Particulate Matter and Odour	When required dust suppression methods, such as water suppression, must be used, especially during dry and windy periods. Dust must be visually monitored on a daily basis and minimised where possible to ensure emissions are minimised.	Project Manager Contractor Operator	Construction activities
	Ensure that all vehicles and machines are adequately maintained to minimise emissions.	Contractor	Construction
	No burning of waste, such as plastic bags, cement bags and litter is permitted.	Contractor	Construction

ACTIVITY/ASPECT	ENVIRONMENTAL MANAGEMENT AND MITIGATION MEASURE	RESPONSIBLE PERSON	PRIORITY TIMEFRAME
	Ensure that stockpiles are protected from wind elements. It is recommended that the clearing of vegetation from the site should be selective and done just before construction so as to minimise erosion and dust.	ECO Contractor	Construction
	All materials transported to site must be transported in such a manner that they do not fly or fall off the vehicle. This may necessitate covering or wetting friable materials	Project Manager Contractor Operator	Construction Operation
	Provide a complaints register to report any excessive odour incidents.	Operator	Operation
	Reduce the possibility of spills by applying good materials handling practices.	Operator	Operation
	Transport waste in the early morning during lower ambient temperatures.	Operator	Operation
	Ensure appropriate handling and storage of animal carcasses to prevent odorous emissions from the facility. The carcasses must be removed from the site before it decomposes and disposed of at an appropriate facility.	Operator	Operation
	Ensure that the settling pond is emptied and cleaned at least once a week to prevent concentration of odour around the feedlot.	Operator	Operation
REHABILITATION			
<u>Objectives:</u> – To return disturbed sites to a natural state characteristic to the area.			

ACTIVITY/ASPECT	ENVIRONMENTAL MANAGEMENT AND MITIGATION MEASURE	RESPONSIBLE PERSON	PRIORITY TIMEFRAME
Construction site	All remaining construction infrastructure, building rubble and waste is to be removed from the site and disposed of by a licensed contractor or at a registered landfill site.	Contractor ECO	Post construction
Rehabilitation and Landscaping	All areas disturbed by construction activities should be inspected for contamination, remediated if necessary and then maintained/landscaped to ensure efficient stormwater drainage.	Contractor ECO	Post construction

8 CONCLUSION

In terms of NEMA, everyone (i.e. all persons engaging in any component of this project) is required to take reasonable measures to ensure that they do not pollute the environment. 'Reasonable measures' includes informing and educating employees about the environmental risks associated with their work and training them to operate in an environmentally responsible manner.

The DRDLR also recognises that, in terms of NEMA, the cost to repair any environmental damage will be borne by the person responsible for the damage. If the above-mentioned environmental guidelines and mitigation measures are adopted, it is anticipated that the negative environmental impacts of the proposed feedlot will be mitigated. A DRDLR appointed ECO can monitor the site periodically throughout construction to ensure that the required environmental controls are in place and working effectively.

If you have any further enquiries, please feel free to contact:

WSP Environmental (Pty) Ltd
Attention: Tutayi Chifadza
PO Box 98867, Sloane Park, 2152
Tel: 011 361 1390
Fax: 011 361 1381
E-mail: Tutayi.Chifadza@wsp.com

A EAP CV





CHIFADZA TUTAYI, B.Sc.H

*Environmental Consultant (Environmental Management),
Environment & Energy*



Years with the firm

2>

Years of experience

5

Areas of practice

Environmental Management

Compliance Auditing

*Environmental, Social and
Governance (Due Diligence
Services)*

*Waste Classification and
Management*

CAREER SUMMARY

Tutayi Chifadza is an Environmental Consultant for WSP at the Johannesburg, Bryanston office in the Environmental Services division. He moved to WSP from Sparrow Consulting almost a year ago where he was Project Manager for their Technical Manual/Training material development team.

He is currently teaming up with Principal Consultants and Associates on two Scoping and EIA projects, one for AgriProtein Gauteng's proposed waste recycling facility and a proposed establishment of a Special Economic Zone for the Coega Development Corporation in Mthatha, Eastern Cape which will have agricultural, industrial and commercial hubs. He is also currently project managing a Basic Assessment for the development of a cattle feedlot in Mpumalanga for the Department of Rural Development and Land Reform.

Tutayi has been previously involved in the technical area of production industries with regards to their processes and instrumentation for the purpose of creating technical training manuals and SOPs. He is currently part of the Employment Equity Committee at WSP and recently completed an online training course in Project Management Professional.

EDUCATION

Bachelor of Science (Honours), Applied Science in Environmental Technology, University of Pretoria, Pretoria, South Africa 2013

Bachelor of Science, Chemistry, University of Pretoria, Pretoria, South Africa 2012

ADDITIONAL TRAINING

IFC Environmental and Social Risk Management Training Course for Due Diligence with focus on IFC performance standards and Equator Principles 2018

Environmental Legal Compliance and Auditing Training by Janice Tooley & Associates 2018

Certificate of Completion for Project Management Professional (PMBOK), e-careers (Online learning) 2016

PROFESSIONAL EXPERIENCE

Environmental Services

- Identification of Interested and Affected Parties for Omnia Sasolburg, Sasolburg, Free State, South Africa (2018): Tutayi's role was to conduct a site visit and identify the interested and affected parties in terms of Clause 4.1 and 4.2 of ISO 14001:2015. Tutayi distributed a questionnaire which will be used to compile a stakeholder engagement report based on the responses. Client: Omnia Fertilizer a Division of Omnia Group (Pty) Ltd
- Wildcoast Special Economic Zone, Mthatha, Eastern Cape, South Africa (2018): Tutayi's role is to draft the scoping phase and EIA phase reports as well as the Environmental Management Programme for the proposed development of a Special Economic Zone on the land parcels adjacent to the Mthatha Airport. Client: Coega Development Corporation.
- Tubatse Waste Management Licence Compliance Audit, Steelpoort, Limpopo, South Africa (2018): Tutayi was responsible for conducting a technical compliance audit of 4 Waste Management Licences and compile audit reports for each as part of the conditions of the licences. Client: Tubatse Chrome (Pty) Ltd.

- Tembisa Bridges Environmental Control Officer, Tembisa, Gauteng, South Africa (2018): Tutayi is responsible for conducting monthly site visits and conducting technical compliance audit against the Environmental Management Programme and Environmental Authorisation conditions for the construction of pedestrian bridges at 2 sites and the stream rehabilitation along a stream section. Client: Ekurhuleni Metropolitan Municipality.
- Kranspoort Cattle Feedlot Basic Assessment Process, Kranspoort, Mpumalanga, South Africa (2018): Tutayi's role was to conduct the Basic Assessment Process by drafting the Basic Assessment Report, Environmental Management Programme as well as the public participation material for the proposed development of a cattle feedlot. Client: Department of Rural Development and Land Reform.
- Hendrina Leachate Dam Basic Assessment Process, Hendrina, Mpumalanga, South Africa (2018): Tutayi's role was to conduct the Basic Assessment Process by drafting the Basic Assessment Report, Environmental Management Programme as well as the public participation material for the proposed construction of a leachate control dam on the Eskom waste disposal facility. Client: Eskom Holdings.
- AgriProtein Gauteng Facility Scoping and EIA Process, Wadeville, Johannesburg, Gauteng, South Africa (2017-Present): Tutayi's role was to draft the scoping phase and EIA phase reports as well as the Environmental Management Programme for the proposed nutrient recycling facility in Wadeville. Client: AgriProtein Gauteng.
- Kelvin Power Water Use Licence Audit, Kempton Park, Gauteng (2017-2018). Tutayi's role was to conduct documentation review, site assessment and compilation of the compliance audit report based on the Water Use Licence conditions for Kelvin Power. Client: Kelvin Power (Pty) Ltd.
- Amandelbult Dangerous Goods Project, Amandelbult, Limpopo, South Africa (2017-2018): Tutayi's role was to conduct the Basic Assessment Process by drafting the Basic Assessment Report, Environmental Management Programme as well as the public participation material for the proposed installation of diesel storage tanks and the extension of two railway segments on the site. Client: Rustenburg Platinum Mines Limited.
- Sappi External Waste Management Licence Compliance Audit, Springs, Gauteng, South Africa (2017): Tutayi was responsible for conducting the Waste Management Licence environmental compliance audit of the solid waste disposal facility situated at Enstra and compile an audit report according to the requirements of the National Environmental Management Waste Act (No. 59 of 2008) (NEMWA). Client: Sappi Southern Africa Limited.
- Compliance Audits of 2 Water Use Licences, Mpumalanga, Gauteng, South Africa (2017): Tutayi's role was to conduct a compliance audit against two water use licences for 2 hydrocarbon pipelines that run from from Secunda to Sasolburg and assessing the state of river crossings and the pipeline along the servitude. Client: Sasol Satellite Pipeline Operations.
- South 32 EMPR PAR, WUL and WML audits, Middelburg, Mpumalanga, South Africa (2017): Tutayi's role was to conduct WUL audits for the Klipfontein, MMS North and South, Douglas and BMK Extension coal mining sections as well as write up the relevant reports. The project is about conducting performance assessment reports (EMPR), as well as WUL and WML auditing. Client: Middleburg Mine Services (South 32).
- Environmental Social Governance Due Diligence, South Africa/Swaziland (2017): Tutayi was partnered with two Senior Associates during the project and his role was to conduct site visits and conduct facility inspections based on the checklist prepared in line with EHS Guidelines and IFC Performance Standards (1 and 2) at selected WACO Africa facilities in Johannesburg and Swaziland on behalf of the client who intended to invest. Client: The Abraaj Group.

- Sasol Third Party Audits, Johannesburg, Gauteng, South Africa (2017): Tutayi's role was to conduct a comprehensive technical and compliance Duty of Care audit on two third party contractors that transport and recover precious metals from the Sasol Secunda Complex. Client: Sasol Synfuels Operations.
- Sasol Oil Pretoria West Depot Environmental Authorisation Compliance Audit, Pretoria West, Gauteng, South Africa (2017): Tutayi was responsible for conducting a technical compliance audit of the Exemption Record of Decision (ROD) and an Amended Environmental Authorisation (EA) and compile an audit report according to the requirements of the National Environmental Management Act (No. 107 of 1998) as amended (NEMA), and as part of the conditions of the EA. Client: Sasol Oil (Pty) Ltd.
- Sasol Energy Technology Blending Facility Upgrade Project, Sasolburg, Free State, South Africa (2017-2018): Tutayi's role was to conduct a Basic Assessment process for the construction of a fuel drum storage warehouse adjacent to the existing underground fuel storage tanks at the Fuel Blending Facility on the Sasol One site. Client: Sasol Energy Technology, a Division of Sasol Oil (Pty) Ltd.
- J.P Morgan Chase & Company, 1 Fricker Road EMP ECO, Illovo, Gauteng, South Africa (2017): Tutayi compiled the EMP for the proposed refurbishment of the office building to attain a Green Star rating and is also responsible for conducting the first EMP compliance audit and training of the DEO to carry out subsequent audits. Client: J.P Morgan Chase & Company.
- Transnet Pipelines, Newcastle Schuinshoogte servitude, Kwazulu Natal, South Africa (2017-2018): Tutayi's role was to conduct the Environmental Control Officer duties for the installation of a protection structure (gabion mattress) on an exposed pipeline. Client: Transnet Pipelines.
- Transnet Pipelines EIA/BA process ECO, Phola-Kendal & Secunda, Mpumalanga, South Africa (2017): Tutayi is responsible for undertaking the BA and EIA process, WUL applications and ECO activities in the Mpumalanga region on an as and when required basis for the existing and potential new pipeline infrastructure. Client: Transnet Pipelines, a Division of Transnet Limited.
- Knightsbridge Development EMP ECO, Johannesburg, Gauteng, South Africa (2016): Tutayi's role was to conduct the ECO audit against the EMP created for Greenstar requirements. Client: Emira Property.
- PPC Waste Classification, All PPC South Africa sites, South Africa (2016): Tutayi's role was to consolidate the waste inventories from different sites into one waste inventory, pre-classify the waste, collect samples, conduct waste profiling, waste classification and create SDSs based on laboratory analysis of samples collected. He also created generic SDSs for waste where sampling was not required. Client: PPC Ltd.
- FFS Construction of a Filtration Plant at the FFS Evander Facility, Evander, Mpumalanga, South Africa (2016): Tutayi's role was to conduct the audit of the relevant license conditions during the construction phase of the filtration plant and. He also conducted the close-out audit for the construction phase. The project is about monitoring and auditing the state of the site during the construction of the filtration plant. Client: FFS Refiners (Pty) Ltd.
- Total SA WMP, Johannesburg, Gauteng, South Africa (2016): Tutayi's role is to create a waste database, rating waste, SDSs and devising best management plans for each type of waste at Total entities. The project involves creating a waste management plan for all forms of waste at Total entities. This includes depots, offices, commercial installations, service stations, ISPs and LMPs. Client: Total SA.
- South 32 EMPR PAR, WUL and WML audits, Middelburg, Mpumalanga, South Africa (2016): Tutayi's role was to conduct WUL audits for the Klipfontein, MMS North and South, Douglas and BMK Extension coal mining sections as well as

write up the relevant reports. The project is about conducting performance assessment reports (EMPR), as well as WUL and WML auditing. Client: Middleburg Mine Services (South 32).

- Impala Plat Landfill Audit, Rustenberg, North West, South Africa (2016): Tutayi's role was to take gas concentration readings from probes strategically placed on the landfill using the Geotech instrument. Methane, oxygen, carbon dioxide and nitrogen gas concentrations were focused on. The project is about auditing the landfill and monitor the gas concentrations to make sure that there is no significant methane build-up within the landfill. Client: Impala Platinum Limited.
- Butsanani EIA-EMPR, Middelburg, Mpumalanga, South Africa (2016): Tutayi's role was to help the senior consultant in compiling, collecting and researching data for the purpose of filling in the WUL application forms. The project is about helping the client acquire the WUL in order to start mining activities. Client: Rietvlei Mining Company (Pty) Ltd.
- Samancor Manganese South Plant demolition, Meyerton, Gauteng, South Africa (2016): Tutayi's role was to provide ECO services for the demolition of the South Plant site on the premises. This entailed conducting environmental audits to ensure EMP compliance for the project to minimise impacts and risk during the activities. Client: Samancor Manganese, Metalloys, operated by South 32.
- Sappi External Waste Management Licence Compliance Audit, Springs, Gauteng, South Africa (2016): Tutayi was responsible for conducting the WML environmental compliance audit of the solid waste disposal facility situated at Enstra and compile an audit report according to the requirements of the National Environmental Management Waste Act (No. 59 of 2008) (NEMWA). Client: Sappi Southern Africa Limited.
- General Electric Healthcare Environmental Health and Safety Audit, Rosebank, Gauteng, South Africa (2016): Tutayi was responsible for undertaking an Environmental Health and Safety (EHS) inspection of the GE Healthcare operations in Rosebank and one field site. The field site was at the Life Carstenhof Hospital where the Field Engineers were installing a new piece of equipment. Client: GE Healthcare, a Division of General Electric.
- Rose Foundation Environmental Compliance Audit of Old Oil Man, Chamdor, Gauteng, South Africa (2016): Tutayi was responsible for undertaking an environmental compliance audit to identify and assess key environmental issues pertaining to the operations and facilities against which on-going continuous improvements and modifications of the facility can be evaluated. The audit covered site operational control measures, legal and regulatory compliance, impacts to environment and general environmental practice. Client: Rose Foundation.
- Samancor Chrome Turfontein Underground Mine Project Mooioi, North West, South Africa (2016): Tutayi assisted in facilitating the public participation process during the public meeting conducted to provide insight into the potential impacts and benefits from the proposed underground mine project. Client: Samancor Chrome.
- Sasol Oil Pretoria West Depot Environmental Authorisation Compliance Audit, Pretoria West, Gauteng, South Africa (2016): Tutayi was responsible for conducting a technical compliance audit of the Exemption Record of Decision (ROD) and an Amended Environmental Authorisation (EA) and compile an audit report according to the requirements of the National Environmental Management Act (No. 107 of 1998) as amended (NEMA), and as part of the conditions of the EA. Client: Sasol Oil (Pty) Ltd.
- BioTherm Wind and Solar Energy Facilities, Western Cape and Northern Cape, South Africa (2017-2017): Tutayi assisted in the creation of a consolidated impact assessment rating based on the available specialist studies as well as consolidating



CHIFADZA TUTAYI, B.Sc.H

*Environmental Consultant (Environmental Management),
Environment & Energy*

the comments and response from commenting authorities and stakeholders.
Client: BioTherm Energy.

- Sasol Energy Technology Blending Facility Upgrade Project, Sasolburg, Free State, South Africa (2016-2017): Tutayi is part of a two-man team responsible for the EIA process for the replacement of old USTs with new ones on the Sasol One site. Client: Sasol Energy Technology, a Division of Sasol Oil (Pty) Ltd.
- Anglo Platinum Water Separation Project, Rustenburg, North West, Gauteng (2016-2017): Tutayi is assisting in the BA process for the proposed refurbishment of an existing pipeline and installation of new pipelines as well in the Water Infrastructure Separation Project. Client: Anglo American Platinum Limited.
- South 32 Middelburg Water Reclamation Plant (MWRP), Middelburg, Mpumalanga, South Africa (2017): Tutayi is part of the team conducting sampling and classification of Stage 1 and Stage 2 gypsum produced as the by-product of the process as well as conducting the fertiliser assessment potential of the by-products. Client: South 32 Limited.

B EAP

DECLARATION

OF INTEREST

AND

UNDERTAKING

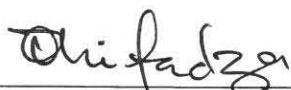
APPENDIX 9
9.1 DECLARATION OF THE EAP

I, **Tutayi Chifadza**, declare that –

- I act as the independent environmental assessment practitioner in this application;
- I have expertise in conducting environmental impact assessments, including knowledge of the Act, Regulations and any guidelines that have relevance to the proposed activity;
- I will comply with the Act, Regulations and all other applicable legislation;
- I will 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 will take into account, to the extent possible, the matters listed in Regulation 18 of the Regulations when preparing the application and any report relating to the application;
- 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, unless access to that information is protected by law, in which case it will be indicated that such information exists and will be provided to the competent authority;
- I will perform all obligations as expected from an environmental assessment practitioner in terms of the Regulations; and
- I am aware of what constitutes an offence in terms of Regulation 48 and that a person convicted of an offence in terms of Regulation 48(1) is liable to the penalties as contemplated in section 49B of the Act.

Disclosure of Vested Interest (delete whichever is not applicable)

- I do not have and will not have any vested interest (either business, financial, personal or other) in the proposed activity proceeding other than remuneration for work performed in terms of the Regulations;



Signature of the environmental assessment practitioner

WSP Environmental (Pty) Ltd

Name of company:

9 July 2018

Date

APPENDIX 9
9.2 UNDERTAKING UNDER OATH/ AFFIRMATION

I, **Tutayi Chifadza**, swear under oath / affirm that all the information submitted or to be submitted for the purposes of this application is true and correct.

Tutayi Chifadza

Signature of the environmental assessment practitioner

WSP Environmental (Pty) Ltd

Name of company

9 JULY 2018

Date

[Signature] 9/07/2018

Signature of the commissioner of oaths

9 JULY 2018

Date

COMMISSIONER OF OATHS (RSA) YUSUF HAJEE CA (SA) Membership No : 04912922 1335 Andes Road Bergbron, Roodeport, 1709 South Africa
--

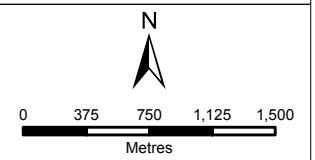
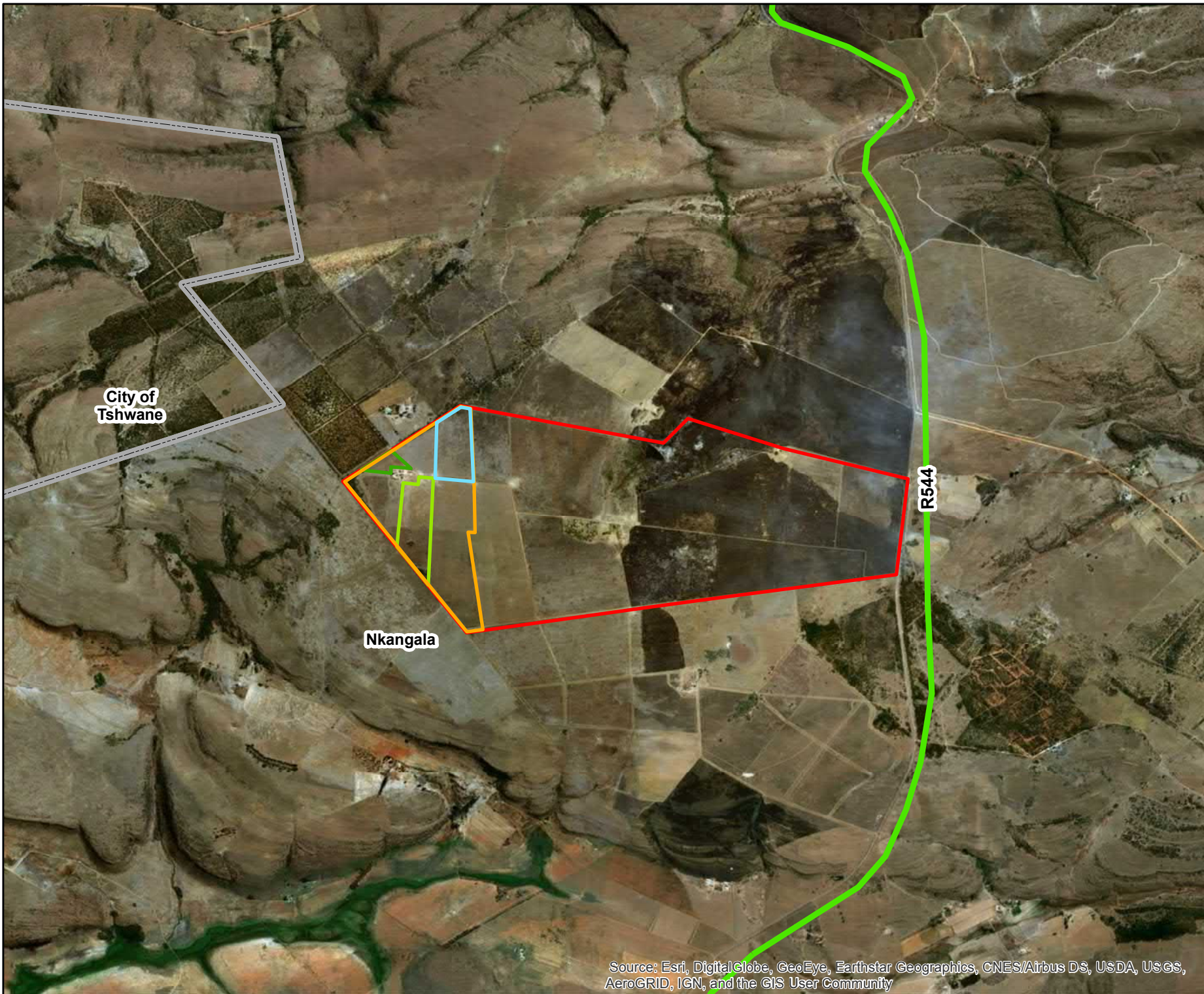
C LAYOUT MAPS



**KRANSPOORT ANIMAL
FEEDLOT
LAYOUT MAP**

Legend

- Roads
- 18 hectares alternative 2
- 20.2 hectares preferred site
- 3.72 hectares alternative 1
- 644 hectares
- Survey area for specialist studies
- District Municipalities



DISCLAIMER
The information on this figure was derived from various digital databases available to WSP Environmental (Pty) Ltd. All information is provided "as is" and it must be acknowledged that data, information, and maps are dynamic and in a constant state of maintenance, correction and update. WSP Environmental (Pty) Ltd cannot accept any responsibility for errors, omissions, or positional accuracy where it has not been directly responsible for the production of the data referenced. There are no warranties, expressed or implied, as to the use of this information, including the warranty of merchantability or fitness for a particular purpose. Notification of any errors will be appreciated.



WSP ENVIRONMENTAL (PTY) LTD
BUILDING C, KNIGHTSBRIDGE
33 SLOANE STREET, BRYANSTON
P.O. BOX 98867, SLOANE PARK 2152, RSA
Tel +27 (0)11 361 1380, Fax +27 (0)11 361 1381, wsp@wspgroup.co.za

DATA SOURCE:

PROJECTION: WGS HARTBEESHOEK 94

PROJECT TITLE: KRANSPOORT ANIMAL FEEDLOT EIA

SCALE: 1:45,000 DRAWN BY: SAMKELO RADEBE

DATE: 2018/03/12 REVIEWED BY: LIAAN PRETORIUS

FIGURE NO: PROJECT NO: 41100804 REV:

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

© COPYRIGHT RESERVED
The content of this document is privileged and confidential and may not be disclosed or reproduced without the express authorisation of the author, being "WSP Environmental (Pty) Ltd"



NOTES

MZINTI FEEDLOT PROPOSED OPTION SITE 2
LAYOUT PLAN
SCALE 1:600

Notes:

1. THE COPYRIGHT OF THIS DRAWING IS VESTED IN LURIWARE (PTY) LTD AND IT MAY NOT BE REPRODUCED IN WHOLE OR PART OR USED FOR THE MANUFACTURE OF ANY ARTICLE WITHOUT THE EXPRESS PERMISSION OF THE COPYRIGHT HOLDERS.
2. WORK TO FIGURED DIMENSIONS ONLY.
3. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT SERVICE ENGINEER'S DRAWINGS AND SPECIFICATIONS.

A	GROUND REVISED.	TJM	04/07/2015
REV:	DESCRIPTION:	BY:	DATE:

LURIWARE (PTY) LTD
 Consulting Agricultural Engineers
 SUITE 202, 2nd Floor, ABSA building
 177 De Boulevard Street, Silverton,
 Pretoria, RSA, 0184
 Tel: +27 (0) 12 804 6600
 Email: info@luriware.co.za

CLIENT: **MPUMALANGA DARDLEA**
 MZINTI 500 CATTLE FEEDLOT OPTION SITE 2
 NKOMAZI MUNICIPALITY
 EHLANZENI SOUTH DISTRICT

CONSULTANT: **PEROZZ CONSULTING**
 CONSULTING AND PROJECTS ENGINEERS
 CALTEX BUILDING
 NELSPRUIT, 1200

DESIGNED BY:	CHECKED:	DATE:	APPROVED BY:
TJMUTENJE	MUSA C	10/07/2015	JJIYANE

PROJECT NAME: **MZINTI CATTLE FEEDLOT SITE 1**
 NKOMAZI, EHLANZENI SOUTH

DRAWING TITLE: **COMPLETE TERRAIN LAYOUT PLAN**

SCALE:	SHEET SIZE:	SHEET NO.:
1:600	A1	1 of 1

PROJECT NO: **MZINTI01** REVISION AND STATUS: **DRAFT 1**

DRAWING NO: **MZINTI01/A/02**

D EMERGENCY RESPONSE PLAN



APPENDIX

Draft Emergency Preparedness Plan

1. Introduction

This Emergency Response Plan (ERP) is intended as a practical working document for the proposed feedlot. The purpose of this document is to provide the basic guidelines on how to respond to potential emergency situations that may arise as at the feedlot. These potential emergency situations include medical emergencies and fires.

2. Site Manager Contact Details

PROJECT PROPONENT DETAILS

Company name:	Department of Rural Development and Land Reform
Company Registration/ Identity number for individuals	N/A
Contact person	Todeni Netshitangani
Postal Address	Private Bag 11305, Nelspruit
Telephone	013 762 8018
E-mail	Todi.Netshitangani@drdlr.gov.za

3. Assigned Responsibilities

Roles, responsibility and authority shall be defined, documented and communicated in order to facilitate effective Emergency Response through implementation of the ERP. Management shall provide resources essential to the implementation and control of the ERP including: human resources, technology, and financial resources.

The DRDLR shall appoint specific Emergency Response representative(s) who, irrespective of other responsibilities, shall have defined roles, responsibility, and authority for emergency response of the facility.

The sections below provide more specific responsibilities related to each position.

<i>Emergency Response representative(s)</i>
<ul style="list-style-type: none">– Actively participate in the facilities planning, implementation and reviewing of the sites Emergency response plan.– Ensure all staff members are aware of the procedures outlined in the ERP.– Setting up practical training schedules (drills) annually to ensure that all staff are prepared encase of an emergency.– Report any incidents that occur to senior management staff and/or the relevant authorities.– Appoint an Emergency Response (ER) team which includes an appropriate first aid representative and a fire warden.– Ensure that the appoint ER team undergo the correct training.– Appoint an appropriate Emergency coordinator.
<i>First Aid representative(s)</i>
<ul style="list-style-type: none">– Ensuring the first aid box is properly stocked to meet all foreseeable incidents which may occur.– Ensure that the boxes are properly safe guarded and that First Aiders name appears on the box.– Should any activity involve hazardous chemical substances, or any other specific first aid emergencies, this should be brought to the attention of the emergency coordinator.– Ensure the first aid certificate is current.– Ensure that there is always a first aider available at each shift.

Fire warden(s)
<ul style="list-style-type: none"> – Ensure that the firefighting equipment is regularly serviced. – Attend the relevant firefighting training. – Report any unserviceable or damaged fire- fighting equipment to the ER.
Emergency Co-ordinator
<ul style="list-style-type: none"> – Ensure that an update of the ERP is kept on file and is easily accessible in case of an emergency. – Ensure that all staff have been issued with the correct Personal Protective Equipment. – Ensure that a list of emergency telephone numbers, including those of the Emergency Response team, are visible to all staff at a number of locations around the facility. – In the case of an emergency, the emergency coordinator is responsible for undertaking roll call at the designated Assembly points.

4. Emergency Response Plan

The following emergency situations have been identified as potential threats at the feedlot:

- Fire;
- Spills; and
- Disease outbreak.

It must be noted that there is a very minor risk associated with these risks as only a very small quantity of chemicals or hazardous substances are actually stored on site.

Fire	Responsibility
■ Raise the alarm	Employee who detected the fire
■ Evacuate all personnel and cattle from the feedlot area	ER Team
■ Contact all relevant emergency services	Emergency Coordinator
■ Report to the emergency Assembly Point and await further instructions	All Staff
■ Remove all vehicles from the premises	ER Team and security
■ Undertake roll call and report all missing staff to the ER team	ER Coordinator
■ Evacuate remaining staff to a safe location outside the site boundaries	ER Team
■ Contain fire until Emergency services arrives	Fire warden
■ Provide First Aid, if required	First Aid representative
Spill	Responsibility
■ Contain the spillage using an onsite spill kit	Employee who discovered/caused the spill
■ Advise emergency services (if required)	Emergency coordinator
■ Provide First Aid (if required)	First Aid representative
■ Ensure that all absorbents used from the spill kits are disposed of in the correct manner.	Emergency coordinator
■ Ensure that the incident is recorded in the incidents register.	Emergency coordinator
Disease Outbreak	Responsibility
■ Contain the outbreak by isolating cattle.	Site Manager / Emergency coordinator
■ Advise emergency services (if required).	Emergency coordinator
■ Alert the carcass disposal facility.	Emergency coordinator
■ Ensure that the incident is recorded in the incidents register.	Emergency coordinator

APPENDIX

The following emergency centres were identified along with the corresponding emergency telephone numbers.

Emergency Centre	Telephone Number
■ Police Emergency Services	10111 013 986 0116
■ Emergency Numbers	10177 (Ambulance/Fire Brigade)
■ KECA Ambulance Services	072 076 2349
■ Suicide Crisis Line	0800 12 13 14 31393