



Baseline and Impact Assessment: Proposed Chloorkop Landfill Expansion

Chloorkop, Gauteng

DATE

June 2019

CLIENT







Prepared for:

SLR Consulting
Matthew Hemming

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



Report Name	Baseline and Impact Assessment: Proposed Chloorkop Landfill Expansion	
Submitted to		
Report Writer (GIS, Botany)	Martinus Erasmus	
	Martinus Erasmus (Cand Sci Nat) obtained his B-Tech degree in Nature Conservation in 2016 at the Tshwane University of Technology. Martinus has been conducting EIAs, basic assessments and assisting specialists in the field during his studies since 2015.	
Report Writer	Lindi Steyn	
	Lindi Steyn has a PhD in Biodiversity and Conservation from the University of Johannesburg. She specialises in avifauna and has worked in this specialisation since 2013.	
Report Reviewer	Andrew Husted	
	Andrew Husted is Pr Sci Nat registered (400213/11) in the following fields of practice: Ecological Science, Environmental Science and Aquatic Science. Andrew is an Aquatic, Wetland and Biodiversity Specialist with more than 12 years' experience in the environmental consulting field. Andrew has completed numerous wetland training courses, and is an accredited wetland practitioner, recognised by the DWS, and also the Mondi Wetlands programme as a competent wetland consultant.	
Declaration	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, 2014 (as amended). 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 principles of science.	



DECLARATION

I, Martinus Erasmus, 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.



Martinus Erasmus

Terrestrial Ecologist

The Biodiversity Company

March 2019

Table of Contents

1	Introduction	1
2	Project Area	2
3	Scope of Work	4
4	Limitations.....	4
5	Methodologies	4
5.1	Geographic Information Systems Mapping	4
5.2	Botanical Assessment.....	5
5.2.1	Literature Study	5
5.3	Wet Season Fieldwork	6
5.4	Faunal Assessment (Mammals & Avifauna).....	6
5.5	Herpetology (Reptiles & Amphibians)	7
6	Key Legislative Requirements.....	7
7	Desktop Spatial Assessment.....	8
7.1	General Land Use.....	9
7.2	Gauteng Conservation Plan (Version 3.3).....	9
7.3	National Biodiversity Assessment	11
7.3.1	Ecosystem Threat Status.....	11
7.3.2	Ecosystem Protection Level.....	12
8	Results & Discussion	13
8.1	Desktop Assessment	13
8.1.1	Vegetation Assessment	13
8.1.2	Vegetation Types	14
8.1.3	Egoli Granite Grassland.....	14
8.1.4	Important Plant Taxa.....	15
8.1.5	Faunal Assessment	17
9	Field Survey.....	24
9.1	Vegetation Assessment	24
9.1.1	Alien and Invasive Plants.....	29
9.2	Faunal Assessment	30

Chloorkop Landfill Expansion

9.2.1	Avifauna.....	30
9.2.2	Mammals	33
9.2.3	Herpetofauna (Reptiles & Amphibians)	33
10	Habitat Sensitivity Mapping	33
11	Impact Assessment	36
11.1	Impact Assessment Methodology	36
11.2	May 2019 Amendments	37
11.3	Current Impacts	38
12	Impact Assessment Results	40
12.1	Construction Phase (Phase 1B).....	40
12.2	Operational Phase (Phase 1B).....	41
12.3	Closure Phase (Phase 1B).....	41
12.4	Assessment of Significance	42
12.4.1	Construction Phase (Phase 1B).....	42
12.4.2	Operational Phase (Phase 1B)	42
12.4.3	Closure Phase (Phase 1B).....	42
12.5	Construction Phase (Phase 1A).....	49
12.6	Operational Phase (Phase 1A).....	49
12.7	Closure Phase (Phase 1A).....	49
12.8	Assessment of Significance	50
12.8.1	Construction Phase (Phase 1A).....	50
12.8.2	Operational Phase (Phase 1A)	50
12.8.3	Closure Phase (Phase 1A).....	50
13	Mitigation Measures	55
13.1	Objectives.....	55
13.2	Mitigation Measures.....	55
13.2.1	Mitigation Measures for Impacts on Vegetation Communities	55
13.2.2	Mitigation Measures for Impacts During the Operational Phase.....	56
13.2.3	Mitigation Measures for Impacts During the Closure Phase	57
13.2.4	Recommendations (Phase 1B and Phase 1A)	57



Chloorkop Landfill Expansion

14	Conclusion	57
15	Impact Statement	59
16	References	60

Tables

Table 1: A list of key legislative requirements relevant to biodiversity and conservation in Gauteng.....	7
Table 2: Desktop spatial features examined.....	8
Table 3: Plant SCC expected to occur in the project area (BODATSA-POSA, 2016).	16
Table 4: List of bird species of regional or global conservation importance that are expected to occur in pentads 2605_2810; 2605_2815; 2605_2805; 2600_2815; 2600_2805; 2555_2815; 2555_2810; 2555_2805; 2600_2810 (SABAP2, 2017, ESKOM, 2014; IUCN, 2017)	17
Table 5: 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)	21
Table 6: Herpetofauna SCC that may occur in the project area.....	24
Table 7: Trees, shrubs and weeds recorded at the proposed project area.	28
Table 8: A list of the avifaunal species recorded in the project area	31
Table 9: A list of herpetofauna recorded in the project area during the March 2019 survey.	33
Table 10: Assessment of significance of potential construction impacts on vegetation communities associated with the proposed development pre- and post- mitigation.....	44
Table 11: Assessment of significance of potential operational impacts on terrestrial biodiversity associated with the proposed development pre- and post- mitigation	45
Table 12: Assessment of significance of potential closure phase impacts on terrestrial biodiversity associated with the proposed development pre- and post- mitigation	47
Table 13: Assessment of significance of potential construction impacts on vegetation communities associated with the proposed development (Phase 1A) pre- and post- mitigation	51
Table 14: Assessment of significance of potential operational impacts on terrestrial biodiversity associated with the proposed development (Phase 1A) pre- and post- mitigation	52
Table 15: Assessment of significance of potential closure phase impacts on terrestrial biodiversity associated with the proposed development (Phase 1A) pre- and post- mitigation	54

Figures



Chloorkop Landfill Expansion

Figure 1: The general location of the project area	3
Figure 2: The project area superimposed on the Gauteng Conservation Plan (2014)	10
Figure 3: Chloorkop project area showing the ecosystem threat status of the associated terrestrial ecosystems (NBA, 2012).....	12
Figure 4: Chloorkop project area showing the level of protection of terrestrial ecosystems (NBA, 2012)	13
Figure 5: Project area showing the vegetation type based on the Vegetation Map of South Africa, Lesotho & Swaziland (BGIS, 2017)	14
Figure 6: Map showing the grid drawn in order to compile an expected species list (BODATSA-POSA, 2016).....	16
Figure 7: Habitats observed; A) Wetland, B) Degraded Grassland, C) Transformed	26
Figure 8: The habitats delineated within the project area	27
Figure 9: Some of the plant species observed in the project area: A) <i>Populus alba</i> , B) <i>Vachellia karroo</i> , C) <i>Verbena bonariensis</i> and D) <i>Cortaderia selloana</i>	29
Figure 10: Avifaunal species recorded during the survey: A) Southern Masked Weaver (<i>Ploceus velatus</i>), B) Pied Crow (<i>Corvus albus</i>), C) Grey-head Gull (<i>Crococephalus cirrocephalus</i>), D) White Stork (<i>Ciconia ciconia</i>), E) Laughing Dove (<i>Streptopelia senegalensis</i>) and F) African Wattled Lapwing (<i>Vanellus senegallus</i>).....	32
Figure 11: Bird flapper observed on the electrical wires in the project area	33
Figure 12: Habitat sensitivity within the project area.....	35
Figure 13: Image depicting the two proposed project phases (Phase 1A and Phase 1B (which collectively includes Phase 1A)	38
Figure 14: Some of the impacts observed: A) Landfill, B) dumping of building rubble with large trucks, C & D) Electrical wires, E) Fencing and F) Invasive plan species	39
Figure 15: Bird with broken wing, most likely due to an impact with the powerlines.....	40

1 Introduction

The Biodiversity Company (TBC) was appointed by SLR Consulting to conduct a Baseline and Impact Assessment on the terrestrial ecosystems associated with the proposed Chloorkop Landfill Expansion.

EnviroServ own the Chloorkop Landfill Site (CLS) and operate it in terms of a waste management license (Ref: 16/2/7/A230/D17/Z1). Municipal solid waste is received from the Midrand area, including the City of Johannesburg and the Ekurhuleni Metropolitan Municipality. The CLS is located in the Chloorkop Industrial area on Portion 63 of Klipfontein 12-IR and is accessed from Marsala Road.

The CLS has been developed over the past two decades with six engineered waste disposal cells that form the waste body. The waste body covers an area of approximately 23.2 ha. In 2016 GDARD granted approval for the permitted height of the waste body to be a maximum of 25 m above ground level.

Motivation for the expansion: The waste body at the CLS has finite airspace, defined by the permitted footprint, height and design parameters. The CLS will not be able to receive waste once it reaches airspace capacity.

Given the current and future waste generation potential of the Midrand region, there is an ongoing need for waste disposal services, even with growing levels of waste diversion. Alternative airspace in the Midrand region is limited. EnviroServ is proposing to expand the CLS in order to provide additional airspace for ongoing disposal of municipal solid waste.

The proposal is to expand the Chloorkop Landfill Site onto adjacent properties. The targeted properties, north of the site, are Erf 334 and 335 of Chloorkop Extension 6, which are approximately 14 ha in extent. EnviroServ is in engagements with the property owner.

The concept is to establish engineered, Class B waste disposal cells on the target properties for ongoing disposal of municipal solid waste. The additional waste disposal cells would join with the current CLS waste body. The facility will include a small Material Recovery Facility for the separation of clean recyclables from the waste. Supporting infrastructure would be integrated with the CLS and/or redeveloped as appropriate.

Anker Street separates part of the extension area from the CLS and thus a phased approach is likely. The first phase would entail the development and use of waste disposal cells between the CLS and Anker Street. The second phase would involve the development and use of waste disposal cells on the northerly portion of the site, connecting with the CLS and the first phase. The second phase would only proceed if Anker Street had been relocated or closed (subject to municipal engagement and approvals). The process to develop detailed designs for the waste disposal cells has been initiated.

Support services: The primary support services and infrastructure associated with the proposed expansion of the CLS include the site entrance and access controls, weigh bridge, leachate and storm water management and landfill gas management. The process to develop detailed designs for the supporting infrastructure has been initiated.



Chloorkop Landfill Expansion

Access to the facility would be via Marsala Road, off the M38. Potable water and electricity would be sourced from the Ekurhuleni Metropolitan Municipality via existing connections. Effluent from the site will be disposed to the municipal sewage system.

A wet season terrestrial biodiversity survey was conducted on the 26th March 2019 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, the 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 development.

A distinct separation exists in the assessments of Phase 1A (located entirely on Erf 335) and the assessment of Phase 1B (located on Erf 334), which cumulatively includes Phase 1A, because it is a possibility that the applicant may elect to only apply for Phase 1A and could discount Phase 1B as an alternative.

As a result, this specialist report has been compiled to provide impact assessments that consider the project phasing as follows:

1. Phase 1A on Erf 335 (south of Anker Street which divides the property);
2. Phase 1A and 1B (entire footprint) cumulatively.

2 Project Area

The CLS is located in the Chloorkop Industrial area on Portion 63 of Klipfontein 12-IR and is accessed from Marsala Road off the M38 in the Gauteng Province, South Africa. The land uses surrounding the project area consists of the existing CLS to the south, the Klipfontein Sands sand mine to the east and urban areas to the west and north. Some open areas of land exist to the north of the project area, much of which exists underneath existing powerline servitudes.



Chloorkop Landfill Expansion

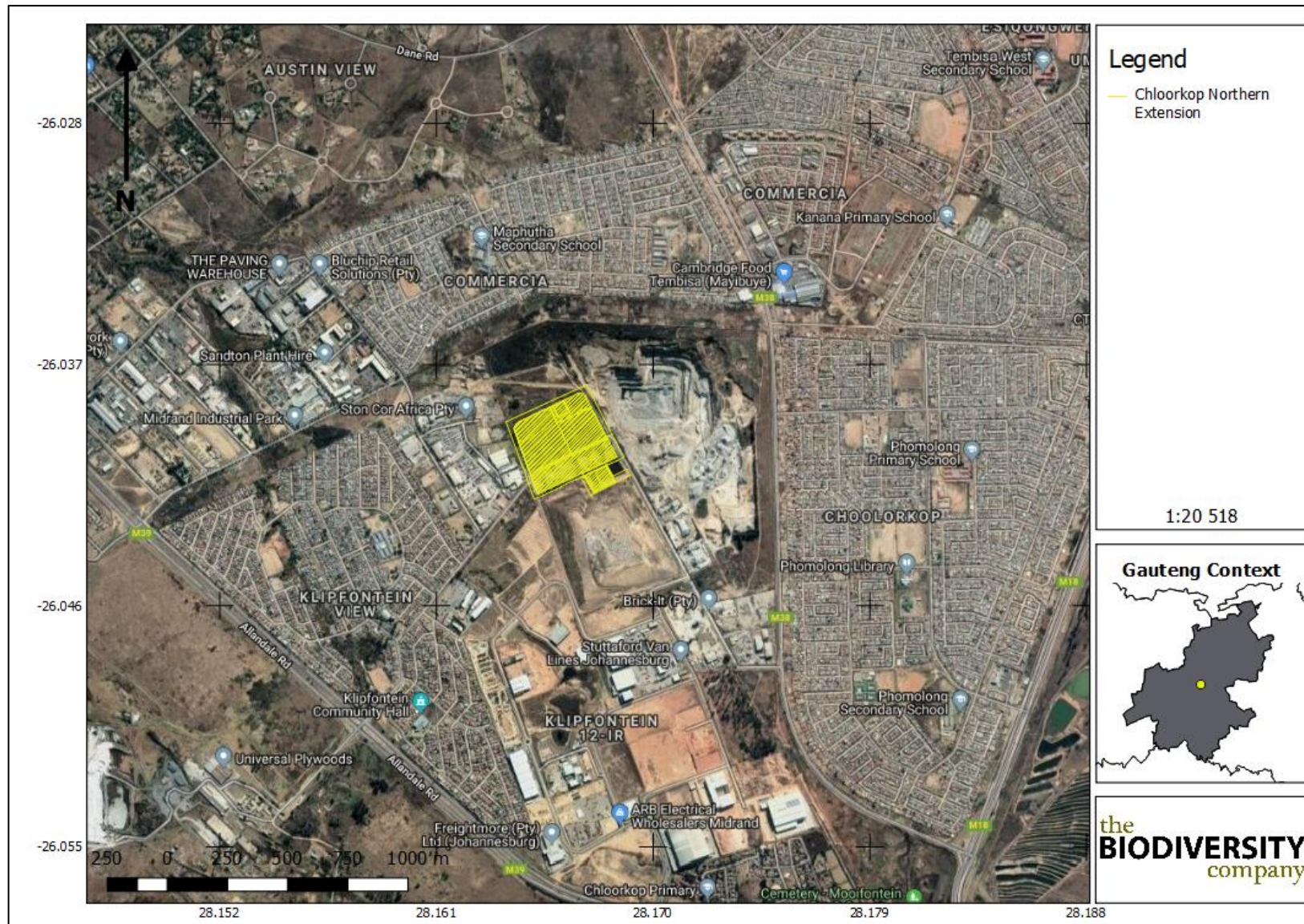


Figure 1: The general location of the project area

www.thebiodiversitycompany.com



3 Scope of Work

TBC was commissioned by SLR to conduct a baseline assessment for the proposed development on Erf 334 and 335 of Chloorkop Extension 6, Gauteng, South Africa. 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 (biodiversity) that occur in the study area, and the manner in which these sensitive receptors may be affected by the activity;
- Identify 'significant' ecological, botanical and zoological features within the proposed development areas;
- Provide a map identifying sensitive receptors in the study area, based on available maps, database information & site visit verification.
- Site visit to verify desktop information; and
- Screening to identify any critical issues (potential fatal flaws) that may result in project delays or rejection of the application.

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 spatial data might not be accurate or based on outdated features; ground truthing has been performed to try and increase the accuracy; 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 Mapping

Existing data layers were incorporated into a (Geographic Information Systems) GIS to establish how the proposed development 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);
- Important Bird Areas 2015 – BirdLife South Africa (vector geospatial dataset); and
- Gauteng Conservation Plan (Version 3.3).

- Field surveys were conducted to confirm (or refute) the presence of species identified in the desktop assessment. The specialist disciplines completed for this study included:
- 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 an ecological habitat 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:

- 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, 2012);
- Grassland Ecosystem Guidelines: landscape interpretation for planners and managers (SANBI, 2013); and
- Red List of South African Plants (Raimondo *et al.*, 2009; SANBI, 2019).

5.3 Wet Season Fieldwork

The wet season fieldwork and sample sites were placed within targeted areas (i.e. target 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 to maximise coverage and navigate to each target site in the field in order to perform a rapid vegetation and ecological habitat assessment at each sample site. Emphasis was placed on sensitive habitats.

At each sample site notes were made regarding current impacts (e.g. pollution, invasive plant species 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.

5.4 Faunal Assessment (Mammals & Avifauna)

The faunal desktop assessment included the following:

- Compilation of identified species lists;
- Compilation of expected 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;
- Identification of tracks and signs; and
- Utilization of local knowledge.



5.5 Herpetology (Reptiles & Amphibians)

A herpetofauna assessment of the project area was also conducted. The herpetological field survey comprised the following techniques:

- Diurnal hand searches - are used for reptile species that shelter in or under particular microhabitats (typically rocks, exfoliating rock outcrops, fallen timber, leaf litter, bark etc.);
- Visual searches - typically undertaken for species whose behaviour involves surface activity or for species that are difficult to detect by hand-searches or pitfall trapping. May include walking transects or using binoculars to view species from a distance without them being disturbed;
- Amphibians – many of the survey techniques listed above will be able to detect species of amphibians. Over and above these techniques, vocalisation sampling techniques are often the best to detect the presence of amphibians as each species has a distinct call; and
- Opportunistic sampling - Reptiles, especially snakes, are incredibly illusive and difficult to observe. Consequently, all possible opportunities to observe reptiles are taken, in order to augment the standard sampling procedures described above. This will include talking to local people and staff at the site and reviewing photographs of reptiles and amphibians that the other biodiversity specialists may come across while on site.

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 (Table 1) where these have a high degree of relevance to the project and/or are referred to in this assessment.

Table 1: A list of key legislative requirements relevant to biodiversity and conservation in Gauteng

INTERNATIONAL	Convention on Biological Diversity (CBD, 1993)
	The United Nations Framework Convention on Climate Change (UNFCCC, 1994)
	The Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES 1973)
	The Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention, 1979)
NATIONAL	Constitution of the Republic of South Africa (Act No. 108 of 2006)
	The National Environmental Management Act (NEMA) (Act No. 107 of 1998)
	The National Environmental Management Protected Areas Act (Act No. 57 of 2003)
	The National Environmental Management Biodiversity Act (Act No. 10 of 2004)

	The National Environmental Management: Waste Act, 2008 (Act 59 of 2008);
	The Environment Conservation Act (Act No. 73 of 1989)
	National Environmental Management Air Quality Act (No. 39 of 2004)
	National Protected Areas Expansion Strategy (NPAES)
	Natural Scientific Professions Act (Act No. 27 of 2003)
	National Biodiversity Framework (NBF, 2009)
	National Forest Act (Act No. 84 of 1998)
	National Veld and Forest Fire Act (101 of 1998)
	National Water Act, 1998 (Act 36 of 1998)
	National Freshwater Ecosystem Priority Areas (NFEPA's)
	National Spatial Biodiversity Assessment (NSBA)
	World Heritage Convention Act (Act No. 49 of 1999)
	National Heritage Resources Act, 1999 (Act 25 of 1999)
	Municipal Systems Act (Act No. 32 of 2000)
	Alien and Invasive Species Regulations, 2014
	South Africa's National Biodiversity Strategy and Action Plan (NBSAP)
	Conservation of Agricultural Resources Act, 1983 (Act 43 of 1983)
	Sustainable Utilisation of Agricultural Resources (Draft Legislation).
	White Paper on Biodiversity
	PROVINCIAL
Gauteng Department of Agriculture and Rural Development (GDARD): Checklist for Biodiversity Assessments	
GDARD Mining and Environmental Impact Guide	

7 Desktop Spatial Assessment

The following features describes the general area and habitat, this assessment is based on spatial data that are provided by various sources such as the provincial environmental authority and SANBI. The desktop analysis and their relevance to this project are listed in Table 2.

Table 2: Desktop spatial features examined

Desktop Information Considered	Relevance	Section
Land Use	Relevant: description included	7.1
Conservation Plan	Checked but falls outside of an ESA and CBA area	7.2
Rocky Ridges	Not relevant, closes ridge is class 4 and its more than 3 km to the west of the project area	-

Ecosystem Threat Status	Falls within an EN ecosystem	7.3.1
Ecosystem Protection Level	Falls in a poorly protected ecosystem	7.3.2
Protected Areas	Irrelevant: 35 km to the closes protected area: Cradle of Human Kind.	-
NFEPA Rivers and Wetlands	No NFEPA wetlands or NFEPA rivers close to the project area.	-
Mining and Biodiversity Guidelines	Irrelevant: no mining component	-
Important Bird and Biodiversity Areas	Irrelevant: 35 km to the closest protected area: Cradle of Human Kind.	-

7.1 General Land Use

The land uses surrounding the project area consists of the existing CLS to the south, the Klipfontein Sands sand mine to the east and urban areas to the west and north. Some open areas of land exist to the north of the project area, much of which exists underneath existing powerline servitudes.

The following infrastructure exists in the project area and surrounds:

- Various roads like Hatchet drive, Anker Street and Marsala Road;
- Power lines;
- Sand and Stone mine;
- Urban area with associated anthropogenic impacts; and
- Current landfill.

7.2 Gauteng Conservation Plan (Version 3.3)

The Gauteng Conservation Plan (Version 3.3) (GDARD, 2014b) (Gauteng C-Plan) classified areas within the province on the basis of its contribution to reach the conservation targets within the province. The Gauteng C-Plan uses the following terms to categorise the various land used types according to their biodiversity and environmental importance:

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

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 (GDARD, 2014b). Thus, if these areas are not maintained in a natural or near natural state then

Chloorkop Landfill Expansion

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).

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

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

As shown in Figure 2, the project area falls outside of any CBA and ESA areas.

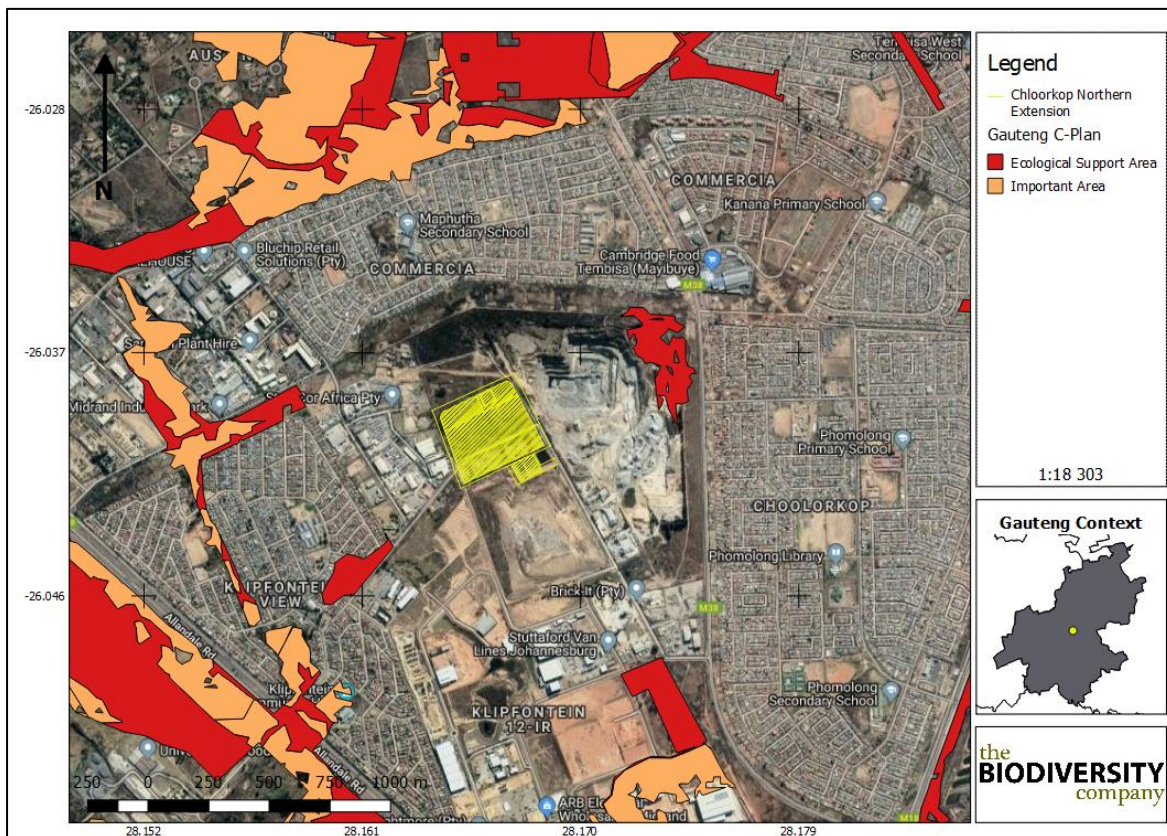


Figure 2: The project area superimposed on the Gauteng Conservation Plan (2014)

7.3 National Biodiversity Assessment

The National Biodiversity Assessment (NBA) was completed as a collaboration between the SANBI, the DEA and other stakeholders, including scientists and biodiversity management experts throughout the country over a three-year period (Driver *et al.*, 2011).

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 *et al.*, 2011).

The two headline indicators assessed in the NBA are *ecosystem threat status* and *ecosystem protection level* (Driver *et al.*, 2011).

7.3.1 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 *et al.*, 2011).

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 *et al.*, 2011).

The project area was superimposed on the terrestrial ecosystem threat status (Figure 3). As seen in Figure 3 the project area falls entirely within an ecosystem which is listed as EN. The NBA utilises a complex set of historic and current spatial datasheets to analyse the threat status of particular ecosystems. Ecosystems can be classified as EN for example if they provide habitat for SCC, threatened vegetation, and/or if only small portions of this ecosystem are left and/or if they are not formally protected, such as in formally protected areas for example. However, current land-uses often completely or partially alter these ecosystems.

The vegetation present in the project area is not representative of vegetation that represents an EN ecosystem type. Only the wetland area in the central portion of the project area may harbour fragments of habitat or vegetation that may represent remnants of an EN ecosystem type.

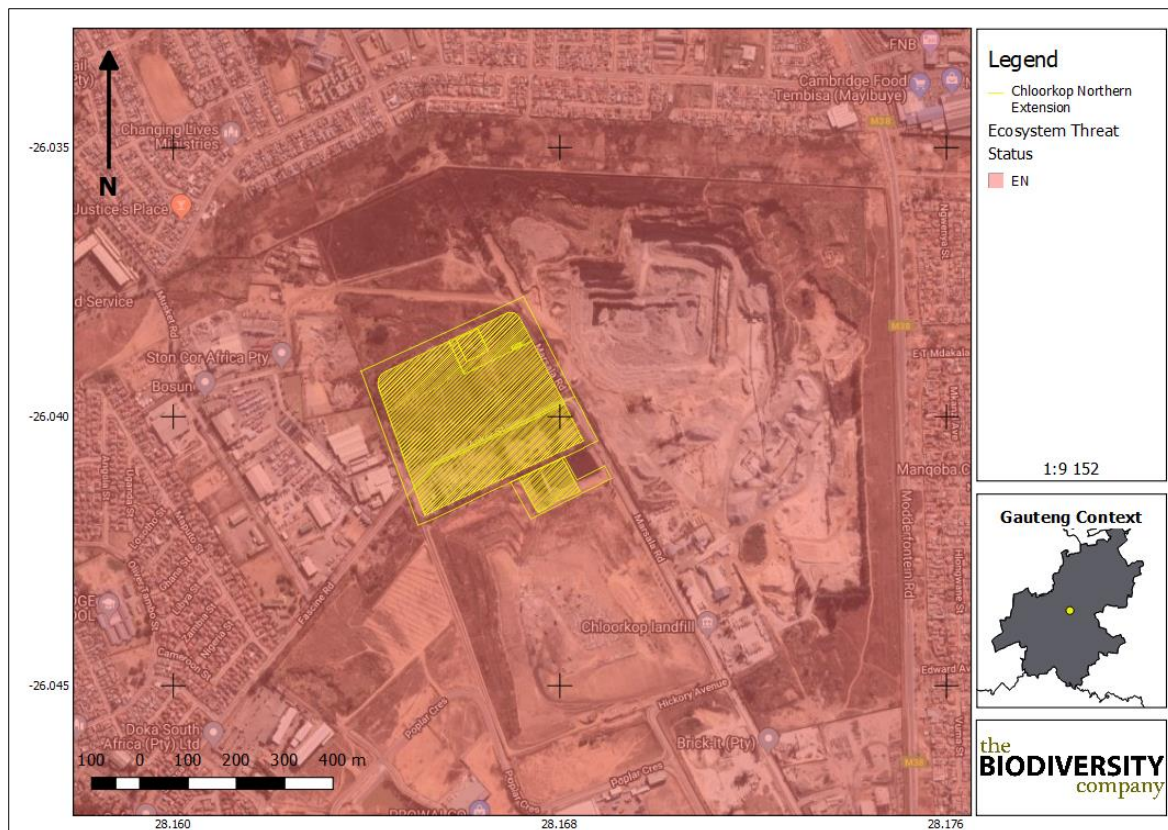


Figure 3: Chloorkop project area showing the ecosystem threat status of the associated terrestrial ecosystems (NBA, 2012)

7.3.2 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 *et al.*, 2011).

The Chloorkop project area 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 (entire project area and surrounds) are rated as *poorly protected*.

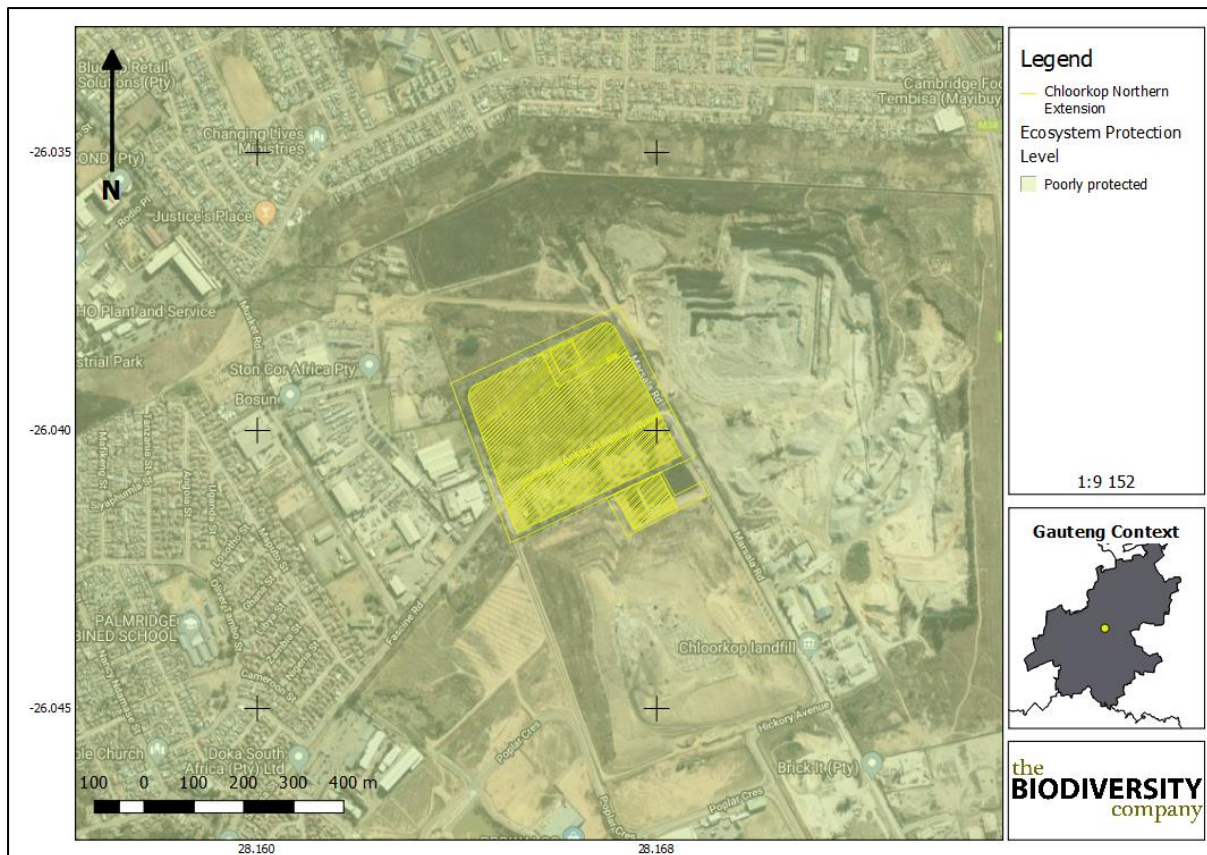


Figure 4: Chloorkop project area showing the level of protection of terrestrial ecosystems (NBA, 2012)

8 Results & Discussion

8.1 Desktop Assessment

8.1.1 Vegetation Assessment

The Chloorkop project area is situated within the grassland biome, specifically the Egoli Granite Grassland. 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

Chloorkop Landfill Expansion

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.

8.1.2 Vegetation Types

The grassland biome comprises many different vegetation types. The project area is situated entirely in one vegetation type; the Egoli Granite Grassland (Gh 10), according to Mucina & Rutherford (2006) (Figure 5).

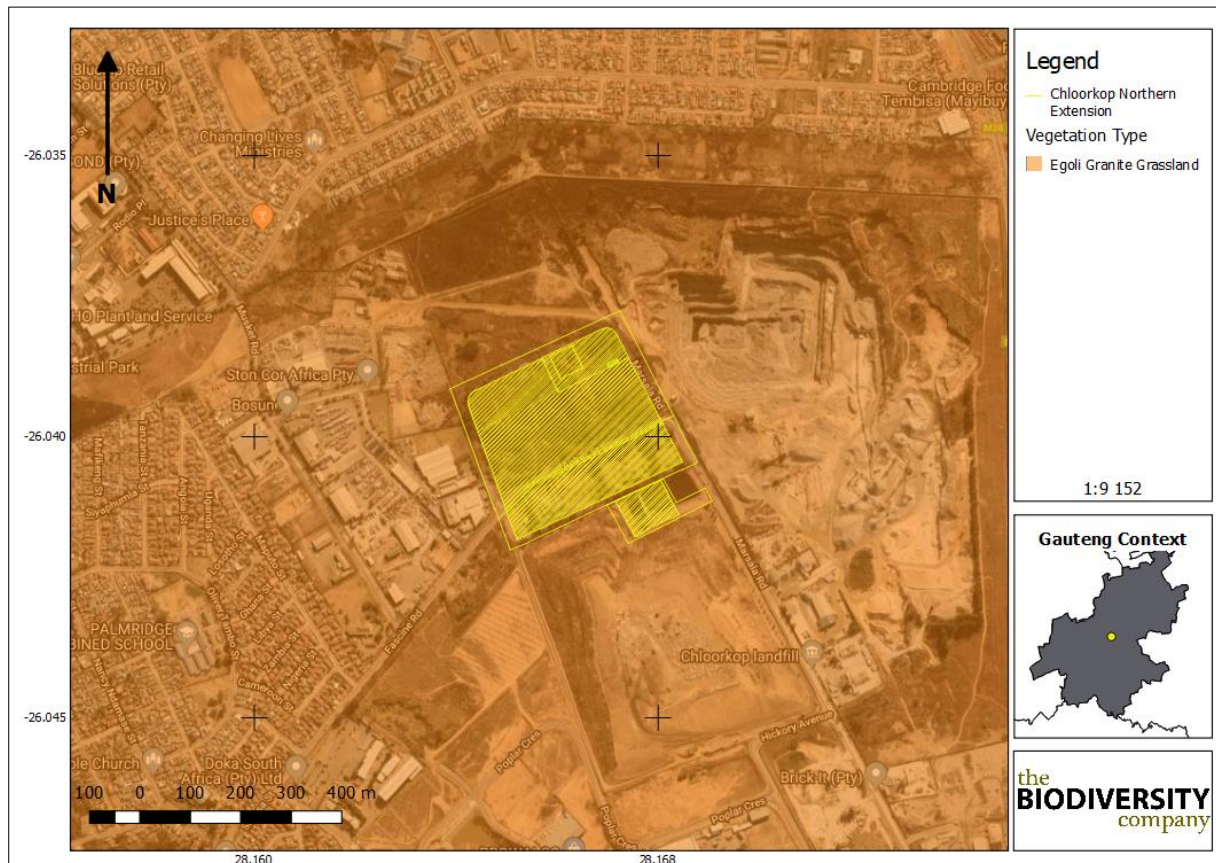


Figure 5: Project area showing the vegetation type based on the Vegetation Map of South Africa, Lesotho & Swaziland (BGIS, 2017)

8.1.3 Egoli Granite Grassland

Egoli Granite Grassland occurs only in the Gauteng province, and less than 32% of this vegetation type remains untransformed. The province has a target to conserve and protect 25% of the remaining vegetation type.

Egoli Granite Grassland is characterised by a high species richness with a patchy dominance of various grass species, and a large variety of forbs (broad leafed herbaceous plant, other than grass), representing a climax or close to climax condition.

8.1.4 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 **Egoli Granite Grassland** vegetation type:

Graminoids: *Aristida canescens*, *A. congesta*, *Cynodon dactylon*, *Digitaria monodactyla*, *Eragrostis capensis*, *E. chloromelas*, *E. curvula*, *E. racemosa*, *Heteropogon contortus*, *Hyparrhenia hirta*, *Melinis repens* subsp. *repens*, *Monocymbium ceresiiforme*, *Setaria sphacelata*, *Themeda triandra*, *Tristachya leucothrix*, *Andropogon eucomus*, *Aristida aequiglumis*, *A. diffusa*, *A. scabrivalvis* subsp. *borumensis*, *Bewsia biflora*, *Brachiaria serrata*, *Bulbostylis burchellii*, *Cymbopogon caesius*, *Digitaria tricholaenoides*, *Diheteropogon amplexans*, *Eragrostis gummiflua*, *E. sclerantha*, *Panicum natalense*, *Schizachyrium sanguineum*, *Setaria nigrirostris*, *Tristachya rehmannii*, *Urelytrum agropyroides*.

Herbs: *Acalypha angustata*, *A. peduncularis*, *Becium obovatum*, *Berkheya insignis*, *Crabbea hirsuta*, *Cyanotis speciosa*, *Dicoma anomala*, *Helichrysum rugulosum*, *Justicia anagaloides*, *Kohautia amatymbica*, *Nidorella hottentotica*, *Pentanisia prunelloides* subsp. *latifolia*, *Pseudognaphalium luteo-album* and *Senecio venosus*.

Geophytic Herbs: *Cheilanthes deltoidea*, *C. hirta*.

Low Shrubs: *Anthospermum hispidulum*, *A. rigidum* subsp. *pumilum*, *Gnidia capitata*, *Helichrysum kraussii*, *Ziziphus zeyheriana*.

Tall Shrub: *Searsia pyroides*.

Succulent Shrub: *Lopholaena coriifolia*.

8.1.4.1 Conservation Status of the Vegetation Type

According to Mucina & Rutherford (2006), this vegetation type is classified as **EN**. The national target for conservation protection for both these vegetation types is 24%, but only 3% is conserved in statutory (Diepsloot and Melville Koppies Nature Reserves). More than two thirds of this vegetation unit have already undergone transformation mostly due to urbanisation, cultivation or by building of roads.

8.1.4.2 Plant Species of Conservation Concern

Based on the Plants of Southern Africa (BODATSA-POSA, 2016) database, 101 plant species are expected to occur in the area (Figure 5). The list of expected plant species is provided in Appendix A. Of the 101-plant species, two (2) species are listed as being SCC (Table 3).

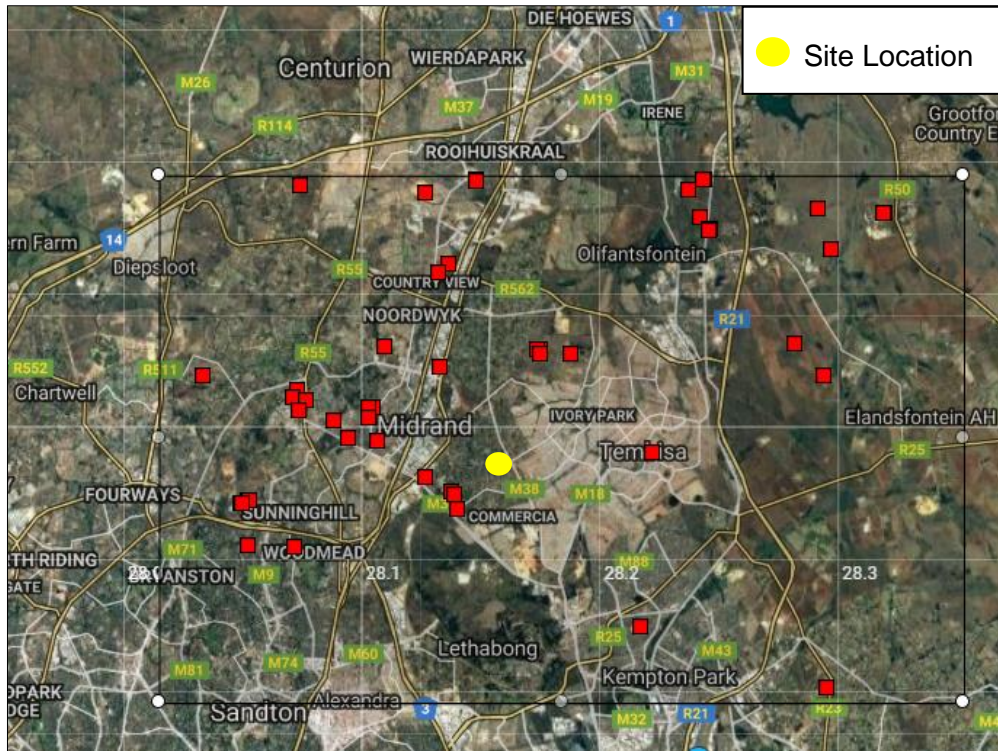


Figure 6: Map showing the grid drawn in order to compile an expected species list (BODATSA-POSA, 2016)

Table 3: Plant SCC expected to occur in the project area (BODATSA-POSA, 2016).

Family	Taxon	Author	IUCN	Ecology
Orchidaceae	<i>Habenaria mossii</i>	(G.Will.) J.C.Manning	EN	Indigenous; Endemic
Aizoaceae	<i>Lithops lesliei</i> subsp. <i>lesliei</i>	(N.E.Br.) N.E.Br.	NT	Indigenous



Habenaria mossii is listed as EN according to the Red List of South African Plants (SANBI, 2017) and can be found in the Carletonville Dolomite Grassland, Andesite Mountain Bushveld and is found in open grassland on dolomite or in black, sandy soil. Threats are mainly urban expansion (Pfab *et al.*, 2005).



Lithops lesliei subsp. *lesliei* is listed as near threatened according to the Red List of South African Plants (SANBI, 2017). This species occurs primarily in arid grasslands, usually in rocky places, growing under the protection of forbs and grasses. This species is threatened by habitat destruction and is used in the muthi trade.

8.1.5 Faunal Assessment

8.1.5.1 Avifauna

Based on the South African Bird Atlas Project, Version 2 (SABAP2) database, 344 bird species are expected to occur in the vicinity of the project area (pentads 2605_2810; 2605_2815; 2605_2805; 2600_2815; 2600_2805; 2555_2815; 2555_2810; 2555_2805; 2600_2810). The full list of potential bird species is provided in Appendix B.

Of the expected bird species, twenty (20) species (5.81%) are listed as SCC either on a regional (19) or global scale (9) (Table 4).

The SCC include the following:

- One (1) species that is listed as CR on a regional basis; and
- Three (3) species that are listed as EN on a regional basis; and
- Five (5) species that are listed as VU on a regional basis; and
- Ten (10) species that are listed as NT on a regional basis.

Table 4: List of bird species of regional or global conservation importance that are expected to occur in pentads 2605_2810; 2605_2815; 2605_2805; 2600_2815; 2600_2805; 2555_2815; 2555_2810; 2555_2805; 2600_2810 (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	Low
<i>Aquila verreauxii</i>	Eagle, Verreaux's	VU	LC	Low
<i>Calidris ferruginea</i>	Sandpiper, Curlew	LC	NT	Low
<i>Ciconia abdimii</i>	Stork, Abdim's	NT	LC	Low
<i>Circus ranivorus</i>	Marsh-harrier, African	EN	LC	Low
<i>Coracias garrulus</i>	Roller, European	NT	LC	Low
<i>Falco biarmicus</i>	Falcon, Lanner	VU	LC	Low
<i>Falco vespertinus</i>	Falcon, Red-footed	NT	NT	Low
<i>Glareola nordmanni</i>	Pratincole, Black-winged	NT	NT	Low
<i>Gyps africanus</i>	Vulture, White-backed	CR	CR	Low
<i>Gyps coprotheres</i>	Vulture, Cape	EN	EN	Low
<i>Mycteria ibis</i>	Stork, Yellow-billed	EN	LC	Low
<i>Oxyura maccoa</i>	Duck, Maccoa	NT	NT	Low
<i>Phoenicopterus minor</i>	Flamingo, Lesser	NT	NT	Low
<i>Phoenicopterus ruber</i>	Flamingo, Greater	NT	LC	Low
<i>Rostratula benghalensis</i>	Painted-snipe, Greater	NT	LC	Low
<i>Sagittarius serpentarius</i>	Secretarybird	VU	VU	Low
<i>Sterna caspia</i>	Tern, Caspian	VU	LC	Low
<i>Tyto capensis</i>	Grass-owl, African	VU	LC	Low

Alcedo semitorquata (Half-collared Kingfisher) is listed as 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 lakes. It mainly feeds on fish (IUCN, 2017). Due to the lack of suitable water sources in the project area the likelihood of occurrence is rated as low.

Anthropoides paradiseus (Blue Crane) is listed as NT on a regional scale and as VU on a global scale. This species has declined, largely owing to direct poisoning, power-line collisions and loss of its grassland breeding habitat owing to afforestation, mining, agriculture and development (IUCN, 2017). This species breeds in natural grass- and sedge-dominated habitats, preferring secluded grasslands at high elevations where the vegetation is thick and short. Due to the lack of suitable habitat and the chance of persecution the chance of likelihood is rated as low.

Aquila verreauxii (Verreaux's Eagle) is listed as VU on a regional scale and LC on a global scale. This species is locally persecuted in southern Africa 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 the state of the environment and the absence of prey species the likelihood of occurrence is rate as low.

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 saltpans (IUCN, 2017). Due to the absence of suitable habitat type the likelihood of occurrence is rated as low.

Ciconia abdimii (Abdim's Stork) is listed as NT on a local 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 existence of wet areas creates the potential for this species to occur in the area but due to the proximity of the urban footprint, the high human density and the degraded state of the environment the likelihood of occurrence was rated as low.

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. There are no suitable habitats in the project area and as such the likelihood of occurrence is rated as low.

Coracias garrulous (European Roller) is a winter migrant from most of South-central Europe and Asia occurring throughout sub-Saharan Africa (IUCN, 2017). The European Roller has a preference for bushy plains and dry savannah areas (IUCN, 2017). There is a low chance of occurrence because of the anthropogenic disturbances in the area.



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 low, even though prey species are present it is unlikely that the species will be present due to the disturbed nature of the area.

Falco chicquera (Red-necked Falcon) is classed as NT on a global scale. This species was recently split from its Indian counterpart *Falco chicquera*. The African species is mostly found in semi-desert and savanna areas with some trees for perching. The number of this species is declining due to ongoing habitat degradation. The likelihood of occurrence in the project area is rated as low due to the absence of suitable habitat.

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. There is no suitable habitat found in the project area and as such the likelihood of occurrence is rated as low.

Gyps africanus (White-backed Vulture) has a large range and only occurs throughout sub-Saharan Africa. Primarily a lowland species of open wooded savanna, particularly areas of Acacia (*Vachellia*). It requires tall trees for nesting. According to the IUCN (2017) this species faces similar threats to other African vultures, being susceptible to habitat conversion to agro-pastoral systems, loss of wild ungulates leading to a reduced availability of carrion, hunting for trade, persecution and poisoning. Even though there might be suitable food sources at the landfill because of the high level of human presence the likelihood of occurrence is rated as low.

Gyps coprotheres (Cape Vulture) is listed as EN on both a regional and global scale. Cape Vultures are long-lived carrion-feeders specialising on large carcasses, they fly long distances over open country, although they are usually found near steep terrain, where they breed and roost on cliffs (IUCN, 2017). It is unlikely for this species to occur in the area because of the disturbed nature of the area.

Mycteria ibis (Yellow-billed Stork) is listed as EN on a regional scale and 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). With no suitable waterbodies present in the project area the likelihood of occurrence is rated as low.

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 of this species in the project area was rated as low, as no suitable habitat is present.

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). Due to the absence of its preferred habitat within the project area, combined the proximity of the urban area, the likelihood of occurrence is low.

Rostratula benghalensis (Greater Painted Snipe) shows a preference for recently flooded areas in shallow lowland freshwater temporary or permanent wetland, it has a wide range of these freshwater habitats which they occur in, in this case, sewage pools, reservoirs, mudflats overgrown with marsh grass which is absent from the project area and as such the likelihood of occurrence is rated as low.

Sagittarius serpentarius (Secretarybird) 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 occurrence is rated as low due to the absence of extensive grassland habitats and the highly disturbed nature of the project area.

Sterna caspia (Caspian Tern) is native to South Africa and are known to occur in inland freshwater systems such as large rivers, creeks, floodlands, reservoirs and sewage ponds. Habitat suitability was found to be low and thus the likelihood of occurrence is low.

Tyto capensis (African Grass-owl) is rated as VU on a regional basis. The distribution of the species includes the eastern parts of South Africa. 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 project area. Furthermore, this species specifically has a preference for nesting in dense stands of the grass species *Imperata cylindrica*. None of this grass species is evident within the project area and as such the likelihood of occurrence is rated as low.

8.1.5.2 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, 9 are medium to large conservation dependant species, such *Ceratotherium simum* (Southern White Rhinoceros) 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 (highlighted in red) in Appendix C.

Of the remaining 80 small to medium sized mammal species, sixteen (16) (20%) are listed as being of conservation concern on a regional or global basis (Table 5). The list of potential species includes:

- Two (2) that are listed as EN on a regional basis;
- Five (5) that are listed as VU on a regional basis; and
- Eight (8) that are listed as NT on a regional scale (Table 5).

On a global scale, 1 species are listed as EN, 2 are listed as VU and 4 as NT (Table 5).

Table 5: 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>	South Africa Hedgehog	NT	LC	Low
<i>Crocidura maquassiensis</i>	Makwassie Musk Shrew	VU	LC	Low
<i>Dasymys incomtus</i>	African Marsh Rat	NT	LC	Low
<i>Eidolon helvum</i>	African Straw-coloured Fruit Bat	LC	NT	Low
<i>Felis nigripes</i>	Black-footed Cat	VU	VU	Low
<i>Hydricus maculicollis</i>	Spotted-necked Otter	VU	NT	Low
<i>Leptailurus serval</i>	Serval	NT	LC	Low
<i>Mystromys albicaudatus</i>	White-tailed Rat	VU	EN	Low
<i>Ourebia ourebi</i>	Oribi	EN	LC	Low
<i>Panthera pardus</i>	Leopard	VU	VU	Low
<i>Parahyaena brunnea</i>	Brown Hyaena	NT	NT	Low
<i>Pelea capreolus</i>	Grey Rhebok	NT	LC	Low
<i>Poecilogle albinucha</i>	African Striped Weasel	NT	LC	Low
<i>Redunca fulvorufula</i>	Mountain Reedbuck	EN	LC	Low
<i>Rhinolophus blasii</i>	Blasius's Horseshoe Bat	NT	LC	Low

Aonyx capensis (Cape Clawless Otter) is the most widely distributed otter species in Africa (IUCN, 2017). This species is predominantly aquatic, and it is seldom found far from water. Based on the absence of non-degraded perennial rivers, wetlands or streams within the project area, the likelihood of occurrence of this species occurring in the project area is considered to be low.

Atelerix frontalis (South African Hedgehog) has a tolerance of a degree of 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. The disturbed nature of the project area lowers the likelihood of occurrence.

Crocidura maquassiensis (Maquassie Musk Shrew) is listed as VU on a regional basis and is known to be found in rocky, mountain habitats. It may tolerate a wider range of habitats and individuals have been collected in Kwa-Zulu Natal from a garden, and in mixed bracken and grassland alongside a river at 1,500 m (IUCN, 2017). There is a lack of suitable habitat for this species in the project area and therefore the likelihood of occurrence is rated as low.

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). Based on the absence of suitable non degraded rivers and wetlands in the project area the likelihood of occurrence of this species in the project area is rated as low.

Eidolon helvum (African Straw-coloured Fruit Bat) is listed as LC on a regional scale and NT on a global scale. This species has been recorded from a very wide range of habitats across the lowland rainforest and savanna zones of Africa (IUCN, 2017). Although considered to be widespread and abundant across its range, certain populations are decreasing due to severe deforestation, hunting for food and medicinal use (IUCN, 2017). This species is known to form large roosts and colonies numbering in the thousands to even millions of individuals (IUCN, 2017). No colonies of this species are known to occur in the project area or in the immediate vicinity. The chance of occasional occurrence in the project area is also rated as low because of the high human disturbance in the area.

Felis nigripes (Black-footed cat) 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. Given that the highest densities of this species have been recorded in the more arid Karoo region of South Africa, the habitat in the project area can be considered to be sub-optimal for the species and the likelihood of occurrence is rated as low.

Hydrictis maculicollis (Spotted-necked Otter) inhabits freshwater habitats where water is un-silted, unpolluted, and rich in small to medium sized fishes (IUCN, 2017). No streams or rivers are present in the project area and as such the likelihood of occurrence is rated as low.

Leptailurus serval (Serval) occurs widely through sub-Saharan Africa and is 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. Due to the absence of natural grassland areas in the project area and human disturbance, the likelihood of occurrence for this species is rated as low.

Mystromys albicaudatus (White-tailed Rat) is listed as VU on a regional basis and 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, no black loam seems to be present on site, therefore the likelihood of occurrence of this species is rated as low.

Ourebia ourebi (Oribi) has a patchy distribution throughout Africa and is known to occur in South Africa. Populations are becoming more fragmented as it is gradually eliminated from moderately to densely settled areas (IUCN, 2017). No suitable habitat is present in the project area combined with the high likelihood of persecution the likelihood of occurrence is rated as low.

Panthera pardus (Leopard) has a wide distributional range across Africa and Asia, but populations have become reduced and isolated, and they are now extirpated from large portions of their historic range (IUCN, 2017). Impacts that have contributed to the decline in populations of this species include continued persecution by farmers, habitat fragmentation, increased illegal wildlife trade, excessive harvesting for ceremonial use of skins, prey base declines and poorly managed trophy hunting (IUCN, 2017). Although known to occur and persist outside of formally protected areas, the densities in these areas are considered to be low. The likelihood of occurrence in the project area which is in such close proximity to an urban area, and where they are likely to be persecuted, is regarded as low.

Parahyaena brunnea (Brown Hyaena) is endemic to southern Africa. This species occurs in dry areas, generally with annual rainfall less than 100 mm, particularly along the coast, semi-desert, open scrub and open woodland savanna. Given its known ability to persist outside of formally protected areas the likelihood of occurrence of this species in the project area is moderate to good. The likelihood of occurrence in the project area which is in such close proximity to an urban area, and where they are likely to be persecuted, is regarded as low.

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 their favoured habitat within the project area, 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 wider habitat tolerance (IUCN, 2017). Due to its secretive nature, it is often overlooked in many areas where it does occur. There is insufficient habitat for this species in the project area and the likelihood of occurrence of this species is therefore considered to be low.

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). Suitable habitat is not present in the project area and as such the likelihood of occurrence is rated as low.

Rhinolophus blasii (Blasius's Horsehoe Bat) is categorised as NT on a regional scale. It typically forages in shrubland and woodland, where it roosts in the summer in natural and artificial underground sites. This species is not very common in South Africa. Threats to the species include loss of woodlands, disturbance and loss of underground habitats, and destruction of roost sites. Due to the lack of suitable roosting areas the likelihood of the species occurring in the project area is rated as low.

8.1.5.3 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) 51 reptile species are expected to occur in the project area (Appendix D). One (1) reptile species of conservation concern could be present in the project area according to the above-mentioned sources (Table 6).

Based on the IUCN Red List Spatial Data (IUCN, 2017) and the AmphibianMap database provided by the Animal Demography Unit (ADU, 2017) 21 amphibian species are expected to occur in the project area (Appendix E). One (1) amphibian species of conservation concern could be present in the project area according to the above-mentioned sources (Table 6).

Table 6: Herpetofauna SCC that may occur in the project area

Species	Common Name	Conservation Status		Likelihood of Occurrence
		Regional (SANBI, 2016)	IUCN (2017)	
REPTILES				
<i>Homoroselaps dorsalis</i>	Striped Harlequin Snake	NT	LC	Low
AMPHIBIANS				
<i>Pyxicephalus adspersus</i>	Giant Bull Frog	NT	LC	Low

Homoroselaps dorsalis (Striped Harlequin Snake) is partially fossorial and known to inhabit old termitaria in grassland habitat (IUCN, 2017). Most of its range is at moderately high altitudes, reaching 1,800 m in Mpumalanga and Swaziland, but it is also found at elevations as low as about 100 m in KwaZulu-Natal. The likelihood of occurrence was rated as low due to the disturbed nature of the area.

The Giant Bull Frog (*Pyxicephalus adspersus*) is a species of conservation concern that will possibly occur in the project area. The Giant Bull Frog is listed as NT on a regional scale. It is a species of drier savannahs. It is fossorial for most of the year, remaining buried in cocoons. They emerge at the start of the rains, and breed in shallow, temporary waters in pools, pans and ditches (IUCN, 2017). The likelihood of occurrence is rated as low due to previous disturbances and on-going anthropogenic disturbances which increase the chance of persecution.

9 Field Survey

The field survey for the Chloorkop project (flora and fauna (mammals, avifauna, amphibians and reptiles)) was conducted on the 26th March 2019. 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.

9.1 Vegetation Assessment

The vegetation assessment was conducted throughout the entire project area (Figure 8). The following habitats were identified in the project area, namely wetlands habitat and degraded grassland habitat and transformed habitat (Figure 7). No SCC were observed in any of the identified habitats.

Chloorkop Landfill Expansion

The wetland habitats are the areas identified in the wetland study (JAWS, 2019) that was provided by SLR. This area (which is situated entirely within Erf 334) hosts a number of wetland plants and due to the nature of this habitat on a local scale, it is considered the most sensitive within the project area. None of these wetland areas were identified on Erf 335 (Phase 1A).

The wetland habitats (depending on the section) were given a moderate to high sensitivities by JAWS (2019). The wetlands, especially the areas with standing water are in a semi-natural state. This area has been impacted upon but forms part of the greater ecosystem as a source of food, refugia and a movement corridor for the fauna present within this habitat.

The degraded grassland habitat is an area where the vegetation is in a heavily degraded state mainly due to the presence of several alien invasive plant species, which were occurring on dumps made up of building material, litter and waste. Much of the soil layer had been disturbed and these areas contained minimal signs of remaining indigenous vegetation.

The transformed habitat are areas that have been altered in such a way that it will struggle to recover to a more natural state. This habitat includes roads, buildings and other forms of man-made infrastructure. This habitat does have stands of vegetation, but mainly comprises of alien invasive plant species.



Figure 7: Habitats observed; A) Wetland, B) Degraded Grassland, C) Transformed

Chloorkop Landfill Expansion

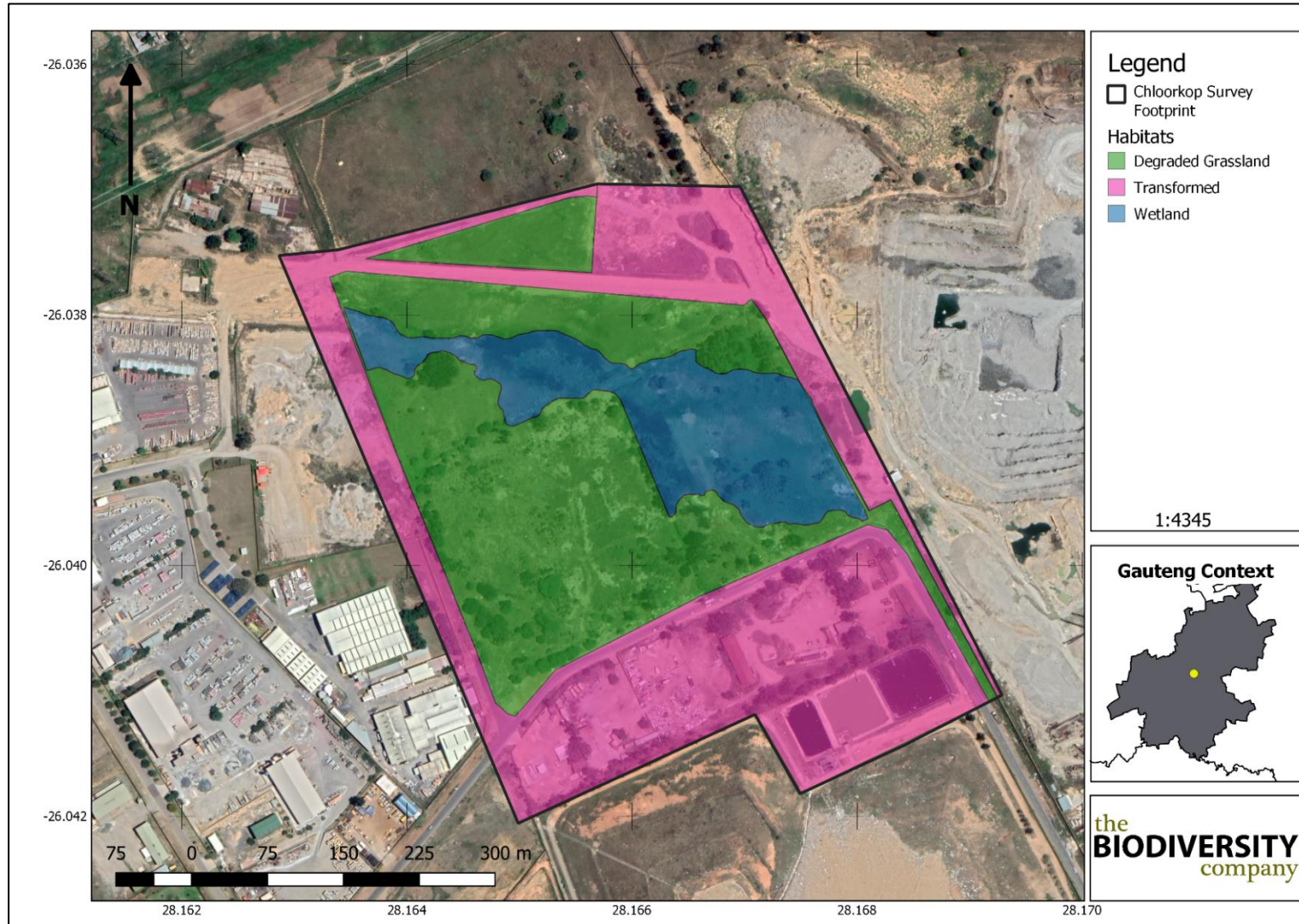


Figure 8: The habitats delineated within the project area

www.thebiodiversitycompany.com

A total of 39 tree, shrub and herbaceous plant species were recorded in the project area during the March 2019 field assessment (Table 7 and Figure 9). Alien/Exotic/Invader plant species appear in blue text, NEMBA Category 1 Plants in green.

Table 7: Trees, shrubs and weeds recorded at the proposed project area.

Scientific Name	Threat Status (SANBI, 2017)	SA Endemic	Alien Category
<i>Acacia mearnsii</i>			NEMBA Category 2
<i>Amaranthus hybridus</i>			Naturalized exotic weed
<i>Arundo donax</i>			NEMBA Category 1b.
<i>Bidens pilosa</i>			Naturalized exotic weed
<i>Campuloclinium macrocephalum</i>			NEMBA – Category 1b
<i>Cortaderia selloana</i>			NEMBA Category 1b
<i>Crabbea hirsuta</i>	LC	No	
<i>Cynodon dactylon</i>			NEMBA Category 2
<i>Eleusine coracana</i>			Not-Indigenous; Naturalised
<i>Eragrostis chloromelas</i>	LC	No	
<i>Eragrostis curvula</i>	LC	No	
<i>Eucalyptus camaldulensis</i>			NEMBA Category 1b
<i>Flaveria bidentis</i>			NEMBA Category 1b.
<i>Helichrysum rugulosum</i>	LC	No	
<i>Hyparrhenia hirta</i>	LC	No	
<i>Imperata cylindrica</i>	LC	No	
<i>Ipomoea crassipes</i>	LC	No	
<i>Leonotis leonurus</i>	LC	No	
<i>Melia azedarach</i>			NEMBA Category 1b.
<i>Melinis repens</i>	LC	No	
<i>Mirabilis jalapa</i>			NEMBA Category 1b.
<i>Morus alba</i>			NEMBA Category 3
<i>Panicum maximum</i>	LC	No	
<i>Pennisetum clandestinum</i>			NEMBA Category 1b
<i>Phragmites australis</i>			Not-Indigenous; Naturalised
<i>Phytolacca octandra</i>			NEMBA Category 1b
<i>Populus alba</i>			NEMBA Category 2
<i>Ricinus communis</i>			NEMBA Category 2
<i>Robinia pseudoacacia</i>			NEMBA Category 1b.
<i>Searsia leptodictya</i>	LC	No	
<i>Solanum mauritianum</i>			NEMBA Category 1b
<i>Sporobolus africanus</i>	LC	No	
<i>Tagetes minuta</i>			Naturalized exotic weed
<i>Tecoma stans</i>			NEMBA Category 1b.
<i>Themeda triandra</i>	LC	No	
<i>Typha capensis</i>	LC	No	
<i>Urochloa mosambicensis</i>	LC	No	
<i>Vachellia karroo</i>	LC	No	
<i>Verbena bonariensis</i>			NEMBA Category 1b.



Figure 9: Some of the plant species observed in the project area: A) *Populus alba*, B) *Vachellia karroo*, C) *Verbena bonariensis* and D) *Cortaderia selloana*

9.1.1 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 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 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.

Thirteen (13) Category 1b invasive species were recorded within the project area 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 7).

9.2 Faunal Assessment

9.2.1 Avifauna

During the March 2019 survey fourteen (14) species of birds were recorded (Table 8 and Figure 10). No SCCs were recorded during the survey, this does however not exclude the likelihood of them occurring in the area.

Figure 11 shows a bird flapper that was observed in the project area, this will help reduce bird strikes of birds that area drawn to the area by the landfill. Bird strikes are considered likely as four species known to get electrocuted by the powerlines were observed in the project area (Appendix F) during the field surveys.

Table 8: A list of the avifaunal species recorded in the project area

Species	Common Name	Conservation Status	
		Regional (SANBI, 2016)	IUCN (2017)
<i>Alopochen aegyptiacus</i>	Goose, Egyptian	Unlisted	LC
<i>Ardea melanocephala</i>	Heron, Black-headed	Unlisted	LC
<i>Bostrychia hagedash</i>	Ibis, Hadedda	Unlisted	LC
<i>Bubulcus ibis</i>	Egret, Cattle	Unlisted	LC
<i>Chroicocephalus cirrocephalus</i>	Gull, Grey-headed	Unlisted	LC
<i>Ciconia ciconia</i>	Stork, White	Unlisted	LC
<i>Corvus albus</i>	Crow, Pied	Unlisted	LC
<i>Euplectes orix</i>	Bishop, Southern Red	Unlisted	LC
<i>Passer domesticus</i>	Sparrow, House	Unlisted	LC
<i>Ploceus velatus</i>	Masked-weaver, Southern	Unlisted	LC
<i>Streptopelia senegalensis</i>	Dove, Laughing	Unlisted	LC
<i>Threskiornis aethiopicus</i>	Ibis, African Sacred	Unlisted	LC
<i>Vanellus senegallus</i>	Lapwing, African Wattled	Unlisted	LC
<i>Vidua macroura</i>	Whydah, Pin-tailed	Unlisted	LC



Figure 10: Avifaunal species recorded during the survey: A) Southern Masked Weaver (*Ploceus velatus*), B) Pied Crow (*Corvus albus*), C) Grey-head Gull (*Crococephalus cirrocephalus*), D) White Stork (*Ciconia ciconia*), E) Laughing Dove (*Streptopelia senegalensis*) and F) African Wattled Lapwing (*Vanellus senegallus*)



Figure 11: Bird flapper observed on the electrical wires in the project area

9.2.2 Mammals

Overall, mammal diversity in the project area was considered low, with no mammal species recorded during this March 2019 survey based on either direct observation, or the presence of visual tracks & signs.

9.2.3 Herpetofauna (Reptiles & Amphibians)

The herpetofauna diversity was considered low, with one (1) reptile and no amphibians recorded during the March 2019 survey (Table 9).

Table 9: A list of herpetofauna recorded in the project area during the March 2019 survey

Species	Common Name	Conservation Status	
		Regional (SANBI, 2016)	IUCN (2017)
<i>Trachylepis striata</i>	Striped Skink	LC	Unlisted

10 Habitat Sensitivity Mapping

As per the terms of reference for the project, a GIS sensitivity map is required in order to identify sensitive features in terms of the relevant specialist discipline/s within the study area. The sensitivity scores identified during the field survey for each habitat were then visually mapped (Figure 12).

Areas that were classified as having low sensitivities are those areas which were deemed by the specialists to have been most impacted upon and/or were modified from their original

condition due to factors such as previous and current human activity and/or presence of alien invasive species.

The wetland areas function as an important part of the ecosystem within the project area as well as within the immediate local area, as these areas have the capacity to serve as habitat or important corridors for various species. Even though the wetland has been degraded it still plays a role within the water resource scheme, and in this case for the Jukskei River system.

According to the JAWS (2019) report the wetland area is divided into four different categories; two seep areas, an unchanneled valley bottom and a channelled valley bottom. The report (JAWS 2019) indicate that seep 1 has a moderate sensitivity while seep 2, the unchanneled valley bottom, and the channelled valley bottom has a high sensitivity. For the purpose of this report the wetlands are grouped as they will function in a similar way for biodiversity services and were given a high sensitivity rating. None of these wetland habitats or sensitivities were recorded on Portion 335 (Phase 1A).

It is important to note that this map does not replace any local, provincial or government legislation relating to these areas or the land use capabilities or sensitivities of these environments.



Figure 12: Habitat sensitivity within the project area

11 Impact Assessment

Clearing of land for development can have significant impacts on biodiversity and ecosystem services, often causing irreversible and large-scale habitat loss across areas important for the provision of ecosystem services. Depending on the methods adopted, land-clearing activities can cause definite environmental degradation. These disturbances have direct, indirect, short- and long-term potentially adverse effects on the landscape and nearby human communities.

However, for this particular development, the existing area is considered to be already moderately or heavily modified from its natural form. A large portion of Erf 335 (Phase 1A) has been extensively developed already and clearing of this area will not have an impact on any environmental process or habitats. Portions of Erf 334 (Phase 1B) will however impact on some of the remaining disturbed grasslands and wetland areas, as they will have to be cleared for those developments.

Key impacts commonly associated with land-clearing activities on biodiversity are discussed below. The listed activities are indicative, and the proposed developments may either have additional or fewer activities depending on the circumstances. It should be noted that these categories, with associated impact descriptions is not exhaustive, and more impacts may be identified at a later stage as more information becomes available.

The significance (quantification) of potential environmental impacts was assessed in terms of the Guideline Documentation on EIA Regulation; Department of Environmental Affairs and Tourism, 2014 (Impact Assessment Methodology, Appendix 6) in the final impact assessment report.

The biodiversity impact assessment report includes the following:

- Assess impacts of ongoing and proposed activities on biodiversity of the project area;
- Assess whether proposed activities are likely to have significant impacts on biodiversity and specifically SCC;
- Identify practically implementable mitigation measures to reduce the significance of proposed activities on biodiversity; and
- Assess residual impacts after implementation of mitigation measures.

11.1 Impact Assessment Methodology

Potential impacts were evaluated against the data captured during the desktop and field assessments to identify relevance to the project area (for both Phase 1A and Phase 1B). The relevant impacts associated with the proposed development were then subjected to a prescribed impact assessment methodology (details of this methodology are available on request).

Impacts were assessed in terms of the construction, operational and closure phases. The construction phase refers to the period when land is cleared and changed into a void for the development of the landfill. During this phase, portions of the remaining (disturbed) grassland and the degraded wetland areas (which have a moderately-high sensitivity) will also be



cleared. The closure phase refers to the phase of the project when the landfill has reached its maximum capacity and will be capped and rehabilitated.

11.2 May 2019 Amendments

As mentioned in Section 1, based on preliminary fieldwork findings and desktop analysis (biodiversity, soils, wetland and hydrology), the presence of a watercourse and wetland on Erf 334 has been identified (also see Section 10 – Habitat Sensitivity Mapping for further information). Although these areas are considered by the specialists to be in poor/degraded condition, they have been highlighted as important during a pre-application meeting with the Gauteng Department of Agriculture and Rural Development (GDARD).

This finding has brought to the fore the need for a distinct separation in the assessments of Phase 1A (located entirely on Erf 335) and the assessment of Phase 1B (located on Erf 334), which cumulatively includes Phase 1A. The approximate locations of these two Phases are depicted in Figure 13.

It is a possibility that the applicant may elect to only apply for Phase 1A and could discount Phase 1B as an alternative.

As a result, this specialist report has been amended to provide impact assessments that consider the project phasing as follows:

1. Phase 1A on Erf 335 (south of Anker Street which divides the property); and
2. Phase 1A and 1B (entire footprint) cumulatively.

Separate impact assessments regarding the two separate Phases (1A and 1B) are presented below. Phase 1B is presented first and Phase 1A presented thereafter.

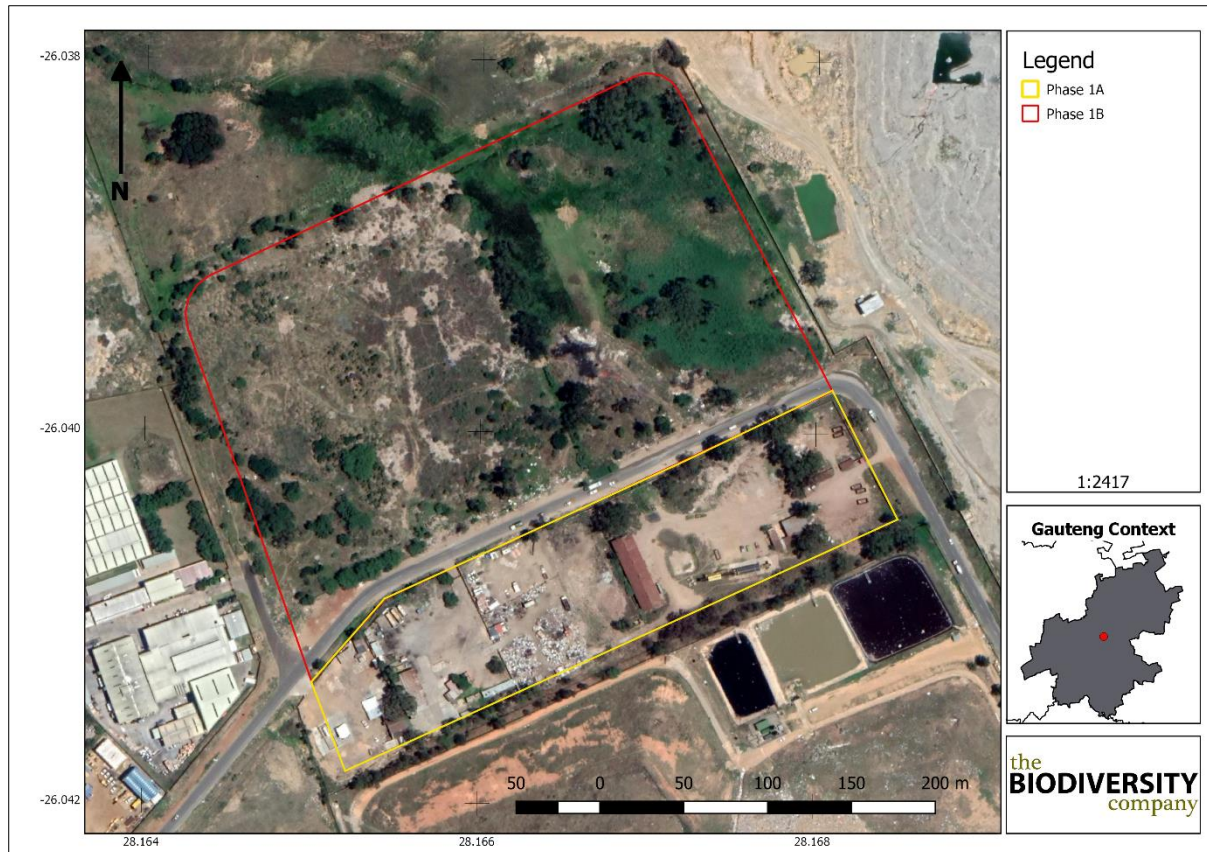


Figure 13: Image depicting the two proposed project phases (Phase 1A and Phase 1B (which collectively includes Phase 1A))

11.3 Current Impacts

During the field survey, the current impacts that are having a negative impact on the area were identified, and are listed below and some are shown in Figure 14;

- Dumping of rubble and litter in the project area;
- Presence of alien invasive plant species;
- Roads (including Anker Street which bisects the two land portions, Erf 335 and Erf 334);
- Possible leaching from the existing landfill. Leachate was observed coming from what appeared to be an underground source (emanating from Erf 335) and flowing over the road in the southern portion of the project area (Erf 334) and flowing into the wetland system. Leachate is considered to be highly toxic and has the potential to severely alter natural systems and cause faunal mortalities; and
- ESKOM powerlines and servitudes.



Figure 14: Some of the impacts observed: A) Landfill, B) dumping of building rubble with large trucks, C & D) Electrical wires, E) Fencing and F) Invasive plant species



Figure 15: Bird with broken wing, most likely due to an impact with the powerlines

12 Impact Assessment Results

The proposed development will result in further loss and disturbance of habitat and displacement of fauna and flora. The potential impacts associated with the various project stages are discussed below. Phase 1A and Phase 1B are presented separately. Phase 1B (which cumulatively includes Phase 1A) is discussed first, with the impact assessment for Phase 1A following thereafter.

12.1 Construction Phase (Phase 1B)

The following potential impacts were considered for the construction phase. This phase refers to the period when the area is cleared, the pit dug and lined accordingly (if deemed necessary). This phase usually has the largest direct impact on biodiversity and will include the loss of some degraded wetland areas as defined in the JAWS Wetland report and highlighted in this report under the Habitat Sensitivity Mapping (Section 10).

Potential impacts were considered on terrestrial biodiversity:

- Destruction, further loss and fragmentation of the vegetation community (including remnants of an EN vegetation type);
- Destruction of degraded (non-FEPA) wetlands (which are present on Erf 334); and
- Displacement of faunal community due to habitat loss, direct mortalities and disturbance (noise, dust and vibration).

12.2 Operational Phase (Phase 1B)

The following potential impacts were considered for the operational phase. This phase refers to the post-construction phase when digging and preparation of the landfill has been constructed and is operational. During this phase there will be an increase in presence of personnel on site and increase in number of vehicles dumping waste into the landfill.

The following potential impacts were considered on terrestrial biodiversity:

- Continued encroachment and displacement of the vegetation community due to alien invasive plant species, particularly in previously disturbed areas;
- Continued displacement and fragmentation of the faunal community due to ongoing anthropogenic disturbances (noise, human presence, litter and increased number of vehicles present);
- Habitat degradation (litter outside the direct footprint of the landfill (such as wind-blown debris));
- Introduction of pest species (e.g. rats, feral cats and flies) due to the new artificial habitats and food sources that are created by the landfill;
- Loss of faunal species (road mortalities);
- Possible chemical leachate from the landfill entering surrounding habitats; and
- Spread of avifaunal disease spread due to the new food source creating an artificially high density of birds.

12.3 Closure Phase (Phase 1B)

This phase refers to the period when the landfill has reached capacity and will be capped and rehabilitated.

The following potential impacts were considered on biodiversity:

- Further impacts due to the continued spread and/or establishment of alien and/or invasive plant species; and
- Continued displacement, direct mortalities and disturbance of faunal community due to habitat loss and disturbances (such as dust, noise and presence of vehicles during capping of the landfill);
- Erosion of soil and top-soil used for capping of the landfill; and
- Possible unintentional introduction of feral species, such as domestic cats and exotic rodents.

12.4 Assessment of Significance

12.4.1 Construction Phase (Phase 1B)

Table 10 shows the significance of potential impacts associated with the development on vegetation communities before and after implementation of mitigation measures. Prior to implementation of mitigation measures the significance of impacts on the vegetation community were rated as *Moderate* (Table 10). Implementation of avoidance measures as mitigation reduced the significance of these potential impacts to *Low* (Table 10).

The significance of potential impacts associated with the development on faunal communities before and after mitigation is presented in Table 10. Prior to implementation of mitigation measures the significance of impacts were rated as *Moderate*. Implementation of avoidance measures as mitigation reduced the significance of potential impact on the faunal communities to *Low* (Table 10).

The significance of potential impacts associated with the development on the loss of the existing (but degraded) wetland areas was rated as *Moderate* pre-mitigation. Due to the nature of the development which will entail the complete removal of these wetlands, mitigation measures are not considered sufficient to reduce this impact, and the significance remained at a *Moderate* level post-mitigation.

12.4.2 Operational Phase (Phase 1B)

Table 11 shows the significance of potential operational phase impacts on vegetation communities before and after implementation of mitigation measures. The significance of encroachment of alien invasive plant species on the vegetation community was rated as *Moderately High* significance prior to mitigation (Table 11). Implementation of mitigation measures in the form of an alien invasive plant management plan of project footprint after completion of construction reduced the significance of the impact to *Low* (Table 11). Habitat degradation was rated as *Moderate* as the chance of litter accumulating outside of the project footprint becoming a problem is significant but by putting mitigations in place the risk was reduced to *Low*.

The significance of operational phase impacts on terrestrial fauna communities was rated as *Moderate* prior to mitigation and *Low* post mitigation. The primary mitigations are based on limiting the spread of pests, disease, and protecting the health of species that will move into the area due to the availability of a new food source. These measures include the installation of bird flappers, monitoring and controlling pest numbers, as well as restricting the food available thus decreasing the number of species drawn to the area.

12.4.3 Closure Phase (Phase 1B)

Table 12 shows the significance of potential closure phase impacts on the floral and faunal communities before and after the implementation of mitigation measures. As for the operational phase above, the significance of encroachment of alien invasive plant species on the vegetation community was rated as *Moderately High* significance prior to mitigation. Implementation of mitigation measures in the form of an alien invasive plant management plan of the project footprint after completion of construction reduced the significance of the impact to *Low*.

Chloorkop Landfill Expansion

The impact of possible erosion of soil and top soil after the landfill has been capped was regarded as *Moderate* pre-mitigation. Implementation of mitigation measures in the form of top-soil management and rehabilitation and re-vegetation of the capped landfill reduced this impact to a Low level.

Table 10: Assessment of significance of potential **construction impacts** on vegetation communities associated with the proposed 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
Destruction, further loss and fragmentation of the vegetation community (including remnants of an EN vegetation type).	5	2	4	1	5		4	1	4	1	4	
	Permanent	Development specific/ within the site boundary / < 100 ha impacted / Linear features affected < 100m	Great / harmful/ ecosystem structure and function largely altered	Ecology not sensitive/i mportant	Definite	Moderate	Life of operation or less than 20 years: Long Term	Activity specific/ < 5 ha impacted / Linear features affected < 100m	Great / harmful/ ecosystem structure and function largely altered	Ecology not sensitive/i mportant	Highly likely	Low
Destruction of degraded (non-FEPA) wetlands (which are present on Erf 334).	5	2	3	3	4		5	1	3	3	4	
	Permanent	Development specific/ within the site boundary / < 100 ha impacted / Linear features affected < 100m	Significant / ecosystem structure and function moderately altered	Ecology moderately sensitive/ /important	Highly likely	Moderate	Permanent	Activity specific/ < 5 ha impacted / Linear features affected < 100m	Significant / ecosystem structure and function moderately altered	Ecology moderately sensitive/ /important	Highly likely	Moderate
Displacement of faunal community due to habitat loss, direct mortalities and disturbance (noise, dust, vibration and land-clearing).	5	2	3	2	5		4	1	3	2	4	
	Permanent	Development specific/ within the site boundary / < 100 ha impacted / Linear features affected < 100m	Significant / ecosystem structure and function moderately altered	Ecology with limited sensitivity/i mportance	Definite	Moderate	Life of operation or less than 20 years: Long Term	Activity specific/ < 5 ha impacted / Linear features affected < 100m	Significant / ecosystem structure and function moderately altered	Ecology with limited sensitivity/i mportance	Highly likely	Low

Table 11: Assessment of significance of potential **operational impacts** on terrestrial biodiversity associated with the proposed 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 the vegetation community due to alien invasive plant species, particularly in previously disturbed areas.	5	2	5	2	4		4	1	3	2	2	
	Permanent	Development specific/ within the site boundary / < 100 ha impacted / Linear features affected < 100m	Disastrous / ecosystem structure and function seriously to critically altered	Ecology with limited sensitivity/importance	Highly likely	Moderately High	Life of operation or less than 20 years: Long Term	Activity specific/ < 5 ha impacted / Linear features affected < 100m	Significant / ecosystem structure and function moderately altered	Ecology with limited sensitivity/importance	Possible	Low
Continued displacement and fragmentation of the faunal community due to ongoing anthropogenic disturbances (noise, human presence, litter and increased number of vehicles present).	5	3	3	3	4		4	2	2	2	2	
	Permanent	Local area/ within 1 km of the site boundary / < 5000ha impacted / Linear features affected < 1000m	Significant / ecosystem structure and function moderately altered	Ecology moderately sensitive/importance	Highly likely	Moderately High	Life of operation or less than 20 years: Long Term	Development specific/ within the site boundary / < 100 ha impacted / Linear features affected < 100m	Small / ecosystem structure and function largely unchanged	Ecology with limited sensitivity/importance	Possible	Low
Habitat degradation (litter outside the direct footprint of the landfill (such as wind-blown debris).	4	3	3	2	4		4	2	2	2	3	
	Life of operation or less than 20 years: Long Term	Local area/ within 1 km of the site boundary / < 5000ha impacted / Linear	Significant / ecosystem structure and function moderately altered	Ecology with limited sensitivity/importance	Highly likely	Moderate	Life of operation or less than 20 years: Long Term	Development specific/ within the site boundary / < 100 ha impacted /	Small / ecosystem structure and function largely	Ecology with limited sensitivity/importance	Likely	Low

Chloorkop Landfill Expansion

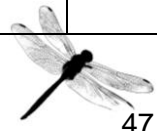
		features affected < 1000m						Linear features affected < 100m	unchanged			
Introduction of pest species (e.g. rats, feral cats and flies) due to the new artificial habitats and food sources that are created by the landfill.	5	2	3	2	4		4	2	2	2	3	
	Permanent	Development specific/ within the site boundary / < 100 ha impacted / Linear features affected < 100m	Significant / ecosystem structure and function moderately altered	Ecology with limited sensitivity/importance	Highly likely	Moderate	Life of operation or less than 20 years: Long Term	Development specific/ within the site boundary / < 100 ha impacted / Linear features affected < 100m	Small / ecosystem structure and function largely unchanged	Ecology with limited sensitivity/importance	Likely	Low
Loss of faunal species (road mortalities).	4	3	3	2	4		4	1	2	2	3	
	Life of operation or less than 20 years: Long Term	Local area/ within 1 km of the site boundary / < 5000ha impacted / Linear features affected < 1000m	Significant / ecosystem structure and function moderately altered	Ecology with limited sensitivity/importance	Highly likely	Moderate	Life of operation or less than 20 years: Long Term	Activity specific/ < 5 ha impacted / Linear features affected < 100m	Small / ecosystem structure and function largely unchanged	Ecology with limited sensitivity/importance	Likely	Low
Possible chemical leachate from the landfill entering surrounding habitats.	4	4	4	2	4		4	2	2	2	3	
	Life of operation or less than 20 years: Long Term	Regional within 5 km of the site boundary / < 2000ha impacted / Linear features affected < 3000m	Great / harmful/ ecosystem structure and function largely altered	Ecology with limited sensitivity/importance	Highly likely	Moderate	Life of operation or less than 20 years: Long Term	Development specific/ within the site boundary / < 100 ha impacted / Linear features affected < 100m	Small / ecosystem structure and function largely unchanged	Ecology with limited sensitivity/importance	Likely	Low
Spread of avifaunal disease spread due to the new food source	4	4	4	2	4		4	2	2	2	3	
	Life of operation or less than 20	Regional within 5 km of the site boundary / <	Great / harmful/ ecosystem structure and	Ecology with limited sensitivity/importance	Highly likely	Moderate	Life of operation or less than 20	Development specific/ within the site	Small / ecosystem structure and	Ecology with limited sensitivity/importance	Likely	Low

Chloorkop Landfill Expansion

creating an artificially high density of birds.	years: Long Term	2000ha impacted / Linear features affected < 3000m	function largely altered				years: Long Term	boundary / < 100 ha impacted / Linear features affected < 100m	function largely unchanged			
---	------------------	--	--------------------------	--	--	--	------------------	--	----------------------------	--	--	--

Table 12: Assessment of significance of potential **closure phase impacts** on terrestrial biodiversity associated with the proposed 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 impacts due to the continued spread and/or establishment of alien and/or invasive plant species.	5	3	4	2	4		4	1	2	2	2	
	Permanent	Local area/ within 1 km of the site boundary / < 5000ha impacted / Linear features affected < 1000m	Great / harmful/ ecosystem structure and function largely altered	Ecology with limited sensitivity/i mportance	Highly likely	Moderately High	Life of operation or less than 20 years: Long Term	Activity specific/ < 5 ha impacted / Linear features affected < 100m	Small / ecosystem structure and function largely unchanged	Ecology with limited sensitivity/i mportance	Possible	Low
Continued displacement, direct mortalities and disturbance of faunal community due to habitat loss and disturbances (such as dust, noise and presence of vehicles during capping of the landfill).	4	3	3	2	4		4	2	2	2	2	
	Life of operation or less than 20 years: Long Term	Local area/ within 1 km of the site boundary / < 5000ha impacted / Linear features affected < 1000m	Significant / ecosystem structure and function moderately altered	Ecology with limited sensitivity/i mportance	Highly likely	Moderate	Life of operation or less than 20 years: Long Term	Development specific/ within the site boundary / < 100 ha impacted / Linear features affected < 100m	Small / ecosystem structure and function largely unchanged	Ecology with limited sensitivity/i mportance	Possible	Low
	5	3	3	2	4		3	1	2	2	3	



Chloorkop Landfill Expansion

Erosion of soil and top-soil used for capping of the landfill.	Permanent	Local area/ within 1 km of the site boundary / < 5000ha impacted / Linear features affected < 1000m	Significant / ecosystem structure and function moderately altered	Ecology with limited sensitivity/i mportance	Highly likely	Moderate	One year to five years: Medium Term	Activity specific/ < 5 ha impacted / Linear features affected < 100m	Small / ecosystem structure and function largely unchanged	Ecology with limited sensitivity/i mportance	Likely	Low
Possible unintentional introduction of feral species, such as domestic cats and exotic rodents.	5	4	4	2	4		4	2	2	2	3	
	Permanent	Regional within 5 km of the site boundary / < 2000ha impacted / Linear features affected < 3000m	Great / harmful/ ecosystem structure and function largely altered	Ecology with limited sensitivity/i mportance	Highly likely	Moderately High	Life of operation or less than 20 years: Long Term	Development specific/ within the site boundary / < 100 ha impacted / Linear features affected < 100m	Small / ecosystem structure and function largely unchanged	Ecology with limited sensitivity/i mportance	Likely	Low

12.5 Construction Phase (Phase 1A)

The following potential impacts were considered for the construction phase of Phase 1A. This phase refers to the period when the area is cleared, the pit dug and lined accordingly (if deemed necessary). This phase usually has the largest direct impact on biodiversity. Phase 1A consists entirely of Erf 335, south of Anker Street. This site is already been extensively transformed and developed. Very little, if any, natural habitat is considered to occur in this area.

Potential impacts were considered on terrestrial biodiversity:

- Loss of remaining fragments of the vegetation community;
- Displacement of faunal community due to habitat loss, direct mortalities and disturbance (noise, dust and vibration).

12.6 Operational Phase (Phase 1A)

The following potential impacts were considered for the operational phase. This phase refers to the post-construction phase when digging and preparation of the landfill has been constructed and is operational. During this phase there will be an increase in presence of personnel on site and increase in number of vehicles dumping waste into the landfill.

The following potential impacts were considered on terrestrial biodiversity:

- Loss of any remaining components of the vegetation community due to alien invasive plant species;
- Habitat degradation (litter outside the direct footprint of the landfill (such as wind-blown debris));
- Introduction of pest species (e.g. rats, feral cats and flies) due to the new artificial habitats and food sources that are created by the landfill;
- Possible chemical leachate from the landfill entering surrounding habitats; and
- Spread of avifaunal disease spread due to the new food source creating an artificially high density of birds.

12.7 Closure Phase (Phase 1A)

This phase refers to the period when the landfill has reached capacity and will be capped and rehabilitated.

The following potential impacts were considered on biodiversity:

- Further impacts due to the continued spread and/or establishment of alien and/or invasive plant species; and
- Erosion of soil and top-soil used for capping of the landfill; and
- Possible unintentional introduction of feral species, such as domestic cats and exotic rodents.

12.8 Assessment of Significance

12.8.1 Construction Phase (Phase 1A)

Table 13 shows the significance of potential impacts associated with the development (Phase 1A) on biodiversity before and after implementation of mitigation measures. The current project area (Phase 1A) has previously been heavily impacted upon and almost no natural habitat or species remain, as such the area was given a low sensitivity for the impact assessment. Prior to implementation of mitigation measures the significance of impacts on local biodiversity was rated as *Low* (Table 13). Implementation of appropriate mitigation measures reduced the significance of these potential impacts to *Absent* (Table 13).

12.8.2 Operational Phase (Phase 1A)

Table 14 shows the significance of potential operational phase impacts on local biodiversity and habitat communities before and after implementation of mitigation measures. The majority of anticipated impacts were assigned a *Low* significance, prior to the implementation of mitigation measures. The possible impact of leachate from the landfill entering the surrounding environment was considered the most significant impact and was given a *Moderate* significance rating pre-mitigation. Post-mitigation, the significance of all the impacts was reduced to either a *Low* or *Absent* rating.

12.8.3 Closure Phase (Phase 1A)

Table 15 shows the significance of potential closure phase impacts on the floral and faunal communities before and after the implementation of mitigation measures. The significance of all the anticipated impacts was rated as *Moderate* significance prior to mitigation. Implementation of mitigation measures of the project footprint after completion of construction reduced the significance of the impact to an *Absent* rating.

Chloorkop Landfill Expansion

Table 13: Assessment of significance of potential **construction impacts** on vegetation communities associated with the proposed development (Phase 1A) 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
Loss of remaining fragments of the vegetation community.	5	1	2	1	4		2	1	2	1	3	
	Permanent	Activity specific/ < 5 ha impacted / Linear features affected < 100m	Small / ecosystem structure and function largely unchanged	Ecology not sensitive/important	Highly likely	Low	One month to one year: Short Term	Activity specific/ < 5 ha impacted / Linear features affected < 100m	Small / ecosystem structure and function largely unchanged	Ecology not sensitive/important	Likely	Absent
Displacement of faunal community due to habitat loss, direct mortalities and disturbance (noise, dust and vibration).	5	1	2	1	4		2	1	2	1	3	
	Permanent	Activity specific/ < 5 ha impacted / Linear features affected < 100m	Small / ecosystem structure and function largely unchanged	Ecology not sensitive/important	Highly likely	Low	One month to one year: Short Term	Activity specific/ < 5 ha impacted / Linear features affected < 100m	Small / ecosystem structure and function largely unchanged	Ecology not sensitive/important	Likely	Absent

Chloorkop Landfill Expansion

Table 14: Assessment of significance of potential **operational impacts** on terrestrial biodiversity associated with the proposed development (Phase 1A) 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
Loss of any remaining components of the vegetation community due to alien invasive plant species.	4	1	1	1	3		4	1	1	1	3	
	Life of operation or less than 20 years: Long Term	Activity specific/ < 5 ha impacted / Linear features affected < 100m	Insignificant / ecosystem structure and function unchanged	Ecology not sensitive/i mportant	Likely	Low	Life of operation or less than 20 years: Long Term	Activity specific/ < 5 ha impacted / Linear features affected < 100m	Insignificant / ecosystem structure and function unchanged	Ecology not sensitive/im portant	Likely	Absent
Habitat degradation (litter outside the direct footprint of the landfill (such as wind-blown debris).	4	2	3	1	4		4	1	2	1	3	
	Life of operation or less than 20 years: Long Term	Developm ent specific/ within the site boundary / < 100 ha impacted / Linear features affected < 100m	Significant / ecosystem structure and function moderately altered	Ecology not sensitive/i mportant	Highly likely	Low	Life of operation or less than 20 years: Long Term	Activity specific/ < 5 ha impacted / Linear features affected < 100m	Small / ecosystem structure and function largely unchanged	Ecology not sensitive/im portant	Likely	Low
Introduction of pest species (e.g. rats, feral cats and flies) due to the new artificial habitats and food sources that are created by the landfill.	5	2	3	1	4		4	1	2	1	3	
	Permanen t	Developm ent specific/ within the site boundary / < 100 ha impacted / Linear features	Significant / ecosystem structure and function moderately altered	Ecology not sensitive/i mportant	Highly likely	Low	Life of operation or less than 20 years: Long Term	Activity specific/ < 5 ha impacted / Linear features affected < 100m	Small / ecosystem structure and function largely unchanged	Ecology not sensitive/im portant	Likely	Low



Chloorkop Landfill Expansion

		affected < 100m										
Possible chemical leachate from the landfill entering surrounding habitats.	4	4	4	1	4		4	2	2	1	3	
	Life of operation or less than 20 years: Long Term	Regional within 5 km of the site boundary / < 2000ha impacted / Linear features affected < 3000m	Great / harmful/ ecosystem structure and function largely altered	Ecology not sensitive/i mportant	Highly likely	Moderate	Life of operation or less than 20 years: Long Term	Development specific/ within the site boundary / < 100 ha impacted / Linear features affected < 100m	Small / ecosystem structure and function largely unchanged	Ecology not sensitive/im portant	Likely	Low
Spread of avifaunal disease due to the new food source creating an artificially high density of birds.	4	3	3	1	4		4	2	2	1	3	
	Life of operation or less than 20 years: Long Term	Local area/ within 1 km of the site boundary / < 5000ha impacted / Linear features affected < 1000m	Significant / ecosystem structure and function moderately altered	Ecology not sensitive/i mportant	Highly likely	Low	Life of operation or less than 20 years: Long Term	Development specific/ within the site boundary / < 100 ha impacted / Linear features affected < 100m	Small / ecosystem structure and function largely unchanged	Ecology not sensitive/im portant	Likely	Low

Chloorkop Landfill Expansion

Table 15: Assessment of significance of potential **closure phase impacts** on terrestrial biodiversity associated with the proposed development (Phase 1A) 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 impacts due to the continued spread and/or establishment of alien and/or invasive plant species.	4	3	2	1	4		4	2	2	1	2	
	Life of operation or less than 20 years: Long Term	Local area/ within 1 km of the site boundary / < 5000ha impacted / Linear features affected < 1000m	Small / ecosystem structure and function largely unchanged	Ecology not sensitive/important	Highly likely	Moderate	Life of operation or less than 20 years: Long Term	Development specific/ within the site boundary / < 100 ha impacted / Linear features affected < 100m	Small / ecosystem structure and function largely unchanged	Ecology not sensitive/important	Possible	Absent
Erosion of soil and top-soil used for capping of the landfill.	5	3	3	1	4		3	1	2	1	3	
	Permanent	Local area/ within 1 km of the site boundary / < 5000ha impacted / Linear features affected < 1000m	Significant / ecosystem structure and function moderately altered	Ecology not sensitive/important	Highly likely	Moderate	One year to five years: Medium Term	Activity specific/ < 5 ha impacted / Linear features affected < 100m	Small / ecosystem structure and function largely unchanged	Ecology not sensitive/important	Likely	Absent
Possible unintentional introduction of feral species, such as domestic cats and exotic rodents.	5	3	3	1	4		3	1	2	1	3	
	Permanent	Local area/ within 1 km of the site boundary / < 5000ha impacted / Linear features affected < 1000m	Significant / ecosystem structure and function moderately altered	Ecology not sensitive/important	Highly likely	Moderate	One year to five years: Medium Term	Activity specific/ < 5 ha impacted / Linear features affected < 100m	Small / ecosystem structure and function largely unchanged	Ecology not sensitive/important	Likely	Absent



13 Mitigation Measures

The mitigation actions provided below are important to consider in conjunction with other specialist assessments which include but are not limited to the following specialist studies: Groundwater, Surface Water and Wetlands. These mitigation measures should be implemented in the Environmental Management Plan (EMP) should the project go-ahead. The mitigation hierarchy was considered for this study.

In accordance with the mitigation hierarchy, avoiding and preventing loss of sensitive landscapes are the first stage of the mitigation hierarchy. All areas in the project area that will be cleared must be rehabilitated (to as near a natural condition as possible) and as soon as the landfill has reached capacity. Areas that are not directly part of the landfill (i.e. any remaining natural or semi-natural areas) must be avoided to minimise the impact of the proposed development. It is recommended that a rehabilitation plan be drafted and implemented from the onset of the project.

All proposed mitigation measures are relevant for both Phase 1A and Phase 1B, except where indicated otherwise.

13.1 Objectives

A number of general mitigation measures are recommended for the project as a whole, while more specific measures (for both Phase 1A and Phase 1B) are detailed in the following sections which relate to impacts to fauna and flora specifically.

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 any remnants of the remaining vegetation community (listed as Endangered) and wetlands on Erf 334 in the northern vicinity of the project site;
- Prevent the loss of the faunal community associated with the vegetation community; and
- Limiting the construction area to the defined project areas and only impacting those areas where it is unavoidable to do so otherwise.

13.2 Mitigation Measures

13.2.1 Mitigation Measures for Impacts on Vegetation Communities

- The new landfill area must be accessed using existing access points in order to decrease the amount of vegetation disturbed and land cleared;
- It is recommended that areas to be developed or cleared be specifically demarcated so that during the construction phase and operational phase, only the demarcated areas be impacted upon. All working areas inside the new pit must be clearly demarcated from surrounding natural areas and no persons should be allowed to enter these areas under any circumstances (relevant for Phase 1B only);

- No dumping of any rubble or waste should be allowed in any areas outside of the demarcated project area or landfill;
- An experienced, qualified environmental control officer must be on site when construction begins to identify floral and faunal species that will be directly disturbed and to relocate any SCC that may be found (relevant for Phase 1B only);
- Air quality mitigation measures must be implemented as prescribed by the relevant specialist for all phases going forward;
- 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 utilised during decommissioning phases and re-vegetation (relevant for Phase 1B only);
- Compilation of and implementation of an alien vegetation management plan for the entire site, including the surrounding project area;
- Faunal species should be given the chance to escape or move away from disturbances during construction. If any faunal species do not move off naturally then the ECO should be consulted to identify the correct course of action; and
- 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 all the phases going forward. The intentional killing of any animals including snakes, lizards, birds or other animals should be strictly prohibited.

13.2.2 Mitigation Measures for Impacts During the Operational Phase

- Areas that are denuded during construction and do not form a part of the landfill footprint need to be re-vegetated with indigenous vegetation to prevent erosion during rainfall events. This will also reduce the likelihood of encroachment by alien invasive plant species (relevant for Phase 1B only);
- It should be made an offence for any staff to intentionally bring any alien / exotic plant species into any portion of the project area, in order to prevent the spread of exotic or invasive species;
- No staff or contractors should be allowed to enter any of the grassland areas (the ones that remain after the infrastructure is complete) surrounding the project area unless absolutely necessary (relevant for Phase 1B only);
- All machinery must be monitored for leaks and spillages of any hydrocarbons should be prevented;
- Set up a composting plan to decrease the amount of available food for the faunal species in the area, including birds. Or cap the waste on a 3-daily basis;
- The intentional trapping or killing of any local fauna must be strictly prohibited, and the use of any herbicides or pesticides strictly controlled;

- No domestic animals are to be allowed into 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 by an appropriate specialist; and
- Pest control plan must be put in place and implemented.

13.2.3 Mitigation Measures for Impacts During the Closure Phase

- Once the landfill reaches capacity, appropriate rehabilitation must commence. Primary among these is replacement of topsoil over the landfill. The soil must be sufficiently deep in order to prevent excessive erosion. The capped landfilled must be revegetated (only with indigenous plant species);
- All voids elsewhere on site need to be backfilled and levelled to prevent erosion; and
- Waste management plan and guidelines must be followed as specified by specialist waste management plan.

13.2.4 Recommendations (Phase 1B and Phase 1A)

- If any new transmission lines are to be constructed as part of the new development, then the feasibility of installing 'bird flappers' on these lines must be investigated. The new landfill will attract a large number and diversity of bird species which will come to the area to forage. And as such the possibility of bird mortalities on these lines will greatly increase unless these 'bird flappers' are installed;
- Appropriate groundwater monitoring should be implemented, especially to monitor for possible leachate draining into the surrounding environment from the landfill; and
- Best practice guidelines pertaining to the composite lining or landfill liner are encouraged as prescribed by law, in order to limit any leachate from the landfill polluting surrounding water resources or habitats.

14 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 survey, which was 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). The proposed Phase 1A development on Erf 335 is considered to have the least impact on the receiving environment, as this area has already been extensively transformed. The following further conclusions were reached based on the results of this assessment:

- The project area does not fall within a CBA or an ESA classified area;
- The project area falls entirely within an ecosystem which is listed as EN (NBA, 2011);

- All of the terrestrial ecosystems associated with the development (entire project area and surrounds) are rated as *poorly protected* (NBA, 2011);
- The project area does not overlap with any formally or informally protected area;
- The project area is situated in one vegetation type; the Egoli Granite Grassland (Gh 10). This vegetation type is classified as EN;
- Based on the Plants of Southern Africa database, 101 plant species are expected in the project and surrounding areas and two (2) of these species are listed as being Species of Conservation Concern (SCC);
- A total of 39 tree, shrub and herbaceous plant species were recorded in the project area during the March 2019 field assessment. No plant SCC were recorded during the survey;
- Thirteen (13) Category 1b invasive species were recorded within the project area, and must therefore be removed by implementing an alien invasive plant management programme on the property used for the project, in compliance of section 75 of the Act as stated above; and
- No faunal SCC were recorded during the survey and overall faunal diversity was considered to be low due to the extensive impacts which have already occurred in the area.

15 Impact Statement

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

Based on the results and conclusions presented in this report, and the outcomes of the field survey, it is the opinion of the specialists that the proposed project can be favourably considered should all mitigations be implemented, and recommendations investigated. Phase 1A is considered to have the least impact on the receiving environment and mitigation measures reduce the significance of these impacts to acceptable levels. Phase 1B will have a direct impact on already modified wetlands as identified by JAWS, and the statement regarding the impact can be found in the relevant report.

16 References

Animal Demography Unit (2017). Virtual Museum. Accessed on the following date: 2018-02-15

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

BirdLife International (2017) Important Bird Areas factsheet. <http://www.birdlife.org> on January 2019.

BODATSA-POSA. (2016). Plants of South Africa - an online checklist. POSA ver. 3.0. <http://newposa.sanbi.org/>. (Accessed: June 2018).

Driver, M., Raimondo, D., Maze, K., Pfab, M.F. & Helme, N.A. (2009). Applications of the Red List for conservation practitioners. In: D. Raimondo, L. Von Staden, W. Foden, J.E. Victor, N.A. Helme, R.C. Turner, D.A. Kamundi & P.A. Manyama (eds). Red List of South African Plants. *Strelitzia*, 25:41-52. South African National Biodiversity Institute, Pretoria.

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

Eskom. (2015). Taylor, M.R., Peacock, F. & Wanless, R.M. (Eds). The 2015 Eskom Red Data Book of birds of South Africa, Lesotho and Swaziland. BirdLife South Africa, Johannesburg.

EWT (Endangered Wildlife Trust). (2017). Threatened Amphibian Programme. Available at FrogMap 2015. The Southern African Frog Atlas Project <https://www.ewt.org.za/TAP/reference.html> (SAFAP, now FrogMAP). <http://vmus.adu.org.za> (January 2019)

FrogMap (2017). The Southern African Frog Atlas Project (SAFAP, now FrogMAP). <http://vmus.adu.org.za> (Accessed in January 2019).

GDARD (2014): Technical Report for the Gauteng Conservation Plan (Gauteng C-Plan v3.3). Gauteng Department of Agriculture and Rural Development: Nature Conservation Directorate. 60 pages.

GDARD. Requirements for biodiversity assessments: Version 3. Johannesburg: Gauteng Department of Agriculture and Rural Development; 2014.

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 (Accessed in November 2017).

IUCN (2019). The IUCN Red List of Threatened Species. Available at www.iucnredlist.org (January 2019).

JAWS (2019). Chloorkop Landfill Extension Project. Wetland, soil and land capability specialist study. Draft report. Report number: JW100/19/6007-25.

Johnson, S. & Bytebier, B. (2015). *Orchids of South Africa: A Field Guide*. Struik publishers, Cape Town.

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.

Mucina, L., Rutherford, M.C. & Powrie, L.W. (Eds.). (2007). *Vegetation map of South Africa, Lesotho and Swaziland*. 1:1 000 000 scale sheet maps. 2nd ed. South African National Biodiversity Institute, Pretoria.

Pfab, M.F. & Victor, J.E. (2009). *National Assessment: Red List of South African Plants version 2017.1*. (Accessed: February 2018).

Pooley, E. (1998). *A Field Guide to Wild Flowers: KwaZulu-Natal and Eastern Region*. The Flora Publications Trust; ABC Bookshop, Durban.

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

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.

South African National Biodiversity Institute (SANBI). 2017. *NBA 2011 Terrestrial Formal Protected Areas 2012*. Available from the Biodiversity GIS website, downloaded on 03 August 2017.

South African National Biodiversity Institute (SANBI). 2017. *Red List of South African Plants version 2017.1*. Downloaded from Redlist.sanbi.org on 2017/08/24.

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

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.

Von Staden, L., Hankey, A.J., Mills, L. & Raimondo, D. (2015). *National Assessment: Red List of South African Plants version 2017.1*. Accessed on 2018/02/10

APPENDIX A: Flora species expected to occur in the project area

Family	Taxon	Author	IUCN	Ecology
Apiaceae	<i>Afroscidium magalismontanum</i>	(Sond.) P.J.D.Winter	LC	Indigenous
Poaceae	<i>Agrostis eriantha</i> var. <i>eriantha</i>	Hack.	LC	Indigenous
Poaceae	<i>Agrostis lachnantha</i> var. <i>lachnantha</i>	Nees	LC	Indigenous
Primulaceae	<i>Anagallis pumila</i>	Sw.		Not-Indigenous; Naturalised
Apocynaceae	<i>Asclepias eminens</i>	(Harv.) Schltr.	LC	Indigenous
Asparagaceae	<i>Asparagus</i> sp.			
Apocynaceae	<i>Aspidoglossum biflorum</i>	E.Mey.	LC	Indigenous
Apocynaceae	<i>Aspidoglossum glabrescens</i>	(Schltr.) Kupicha	LC	Indigenous; Endemic
Elatinaceae	<i>Bergia decumbens</i>	Planch. ex Harv.	LC	Indigenous
Asteraceae	<i>Bidens pilosa</i>	L.		Not-Indigenous; Naturalised
Hyacinthaceae	<i>Bowiea volubilis</i>	Harv. ex Hook.f.		Indigenous
Apocynaceae	<i>Brachystelma chloranthum</i>	(Schltr.) Peckover	LC	Indigenous
Apocynaceae	<i>Brachystelma circinatum</i>	E.Mey.	LC	Indigenous
Asphodelaceae	<i>Bulbine angustifolia</i>	Poelln.	LC	Indigenous
Cyperaceae	<i>Bulbostylis densa</i> subsp. <i>afromontana</i>	(Wall.) Hand.-Mazz.	LC	Indigenous
Poaceae	<i>Calamagrostis epigejos</i> var. <i>capensis</i>	(L.) Roth	LC	Indigenous
Apocynaceae	<i>Ceropegia rendallii</i>	N.E.Br.	LC	Indigenous
Solanaceae	<i>Cestrum parqui</i>	L'Her.		Not-Indigenous; Naturalised; Invasive
Fabaceae	<i>Chamaecrista mimosoides</i>	(L.) Greene	LC	Indigenous
Gentianaceae	<i>Chironia purpurascens</i> subsp. <i>humilis</i>	(E.Mey.) Benth. & Hook.f.	LC	Indigenous
Agavaceae	<i>Chlorophytum fasciculatum</i>	(Baker) Kativu		Indigenous
Asteraceae	<i>Cineraria lyratiformis</i>	Cron	LC	Indigenous
Asteraceae	<i>Cirsium vulgare</i>	(Savi) Ten.		Not-Indigenous; Naturalised; Invasive
Combretaceae	<i>Combretum</i> sp.			
Caryophyllaceae	<i>Corrigiola litoralis</i> subsp. <i>litoralis</i>	L.		Indigenous
Crassulaceae	<i>Crassula capitella</i> subsp. <i>nodulosa</i>	Thunb.		Indigenous
Convolvulaceae	<i>Cuscuta campestris</i>	Yunck.		Not-Indigenous; Naturalised; Invasive
Cyperaceae	<i>Cyperus congestus</i>	Vahl	LC	Indigenous
Cyperaceae	<i>Cyperus denudatus</i>	L.f.	LC	Indigenous
Cyperaceae	<i>Cyperus difformis</i>	L.	LC	Indigenous
Cyperaceae	<i>Cyperus esculentus</i> var. <i>esculentus</i>	L.	LC	Indigenous
Cyperaceae	<i>Cyperus fastigiatus</i>	Rottb.	LC	Indigenous
Cyperaceae	<i>Cyperus sphaerospermus</i>	Schrad.	LC	Indigenous
Solanaceae	<i>Datura stramonium</i>	L.		Not-Indigenous; Naturalised; Invasive
Aizoaceae	<i>Delosperma</i> sp.			
Poaceae	<i>Digitaria eylesii</i>	C.E.Hubb.	LC	Indigenous
Rosaceae	<i>Duchesnea indica</i>	(Andrews) Focke		Not-Indigenous; Naturalised; Invasive
Cyperaceae	<i>Eleocharis dregeana</i>	Steud.	LC	Indigenous

Chloorkop Landfill Expansion

Ruscaceae	<i>Eriospermum porphyrium</i>	Archibald	LC	Indigenous
Euphorbiaceae	<i>Euphorbia sp.</i>			
Cyperaceae	<i>Fuirena pubescens var. pubescens</i>	(Poir.) Kunth	LC	Indigenous
Iridaceae	<i>Gladiolus crassifolius</i>	Baker	LC	Indigenous
Iridaceae	<i>Gladiolus permeabilis subsp. edulis</i>	D.Delaroche	LC	Indigenous
Asteraceae	<i>Gnaphalium filagopsis</i>	Hilliard & B.L.Burt	LC	Indigenous
Amaranthaceae	<i>Gomphrena celosioides</i>	Mart.		Not-Indigenous; Naturalised
Orobanchaceae	<i>Graderia subintegra</i>	Mast.	LC	Indigenous
Orchidaceae	<i>Habenaria falcicornis subsp. caffra</i>	(Burch. ex Lindl.) Bolus	LC	Indigenous
Orchidaceae	<i>Habenaria mossii</i>	(G.Will.) J.C.Manning	EN	Indigenous; Endemic
Asteraceae	<i>Helichrysum aureonitens</i>	Sch.Bip.	LC	Indigenous
Hypericaceae	<i>Hypericum lalandii</i>	Choisy	LC	Indigenous
Asteraceae	<i>Hypochaeris radicata</i>	L.		Not-Indigenous; Naturalised
Hypoxidaceae	<i>Hypoxis argentea</i>	Harv. ex Baker		Indigenous
Fabaceae	<i>Indigofera melanadenia</i>	Benth. ex Harv.	LC	Indigenous
Cyperaceae	<i>Isolepis fluitans var. fluitans</i>	(L.) R.Br.	LC	Indigenous
Juncaceae	<i>Juncus exsertus</i>	Buchenau	LC	Indigenous
Rubiaceae	<i>Kohautia amatymbica</i>	Eckl. & Zeyh.	LC	Indigenous
Verbenaceae	<i>Lantana camara</i>	L.		Not-Indigenous; Cultivated; Naturalised; Invasive
Thymelaeaceae	<i>Lasiosiphon capitatus</i>	(L.f.) Burt Davy	LC	Indigenous
Fabaceae	<i>Leobordea eriantha</i>	(Benth.) B.-E. van Wyk & Boatwr.	LC	Indigenous
Aizoaceae	<i>Lithops lesliei subsp. lesliei</i>	(N.E.Br.) N.E.Br.	NT	Indigenous
Lobeliaceae	<i>Monopsis decipiens</i>	(Sond.) Thulin	LC	Indigenous
Moraceae	<i>Morus alba</i>	L.		Not-Indigenous; Naturalised; Invasive
Scrophulariaceae	<i>Nemesia fruticans</i>	(Thunb.) Benth.	LC	Indigenous
Asteraceae	<i>Nidorella anomala</i>	Steetz	LC	Indigenous
Apocynaceae	<i>Pachycarpus schinzianus</i>	(Schltr.) N.E.Br.	LC	Indigenous
Poaceae	<i>Panicum hygrocharis</i>	Steud.	LC	Indigenous
Apocynaceae	<i>Parapodium costatum</i>	E.Mey.	LC	Indigenous
Poaceae	<i>Paspalum dilatatum</i>	Poir.	NE	Not-Indigenous; Naturalised
Poaceae	<i>Paspalum distichum</i>	L.	LC	Indigenous
Rubiaceae	<i>Pentodon pentandrus var. minor</i>	(Schumach. & Thonn.) Vatke	LC	Indigenous
Polygonaceae	<i>Persicaria lapathifolia</i>	(L.) Delarbre		Not-Indigenous; Naturalised
Pinaceae	<i>Pinus patula var. patula</i>	Schltl. & Cham.		Not-Indigenous; Naturalised
Lamiaceae	<i>Plectranthus neochilus</i>	Schltr.	LC	Indigenous
Polygalaceae	<i>Polygala hottentotta</i>	C.Presl	LC	Indigenous
Asteraceae	<i>Pseudognaphalium oligandrum</i>	(DC.) Hilliard & B.L.Burt	LC	Indigenous
Cyperaceae	<i>Pycreus macranthus</i>	(Boeck.) C.B.Clarke	LC	Indigenous
Rosaceae	<i>Pyracantha crenulata</i>	(D.Don) M.Roem.		Not-Indigenous; Cultivated; Naturalised; Invasive
Lamiaceae	<i>Rothea louwalbertsii</i>	(P.P.J.Herman) P.P.J.Herman & Retief		Indigenous

Chloorkop Landfill Expansion

Polygonaceae	<i>Rumex crispus</i>	L.		Not-Indigenous; Naturalised; Invasive
Poaceae	<i>Sacciolepis typhura</i>	(Stapf) Stapf	LC	Indigenous
Cyperaceae	<i>Schoenoplectus leucanthus</i>	(Boeck.) J.Raynal	LC	Indigenous
Cyperaceae	<i>Schoenoplectus muricinux</i>	(C.B.Clarke) J.Raynal	LC	Indigenous
Cyperaceae	<i>Schoenoplectus pulchellus</i>	(Kunth) J.Raynal	LC	Indigenous
Cyperaceae	<i>Scirpoides burkei</i>	(C.B.Clarke) Goetgh., Muasya & D.A.Simpson	LC	Indigenous
Asteraceae	<i>Senecio erubescens var. crepidifolius</i>	Aiton	NE	Indigenous
Asteraceae	<i>Senecio inornatus</i>	DC.	LC	Indigenous
Poaceae	<i>Setaria pumila</i>	(Poir.) Roem. & Schult.	LC	Indigenous
Solanaceae	<i>Solanum sisymbriifolium</i>	Lam.		Not-Indigenous; Naturalised; Invasive
Poaceae	<i>Sporobolus africanus</i>	(Poir.) Robyns & Tournay	LC	Indigenous
Asteraceae	<i>Tagetes minuta</i>	L.		Not-Indigenous; Naturalised; Invasive
Fabaceae	<i>Tephrosia elongata</i>	E.Mey.		Indigenous
Cucurbitaceae	<i>Trochomeria macrocarpa subsp. macrocarpa</i>	(Sond.) Hook.f.	LC	Indigenous
Alliaceae	<i>Tulbaghia leucantha</i>	Baker	LC	Indigenous
Typhaceae	<i>Typha capensis</i>	(Rohrb.) N.E.Br.		Indigenous
Asteraceae	<i>Ursinia sp.</i>			
Lentibulariaceae	<i>Utricularia stellaris</i>	L.f.	LC	Indigenous
Fabaceae	<i>Vachellia nilotica subsp. kraussiana</i>	(L.) P.J.H.Hurter & Mabb.	LC	Indigenous
Verbenaceae	<i>Verbena bonariensis</i>	L.		Not-Indigenous; Naturalised; Invasive
Campanulaceae	<i>Wahlenbergia banksiana</i>	A.DC.	LC	Indigenous
Campanulaceae	<i>Wahlenbergia undulata</i>	(L.f.) A.DC.	LC	Indigenous
Apocynaceae	<i>Xysmalobium undulatum var. undulatum</i>	(L.) W.T.Aiton	LC	Indigenous

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

Species	Common Name	Conservation Status	
		Regional (SANBI, 2016)	IUCN (2017)
<i>Accipiter badius</i>	Shikra	Unlisted	LC
<i>Accipiter melanoleucus</i>	Sparrowhawk, Black	Unlisted	LC
<i>Accipiter minullus</i>	Sparrowhawk, Little	Unlisted	LC
<i>Accipiter ovampensis</i>	Sparrowhawk, Ovambo	Unlisted	LC
<i>Acridotheres tristis</i>	Myna, Common	Unlisted	LC
<i>Acrocephalus arundinaceus</i>	Reed-warbler, Great	Unlisted	LC
<i>Acrocephalus baeticatus</i>	Reed-warbler, African	Unlisted	Unlisted
<i>Acrocephalus gracilirostris</i>	Swamp-warbler, Lesser	Unlisted	LC
<i>Acrocephalus palustris</i>	Warbler, Marsh	Unlisted	LC
<i>Acrocephalus schoenobaenus</i>	Warbler, Sedge	Unlisted	LC
<i>Actitis hypoleucos</i>	Sandpiper, Common	Unlisted	LC
<i>Actophilornis africanus</i>	Jacana, African	Unlisted	LC
<i>Afrotis afroides</i>	Korhaan, Northern Black	Unlisted	LC
<i>Agapornis roseicollis</i>	Lovebird, Rosy-faced	Unlisted	LC
<i>Alcedo cristata</i>	Kingfisher, Malachite	Unlisted	Unlisted
<i>Alcedo semitorquata</i>	Kingfisher, Half-collared	NT	LC
<i>Alopochen aegyptiacus</i>	Goose, Egyptian	Unlisted	LC
<i>Amadina erythrocephala</i>	Finch, Red-headed	Unlisted	LC
<i>Amandava subflava</i>	Waxbill, Orange-breasted	Unlisted	Unlisted
<i>Amaurornis flavirostris</i>	Crake, Black	Unlisted	LC
<i>Amblyospiza albifrons</i>	Weaver, Thick-billed	Unlisted	LC
<i>Anas capensis</i>	Teal, Cape	Unlisted	LC
<i>Anas erythrorhyncha</i>	Teal, Red-billed	Unlisted	LC
<i>Anas hottentota</i>	Teal, Hottentot	Unlisted	LC
<i>Anas platyrhynchos</i>	Duck, Mallard	Unlisted	LC
<i>Anas smithii</i>	Shoveler, Cape	Unlisted	LC
<i>Anas sparsa</i>	Duck, African Black	Unlisted	LC
<i>Anas undulata</i>	Duck, Yellow-billed	Unlisted	LC
<i>Anhinga rufa</i>	Darter, African	Unlisted	LC
<i>Anomalospiza imberbis</i>	Finch, Cuckoo	Unlisted	LC
<i>Anser anser</i>	Goose, Domestic	Unlisted	LC
<i>Anthropoides paradiseus</i>	Crane, Blue	NT	VU
<i>Anthus cinnamomeus</i>	Pipit, African	Unlisted	LC
<i>Anthus leucophrys</i>	Pipit, Plain-backed	Unlisted	LC
<i>Anthus similis</i>	Pipit, Long-billed	Unlisted	LC
<i>Anthus vaalensis</i>	Pipit, Buffy	Unlisted	LC
<i>Apalis thoracica</i>	Apalis, Bar-throated	Unlisted	LC
<i>Apus affinis</i>	Swift, Little	Unlisted	LC
<i>Apus apus</i>	Swift, Common	Unlisted	LC
<i>Apus barbatus</i>	Swift, African Black	Unlisted	LC
<i>Apus caffer</i>	Swift, White-rumped	Unlisted	LC
<i>Apus horus</i>	Swift, Horus	Unlisted	LC
<i>Aquila verreauxii</i>	Eagle, Verreaux's	VU	LC
<i>Ardea cinerea</i>	Heron, Grey	Unlisted	LC
<i>Ardea goliath</i>	Heron, Goliath	Unlisted	LC
<i>Ardea melanocephala</i>	Heron, Black-headed	Unlisted	LC
<i>Ardea purpurea</i>	Heron, Purple	Unlisted	LC
<i>Ardeola ralloides</i>	Heron, Squacco	Unlisted	LC
<i>Asio capensis</i>	Owl, Marsh	Unlisted	LC
<i>Aviceda cuculoides</i>	Hawk, African Cuckoo	Unlisted	LC
<i>Batis molitor</i>	Batis, Chinspot	Unlisted	LC

Chloorkop Landfill Expansion

<i>Bostrychia hagedash</i>	Ibis, Hadedda	Unlisted	LC
<i>Bradornis mariquensis</i>	Flycatcher, Marico	Unlisted	LC
<i>Bradypterus baboecala</i>	Rush-warbler, Little	Unlisted	LC
<i>Bubo africanus</i>	Eagle-owl, Spotted	Unlisted	LC
<i>Bubulcus ibis</i>	Egret, Cattle	Unlisted	LC
<i>Burhinus capensis</i>	Thick-knee, Spotted	Unlisted	LC
<i>Buteo rufofuscus</i>	Buzzard, Jackal	Unlisted	LC
<i>Buteo vulpinus</i>	Buzzard, Common	Unlisted	Unlisted
<i>Butorides striata</i>	Heron, Green-backed	Unlisted	LC
<i>Calandrella cinerea</i>	Lark, Red-capped	Unlisted	LC
<i>Calidris ferruginea</i>	Sandpiper, Curlew	LC	NT
<i>Calidris minuta</i>	Stint, Little	LC	LC
<i>Campephaga flava</i>	Cuckoo-shrike, Black	Unlisted	LC
<i>Campethera abingoni</i>	Woodpecker, Golden-tailed	Unlisted	LC
<i>Caprimulgus rufigena</i>	Nightjar, Rufous-cheeked	Unlisted	LC
<i>Caprimulgus tristigma</i>	Nightjar, Freckled	Unlisted	LC
<i>Centropus burchellii</i>	Coucal, Burchell's	Unlisted	Unlisted
<i>Cercomela familiaris</i>	Chat, Familiar	Unlisted	LC
<i>Cercotrichas leucophrys</i>	Scrub-robin, White-browed	Unlisted	LC
<i>Ceryle rudis</i>	Kingfisher, Pied	Unlisted	LC
<i>Chalcomitra amethystina</i>	Sunbird, Amethyst	Unlisted	LC
<i>Charadrius hiaticula</i>	Plover, Common Ringed	Unlisted	LC
<i>Charadrius pecuarius</i>	Plover, Kittlitz's	Unlisted	LC
<i>Charadrius tricollaris</i>	Plover, Three-banded	Unlisted	LC
<i>Chersomanes albofasciata</i>	Lark, Spike-heeled	Unlisted	LC
<i>Chlidonias hybrida</i>	Tern, Whiskered	Unlisted	LC
<i>Chlidonias leucopterus</i>	Tern, White-winged	Unlisted	LC
<i>Chloropeta natalensis</i>	Warbler, Dark-capped Yellow	Unlisted	LC
<i>Chrysococcyx caprius</i>	Cuckoo, Diderick	Unlisted	LC
<i>Ciconia abdimii</i>	Stork, Abdim's	NT	LC
<i>Ciconia ciconia</i>	Stork, White	Unlisted	LC
<i>Ciconia episcopus</i>	Stork, Woolly-necked	Unlisted	VU
<i>Cinnyricinclus leucogaster</i>	Starling, Violet-backed	Unlisted	LC
<i>Cinnyris afer</i>	Sunbird, Greater Double-collared	Unlisted	LC
<i>Cinnyris talatala</i>	Sunbird, White-bellied	Unlisted	LC
<i>Circaetus pectoralis</i>	Snake-eagle, Black-chested	Unlisted	LC
<i>Circus ranivorus</i>	Marsh-harrier, African	EN	LC
<i>Cisticola aberrans</i>	Cisticola, Lazy	Unlisted	LC
<i>Cisticola aridulus</i>	Cisticola, Desert	Unlisted	LC
<i>Cisticola ayresii</i>	Cisticola, Wing-snapping	Unlisted	LC
<i>Cisticola chiniana</i>	Cisticola, Rattling	Unlisted	LC
<i>Cisticola fulvicapilla</i>	Neddicky, Neddicky	Unlisted	LC
<i>Cisticola juncidis</i>	Cisticola, Zitting	Unlisted	LC
<i>Cisticola lais</i>	Cisticola, Wailing	Unlisted	LC
<i>Cisticola textrix</i>	Cisticola, Cloud	Unlisted	LC
<i>Cisticola tinniens</i>	Cisticola, Levallant's	Unlisted	LC
<i>Clamator glandarius</i>	Cuckoo, Great Spotted	Unlisted	LC
<i>Clamator jacobinus</i>	Cuckoo, Jacobin	Unlisted	LC
<i>Clamator levallantii</i>	Cuckoo, Levallant's	Unlisted	LC
<i>Colius colius</i>	Mousebird, White-backed	Unlisted	LC
<i>Colius striatus</i>	Mousebird, Speckled	Unlisted	LC
<i>Columba arquatrix</i>	Olive-pigeon, African	Unlisted	LC
<i>Columba guinea</i>	Pigeon, Speckled	Unlisted	LC
<i>Columba livia</i>	Dove, Rock	Unlisted	LC
<i>Coracias caudatus</i>	Roller, Lilac-breasted	Unlisted	LC
<i>Coracias garrulus</i>	Roller, European	NT	LC

Chloorkop Landfill Expansion

<i>Corvus albus</i>	Crow, Pied	Unlisted	LC
<i>Corvus capensis</i>	Crow, Cape	Unlisted	LC
<i>Corythaixoides concolor</i>	Go-away-bird, Grey	Unlisted	LC
<i>Cossypha caffra</i>	Robin-chat, Cape	Unlisted	LC
<i>Cossypha humeralis</i>	Robin-chat, White-throated	Unlisted	LC
<i>Coturnix coturnix</i>	Quail, Common	Unlisted	LC
<i>Creotophora cinerea</i>	Starling, Wattled	Unlisted	LC
<i>Crecopsis egregia</i>	Crake, African	Unlisted	LC
<i>Crex crex</i>	Crake, Corn	Unlisted	LC
<i>Crithagra atrogularis</i>	Canary, Black-throated	Unlisted	LC
<i>Crithagra flaviventris</i>	Canary, Yellow	Unlisted	LC
<i>Crithagra gularis</i>	Seedeater, Streaky-headed	Unlisted	LC
<i>Crithagra mozambicus</i>	Canary, Yellow-fronted	Unlisted	LC
<i>Cuculus canorus</i>	Cuckoo, Common	Unlisted	LC
<i>Cuculus clamosus</i>	Cuckoo, Black	Unlisted	LC
<i>Cuculus gularis</i>	Cuckoo, African	Unlisted	LC
<i>Cuculus solitarius</i>	Cuckoo, Red-chested	Unlisted	LC
<i>Cursorius temminckii</i>	Cursorer, Temminck's	Unlisted	LC
<i>Cypsiurus parvus</i>	Palm-swift, African	Unlisted	LC
<i>Delichon urbicum</i>	House-martin, Common	Unlisted	LC
<i>Dendrocygna bicolor</i>	Duck, Fulvous	Unlisted	LC
<i>Dendrocygna viduata</i>	Duck, White-faced Whistling	Unlisted	LC
<i>Dendroperdix sephaena</i>	Francolin, Crested	Unlisted	LC
<i>Dendropicos fuscescens</i>	Woodpecker, Cardinal	Unlisted	LC
<i>Dicrurus adsimilis</i>	Drongo, Fork-tailed	Unlisted	LC
<i>Dryoscopus cubla</i>	Puffback, Black-backed	Unlisted	LC
<i>Egretta alba</i>	Egret, Great	Unlisted	LC
<i>Egretta ardesiaca</i>	Heron, Black	Unlisted	LC
<i>Egretta garzetta</i>	Egret, Little	Unlisted	LC
<i>Egretta intermedia</i>	Egret, Yellow-billed	Unlisted	LC
<i>Elanus caeruleus</i>	Kite, Black-shouldered	Unlisted	LC
<i>Emberiza capensis</i>	Bunting, Cape	Unlisted	LC
<i>Emberiza tahapisi</i>	Bunting, Cinnamon-breasted	Unlisted	LC
<i>Estrilda astrild</i>	Waxbill, Common	Unlisted	LC
<i>Estrilda erythronotos</i>	Waxbill, Black-faced	Unlisted	LC
<i>Euplectes afer</i>	Bishop, Yellow-crowned	Unlisted	LC
<i>Euplectes albonotatus</i>	Widowbird, White-winged	Unlisted	LC
<i>Euplectes ardens</i>	Widowbird, Red-collared	Unlisted	LC
<i>Euplectes axillaris</i>	Widowbird, Fan-tailed	Unlisted	LC
<i>Euplectes capensis</i>	Bishop, Yellow	Unlisted	LC
<i>Euplectes orix</i>	Bishop, Southern Red	Unlisted	LC
<i>Euplectes progne</i>	Widowbird, Long-tailed	Unlisted	LC
<i>Falco amurensis</i>	Falcon, Amur	Unlisted	LC
<i>Falco biarmicus</i>	Falcon, Lanner	VU	LC
<i>Falco naumanni</i>	Kestrel, Lesser	Unlisted	LC
<i>Falco peregrinus</i>	Falcon, Peregrine	Unlisted	LC
<i>Falco rupicoloides</i>	Kestrel, Greater	Unlisted	LC
<i>Falco rupicolus</i>	Kestrel, Rock	Unlisted	LC
<i>Falco subbuteo</i>	Hobby, Eurasian	Unlisted	LC
<i>Falco vespertinus</i>	Falcon, Red-footed	NT	NT
<i>Fulica cristata</i>	Coot, Red-knobbed	Unlisted	LC
<i>Gallinago nigripennis</i>	Snipe, African	Unlisted	LC
<i>Gallinula angulata</i>	Moorhen, Lesser	Unlisted	LC
<i>Gallinula chloropus</i>	Moorhen, Common	Unlisted	LC
<i>Glareola nordmanni</i>	Pratincole, Black-winged	NT	NT
<i>Glaucidium perlatum</i>	Owlet, Pearl-spotted	Unlisted	LC

Chloorkop Landfill Expansion

<i>Granatina granatina</i>	Waxbill, Violet-eared	Unlisted	LC
<i>Gyps africanus</i>	Vulture, White-backed	CR	CR
<i>Gyps coprotheres</i>	Vulture, Cape	EN	EN
<i>Halcyon albiventris</i>	Kingfisher, Brown-hooded	Unlisted	LC
<i>Halcyon senegalensis</i>	Kingfisher, Woodland	Unlisted	LC
<i>Haliaeetus vocifer</i>	Fish-eagle, African	Unlisted	LC
<i>Himantopus himantopus</i>	Stilt, Black-winged	Unlisted	LC
<i>Hirundo abyssinica</i>	Swallow, Lesser Striped	Unlisted	LC
<i>Hirundo albicularis</i>	Swallow, White-throated	Unlisted	LC
<i>Hirundo cucullata</i>	Swallow, Greater Striped	Unlisted	LC
<i>Hirundo dimidiata</i>	Swallow, Pearl-breasted	Unlisted	LC
<i>Hirundo fuligula</i>	Martin, Rock	Unlisted	Unlisted
<i>Hirundo rustica</i>	Swallow, Barn	Unlisted	LC
<i>Hirundo semirufa</i>	Swallow, Red-breasted	Unlisted	LC
<i>Hirundo spilodera</i>	Cliff-swallow, South African	Unlisted	LC
<i>Indicator indicator</i>	Honeyguide, Greater	Unlisted	LC
<i>Indicator minor</i>	Honeyguide, Lesser	Unlisted	LC
<i>Ixobrychus minutus</i>	Bittern, Little	Unlisted	LC
<i>Jynx ruficollis</i>	Wryneck, Red-throated	Unlisted	LC
<i>Kaupifalco monogrammicus</i>	Buzzard, Lizard	Unlisted	LC
<i>Lagonosticta rhodopareia</i>	Firefinch, Jameson's	Unlisted	LC
<i>Lagonosticta rubricata</i>	Firefinch, African	Unlisted	LC
<i>Lagonosticta senegala</i>	Firefinch, Red-billed	Unlisted	LC
<i>Lamprotonis nitens</i>	Starling, Cape Glossy	Unlisted	LC
<i>Laniarius atrococcineus</i>	Shrike, Crimson-breasted	Unlisted	LC
<i>Laniarius ferrugineus</i>	Boubou, Southern	Unlisted	LC
<i>Lanius collaris</i>	Fiscal, Common (Southern)	Unlisted	LC
<i>Lanius collurio</i>	Shrike, Red-backed	Unlisted	LC
<i>Lanius minor</i>	Shrike, Lesser Grey	Unlisted	LC
<i>Larus cirrocephalus</i>	Gull, Grey-headed	Unlisted	LC
<i>Larus fuscus</i>	Gull, Lesser Black-backed	Unlisted	LC
<i>Leptoptilos crumeniferus</i>	Stork, Marabou	Unlisted	LC
<i>Locustella fluviatilis</i>	Warbler, River	Unlisted	LC
<i>Lophaetus occipitalis</i>	Eagle, Long-crested	Unlisted	LC
<i>Lybius torquatus</i>	Barbet, Black-collared	Unlisted	LC
<i>Macronyx capensis</i>	Longclaw, Cape	Unlisted	LC
<i>Malaconotus blanchoti</i>	Bush-shrike, Grey-headed	Unlisted	LC
<i>Megaceryle maximus</i>	Kingfisher, Giant	Unlisted	Unlisted
<i>Melaenornis pammelaina</i>	Flycatcher, Southern Black	Unlisted	LC
<i>Melierax canorus</i>	Goshawk, Southern Pale Chanting	Unlisted	LC
<i>Melierax gabar</i>	Goshawk, Gabar	Unlisted	LC
<i>Merops apiaster</i>	Bee-eater, European	Unlisted	LC
<i>Merops bullockoides</i>	Bee-eater, White-fronted	Unlisted	LC
<i>Merops hirundineus</i>	Bee-eater, Swallow-tailed	Unlisted	LC
<i>Merops pusillus</i>	Bee-eater, Little	Unlisted	LC
<i>Milvus aegyptius</i>	Kite, Yellow-billed	Unlisted	Unlisted
<i>Milvus migrans</i>	Kite, Black	Unlisted	LC
<i>Mirafraga africana</i>	Lark, Rufous-naped	Unlisted	LC
<i>Mirafraga cheniana</i>	Lark, Melodious	LC	LC
<i>Mirafraga fasciolata</i>	Lark, Eastern Clapper	Unlisted	LC
<i>Monticola explorator</i>	Rock-thrush, Sentinel	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>Muscicapa striata</i>	Flycatcher, Spotted	Unlisted	LC

Chloorkop Landfill Expansion

<i>Myxerops ibis</i>	Stork, Yellow-billed	EN	LC
<i>Myrmecocichla formicivora</i>	Chat, Anteating	Unlisted	LC
<i>Nectarinia famosa</i>	Sunbird, Malachite	Unlisted	LC
<i>Netta erythrophthalma</i>	Pochard, Southern	Unlisted	LC
<i>Nilaus afer</i>	Brubru	Unlisted	LC
<i>Numida meleagris</i>	Guineafowl, Helmeted	Unlisted	LC
<i>Nycticorax nycticorax</i>	Night-Heron, Black-crowned	Unlisted	LC
<i>Oena capensis</i>	Dove, Namaqua	Unlisted	LC
<i>Oenanthe monticola</i>	Wheatear, Mountain	Unlisted	LC
<i>Oenanthe pileata</i>	Wheatear, Capped	Unlisted	LC
<i>Onychognathus morio</i>	Starling, Red-winged	Unlisted	LC
<i>Oriolus larvatus</i>	Oriole, Black-headed	Unlisted	LC
<i>Ortygospiza atricollis</i>	Quailfinch, African	Unlisted	LC
<i>Oxyura maccoa</i>	Duck, Maccoa	NT	NT
<i>Parisoma subcaeruleum</i>	Tit-babbler, Chestnut-vented	Unlisted	Unlisted
<i>Passer diffusus</i>	Sparrow, Southern Grey-headed	Unlisted	LC
<i>Passer domesticus</i>	Sparrow, House	Unlisted	LC
<i>Passer melanurus</i>	Sparrow, Cape	Unlisted	LC
<i>Passer motitensis</i>	Sparrow, Great	Unlisted	LC
<i>Pavo cristatus</i>	Peacock, Common	Unlisted	LC
<i>Peliperdix coqui</i>	Francolin, Coqui	Unlisted	LC
<i>Pernis apivorus</i>	Honey-buzzard, European	Unlisted	LC
<i>Petronia supercilialis</i>	Petronia, Yellow-throated	Unlisted	LC
<i>Phalacrocorax africanus</i>	Cormorant, Reed	Unlisted	LC
<i>Phalacrocorax carbo</i>	Cormorant, White-breasted	LC	LC
<i>Philomachus pugnax</i>	Ruff	Unlisted	LC
<i>Phoenicopterus minor</i>	Flamingo, Lesser	NT	NT
<i>Phoenicopterus ruber</i>	Flamingo, Greater	NT	LC
<i>Phoeniculus purpureus</i>	Wood-hoopoe, Green	Unlisted	LC
<i>Phylloscopus trochilus</i>	Warbler, Willow	Unlisted	LC
<i>Platalea alba</i>	Spoonbill, African	Unlisted	LC
<i>Plectropterus gambensis</i>	Goose, Spur-winged	Unlisted	LC
<i>Plegadis falcinellus</i>	Ibis, Glossy	Unlisted	LC
<i>Plocepasser mahali</i>	Sparrow-weaver, White-browed	Unlisted	LC
<i>Ploceus capensis</i>	Weaver, Cape	Unlisted	LC
<i>Ploceus cucullatus</i>	Weaver, Village	Unlisted	LC
<i>Ploceus intermedius</i>	Masked-weaver, Lesser	Unlisted	LC
<i>Ploceus velatus</i>	Masked-weaver, Southern	Unlisted	LC
<i>Podiceps cristatus</i>	Grebe, Great Crested	Unlisted	LC
<i>Podiceps nigricollis</i>	Grebe, Black-necked	Unlisted	LC
<i>Pogoniulus chrysoconus</i>	Tinkerbird, Yellow-fronted	Unlisted	LC
<i>Polyboroides typus</i>	Harrier-Hawk, African	Unlisted	LC
<i>Porphyrio madagascariensis</i>	Swamphen, African Purple	Unlisted	Unlisted
<i>Porzana porzana</i>	Crake, Spotted	Unlisted	LC
<i>Prinia flavicans</i>	Prinia, Black-chested	Unlisted	LC
<i>Prinia subflava</i>	Prinia, Tawny-flanked	Unlisted	LC
<i>Prionops plumatus</i>	Helmet-shrike, White-crested	Unlisted	LC
<i>Prodotiscus regulus</i>	Honeybird, Brown-backed	Unlisted	LC
<i>Psittacula krameri</i>	Parakeet, Rose-ringed	Unlisted	LC
<i>Psophocichla litsipsirupa</i>	Thrush, Groundscraper	Unlisted	Unlisted
<i>Pternistis natalensis</i>	Spurfowl, Natal	Unlisted	LC
<i>Pternistis swainsonii</i>	Spurfowl, Swainson's	Unlisted	LC
<i>Pycnonotus nigricans</i>	Bulbul, African Red-eyed	Unlisted	LC
<i>Pycnonotus tricolor</i>	Bulbul, Dark-capped	Unlisted	Unlisted
<i>Pytilia melba</i>	Pytilia, Green-winged	Unlisted	LC
<i>Quelea quelea</i>	Quelea, Red-billed	Unlisted	LC

Chloorkop Landfill Expansion

<i>Rallus caerulescens</i>	Rail, African	Unlisted	LC
<i>Recurvirostra avosetta</i>	Avocet, Pied	Unlisted	LC
<i>Rhinopomastus cyanomelas</i>	Scimitarbill, Common	Unlisted	LC
<i>Riparia cincta</i>	Martin, Banded	Unlisted	LC
<i>Riparia paludicola</i>	Martin, Brown-throated	Unlisted	LC
<i>Riparia riparia</i>	Martin, Sand	Unlisted	LC
<i>Rostratula benghalensis</i>	Painted-snipe, Greater	NT	LC
<i>Sagittarius serpentarius</i>	Secretarybird	VU	VU
<i>Sarkidiornis melanotos</i>	Duck, Comb	Unlisted	LC
<i>Sarothrura rufa</i>	Flufftail, Red-chested	Unlisted	LC
<i>Saxicola torquatus</i>	Stonechat, African	Unlisted	LC
<i>Scleroptila levallantii</i>	Francolin, Red-winged	Unlisted	LC
<i>Scleroptila levallantoides</i>	Francolin, Orange River	Unlisted	LC
<i>Scleroptila shelleyi</i>	Francolin, Shelley's	Unlisted	LC
<i>Scopus umbretta</i>	Hamerkop, Hamerkop	Unlisted	LC
<i>Serinus canicollis</i>	Canary, Cape	Unlisted	LC
<i>Sigelus silens</i>	Flycatcher, Fiscal	Unlisted	LC
<i>Spermestes cucullatus</i>	Mannikin, Bronze	Unlisted	Unlisted
<i>Sphenoecus afer</i>	Grassbird, Cape	Unlisted	LC
<i>Sporopipes squamifrons</i>	Finch, Scaly-feathered	Unlisted	LC
<i>Spreo bicolor</i>	Starling, Pied	Unlisted	LC
<i>Stenostira scita</i>	Flycatcher, Fairy	Unlisted	LC
<i>Sterna caspia</i>	Tern, Caspian	VU	LC
<i>Streptopelia capicola</i>	Turtle-dove, Cape	Unlisted	LC
<i>Streptopelia semitorquata</i>	Dove, Red-eyed	Unlisted	LC
<i>Streptopelia senegalensis</i>	Dove, Laughing	Unlisted	LC
<i>Struthio camelus</i>	Ostrich, Common	Unlisted	LC
<i>Sturnus vulgaris</i>	Starling, Common	Unlisted	LC
<i>Sylvia borin</i>	Warbler, Garden	Unlisted	LC
<i>Sylvia communis</i>	Whitethroat, Common	Unlisted	LC
<i>Sylvietta rufescens</i>	Crombec, Long-billed	Unlisted	LC
<i>Tachybaptus ruficollis</i>	Grebe, Little	Unlisted	LC
<i>Tachymartus melba</i>	Swift, Alpine	Unlisted	LC
<i>Tadorna cana</i>	Shelduck, South African	Unlisted	LC
<i>Tchagra australis</i>	Tchagra, Brown-crowned	Unlisted	LC
<i>Tchagra senegalus</i>	Tchagra, Black-crowned	Unlisted	LC
<i>Telophorus sulfureopectus</i>	Bush-shrike, Orange-breasted	Unlisted	LC
<i>Telophorus zeylonus</i>	Bokmakierie, Bokmakierie	Unlisted	LC
<i>Terpsiphone viridis</i>	Paradise-flycatcher, African	Unlisted	LC
<i>Thalassornis leuconotus</i>	Duck, White-backed	Unlisted	LC
<i>Thamnolaea cinnamomeiventris</i>	Cliff-chat, Mocking	Unlisted	LC
<i>Threskiornis aethiopicus</i>	Ibis, African Sacred	Unlisted	LC
<i>Tockus nasutus</i>	Hornbill, African Grey	Unlisted	LC
<i>Trachyphonus vaillantii</i>	Barbet, Crested	Unlisted	LC
<i>Treron calvus</i>	Green-pigeon, African	Unlisted	LC
<i>Tricholaema leucomelas</i>	Barbet, Acacia Pied	Unlisted	LC
<i>Tringa glareola</i>	Sandpiper, Wood	Unlisted	LC
<i>Tringa nebularia</i>	Greenshank, Common	Unlisted	LC
<i>Tringa ochropus</i>	Sandpiper, Green	Unlisted	LC
<i>Tringa stagnatilis</i>	Sandpiper, Marsh	Unlisted	LC
<i>Turdoides jardineii</i>	Babbler, Arrow-marked	Unlisted	LC
<i>Turdus libonyanus</i>	Thrush, Kurrichane	Unlisted	Unlisted
<i>Turdus olivaceus</i>	Thrush, Olive	Unlisted	LC
<i>Turdus smithi</i>	Thrush, Karoo	Unlisted	LC
<i>Turnix sylvaticus</i>	Buttonquail, Kurrichane	Unlisted	LC

Chloorkop Landfill Expansion

<i>Turtur chalcospilos</i>	Wood-dove, Emerald-spotted	Unlisted	LC
<i>Tyto alba</i>	Owl, Barn	Unlisted	LC
<i>Tyto capensis</i>	Grass-owl, African	VU	LC
<i>Upupa africana</i>	Hoopoe, African	Unlisted	LC
<i>Uraeginthus angolensis</i>	Waxbill, Blue	Unlisted	LC
<i>Urocolius indicus</i>	Mousebird, Red-faced	Unlisted	LC
<i>Urolestes melanoleucus</i>	Shrike, Magpie	Unlisted	LC
<i>Vanellus armatus</i>	Lapwing, Blacksmith	Unlisted	LC
<i>Vanellus coronatus</i>	Lapwing, Crowned	Unlisted	LC
<i>Vanellus senegallus</i>	Lapwing, African Wattled	Unlisted	LC
<i>Vidua chalybeata</i>	Indigobird, Village	Unlisted	LC
<i>Vidua macroura</i>	Whydah, Pin-tailed	Unlisted	LC
<i>Vidua paradisaea</i>	Paradise-whydah, Long-tailed	Unlisted	LC
<i>Vidua purpurascens</i>	Indigobird, Purple	Unlisted	LC
<i>Zosterops virens</i>	White-eye, Cape	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>Aethomys namaquensis</i>	Namaqua Rock Rat	LC	LC
<i>Alcelaphus buselaphus</i>	Hartebeest	LC	LC
<i>Antidorcas marsupialis</i>	Sclater's Shrew	LC	LC
<i>Aonyx capensis</i>	Cape Clawless Otter	NT	NT
<i>Atelerix frontalis</i>	South Africa 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>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>	Makwassie Musk Shrew	VU	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>Desmodillus auricularis</i>	Short-tailed Gerbil	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>Epomophorus wahlbergi</i>	Wahlberg's epauletted fruit bat	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>	African Wildcat	LC	LC
<i>Genetta genetta</i>	Small-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 africae australis</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
<i>Leptailurus serval</i>	Serval	NT	LC
<i>Lepus saxatilis</i>	Scrub Hare	LC	LC
<i>Lepus victoriae</i>	African Savanna Hare	LC	LC

Chloorkop Landfill Expansion

<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>Mungos mungo</i>	Banded Mongoose	LC	LC
<i>Myotis tricolor</i>	Temminck's Hairy Bat	LC	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 nana</i>	Banana 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>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>Phacochoerus africanus</i>	Common Warthog	LC	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 Rabbit	LC	LC
<i>Proteles cristata</i>	Aardwolf	LC	LC
<i>Raphicerus campestris</i>	Steenbok	LC	LC
<i>Rattus rattus</i>	House Rat	Exotic (Not listed)	LC
<i>Redunca fulvorufula</i>	Mountain Reedbuck	EN	LC
<i>Rhabdomys pumilio</i>	Xeric Four-striped Mouse	LC	LC
<i>Rhinolophus blasii</i>	Blasius's Horseshoe Bat	NT	LC
<i>Rhinolophus clivosus</i>	Geoffroy's Horseshoe Bat	LC	LC
<i>Rhinolophus darlingi</i>	Darling's Horseshoe Bat	LC	LC
<i>Rhinolophus simulator</i>	Bushveld Horseshoe Bat	LC	LC
<i>Saccostomus campestris</i>	Pouched Mouse	LC	LC
<i>Sauromys petrophilus</i>	Flat-headed Free-tail Bat	LC	LC
<i>Scotophilus dinganii</i>	Yellow House Bat	LC	LC
<i>Steatomys krebsii</i>	Krebs's Fat Mouse	LC	LC
<i>Steatomys pratensis</i>	Fat Mouse	LC	LC
<i>Suncus varilla</i>	Lesser Dwarf Shrew	LC	LC
<i>Suricata suricatta</i>	Suricate	LC	LC
<i>Sylvicapra grimmia</i>	Common Duiker	LC	LC
<i>Syncerus caffer</i>	African Buffalo	LC	LC
<i>Tadarida aegyptiaca</i>	Egyptian Free-tailed Bat	LC	LC
<i>Taphozous mauritanus</i>	Mauritian Tomb Bat	LC	LC

Chloorkop Landfill Expansion

<i>Thallomys paedulus</i>	Tree Rat	LC	LC
<i>Tragelaphus oryx</i>	Common Eland	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>Acontias gracilicauda</i>	Thin-tailed Legless Skink	LC	LC
<i>Afroedura nivaria</i>	Drankensberg Flat Gecko	LC	LC
<i>Afrotyphlops bibronii</i>	Bibron's Blind Snake	LC	LC
<i>Agama aculeata distanti</i>	Eastern Ground Agama	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>Bitis arietans arietans</i>	Puff Adder	LC	Unlisted
<i>Boaedon capensis</i>	Brown House Snake	LC	LC
<i>Bradypodion ventrale</i>	Eastern Cape Dwarf Chameleon	LC	LC
<i>Causus rhombeatus</i>	Rhombic Night Adder	LC	LC
<i>Chamaeleo dilepis</i>	Common Flap-neck Chameleon	LC	LC
<i>Cordylus vittifer</i>	Common Girdled Lizard	LC	LC
<i>Crotaphopeltis hotamboeia</i>	Red-lipped Snake	LC	Unlisted
<i>Dasypeltis scabra</i>	Rhombic Egg-eater	LC	LC
<i>Dendroaspis polylepis</i>	Black Mamba	LC	LC
<i>Duberria lutrix</i>	Common Slug-eater	LC	LC
<i>Elapsoidea sundevallii sundevallii</i>	Sundevall's Garter Snake	LC	Unlisted
<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>Homoroselaps dorsalis</i>	Striped Harlequin Snake	NT	LC
<i>Homoroselaps lacteus</i>	Spotted Harlequin Snake	LC	LC
<i>Lamprophis aurora</i>	Aurora House Snake	LC	LC
<i>Leptotyphlops scutifrons scutifrons</i>	Peters' Thread Snake	LC	Unlisted
<i>Lycodonomorphus inornatus</i>	Olive House Snake	LC	LC
<i>Lycodonomorphus rufulus</i>	Brown Water Snake	LC	Unlisted
<i>Lycophidion capense capense</i>	Cape Wolf Snake	LC	Unlisted
<i>Lygodactylus capensis capensis</i>	Common Dwarf Gecko	LC	Unlisted
<i>Naja mossambica</i>	Mozambique Spitting Cobra	LC	Unlisted
<i>Nucras lalandii</i>	Delalande's Sandveld Lizard	LC	LC
<i>Pachydactylus affinis</i>	Transvaal Gecko	LC	LC
<i>Pachydactylus capensis</i>	Cape Gecko	LC	Unlisted
<i>Panaspis wahlbergi</i>	Wahlberg's Snake-eyed Skink	LC	Unlisted
<i>Pedioplanis burchelli</i>	Burchell's Sand Lizard	LC	LC
<i>Pelomedusa galeata</i>	South African Marsh Terrapin	Not evaluated	Unlisted
<i>Pelomedusa subrufa</i>	Central Marsh Terrapin	LC	Unlisted
<i>Prosymna ambigua</i>	Angolan Shovel-snout	Unlisted	LC
<i>Prosymna sundevallii</i>	Sundevall's Shovel-snout	LC	LC
<i>Psammophis brevirostris</i>	Short-snouted Grass Snake	LC	Unlisted
<i>Psammophis crucifer</i>	Cross-marked Grass Snake	LC	LC

Chloorkop Landfill Expansion

<i>Psammophis subtaeniatus</i>	Stripe-bellied Sand Snake	LC	LC
<i>Psammophylax rhombeatus</i>	Spotted Grass Snake	LC	Unlisted
<i>Psammophylax tritaeniatus</i>	Striped Grass Snake	LC	LC
<i>Pseudaspis cana</i>	Mole Snake	LC	Unlisted
<i>Pseudocordylus melanotus melanotus</i>	Common Crag Lizard	LC	LC
<i>Rhinotyphlops lalandei</i>	Delalande's Beaked Blind Snake	LC	Unlisted
<i>Stigmochelys pardalis</i>	Leopard Tortoise	LC	LC
<i>Trachylepis capensis</i>	Cape Skink	LC	Unlisted
<i>Trachylepis punctatissima</i>	Speckled Rock Skink	LC	LC
<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>Amietia fuscigula</i>	Cape River Frog	LC	LC
<i>Amietia poyntoni</i>	Poynton's River Frog	LC	LC
<i>Breviceps adspersus</i>	Bushveld Rain Frog	LC	LC
<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 anchietae</i>	Plain Grass Frog	LC	LC
<i>Pyxicephalus adspersus</i>	Giant Bullfrog	NT	LC
<i>Schismaderma carens</i>	African 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>Sclerophrys poweri</i>	Power's Toad	LC	LC
<i>Semnodactylus wealii</i>	Rattling Frog	LC	LC
<i>Strongylopus fasciatus</i>	Striped 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
<i>Xenopus laevis</i>	Common Platanna	LC	LC

Appendix F: Some of the bird species most commonly impacted by powerlines (The Endangered Wildlife Trust, 2017).

BIRDS & POWER LINES

Blue Crane *Bluecransvoël* / *ibhee* / 100-120cm / Vulnerable (C)

Grey Crowned Crane *Makhe* / *uAchoemu* / *Pheni* / *Sabaashandzana* / 100-130cm / Vulnerable (C, E)

Wattled Crane *Leflanaasvoël* / *uBhamutwe* / *ipamipi* / *Nyakuholiet* / 120-175cm / Critical (C)

Spur-Winged Goose *Widermakku* / *inophe* / *Rhoye* / *Seswengogwane* / 95cm / Vulnerable (C, E)

Pied Crow *Wiborakran* / *ngwababane* / *Unomayi* / *Kikhunguba* / 52cm / Vulnerable (E, N)

Black-chested Snake-Eagle *Swariborakrangend* / *uBhozi* / *Xhahungwa* / 43-68cm / Vulnerable (E, N)

Southern Palm-Chanting Goshawk *Bheksingpho* / 46-63cm / Vulnerable (E, N)

Marital Eagle *Bheksoprend* / *uKuhle* / *Ghama* / 78-83cm / Vulnerable (C, E, N, P)

Kori Bustard *Gompou* / *umlegapho* / *lamhe* / *Mthau* / 100-150cm / Vulnerable (C)

Lang-crested Eagle *Langkulend* / *uPhungumangapho* / *Ngphungu* / *Mtswamhlesawu* / 53-58cm / Vulnerable (E)

Verreaux's Eagle *Wibrusazend* / *uBhozi* / *Lindho* / *Ghama* / 80-95cm / Vulnerable (C, E, N, P)

Spotted Eagle-Owl *Gehlethe Druel* / *uKhowampondo* / *Rufesi* / *Xyaka* / 43-47cm / Vulnerable (E)

Great White Pelican *Wibetlisaan* / *uBho* / *Ingwanguba* / *Gumbata* / 145-178cm / Near threatened (C, E, P)

Cape Vulture *Kranzasvoël* / *Rhe* / *ushalanga* / *Koti* / 100-120cm / Vulnerable (C, E, P)

White-backed Vulture *Witragasvoël* / *Koti* / 90-120cm / Vulnerable (C, E, N, P)

Lappin-faced Vulture *Swarfasvoël* / *uSwangangubhe* / *Koti* / 96-120cm / Vulnerable (C, E, P)

Secretary Bird *Seketerasvoël* / *uMungunono* / *Ingangonoo* / *Mangyama* / 125-150cm / Near threatened (C)

Lesser Flamingo *Keefflamink* / *uNonobebu* / 113-122cm / Near threatened (C)

Greater Flamingo *Grootflamink* / *uKhowise* / 145-185cm / Near threatened (C)

Helmeted Guinea-fowl *Gwone Tarentaal* / *uPangole* / *Impangole* / *Mhanghela* / 53-58cm / Vulnerable (E, P)

Grey Heron *Bhouster* / *uKhotanka* / *uKhowampondo* / 90-98cm / Vulnerable (C, E, N, P)

Hadenia Ibis *Hadenia* / *uKankane* / *Ingangone* / *uKhowa Ni jamba* / 76cm / Vulnerable (S, E, N)

Egyptian Goose *Kigama* / *Kungwa* / *Rose* / *Sekwe* / 545-165cm / Vulnerable (C, E, P)

Southern Ground-Hornbill *Brommel* / *Ngubulu* / *Inhango* / *Nghutulu* / 90-130cm / Vulnerable (E, C)

African Fish Eagle *Vuanael* / *Ingaphile* / *uNgqolenthe* / *Ingwama* / 63-73cm / Vulnerable (C, E)

Common Myna (C)

Streamers (S)

Nesting (N)

Insulator Pollution (P)

Electrocutation (E)

Credits to Photographers: Gopi Sundar / André Botha / Constant Hoogstad

S = Streamers **C** = Collision **E** = Electrocutation **P** = Insulator Pollution **N** = Nesting

Report bird fatalities linked to power lines
Toll free 0860 111 535
 Wildlife interaction series No. 1



STRATEGIC PARTNERSHIP

