



Ecological Opinion to Inform the Waste
Management License Application and Basic
Assessment for the Topline Landfill Site, Gannaput,
Northern Cape, South Africa.

October 2015

Drafted by
Limosella Consulting Pty Ltd
Reg No: 2014/023293/07
Email: antoINETTE@limosella.co.za
Cell: +27 83 4545 454
www.limosella.co.za

Prepared for:
GA Environment
Tel: +27 11 312 2537
Fax: +27 11 805 1950
Cell: +27 72 550 9669
Email: nkhensanik@gaenvironment.com



GA Environment

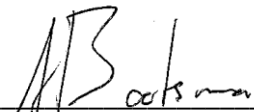
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I, **Antoinette Bootsma**, in my capacity as a specialist consultant, hereby declare that I -

- Act as an independent consultant;
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- Undertake to disclose, to the competent authority, any material information that has or may have the potential to influence the decision of the competent authority or the objectivity of any report, plan or document required in terms of the National Environmental Management Act, 1998 (Act 107 of 1998);
- As a registered member of the South African Council for Natural Scientific Professions, will undertake my profession in accordance with the Code of Conduct of the Council, as well as any other societies to which I am a member; and
- Based on information provided to me by the project proponent, and in addition to information obtained during the course of this study, have presented the results and conclusion within the associated document to the best of my professional judgement.



Antoinette Bootsma (PrSciNat)
Ecologist/Botanist
SACNASP Reg. No. 400222-09

2015.10.25
Date



Indemnity

This report is based on survey and assessment techniques which are limited by time and budgetary constraints relevant to the type and level of investigation undertaken. The findings, results, observations, conclusions and recommendations given in this report are based on the author's best scientific and professional knowledge as well as information available at the time of study. Therefore the author reserves the right to modify aspects of the report, including the recommendations, if and when new information may become available from ongoing research or further work in this field, or pertaining to this investigation.

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Qualification of Specialists

<p>Report writing and review</p>	<p>Antoinette Bootsma Ecologist/Botanist/Wetland specialist SACNASP Reg. No. 400222-09</p> <p>Jaco Van Wyk Herpetologist/Mamologist SACNASP Reg. No.400062-09</p> <p>Dr Alan Kemp Ornithologist SACNASP Reg. No.400059-09</p>
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EXECUTIVE SUMMARY

Limosella Consulting was appointed by GA Environment to undertake a desktop based ecological opinion to inform the Waste Management Licence Application and Basic Assessment Process for the landfill site at Topline, Gannaput, Northern Cape, South Africa.

The terms of reference for the study were as follows:

- Highlight sensitive environmental components including watercourses, conservation-worthy vegetation and fauna habitat.
- Discuss potential impacts, mitigation and management procedures relevant to the protection of the conservation-worthy aspects of the site, and also downstream areas.

The Topline landfill site is impacted by existing landfill activities and edge effects from the town and gravel roads. The area surrounding the landfill site includes waste water treatment works, the town of Gannaput, agricultural activities and roads which has led to the area surrounding the site being largely transformed in terms of vegetation and fauna habitat. The site is not considered to be regionally sensitive in terms of fauna.

A drainage line lies within the site boundary which drains into a dry bed system and the Orange River. Mitigation measures should be put in place to avoid contamination of the dry bed system and subsequently the Orange River, to the current landfill activities. Installation of litter traps and an investigation as to the actual effect of the landfill site on water quality are suggested.



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1 INTRODUCTION

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1.1 Terms of Reference

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- Highlight sensitive environmental components including watercourses, conservation-worthy vegetation and fauna habitat.
- Discuss potential impacts, mitigation and management procedures relevant to the protection of the conservation-worthy aspects of the site, and also downstream areas.

1.2 Assumptions and Limitations

The ecological opinion assessment presented in this report is based on available aerial imagery. No site visit was undertaken by the authors. However photos of the site and surrounds was obtained by the Environmental Assessment Practitioner. It is therefore possible that red-data plants or animals that utilize the site are not highlighted in this report

1.3 Definitions and Legal Framework

This assignment is conducted in accordance with the 2010 Environmental Impact Assessment (EIA) Regulations (No. R. 982, DEAT, Department of Environmental Affairs and Tourism, 4 December 2014) and their latest guidelines (Notice 891 of 2014) that emanate from Chapter 5 of NEMA, the National Environmental Management Act, 1998 (Act No. 107 of 1998).

It is widely recognised that the natural resources on Earth are essential in providing the ecological processes and life support systems that maintain healthy and viable populations of plants and animals, including humans. Therefore, for any sustainable development to take place, all possible impacts of such development on the environment must be considered before it can be approved by the relevant authorities. This has led to various and increasing legislation that protects the natural environment in South Africa. In 1992, the Convention of Biological Diversity (CBD), a landmark international convention, was signed by >90 % of members of the United Nations. In South Africa, the Environmental Conservation Act (ECA, Act 73 of 1989), the National Environmental Management Act (NEMA, Act 107 of 1998) and the National Environmental Management Biodiversity Act (NEMBA, Act 10 Of 2004) ensure the protection of ecological processes, natural systems and natural beauty, as well as the preservation of biotic diversity within the natural environment. They also ensure the protection of the environment against disturbance, deterioration, defacement or destruction as a result of man-made structures, installations, processes, products or activities. In support of these Acts, a draft list of Threatened Ecosystems was published (Government Gazette 2009), as part of the NEMBA (Act 10 of 2004). Details of these Threatened Ecosystems have been described by SANBI & DEAT (2009) and a list of Threatened or Protected Species



(ToPS) regulations is also available (NEMBA Notice 388 of 2013). International and national Red Data lists have also been produced for various threatened plant and animal taxa.

The National Water Act, 1998 (Act No. 36 of 1998) [NWA] provides for Constitutional water demands including pollution prevention, ecological and resource conservation and sustainable utilisation. In terms of this Act, all water resources are the property of the State and are regulated by the Department of Water and Sanitation (DWS). The NWA sets out a range of water use related principles that are to be applied by DWS when taking decisions that significantly affect a water resource. The NWA defines a water resource as including a watercourse, surface water, estuary or aquifer. A watercourse includes a river or spring; a natural channel in which water flows regularly or intermittently; a wetland, lake, pan or dam, into which or from which water flows; any collection of water that the Minister may declare to be a watercourse; and were relevant its beds and banks.

Authorisations related to wetlands are regulated by Government Notices R.1198 and R.1199 of 18 December 2009. GN 1198 and 1199 of 2009 grants General Authorisation (GA) for the above water uses on certain conditions:

GN R.1198: Any activity in a wetland for the rehabilitation of a wetland for conservation purposes.

GN R.1199: Any activity more than 500 m from the boundary of a wetland.

These regulations also stipulate that these water uses must be registered with the responsible authority. Any activity that is not related to the rehabilitation of a wetland and which takes place within 500 m of a wetland are excluded from a GA under either of these regulations. Wetlands situated within 500 m of proposed activities should be regarded as sensitive features potentially affected by the proposed development (GN 1199). Such an activity requires a Water Use Licence (WUL) from the relevant authority.

In addition to the above, the proponent must also comply with the provisions of the following relevant national legislation, conventions and regulations applicable to wetlands and riparian zones:

- Convention on Wetlands of International Importance - the Ramsar Convention and the South African Wetlands Conservation Programme (SAWCP).
- National Environmental Management Act, 1998 (Act No. 107 of 1998) [NEMA].
- National Environmental Management: Biodiversity Act, 2004 (Act 10 of 2004).
- National Environment Management Protected Areas Act, 2003 (Act No. 57 of 2003).
- Regulations GN R.982, R.983, R. 984 and R.985 of 2014, promulgated under NEMA.
- Conservation of Agriculture Resources Act, 1983 (Act 43 of 1983).
- Regulations and Guidelines on Water Use under the NWA.
- South African Water Quality Guidelines under the NWA.
- Mineral and Petroleum Resources Development Act, 2002 (Act No. 287 of 2002).

1.4 Locality of the study site

The landfill site lies approximately 500 m to the south east of the town of Topline, Gannaput, Northern Cape. There is a gravel road into the site from the N10 which lies, approximately 600 m, to the east of the site. To the north of the site lies the town of Gannaput. There is a drainage line which is present and runs through the site drains into a dry bed river to the south and east of the site, finally draining into the Orange



River approximately 3km east of the site. The immediate surrounding areas of the site largely transformed including roads, the town of Topline, and agriculture and recreational activities. Approximate central coordinates for the site are 28°45'30.15"S and 21°50'14.46"E. Figure 1 presents the locality of the study site.



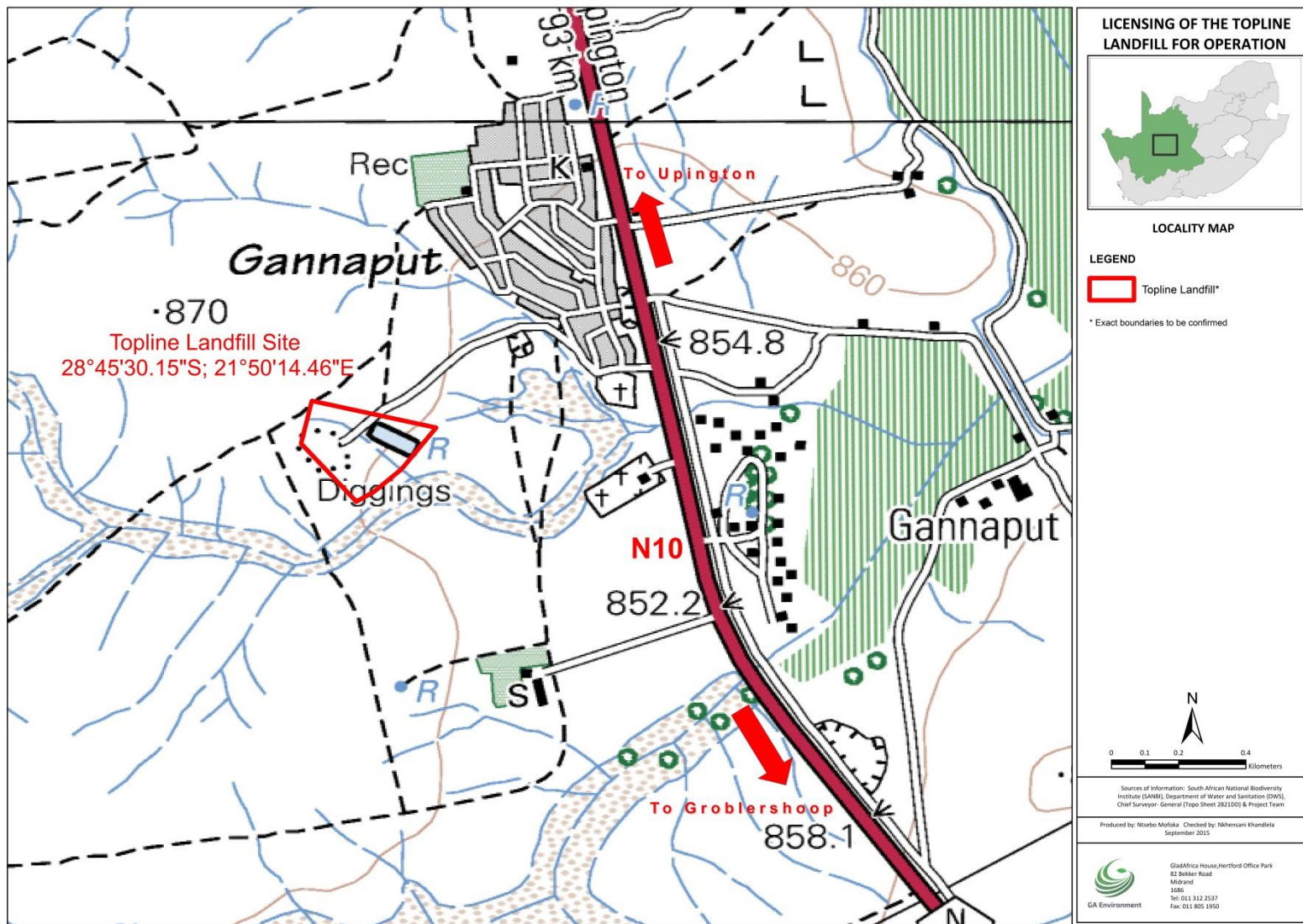


Figure 1: Locality Map (GA Environment Pty (Ltd), 2015)



2 RESULTS

2.1 Land Use, Cover and Ecological State

Landfill activities are visible on aerial imagery from 2004(Google Earth). From the google earth images it is evident that transformation including the agricultural activities, roads and the town of Gannaput has occurred regionally. The town of Gannaput lies to the north of the site. This town contains residential infrastructure, roads and pathways. The towns waste water treatment works lies, approximately 150 m, to the north west of the site. In terms of topography the site slopes gently from the north to the south toward thr drainage line. All runoff will form the landfill site is likely to run directly into the drainage line. Most of the naturally occurring vegetation has been removed from the site and very little indigenous vegetative cover remains on the site (Figure 2).



Figure 2: General characteristics of the study site (sourced from GA Environment Pty (Ltd) September 2015)

2.1.1 Hydrology

The region is characterised by dry drainage features in which terrestrial vegetation grows slightly more densely to become visible on aerial imagery. The area is covered with alluvium and clacrete. Soils are mostly apedan and red to yellow in colour and freely drained (Mucina and Rutherford, 2006). It is unlikely that riparian or wetland habitat occurs in these drainage lines. They are however an important hydrological feature of the landscape which may transport high volumes of water during precipitation events.

The site contains a drainage line (Figure 3). This drainage line drains into a dry bed system which drains into the Orange River approximately 3 km to the east of the site. During events of high rainfall and increased surface flow it is likely that some of the landfill material and waste may run into these dry bed systems and subsequently the Orange River.





Figure 3: The position of the drainage line relative to the landfill footprint.

2.1.2 Fauna

Desktop assessment of vertebrate fauna at a site rests mainly on point data or mapping, usually at a quarter-degree grid-cell scale, especially for birds (www.sabap2.adu.org.za), and also judgement of habitats based on photo and satellite images. Landfill sites have the potential to attract and negatively affect fauna if any edible waste remains uncovered and available. Vertebrates of all sizes attracted to small animals as prey, or larger species to carcasses and other forms of offal/carrion/medical-veterinary waste are especially vulnerable, since such waste often contain dangerous medicines (e.g. diclofenac) or poisons (e.g. lead fragments or pesticides), that can incapacitate such Red-data vertebrate species as carnivores and primates, vultures and raptors, or herpetofauna.

Birds

The site is close to the eastern edge of the town and just south of the Gariep/Orange River. To the south and west are extensive areas of natural habitat, sparse thorn scrub and tufted grasses on the sandy red soils, so birds can easily approach the site from these sides, and from the low rocky hills further inland. If consumables enter and are exposed at the site a variety of birds from the surroundings are expected to feed on the waste or the other small animals it attracts. The landfill site itself is not expected to attract any species classified as threatened (Taylor 2015) or otherwise of local conservation concern. Based on SABAP data, Kori Bustard (*Ardeotis kori*) and Karoo Korhaan (*Eupodotis vigorsii*; both Near Threatened), Verreaux's Eagle (*Aquila verreauxii*; Vulnerable) and Lanner Falcon (*Falco biarmicus*; Vulnerable) are expected in the area, with the bustard, korhaan and eagle most recently reported.

Mammals

The landfill site itself can attract Brown Hyaenas (*Hyaena brunnea*) as Skinner & Chimimba (2005) mention that they visit rubbish dumps in the proximity of farmhouses and kraals at night. Honey Badgers (*Mellivora*



capensis) eat carrion although they are not usually attracted by carrion (Skinner & Chimimba 2005). The possibility exists that honey badgers may visit the landfill site if any edible waste remains uncovered and available. The Southern African Hedgehog (*Atelerix frontalis*) is normally shy, but may eat invertebrates which live in carrion or otherwise at the landfill site. Migratory Straw-Coloured Fruit Bat (*Eidolon helvum*) may fly over the site and the landfill site will have no impact on this species. The Ground Pangolin (*Mantis temminckii*) is too shy to be attracted to the landfill site. The Bushveld Gerbil (*Gerbilliscus [Tatera] leucogaster*) prefers sandy or sandy alluvium soils and will not be attracted to the landfill site.

Herpetofauna

No reptile or amphibian Red Data species should occur on or near the site.

Workers on and visitors to sites should not enter surrounding habitats, be supplied with adequate ablution facilities, but be made aware of and avoid disturbing any threatened species that might visit the site.

2.1.3 Vegetation

The site is present in the Nama-Karoo biomes (Mucina and Rutherford, 2006). The vegetation unit present is the Bushmanland Arid Grassland (NKb 3) *sensu* Mucina and Rutherford (2006). The Bushmandland Arid Grassland consist mainly of plains with grass being the dominant plant species present. There are patches where low shrubs of the genus *Salsola* are more dominant than members of the grass family. The presence and dominance of herbs in this vegetation unit is mainly driven by rainfall and during years of high rainfall herbs will be more abundant than in years of low rainfall. Northern Upper Karroo contains mainly dwarf karoo shrubs, grasses and the low trees. *Senegalia mellifera* subsp. *detinens* along with other low tree species occur mostly on sandy soils in close proximity to the Orange River. Endemic taxa include the succulent shrubs include *Diteranthus pole-evansii*, *Larryleachia dinteri*, *L. marlothii*, *Ruschia kenhardtensis* and the herbs *Lotononis oligocephala* and *Nemsia maxi*. This vegetation unit is classified as 'Least Threatened' since very little of the area has been transformed, or is threatened by transformation (Mucina and Rutherford, 2006).

A search for red listed species with in the 2821DD grid was conducted. A total of sixty five (65) species was listed in the 2821DD grid. All of the sixty (60) plants listed within this grid are least concern in terms of conservation status and five(5) plants are not evaluated of which four (4) are invasive species (POSA 2015).

From the site photos (Figure 2) it is clear that very little natural vegetative cover remains on the site. It is not likely that sensitive plant species along with sensitive aquatic ecosystems are present in close proximity to the site. Every effort should be made to limit disturbance to the areas surrounding the site.

3 IMPACTS AND MITIGATIONS

Continuation of the landfill activities on the site is not likely to negatively affect local ecological function. However, it is suggested that measures are put in place to ensure that water moving in the drainage line within the site does not contribute to pollution of the larger dry bed area downstream and subsequently



the Orange River. Litter traps could be installed downstream of the site to prevent litter from being carried downstream into the drainage area and Orange River. Mitigating for input of polluting chemicals from the landfill site is more complex. An aquatic specialist should provide input into the amount and nature of chemicals potentially washed into the drainage line and possibly the Orange River. Furthermore a Geohydrologist should investigate the impact of the landfill on groundwater. From this information realistic mitigation measures can be formulated.

It is important that annual monitoring for establishment of alien invasive plant species should be done. These species can easily spread downstream, likely resulting in offsite impacts.

4 CONCLUSION

The Topline landfill site is impacted by existing landfill activities and edge effects from the town and gravel roads. The area surrounding the landfill site includes waste water treatment works, the town of Gannaput, agricultural activities and roads which has led to the area surrounding the site being largely transformed in terms of vegetation and fauna habitat. A drainage line lies within the site boundary which drains into a dry bed system and the Orange River. Mitigations measures should be put in place to avoid contamination of the dry bed system and subsequently the Orange River, to the current landfill activities. Installation of litter traps and an investigation as to the actual effect of the landfill site on water quality are suggested.



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