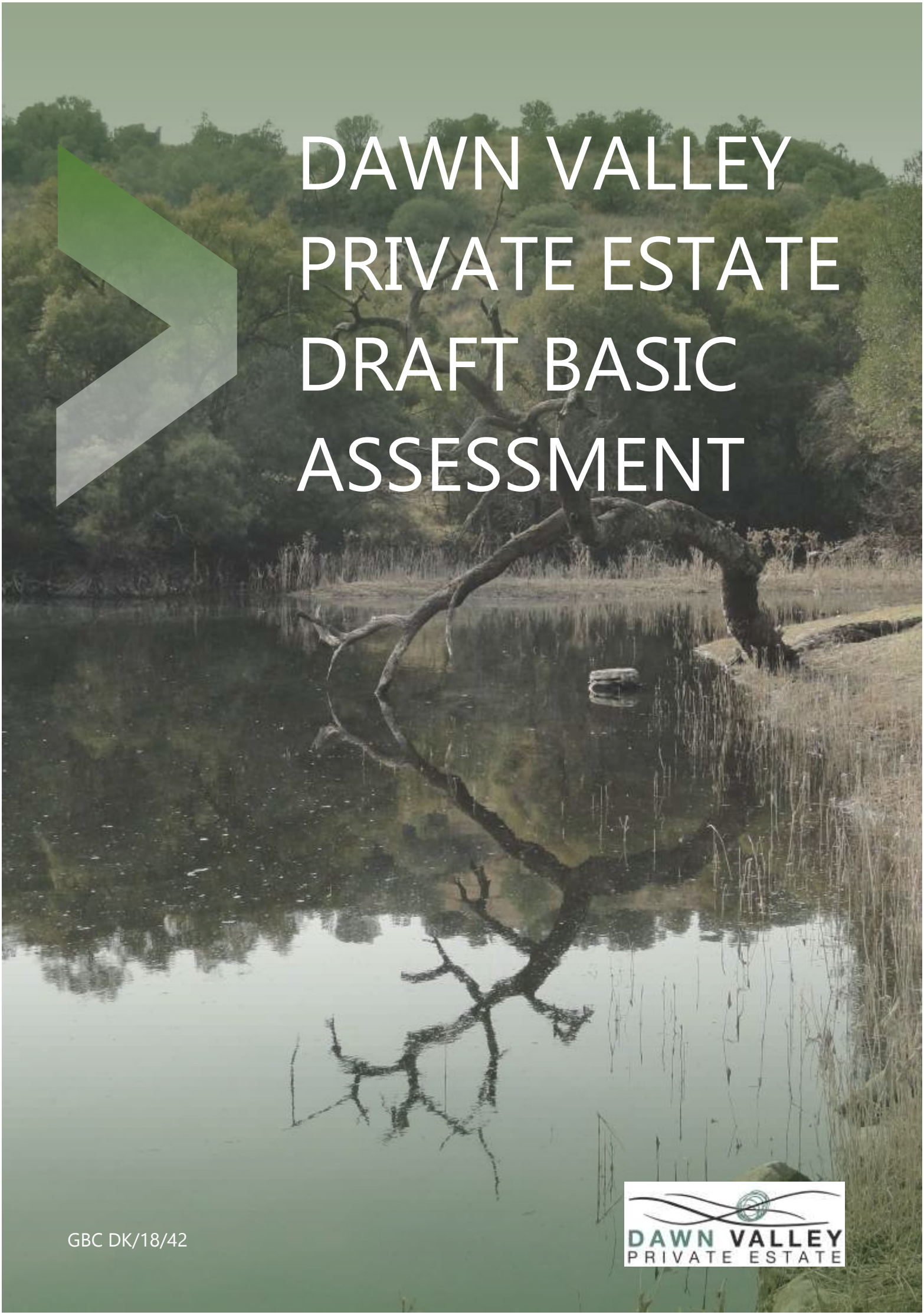
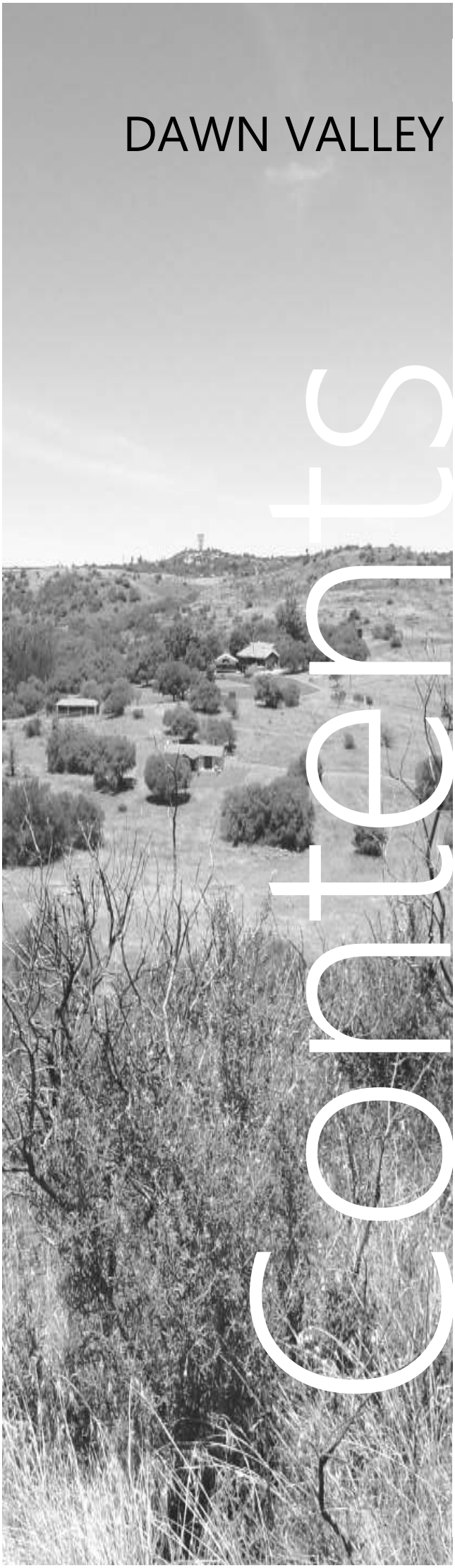


DAWN VALLEY PRIVATE ESTATE DRAFT BASIC ASSESSMENT

GBC DK/18/42

DAWN VALLEY
PRIVATE ESTATE



DAWN VALLEY PRIVATE ESTATE
draft basic assessment

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Draft Basic Assessment Report for the proposed development of the Dawn Valley Private Estate, Bloemfontein, Free State

Prepared for: Dr. D.J. Gouws and Mr. J.E. Raubenheimer, Orcom Trading 285 (Pty) Ltd. and Raubex Eiendomme (Pty) Ltd.

Prepared by: Mr. D. Krynauw, Green-Box Consulting

DESTEA Reference no.:
EMB/19,27,2(b)(ii)(bb),6(b)(ii),12(b)(iv),14(i)(a)(b)(ii)/18/58

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Document Status: Draft (version 00)

Date: March 2019

green-box consulting

report revision & tracking schedule

PROJECT DETAILS

Document Title	Draft Basic Assessment Report for the proposed development of the Dawn Valley Private Estate, Bloemfontein, Free State		
Client name & Address	Dr. D.J. Gouws and Mr. J.E. Raubenheimer		
Document Reference	DESTEA: EMB/19,27,2(b)(ii)(bb),6(b)(ii),12(b)(iv),14(i)(a)(b)(ii)/18/58		
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EAP	Mr. D. Krynauw		
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	Mr. H. Lambrechts (Project Manager)	1	0
	DESTEA	1	1

Executive summary

Project Overview

Dr. D.J. Gouws and Mr. J.E. Raubenheimer (the project proponent) proposes the development of a residential estate (Dawn Valley Estate) and associated infrastructure Portion 14 of the farm Lilyvale 2313 of Tempe 2277, Portion 23 of Lilyvale 2313, and Portions 1 and 2 of the farm Bayswater 2865, situated in Bloemfontein (the project site). The project site is situated approximately 6km north of the Bloemfontein Central Business District (CBD), and falls within the jurisdiction of the Mangaung Metropolitan Municipality, Free State Province. The project site is approximately 113ha in extent, while the proposed Dawn Valley Estate development requires a development area of approximately 12.4ha in extent (the development footprint).

In accordance with Regulation 12 of the EIA Regulations (GN R326) the Proponent has appointed Green-Box Consulting as the independent environmental consultants responsible for managing the application for EA, and supporting BAR process, inclusive of specialist studies and public participation process.

Need for the Project

The primary objective of the project represents an opportunity to fulfil the Proponents environmental objectives as follows:

- to ensure conservation, preservation and security of these properties;
- to maintain the natural integrity of the property by generating revenue from the proposed estate development;
- to liaise and integrate environmental awareness initiatives with the Valley of Seven Dams Conservancy;
- Constitutes to abide by the concept of developing within "green" standards;
- Maintaining the continuity and integrity of the green corridor running from the Seven Dams through these properties towards the Botanical Gardens.

In addition to this, the project aims to be in line with a range of government policies at national, provincial and local level. These policies are aimed at the pursuance of sustainable development and include amongst others; Mangaung Spatial Development Framework as well as the Mangaung Open Space Framework and Policy, the Valley of Seven Dams Conservancy Environmental Management Plan, and also Mangaung's Integrate Development Plans (IDP's).

Project Description

The proponent's intention is to provide serviced low density erven for unique up-market housing. Furthermore, the proposed development is envisaged to be a sustainable precinct by incorporating green building design principles. This includes design elements that facilitate environmental resource efficiency (water, energy and space) as well social benefits such as synergies between live, and the outdoors.

The aim of this development proposal is to provide exclusive residential erven within a serene natural environment. The development will concentrate on incorporating service infrastructure with the natural environment of the site by considering the concept of "green" principles, affecting as little footprint as possible. Housing units has been restricted to very low density distribution (only 11% of the property will be affected). House owners will be further restricted to develop through a set of architectural guidelines. Various energy use saving initiative will be considered, water saving and rain water harvesting measures will be incorporated to make the estate one of the first "green" living residential areas in the Free State.

Imperative to the success of the development concept has been based on a holistic strategy of sustainability. This was achieved on a number of levels by:

- Macro level urban context and urban layout of the site in relation to weather, topography, surrounding fabric, natural aspects and movement systems;
- The concept of the human connection in balance with the forces of the environment and enclosure from these forces; and
- The use of energy to support or supplement the living condition and the ramifications thereof. The collection and treatment of waste materials into the environment.

Dawn Valley Estate has been designed as a residential cluster of seven town house erven, 84 single residential and one hotel erven, as well as a single manor house erven. The development footprint will total 11% of the development area, approximately 12.4ha. Green open spaces will occupy a large proportion of the site as the building and infrastructure footprints only occupy 11%.

In order to ensure an eco-friendly development with emphasis on 'Living with Nature' appeal of the property, architectural guidelines will be created to establish the style and maintain an overall design of the development. An overall master plan with a unique cohesive architectural character was developed. This include creation of green belts, scenic walking trails, areas of natural vegetation and tranquil streams as well as designed style homes that reflect the sense of place of the surrounding area. The zones and plots will be sold on a freehold basis and a home owners association will be established to manage the common areas of the estate and enforce the overall rules of the development. The open spaces (green areas) where no development will take place will be maintained as ecological corridors for the free passage of wildlife within the fenced off boundaries of the estate.

Approach of the EIA Process

This Basic Assessment Report has been prepared as part of the EIA process being conducted in support of an application for EA for the proposed development of a residential estate. The primary objective of this BA Report is to present stakeholders, Interested and Affected Parties (I&APs) and the Competent Authority, DESTEA, with an overview of the predicted impacts and associated management actions required to avoid or mitigate the negative impacts; or to enhance the benefits of the proposed project. In broad terms, the EIA Regulations (GN R326) stipulates that the EIA Process must include a description of the potential environmental impacts, mitigation and closure outcomes, as well as the residual risks of the proposed activity.

Overall Evaluation by the Environmental Assessment Practitioner

Table 1 provides an overview of Environmental Significance Score & Ratings of impacts identified for the proposed project both prior to mitigation and after mitigation. From this table it is evident that while a number of potential impacts of medium, and medium-high, significance have been identified for the project, all of these can successfully be reduced to low significance rating with the implementation and application of appropriate mitigation measures.

Table 1: Environmental Significance Score & Ratings of impacts identified for the proposed project both prior to mitigation and after mitigation.

	Environmental Significance Score & Rating prior to mitigation	**Environmental Significance Score & Rating after mitigation**
Construction Phase Impacts		
Transformation of terrestrial and aquatic vegetation	Medium (72)	Low (45)
Terrestrial and aquatic alien invasive species establishment.	Low (45)	Low (12)
Surface material erosion.	Low (45)	Low (12)
Dust generation and emissions.	Low (39)	Low (10)
Impeding of the perennial watercourse catchment area and flow regime.	Medium (72)	Low (28)
Contamination of the perennial watercourse and subsequent downstream watercourses	Medium-High (76)	Low (30)
Operational Phase Impacts		
Continued impeding of the perennial watercourse catchment area and flow regime.	Medium-High (92)	Low (38)
Continued contamination of the perennial watercourse and subsequent downstream watercourses.	Medium-High (88)	Low (34)
Disruption of nocturnal faunal activities through noise and lighting emissions.	Low (32)	Low (16)

Based on the nature and extent of the proposed project, the local level of disturbance predicted as part of the estate and associated infrastructure, the findings of the BAR, and the understanding of potential environmental impacts, it is the opinion of the EIA project team that environmental impacts associated with the application for EA for the proposed development of an residential estate on the preferred project site can be mitigated to an acceptable level.

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

(For official use only)

File Reference Number:	
Application Number:	
Date Received:	

Basic assessment report in terms of the Environmental Impact Assessment Regulations, 2014, promulgated in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended.

Kindly note that:

1. This **basic assessment report** is a standard report that may be required by a competent authority in terms of the EIA Regulations, 2014 as amended and is meant to streamline applications. Please make sure that it is the report used by the particular competent authority for the activity that is being applied for.
2. This report format is current as of **07 April 2017**. It is the responsibility of the applicant to ascertain whether subsequent versions of the form have been published or produced by the competent authority
3. The report must be typed within the spaces provided in the form. The size of the spaces provided is not necessarily indicative of the amount of information to be provided. The report is in the form of a table that can extend itself as each space is filled with typing.
4. Where applicable **tick** the boxes that are applicable in the report.
5. An incomplete report may be returned to the applicant for revision.
6. The use of "not applicable" in the report must be done with circumspection because if it is used in respect of material information that is required by the competent authority for assessing the application, it may result in the rejection of the application as provided for in the regulations.
7. This report must be handed in at offices of the relevant competent authority as determined by each authority.
8. No faxed or e-mailed reports will be accepted.
9. The signature of the EAP on the report must be an original signature.
10. The report must be compiled by an independent environmental assessment practitioner.
11. Unless protected by law, all information in the report will become public information on receipt by the competent authority. Any interested and affected party should be provided with the information contained in this report on request, during any stage of the application process.
12. A competent authority may require that for specified types of activities in defined situations only parts of this report need to be completed.
13. Should a specialist report or report on a specialised process be submitted at any stage for any part of this application, the terms of reference for such report must also be submitted.
14. Two (2) colour hard copies and one (1) electronic copy of the report must be submitted to the competent authority.
15. Shape files (.shp) for maps must be included in the electronic copy of the report submitted to the competent authority.

SECTION A: ACTIVITY INFORMATION

Has a specialist been consulted to assist with the completion of this section? NO

If YES, please complete the form entitled "Details of specialist and declaration of interest" for the specialist appointed and attach in Appendix I.

1. PROJECT DESCRIPTION

a) Describe the project associated with the listed activities applied for

This report serves as the documentation in support of a basic assessment level of study as part of an Environmental Impact Assessment process being carried out for a proposed private estate development on Portion 14 of the farm Lilyvale 2313 of Tempe 2277, Portion 23 of Lilyvale 2313, and Portions 1 and 2 of the farm Bayswater 2865, situated in Bloemfontein. The property, Portion 14 of the farm Lilyvale 2313 of Tempe 2277 and Portions 1 and 2 of the farm Bayswater 2865 is owned by Dr. D. Gouws and Portion 23 of Lilyvale 2313 by Mr. K. Raubenheimer, hereafter referred to as the Proponents, and represents an opportunity to fulfil the Proponents environmental objectives as follows:

- to ensure conservation, preservation and security of these properties;
- to maintain the natural integrity of the property by generating revenue from the proposed estate development;
- to liaise and integrate environmental awareness initiatives with the Valley of Seven Dams Conservancy;
- Constitutes to abide by the concept of developing within "green" standards;
- Maintaining the continuity and integrity of the green corridor running from the Seven Dams through these properties towards the Botanical Gardens.

In addition to this, the project aims to be in line with a range of government policies at national, provincial and local level. These policies are aimed at the pursuance of sustainable development and include amongst others; Mangaung Spatial Development Framework as well as the Mangaung Open Space Framework and Policy, the Valley of Seven Dams Conservancy Environmental Management Plan, and also Mangaung's Integrate Development Plans (IDP's).

The combined assessment site is approximately 113 hectares in extent (see Annexure 1 for site map) and is owned by the two Proponents. The study area falls within the jurisdiction of the Mangaung Metropolitan Municipality (see Figure 1) and is located at middle point 29°03'22.97"S and 26°13'1.32"E. The assessment site consists of four farm portions, including Portion 14 of the farm Lilyvale 2313 of Tempe 2277, Portion 23 of Lilyvale 2313, and Portions 1 and 2 of the farm Bayswater 2865.

The site is bound by the Botanical Gardens to the north-west, and to the south by the Valley of Seven Dams Conservancy, the rest are surrounding private property.

The N1 road meanders further west and north of the site while the residential extension of Rayton is located further south of the site.

Green-Box Consulting has been commissioned by the two Proponents, to undertake a Basic Assessment for the proposed development (see Annexure 2 for details and expertise of the Environmental Assessment Practitioner). The application for environmental authorisation will be submitted to the Department of Economic, Small Business Development, Tourism and Environmental; Affairs (DESTEA).

The proponent's intention is to provide serviced low density erven for exclusive up-market housing. Furthermore, the proposed development is envisaged to be a sustainable precinct by incorporating green building design principles. This includes design elements that facilitate environmental resource efficiency (water, energy and space) as well social benefits such as synergies between live, and the outdoors.

This draft Basic Assessment Report (Revision 0) is being made available for a 30 day comment period in order to obtain inputs from I&APs. All comments received will be presented and responded to in the final Basic Assessment Report in a Comments and Response Table.

The sequence of documents produced thus far for this Environmental Impact Assessment application is the Department of Economic, Small Business Development, Tourism and Environmental Affairs (DESTEA) application form, providing the formal application for the project, a Background Information Document, media notice, site notices, and this draft Basic Assessment Report (Revision 0). The application is acknowledged by DESTEA, with reference number: EMB/19,27,2(b)(ii)(bb),6(b)(ii),12(b)(iv),14(i)(a)(b)(ii)/18/58 (see Annexure 3).

The proposed property comprises of four land portions (as described above) all of which are seen as part of the eventual proposed development area. The properties are largely vacant except for Dr. Gouws homestead, gardens and infrastructure all of which are situated in the centre of Portion 1 of Bayswater 2865. A guest house and workers houses are also located on the property. On Portion 23 of Lilyvale 2313 a single dwelling and outhouses reside on the southern side.

The four portions are basically sliced in half by a watercourse, flowing towards the Botanical Gardens from the Valley of Seven Dams Conservancy area, while on the northern and eastern borders elevated ridges creates scenic boundaries.

The current spatial development framework of Mangaung has prioritized the three portions as part of its Metropolitan Open Space.

In terms of topographical features the assessment site is a combination of steep sides, rocky hills, open and flat topped sheet rock plateaus, dames streams, riparian wetlands

and open flood plains. These various habitats comprise a mix of several vegetation types specific to each habitat. The most significant vegetation type (ecosystem) is designated the Bloemfontein Karroid Shrubland. The second vegetation type occurring on the property is confined mostly to the cool, moist southern slopes of hills, the Gh 7 Winburg Grassy Shrubland. The drainage line streams and open flood plains comprise a mix of hydrogeological conditions and associated vegetation, which form Freshwater Wetlands. The flood plain habitat provides the conditions for the evolution of third vegetation type; the AZa 3 Lower Gariep Alluvial Vegetation.

Also located on the site are a few grave site concentrations and a stone wall dated from the Anglo Boere War times.

The project proposal is to establish a residential development (estate) that include design elements that facilitate environmental resource efficiency (water, energy and space) as well social benefits such as synergies between live, and outdoors. The proposed development is intended to cater primarily for up market, unique living. The development area is approximately 113ha in extent, with two access points.

The aim of this development proposal is to provide unique residential erven within a serene natural environment. The development will concentrate on incorporating service infrastructure with the natural environment of the site by considering the concept of "green" principles, affecting as little footprint as possible. Housing units has been restricted to very low density distribution (only 11% of the property will be affected). In other words 89% of the property will remain open space. House owners will be further restricted to develop through a set of architectural guidelines. Various energy use saving initiative will be considered, water saving and rain water harvesting measures will be incorporated to make the estate one of the first "green" living residential areas in the Free State.

Imperative to the success of the development concept has been based on a holistic strategy of sustainability. This was achieved on a number of levels by:

- Macro level urban context and urban layout of the site in relation to weather, topography, surrounding fabric, natural aspects and movement systems;
- The concept of the human connection in balance with the forces of the environment and enclosure from these forces; and
- The use of energy to support or supplement the living condition and the ramifications thereof. The collection and treatment of waste materials into the environment.

Dawn Valley Estate has been designed as a residential cluster of seven town house erven, 84 single residential and one hotel erven, as well as a single manor house erven. The development footprint will total 11% of the development area, approximately 12.4ha. Green open spaces will occupy a large proportion of the site as the building and infrastructure footprints only occupy 11%.

In order to ensure an eco-friendly development with emphasis on 'Living with Nature' appeal of the property, architectural guidelines will be created to establish the style and maintain an overall design of the development. An overall master plan with a unique cohesive architectural character was developed. This include, creation of green belts, scenic walking trails, areas of natural vegetation and tranquil streams as well as designed style homes that reflect the sense of place of the surrounding area. The zones and plots will be sold on a freehold basis and a home owners association will be established to manage the common areas of the estate and enforce the overall rules of the development. The open spaces (green areas, a total of 89% of the development area) where no development will take place will be maintained as ecological corridors for the free passage of wildlife within the fenced off boundaries of the estate.

Hennie Lambrechts Argitekte designed the development properties into the following:

1. Properties

1.1	Lilyvale 23/2313	33,3276 ha
1.2	Lilyvale 14/2313 of Tempe 2277	30,2591 ha
1.3	Bayswater 1/2865	28,2711 ha
1.4	Bayswater 2/2865	21,4422 ha
	Total Area of Estate	**1,133,000m^2**
		113,3 ha

2. Erven

2.1	Erf No. 01	Manor House	60x110 m	6600m^2
2.2	Erf No. 02	Town Houses (5x)	60x24 m	1440m^2
2.3	Erf No. 03	Single Residential	30x20 m	600m^2
2.4	Erf No. 04	Single Residential	30x20 m	600m^2
2.5	Erf No. 05	Single Residential	30x20 m	600m^2
2.6	Erf No. 06	Single Residential	30x20 m	600m^2
2.7	Erf No. 07	Single Residential	30x20 m	600m^2
2.8	Erf No. 08	Single Residential	30x20 m	600m^2
2.9	Erf No. 09	Single Residential	30x20 m	600m^2
2.10	Erf No. 10	Single Residential	30x40 m	1200m^2
2.11	Erf No. 11	Single Residential	30x20 m	600m^2
2.12	Erf No. 12	Single Residential	30x20 m	600m^2
2.13	Erf No. 13	Single Residential	30x20 m	600m^2
2.14	Erf No. 14	Single Residential	30x20 m	600m^2
2.15	Erf No. 15	Single Residential	30x20 m	600m^2
2.16	Erf No. 16	Single Residential	30x20 m	600m^2
2.17	Erf No. 17	Single Residential	30x20 m	600m^2
2.18	Erf No. 18	Town Houses (5x)	60x24 m	1440m^2
2.19	Erf No. 19	Single Residential	30x20 m	600m^2
2.20	Erf No. 20	Single Residential	40x30 m	1200m^2
2.21	Erf No. 21	Single Residential	40x30 m	1200m^2
2.22	Erf No. 22	Single Residential	40x30 m	1200m^2
2.23	Erf No. 23	Single Residential	30x20 m	600m^2

2.24	Erf No. 24	Single Residential	30x20 m	600m^2
2.25	Erf No. 25	Town Houses (5x)	60x24 m	1440m^2
2.26	Erf No. 26	Single Residential	30x20 m	600m^2
2.27	Erf No. 27	Single Residential	30x20 m	600m^2
2.28	Erf No. 28	Single Residential	30x20 m	600m^2
2.29	Erf No. 29	Single Residential	30x20 m	600m^2
2.30	Erf No. 30	Town Houses (5x)	60x24 m	1440m^2
2.31	Erf No. 31	Town Houses (5x)	60x24 m	1440m^2
2.32	Erf No. 32	Single Residential	30x20 m	600m^2
2.33	Erf No. 33	Single Residential	30x20 m	600m^2
2.34	Erf No. 34	Single Residential	30x20 m	600m^2
2.35	Erf No. 35	Single Residential	30x20 m	600m^2
2.36	Erf No. 36	Single Residential	30x20 m	600m^2
2.37	Erf No. 37	Single Residential	30x20 m	600m^2
2.38	Erf No. 38	Single Residential	30x20 m	600m^2
2.39	Erf No. 39	Single Residential	30x20 m	600m^2
2.40	Erf No. 40	Single Residential	30x20 m	600m^2
2.41	Erf No. 41	Single Residential	30x20 m	600m^2
2.42	Erf No. 42	Single Residential	30x20 m	600m^2
2.43	Erf No. 43	Single Residential	30x20 m	600m^2
2.44	Erf No. 44	Single Residential	30x20 m	600m^2
2.45	Erf No. 45	Single Residential	40x30 m	1200m^2
2.46	Erf No. 46	Single Residential	30x40 m	1200m^2
2.47	Erf No. 47	Single Residential	30x40 m	1200m^2
2.48	Erf No. 48	Single Residential	30x20 m	600m^2
2.49	Erf No. 49	Town Houses (5x)	60x24 m	1440m^2
2.50	Erf No. 50	Single Residential	30x20 m	600m^2
2.51	Erf No. 51	Single Residential	30x20 m	600m^2
2.52	Erf No. 52	Single Residential	30x20 m	600m^2
2.53	Erf No. 53	Single Residential	30x20 m	600m^2
2.54	Erf No. 54	Single Residential	30x20 m	600m^2
2.55	Erf No. 55	Single Residential	30x20 m	600m^2
2.56	Erf No. 56	Single Residential	30x20 m	600m^2
2.57	Erf No. 57	Single Residential	40x30 m	1200m^2
2.58	Erf No. 58	Single Residential	30x20 m	600m^2
2.59	Erf No. 59	Single Residential	40x30 m	1200m^2
2.60	Erf No. 60	Single Residential	40x30 m	1200m^2
2.61	Erf No. 61	Single Residential	40x30 m	1200m^2
2.62	Erf No. 62	Single Residential	30x20 m	600m^2
2.63	Erf No. 63	Single Residential	40x30 m	1200m^2
2.64	Erf No. 64	Single Residential	40x30 m	1200m^2
2.65	Erf No. 65	Single Residential	30x20 m	600m^2
2.66	Erf No. 66	Single Residential	40x30 m	1200m^2
2.67	Erf No. 67	Single Residential	40x30 m	1200m^2
2.68	Erf No. 68	Single Residential	40x30 m	1200m^2
2.69	Erf No. 69	Single Residential	40x30 m	1200m^2
2.70	Erf No. 70	Single Residential	40x30 m	1200m^2
2.71	Erf No. 71	Single Residential	40x30 m	1200m^2
2.72	Erf No. 72	Single Residential	40x30 m	1200m^2

2.73	Erf No. 73	Single Residential	40x30 m	1200m^2
2.74	Erf No. 74	Town Houses (5x)	60x24 m	1440m^2
2.75	Erf No. 75	Single Residential	30x20 m	600m^2
2.76	Erf No. 76	Single Residential	30x20 m	600m^2
2.77	Erf No. 77	Single Residential	30x20 m	600m^2
2.78	Erf No. 78	Single Residential	30x20 m	600m^2
2.79	Erf No. 79	Single Residential	30x20 m	600m^2
2.80	Erf No. 80	Single Residential	30x20 m	600m^2
2.81	Erf No. 81	Single Residential	30x20 m	600m^2
2.82	Erf No. 82	Single Residential	30x20 m	600m^2
2.83	Erf No. 83	Single Residential	30x20 m	600m^2
2.84	Erf No. 84	Single Residential	30x20 m	600m^2
2.85	Erf No. 85	Single Residential	30x20 m	600m^2
2.86	Erf No. 86	Single Residential	30x40 m	1200m^2
2.87	Erf No. 87	Single Residential	30x40 m	1200m^2
2.88	Erf No. 88	Single Residential	30x40 m	1200m^2
2.89	Erf No. 89	Single Residential	30x20 m	600m^2
2.90	Erf No. 90	Single Residential	20x30 m	600m^2
2.91	Erf No. 91	Single Residential	20x30 m	600m^2
2.92	Erf No. 92	Single Residential	20x30 m	600m^2
2.93	Erf No. 93	Hotel (40 Units)		4347m^2
	Total Area			**85827m^2**

3.	**Roads and Services**				
3.1	**Asphalt**				
3.1.1	Gate entrance	6m	210m	1260m^2	
3.1.2	Estate axis	5.5m	550m	3025m^2	4285m^2
	Total Length Asphalt		**760m**		
3.2	**Two Track Concrete**				
3.2.1	From Erf No.16-03	5.5m	854m	4697m^2	
3.2.2	From Erf No.18-30	5.5m	666m	3663m^2	
3.2.3	From Erf No.1-42	5.5m	608m	3344m^2	
3.2.4	From Erf No.52-90	5.5m	1645m	9047.5m^2	
3.2.5	From Erf No.1-50	5.5m	272m	1496m^2	
3.2.6	From Erf No.45-65	5.5m	1221m	6715.5m^2	
3.2.7	Erf No.59	5.5m	60m	330m^2	29293m^2
	Total Length Concrete		**5326m**		
3.3	**Paving (Roads)**				
3.3.1	Erf No.01	3m	68m	204m^2	
3.3.2	From Erf No.25-22	3m	185m	555m^2	
3.3.3	From Erf No.31-32	3m	196m	588m^2	
3.3.4	From Erf No.30-33	5.5m	155m	853m^2	
3.3.5	From Erf No.42-44	4m	82m	328m^2	
3.3.6	From Erf No.33-76	3m	227m	681m^2	
3.3.7	From Erf No.74-73	3m	156m	468m^2	

3.3.8	From Erf No.75-71	3m	70m	210m^2	3887m^2
	Total Length Paving		**1139m**		
3.4	**Solid Paving (Junctions)**				
3.4.1	Parking Area Erf No.01			447m^2	
3.4.2	T-Junction Erf No.21			222m^2	
3.4.3	Dead end Erf No.22			135m^2	
3.4.4	Dead end Erf No.44			135m^2	
3.4.5	Dead end Erf No.45			135m^2	
3.4.6	T-Junction Erf No.50			265m^2	
3.4.7	T-Junction Erf No.52			260m^2	
3.4.8	T-Junction Erf No.54			250m^2	
3.4.9	T-Junction Erf No.59			188m^2	
3.4.10	T-Junction Erf No.71			135m^2	
3.4.11	Dead end Erf No.72			135m^2	
3.4.12	T-Junction Erf No.74			135m^2	
3.4.13	Dead end Erf No.76			135m^2	
3.4.14	T-Junction Erf No.81			255m^2	2832m^2
	Total Length Junctions 14x20		**280m**		
	Total Length		**7500m**		
	Total Area				**40300m^2**
4.	**Foot Paths**				
4.1	North		3605m		
4.2	East		1324m		
4.3	South		1659m		
4.4	West		2513m		**9100m^2**
5.	**Total Development Area**				
5.1	Erven (Coverage)		85827m^2		7.6 %
5.2	Roads and Services (Disturb Area)		40300m^2		3.6 %
	Total Development Area				**11.2 %**

Please refer to Appendix B for the layout plan (master Plan) of the proposed development.

In terms of bulk service provision the following is considered:

Water Use

- The property has an existing 50mm Ø water connection from the Municipal network on Bloemendal Road. This supply is from the Heuwelsig Reservoir (capacity 10,5 ML) with a full water level of approximately 1 485m. This reservoir also supplies water to the new developments on the eastern and southern boundaries of the property (Pentagon Park, Helicon Heights, Bayswater Ext 4 and

Bloemfontein Ext 212). The proposed positions of units on the development, all lie below the 1 425 contour, which indicates a static pressure from the Heuwelsig Reservoir of approximately 6 Bar, which is more than adequate. Based on the Bulk Services Report prepared by LMV Engineers it is proposed that the water connection for the proposed development be obtained from the municipal network to the southeast of the property. Based on a peak flow of 5,56 F/s, a 110 mm Ø water connection will be required. It is also possible to construct a 250 kℓ reservoir on a high point on the proposed development, which will provide for the peak flows. In this case, the Municipal connection will only have to provide approximately 1,5 ℓ/s (50mm connection).

Sanitation

- Sewage from this development will be discharged into the municipal sewerage line that runs through the development.
- The internal sewerage network will be connected to a section of the bulk pipeline.
- Untreated effluent will be conveyed through this pipeline to the Northern Waste Water Treatment Works that is situated on the Farm Hillandale 2960.

Roads

- The internal street network will be constructed in such a way that there is minimum damage to the environment. The existing road to the manor house and other roads on the valley floor, will be constructed from 90 mm interlocking grass paving blocks with two concrete strips and will be 1.5 wide on both sides.

  The roads up the slopes and on top of the high ground, will be constructed from two 600 mm wide concrete strips, 200 mm thick, with 90 mm thick Concor grass frames between the concrete strips as well as 1,6 m wide on both sides of the concrete strips to allow passing of vehicles. The concrete/grass frame streets is proposed to be constructed at the existing ground level to allow storm water flow over the road reserve. No specific storm water structures will be provided and storm water run-off will flow as before the roads were constructed. In the case of the paved roads, surface concrete storm water channels will be provided, where necessary, to divert storm water to the river and prevent erosion.

  The access to the development is proposed to be via the existing access to the farm from Bloemendal Road at the entrance gate to the Botanical Gardens. The proposed intersection with Bloemendal. The existing access road will have to be widened to 6m, which should be possible in the approved servitude, which is approximately 7,8 m wide.

  Two stream crossings is planned (see **Appendix J** for design) to give internal access of the water course dissecting the property. A Water Use application will apply for these two water course crossings, application will be applied for pending a planned site visit by the Water and Sanitation (DWS). The crossing structures will

be registered under Regulation 509 as a General Authorisation. Activities 21 (c) and (i) are applicable and refers to –

21(c) - Impeding or diverting the flow of water in a watercourse;

21(i) - Altering the bed, banks, course or characteristics of a watercourse.

Electrical parameters

This development area falls within the electricity supply area of CENTLEC. The existing farm house on the site is supplied with an overhead 11kV network. Application will be done at CENTLEC for the removal of this network. FCE Consulting Engineers had a thorough discussion with CENTLEC regarding this proposed development and they confirmed sufficient capacity will be available from the Groenvlei Distribution Centre.

Waste removal

- Solid waste will be collected by the Municipality at a central point close to the entrance gate to the development. Removal of solid waste from the houses to this point will be done by the Home Owners Association.

The following listed activities are relevant to the proposed development and requires a Basic Assessment in accordance with NEMA EIA Regulations of 2014 as amended:

b) Provide a detailed description of the listed activities associated with the project as applied for

Listed activity as described in GN 327,325 and 324	Description of project activity
Example: ***GN 327 Item xx xx): The construction of a bridge where such construction occurs within a watercourse or within 32 metres of a watercourse, measured from the edge of a watercourse, excluding where such construction will occur behind the development setback line.***	***A bridge measuring 5 m in height and 10m in length, no wider than 8 meters will be built over the Orange river***
Government Notice R327 – 07 April 2017, Activity No. 19: "The infilling or depositing of any material of more than10 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 10 cubic metres from a watercourse"	The construction of two small river road crossings (bridges) to give access to and from both the western and eastern sections of the residential development over the applicable watercourse. The road crossings will be in the form of concrete structures, approximately 5.2m wide and 8.5meters long with 5 concrete stormwater pipes for water through flow. The structures will not be higher than 1meter from the surface.
GN Government Notice R327 – 07 April 2017, Activity No. 27: "The clearance of an area of 1 hectares of more, but less than 20 hectares of indigenous vegetation"	The construction of the various housing units and associated infrastructure will occupy 11% of the total development area which amounts to approximately 12.4ha of surface area. This surface area was carefully selected not to impact on sensitive areas.
Government Notice R324 – 07 April 2017, Activity No. 6(b)(ii)(bb): "The development of resorts, lodges, hotels, tourism or hospitality facilities that sleeps 15 people or more. b. Free State ii. Inside urban areas: (bb) Areas designated for conservation use in Spatial Development Frameworks adopted by the competent authority or zoned for a conservation purpose"	It is proposed that a small off stream water reservoir is constructed to serve as a backup water source for the estate. The reservoir is to be located on higher portion of the development area and will fall on portion 2 of the farm Bayswater 2865. This portion is located inside a Metropolitan Open Space System area in terms of Mangaung Spatial Development Framework.
Government Notice R324 – 07 April 2017, Activity No. 2(b)(iii)(bb): "The development of reservoirs excluding	A boutique hotel is proposed on the south corner of the Portion 1 of Bayswater 2865. The boutique hotel will have a maximum of 40 rooms. This

dams, with a capacity of more than 250 cubic metres. b. Free State iii. Inside urban areas: (bb) Areas designated for conservation use in Spatial Development Frameworks adopted by the competent authority, or zoned for a conservation purpose"	portion is located inside a Metropolitan Open Space System area in terms of Mangaung Spatial Development Framework.
Government Notice R324 – 07 April 2017, Activity No. 12(b)(iv): "The clearance of an area of 300 square metres or more of indigenous vegetation except where such clearance of indigenous vegetation is required for maintenance purposes undertaken in accordance with a maintenance management plan. b. Free State iv. Areas within a watercourse or wetland; or within 100 metres from the edge of a watercourse or wetland"	Thirty two erven are proposed within 100meters from the spruit (water course) running through the development area. Vegetation clearance of more than 300m^2 will be applicable.
Government Notice R324 – 07 April 2017, Activity No. 14(i)(a)(b)(ii)(bb): "The development of— i. dams or weirs, where the dam or weir, where such development occurs— (a) within a watercourse; b. Free State ii. Inside urban areas: (bb) Areas designated for conservation use in Spatial Development Frameworks adopted by the competent authority, zoned for a conservation purpose"	It is proposed that two dams be formalized both located on Portion 3 of Lilyvale 2313. These two dams are located inside a stormwater drainage line (non-perennial).

2. FEASIBLE AND REASONABLE ALTERNATIVES

"alternatives", in relation to a proposed activity, means different means of meeting the general purpose and requirements of the activity, which may include alternatives to—

(a) the property on which or location where it is proposed to undertake the activity;
(b) the type of activity to be undertaken;

(c) the design or layout of the activity;
(d) the technology to be used in the activity;
(e) the operational aspects of the activity; and
(f) the option of not implementing the activity.

Describe alternatives that are considered in this application as required by Appendix 1 (3)(h) of GN 326, Regulation 2014 as amended. Alternatives should include a consideration of all possible means by which the purpose and need of the proposed activity (NOT PROJECT) could be accomplished in the specific instance taking account of the interest of the applicant in the activity. The no-go alternative must in all cases be included in the assessment phase as the baseline against which the impacts of the other alternatives are assessed.

The determination of whether site or activity (including different processes, etc.) or both is appropriate needs to be informed by the specific circumstances of the activity and its environment. After receipt of this report the, competent authority may also request the applicant to assess additional alternatives that could possibly accomplish the purpose and need of the proposed activity if it is clear that realistic alternatives have not been considered to a reasonable extent.

The identification of alternatives should be in line with the Integrated Environmental Assessment Guideline Series 11, published by the DEA in 2004. Should the alternatives include different locations and lay-outs, the co-ordinates of the different alternatives must be provided. The co-ordinates should be in degrees, minutes and seconds. The projection that must be used in all cases is the WGS84 spheroid in a national or local projection.

a) Site alternatives

Alternative 1 (preferred alternative)		
Description	Lat (DDMMSS)	Long (DDMMSS)
Only one site alternative has been assessed, the Proponents owns the properties proposed for the estate development and it has been identified through extensive strategic planning as one of the most suitable sites on the Dawn Valley Estate for development opportunities. The layout of the preferred alternative (**Appendices C**) was determined by means of specialist input. The aim of the preferred layout is to have minimal impact on identified environmentally sensitive areas (wetlands, riparian zones, heritage areas). The development plan comprises of four residential areas of different sizes with an estimated total of up to 93 units at a proposed density of 1.215 units per ha. The manor house erven is existing and positioned in the western section of Portion 1 of Bayswater 2865, Farm. Seven Townhouse erven is proposed and located on selected portions (see Master Layout). One Hotel erven is also proposed and located at the most southern point of Portion 1 of Bayswater 2865. The rest of the erven 85 is single residential and spread over the development area to create exclusivity. Roads and services will cover approximately 4.03ha the rest of the property will remain open spaces (green space).		

Portion 14 of the farm Lilyvale 2313 of Tempe 2277	29° 3'23.13"S	26° 13'1.94"E
Portion 23 of Lilyvale 2313	29° 3'19.11"S	26° 12'52.15"E
Portions 1 of the farm Bayswater 2865	29° 3'34.43"S	26° 13'4.29"E
Portions 2 of the farm Bayswater 2865	29° 3'26.31"S	26° 13'13.82"E

Alternative 2		
Description	Lat (DDMMSS)	Long (DDMMSS)
None considered		

Alternative 3		
Description	Lat (DDMMSS)	Long (DDMMSS)
None considered		

In the case of linear activities:

Alternative:	**Latitude (S):**	**Longitude (E):**
Alternative S1 (preferred)		
• Starting point of the activity		
• Middle/Additional point of the activity		
• End point of the activity		
Alternative S2 (if any)		
• Starting point of the activity		
• Middle/Additional point of the activity		
• End point of the activity		
Alternative S3 (if any)		
• Starting point of the activity		
• Middle/Additional point of the activity		
• End point of the activity		

For route alternatives that are longer than 500m, please provide an addendum with co-ordinates taken every 250 meters along the route for each alternative alignment.

In the case of an area being under application, please provide the co-ordinates of the corners of the site as indicated on the lay-out map provided in Appendix A of this form.

b) Lay-out alternatives

Alternative 1 (preferred alternative)		
Description	Lat (DDMMSS)	Long (DDMMSS)
The preferred layout design was determined by various amendments in terms of erven placement, density, and road network. Various layouts were presented and scrutinised over a three year period and was informed by various specialists. The preferred layout design aims to have minimal impact on the identified natural areas. The layout also incorporates migration movement of fauna from south to north, with its wide open spaces. The development plan comprises of four residential areas of different sizes with an		

estimated total of up to 93 units at a proposed density of 1.215 units per ha. The manor house erven is existing and positioned in the western section of Portion 1 of Bayswater 2865, Farm. Seven Townhouse erven is proposed and located on selected portions (see Master Layout). One Boutique Hotel erven is also proposed and located at the most southern point of Portion 1 of Bayswater 2865. The rest of the erf, 85 is single residential and spread over the development area to create exclusivity. Roads and services will cover approximately 4.03ha the rest of the property will remain open spaces (green space). See attached list of coordinates of each erven. Below middle points of the 4 farm Portions. That which could be considered as an alternative Layout for the proposed project, referred to in **Appendix C** , would be the shifting of sites 86, 87, and 88 from the Layout Plan proposed for the development, as requested by the Biodiversity Specialist, and these sites shifted outside Bloemfontein Karroid Shrubland vegetation type. Figure 3 being the preferred layout.		
Portion 14 of the farm Lilyvale 2313 of Tempe 2277	29° 3'23.13"S	26° 13'1.94"E
Portion 23 of Lilyvale 2313	29° 3'19.11"S	26° 12'52.15"E
Portions 1 of the farm Bayswater 2865	29° 3'34.43"S	26° 13'4.29"E
Portions 2 of the farm Bayswater 2865	29° 3'26.31"S	26° 13'13.82"E
Alternative 2		
Description	Lat (DDMMSS)	Long (DDMMSS)
Alternative Layout 2 considers the original design layout of the erven placement prior to specialist input. It was envisaged that units would be built only on three farm Portions e.g. Portion 14 of the farm Lilyvale 2313 of Tempe 2277, Portions 1 of the farm Bayswater 2865 and Portions 2 of the farm Bayswater 2865. This concluded to a higher density ratio. Portion 23 of Lilyvale 2313 was added and units were spaced across the 4 farm Portions. Sensitive environmental receptors identified after specialist input have been avoided by the preferred layout, while the original would have resulted in a higher significance impact. (see Appendix B for alternative layout designs assessed)		
Portion 14 of the farm Lilyvale 2313 of Tempe 2277	29° 3'23.13"S	26° 13'1.94"E
Portions 1 of the farm Bayswater 2865	29° 3'34.43"S	26° 13'4.29"E
Portions 2 of the farm Bayswater 2865	29° 3'26.31"S	26° 13'13.82"E
Alternative 3		
Description	Lat (DDMMSS)	Long (DDMMSS)
None considered		

HENNIE LAMBRECHTS
ARGITEKTE
BLOEMFONTEIN

SURVEY
DE WAAL & NORTJE
DAWN VALLEY

COORDINATE FILE : (Wg27) - DAWN VALLEY

NUMBER	NAME	Y	X	Z	DESCRIPTION
	CONSTS	0.000	0.000		
1	1P	76341.216	3215859.194	1392.430	10MM
2	2P	76359.260	3215796.676	1392.537	10MM
3	3P	76418.160	3215757.682	1388.290	10MM
4	4P	76462.817	3215778.689	1387.224	10MM
5	5P	76486.060	3215830.065	1389.131	10MM
6	6P	76505.188	3215914.539	1395.712	10MM
7	7P	76589.129	3215937.819	1391.768	10MM
8	8P	76629.359	3215991.012	1395.713	10MM
9	9P	76681.986	3216006.952	1397.097	10MM
10	10P	76717.705	3215935.597	1396.211	10MM
11	11P	76670.705	3215876.215	1391.855	10MM
12	12P	76656.396	3215834.063	1391.036	10MM
13	13P	76649.764	3215783.866	1390.786	10MM
14	14P	76653.191	3215733.302	1390.367	10MM
15	15P	76684.253	3215689.098	1390.201	10MM
16	16P	76756.672	3215598.569	1392.332	10MM
17	17P	76681.902	3215592.661	1384.702	10MM
18	18P	76565.492	3215595.519	1383.136	10MM
19	19P	76522.256	3215548.397	1380.294	10MM
20	20P	76496.660	3215508.816	1379.280	10MM
21	21P	76411.999	3215483.052	1379.601	10MM
22	22P	76367.199	3215317.871	1382.541	10MM
23	23P	76329.759	3215357.488	1383.777	10MM
24	24P	76306.346	3215387.386	1385.627	10MM
25	25P	76344.270	3215496.958	1379.999	10MM
26	1V	76253.114	3215536.297	1381.386	10MM
27	H2V	76204.708	3215540.834	1381.952	10MM
28	P100	76161.041	3215583.908	1382.589	10MM
29	4P	76139.810	3215622.012	1383.565	10MMP
30	5P	76158.017	3215692.141	1383.959	10MMP
31	31P	76252.030	3215662.725	1385.417	10MM
32	6V	76181.652	3215753.465	1386.112	10MM
33	7N	76227.260	3215785.950	1388.084	10MM
34	8NP	76331.672	3216008.360	1390.373	10MMP
35	9NP	76327.906	3216071.668	1391.474	10MMP
36	10NP	76329.258	3216130.101	1393.086	10MMP
37	11N	76359.956	3216191.831	1395.668	10MM
38	12T	76337.326	3216240.919	1395.750	10MM
39	13N	76292.998	3216271.098	1394.860	10MM
40	14N	76260.752	3216322.428	1394.424	10MM
41	15N	76217.262	3216378.742	1394.527	10MM
42	16N	76166.151	3216445.960	1394.565	10MM
43	17N	76101.987	3216472.882	1400.894	10MM
44	18N	76062.191	3216493.032	1399.015	10MM
45	19N	76112.459	3216386.410	1391.554	10MM
46	20N	76158.491	3216330.614	1391.200	10MM
47	21N	76185.959	3216264.715	1390.446	10MM
48	22N	76145.938	3216196.301	1395.059	10MM
49	49P	76176.797	3216120.852	1390.200	10MM

50	23P	76108.620	3216139.260	1393.328	10MM
51	24N	76040.176	3216116.062	1393.621	10MM
52	25N	75972.448	3216110.856	1394.886	10MM
53	26N	75907.553	3216112.862	1396.905	10MM
54	27N	75813.607	3216157.316	1408.988	10MM
55	28N	75850.461	3216204.502	1415.539	10MM
56	29T	75875.304	3216278.279	1424.976	10MM
57	30N	75827.345	3216332.674	1424.419	10MM
58	31N	75757.252	3216308.965	1418.534	10MM
59	32N	75697.835	3216245.258	1416.093	10MM
60	33N	75694.723	3216141.071	1414.862	10MM
61	34N	75668.797	3216066.793	1412.679	10MM
62	35N	75688.272	3216004.055	1405.948	10MM
63	36N	75751.088	3216009.261	1407.456	10MM
64	37N	75801.371	3216049.807	1405.815	10MM
65	38T	75846.723	3216084.409	1398.800	10MM
66	39T	75888.110	3216025.926	1396.061	10MM
67	40T	75924.409	3215958.773	1395.407	10MM
68	41T	75952.909	3215897.095	1393.678	10MM
69	42T	75966.791	3215825.144	1391.173	10MM
70	43N	75961.093	3215764.990	1390.059	10MM
71	44N	75934.178	3215691.885	1392.076	10MM
72	45NT	75874.991	3215671.841	1395.634	10MM
73	46N	75817.108	3215668.733	1397.054	10MM
74	74P	75870.740	3215592.648	1391.834	10MM
75	47N	76093.745	3215574.329	1387.035	10MM
76	48N	76080.514	3215606.496	1385.154	10MM
77	49N	76005.076	3215638.269	1389.613	10MM
78	78P	75946.643	3215600.562	1395.002	10MM
79	51T	75915.737	3215560.375	1393.069	10MM
80	52T	75912.248	3215488.039	1391.250	10MM
81	53P	75935.292	3215419.916	1390.143	10MM
82	54N	75995.800	3215384.128	1392.292	10MM
83	55T	76036.256	3215434.285	1401.848	10MM
84	56T	76099.902	3215418.496	1403.753	10MM
85	57T	76151.325	3215364.427	1403.879	10MM
86	58T	76179.697	3215294.932	1411.137	10MM
87	59T	76187.213	3215216.572	1411.939	10MM
88	60T	76168.849	3215147.401	1412.315	10MM
89	61N	76124.938	3215090.352	1409.479	10MM
90	62T	76078.787	3215132.766	1399.536	10MM
91	63N	76053.607	3215202.002	1398.795	10MM
92	64N	76073.032	3215273.996	1398.029	10MM
93	H5N	75947.728	3216490.584	1396.614	10MM
	H6N	75887.868	3216524.821	1397.189	PYP/HYP
	1EV	75922.043	3216575.395	1406.650	16MM
	H8N	75988.635	3216545.052	1398.409	10MM

Coordinates of each erf

c) Technology alternatives

Alternative 1 (preferred alternative)
All facilities will be connected to Eskom electricity lines, available on site. Energy savings measures will be considered for each facility proposed, and will include aspects such as energy saving lamps, modern structure design, new technology use, etc.
Alternative 2
None considered
Alternative 3
None considered

d) Other alternatives (e.g. scheduling, demand, input, scale and design alternatives)

Alternative 1 (preferred alternative)
In terms of the internal road network design, both asphalt and the use of grass blocks were assessed. It is preferred that internal roads be constructed through the use of interlocking grass blocks with two concrete strips, at a total width of 5.160meters. This design alternative allows for not only an aesthetic look but softens the impact on flora, and soil erosion, grasses will be able to grow through the grass blocks. The road with is also narrower than a standard asphalt strip, again allowing for a more environmental friendly approach. An asphalt road is proposed at the entrance and will be 5.5meters wide with a 13meter reserve.
Alternative 2
The construction of a standard asphalt strip throughout the development. Due to the resulting higher significant impacts, this alternative was not considered any further.
Alternative 3
None considered

e) No-go alternative

The No-Go alternative considers no residential development for the Dawn Valley Estate and the current land use would be maintained on the four properties. Other land uses were investigated such as grazing, agriculture and game farming but due to the size, locality and topography none of these alternatives were found to be viable, thus the option of integrating housing within this serene natural environment was envisaged.

Paragraphs 3 – 13 below should be completed for each alternative.

3. PHYSICAL SIZE OF THE ACTIVITY

a) Indicate the physical size of the preferred activity/technology as well as alternative activities/technologies (footprints):

Alternative:

Alternative A1[1] (preferred activity alternative)

Alternative A2 (if any) -

Alternative A3 (if any) -

Size of the activity:

Portion 14 of the farm Lilyvale 2313 of Tempe 2277	2.59ha
Portion 23 of Lilyvale 2313	1.78ha
Portions 1 of the farm Bayswater 2865	2.31ha
Portions 2 of the farm Bayswater 2865	1.70ha
Infrastructure	3.7ha

or, for linear activities:

[1] "Alternative A.." refer to activity, process, technology or other alternatives.

Alternative:	Length of the activity:
Alternative A1 (preferred activity alternative)	m
Alternative A2 (if any)	m
Alternative A3 (if any)	m

b) Indicate the size of the alternative sites or servitudes (within which the above footprints will occur):

Alternative:	Size of the site/servitude:	
Alternative A1 (preferred activity alternative)	Portion 14 of the farm Lilyvale 2313 of Tempe 2277	30.2591ha
Alternative A2 (if any)	Portion 23 of Lilyvale 2313	33.3276ha
Alternative A3 (if any)	Portions 1 of the farm Bayswater 2865	28.2711ha
	Portions 2 of the farm Bayswater 2865	21.4422ha

4. SITE ACCESS

Does ready access to the site exist?	YES
If NO, what is the distance over which a new access road will be built	-

Describe the type of access road planned:

Access will be gained from Bloemendal Street. Existing internal street networks is proposed to be of grass blocks and two track concrete strips. (See **Appendix J** for illustration)

A Second access is planned from a servitude road, registered to give access to the property from Kenneth Kaunda Rd.

A Separate connection to the Wild Olive Estate development will give access to the proposed Hotel erf.

Include the position of the access road on the site plan and required map, as well as an indication of the road in relation to the site.

5. LOCALITY MAP

An A3 locality map must be attached to the back of this document, as Appendix A. The scale of the locality map must be relevant to the size of the development (at least 1:50 000. For linear activities of more than 25 kilometres, a smaller scale e.g. 1:250 000 can be used. The scale must be indicated on the map.). The map must indicate the following:

- an accurate indication of the project site position as well as the positions of the alternative sites, if any;

- indication of all the alternatives identified;
- closest town(s;)
- road access from all major roads in the area;
- road names or numbers of all major roads as well as the roads that provide access to the site(s);
- all roads within a 1km radius of the site or alternative sites; and
- a north arrow;
- a legend; and
- locality GPS co-ordinates (Indicate the position of the activity using the latitude and longitude of the centre point of the site for each alternative site. The co-ordinates should be in degrees and decimal minutes. The minutes should have at least three decimals to ensure adequate accuracy. The projection that must be used in all cases is the WGS84 spheroid in a national or local projection.

6. LAYOUT/ROUTE PLAN

A detailed site or route plan(s) must be prepared for each alternative site or alternative activity. It must be attached as Appendix A to this document.

The site or route plans must indicate the following:

- the property boundaries and numbers of all the properties within 50 metres of the site;
- the current land use as well as the land use zoning of the site;
- the current land use as well as the land use zoning each of the properties adjoining the site or sites;
- the exact position of each listed activity applied for (including alternatives);
- servitude(s) indicating the purpose of the servitude;
- a legend; and
- a north arrow.

7. SENSITIVITY MAP

The layout/route plan as indicated above must be overlain with a sensitivity map that indicates all the sensitive areas associated with the site, including, but not limited to:

- watercourses;
- the 1:100 year flood line (where available or where it is required by DWS);
- ridges;
- cultural and historical features;
- areas with indigenous vegetation (even if it is degraded or infested with alien species); and
- critical biodiversity areas.

The sensitivity map must also cover areas within 100m of the site and must be attached in Appendix A.

8. SITE PHOTOGRAPHS

Colour photographs from the centre of the site must be taken in at least the eight major compass directions with a description of each photograph. Photographs must be attached under Appendix B to this report. It must be supplemented with additional photographs of relevant features on the site, if applicable.

9. FACILITY ILLUSTRATION

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

10. ACTIVITY MOTIVATION

Motivate and explain the need and desirability of the activity (including demand for the activity):

1. Is the activity permitted in terms of the property's existing land use rights?	YES		Please explain

The current property land use is agriculture in terms of its zonation, however in terms of the Mangaung SDF the southern portion of Portion 23 of Lilyvale 2313 is earmarked for residential expansion, while the other three portions are defined as Metropolitan Open Space in terms of the current Mangaung SDF. An application for rezoning and SDF amendment has been submitted for approval to the city council. Prior meetings and consultation with Mangaung Metropolitan Municipality were held as part of pre-planning. Based on the already extensive spread of developments around and bordering the assessment area, and outdated Metropolitan Open Space Policy, the amendment of the SDF will be considered.

Prior to this application being lodged, several specialists were appointed by the Proponents to assist with the pre-application planning components of the proposed estate development. This involved the services of Green-Box Consulting who initially reviewed the environmental constraints of the site. Based on the outcomes of these preliminary inputs the master plan put forward in this Basic Assessment Report was drafted, which in the opinion of the consultants presents the most suitable proposal for the development of the site when taking into account the objectives of the proposed development. Higher density alternatives have not been considered as the impact thereof on the biodiversity and cultural features is deemed to be too high and considered to be unreasonable in context of the estate concept of being a highly unique private estate.

The application, furthermore, is the result of responsible planning and consideration of the optimum and effective use of the Dawn Valley property.

In terms of social need for the development, there is currently a significant rate of unemployment in the region of the Free State. The residents in and surrounding Bloemfontein area would be able to take advantage of the various construction and operational opportunities presented by this proposed development. Based on the Building Industries Federation of South Africa estimates, construction employment is estimated at approximately 27.6 jobs for every million rand spent. It is estimated that the proposed development will entail construction expenditure of approximately 500 million

once completed. This equates to approximately 13800 jobs. This would include management personnel, domestic and construction workers and other general unskilled job opportunities associated with operation and maintenance on the proposed estate.

The proposed development is therefore deemed to be in line with the Local Economic Development Strategy and concomitantly, there would be a significant increase in the rates base for the Local Municipality.

The need for the proposed development is further illustrated, see below, as the proposed development wishes to address aspects of the National Development Plan, the Integrated Development Plan and the Spatial Development Plan, as set out in the Integrated Development Plan for the Dawn Valley Estate.

The intention of the National Development Plan (NDP 2030 Vision)[1] is to improve service delivery for citizens of South Africa, whilst integrating national, provincial and local policies and programs into a single, target orientated and long term based plan. In this plan a collective approach to improving the lives of the citizens is applied.[2]

Key development challenges listed in the NDP include:

- High rates of unemployment and low economic growth;
- High levels of poverty;
- Low levels of skills development and literacy;
- Limited access to basic household and community services;
- Increased incidents of HIV/AIDS and communicable diseases;
- Loss of Natural Capital;
- Unsustainable developmental practices;
- High levels of crime and risk;
- Ensuring adequate energy and water supply;
- Ensuring food security;
- Infrastructure degradation;
- Climate change;
- Ensuring financial sustainability.

Aspects of the NDP, which aims to address issues on a national level, are brought into and considered in the Integrated Development Plan for the Dawn Valley Estate (the proposed development). The proposed development wishes to address, to some degree, aspects of the key development challenges as set out above.

[1] National Development Plan 2030 Accessed: 10/01/2019 http://www.gov.za/issues/national-development-plan-2030
[2] Integrated Development Plan (IDP): 2018/2019 Financial Year: Accessed: 10/01/2019 http://www.mangaung.co.za/wp-content/uploads/2018/04/IDP-2018-2019-Version-11-DRAFT.pdf

2. Will the activity be in line with the following?			
(a) Provincial Spatial Development Framework (PSDF)		NO	Please explain
The Free State Spatial Development Framework (PSDF) (February 2014) is an integral part			

of a national, provincial, and municipal plan-led system that aims to bring coherency to spatial planning and land-use, and allow long-term public interests to guide the development process. The PSDF promotes economic development of the province, such as urban developments, but realises that such generally have detrimental impacts on the environment. In its own words, the Provincial Spatial Development Framework is a "broad and essentially generic provincial framework" (CoGTA, 2014, p. 6) and acknowledges the right of landowners and others to bring applications for developments, stipulating that each should be measured on its own merit (CoGTA, 2014). In the same vein, the PSDF notes that due regard must be given to the National Environmental Management Act and a clear need and desirability should be proven. Also, the proposed development must fit in with the Integrated Development Plan (IDP), Spatial Development Framework (SDF), and Environmental Management Framework (EMF). Finally, the principles of Integrated Environmental Management (IEM) should always be considered (GoGTA, 2014).

The PSDF, identifies Bloemfontein as being situated in an industrial node, hence a town with very high economical potential. At the same time the PSDF C7.2 objective is to ensure sustainable use and protection of environmental capital. Dawn Valley Estate design is aligned to achieve both economic growth and maintain the natural environmental integrity of the natural corridor applicable from the Valley of Seven Dams towards the Botanical Gardens.

(b) Urban edge / Edge of Built environment for the area	YES		Please explain

The development is within the urban edge. The proposed development property is surrounded by existing residential developments on its east, west and partly on the northern sides. The Valley of Seven Dams Conservancy is situated on the southern border, with the Botanical Gardens located in the north-western corner. Both the surrounding residential land uses and the open spaces of the Valley of Seven Dams as well as the Botanical Gardens are extended by the proposed Dawn Valley Estate. Corridor movement of fauna and flora will be accommodated through the development site, while the residential component proposed be in line with surrounding estate developments. (see attached **Appendix A,** Map of surrounding land uses)

(c) Integrated Development Plan (IDP) and Spatial Development Framework (SDF) of the Local Municipality (e.g. would the approval of this application compromise the integrity of the existing approved and credible municipal IDP and SDF?).		No	Please explain

The southern portion of Portion 23 of Lilyvale 2313 is earmarked for residential expansion, while the other three portions are defined Metropolitan Open Space. An application for rezoning and SDF amendment has been submitted for approval to the city council. Prior meetings and consultation with Mangaung Metropolitan Municipality were held as part of pre-planning. Based on the already extensive spread of developments around and bordering the assessment area, and an outdated Metropolitan

Open Space Policy, amendment of the SDF will be considered. The approval of the application will not compromise the integrity of the existing approved and credible municipal IDP and SDF.			
(d) Approved Structure Plan of the Municipality	YES		Please explain
Mangaung Metropolitan Municipality adopted a municipal spatial development framework, see point (c) above.			
(e) An Environmental Management Framework (EMF) adopted by the Department (e.g. Would the approval of this application compromise the integrity of the existing environmental management priorities for the area and if so, can it be justified in terms of sustainability considerations?)	YES		Please explain
The proposed development would not compromise the integrity of the environmental management priorities for the area. No environmental fatal flaws were identified and it was established that the impacts can be suitably mitigated. In addition, the development would result in socio-economic benefits for the area at large.			
(f) Any other Plans (e.g. Guide Plan)		NO	Please explain
None applicable			
3. Is the land use (associated with the activity being applied for) considered within the timeframe intended by the existing approved SDF agreed to by the relevant environmental authority (i.e. is the proposed development in line with the projects and programmes identified as priorities within the credible IDP)?	YES		Please explain
The proposed development is in line with the Municipality's IDP. It should be noted that although the development proposal is within a Metropolitan Open Space, that none of the functions associated with this open space will be lost. Only 11% footprint coverage of the total 113ha is proposed, in other words natural integration between the Valley of Seven Dams as well as the Botanical Gardens can be maintained. The below draft land use layout for the development proposal illustrates this assumption:			

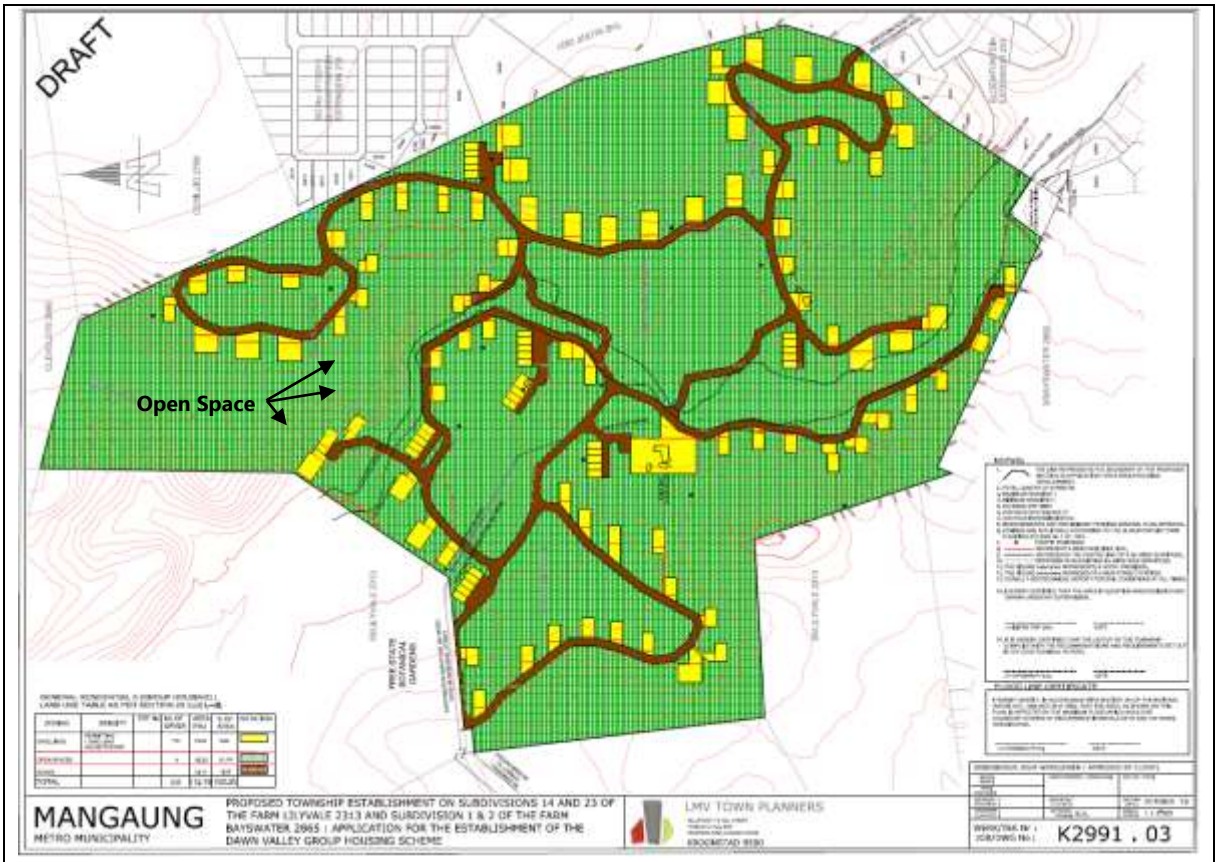


Figure 1: Draft Land Use map (LMV, 2018)

4. Does the community/area need the activity and the associated land use concerned (is it a societal priority)? (This refers to the strategic as well as local level (e.g. development is a national priority, but within a specific local context it could be inappropriate.)	YES		Please explain

The placement of a low density unique residential component, integrated with the natural beauty of Dawn Valley, presents an opportunity for potential residents to life inside a managed estate where living is integrated with nature, such as the popular Oubos estate east of Dawn Valley. Therefore, within its local context the proposal (land use) is exceedingly appropriate.

5. Are the necessary services with adequate capacity currently available (at the time of application), or must additional capacity be created to cater for the development? (Confirmation by the relevant Municipality in this regard must be attached to the final Basic Assessment Report as Appendix I.)	YES		Please explain

A Bulk Services investigation has been conducted and concluded that the proposed development can obtain bulk services from the Mangaung Municipality, where required. An agreement will have to be reached with the Municipality with regards to bulk services contribution. (see **Appendix D** for Services report)

6. Is this development provided for in the infrastructure planning of the municipality, and if not what will the implication be on the infrastructure planning of the municipality (priority and placement of services and opportunity costs)? (Comment by the relevant Municipality in this regard must be attached to the final Basic Assessment Report as Appendix I.)	YES		Please explain
Both water, electrical and sanitation bulk infrastructure networks exist in and around the development properties. Connection to these have been calculated to be viable.			
7. Is this project part of a national programme to address an issue of national concern or importance?		NO	Please explain
Indirectly this proposed development will increase the creation of job opportunities associated with construction activities of such an estate development. The operation phase will open permanent employment for house workers and the like.			
8. Do location factors favour this land use (associated with the activity applied for) at this place? (This relates to the contextualisation of the proposed land use on this site within its broader context.)	YES		Please explain
Based on the design concept proposed of low density, highly unique land use development within a natural setting, the study area favours this land use. This proposed land use concept (environmental conscious) allows for integration of surrounding open space functions. For the most, the land is vacant, however, the specialist studies that were undertaken for assessment of the area, determined potential impacts and has provided mitigation measure to avoid adverse negative impacts to the environment/ natural resources.			
9. Is the development the best practicable environmental option for this land/site?	YES		Please explain
The development properties are all privately owned, comparing the proposed low density concept with continuation of small scale cattle grazing activities the former will retain the natural integrity of the footprint area. Other alternative development proposals such as full township establishment with high density coverage will totally destroy the natural features of the site, while farming practices gradually destroy vegetation cover.			
10. Will the benefits of the proposed land use/development outweigh the negative impacts of it?	**YES**		Please explain
No major impacts were identified as part of this report.			

11. Will the proposed land use/development set a precedent for similar activities in the area (local municipality)?		NO	Please explain
Part of the development property is already earmarked for residential land uses in terms of the Mangaung SDF. Residential developments already surrounds the proposed study area. The southern border is characterised as an open space and is registered as a conservancy (Valley of Seven Dams). This conservancy is also already surrounded by residential developments.			
12. Will any person's rights be negatively affected by the proposed activity/ies?		NO	Please explain
Although the Valley of Seven Dams Conservancy is in close proximity to the proposed Dawn Valley Estate proposal, leisure activities at the conservancy will continue unhindered.			
13. Will the proposed activity/ies compromise the "urban edge" as defined by the local municipality?		NO	Please explain
The proposed sites are situated within the urban edge of Bloemfontein.			
14. Will the proposed activity/ies contribute to any of the 17 Strategic Integrated Projects (SIPS)?		NO	Please explain
The project is deemed to be in line with the national plans in that the envisaged development is regarded as an extension of the residential component and introduces land uses that is recommended in the local development legislation such as SPLUMA on sustainable development.			
15. What will the benefits be to society in general and to the local communities?			Please explain
Bloemfontein has experienced good growth over the last decade which can be seen in the number of new retail and commercial outlets as well as offices in the city and especially to north of Bloemfontein in the Northridge area. This has been supported by growth in the service sector. This growth was bound to impact on the housing market. The development will therefore provide much needed residential development. The residential development aims to conserve and manage the sensitive areas on the properties by keeping them "green" areas, but allowing for limited residential development, thereby promoting sustainable development. The proposed development will also contribute positively towards the economy of the city and will generate an additional income for the Municipality by means of rates and taxes.			
16. Any other need and desirability considerations related to the proposed activity?			Please explain
Three of the four properties for development is earmarked as "Metropolitan Open Space" in terms of the Bloemfontein Micro Framework plan of the Mangaung Spatial Development			

Framework (SDF). Abutting properties to the east and west is earmarked "Neighbourhood District". The proposed site development was formulated as a result of environmental specialist studies, a geotechnical study, and infrastructure services report, a flood line and traffic impact assessment so as to ultimately enable the development of mitigation and control measures towards environmental responsible practices and the sustainability of the proposed development.

In its present form the proposed development (see attached layout plan) will comprise 85 single residential erven, 7 townhouse erven and 1 hotel erven on a total of 113.3ha. These erven have been designed in direct response to the topography of the terrain, and with intense focus on the watercourse that is dissection the development properties. The latter not only provides one of the primary features in the development, but also forms part of the larger Seven Dams ecological system. It has as such together with all other areas (89%) of the development properties been accommodated in the proposed development as open space.

The result is that the layout achieves a very low net density of approximately 0.07dwelling units per ha (du/ha). As a result, the intensity of the proposed development is much lower than that of most alternative types of housing developments, e.g. smaller residential erven, cluster housing, etc.

The protection of the environmental zone, as an integral component of the greater Metropolitan Open Space System (as contemplated in the in the Spatial Development Framework) will be achieved through defining these areas as cadastral entities and zoning thereof as open space.

Building lines will also be introduced on the boundaries of all residential erven, on the one hand, to further sustain the natural drainage pattern in the area and increase the "green", and on the other hand, to limit residential building "footprints" in an effort to retain the rural ambience of the place to the greatest possible effect.

Street design has been altered from the normal tarred streets to a more environmental friendly design incorporating eco blocks allowing natural vegetation to be retained.

17. How does the project fit into the National Development Plan for 2030?	Please explain
Supplying of housing opportunities needed in the area.	

18. Please describe how the general objectives of Integrated Environmental Management as set out in section 23 of NEMA have been taken into account.

According to Section 23 of NEMA, 1998, the following should be considered:

EIA process for listed activities should be followed.

- An application for environmental authorisation was submitted to DESTEA.
- Baseline assessment was undertaken.
- Compilation of a Draft Basic Assessment Report which includes the potential impacts identified during the assessments.
- Submission of draft reports to the respective competent authorities for perusal.
- The final BAR will also be made available to the respective competent authorities.

Compilation of an EMPr

- An EMPr containing management measures to be implemented to limit environmental impacts are attached hereto.
- All possible interested and / or affected parties were notified of the proposed project by means of letters, advertisement and site notices.
- I&APs were given the opportunity to register and comment on the Draft BAR.

Other necessary approvals should be obtained

- General Authorisation for watercourse crossings (Section 21 (c) and (i)) will be obtained from Department of Water and Sanitation.

Need in terms of socio-economic level

- The need in terms of the socio-economic level was assessed.

The proposed development has been adequately considered by a trained and competent Environmental Assessment Practitioner, and all potential impacts that may have a significant impact on the receiving environment have been considered and mitigated to acceptable levels as required by the NEMA 2014 EIA Regulations. The conclusions of the environmental impact assessment have been concisely summarised to adequately inform decision-making by the competent authority. A comprehensive Public Participation Process was also undertaken, which conformed to requirements in Chapter 6 of the Environmental Impact Assessment Regulations. Further all Interested and Affected Parties were given ample time to review and comment on all documents and reports.

19. Please describe how the principles of environmental management as set out in section 2 of NEMA have been taken into account.

An application for environmental authorisation was submitted to DESTEA.

DESTEA acknowledged receipt of the application and provided this office with a reference number. The results obtained from baseline assessments were used to assess the possible impacts (positive and negative) on an environmental as well as social level. This Draft BAR will be made available to the relevant sector departments and the public for their respective comments. These comments will be assessed and included in the Final BAR to be approved (or not) by DESTEA.

Compilation of an EMPr
An EMPr containing management measures to be implemented on site was compiled by taking the possible impacts that the proposed project may have on the environment, into consideration.

Public participation process undertaken
Adjacent landowners to the proposed development site will be notified of the proposed project by means of formal notices either delivered by hand / e-mail / postage. In addition, site notices were placed, and a notification was published in a local newspaper. The local municipality was also notified of the proposed project. I&APs are given the opportunity to register and comment on this Draft BAR.

Need in terms of socio-economic level
The proposed project will provide employment opportunities for a number of people from the local community during the construction and operational phases.

The principles of environmental management as set out in Section 2 of NEMA have been taken into account through the following means:

- There will be no loss of endangered or protected biological diversity;
- Pollution will be minimised; and
- This activity will reduce the exploitation of non-renewable resources.

11. APPLICABLE LEGISLATION, POLICIES AND/OR GUIDELINES

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

Title of legislation, policy or guideline	Applicability to the project	Administering authority	Date
National Environmental Management Act, 1998 (Act No. 107 of 1998)	2014 NEMA Regulations - Development proposal listed in terms of GN R 327	Department of Environmental Affairs	1998
National Water Act 36 of 1998	All water use is regulated by this Act; as such all water course crossings applicable must be registered through GN R 509	DWS	1998
Occupational Health and Safety Act (Act 85 of 1993).	Regulations applicable both during construction and operation of the proposal.	Department of Labour	1993
National Environmental Management: Biodiversity	Under the NEMBA the project proponent is	Department of Environmental	2004

Act, 2004 (Act No. of 2004) (NEMBA)	required to take appropriate reasonable measures to limit the impacts on biodiversity, to obtain permits if required and to invite SANBI to provide commentary on any documentation resulting from the proposed development.	Affairs (DEA) and South African National Biodiversity Institute (SANBI)	
National Forests Act, 1998 (Act 84 of 1998) (NFA)	The proposed project may result in the disturbance or damage to a tree protected under the NFA.	Department of Agriculture, Forestry and Fisheries (DAFF)	1998
National Heritage Resources Act, 1999 (Act No. 25 of 1999)	If any archaeological remains are found on the proposed site where the activity is proposed SAHRA must be notified immediately.	South African Heritage Resources Authority (SAHRA)	1999
Municipality System Act, 2000 (Act No. 32 of 2000)	The proposed development falls within the future development of the Mangaung Municipality as stipulated by the Act.	Mangaung Metropolitan Municipality (MMM)	2000
Free State Biodiversity Plan (Guideline)	The Free State Biodiversity Plan assessed the whole of the Free State land cover and categorised land uses from degraded to Critical Biodiversity areas. Landscapes that fall inside critical biodiversity areas are so defined because of their biodiversity significance and protection value. The proposed Dawn Valley Estate will also be assessed in terms of these categories.	DESTEA	2016

Mangaung Metropolitan Urban Open Space Policy	The Metropolitan Open Space System (MOSS) is a rationalised network of open spaces aimed at complementing the built fabric by providing the urban environment with natural open space for recreation and general amenity, protecting biodiversity in urban areas and providing animal and plants species with habitats and protecting heritage or cultural sites where possible within the system. The proposed Dawn Valley Estate development is located partly within the Mangaung MOSS.	Mangaung Metropolitan Municipality	2004

MORE DETAILED DESCRIPTION OF APPLICABLE LEGISLATION:

There are various gazetted Acts and Regulations that regulate environmental management in South Africa.

These regulatory documents must be considered in order to guide development initiatives and therefore assist in proper decision making. Environmental Impact Assessments, when conducted with the purpose of obtaining Environmental Authorisation for a proposed development activity, are also regulated by this legislation. South African Environmental Law is founded in the Constitution of South Africa (Act No. 108 of 1996). The Bill of Rights states that everyone has a right to a non-threatening environment and requires that reasonable measures are applied to protect the environment. This protection encompasses preventing pollution and promoting conservation and environmentally sustainable development.

The National Environmental Management Act (NEMA, Act 107 of 1998) expands on and specifies these principles. The act states that the principles of Integrated Environmental Management (IEM) should be adhered to in order to ensure sustainable development. Accountability to the various parties that may be interested in and/or affected by the proposed development forms an integral part of the IEM procedure. The purpose of the IEM procedure is to ensure that the environmental consequences of a development proposal are understood and adequately considered and that negative aspects are resolved or mitigated and positive aspects enhanced.

Government Notices R 324, R 325, R 326 and R 327, in Government Gazette No 40772 (dated 07 April 2017), in terms of Chapter 5 of the National Environmental Management Act, Act No 107 of 1998 (as amended), contain the EIA Regulations, as well as a schedule of activities that may have substantial detrimental effects on the environment and therefore require authorisation from the competent environmental authority. The listed activities that is associated with the proposed Dawn Valley Estate project include the following:

Government Notice R327 – 07 April 2017	Activity No. 19	The construction of one small river road crossing to give access to and from both the western and eastern sections of the residential development over the applicable watercourse. The road crossings will be in the form of concrete structures, approximately 5.2m wide and 8.5meters long with 5 concrete stormwater pipes for water through flow. The structures will not be higher than 1meter from the surface.
Government Notice R327 – 07 April 2017	Activity No. 27	The construction of the various housing units and associated infrastructure will occupy 11% of the total development area which amounts to approximately 12.4ha of surface area.
Government Notice R324– 07 April 2017	Activity No. 2(b)(iii)(bb)	It is proposed that a small off stream water reservoir (capacity of 33kℓ) is constructed to serve as a backup water source for the estate. The reservoir is to be located on higher portion of the development area and will fall on portion 2 of the farm Bayswater 2865. This portion is located inside a Metropolitan Open Space System area in terms of Mangaung Spatial Development Framework. The reservoir will be sunken to mitigate against visual intrusion.
Government Notice R324– 07 April 2017	Activity No. 6(b)(ii)(bb)	A boutique hotel is proposed on the south corner of the Portion 1 of Bayswater 2865. The boutique hotel will have a maximum of 40 suites. This portion is located inside a Metropolitan Open Space System area in terms of Mangaung Spatial Development Framework
Government Notice R324– 07 April 2017	Activity No. 12(b)(iv)	Thirty two erven are proposed within 100meters from the spruit (water course) running through the development area. Vegetation clearance of more than 300m^2 will be applicable.
Government Notice R324– 07 April 2017	Activity No. 14(i)(a)(b)(ii)(bb)	It is proposed that two dams be formalized both located on Portion 3 of Lilyvale 2313. These two dams are located inside a stormwater drainage line (non-perennial).

An application for environmental authorisation through the execution of a BAR is being executed. It will be submitted to and reviewed by the DESTEA, who is the competent authority in this regard.

In addition to its function as a decision-making aid in terms of environmental authorisation, an EIA is an effective planning and decision-making tool for the project developer as it allows for the identification and management of potential environmental impacts, as well as the identification of other applicable legislation that must be considered and adhered to.

Other applicable legislation and policies include:

National Heritage Resources Act (Act 25 of 1999)

In section 38 of the **National Heritage Resources Act, Act No. 25 of 1999**, the following is stipulated:

"(1) Subject to the provisions of subsections (7), (8) and (9), any person who intends to undertake a development categorised as—

(a) the construction of a road, wall, powerline, pipeline, canal or other similar form of linear development or barrier exceeding 300m in length;

(b) the construction of a bridge or similar structure exceeding 50 m in length;

(c) any development or other activity which will change the character of a site—

(i) exceeding 5 000 m2 in extent; or

(ii) involving three or more existing erven or subdivisions thereof; or

(iii) involving three or more erven or divisions thereof which have been consolidated within the past five years; or

(iv) the costs of which will exceed a sum set in terms of regulations by SAHRA or a provincial heritage resources authority;

(d) the re-zoning of a site exceeding 10 000 m2 in extent; or

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

(2) The responsible heritage resources authority must, within 14 days of receipt of a notification in terms of subsection (1)—

(a) if there is reason to believe that heritage resources will be affected by such development, notify the person who intends to undertake the development to submit an impact assessment report. Such report must be compiled at the cost of the person proposing the development, by a person or persons approved by the responsible heritage resources authority with relevant qualifications and experience and professional standing in heritage resources management; or

(b) notify the person concerned that this section does not apply.

The responsible heritage resources authority in this case is the Free State Provincial Heritage Resources Agency and/or the South African Heritage Resources Agency (SAHRA). A Heritage Impact Assessment has been conducted to inform SAHRA of any findings.

Relevance to the proposed Dawn Valley Estate development:

- An archaeological impact assessment must be undertaken during the BAR phase of the proposed project.
- No person may alter or demolish any structure or part of a structure, which is older than 60 years or disturb any archaeological or palaeontological site or grave older than 60 years without a permit issued by the relevant provincial heritage resources authority.
- No person may, without a permit issued by the responsible heritage resources authority destroy, damage, excavate, alter or deface archaeological or historically significant sites.

Conservation of Agricultural Resources Act (Act 43 of 1983)

Section 5 of the **Conservation of Agricultural Resources Act, Act No 43 of 1983 (CARA)**, prohibits the spreading of weeds and Section 6 and Regulation 15 and 15 E of GN R 1048 addresses the implementation of control measures for alien and invasive plant species.

The Department of Agriculture, Land Reform and Rural Development is guided by this act. With the development of the mentioned activities the developer must take care of the following:

Article 7.(3)b of Regulation 9238: Conservation of Agriculture Resources, 1983 (Act 43 of 1983) states as follow:

Utilisation and protection of vlei, marshes, water sponges and water courses

7.(1) "...no land user shall utilize the vegetation in a vlei, marsh or water sponge or within the flood area of a water course or within 10 metres horizontally outside such flood area in a manner that causes or may cause the deterioration of or damage to the natural agricultural resources."

(3) "Except on authority of a written permission by the executive officer, no land user shall (b) cultivate any land on his farm unit within the flood area of a water course or within 10 metres horizontally outside the flood area of a water course."

Implications to the proposed Dawn Valley Estate development:

- If any declared weed and/or invader species listed in terms of this Act is present on site, it will have to be removed.

National Forests Act (Act No 84 of 1998)

The National Forests Act (NFA) as amended and Regulations, Section 7 conclude that: No person may cut, disturb, damage or destroy any indigenous, living tree in a natural forest, except in terms of a licence issued under Section 7(4) or Section 23; or an exemption from the provisions of this subsection published by the Minister in the Gazette. Sections 12-16 (read with S 62(2)(c)) deal with protected trees, with the Minister having the power to declare a particular tree, a group of trees, a particular woodland, or trees belonging to a certain species, to be a protected tree, group of trees, woodland or species. In terms of Section 15, no person may cut, disturb, damage, destroy or remove any protected tree; or collect, remove, transport, export, purchase, sell, donate or in any other manner acquire or dispose of any protected tree, except under a licence granted by the Minister. The list of protected tree species was published in GN 716 of 7 September 2012.

The Branch: Forestry and Natural Resource Management, DAFF, is mainly concerned about the potential impacts on protected tree species. See the National Forests Act, Act 84 of 1998 (NFA) as amended, section 12(1)(d) read with s15(1) and s62(2)(c). The list of protected tree species was published in GN 877 of 22 November 2013. **No protected tree may be cut, removed, damaged, disturbed or destroyed without a valid Forest Act License.**

Implications to the proposed Dawn Valley Estate development:

- If any protected trees in terms of this Act occur on site, the developer will require a licence from the DWAF to perform any of the above-listed activities.

National Environmental Management: Biodiversity Act (Act 10 of 2004)

The National Environmental Management: Biodiversity Act, Act No 10 of 2004 (NEM:BA) provides for the MEC/Minister to list ecosystems which are threatened and in need of protection (Section 52) and to identify any process or activity in such a listed ecosystem as a threatening process (Section 53). A list of threatened & protected species has been published in terms of Section 56 (1) GG 29657 GN R 151 and GN R 152, Threatened or Protected Species Regulations.

The act also deals with restricted activities involving alien species; restricted activities involving certain alien species totally prohibited; and duty of care relating to listed invasive species.

Implications to the proposed Dawn Valley Estate development:

- Sections 52 to 55 of the Biodiversity Act deal directly with listing threatened or protected ecosystems. The Minister may publish a national list of ecosystems that are threatened and in need of protection, and an MEC may publish a provincial list of such ecosystems with the concurrence of the Minister. Dawn Valley Estate is not situated within any vulnerable ecosystems.

- The Biodiversity Act allows for the publishing of bioregional plans, to provide a map of critical biodiversity areas with accompanying land-use planning and decision-making guidelines, to inform land-use planning, environmental assessment and authorisations, and natural resource management by a range of sectors whose policies and decisions impact on biodiversity. Such a biodiversity plan has been developed for the Free State, however not published (the plan is in its draft phase). Dawn Valley Estate falls within an environmental support area according to the Free State Biodiversity Plan. This biodiversity plan will be used as a guideline to inform the proposed development proposal, its layout and sustainable functioning. It should be clearly noted that the Free State Biodiversity Plan is not gazetted, and serve as a guideline document. It is in this light that the Plan will be used to inform the development proposal towards a sustainable proposal.

- The proposed development must consider endangered ecosystems, protect and promote biodiversity;

- Must assess the impacts of the proposed development on endangered ecosystems; although there are no endangered ecosystems applicable at Dawn Valley Estate.

- No protected species may be removed or damaged without a permit;

- The proposed site must be cleared of alien vegetation using appropriate means.

National Environmental Management Act: Protected Areas Act (Act 57 of 2003)

The National Environmental Management Act: Protected Areas Act (Act No. 57 of 2003) (NEM:PAA) provides for the protection and conservation of ecologically viable areas representative of South Africa's biological diversity and its natural landscapes and seascapes; for the establishment of a national register of all national, provincial and local protected areas; for the management of those areas in accordance with national norms and standards;

for intergovernmental co-operation and public consultation in matters concerning protected areas; and for matters in connection therewith.

Implications to the proposed Dawn Valley Estate development:

- The properties at Dawn Valley Estate is **not** listed in a national register as a protected area.

National Water Act (Act 36 of 1998)

In terms of the definitions contained in Section 1 of the National Water Act, Act No 36 of 1998, (NWA) a "water resource" includes a watercourse, surface water, estuary, or aquifer. "Aquifer" means a geological formation which has structures or textures that hold water or permit appreciable water movement through them. "Watercourse" means a river or spring; a natural channel in which water flows regularly or intermittently; a wetland, lake or dam into which, or from which, water flows; and any collection of water which the Minister may, by notice in the Gazette, declare to be a watercourse, and a reference to a watercourse includes, where relevant, its bed and banks.

Furthermore, in terms of the definitions contained in Section 1 of the National Water Act, waste "includes any solid material or material that is suspended, dissolved or transported in water (including sediment) and which is spilled or deposited on land or into a water resource in such volume, composition or manner as to cause, or to be reasonably likely to cause, the water resource to be polluted".

The Minister of Water and Environmental Affairs is allowed to regulate activities which have a detrimental impact on water resources by declaring them to be controlled activities. No person may undertake a controlled activity unless such person is authorised to do so by or under this Act.

Duty of Care to prevent and remedy the effects of pollution to water resources is addressed in Section 19. Section 20 addresses the procedures to be followed, as well as control of emergency incidents which may impact on a water resource. Recognised water uses are addressed in terms of Section 21 and the requirements for registration of water uses are stipulated in Section 26 and Section 34.

Implications to the proposed Dawn Valley Estate development:

- All Section 21 water uses, such as water course crossings, storage of water, use of grey water, groundwater use, etc. must be licensed by Department of Water and Sanitation.

National Environmental Management Act (Act 107 of 1998)

Section 28 of the National Environmental Management Act, Act No. 107 of 1998 (NEMA) requires duty of care where reasonable measures are taken to prevent pollution or degradation from occurring, continuing or recurring, or, where this is not possible, to minimise and rectify pollution or degradation of the environment. Section 29 addresses the protection of workers refusing to do environmental hazardous work. Procedures to be followed in the event of an emergency incident which may impact on the environment are addressed in Section 30. Section 31 addresses access to environmental information and protection of whistle blowers.

Relevance to the proposed Dawn Valley Estate development:

- The developer must be mindful of the principles, broad liability and implications associated with NEMA and must eliminate or mitigate any potential impacts;
- The developer must be mindful of the principles, broad liability and implications of causing damage to the environment.

12. WASTE, EFFLUENT, EMISSION AND NOISE MANAGEMENT

In order to justify the proposed development, it became important to investigate the availability of civil services and to this effect, a report from LMV consulting engineers is attached as **Appendix D**. In terms of the services report, the services are deemed to be adequate to sustain the new development.

a) Solid waste management

Will the activity produce solid construction waste during the construction/initiation phase?	YES
If YES, what estimated quantity will be produced per month?	Limited quantity of construction waste will be generated. Quantity currently unknown.

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

Waste skips will be available at the proposed construction sites, construction waste will be deposited into these skips will be weather as well as scavenger proof. Solid waste from construction will be stored in a demarcated area on site and will be disposed of at a registered landfill site. It will be suggested to the applicant that recycling be a priority in order to minimize construction waste so that waste is sorted into recyclable and waste that is non-recyclable.

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

The construction waste will be minimal; however, the waste will be transported to Bloemfontein North General Waste Site, Licence- 16/2/7/C522/D1/Z2/P478, and will be managed as per the municipal waste management system.

Will the activity produce solid waste during its operational phase? YES

If YES, what estimated quantity will be produced per month?

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

The refuse generated by the development may not be dumped or treated on site. The area is serviced by Mangaung Municipality, the development household waste will managed as per the municipal waste management system.

If the solid waste will be disposed of into a municipal waste stream, indicate which registered landfill site will be used.

North General Waste Site, Licence- 16/2/7/C522/D1/Z2/P478

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

N/A

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

Can any part of the solid waste be classified as hazardous in terms of the NEM:WA? NO

If YES, inform the competent authority and request a change to an application for scoping and EIA. An application for a waste permit in terms of the NEM:WA must also be submitted with this application.

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

If YES, then the applicant should consult with the competent authority to determine whether it is necessary to change to an application for scoping and EIA. An application for a waste permit in terms of the NEM:WA must also be submitted with this application.

b) Liquid effluent

See the attached services report in **appendix D**. Please note that MMM and the client will enter into a services agreement for the provision of civil engineering services for the proposed development.

Will the activity produce effluent, other than normal sewage, that will be disposed of in a municipal sewage system?	NO
If YES, what estimated quantity will be produced per month?	N/A
Will the activity produce any effluent that will be treated and/or disposed of on site?	NO

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

Will the activity produce effluent that will be treated and/or disposed of at another facility?	YES

If YES, provide the particulars of the facility:

Facility name:	Northern waste water treatment works - MMM		
Contact person:	Mr. Wagenaar		
Postal address:	P O. Box 3704, Bloemfontein		
Postal code:	9300		
Telephone:	051-410 6605	**Cell:**	-
E-mail:	gerhard.fritz@mangaung.co.za	**Fax:**	-

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

N/A

c) Emissions into the atmosphere

Will the activity release emissions into the atmosphere other that exhaust emissions and dust associated with construction phase activities?	NO
If YES, is it controlled by any legislation of any sphere of government?	NO

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

If NO, describe the emissions in terms of type and concentration:

Construction activities will result in emissions in the form of dust and fuel vapour. However the impact(s) associated with such emissions will be limited to the surrounding area. Further such impacts are considered to be of short term and will be limited to only the construction phase. Appropriate mitigation of the anticipated impacts have been included in the environmental management plan.

d) Waste permit

Will any aspect of the activity produce waste that will require a waste permit in terms of the NEM:WA?	NO

If YES, please submit evidence that an application for a waste permit has been submitted to the competent authority

e) Generation of noise

Will the activity generate noise?	YES
If YES, is it controlled by any legislation of any sphere of government?	NO

Describe the noise in terms of type and level:

While it is not anticipated that noise levels will exceed the legislated limits for the area, The Applicant is required to comply with all the relevant noise regulations, by-laws and legislation.

13. WATER USE

See the attached services report.

Please indicate the source(s) of water that will be used for the activity by ticking the appropriate box(es):

Municipal	

If water is to be extracted from groundwater, river, stream, dam, lake or any other natural feature, please indicate the volume that will be extracted per month:	-
Does the activity require a water use authorisation (general authorisation or water use license) from the Department of Water Affairs?	YES

If YES, please provide proof that the application has been submitted to the Department of Water Affairs.

A General Authorisation is required in terms of the NWA, the road crossings over delineated ephemeral watercourses (see figure 2) below) triggers Section 21 (c) and (i) water uses.

Figure 2: Drainage line map with stream crossing (Google Earth, 2018)

14. ENERGY EFFICIENCY

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

The following energy saving technology may be considered for incorporation for the Project:

- Blinds can be installed where necessary to decrease sunlight penetration and associated uncontrolled room temperature increase in summer, and to increase sunlight penetration and associated heating in winter. This will reduce electricity consumption associated with running heating, ventilation and Air Conditioning (HVAC) systems.

- Adequate structure / housing unit layout and design can ensure adequate air-flow inside buildings to ensure that the HVAC systems operate more efficiently and use less energy.

- Where appropriate, insulation of walls, double glazing can be employed to reduce heat exchange between conditioned and unconditioned spaces, thereby minimising energy consumption by HVAC systems.

- A balance between natural lighting and electrical lighting if maintained can ensure minimal electricity consumption.

- Where appropriate, cool fluorescent tube lights, or energy saving compact fluorescent lamps (CFLs) can be installed to minimise electricity consumption for lighting.

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

Where possible, the use of alternative energy supply will be promoted and used.

This could include:

- Solar lighting.
- Solar water heating.
- The use of light emitting diode (led) bulbs.

SECTION B: SITE/AREA/PROPERTY DESCRIPTION

Important notes:

1. For linear activities (pipelines, etc) as well as activities that cover very large sites, it may be necessary to complete this section for each part of the site that has a significantly different environment. In such cases please complete copies of Section B and indicate the area, which is covered by each copy No. on the Site Plan.

Section B Copy No. (e.g. A): [redacted]

2. Paragraphs 1 - 6 below must be completed for each alternative.

3. Has a specialist been consulted to assist with the completion of this section? [redacted] NO

If YES, please complete the form entitled "Details of specialist and declaration of interest" for each specialist thus appointed and attach it in Appendix I. All specialist reports must be contained in Appendix D.

Property description/physical address:

Province	Free State Province
District Municipality	Mangaung Metropolitan Municipality
Local Municipality	Mangaung Metropolitan Municipality
Ward Number(s)	22
Farm name and number	Portion 14 of the farm Lilyvale 2313 of Tempe 2277, Portion 23 of Lilyvale 2313, and Portions 1 and 2 of the farm Bayswater 2865
Portion number	Portion 14 of the farm Lilyvale 2313 of Tempe 2277, Portion 23 of Lilyvale 2313, and Portions 1 and 2 of the farm Bayswater 2865
SG Code	F0030000000231300014 F0030000000286500001 F0030000000286500002 F0030000000231300023

Where a large number of properties are involved (e.g. linear activities), please attach a full list to this application including the same information as indicated above.

Current land-use zoning as per local municipality IDP/records:

Agriculture

In instances where there is more than one current land-use zoning, please attach a list of current land use zonings that also indicate which portions each use pertains to, to this application.

Is a change of land-use or a consent use application required? YES [redacted]

1. GRADIENT OF THE SITE

Indicate the general gradient of the site.

Alternative S1:

Flat	**1:50 – 1:20**				**1:7,5 – 1:5**	

Alternative S2 (if any):

~~Flat~~	~~1:50 – 1:20~~	~~1:20 – 1:15~~	~~1:15 – 1:10~~	~~1:10 – 1:7,5~~	~~1:7,5 – 1:5~~	~~Steeper than 1:5~~

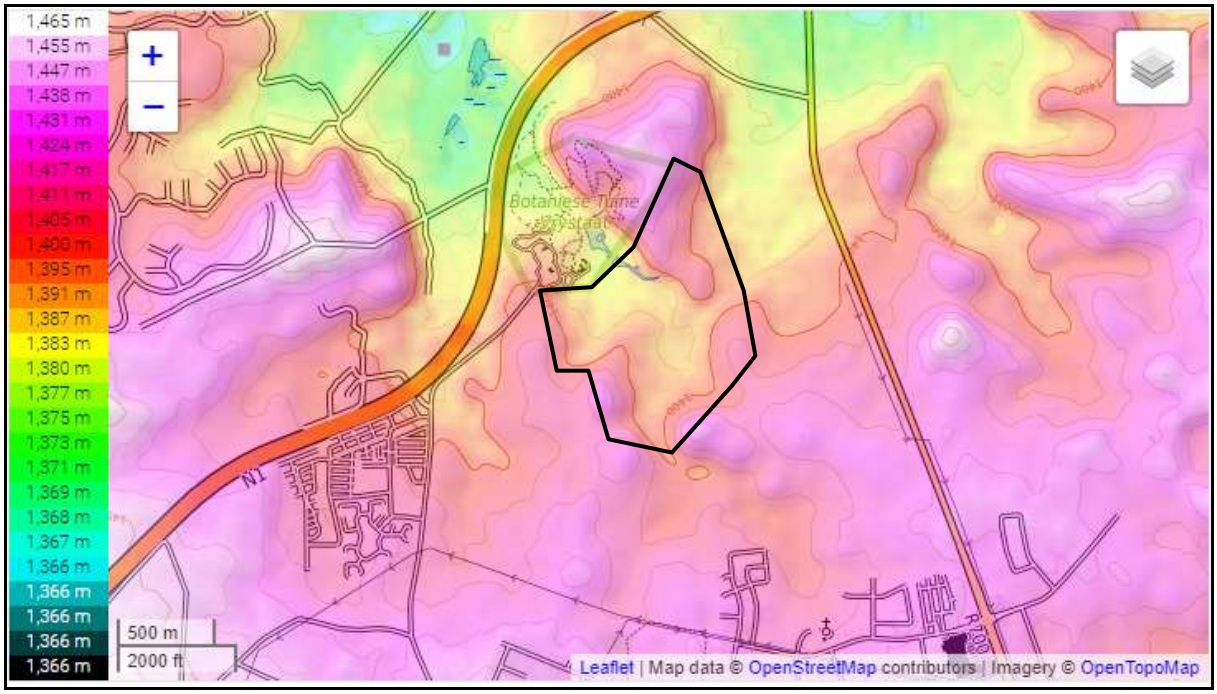
Alternative S3 (if any):

~~Flat~~	~~1:50 – 1:20~~	~~1:20 – 1:15~~	~~1:15 – 1:10~~	~~1:10 – 1:7,5~~	~~1:7,5 – 1:5~~	~~Steeper than 1:5~~

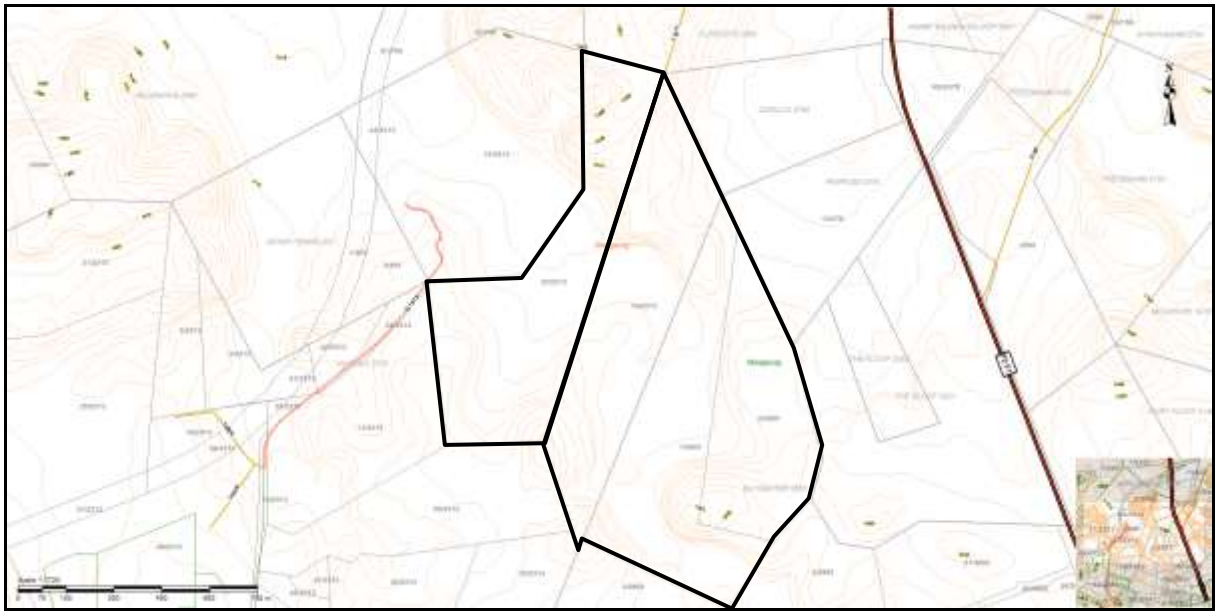
2. LOCATION IN LANDSCAPE

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

2.1 Ridgeline	X	2.4 Closed valley		2.7 Undulating plain / low hills	
2.2 Plateau	X	2.5 Open valley		2.8 Dune	
2.3 Side slope of hill/mountain		2.6 Plain	X	2.9 Seafront	
2.10 At sea					



Map 2: Slope classification map (Map Data, 2018)



Map 3: Contour map (Planet GIS, 2019)

The site is a combination of steep sided, rocky hills, open, flat-topped sheet rock plateaus, dammed streams, riparian wetlands and open flood plains. These various habitats comprise a mix of several vegetation types specific to each habitat.

A water course enters the study area through the eastern boundary of Lilyvale 2313 portion 23 and exits near the mid-point of the western boundary. This water course eventually links up with the Stinkhoutspruit 10km to the north.

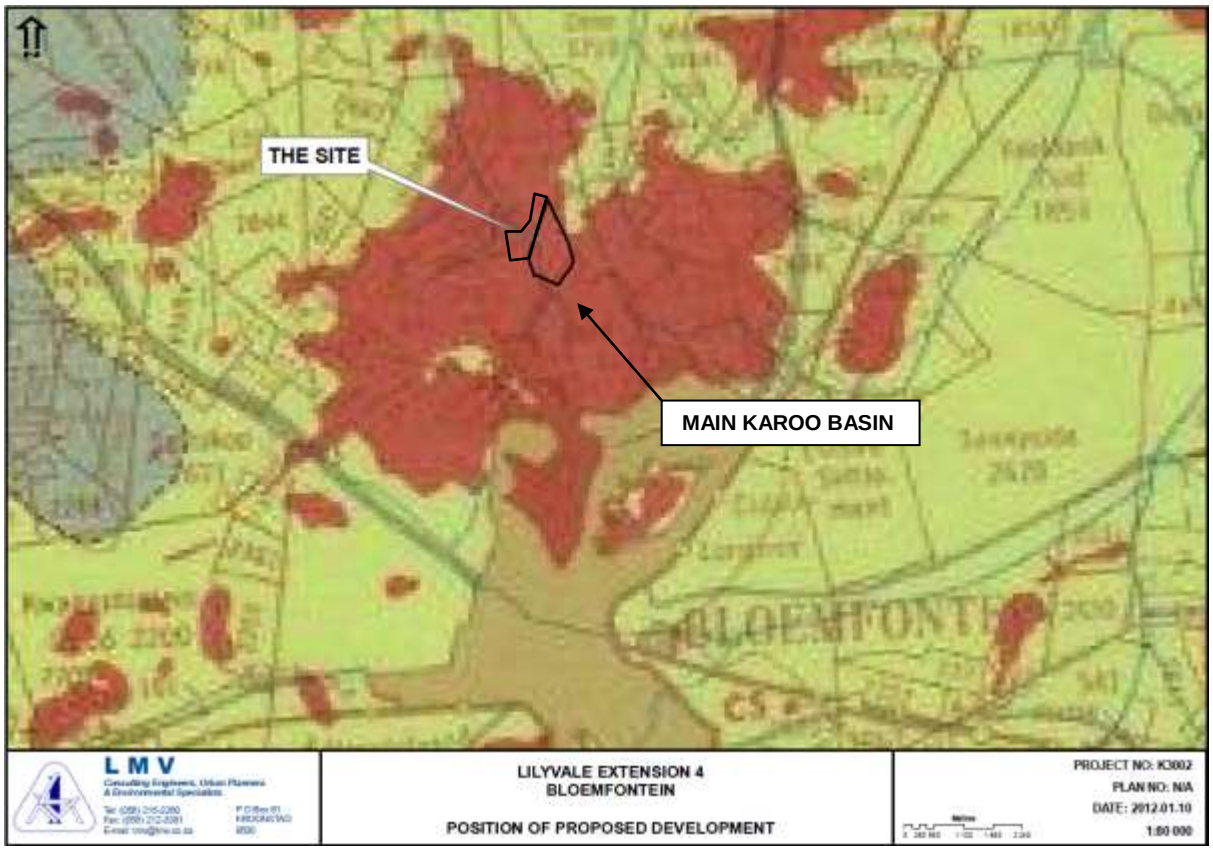
3. GROUNDWATER, SOIL AND GEOLOGICAL STABILITY OF THE SITE

Is the site(s) located on any of the following?

	Alternative S1:	Alternative S2 (if any):	Alternative S3 (if any):
Shallow water table (less than 1.5m deep)	NO		
Dolomite, sinkhole or doline areas	NO		
Seasonally wet soils (often close to water bodies)	NO		
Unstable rocky slopes or steep slopes with loose soil	NO		
Dispersive soils (soils that dissolve in water)	NO		
Soils with high clay content (clay fraction more than 40%)	NO		
Any other unstable soil or geological feature	NO		
An area sensitive to erosion	NO		

If you are unsure about any of the above or if you are concerned that any of the above aspects may be an issue of concern in the application, an appropriate specialist should be appointed to assist in the

completion of this section. Information in respect of the above will often be available as part of the project information or at the planning sections of local authorities. Where it exists, the 1:50 000 scale Regional Geotechnical Maps prepared by the Council for Geo Science may also be consulted.



Map 4: Geological map (LMV, 2018)

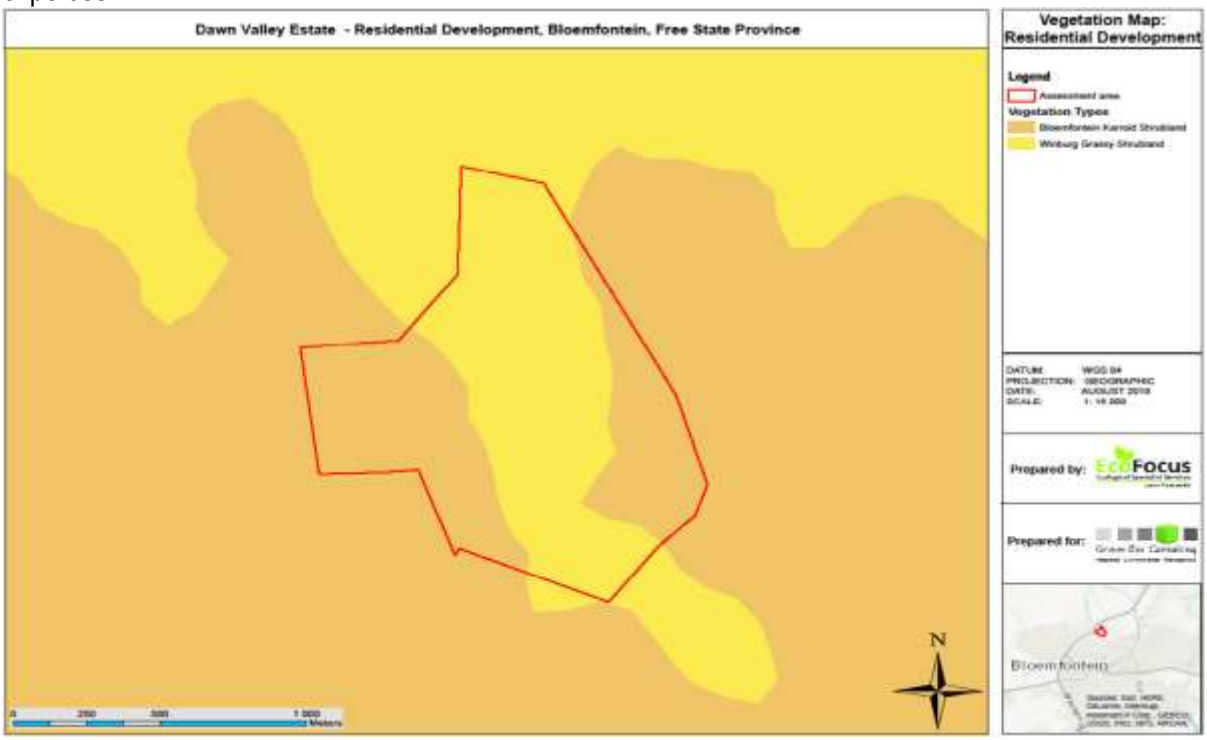
The greater Bloemfontein area falls within a geographically demarcated area that is known as the Main Karoo Basin. Portion 23 of the farm Lilyvale 2313 is situated on top of one of the intrusive dolerite rock formations. A mosaic of solitary hills, slopes and escarpments with isolated rocky sheets/outcrops scattered through the area. Extensive dolerite sills forming rides, plateaus and slopes of koppies are present also covering sedimentary mudstones and sandstones mainly of the Adelaide subgroup. Stoney Mispah and gravel rich Glenrosa soil types derived from Jurassic dolerite are prominent within these hills and ridges while the outcrops usually possess a shallow layer of sand of aeolian origin overlaying the dolerite. The dominant land type is Ea followed by Dc and Fa.

4. GROUNDCOVER

Indicate the types of groundcover present on the site. The location of all identified rare or endangered species or other elements should be accurately indicated on the site plan(s).

Natural veld - good condition[E]	**Natural veld with scattered aliens[E]**			**Gardens**
		Paved surface	**Building or other structure**	

If any of the boxes marked with an "[E] "is ticked, please consult an appropriate specialist to assist in the completion of this section if the environmental assessment practitioner doesn't have the necessary expertise.



Map 5: Vegetation map illustrating the vegetation types associated with the assessment area (Lampbrecht, 2018)

According to SANBI (2006-), the assessment area forms a mosaic of the Winburg Grassy Shrubland (Gh 7) and Bloemfontein Karroid Shrubland (Gh 8) vegetation types.

The former mainly consists of solitary hills, slopes and escarpments creating a mosaic of habitats ranging from open grassland on the plateaus to shrubland on the side slopes while the latter is characterised by plateaus or slightly sloping flanks of isolated rocky sheets/outcrops of Jurassic dolerites which are scattered within the sediments of the Adelaide subgroup. The shallow layer of sand of aeolian origin overlaying the dolerite mainly supports low shrubland dominated by dwarf small leaved karroid and succulent shrubs. Grasses are mostly restricted to depressions and crevices filled with fine soil. Solitary shrubs or small groups of shrubs are occasionally present where root penetration into deeper crevasses and cracks in the dolerite are possible. Both of these vegetation types are classified as least threatened (SANBI, 2006-) but are under pressure in the Bloemfontein area due to their limited and confined presence and significant cultivation transformation and urbanisation expansion pressures.

The assessment area forms a mosaic of Ecological Support Areas one and two (ESA 1 & 2) in accordance with the Free State Provincial Spatial Biodiversity Plan 2017, which sets out biodiversity priority areas in the province. ESA's are areas that must be maintained in at least fair ecological condition (semi-natural/moderately modified state) in order to support the ecological functioning of a Critical Biodiversity Area (CBA) or protected area or that play an important role in delivering ecosystem services (Collins, 2017).

5. SURFACE WATER

Indicate the surface water present on and or adjacent to the site and alternative sites?

Perennial River	**YES**	
Non-Perennial River		**NO**
Permanent Wetland		**NO**
Seasonal Wetland	**YES**	
Artificial Wetland		**NO**
Estuarine / Lagoonal wetland		**NO**

If any of the boxes marked YES or UNSURE is ticked, please provide a description of the relevant watercourse.

A significant perennial watercourse traverses the assessment area in a south to north-westerly direction. It forms an important part of the upper region of a quaternary surface water catchment and drainage area which regionally drains towards the north and eventually discharges into the Modder River. The watercourse possesses a distinct narrow riparian zone around the edges consisting of a relatively dense woody canopy and floodplains occupied by hydrophytic and aquatic vegetation. Tree species such as Salix babylonica (alien), Populus deltoides (alien), Populus canescens (Category 2 invasive species) & Cypress species are mostly present within the riparian zone while indigenous tree species mainly constitute Searsia lancea, Vachellia karroo & Olea europaea (provincially protected). The floodplain areas within the riparian zone are mainly dominated by the legally declared invasive grass species Pennisetum clandestinum (Category 1b), Cynodon dactylon, Cyperus spp., Typha capensis & the aquatic forb Phyla nodiflora. (Lampbrecht, 2018)

6. LAND USE CHARACTER OF SURROUNDING AREA

Indicate land uses and/or prominent features that currently occur within a 500m radius of the site and give description of how this influences the application or may be impacted upon by the application:

Natural area	**Dam**	
Low density residential	**Hospital/medical centre**	

Medium density residential	**School**	
		River, stream or wetland
		Mountain, koppie or ridge
	Major road (4 lanes or more) N	
		Graveyard

If any of the boxes marked with an "N "are ticked, how will this impact / be impacted upon by the proposed activity? Specify and explain:

The N1 national road runs past the western corner of Portion 23 of Lilyvale 2313, no access will be allowed directly onto the N1, therefore no impacts is foreseen from or on the N1 road.

If any of the boxes marked with an "An" are ticked, how will this impact / be impacted upon by the proposed activity? Specify and explain:

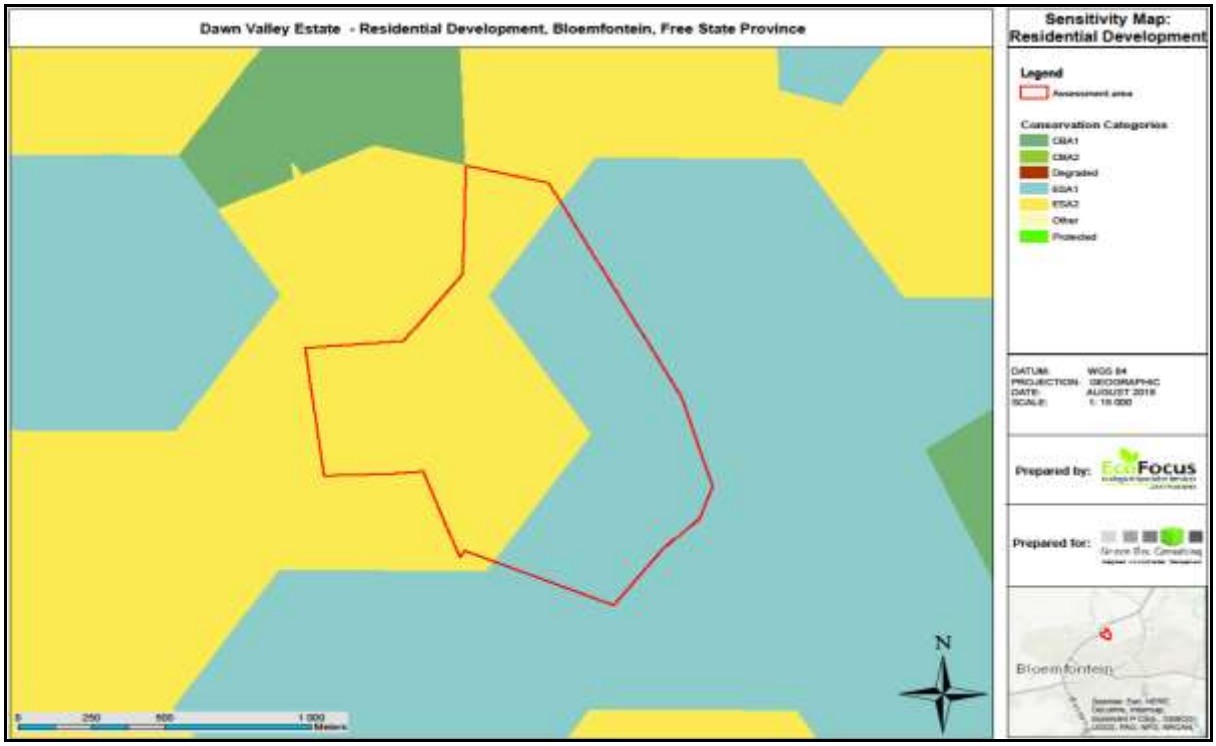
Not Applicable

If any of the boxes marked with an "H" are ticked, how will this impact / be impacted upon by the proposed activity? Specify and explain:

Not Applicable

Does the proposed site (including any alternative sites) fall within any of the following:

Critical Biodiversity Area (as per provincial conservation plan)		**NO**
Core area of a protected area?		**NO**
Buffer area of a protected area?		**NO**
Planned expansion area of an existing protected area?		**NO**
Existing offset area associated with a previous Environmental Authorisation?		**NO**
Buffer area of the SKA?		**NO**



Map 6: Sensitivity map illustrating the conservation statuses associated with the assessment area (Lampbrecht, 2018)

If the answer to any of these questions was YES, a map indicating the affected area must be included in Appendix A.

7. CULTURAL/HISTORICAL FEATURES

Are there any signs of culturally or historically significant elements, as defined in section 2 of the National Heritage Resources Act, 1999, (Act No. 25 of 1999), including Archaeological or paleontological sites, on or close (within 20m) to the site? If YES, explain:	**YES**	
	Uncertain	

A Phase 1 Archaeological Impact Assessment was carried out on the proposed development areas. A pedestrian survey was conducted in the proposed area and the following results are given below:

- The Stone Age component are made up of a few individual stone tools represented as surface scatters on sheet wash and lag deposits.
- There is no evidence of intact or capped Stone Age archaeological material.
- There is no evidence for the accumulation and preservation of intact fossil material within the overlying Quaternary sediments at the site.
- There are also no indications of prehistoric structures or rock engravings within the areas that will be directly impacted by the proposed development.
- The area investigated is located within an old military zone relating to the military occupation of Bloemfontein by the British after 1900.
- Several historical components, including the remains of a number of stone-build dwellings, an old road and an existing dam older than 60 years old, were identified.
- A section of stone wall located in the affected area is older than 60 years. It is part of a larger structure and can be related directly to the presence of the British troops in Bloemfontein from 1900.
- The stone wall can be included into the development plan of the site with positive effect. This will require a management plan to include buffer zones for their preservation both during and after development.
- Two graveyards are located within the affected area, but only one will be directly impacted by the proposed development. A management plan needs to be submitted for the two graveyards as part of the proposed development. The owners of the property are responsible for the protection and maintenance of the graves unless there is an agreement reached with regard to the exhumation and re-interment of the contents of the graves in accordance with any regulations made by the responsible heritage resources authority.

If uncertain, conduct a specialist investigation by a recognised specialist in the field (archaeology or palaeontology) to establish whether there is such a feature(s) present on or close to the site. Briefly explain the findings of the specialist:

A Specialist study was undertaken by Dr. L. Rossouw of the National Museum, his full report is attached under **Appendix D**.

Will any building or structure older than 60 years be affected in any way?	**NO**
Is it necessary to apply for a permit in terms of the National Heritage Resources Act, 1999 (Act 25 of 1999)?	**NO**

If YES, please provide proof that this permit application has been submitted to SAHRA or the relevant provincial authority.

8. SOCIO-ECONOMIC CHARACTER

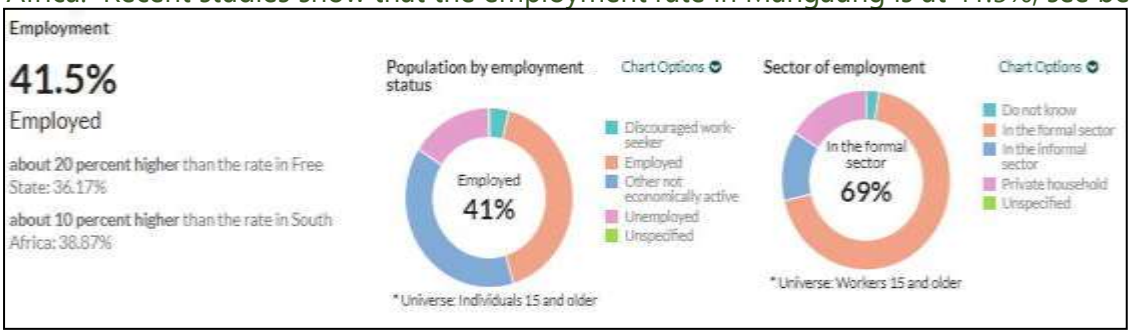
a) Local Municipality

Please provide details on the socio-economic character of the local municipality in which the proposed site(s) are situated.

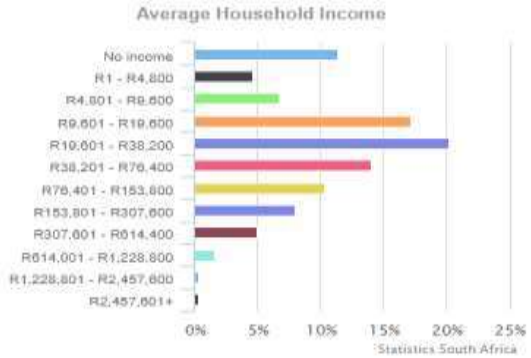
Level of unemployment:

Mangaung Metropolitan Municipality

With regards to the employment rate in the Mangaung Metropolitan Municipality, it is understood that the unemployment is fairly high compared to other provinces in South Africa. Recent studies show that the employment rate in Mangaung is at 41.5%, see below.



Employment Status	Number
Employed	211746
Unemployed	81225
Discouraged Work Seeker	18244
Not Economically Active	195707



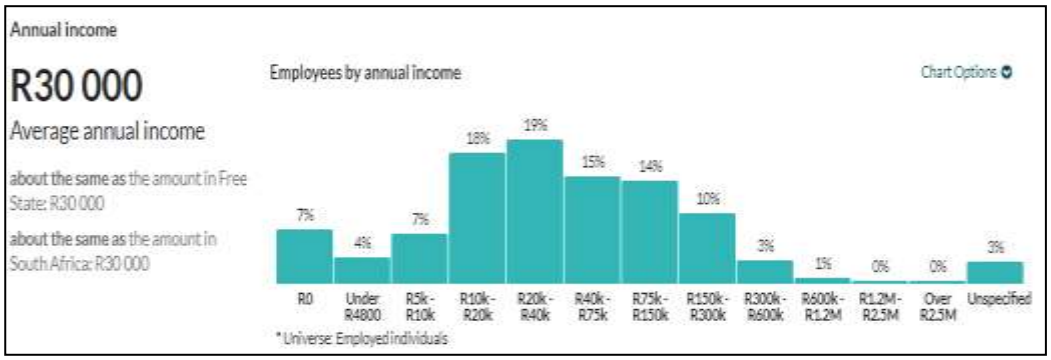
Source: https://wazimap.co.za/profiles/municipality-MAN-mangaung/#economics

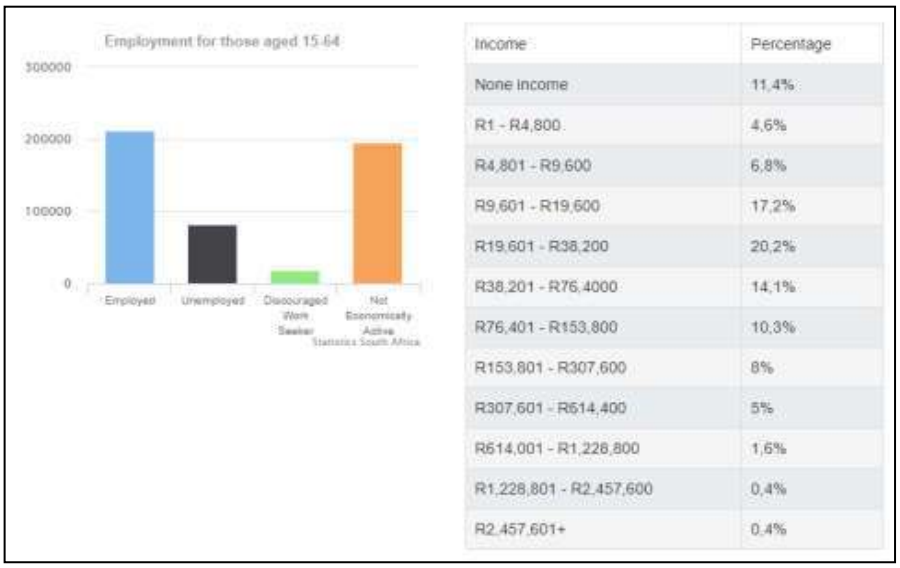
Source: http://www.statssa.gov.za/?page_id=1021&id=mangaung-municipality

Economic profile of local municipality:

Mangaung Metropolitan Municipality

The economic growth within the Mangaung Metropolitan Municipality is classified by strong economic growth, with a growth rate of 2.8% in GDP between 1995 and 2011. In 2012, the Free State contributed 5.3% to the national economy while the Mangaung Metropolitan Municipality contributed 1.7%. According to the Mangaung Metropolitan Municipality Integrated Development Plan (IDP) review (2013-2014), the Mangaung Metropolitan Municipality is the largest contributor to the GDP of the province and is regarded as one of the most diverse economies in nature.





Income	Percentage
None income	11.4%
R1 - R4,800	4.6%
R4,801 - R9,600	6.8%
R9,601 - R19,600	17.2%
R19,601 - R38,200	20.2%
R38,201 - R76,4000	14.1%
R76,401 - R153,800	10.3%
R153,801 - R307,600	8%
R307,601 - R614,400	5%
R614,001 - R1,228,800	1.6%
R1,228,801 - R2,457,600	0.4%
R2,457,601+	0.4%

Source: https://wazimap.co.za/profiles/municipality-MAN-mangaung/#economics

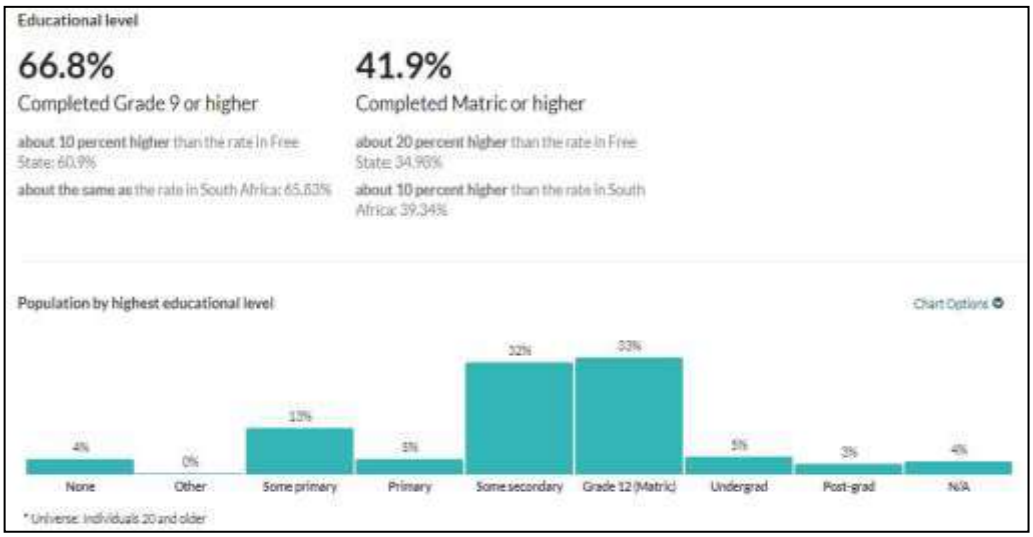
Source: http://www.statssa.gov.za/?page_id=1021&id=mangaung-municipality

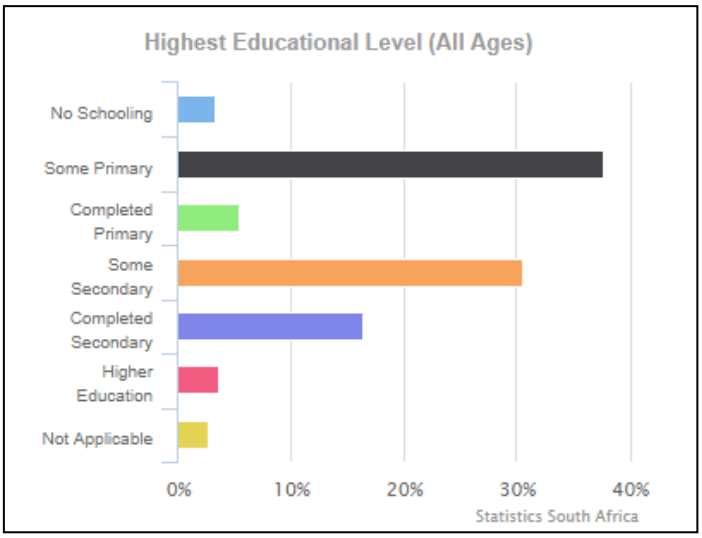
Level of education:

Mangaung Metropolitan Municipality

Mangaung has a population of 747 431, of which 83,3% are black African, 11,0% are white, 5,0% are coloured, with other population groups making up the remaining 0,7%. Of those aged 20 years and older, 4,7% have completed primary education, 33,2% have some secondary education, 30,3% have completed matric and 14,2% have some form of higher

education. 4,3% of this group have no formal schooling.





Source: http://www.statssa.gov.za/?page_id=1021&id=mangaung-municipality

Source: https://wazimap.co.za/profiles/municipality-MAN-mangaung/#economics

b) Socio-economic value of the activity

What is the expected capital value of the activity on completion?	**Approximately R 500 000 000.00**
What is the expected yearly income that will be generated by or as a result of the activity?	**R uncertain**
Will the activity contribute to service infrastructure?	**NO**
Is the activity a public amenity?	**NO**
How many new employment opportunities will be created in the development and construction phase of the activity/ies?	**uncertain**
What is the expected value of the employment opportunities during the development and construction phase?	**R uncertain**

What percentage of this will accrue to previously disadvantaged individuals?	80%
How many permanent new employment opportunities will be created during the operational phase of the activity?	80
What is the expected current value of the employment opportunities during the first 10 years?	R uncertain
What percentage of this will accrue to previously disadvantaged individuals?	80%

9. BIODIVERSITY

Please note: The Department may request specialist input/studies depending on the nature of the biodiversity occurring on the site and potential impact(s) of the proposed activity/ies. To assist with the identification of the biodiversity occurring on site and the ecosystem status consult http://bgis.sanbi.org or BGIShelp@sanbi.org. Information is also available on compact disc (cd) from the Biodiversity-GIS Unit, Ph (021) 799 8698. This information may be updated from time to time and it is the applicant/ EAP's responsibility to ensure that the latest version is used. A map of the relevant biodiversity information (including an indication of the habitat conditions as per (b) below) and must be provided as an overlay map to the property/site plan as Appendix D to this report.

a) Indicate the applicable biodiversity planning categories of all areas on site and indicate the reason(s) provided in the biodiversity plan for the selection of the specific area as part of the specific category)

Systematic Biodiversity Planning Category			If CBA or ESA, indicate the reason(s) for its selection in biodiversity plan
[redacted]	**Ecological Support Area (ESA)**	[redacted]	The assessment area forms a mosaic of Ecological Support Areas one and two (ESA 1 & 2) in accordance with the Free State Provincial Spatial Biodiversity Plan 2017, which sets out biodiversity priority areas in the province. ESA's are areas that must be maintained in at least fair ecological condition (semi-natural/moderately modified state) in order to support the ecological functioning of a Critical Biodiversity Area (CBA) or protected area or that play an important role in delivering ecosystem services (Collins, 2017).

b) Indicate and describe the habitat condition on site

Habitat Condition	Percentage of habitat condition class (adding up to 100%)	Description and additional Comments and Observations (including additional insight into condition, e.g. poor land management practises, presence of quarries, grazing, harvesting regimes etc).
Natural	**60%**	The assessment area falls inside the municipal urban edge with a portion zoned for development within the municipal Spatial Development Framework (SDF). A greater portion falls within the Mangaung MOSS. The majority of the site is in a natural undisturbed condition. Although this is the case, the assessment area will in the near future be completely isolated by existing and pending already authorised surrounding residential developments to the east, south and west. Its ecological connectivity to the broader surrounding undeveloped ecosystem will therefore be significantly compromised and it will effectively become an isolated ecological "island".
Near Natural (includes areas with low to moderate level of alien invasive plants)	**30%**	
Degraded (includes areas heavily invaded by alien plants)	**0%**	
Transformed (includes cultivation, dams, urban, plantation, roads, etc)	**10%**	

c) Complete the table to indicate:

(i) the type of vegetation, including its ecosystem status, present on the site; and

(ii) whether an aquatic ecosystem is present on site.

Terrestrial Ecosystems		Aquatic Ecosystems					
Ecosystem threat status as per the National Environmental Management: Biodiversity Act (Act No. 10 of 2004)	[redacted] **Least Threatened**	Wetland (including rivers, depressions, channelled and unchanneled wetlands, flats, seeps pans, and artificial wetlands)		Estuary		Coastline	
		YES	[redacted]		**NO**	[redacted]	**NO**

d) Please provide a description of the vegetation type and/or aquatic ecosystem present on site, including any important biodiversity features/information identified on site (e.g. threatened species and special habitats)

Terrestrial Ecosystem:

According to SANBI (2006-), the assessment area forms a mosaic of the Winburg Grassy Shrubland (Gh 7) and Bloemfontein Karroid Shrubland (Gh 8) vegetation types. Both of these vegetation types are classified as least threatened (SANBI, 2006-) but are under pressure in the Bloemfontein area due to their limited and confined presence and significant cultivation transformation and urbanisation expansion pressures.

The total proposed development footprint which will be transformed, is approximately 178 228 m^2 (17.82 ha) in size while the remaining approximate 95.48 ha of the assessment area will be left undeveloped in its current state.

Aquatic ecosystem:

The Present Ecological State (PES) of the perennial watercourse is classified as Class B as it is largely natural. A small change in natural habitats and biota may have taken place due to surrounding anthropogenic activities and disturbances but the ecosystem functionality has remained essentially unchanged. The Present Ecological State (PES) of the floodplains and grass and shrubland is classified as Class C as they are moderately modified. Moderate loss and transformation of natural habitat and biota have occurred due to anthropogenic activities and disturbances, but the basic ecosystem functionality has still remained predominantly unchanged.

The perennial watercourse forms an important part of the upper region of a quaternary surface water catchment and drainage area which regionally drains towards the north and eventually discharges into the Modder River. The watercourse also provides significant natural breeding, foraging and persistence habitat for a high diversity of specialised amphibian and aquatic avifaunal species. Important aquatic avifaunal species observed during the site visit include the Grey Heron (Ardea cinerea), White Faced Whistling Duck (Dendrocygna viduata), Lapwing species (Vanellus spp.), Bee-eater species (Merops spp.) & Kingfisher species which are all provincially protected.

SECTION C: PUBLIC PARTICIPATION

1. ADVERTISEMENT AND NOTICE

Publication name	**Volkblad Newspaper**	
Date published	**Thursday, 25 October 2018**	
Site notice position	**Latitude**	**Longitude**
Site Notice 1	**29° 3'17.45"S**	**26° 12'38.60"E**
Site Notice 2	**29° 4'25.66"S**	**26° 13'10.43"E**
Site Notice 3	**29° 4'11.11"S**	**26° 14'0.66"E**
Date placed	**23 October2018**	

Include proof of the placement of the relevant advertisements and notices in Appendix E1.

2. DETERMINATION OF APPROPRIATE MEASURES

Provide details of the measures taken to include all potential I&APs as required by Regulation 41(2)(e) and 41(6) of GN 326

Key stakeholders (other than organs of state) identified in terms of Regulation 41(2)(b) of GN 326

Title, Name and Surname	Affiliation/ key stakeholder status	Contact details (tel number or e-mail address)
Mr. Johan Pretorius	War Counsellor, Ward 48	Tel: 072 2260 222 E-mail: xgrafies@gmail.com
Mr. Deon Potgieter	Botanical Gardens(Lilyvale 16/2313)	Tel: 051-436 3530 E-mail: deonpotgieter@iclix.co.za
Mr. Deon Potgieter	Botanical Gardens (Bergendal 3/1706)	Tel: 051-436 3530 E-mail: deonpotgieter@iclix.co.za
Adv. JHS Hiemstra	Friends of the Seven Dams Conservancy	Tel: 084 253 0674 jounshiem@gmail.com
Lettie Fouché Sentrum	Lilyvale 26 and 11/2313	Tel: 051-436 6770 E-Mail: dawiehugo55@gmail.com
Mr. Solomon Zhu	Lenova Construction and Development (Pty) Ltd Lilyvale 33/2313	Tel: 076 1170 899 E-mail: solomonz@lenovaconstruction.co.za
Mr. C. Cooper	Mojalefa Trust (Portion 4 Bayswater 2865)	Tel: 051-448 0096 E-mail: supercooper@cktrust.co.za
Somerton Estate PTY Ltd	Somerton Estate (Penrose 1/2378	P.O. Box 13147 Northridge 9301
Mr. Koos Raubenheimer	Landowner of Cleveleys 2990	Proponent
Mr. Koos Raubenheimer	Landowner of Cerillion 2766	Proponent

P.G. De Bruyn	Penrose 2378	P.O. Box 27991 Danhof 9310
Jurgens JW Stuhlinger (Jumali Investments Pty Ltd)	Die Kloof 2921	P.O. Box 763 Cape Town 8000 info@pands.co.za

Include proof that the key stakeholder received written notification of the proposed activities as Appendix E2. This proof may include any of the following:

- e-mail delivery reports;
- registered mail receipts;
- courier waybills;
- signed acknowledgements of receipt; and/or
- or any other proof as agreed upon by the competent authority.

3. ISSUES RAISED BY INTERESTED AND AFFECTED PARTIES

Summary of main issues raised by I&APs	Summary of response from EAP
To be submitted with final report	To be submitted with final report

4. COMMENTS AND RESPONSE REPORT

The practitioner must record all comments received from I&APs and respond to each comment before the Draft BAR is submitted. The comments and responses must be captured in a comments and response report as prescribed in the EIA regulations and be attached to the Final BAR as Appendix E3.

5. AUTHORITY PARTICIPATION

Authorities and organs of state identified as key stakeholders:

Authority/Organ of State	Contact person (Title, Name and Surname)	Tel No	Fax No	e-mail	Postal address
SAHRA	Mr. Andrew Salomon	021-462 4502	021-462 4549	asalomon@sahra.org.za	P.O. Box 4637 Cape Town 8000
FS-SAHRA	Ntando Mbatha	074 945 3255	-	Mbatha.npz@sacr.fs.gov.za	C/o Henry & East Burger Street Business Partner Building Office 307 Bloemfontein, 9301
Department of Police, Roads and Transport	Mr. Hannes Maree	051-409 8275	086 2757 39	mareeh@freetrans.gov.za	
CENTLEC (Planning)	Mr. Kobus Booysen	051-409 2252	-	Kobus.booysen@centlec.co.za	195 Nelson Mandela Drive Telkom Building

Department of Water and Sanitation- Free State	Mr. TP Ntili	051-405 9281	-	ntilit@dwa.gov.za	PO Box 528 Bloemfontein 9300
Department of Agriculture , Forestry and Fisheries	Mr. Jack Morton	051-861 8369	086 234 6758	jack@fs.agric.za	Private Bag X01 Glen Bloemfontein 9360
Mangaung Metropolitan Municipality (Town Planning)	Mr. Collin Dihemo	051-405 8740	051-405 8707	collin.dihemo@mangaung.co.za	P O Box 3704 Bloemfontein 9300
Mangaung Metropolitan Municipality (Infrastructure)	Mr. G. Fritz	051-405 8577	051-405 8707	Gerhard.fritz@mangaung.co.za	P O Box 3704 Bloemfontein 9300
Mangaung Metropolitan Municipality (Environmental Management)	Ms. Mpolokeng Kolobe	051- 405 8577	-	mpolokeng.kolobe@mangaung.co.za	Room 1017 10th Floor Bram Fischer's Building Bloemfontein

Include proof that the Authorities and Organs of State received written notification of the proposed activities as appendix E4.

In the case of renewable energy projects, Eskom and the SKA Project Office must be included in the list of Organs of State.

6. CONSULTATION WITH OTHER STAKEHOLDERS

Note that, for any activities (linear or other) where deviation from the public participation requirements may be appropriate, the person conducting the public participation process may deviate from the requirements of that sub-regulation to the extent and in the manner as may be agreed to by the competent authority.

Proof of any such agreement must be provided, where applicable. Application for any deviation from the regulations relating to the public participation process must be submitted prior to the commencement of the public participation process.

A list of registered I&APs must be included as appendix E5.

Copies of any correspondence and minutes of any meetings held must be included in Appendix E6.

SECTION D: IMPACT ASSESSMENT

The assessment of impacts must adhere to the minimum requirements in the EIA Regulations, 2014 as amended and should take applicable official guidelines into account. The issues raised by interested and affected parties should also be addressed in the assessment of impacts.

1. IMPACTS THAT MAY RESULT FROM THE PLANNING AND DESIGN, CONSTRUCTION, OPERATIONAL, DECOMMISSIONING AND CLOSURE PHASES AS WELL AS PROPOSED MANAGEMENT OF IDENTIFIED IMPACTS AND PROPOSED MITIGATION MEASURES

Provide a summary and anticipated significance of the potential direct, indirect and cumulative impacts that are likely to occur as a result of the planning and design phase, construction phase, operational phase, decommissioning and closure phase, including impacts relating to the choice of site/activity/technology alternatives as well as the mitigation measures that may eliminate or reduce the potential impacts listed. This impact assessment must be applied to all the identified alternatives to the activities identified in Section A(2) of this report.

Identifies Impact- Construction Phase

	Assessment Area	No go alternative
Identified Environmental Impact	**Transformation of terrestrial and aquatic vegetation on the assessment area associated with the Winburg Grassy Shrubland (Gh7), the Bloemfontein Karroid Shrubland (Gh8), Riparian zone, and floodplain vegetation. Residential footprint size that will affect the Winburg Grassy Shrubland equates to 5.59ha. Residential footprint size that will affect the Bloemfontein Karroid Shrubland equates to 1.08ha. 0.3ha of floodplain area will be affected by the proposed agricultural garden footprint.**	
Magnitude of Negative or Positive Impact	Medium (6)	-
Duration of Negative or Positive Impact	Long term (4)	-
Extent of Positive or Negative Impact	Local (2)	-
Irreplaceability of Natural Resources being impacted upon	Low (2)	-
Reversibility of Impact	Low (4)	-
Probability of Impact Occurrence	High (4)	-
Cumulative Impact Rating prior to mitigation	Medium	-
Environmental Significance Score and Rating prior to mitigation	Medium (72)	-
Mitigation Measures to be implemented	• The proposed development must be specifically focussed within the footprint areas. • The project construction footprints must be kept as small as practicably possible to reduce the actual surface impact on vegetation and no unnecessary / unauthorised footprint expansion into the surrounding areas may take place. • The proposed development must refrain from encroaching into- and significantly impacting on the remaining cultural / historical structures identified. • No site construction camps to be established within the surrounding natural areas outside the project footprint areas. If site camps are required outside the project footprint areas, they must be set up within the associated road network footprints so as not to impact on the surrounding natural vegetation.	

	Assessment Area	No go alternative
	• Adequately fence off the construction areas and ensure that no construction activities, machinery or equipment operate or impact outside the fenced off areas. • Existing roads and dirt tracks in close proximity to the proposed project area must be used during construction. No new roads or dirt tracks to be constructed or implemented outside the fenced off construction areas. • Adequate operational procedures for machinery and equipment must be developed in order to strictly govern movement of machinery only within project footprint areas and ensure environmentally responsible construction practices and activities. • An Environmental Control Officer (ECO) must be present on site during all construction activities in order to monitor the construction phase and ensure environmentally responsible construction practices and activities are adhered to.	
Cumulative Impact Rating after mitigation implementation	Low	-
Environmental Significance Score and Rating after mitigation implementation	Low (45)	-

	Assessment Area	No go alternative
Identified Environmental Impact	**Terrestrial and aquatic alien invasive species establishment.**	
Magnitude of Negative or Positive Impact	Medium (6)	-
Duration of Negative or Positive Impact	Short term (2)	-
Extent of Positive or Negative Impact	Local (2)	-
Irreplaceability of Natural Resources being impacted upon	Moderate (3)	-
Reversibility of Impact	High (2)	-
Probability of Impact Occurrence	Medium (3)	-
Cumulative Impact Rating prior to mitigation	Low	-
Environmental Significance Score and Rating	Low (45)	-

	Assessment Area	No go alternative
prior to mitigation		
Mitigation Measures to be implemented	• Alien invasive species individuals currently on site must be actively eradicated from the assessment area and adequately disposed of in accordance with the National Environmental Management: Biodiversity Act (Act 10 of 2004); Alien and Invasive Species Regulations, 2014. • An active alien invasive species clearance and eradication initiative must be implemented for the improvement of the perennial watercourse ecological integrity. • Implement an adequate Alien Invasive Species Establishment Management and Prevention Plan during the construction phase. Such a management plan must be compiled by a suitably qualified and experienced ecologist. • Areas within and immediately surrounding the proposed development footprints must be adequately rehabilitated as soon as practicably possible after construction in order to prevent significant alien invasive species establishment. • Adequately fence off the construction areas and ensure that no construction activities, machinery or equipment operate or impact outside the fenced off areas. • Existing roads and dirt tracks in close proximity to the proposed project area must be used during construction. No new roads or dirt tracks to be constructed or implemented outside the fenced off construction areas.	
Cumulative Impact Rating after mitigation implementation	Low	-
Environmental Significance Score and Rating after mitigation implementation	Low (12)	-

	Assessment Area	No go alternative
Identified Environmental Impact	**Surface material erosion.**	
Magnitude of Negative or Positive Impact	Medium (6)	-
Duration of Negative or Positive Impact	Short term (2)	-

	Assessment Area	No go alternative
Extent of Positive or Negative Impact	Local (2)	-
Irreplaceability of Natural Resources being impacted upon	Moderate (3)	-
Reversibility of Impact	High (2)	-
Probability of Impact Occurrence	Medium (3)	-
Cumulative Impact Rating prior to mitigation	Low	-
Environmental Significance Score and Rating prior to mitigation	Low (45)	-
Mitigation Measures to be implemented	• An adequate Storm Water and Erosion Management Plan must be implemented for the entire assessment area during the construction phase. This must be done to sufficiently manage storm water runoff in order to prevent any significant erosion from occurring. • Areas within and immediately surrounding the proposed development footprints must be adequately rehabilitated as soon as practicably possible after construction in order to prevent significant erosion.	
Cumulative Impact Rating after mitigation implementation	Low	-
Environmental Significance Score and Rating after mitigation implementation	Low (12)	-

	Assessment Area	No go alternative
Identified Environmental Impact	**Dust generation and emissions.**	
Magnitude of Negative or Positive Impact	Low (4)	-
Duration of Negative or Positive Impact	Short term (2)	-
Extent of Positive or Negative Impact	Local (2)	-
Irreplaceability of Natural Resources being impacted upon	Moderate (3)	-
Reversibility of Impact	High (2)	-

	Assessment Area	No go alternative
Probability of Impact Occurrence	Medium (3)	-
Cumulative Impact Rating prior to mitigation	Low	-
Environmental Significance Score and Rating prior to mitigation	Low (39)	-
Mitigation Measures to be implemented	• Implement suitable dust management and prevention measures during the construction phase. • Construction roads and camps must be adequately wetted-down on a continual basis. • The water being used for wetting-down areas must be of sufficient quality in order to prevent significant contamination of the surrounding areas. • Areas within and immediately surrounding the proposed development footprints must be adequately rehabilitated as soon as practicably possible after construction in order to prevent significant dust emissions.	
Cumulative Impact Rating after mitigation implementation	Low	-
Environmental Significance Score and Rating after mitigation implementation	Low (10)	-

	Assessment Area	No go alternative
Identified Environmental Impact	**Impeding of the perennial watercourse catchment area and flow regime.**	
Magnitude of Negative or Positive Impact	Medium (6)	-
Duration of Negative or Positive Impact	Short term (2)	-
Extent of Positive or Negative Impact	Regional (3)	-
Irreplaceability of Natural Resources being impacted upon	High (4)	-
Reversibility of Impact	Moderate (3)	-
Probability of Impact Occurrence	High (4)	-
Cumulative Impact Rating prior to mitigation	Medium	-

	Assessment Area	No go alternative
Environmental Significance Score and Rating prior to mitigation	Medium (72)	-
Mitigation Measures to be implemented	• The delineated watercourse dissecting the assessment area, must be adequately buffered out during the construction phase to keep construction activities from encroaching riparian areas. • The proposed development must be focussed within the recommended development areas. • The project construction footprints must be kept as small as practicably possible to reduce the actual surface impact on vegetation and no unnecessary / unauthorised footprint expansion into the surrounding areas may take place. • An adequate Storm Water and Erosion Management Plan must be implemented for the entire assessment area during the construction phase. This must be done to ensure and sufficiently manage storm water runoff quality, quantities and flow speed towards the watercourses in order to maintain their ecological functionality and integrity. • Development and layout designs for the proposed project should include adequate storm water management measures to ensure that sufficient volumes and quality of surface water runoff from the footprint area is still channelled back into the watercourse. This must be done in order to maintain the ecological functionality and integrity of the broader surface water catchment and drainage area. • A Water Use License Application (WULA) must be submitted to the Department of Water and Sanitation if required in accordance with the National Water Act (No. 36 of 1998) (NWA).	
Cumulative Impact Rating after mitigation implementation	Low	-
Environmental Significance Score and Rating after mitigation implementation	Low (28)	-

	Assessment Area	No go alternative

	Assessment Area	No go alternative
Identified Environmental Impact	**Contamination of the perennial watercourse and subsequent downstream watercourses.**	
Magnitude of Negative or Positive Impact	Medium (6)	-
Duration of Negative or Positive Impact	Short term (2)	-
Extent of Positive or Negative Impact	Regional (3)	-
Irreplaceability of Natural Resources being impacted upon	High (4)	-
Reversibility of Impact	Low (4)	-
Probability of Impact Occurrence	High (4)	-
Cumulative Impact Rating prior to mitigation	Medium	-
Environmental Significance Score and Rating prior to mitigation	Medium-High (76)	-
Mitigation Measures to be implemented	• The perennial watercourse dissecting the assessment area, must be adequately buffered out of the proposed development footprint during the construction phase. • A minimum 30m construction buffer area must be implemented around the watercourse. • The proposed development must be focussed within the recommended development area. • The project construction footprints must be kept as small as practicably possible to reduce the actual surface impact on vegetation and no unnecessary / unauthorised footprint expansion into the surrounding areas may take place. • An adequate Storm Water and Erosion Management Plan must be implemented for the entire assessment area during the construction phase. This must be done to ensure and sufficiently manage storm water runoff, clean / dirty water separation and erosion towards the watercourses in order to maintain their ecological functionality and integrity. • Development and layout designs for the proposed project should include adequate storm water management measures to ensure that sufficient volumes and quality of surface water runoff from the footprint area is still channelled back into the watercourse. This must be done in order to maintain the ecological functionality and integrity of the broader surface water catchment and drainage area.	

	Assessment Area	No go alternative
	• A comprehensive South African Scoring System 5 (SASS 5) aquatic bio-monitoring assessment must be conducted of the watercourses directly downstream of the proposed project area prior to commencement of the construction phase. This information will serve as baseline wetland health data to be used for subsequent monitoring assessments to be conducted. Such an assessment must be conducted by a suitably qualified and experienced ecologist. • Water samples of the watercourses must be collected directly downstream of the proposed project area prior to commencement of the construction phase. The quality of these samples must be chemically and biologically analysed by an accredited laboratory in order to serve as baseline water quality data to be used for subsequent monitoring assessments to be conducted. • If hydrocarbons or other chemicals are to be stored on site during the construction phase, the storage areas must be situated as far away as practicably possible from the watercourses and buffer zone. • Hydrocarbon and other chemical storage areas must be adequately bunded in order to be able to contain a minimum of 150% of the capacity of storage tanks / units. • Adequate hydrocarbon and other chemical storage, handling and usage procedures must be developed and all relevant construction personnel must be sufficient trained on- and apply these procedures during the entire construction phase. • Process water, waste water and any other chemical / artificial by-products must be adequately contained and disposed of in a lawful and environmentally responsible manner. • No process water or any form of contaminated waste water or any other chemical / artificial by-products resulting from any construction activities is allowed to be unlawfully discharged directly or indirectly into any watercourses or wetland area. If any form of process- or waste water or any other chemical / artificial by-products needs to be discharged into any watercourses or wetland area, this must be lawfully done in accordance with all relevant legal requirements and the quality of the water must continuously meet legal discharge quality and quantity standards.	

	Assessment Area	No go alternative
	• A Water Use License Application (WULA) must be submitted to the Department of Water and Sanitation if required in accordance with the National Water Act (No. 36 of 1998) (NWA).	
Cumulative Impact Rating after mitigation implementation	Low	-
Environmental Significance Score and Rating after mitigation implementation	Low (30)	-

Identifies Impacts- Operational Phase

	Assessment Area	No go alternative
Identified Environmental Impact	**Continued impeding of the perennial watercourse catchment area and flow regime.**	
Magnitude of Negative or Positive Impact	High (8)	-
Duration of Negative or Positive Impact	Long term (4)	-
Extent of Positive or Negative Impact	Regional (3)	-
Irreplaceability of Natural Resources being impacted upon	High (4)	-
Reversibility of Impact	Low (4)	-
Probability of Impact Occurrence	High (4)	-
Cumulative Impact Rating prior to mitigation	Medium	-
Environmental Significance Score and Rating prior to mitigation	Medium-High (92)	-
Mitigation Measures to be implemented	• An adequate Storm Water and Erosion Management Plan must be implemented for the entire assessment area during the operational phase. This must be done to ensure and sufficiently manage storm water runoff quality, quantities and flow speed towards the watercourses in order to maintain their ecological functionality and integrity. • Development and layout designs for the proposed project should include adequate storm	

	Assessment Area	No go alternative
	water management measures to ensure that sufficient volumes and quality of surface water runoff from the footprint area is still channelled back into the watercourse. This must be done in order to maintain the ecological functionality and integrity of the broader surface water catchment and drainage area. • The footprint positions of residential unit's 45-47 positions must be located on the very edge of the riparian zone in the three identified areas where slight disturbance has already taken place. Furthermore, the construction of these three residential units must be on stable barrel vault raft concrete slabs at an average height of 1500 mm above the natural ground level to allow for unimpeded natural flow of the watercourse with minimal interference to the existing vegetation or movement of amphibians and aquatic insects. Interference with the natural vegetation and/or artificial planting (gardening) beyond the perimeter of the residential unit will be strictly prohibited. Building activities will also be restricted to predetermined demarcated areas during construction so as not to significantly impact on the natural flow of the watercourse or natural vegetation. (Lampbrecht, 2018)	
Cumulative Impact Rating after mitigation implementation	Low	-
Environmental Significance Score and Rating after mitigation implementation	Low (38)	-

	Assessment Area	No go alternative
Identified Environmental Impact	**Continued contamination of the perennial watercourse and subsequent downstream watercourses.**	
Magnitude of Negative or Positive Impact	Very high (8)	-
Duration of Negative or Positive Impact	Long term (3)	-
Extent of Positive or Negative Impact	Regional (3)	-
Irreplaceability of Natural Resources being impacted upon	High (4)	-
Reversibility of Impact	Low (4)	-
Probability of Impact Occurrence	High (4)	-
Cumulative Impact Rating prior to mitigation	Medium-high	-
Environmental Significance Score and Rating prior to mitigation	Medium -high (88)	-
Mitigation Measures to be implemented	• An adequate Storm Water and Erosion Management Plan must be implemented for the entire assessment area during the operational phase. This must be done to ensure and sufficiently manage storm water runoff and clean / dirty water separation towards the watercourses in order to maintain their ecological functionality and integrity. • Development and layout designs for the proposed project should include adequate storm water management measures to ensure that sufficient volumes and quality of surface water runoff from the footprint area is still channelled back into the watercourse. This must be done in order to maintain the ecological functionality and integrity of the broader surface water catchment and drainage area. • A comprehensive South African Scoring System 5 (SASS 5) aquatic bio-monitoring assessment must be conducted of the watercourses directly downstream of the proposed project area on an annual basis in order to ensure that the ecological functionality and integrity of the watercourses is maintained. This information must then be compared to the baseline data collected during the initial assessment prior to the commencement of the construction phase. Such an assessment must be conducted by a suitably qualified and	

	Assessment Area	No go alternative
	experienced ecologist. • Water sample chemical and biological analyses of the watercourses directly downstream of the proposed project area must be continually conducted on a 6-month basis in order to ensure that the water quality of the watercourses is maintained. This information must then be compared to the baseline data collected during the initial analyses prior to the commencement of the construction phase. • If any reduction in wetland health, SASS 5 scores or chemical and biological water quality is determined due to the project, the competent authority must immediately be notified and the necessary steps must be followed by the project owner to locate and remediate the source of contamination / health reduction as soon as practicably possible. • If hydrocarbons or other chemicals are to be stored on site during the operational phase, the storage areas must be situated as far away as practicably possible from the watercourses and buffer zone. • Hydrocarbon and other chemical storage areas must be adequately bunded in order to be able to contain a minimum of 150% of the capacity of storage tanks / units. • Adequate hydrocarbon and other chemical storage, handling and usage procedures must be developed and all relevant operational personnel must be sufficient trained on- and apply these procedures during the entire operational phase. • Process water, waste water and any other chemical / artificial by-products must be adequately contained and disposed of in a lawful and environmentally responsible manner. • No process water or any form of contaminated waste water or any other chemical / artificial by-products resulting from any operational activities is allowed to be unlawfully discharged directly or indirectly into any watercourses or wetland area. If any form of process- or waste water or any other chemical / artificial by-products needs to be discharged into any watercourses or wetland area, this must be lawfully done in accordance with all relevant legal requirements and the quality of the water must continuously meet legal discharge quality and quantity standards. • Chemical and biological analyses of process water, waste water and any other chemical /	

	Assessment Area	No go alternative
	artificial by-products to be discharged into any watercourses or wetland area must be continually conducted on a weekly basis in order to ensure that the quality and quantity standards of all discharges are legal and environmentally responsible.	
Cumulative Impact Rating after mitigation implementation	Low	-
Environmental Significance Score and Rating after mitigation implementation	Low (34)	-

	Assessment Area	No go alternative
Identified Environmental Impact	**Disruption of nocturnal faunal activities through noise and lighting emissions.**	
Magnitude of Negative or Positive Impact	Low (4)	-
Duration of Negative or Positive Impact	Long term (4)	-
Extent of Positive or Negative Impact	Local (2)	-
Irreplaceability of Natural Resources being impacted upon	Low (2)	-
Reversibility of Impact	High (4)	-
Probability of Impact Occurrence	Low (2)	-
Cumulative Impact Rating prior to mitigation	Low	-
Environmental Significance Score and Rating prior to mitigation	Low (32)	-
Mitigation Measures to be implemented	• Lighting and illumination infrastructure technology and layout designs must be done in an environmentally friendly manner. • The minimum amount of lighting and illumination infrastructure which is practicably possible for operations to function at, must be utilised during night time. • Lighting and illumination infrastructure must as far as practicably possible be directed at low shining angles towards the ground and towards the inner portions of the development areas in order to reduce the amount of bright light being emitted into the surrounding	

	Assessment Area	No go alternative
	adjacent areas. • Lower shining intensity environmentally friendly lighting products must be utilised in order to reduce the brightness of light being emitted into the surrounding adjacent areas. • Adequate design, technology and operational mitigation measures must be implemented in order to reduce the amount of night time noise being emitted from the operational activities as far as practicably possible.	
Cumulative Impact Rating after mitigation implementation	Low	-
Environmental Significance Score and Rating after mitigation implementation	Low (16)	-

Cumulative impacts

Cumulative impacts include creation of permanent employment and development opportunities for members from the local community. This will create an addition and cumulative impact on the employment opportunities in the area. Whilst the additional impact might be minor it will be long term in nature and will contribute to the reduction of unemployment figures for Mangaung.

Assessment of no-go alternative

It has been determined following an assessment of potential environmental impacts associated with the project that the potential negative impacts associated with the proposed Estate development can be mitigated to within acceptable levels (i.e. low significance) with the application of appropriate mitigation measures. In the event that the Estate is not constructed, the objectives associated with the development of an environmental friendly estate will not be realised. These include:

The economic benefits associated with the development outweigh the benefits associated with the current activities occurring onsite. From an economical perspective the estate will generate revenue for the Mangaung Metro on a continual basis. It is therefore recommended that the "no-go" alternative not be considered a viable option in terms of economical sustainability.

A complete impact assessment in terms of Regulation 19(3) of GN 326 must be included as Appendix F.

Description of key assumptions and knowledge gaps

In undertaking this investigation and compiling the Basic Assessment Report, it has been assumed that:

- The information provided by the project proponent and specialists is accurate and unbiased.
- The scope of this investigation is limited to assessing the environmental impacts associated with the proposed development of a Residential Estate and associated infrastructure.
- Should the proposed project be authorised, the Proponent will incorporate the recommendations and mitigation measures outlined in the specialists' investigations and the final BAR for the Dawn Valley Residential Estate.

2. ENVIRONMENTAL IMPACT STATEMENT

Taking the assessment of potential impacts into account, please provide an environmental impact statement that summarises the impact that the proposed activity and its alternatives may have on the environment after the management and mitigation of impacts have been taken into account, with

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

Alternative A (preferred alternative) Site Layout Alternative

Based on the nature and extent of the proposed project, the local level of disturbance predicted as part of the estate and associated infrastructure, the findings of the BAR, and the understanding of potential environmental impacts, it is the opinion of the EIA project team that environmental impacts associated with the application for EA for the proposed development of an residential estate on the preferred project site can be mitigated to an acceptable level.

The following conditions would require being included within an authorisation issued for the project.

- Recommendations and mitigation measures contained within this BAR and the specialist studies attached as **Appendix D** must be implemented.
- Once finalised the EMPr contained within **Appendix G** of this BAR should form part of the contract with the contractors appointed work in the area and will be used to ensure compliance with environmental specifications and management measures. The implementation of this EMPr is considered key in achieving the appropriate environmental management standards as detailed for this project.
- Applications for all other relevant and required permits / licences / agreement required to be obtained by Proponent must be obtained from the relevant regulating authorities.
- During construction, unnecessary disturbance to habitats should be strictly controlled and the footprint of the impact should be kept to a minimum and disturbed areas should be rehabilitated as quickly as possible.

Alternative B

-

Alternative C

-

No-go alternative (compulsory)

It has been determined following an assessment of potential environmental impacts associated with the project that the potential negative impacts associated with the proposed Estate development can be mitigated to within acceptable levels (i.e. low significance) with the application of appropriate mitigation measures. In the event that the Estate is not constructed, the objectives associated with the development of an environmental friendly estate will not be realised. These include:

The economic benefits associated with the development outweigh the benefits associated with the current activities occurring onsite. From an economical perspective the estate will

generate revenue for the Mangaung Metro on a continual basis. It is therefore recommended that the "no-go" alternative not be considered a viable option in terms of economical sustainability.

SECTION E. RECOMMENDATION OF PRACTITIONER

Is the information contained in this report and the documentation attached hereto sufficient to make a decision in respect of the activity applied for (in the view of the environmental assessment practitioner)?	YES	

If "NO", indicate the aspects that should be assessed further as part of a Scoping and EIA process before a decision can be made (list the aspects that require further assessment).

N/A

If "YES", please list any recommended conditions, including mitigation measures that should be considered for inclusion in any authorisation that may be granted by the competent authority in respect of the application.

- All mitigation measures listed in the BAR as well as the EMPr must be implemented and adhered to.
- The monitoring of the construction site must be carried out by a qualified Environmental Compliance Officer (ECO) with proven expertise in the field so as to ensure compliance to the Environmental Management Programme (EMPr)
- Mitigation measures and strict waste management should ensure the prevention of contamination on site.
- Construction activities should be done in accordance with best practice and standards for construction and installation of infrastructure and building of structures.
- Construction activities should be limited to the designated construction areas.
- No vehicles should drive outside the restricted construction sites.
- Restrict all habitat loss and disturbances from construction activities to within the proposed and agreed upon site layout.
- Hunting should be prohibited; the removal of indigenous vegetation should not take place under any circumstances.
- Alien vegetation should be removed from site, and immediately be carted off to a dumping site.
- Workers should have "toolbox talks" in order to differentiate between indigenous and alien vegetation.
- During construction there should be adherence towards noise regulations, work should only be done during the day time.
- Ensure that flammable materials are stored in an appropriate safe house. Ensure that there are appropriate control measures in place for any accidental fires.
- Erosion control measures must be implemented.
- Proper waste management need to be carried out, with waste being removed on a weekly basis.

Is an EMPr attached?	YES	

The EMPr must be attached as Appendix G.

The details of the EAP who compiled the BAR and the expertise of the EAP to perform the Basic Assessment process must be included as Appendix H.

If any specialist reports were used during the compilation of this BAR, please attach the declaration of interest for each specialist in Appendix I.

Any other information relevant to this application and not previously included must be attached in Appendix J.

Conclusion and recommendations

The findings of the studies undertaken within this EIA to assess both the benefits and potential negative impacts anticipated from the proposed development of a residential estate conclude that:

- There are no environmental fatal flaws that should prevent the proposed development of an residential estate, provided that:
  - The recommendations provided are considered.
  - The recommended mitigation and management measures in the EIA and EMPr are implemented and given due consideration during the formalisation process.
  - The required additional capacity for bulk service supply is made available by the municipality to fully cater for the requirements of the project (this can however be implemented across a phased development approach).
- The cumulative significance of all the negative potential impacts on the natural environment is considered low.
- The social significance is seen as positive based on the fact that the development of the estate is likely to contribute towards socio-economic upliftment within the region.
- The development erven has been carefully selected to be on areas previously disturbed or transformed, in order to avoid sensitive areas.
- Vegetation will only be disturbed if the required approvals from the body-corporate are given, and only through professional supervision.
- Only one spruit crossing is proposed and will be through a ground level design.
- Architectural guidelines have been established to minimise the possible impacts associated with building design and construction.
- The design and layout of internal streets and services have been done ways to minimise impact on the natural environment. Services will be placed non-sensitive corridors, while even the emergency water storage facility be constructed underground, to curb against visual intrusion.

_____

NAME OF EAP

_____ _____

SIGNATURE OF EAP DATE

SECTION F: APPENDIXES

The following appendixes must be attached:

Appendix A: Maps

Appendix B: Photographs

Appendix C: Facility illustration(s)

Appendix D: Specialist reports (including terms of reference)

Appendix E: Public Participation

Appendix F: Impact Assessment

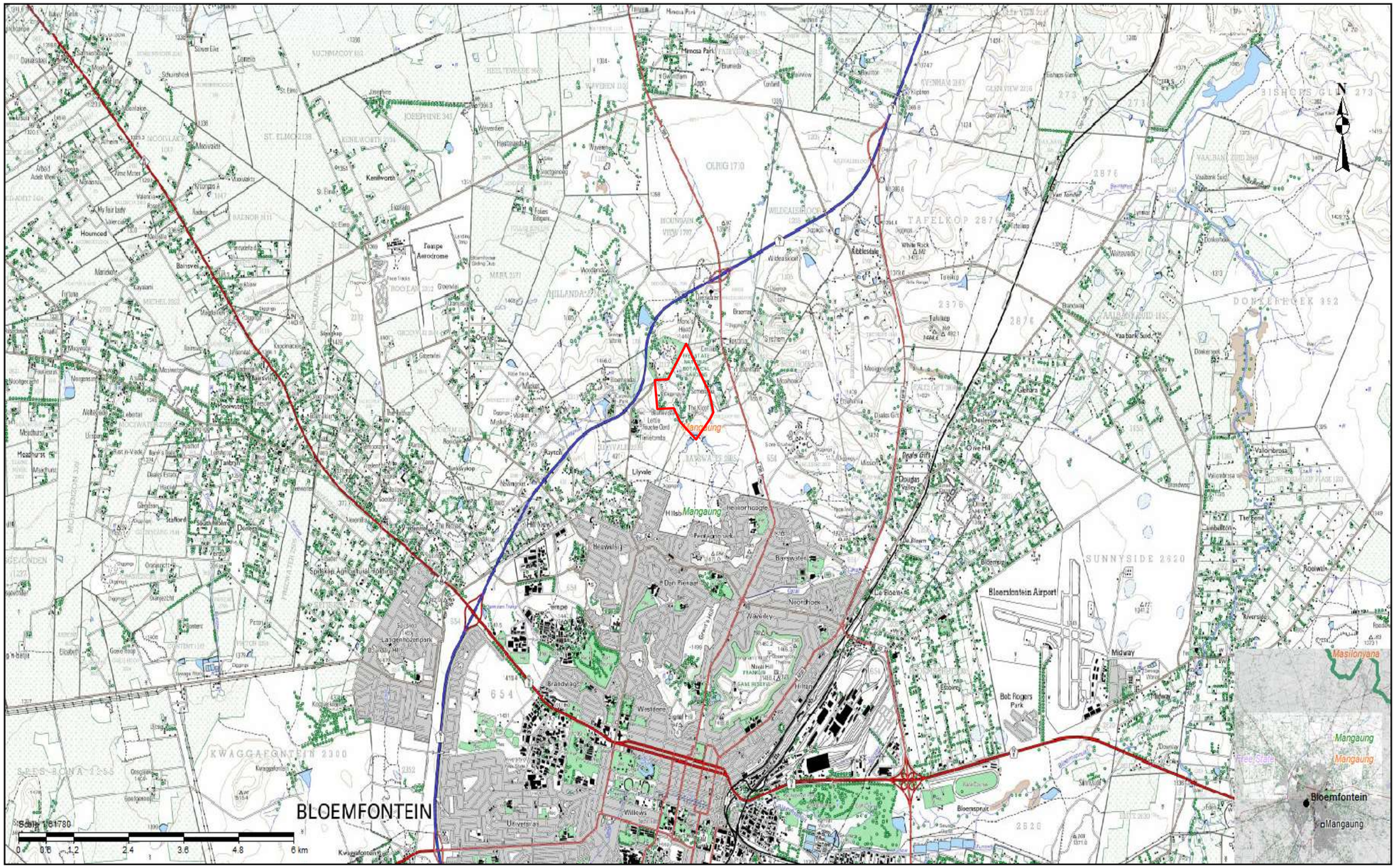
Appendix G: Environmental Management Programme (EMPr)

Appendix H: Details of EAP and expertise

Appendix I: Specialist's declaration of interest

Appendix J: Additional Information

Appendix: A
Maps



Legend

- Local Municipal Boundaries
- National Routes
- Main Arterial Routes
- Railways
- Existing High Voltage Power Lines (>=132kV)
- Major Rivers
- Urban/Built-Up Areas
- Waterbodies / Wetlands
- **Site**

Map 7: Location Map of development site

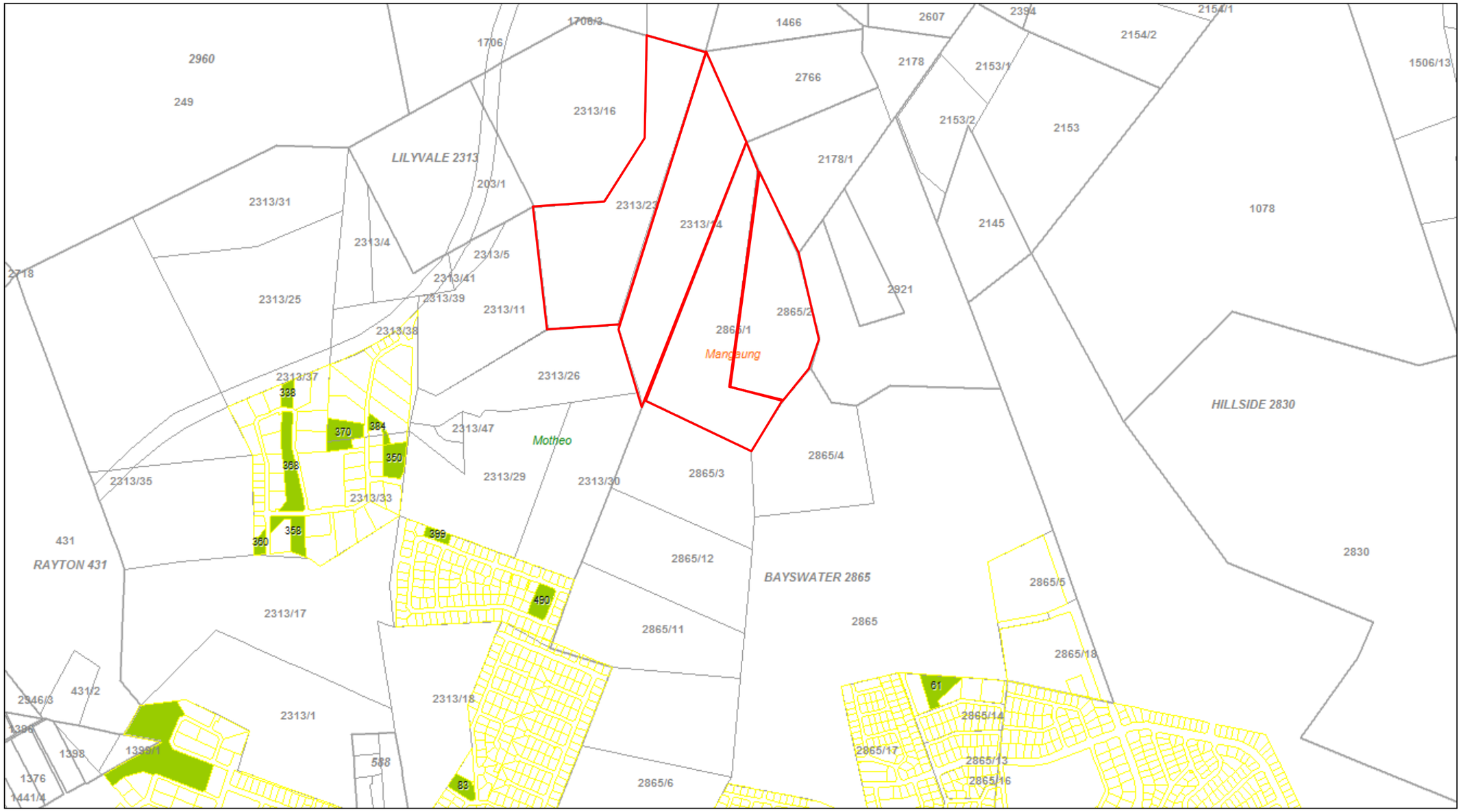
Plan No.:
30/2018/Dawn Valley Estate

(not to scale)

Green-Box Consulting

P.O. Box 37738
Langenhovenpark
9330
Tel: 0824352108

GREEN-BOX CONSULTING
INTEGRATED ENVIRONMENTAL MANAGEMENT



Site: Portion 14 of the farm Lilyvale 2313 of Tempe 2277, Portion 23 of Lilyvale 2313, and Portions 1 and 2 of the farm Bayswater 2865

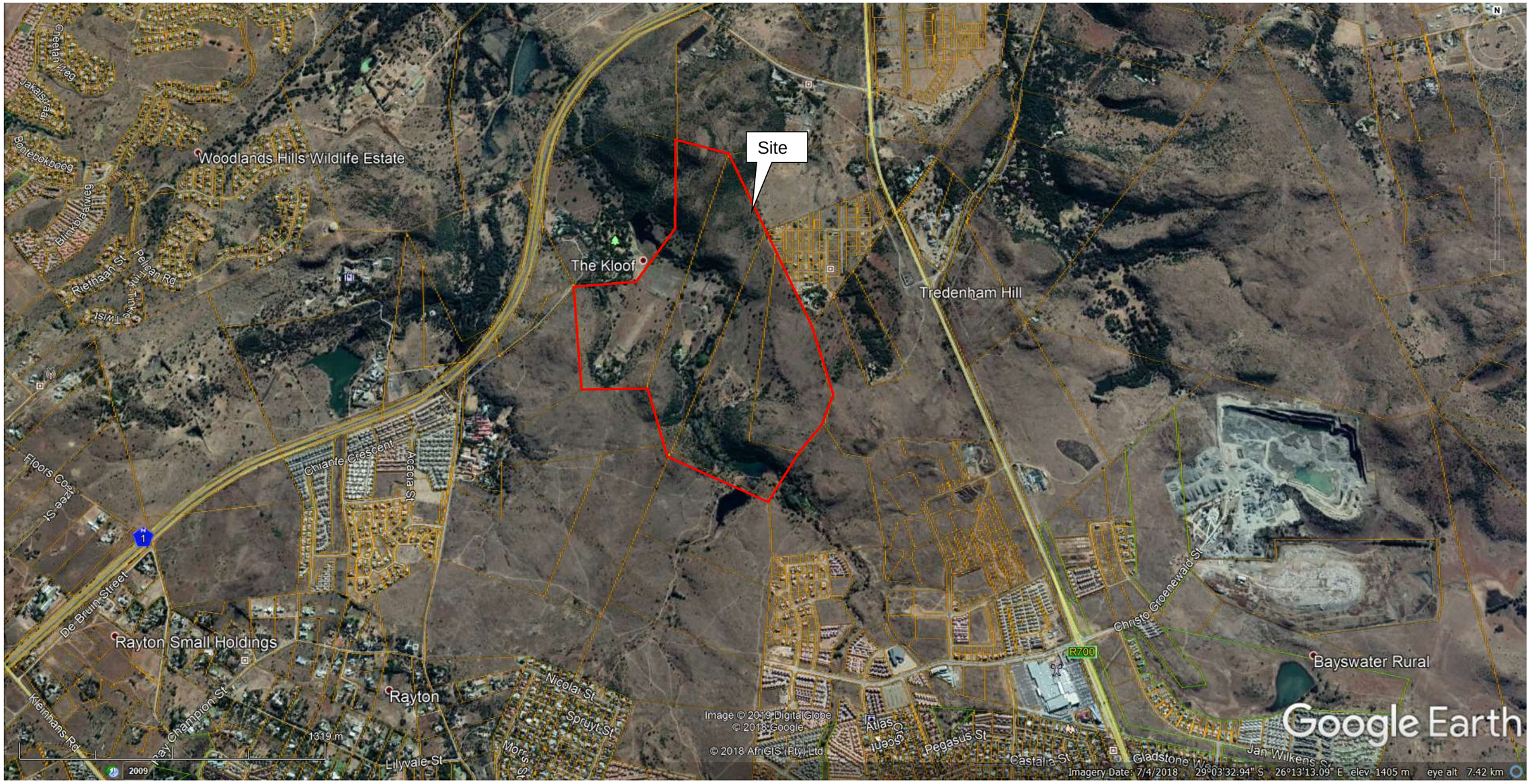
Size: 113ha
GPS: middle point 26.2188212, -29.0591707
2926AA - Bloemfontein

Map 8: CADASTRAL MAP

1:50 000 Topo Cadastral Map
(Planet GIS, 2017)
Map no.: 31/2018/Dawn Valley Estate

Map compiled by:

Green-Box Consulting
P.O. Box 37738
Langenhovenpark, 9330



Site: Portion 14 of the farm Lilyvale 2313 of Tempe 2277, Portion 23 of Lilyvale 2313, and Portions 1 and 2 of the farm Bayswater 2865

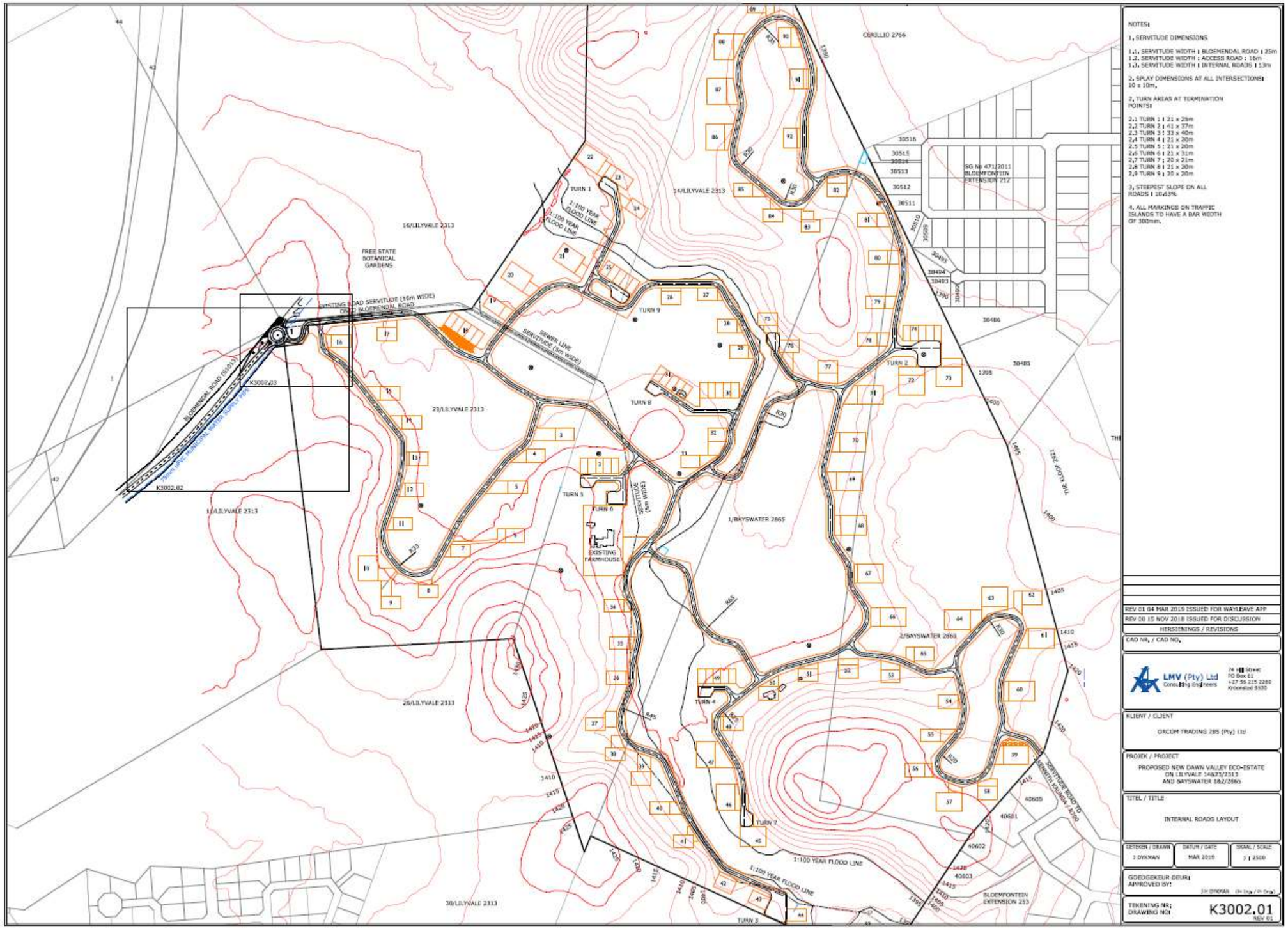
Map 9: GOOGLE EARTH IMAGE

October 2018
Map no.: 32/2018/Dawn Valley Estate

Map compiled by:

Green-Box Consulting
P.O. Box 37738
Langenhovenpark, 9330

Map 10: Master layout plan



Map 11: Internal road layout

Appendix B
Photographs

Photo 1: Portion 23 of Lilyvale towards the north

Photo2: Portion 23 Dam connected with Botanical Gardens

Photo 3: Portion 23 view towards the south

Photo 4: Portion 23 old concrete farm dam, amongst Olienhout trees

Photo 5: Portion 23 panoramic view towards the south

Photo 6: Portion 23 panoramic view towards the North east with old quarry in foreground

Photo 7: Riparian zone with watercourse Portion 1, Bayswater

Photo 8: Dam Portion 1

Photo 9: Ridge, koppie in background Portion 1)

Photo 10: Floodplain Portion 1

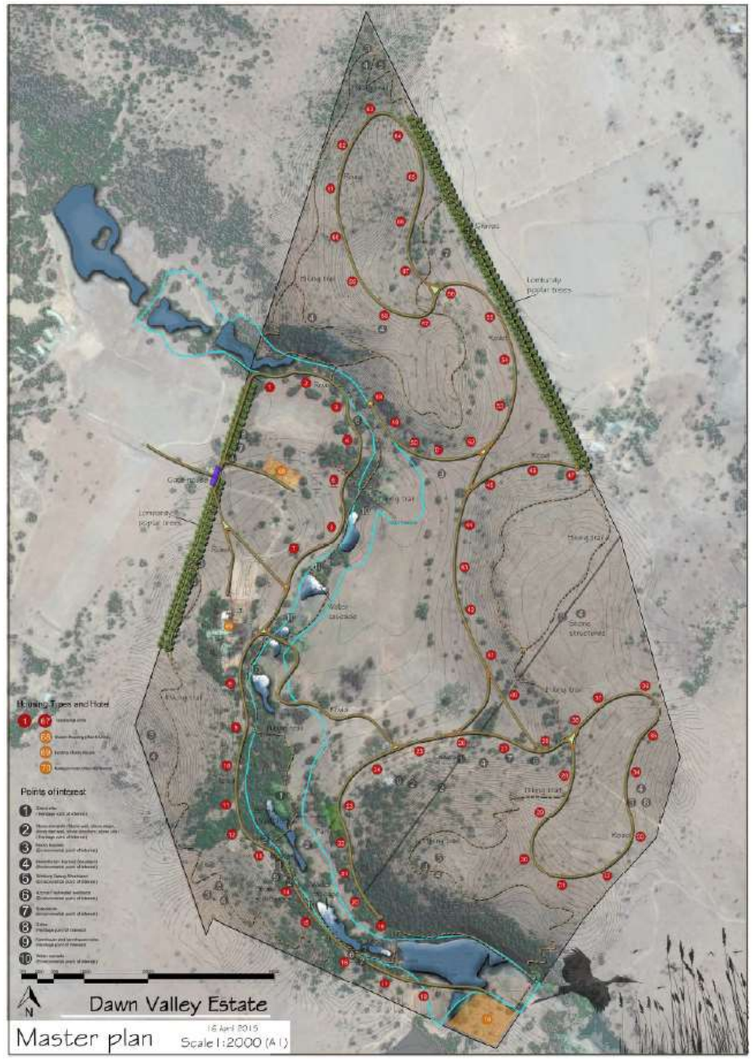
Photo 11: Portion 2 Bayswater, view towards the north west

Photo 12: Historical rock wall on portion 2 Bayswater

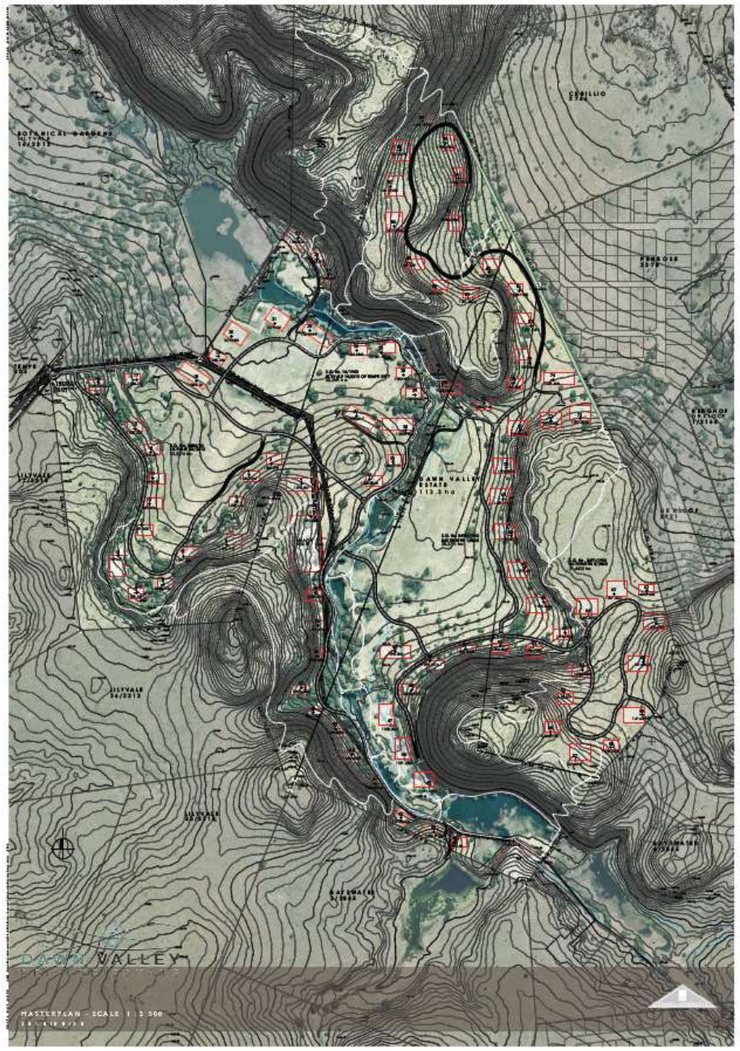
Photo 13: Image taken towards the manor house on Portion 14 of Lilyvale

Photo 14: Watercourse running past the manor house located on Portion 14 of Lilyvale

Appendix C
Facility Illustrations



Map 11: Consept layout plan (prior specilaist investigation and impact assessment)



Map 12: Amended consept layout plan after informed by specialist input

Map 13: Final layout plan, after incorporation of specilaist and EIA input

Visual interpretation of residential units proposed for the estate

Appendix D
Specialist reports

1. **Ecological Report**
2. **Heritage Report**
3. **Geotechnical report**
4. **Bulk Services Report**
5. **Electricity Report**
6. **Traffic Report**
7. **Geotechnical Report**
8. **Main access connection proposal**

Appendix E
Public Participation

Interested and Affected Parties

Identified relevant authorities, adjacent landowners and other stakeholders also known as Interested and Affected Parties (I & APs) were informed about the development and given an opportunity to comment and/or object against the proposed development. Below is a list of stakeholders identified, as well as a list of all registered interested and/or affected parties and comments that were raised.

The following was conducted:

- **Placement of an advertisement in the Volksblad Newspaper on 25 October 2018.**
- **Placement of two (2) site notices. The first being placed at the entrance to the Botanical Gardens also the entrance of Dawn Valley, coordinates: 29° 3'16.90"S, 26° 12'38.37"E. The second site notice was placed on Calliope Street leading to a cul-de-sac and entrance to the Valley of Seven Dams Conservancy, coordinates: 29° 4'25.66"S, 26° 13'10.43"E.**
- **Surrounding landowners were consulted, draft BAR issued for their comments.**
- **Registered notices issued the relevant Authority / Organs of State.**
- **Registered notice sent to ward councillor of the area.**
- **Registered notice sent to Valley of Seven Dams Conservancy.**
- **Registered notice sent to the Botanical Gardens.**

Authorities and organs of state identified as key stakeholders

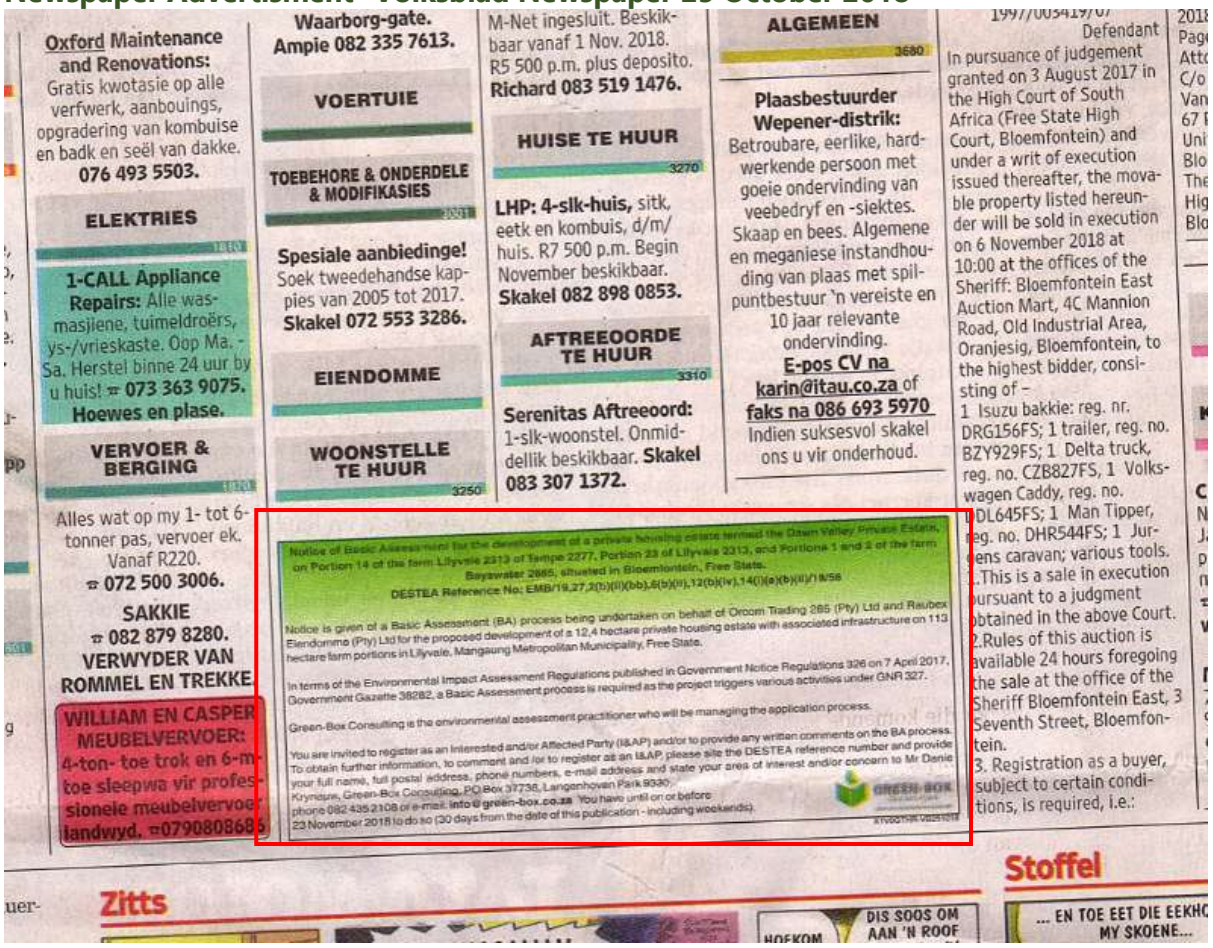
Authority/Organ of State	Contact person (Title, Name and Surname)	Tel No	Fax No	e-mail	Postal address
SAHRA	Mr. Andrew Salomon	021-462 4502	021-462 4549	asalomon@sahra.org.za	P.O. Box 4637 Cape Town 8000
FS-SAHRA	Ntando Mbatha	074 945 3255	-	Mbatha.npz@sacr.fs.gov.za	C/o Henry & East Burger Street Business Partner Building Office 307 Bloemfontein, 9301
Department of Police, Roads and Transport	Mr. Hannes Maree	051-409 8275	086 2757 39	mareeh@freetrans.gov.za	
CENTLEC (Planning)	Mr. Kobus Booysen	051-409 2252	-	Kobus.booysen@centlec.co.za	195 Nelson Mandela Drive Telkom Building
Department of Water and Sanitation- Free State	Mr. TP Ntili	051-405 9281	-	ntilit@dwa.gov.za	PO Box 528 Bloemfontein 9300
Department of Agriculture , Forestry and Fisheries	Mr. Jack Morton	051-861 8369	086 234 6758	-	Private Bag X01 Glen Bloemfontein 9360
Mangaung Metropolitan Municipality (Town Planning)	Mr. Collin Dihemo	051-405 8740	051-405 8707	collin.dihemo@mangaung.co.za	P O Box 3704 Bloemfontein 9300
Mangaung Metropolitan Municipality (Infrastructure)	Mr. G. Fritz	051-405 8577	051-405 8707	Gerhard.fritz@mangaung.co.za	P O Box 3704 Bloemfontein 9300
Mangaung Metropolitan Municipality (Environmental Management)	Ms. Mpolokeng Kolobe	051- 405 8577	-	mpolokeng.kolobe@mangaung.co.za	Room 1017 10th Floor Bram Fischer's Building Bloemfontein

Key stakeholders -Other than organs of state

Title, Name and Surname	Affiliation/ key stakeholder status	Contact details (tel number or e-mail address)
Mr. Johan Pretorius	War Counsellor, Ward 48	Tel: 072 2260 222 E-mail: xgrafies@gmail.com
Mr. Deon Potgieter	Botanical Gardens(Lilyvale 16/2313)	Tel: 051-436 3530 E-mail: deonpotgieter@iclix.co.za
Mr. Deon Potgieter	Botanical Gardens (Bergendal 3/1706)	Tel: 051-436 3530 E-mail: deonpotgieter@iclix.co.za

Adv. Jo Hiemstra	Valley of Seven Dams Conservancy	Tel: 084 253 0674
Lettie Fouché Sentrum	Lilyvale 26 and 11/2313	Tel: 051-436 6770 E-Mail: dawiehugo55@gmail.com
Mr. Solomon Zhu	Lenova Construction and Development (Pty) Ltd Lilyvale 33/2313	Tel: 076 1170 899 E-mail: solomonz@lenovaconstruction.co.za
Mr. C. Cooper	Mojalefa Trust (Portion 4 Bayswater 2865)	Tel: 051-448 0096 E-mail: supercooper@cktrust.co.za
Somerton Estate PTY Ltd	Somerton Estate (Penrose 1/2378	P.O. Box 13147 Northridge 9301
Mr. Koos Raubenheimer	Landowner of Cleveleys 2990	
Mr. Koos Raubenheimer	Landowner of Cerillion 2766	
P.G. De Bruyn	Penrose 2378	P.O. Box 27991 Danhof 9310
Jurgens JW Stuhlinger (Jumali Investments Pty Ltd)	Die Kloof 2921	P.O. Box 763 Cape Town 8000 info@pands.co.za

Newspaper Advertisment- Volksblad Newspaper 25 October 2018



Notice of Basic Assessment for the development of a private housing estate termed the Dawn Valley Private Estate, on Portion 14 of the farm Lilyvale 2313 of Tempe 2277, Portion 23 of Lilyvale 2313, and Portions 1 and 2 of the farm Bayswater 2865, situated in Bloemfontein, Free State.

DESTEA Reference No: EMB/19,27,2(b)(ii)(bb),6(b)(ii),12(b)(iv),14(l)(a)(b)(ii)/18/58

Notice is given of a Basic Assessment (BA) process being undertaken on behalf of Orcom Trading 285 (Pty) Ltd and Raubex Eiendomme (Pty) Ltd for the proposed development of a 12,4 hectare private housing estate with associated infrastructure on 113 hectare farm portions in Lilyvale, Mangaung Metropolitan Municipality, Free State.

In terms of the Environmental Impact Assessment Regulations published in Government Notice Regulations 326 on 7 April 2017, Government Gazette 38282, a Basic Assessment process is required as the project triggers various activities under GNR 327.

Green-Box Consulting is the environmental assessment practitioner who will be managing the application process.

You are invited to register as an Interested and/or Affected Party (I&AP) and/or to provide any written comments on the BA process. To obtain further information, to comment and /or to register as an I&AP, please site the DESTEA reference number and provide your full name, full postal address, phone numbers, e-mail address and state your area of interest and/or concern to Mr Danie Krynauw, Green-Box Consulting, PO Box 37738, Langenhoven Park 9330.
phone 082 435 2108 or e-mail: **info@green-box.co.za** You have until on or before
23 November 2018 to do so (30 days from the date of this publication - including weekends).

X1V0GTHR-VB251018

Site Notices- Placed on 23 October 2018

Photo 15: Site notice place at entrance to the Botanical Gardens and Dawn Valley entrance

Photo 16: Site notice place at entrance to the Botanical Gardens and Dawn Valley entrance

Photo 17: Site notice placed at entrance to Valley of Seven Dams Conservancy from Caliope Street

Photo 18: Site notice placed at entrance to Valley of Seven Dams Conservancy from Caliope Street

Photo 19: Site notice placed at intersection of Christo Groenewald Street and entrance to North Ridge Mall

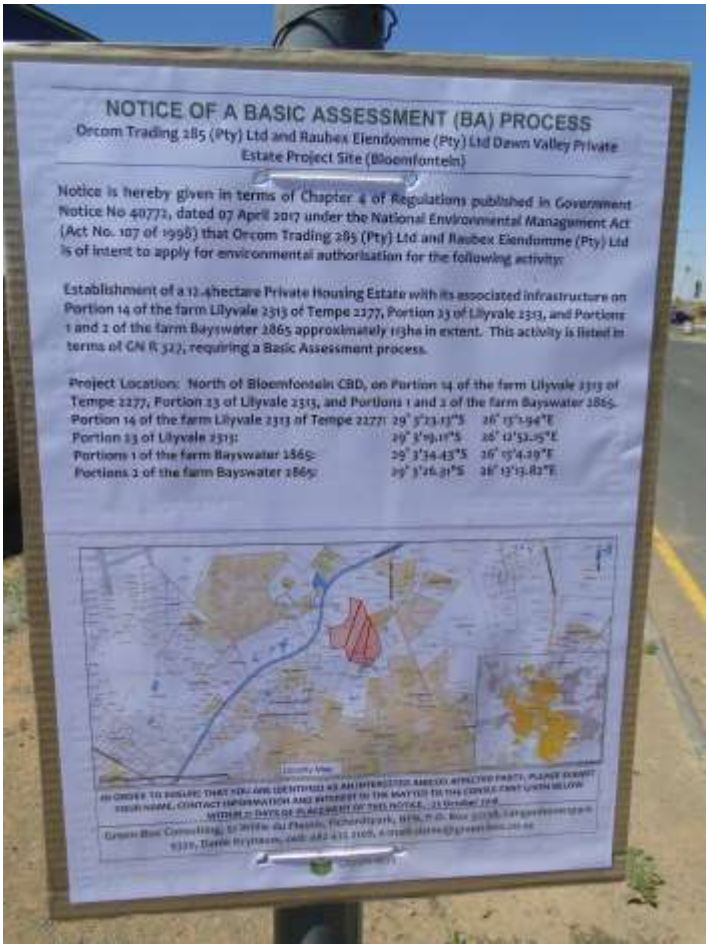


Photo 20: Site notice placed at intersection of Christo Groenewald Street and entrance to North Ridge Mall

Appendix F
Impact Assessment

Assessment Criteria for Environmental Impacts

Cumulative Effects

It is important to assess the natural environment using a systems approach that will consider the cumulative impact of various actions. Cumulative impact refers to the impact on the environment, which results from the incremental impact of the actions when added to other past, present and reasonably foreseeable future actions regardless of what agencies or persons undertake such actions. Cumulative impacts can result from individually minor but collectively significant actions or activities taking place over a period of time. Cumulative effects can take place so frequently in time that the effects cannot be assimilated by the environment.

An assessment of the impact that the proposed development may have on the environment includes evaluating the impact according to a series of assessment criteria. This will be undertaken by considering the effects that may result should the impact occur.

Impact Assessment

The assessment of impacts was based on specialist's expertise, Green-Box professional judgement, field observations and desk-top analysis. The significance of potential impacts that may result from the proposed project was determined in order to assist decision-makers, specifically the DESTEA and other relevant authorities, but to some extent also the proponent.

The **significance** of an impact is defined as a combination of the **consequence** of the impact occurring and the **probability** that the impact will occur. The criteria used to determine the consequence of the impacts assessed for the proposed project are listed in Table below, along with the ratings and rating definitions applicable to each consequence criterion.

Table 1: Criteria used to determine the consequence of an impact.

Rating	Definition of Rating	Score
A. Extent– the area over which the impact will be experienced		
Local	Confined to project area or part thereof	1
Regional	Defined by regional context of study area, i.e. the WCDM and/or quaternary catchment	2
(Inter)national	Nationally and/or beyond	3
B. Intensity– the magnitude of the impact in relation to the sensitivity of the receiving environment, taking into account the degree to which the impact may cause irreplaceable loss of resources		
Low	Site-specific and wider natural and/or social functions and processes are negligibly altered	1
Medium	Site-specific and wider natural and/or social functions and processes continue albeit in a modified way	2
High	Site-specific and wider natural and/or social functions or processes are severely altered	3
C. Duration– the timeframe over which the impact will be experienced and its reversibility		
Short-term	Up to 2 years and reversible	1

Medium-term	2 to 15 years and reversible	2
Long-term	More than 15 years and irreversible	3

The combined score of these three criteria corresponds to a *consequence rating*, as set out in Table 2.

Table 2: Method used to determine the consequence rating.

Combined score (A+B+C)	3-4	5	6	7	8-9
Consequence rating	Very Low	Low	Medium	High	Very High

Once the consequence is derived, the probability of the impact occurring is considered, using the probability classifications presented in Table 3 below.

Table 3: Probability classification

Probability – the likelihood of the impact occurring	
Improbable	< 40% chance of occurring
Possible	40% - 70% chance of occurring
Probable	>70% - 90% chance of occurring
Definite	>90% chance of occurring

The overall **significance** of an impact is determined by considering the consequence rating and the probability classification using the rating system prescribed in Table 4 below.

Table 4: Impact significance rating

		Probability			
		Improbable	Possible	Probable	Definite
Consequence	Very Low	**INSIGNIFICANT**	**INSIGNIFICANT**	**VERY LOW**	**VERY LOW**
	Low	**VERY LOW**	**VERY LOW**	**LOW**	**LOW**
	Medium	**LOW**	**LOW**	**MEDIUM**	**MEDIUM**
	High	**MEDIUM**	**MEDIUM**	**HIGH**	**HIGH**
	Very High	**HIGH**	**HIGH**	**VERY HIGH**	**VERY HIGH**

Finally, the impact is also considered in terms of its status (positive or negative) and the confidence in the ascribed impact significance rating. The prescribed system for considering impact status and confidence (in the assessment) is laid out in Table 5 below.

Table 5: Impact status and confidence classification

Status of Impact	
Indication whether the impact is adverse (negative) or beneficial (positive).	+ ve (positive – a 'benefit')
	– ve (negative – a 'cost')
Confidence in the assessment	
The degree of confidence in predictions based on available information, Terra Works judgment and/or specialist knowledge.	Low
	Medium
	High

The impact significance rating should be considered by authorities in their decision-making process based on the implications of ratings ascribed below:

- **INSIGNIFICANT**: the potential impact is negligible and will not have an influence on the decision regarding the proposed activity/development.
- **VERY LOW**: the potential impact is very small and should not have any meaningful influence on the decision regarding the proposed activity/development.
- **LOW**: the potential impact may not have any meaningful influence on the decision regarding the proposed activity/development.
- **MEDIUM**: the potential impact should influence the decision regarding the proposed activity/development.
- **HIGH**: the potential impact will affect the decision regarding the proposed activity/development.
- **VERY HIGH**: The proposed activity should only be approved under special circumstances.

Practicable mitigation and optimization measures are recommended, and impacts are rated in the prescribed way both without and with the assumed effective implementation of the recommended mitigation (and/or optimization) measures. Mitigation and optimization measures are either:

- **Essential**: measures that must be implemented and are non-negotiable; or
- **Best Practice**: recommended to comply with best practice, with adoption dependent on the proponent's risk profile and commitment to adhere to best practice, and which must be shown to have been considered and sound reasons provided by the proponent if not implemented.

Identifies Impact- Construction Phase

	Assessment Area	No go alternative
Identified Environmental Impact	**Transformation of terrestrial and aquatic vegetation on the assessment area associated with the Winburg Grassy Shrubland (Gh7), the Bloemfontein Karroid Shrubland (Gh8), Riparian zone, and floodplain vegetation. Residential footprint size that will affect the Winburg Grassy Shrubland equates to 5.59ha. Residential footprint size that will affect the Bloemfontein Karroid Shrubland equates to 1.08ha. 0.3ha of floodplain area will be affected by the proposed agricultural garden footprint.**	
Magnitude of Negative or Positive Impact	Medium (6)	-
Duration of Negative or Positive Impact	Long term (4)	-
Extent of Positive or Negative Impact	Local (2)	-
Irreplaceability of Natural Resources being impacted upon	Low (2)	-
Reversibility of Impact	Low (4)	-
Probability of Impact Occurrence	High (4)	-
Cumulative Impact Rating prior to mitigation	Medium	-
Environmental Significance Score and Rating prior to mitigation	Medium (72)	-
Mitigation Measures to be implemented	• The proposed development must be specifically focussed within the footprint areas. • The project construction footprints must be kept as small as practicably possible to reduce the actual surface impact on vegetation and no unnecessary / unauthorised footprint expansion into the surrounding areas may take place. • The proposed development must refrain from encroaching into- and significantly impacting on the remaining cultural / historical structures identified. • No site construction camps to be established within the surrounding natural areas outside the project footprint areas. If site camps are required outside the project footprint areas, they must be set up within the associated road network footprints so as not to impact on the surrounding natural vegetation. • Adequately fence off the construction areas and ensure that no construction activities,	

	Assessment Area	No go alternative
	machinery or equipment operate or impact outside the fenced off areas. • Existing roads and dirt tracks in close proximity to the proposed project area must be used during construction. No new roads or dirt tracks to be constructed or implemented outside the fenced off construction areas. • Adequate operational procedures for machinery and equipment must be developed in order to strictly govern movement of machinery only within project footprint areas and ensure environmentally responsible construction practices and activities. • An Environmental Control Officer (ECO) must be present on site during all construction activities in order to monitor the construction phase and ensure environmentally responsible construction practices and activities are adhered to.	
Cumulative Impact Rating after mitigation implementation	Low	-
Environmental Significance Score and Rating after mitigation implementation	Low (45)	-

	Assessment Area	No go alternative
Identified Environmental Impact	**Terrestrial and aquatic alien invasive species establishment.**	
Magnitude of Negative or Positive Impact	Medium (6)	-
Duration of Negative or Positive Impact	Short term (2)	-
Extent of Positive or Negative Impact	Local (2)	-
Irreplaceability of Natural Resources being impacted upon	Moderate (3)	-
Reversibility of Impact	High (2)	-
Probability of Impact Occurrence	Medium (3)	-
Cumulative Impact Rating prior to mitigation	Low	-
Environmental Significance Score and Rating prior to mitigation	Low (45)	-
Mitigation Measures to be implemented	• Alien invasive species individuals currently on site must be actively eradicated from the	

	Assessment Area	No go alternative
	assessment area and adequately disposed of in accordance with the National Environmental Management: Biodiversity Act (Act 10 of 2004); Alien and Invasive Species Regulations, 2014. • An active alien invasive species clearance and eradication initiative must be implemented for the improvement of the perennial watercourse ecological integrity. • Implement an adequate Alien Invasive Species Establishment Management and Prevention Plan during the construction phase. Such a management plan must be compiled by a suitably qualified and experienced ecologist. • Areas within and immediately surrounding the proposed development footprints must be adequately rehabilitated as soon as practicably possible after construction in order to prevent significant alien invasive species establishment. • Adequately fence off the construction areas and ensure that no construction activities, machinery or equipment operate or impact outside the fenced off areas. • Existing roads and dirt tracks in close proximity to the proposed project area must be used during construction. No new roads or dirt tracks to be constructed or implemented outside the fenced off construction areas.	
Cumulative Impact Rating after mitigation implementation	Low	-
Environmental Significance Score and Rating after mitigation implementation	Low (12)	-

	Assessment Area	No go alternative
Identified Environmental Impact	**Surface material erosion.**	
Magnitude of Negative or Positive Impact	Medium (6)	-
Duration of Negative or Positive Impact	Short term (2)	-
Extent of Positive or Negative Impact	Local (2)	-
Irreplaceability of Natural Resources being impacted upon	Moderate (3)	-

	Assessment Area	No go alternative
Reversibility of Impact	High (2)	-
Probability of Impact Occurrence	Medium (3)	-
Cumulative Impact Rating prior to mitigation	Low	-
Environmental Significance Score and Rating prior to mitigation	Low (45)	-
Mitigation Measures to be implemented	• An adequate Storm Water and Erosion Management Plan must be implemented for the entire assessment area during the construction phase. This must be done to sufficiently manage storm water runoff in order to prevent any significant erosion from occurring. • Areas within and immediately surrounding the proposed development footprints must be adequately rehabilitated as soon as practicably possible after construction in order to prevent significant erosion.	
Cumulative Impact Rating after mitigation implementation	Low	-
Environmental Significance Score and Rating after mitigation implementation	Low (12)	-

	Assessment Area	No go alternative
Identified Environmental Impact	**Dust generation and emissions.**	
Magnitude of Negative or Positive Impact	Low (4)	-
Duration of Negative or Positive Impact	Short term (2)	-
Extent of Positive or Negative Impact	Local (2)	-
Irreplaceability of Natural Resources being impacted upon	Moderate (3)	-
Reversibility of Impact	High (2)	-
Probability of Impact Occurrence	Medium (3)	-
Cumulative Impact Rating prior to mitigation	Low	-
Environmental Significance Score and Rating prior to mitigation	Low (39)	-

	Assessment Area	No go alternative
Mitigation Measures to be implemented	• Implement suitable dust management and prevention measures during the construction phase. • Construction roads and camps must be adequately wetted-down on a continual basis. • The water being used for wetting-down areas must be of sufficient quality in order to prevent significant contamination of the surrounding areas. • Areas within and immediately surrounding the proposed development footprints must be adequately rehabilitated as soon as practicably possible after construction in order to prevent significant dust emissions.	
Cumulative Impact Rating after mitigation implementation	Low	-
Environmental Significance Score and Rating after mitigation implementation	Low (10)	-

	Assessment Area	No go alternative
Identified Environmental Impact	**Impeding of the perennial watercourse catchment area and flow regime.**	
Magnitude of Negative or Positive Impact	Medium (6)	-
Duration of Negative or Positive Impact	Short term (2)	-
Extent of Positive or Negative Impact	Regional (3)	-
Irreplaceability of Natural Resources being impacted upon	High (4)	-
Reversibility of Impact	Moderate (3)	-
Probability of Impact Occurrence	High (4)	-
Cumulative Impact Rating prior to mitigation	Medium	-
Environmental Significance Score and Rating prior to mitigation	Medium (72)	-
Mitigation Measures to be implemented	• The delineated watercourse dissecting the assessment area, must be adequately buffered out during the construction phase to keep construction activities from encroaching riparian areas.	

	Assessment Area	No go alternative
	• The proposed development must be focussed within the recommended development areas. • The project construction footprints must be kept as small as practicably possible to reduce the actual surface impact on vegetation and no unnecessary / unauthorised footprint expansion into the surrounding areas may take place. • An adequate Storm Water and Erosion Management Plan must be implemented for the entire assessment area during the construction phase. This must be done to ensure and sufficiently manage storm water runoff quality, quantities and flow speed towards the watercourses in order to maintain their ecological functionality and integrity. • Development and layout designs for the proposed project should include adequate storm water management measures to ensure that sufficient volumes and quality of surface water runoff from the footprint area is still channelled back into the watercourse. This must be done in order to maintain the ecological functionality and integrity of the broader surface water catchment and drainage area. • A Water Use License Application (WULA) must be submitted to the Department of Water and Sanitation if required in accordance with the National Water Act (No. 36 of 1998) (NWA).	
Cumulative Impact Rating after mitigation implementation	Low	-
Environmental Significance Score and Rating after mitigation implementation	Low (28)	-

	Assessment Area	No go alternative
Identified Environmental Impact	**Contamination of the perennial watercourse and subsequent downstream watercourses.**	
Magnitude of Negative or Positive Impact	Medium (6)	-
Duration of Negative or Positive Impact	Short term (2)	-
Extent of Positive or Negative Impact	Regional (3)	-
Irreplaceability of Natural Resources being	High (4)	-

	Assessment Area	No go alternative
impacted upon		
Reversibility of Impact	Low (4)	-
Probability of Impact Occurrence	High (4)	-
Cumulative Impact Rating prior to mitigation	Medium	-
Environmental Significance Score and Rating prior to mitigation	Medium-High (76)	-
Mitigation Measures to be implemented	• The perennial watercourse dissecting the assessment area, must be adequately buffered out of the proposed development footprint during the construction phase. • A minimum 30m construction buffer area must be implemented around the watercourse. • The proposed development must be focussed within the recommended development area. • The project construction footprints must be kept as small as practicably possible to reduce the actual surface impact on vegetation and no unnecessary / unauthorised footprint expansion into the surrounding areas may take place. • An adequate Storm Water and Erosion Management Plan must be implemented for the entire assessment area during the construction phase. This must be done to ensure and sufficiently manage storm water runoff, clean / dirty water separation and erosion towards the watercourses in order to maintain their ecological functionality and integrity. • Development and layout designs for the proposed project should include adequate storm water management measures to ensure that sufficient volumes and quality of surface water runoff from the footprint area is still channelled back into the watercourse. This must be done in order to maintain the ecological functionality and integrity of the broader surface water catchment and drainage area. • A comprehensive South African Scoring System 5 (SASS 5) aquatic bio-monitoring assessment must be conducted of the watercourses directly downstream of the proposed project area prior to commencement of the construction phase. This information will serve as baseline wetland health data to be used for subsequent monitoring assessments to be conducted. Such an assessment must be conducted by a suitably qualified and experienced ecologist. • Water samples of the watercourses must be collected directly downstream of the proposed	

	Assessment Area	No go alternative
	project area prior to commencement of the construction phase. The quality of these samples must be chemically and biologically analysed by an accredited laboratory in order to serve as baseline water quality data to be used for subsequent monitoring assessments to be conducted. • If hydrocarbons or other chemicals are to be stored on site during the construction phase, the storage areas must be situated as far away as practicably possible from the watercourses and buffer zone. • Hydrocarbon and other chemical storage areas must be adequately bunded in order to be able to contain a minimum of 150% of the capacity of storage tanks / units. • Adequate hydrocarbon and other chemical storage, handling and usage procedures must be developed and all relevant construction personnel must be sufficient trained on- and apply these procedures during the entire construction phase. • Process water, waste water and any other chemical / artificial by-products must be adequately contained and disposed of in a lawful and environmentally responsible manner. • No process water or any form of contaminated waste water or any other chemical / artificial by-products resulting from any construction activities is allowed to be unlawfully discharged directly or indirectly into any watercourses or wetland area. If any form of process- or waste water or any other chemical / artificial by-products needs to be discharged into any watercourses or wetland area, this must be lawfully done in accordance with all relevant legal requirements and the quality of the water must continuously meet legal discharge quality and quantity standards. • A Water Use License Application (WULA) must be submitted to the Department of Water and Sanitation if required in accordance with the National Water Act (No. 36 of 1998) (NWA).	
Cumulative Impact Rating after mitigation implementation	Low	-
Environmental Significance Score and Rating after mitigation implementation	Low (30)	-

Identifies Impacts- Operational Phase

	Assessment Area	No go alternative
Identified Environmental Impact	**Continued impeding of the perennial watercourse catchment area and flow regime.**	
Magnitude of Negative or Positive Impact	High (8)	-
Duration of Negative or Positive Impact	Long term (4)	-
Extent of Positive or Negative Impact	Regional (3)	-
Irreplaceability of Natural Resources being impacted upon	High (4)	-
Reversibility of Impact	Low (4)	-
Probability of Impact Occurrence	High (4)	-
Cumulative Impact Rating prior to mitigation	Medium	-
Environmental Significance Score and Rating prior to mitigation	Medium-High (92)	-
Mitigation Measures to be implemented	• An adequate Storm Water and Erosion Management Plan must be implemented for the entire assessment area during the operational phase. This must be done to ensure and sufficiently manage storm water runoff quality, quantities and flow speed towards the watercourses in order to maintain their ecological functionality and integrity. • Development and layout designs for the proposed project should include adequate storm water management measures to ensure that sufficient volumes and quality of surface water runoff from the footprint area is still channelled back into the watercourse. This must be done in order to maintain the ecological functionality and integrity of the broader surface water catchment and drainage area. • The footprint positions of residential unit's 45-47 positions must be located on the very edge of the riparian zone in the three identified areas where slight disturbance has already taken place. Furthermore, the construction of these three residential units must be on stable barrel vault raft concrete slabs at an average height of 1500 mm above the natural ground level to allow for unimpeded natural flow of the watercourse with minimal interference to the existing vegetation or movement of amphibians and aquatic insects.	

	Assessment Area	No go alternative
	Interference with the natural vegetation and/or artificial planting (gardening) beyond the perimeter of the residential unit will be strictly prohibited. Building activities will also be restricted to predetermined demarcated areas during construction so as not to significantly impact on the natural flow of the watercourse or natural vegetation. (Lampbrecht, 2018)	
Cumulative Impact Rating after mitigation implementation	Low	-
Environmental Significance Score and Rating after mitigation implementation	Low (38)	-

	Assessment Area	No go alternative
Identified Environmental Impact	**Continued contamination of the perennial watercourse and subsequent downstream watercourses.**	
Magnitude of Negative or Positive Impact	Very high (8)	-
Duration of Negative or Positive Impact	Long term (3)	-
Extent of Positive or Negative Impact	Regional (3)	-
Irreplaceability of Natural Resources being impacted upon	High (4)	-
Reversibility of Impact	Low (4)	-
Probability of Impact Occurrence	High (4)	-
Cumulative Impact Rating prior to mitigation	Medium-high	-
Environmental Significance Score and Rating prior to mitigation	Medium -high (88)	-
Mitigation Measures to be implemented	• An adequate Storm Water and Erosion Management Plan must be implemented for the entire assessment area during the operational phase. This must be done to ensure and sufficiently manage storm water runoff and clean / dirty water separation towards the watercourses in order to maintain their ecological functionality and integrity. • Development and layout designs for the proposed project should include adequate storm water management measures to ensure that sufficient volumes and quality of surface water	

	Assessment Area	No go alternative
	runoff from the footprint area is still channelled back into the watercourse. This must be done in order to maintain the ecological functionality and integrity of the broader surface water catchment and drainage area. • A comprehensive South African Scoring System 5 (SASS 5) aquatic bio-monitoring assessment must be conducted of the watercourses directly downstream of the proposed project area on an annual basis in order to ensure that the ecological functionality and integrity of the watercourses is maintained. This information must then be compared to the baseline data collected during the initial assessment prior to the commencement of the construction phase. Such an assessment must be conducted by a suitably qualified and experienced ecologist. • Water sample chemical and biological analyses of the watercourses directly downstream of the proposed project area must be continually conducted on a 6-month basis in order to ensure that the water quality of the watercourses is maintained. This information must then be compared to the baseline data collected during the initial analyses prior to the commencement of the construction phase. • If any reduction in wetland health, SASS 5 scores or chemical and biological water quality is determined due to the project, the competent authority must immediately be notified and the necessary steps must be followed by the project owner to locate and remediate the source of contamination / health reduction as soon as practicably possible. • If hydrocarbons or other chemicals are to be stored on site during the operational phase, the storage areas must be situated as far away as practicably possible from the watercourses and buffer zone. • Hydrocarbon and other chemical storage areas must be adequately bunded in order to be able to contain a minimum of 150% of the capacity of storage tanks / units. • Adequate hydrocarbon and other chemical storage, handling and usage procedures must be developed and all relevant operational personnel must be sufficient trained on- and apply these procedures during the entire operational phase. • Process water, waste water and any other chemical / artificial by-products must be adequately contained and disposed of in a lawful and environmentally responsible manner.	

	Assessment Area	No go alternative
	• No process water or any form of contaminated waste water or any other chemical / artificial by-products resulting from any operational activities is allowed to be unlawfully discharged directly or indirectly into any watercourses or wetland area. If any form of process- or waste water or any other chemical / artificial by-products needs to be discharged into any watercourses or wetland area, this must be lawfully done in accordance with all relevant legal requirements and the quality of the water must continuously meet legal discharge quality and quantity standards. • Chemical and biological analyses of process water, waste water and any other chemical / artificial by-products to be discharged into any watercourses or wetland area must be continually conducted on a weekly basis in order to ensure that the quality and quantity standards of all discharges are legal and environmentally responsible.	
Cumulative Impact Rating after mitigation implementation	Low	-
Environmental Significance Score and Rating after mitigation implementation	Low (34)	-

	Assessment Area	No go alternative
Identified Environmental Impact	**Disruption of nocturnal faunal activities through noise and lighting emissions.**	
Magnitude of Negative or Positive Impact	Low (4)	-
Duration of Negative or Positive Impact	Long term (4)	-
Extent of Positive or Negative Impact	Local (2)	-
Irreplaceability of Natural Resources being impacted upon	Low (2)	-
Reversibility of Impact	High (4)	-
Probability of Impact Occurrence	Low (2)	-
Cumulative Impact Rating prior to mitigation	Low	-
Environmental Significance Score and Rating prior to mitigation	Low (32)	-

	Assessment Area	No go alternative
Mitigation Measures to be implemented	• Lighting and illumination infrastructure technology and layout designs must be done in an environmentally friendly manner. • The minimum amount of lighting and illumination infrastructure which is practicably possible for operations to function at, must be utilised during night time. • Lighting and illumination infrastructure must as far as practicably possible be directed at low shining angles towards the ground and towards the inner portions of the development areas in order to reduce the amount of bright light being emitted into the surrounding adjacent areas. • Lower shining intensity environmentally friendly lighting products must be utilised in order to reduce the brightness of light being emitted into the surrounding adjacent areas. • Adequate design, technology and operational mitigation measures must be implemented in order to reduce the amount of night time noise being emitted from the operational activities as far as practicably possible.	
Cumulative Impact Rating after mitigation implementation	Low	-
Environmental Significance Score and Rating after mitigation implementation	Low (16)	-

Appendix G Environmental Management Programme

DAWN VALLEY PRIVATE ESTATE

EMPr

February 2019

DESTEA Reference Number:
EMB/19,27,2(b)(ii)(bb),6(b)(ii),12(b)(iv),14(i)(a)(b)(ii)/18/58

DAWN VALLEY
PRIVATE ESTATE

DAWN VALLEY
PRIVATE ESTATE PROJECT DETAILS

EMPr for the proposed development of the Dawn Valley Private Estate, Bloemfontein, Free State

Prepared for: Dr. D.J. Gouws and Mr. J.E. Raubenheimer, Orcom Trading 285 (Pty) Ltd. and Raubex Eiendomme (Pty) Ltd.

Prepared by: Mr. D. Krynauw, Green-Box Consulting

DESTEA Reference no.:
EMB/19,27,2(b)(ii)(bb),6(b)(ii),12(b)(iv),14(i)(a)(b)(ii)/18/58

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Document Status: Draft (version 00)

Date: March 2019

DAWN VALLEY PRIVATE ESTATE

EMPr

ACRONYMS USED IN THIS REPORT

CBD	:	Central Business District
DESTEA	:	Department of Economic, Small Business Development, Tourism and Environmental Affairs
DWS	:	Department of Water and Sanitation
EA	:	Environmental Authorisation
EAP	:	Environmental Assessment Practitioner
EIA	:	Environmental Impact Assessment
EMPr	:	Environmental Management Programme
GN	:	Government Notice
I&AP	:	Interested and Affected Party
IEM	:	Integrated Environmental Management
NEMA	:	National Environmental Management Act (No. 107 of 1998)
PPP	:	Public Participation Process
PSDF	:	Provincial Spatial Development Framework
SAHRA	:	South African Heritage Resources Agency

1. INTRODUCTION

1.1 INTRODUCTION AND BACKGROUND

This Environmental Management Programme (EMPr) has been prepared as part of the Environmental Impact Assessment (EIA) process being conducted for the proposed development of A Private Estate and associated infrastructure on a 4 sites north of Bloemfontein CBD, in the Free Strate Province. This Environmental Management Programme (EMPr) has been compiled in accordance with the Integrated Environmental Management (IEM) philosophy, which aims to achieve a desirable balance between conservation and development. IEM is a key instrument of the National Environmental Management Act (No. 107 of 1998, as amended) (NEMA). This Act promotes the integration of environmental management to activities that may have a significant effect on the environment, while IEM prescribes a methodology for ensuring that environmental management principles are fully integrated into all stages of the development process. It advocates the use of several environmental management tools that are appropriate for the various levels of decision-making. One of these tools in an Environmental Management Programme (EMPr). This Environmental Management Programme (EMPr) outlines the mitigation measures to be implemented for the Estate proposed on Portion 14 of the farm Lilyvale 2313 of Tempe 2277, Portion 23 of Lilyvale 2313, and Portions 1 and 2 of the farm Bayswater 2865 (the project site).

The project site is situated approximately 6km north of the Bloemfontein Central Business District (CBD), and falls within the jurisdiction of the Mangaung Metropolitan Municipality, (refer to **Figure 1.1** for a locality map depicting the locality of the proposed project).

1.2 PROJECT OVERVIEW

The development proposal for the approximately 113ha of combined land is to provide serviced low density erven for unique up-market housing. Furthermore, the proposed development is envisaged to be a sustainable precinct by incorporating green building design principles. This includes design elements that facilitate environmental resource efficiency (water, energy and space) as well social benefits such as synergies between live, and the outdoors. A conceptual layout has been prepared for the project which depicts the typical range of erven and services that will be housed within the Dawn Valley Private Estate (refer to **Figure 1.2**). These include amongst others:

- Single residential erven
- Townhouse erven,
- Hotel,
- Internal streets, and
- Open spaces.

Associated infrastructure includes bulk water provision, waste water removal infrastructure, roads and electricity supply.

The provisional assumption is that the development of the Estate will provide for a phased approach, comprising 6 phases, in which all aspects of the Estate will be expanded to accommodate growth. Phase 1 development will incorporate all civil service installations, with Phase two opening even to be sold and occupied.

1.3 ENVIRONMENTAL CONSULTANTS AND EIA TEAM

In accordance with Regulation 12 of the EIA Regulations (GN R326) the Proponent has appointed Green-Box Consulting as the independent environmental consultants responsible for managing the application for EA, and supporting BAR Process. Green-Box Consulting is therefore also responsible for the preparation of an EMPr as part of the BAR process being conducted for the project.

Over the past 8 years Green-Box Consulting has been involved in the management and execution of environmental assessment and management studies for a multitude of projects across South Africa. These include projects for both public and private sector clients. The Green-Box Consulting team consequently offers a wealth of experience and appreciation of the environmental and social priorities, and national policies and regulations in South Africa.

The EIA project team is being led by Danie Krynauw, who is also the registered Environmental Assessment Practitioner (EAP) on the project. Danie will be supported by Niel Badenhorst in the role of Technical Advisor.

- **Danie Krynauw** is a Senior EAP at Green-Box Consulting and has a Master's Degree in Town and Regional Planning. Danie has over 15 years' experience in the Environmental Management field, and has been involved in various Basic Assessments, EIAs, and EMPs, in the land transformation fields.
- **Niel Badenhorst** is a Junior EAP at Green-Box Consulting and has a BA Degree in Geography and Environmental Management. Niel has 5 years' experience in environmental assessment studies. He has experience in the Environmental Management field, and has been involved in a diverse range of Basic Assessments, and EIAs.

The EIA team involved in the EIA Process being conducted for the Dawn Valley Estate is listed in **Table 1.1**. This team includes a number of specialists which have been involved in, or provided input into the EIA Process and supporting EMPr.

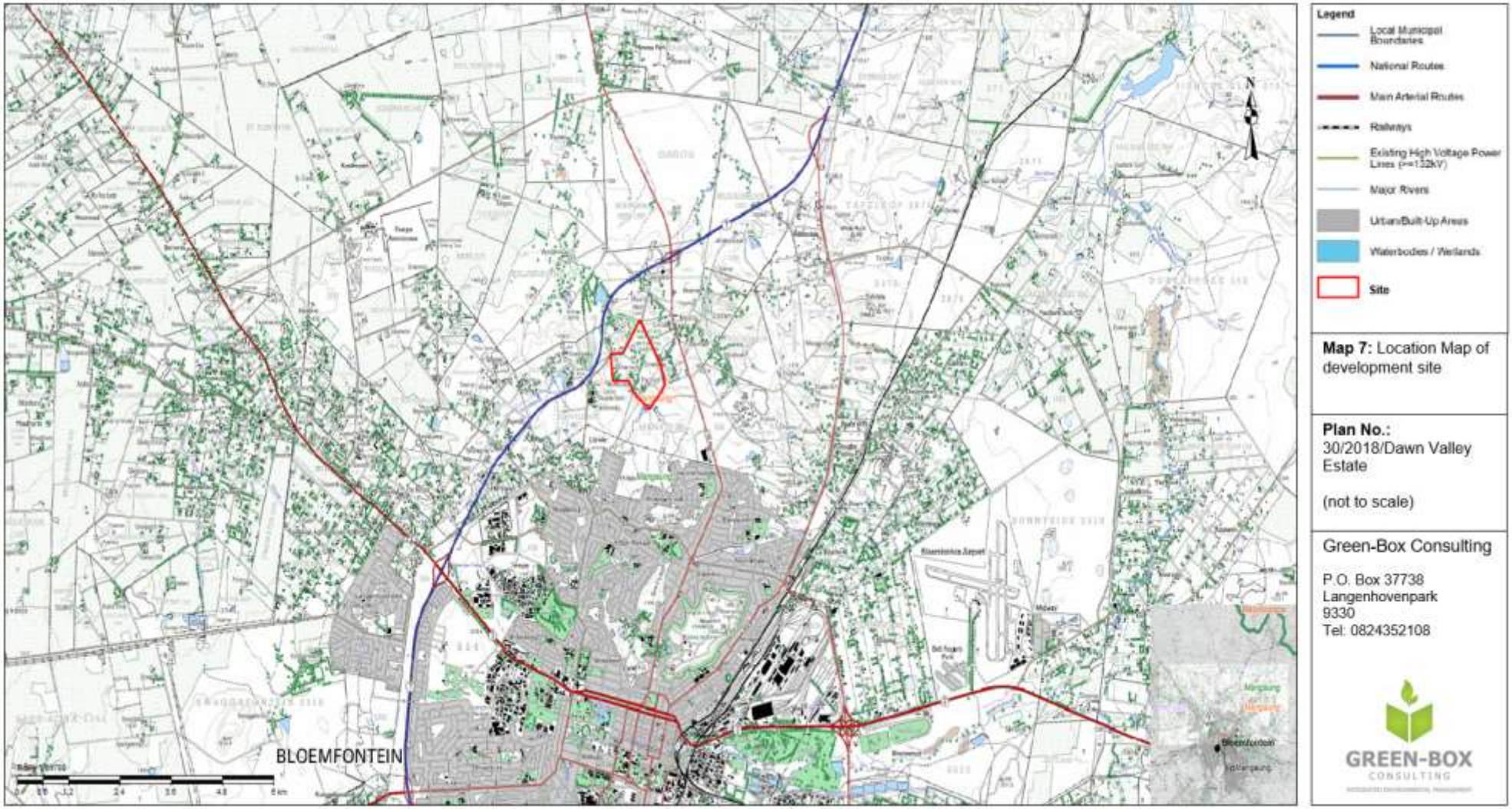

Figure 1.1: Locality map of the project site.

Figure 1.2: Conceptual layout plan.

Table 1.1: EIA Team

Name	Organisation	Role
Environmental Consultants		
Danie Krynauw	Green-Box Consulting	Lead EAP
Niel Badenhorst	Green-Box Consulting	EAP Assistant
Specialists		
Rikus Lampbrecht	EcoFocus Consulting	Ecological and Wetland Specialist
Lloyd Rossouw	Palaeo Field Services	Heritage Impact Assessment
Koot Marais	KMA Consulting Engineers	Traffic Impact Assessment
Schalk Boshoff & Jan Dykman	LMV Consulting Engineers	Services Study
Jan Dykman	LMV Consulting Engineers	Geotechnical Investigation
FCE Consulting Engineers	FCE Consulting Engineers	Electrical Services Report
Hennie Lambrechts	Hennie Lambrechts Architects	Architect and Urban Design
Jako Viviers	LMV Town and Regional Planners	Town Planner

A Curriculum Vitae detailing the EAPs relevant experience and expertise, is included in **Appendix A** of this EMPr.

1.4 AIM AND PURPOSE OF THE EMPr

The aim of this EMPr is to as far as possible minimise potential impacts that the development may have on the surrounding biophysical and socio-economic environment during the following development phases:

- Construction, and
- Operational.

The purpose of this EMPr is to:

- Encourage good management practices and commitment to environmental issues.
- Define how the management of the environment is reported and performance evaluated.
- Provide rational and practical environmental guidelines to:
  - Minimise disturbance of the natural environment,
  - Prevent or minimise all forms of pollution,
  - Comply with all applicable laws, regulations, standards and guidelines for the protection of the environment, and
  - Adopt the best practicable means available to prevent or minimise adverse environmental impacts.
- Describe all monitoring procedures required to identify impacts on the environment.

In addition, the EMPr prepared for the project is intended to enable the project proponent, and its contractors to meet their environmental obligations in accordance with NEMA. This EMPr provides systematic and explicit mitigation and monitoring measures for the proposed development of a Private Estate and associated infrastructure.

The EMPr sets environmental targets for the contractor and reasonable standards against which the contractor's performance can be measured during construction. The EMPr further enables authorities to check the practicability and likelihood of implementation of mitigation and monitoring measures.

The specific objectives of this EMPr are to:

- To provide explicit operational guidelines and environmental monitoring requirements during the construction phases so that activities are done in environmentally responsible and sustainable manner.
- To benefit the host communities, minimise the impacts on the environment and to ensure the health and safety of the community by creating a development that eliminates unacceptable health hazards and ensures public and animal safety.
- To enable the Proponent and its contractors to use resources efficiently and effectively during the project lifecycle in order to reduce wastage and thereby reduce associated negative environmental impacts. In addition, the aim is also to handle waste streams responsibly and apply the 'reduce, re-use and recycle' principle, wherever possible
- To leave areas disturbed by construction in a rehabilitated, stable, non-polluting and tidy condition.

1.5 CONTENTS AND STRUCTURE OF THE EMPr

This EMPr has been prepared in accordance with the requirements of Appendix 4 of the EIA Regulation (GN R326). An overview of where the requirements of Appendix 3 of the EIA Regulations (GN R326) are addressed in this EIA Report is presented in **Table 1.2**.

Table 1.2: Requirements for an EMPr in terms of Appendix 4 of the 2014 NEMA EIA Regulations.

EIA Regulation	Requirements for an EMPr in terms of Appendix 4 of the 2014 NEMA EIA Regulations (GN R326)	Location in this EMPr
Appendix 4 – 1.(1)(a)	Details of – (i) The EAP who prepared the EMPr, and (ii) The expertise of that EAP to prepare an EMPr, including a curriculum vitae.	**Chapter 1 Appendix A**
Appendix 4 – 1.(1)(b)	A detailed description of the aspects of the activity that are covered by the EMPr as identified by the project description.	**Chapter 2**
Appendix 4 – 1.(1)(c)	A map at an appropriate scale which superimposes the proposed activity, its associated structures, and infrastructure on the environmental sensitivities of the preferred site, indicating any areas that should be avoided, including buffers	**Chapter 1 Appendix B**
Appendix 4 – 1.(1)(d)	A description of the impact management outcomes, including management statements, identifying the impacts and risks that need to be avoided, managed and mitigated as identified through the environmental impact assessment process for all phases of the development including – (i) Planning and design, (ii) Pre-construction activities, (iii) Construction activities, (iv) Rehabilitation of the environment after construction and where applicable post closure, and	**Chapter 10**

EIA Regulation	Requirements for an EMPr in terms of Appendix 4 of the 2014 NEMA EIA Regulations (GN R326)	Location in this EMPr
	(v) Where relevant, operation activities.	
Appendix 4 – 1.(1)(f)	A description of proposed impact management actions, identifying the manner in which the impact management outcomes contemplated in paragraph (d) will be achieved, and must, where applicable, include actions to – (i) Avoid, modify, remedy, control or stop any action, activity or process which causes pollution or environmental degradation, (ii) Comply with any prescribed environmental management standards or practices, (iii) Comply with any applicable provisions of the Act regarding closure, where applicable, and (iv) Comply with any provisions of the Act regarding financial provision for rehabilitation, where applicable.	**Chapter 10**
Appendix 4 – 1.(1)(g)	The method of monitoring the implementation of the impact management actions contemplated in paragraph (f).	**Chapter 4**
Appendix 4 – 1.(1)(h)	The frequency of monitoring the implementation of the impact management actions contemplated in paragraph (f).	**Chapter 4**
Appendix 4 – 1.(1)(i)	An indication of the persons who will be responsible for the implementation of the impact management actions.	**Chapter 3**
Appendix 4 – 1.(1)(j)	The time periods within which the impact management actions contemplated in paragraph (f) must be implemented.	**Chapter 10**
Appendix 4 – 1.(1)(k)	The mechanism for monitoring compliance with the impact management actions contemplated in paragraph (f).	**Chapter 4**
Appendix 4 – 1.(1)(l)	A program for reporting on compliance, taking into account the requirements as prescribed by the Regulations.	**Chapter 4** **Chapter 5** **Chapter 6**
Appendix 4 – 1.(1)(m)	An environmental awareness plan describing the manner in which – (i) The applicant intends to inform his or her employees of any environmental risk which may result from their work, and (ii) Risks must be dealt with in order to avoid pollution or the degradation of the environment.	**Chapter 9**
Appendix 4 – 1.(1)(n)	Any specific information that may be required by the competent authority.	N/A
Appendix 4 – 1.(2)	Where a government notice gazetted by the Minister provides for a generic EMPr, such generic EMPr as indicated in such notice will apply.	N/A

2. ACTIVITIES COVERED BY THE EMP

2.1 PLANNING STAGE

The project planning stage consists of infrastructure designing, surveying and ensuring that all plans and required contracts, permits / licenses and agreements are in place. No significant environmental impacts are expected at this stage.

2.2 CONSTRUCTION PHASE

The construction phase will commence following the issuing of Environmental Authorisation (EA) for the project, and once all the applicable authorisations have been obtained. The construction phase is expected to extend over 6 phases, with the aim to divide the site into 6 areas, with infrastructure to be installed in one area and housing units completed, thereafter construction will move to a second area or phase.. The construction phase will involve the removal of vegetation, transportation of personnel, construction material and equipment to the site, and personnel away from the site. In terms of site establishment, laydown areas will be required at the outset of the construction phase, as well as dedicated access routes from the laydown areas to the working areas. Haul roads for construction traffic (for the delivery of concrete, road materials and other construction materials) will also be required.

The laydown areas will be located at the project site. It is expected that the laydown areas will be temporary in nature (for the duration of the construction phase) and will include the establishment of construction site camps (including site offices and other temporary facilities for the appointed Contractors). The laydown areas are expected to cover a maximum area of 500m^2 (depending on the contracting strategy at the time). If the laydown area is located outside of the footprint of the Estate, the area will be rehabilitated (i.e. returned to its pre-construction condition) at the end of the construction phase.

All efforts will be made to ensure that all construction work will be undertaken in compliance with local, provincial and national legislation, local and international best practice, as well as this EMPr.

2.3 OPERATIONAL PHASE

During operation the Estate will provide excusive erven for upmarket housing. Residents in this estate will stay within a scenic environmental friendly environment where the aim is to live with nature.

3. ROLES AND RESPONSIBILITIES

A number of potential environmental impacts, mitigatory measures and environmental management controls are laid out in this document. The effective implementation of this EMPr requires the involvement of several stakeholders, each fulfilling a different but vital role to ensure sound environmental management during the project life cycle. The key role players responsible for the successful implementation of the mitigation measures associated with the project include the Free State department of Economic, Small Business Development, Tourism and Environmental Affairs (DESTEA), The Proponent, the Contractor, the Designated Environmental Officer (DEO), and independent Environmental Control Officer (ECO).

3.1 DEPARTMENT OF ECONOMIC, SMALL BUSINESS DEVELOPMENT, TOURISM AND ENVIRONMENTAL AFFAIRS (DESTEA)

This Department is responsible for issuing EA and authorising the EMPr for the proposed project. DESTEA also has overall responsibility for ensuring that the project proponent, The Proponent complies with the conditions contained within this EMPr.

3.2 PROJECT PROPONENT – THE PROPONENT

It is the responsibility of the project proponent, The Proponent, to ensure that this EMPr is fully implemented. The project proponent shall ensure that competent people are employed on the project by its construction contractor. Where necessary a skills development program will be instituted to ensure that the required levels of competency are attained. The Proponent should ensure that the selected contractor is able to adequately deal with the environmental challenges in this project.

3.3 CONTRACTOR

The Contractor refers to the team / company appointed by the project proponent to undertake the construction activities for the project. The Contractor shall have the following responsibilities:

- To implement all provisions of the EMPr. If the Contractor encounters difficulties with specifications, he / she must discuss alternative approaches with the The Proponent or ECO prior to proceeding.
- To ensure that all staff and sub-contractors are familiar with the EMPr and that duties and responsibilities of employees working on site include environmental responsibilities pertaining to the nature of their work.
- To make personnel aware of environmental issues and to ensure they show adequate consideration of the environmental aspects of the project.
- To report any incidents of non-compliance with the EMPr to the ECO and The Proponent's project managers.

3.3.1 THE DESIGNATED ENVIRONMENTAL OFFICER (DEO)

The contractor is required to appoint a competent individual on-site as a Designated Environmental Officer (DEO). The DEO must be appropriately trained in environmental management and must possess the skills necessary to impart environmental management to all personnel involved during the operational phase. The DEO will be responsible for overseeing the internal compliance with the

EMPr requirements and ensuring that the environmental specifications are adhered to. The DEO must ensure that the required Method Statements are in place and appoint or designate personnel for environmental management issues. The DEO is responsible for training and for keeping detailed records of all site activities associated with the project that may pertain to the environment.

3.4 THE INDEPENDENT ENVIRONMENTAL CONTROL OFFICER (ECO)

In order to ensure compliance with this EMPr during construction an independent Environmental Control Officer (ECO) must be appointed The Proponent to monitor the implementation of the recommendations made herein. The ECO must undertake monthly audits in respect of compliance with the EMPr and report to The Proponent, the Contractor and DESTEA if areas of non-conformance are identified. The ECO shall also advise The Proponent and its Contractor(s) on any identified opportunities for improving environmental performance.

4. ENVIRONMENTAL MONITORING

Monitoring will be undertaken to ensure compliance with all aspects of the EMPr. The day-to-day monitoring and verification that the EMPr is being adhered to shall be undertaken by the Contactor and DEO.

The Contractor shall establish an internal review procedure to monitor the progress and implementation of the EMPr. Where necessary, and upon the recommendation of the ECO, procedures that require modification shall be changed to improve the efficiency of the EMPr. Any slight changes or adjustments to the EMPr shall be discussed with the ECO and documented. Significant modifications to the EMPr will however need to be approved by DESTEA before the changes or adjustments to the EMPr are implemented.

The ECO shall visit and audit the site once a month to ensure that correct operational procedures are being implemented and that the Contractor is complying with the environmental specifications in the EMPr. Additional site inspections by the ECO may be needed during the initial and final stages of the project. The ECO shall address any queries to the Contractor and The Proponent. If the queries cannot be resolved at this level they shall be addressed to DESTEA.

At the conclusion of the project an environmental performance report shall be compiled and submitted to DESTEA. This report shall be compiled by the ECO, in collaboration with the Contractor and The Proponent and project managers. It shall, as a minimum, outline the implementation of the EMPr, and highlight any problems and issues that arose to report, on a formal basis, the lessons learned from the project.

5. NON-COMPLIANCE WITH THE EMPr

Any non-compliance with this EMPr will be treated as serious. Ultimate liability for non-compliance with the EMPr rests with the Project Proponent, The Proponent, and its Contractors. During the construction process work may be suspended by The Proponent in part, or in full if the Contractor fails to comply with the specifications set out within this EMPr. Such suspension of work shall be enforced until compliance is achieved.

6. RECORD OF ACTIVITIES

The Contractor shall keep a record of activities on site, including but not limited to the compliance with the EMPr. The records include but are not limited to:

- Environmental awareness and training records.
- Details of inspections and audits conducted, and corrective action taken.
- Details of complaints received from Interested and Affected Parties (I&APs) and responses provided.
- Records of environmental measurements and monitoring done that is mentioned in the EMPr.
- Internal and external meetings and reviews and any communication with authorities related to environmental management of the project.
- Environmental incidents and accidents and actions taken.
- Photographic records of progress on site from an environmental perspective.
- Environmental Incidents and Accidents records.

At the completion of the construction, reports confirming compliance with various points identified in the EMPr will be submitted to the project proponent.

7. COMPLAINTS REGISTER

All complaints received will be investigated and a response (even if pending further investigation) will be given to the complainant within seven working days. All environmental incidents occurring on site will be recorded. The following information for each incident will be recorded:

- Time, date, location and nature of the incident, and
- Actions taken and by whom.

Any complaints received from the community during the lifetime of the project will be registered and recorded by the Contractor and / or Project Manager on site. The following information will be recorded:

- Time, date and nature of the complaint,
- Response and investigation undertaken, and
- Actions taken and by whom.

8. REPORT AVAILABILITY

This EMPr must form part of the Terms of Reference (ToR) for all Sub-contractors, Suppliers, Staff and Visitors. Copies of this EMPr shall be kept at the construction site office and will be accessible to all senior contract personnel. All senior personnel working on the project shall be required to familiarise themselves with the contents of this EMPr.

9. ENVIRONMENTAL AWARENESS TRAINING

The Project Proponent has a responsibility to ensure that all those people involved in the project are aware of and are familiar with the contents of this EMPr. During the construction phase, the Contractor and his Sub-contractors have to give assurance that they understand the EMPr and that they comply with the conditions therein. All senior and supervisory staff members must familiarise themselves with the full contents of this EMPr. They must know and understand specifications of the EMPr and be able to assist other staff members in matters relating to the EMPr. During the operational phase, the Project Proponent, Project Manager, and all senior and supervisory staff members, must understand and comply fully with the contents of this EMPr. In addition, all other site personnel must be educated in the contents of this document. Before commencing with any work, all staff members will be appropriately briefed about the EMPr and relevant occupational health and safety issues.

The successful implementation of the EMPr is hinged on adequate environmental awareness training of employees. The workforce needs to understand their role in the achievement of the objectives specified in this EMPr. All staff should be provided with environmental awareness training, while employees who require specialised training in line with the nature of their job should be provided with such, and records to this effect should be maintained

Environmental awareness training should include as a minimum the following:

- Making employees aware that everyone has a right to a clean environment and that everyone has a responsibility to protect the environment.
- Explanation of the importance of complying with the EMPr.
- Discussion of the potential environmental impacts of construction activities and mitigation measures that must be implemented when carrying out activities.
- Explanation of the management structure of individuals responsible for matters pertaining to the EMPr.
- Employees' roles and responsibilities, including emergency preparedness and response.
- Explanation of the specifics of the EMPr and its specification.
- It is recommended that a short induction lecture on environmental awareness be conducted for all Contractors and causal workers covering the following topics.
  - Importance of water conservation and conservation techniques
  - Waste management
  - Dust management
  - Artefacts
  - Noise
  - Fires
  - Storage of hazardous materials
  - Importance of good house keeping
  - Importance of minimising vegetation removal

The training should include showing areas within the construction site where no clearing of vegetation is to be done, as well as showing the personnel no-go areas, locations for stockpiles, and access roads to be used.

Training can either be done in a written or verbal format depending on whichever format is most appropriate for the receiving audience. Records of people who have undergone environmental awareness training must be maintained.

10. ENVIRONMENTAL MITIGATION SPECIFICATIONS FOR IMPACTS

10.1 CONSTRUCTION PHASE

10.1.1 Social Environmental Issues

It is important to minimise the potential for negative perceptions, by taking proactive measures to prevent any social conflicts or social gaps, and to develop a positive attitude of the project within the community. The following management strategies are to be implemented in this regard:

- Transparent fair recruitment and procurement practices. The Contractor chosen should maximise the involvement of local communities in construction and support activities, to the extent possible, based on available skill levels. Whenever possible, training programmes that will benefit both construction stage skills requirements and long-term employment demand should be developed.
- The recruitment selection process should seek to promote gender equality and the employment of women wherever possible.
- As far as possible, priority should be given to local suppliers of goods and services, which meet the requirements of project procurement. In order to optimise opportunities for local businesses to supply goods and services to the project, the Contractor will conduct a survey of goods and services that are available locally, and that are of an acceptable standard and quality, and a survey of the capabilities of local construction companies and identify opportunities for local suppliers.
- A public complaints register and system to ensure that community complaints are clearly investigated and adequate remedial taken should be instituted.
- Adequate notification should be done to people residing close to where construction activities are taking place especially if they are to be affected by them. In addition, there should be a system of compensation for any damages to infrastructure that may occur.
- Each worker should be required to abide by a Code of Conduct which will limit unsavoury activities in local towns and communities and restrict certain behaviours in the work sites and accommodation.

10.1.2 Establishing Office / Camp Sites

- The area chosen for these purposes shall be the minimum reasonably required and which will involve the least disturbance to vegetation. No trees or shrubs will be felled or damaged for the purpose of obtaining firewood, unless agreed to by the landowner.
- Fires will only be allowed in facilities or equipment specially constructed for this purpose. If required by applicable legislation, a fire-break shall be cleared around the perimeter of the camp and office sites.
- Lighting and noise disturbance or any other form of disturbance that may have an effect on surrounding landowners / tenants / persons lawfully residing within the vicinity shall be kept to a minimum.
- Chemical toilet facilities or other approved toilet facilities should be sited in such a way that they do not cause water or other pollution. The use of existing facilities must take place in consultation with the landowner / tenant.
- In cases where facilities are linked to existing sewerage structures, all necessary regulatory requirements concerning construction and maintenance should be adhered to. The facilities must comply with requirements of the National Water Act (No. 59 of 2008) (NWA).

- Adequate signage must be provided, and the area must be appropriated secured.
- Adequate parking and security should be provided at the campsites.

10.1.3 Air Quality

The main sources of impacts on air quality during the construction phase include the mobilisation of equipment, land clearing and earthworks. To ensure air quality characteristics of the project area are maintained near the baseline conditions during of the construction phase, the following measures shall be implemented:

- Regular inspection and scheduled maintenance of all equipment to ensure that construction vehicles are in good working condition, are utilising fuel efficiently, and do not result in the generation or release of smoke.
- Periodically watering the bare surfaces and excavations which have been cleared of vegetation during construction to minimise dust generation.
- Slowing down vehicles carrying construction materials to reduce dust generation along access roads.
- Properly wrapping the material truck containers with covers to avoid dust generation on windy days and prohibiting over loading of trucks.
- Providing and utilising safety equipment such as dust masks, and noise covers for employees who work near dusty locations such as the heavy equipment operators.
- Optimisation of working schedule and work activities to help to minimise vehicle mobilisation trips.

10.1.4 Noise and Vibrations

The primary sources of noise sources during construction will be vehicles and equipment utilised during the construction stage including graders, bulldozers, general purpose vehicles, etc. To manage the impact the following will be done:

- Working schedule for the activities with high noise level will be arranged between 07:00 AM to 18:00 PM.
- Only well-maintained vehicles and equipment should be operated onsite and all machinery should be serviced regularly during the construction stage.
- Avoid unnecessarily undertaking noisy activities simultaneously.
- No amplified music shall be allowed at the site.
- Selecting "quiet" construction equipment and working method and avoiding unnecessary revving and hooting of vehicles.
- Providing ear protection for activities that are likely to create noise in order to protect worker's health and safety.

10.1.5 Dust Generation and Emissions

- Implement suitable dust management and prevention measures during the construction phase.
- Construction roads and camps must be adequately wetted-down on a continual basis.
- The water being used for wetting-down areas must be of sufficient quality in order to prevent significant contamination of the surrounding areas.

- Areas within and immediately surrounding the proposed development footprints must be adequately rehabilitated as soon as practicably possible after construction in order to prevent significant dust emissions.

10.1.6 Transformation of Terrestrial and Aquatic Vegetation

- The delineated perennial watercourse dissecting the assessment area, must be adequately buffered out of the proposed development footprint.
- The proposed development must be focussed within the recommended development area.
- The project construction footprints must be kept as small as practicably possible to reduce the actual surface impact on vegetation and no unnecessary / unauthorised footprint expansion into the surrounding areas may take place.
- The proposed development must refrain from encroaching into- and significantly impacting on the remaining natural areas not forming part of the development layout.
- No site construction camp to be established within the recommended buffer zone or in any natural surrounding areas outside the assessment area. Site construction camps only to be established within specific areas recommended for such.
- Adequately fence off the construction areas and ensure that no construction activities, machinery or equipment operate or impact outside the fenced off areas or within the buffer zone or the remaining natural areas.
- Existing roads and dirt tracks in close proximity to the proposed project area must be used during construction. No new roads or dirt tracks to be constructed or implemented outside the fenced off construction areas or within the buffer zone or the remaining natural areas.

10.1.7 Control of Alien Invasive Species

- Alien invasive species individuals currently on site must be actively eradicated from the assessment area and adequately disposed of in accordance with the National Environmental Management: Biodiversity Act (Act 10 of 2004); Alien and Invasive Species Regulations, 2014.
- An active alien invasive species clearance and eradication initiative must be implemented for the improvement of the perennial watercourse' ecological integrity.
- Implement an adequate Alien Invasive Species Establishment Management and Prevention Plan during the construction phase. Such a management plan must be compiled by a suitably qualified and experienced ecologist.
- Areas within and immediately surrounding the proposed development footprints must be adequately rehabilitated as soon as practicably possible after construction in order to prevent significant alien invasive species establishment.
- Adequately fence off the construction areas and ensure that no construction activities, machinery or equipment operate or impact outside the fenced off areas or within the buffer zone or the remaining natural areas.
- Existing roads and dirt tracks in close proximity to the proposed project area must be used during construction. No new roads or dirt tracks to be constructed or implemented outside the fenced off construction areas or within the buffer zone or the remaining natural areas.

10.1.8 Erosion Control

Construction activities will require the removal of vegetation cover, potentially resulting in soil erosion and subsequent impacts on surface water quality due to uncontrolled rainwater run-off or mechanical / wind action. The following measures are necessary to minimise impacts:

- An adequate Storm Water and Erosion Management Plan must be implemented for the entire assessment area during the construction phase. This must be done to sufficiently manage storm water runoff in order to prevent any significant erosion from occurring.
- Areas within and immediately surrounding the proposed development footprints must be adequately rehabilitated as soon as practicably possible after construction in order to prevent significant erosion.
- Clearance of vegetation should be restricted to the absolute minimum required to facilitate construction activities to proceed. No protected plant species shall be removed without a permit. Disturbance of topsoil and vegetation rootstock must be minimised as far as possible.
- Appropriate drainage systems will be built to accommodate the surface water movement from the rain and wind.
- Construction activities shall take place only within the approved demarcated area. Appropriate drainage facilities must be constructed to make sure water runs smoothly downstream.
- Top soil layer will be kept for rehabilitation and will be adequately stored to protect it from erosion.
- Areas where construction has been finished should immediately be re-vegetated.

10.1.9 Contamination of Land

Land contamination may occur as a result of fuel and oil leaks or spills and / or poor fuel, chemical and waste storage.

- The storage areas shall be securely fenced and secured, and appropriately marked to indicate the goods in the storage. Material Safety Data Sheets (MSDSs) should be kept for all hazardous materials on site.
- All hazardous substances and stocks such as diesel, oils, detergents, etc., shall be stored in areas with impervious flooring such as concrete and properly bunded. Drip pans, other impervious surface, shall be installed in such storage areas with a view to prevent soil and water pollution.
- Dedicated impervious areas should be designated for concrete mixing and the spillage from concrete mixed should be cleaned immediately.
- The waste management strategy on the construction site should be hinged on the waste hierarchy model of 'reduce, reuse and recycle' waste in order to reduce the ultimate impact on the environment.
- All used oils, grease or hydraulic fluids shall be placed in appropriate impervious containers and these receptacles will be removed from the site on a regular basis for disposal at a licensed disposal facility or sent for recycling / reuse with a registered facility.
- Residues from machinery maintenance and other sources contaminated with hazardous waste should be stored in proper containers that avoid seepage to ground.
- Spills should be cleaned up immediately by removing the spillage together with the polluted soil and by disposing of them at a recognised facility. In areas where the spills are some, an absorbent agent can be used, and the area treated in situ.
- Adequate waste receptacles shall be made available and all waste shall be adequately stored so that it does not pose a pollution risk. General waste is to be disposed of through the municipal service. Any other waste will be disposed of through only licensed waste disposal facilities.

10.1.10 Impeding of the Perennial Watercourse's Catchment Area and Flow Regime

- The delineated perennial watercourse dissecting the assessment area, must be adequately buffered out of the proposed development footprint during the construction phase.
- The proposed development must be focussed within the recommended development area.
- The project construction footprints must be kept as small as practicably possible to reduce the actual surface impact on vegetation and no unnecessary / unauthorised footprint expansion into the surrounding areas may take place.
- An adequate Storm Water and Erosion Management Plan must be implemented for the entire assessment area during the construction phase. This must be done to ensure and sufficiently manage storm water runoff quality, quantities and flow speed towards the watercourses in order to maintain their ecological functionality and integrity.
- Development and layout designs for the proposed project should include adequate storm water management measures to ensure that sufficient volumes and quality of surface water runoff from the footprint area is still channelled back into the perennial watercourse. This must be done in order to maintain the ecological functionality and integrity of the broader surface water catchment and drainage area.
- A Water Use License Application (WULA) must be submitted to the Department of Water and Sanitation if required in accordance with the National Water Act (No. 36 of 1998) (NWA).

10.1.11 Contamination of the Perennial Watercourse and Subsequent Downstream Watercourses.

- The delineated perennial watercourse dissecting the assessment area, must be adequately buffered out of the proposed development footprint during the construction phase.
- The proposed development must be focussed within the recommended development area.
- The project construction footprints must be kept as small as practicably possible to reduce the actual surface impact on vegetation and no unnecessary / unauthorised footprint expansion into the surrounding areas may take place.
- An adequate Storm Water and Erosion Management Plan must be implemented for the entire assessment area during the construction phase. This must be done to ensure and sufficiently manage storm water runoff, clean / dirty water separation and erosion towards the watercourses in order to maintain their ecological functionality and integrity.
- Development and layout designs for the proposed project should include adequate storm water management measures to ensure that sufficient volumes and quality of surface water runoff from the footprint area is still channelled back into the perennial watercourse. This must be done in order to maintain the ecological functionality and integrity of the broader surface water catchment and drainage area.
- A comprehensive South African Scoring System 5 (SASS 5) aquatic bio-monitoring assessment must be conducted of the watercourses directly downstream of the proposed project area prior to commencement of the construction phase. This information will serve as baseline wetland health data to be used for subsequent monitoring assessments to be conducted. Such an assessment must be conducted by a suitably qualified and experienced ecologist.
- Water samples of the watercourses must be collected directly downstream of the proposed project area prior to commencement of the construction phase. The quality of these samples must be chemically and biologically analysed by an accredited laboratory in order to serve as baseline water quality data to be used for subsequent monitoring assessments to be conducted.

- If hydrocarbons or other chemicals are to be stored on site during the construction phase, the storage areas must be situated as far away as practicably possible from the watercourses and buffer zone.
- It is recommended that hydrocarbon and other chemical storage areas be situated within the eastern or southern portions of both the assessment area.
- Hydrocarbon and other chemical storage areas must be adequately bunded in order to be able to contain a minimum of 150% of the capacity of storage tanks / units.
- Adequate hydrocarbon and other chemical storage, handling and usage procedures must be developed and all relevant construction personnel must be sufficient trained on- and apply these procedures during the entire construction phase.
- Process water, waste water and any other chemical / artificial by-products must be adequately contained and disposed of in a lawful and environmentally responsible manner.
- No process water or any form of contaminated waste water or any other chemical / artificial by-products resulting from any construction activities is allowed to be unlawfully discharged directly or indirectly into any watercourses or wetland area. If any form of process- or waste water or any other chemical / artificial by-products needs to be discharged into any watercourses or wetland area, this must be lawfully done in accordance with all relevant legal requirements and the quality of the water must continuously meet legal discharge quality and quantity standards.
- A Water Use License Application (WULA) must be submitted to the Department of Water and Sanitation if required in accordance with the National Water Act (No. 36 of 1998) (NWA).

10.1.12 Surface Water Quality

Poor chemical storage and poor waste management practices may lead to the contamination of water sources. Sewage and sanitary effluent has the potential to adversely affect the quality of receiving water bodies unless properly managed. To eliminate the risk of contamination the following measured have to be instituted.

- Chemical toilets shall be used during the construction stage and a registered service provider shall be contracted to service the toilets regularly.
- Suitable covered receptacles for waste shall be available at all times and conveniently placed for the disposal of waste.
- Refuelling, fuel loading / unloading, oil change-outs, waste storage and disposal activities must be carefully managed to prevent spillages.
- Adequate toilets must be available on site for use by construction staff at all times. The digging of pit latrines for this purpose is not allowed under any circumstances. Should chemical toilets be used, an appropriate contractor must be employed to service these facilities on an ongoing basis.
- Spills or overflows from chemical or other toilets used by construction staff must be dealt with by a sanitation expert immediately.
- Any effluents containing oil, grease or other industrial substances must be collected in a suitable receptacle and treated prior to discharge or removed from the site for appropriate disposal at a recognised facility.

10.1.13 Water Usage

- Any water that is used which is does not emanate from Municipality supplies must be registered and authorised by the Department of Water and Sanitation (DWS) prior to usage commencement.
- The contractor shall promote responsible water use by all personnel.

10.1.14 Fauna and Flora

Fauna and flora are negatively impacted by the clearance of vegetation, noise from construction activities (disturbance) and gathering / hunting of flora and fauna by workers. The following measures are necessary to mitigate impacts:

- Clearance of vegetation should be restricted to the absolute minimum required to facilitate access and undertaken construction activities.
- Topsoil shall be removed and kept for use during rehabilitation.
- The Contractor shall be responsible for the removal of alien vegetation within areas affected by the construction activities including cleared ground and topsoil stockpiles. Equipment used should be regularly washed down to avoid transporting seeds (invasive species) or plant diseases.
- No protected or endangered plant species shall be removed without a permit or license.
- No trees or shrubs will be felled or damaged for the purpose of obtaining firewood, unless agreed to by the landowner / tenant.
- The rehabilitation activities require the re-planting of vegetation in any areas cleared for the construction activities. This will promote soil stability, improve the visual environment and provide faunal habitat.
- Hunting / gathering by construction workers must not be permitted.
- Localised habitat features such as nests, dens or burrow sites should be avoided as much as possible. In addition, care should be taken in working in areas of active nesting, spawning, and feeding areas where present on site.

10.1.15 Safety

- The Contractor shall be responsible for the protection of the public and public property from any dangers associated with the construction and operation of the road activities.
- All work should be handled in accordance with the Occupational Health and Safety Act (No. 85 of 2003) (OHSA) and adequate safety precautions taken and suitable sanitation facilities provided in line with the requirements of OHSA. It is the duty of the Contactor to ensure that the all protective measures against accidents are done.
- Any works / activities which may pose a hazard to humans and / or domestic animals are to be protected or cordoned off and, if appropriate, warning signage erected.
- Appropriate security is to be provided at the site to protect equipment and provide for a safe construction site and works areas.
- Any damage caused as a result of the construction activities shall be repaired to the satisfaction of the project manager and owner.

10.1.16 Historical Archaeological and Heritage Impacts

- Should any cultural or archaeological artefacts be found during operational activities, operations must cease immediately, and the area secured and SAPS, the South African Heritage Resources Agency (SAHRA), the Free State Provincial Heritage Resources Agency and other relevant authorities informed immediately.
- No site of archaeological or historical significance maybe moved without a permit from the SAHRA. Any permitted removal of any archaeological or historical matter must be done under the strict supervision of a qualified registered archaeologist.

10.2 OPERATIONAL PHASE

10.2.1 Continued impeding of the perennial watercourse's catchment area and flow regime.

- An adequate Storm Water and Erosion Management Plan must be implemented for the entire assessment area during the operational phase. This must be done to ensure and sufficiently manage storm water runoff quality, quantities and flow speed towards the watercourses in order to maintain their ecological functionality and integrity.
- Development and layout designs for the proposed project should include adequate storm water management measures to ensure that sufficient volumes and quality of surface water runoff from the footprint area is still channelled back into the perennial watercourse and through the culverts into the watercourse situated directly north of the assessment area. This must be done in order to maintain the ecological functionality and integrity of the broader surface water catchment and drainage area.

Continued contamination of the perennial watercourse and subsequent downstream watercourses.

- An adequate Storm Water and Erosion Management Plan must be implemented for the entire assessment area during the operational phase. This must be done to ensure and sufficiently manage storm water runoff and clean / dirty water separation towards the watercourses in order to maintain their ecological functionality and integrity.
- Development and layout designs for the proposed project should include adequate storm water management measures to ensure that sufficient volumes and quality of surface water runoff from the footprint area is still channelled back into the perennial watercourse. This must be done in

order to maintain the ecological functionality and integrity of the broader surface water catchment and drainage area.

- A comprehensive South African Scoring System 5 (SASS 5) aquatic bio-monitoring assessment must be conducted of the watercourses directly downstream of the proposed project area on an annual basis in order to ensure that the ecological functionality and integrity of the watercourses is maintained. This information must then be compared to the baseline data collected during the initial assessment prior to the commencement of the construction phase. Such an assessment must be conducted by a suitably qualified and experienced ecologist.
- Water sample chemical and biological analyses of the watercourses directly downstream of the proposed project area must be continually conducted on a 6-month basis in order to ensure that the water quality of the watercourses is maintained. This information must then be compared to the baseline data collected during the initial analyses prior to the commencement of the construction phase.
- If any reduction in wetland health, SASS 5 scores or chemical and biological water quality is determined due to the project, the competent authority must immediately be notified and the necessary steps must be followed by the project owner to locate and remediate the source of contamination / health reduction as soon as practicably possible.
- If hydrocarbons or other chemicals are to be stored on site during the operational phase, the storage areas must be situated as far away as practicably possible from the watercourses and buffer zone.
- Hydrocarbon and other chemical storage areas must be adequately bunded in order to be able to contain a minimum of 150% of the capacity of storage tanks / units.
- Adequate hydrocarbon and other chemical storage, handling and usage procedures must be developed and all relevant operational personnel must be sufficient trained on- and apply these procedures during the entire operational phase.
- Process water, waste water and any other chemical / artificial by-products must be adequately contained and disposed of in a lawful and environmentally responsible manner.
- No process water or any form of contaminated waste water or any other chemical / artificial by-products resulting from any operational activities is allowed to be unlawfully discharged directly or indirectly into any watercourses or wetland area. If any form of process- or waste water or any other chemical / artificial by-products needs to be discharged into any watercourses or wetland area, this must be lawfully done in accordance with all relevant legal requirements and the quality of the water must continuously meet legal discharge quality and quantity standards.
- Chemical and biological analyses of process water, waste water and any other chemical / artificial by-products to be discharged into any watercourses or wetland area must be continually conducted on a weekly basis in order to ensure that the quality and quantity standards of all discharges are legal and environmentally responsible.

10.2.2 Chemical air emissions pollution.

- Adequate design, technology and operational mitigation measures must then be implemented in order to reduce the impact significance and extent of the air emissions pollution plume to within acceptable and legally compliant levels.

10.2.3 Disruption of nocturnal faunal activities through noise and lighting emissions.

- Lighting and illumination infrastructure technology and layout designs must be done in an environmentally friendly manner.

- The minimum amount of lighting and illumination infrastructure which is practicably possible for operations to function at, must be utilised during night time.
- Lighting and illumination infrastructure must as far as practicably possible be directed at low shining angles towards the ground and towards the inner portions of the development areas in order to reduce the amount of bright light being emitted into the surrounding adjacent areas.
- Lower shining intensity environmentally friendly lighting products must be utilised in order to reduce the brightness of light being emitted into the surrounding adjacent areas.
- Adequate design, technology and operational mitigation measures must be implemented in order to reduce the amount of night time noise being emitted from the operational activities as far as practicably possible.

10.3 REHABILITATION

- On completion of operations, all buildings, structures or objects on the camp / office site shall be demolished and removed.
- Where office / camp sites have been rendered devoid of vegetation / grass or where soils have been compacted owing to traffic, the surface shall be scarified or ripped.
- On completion of operations, the areas shall be cleared of any contaminated soil, which must be dumped as per the waste management plan.
- All infrastructure, equipment, plant, temporary housing and roads and other items used during the construction period will be removed from the site.
- Waste material of any description, including receptacles, scrap, rubble and tyres, will be removed entirely from the area and disposed of at a registered waste disposal facility. It will not be permitted to be buried or burned on the site
- Disturbed areas should be left in a safe and stable manner. Preventative measures may be necessary to construct adequate drainage structures including ditches and other structures to facilitate the movement of surface water.
- Photographs of the camp and office sites, before and during the construction and after rehabilitation, shall be taken at selected fixed points and kept on record.
- The disturbed surfaces shall then be ripped or ploughed and the topsoil previously stored shall be spread evenly to its original depth over the whole area. The area shall then be fertilised if necessary (based on a soil analysis).
- The site shall be seeded with a vegetation seed mix adapted to reflect the local indigenous flora.
- If a reasonable assessment indicates that the re-establishment of vegetation is unacceptably slow, the might be need that the soil be analysed and any deleterious effects on the soil arising from the construction operation be corrected and the area be seeded with a seed mix to his or her specification.

11. HANDLING OF EMERGENCIES

- The Contractor should identify all situations that can lead to emergency situations and provide response strategies. The situations should include fire and major chemical spills.
- Contact details of all departments / service providers to be contacted in case of an emergency shall be made available to employees.
- Equipment for dealing with emergencies such as spill kits, firefighting equipment, first aid boxes etc., shall be made available and personnel properly trained in its use.
- All staff on site should be trained on how to handle emergency situations and emergency drills / rehearsals should be conducted periodically to ensure that staff are prepared.

12. METHOD STATEMENTS

The Contractor shall submit written Method Statements for all environmentally sensitive aspects of the work. It should be noted that Method Statements must contain sufficient information and detail to mitigate the potential impacts of the works on the environment. The Contractor will also need to thoroughly understand what is required of him / her in order to undertake the works. Work shall not commence until Method Statements have been prepared and are in place.

APPENDIX A CURRICULUM VITAE OF THE EAP

EMPr PREPARED BY: Danie Krynauw

CONTACT DETAILS:
Green-Box Consulting
P.O. Box 37738
Langenhovenpark
9330

Tel: 082 435 2108
Fax: 086 66 34343
Email: danie@green-box.co.za

QUALIFICATIONS OF EAP: Danie Krynauw has a Master's degree in Town and Regional Planning from the University of the Free State (UFS), and is currently completing his dissertation to obtain a Masters degree in Environmental Management from UFS. Danie has over 14 years' experience in the environmental management field, and is a member of the International Association of Impact Assessments South Africa (IAIAsa).

CURRICULUM VITAE – DANIE KRYNAUW

1. Family name: Krynauw
2. First name: Daniël
3. Date of birth: 14/12/1971
4. Nationality: South African
5. Contacts: Cell: 082 435 2108
   Email: danie@green-box.co.za

6. Education:

Institution	Degree(s) or Diploma(s) obtained
University of the Free State 2001 – 2002	Master in Environmental Management – Dissertation pending
University of the Free State 1996 – 1998	Masters in Urban and Regional Planning
University of the Free State 1993 – 1995	BA Geography and Sociology

7. Membership of professional bodies:
   - International Association of Impact Assessment South Africa (IAIAsa)

8. Present position:
   - Environmental Scientist / Director – Green-Box Consulting

9. Current Responsibilities:
   - Liaising with clients in both the private and public sectors.
   - Conduct Environmental Impact Assessments and other Environmental Technical Investigations.
   - Apply and obtain waste licenses, water licenses, mining permits and environmental authorisations for clients.
   - Use different GIS datasets in order to create new information or investigate patterns for projects.
   - Conduct environmental compliance and other environmental audits.
   - Provide technical-level support for environmental remediation and mitigation projects, including remediation system design and determination of regulatory applicability for incoming projects.
   - Collaborate with other environmental scientists, planners, engineers, and other specialists, and experts in law and business etc. to address environmental problems for clients.
   - Conduct Environmental training.

10. Years within the organization:
    - 7 years

11. Other skills (e.g. computer literacy, etc.):
    - All suits of Microsoft Office, Arc View, ReGIS, and Project Professional.

12. Professional experience:

Date	2011 – Current
Organisation	Green-Box Consulting (Environmental Consultants)

Position	Environmental Scientist (Owner and Director)

Date	2009 – 2016
Organisation	Terra Works Environmental Consultants
Position	Senior Environmental Scientist and COO

Date	2001 – 2009
Organisation	Department of Economic Development, Tourism and Environmental Affairs, Free State
Position	Principal Environmental Officer
Description of duties	• Review Environmental Impact Assessments • Review Environmental Management Programmes • Issuing Environmental Authorisations

APPENDIX B MAPS

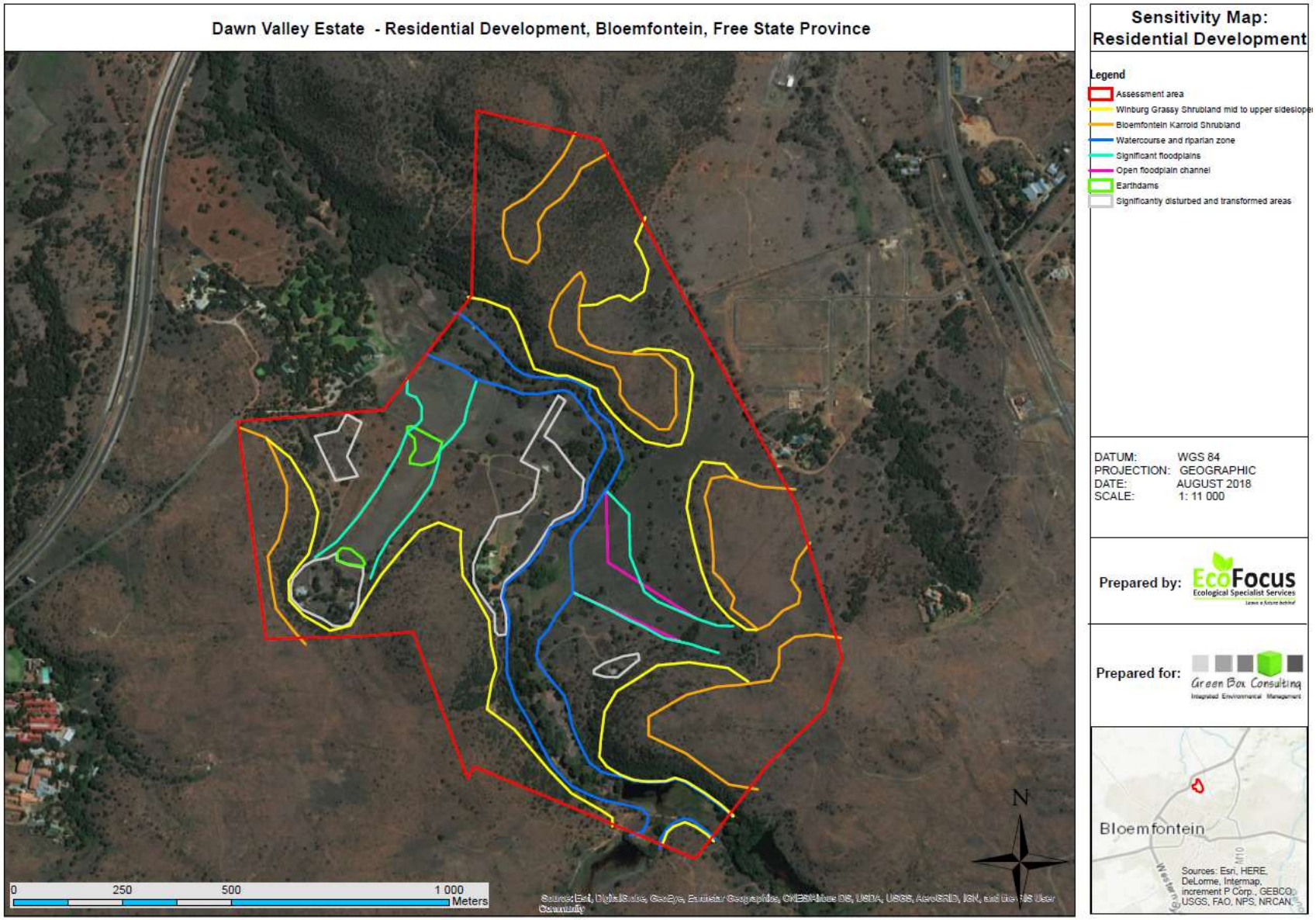

Figure 1: Environmental Sensitivity Map prepared for the project site illustrating the different environmental sensitive areas

Figure 2: Conceptual layout with proposed land uses

Appendix H
Details of the EAP

DETAILS AND EXPIRIENCE OF PERSON PREPAIRING REPORT

REPORT PREPARED BY:	Danie Krynauw
CONTACT DETAILS:	Email: danie@green-box.co.za
ENVIRONMENTAL CONSULTING COMPANY:	Green Box Consulting P.O. Box 37738 Langenhovenpar k 9330 Tel: 082 435 2108 Fax: 086 66 34343

QUALIFICATIONS OF EAP: Danie Krynauw has a Master's degree in Town and Regional Planning (UFS), and completing his dissertation to obtain a Master in Environmental Management (UFS). D. Krynauw has over 14 years' experience in the environmental management field, and is a member of the International Association of Impact Assessments South Africa.

ONE PAGER - CURRICULUM VITAE

DANIE KRYNAUW

1. Family name: Krynauw
2. First name: Daniël
3. Date of birth: 1971/12/14
4. Nationality: South African
5. Contacts: Cell: 0824352108 / e-mail: danie@green-box.co.za
6. Education:

Institution	Degree(s) or Diploma(s) obtained
University of the Free State 2001 - 2002	Master in Environmental Management – Dissertation pending
University of the Free State 1996-1998	Masters in Urban and Regional Planning (UFS)
University of the Free State 1993-1995	BA Geography and Sociology (UFS)

7. Membership of professional bodies:
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8. Present position: Environmental Scientist / Director – Green-Box Consulting

9. Current Responsibilities:
   - Liaising with clients in both the private and public sectors.
   - Conduct Environmental Impact Assessments and other Environmental Technical Investigations.
   - Apply and obtain waste licenses, water licenses, mining permits and environmental authorisations for clients.
   - Use different GIS datasets in order to create new information or investigate patterns for projects.
   - Conduct environmental compliance and other environmental audits.
   - Provide technical-level support for environmental remediation and mitigation projects, including remediation system design and determination of regulatory applicability for incoming projects.
   - Collaborate with other environmental scientists, planners, engineers, and other specialists, and experts in law and business etc to address environmental problems for clients.
   - Conduct Environmental training.

10. Years within the organization: 7 years

11. Other skills (e.g. computer literacy, etc.): All suits of Microsoft Office, Arc View, ReGIS, and Project
    Professional.

12. Professional experience:

Date	2011 - Current
Organisation	Green-Box Consulting (Environmental Consultants)
Position	Environmental Scientist (Owner and Director)

Date	2009 - 2016
Organisation	Terra Works Environmental Consultants
Position	Senior Environmental Scientist and COO

Date	2001 - 2009

Organisation	Department of Economic Development, Tourism and Environmental Affairs, Free State
Position	Principal Environmental Officer
Description of duties	Review Environmental Impact Assessments Review Environmental Management Programmes Issuing Environmental Authorisations

Appendix I Specialist Declaration of interest

Appendix J
Additional Information

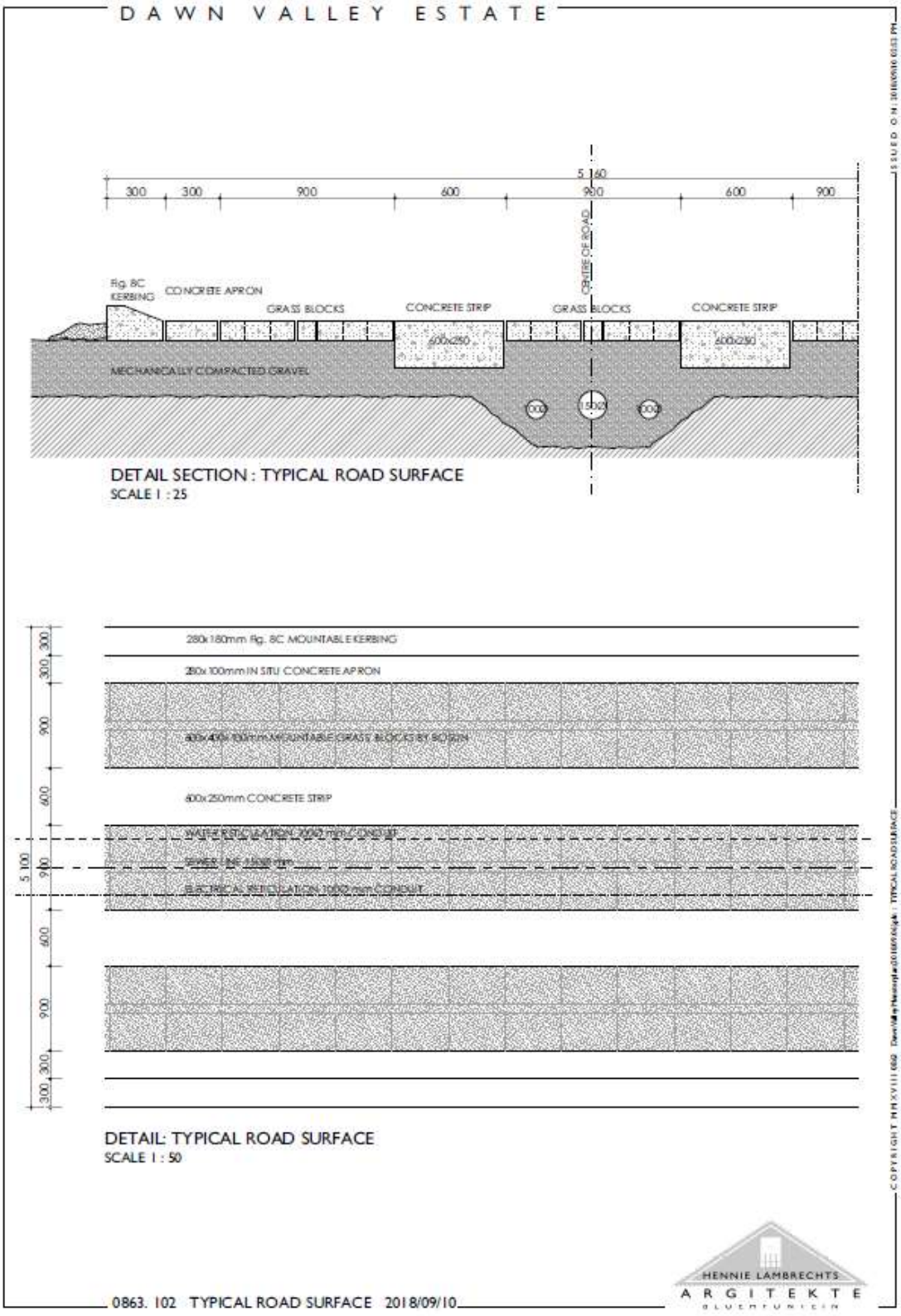

Figure 3: Typical Road Surface


GREEN-BOX
CONSULTING