Draft Basic Assessment Report

Proposed construction of a housing development and associated infrastructure on Erf 61, Pietermaritzburg, Msunduzi Local Municipality, KwaZulu-Natal

EDTEA REF: DC22/0020/2019

November 2019

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VERIFICATION PAGE

TITLE:

PROPOSED HOUSING DEVELOPMENT AND ASSOCIATED INFRASTRUCTURE ON ERF 61, PIETERMARITZBURG, KWAZULU-NATAL.

PROJECT NO.:	DATE:	REPORT STATUS:
41748	22/11/2019	Draft

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SYNOPSIS:

Draft Basic Assessment for the proposed housing development and associated infrastructure, Lincoln Meade, KwaZulu-Natal.

KEY WORDS:

Basic Assessment, EMPr, Lincoln Meade, housing, NEMA (Act 107 of 1998) EIA Regulations 2014 (as amended, 2017), GNR 326, GNR 327, GNR 324

QUALITY VERIFICATION

This report has been prepared under the controls established by a quality management system that meets the requirements of ISO9001: 2015, which has been independently certified by DEKRA Certification under certificate number 90906882.

VERIFICATION	CAPACITY	NAME	SIGNATURE	DATE
By Author	Environmental Scientist	Riona Patak		27/11/2019
Checked by	Senior Environmental Scientist	Liz Dralle		27/11/2019
Authorised by	Executive Associate	Magnus van Rooyen		27/11/2019

File name:	W:\Enviro\TT\41748 - Lincoln Meade BA and WULA\1. PROJECT\7. Reports\DBAR

EXECUTIVE SUMMARY

Terratest (Pty) Ltd has been appointed by Person Drive Trading (Pty) Ltd to undertake the environmental services required for the proposed construction works associated with the proposed residential development and associated infrastructure located on Grimthorpe Avenue, Lincoln Meade, Msunduzi Local Municipality, KwaZulu-Natal. The street address of the site is 55 Grimthorpe Avenue and currently consists of one residential unit and open space area. The property description is Erf 61, Pietermaritzburg.

The proposed development is approximately 1.85 hectares in extent and in terms of the Spatial Development Framework of the Municipality's Integrated Development Plan, the site is classified as Residential. The proposed development consists of the construction of 23 residential units and the upgrade of the existing residential unit on-site and associated infrastructure.

The proposed construction will consist of 20 x 3 bedroom units (each 104.69m^2) and 3 x 2 bedroom units (each 81.72m^2). The land development area will transform approximately 52% of the Erf to provide new units, parking and an internal road network. Alternative layout options have previously been examined as per Section 8 of this Report.

Electrical provision will be via ESKOM supply. Access to the proposed development will be along Grimthorpe Avenue at 29°37'11"S; 30°26'6.7"E. The proposed development will tie into the existing municipal water and sewage network.

In terms of Specialist input, a Wetland Assessment was undertaken by Ikwane Wetland Science. A single wetland was identified on-site. The results of the assessment concluded that the wetland is largely modified and the proposed development will have a low impact on the wetland. A Heritage Impact Assessment was also undertaken by Active Heritage to determine if any items of cultural or historical value would be impacted on during construction. A Vegetation Specialist was consulted and confirmed that a majority of the site is disturbed by alien vegetation. No fatal flaws were identified by any of the Specialist Studies provided that certain mitigation was put in place. Several key recommendations were therefore made in order to sustain and preserve the identified wetland systems on the site and as such certain amendments to the placement of residential stands was made during the pre-application planning process to ensure that the proposed development would be sustainable in the long term. Furthermore, a Water Use Licence Application (WULA) is currently being undertaken by Terratest (Pty) Ltd. The WULA is being applied for to obtain the necessary approvals from the Department of Water and Sanitation (DWS) in terms of the National Water Act of 1998, as amended.

This Basic Assessment (BA) Report has been drafted in accordance with the NEMA: EIA Regulations, 2014, as amended, and adheres to the requirements contained in Appendix 1 of GNR 326 of 2017, as noted in Table 1.

TABLE 1: Content of a BA Report (2014 EIA Regulations)

2014 EIA Regulations	Description of EIA Regulations Requirements for BA Reports	Location in the BA Report
Appendix 1, Section 3 (a)	Details of – (i) The EAP who prepared the report; and the expertise of the EAP; and (ii) The expertise of the EAP, including a curriculum vitae.	Section 2 & Appendix 1
Appendix 1, Section 3 (b)	The location of the activity, including – (i) The 21 digit Surveyor General code of each cadastral land parcel; (ii) Where available, the physical address and farm name; (iii) Where the required information in items (i) and (ii) is not available, coordinates of the boundary of the property or properties	Section 3
Appendix 1, Section 3 (c)	A plan which locates the proposed activity or activities applied for at an appropriate scale, or, if it is – (i) A linear activity, a description and coordinates of the corridor in which the proposed activity or activities is to be undertaken; or (ii) On land where the property has not been defined, the coordinates within which the activity is to be undertaken.	Section 3 & Appendix 2

2014 EIA Regulations	Description of EIA Regulations Requirements for BA Reports	Location in the BA Report
Appendix 1, Section 3 (d)	A description of the scope of the proposed activity, including – (i) All listed and specified activities triggered; (ii) A description of the activities to be undertaken, including associated structures and infrastructure.	Section 4
Appendix 1, Section 3 (e)	A description of the policy and legislative context within which the development is proposed including an identification of all legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks and instruments that are applicable to this activity and are to be considered in the assessment process.	Section 5
Appendix 1, Section 3 (f)	A motivation for the need and desirability for the proposed development including the need and desirability of the activity in the context of the preferred location.	Section 6
Appendix 1, Section 3 (h)	A full description of the process followed to reach the proposed preferred activity, site and location within the site, including- (i) Details of all alternatives considered; (ii) Details of the Public Participation Process undertaken in terms of Regulation 41 of the Regulations, including copies of the supporting documents and inputs; (iii) A summary of the issues raised by interested and affected parties, and an indication of the manner in which the issues were incorporated, or the reasons for not including them; (iv) The environmental attributes associated with the alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects; (v) The impacts and risks identified for each alternative, including the nature, significance, consequence, extent, duration, and probability of the impacts, including the degree to which the impacts- (aa) Can be reversed; (bb) May cause irreplaceable loss of resources; and (cc) Can be avoided, managed, or mitigated. (vi) The methodology used in deterring and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks associated with the alternatives; (vii) Positive and negative impacts that the proposed activity and alternatives will have on the environment and on the community that may be affected focusing on the geographic, physical, biological, social, economic, heritage and cultural aspects; (viii) The possible mitigation measures that could be applied and level of residual risk; (ix) The outcome of the site selection matrix; (x) If no alternatives, including alternative locations for the activity were investigated, the motivation for not considering such and; (xi) A concluding statement indicating the preferred alternatives, including preferred location of the activity.	 Section 7 Section 8 Section 8 Section 9 Section 13 Section 11 Section 7 Section 12 Section 13 Section 7 Section 15
Appendix 1, Section 3 (i)	A full description of the process undertaken to identify, assess and rank the impacts the activity will impose on the preferred location through the life of the activity, including- (i) A description of all environmental issues and risks that were identified during the environmental impact assessment process; and (ii) An assessment of the significance of each issue and risk and an indication of the extent to which the issue and risk could be avoided or addressed by the adoption of mitigation measures.	Section 13
Appendix 1, Section 3 (j)	An assessment of each identified potentially significant impact and risk, including- (i) Cumulative impacts; (ii) The nature, significance and consequences of the impact and risk; (iii) The extent and duration of the impact and risk; (iv) The probability of the impact and risk occurring; (v) The degree to which the impact and risk can be reversed; (vi) The degree to which the impact and risk may cause irreplaceable loss of resources; and (vii) The degree to which the impact and risk can be avoided, managed or mitigated.	Section 13
Appendix 1, Section 3 (k)	Where applicable, a summary of the findings and impact management measures identified in any specialist report complying with Appendix 6 to these Regulations and an indication as to how these findings and recommendations have been included in the final report.	Section 10
Appendix 1, Section 3 (l)	An environmental impact statement which contains- (i) A summary of the key findings of the environmental impact assessment; (ii) A map at an appropriate scale which superimposes the proposed activity and its associated structures and infrastructure on the environmental sensitivities of the preferred site indicating any areas that should be avoided, including buffers; and	Section 14

2014 EIA Regulations	Description of EIA Regulations Requirements for BA Reports	Location in the BA Report
	(iii) A summary of the positive and negative impacts and risks of the proposed activity and identified alternatives.	
Appendix 1, Section 3 (m)	Based on the assessment, and where applicable, impact management measures from specialist reports, the recording of the proposed impact management objectives, and the impact management outcomes for the development for inclusion in the EMPr.	Section 14
Appendix 1, Section 3 (n)	Any aspects which were conditional to the findings of the assessment either by the EAP or specialist which are to be included as conditions of authorisation.	Section 14
Appendix 1, Section 3 (o)	A description of any assumptions, uncertainties, and gaps in knowledge which relate to the assessment and mitigation measures proposed;	-
Appendix 1, Section 3 (p)	A reasoned opinion as to whether the proposed activity should or should not be authorised, and if the opinion is that it should be authorised, any conditions that should be made in respect of that authorisation.	Section 15
Appendix 1, Section 3 (q)	Where the proposed activity does not include operational aspects, the period for which the environmental authorisation is required, the date on which the activity will be concluded, and the post construction monitoring requirements finalised.	Section 16
Appendix 1, Section 3 (r)	An undertaking under oath or affirmation by the EAP in relation to- (i) The correctness of the information provided in the report; (ii) The inclusion of the comments and inputs from stakeholders and interested and affected parties; (iii) the inclusion of inputs and recommendations from the specialist reports where relevant; and (iv) Any information provided by the EAP to interested and affected parties and any responses by the EAP to comments or inputs made by interested and affected parties.	Section 18
Appendix 1, Section 3 (s)	Where applicable, details of any financial provisions for the rehabilitation, closure, and ongoing post decommissioning management of negative environmental impacts.	-
Appendix 1, Section 3 (t)	Where applicable, any specific information required by the Competent Authority.	-
Appendix 1, Section 3 (u)	Any other matter required in terms of section 24(4) (a) and (b) of the Act.	-

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1 INTRODUCTION

Terratest (Pty) Ltd has been appointed by Person Drive Trading (Pty) Ltd to undertake the environmental services required for the proposed construction works associated with the proposed residential development and associated infrastructure located on Grimthorpe Avenue, Lincoln Meade, Msunduzi Local Municipality, KwaZulu-Natal. The street address of the site is 55 Grimthorpe Avenue and currently consists of one residential unit and open space area. The property description is Erf 61, Pietermaritzburg.

The proposed development is approximately 1.85 hectares in extent and in terms of the Spatial Development Framework of the Municipality's Integrated Development Plan, the site is classified as Residential. The proposed development consists of the construction of 23 residential units and the upgrade of the existing residential unit on-site and associated infrastructure.

The proposed construction will consist of 20 x 3 bedroom units (each 104.69m^2) and 3 x 2 bedroom units (each 81.72m^2). The land development area will transform approximately 52% of the Erf to provide new units, parking and an internal road network.

Extensive pre-planning and assessment work undertaken by the Applicant and his appointed Specialists has informed the selection of the proposed layout for development and this is elaborated on further in other sections of this report. Planning has taken cognisance of electrical, water and sewerage provision, as well as stormwater management and sensitive areas such as watercourses and wetlands.

As per GN R326 of the EIA Regulations, 2014, a Basic Assessment (BA) Process must be undertaken in such a manner that the environmental outcomes, impacts and residual risks of the proposed Listed Activity being applied for are noted in the BA Report and assessed accordingly by the Environmental Assessment Practitioner (EAP). In this regard, the requirements of the BA Process are noted in the EIA Regulations (2014), as amended, Listing Notice 1, Appendix 1 of GNR 326 and are consequently adhered to in this report (please refer to Table 1 of the Executive Summary).

Ultimately, the outcome of the BA Process is to provide the Competent Authority, the Department of Economic Development, Tourism and Environmental Affairs (EDTEA), with sufficient information to provide a decision on the Application in terms of Environmental Authorisation (EA), in order to avoid or mitigate any detrimental impacts that the activity may inflict on the receiving environment.

2 DETAILS OF THE ENVIRONMENTAL ASSESSMENT PRACTITIONER (EAP)

As noted previously, Terratest (Pty) Ltd has been appointed by Person Drive Trading (Pty) Ltd to undertake the BA Process for the construction works associated with the proposed housing development and associated infrastructure on Erf 61, Pietermaritzburg, KwaZulu-Natal. Details of the qualified EAPs involved in undertaking the BA Process are noted in Table 2 and the Curriculum Vitae (CV) of the relevant EAPs attached as Appendix 1.

TABLE 2: Details of the EAP

Company: Terratest (Pty) Ltd			
EAP	**Qualifications & Professional affiliations**	**Experience at environmental assessments**	**Contact details**
Mr M. van Rooyen Executive Associate	BSc, BSc Hons, MPhil. (Environmental Management), Pr. Sci. Nat, IAIAsa	14 years	Terratest (Pty) Ltd Tel: (033) 343 6789 Email: vanrooyenm@terratest.co.za
Mr J Richardson Associate	BSc. Hons. Geography and Environmental Management, IAIAsa	11 years	Terratest (Pty) Ltd Tel: (033) 343 6789 Email: richardsonj@terratest.co.za
Ms R. Patak Environmental Scientist	BSc. Hons. Environmental Science, IAIAsa	6 years	Terratest (Pty) Ltd Tel: (033) 343 6789 Email: patakr@terratest.co.za

3 LOCATION OF THE ACTIVITY

The proposed activity is located within Ward 35 of the Msunduzi Local Municipality. The 21-digit Surveyor General (SG) code for the cadastral land parcel, as well as property details and coordinates, are detailed in Table 3.

TABLE 3: Location of proposed development

ERF 61 LINCOLN MEADE	
21 digit SG code	N0FT01860000006100000
Physical address / Erf / Farm / Portion	Erf 61, Pietermaritzburg / 55 Grimthorpe Avenue, Lincoln Meade
Central coordinates	29°37'11.00"S; 30°26'06.70"E
Property size (ha)	1.85Ha
Site entrance and coordinates	Grimthorpe Avenue - 29°37'11"S; 30°26'6.7"E

A Locality Map of the site, as well as the associated layout drawings are provided in Figures 1 and 2, as well as in Appendix 2. A 3D model of the site depicting the approximate outline of the proposed development area is provided as Plate 1. Approximately 52% (0.98Ha) of the site will be transformed for residential use, while the remaining 48% (0.87Ha) will be retained as open space for the preservation of the wetland system identified on-site (refer Section 10 of this report).

PLATE 1: 3D model of site showing a rough outline of the proposed development area

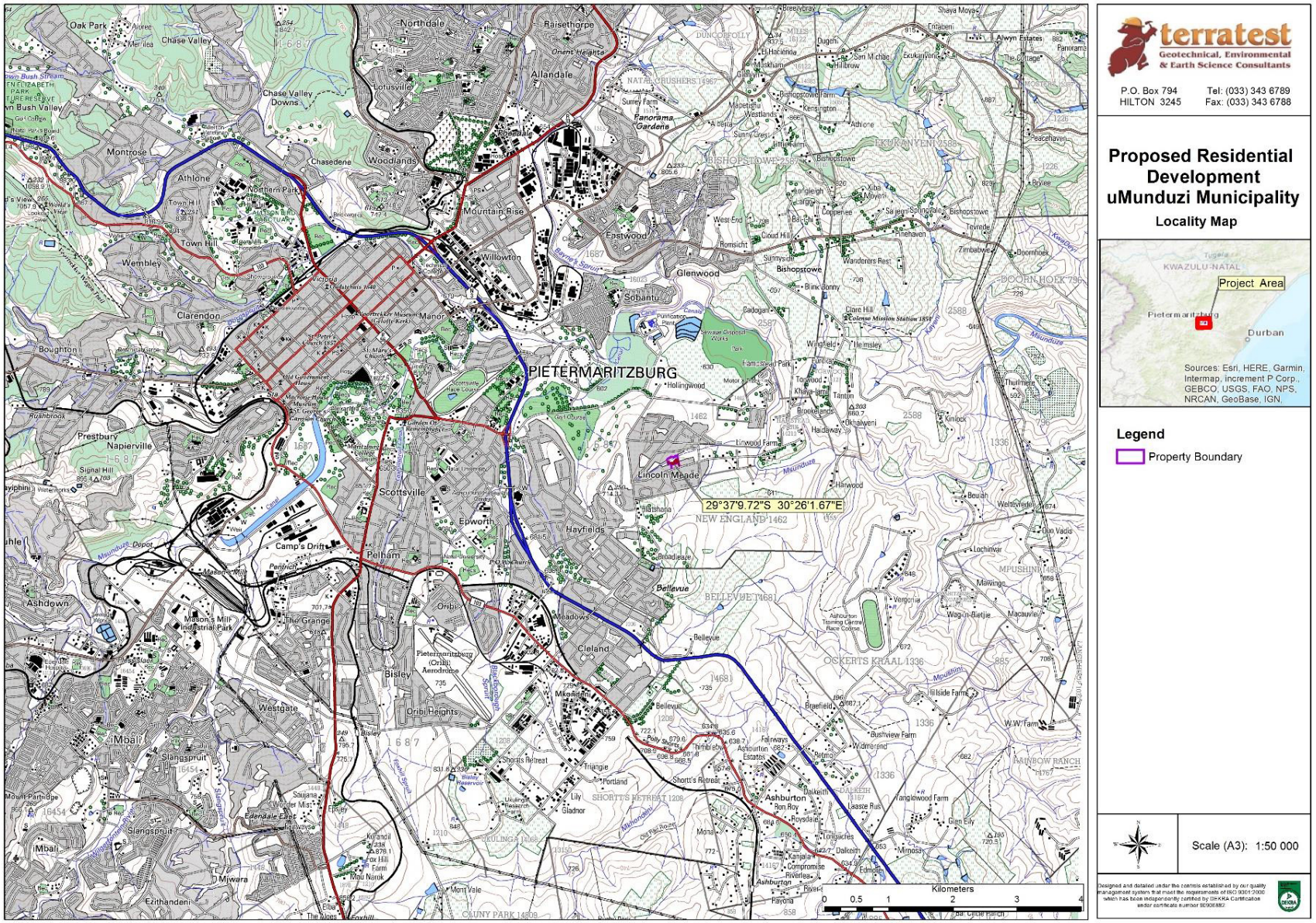


FIGURE 1: Locality Map

FIGURE 2: Preferred Layout Plan

4 ACTIVITY DESCRIPTION

4.1 APLICABLE LISTED ACTIVITIES

In terms of the Environmental Impact Assessment (EIA) Regulations (2014), promulgated in terms of the National Environmental Management Act, 1998 (NEMA), certain Listed Activities are specified for which either a Basic Assessment (GN R 327 and 324) or a full Scoping and EIA (GN R 325) is required.

Terratest (Pty) Ltd liaised with the EDTEA and the Msunduzi Municipality: Environmental Management Department regarding the applicability of the proposed development to the relevant legislation. The following correspondence occurred prior to the lodging of the Application for Environmental Authorisation:

1. A query regarding the applicability of identified Listed Activities was submitted to the EDTEA for comment on the 19 September 2018.
2. EDTEA correspondence was received on 19 November 2018 (Q-2018-94) which confirmed that two identified Listed Activities must be applied for with reference to the proposed development. These activities were GNR 327: Activity 12[1] and GNR 324: Activity 14[2].
3. As a result of the EDTEA correspondence, Terratest (Pty) Ltd commissioned a Vegetation Specialist to confirm the applicability of the Listed Activities which were proposed to be triggered by the EDTEA. The resultant outcome from the Vegetation Specialist confirmed that 300m^2 of indigenous vegetation will not be cleared (refer Section 10 of this Report). Terratest (Pty) Ltd therefore relodged the query to EDTEA on 1 April 2019.
4. A site inspection was conducted with the EDTEA, the Msunduzi Municipality: Environmental Management Department and Terratest (Pty) Ltd on 21 April 2019.
5. As a result of the site visit, the EDTEA sent further correspondence to Terratest (Pty) Ltd regarding the applicability of Listed Activities identified for the proposed development on 15 August 2019 (Q-2019-38). The correspondence confirmed that GNR 324: Activity 14 is the only applicable Listed Activity for the proposed development.

Information regarding the abovementioned correspondence is found in Appendix 3.

Therefore based on the correspondence conducted between Terratest (Pty) Ltd, the EDTEA and the Msunduzi Municipality: Environmental Management Department, the following Listed Activity contained in GNR 324 requires a Basic Assessment (BA) Process to be completed and a positive Environmental Authorisation received prior to construction commencing:

- GN R 324 – Activity 14: *"The development of infrastructure or structures with a physical footprint of 10 square metres or more; where such development occurs — (c) if no development setback has been adopted, within 32 metres of a watercourse, measured from the edge of a watercourse; d. KwaZulu-Natal (viii.) Sensitive areas as identified in an Environmental Management Framework as contemplated in Chapter 5 of the Act and as adopted by the Competent Authority".*
    - This Listed Activity is relevant as the proposed development will occur within 32m of a sensitive area as identified within the Msunduzi Environmental Management Framework (EMF).

The associated Environmental Authorisation (EA) Application form is attached to this Report as Appendix 4 and an organogram of the BA Process is provided in Figure 3 for reference purposes.

[1] GNR 327: Activity 12, "*The development of (ii) Infrastructure or structures with a physical footprint of 100 square metres or more; where such development occurs (a) within a watercourse (c) or within 32 metres of a watercourse, measured from the edge of a watercourse."*

[2] GNR 324: Activity 14*: "The development of infrastructure or structures with a physical footprint of 10 square metres or more; where such development occurs — (c) if no development setback has been adopted, within 32 metres of a watercourse, measured from the edge of a watercourse; d. KwaZulu-Natal (viii.) Sensitive areas as identified in an Environmental Management Framework as contemplated in Chapter 5 of the Act and as adopted by the Competent Authority".*

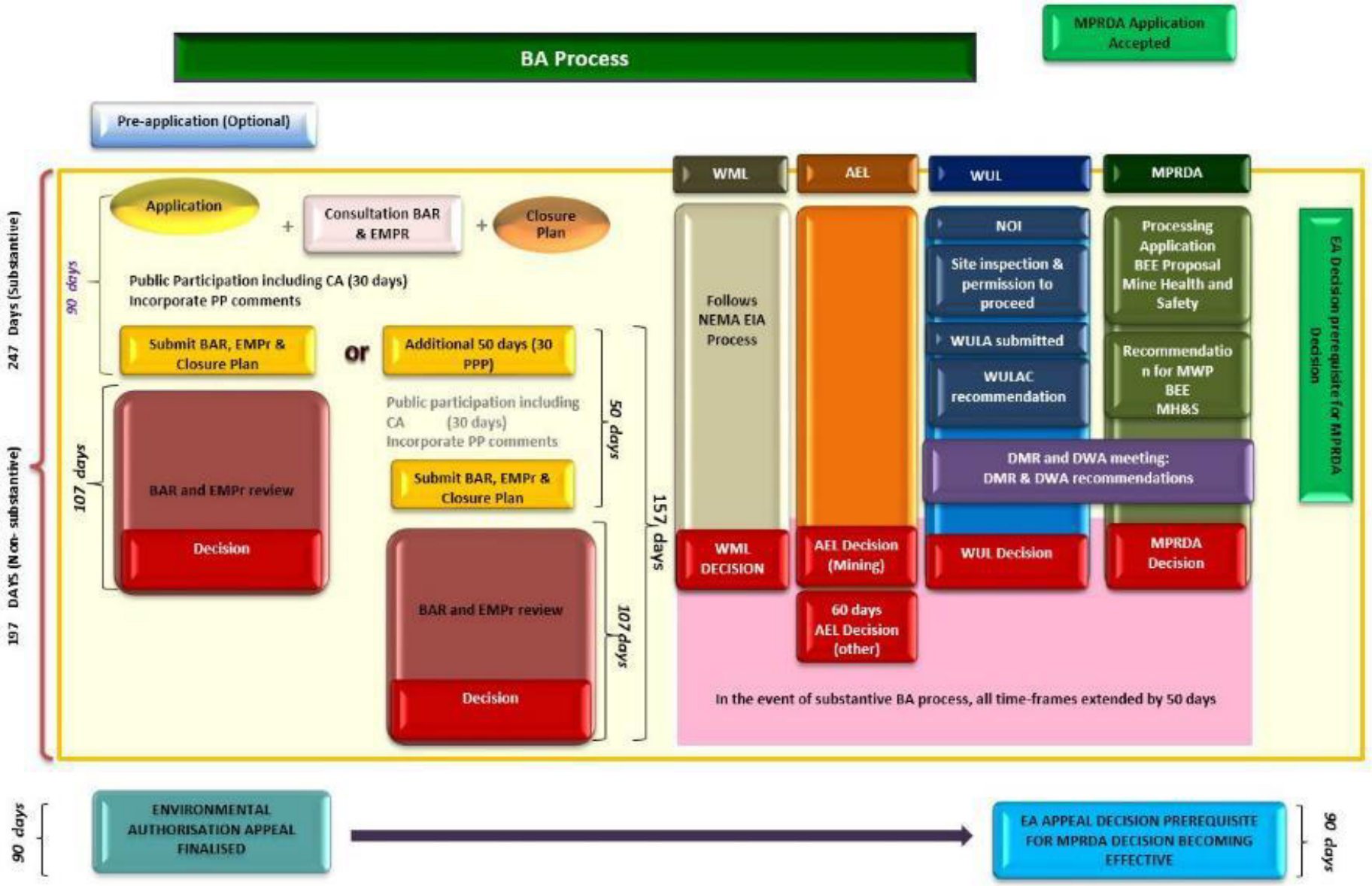


FIGURE 3: Basic Assessment Process Organogram

4.2 PRE-APPLICATION MEETING

A Pre-Application Meeting was held with Ms R. Kallicharan and Ms M. Padayachee of the EDTEA: uMgungundlovu District on 04 September 2019. The minutes thereof are included in Appendix 4. The purpose of the Pre-Application Meeting was to introduce the project to the EDTEA and present and confirm the relevant Listed Activities and Specialist Studies pertinent to the proposed development.

The Pre-Application meeting confirmed the following:

- Activity 14 of GNR 324 is the only activity triggered; and
- The following Stakeholders / IAPs must be included in the BAR notification:
  - Ezemvelo KZN Wildlife;
  - Department of Water and Sanitation;
  - AMAFA;
  - Msunduzi Local Municipality;
  - uMgungundlovu District Municipality;
  - Ward Councillor; and
  - Neighbours and the Homeowners Association.

4.3 DESCRIPTION OF THE ACTIVITY

4.3.1 Project Overview

The proposed housing development consists of the construction of 23 residential units and the upgrade of the existing residential unit on site and associated infrastructure. The project is located on Erf 61, Pietermaritzburg / 55 Grimthorpe Avenue, Lincoln Meade, Pietermaritzburg (refer Figures 1 and 2). The site is zoned as Residential.

The proposed construction will consist of 20 x 3 bedroom units (each 104.69m^2) and 3 x 2 bedroom units (each 81.72m^2) and will cater to the middle income household. The total size of the property is 1.85ha. The land development area will transform approximately 52% of the Erf (i.e. 0.98ha) to provide new units, parking and the internal road network. The remaining 48% (i.e. 0.87Ha) will be retained as open space for the preservation of the wetland system identified on-site (refer Section 10 of this report). Alternative layout options have previously been examined as per Section 8 of this Report.

There are currently has two different access points to the site. Both access points will be utilised for the development. Movement within the development will be via one-way traffic i.e. one entrance point to the site only and one exit point for the site only. The proposed entrance to the site, for the development, is via Grimethorpe Avenue, number 55. The GPS co-ordinates at the approximate entrance of the site are 29°37'11.00"S; 30°26'06.70"E. All units will form part of a sectional title development. Should the project be granted a positive Environmental Authorisation, a decision as to weather a Body Corporate or a Managing Agent will be tasked with maintenance of the wetland system will be determined.

An Engineering Report and Stormwater Management Plan have been developed for the site. Refer Appendices 5 and 6 respectively. Based on the assessments undertaken in these reports, the following information is provided specific to the site and the chosen layout:

- **Existing services:**
  - Roads
    - Grimthorpe Avenue is a 7m wide surfaced residential collector street stretching from Murray Road to Rogers Avenue which thereafter transitions from a surfaced road to a gravel road up until the causeway traversing over the Msunduzi River.
  - Water
    - There is an existing 225mm Ø distribution main on Erf 61s' side of Grimthorpe Avenue and an existing 150mm Ø reticulation pipe on the adjacent side of the road.

- Sanitation
  - The surrounding properties are linked into an existing 150mm Ø gravity fed sewer line. The sewer line gravitates along the lower portion of Erf 61.

- Stormwater
  - There are no existing stormwater systems in place on site.

- **Proposed services:**
  - Roads
    - Bulk Road Network:
      The access to the site is along Grimthorpe Avenue, which is a 7m wide surface road serving most of the surrounding residential sites in the area. Grimthorpe Avenue is not a through road, although it does gain access to a small agricultural community known as Bishopstowe on the adjacent side of the Msunduzi River. The proposed entrance to the development is approximately 835m from the intersection between Murray Road and Grimthorpe Avenue. The site layout shows a separate entrance and exit off Grimthorpe Avenue, which shall be able to accommodate the expected traffic volumes generated from the proposed development. The access will need to be upgraded to meet the required municipal standards.

    - Internal Road Network:
      The proposed development will have an entrance and an exit gate. Internal roads are therefore designed to cater for a single vehicle forward movement with no oncoming obstructions. The following criteria will be followed:

      - Internal Roads: 5m wide road
      - Design Speed: 20 km/hr
      - Min Vertical Length: 20m
      - Pavement Design: 30mm Asphalt (minimum)
        125mm G2 base
        150mm G5 subbase
        150mm G7 selected subgrade
        150mm *in situ* material

      Alternatives to asphalt surfacing are concrete and interlocking pavers with associated layerworks.

- **Sewer:**
  The internal sewer network will connect to the existing Municipal sewer infrastructure (150mm Ø gravity fed line) in the area. The Municipal sewer infrastructure links to the Darville Wastewater Treatment Site.

- **Stormwater Management:**
  As per the Engineering Report (Appendix 5) and Stormwater Management Plan (Appendix 6), generated, the stormwater management strategy will be to manage and collect all surface runoff which will gravitate, via stormwater pipes or swales[3], and discharge into two stormwater attenuation ponds located at two outlet points along the site. The stormwater attenuation ponds shall be earth-lined structures designed to contain volumes of stormwater generated by a 1:50 year rainfall over a 15-minute period. The ponds shall be designed to receive stormwater from the development at a post-development flow and will be able to release the stormwater at a pre-development flow through stormwater pipe outlets.

[3] A shallow channel with gently sloping sides.

The stormwater infrastructure will be constructed in accordance with the "Guidelines for Human Settlement Planning and Designs"[4].

- **Electricity:**
  There is an existing electrical connection to the site given the existing dwelling on the property and other infrastructure is available along Grimthorpe Avenue. The Developer will, however, have to apply, should the development be authorised, to the Msunduzi Municipality for an increase in bulk supply, which will be distributed after the bulk connection to each of the dwellings contained within the development footprint. Downfacing lighting is encouraged to ensure minimal disturbance to neighbouring properties.

- **Wetland Rehabilitation:**
  A wetland is present on a portion of the site outside the development footprint. As per the Specialist Recommendations (Section 10), a Wetland Rehabilitation Plan will be developed for the area. No tracks or activities within the wetland area will be permitted. The grassed swales will direct runoff from the development area into the attenuation ponds. Water collected in the attenuation ponds will be discharged into the wetland at pre-development flow rates.

- **Refuse:**
  The Home Owner's Association/Body Corporate will be responsible for the weekly collection and disposal of refuse to a registered landfill site, unless otherwise provided by the Msunduzi Municipality.

  The provision of services from the Msunduzi Municipality will be confirmed during the Spatial Planning and Land Use Management Act (SPLUMA) process, which will only occur if Environmental Authorisation is granted for the proposed development.

- **Construction Access Routes:**
  It is anticipated that both site entrances will be utilised for the construction period.

Photographs of the site are provided in Plates 2 – 7 and illustrate the existing site entrance, the second access point, as well as the existing residential unit on the site. The proposed site layout is provided in Figure 2.

[4] http://researchspace.csir.co.za/dspace/bitstream/handle/10204/3750/CSIR%20Red%20Book_Vol1_2000.pdf;sequence=4

PLATE 2: Grimthorpe Avenue

PLATE 3: Current site entrance

PLATE 4: Current dwelling on site

PLATE 5: Second site entrance

PLATE 6: Alien vegetation on western portion of site

PLATE 7: Alien vegetation on north eastern portion of site

4.3.2 Water Use Licence Application

A Water Use Licence Application (WULA) is also being applied for as the proposed construction will occur within 500 metres of a wetland. In this regard, the National Water Act (1998 (Act No. 36 of 1998) notes that any water use, as defined in the Act, requires a Water Use Licence. Section 21 of the Act identifies the following two water uses which will require a WULA to be made to the Department of Water and Sanitation (DWS), specific to the proposed development:

- Section 21(c): Impeding or diverting the flow of water in a watercourse; and
- Section 21(i): Altering the bed, banks, course or characteristics of a watercourse.

Furthermore, any such activity that triggers the above-mentioned, which occurs within 32m of a watercourse, or within the 1:100 year floodline, or within 500m of a wetland, also necessitates the need for a WULA.

The WULA Application is being undertaken as a separate process.

5 APPLICABLE LEGISLATION, POLICIES AND/OR GUIDELINES

Table 4 provides a list of all the applicable legislation, policies and/or guidelines of any sphere of government that are relevant to the application as contemplated in the EIA Regulations (2014, as amended).

TABLE 4: Applicable Legislation

Title of legislation, policy or guideline:	Administering authority:	Date:
National Environmental Management Act (Act 107 of 1998) – for its potential to cause degradation of the environment (Section 28).	Department of Environmental Affairs	1998
Environmental Conservation Act (Act 73) – for potential environmental degradation.	Department of Environmental Affairs	1989
National Water Act (Act 36 of 1998) – for potential to cause pollution of water resources defined under the Act (Section 19 and 21).	Department of Water Affairs and Forestry	1998
Conservation of Agricultural Resources Act, 1983 (Act 43 of 1983) – for protection of agricultural resources and for control and removal of alien invasive plants.	National Department of Agriculture	1983
National Environmental Management: Biodiversity Act, 2004 (Act 10 of 2004) – for protection of biodiversity.	Department of Agriculture and Environmental Affairs & Ezemvelo KZN Wildlife	2004
The National Heritage Resources Act (Act No 25 of 1999 as amended) – for the identification and preservation of items of heritage importance.	Department of Arts and Culture (Amafa KwaZulu-Natal)	1999
Integrated Environmental Management Guideline: Guideline on Need and Desirability (2017).	Department of Environmental Affairs	2017
Public Participation Guideline in Terms of National Environmental Management Act, 1998 Environmental Impact Assessment Regulations (2017).	Department of Environmental Affairs	2017
Guideline 7: Detailed Guide to Implementation of the Environmental Impact Assessment Regulations (2006).	Department of Environmental Affairs and Tourism	2007
Msunduzi Municipality By-laws, Environmental Management Framework (EMF), Spatial Development Framework (SDF) and Integrated Development Plan (IDP).	Local Municipality	Updated Accordingly

6 NEED AND DESIRABILITY

The following statement on need and desirability is informed by the Guideline on Need and Desirability issued by the National Department of Environmental Affairs (2017). This document states that when addressing need and desirability this should be based on the principle of sustainability. Furthermore, the assessment of need and desirability is a way of ensuring that a development is ecologically sustainable as well as socially and economically sustainable. The consideration of need and desirability endeavours to ensure a balance between the socio-economic impacts and any possible impacts on people's environmental rights.

The proposed residential development on Erf 61 consists of 24 residential units and associated infrastructure. Erf 61 is currently zoned as residential which is consistent with the surrounding environment. In this regard, there are existing residential properties to the north, west, south and east of the site. Streatham Hill, which located to the east of the site is an existing residential estate comprising approximately 28 units. The presence of existing bulk water, sewer and electricity as confirmed within the Engineering Report (Appendix 5) and on-site investigations, supports the development within the area.

The need and desirability component of any Environmental Impact Assessment (EIA) must take into account the needs and interests of the of the broader community as reflected in the municipal Integrated Development Plan (IDP) and the Municipal Spatial Development Framework (SDF), as well as in the local strategic environmental assessment. In this regard, it is considered essential that national, provincial and local policies and strategies support growth in the economy.

The areas around the proposed site comprises of residential development. As per the Msunduzi Municipality SDF[5], the land use designation for the area is residential. Refer Figure 4.

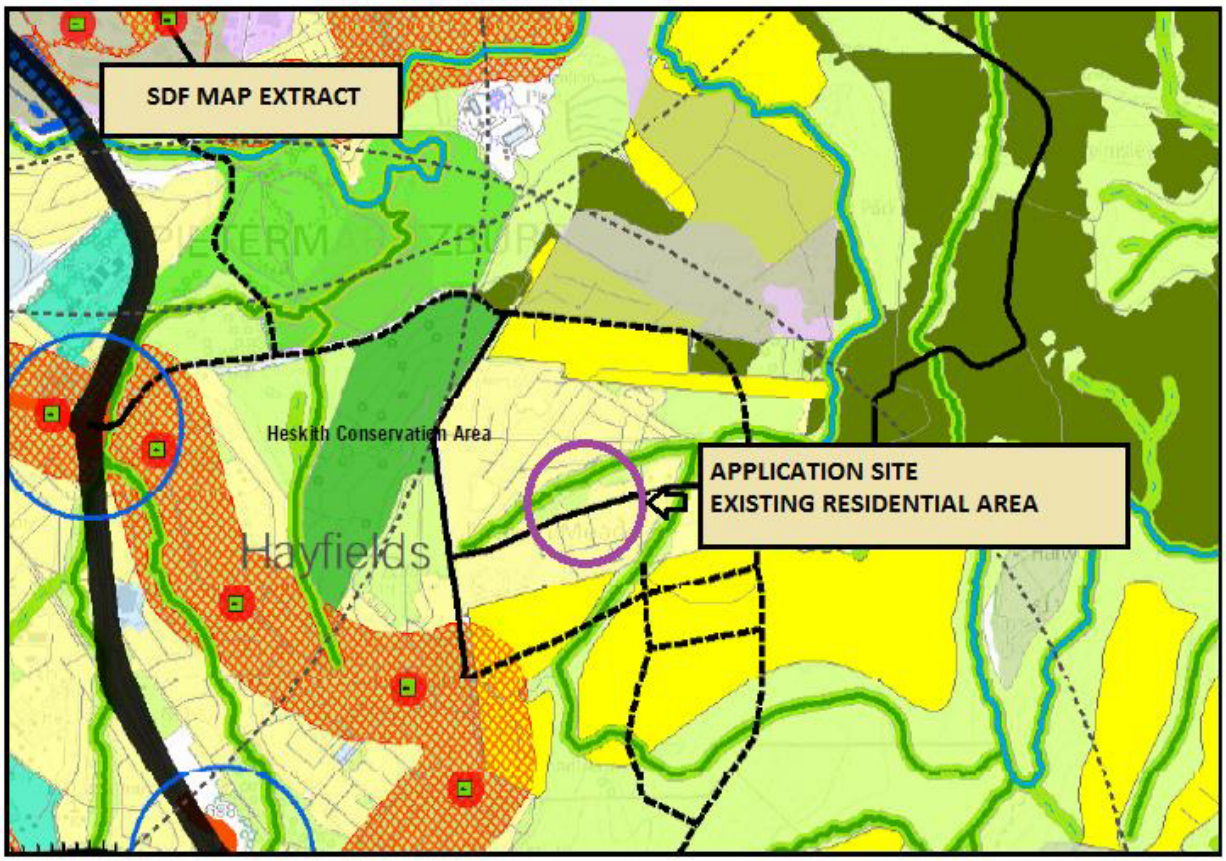


FIGURE 4: Extract from the SDF

[5] http://www.msunduzi.gov.za/site/search/downloadencode/nLa8aKPUbNeqrYyx/index.pdf (accessed 13/09/19)

The development will not require any financial input from the Municipality and it will be developed at no cost to the public. There will be a nett gain to the Municipality in that the development will provide employment, as well as rates to the Municipality. In terms of the principle of employment generation and the objective of the government to meet the estimated growth rate in the economy and redress past imbalances, the proposed development will generate employment for people during the construction phase. It is estimated that 364 job opportunities will be available during the construction phase of the proposed development. The expected value of employment opportunities during the operational phase is R8.6 million.

The Msunduzi Municipality's Environmental Management Framework (EMF[6]) for the area was interrogated and identified the following constraints in the area:

1. High Wetland Development Constraint;
2. High Biodiversity Constraint; and
3. High Air Quality Constraints.

Refer to Figure 5.

Further, the Msunduzi Municipality's C-Plan was also interrogated which details that a large portion of the site is considered "*Totally irreplaceable*". Refer Figure 6.

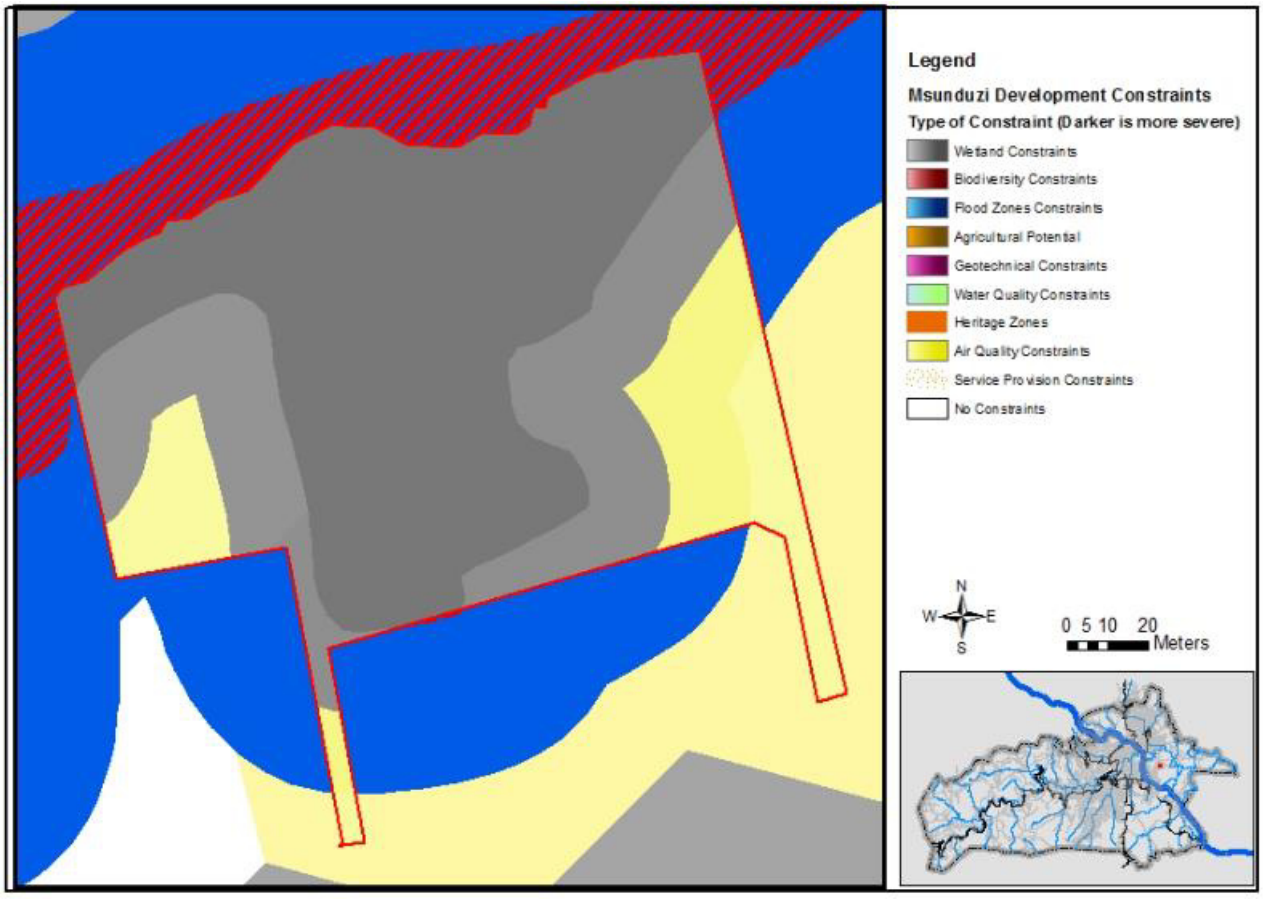


FIGURE 5: Msunduzi Municipality EMF

[6] EMF information provided by the Msunduzi Municipality Environmental Division, 2018.

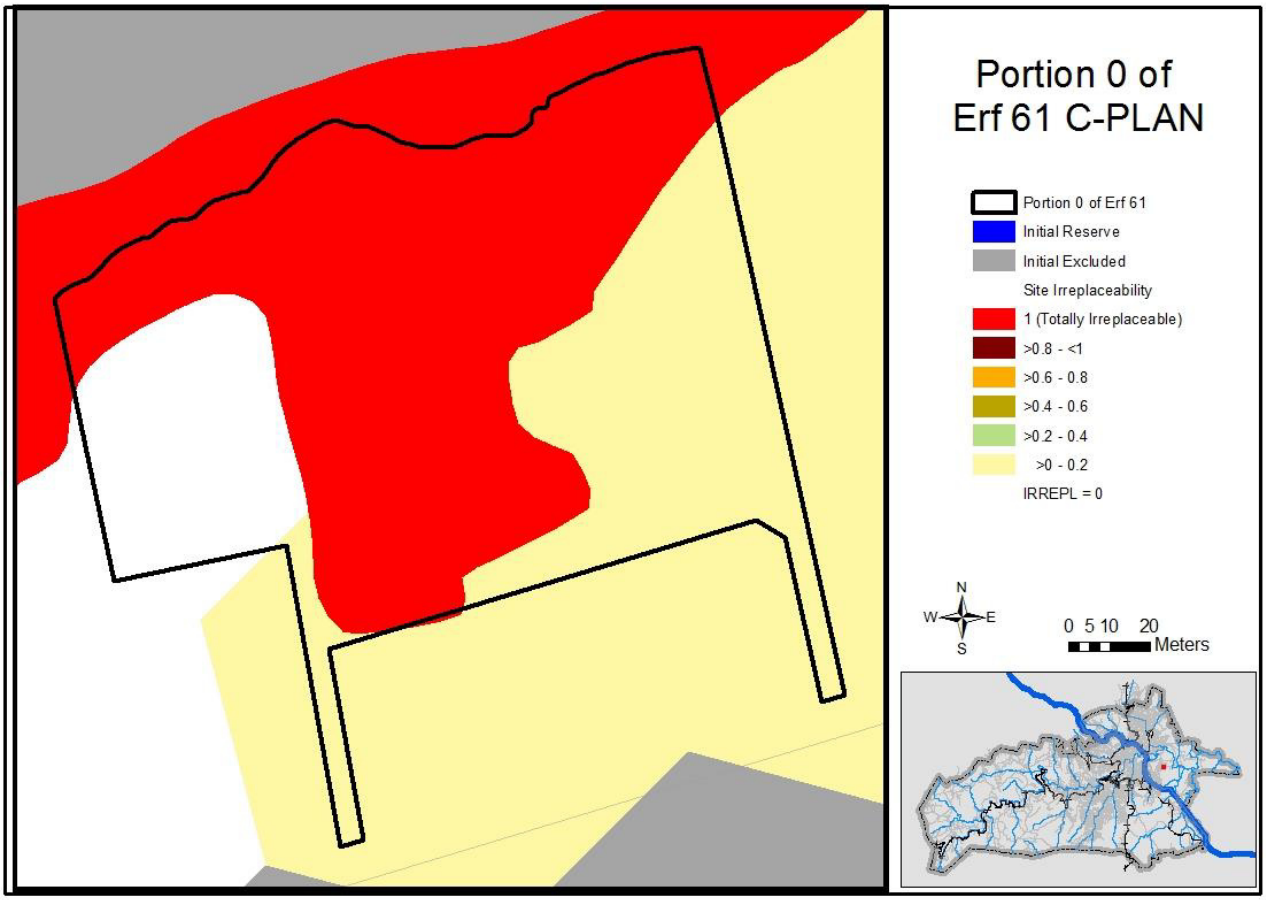


FIGURE 6: Msunduzi Municipality C-Plan

It must, however, be noted that the EMF is based on a desktop analysis of the Municipality and therefore ground truthing is required to ensure that an accurate assessment of the site is considered. Although the C-Plan and EMF identifies the central portion of the area as totally irreplaceable as it consists of high biodiversity and wetland constraints, a majority of the site has been infested with alien vegetation and only the lower portion of the site consists of a wetland area. This is supported by the Wetland Specialist Study and Vegetation Assessment which are detailed in Section 10 and 11 of this Report. Figure 7 provides an illustration of the delineated wetland on-site against the Msunduzi Municipality's C-Plan.

The Applicant has, however, taken cognisance of the sensitive areas on site and as a result has amended the layout (Section 7.3) to ensure that there is no disturbance to the delineated wetland area (refer Section 7.3 of this Report).

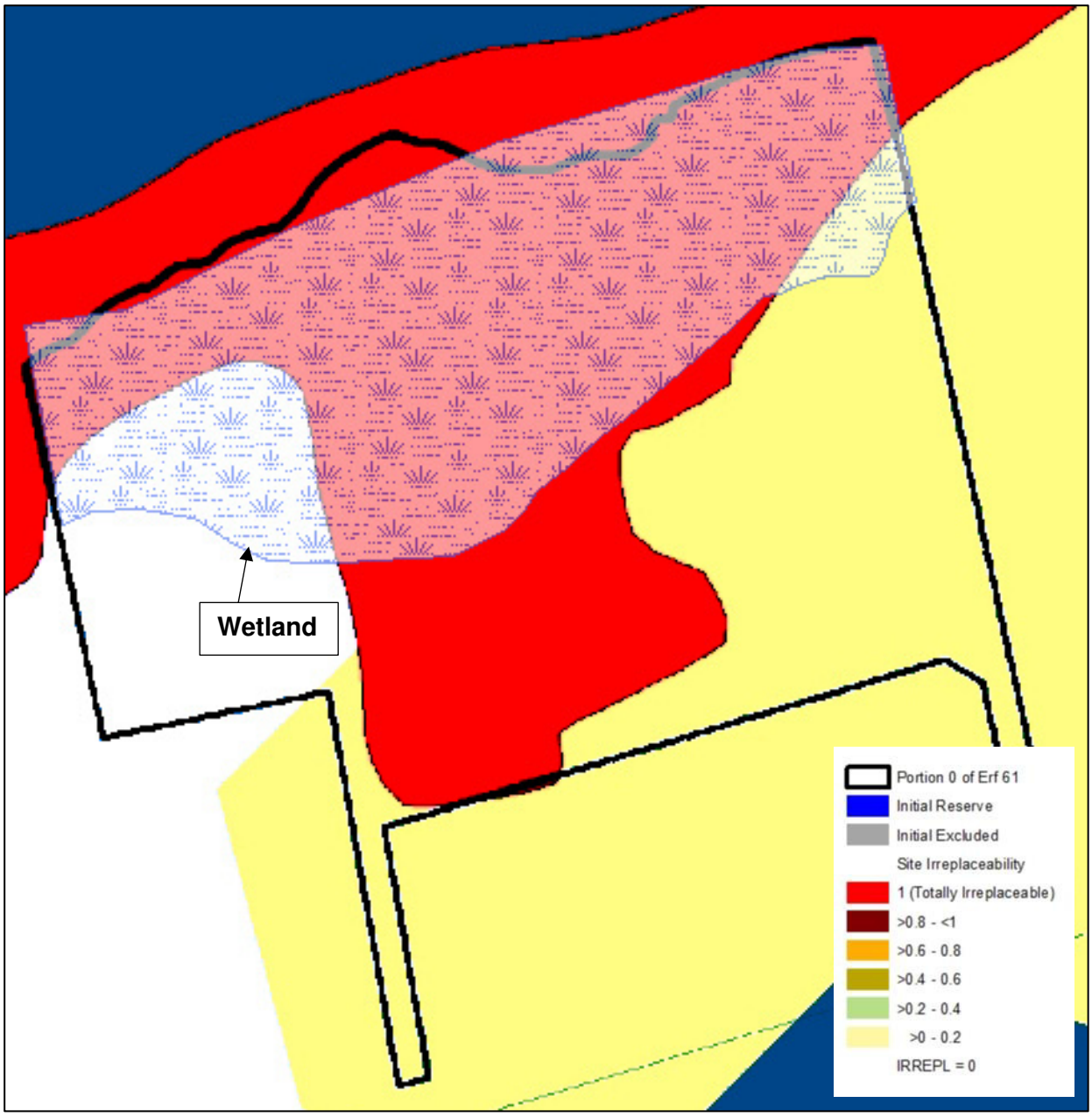


FIGURE 7: Delineated wetland vs C-Plan

The proposed development will make full use of existing transport infrastructure and existing service infrastructure to bring accommodation and employment opportunities to the area.

One of the benefits for the local economy will be the increase in rates and service charges which the Municipality will collect as a result of the new development.

The total investment in the local economy, as per the Applicant, is as follows:

- Total job creation (Direct and indirect) = 487 employment opportunities
- Total direct investment = R21 600 000.
- Total wages = R 8 600 000.

To reiterate, the area around the site consists of residential estates of a similar nature. More specifically, the area surrounding the application site has been identified as being residential. To this extent, the proposed development is fulfilling the objectives of the Msunduzi Municipal IDP and SDF.

7 MOTIVATION FOR THE PREFERRED SITE, ACTIVITY AND TECHNOLOGY ALTERNATIVE

As per the GNR 326, Appendix 1(2)(b), alternatives for the proposed development are to be identified and considered. Chapter 1 of the EIA Regulations (2014, as amended) provides an interpretation of the word "*alternatives*", which is to mean "*in relation to a proposed activity, means different means of meeting the general purpose and requirements of the activity, which may include alternatives to the -*

a) Property on which or location where the activity is proposed to be undertaken;
b) Type of activity to be undertaken;
c) Design or layout of the activity;
d) Technology to be in the activity; or
e) Operational aspects of the activity;
And includes the option of not implementing the activity."

Based on the above, the following alternatives are presented for the proposed development.

7.1 PREFERRED SITE ALTERNATIVE

The proposed site for the development, i.e. Erf 61, Pietermaritzburg / 55 Grimthorpe Avenue, is the preferred site as the Applicant has ownership of the land. The site has further been identified through extensive strategic planning and IDP initiatives as a suitable site for residential development. The development of site may also improve security in the area as the site is not open and available for vagrant use or available for criminals.

7.2 PREFERRED ACTIVITY ALTERNATIVE

No other activity alternative exists that would meet the need and desirability of the Applicant in terms of the SDF and IDP requirements other than the No-go Alternative which would be to retain the site as an open area. This would, however, not result in a significant gain for the local economy in contrast to the proposed development. It could potentially act as a carbon sink as the area is open space however it must be noted that the area is infested with alien vegetation and therefore has a lowered biodiversity value. As such alternative activities have not been considered further.

7.3 PREFERRED LAYOUT ALTERNATIVE

Two layouts have been assessed for the proposed development.

7.3.1 Layout Alternative 1

Alternative Layout 1 was initially provided by the Applicant. The layout provided for development of the northern most units in close proximity to the wetland area (i.e. 1.5m closer to the wetland boundary than that detailed in the Preferred Alternative). The layout included for the development of 23 residential units and the upgrading of the existing unit, including internal roads and associated infrastructure. Layout Alternative 1 is represented in Figure 8.

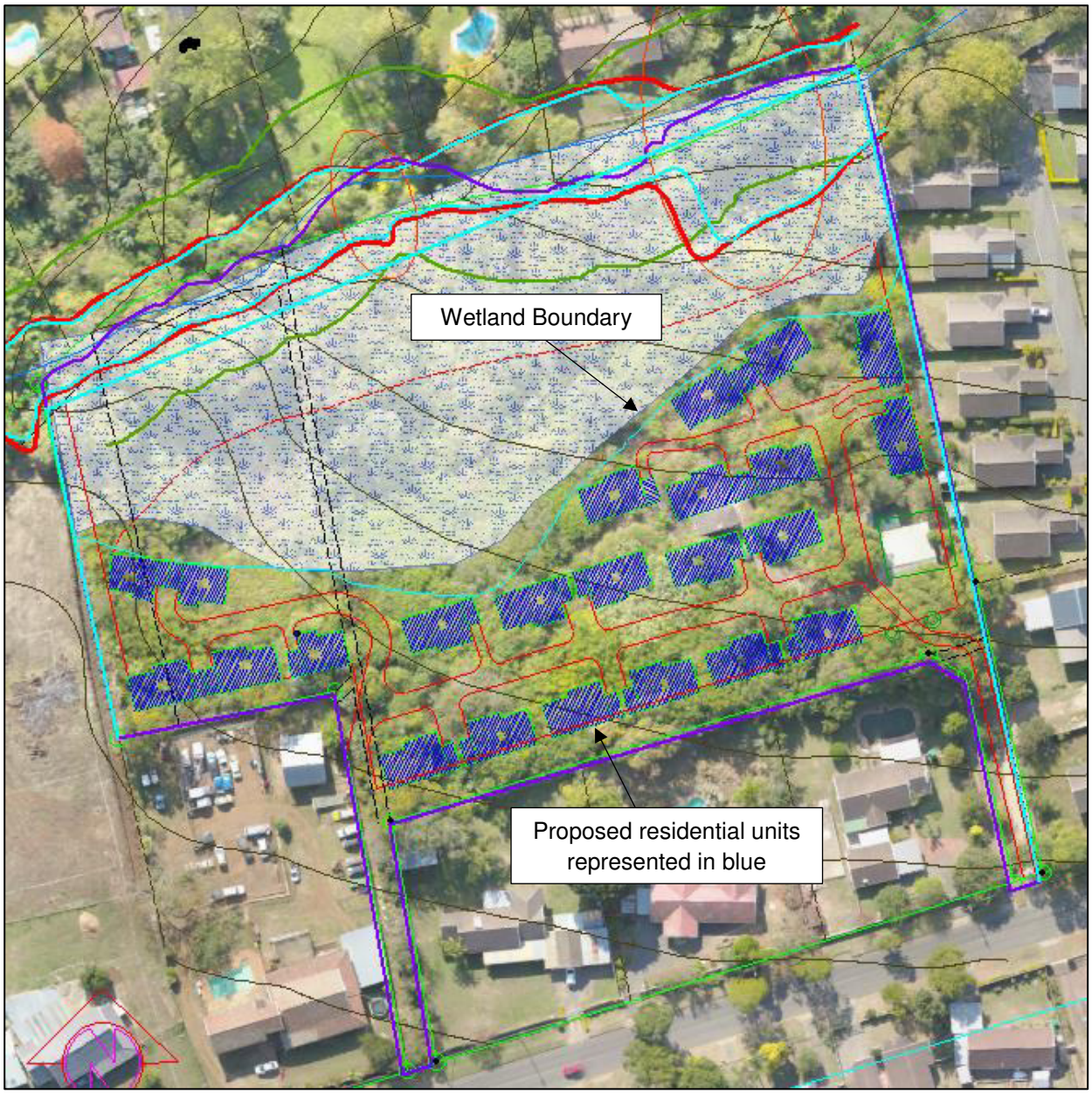


FIGURE 8: Alternative layout

7.3.2 Preferred Layout Alternative

As per Section 1, several Specialists have been consulted prior to the lodging of the Application for Environmental Authorisation. During this consultation process, it was recommended that the development be moved further away from the delineated wetland area. The northern most units have therefore been shifted 1.5m back from the delineated wetland area, in consultation with the Wetland Specialist. This layout is therefore deemed more suitable and is considered as the Preferred Layout Alternative as the delineated wetland has been afforded protection from the proposed anthropogenic features (Figure 9).

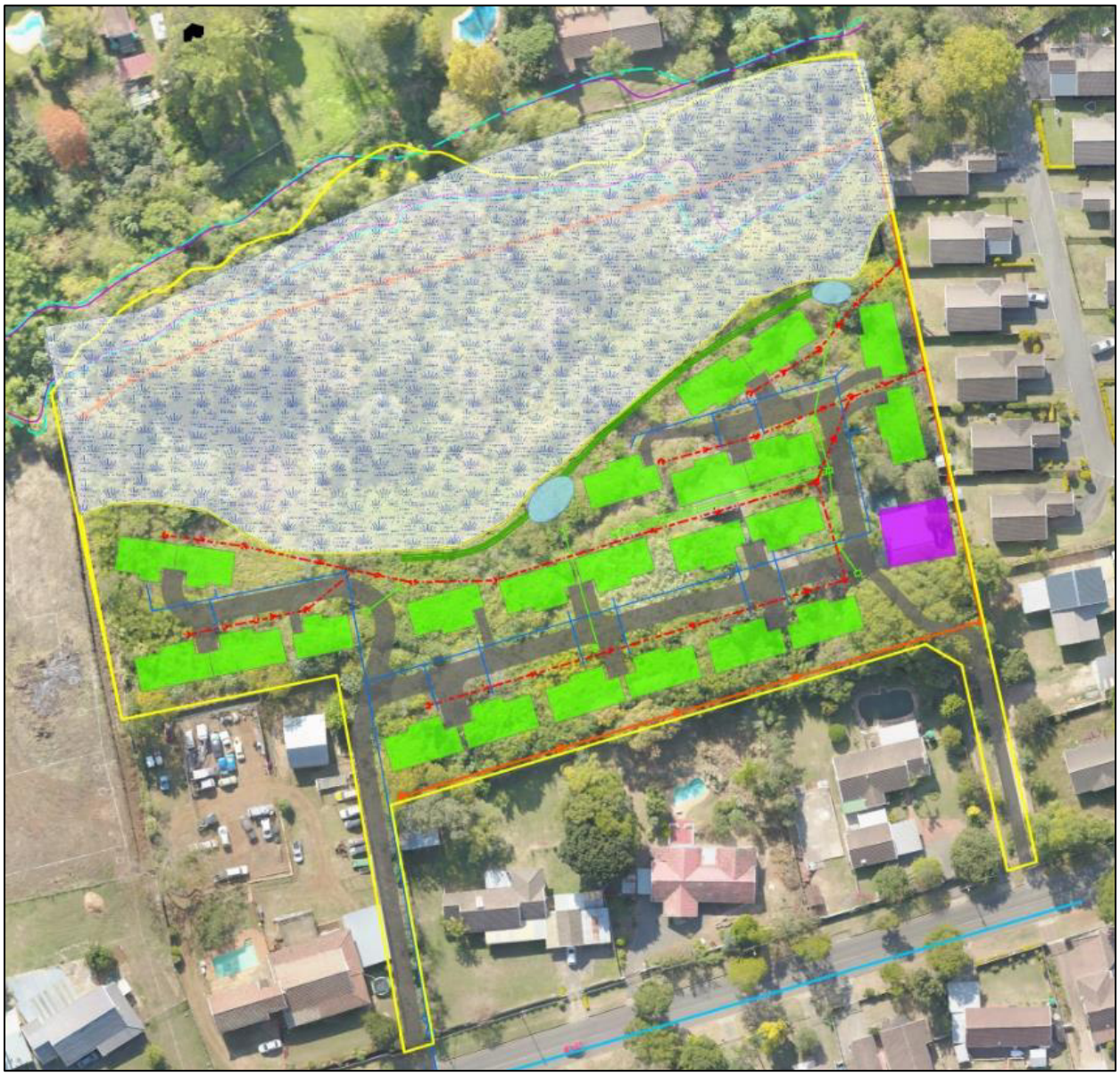


FIGURE 9: Preferred Layout

7.4 PREFERRED TECHNOLOGY ALTERNATIVE

Alternatives to asphalt surfacing have been examined. These include interlocking pavers or concrete surfacing. It must be noted that the Applicant is yet to confirm the preferred alternative.

The pros and cons of the alternatives are tabulated below:

ALTERNATIVE	PRO	CON
Asphalt	Quick to apply, fast drying	Toxic to the environment in wet form
Concrete	Low maintenance	Toxic to the environment in cement form
Interlocking pavers	Easy to repair should there be any damages	Alien vegetation may grow between the pavers. Regular maintained is required.

7.5 NO-GO ALTERNATIVE

The No-go Alternative is to not to develop the site. No local employment opportunities during the construction and operational phase will be created and no additional income to the local economy will be generated in the short or long term. Should the No-go Alternative be implemented, the area will remain undeveloped and will continue to be overrun with alien invasive vegetation which is unlikely to be controlled. The alien invasive vegetation may then potentially spread to neighbouring properties. As per Section 6.2 of this Report, the proposed development is anticipated to generate the following:

Total investment in the local economy is as follows:

- Total job creation (Direct and indirect) = 487 employment opportunities.
- Total direct investment = R21 600 000.
- Total wages = R 8 600 000.

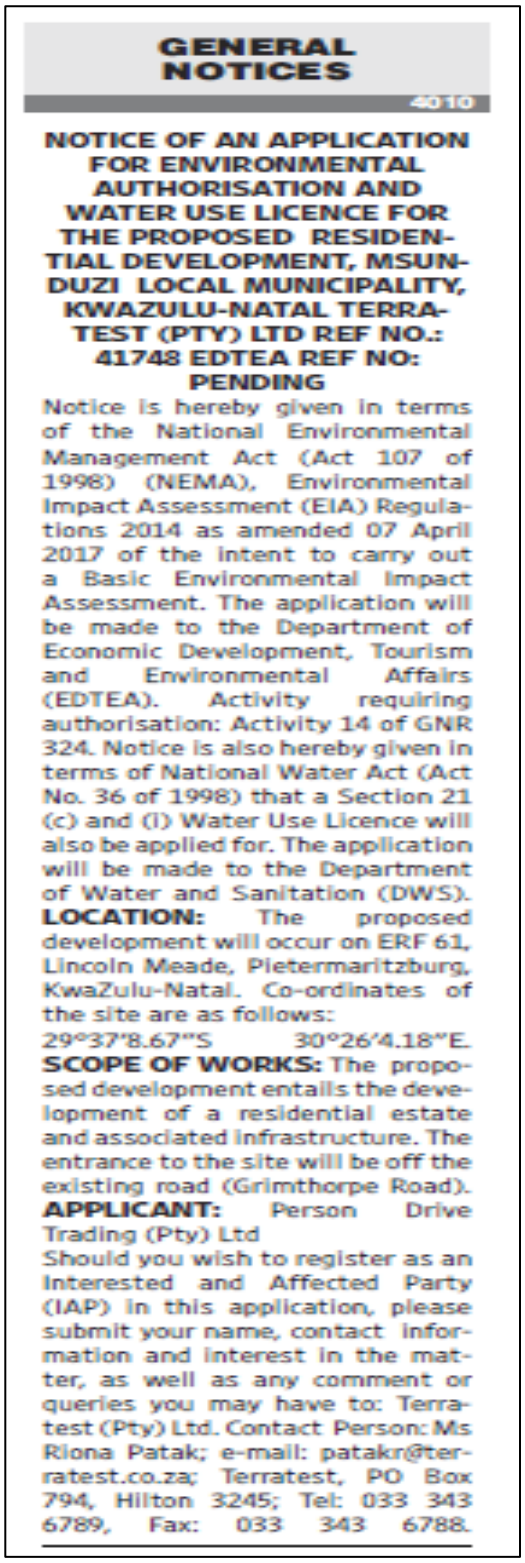
Should the No-go Alternative be implemented, the abovementioned amounts will not contribute to the local economy and employment opportunities will not be generated.

8 PUBLIC PARTICIPATION

To fulfil the necessary public participation required as part of the BA Process, the following methods of stakeholder engagement were conducted by the EAP, as outlined below.

8.1 NEWSPAPER ADVERTISEMENT

A newspaper advertisement was published at the outset of the project to inform the general public of the BA Process. An advertisement was published on 4 October 2019 in the Witness newspaper. Proof of publication is provided in Figure 10.



GENERAL NOTICES

4010

NOTICE OF AN APPLICATION FOR ENVIRONMENTAL AUTHORISATION AND WATER USE LICENCE FOR THE PROPOSED RESIDENTIAL DEVELOPMENT, MSUNDUZI LOCAL MUNICIPALITY, KWAZULU-NATAL TERRATEST (PTY) LTD REF NO.: 41748 EDTEA REF NO: PENDING

Notice is hereby given in terms of the National Environmental Management Act (Act 107 of 1998) (NEMA), Environmental Impact Assessment (EIA) Regulations 2014 as amended 07 April 2017 of the intent to carry out a Basic Environmental Impact Assessment. The application will be made to the Department of Economic Development, Tourism and Environmental Affairs (EDTEA). Activity requiring authorisation: Activity 14 of GNR 324. Notice is also hereby given in terms of National Water Act (Act No. 36 of 1998) that a Section 21 (c) and (i) Water Use Licence will also be applied for. The application will be made to the Department of Water and Sanitation (DWS).
LOCATION: The proposed development will occur on ERF 61, Lincoln Meade, Pietermaritzburg, KwaZulu-Natal. Co-ordinates of the site are as follows:
29°37'8.67"S 30°26'4.18"E.
SCOPE OF WORKS: The proposed development entails the development of a residential estate and associated infrastructure. The entrance to the site will be off the existing road (Grimthorpe Road).
APPLICANT: Person Drive Trading (Pty) Ltd
Should you wish to register as an Interested and Affected Party (IAP) in this application, please submit your name, contact information and interest in the matter, as well as any comment or queries you may have to: Terratest (Pty) Ltd. Contact Person: Ms Riona Patak; e-mail: patakr@terratest.co.za; Terratest, PO Box 794, Hilton 3245; Tel: 033 343 6789, Fax: 033 343 6788.

FIGURE 10: Witness newspaper advert

8.2 SITE NOTICE BOARDS

Seven (7) site notice boards in total were placed at both entrances to the site and in the surrounding area over two different periods in six locations. The notice boards were written in English and isiZulu. Posters were placed on site on 8 June 2018 and 3 October 2019.

Figure 11 provides an illustration of the location of the notice boards on site, while Figure 12 provides a copy of the site notice.

The purpose of the notice boards was to inform neighbours, community members and passers-by of the proposed BA Application. The details of the EAP were also provided should any member of the public require additional information or wish to register as an Interested and Affected Party (IAP) in the Application. Plates 8 – 16 provides proof that the notice boards were placed on site.

FIGURE 11: Location of Site Notices placed on site [Map Source: Google Earth, 2015]

NOTICE OF AN APPLICATION FOR ENVIRONMENTAL AUTHORISATION AND WATER USE LICENCE FOR THE PROPOSED RESIDENTIAL DEVELOPMENT, UMSUNDUZI LOCAL MUNICIPALITY, KWAZULU-NATAL

TERRATEST (PTY) LTD REF NO.: 41748

EDTEA REF NO: PENDING

Notice is hereby given in terms of the National Environmental Management Act (Act 107 of 1998) (NEMA), Environmental Impact Assessment (EIA) Regulations 2014 as amended 07 April 2017 of the intent to carry out a Basic Environmental Impact Assessment. The application will be made to the Department of Economic Development, Tourism and Environmental Affairs (EDTEA).

Activities requiring authorisation: Activity 14 of GNR 327.

Notice is also hereby given in terms of National Water Act (Act No. 36 of 1998) that a Section 21 (c) and (i) Water Use Licence will also be applied for. The application will be made to the Department of Water and Sanitation (DWS)

LOCATION: The proposed development will occur on ERF 61, 55 Grimthorpe Road, Lincoln Meade, Pietermaritzburg, KwaZulu-Natal.

SCOPE OF WORKS: The proposed development entails the development of a residential estate, catering for approximately 24 stands and associated infrastructure. The entrance to the site will be off the existing road (Grimthorpe Road). Co-ordinates of the site are as follows: 29°37'8.67"S 30°26'4.18"E.

APPLICANT: Person Drive Trading (Pty) Ltd

Should you wish to register as an Interested and Affected Party (IAP) in either of these Applications, please submit your name, contact information and interest in the matter, as well as any comments or queries you may have to:

Terratest (Pty) Ltd
Contact Person: Ms Riona Patak
Email: patakr@terratest.co.za
Tel: 033 343 6789
Fax: 033 343 6701
Address: Terratest, PO Box 794, Hilton, 3245

terratest
Geotechnical, Environmental & Earth Science Consultants

ISAZISO NGESICELO SOKUGUNYAZA NGOKWEZEMVELO KANYE NELAYISENSI YOKUSETSHENZISWA KWAMANZI KOMSEBENZI OHLONGOZWAYO WOKWAKHIWA KWEZINDLU, KUMASIPALA WENDAWO YASEMSUNDUZI, KWAZULU NATALI

TERRATEST (PTY) LTD REF NO.: 41748 EDTEA REF NO: PENDING

Lesi saziso sikhishwa ngokoMthetho kaZwelonke wezeMvelo (National Environmental Management Act, No. 107 of 1998) kanye nemithethonqubo yokucwaninga ngokwezemvelo (Environmental Impact Assessment Regulations 2014, as amended), eshicilelwe kwiSaziso sikaHulumeni u-GNR 326, mayelana nehloso yokwenza ucwaningo oluyisisekelo ngalomsebenzi ohlongozwayo. Isicelo sizofakwa kuMnyango wezokuThuthukiswa koMnotho, ezokuVakasha kanye nezeMvelo (EDTEA).

iMisebenzi edinga ukugunyazwa ngokwezemvelo: GNR 327 (14).

Lesi saziso sikhishwa futhi ngokoMthetho kaZwelonke wezaManzi (National Water Act, No. 36 of 1998), ngokuthi kuzofakwa isicelo eMnyangweni wezaManzi (DWS) selayisensi yokusetshenziswa kwamanzi ngokweSigaba 21 (c) no (i) saloMthetho.

INDAWO: Umsebenzi ohlongozwayo uzokwenziwa ku-ERF 61, ku-55 Grimthorpe Road, e-Lincoln Meade, e-Pietermaritzburg kwaZulu Natali.

UMSEBENZI OHLONGOZWAYO: Umsebenzi ohlongozwayo umayelana nokwakhiwa kwezindlu zokuhlala ezingu-24 kanye nengqalasizinda efanele. Kuzofinyelelwa kulendawo ngomgwaqo u-Grimthorpe Road. Izinkombandlela zendawo yalomsebenzi zingu-29°37'8.67"S 30°26'4.18"E.

UMFAKI SICELO: Person Drive Trading (Pty) Ltd

Uma ufisa ukubhaliswa njengomunye othintekayo noma onendaba ngalezi zicelo zalomsebenzi ohlongozwayo, uyacelwa uthumele imininingwane yakho kanye nokuthinteka noma ukuphawula kwakho ngalomsebenzi kuMeluleki wezeMvelo kulemininingwane elandelayo:

Umeluleki wezeMvelo: Terratest (Pty) Ltd
Umxhumanisi: Ms Riona Patak
Email: patakr@terratest.co.za
Tel: 033 343 6789
Fax: 033 343 6701
Address: Terratest, PO Box 794, Hilton, 3245

terratest
Geotechnical, Environmental & Earth Science Consultants

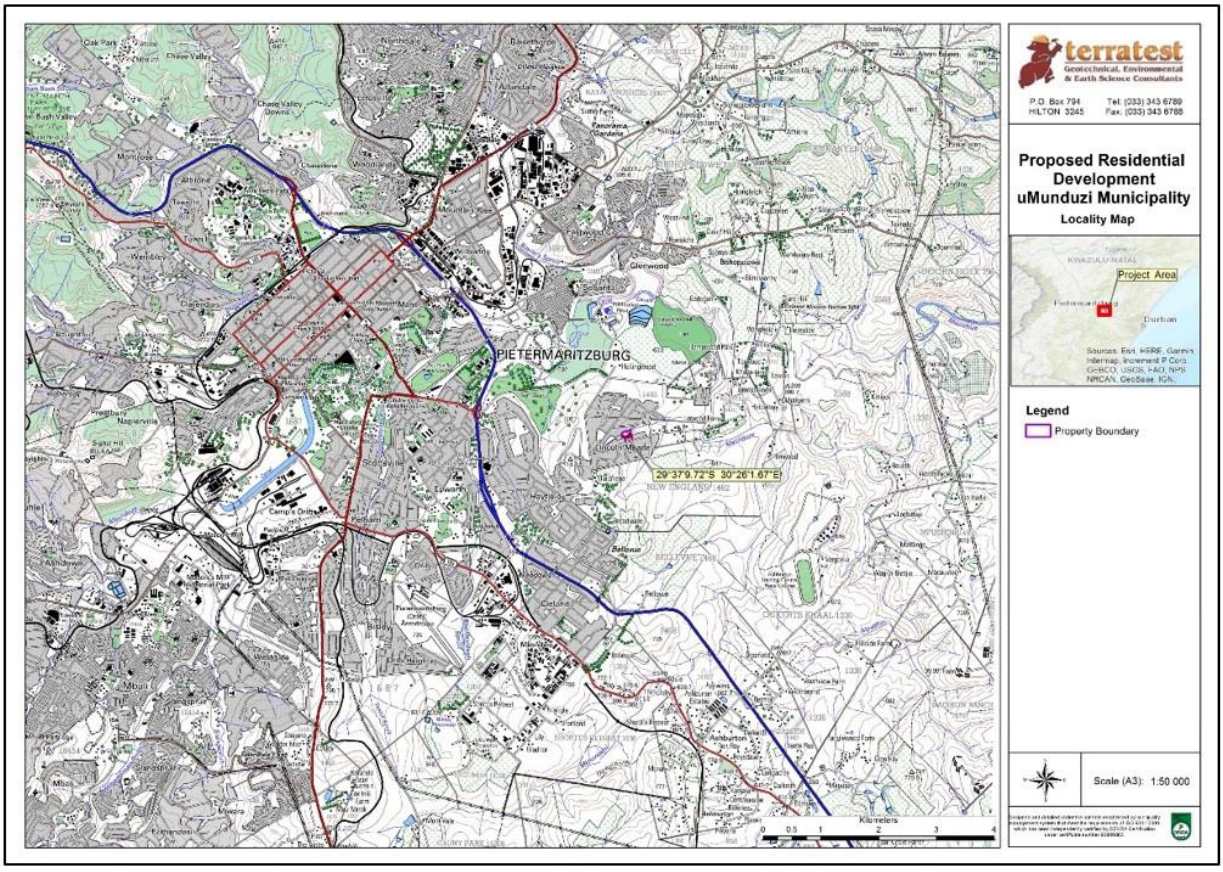


FIGURE 12: Copy of the site notice placed on site, written in English and isiZulu along with the contact details of the EAP

PLATE 8: Poster placed along Grimthorpe Avenue (2018)

PLATE 9: Poster placed near Les De Jager Drive (2018)

PLATE 10: Poster placed at site entrance (2018)

PLATE 11: Poster placed on Spilsby Road (2018)

PLATE 12: Poster placed at the intersection of Grimthorpe Avenue and Murray Road (2018)

PLATE 13: Poster placed on Stamford Road (2019)

PLATE 14: Poster placed on Grimthorpe Avenue 2019)

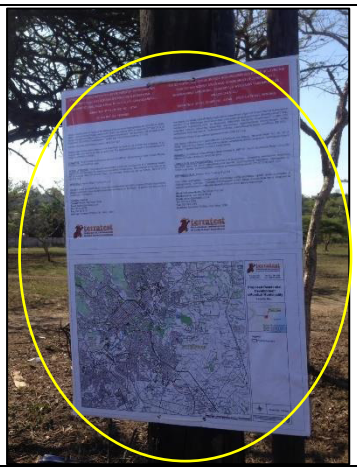


PLATE 15: Poster placed near the intersection of Grimthorpe Avenue and Murray Road (2019)

PLATE 16: Poster placed at the site entrance (2019)

8.3 WRITTEN NOTIFICATION TO AUTHORITIES AND NEIGHBOURS

8.3.1 Interested and Affected Parties (IAPs)

A register of IAPs was compiled as per Section 42 of the EIA Regulations, 2014. This included all relevant authorities, Government Departments, the Local Municipality, the District Municipality, relevant conservation bodies and non-governmental organisations (NGO's), as well as neighbouring landowners and the surrounding community. This register will be regularly updated to include those IAPs responding to the newspaper advertisement, site notice boards and Notification Letters. A copy of the IAP Register is included as Appendix 7 of this report.

8.3.2 Notification Letter

A Notification Letter was compiled and circulated to all identified IAPs by email. The purpose of the Notification Letter was to provide preliminary information regarding the project and its location. Furthermore, the Notification Letter invited preliminary comments from IAPs and requested those notified to provide details of other potential IAPs which they may be aware of. A copy of the Notification Letter is included as Appendix 7 of this report.

8.3.3 Submission of Application for Environmental Authorisation

The Application for Environmental Authorisation was submitted to EDTEA on 3 October 2019, a reference number DC22/0020/2019 was issued.

8.4 CIRCULATION OF DRAFT BASIC ASSESSMENT REPORT FOR COMMENT

Copies of the Draft BA Report are circulated to the following Key Stakeholders and IAPs for review and comment on 29 November 2019.

- Ezemvelo KZN Wildlife;
- AMAFA;
- Department of Water and Sanitation;
- Msunduzi Local Municipality;
- Umgungundlovu District Municipality; and
- Ward 35 Councillor.

Further, one copy of the report was placed in the Public Library (260 Church Street, Pietermaritzburg, 3201) on 29 November 2019 and a copy was made available to download on the Terratest website (www.terratest.co.za).

All registered IAPs were notified of the availability of the Draft BA Report and the deadline for comments, being on, or before, 20 January 2020. As per EIA Regulations (2014, as amended), GNR 326 43(2), State Departments that administer a law relating to a matter affecting the environment, specific to the Application, must submit comments within 30 days to the EAP (i.e. Terratest (Pty) Ltd). Should no comment be received within the 30 day commenting period, it will be assumed that the relevant IAP, Stakeholder or State Department has no comment to provide.

All comments received will be included in the Final Basic Assessment Report for submission to the EDTEA.

9 DESCRIPTION OF THE BASELINE ENVIRONMENT

9.1 TOPOGRAPHY

The site gently slopes from south to the northern boundary where the wetland and watercourse is located.

The elevation profile of the development is provided in Figure 13.

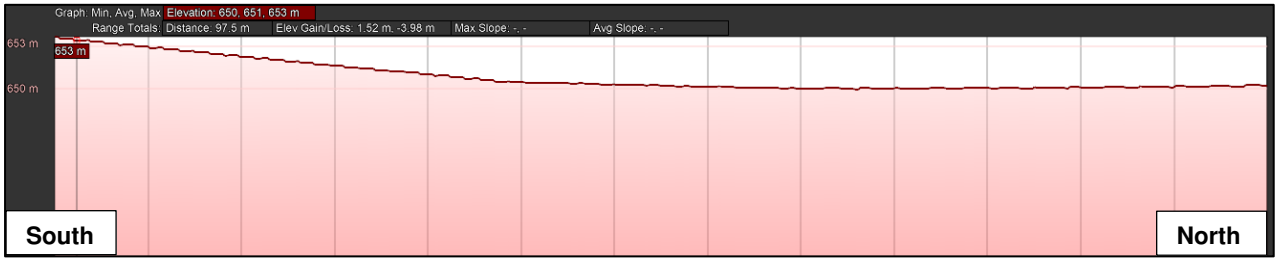


FIGURE 13: Gradient of the site

9.2 VEGETATION

According to Mucina and Rutherford (2006), the vegetation cover within the proposed development area is classified as KwaZulu-Natal Hinterland Thornveld and Alluvial Wetlands: Temperate Alluvial Vegetation. The KwaZulu-Natal Hinterland Thornveld vegetation type is found in the central-northern regions of KwaZulu-Natal and typically occurs in hilly undulating landscapes and is usually dominated by Thatching grass (*Hyparrhenia hirta),* with occasional savannoid woodlands with scattered Acacia (*Sieberiana var woodii)*.

The Alluvial Wetlands: Temperate Alluvial Vegetation type is found in Lowveld, Central Bushveld and in northern KwaZulu-Natal and typically occurs in flat alluvial riverine terraces, marginal reed belts, as well as extensive flooded grasslands, ephemeral herblands and riverine thickets. This vegetation type forms part of the Subtropical Alluvial Vegetation group.

As per the South African National Biodiversity Institute (SANBI) threatened ecosystems database available, there are no endangered or critically endangered ecosystems on site.

9.3 FAUNA

Any development has the potential to negatively impact upon the local fauna, given the intrusion of an unnatural object in a natural environment, or artificial environment. The Ezemvelo KZN Wildlife Critical Biodiversity Areas (CBA), Irreplaceable and Optimum, and the Ecological Support Areas (ESA) databases, dated 2019, was interrogated. As per the databases available, the site is not regarded as a CBA or an ESA.

9.4 GEOLOGY

According to the 1:250 000 Geological Map 2930 Durban, the site is underlain by siltstones and mudstones of the Pietermaritzburg Formation, Ecca Group of the Karoo Super Group. No fatal flaws in the geology of the area has been identified.

9.5 SURFACE HYDROLOGY

The project site is situated within the U20J quaternary catchment, which falls within the Mvoti to Umzimkhulu Water Management Area. One drainage line is located on the northern boundary of the property. The drainage line extends in a easterly direction prior to joining the Msunduzi River. No development will occur on or near the drainage line. A wetland has been delineated on the northern portion of the property which includes for the drainage line. Further details are provided in Section 10.

9.6 CLIMATE

The average maximum temperature for the Pietermaritzburg area is 25°C. Pietermaritzburg has experienced high rainfall periods between October 2018 and May 2019. The potential for run-off in the

wetland and drainage line is high during the wet season. It is therefore recommended that construction works commence in the dry season if possible. A summary of the average rainfall experienced in Pietermaritzburg is provided in Figure 14.

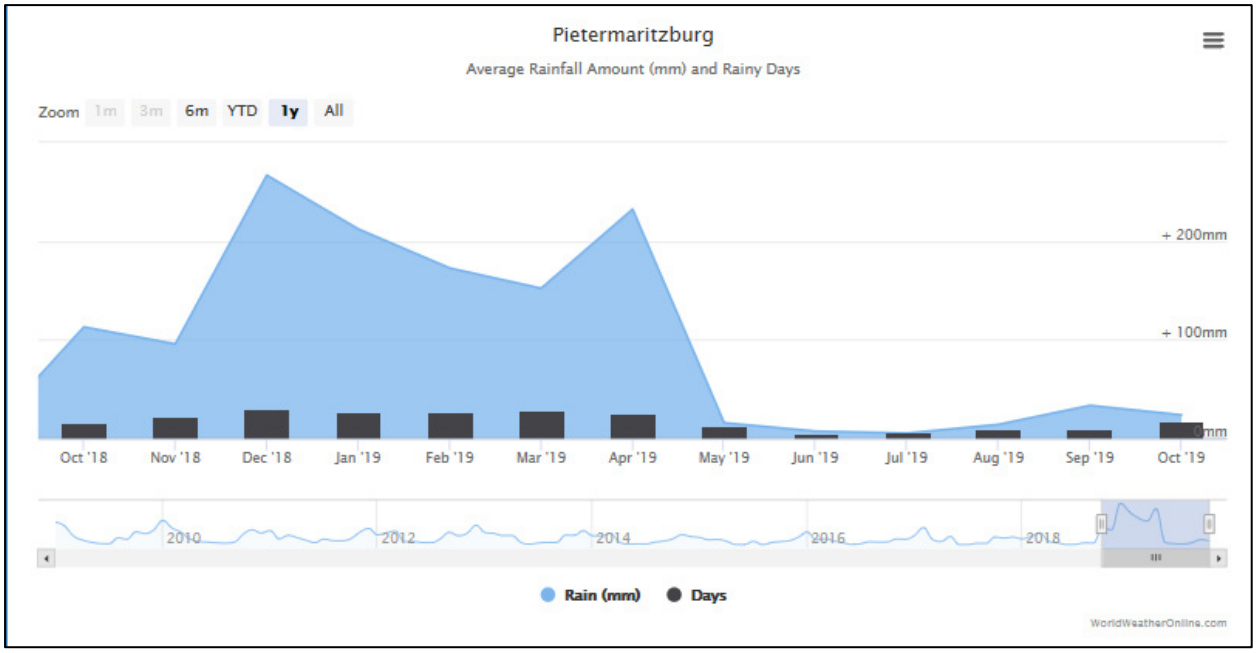


FIGURE 14: Average Rainfall (Source: World Weather Online)

9.7 CURRENT LAND USE

The site is zoned as Residential and is located in an urban area, in the suburb of Lincoln Meade. The majority of the site is currently open space. An existing residential structure is present on site and is currently in use. The surrounding land use is also residential.

9.8 AREAS OF CULTURAL/HERITAGE SIGNIFICANCE

No areas of cultural or heritage significance, such as graves or places of worship were identified on site during the site visit. A desktop Heritage Impact Assessment and Palaeontological Desktop Assessment have been undertaken by Active Heritage cc. Further details are provided in Section 10 and Appendix 9.

9.9 SOCIO-ECONOMIC

The proposed development will target individuals in the middle-income range.

The Msunduzi Local Municipality is located within the uMgungundlovu District in KwaZulu-Natal and is the smallest of the seven municipalities in the district. Pietermaritzburg is the capital of the province and the main economic hub of the district.

The demographic information available is provided in Table 5 below. There has been an increase in population and households within the municipality. The proposed development may therefore assist with the increased need for housing for the expanding population.

TABLE 5: Msunduzi Municipality Demographic Information

	2016	2011
Population	679 039	621 793
Age Structure		
Population under 15	31.5%	26.7%
Population 15 to 64	64.7%	68.3%
Population over 65	3.9%	5.0%
Dependency Ratio		
Per 100 (15-64)	54.7	46.4
Sex Ratio		

	2016	2011
Males per 100 females	92.9	90.8
Population Growth		
Per annum	2.00%	n/a
Household Dynamics		
Households	180 469	164 772
Average household size	3.8	3.6
Female headed households	45.9%	45.2%
Formal dwellings	80.0%	73.5%
Housing owned	70.1%	58.0%
Household Services		
Flush toilet connected to sewerage	49.3%	51.4%
Weekly refuse removal	47.4%	53.1%
Piped water inside dwelling	41.7%	47.9%
Electricity for lighting	96.1%	91.8%

10 SPECIALIST STUDIES

10.1 WETLAND ASSESSMENT

A Wetland Assessment Report was conducted by Ikhwane Wetland Science. Details of the specialist are provided in Table 6.

TABLE 6: Details of the Wetland Specialist

Company Name	Contact Person	Qualifications	Field of Expertise	Report Title
Ikhwane Wetland Science.	Damian Walters	PhD Environment, Agriculture and Development (UKZN)	Wetland Specialist	Wetland Delineation and Assessment on Erf 61 Lincoln Meade (55 Grimthorpe Avenue), Pietermaritzburg, South Africa.

During the site visit, the entire area of the proposed development was examined and assessed. The results of the Specialist Report are summarized herewith:

A single seepage wetland is present within the property boundary and is ~1hectare in extent. The wetland is located on the northern portion of the property outside the proposed development footprint. The Wetland Assessment concluded the following:

- The wetland is largely modified with an integrated Present Ecological State (PES) class of “D” (largely modified) i.e. a large change in ecosystem in ecosystem process and loss of habitat has occurred;
- The vegetation is disturbed by alien vegetation encroachment;
- The wetland is considered to be unimportant from an ecological, human use and hydrological perspective due to its location within an urban area and the disturbance to its vegetation; and
- The proposed residential development would have a low impact on the wetland provided the recommendations detailed below are implemented.

10.1.1 Recommendations

The mitigation measures suggested are as follows:

- The wetland is in very poor condition because of the abundance alien invasive plants evident within it. It is strongly recommended that the wetland is cleared of all alien vegetation and an appropriate herbaceous (grass and or sedge) indigenous plant community be established in its place. This can be undertaken concurrently with the construction of the development or post construction of the development. A plan to rehabilitate the wetland should be included as a Condition of Authorisation.
- In general, a key measure that can be taken to protect wetlands within the context of urban development is the implementation of a buffer. In the case of this development, it is suggested that a five meter grassed buffer, plus a sediment fence be employed during the construction phase. During the operational phase, a buffer of at least five grassed meters must be implemented. The use of a buffer is especially important if the rehabilitation of the wetland is done concurrently to the construction of the development. In addition to the above, the requisite Wetland Rehabilitation Plan must consider sediment management as the wetland may be denuded of vegetation during its rehabilitation. It should be noted that it is acceptable to have the grassed swales and attenuation ponds within the buffer.

- The management of stormwater, particularly its attenuation, is an important part of managing wetlands in urbanised landscapes. The Stormwater Management Plan (refer Section 10.4 and Appendix 6) for the development provides for suitable attenuation and water quality management and as such should be considered an important mitigation measure

A copy of the Wetland Assessment can be found in Appendix 8.

FIGURE 15: Delineated wetland on site

The coordinates of the wetland boundary centrally located within the property at 10m intervals are provided in Figure 16.

Number	Latitude	Longitude
0	29° 37' 8.679" S	30° 25' 59.793" E
1	29° 37' 8.599" S	30° 26' 0.149" E
2	29° 37' 8.621" S	30° 26' 0.518" E
3	29° 37' 8.729" S	30° 26' 0.861" E
4	29° 37' 8.890" S	30° 26' 1.184" E
5	29° 37' 8.926" S	30° 26' 1.550" E
6	29° 37' 8.920" S	30° 26' 1.921" E
7	29° 37' 8.900" S	30° 26' 2.292" E
8	29° 37' 8.836" S	30° 26' 2.649" E
9	29° 37' 8.658" S	30° 26' 2.953" E
10	29° 37' 8.425" S	30° 26' 3.207" E
11	29° 37' 8.215" S	30° 26' 3.490" E
12	29° 37' 8.007" S	30° 26' 3.776" E
13	29° 37' 7.797" S	30° 26' 4.059" E
14	29° 37' 7.591" S	30° 26' 4.346" E
15	29° 37' 7.372" S	30° 26' 4.620" E
16	29° 37' 7.241" S	30° 26' 4.950" E
17	29° 37' 7.194" S	30° 26' 5.315" E
18	29° 37' 7.001" S	30° 26' 5.546" E
19	29° 37' 6.745" S	30° 26' 5.750" E

FIGURE 16: Wetland Boundary Points (10m intervals)

10.2 HERITAGE IMPACT ASSESSMENT

A Heritage Impact Assessment (HIA) was commissioned for the proposed development. Active Heritage cc was appointed to conduct the Heritage Impact Assessment for the proposed development. Details of the specialist are provided in Table 8.

TABLE 7: Details of the Heritage Specialist

Company Name	Contact Person	Qualifications	Field of Expertise	Report Title
Active Heritage cc	Frans Prins	MA (Archaeology)	Heritage Specialist	Cultural Heritage Impact Assessment of Erf 61, Lincoln Meade, Umsunduzi Municipality.

No sensitive areas were identified on site by the Specialist and therefore no recommendations have been provided. Copies of the HIA is attached as Appendix 9.

10.3 VEGETATION ASSESSMENT

Details of the specialist are provided in Table 9.

TABLE 8: Details of Vegetation Specialist

Company Name	Contact Person	Qualifications	Field of Expertise	Report Title
Terratest (Pty) Ltd	Magnus van Rooyen	MPhil Environmental Management	Vegetation Specialist	Note a letter has been provided as specialist opinion was requested and not a Vegetation Assessment.

A Vegetation Specialist was consulted to investigate the current vegetation on site in relation to the NEMA EIA Regulations (2014, as amended). In this regard, GNR 985, Activity 12 states, *"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 in (d) KwaZulu-Natal (xi) Sensitive areas as identified in an Environmental Management Framework as contemplated in Chapter 5 of the Act and as adopted by the Competent Authority".*

The findings of the Vegetation Specialist stated that the vegetation on site is highly transformed as a result of anthropogenic impacts. These impacts have allowed the encroachment of a large number of alien invasive plant species which have subsequently decreased the biodiversity value of the vegetation. As a result, the Vegetation Specialist has noted that due to the high level of infestation, he is of the opinion that the amount of specifically indigenous vegetation that will be cleared during the establishment of the residential development will not exceed 300m^2. As such, GNR 985, Activity 12 is not applicable to this Application for Environmental Authorisation.

The letter provided by the Vegetation Specialist is included as Appendix 10.

10.4 STORMWATER MANAGEMENT PLAN

A Stormwater Management Plan has been generated by Umsunguli Project Management. The proposed stormwater management system has been designed to be self-regulating with no external control. It will aim to collect run-off into rainwater harvesting tank, swales, underground pipes. Two attenuation ponds will be specifically built on the site to attenuate and manage the increase in flow between the pre- and post-development stages from the transformed areas.

The run-off from the roofs, gutters and downpipes will be collected in rainwater harvesting tanks[7] taking into account any overflows being dispersed overland into swales and ultimately collected into underground stormwater systems and contained in two stormwater attenuation ponds. The two stormwater attenuation ponds are proposed to be located along the lower boundary of the site where increased flow will be attenuated, whilst silt is deposited. The outlet or discharge from the attenuation pond will be protected with gabion mattresses and other energy dissipaters from where it will be released into the natural drainage areas and stream in a controlled manner. The storage capacity of the attenuation ponds have been calculated to be 46m^3 and 56m^3 respectively.

Run-off from hardened areas, like roads and parking areas, will be routed overland, collected in kerbs and channels and into grid inlets or catchpits where it is collected in concrete stormwater pipes and diverted into the two stormwater attenuation ponds along the lower boundary of the site, where increased flow will be attenuated, whilst silt is deposited.

[7] Rainwater harvesting should be encouraged at all residential dwellings.

11 IMPACT ASSSESSMENT AND MITIGATION MEASURES

11.1 IMPACT ASSESSMENT METHODOLOGY

The EIA Regulations, (2014, as amended) prescribes requirements to be adhered to and objectives to be reached when undertaking Impact Assessments. These are noted in the following sections contained within the EIA Regulations (2014):

- Regulation 326, Appendix 1, Section 2 and Section 3 – Basic Assessment Impact Requirements; and
- Regulation 326, Appendix 2 and Appendix 3 – Environmental Impact Assessment Requirements.

In terms of these Regulations, the following should be considered when undertaking an Impact Assessment:

- *A description and assessment of the significance of any environmental impact including:*
  - Cumulative impacts that may occur as a result of the undertaking of the activity during the project life cycle;
  - Nature of the impact;
  - Extent and duration of the impact;
  - The probability of the impact occurring;
  - The degree to which the impact can be reversed;
  - The degree to which the impact may cause irreplaceable loss of resources; and
  - The degree to which the impact can be mitigated.

The overall significance of an impact / effect has been ascertained by attributing numerical ratings to each identified impact. The numerical scores obtained for each identified impact have been multiplied by the probability of the impact occurring before and after mitigation. High values suggest that a predicted impact / effect is more significant, whilst low values suggest that a predicted impact / effect is less significant.

The interpretation of the overall significance of impacts is presented in Table 10.

TABLE 9: Interpretation of the significance scoring of a negative impact / effect

Scoring value	Significance
>35	**High - The impact is total / consuming / eliminating** - In the case of adverse impacts, there is no possible mitigation that could offset the impact, or mitigation is difficult, expensive, time-consuming or some combination of these. Social, cultural and economic activities of communities are disrupted to such an extent that these come to a halt. Mitigation may not be possible / practical. Consider a potential fatal flaw in the project.
25 - 35	**High - The impact is profound** - In the case of adverse impacts, there are few opportunities for mitigation that could offset the impact, or mitigation has a limited effect on the impact. Social, cultural and economic activities of communities are disrupted to such an extent that their operation is severely impeded. Mitigation may not be possible / practical. Consider a potential fatal flaw in the project.
20 – 25	**Medium - The impact is considerable / substantial** - The impact is of great importance. Failure to mitigate with the objective of reducing the impact to acceptable levels could render the entire project option or entire project proposal unacceptable. Mitigation is therefore essential.
7 – 20	**Medium - The impact is material / important to investigate** - The impact is of importance and is therefore considered to have a substantial impact. Mitigation is required to reduce the negative impacts and such impacts need to be evaluated carefully.

Scoring value	Significance
4 – 7	Low - **The impact is marginal / slight / minor** - The impact is of little importance, but may require limited mitigation; or it may be rendered acceptable in light of proposed mitigation.
0 – 4	Low - **The impact is unimportant / inconsequential / indiscernible** – no mitigation required, or it may be rendered acceptable in light of proposed mitigation.

The significance rating of each identified impact / effect was further reviewed by the Environmental Assessment Practitioner (EAP) by applying professional judgement.

For the purpose of this assessment, the impact significance for each identified impact was evaluated according to the following key criteria outlined in the sub-sections below.

11.2 NATURE OF IMPACT

The environmental impacts of a project are those resultant changes in environmental parameters, in space and time, compared with what would have happened had the project not been undertaken. It is an appraisal of the type of effect the activity would have on the affected environmental parameter. Its description includes what is being affected, and how.

11.3 SPATIAL EXTENT

This addresses the physical and spatial scale of the impact. A series of standard terms and ratings used in this assessment relating to the spatial extent of an impact / effect are outlined in Table 11.

TABLE 10: Rating scale for the assessment of the spatial extent of a predicted effect / impact

RATING	SPATIAL DESCRIPTOR
7	**International** - The impacted area extends beyond national boundaries.
6	**National** - The impacted area extends beyond provincial boundaries.
5	**Ecosystem** - The impact could affect areas essentially linked to the site in terms of significantly impacting ecosystem functioning.
4	**Regional** - The impact could affect the site including the neighbouring areas, transport routes and surrounding towns etc.
3	**Landscape** - The impact could affect all areas generally visible to the naked eye, as well as those areas essentially linked to the site in terms of ecosystem functioning.
2	**Local** - The impacted area extends slightly further than the actual physical disturbance footprint and could affect the whole, or a measurable portion of adjacent areas.
1	**Site Related** - The impacted area extends only as far as the activity e.g. the footprint; the loss is considered inconsequential in terms of the spatial context of the relevant environmental or social aspect.

11.4 SEVERITY / INTENSITY / MAGNITUDE

This provides a qualitative assessment of the severity of a predicted impact / effect. A series of standard terms and ratings used in this assessment which relate to the magnitude of an impact / effect are outlined in Table 12.

TABLE 11: Rating scale for the assessment of the severity / magnitude of a predicted effect / impact[8]

RATING	MAGNITUDE DESCRIPTOR

[8] **Source:** adapted from Glasson J, Therivel R & Chadwick A. Introduction to Environmental Impact Assessment, 2nd Edition. 1999. pp 258. Spoon Press, United Kingdom.

7	**Total / consuming / eliminating** - Function or process of the affected environment is altered to the extent that it is permanently changed.
6	**Profound / considerable / substantial** - Function or process of the affected environment is altered to the extent where it is permanently modified to a sub-optimal state.
5	**Material / important** - The affected environment is altered, but function and process continue, albeit in a modified way.
4	**Discernible / noticeable** - Function or process of the affected environment is altered to the extent where it is temporarily altered, be it in a positive or negative manner.
3	**Marginal / slight / minor** - The affected environment is altered, but natural function and process continue.
2	**Unimportant / inconsequential / indiscernible** - The impact temporarily alters the affected environment in such a way that the natural processes or functions are negligibly affected.
1	**No effect / not applicable**

11.5 DURATION

This describes the predicted lifetime / temporal scale of the predicted impact. A series of standard terms and ratings used in this assessment are included in Table 13.

TABLE 12: Rating scale for the assessment of the temporal scale of a predicted effect / impact

RATING	TEMPORAL DESCRIPTOR
7	**Long term** – Permanent or more than 15 years post decommissioning. The impact remains beyond decommissioning and cannot be negated.
3	**Medium term** – Lifespan of the project. Reversible between 5 to 15 years post decommissioning.
1	**Short term** – Quickly reversible. Less than the project lifespan. The impact will either disappear with mitigation or will be mitigated through natural process in a span shorter than any of the project phases or within 0 -5 years.

11.6 IRREPLACEABLE LOSS OF RESOURCES

Environmental resources cannot always be replaced; once destroyed, some may be lost forever. It may be possible to replace, compensate for or reconstruct a lost resource in some cases, but substitutions are rarely ideal. The loss of a resource may become more serious later, and the assessment must take this into account. A series of standard terms and ratings used in this assessment are included in Table 14.

TABLE 13: Rating scale for the assessment of loss of resources due to a predicted effect / impact

RATING	RESOURCE LOSS DESCRIPTOR
7	**Permanent** – The loss of a non-renewable / threatened resource which cannot be renewed / recovered with, or through, natural process in a time span of over 15 years, or by artificial means.
5	**Long term** – The loss of a non-renewable / threatened resource which cannot be renewed / recovered with, or through, natural process in a time span of over 15 years, but can be mitigated by other means.
4	**Loss of an 'at risk' resource** - one that is not deemed critical for biodiversity targets, planning goals, community welfare, agricultural production, or other criteria, but cumulative effects may render such loss as significant.
3	**Medium term** – The resource can be recovered within the lifespan of the project. The resource can be renewed / recovered with mitigation or will be mitigated through natural process in a span between 5 and 15 years.

2	**Loss of an 'expendable' resource** - one that is not deemed critical for biodiversity targets, planning goals, community welfare, agricultural production, or other criteria.
1	**Short-term** – Quickly recoverable. Less than the project lifespan. The resource can be renewed / recovered with mitigation or will be mitigated through natural process in a span shorter than any of the project phases, or in a time span of 0 to 5 years.

11.7 REVERSIBILITY / POTENTIAL FOR REHABILITATION

The distinction between reversible and irreversible impacts is a very important one and the irreversible impacts not susceptible to mitigation can constitute significant impacts in an EIA (Glasson *et al*, 1999). The potential for rehabilitation is the major determinant factor when considering the temporal scale of most predicted impacts. A series of standard terms and ratings used in this assessment are included in Table 15.

TABLE 14: Rating scale for the assessment of reversibility of a predicted effect / impact

RATING	REVERSIBILITY DESCRIPTOR
7	**Long term** – The impact / effect will never be returned to its benchmark state.
3	**Medium term** – The impact / effect will be returned to its benchmark state through mitigation or natural processes in a span shorter than the lifetime of the project, or in a time span between 5 and 15 years.
1	**Short term** – The impact / effect will be returned to its benchmark state through mitigation or natural processes in a span shorter than any of the phases of the project, or in a time span of 0 to 5 years.

11.8 PROBABILITY

The assessment of the probability / likelihood of an impact / effect has been undertaken in accordance with ratings and descriptors provided in Table 16.

TABLE 15: Rating scale for the assessment of the probability of a predicted effect / impact[9]

RATING	PROBABILITY DESCRIPTOR
1.0	Absolute certainty / will occur
0.9	Near certainty / very high probability
0.7 – 0.8	High probability / to be expected
0.4 - 0.6	Medium probability / strongly anticipated
0.3	Low probability / anticipated
0.2	Possibility
0.0 - 0.1	Remote possibility / unlikely

11.9 MITIGATION

In terms of the assessment process the potential to mitigate the negative impacts is determined and rated for each identified impact and mitigation objectives that would result in a measurable reduction or enhancement of the impact are taken into account. The significance of environmental impacts has therefore been assessed taking into account any proposed mitigation measures. The significance of the impact "without mitigation" is therefore the prime determinant of the nature and degree of mitigation required.

[9] **Source:** adapted from Glasson J, Therivel R & Chadwick A. Introduction to Environmental Impact Assessment, 2nd Edition. 1999. pp 258. Spoon Press, United Kingdom.

11.10 IMPACT MANAGEMENT HIERARCHY

The NEMA and the EIA Regulations (2014, as amended) also call for a hierarchical approach to impact management when considering impact assessment. The mitigation of negative impacts that a proposed development may have on the receiving environment must take on different forms depending on the significance of the impact and the area which may be affected. Therefore, mitigation requires proactive planning which is enabled by following the impact mitigation hierarchy. In this regard, during the assessment of alternatives it is preferable to investigate alternatives that avoid negative impacts in their entirety, and if this is not feasible, then alternatives which will reduce an unavoidable negative impact must be assessed through the adoption of mitigation and management measures. Progressing down the impact mitigation hierarchy, the rehabilitation of the negative impact must be considered and lastly, should the unavoidable impact remain post-mitigation and remediation, options to offset the negative impacts must be investigated. An illustration of the impact mitigation hierarchy is provided in Figure 17.

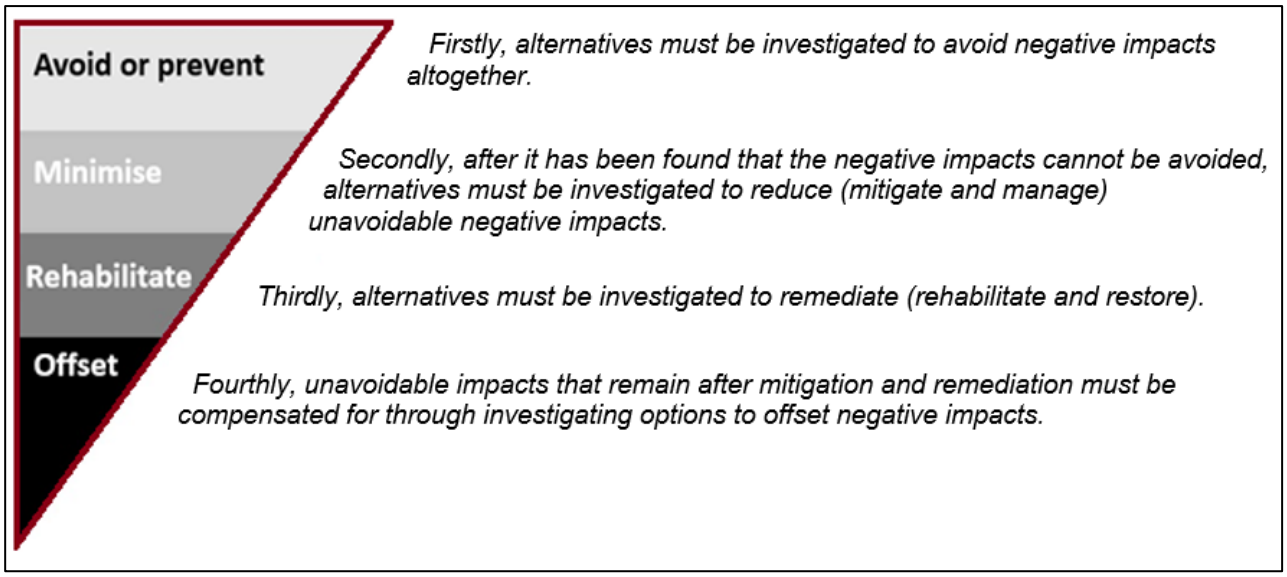


FIGURE 17: Impact Mitigation Hierarchy

The Impact Mitigation Hierarchy has been implemented in this assessment via the minor realignment of the houses away from the wetland buffer. Thus any impact has been minimised. via the identified of mitigation measures.

The alternatives identified in Section 7 and the respective impact assessment considered in Section 12 of this report reflects the hierarchal approach to impact mitigation to the best of the EAP's ability, taking into consideration the need and desirability of the application, as well as the surrounding biophysical and social environment evident within the immediate and greater environment.

12 IMPACTS IDENTIFIED

The preferred site alternative is located on Erf 61, Pietermaritzburg. This site alternative is the only site alternative which can meet the need and desirability of the Application.

Two layout alternatives were investigated. The layout remains the same however the location of the units in proximity of the wetland system on the northern portion of the site varies between the layouts. Layout Alternative 1 placed the units closer to the wetland system. Based on the outcome of the Specialist report, the units were relocated 1.5m further away from the wetland system. The revised layout is referred to as the preferred layout alternative. The preferred layout is therefore more favourable from an environmental sensitivity perspective.

Three technology alternatives have been identified i.e. asphalt, concrete and interlocking pavers. The asphalt surface is currently considered the preferred alternative.

The No-go alternative is to not to develop within Erf 61. As a result, no housing development will be constructed. The area will remain open space with the exception of the existing dwelling. Alien vegetation will continue to establish on site and potentially affect neighbouring properties. The current status quo will remain the same.

Based on the identification of the above alternatives, the Specialist Studies conducted, and construction works that will be required to implement the proposal, the following potential impacts to the receiving environment have been identified:

- Impacts to soils during construction;
- Impacts to surrounding vegetation during construction;
- Impacts to local fauna during construction;
- Air quality deterioration and an increase in noise pollution as a result of construction activities;
- An increase in construction traffic as a result of construction activities;
- The impact of construction waste as a result of construction activities;
- Socio-economic impacts;
- Potential to disturb existing infrastructure during construction; and,
- Safety and security impacts associated with construction activities;

The impacts identified for the proposed activity and the associated mitigation measures which directly and indirectly relate to the Listed Activities being applied for are provided in Table 17. Please note Table 17 identifies impacts and mitigation measures for the Layout Alternative and Technology Alternative inclusively.

TABLE 16: Impacts identified and associated mitigation measures

Impact	Description	Mitigation
Soil	• Potential disturbances include compaction, physical removal and potential pollution; • The exposed soil surfaces have the potential to erode easily if left uncovered; • Potential loss of stockpiled topsoil and other materials if not protected properly; • Insufficient stormwater control measures may result in localised high levels of soil erosion, possibly creating rills or gullies; • Increased erosion could result in increased sedimentation which could impact on ecological processes i.e. sediment entering the wetland and associated drainage line; • The additional hardened surfaces created during construction and operation will increase the amount of stormwater runoff, which has the potential to cause erosion; • Contamination of soil during construction activities; • Physical disturbance of the soil and plant removal may result in soil erosion/loss; and • Erosion and potential soil loss from cut and fill activities.	• Soil erosion prevention measures must be implemented such as gabions, sand bags etc. whilst energy dissipaters should be constructed at any surface water outflow points. The sites should be monitored weekly for any signs of off-site siltation. All areas impacted by earth-moving activities should be re-shaped post-construction to ensure natural flow of runoff and to prevent ponding. All exposed earth should be rehabilitated promptly with suitable vegetation to stabilize the soil; • The area surrounding the wetland area must be regularly checked for signs of erosion and sediment accumulation. If erosion is evident, corrective action must be taken. Sediment traps must be implemented before the recommended 5m buffer area during the construction phase; • Drip trays must be utilised under all standing plant to prevent hydrocarbon spillages. Should spillages occur, the contaminated soil is to be removed, contained in a durable plastic packet and appropriately disposed of at a licenced Hazardous Waste Facility; and • Any exposed earth should be rehabilitated promptly with suitable vegetation to protect the soil. Vigorous grasses planted with fertiliser are very effective at covering exposed soil. It is important to note, that the use of fertilisers, must be undertaken with caution and must not be allowed, in any circumstances, to run into the wetland area or the drainage line to avoid any possible eutrophication impacts.
Vegetation and fauna	• Disturbance of the site may lead to encroachment of alien plant species on-site and into the surrounding areas; • Increase in alien invasive species could lead to a possible loss in biodiversity; • Potential pollution as a result of accidental spillages of petrochemicals or bituminous substances; and • Increase in road strikes of birds and wildlife, especially slow-moving organisms such as frogs.	• Identify sensitive fauna and flora prior to construction works; • Site personnel must undergo Environmental Training and be educated on keeping any vegetation disturbance to a minimum; • Poaching or harvesting of indigenous flora / fauna is strictly forbidden; • Alien plant encroachment must be monitored and prevented as outlined in the EMPr (Appendix 11); • All exposed earth should be rehabilitated promptly with suitable vegetation to protect the soil. Vigorous grasses planted with fertiliser are very effective at covering exposed soil; • A rigorous programme of alien weed control must be implemented and sustained; • No hunting is permitted on-site or the surrounding areas; • No animals required for hunting e.g. dogs, under the supervision of construction workers, must be allowed on site. All construction personnel on the property must be informed of this ruling; and • Any construction personnel found to be poaching in the area must be subjected to a disciplinary hearing.

Impact	Description	Mitigation
Air quality and noise pollution	• Potential dust generation from soil stripping, vehicle traffic on the access roads and motor vehicle fumes will have an impact on air quality; • Potential increase in noise from the operation of machinery and equipment, as well as the construction vehicle traffic; • Dust and noise will be created during the Construction Phase, which may impact neighbours and the local community; and • Disruption to residents through increased activity and noise in the area.	• All construction machinery and equipment must be regularly serviced and maintained to keep noise, dust and possible leaks to a minimum, as per the requirements of the EMPr (Appendix 11); • Site dampening should be undertaken to prevent excess dust during construction; • Operational Hours: No works shall be executed between sunset and sunrise and on the non-working and special non-working days as stated in the Contract Data unless otherwise agreed between the Engineer and Contractor. Cognisance of the fact that the site is located in an urban environment and neighbours reside immediately adjacent to the site, works should be undertaken during normal working hours; and • Construction personnel must be made aware of the need to prevent unnecessary noise such as hooting and shouting.
Traffic	• Increase in construction vehicles in the area; • Slow-moving construction vehicles on the surrounding urban roads may cause accidents; and • Damage to the existing road infrastructure.	• Appropriate temporary traffic control /accommodation and warning signage must be erected and implemented on Grimthorpe Road; • Construction worker's / construction vehicles must take heed of normal road safety regulations; thus all personnel must obey and respect the law of the road. A courteous and respectful driving manner must be enforced and maintained so as not to cause harm to any individual; • Any damage to surrounding roads must be repaired as soon as possible to prevent further deterioration to the road network.
Waste	• There is potential for the site and surrounding areas to become polluted if construction activities are not properly managed (e.g. oil / bitumen spills, litter from personnel on-site, sewage from ablutions etc.); • Potential off-site pollution as a result of accidental spillages of petrochemicals or concrete; and • Waste generation could be created by the following: - Solid waste - plastics, metal, wood, concrete, stone; - Chemical waste- petrochemicals, resins and paints; and - Sewage as may be generated by employees.	• All waste generated on-site during construction must be adequately managed. Separation and recycling of different waste materials is supported; • All solid waste should be disposed of at a registered landfill site and records maintained to confirm safe disposal; • Adequate scavenger-proof refuse disposal containers must be supplied to control solid waste on-site; • It must be ensured that existing waste disposal facilities in the area are able to accommodate the increased waste generated from the proposed construction; • Chemical waste must be stored in appropriate containers and disposed of at a licensed disposal facility; • Portable sanitation facilities must be erected for construction personnel. Use of these facilities must be enforced (these facilities should be kept clean so that they are a desired alternative to the surrounding vegetation). These facilities must also be monitored and serviced regularly so as to prevent contamination of the water resources. • The construction site must be inspected for litter on a daily basis. Extra care should be taken on windy days. Precautions should be taken to avoid litter from entering the wetland system on site, as well as the drainage line;

Impact	Description	Mitigation
		• Soil that is contaminated with, e.g. cement, petrochemicals or paint, must be disposed of at a registered waste disposal site and is NOT to be deposited into the wetland or associated drainage line; and • It must be ensured that all hazardous contaminants are stored in designated areas that are sign-posted, lined with an appropriate barrier and bunded to 110% of the volumes of liquid being stored to prevent the bio-physical contamination of the environment (ground and surface water and soil contamination). Hazardous substance storage must not take place within 50m of a watercourse or within the 1:100 year floodline; and • Any significant spills on-site must be reported to the relevant Authority (e.g. Department of Water and Sanitation / Municipality / EDTEA etc.) and must be remediated as per the EMPr (Appendix 11).
Socio-Economic	• Creation of job opportunities for skilled personnel (e.g. engineers, specialists etc.) and non-skilled personnel (e.g. labourers); • Skills development of the local community through employment opportunities; • Social anxiety may arise should the surrounding community not be adequately notified of the proposed activity; • Possible economic benefits to suppliers of building materials in the local area as goods and services may be purchased from these entities during the construction phase; and • Provision of middle-income housing to willing buyers.	• Inform the surrounding communities and general public of the proposed activity as soon as possible. This will serve to ease potential social anxiety. Such notification can be conducted through the Public Participation Process; • Local people should be employed where possible; and • A Community Liaison Officer must assist in raising any concerns / complaints noted by the affected community to the Contractor.
Existing infrastructure disturbance	• If care is not taken, existing powerlines or telephone lines and could be damaged during construction activities, as well as sewerage pipelines and water pipelines.	• Notify appropriate stakeholders as soon as possible, e.g. Eskom, Telkom, Municipality and have the respective contact numbers should any damages be inflicted such that they can be identified, reported and resolved quickly; and • Existing services and/or servitudes must be identified and marked prior to construction excavations occurring.
Safety and security	• There is potential for construction labour to trespass onto neighbouring properties; • Construction personnel / construction vehicles – movement of construction personnel and vehicles may pose a potential health and safety risk to road users and local residents.	• Any construction personnel found to be trespassing must be subjected to a disciplinary hearing; • Potential job seekers are not permitted to loiter outside the site. Should this occur, the Contractor is to provide them with details of his respective Human Resources department for them to make an application for employment and ask them to kindly remove themselves from the site. • Construction workers / construction vehicles must take heed of normal road safety regulations, thus all personnel must obey and respect the law of the road. A courteous and respectful driving manner should be enforced and maintained so as not to cause harm to any individual; and • A designated speed limit must be set by the developer to limit possible road strikes.

Impact	Description	Mitigation
Water Resources	• Contamination of ground and surface water and soil; • Excavation of wetland; • Wetland areas and associated drainage lines may be polluted due to accidental spillages of petrochemicals from vehicles and equipment, or cement from construction; • The additional hardened surfaces created during construction will increase the amount of stormwater runoff, which has the potential to cause erosion and result in sedimentation in the wetland and associated wetland. This in turn could result in turbid conditions in the drainage line; • Accidental spillages of petrochemicals from vehicles and equipment, or cement; and • Impedance or divergence of flow in seasonal watercourses and wetlands.	• Appropriate stormwater / surface water management measures must be put in place before construction commences and maintained throughout the lifetime of the development; • The recommended 5m no-go construction buffer must be demarcated around the wetland and all construction made aware that under no circumstances are they to conduct works in this area with the exception of approved works as per the layout plan; • An appropriate number of toilets (1 toilet for every 20 workers) must be provided for labourers during the Construction Phase. These must be maintained in a satisfactory condition and a minimum of 50m away from any water resources and outside of the 1:100 year floodline; • Any contaminated water associated with construction activities must be contained in separate areas or receptacles such as Jo-Jo tanks or water-proof drums, and must not be allowed to enter into the wetland or associate drainage line; • The Construction Camp should be positioned on previously disturbed areas (if possible) and outside of the 1:100 year floodline; • Soil erosion prevention measures must be implemented and energy dissipaters must be constructed at any surface water outflow points. The site should be monitored by the Contractor weekly for any signs of off-site siltation. All areas impacted by earth-moving activities must be re-shaped post-construction to ensure natural flow of runoff and to prevent ponding; • Appropriate silt control mechanisms must be installed around the 5m wetland buffer to prevent silt from entering the wetland and associated drainage line; • Should any excavations require dewatering, this is to occur through an adequately designed silt trap prior to discharge. All silt traps are to be regularly monitored and maintained to ensure efficient and effective use; • All recommendations noted in the Wetland Assessment Report (Appendix 8) and Stormwater Management Plan (Appendix 6) must be adhered to.
Heritage & Palaeontological	• Potential disturbance to items of cultural or heritage significance during excavations.	• Should items of heritage significance be discovered, construction in that specific area must stop; the area is to be cordoned off; and an appropriately qualified Heritage Specialist or Amafa is to be immediately notified. Should a grave be discovered, the same methodology is to be employed and the South African Police Service immediately notified.

13 IMPACT ASSESSMENT

Tables 18 presents a summary of the impact assessment findings assessed in Tables 20, 21 and 22, in relation to the proposed Preferred Layout Alternative, Layout Alternative 1 and No-Go alternative. As per Section 6 and 7, no site and activity alternative has been assessed. Tables 19 presents a summary of the impact assessment findings assessed in Tables 23, 24 and 25, in relation to the Technology Alternatives.

TABLE 17: Summary of Impact Assessment (Layout Alternatives)

Nature of Impact	Preferred Layout		Alternate Layout 1		No-Go Alternative	
	Significance without mitigation	Significance with mitigation	Significance without mitigation	Significance with mitigation	Significance without mitigation	Significance with mitigation
Soil impacts	4.4	2.4	11.7	2.4	2	2
Flora and Fauna impacts	7.2	0.5	7.2	0.5	11.2	11.2
Waste	1.6	0.5	1.6	0.5	0.7	0.7
Safety and Security	1.4	0.5	1.4	0.5	1.8	1.8
Noise Impacts	1.6	0.6	1.6	0.6	0.7	0.7
Water Resources	3.0	0.7	7.7	1.6	11.2	11.2
Overall Significance	**3.2**	**0.9**	**5.2**	**1.0**	**3.9**	**3.9**
	LOW	**LOW**	**LOW**	**LOW**	**LOW**	**LOW**

TABLE 18: Summary of Impact Assessment (Technology Alternatives)

Nature of Impact	Asphalt Surface		Concrete Surface		Interlocking Pavers	
	Significance without mitigation	Significance with mitigation	Significance without mitigation	Significance with mitigation	Significance without mitigation	Significance with mitigation
Soil impacts	4.9	1.2	4.9	1.2	4.9	1.2
Flora and Fauna impacts	9.9	0.5	9.9	0.5	9.9	0.5
Waste	1.4	0.5	1.4	0.5	1.4	0.5
Safety and Security	1.4	0.5	1.4	0.5	1.4	0.5
Noise Impacts	3.2	1.2	3.2	1.2	3.2	1.2
Water Resources	8	1	8	1	8	1
Overall Significance	**4.8**	**0.8**	**4.8**	**0.8**	**4.8**	**0.8**
	Low	**Low**	**Low**	**Low**	**Low**	**Low**

TABLE 19: Alternate Layout Impact Assessment

Nature of Impact	Spatial extent		Severity/ intensity/ magnitude		Duration		Resource loss	Reversibility		Probability		Significance without mitigation	Significance with mitigation
	Without	With	Without	With	Without	With		Without	With	Without	With		
Soil impacts	2	1	4	2	3	1	3	1	1	0.9	0.3	11.7	2.4
Flora and Fauna impacts	2	1	3	1	1	1	1	1	1	0.9	0.1	7.2	0.5
Waste	2	1	3	1	1	1	1	1	1	0.2	0.1	1.6	0.5
Safety and Security	2	1	2	1	1	1	1	1	1	0.2	0.1	1.4	0.5
Noise Impacts	2	1	3	2	1	1	1	1	1	0.2	0.1	1.6	0.6
Water Resources	2	1	4	2	1	1	3	1	1	0.7	0.2	7.7	1.6
											Overall Significance	**5.2**	**1.0**
												Low	**Low**

TABLE 20: Preferred Layout Impact Assessment

Nature of Impact	Spatial extent		Severity/ intensity/ magnitude		Duration		Resource loss	Reversibility		Probability		Significance without mitigation	Significance with mitigation
	Without	With	Without	With	Without	With		Without	With	Without	With		
Soil impacts	2	1	4	2	1	1	3	1	1	0.4	0.3	4.4	2.4
Flora and Fauna impacts	2	1	3	1	1	1	1	1	1	0.9	0.1	7.2	0.5
Waste	2	1	3	1	1	1	1	1	1	0.2	0.1	1.6	0.5
Safety and Security	2	1	2	1	1	1	1	1	1	0.2	0.1	1.4	0.5
Noise Impacts	2	1	3	2	1	1	1	1	1	0.2	0.1	1.6	0.6
Water Resources	2	1	3	1	1	1	3	1	1	0.3	0.1	3	0.7
											Overall Significance	3.2	0.9
												LOW	**LOW**

TABLE 21: No-go Alternative Assessment

Nature of Impact	Spatial extent		Severity/ intensity/ magnitude		Duration		Resource loss	Reversibility		Probability		Significance without mitigation	Significance with mitigation
	Without	With	Without	With	Without	With		Without	With	Without	With		
Soil impacts	1	1	1	1	3	3	2	3	3	0.2	0.2	2	2
Flora and Fauna impacts	2	2	3	3	3	3	3	3	3	0.8	0.8	11.2	11.2
Waste	1	1	1	1	3	3	1	1	1	0.1	0.1	0.7	0.7
Safety and Security	2	2	2	2	3	3	1	1	1	0.2	0.2	1.8	1.8
Noise Impacts	1	1	1	1	3	3	1	1	1	0.1	0.1	0.7	0.7
Water Resources	1	1	3	3	3	3	4	3	3	0.8	0.8	11.2	11.2
Overall Significance												3.9	3.9
												LOW	LOW

TABLE 22: Technology alternative (Asphalt)

Nature of Impact	Spatial extent		Severity/ intensity/ magnitude		Duration		Resource loss	Reversibility		Probability		Significance without mitigation	Significance with mitigation
	Without	With	Without	With	Without	With		Without	With	Without	With		
Soil impacts	1	1	3	2	1	1	1	1	1	0.7	0.2	4.9	1.2
Flora and Fauna impacts	2	1	3	1	2	1	1	3	1	0.9	0.1	9.9	0.5
Waste	2	1	2	1	1	1	1	1	1	0.2	0.1	1.4	0.5
Safety and Security	2	1	2	1	1	1	1	1	1	0.2	0.1	1.4	0.5
Noise Impacts	2	1	3	2	1	1	1	1	1	0.4	0.2	3.2	1.2
Water Resources	2	1	3	1	1	1	1	3	1	0.8	0.2	8	1
Overall Significance												4.8	0.8
												Low	Low

TABLE 23: Technology alternative (Concrete)

Nature of Impact	Spatial extent		Severity/ intensity/ magnitude		Duration		Resource loss	Reversibility		Probability		Significance without mitigation	Significance with mitigation
	Without	With	Without	With	Without	With		Without	With	Without	With		
Soil impacts	1	1	3	2	1	1	1	1	1	0.7	0.2	4.9	1.2
Flora and Fauna impacts	2	1	3	1	2	1	1	3	1	0.9	0.1	9.9	0.5
Waste	2	1	2	1	1	1	1	1	1	0.2	0.1	1.4	0.5
Safety and Security	2	1	2	1	1	1	1	1	1	0.2	0.1	1.4	0.5
Noise Impacts	2	1	3	2	1	1	1	1	1	0.4	0.2	3.2	1.2
Water Resources	2	1	3	1	1	1	1	3	1	0.8	0.2	8	1
Overall Significance												**4.8**	**0.8**
												Low	**Low**

TABLE 24: Technology alternative (Interlocking Pavers)

Nature of Impact	Spatial extent		Severity/ intensity/ magnitude		Duration		Resource loss	Reversibility		Probability		Significance without mitigation	Significance with mitigation
	Without	With	Without	With	Without	With		Without	With	Without	With		
Soil impacts	1	1	3	2	1	1	1	1	1	0.7	0.2	4.9	1.2
Flora and Fauna impacts	2	1	3	1	2	1	1	3	1	0.9	0.1	9.9	0.5
Waste	2	1	2	1	1	1	1	1	1	0.2	0.1	1.4	0.5
Safety and Security	2	1	2	1	1	1	1	1	1	0.2	0.1	1.4	0.5
Noise Impacts	2	1	3	2	1	1	1	1	1	0.4	0.2	3.2	1.2
Water Resources	2	1	3	1	1	1	1	3	1	0.8	0.2	8	1
Overall Significance												**4.8**	**0.8**
												Low	**Low**

13.1 SIGNIFICANCE

Based on the outcome of the significance scoring noted in Tables 18-28, the overall significance impact without mitigation, is considered to be Low. With mitigation, the overall significance impact is considered to be Lower.

The greatest impacts of significance are considered to be soil, water and floral impacts. Layout Alternative 1 is considered to have a greater impact on wetland soils and water resources as the development is in closer proximity. The Preferred Layout Alternative is therefore deemed to have a lower impact on water resources and soil than Layout Alternative 1. With the correct mitigation measures employed as noted in Table 12 and as per the EMPr (Appendix 11), these impacts can be significantly reduced. Based on this outcome, it is recommended that the **Preferred Layout Alternative** is adopted. All technology alternatives were found to have **similar** impacts and therefore any technology alternative discussed is deemed to be suitable for the development. The Applicant, will determine the preferred technology alternative pending an Environmental Authorisation (should this be granted).

14 ENVIRONMENTAL IMPACT STATEMENT

Assuming all phases of the project adhere to the conditions stated in the EMPr (Appendix 11) it is believed that the impacts associated with the proposed construction of a residential development on Erf 61, Pietermaritzburg (55 Grimthorpe Avenue) will have no significant, adverse, long term environmental impact on the surrounding environment.

Positive impacts associated with construction include:

- Provision of housing for middle-income bracket;
- Economic growth and development;
- Alignment with various strategies of the Msunduzi Local Municipality; and
- Employment opportunities and skills development.

It is perceived that these impacts will have sustainable benefits.

It must be ensured that the construction phase, in no way, hampers the health of any of the ecological systems identified on site, and that post-construction rehabilitation leaves the surrounding environments in an as good, if not better, state.

After the construction phase of the project, the contractors must ensure that all hazardous materials are removed from the site and that site is rehabilitated as per the requirements of the EMPr (Appendix 11).

Any alien plant management programmes that are implemented during the construction phase must be maintained during the construction defects liability period.

15 RECOMMENDATIONS OF THE EAP

The proposed residential development should not result in impacts on the natural or social environment that are highly detrimental, nor result in undue risks to the natural environment. The nature and types of negative impacts do not outweigh the potential benefits of this project, provided that the short-term localised impacts of the construction phase are adequately mitigated. In this regard, an EMPr has been compiled and is attached to this report (see Appendix 11).

It is the EAP's recommendation that the **Preferred Layout Alternative** should be adopted.

It is recommended that external monthly EMPr monitoring takes place by an independent Environmental Control Officer (ECO) to ensure that the requirements of the EMPr are being correctly implemented, thus ensuring the protection of the surrounding environment during construction.

It is the recommendation of the EAP that the following management and mitigation measures be incorporated into any project approvals which may be issued:

- Prior to the start of construction the contractor must produce a method statement indicating how the construction process will be undertaken.
- Ideally, the construction work should be done in the dry season;
- All conditions and requirements of the project Environmental Management Programme (EMPr) (Appendix 11) must be adhered to;
- The Stormwater Management Plan (Appendix 6) must be implemented;
- All recommendations noted in the Wetland Assessment Report (Appendix 8) must be adopted and followed by the contractor i.e.:
    - A Wetland Rehabilitation Plan must be developed prior to construction commencing. This must consider sediment management and must be approved by the Msunduzi Municipality Environmental Unit and EDTEA.
    - A grassed five metre buffer, plus a sediment fence must be implemented prior to construction commencing and maintained throughout the construction phase. A grassed five meter buffer must be maintained during the operational phase.
- Further, in terms of Environmental Monitoring, the following is recommended:
    - An ECO must audit the site once a month during construction until completion of the rehabilitation phase of project; and
    - The Project Manager is responsible to ensure that an Environmental Audit Report is submitted to the EDTEA: Compliance and Monitoring for the duration of the construction period.
- All areas affected by construction activities must be reinstated to their previous condition, if not to an improved condition post-construction

All of the above recommendations have been incorporated into the EMPr (Appendix 11). Furthermore, no-go areas must be suitably demarcated to prevent the traversing of plant and stockpiles into the wetland area (Appendix 2).

It is the EAP's recommendation that the Preferred Layout Alternative should be adopted. Based on the above, it is the opinion of the EAP the Application should be granted a positive decision on Environmental Authorisation.

16 CONSTRUCTION TIMEFRAMES

It is requested that the Environmental Authorisation, if issued by the Competent Authority, be valid for a period of ten (10) years from the date of signature.

17 SUBMISSION AND CONSIDERATION OF DOCUMENTATION BY THE COMPETENT AUTHORITY

It is to be noted that in terms of the EIA Regulations (2014), GNR 326 43(2), all State Departments that administer a law relating to a matter affecting the environment, specific to the Application, must submit comments within 30 days to the EAP as per the request of the EAP. Should no comment be received within the 30 day commenting period, it will be assumed that the relevant State Department has no comment to provide. In this regard, all Key Stakeholders and registered IAPs were requested to submit comment to the EAP upon the initial circulation of the Draft BA Report (28 October 2019 to 20 January 2020).

All comments received in response to the BA Report will be attached to, summarised and responded to in a final version of the BA Report (i.e. Final BA Report), which will be submitted to the Competent Authority, (i.e. EDTEA) for consideration in terms of issuing an Environmental Authorisation.

18 UNDERTAKING

Terratest (Pty) Ltd hereby confirms that the information provided in this report is correct at the time of compilation and was compiled with input provided by Person Drive Trading (Pty) Ltd and the respective specialists.

Terratest (Pty) Ltd further confirms that all comments received from Stakeholders and IAPs will be included in the Final BA Report submitted to the EDTEA. Further, a record has been kept to-date, and will continue to be kept, of all comments, which will be consolidated and incorporated into all subsequent reports, either submitted for comment to IAPs, or to the EDTEA for consideration and decision-making.

For Terratest (Pty) Ltd:

R. Patak
Environmental Scientist

19 REFERENCES

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

Scott-Shaw, C.R and Escott, B.J. (Eds) (2011) KwaZulu-Natal Provincial Pre-Transformation Vegetation Type Map – 2011. Unpublished GIS Coverage [kznveg05v2_1_11_wll.zip], Biodiversity Conservation Planning Division, Ezemvelo KZN Wildlife, P. O. Box 13053, Cascades, Pietermaritzburg, 3202.

20 APPENDICES

APPENDIX 1: CVs

APPENDIX 2: Maps

APPENDIX 3: EDTEA Correspondence

APPENDIX 4: Application Form

APPENDIX 5: Engineering Report

APPENDIX 6: Stormwater Management Plan

APPENDIX 7: Public Participation

APPENDIX 8: Wetland Assessment

APPENDIX 9: Heritage Impact Assessment

APPENDIX 10: Vegetation Specialist Letter

APPENDIX 11: Environmental Management Programme (EMPr)