

Dan Spares cc

**PROPOSED HOUSING DEVELOPMENTS ON ERVEN 2954,
2955 AND 2956 KINGSBURGH EXTENSION 9, KWAZULU
NATAL**

DRAFT BASIC ASSESSMENT REPORT

EDTEA REF NO: *TO BE ASSIGNED*

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EXECUTIVE SUMMARY

INTRODUCTION AND LEGAL REQUIREMENTS

This report is a Basic Assessment Report (BAR) for part of the application by Dan's Spares cc to develop residential developments on Erven 2954, 2955 and 2956 Kingsburgh Extension 9 in KwaZulu-Natal. It has been prepared on behalf of Dan Spares by Metamorphosis Environmental Consultants (MEC), in terms of the requirements of the Environmental Impact Assessment (EIA) Regulations of 2014 (as amended), published under the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA). The Basic Assessment process has included technical investigations and public participation in accordance with GN R. 326. This Draft BAR has been made available for public review and comment during the period 30 March 2020 to 30 April 2020.

Further to the requirement for environmental authorisation, a host of other environmental laws, policies and guidelines are applicable to this project and are listed in Table 2 of this report.

PROJECT NEED AND DESIRABILITY

eThekweni Municipality estimates in its latest Integrated Development Plan that the current backlog for housing stands at just over 38 5000 dwellings. One of the key issues identified is the lack of well located land within areas zoned for residential use. The majority of housing units required is in the "affordable" sector and the proposed development of Kingsburgh x 9 is aimed at the lower end of the middle-income market.

The IDP estimates that 33% of households in the area rent their accommodation. Although rental stock in the denser parts of the city is significant, it is particularly scarce in low and middle-income suburbs. Kingsburgh x 9 is situated in one such developed suburb and will provide much needed stock in this sector.

The proposed development falls within one of the eThekweni High Priority Integration Zones which promotes high density multi storey buildings on vacant zoned and serviced land.

In terms of the Municipal Economic Development Strategy, the fact that Kingsburgh x 9 is a fully zoned and serviced township means that the council will not need to budget for infra-structure cost. This development is situated close to various informal and formal settlements from where the labour will come for most of the jobs created during the construction and operational phases and ample transport options is already available thus negating the implementation cost to provide same.

Approximately 665 skilled and 450 unskilled workers will be required during the construction phase of the project and the project will provide about 260 permanent jobs during operational phase, ranging from administrative positions to maintenance, domestic, gardening, etc.

The required skills match the skills available in the area and this development is situated within easy travelling distance from where the potential labour force resides, some even within walking distance, thus facilitating socio-economic upliftment in the area.

PROJECT LOCATION AND MAIN COMPONENTS

The study area falls within eThekweni Metropolitan Municipality, KwaZulu-Natal, affecting Ward 97 in the Southern portion of the Municipality.

The development falls within the suburb of Shulton Park within Kingsburgh. Small areas of Erven 2954, 2955 and 2956 will be developed for residential purposes.

The development will comprise the construction of small double story simplexes, together with access roads and parking bays. Each dwelling will be approximately 60m² in extent.

It should be noted that the number and mix of units may change when the final layouts are developed.

Development on the individual Erven is as follows:

Erf 2954 – 39 738.62m²

Proposed 82 units and 125 parking bays with a building coverage of 4 920m². The remaining open space area on the property will be approximately 35 000m².

The permitted FAR on this site is 14 300m².

Erf 2955 – 27 843.65m²

Proposed 46 units and 139 parking bays with a building coverage of 2 520m². The remaining open space area on the property will be approximately 5 000m².

The permitted FAR on this site is 9 700m².

Erf 2956 – 33 555.19m²

Proposed 60 units and 95 parking bays with a building coverage of 3 600m². The remaining open space area on the property will be approximately 30 000m².

The permitted FAR on this site is 12 600m².

The central portion of the area (Erf 2957 – 102937.03m²) is also owned by the proponent but is zoned open space. There will be no disturbance on this area with the exception of the sewer lines and some stormwater discharge. The location of the sewer pipelines and stormwater outlets is also shown on Figure 2.

PROJECT ALTERNATIVES

In line with the EIA Regulations, a number of alternatives have been considered for the proposed project. However, not site alternatives were considered as the proponent purchased the properties with the express intention of developing them for residential use. The initial proposal involved the development of almost double the number now proposed. The number was reduced to lessen the environmental impact of the proposed development. It must, however, be understood that the final project proposal for which environmental authorisation is requested presents only **one feasible overall alternative** which has been selected based on optimising logistics whilst minimising the environmental impacts.

The No-Development alternative (not preferred) provides the baseline against which alternatives are assessed and also demonstrates the consequences of not authorising the development proposal.

THE RECEIVING ENVIRONMENT

The site is highly undulating, with the proposed development areas occupying the relative level ridges around a central steep valley. A season stream (a tributary of the Little Manzimtoti River) runs along the valley bottom. There are no wetlands on the site. Vegetation on the site comprises:

- Alien-dominated vegetation;
- Remnant grassland;
- Early successional forest and thicket (younger woody plant growth, estimated to have been absent or just emergent 30 years ago); and
- Older growth forest (present more than 30 years ago, and some decades prior to that). In spite of being distinguished as being older growth forest, it is only so in relative terms as it is not more than 80 years old and some species indicative of very long-established forests in the eThekweni Municipal Area are absent.

The site is surrounded by residential development and a school is located close to the access point for Erf 2954.

No cultural heritage or palaeontological resources were identified on the site.

PUBLIC PARTICIPATION PROCESS

The public participation process undertaken was designed to comply with the requirements of the EIA Regulations and NEMA. A detailed description is provided in Chapter 6 of this report.

ASSESSMENT METHODOLOGY

Issues and potential impacts of the project on the environment (and *vice versa*) were identified by way of field investigations, desktop studies and interaction with Interested and Affected Parties (I&APs). Key issues and impacts requiring further investigation were addressed by specialist studies and/or further detailed input from the environmental and technical team. Mitigation measures were identified with inputs from I&APs, the specialists, the design engineers and the Environmental Assessment Practitioner (EAP) team. Information was collated, evaluated and integrated, taking into account the specialist findings and recommended mitigation measures. Thereafter, each impact was assessed using the assessment conventions outlined in Table 14 of this report.

SUMMARY OF KEY ISSUES AND POTENTIAL IMPACTS ASSOCIATED WITH THE DEVELOPMENT AND ASSESSMENT OF THE SIGNIFICANCE OF THE IDENTIFIED IMPACTS

The key issues identified and assessed during this Basic Assessment were formulated as eight questions. Associated potential impacts were identified and their significance assessed.

What economic and socio-economic benefits will result from the proposed development at a local, regional and national scale?

- Employment creation, capacity building (+ve).
- Local contractors and SMMEs (+ve).
- Reduced travel time (reduced traffic congestion and improved road conditions) (+ve).

With management, these positive impacts are considered to be of medium significance (+ve)

What effects will the development have on adjacent properties, infrastructure and services and vice versa?

- Increased potential for crime (-ve).
- Effect on property values (+ve).
- Damage to/disruption to local roads/traffic (-ve).
- Dust, Noise, visual impacts (-ve).

With management, these impacts are considered to be of low and medium significance.

What potential health, safety, security and other nuisance impacts may be experienced as a result of the project during construction?

- The effect of increased noise on surrounding receivers during construction (-ve).
- Disruption to vehicle traffic/road safety and access (-ve).
- Health and safety risks to those in close proximity to construction activities (-ve).
- Increased dust and vehicle emissions (-ve).
- Increased spread of disease (-ve).
- Increased crime (increased security risk) (-ve).
- Other nuisance impacts e.g. increased degraded aesthetics (-ve).

With management, these impacts are considered to be of low and medium significance.

What negative impacts will the proposed development have on the social environment, during operation?

- Increased noise (-ve).
- Increased traffic at site access points (-ve).
- Damage to adjacent properties due to poorly designed stormwater drainage (-ve).

With management, these impacts are considered to be of low to medium significance.

What effects will the proposed development have on cultural heritage resources?

There will be no impact on cultural heritage resources.

What effects will the proposed development have on the biodiversity of protected areas, D'MOSS and other natural habitat (terrestrial/riparian)?

- Loss of topsoil (-ve).
- Loss/degradation of terrestrial vegetation and natural habitat (-ve).
- Loss/degradation of riparian and wetland areas¹ (-ve).
- Faunal mortalities and negative effect on local faunal populations due to disturbance, loss of habitat and poaching (-ve).

With management, the impacts are considered to be of low to medium significance.

What potential cumulative impacts can result from the proposed development?

A cumulative impact is an incremental impact on the environment that results from the impact of a proposed action when added to existing and reasonably foreseeable future actions. Cumulative effects can be both positive and negative. Also, the nature of cumulative impacts can be both temporary in nature (i.e. impacts that are restricted to the construction phase) and permanent (i.e. impacts that occur in both the construction and operation phases).

To enhance the positive impacts of the proposed development and, thus, enhance positive cumulative effects, the project should be implemented efficiently according to best environmental practise and the infrastructure should be well maintained.

To minimise negative impacts of the proposed development and, thus, its negative contributions towards cumulative effects on the environment, the project should be implemented with the recommended mitigation measures.

What are the impacts of the No Development Alternative?

The No Development Alternative would result in the continued degradation of the natural environment in the area, with increasing encroachment of alien invasive plants, as well as the human interference occurring in the area.

The area is zoned for residential development, although the majority of the land is too steep for development.

The development will result in the creation of jobs and management of the remaining open areas under the same ownership in the area.

According to the assessment, the predicted impacts of the No Development Alternative are considered to be of medium (-) significance.

ENVIRONMENTAL IMPACT STATEMENT

Taking the assessment of potential impacts into account, a summary of the environmental impacts of the proposed activity (after mitigation) is provided below.

Effects of the project on the social environment and vice versa

The impacts on the social environment are both positive and negative. However, the long term impacts are, in general positive, together with the short term creation of hundreds of jobs during construction.

The majority of the negative social impacts are short term, related to the disruption (noise, dust, traffic etc) during construction.

With efficient and proper project management and implementation, as well as the application of the mitigation measures recommended in this report (carried over into the EMP), the negative social impacts during construction, will be of low-medium significance, with no negative social impacts of high significance.

The positive impacts of the project on the social environment during operation will be of medium significance.

During the construction period, it is definite that some positive economic/socio-economic impacts of medium significance will accrue to the local community due to the provision of temporary jobs for semi skilled and unskilled workers, the increased opportunities for local contractors and SMMEs.

There are potentially low to medium significance negative impacts during operation (relating to traffic, noise and stormwater).

Effects of the project on cultural heritage resources and vice versa

There will be no impacts on cultural heritage resources either during construction or operation.

Effects of the project on the biophysical environment and vice versa

The potential impacts on the vegetation on the site, without appropriate mitigation, are potentially of high significance due to the potential extent of disturbance due to the large amount of cut and fill and the sensitivity of some of the 'old forest' and grassland plants in some of the areas. With mitigation, the negative impacts of construction and operation on the biophysical environment (soils and substrates, terrestrial and riparian habitat, as well as associated fauna) will be of low to medium significance.

Effects of the No Development Alternative

While the No Development Alternative would defer the negative impacts of construction on the social and biophysical environment, as described above, this would be of short term benefit only. In the longer term, the No Development Alternative will result in increasing degradation of the flora on site with further encroachment of alien vegetation, and continued risks of vagrants on the property. The negative impacts of the No Development Alternative have been assessed as being of medium negative significance. For these reasons, this alternative is not recommended.

RECOMMENDATION OF THE ENVIRONMENTAL ASSESSMENT PRACTITIONER

It is the opinion of the EAP that the information contained in this report and the documentation attached hereto is sufficient to make a decision in respect of the activity applied for, viz the proposed development of dwelling units of Erf 2954, 2955 and 2956 Kingsburgh ext 9.

It is the opinion of the EAP that the proposed activity can be authorised, based on the findings of the assessment process and conditional on the items listed in Section 11 of this report.

TABLE OF CONTENTS

EXECUTIVE SUMMARY	II
TABLE OF CONTENTS	VIII
LIST OF FIGURES	XII
LIST OF TABLES	XIII
ACRONYMS AND ABBREVIATIONS	XIV
ADHERANCE TO REGULATORY REQUIREMENTS	XV
1. INTRODUCTION	1
1.1 Background	1
1.2 Project purpose, need and desirability	1
1.3 Location and scope of the project	2
1.4 Environmental authorisation requirements and listed activities triggered by the project	5
1.4.1 <i>Listed activities triggered by the project</i>	5
1.4.2 <i>Basic assessment process and requirements</i>	7
1.4.3 <i>Contents of a Basic Assessment Report (BAR)</i>	8
1.4.4 <i>Public participation process during the Basic Assessment</i>	8
2. LEGISLATIVE FRAMEWORK	8
3. DESCRIPTION OF THE PROPOSED ACTIVITY	10
3.1 Proposed Development	10
3.2 Construction phase activities	13
3.2.1 <i>Access to construction sites</i>	13
3.2.2 <i>Relocation of services</i>	13
3.2.3 <i>Contractors' site offices and stockpile areas</i>	13
3.2.4 <i>Waste management</i>	13
3.2.5 <i>Borrow pits and quarries</i>	13
3.2.6 <i>Batching plants</i>	14
3.2.7 <i>Water use</i>	14
3.2.8 <i>Energy use</i>	14
3.2.9 <i>Earthworks</i>	14
3.2.10 <i>Generation of noise</i>	14
3.2.11 <i>Accommodation of traffic during construction</i>	14
3.2.12 <i>General construction activities</i>	15
3.2.13 <i>Employment opportunities</i>	15
3.2.14 <i>Communication with land owners and stakeholders</i>	15
3.3 Operation phase activities	15
3.3.1 <i>Vehicle traffic</i>	15
3.3.2 <i>Waste generation</i>	16
3.3.3 <i>Energy use</i>	16
3.3.4 <i>Generation of noise</i>	16
4. PROJECT ALTERNATIVES	17
4.1 Property/location/ alternatives	17
4.2 Design/layout alternatives	17
4.3 Technology alternatives	17
4.4 The no-go alternative	17
5. DESCRIPTION OF THE RECEIVING ENVIRONMENT	18
5.1 Current land use and zoning	18
5.2 Land ownership and affected properties	18

5.2.1	Land ownership.....	18
5.2.2	Property names and numbers	18
5.3	The social/socio-economic environment.....	18
5.3.1	Demographics	18
5.3.2	Economic sectors	19
5.3.3	Traffic.....	19
5.4	Cultural heritage resources.....	25
5.4.1	Places, buildings, structures and equipment	26
5.4.2	Landscapes and natural features	26
5.5	The biophysical environment.....	26
5.5.1	Site gradient.....	26
5.5.2	Geological conditions along the route.....	26
5.5.3	Rivers and wetlands.....	29
5.5.4	Natural habitat affected by the project.....	31
5.5.5	Vegetation types.....	34
5.5.6	Provincial Conservation planning	35
5.5.7	Protected areas	36
5.5.8	Plants of Conservation Importance.....	37
5.5.9	Vegetation on site	38
ERF 2954	.....	38
RESULTS OF PLOT-BASED SURVEYING OF THE GRASSLAND	.....	38
CONSERVATION IMPORTANCE OF THE GRASSLAND	.....	39
THE ETHEKWINI SUPPORTED DEVELOPMENT AREA	.....	39
ERF 2956	.....	40
ERF 2955	.....	40
6.	PUBLIC PARTICIPATION PROCESS	43
6.1	Objectives.....	43
6.2	Stakeholder/I&AP profile	43
6.3	Project notification and invitation to participate.....	45
6.4	Summary of Issues Raised by I&APs.....	45
6.5	Circulation of draft BAR for public review (still to be undertaken)	47
7.	ASSESSMENT METHODOLOGY	47
7.1	Identification and assessment of significance of key issues and impacts	47
7.2	Assumptions, limitations and gaps in knowledge	49
7.2.1	General assumptions, limitations and gaps in knowledge.....	49
7.2.2	Specialist assumptions, limitations and gaps in knowledge	49
8.	INTEGRATED DESCRIPTION OF ENVIRONMENTAL ISSUES AND POTENTIAL IMPACTS	51
8.1	What economic and socio-economic benefits will result from the proposed development, at a local, regional and national scale?.....	52
8.1.1	Employment creation and capacity building.....	52
8.1.2	Potential positive economic and socio-economic impacts and recommended measures for management (enhancement).....	52
8.2	What effects will the proposed development have on adjacent properties, infrastructure and services and vice versa?	52
8.2.1	Increased potential for crime as a result of construction activities	53
8.2.2	Effect on property values	53
8.2.3	Damage to/disruption of adjacent roads	53

8.2.4	<i>Dust, Noise and Visual Impact</i>	53
8.2.5	<i>Potential impacts to adjacent properties, infrastructure and services, and recommended measures for mitigation/management</i>	53
8.3	What potential health, safety, security and other nuisance impacts may be experienced as a result of the proposed development during construction?	54
8.3.1	<i>Disruption of traffic and increased road safety risks</i>	54
8.3.2	<i>Increased noise from construction activities</i>	54
8.3.3	<i>Health and safety risks to those in close proximity to construction activities</i>	54
8.3.4	<i>Increased crime and security risks to those in close proximity to construction activities</i>	54
8.3.5	<i>Increased spread of disease</i>	54
8.3.6	<i>Other temporary nuisance impacts</i>	55
8.3.7	<i>Potential health, safety, security and nuisance impacts and recommended measures for mitigation/management</i>	55
8.4	What negative impacts will the proposed development have on the social environment during operation?	56
8.4.1	<i>Increased noise once the development is complete and occupied</i>	56
8.4.2	<i>Possible stormwater damage to neighbouring properties due to the hard surfacing of the development</i>	56
8.4.3	<i>Increased traffic in the vicinity of the development</i>	56
8.4.4	<i>Potential negative social impacts during operation and recommended measures for mitigation/management</i>	57
8.5	What effects will the proposed development have on cultural heritage?	57
8.5.1	<i>Potential impacts on cultural heritage and recommended mitigation/management actions</i>	57
8.6	What effects will the proposed development have on the biodiversity of protected areas and other natural habitat (terrestrial and aquatic)?	57
8.6.1	<i>Loss/degradation of soils and substrates</i>	57
8.6.1.1	<i>Potential impacts on soils and substrates and recommended measures for mitigation/management</i>	57
8.6.2	<i>Loss/degradation of terrestrial vegetation and natural habitat</i>	58
8.6.2.1	<i>Potential impacts on terrestrial vegetation and natural habitat and recommended measures for mitigation/management</i>	58
8.6.3	<i>Degradation of riparian areas</i>	60
8.6.3.1	<i>Potential impacts on wetland and riparian areas and recommended measures for mitigation/management</i>	61
8.6.4	<i>Faunal mortalities and negative effects on local faunal populations due to disturbance, loss of habitat and poaching</i>	64
8.6.4.1	<i>Potential impacts on fauna and recommended measures for mitigation/management</i>	64
8.7	What potential cumulative impacts can result from the proposed development?	65
8.7.1	<i>Cumulative national, regional and local economic and social benefits arising from the development</i>	65
8.7.2	<i>Cumulative impacts on adjacent properties infrastructure and services</i>	65
8.7.3	<i>Cumulative health, safety, security and other nuisance impacts</i>	65
8.7.4	<i>Cumulative impacts on the social and socio-economic environment during operation</i>	66
8.7.5	<i>Cumulative impacts on natural habitat</i>	66

8.8	What are the impacts of the No Development Alternative?	66
9.	ASSESSMENT OF THE SIGNIFICANCE OF POTENTIAL IMPACTS	67
9.1	Assessment.....	67
10.	ENVIRONMENTAL IMPACT STATEMENT.....	74
	EFFECTS OF THE PROJECT ON THE SOCIAL ENVIRONMENT AND <i>VICE VERSA</i>	74
	EFFECTS OF THE PROJECT ON CULTURAL HERITAGE RESOURCES AND <i>VICE</i> <i>VERSA</i>	74
	EFFECTS OF THE PROJECT ON THE BIOPHYSICAL ENVIRONMENT AND <i>VICE</i> <i>VERSA</i>	74
	EFFECTS OF THE NO DEVELOPMENT ALTERNATIVE	74
11.	RECOMMENDATION OF THE ENVIRONMENTAL ASSESSMENT PRACTITIONER	75
12.	CONCLUDING REMARKS	76
13.	REFERENCES	77
	APPENDIX A: APPLICATION FORM, EAP DECLARATION ETC.....	78
	APPENDIX B: SITE PHOTOGRAPHS.....	79
	APPENDIX C: ZONATION,	80
	APPENDIX D: PUBLIC PARTICIPATION DOCUMENTATION & CORRESPONDENCE.....	81
	APPENDIX E: SPECIALIST STUDIES	82
	APPENDIX F: ENVIRONMENTAL MANAGEMENT PROGRAMME (DRAFT)	83
	APPENDIX G: SCREENING REPORTS.....	84

LIST OF FIGURES

Figure 1	Location of proposed development	4
Figure 2:	Proposed Site Layout Plan	12
Figure 3:	Erf 2954 Traffic	21
Figure 4:	Erf 2955 Traffic	23
Figure 5:	Erf 2956 Traffic	25
Figure 6:	Map showing watercourses identified as being at particular risk of being impacted by the development.....	30
Figure 7:	Vegetation in the study area	33

LIST OF TABLES

Table 1	Required content of Basic Assessment Report according to GNR 326 (7 April 2017) xv
Table 2	Regulatory requirement for public participation in a Basic Assessment Process according to Chapter 6 of GNR 326 (7 April 2017) .....xix
Table 3	Municipalities and wards affected by the project..... 3
Table 4	Geographical co-ordinates of the project 3
Table 5	Listed activities in terms of which Dan Spares cc is seeking environmental authorisation for the proposed development. 6
Table 6	Applicable legislation, policies and guidelines..... 8
Table 7:	Trip Generation – Multiple Unit Residential Development 21
Table 8:	Trip Generation – Multiple Unit Residential Development 23
Table 9:	Trip Generation – Multiple Unit Residential Development 24
Table 10:	Summary of the PES assessment..... 30
Table 11:	Summary of the assessment of the Resources Management Objectives based on the PES and EIA ratings 31
Table 12	Sectors of society represented by I&APs on the direct mailing list 43
Table 13	Authorities and organs of state identified as key stakeholders 44
Table 14	Summary of adverts and project notifications to the public and key stakeholders..... 46
Table 15	Summary of issues raised by interested and affected parties..... 46
Table 16	Conventions applied to the impact assessment 48
Table 17	Assessment of potential beneficial economic and socio-economic impacts resulting from the proposed development, at a local, regional and national scale, during planning, construction, operation and rehabilitation (with and without mitigation) 68
Table 18	Assessment of potential impacts of the proposed development on adjacent properties, infrastructure and services, and <i>vice versa</i> , during planning, construction, operation and rehabilitation (with and without mitigation)..... 69
Table 19	Assessment of potential health, safety, security and other nuisance impacts resulting during construction of the proposed development (with and without mitigation) 70
Table 20	Assessment of potential negative impacts of the proposed development on the social and socio-economic environment during operation (with and without mitigation)..... 71
Table 21	Assessment of potential impacts of the proposed development on the biophysical environment (soils, riparian, wetland, terrestrial natural habitat and fauna) during construction, operation and rehabilitation (with and without mitigation) 72
Table 22	Assessment of potential impacts of the No Development Alternative 73

ACRONYMS AND ABBREVIATIONS

BA	Basic Assessment
BAR	Basic Assessment Report
D'MOSS	Durban Metropolitan Open Space System
EAP	Environmental Assessment Practitioner
ECO	Environmental Control Officer
EDTEA	Department of Economic Development, Traditional and Environmental Affairs
EIA	Environmental Impact Assessment
EKZNW	Ezemvelo KwaZulu-Natal Wildlife
EMPr	Environmental Management Programme
EPCPD	eThekweni Environmental Planning and Climate Protection Department
ha	hectare
I&APs	Interested and Affected Parties
KZN	KwaZulu-Natal Province
NEMA	National Environmental Management Act (Act No. 107 of 1998)

DETAILS AND EXPERTISE OF THE SPECIALIST TEAM

Details and CVs of specialists are contained in Appendix E.

ADHERANCE TO REGULATORY REQUIREMENTS

Table 1 Required content of Basic Assessment Report according to GNR 326 (7 April 2017)

Content of Basic Assessment report according to GNR 326 (7 April 2017)		Reference
1	A basic assessment report must contain the information that is necessary for the competent authority to consider and come to a decision on the application must include	
a	Details of	
	i The EAP who prepared the report and	Appendix A
	ii The expertise of the EAP, including a curriculum vitae	Appendix A
b	The location of the activity, including	Section 1.3, Figures 1 & 2
	i The 21-digit Surveyor General code of each cadastral land parcel	Appendix A
	ii Where available, the physical address and farm name	Appendix A
	iii Where the required information in items (i) and (ii) is not available, the coordinates of the boundary of the property or properties	N/a.
c	A plan which locates the proposed activity or activities applied for as well as associated structures and infrastructure at an appropriate scale, or if it is	Figure 2
	i A linear activity, a description and coordinates of the corridor in which the proposed activity or activities is to be undertaken, or	N/a
	ii On land where the property has not been defined, the coordinates within which the activity is to be undertaken	N/a
d	A description of the scope of the proposed activity, including	Chapters 1 and 3.
	i All listed and specified activities triggered and being applied for, and	Table 6
	ii A description of the activities to be undertaken including associated structures and infrastructure	Chapter 1, Table 6; Chapter 3
e	A description of the policy and legislative context within which the development is proposed including	Chapter 2
	i An identification of all legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks, and instruments that are applicable to this activity and have been considered in the preparation of the report, and	Chapter 2
	ii How the proposed activity complies with and responds to the legislation and policy context, plans guidelines, tools frameworks and instruments	Section 1.2
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 1.2
g	A motivation for the preferred site, activity and technology alternative	Chapter 4
h	A full description of the process followed to reach the proposed preferred alternative within the site including	Chapter 4

Content of Basic Assessment report according to GNR 326 (7 April 2017)		Reference
i	Details of all the alternatives considered	Chapter 3 & 4
ii	Details of the public participation process undertaken in terms of regulation 411 of the Regulations, including copies of the supporting documents and inputs	Chapter 6, Appendix D
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.	Section 6.4. Table 13 and Appendix D
iv	The environment attributes associated with the alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspect.	Chapter 5
v	The impact and risks identified for each alternative, including the nature significance, consequence, extent, duration and probability of the impacts, including the degree to which these impacts	Chapter 8
aa	Can be reversed	Chapter 9
bb	May cause irreplaceable loss of resources, and	Chapter 9
cc	Can be avoided, managed or mitigated	Chapter 8 & 9
iv	The methodology used in determining and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks associated with the alternatives,	Chapter 7
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 geographical, physical, biological, social, economic, heritage and cultural aspects	Chapter 8
viii	The possible mitigation measures that could be applied and level of residual risk	Chapter 8
ix	The outcome of the site selection matrix	N/a
x	If no alternative locations for the activity were investigated, the motivation for not considering such, and	Chapter 4
xi	A concluding statement indicating the preferred alternatives, including preferred location of the activity	N/a
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	Chapter 7
ii	A description of all environmental issues and risks that were identified during the environmental impact assessment process, and	Chapter 8
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	Chapter 9
j	An assessment of each identified potentially significant impact and risk, including	Chapter 9
i	Cumulative impacts	Chapter 9
ii	The nature, significance and consequences of the impacts and risk	Chapter 9
iii	The extent and duration of the impact and risk	Chapter 9
iv	The probability of the impact and risk occurring	Chapter 9

	Content of Basic Assessment report according to GNR 326 (7 April 2017)		Reference
	v	The degree to which the impact and risk can be reversed	Chapter 9
	vi	The degree to which the impact and risk may cause irreplaceable loss of resources and	Chapter 9
	vii	The degree which the impact and risk can be avoided, managed or mitigated	Chapter 9
k		Where applicable, a summary of the findings and impact management measures identified in any specialist's report complying and Appendix 6 to these regulations and an indication as to how these findings and recommendations have been included in the final report	Chapter 8
l		An environmental impact statement which contains	
	i	A summary of the key findings of the environmental impact assessment	Chapter 10
	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	Appendix E
	iii	A summary of the positive and negative impacts and risks of the proposed activity and identified alternatives	Executive Summary, Chapter 10, and Chapter 11
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 the inclusion in the EMPr	Chapter 8, Appendix F
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	Chapter 11
o		A description of any assumptions, uncertainties and gaps in knowledge which relate to the assessment and mitigation measures proposed.	Section 7.2
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.	Chapter 11
q		Where the proposed activity does not include operational aspects, period for which the environmental authorisation is required, the date on which the activity will be concluded, and the post construction monitoring requirements finalised	N/a
r		An undertaking under oath or affirmation by the EAP in relation to	Appendix A
	i	The correctness of the information provided in the reports	Appendix A
	ii	The inclusion of comments and inputs from stakeholders and I&APs	Appendix A
	iii	The inclusion of inputs and recommendations from the specialist reports where relevant, and	Appendix A
	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, and	Appendix A
s		Where applicable, details of any financial provision for the rehabilitation, closure, and ongoing post decommissioning management of negative environmental impacts	N/a
t		Any specific information that may be required by the competent authority,	N/a

	Content of Basic Assessment report according to GNR 326 (7 April 2017)	Reference
	and	
u	Any other matters required in terms of section 24(4)(a) and (b) of the Act.	N/a

Table 2 Regulatory requirement for public participation in a Basic Assessment Process according to Chapter 6 of GNR 326 (7 April 2017)

	Public Participation Process (Chapter 6 of GNR 326, 7 April 2017)	Undertaken during the Basic Assessment
41(1)	This regulation only applies in instances where adherence to the provisions of these regulations specifically required.	
2	The person conducting a public participation process must take into account any relevant guidelines applicable to public participation as contemplated in section 24J of the Act and must give notice to all potential interested and affected parties of an application or proposed application which is subjected to public participation by—	
a	fixing a notice board at a place conspicuous to and accessible by the public at the boundary, on the fence or along the corridor of—	Appendix D
	i the site where the activity to which the application or proposed application relates is or is to be undertaken; and	Appendix D
	ii any alternative site	N/a
b	giving written notice, in any of the manners provided for in section 47D of the Act to—	
	i the occupiers of the site and, if the proponent or applicant is not the owner or person in control of the site on which the activity is to be undertaken, the owner or person in control of the site where the activity is or is to be undertaken and to any alternative site where the activity is to be undertaken	Section 6.3; Appendix D
	ii owners, persons in control of, and occupiers of land adjacent to the site where the activity is or is to be undertaken and to any alternative site where the activity is to be undertaken;	Section 6.3; Appendix D
	iii the municipal councillor of the ward in which the site and alternative site is situated and any organisation of ratepayers that represent the community in the area;	Section 6.3; Appendix D
	iv the municipality which has jurisdiction in the area	Section 6.3; Appendix D
	v any organ of state having jurisdiction in respect of any aspect of the activity; and	Section 6.3; Appendix D
	vi any other party as required by the competent authority;	Section 6.3
c	placing an advertisement in—	
	i one local newspaper; or	Section 6.3; Appendix D
	ii any official Gazette that is published specifically for the purpose of providing public notice of applications or other submissions made in terms of these Regulations;	N/a
d	placing an advertisement in at least one provincial newspaper or national newspaper, if the activity has or may have an impact that extends beyond the boundaries of the metropolitan or district municipality in which it is or will be undertaken: Provided that this paragraph need not be complied with if an advertisement has been placed in an official Gazette referred to in	N/a

	Public Participation Process (Chapter 6 of GNR 326, 7 April 2017)	Undertaken during the Basic Assessment
	paragraph (c)(ii); and	
e	using reasonable alternative methods, as agreed to by the competent authority, in those instances where a person is desirous of but unable to participate in the process due to—	
	i illiteracy;	
	ii disability; or	
	iii any other disadvantage.	
3	A notice, notice board or advertisement referred to in subregulations (2) must—	
a	give details of the application or proposed application which is subjected to public participation; and	Appendix D
b	state—	
	i whether basic assessment or S&EIR procedures are being applied to the application;	Appendix D
	ii the nature and location of the activity to which the application relates;	Appendix D
	iii where further information on the application or proposed application can be obtained; and	Appendix D
	iv the manner in which and the person to whom representations in respect of the application or proposed application may be made	Appendix D
4	A notice board referred to in subregulation (2) must—	Appendix D
a	be of a size of at least 60cm by 42cm; and	Appendix D
b	display the required information in lettering and in a format as may be determined by the competent authority.	Appendix D
5	Where public participation is conducted in terms of this regulation for an application or proposed application, subregulation (2)(a), (b), (c) and (d) need not be complied with again during the additional public participation process contemplated in regulations 19(1)(b) or 23(1)(b) or the public participation process contemplated in regulation 21(2)(d), on condition that—	Noted.
a	such process has been preceded by a public participation process which included compliance with subregulations (2)(a), (b), (c) and (d); and	N/a
b	written notice is given to registered interested and affected parties regarding where the—	N/a
	i revised basic assessment report or, EMPr or closure plan, as contemplated in regulation 19(1)(b);	N/a
	ii revised environmental impact assessment report or EMPr as contemplated in regulation 23(1)(b); or	N/a
	ii environmental impact assessment report and EMPr as contemplated in regulation 21(2)(d); may be obtained, the manner in which and the person to whom representations on these reports or plans may be made and the date on which such representations are due.	N/a
6	When complying with this regulation, the person conducting the public participation process must ensure that—	
a	information containing all relevant facts in respect of the application or proposed application is made available to potential interested and affected	This BAR

Public Participation Process (Chapter 6 of GNR 326, 7 April 2017)		Undertaken during the Basic Assessment
	parties; and	
b	participation by potential or registered interested and affected parties is facilitated in such a manner that all potential or registered interested and affected parties are provided with a reasonable opportunity to comment on the application or proposed application.	Section 6.3; Appendix D
7	Where an environmental authorisation is required in terms of these Regulations and an authorisation, permit or licence is required in terms of a specific environmental management Act, the public participation process contemplated in this Chapter may be combined with any public participation processes prescribed in terms of a specific environmental management Act, on condition that all relevant authorities agree to such combination of processes.	Noted.

1. INTRODUCTION

1.1 Background

This report is a Basic Assessment Report (BAR) for part of the application by Dan's Spares cc to develop residential developments on Erven 2954, 2955 and 2956 Kingsburgh Extension 9 in KwaZulu-Natal. It has been prepared on behalf of Dan Spares by Metamorphosis Environmental Consultants (MEC), in terms of the requirements of the Environmental Impact Assessment (EIA) Regulations of 2014 (as amended), published under the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA). The details of the MEC Environmental Assessment Practitioner (EAP) team are provided in Appendix A.

1.2 Project purpose, need and desirability

eThekweni Municipality estimates in its latest Integrated Development Plan that the current backlog for housing stands at just over 38 5000 dwellings. One of the key issues identified is the lack of well located land within areas zoned for residential use. The majority of housing units required is in the "affordable" sector and the proposed development of Kingsburgh x 9 is aimed at the lower end of the middle-income market.

The IDP estimates that 33% of households in the area rent their accommodation. Although rental stock in the denser parts of the city is significant, it is particularly scarce in low and middle-income suburbs. Kingsburgh x9 is situated in one such developed suburb and will provide much needed stock in this sector.

The proposed development falls within one of the eThekweni High Priority Integration Zones which promotes high density multi storey buildings on vacant zoned and serviced land.

In terms of the Municipal Economic Development Strategy, the fact that Kingsburgh x 9 is a fully zoned and serviced township means that the council will not need to budget for infrastructure cost. This development is situated close to various informal and formal settlements from where the labour will come for most of the jobs created during the construction and operational phases and ample transport options is already available thus negating the implementation cost to provide same.

This development will complement the Local Socio-Economic initiatives (LED) and skills development programs of the council for the area. The development will create residential and employment opportunities within the integration zone.

The development will also result in densification and the achievement of thresholds in terms of public transport; it will complement other uses in the area; it will be in line with the planning for the area; it will optimize the use of existing resources and infrastructure; and it will discourage urban sprawl and contribute to compaction and densification.

A risk-averse and cautious analysis was applied in terms of the potential socio-economic impacts. The current economic conditions in the country makes it very difficult for young families to buy property and therefore the developer plans to provide rental accommodation. The developer will also offer a "rent to own" option whereby a family can save up the deposit to buy the unit during the rental period. This will be achieved by a system where a portion of the rental is held in a trust savings account and together with the increase in value of the property over the rental period creating the equity in the value of the unit to satisfy a financial institution. This will therefore make the development affordable and therefore desirable, increasing the potential market and improving the local socio-economic environment.

Approximately 665 skilled and 450 unskilled workers will be required during the construction phase of the project and the project will provide about 260 permanent jobs during operational phase, ranging from administrative positions to maintenance, domestic, gardening, etc.

The required skills match the skills available in the area and this development is situated within easy travelling distance from where the potential labour force resides, some even within walking distance, thus facilitating socio-economic upliftment in the area.

1.3 Location and scope of the project

The study area falls within eThekweni Metropolitan Municipality, KwaZulu-Natal, affecting Ward 97 in the Southern portion of the Municipality.

The development falls within the suburb of Shulton Park within Kingsburgh. Small areas of Erven 2954, 2955 and 2956 will be developed for residential purposes. (See Figure 1)

Table 3 Municipalities and wards affected by the project

Province	KwaZulu-Natal
District Municipality	eThekweni Metropolitan Municipality
Local Municipality	eThekweni Metropolitan Municipality
Ward Number	97

Table 4 Geographical co-ordinates of the project

	Latitude (S)	Longitude (E)
Centre point of Erf 2954	30° 04' 04.65"	30° 51' 32.93"
Centre point of Erf 2955	30° 04' 14.90"	30° 51' 17.62"
Centre point of Erf 2956	30° 04' 16.71"	30° 51' 26.51"

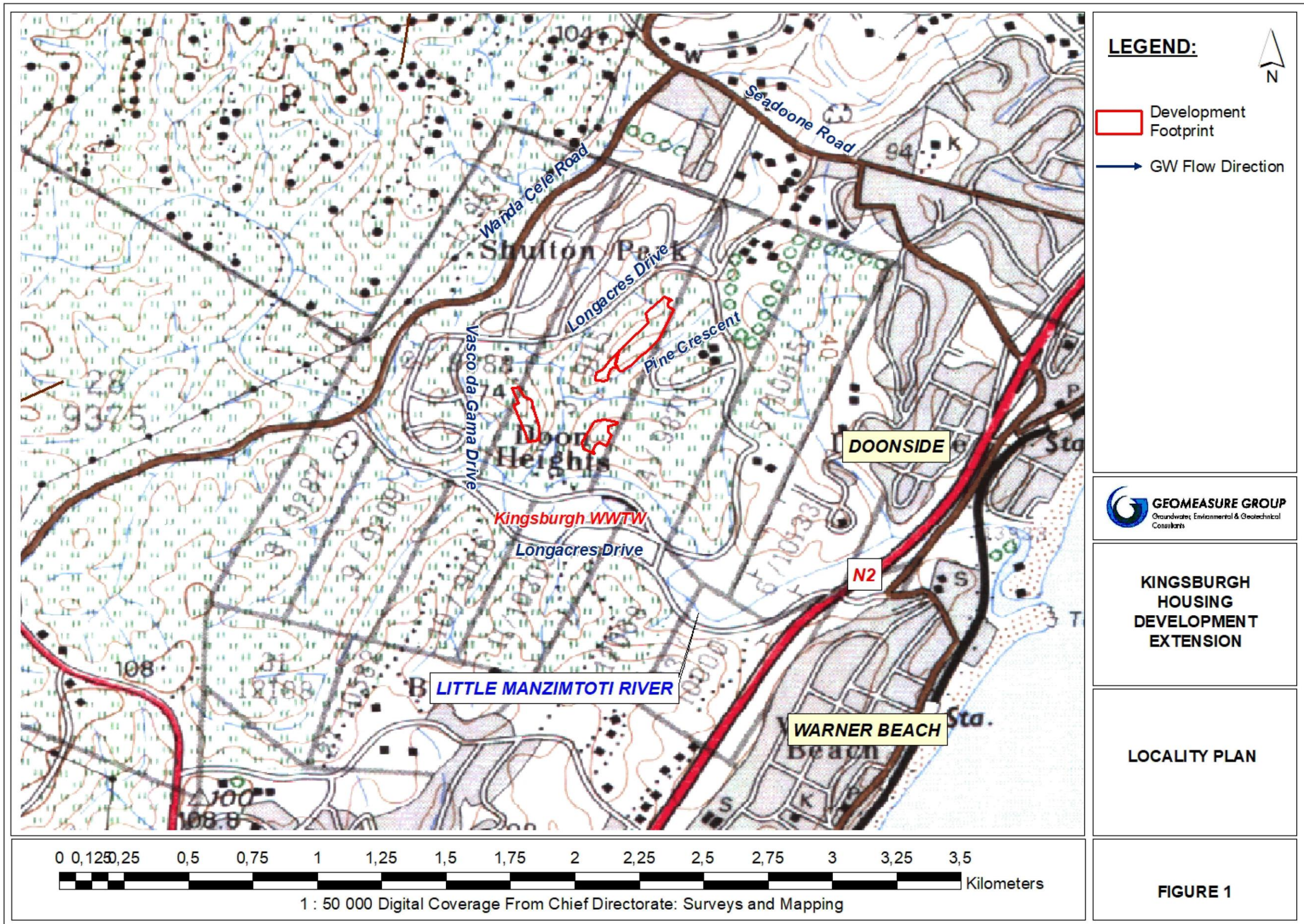


Figure 1 Location of proposed development

1.4 Environmental authorisation requirements and listed activities triggered by the project

In terms of the 2014 EIA Regulations (as amended April 2017) published in Government Notices R.324, R.325, R.326 and R.327 under Section 24 of the National Environmental Management Act (NEMA), 1998 (Act No. 107 of 1998), the proposed project triggers activities that may affect the environment. Therefore, Dan Spares cc requires environmental authorisation from the competent authority, viz. the Provincial Department of Economic Development, Traditional and Environmental Affairs (EDTEA).

1.4.1 Listed activities triggered by the project

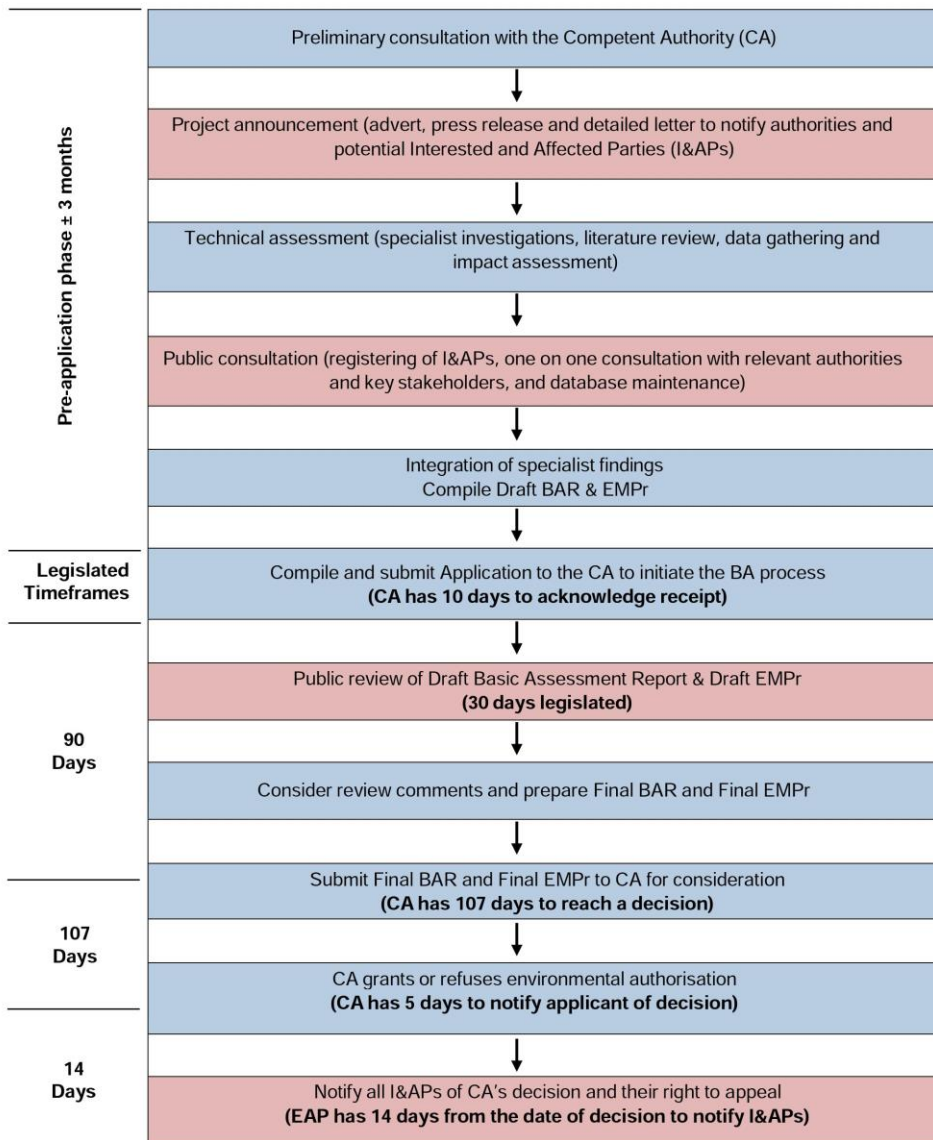
Activities from Listing Notice 1 (GN R.327) and Listing Notice 3 (GN. R. 324) are triggered by the project and are detailed in Table 5.

Table 5 Listed activities in terms of which Dan Spares cc is seeking environmental authorisation for the proposed development.

Listed activity as described in GN R.327, GN R.325 and GN R.324 (EIA Regulations 2014, as amended)	Description of project activity that may trigger the listed activity
<p>Listing Notice 1 (Government Notice, No. R. 327, 7 Apr 2017) Item 19: The infilling or depositing of any material of more than 10 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 10 cubic metres from a watercourse.</p>	<p>Construction of the sewer connections from the erven to the existing mains sewer will result in some disturbance of the river channels on the property below the developments. There will be one connection from each Erf. The pipe from Erf 2955 will cross the Little Amanzimtoti River before connecting into the mains sewer on the opposite side of the river. Construction activities will involve burying the pipe, encased in concrete, under the river channel.</p>
<p>Listing Notice 1 (Government Notice, No. R. 327, 7 Apr 2017) Item 27: The Clearance of an area of 1 hectare or more, but less than 20ha of indigenous vegetation, except where such clearance of indigenous vegetation is required for:</p> <ul style="list-style-type: none"> i. The undertaking of a linear activity ii. Maintenance purposes undertaken in accordance with a maintenance management plan. 	<p>The total building footprint across the three sites is approximately 1,2ha. However, additional areas will be disturbed for the construction of the sewer pipelines, earthworks etc. The total estimated area of disturbance is about 4.5ha.</p>
<p>Listing Notice 3 (Government Notice, No. R. 324, 7 Apr 2017) Item 12d (v), (vii) 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 KZN:</p> <ul style="list-style-type: none"> v Within critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans vii on land, where, at the time of coming into effect of this notice or thereafter such land was zoned open space, conservation or had an equivalent zoning. 	<p>The eThekweni's Systematic Conservation Assessment or SCA (Maclean et al, 2015) identifies local conservation priorities in the form of CBAs (Critical Biodiversity Areas) and ESAs (Ecological Support Areas). These areas are considered important in meeting municipal biodiversity conservation targets and maintaining ecological functioning within untransformed terrestrial and freshwater ecosystems. According to the SCA spatial coverage the full extent of the property boundary is marked as a CBA</p>
<p><i>For clarity, please note that the following listed activities are not triggered because the whole study area is within an urban area: Listing Notice 1 (Government Notice, No. R. 327, 7 Apr 2017) Items 9,10,12 and 48.</i></p>	

1.4.2

7

BASIC ASSESSMENT PROCESS

1.4.3 Contents of a Basic Assessment Report (BAR)

A BAR must contain the information set out in Appendix 1 of GN No. 326. Table 1 indicates where in this BAR these various components are covered.

1.4.4 Public participation process during the Basic Assessment

Public participation is to be undertaken in accordance with Chapter 6 of GN No. 326. A detailed description of the public participation undertaken for this project is provided in Chapter 6 of this BAR.

2. LEGISLATIVE FRAMEWORK

Further to the regulatory process for environmental authorisation outlined in Section 1.4, the environmental legislation applicable to this project includes but is not limited to that indicated in Table 6. Note that the development is in line with, national, provincial and municipal development goals and planning frameworks.

Table 6 Applicable legislation, policies and guidelines

Title of legislation, policy or guideline	Applicability to the project	Administering authority	Date
The Constitution of the Republic of South Africa, 1996 (Act No. 108 of 1996) (as amended)	The Environmental Clause, Access to Information, Fair Administrative Action, Enforcement of Rights and Administrative Review	Government of South Africa	1996
National Environmental Management Act, 1998 (Act No. 107 of 1998)	Management of activities that may have a significant impact on the environment. Principles include: <ul style="list-style-type: none"> <input type="checkbox"/> The sustainability principle. <input type="checkbox"/> The life-cycle, cradle-to-grave principle. <input type="checkbox"/> The 'polluter pays' principle. <input type="checkbox"/> The precautionary principle. <input type="checkbox"/> The duty of care principle. <input type="checkbox"/> Fair and transparent public consultation. 	Department of Environmental Affairs	1998
National Environmental Management: Biodiversity Act, 2004 (Act No 10 of 2004)	The conservation of natural habitats, fauna and flora. Permits required to remove or relocate protected plant species.	Department of Environmental Affairs	2004
National Environmental Management: Protected Areas Act, 2003 (Act No 57 of 2003)	To provide for the protection and conservation of ecologically viable areas representative of South Africa's biological diversity and its natural landscapes and seascapes.	Department of Environmental Affairs	2003
National Environmental Management: Waste Act, 2008 (Act No.59 of 2008)	Management of activities that generate waste.	KZN Department of Economic Development, Tourism and Environmental Affairs	2008

Title of legislation, policy or guideline	Applicability to the project	Administering authority	Date
KwaZulu-Natal Nature Conservation Management Act, 1997 (Act 9 of 1997)	The Act provides for the management of nature conservation within KZN and protected areas. Permits required to remove or relocate protected plant species.	Ezemvelo KZN Wildlife	1997
Conservation of Agricultural Resources Act, 1983 (Act No. 43 of 1983)	The conservation of agricultural resources. Protection of soils.	KZN Department of Economic Development, Tourism and Environmental Affairs	1983
National Forests Act, 1998 (Act No. 84 of 1998)	The conservation of natural forests. Permits required to remove or cut protected tree species.	Department of Agriculture, Forestry and Fisheries	1998
National Heritage Resources Act, 1999 (Act No. 25 of 1999)	The protection of cultural heritage resources and the management of activities that may have a significant impact on cultural heritage resources.	South African Heritage Resources Agency	1999
KwaZulu-Natal Heritage Act, 1997 (Act No. 10 of 1997)	The protection of cultural heritage resources and the management of activities that may have a significant impact on cultural heritage resources (specifically within KZN).	Amafa aKwaZulu-Natali	1997
Environment Conservation Act, 1989 (Act No 73 of 1989)	National Noise Control Regulations (GN R154 dated 10 January 1992)	Department of Environmental Affairs	1989
National Water Act, 1998 (Act No 36 of 1998)	Legislation regulating and protecting water resources in South Africa which includes non-consumptive water uses such as the impeding or diverting of water in a water course or altering of beds, banks or characteristics of a watercourse. Also regulates abstraction of large volumes of water from natural water bodies.	Department of Water and Sanitation Provincial Office of Water and Sanitation	1998
National Environmental Management: Air Quality Act, 2004 (Act No 39 of 2004)	Measures in respect to air quality.	Department of Environmental Affairs	2004
National Roads Traffic Act, 1996 (Act No 93 of 1996)	Measures in respect to road use in South Africa	South African National Roads Agency Limited (national roads); Provincial Department of Transport	1996
Promotion of Access to Information Act, 2000 (Act No 2 of 2000)	All requests for access to information held by the state or private bodies are provided for in the Act under Section 11.	Department of Justice and Constitutional Development	2000

Title of legislation, policy or guideline	Applicability to the project	Administering authority	Date
Promotion of Administration Justice Act, 2000 (Act No 3 of 2000)	In terms of Section 3, the Government is required to act lawfully and take procedurally fair, reasonable, and rational decisions. Interested and affected parties have a right to be heard.	Department of Justice and Constitutional Development	2000
Public Participation Guideline in Terms of the National Environmental Management Act, 1998 and Environmental Impact Assessment Regulations	The guideline provides information and guidance for proponents or applicants, I&APs, competent authorities and Environmental Assessment Practitioners on the public participation requirements of the Act. It further provides information on the characteristics of a rigorous and inclusive public participation process.	Department of Environmental Affairs	2017
Guideline Series 5: Companion to the Environmental Impact Assessment Regulations of 2010 Guideline Series 7: Public Participation in the Environmental Impact Assessment Process Guideline Series 9: Need and Desirability in terms of the Environmental Impact Assessment Regulations of 2010 (Draft) DEA Alternatives Guideline 5 DEA Guidelines for EMPs	These guidelines provide information and guidance on the requirements of the EIA Regulations and various associated aspects of the environmental impact assessment process.	Department of Environmental Affairs	2010

3. DESCRIPTION OF THE PROPOSED ACTIVITY

3.1 Proposed Development

The development will comprise the construction of small double story simplexes, together with access roads and parking bays. Each dwelling will be approximately 60m² in extent. The layout of each of the Erven is shown on Figure 2.

It should be noted that the number and mix of units may change when the final layouts are developed.

Development on the individual Erven is as follows:

Erf 2954 – 39 738.62m²

Proposed 82 units and 125 parking bays with a building coverage of 4 920m². The remaining open space area on the property will be approximately 35 000m².

The permitted FAR on this site is 14 300m².

Erf 2955 – 27 843.65m²

Proposed 46 units and 139 parking bays with a building coverage of 2 520m². The remaining open space area on the property will be approximately 5 000m².

The permitted FAR on this site is 9 700m².

Erf 2956 – 33 555.19m²

Proposed 60 units and 95 parking bays with a building coverage of 3 600m². The remaining open space area on the property will be approximately 30 000m².

The permitted FAR on this site is 12 600m².

The central portion of the area (Erf 2957 – 102937.03m²) is also owned by the proponent but is zoned open space. There will be no disturbance on this area with the exception of the sewer lines and some stormwater discharge. The location of the sewer pipelines and stormwater outlets is also shown on Figure 2.

Figure 2: Proposed Site Layout Plan

INSERT A3 FIGURE SHOWING LAYOUT

3.2 Construction phase activities

3.2.1 Access to construction sites

All access for construction will be via existing roads (national, provincial and municipal roads).

3.2.2 Relocation of services

There are no services on the sites which will require relocation.

3.2.3 Contractors' site offices and stockpile areas

Contractors' site offices and stockpile areas will be located within the development area. The exact sites will be identified by the contractor who is awarded the tender for the work. Siting and establishment will be guided by specifications in the Environmental Management Programme (EMPr). No staff (except security) will be accommodated overnight at site offices/stockpile sites.

3.2.4 Waste management

Solid waste

Solid waste will be produced during construction. However, there will be no waste management activities requiring a permit in terms of the Waste Regulations under the National Environmental Management: Waste Act.

The project will generate some general builders waste such as cement bags, packaging, plastic and used metal canisters. The inert waste will be disposed at licensed landfill sites. Monthly quantities are unknown at present but quantities are estimated to be low.

The project will also generate a small surplus of cut material from earthworks, estimated at approximately 6046m³. (Erf 2954 – 3602m³, Erf 2955 – 727m³ and Erf 2956 – 1717m³). This will be set aside for use in the event of the contractor finding poor material which cannot be used. Whatever is not used at the end of the project will be removed from site.

Liquid effluent/waste water

The project will not produce effluent other than normal sewage, which will be disposed. Sewer connections will be constructed prior to the construction of the residences. Therefore, during sewer line construction, rented portable chemical toilets will be used for workers, to be serviced by the contractor's appointed service provider, thereafter the toilets for the workers will be connected to the mains sewer wherever possible.

There will be no waste water generated by the project that can be recycled.

Emissions

There will be no emissions other than exhaust and dust emissions.

3.2.5 Borrow pits and quarries

No new borrow pits or quarries will be established as materials will be sourced from commercial sources.

3.2.6 Batching plants

No batching plants will be established on site.

3.2.7 Water use

The estimated average volume of water required during construction is approximately 1000kl (m³) per day. Water will be obtained from a municipal supply.

3.2.8 Energy use

During construction, conventional sources of energy will be used (e.g. municipal electrical supply, generators, and conventional fuels and oils). Alternative energy sources will not apply.

3.2.9 Earthworks

The earthworks on site are proposed as follows:

Erf 2954

Area of disturbance: 21 000m²

Cut volume: 12 631.80m³

Fill volume: 9 029.62m³

Erf 2955

Area of disturbance: 16 800m²

Cut volume: 13 658.97m³

Fill volume: 12 932.77m³

Erf 2956

Area of disturbance: 8 000m²

Cut volume: 6 237.80m³

Fill volume: 4 520.52m³

3.2.10 Generation of noise

During construction, construction activities will elevate existing noise levels in the area. Project construction activities will add to the existing noise levels. Although this will be temporary and confined to daylight hours.

If blasting occurs, this will generate temporary and short lived loud noises. Blasting will be undertaken in accordance with relevant legislation and with prior notice to affected neighbours.

3.2.11 Accommodation of traffic during construction

Some traffic disruption will occur during construction, particularly in the vicinity of the school and pre school close to the entrance to Erf 2954. Traffic management recommendations are provided in the EMPr to ensure that disruption and risks are minimised during construction.

3.2.12 General construction activities

The main construction activities are presented hereunder.

Site preparation

- Establishment of site camps and stockpile areas.
- Provision for on site waste management – sewage, waste water, solid waste, general waste, etc.
- Provision for storage/handling/disposal of hazardous substances (e.g. cement, asphalt, fuels and oils). A bunded area will be provided for storage.
- Clearance of vegetation.
- Removal and stockpiling of topsoil and subsoil.

Construction

- Earthworks.
- Construction of the sewer and stormwater reticulation
- Construction of access roads.
- Building work associated with the housing development

Re-instatement and rehabilitation

- Reinstatement of slopes.
- Reinstatement of topsoil.
- Revegetation.
- Erosion control.
- Alien plant control.

3.2.13 Employment opportunities

Contractors, with their skilled labour, will be appointed by the developer. Unskilled labour will be sourced by the contractors involved in the work.

Approximately 665 skilled and 450 unskilled workers will be required during the construction phase of the project and the project will provide about 260 permanent jobs during operational phase, ranging from administrative positions to maintenance, domestic, gardening etc.

3.2.14 Communication with land owners and stakeholders

All key stakeholders including as many as possible of the adjacent property owners have been notified and given an opportunity to consult with the project team as part of the public participation process conducted for this application for environmental authorisation. During construction, the developer and its appointed contractor(s) will be responsible for keeping adjacent landowners informed of relevant planned construction activities (e.g. blasting, etc).

3.3 Operation phase activities

3.3.1 Vehicle traffic

Traffic studies have indicated that the road infrastructure is adequate for the additional vehicle usage generated as a result of the three developments. Each development has separate access, reducing the pressures on the road infrastructure. Some impacts will occur in the vicinity of the school and pre-school in proximity to the access to Erf 2954 during peak times.

3.3.2 Waste generation

Once the development has been completed, the generation of waste will be restricted to domestic waste and sewage. The domestic waste will be stored appropriately on site and collected by the Municipality on a weekly basis. The sewage will be piped to the Kingsburgh Wastewater Treatment Works for disposal.

3.3.3 Energy use

The detailed design of the properties is still being undertaken and energy saving initiatives and alternative sources of energy are being considered.

3.3.4 Generation of noise

The developments will generate relatively low levels of noise on an ongoing basis. Noise levels will be typical of a residential area and should not exceed the SANS standards for Residential areas.

4. PROJECT ALTERNATIVES

4.1 Property/location/ alternatives

The properties are zoned for residential development and were purchased with the intention of developing them. Therefore no site alternatives were considered.

4.2 Design/layout alternatives

The initial layouts proposed by the developer covered larger portions of the properties, and the number of units has been reduced from the original proposals.

The coverage was reduced as a result of communications with eThekweni Municipality EPCPD, who stated that the ecological disturbance which would result from development on the steeper portions of the properties would be unacceptable to them.

4.3 Technology alternatives

The detailed design of the properties is still being undertaken and energy saving initiatives and alternative sources of energy are being considered. Recycling of grey water and water use reduction strategies will also be included into the designs.

At least 60% of stormwater will be attenuated on site, the architects are hoping to achieve 80% in the final plans.

4.4 The no-go alternative

These properties are zoned for residential development and are surrounded by residential areas. Land is at a premium in serviced areas and should this developer choose not to develop these sites, it is highly likely that they will still ultimately be developed.

Currently the vacant properties pose a security and fire risk to the adjacent landowners and developing the areas will reduce these risks.

The sites are currently infested with alien vegetation and this will be managed should the development proceed, if the sites are not developed, the situation will deteriorate further.

The existing sewer line along the Little Amanzimtoti River is currently leaking. This has been brought to the attention of the Authorities as part of this environmental authorisation process. Should the project not proceed – there will be no one to ensure that this does not occur again in the future.

Obviously, should the development not take place, traffic volumes and noise from the area will remain unchanged, this would be a positive impact. However, no new jobs would be created and there would remain a shortage of affordable, entry level, housing in the area.

While the no-development option is not preferred, it forms the baseline against which the project is assessed.

5. DESCRIPTION OF THE RECEIVING ENVIRONMENT

A description of aspects of the receiving environment relevant to the assessment is provided below. Refer to Appendix B for photographs.

5.1 Current land use and zoning

The development falls within the South Planning Region of eThekweni and well within the urban development line. Figure 1 provides an indication of land use in the study area.

The three Erven to be developed are zoned as General Residential 5, which permits an FAR of 0.35 with 30% coverage. The maximum height allowed is 2 storeys and the minimum erf size is 1800m². Erf 2957 is zoned as public open space. Refer to Appendix C for a town planning/zonation map.

5.2 Land ownership and affected properties

5.2.1 Land ownership

The four Erven are owned by Dan Spares cc. Surrounding land is privately owned and developed.

5.2.2 Property names and numbers

The erven are as follows:

Erf 2954 Kingsburgh Ext 9

Erf 2955 Kingsburgh Ext 9

Erf 2856 Kingsburgh Ext 9

Erf 2957 Kingsburgh Ext 9 (public open space between the development properties).

5.3 The social/socio-economic environment

A summary of the socio-economic character of the receiving environment is provided below.

5.3.1 Demographics

eThekweni covers an area of approximately 2,297 km² with approximately 3.5 million people residing in the municipality, the majority of whom (89.9%) reside in urban areas (Stats SA, 2012). The population is characterised by a high proportion of people under the age of 34 with 70% of the population aged between 15 and 34 years, and 25.2% below the age of 15 (StatsSA, 2012). Unemployment in the municipality is reported to be 30% which equates to almost one in three people of working age being unemployed; however, it is still below the unemployment level for KwaZulu-Natal which is 33% (Stats SA, 2012). High levels of unemployment have been cited as a key development challenge throughout eThekweni, with high levels of economic inactivity among the economically active portion of the population resulting in high levels of dependency, both of which contribute to eThekweni having the highest number of people living on less than US \$ 2/day amongst all the leading metros in South Africa (eThekweni IDP, 2011/2012).

As would be expected of the major urban centre in KwaZulu-Natal, 80% of households reside in formal dwellings with only 4.2% residing in traditional dwellings, which is significantly lower than the provincial average of 19% (StatsSA, 2012).

Of significance is that the proportion of households reported to reside in informal dwellings (15.8%) in the municipality is above the provincial average (8.3%) (StatsSA, 2012). This trend is typical of urban centres in South Africa where informal settlements grow on vacant land adjacent to the urban periphery and are often occupied by people migrating to the city in search of opportunities.

5.3.2 Economic sectors

As the economic hub of KwaZulu-Natal, eThekweni contributes 64.1% of the total provincial GDP and 10.1% of the South African GDP. The tertiary sector, including: wholesale and retail trade, transport, storage and communication, financial and business services, and community services, are the largest contributors to the local economy. It should also be noted that manufacturing, in particular, the production of food and beverages, and fuel, petroleum, and chemical and rubber products, contributed 22.8% of total economic activity (eThekweni IDP, 2011/2012). The economy of eThekweni is to a large degree reliant on the N3 corridor linking the Port of Durban with Gauteng, currently the busiest road freight corridor in South Africa. The corridor is of vital importance to ensuring transport efficiencies and lower logistics costs thereby aiding economic growth and ensuring that the country remains competitive.

5.3.3 Traffic

Traffic studies were originally undertaken in February 2018 for each of the three properties by NSA Consulting Engineers and revised in October 2019 with the reduced densities.

In general, the scope of traffic studies is limited to intersections (and road networks) that will deteriorate significantly, due to the development-generated traffic. It is common cause that the traffic impacts of new developments are concentrated on the immediate transportation network with these impacts dissipating rapidly further away from the development as more access opportunities become available and traffic disperses onto the broader road network.

Erf 2954

Access to Erf 2954 is via Vaughan Goodwin Road. The site development will involve construction of 82 units.

The impacts of this proposed development are limited to adjacent road network, with the key focus on the intersection of Vaughan Goodwin Road and Longacres Drive.

Road Name: Vaughan Goodwin Road

Road Width: Varies between 5.1m – 5.2m
Road Reserve: 18.0m
Road Class: Class 5
Number of Lanes: 1 in each direction
Region: South Region
Authority: Ethekewini Municipality
Surface: Asphalt
Speed Humps: N/A
Sidewalks: No (Grassed Verges)
Street Lighting: Yes
Line Marking: Centre Line – Dashed White Line

Road Name: Longacres Drive

Road Width: Varies between 6.1m – 6.3m
Road Reserve: 24.0m

Road Class:	Class 5
Number of Lanes:	1 in each direction
Region:	South Region
Authority:	Ethekwini Municipality
Surface:	Asphalt
Speed Humps:	Yes
Sidewalks:	No (Grassed Verges)
Street Lighting:	Yes
Line Marking:	Centre Line – solid white line

Traffic counts were undertaken on Tuesday 30th January 2018, Saturday 03rd February 2018 and Sunday 04th February 2018.

Observations during the AM peak hour revealed that there is moderate flow of traffic along Longacres Drive due to neighbourhood school Doon Heights Primary School and their Edu-Care Center and Aftercare Facility. Vaughan Goodwin Road forms a stop intersection with Longacres Drive. The proposed development is situated at the end of the cul-de-sac on Vaughan Goodwin Road. The area is predominantly residential in nature.

Vaughan Goodwin Road also provides access to two residential properties as well as Doon Heights Primary School for the Teachers and parents. The access to Doon Heights Primary School is via an automated automatic gate that provides entrance only access. Students are dropped off inside the school and parents exit via the exit only access on Longacres Drive. The exit only access on Longacres Drive also provides for an outside drop off facility for parents as well as organised lift clubs that do not wish to enter the school. The school operational hours are from 07:45am – 13:30pm. However, kids are dropped off for school from 06:45am.

The Edu-Care Center and Aftercare Facility is located on Longacres Drive. There is an outside drop off facility for parents and organised lift clubs. There are teachers that escort the kids from the drop off area into the facility making it convenient for the parents and the drivers. The operational hours are 06:30am – 12:30pm and the Aftercare operates until 17:00pm.

Observations during the AM Peak Hour show that the Minibus-taxis that operate along Longacres Drive are the organised lift clubs for Doon Heights Primary School and the Edu-care Centre and Aftercare facility .

The existing developments, accesses and drop off facilities/points that have been discussed above are illustrated in Figure 3 below.



Figure 3: Erf 2954 Traffic

The trip generation rate for the proposed residential land use as per the 'EThekweni Transport Authority manual for Traffic Impact Assessments (October 2015)' is 1.3 trips/Unit during the AM and PM peak (this applies to all 3 studies).

Table 7: Trip Generation – Multiple Unit Residential Development

Land Use		No. of Units	Rate	No. of Trips	Split Ratio	Split in/out
Multiple Unit Residential Development	AM	82	1.3	107	25:75	27:80
	PM	82	1.3	107	70:30	75:32
	SAT	82	0.65	53	50:50	27:26
	SUN	82	0.65	53	50:50	26:27

The study determined that parking and access infrastructure is sufficient for the proposed development. No public transport routes will be affected by the development. Detailed site development plans must be assessed in terms of the Ethekeeni Transport Authority Assessment checklist prior to finalisation (See Traffic Report in Appendix E for more detail).

Erf 2955

Access to Erf 2955 is via Boekenhout Drive. The site development will involve construction of 42 units.

The impacts of this proposed development are limited to adjacent road network, with the key focus on the intersection of Chestnut Lane and Boekenhout Drive.

Road Name: Chestnut Lane

Road Width: Varies between 6.0m – 6.1m
Road Reserve: 20.0m
Road Class: Class 5
Number of Lanes: 1 in each direction
Region: South Region
Authority: Ethekewini Municipality
Surface: Asphalt
Speed Humps: N/A
Sidewalks: No (Grassed Verges)
Street Lighting: Yes
Line Marking: Centre Line – N/A

Road Name: Boekenhout Drive

Road Width: Varies between 5.9m – 6.1m
Road Reserve: 20.0m
Road Class: Class 5
Number of Lanes: 1 in each direction
Region: South Region
Authority: Ethekewini Municipality
Surface: Asphalt
Speed Humps: N/A
Sidewalks: No (Grassed Verges)
Street Lighting: Yes
Line Marking: Centre Line – solid white line

Traffic counts were conducted under normal weather conditions by NSA Consulting Engineers on Tuesday 30th January 2018, Saturday 03rd February 2018 and Sunday 04th February 2018.

Observations during the AM peak hour revealed that there is minimal flow of traffic along Boekenhout Drive. The proposed development is situated in an area, which is residential in nature

Summary of the trip generation is illustrated on Table 8 below.

Table 8: Trip Generation – Multiple Unit Residential Development

Land Use		No. of Units	Rate	No. of Trips	Split Ratio	Split in/out
Multiple Unit Residential Development	AM	42	1.3	55	25:75	14:41
	PM	42	1.3	55	70:30	39:16
	SAT	42	0.65	27	50:50	13:14
	SUN	42	0.65	27	50:50	14:13

The proposed development access position is illustrated on Figure 4 below:



Figure 4: Erf 2955 Traffic

The study determined that parking and access infrastructure is sufficient for the proposed development. No public transport routes will be affected by the development. Detailed site development plans must be assessed in terms of the Ethekwini Transport Authority Assessment checklist prior to finalisation (See Traffic Report in Appendix E for more detail).

Erf 2956

Access to Erf 2956 is via Karridale Drive. The site development will involve construction of 60 units.

The impacts of this proposed development are limited to adjacent road network, with the key focus on the intersection of Karridale Drive and Erasmus Smit Place.

Road Name:Karridale Drive

Road Width: Varies between 7.1m – 7.4m
Road Reserve: 18.0m
Road Class: Class 5
Number of Lanes: 1 in each direction
Region: South Region
Authority: Ethekewini Municipality
Surface: Asphalt
Speed Humps: No
Sidewalks: No (Grassed Verges)
Street Lighting: Yes
Line Marking: Centre Line – Solid white line

Road Name:Erasmus Smit Place

Road Width: Varies between 6.0m – 6.2m
Road Reserve: 18.0m
Road Class: Class 5
Number of Lanes: 1 in each direction
Region: South Region
Authority: Ethekewini Municipality
Surface: Asphalt
Speed Humps: No
Sidewalks: No (Grassed Verges)
Street Lighting: Yes
Line Marking: Centre Line – solid white line

The traffic counts were conducted under normal weather conditions by NSA Consulting Engineers on Tuesday 30th January 2018, Saturday 03rd February 2018 and Sunday 04th February 2018

Observations during the AM peak hour revealed that there is minimal flow of traffic along Karridale Drive. The proposed development is situated at the end of the cul-de-sac on Karridale Drive. The area is predominantly residential in nature. Erasmus Smit Place is also a cul-de-sac Road and forms a stop intersection with Karridale Drive

Summary of the trip generation is illustrated on Table 9 below.

Table 9: Trip Generation – Multiple Unit Residential Development

Land Use		No. of Units	Rate	No. of Trips	Split Ratio	Split in/out
Multiple Residential Development	AM	60	1.3	61	25:75	15:46
	PM	60	1.3	61	70:30	43:18
	SAT	60	0.65	39	50:50	19:20
	SUN	60	0.65	39	50:50	20:19



Figure 5: Erf 2956 Traffic

The study determined that parking and access infrastructure is sufficient for the proposed development. No public transport routes will be affected by the development. Detailed site development plans must be assessed in terms of the Ethekwini Transport Authority Assessment checklist prior to finalisation (See Traffic Report in Appendix E for more detail).

5.4 Cultural heritage resources

Active Heritage Consultants undertook a specialist study to assess impacts of the project on heritage resources within the study area. Study findings indicate that there are no cultural heritage resources in the project area (refer to Appendix E for the Cultural Heritage Specialist Report).

The Cultural Heritage Report recommended that a desktop palaeontological study should be undertaken. This was completed by Professor Marion Bamford of the University of Witwatersrand and concluded that it is highly unlikely that any trace fossils would be preserved in the area and that a site visit was not deemed necessary. She recommended that a 'Chance Find' Protocol should be included in the EMP. This has been undertaken.

5.4.1 Places, buildings, structures and equipment

There are houses adjacent to the proposed development areas but none of these are more than 60 years old. There are no structures on the sites.

5.4.2 Landscapes and natural features

There are no notable cultural features or landscapes on the site.

5.5 The biophysical environment

5.5.1 Site gradient

Erf 2954

The northern most positioned site within the project area, comprises the upper and mid sideslopes of a roughly north east - south west trending ridge. The natural ground along the crest of the ridge is generally gently sloping however, gives way to moderately to steeply sloping mid to lower, north west and south easterly facing sideslopes that generally reflect a planar to slightly convex or concave slope conformation across the central and southern parts of the site. The northern most portion of the site is characterised by a convex moderately steep to steep slope which abuts against a steeply incised, north westerly plunging drainage line.

Erf 2955

The site is located to the south east of Erf 2954 and comprises the upper to mid sideslope areas to the north, west and south west of the cul-de-sac at the western limit of the Boekenhout road. The site comprises the western most limit of a west-east trending ridge, along the spine of which Boekenhout Road is positioned.

The site is characterised by medium to steep slopes (10 - >18°) which face in a north westerly to westerly direction with a planar to convex conformation across the northern and central portions of the site and southerly to easterly direction with a convex to concave slope conformation towards the southern and south eastern portion of the site.

Erf 2956

The site is located to the south west and west of Erven 2954 and 2955 respectively, along the mid to lower slope portions of a roughly north-south trending ridge line. Across its northern portion the site comprises the upper to mid sideslopes which slope moderately to steeply in a north easterly direction with a planar to slightly convex conformation.

The southern half of the site comprises the steeply sloping, south easterly facing mid sideslope which reflects a general planar to convex slope conformation. The steep terrain gives way towards the southern-most extent of the site to a relatively level area comprising the flood plain of the Little Amanzimtoti river.

5.5.2 Geological conditions along the route

Geological information was taken from the Drennan Maud Geotechnical Report (September 2017) - refer to the specialist geotechnical report in Appendix E for further detail).

Regional Geology

According to the Port Shepstone (3030) 1:250 000 scale Geological series map, the site area is underlain by tillite bedrock of the Dwyka Group with shale bedrock of the Pietermaritzburg Formation conformably overlying the tillite bedrock towards the east and capping the elevated hill/ridge tops.

Although not indicated on the geological plan, from previous experience with the above mentioned bedrock types it is known that there exists a member of the Dwyka Group known as the 'Passage beds' which occurs locally and represents a transitional material between the older Dwyka tillite and younger overlying Pietermaritzburg Formation shale.

The above mentioned parent rock materials are overlain by variable amounts of colluvial and residual material derived from the natural weathering thereof.

Furthermore, lower lying areas along the base of drainage lines or areas adjacent to the Little Amanzimtoti River and its flood plain are underlain by alluvial material.

Geological Structures

Although not depicted on the geological map of the area, a minor north west - south east trending is inferred towards the northern portion of the Site A due to the juxtaposition of weathered tillite bedrock and shale bedrock at similar elevations as well as occurrence of a steeply incised drainage line.

Dwyka Tillite

The weathered tillite encountered across all three sites generally occurs as khaki brown to yellow brown, highly weathered, very close to closely jointed, very soft rock.

The weathered bedrock generally occurs at depths ranging between 1.0 - 1.5m along elevated sideslopes and between 2.0 - 2.5m where locally more deeply weathered. However, along the elevated ridge lines within Sites A and B highly weathered bedrock occurs at relatively shallower depths of 0.3 - 0.8m.

Across the mid to upper northern and central portions of Sites A and B the bedrock material comprised highly weathered, very close to closely jointed, thinly bedded very soft rock containing small drops stones. The material which resembles a bedded shale/siltstone material comprises the upper member of the Dwyka Group, known as the 'Passage Beds'. The material occurs at depths ranging between 1.5 - 2.0m below existing ground level where present. No clear occurrences of Passage bed material was encountered on Site C.

The highly weathered bedrock was found to be occasionally mantled by completely weathered material recovered as gravelly, clayey silt to silty clay. The mantle of completely weathered material, most commonly present along the flanks of minor drainage lines towards the north of Site A and sideslopes of Site A and C was encountered to be generally ~1m thick where present.

Although no indication of relatively less weathered, hard rock tillite corestones were encountered, the present thereof cannot be completely excluded.

Pietermaritzburg Formation Shale

The weathered shale bedrock was found to generally cap the more elevated hill/ridge tops of the respective site areas.

Highly weathered shale bedrock occurs as grey weathered brown, very close to closely jointed, thinly bedded, very soft rock at depths ranging between ~1.0 - 1.6m below existing ground level, being locally encountered at shallower depths in the order of 0.3m below the ground surface (Elevated central portion of Site C). The highly weathered shale bedrock is generally mantled by a <0.5m thick horizon of completely weathered material recovered as gravelly clayey sand to sandy clay in places.

The shale bedrock where encountered was observed to dip at between 15 - 45° in an easterly, south easterly to southerly direction (120 - 180°) which coincides with the general regional dip of inclined strata along the Kwa-Zulu Natal coast line.

Soils

In addition to the occasional occurrence of completely weathered horizons noted above, the bedrock is further mantled by an approximately 0.5 - 1.0m horizon of residual clay subsoil which generally presents brown and grey brown mottled orange, stiff to very stiff, silty clay.

In some instances the thickness of the residual soils is seen to exceed 3m, this likely defining weathering "pockets" etched into the bedrock along preferential groundwater paths (i.e heads of drainage lines or deeply weathered sideslopes).

Within virgin residual soils, adverse soil structure in the form of fissuring and local slickensiding, was noted. This is strong evidence for the clay soils being active.

Capping the residual soils and being generally <0,5m in thickness, is a transported colluvial soil. This material ranges from a brown, gravelly clayey sand (generally the re- worked topsoil), through to a dark grey brown, strongly fissured sandy silty clay.

Alluvial soils encountered along the southern, lower lying portions of Site C ranged from orange mottled grey, stiff to very stiff, very weakly cemented, silty clay to light brown, loose, fine to medium grained sand, both ranging between ~1.0 - >2.5m thick.

Some of the more clayey soils will be moderately to highly active, and on the uppermost relatively sandy soils, erosion may be a potential problem as these soils are erosive. The sub soils do not appear to be highly erodible, but care will have to be taken with the topsoils during and after construction.

Areas of potential slope instability have been indicated on the geotechnical site plans (See Appendix E), these generally comprising areas potentially underlain by shale bedrock dipping adversely out of the slope or where deeply weathered residual tillite material prevails to considerable depth.

Areas steeper than 1 in 3 are expected to be very costly to develop due to the expensive stability measures deemed necessary for stable cut/fill platforms and retaining structures deemed necessary to avoid chasing slopes. Such areas have been designated as P3 zones on the geotechnical plan (see specialist report in Appendix E).

Taking into consideration the nature of the site in terms of geology, topography, drainage and the likely need for significant cutting and/or filling for proposed development, slope stability will be a chief cause for concern and will need to be considered prior to and during any proposed development.

Zones of potential seepage are inferred along the flanks of minor drainage lines towards the northern portion of Erf 2954 and central eastern portion of Erf 2955.

Although no groundwater seepage was encountered in these areas during the geotechnical investigation, the heads of drainage lines are generally found to harbour ground water during wetter summer months. Furthermore, the lush vegetation in addition to being underlain by mottled clay soils is suggestive of seasonal groundwater seepage.

A zone of further potential seepage is included across the lower lying, level flood plain area towards the southern portion of Erf 2956. Though no ground water seepage was encountered, the mottled and weakly cemented nature of the soils suggests seasonal ground water seepage whilst the areas proximity to the nearby Little Amanzimtoti River and relative elevation thereto suggests it is likely this area is prone to potential water-logging during heavy seasonal rains.

Intermediate to hard excavation may be encountered within the tillite bedrock should relatively large unweathered corestones be intersected within cuts. Where such boulders occur, excavation rates will likely be slower and depending on their size may require localised blasting to remove.

5.5.3 Rivers and wetlands

A specialist Aquatic Assessment Report was compiled by Eco-Pulse for the project. The report is presented in Appendix E.

The area of study is located within the Pongola-Mtamvuna WMA (Water Management Area) and within DWS Quaternary catchment U70F. A seasonal stream runs through the middle of the property in a southerly direction where it meets and discharges into the Little Manzimtoti River Borders the property boundary to the South. The Little Manzimtoti Estuary is approximately 0.5km downstream of the property. Two ephemeral streams drain the eastern portion of the property.

Several watercourses were identified within the DWS regulated area for water use consideration (i.e. 500m radius of the development property). These watercourses were assessed and screened in terms of their potential risk of being impacted by the proposed development. The results of this screening process highlighted one (1) seasonal mountain stream and two (2) ephemeral mountain streams that were rated as being risk of being potentially impacted by the development.

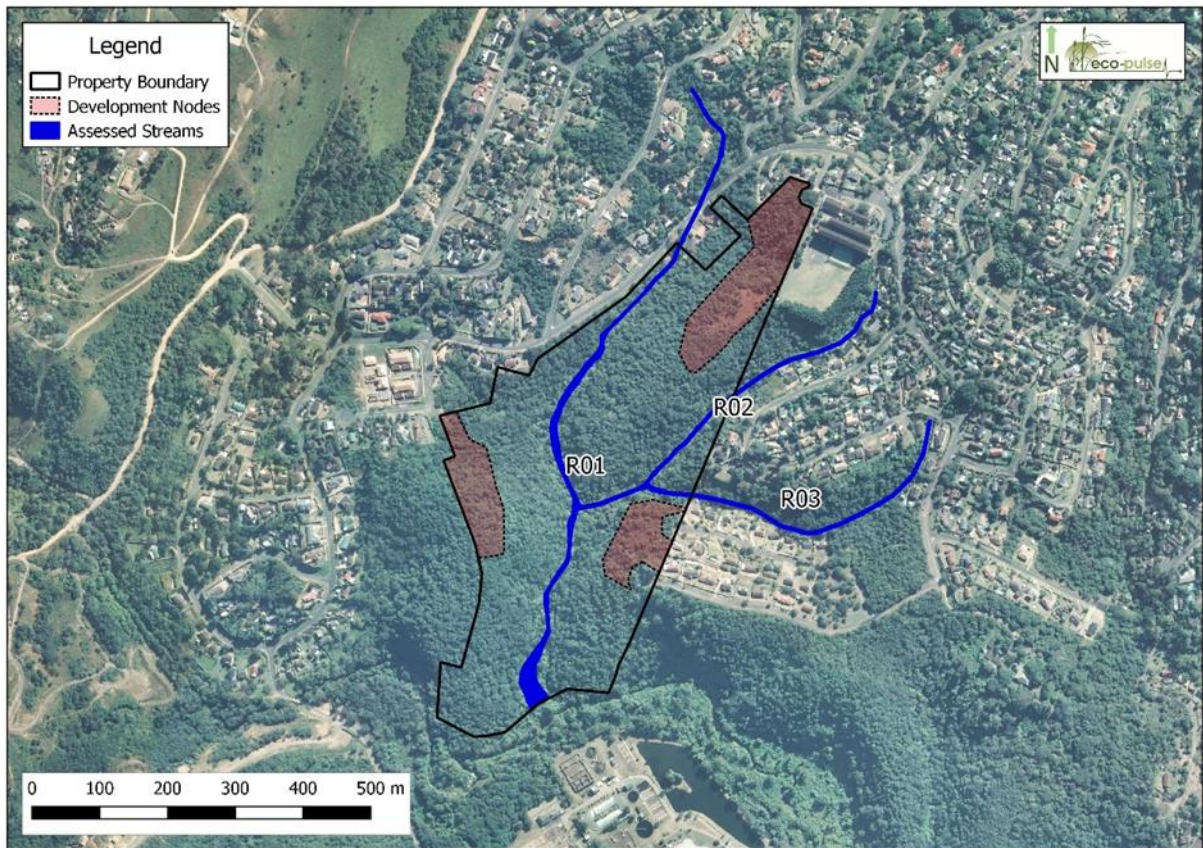


Figure 6: Map showing watercourses identified as being at particular risk of being impacted by the development.

The findings of the baseline aquatic assessment showed that, owing to a range of existing impacts, all three stream units (R01, R02 and R03) were in a ‘largely modified’ (‘D’ PES class) state with a ‘Moderately-Low’ to ‘Low’ EIS rating (See Tables 10 and 11 below).

IMPORTANTLY, NO WETLANDS WERE IDENTIFIED WITHIN 500M OF THE DEVELOPMENT AT RISK OF BEING POTENTIALLY IMPACTED BY THE DEVELOPMENT PROJECT.

Table 10: Summary of the PES assessment

TYPE	Instream Habitat PES	Riparian Habitat PES	Overall PES	PES Description
R01 <i>‘Seasonal Mountain Stream’</i>	D PES: ‘Poor’	D PES: ‘Poor’	D PES: ‘Poor’	<ul style="list-style-type: none"> Both the riparian and instream habitat has been severely impacted by dense alien plant infestations which has replaced much of the indigenous instream and riparian vegetation. Increased runoff (timing and quantity of flows) is associated with this river’s largely urban catchment, which has caused bed scour and bank erosion along much of the stream course. Multiple surcharging sewage manholes exist along the course of this unit. This is having a critical effect on the water quality of the stream.
R02 <i>‘Ephemeral Mountain Stream’</i>	D PES: ‘Poor’	C PES: ‘Fair’	D PES: ‘Poor’	<ul style="list-style-type: none"> Both the riparian and instream habitat has been severely impacted by dense alien plant infestations which has replaced much of the indigenous instream and riparian vegetation. Increased runoff (timing and quantity of flows) is

TYPE	Instream Habitat PES	Riparian Habitat PES	Overall PES	PES Description
				<p>associated with this river's largely urban catchment, which has caused bed scour and bank erosion along much of the stream course.</p> <ul style="list-style-type: none"> Multiple surcharging sewage manholes exist along the course of this unit. Sewage inputs from surcharging manholes is maintaining flow in this unit during dry/low flow conditions, and is having a critical effect on the water quality of the stream.
R03 'Ephemeral Mountain Stream'	D PES: 'Poor'	D PES: 'Poor'	D PES: 'Poor'	<ul style="list-style-type: none"> Both the riparian and instream habitat has been severely impacted by dense alien plant infestations which has replaced much of the indigenous instream and riparian vegetation. Informally dumped rubbish (garden and household refuse) were common along the course of this unit. Although limited compared to R01 and R02, bed scour was evident along the length of this stream unit,

Table 11: Summary of the assessment of the Resources Management Objectives based on the PES and EIA ratings

Watercourse	Type	PES	EIS	RMO
R01	Seasonal Stream	D: Poor	Moderately- Low	<i>Maintain PES/EIS</i>
R02	Ephemeral Stream	D: Poor	Low	
R03	Ephemeral Stream	D: Poor	Very Low	

Water Use Licence Requirements

The proposed development requires a Water Use License (WUL) in terms of Chapter 4 and Section 21 (c) and (i) of the National Water Act No. 36 of 1998 and this must be secured prior to the commencement of construction. Key activities that constitute a 'non-consumptive' water use in terms of Section 21 (c) and (i) include:

- Construction of wastewater (sewer) pipelines across watercourses; and
- Storm water runoff management from the operation of the development.

There are no consumptive water uses identified (no abstraction or storage of water), hence Section 21 (a) and (b) water uses do not apply. Since wastewater will be managed by tying in to an existing wastewater pipeline to the regional/municipal WWTW (Waste Water Treatment Works) for treatment and disposal offsite, Section 21 (g) water use also does not apply to the project.

Given that wastewater pipelines are to be constructed and installed as part of this project (with crossings of river R01 planned), this development does not meet the DWS conditions for a General Authorisation for 21 (c) and (i) water uses under this scenario and a full WULA will therefore be required.

Further detailed information is provided in the attached wetland specialist report (Appendix E).

5.5.4 Natural habitat affected by the project

Mr D Styles undertook vegetation assessments on these properties in 2009, and again in 2017. His reports were further updated in 2018 (see Appendix E).

The vegetation of South Africa and KwaZulu-Natal has been mapped at high level. This part of the KwaZulu-Natal Coast is designated as KwaZulu-Natal Coastal Belt Grassland (national code CB 3 and provincial code KZN 29). This comprises highly "dissected undulating coastal plains which presumably used to be covered by coastal grassland and various types of subtropical coastal forest" between about Mtunzini and Port Edward.

Most of this vegetation is now transformed or disturbed to some degree and includes secondary and alien vegetation. KwaZulu-Natal Coastal Belt Grassland is considered Critically Endangered (Mucina & Rutherford 2006), with conservation of remaining natural vegetation considered important.

A core component within the KwaZulu-Natal Coastal Belt Grassland is Northern Coastal Forest (FOz 7). Although KwaZulu-Natal Coastal Belt Grassland is considered endangered (Mucina & Rutherford 2006), Northern Coastal Forest is considered least threatened.

Northern Coastal Forest is stated to occur along the seaboard of KwaZulu-Natal to the Transkei region of the Eastern Cape, and to comprise “species-rich, tall/medium- height subtropical coastal forests occur on coastal (rolling) plains and stabilised coastal dunes.” Northern Coastal Forest is shown (SANBI 2012) as extending to the eastern edge of the properties. There is no reason for such a discontinuity in this mapping, and as there is little difference in woody vegetation, that on the properties should also be considered to be Northern Coastal Forest (albeit of recent origin).

Please refer to the specialist vegetation report in Appendix E for detailed information and mapping.

The study area sits within a generally undulating topography, with altitude ranging between 10-60masl. A small number of stream lines dissect the area, and drain to the south. The area falls within the Indian Ocean Coastal Belt Biome, and is broadly defined as KwaZulu-Natal Coastal Belt (Mucina & Rutherford, 2006), in its natural state, a mosaic of subtropical forest with grassland in higher-lying areas. This vegetation type is considered Endangered.

The site can be broken into the following broad habitat types:

- Coastal forest – dense forest fills the valleys and extends up the slopes, where it intergrades with more recently forested areas on the higher slopes that have mosaics of alien vegetation.
- Alien plant-infested areas – extensive areas, primarily within the erven footprints of dense alien invasives, presumably where grassland was previously present.
- Grassland – a single, small (0.15ha), degraded, isolated piece of grassland is present within Erf 2954.
- Aquatic systems – aquatic systems are limited within the study area. None are present within the proposed footprints. There are a few small, low gradient streams, in the valleys, with shallow rocky beds. There is little overhanging vegetation and fringing alien infestations are widespread. These streams have existing effluent input pipes releasing effluent into them.

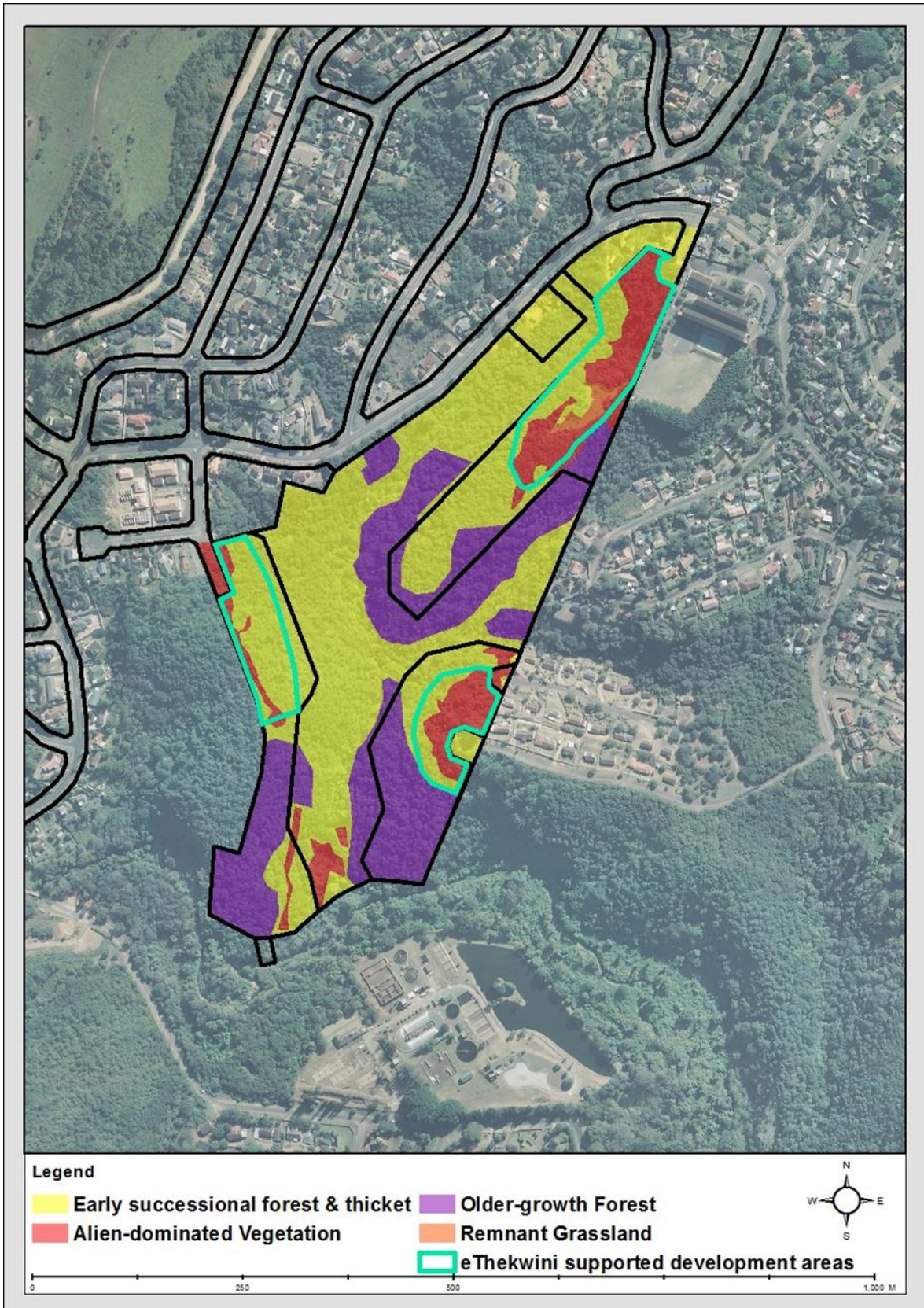


Figure 7: Vegetation in the study area

5.5.5 Vegetation types

In the 2007 report an effort was made to distinguish between more well established woody vegetation, and that which is more recent origin. Based on the 2017 and 2018 surveying and study of aerial photography, forest is again separated into whether tree growth likely more than 30 years old, or whether tree growth was absent or only emergent 30 years ago. This distinction is shown in the specialist report, where the older woody vegetation is designated “older-growth forest” (although so only in relative terms) and younger growth (early successional forest and thicket, which is often diffuse). Due to lack of resolution in aerial imagery and the dense growth and interpolation of vegetation, the mapped boundaries are approximate.

Soils of the site are clayey with shale conspicuous. These soils are poorly drained but also dry out to a hard consistency in the winter months. Most of the tree growth is consequently not very tall, and has a particular species association which also occurs on other Dwyka Group tillite or shale sites in the eThekweni Municipal Area. Typical species in this association are *Apodytes dimidiata* (White Pear), *Burchellia bubalina* (Wild Pomegranate), *Dalbergia obovata* (Climbing Flat-bean), *Kraussia floribunda* (Rhino-coffee), *Hippobromus pauciflorus* (False Horsewood), *Pittosporum viridiflorum* (Cheesewood) and *Searsia chirindensis* (Red Currant). Although not a common species in the eThekweni Municipal Area, *Pittosporum viridiflorum* can be locally common on clay soils. It is, however, a tree species protected by the National Forests Act.

Vegetation is mapped in Figure 7 as follows:

- Alien-dominated vegetation;
- Remnant grassland;
- Early successional forest and thicket (younger woody plant growth, estimated to have been absent or just emergent 30 years ago); and
- Older growth forest (present more than 30 years ago, and some decades prior to that). In spite of being distinguished as being older growth forest, it is only so in relative terms as it is not more than 80 years old and some species indicative of very long-established forests in the eThekweni Municipal Area are absent.

The early successional forest and thicket is given this designation as due to recent origin and much of the thicket being transitional or transitioning to forest, making clear distinction difficult. The early successional forest and thicket typically comprises only a few dominant species, including *Albizia adianthifolia* (Flatcrown), *Apodytes dimidiata*, most common), *Brachylaena discolor* (Coast Silver-oak), *Dalbergia obovata*, *Hippobromus pauciflorus* (False Horsewood) and *Searsia chirindensis*. Of these *Apodytes dimidiata* and *Searsia chirindensis* are by far the dominant trees, with dense growth in between and where transforming into thicket, of the low, climbing woody shrub or small tree *Dalbergia obovata*. These species are common in the KwaZulu-Natal Coastal area and most are conspicuous in early successional woody vegetation.

On Erf 2956, pioneer indigenous trees, including *Albizia adianthifolia* (Flatcrown), *Apodytes dimidiata* (White Pear), *Dalbergia obovata* (Climbing Flat-bean), *Bridelia micrantha* (Mitzeerie) and *Brachylaena discolor* (Coast Silver-oak) grow taller than the other properties. In spite of pioneer trees predominating, and the being in places diffuse, it meets the definition of forest in terms of the National Forests Act and is protected by this Act.

Woody plant growth is more species diverse on steeper slopes away from the eThekweni supported development areas. A complete list of trees and other, smaller plant species on the properties is attached to the specialist report in Appendix E.

5.5.6 Provincial Conservation planning

EKZN Wildlife Minset database

The minset database shows that the Erven 2954, 2956 and 2957 fall within a 'Critical Biodiversity Priority Area (Type 3 Optimal)' (CBA3), while Erf 2955 falls within CBA3 and Biodiversity Areas, as based on the C-Plan Irreplaceability analyses (EKZNW 2010). These are defined as follows:

- CBA 3 Optimal areas are areas identified through systematic conservation planning software that represent the best localities out of a potentially larger selection of available Planning Units that are optimally located to meet both the conservation target but also the criteria defined within the Decision Support Layers. Using C-Plan, these areas are identified through the MINSET analysis process and reflect the negotiable sites with an Irreplaceability score of less than 0.8. Even though these areas may display a lower Irreplaceability value or selection frequency score than CBA1 and CBA2, it must be noted that these areas, together with the above two categories, collectively reflect the minimal reserve design required to meet the Systematic Conservation Plans targets and as such, they are also regarded as CBA areas.
- Areas identified as Biodiversity Areas (BAs) represent the natural and/or near natural environmental areas (i.e. non-transformed areas) not identified within the optimisation software output. Whilst it is preferred that development be focussed within these areas, this still has to be conducted in an informed and sustainable manner. Important species and ecosystem services can still be associated with these PU's and should be accounted for in the EIA process.

Interrogation of these areas shows that no vertebrate fauna contribute specifically to these minset classifications. This does not preclude the presence of sensitive vertebrate fauna however, as these tools are derived and employed at a relatively coarse scale; faunal communities were looked at in greater detail during this study and are discussed above and in the specialist Fauna report (Appendix E).

SEA

The SEA modelled the distribution of 255 red data and endemic species in KwaZulu-Natal, and allows for the prediction of potential occurrence of these priority species. Two vertebrate species are listed as potentially occurring within the study area – Pickersgill's Reed Frog *Hyperolius pickersgilli* and KwaZulu (Black-headed) Dwarf Chameleon *Bradypodion melanocephalum*. These two species are expected to be absent from the footprints.

Threatened Ecosystems

The Biodiversity Act (Act 10 of 2004) provides for listing threatened or protected ecosystems, in one of four categories: Critically Endangered (CR), Endangered (EN), Vulnerable (VU) or Protected, classified as such if satisfying one or more of six defining criteria. The purpose of listing threatened ecosystems is primarily to reduce the rate of ecosystem and species extinction. This includes preventing further degradation and loss of structure, function and composition of threatened ecosystems.

Note: the data represents the original extent of listed ecosystems; in other words, natural areas which have been converted to agriculture, mining and urban areas have been included.

The study area falls within the junction of two threatened ecosystems – Interior South Coastal Grassland (KZN7) and Southern Coastal Grasslands (KZN18). Both ecosystems are listed as Critically Endangered. Both are classified based on Criterion F - Priority areas for meeting explicit biodiversity targets as defined by a systematic biodiversity plan, in this case, EKZNW's C-Plan. Relevant vertebrate faunal features contributing to the value of these areas for the broader study area are Pickersgill's Reed Frog *Hyperolius pickersgilli* and KwaZulu (Black-headed) Dwarf Chameleon *Bradypodion melanocephalum*. These two species are expected to be absent from the footprints.

D'MOSS

D'MOSS is a system of open spaces that incorporates areas of high biodiversity value linked together in a viable network of open spaces within the eThekweni municipal area. Apart from contributing to the attainment of provincial and national biodiversity conservation targets, D'MOSS provides a range of ecosystem goods and services to all residents of Durban, including the formation of soil, erosion control, water supply and regulation, climate regulation, cultural and recreational opportunities, raw materials for craft and building, food production, pollination, nutrient cycling and waste treatment (www.durban.gov.za)

The map of the D'MOSS system shows that the bulk of the site falls within D'MOSS areas (Appendix E).

Important Bird and Biodiversity Areas

Important Bird and Biodiversity Areas (IBAs) are sites of global significance for bird conservation, identified nationally through multi-stakeholder processes using globally standardised, quantitative and scientifically agreed criteria (Marnewick et al. 2015). The criteria for the identification of IBAs are based on the presence of 1) threatened species, 2) assemblages of restricted-range and biome-restricted species, and 3) large concentrations of congregatory species, referred to collectively as IBA 'trigger' species. The study site does not fall within or close to any IBAs.

5.5.7 Protected areas

The properties are shown as falling within two listed ecosystems, namely Interior South Coast Grasslands (KZN 7) and Southern Coastal Grasslands (KZN 18). The extent of the ecosystems and distribution on the properties is shown in the specialist report. Again, this discontinuity is artificial and the vegetation does not suggest such a difference, but this mapping has occurred at a high level, with boundaries needing to be drawn somewhere. Both ecosystems are critically endangered. In the Interior Coastal Grassland ecosystem, six vegetation types occur (including those mentioned) and 17 priority plant species, of which only the orchid *Diaphanathe millarii* has some possibility of occurring. In the Southern Coastal Grasslands ecosystem five vegetation types are stated to occur including those already mentioned and three plant species, although due to known distribution the plant species mentioned have no possibility of occurring on the properties. EKZNW includes the properties within its high value Irreplaceable layer (Ezemvelo KZN Wildlife 2016).

5.5.8 Plants of Conservation Importance

Protected Tree species

The following trees species were found on the property within or next to the eThekweni supported development area that are protected by the National Forests Act. Disturbance, cutting or clearing of any of these tree species will require license authorization from DAFF. These are:

- *Pittosporum viridiflorum* (Cheesewood, a number of trees); and
- *Sideroxylon inerme* (White Milkwood, one tree only).

Positions of these trees are shown in the specialist report in Appendix E. More examples of *Pittosporum viridiflorum* occur at further distance from the eThekweni supported development areas. Protected tree species were not found along the routes of proposed pipeline infrastructure outside of these areas.

Smaller protected plants

Smaller plants occur on the properties that are protected by the KwaZulu-Natal provincial conservation ordinance. Most of the species were seen during the summer of 2009. They are mostly winter deciduous and so were not found during the surveying which occurred in the winters of 2017 and 2018. Those that are winter-deciduous are indicated with an asterisk below. It will be necessary to search development areas in the summer months in order to identify any occurrences within development areas and relocate them if necessary.

The smaller protected plants found on the properties (mainly in 2009) are:

- *Aloe cooperi* (fewer than 10 plants seen)
- *Anomatheca (Freesia) laxa* (likely in identified better development areas)
- *Crocasmia aurea* (seen away from identified better development areas in 2009, only possibly present within)
- *Dietes grandiflora* (plants shown in Appendix 2, appear sufficiently away from sewer infrastructure that they will not be impacted upon, providing care is taken)
- *Drimiopsis maculata* (not seen in identified better development areas)
- *Kniphofia* sp. (seen as a single example)
- *Resnova humifusa* (seen away from identified better development areas in 2009, only possibly present within)
- *Scadoxus puniceus* (likely in the identified better development areas)

The positions of the *Aloe cooperi* plants are not shown in the mapping as they are all confined to the small grassland patch shown. Most are difficult to see amongst moribund grass, vegetation cut down in 2017, and alien and weedy plant invasion.

The single *Kniphofia* plant seen is surrounded by alien and weedy vegetation and is a relic from when this was grassland. It cannot be identified to species as it was not in flower. It is not the critically endangered *Kniphofia pauciflora*, as it is far too large for that species.

All of the species mentioned above, with the exception of *Aloe cooperi* and the *Kniphofia* sp., are quite common and widespread in the KwaZulu-Natal coastal area. None of these plants is threatened. It is feasible to relocate all of these smaller plants. Special and separate mention is made of *Aristea ecklonii*. It is protected as all members of the Iridaceae family of which it is part, are protected. However, it is a common species with somewhat weedy properties. For this reason, while there are many (estimated as several hundred) in the remnant grassland patch, it is not recommended they be relocated.

Red Listed Species

Only one species was found in red list categories other than Least Concern (and so not threatened). The single species is the woody climber *Adenia gummifera* which is declining, likely due to medicinal collection rather than habitat destruction. It is quite widespread though sparse in Northern Coastal Forest and some Scarp Forest in KwaZulu-Natal. However, the plant seen is outside the eThekweni supported development areas.

5.5.9 Vegetation on site

The vegetation on site is described below, with an emphasis on sensitive areas. Detailed species lists are provided in the specialist report (Appendix E).

Erf 2954

The grassland patch

As the aerial photography indicates, the area of grassland on Erf 2954 is a remnant from a time when grassland was the dominant vegetation in this area, nearly all of which has now transformed to woody vegetation. This patch of grassland has been mapped from 2017 aerial photography as being approximately 0.16 ha (1 560 m²) in extent. In aerial photography dated 2003 it is 0,32 ha (3 235 m²) in extent. This represents a 50 % contraction (a reduction to less than half its size) over 15 years. When recently visited, the grassland was moribund and there was also a considerable amount of woody plant encroachment.

Results of plot-based surveying of the grassland

Grassland should preferably not be surveyed in the winter months, as many grassland herbs are winter deciduous or then die back, when they are invisible or inconspicuous. Nevertheless, this exercise can render useful information as many are still present in fragmentary or diminished state and many can still be found and identified by a careful and experienced fieldworker.

The dominant grass is *Aristida junciformis*. The survey found the 100 m² plots to comprise between 15 and 17 non-graminoid (i.e. herbaceous or woody) species, with between one-third and more than one-half comprised of alien, ruderal or woody encroacher species. Ruderal species are those that have weedy propensity and flourish in conditions of disturbance, while the woody encroachers are pioneer trees that are precursory to conversion of grassland to scrub and woody vegetation. Average number of species per 1 m² is 3,9 to 4,5, which is low. However, results will likely increase, but probably not substantially, if plots are surveyed in the summer months.

The grassland is mainly notable for the occurrence of two species, namely *Aloe cooperi* and *Chironia palustris*. *Aloe cooperi* was formerly red listed by Raimondo et al (2009) as declining, however the latest red list (SANBI 2017) now assesses the status as least concern. According to this red list assessment: "There are continuing declines in many areas, mainly due to overgrazing and invasive alien encroachment, but *A. cooperi* is still too widespread and common to meet any of the criteria for a threatened status." *Aloe cooperi* is rare in the eThekweni Municipal Area and I have only seen it at only two other localities within it, most likely due to habitat destruction. *Chironia palustris* is also uncommon in the eThekweni Municipal Area.

Both *Aloe cooperi* and *Chironia palustris* have a preference for damp soils and are often found on the edge of wet places. As the soils are rocky and poorly drained on Erf 2954, they likely are seasonally damp, creating suitable habitat for these two species.

There appears to have been a reduction of the number of *Aloe cooperi* plants since the 2007 as fewer than 10 plants were found (all of which were in poor condition). It is possible that some had been covered by recently cut vegetation. Large numbers of *Chironia palustris* remain, with the number estimated at over 100.

Conservation importance of the grassland

Grassland is one of the most threatened vegetation types within the city, and almost none remains on the close coastal littoral. This grassland also contains two more unusual plants, as noted above. On the other hand, this is a very small and moribund fragment of what was once extensive grassland, has contracted dramatically over the past 15 years, and has been invaded by woody plants, scrub and weedy and alien species. It is isolated and entirely surrounded by woody vegetation, and fires that are essential for maintaining grassland health are no longer likely to burn into it. Apart from the occurrence of *Aloe cooperi* and *Chironia palustris*, species richness is low. The *Aloe cooperi* plants are also in poor condition. Without active management, this grassland will persist for some time, perhaps for more than one or two decades but likely in increasingly degraded state and will steadily reduce as it is supplanted by scrub and woody plants.

The active management needed to conserve it will be difficult to sustain (as burning of grassland next to residential properties is a challenge). It is therefore suggested that the unusual plants (principally *Aloe cooperi* and *Chironia palustris*) be relocated to other suitable habitat in the municipal area.

The eThekweni supported development area

The area includes the grassland patch and the following.

- Alien dominated-vegetation, much cut down in 2017, but which by 2018 had grown back;
- Other secondary indigenous vegetation well infiltrated by alien species;
- A small number of freestanding trees, including the protected tree *Pittosporum viridiflorum*; and
- A small amount of thicket and early successional forest. Although transitioning into forest, this is in my opinion better described as thicket as the canopy is mostly low (not much more than four metres). *Apodytes dimidiata* and *Searsia chirindensis* are the main trees, with a considerable amount of *Dalbergia obovata* and infiltration by *Chromolaena odorata*.

If development is mostly confined to the eThekweni supported development area, it will, except for the grassland patch, least impact on better quality natural vegetation on the property. There is an area of woody vegetation that extends a little south-west and a rough track has been cleared into it. Although this tree growth appears to be not as long-standing as some of the other vegetation on the property and is mapped as early successional forest and thicket in Appendix 2 of the Vegetation report, it includes numbers of *Pittosporum viridiflorum* trees and the closed nature of the tree growth means that it can more certainly be described as forest. As a result, it is not included in the eThekweni supported development area.

On the south-eastern edge, there is forest that is better developed and contains a more diverse array of species, although those mentioned are still most common. It also includes a number of protected *Pittosporum viridiflorum* trees. This is shown in Appendix 2 of the Vegetation Report as older-growth forest. It is not recommended that development activity extend so far as to disturb the edge, or that it occurs beyond this edge.

Erf 2956

General coverage of the property by forest does not commend it as suitable for any kind of extensive development. This is so even though much of the forest is diffuse, of more recent origin and conspicuous in containing pioneer indigenous trees. It is not possible to develop this property to any more than very minor extent without impacting on some of this forest. However, if confined to the eThekweni supported development area it will have lower impact than if situated elsewhere. Common species in this forest are *Albizia adianthifolia*, *Apodytes dimidiata*, *Brachylaena discolor*, *Searsia chirindensis* and extensive growth of *Dalbergia obovata*. Less common species are *Bridelia micrantha*, *Burchellia bubalina*, *Protorhus longifolia* and *Psyrax obovata*.

However, it must be emphasized that none of the forest, even though it is diffuse, of recent origin and mainly comprised of pioneer and common species, can be lawfully cleared without permit authorization from DAFF. On this property and Erf 2955 it is particularly important to enter into an early discussion with DAFF about any development proposal, in order to establish the limits of what DAFF is willing to accept and enable through the issue of a license. This may result in a more limited development area than supported by the eThekweni Municipality's EPCPD.

Erf 2955

The property includes an area invaded by alien vegetation (mainly *Chromolaena odorata*) with the balance covered by thicket transitional to early successional forest, earlier successional forest and older forest. It proved difficult to exactly determine the boundary between older- and early-successional forest due to lack of resolution in aerial imagery, and interpolation and graduation between the two. These mapped boundaries are therefore only approximate.

The eThekweni supported development area is mostly founded on the alien plant invaded area, but includes early successional forest and thicket. On its southern edge, three protected *Pittosporum viridiflorum* trees were found and it also very closely abuts older-growth forest. Given the broad definition and consequently protection provided in the National Forests Act, impacts on this vegetation should also form the part of consultations with, and license application to DAFF. Unless supported by DAFF, it cannot be lawfully cleared or developed.

The thicket transitioning into early successional forest is founded on two main species: *Apodytes dimidiata* (White Pear) and *Searsia chirindensis* (Red Currant). *Dalbergia obovata* (Climbing Flatbean) is also very common. There is notable infiltration by alien species, particularly *Chromolaena odorata*. There is, however, one larger, protected *Sideroxylon inerme* (White Milkwood) tree in eThekweni supported development area. It is not recommended that older and more certain forest (i.e. older than 30 years) be disturbed or cleared.

The proposed development extends into the sensitive 'Older Growth Forest' to the south of the eThekweni supported area, which the vegetation specialist recommended be avoided for development.

Infrastructure areas in Erf 2957

It is necessary to connect the proposed dwellings with existing sewerage lines in the valley bottoms, along a drainage lines and streams that form part of the Little Amanzimtoti River. The connecting lines pass through both thicket and early successional forest and older growth forest (as shown in Appendix 2 of the Vegetation Report), but do not intersect with rare, unusual or red listed species, or protected tree species. It is important that this linkage is constructed with great care through older growth forest and that larger trees (15 cm diameter or more at chest height) are avoided wherever possible.

The valley lines in which there are drainage lines or watercourses along which existing sewer lines run were found to be quite disturbed, with a large amount of the plant growth comprised of alien species (including *Arundo donax*, *Casuarina equisetifolia*, *Melia azedarach* and *Schinus terebinthifolius*), although mixed with indigenous trees. As a result, the woody vegetation along the existing sewerage lines is in worse condition than that on slopes above. It is very likely that the disturbance caused by construction infrastructure contributed to this outcome, although watercourses are also more vulnerable to alien plant invasion. No alteration to the routes of the connecting sewerage lines are recommended, although it is important that larger trees are avoided wherever possible.

5.5.10 Fauna and avifauna

A faunal assessment of the properties was undertaken by James Harvey of Harvey Ecological in August 2018 (See Appendix E for specialist report).

Mammals

Approximately fifty-five species of mammal are known to occur or likely to occur within the region (Friedmann & Daly 2004, Skinner & Chimimba 2005, Monadjem et al. 2010), although only a portion of these are expected to be present within the study site. The community is expected to consist primarily of a small number of rodents, shrews and small carnivores, several species of bats, and small number of antelope species. Very few species are expected to occur within the Erven footprints 2954 and 2955, (primarily generalist species), given the limited habitats available and the degraded nature of much of the footprints. A number may utilise wooded portions of 2956, and particularly, the remainder of the study site.

Four species of conservation importance are known to occur in the broader region (Child et al. 2016 2004; Monadjem et al. 2010), (Dark Footed Forest Shrew – Vulnerable, Natal Red Duiker – Near Threatened, Blue Duiker – Vulnerable and Damara Wooley Bat – Near Threatened). Some or all of these may be present within the forested areas of the study site. Erven footprints 2954 and 2955 are not expected to support any of these species. The wooded portion of the 2956 footprint may however support some these species, as will the remainder of the study site.

Birds

The study area falls within a broader area that supports a high diversity of species, with over 250 species recorded in the pentad that incorporates the site (Pentad 3000_3050; 9km x 9km in extent) (Harrison et al. 1996, SABAP2 2017), The study site will not support the full complement of these species, given the limited diversity of habitats present. However a good diversity of species that reflects the habitats available will utilise the study area, primarily comprised of forest and woodland specialists and habitat generalists that are capable of utilising degraded and secondary habitats. The footprint areas of Erven 2954 and 2955 hold a low diversity of species and have very few habitat specialists, given their very limited diversity of habitats and disturbed nature, while richness and number of specialists will be somewhat higher in the forested portions of the Erf 2956 footprint and particularly the remainder of the study area.

Nine rare and threatened bird species have been recorded within the pentad that includes the site (Harrison et al. 1996, SABAP2 2018, Taylor et al. 2015) (See specialist report in Appendix E for detailed information). The majority of these species will not occur within the study area or the proposed footprints. Two species, Crowned Eagle (recorded overhead during the site visit) and Spotted Ground-Thrush may occur with some regularity within the study area. They will be mostly absent from the footprints, however the wooded of Erf 2956 may be utilised to some degree by these two species

Amphibians

The study area sits within a broader area that supports high amphibian species diversity (Minter et al. 2004). In a biogeographical context, the study area primarily falls within a region that has been described in terms of amphibian fauna as the 'Maputaland assemblage' (Alexander et al. 2004), an area characterised by high species diversity within a national context, although with a fairly low level of endemism. Richness locally is high, with at least 20 species recorded from the Quarter Degree Cell (QDC) and surrounding areas (Minter et al. 2004). Most frogs are tied to some degree to aquatic habitats for part of their life-cycle, and will use seasonal or permanent wetlands, slow flowing streams and other waterbodies for breeding. However, they also require adjacent terrestrial habitats for foraging, sheltering (particularly during the dry season) and to facilitate dispersal between breeding sites.

Diversity and quality of aquatic habitats are fairly low within the study area and are absent from the footprint. The amphibian fauna present will be relatively species poor, with few breeding species present. The footprints' value for amphibians will be particularly low, given the lack of and distance from aquatic habitats, and the largely degraded quality of terrestrial habitats available.

The site falls within an area that is known to support several conservation important species (Branch & Harrison 2005, Measey 2011) (Spotted Shovel-nosed Frog – Near Threatened, Pickersgill's Reed Frog – Endangered, Kloof Frog – Endangered and Power's Reed Frog - Rare). However, all of these species will be absent or rare from the study area, and the footprints in particular. Although the Endangered Pickersgill's Reed Frog is highlighted in strategic plans for the broader area, it will not be present within the footprints, and rare or likely absent from any part of the study area.

Reptiles

In a national context, the broader region's reptile diversity is high, and the QDC and adjacent areas are in line with that, with at least 43 reptile species recorded (Bates et al. 2014). Six of these won't occur, as they are grassland species or require sandy soils, and no such quality habitat is available, however, it is likely that a fair proportion of the remainder are present in the study area. Diversity is expected to be low within the Erven 2954 and 2955 footprints, given the limited and highly modified habitat available, but somewhat higher in the forested portion of the Erf 2956 footprint.

Five Red Data reptile species are known from the area (Bates et al. 2014) (See specialist Report in Appendix E for more detail). However, none of these are expected to occur within the bulk of the footprints, and most will not be present within the broader study area. Two species may occur, possibly within the forested portion of the Erf 2956 footprint, but primarily in the mature forest within the valleys. Although the Vulnerable KwaZulu Dwarf Chameleon is highlighted in strategic plans for the broader area, it will not be present within the footprints, and rare and local or absent from any part of the study area

6. PUBLIC PARTICIPATION PROCESS

6.1 Objectives

The public participation process for the proposed project was designed to comply with the requirements of the EIA Regulations and NEMA (Table 2). The objectives of public participation are to provide sufficient and accessible information to I&APs in an objective manner to assist them to:

- Identify issues of concern, and provide suggestions for enhanced benefits and alternatives.
- Contribute local knowledge and experience.
- Verify that their issues have been considered.
- Comment on the findings of the assessment, including the measures that have been proposed to enhance positive impacts and reduce or avoid negative ones.

6.2 Stakeholder/I&AP profile

Table 12 lists the stakeholder profile registered on the database (Appendix D) and Table 13 lists the organs of state who have been identified as key stakeholders.

Table 12 Sectors of society represented by I&APs on the direct mailing list

Government (National, Provincial and Local)
Non-Governmental Organisations/Community Based Organisations
Private and institutional adjacent landowners
Local residents and businesses
Conservation Authorities
Business and Industry

Table 13 Authorities and organs of state identified as key stakeholders

Authority/Organ of State	Contact person	Tel No	Fax No	e-mail	Postal address
eThekweni Municipality	Diane van Rensburg/ Greg Mullins			Diane.vanRensburg@durban.gov.za Greg.Mullins@durban.gov.za	
Department of Water & Sanitation	Ms Rene Pillay			PillayR@dws.gov.za	P O Box 1018 Durban, 4000
Department of Water and Sanitation	Ms Hassina Aboobaker			AboobakerH@dws.gov.za	P O Box 1018 Durban 4000
KZN Department of Transport	Mrs Judy Reddy	033 355 8600	033 342 3962	Judy.Reddy@kzntransport.gov.za	224 Prince Alfred Street Private Bag X9043 Pietermaritzburg, 3200
KZN Department of Economic Development, Tourism and Environmental Affairs	Ms Natasha Brijlal	031 366 7317	031 302 2824	Natasha.brijlal@kznedtea.gov.za	Private Bag X54321 Durban, 4000
DAFF- KZN Forestry Regulations & Support	Wiseman Rozani, Thembalakhe Sibozana, Nandipha Sontangane	033 392 7721	033 342 8783	WisemanR@daff.gov.za ThembalakheS@daff.gov.za NandiphaS@daff.gov.za / NandiphaS@nda.agric.za	Private Bag X9029 Pietermaritzburg, 3200
AMAFA Heritage KwaZulu Natal	Ms Bernadette Pawandiwa	033 394 6543			PO Box 268, Pietermaritzburg, 3200
Ezemvelo KZN Wildlife	Mr D Wieners	033 845 1999		Dominic.Wieners@kznwildlife.com	P O Box 13053, Pietermaritzburg, 3232

6.3 Project notification and invitation to participate

Notification of the project and the opportunity to participate in the Basic Assessment process was announced during July and August of 2018. Notifications to I&APs were made available in two local languages, English and isiZulu. The process undertaken is described below. All relevant documentation associated with the public participation is contained in Appendix E.

- ❑ Compilation of a **database of I&APs** (Appendix D) identified as being potentially interested and/or affected, including authorities, municipalities, organs of state, councillors, conservation bodies, non-government organisations, landowners, local residents, etc.
- ❑ **Electronic mail and letter drop, including a Background Information Document** (Appendix D) containing relevant details of the project and environmental application process were sent out to all I&APs on this database. A letter drop was undertaken to all properties in the vicinity of the developments, this included the schools and townhouse complexes in the area. A comment sheet was provided for I&APs to update their contact details, register themselves on the database, to record issues and to send back by fax or email. Contact telephone numbers of the project public participation team were provided to enable direct telephonic liaison with the project team, if required.
- ❑ **Advertisements** (Appendix D, and Table 14) were placed in two local newspapers at the beginning of August, providing project details and contact details of where to register and obtain further information:
 - The South Coast Sun (English).
 - The Isolezwe (Zulu).
- ❑ **Public notices** Site notices in English and Zulu were placed in selected areas adjacent to the access points of the relevant developments (see Appendix D).
- ❑ A meeting was held with the eThekweni Environmental Planning Department, on the 6th June 2018 (Appendix D).
- ❑ Receipt of comments from I&APs and acknowledgement of comments has been ongoing since project announcement in July/August 2018. Responses to these comments are in the **Comments and Responses Report** (Appendix D).

6.4 Summary of Issues Raised by I&APs

Table 15 provides a summary of issues raised by I&APs and the responses provided by the EAP. A full Comments and Responses Report is provided in Appendix D.

Table 14 Summary of adverts and project notifications to the public and key stakeholders

Publication/event	Type	Placement date
South Coast Sun	English Advert	2 August 2018
Isolezwe	Zulu Advert	1 August 2018
A2 On Site Notices	6 (English) (6) Zulu	30 July 2018
Letter drop to neighbouring residences	Background Information Document and comment sheet	30 July 2018
Email to database	Background Information Document and comment sheet	Emailed 26 July 2018

Table 15 Summary of issues raised by interested and affected parties

Summary of main issues raised by I&APs	Summary of response from EAP
Increased traffic/upgrading of access roads. Concerns around the school traffic on Vaughan Goodwin Road.	The traffic surveys state that the current road infrastructure is adequate to support the additional traffic (the number of dwellings has been significantly reduced from the original proposal).
Risk of flooding	The developments occupy the high lying plateaus on each of the Erven. There is therefore no risk of flooding. Detailed stormwater planning will be undertaken for the site to ensure that risks are further minimised.
Risks to the Little Amanzimtoti River, estuary and beach.	These risks have been considered and mitigation recommendations provided in the EMPr in order to reduce the risk of impacts.
Capacity of sewage works	The Water and Sanitation Unit of the eThekweni Municipality has issued the project engineers with a letter stating that the Kingsburgh Wastewater Treatment Works has sufficient capacity to accept the predicted wastewater from the development.
The Department of Agriculture, Forestry and Fisheries requested a vegetation survey to be undertaken.	This has been undertaken – See Appendix E.
eThekweni Environmental Planning and Climate Protection Department raised issues around biodiversity, vegetation and earthworks impacts.	These issues have been addressed in the various sections of the report. EPCPD defined acceptable areas for development and the majority of the development has been contained within these areas. The proposed number of dwellings has been reduced in order to accommodate the requirements.
Large areas of the sites are within the DMOSS area	Cognisance has been taken of the sensitivity of the site. Vegetation and ecological specialists have been engaged, and communication with the EPCPD is ongoing in this regard.
Space for social facilities should be determined using the space planner requirement in terms of the "Accessibility Mapping and Optimisation of Community Social Services in eThekweni 2008", CSIR,	No social facilities have been provided.

Summary of main issues raised by I&APs	Summary of response from EAP
Report No.: CSIR/BE/PSS/ER/2008/0055/B	
eThekwini Environmental Health Department raised issues relating to water supply, dust suppression and waste management.	These issues have all been addressed in the Environmental Management Programme for the proposed development. Detail with regard to specifics will be submitted along with the formal plan submission to the Municipality.
eThekwini Water and Sanitation Department requested a sewer impact report.	This will be undertaken once environmental approval has been received.
DSW raised several issues relating to waste disposal.	These have been addressed in the report and the EMPr.
eThekwini Fire Safety Department requested detail on the fire safety of the proposed development.	The Fire Safety Plans will be submitted with the detailed building plans for the site.

6.5 Circulation of draft BAR for public review (still to be undertaken)

- Stakeholders on the project database (registered stakeholders) were notified of the availability of the draft BAR & EMPr for comment, for a period of 30 days (all I&APs including authorities). Notification was done by post and email.
- The documents were made available on the Metamorphosis website.
- Hard copies of the draft BAR and EMPr were made available at the Warner Beach Public Library.
- Hard copies and/or CDs of the draft BAR & EMPr were provided to key municipalities and organs of state (eThekwini Metropolitan Municipality, KwaZulu-Natal Department of Economic Development, Tourism and Environmental Affairs, Department of Agriculture, Fisheries and Forestry, and the Department of Water and Sanitation).
- CDs were made available to key stakeholders affected by the project such as ward councillors, and other landowners on request.

7. ASSESSMENT METHODOLOGY

7.1 Identification and assessment of significance of key issues and impacts

Issues and potential impacts of the project on the environment (and *vice versa*) were identified by way of field investigations, desktop studies and interaction with I&APs. Key issues and impacts requiring further investigation were addressed by specialist studies (Appendix E) and/or further detailed input from the environmental and technical teams. Specialist studies were guided by Terms of Reference to ensure that issues and associated impacts were correctly identified, understood and addressed, thereby enabling an integrated assessment of the development proposal. Mitigation measures were identified with inputs from I&APs, the specialists, the design engineers and the EAP team. Information was collated, evaluated and integrated. Thereafter, the significance of each impact was assessed using the assessment conventions outlined in Table 16 (in line with the requirements of the EIA Regulations). It should be noted that the significance of an impact is a function of all the attributes outlined in Table 16, and the relationships between them.

The assessment conventions are applied qualitatively by the EAP, based on an understanding of the receiving environment, the proposed project components and activities, and the information gathered from different sources, including specialists and the public.

Table 16 Conventions applied to the impact assessment

Criteria	Rating Scales	Definition
Nature	Positive	This is an evaluation of the overall impact of the construction, operation and management that the proposed developments would have on the affected environment (social, biophysical and economic)
	Negative	
	Neutral	
Spatial extent	Low	Site-specific, affects only the development footprint
	Medium	Local (< 2 km from site)
	High	Regional (within 30 km of site) to national
Duration	Very low	Temporary (less than 1 year)
	Low	Short term (1-4 years, i.e. duration of construction phase)
	Medium	Medium term (5-10 years)
	High	Long term (impact will only cease after the operational life of the activity) to permanent
Intensity	Low	Negligible alteration of natural systems, patterns or processes
	Medium	Noticeable alteration of natural systems, patterns or processes
	High	Severe alteration of natural systems, patterns or processes
Irreplaceability of resource caused by impacts	Low	No irreplaceable resources will be impacted (the affected resource is easy to replace/rehabilitate)
	Medium	Resources that will be impacted can be replaced, with effort
	High	Project will destroy unique resources that cannot be replaced
Reversibility of impacts	Low	Low reversibility to non-reversible
	Medium	Moderate reversibility of impacts
	High	High reversibility of impacts
Consequence (a combination of spatial extent, duration, intensity and irreplaceability of impact on resources).	Low	A combination of any of the following: - Intensity, duration, extent and impact on irreplaceable resources are all rated low - Intensity is low and up to two of the other criteria are rated medium - Intensity is medium and all three other criteria are rated low
	Medium	Intensity is medium and at least two of the other criteria are rated medium
	High	Intensity and impact on irreplaceable resources are rated high, with any combination of extent and duration Intensity is rated high, with all of the other criteria being rated medium or high
Probability (the likelihood of the impact occurring)	Low	It is highly unlikely or there is a less than 50% chance that an impact will occur
	Medium	It is between 50 and 75% certain that the impact will occur
	High	It is more than 75% certain that the impact will occur or it is definite that the impact will occur
Significance (all impacts including potential cumulative impacts)	Low	Low consequence and low probability Low consequence and medium probability Low consequence and high probability
	Medium	Medium consequence and low probability Medium consequence and medium probability Medium consequence and high probability High consequence and low probability
	High	High consequence and medium probability High consequence and high probability

7.2 Assumptions, limitations and gaps in knowledge

7.2.1 General assumptions, limitations and gaps in knowledge

- ❑ It is assumed that technical data supplied by the applicant and its appointed engineers are correct and valid at the time of compilation of the BAR.
- ❑ It is assumed that data supplied by external institutions (for example, eThekweni Environmental Planning and Climate Protection Department) were correct and valid at the time of compilation of the specialist reports and the BAR.
- ❑ While every effort was made to directly contact all affected landowners and adjacent landowners, there were cases where it was not possible to leave the Background Document at the premises. However, it is assumed that the widespread advertising and public notices would serve to notify the public at large.

7.2.2 Specialist assumptions, limitations and gaps in knowledge

The assumptions, limitations and gaps in knowledge stated in the specialist reports are listed below.

Cultural Heritage Resources Impact Assessment

Assumptions

- ❑ The description of the proposed project, provided by the client, is accurate.

Limitations

- ❑ Dense woody vegetation compromised site visibility over most of the area.
- ❑ The palaeontological survey was limited to a desktop survey – no site visit was deemed to be necessary.

Vegetation and Ecology Impact Assessments

The following assumptions have been made with regard to affected areas and associated impacts on vegetation, and assumes a worst-case scenario:

Assumptions

- ❑ All vegetation within the development footprints will be cleared during construction.
- ❑ Vegetation clearance will also occur along the pipeline routes into the valley below the sites and at the stormwater discharge points.
- ❑ Habitat degradation is likely to occur directly adjacent to cleared areas, due to edge effects that will manifest over time once construction activities have commenced.

Limitations

- ❑ Access to the sites is extremely difficult due to the dense vegetation.
- ❑ The 2017 and 2018 vegetation surveys were undertaken in the winter months, when herbaceous grassland and forest plants senesce and die back and therefore some species may not have been seen.
- ❑ The purpose of the faunal field assessment was not to perform a biodiversity species inventory, given the fact that most faunal species are fairly cryptic and not easily detected within a short space of time. However, the techniques undertaken are considered adequate for the scope of the assessment.

Wetland and Riparian Impact Assessment

Assumptions and Limitations

- ❑ The report deals exclusively with a defined area and the extent and nature of freshwater/aquatic habitat and ecosystems in that area.

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- ❑ Additional information used to inform the assessment was limited to data and GIS coverage's available for the Province at the time of the assessment.
 - ❑ All field assessments were limited to day-time assessments.
 - ❑ With ecology being dynamic and complex, there is the likelihood that some aspects (some of which may be important) may have been overlooked.
 - ❑ While disturbance and transformation of habitats can lead to shifts in the type and extent of freshwater ecosystems, it is important to note that the current extent and classification is reported on here.
 - ❑ Sampling by its nature, means that generally not all aspects of ecosystems can be assessed and identified.
 - ❑ All vegetation information recorded was based on the onsite observations of the author and no formal vegetation sampling was undertaken. Furthermore, the vegetation information provided only gives an indication of the dominant and/or indicator riparian species and only provides a general indication of the composition of the vegetation communities. Thus, the vegetation information provided has limitations for true botanical applications i.e. accurate and detailed species lists and rare / Red Data species identification.
 - ❑ Not all watercourses within the 500m DWS regulated area were assessed/delineated in the field. Focal areas at risk of being impacted or triggering Section 21 water use were flagged during the desktop risk/screening exercise to be assessed in detail in the field. Thus, finer habitat type details of the systems not formally assessed were not acquired.
 - ❑ Inferences made about the ecological integrity/health of the watercourses assessed was based on selected variables sampled on selected occasions at selected geographic locations. This limits the degree to which this information can be extrapolated spatially and temporally (i.e. over seasons). Watercourses by nature can be highly variable ecosystems and can display fine and large scales changes in the structure, composition and quality of the habitat over periods of time.
 - ❑ A single site visit was undertaken in June 2018. This does not cover seasonal variability in flows and riverine vegetation.
 - ❑ The location of the study area within the coastal zone of KZN (largely subtropical climate) means that climate has less of an effect on aquatic ecosystems and vegetation characteristics than typical Highveld inland systems which are exposed to more extreme variations in temperatures between seasons. Thus, vegetation response is limited and species structure and composition tend to remain the same or very similar between seasons.
 - ❑ The purposes of field investigations were to gather information about the condition and sensitivity of watercourses onsite. Seasonality was not seen as a limiting factor in the collection of this information.
 - ❑ The PES and EIS assessments undertaken are largely qualitative assessment tools and thus the results are open to professional opinion and interpretation.
 - ❑ The EIS assessment did not specifically address the finer-scale biological aspects of the rivers such as occurrence of fauna (amphibians and invertebrates).
 - ❑ Where necessary expert knowledge and insight was used to override prescriptive tools which may not capture subtleties that exist in the natural environment.
 - ❑ The assessment of impacts and recommendation of mitigation measures was informed by the site-specific ecological concerns arising from the field survey and based on the assessor's working knowledge and experience with similar projects.
 - ❑ Evaluation of the significance of impacts with mitigation takes into account mitigation measures and best management practice, as provided in this report.
 - ❑ Risks were assessed based on the DWS Risk Assessment Matrix. The following assumptions apply to the application of the DWS risk matrix tool in the context of project in question:

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- ❑ All risk ratings generated by the DWS risk matrix are conditional on the effective implementation of the specialist mitigation measures provided in this report.
 - ❑ For the severity ratings, impacts to watercourses were assessed on their merits rather than automatically scoring impacts to watercourses as 'disastrous' as guided in the DWS risk matrix.
 - ❑ The severity assessment for changes in flow regime and physico-chemical impacts were interpreted in terms of the changes to the local freshwater ecosystem represented by the potentially affected reaches.
 - ❑ For the scoring of impact duration, the predicted change in PES was also considered which could override the actual duration of the impact where applicable e.g. if the impact duration was long term (typically a score of 4 out of 5) but the predicted change in PES is negligible, the impact duration was down-rated to a score of 2 in line with the duration criteria descriptions in the risk matrix tool.

8. INTEGRATED DESCRIPTION OF ENVIRONMENTAL ISSUES AND POTENTIAL IMPACTS

The key issues identified and assessed during this Basic Assessment were formulated as eight questions:

- ❑ What economic and socio-economic benefits will result from the proposed developments at a local, regional and national scale?
- ❑ What effects will the proposed development have on adjacent properties, infrastructure and services, and *vice versa*?
- ❑ What potential health, safety, security and other nuisance impacts may be experienced as a result of the proposed development during construction?
- ❑ What negative impacts will the proposed development have on the social environment during operation?
- ❑ What effects will the proposed development have on cultural heritage resources?
- ❑ What effects will the proposed development have on the biodiversity of protected areas, MOSS and other natural habitat (terrestrial/riparian)?
- ❑ What potential cumulative impacts can result from the proposed development?
- ❑ What are the impacts of the No Development Alternative?

Potentially significant impacts associated with each of the above issues (including cumulative impacts) are discussed in the sections below. The assignment of significance ratings to impacts (where applicable), according to the assessment conventions (Table 16), is provided in Chapter 9 (Tables 17 – 22).

8.1 What economic and socio-economic benefits will result from the proposed development, at a local, regional and national scale?

A summary of impacts (incorporating a summary of specialist findings as applicable) is provided below, including recommended measures for management/mitigation of impacts. According to the assessment, these positive impacts are considered to be of low significance, without management. With management, the impacts are considered to be of medium significance (Table 17 in Chapter 9).

8.1.1 Employment creation and capacity building

During the planning, design and construction phases, economic and socio-economic benefits will accrue locally through project spend, estimated to be in the region of R237 Million. There will be increased opportunities for temporary employment and capacity building for individuals, local contractors, SMMEs, service providers and retailers.

Approximately 1000 new jobs will be created during construction (skilled and unskilled) and about 250 direct employment opportunities during operation. There will however be many more jobs created indirectly in the area as a result of the housing development.

8.1.2 Potential positive economic and socio-economic impacts and recommended measures for management (enhancement)

Pre-construction and construction

- Increased employment creation/opportunities for local contractors and SMMEs (all project phases):
 - Ensure that, wherever possible, labour is sourced locally.
 - Sub-contractors, SMMEs and service providers should be sourced locally where the requisite skills exist.
 - Conduct procurement in accordance with the Preferential Procurement Policy Framework Act, specifically Section 10, pre-qualification criteria for preferential procurement, which stipulates that a required value of the contract must go to Exempted Micro Enterprises and Qualifying Small Business Enterprises which, as a minimum, are Black owned. These criteria are likely to enhance the potential positive impacts for local contractors and SMMEs. This will be addressed via the Contract Participation Goals in the contract documents which assist the Targeted Enterprises.

Operation

- In conjunction with the eThekweni Municipality, develop a database of all locally based service providers.

8.2 What effects will the proposed development have on adjacent properties, infrastructure and services and vice versa?

A summary of impacts is provided below, including recommended measures for management/mitigation of impacts. According to the assessment, the impacts on adjacent properties, infrastructure and services are of low to medium significance without management. With management, the impacts are considered to remain low and medium significance (Table 18 in Chapter 9).

8.2.1 Increased potential for crime as a result of construction activities

It is possible that the presence of construction workers and job seekers etc in the area will increase the crime rate in the neighbouring areas.

8.2.2 Effect on property values

It is likely that, once complete, the development will have a positive effect on surrounding property values due to the development of currently unoccupied and unmanaged land.

8.2.3 Damage to/disruption of adjacent roads

During construction, there is the potential for incurring damage to access roads in the area due to the heavy vehicles accessing the sites. Traffic disruption may also occur as a result of the presence of construction traffic. The traffic reports indicate that the long term 'operational' traffic should not cause significant impacts.

8.2.4 Dust, Noise and Visual Impact

Construction activities will have significant impacts on adjacent landowners, particularly if mitigation measures are not adequately implemented. Construction activities, in particular the large amount of earthworks required on the site, will cause large amounts of noise and dust in the neighbourhood.

8.2.5 Potential impacts to adjacent properties, infrastructure and services, and recommended measures for mitigation/ management

Planning and design

- Increased interaction with adjacent landowners.
 - Maintain good communication with affected landowners throughout the project lifecycle.
- Geotechnical investigations.
 - Geotechnical team to comply with relevant industry standards.
- Increased need for repairs and maintenance to associated roads
 - This must be budgeted for in the contract documents.

Pre-construction and construction

- Increased Crime.
 - Contractor to ensure that job seekers are discouraged and that staff are not permitted to leave the working areas during working hours. Site camps will be fenced and security provided to ensure that criminals are not attracted to the area.
- Property Values.
 - Working areas will be kept as small as possible and rehabilitation and landscaping undertaken as soon as possible after disturbance.
- Damage to and disruption of local roads.
 - Contractors are to maintain roads/repair damages caused by construction vehicles. This must be budgeted for in the contract documents.
 - Contract vehicles to access and leave the sites outside rush hour and school drop off and collection times.
- Dust, Noise and Visual Impact.
 - Working areas will be kept as small as possible and rehabilitation and landscaping undertaken as soon as possible after disturbance.

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- Noise to be kept to a minimum by educating workforce and ensuring that vehicles are in good condition.
 - Construction work to be undertaken only during normal working hours and no earthworks to be undertaken in highly windy conditions.

8.3 What potential health, safety, security and other nuisance impacts may be experienced as a result of the proposed development during construction?

A summary of impacts is provided below, including recommended measures for management/mitigation of impacts. According to the assessment, the potential health, safety, security and other nuisance impacts on adjacent properties, infrastructure and services are of low, medium and high significance, without management. With management, the impacts are considered to be of low and medium significance (see Table 19 in Chapter 9).

8.3.1 Disruption of traffic and increased road safety risks

The construction phase of the development will have a negative impact on road users in the vicinity of the access points to each property.

The road conditions during the construction period may well cause significant frustration to drivers, contributing to incidences of road rage and flouting of road rules. Road safety may be compromised by restricted access and increased traffic congestion during construction. This may result in increased vehicle and pedestrian accidents and injuries.

8.3.2 Increased noise from construction activities

Construction activities will involve the use of heavy plant and equipment which will generate noise. Construction noise will vary in intensity, depending on the equipment being used at the time. Generally, noise levels will have the greatest negative impact on receivers up to 300 m distance from the construction activities. Construction noise cannot be avoided and will negatively affect people situated in close proximity to the source. Construction noise will be managed by the contractor, with the aim of keeping noise nuisance to a minimum.

8.3.3 Health and safety risks to those in close proximity to construction activities

Construction activities in close proximity may expose nearby residents and properties to danger and injury, large excavations must be fenced and access to the construction sites discouraged.

8.3.4 Increased crime and security risks to those in close proximity to construction activities

The presence of construction teams, site camps, etc increases the risk for opportunistic crime and, thus, may increase security risks to nearby residents.

8.3.5 Increased spread of disease

Health and social well-being may be negatively affected due to increased spread of disease. Any development which causes the migration of people has the potential to lead to the spread of disease. In the case of South Africa, the spread of HIV/AIDS as a result of project induced migration is particularly pertinent.

8.3.6 Other temporary nuisance impacts

Construction activities may result in increased dust particularly in the drier months and during windy periods.

Construction equipment, materials and activities and exposed soils will detract from the aesthetics of the area.

8.3.7 Potential health, safety, security and nuisance impacts and recommended measures for mitigation/management

Planning and Design

- Management of waste.
 - A materials management plan should be developed to ensure that the location and size of stockpile areas and waste management areas are appropriate.
 - Landfill sites should be contacted prior to construction, to ensure that anticipated volumes can be accepted.

Pre-construction and construction

- Increased need for public liaison
 - Key to management of all traffic, health, safety and other impacts will be timeous and regular communication by the developer and contractors, with affected road users, pedestrians and residents over the entire duration of the construction period.
- Disruptions to traffic and increased road safety risks.
 - The traffic management recommendations must be adhered to, as contained in the EMPr (Appendix F).
 - Encourage road users to avoid the affected section of road during peak periods.
 - Signage for pedestrians must be erected, where applicable.
 - All staff and visitors on site are to wear suitable PPE at all times.
 - Suitable signage warning road users of construction activities is to be erected.
 - Avoid access by heavy vehicles during peak hours and school drop off and pick up times.
- Increased noise during construction.
 - Avoid undertaking construction activities after daylight hours. If blasting is required, ensure that potentially affected parties are informed prior to any blasting taking place. Blasting is to be done in accordance with relevant legislation and due regard for the proximity of structures that may be vulnerable to vibrations from the blast.
 - Management of noise during construction is the responsibility of the contractor, who will be obliged to adhere to the noise management recommendations in the EMPr.
- Health and safety risks on and adjacent to site.
 - Health and safety risks during construction are to be managed by the contractor in accordance with the Construction Regulations under the Occupational Health and Safety Act, 1993 (Act 85 of 1993) as well as relevant specifications in the EMPr (Appendix F).
 - Erect barriers around the construction areas where excavations and localised machinery movements will be considered a danger to the public.
 - The contractor is to implement and abide by the specifications of the traffic management recommendations in the EMPr.
- Increased crime and security risks on and adjacent to site.
 - Construction teams should be clearly identified by wearing uniforms and/or wearing identification cards that should be exhibited in a visible place on the body.

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- Dismiss and prosecute any staff caught in criminal activities of any kind.
 - Inform local law enforcement agencies of the possibilities of increased criminal activity in the area.
 - Urban reserves are conduits for crime and contractors will need to be mindful of security on site at all times.
 - Continual vigilance for one's own person and property is key to avoiding incidences of crime.
 - Increased spread of disease.
 - The contractor is to ensure that all construction staff go through an HIV and AIDS education awareness programme as part of induction.
 - The contractor must make education material regarding general hygiene, HIV & AIDS and sexually transmitted diseases, readily available to staff.
 - Condoms should be made readily available to staff.
 - Increased dust.
 - Suitable dust suppression techniques should be implemented, such as the use of water carts and shade cloth screens in areas where activities are taking place which will generate excessive dust.
 - Conduct regular monitoring to ensure that dust levels remain at an acceptable level.
 - Negative visual/aesthetic impacts.
 - Ensure that 'good housekeeping' is practiced on the construction site at all times.

8.4 What negative impacts will the proposed development have on the social environment during operation?

A summary of impacts is provided below, including recommended measures for management/mitigation of impacts. According to the assessment, the potential negative impacts on the social and socio-economic environment during operation are of low to high significance without management. With management, the impacts are considered to be of low to medium significance (see Table 20 in Chapter 9).

8.4.1 Increased noise once the development is complete and occupied.

It is not possible to eliminate noise from residential areas. Property owners will be required to comply with the bylaws relating to noise and nuisance.

8.4.2 Possible stormwater damage to neighbouring properties due to the hard surfacing of the development

I&APs have raised concerns regarding the damaging effect of stormwater on adjacent properties being attributed to runoff from the development. The risk of stormwater damage should be low if drainage is properly designed.

8.4.3 Increased traffic in the vicinity of the development

Once the developments are complete and fully occupied, there will be more traffic accessing the properties than prior to development. However the traffic assessment states that this will not be significant.

8.4.4 Potential negative social impacts during operation and recommended measures for mitigation/management

Planning and design

- Risk of damage from stormwater runoff.
 - Ensure drainage design prevents damaging stormwater runoff on adjacent properties.

Operation and maintenance

- Increased noise.
 - Compliance with bylaws must be ensured.
- Increased traffic.
 - Compliance with the traffic management recommendations in the EMPr must be complied with.
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8.5 What effects will the proposed development have on cultural heritage?

No heritage resources were identified on the sites and therefore there will be no impact as a result of the construction or operation of the development.

8.5.1 Potential impacts on cultural heritage and recommended mitigation/management actions

Design, pre-construction and construction

- General protection of Cultural Heritage.
 - Should any other cultural heritage resources be encountered during the course of construction, work in the affected area must be immediately be halted, the area cordoned off and the heritage authority contacted for advice on further action.

8.6 What effects will the proposed development have on the biodiversity of protected areas and other natural habitat (terrestrial and aquatic)?

A summary of impacts (incorporating a summary of specialist findings) is provided below, including recommended measures for management/mitigation of impacts. For further detail, please refer to the Geotechnical, Riparian/Wetland, Fauna and Vegetation specialist reports (Appendix E). According to the assessment, the potential negative impacts on biodiversity and natural habitat during construction, operation and rehabilitation are of high and medium significance, without management. With management, the impacts are considered to be of low and medium significance (see Table 21 in Chapter 9).

8.6.1 Loss/degradation of soils and substrates

The project will entail significant excavation work with heavy machinery, including cuts and fills.. These activities will potentially result in increased soil erosion, increased loss of topsoil, increased safety risk due to unstable banks or rockfall, and could also result in high sediment loads entering drains and nearby water courses.

8.6.1.1 Potential impacts on soils and substrates and recommended measures for mitigation/management

Preconstruction and construction

- Increased soil erosion and increased slope instability.
 - Topsoil is to be removed separately to subsoil and be safely stockpiled for use in rehabilitation.

- Exposed soils, and cut and filled surfaces are to be adequately safeguarded as per recommendations of the geotechnical report (Appendix E) and other applicable mitigation measures provided in the EMPr (Appendix F).
- Specialist geotechnical advice must be followed to ensure all new fill embankments are constructed to rule out the potential for large-scale instability and the associated negative environmental implications.
- Soil erosion on site must be controlled in accordance with the relevant specifications in the EMPr (Appendix F).
- Large sediment loads must be prevented from entering drains and watercourses.
- Controlled blasting is to be undertaken in accordance with legal requirements and best practice.
- The impacts on soils and substrates must be monitored during the construction phase as part of environmental management of the contract.

8.6.2 Loss/degradation of terrestrial vegetation and natural habitat

The project will require clearance of vegetation over the entire development and cut/fill areas. The project will, therefore, result in the permanent loss of vegetation. Degradation of habitat and loss of biodiversity could also potentially occur due to:

- ❑ Loss of Red Listed and protected species.
- ❑ Edge effects which lead to increased degradation of adjacent veld including spread of alien invasive plant species.
- ❑ Increased collection of medicinal plants, firewood, building wood and other plant material from adjacent areas.
- ❑ The production of a large amount spoil which could be dumped in a manner that degrades vegetation or hinders rehabilitation of cleared areas.

The eThekweni's Systematic Conservation Assessment or SCA (Maclean et al, 2015) identifies local conservation priorities in the form of CBAs (Critical Biodiversity Areas) and ESAs (Ecological Support Areas). These areas are considered important in meeting municipal biodiversity conservation targets and maintaining ecological functioning within untransformed terrestrial and freshwater ecosystems. According to the SCA spatial coverage the full extent of the property boundary is marked as a CBA.

Various areas of sensitive natural vegetation have been identified and investigated in detail in the specialist vegetation report (Appendix E), with site specific recommendations made for mitigation of impacts at the following locations:

- ❑ Grassland on Erf 2954 (*Aloe cooperi* and *Chironia palustris*)
- ❑ Encroachment into older forest growth on Erf 2955 (plus protected *Pittisporum viridiflorum*) outside eThekweni supported area.

8.6.2.1 Potential impacts on terrestrial vegetation and natural habitat and recommended measures for mitigation/management

Planning and design

- ❑ Loss/degradation of habitat and loss of biodiversity.
 - Ensure during project planning and tender processes that sufficient budget is allowed for plant rescue prior to vegetation clearance and rehabilitation post construction,.
 - Ensure sufficient funding will be available for an effective alien plant control programme.

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- Ensure sensitive areas (especially the older growth forest) are avoided where possible.
 - Communication and approvals from eThekweni Municipality's environmental division must be provided prior to construction.

Pre-construction and construction

- Loss/degradation of habitat and loss of biodiversity.
 - Where construction occurs close to any sensitive areas of natural vegetation or any plants of high conservation value, these must be suitably and visibly demarcated and cordoned off by the ECO prior to and during the construction phase.
 - Communication must be maintained with eThekweni Municipality's environmental division throughout construction.
 - A plant 'rescue' operation must be undertaken under the direction of an ecologist/botanist prior to construction, where plants of high conservation value will be impacted by any part of the development (construction or operation phase). The contractor is to conduct plant rescue according to the EMPr.
 - The construction footprint is to be kept to a minimum. No works are to occur outside of the negotiated servitude/working area and the working area is to be clearly demarcated.
 - Clearance and cutting back of natural vegetation to be kept to a minimum. The contractor is to conduct vegetation clearance according to the relevant specifications in the EMPr.
 - Stockpile and lay down areas are to be kept away from areas of sensitive natural vegetation.
 - Alien invasive plants around any excavated areas/work areas and within the road reserve must be kept under control during both construction and operation.
 - Where construction may impact on plants designated as 'specially protected' under the Natal Nature Conservation Ordinance (Act No. 15 of 1974), an application must be submitted to EKZNW to clear or translocate these plants as part of the plant rescue operation.
 - Where construction may impact on natural forests or individual trees protected in terms of the National Forests Act, 1998, an application must be submitted to the Department of Water Affairs (DWA).
 - Where construction may impact on plants listed as Threatened or Protected species (TOPS) under the National Environmental Management Act: Biodiversity Act, 2004 (10 of 2004), an application must be submitted to EKZNW to translocate these plants as part of the plant rescue operation.
 - Relevant general recommendations in the EMPr are to be followed. These include specifications relating to:
 - Vegetation clearance.
 - Site access and working areas.
 - Pollution prevention.
 - Siting of construction camps.
 - Rules for construction teams.
 - Control of alien invasive plants.
 - Site rehabilitation.
 - Dealing with excess spoil.

Operation

- Spread of alien invasive plants.
 - Alien invasive plants around any excavated areas/ fill areas must be kept under control during operation. Additional effort (follow ups) will be required in sensitive areas and additional funding will need to be made available.

8.6.3 Degradation of riparian areas

It should be noted that there are no wetlands on or in proximity to the site.

One seasonal stream and two ephemeral streams were identified on site during the aquatic investigation (see Appendix E).

The planned development is to be located outside of the delineated riparian habitat of the seasonal and ephemeral streams downstream of the three development notes/sites. Planned infrastructure which will affect the streams however, will include:

- Hardened surfaces associated with the residential development;
- Parking and road infrastructure;
- Storm water management infrastructure comprising outfalls to the downstream environment; and
- Waste water pipeline to traverse stream channels (pipe network) to connect to the waterborne sewage pipeline conveying wastewater to the Amanzimtoti Regional WWTW (Waste Water Treatment Works) located downstream.

In order to provide sanitation services to the development, a gravity pipeline is proposed to provide for the reticulation of domestic wastewater down the valley towards the regional Kingsburgh WWTW located downstream. This will require a pipeline crossing over the seasonal stream R01 at two locations to tie into the existing municipal wastewater pipeline. Whilst instream riverine habitat is unlikely to be disturbed where pipes are suspended across the channel (pipe bridge), the riparian habitat at each crossing is likely to be disturbed. Due to the riparian habitat of R01 being in a 'poor' condition (D PES) and dominated by Alien Plant species, the magnitude of the habitat disturbance is likely to be relatively moderate, with impact significance likely to be 'moderately-low' under a 'good' mitigation scenario taking into account the mitigation measures proposed in the EMPr.

Impact risks related specifically to construction associated with the riparian areas may include the following:

- The introduction of foreign and hazardous materials to the habitat which may result in pollution, such as fuel, cement, explosives and other building materials.
- Erosion, and the sedimentation of watercourses and aquatic habitat.
- Removal of terrestrial and riparian indigenous vegetation.
- Loss of sections of riparian habitat.
- Modifications to the river banks and beds as a result of earthworks, excavations and sloping.
- River canalisation and diversion.
- Erosion and the diversion of subsurface flow if artificial preferential flow paths are created as a result of earthworks.
- Risk of erosion forming if infilling is not adequately compacted or the longitudinal slope of the wetland system is not maintained.
- Vegetation disturbance leading to increased encroachment by alien invasive or ruderal plant species.

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- ❑ The impoundment of flows upstream of the crossing during construction, and desiccation of the systems downstream during construction. These conditions could continue post-development depending on how effectively the area has been rehabilitated.
 - ❑ The production of a large amount of spoil which could be dumped in a manner that degrades watercourses.
 - ❑ Impacts of discharge of large volumes of stormwater into the riparian areas.

8.6.3.1 *Potential impacts on wetland and riparian areas and recommended measures for mitigation/management*

Planning and design

- ❑ Increased erosion and instability due to earthworks and crossings.
 - The pipeline should be designed in such a way so as to take into account future channel dynamics.
 - Where practically possible river crossings are to follow pipe bridges over the river and not cross the channel. The pipe bridges will need to be designed such that pipes are suspended sufficiently high above the channel bed and above the high water mark so as not to interfere with natural flow regimes and such that pipes do not act as traps for debris and sediment transported through the channel.
 - Piers are to be placed on either side of the channel and not to be placed within the channel bed. Piers should be placed a sufficient distance up the bank (preferably on the top of the upper bank) and not below the water mark/bank full level.
 - Necessary erosion protection works must be constructed where the pipeline intersects the macro-channel banks of the river in order to prevent scouring or outer-bank erosion. Protection works to be considered include gabions, Reno-mattresses or other stabilising structures to armour them.
- ❑ Potential problems due to generation of large volumes spoil material.
 - The developer must ensure that the construction contracts that go out to tender are clear about re-use and/or disposal of material.

Pre-construction, construction

- ❑ Increased soil erosion, sedimentation and instability due to earthworks and crossings.
 - Earthworks associated with river crossings should take place in the winter months as this is the driest period for this region. It is acknowledged that this is not always practically achievable but should be accommodated as far as possible in construction scheduling. In addition, it should be noted that working in river channels during summer can be dangerous due to sudden flooding following thunder storms upstream in the catchment. Construction personnel need to be aware of this risk.
 - The crossings should be designed to ensure that flow patterns along the stream/river channel are not altered or diverted potentially resulting in stream bed and bank erosion and instability.
 - On steep slopes draining towards the identified freshwater ecosystems, small-scale diversion berms should be constructed, to reduce the risk of the earthworks becoming a preferred surface flow path leading to erosion. Where space is insufficient, suitable road fill embankment protection must be designed.
 - “Trench-breakers”, which are in-trench barriers, should be installed within any trench excavations to minimise the interception and accumulation of surface runoff water from upslope areas.
 - During earthworks, the top 50 cm of the riparian topsoil must be removed and stockpiled, to be replaced once activities have been completed. This is to maintain the existing seed bed and soil profiles as best as possible.

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- The construction footprint across the systems must be as narrow as practically possible, i.e. machinery must utilise the same route through the systems at all times so as to avoid unnecessary disturbance.
 - Increased soil compaction due to access and working areas.
 - Each construction working area must be clearly demarcated. Vehicle and personnel traffic must be minimised and must be restricted to within designated working areas.
 - Vehicle access routes must not pass through watercourses or any areas of sensitive vegetation.
 - Existing roads, tracks and pathways should be used wherever possible, and multiple pathways must not be allowed to develop.
 - Disturbance to steep slopes must be kept to an absolute minimum.
 - The activity must cover as small a working area as is feasible, to minimise the areas disturbed on site at any one time. If applicable to non-working areas, buffers must be established around open water, aquatic habitats, riparian and wetland vegetation and riparian banks.
 - Degradation of riparian vegetation, and faunal habitat.
 - The activity must cover as small a working area as is feasible to minimise the area disturbed at any one time.
 - Strict buffers must be established around all open water, aquatic habitats and riparian banks, outside of necessary access routes and designated work areas. It is recommended that a 50m buffer is maintained from the edge of riparian zones (Macfarlane et al., 2010). These limits are subject to review by authorities.
 - The buffers outside of access routes and designated working areas become strict no-go areas where habitats must not be disturbed, and personnel and machinery are not permitted entry unless directed by the ECO during rehabilitation.
 - The removal, damage or disturbance of any flora outside the working areas is not permitted. Fishing must be strictly prohibited in and around the working areas.
 - Clearing or pruning of indigenous vegetation at the site of activity must be kept to an absolute minimum. This must be done under the supervision of an appropriately qualified specialist. Any trimming or clearing of any threatened or protected species (TOPS) will require a permit from Ezemvelo KZN Wildlife.
 - Where protected or otherwise important fauna and flora are encountered and require removal, the ECO should be consulted and the individuals transferred to a nearby 'safe', similar habitat.
 - Where clearing is required outside of earthwork/construction areas, vegetation should be brush-cut rather than cleared to speed re-establishment following site closure.
 - No herbicides may be used on indigenous vegetation, particularly within proximity to wetland and riparian areas.
 - No project workers are permitted to catch, trap, poison, kill or disturb any animals present in the project areas.
 - No disturbance of nesting or feeding sites and fauna habitat is allowed. Advice from the ECO should be sought if such sites are encountered.
 - Increased risk of damage due to erosion and stormwater runoff.
 - Where construction activity takes place within floodlines of watercourses, temporary berms need to be formed to ensure the construction site and disturbed soils are protected from flooding, storm flows and erosion. This is particularly important when construction activities are taking place outside of the dry season.
 - Erosion that takes place during rainfall events must be rehabilitated immediately. A stock of suitable materials (e.g. sub- and top soil stock piles from excavated areas) for this purpose must be kept in a secure facility.

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- Stormwater control measures must be implemented with all stormwater generated within disturbed earthwork areas channelled to temporarily constructed settling ponds which allow the water to naturally filter back to the watercourse after settling.
 - Storm water retention and other constructed settling ponds must be suitably sited or protected so that river channel high flows will not cause flooding of the ponds. Siting of such ponds must be undertaken by a suitably qualified specialist (e.g. agricultural/wetland engineer) who must also provide advice as to the size and maintenance of the ponds.
 - Increased risk of pollution.
 - Fuel and hazardous material storage, handling and refuelling areas must not fall within the 1:100 year flood line of riparian / wetland habitat and buffer zones. Such storage areas must be located far (100m (horizontal distance) from riparian zones and any other sensitive environments.
 - All spills of foreign or hazardous materials or fluids must be cleaned up immediately, with all spills larger than 20 litres being reported to the ECO immediately.
 - A record must be kept of all spills and the corrective action taken.
 - Vehicles should not be parked in or near sensitive areas, such as watercourses or drainage areas.
 - Drip trays are to be provided under all standing vehicles to minimise hydrocarbon spills.
 - No eating or cooking and cleaning of persons, utensils or equipment may take place near rivers, streams or watercourses.
 - Appropriate provision must be made for ablutions during construction. If chemical toilets are used, they must be well serviced, and must be placed on level surfaces well away from any water courses, drainage lines or seeps, and any areas which may be subject to flooding. No spillage must occur during servicing and contents must be correctly removed from site.
 - Increased risk from demolition rubble and rock material.
 - No rock/soil from earthworks may be temporarily stockpiled or dumped within 32 m of the river channels and wetlands.

Construction and post construction

- Site rehabilitation following construction (construction and post construction).
 - In riparian areas, backfilling should occur as soon as possible, with soil compaction undertaken and shaping to original levels.
 - All disturbed areas are to be rehabilitated, with the riparian habitat at the crossing points and areas where disturbance has resulted from excavation being restored to near-natural conditions. This must be implemented immediately following completion of construction activity at each localised crossing.
 - The crossings should be rehabilitated to ensure that no barriers exist within the stream and that in-stream habitat is comparable to the natural or, at a minimum, preconstruction state.
 - Re-vegetation and rehabilitation must take place at worked sections immediately following completion so that vegetation can re-establish as quickly as possible.
 - Within, and in proximity to riparian areas, successful re-vegetation is crucial to stabilise soils and limit infestation by invasive alien plant species and dominance by ruderal species.
 - Simple re-vegetation with terrestrial species will not be suitable. Correct species for riparian and wetland habitats of the region must be re-established in consultation with an appropriately qualified specialist (e.g. botanist/vegetation ecologist).

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- Progress of vegetation establishment must be monitored regularly, with slow recovery requiring intervention to ensure site recovery and integrity, as well as physical stability.
 - Vehicle access tracks, footpaths and other areas of soil compaction and vegetation denudation as a result of the construction activities must be appropriately contoured, scarified and re-vegetated where required.
 - Any soil stockpile sites and sites of excavation must also be rehabilitated in the same fashion. Rehabilitation of such sites must be monitored and the results reported to the ECO.
 - All excess soil stockpile not taken off site or used to fix erosion issues, must be spread evenly over the disturbed areas, and capped with topsoil, prior to rehabilitation and re-vegetation.
 - Construction areas must be rehabilitated to a land surface which integrates with the surrounding slope morphology and river channel form so as not to create areas of soil instability, or flow paths which incorrectly direct stormflows and floods, thereby causing scour, erosion and damage to adjacent habitats and infrastructure.
 - Areas subject to concentrated water flows during rainfall or high flow events must receive particular attention during rehabilitation and re-vegetation. Where possible, these must be identified prior to commencement of construction activities. Where required, erosion protection structures may need to be designed and installed.
 - Artificial embankments, depressions and holes created by the construction activity must be contoured/rehabilitated to minimise risk to, and death of, all fauna types, from large mammals to small invertebrates.
 - Upon site closure, all infrastructure, foreign materials, waste, litter and contaminated water, rock or soil must be removed from site and disposed of in accordance with best environmental practice.

8.6.4 Faunal mortalities and negative effects on local faunal populations due to disturbance, loss of habitat and poaching

All disturbance to natural habitat (whether degraded or not) will impact negatively on the fauna that uses this habitat. Various types of fauna including reptiles, rodents, spiders and various other invertebrates will be disturbed and exposed during the works. Some may be injured and/or killed due to physical impact from machinery. Those that are exposed and displaced will be vulnerable to harm from other predators and from human beings. The project will result in a loss of habitat when the development occurs.

8.6.4.1 Potential impacts on fauna and recommended measures for mitigation/management

Construction

- Increased animal mortalities (including poaching)
 - Mortalities of various types of animals are inevitable due to the earthworks and movement of heavy machinery. This should be minimised by keeping the construction footprint to a minimum and by using existing access roads and disturbed areas for vehicle access and for stockpiling.
 - If snakes are encountered, they are not to be killed. There are several snake experts who can be contacted to remove and relocate snakes (e.g. the Fitzimons Snakepark in Durban tel: 031 337 6456).
 - Where possible, exposed vulnerable animals should be removed from the work area along with some of the soil/substrate they were found in (if applicable) and placed carefully in similar but safe habitat adjacent to/up or downstream of the works. The ECO must be notified and consulted in this regard.

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- Fishing must be strictly prohibited in and around the working areas.
 - No project workers are permitted to catch, trap, poison, kill or disturb any animals present in the project areas.
 - No disturbance of nesting or feeding sites and fauna habitat is allowed. Advice from the ECO should be sought if such sites are encountered in the work areas.
 - Monitoring of impacts on fauna must be included in environmental compliance monitoring.

8.7 What potential cumulative impacts can result from the proposed development?

A cumulative impact is an incremental impact on the environment that results from the impact of a proposed action when added to existing and reasonably foreseeable future actions. Cumulative effects can be both positive and negative. Also, the nature of cumulative impacts can be both temporary in nature (i.e. impacts that are restricted to the construction phase) and permanent (i.e. impacts that occur in both the construction and operation phases).

To enhance the positive impacts of the proposed development and, thus, enhance positive cumulative effects, the project should be implemented efficiently according to best environmental practise and the infrastructure should be well maintained.

To minimise negative impacts of the proposed development and, thus, its negative contributions towards cumulative effects on the environment, the project should be implemented with the recommended mitigation measures.

Potential cumulative impacts from the proposed development to the environment, as related to the key identified issues and impacts, are described below. Where relevant and applicable, significance ratings are assigned to impacts, according to the assessment conventions (Table 16) in the relevant impact tables (Chapter 9).

8.7.1 Cumulative national, regional and local economic and social benefits arising from the development.

This project, will increase the rates base in eThekweni municipality, as well as increasing employment opportunities significantly particularly during construction.

The cumulative contribution of the project to the local economy is considered to be of low (+) significance.

8.7.2 Cumulative impacts on adjacent properties infrastructure and services

The area around the proposed developments is either zoned open space or already developed, there is very little opportunity for other development in the area. The cumulative contribution of the project on adjacent properties and infrastructure is therefore considered to be of low (-) significance with or without mitigation (see Table 18 in Chapter 9).

8.7.3 Cumulative health, safety, security and other nuisance impacts

All or most of the health, safety, security and other nuisance impacts discussed in Section 8.3 have the potential to be compounded if other developments in close proximity occur simultaneously in the area. Activities that place additional pressure on traffic flow could be particularly problematic. However, as previously mentioned, there is unlikely to be other development occurring in the area. The cumulative impact on traffic with the school on Erf 2954 is potentially problematic.

These potential cumulative impacts are considered to be of medium (-) significance without mitigation and of low (-) significance with mitigation (see Table 19 in Chapter 9).

8.7.4 Cumulative impacts on the social and socio-economic environment during operation

The cumulative impact of noise, stormwater disposal, sewage disposal and traffic with the other developments around the properties could present a significant cumulative impact, particularly on Municipal infrastructure.

These potential cumulative impacts are considered to be of medium (-) significance without mitigation and of low (-) significance with mitigation.

8.7.5 Cumulative impacts on natural habitat

Along with other pressures on the natural environment, the proposed project will contribute cumulatively to the loss of good quality natural habitat and biodiversity in the study area and may accelerate degradation of adjacent areas through soil erosion, edge effects, spread of alien invasive plants, etc. The cumulative impact of the project on natural habitat is considered to be of medium (-) significance without mitigation and of low (-) significance with mitigation. (see Table 21 in Chapter 9).

8.8 What are the impacts of the No Development Alternative?

The No Development Alternative would result in the continued degradation of the natural environment in the area, with increasing encroachment of alien invasive plants, as well as the human interference occurring in the area.

The area is zoned for residential development, although the majority of the land is too steep for development.

The development will result in the creation of jobs and management of the remaining open areas under the same ownership in the area.

Currently the vacant properties pose a security and fire risk to the adjacent landowners and developing the areas will reduce these risks.

The sites are currently infested with alien vegetation and this will be managed should the development proceed, if the sites are not developed, the situation will deteriorate further.

The existing sewer line along the Little Amanzimtoti River is currently leaking. This has been brought to the attention of the Authorities as part of this environmental authorisation process. Should the project not proceed – there will be no one to ensure that this does not occur again in the future.

Obviously, should the development not take place, traffic volumes and noise from the area will remain unchanged, this would be a positive impact. However, no new jobs would be created and there would remain a shortage of affordable, entry level, housing in the area.

According to the assessment, the predicted impacts of the No Development Alternative are considered to be of medium (-) significance. Mitigation measures are not applicable in this case (see Table 22 in Chapter 9).

For the above reasons, the No Development Alternative is not recommended.

9. ASSESSMENT OF THE SIGNIFICANCE OF POTENTIAL IMPACTS

9.1 Assessment

This Chapter deals with the assessment of the significance of the potential impacts, both with and without management measures (mitigation). Impact tables, **where applicable** to the key issues discussed in this report, are provided in Tables 17-22.

Table 17	What economic and socio-economic benefits will result from the proposed development, at a local, regional and national scale?
Table 18	What effects will the development have on adjacent properties, infrastructure and services, and <i>vice versa</i> ?
Table 19	What potential health, safety, security and other nuisance impacts may be experienced as a result of the proposed development during construction?
Table 20	What negative impacts will the proposed development have on the social environment during operation?
Table 21	What effects will the proposed development have on the biophysical environment (soils, riparian, wetland and terrestrial natural habitat, fauna) during construction, operation and rehabilitation?
Table 22	What are the impacts of the No Development Alternative?

Table 17 Assessment of potential beneficial economic and socio-economic impacts resulting from the proposed development, at a local, regional and national scale, during planning, construction, operation and rehabilitation (with and without mitigation)

Description and Nature of Impact	Mitigation	Nature (Positive, Negative, Neutral)	Spatial Extent (Low, Medium, High)	Duration (Very Low, Low, Medium, High)	Intensity (Low, Medium, High)	Irreplaceable Loss of Resources (Low, Medium, High)	Reversibility of Impacts (Low, Medium, High)	Consequence (Low, Medium, High)	Probability (Low, Medium, High)	Significance (Low, Medium, High)
Employment creation and capacity building	Unmanaged	Positive	Medium	Low	Low	Low	Low	Low	Medium	Low
	Managed	Positive	Medium	Low	Medium	Low	Low	Medium	High	Medium
Opportunities for local contractors and SMMEs	Unmanaged	Positive	Medium	Low	Low	Low	Low	Low	Medium	Low
	Managed	Positive	Medium	Low	Medium	Low	Low	Medium	Medium	Medium

Table 18 Assessment of potential impacts of the proposed development on adjacent properties, infrastructure and services, and *vice versa*, during planning, construction, operation and rehabilitation (with and without mitigation)

Description and Nature of Impact	Mitigation	Nature (Positive, Negative, Neutral)	Spatial Extent (Low, Medium, High)	Duration (Very Low, Low, Medium, High)	Intensity (Low, Medium, High)	Irreplaceable Loss of Resources (Low, Medium, High)	Reversibility of Impacts (Low, Medium, High)	Consequence (Low, Medium, High)	Probability (Low, Medium, High)	Significance (Low, Medium, High)
Increased potential for crime	Unmitigated	Negative	Medium	Low	Medium	Low	High	Low	Medium	Low
	Mitigated	Negative	Medium	Low	Low	Low	High	Low	Low	Low
Effect on property values	Unmanaged	Positive	Medium	High	Low	Low	Low	Medium	Medium	Medium
	Managed	Positive	Medium	High	Low	Low	Low	Medium	Medium	Medium
Damage to/disruption of roads	Unmitigated	Negative	Medium	Very Low	Medium	Low	High	Low	Medium	Low
	Mitigated	Negative	Medium	Very Low	Medium	Low	High	Low	Low	Low
Dust, noise and Visual Impact	Unmitigated	Negative	Medium	Low	Medium	Low	High	Medium	Medium	Medium
	Mitigated	Negative	Medium	Low	Medium	Low	High	Low	High	Low
Cumulative impacts on adjacent properties, services and infrastructure	Unmitigated	Negative	Medium	Low	Low	Low	Medium	Low	Medium	Low
	Mitigated	Negative	Medium	Low	Low	Low	Medium	Low	Medium	Low

Table 19 Assessment of potential health, safety, security and other nuisance impacts resulting during construction of the proposed development (with and without mitigation)

Description and Nature of Impact	Mitigation	Nature (Positive, Negative, Neutral)	Spatial Extent (Low, Medium, High)	Duration (Very Low, Low, Medium, High)	Intensity (Low, Medium, High)	Irreplaceable Loss of Resources (Low, Medium, High)	Reversibility of Impacts (Low, Medium, High)	Consequence (Low, Medium, High)	Probability (Low, Medium, High)	Significance (Low, Medium, High)
Increased likelihood of road traffic accidents	Unmitigated	Negative	Medium	Low	Low	Low	High	Medium	Medium	Medium
	Mitigated	Negative	Medium	Low	Low	Low	High	Low	Low	Low
Disruption to vehicle traffic and access	Unmitigated	Negative	Medium	Low	High	Low	High	High	High	High
	Mitigated	Negative	Medium	Low	Medium	Low	High	Medium	High	Medium
The effect of increased noise on surrounding receivers during construction	Unmitigated	Negative	Medium	Low	Medium	Low	High	Medium	Medium	Medium
	Mitigated	Negative	Medium	Low	Medium	Low	High	Low	Medium	Low
Health and safety risks to those in close proximity to construction activities	Unmitigated	Negative	Low	Low	Medium	Low	High	Medium	Medium	Medium
	Mitigated	Negative	Low	Low	Medium	Low	High	Low	Medium	Low
Increased crime (increased security risk)	Unmitigated	Negative	Medium	Low	Medium	Low	High	Low	Medium	Low
	Mitigated	Negative	Medium	Low	Low	Low	High	Low	Low	Low
Increased dust	Unmitigated	Negative	Medium	Low	Medium	Low	High	Medium	Medium	Medium
	Mitigated	Negative	Medium	Low	Medium	Low	High	Low	Medium	Low
Increased spread of disease	Unmitigated	Negative	Medium	Low	Medium	Low	High	Medium	Medium	Medium
	Mitigated	Negative	Medium	Low	Medium	Low	High	Low	Medium	Low

Description and Nature of Impact	Mitigation	Nature (Positive, Negative, Neutral)	Spatial Extent (Low, Medium, High)	Duration (Very Low, Low, Medium, High)	Intensity (Low, Medium, High)	Irreplaceable Loss of Resources (Low, Medium, High)	Reversibility of Impacts (Low, Medium, High)	Consequence (Low, Medium, High)	Probability (Low, Medium, High)	Significance (Low, Medium, High)
Degraded aesthetics	Unmitigated	Negative	Medium	Low	Low	Low	High	Low	High	Low
	Mitigated	Negative	Medium	Low	Low	Low	High	Low	High	Low
Cumulative health, safety, security and other nuisance impacts	Unmitigated	Negative	Medium	Low	High	Low	Medium	Medium	Medium	Medium
	Mitigated	Negative	Medium	Low	Medium	Low	High	Low	Medium	Low

Table 20 Assessment of potential negative impacts of the proposed development on the social and socio-economic environment during operation (with and without mitigation)

Description and Nature of Impact	Mitigation	Nature (Positive, Negative, Neutral)	Spatial Extent (Low, Medium, High)	Duration (Very Low, Low, Medium, High)	Intensity (Low, Medium, High)	Irreplaceable Loss of Resources (Low, Medium, High)	Reversibility of Impacts (Low, Medium, High)	Consequence (Low, Medium, High)	Probability (Low, Medium, High)	Significance (Low, Medium, High)
Increased noise	Unmitigated	Negative	Medium	High	Medium	Low	Low	Low	Medium	Low
	Mitigated	Negative	Medium	High	Low	Low	Low	Low	Low	Low
Increased traffic in the vicinity of the access points to the developments	Unmitigated	Negative	Medium	High	Medium	Low	High	High	High	High
	Mitigated	Negative	Medium	High	Low	Low	High	Medium	Medium	Medium
Damage to adjacent properties due to poorly designed stormwater drainage	Unmitigated	Negative	Medium	High	Medium	Medium	High	Medium	Low	Medium
	Mitigated	Negative	Medium	High	Low	Low	High	Low	Low	Low

Table 21 Assessment of potential impacts of the proposed development on the biophysical environment (soils, riparian, wetland, terrestrial natural habitat and fauna) during construction, operation and rehabilitation (with and without mitigation)

Description and Nature of Impact	Mitigation	Nature (Positive, Negative, Neutral)	Spatial Extent (Low, Medium, High)	Duration (Very Low, Low, Medium, High)	Intensity (Low, Medium, High)	Irreplaceable Loss of Resources (Low, Medium, High)	Reversibility of Impacts (Low, Medium, High)	Consequence (Low, Medium, High)	Probability (Low, Medium, High)	Significance (Low, Medium, High)
Loss of topsoil	Unmitigated	Negative	Medium	High	High	Medium	Low	High	High	High
	Mitigated	Negative	Low	Low	Low	Medium	Low	Low	Low	Low
Loss/degradation of terrestrial vegetation and natural habitat	Unmitigated	Negative	Medium	High	Medium	High	Low	High	High	High
	Mitigated	Negative	Low	Low	Medium	High	Low	Medium	Low	Medium
Loss/ degradation of riparian areas ²	Unmitigated	Negative	Medium	High	Medium	Medium	Low	Medium	Medium	Medium
	Mitigated	Negative	Medium	Low	Medium	Medium	Low	Low	Low	Low
Faunal mortalities and negative effect on local faunal populations due to disturbance, loss of habitat and poaching	Unmitigated	Negative	Medium	Medium	Medium	Low	Medium	Medium	High	Medium
	Mitigated	Negative	Medium	Medium	Low	Low	High	Low	Low	Low
Cumulative impacts on natural habitat	Unmitigated	Negative	Medium	High	Medium	Medium	Medium	Medium	High	Medium
	Mitigated	Negative	Medium	High	Low	Low	High	Low	High	Low

Table 22 Assessment of potential impacts of the No Development Alternative

Description and Nature of Impact	Mitigation	Nature (Positive, Negative, Neutral)	Spatial Extent (Low, Medium, High)	Duration (Very Low, Low, Medium, High)	Intensity (Low, Medium, High)	Irreplaceable Loss of Resources (Low, Medium, High)	Reversibility of Impacts (Low, Medium, High)	Consequence (Low, Medium, High)	Probability (Low, Medium, High)	Significance (Low, Medium, High)
Deferment/avoidance of the negative impacts of construction (social disruption, noise and nuisance, and destruction/disturbance of natural habitat)	Unmitigated	Positive	High	N/a	N/a	N/a	N/a	medium	High	Medium
	N/a	N/a	N/a	N/a	N/a	N/a	N/a	N/a	N/a	N/a
Disadvantages to the local, regional and national economy	Unmitigated	Negative	Medium	High	Medium	High	Low	Medium	High	Medium
	Mitigated	N/a	N/a	N/a	N/a	N/a	N/a	N/a	N/a	N/a

10. ENVIRONMENTAL IMPACT STATEMENT

Taking the assessment of potential impacts into account, a summary of the environmental impacts of the proposed activity (after mitigation) is provided below.

Effects of the project on the social environment and *vice versa*

The impacts on the social environment are both positive and negative. However, the long term impacts are, in general positive, together with the short term creation of hundreds of jobs during construction.

The majority of the negative social impacts are short term, related to the disruption (noise, dust, traffic etc) during construction.

With efficient and proper project management and implementation, as well as the application of the mitigation measures recommended in this report (carried over into the EMP), **the negative social impacts during construction, will be of low-medium significance, with no negative social impacts of high significance.**

The positive impacts of the project on the social environment during operation will be of medium significance.

During the construction period, it is definite that some **positive economic/socio-economic impacts of medium significance will accrue to the local community** due to the provision of temporary jobs for semi skilled and unskilled workers, the increased opportunities for local contractors and SMMEs.

There are potentially **low to medium significance negative impacts during operation** (relating to traffic, noise and stormwater).

Effects of the project on cultural heritage resources and *vice versa*

There will be no impacts on cultural heritage resources either during construction or operation.

Effects of the project on the biophysical environment and *vice versa*

The potential impacts on the vegetation on the site, without appropriate mitigation, are potentially of high significance due to the potential extent of disturbance due to the large amount of cut and fill and the sensitivity of some of the 'old forest' and grassland plants in some of the areas. **With mitigation, the negative impacts of construction and operation on the biophysical environment (soils and substrates, terrestrial and riparian habitat, as well as associated fauna) will be of medium significance.**

Effects of the No Development Alternative

While the No Development Alternative would defer the negative impacts of construction on the social and biophysical environment, as described above, this would be of short term benefit only. In the longer term, the No Development Alternative will result in increasing degradation of the flora on site with further encroachment of alien vegetation, and continued risks of vagrants on the property. **The negative impacts of the No Development Alternative have been assessed as being of medium negative significance. For these reasons, this alternative is not recommended.**

11. RECOMMENDATION OF THE ENVIRONMENTAL ASSESSMENT PRACTITIONER

It is the opinion of the EAP that the information contained in this report and the documentation attached hereto is sufficient to make a decision in respect of the activity applied for, viz the proposed development of dwelling units of Erf 2954, 2955 and 2956 Kingsburgh ext 9.

It is the opinion of the EAP that the proposed activity can be authorised, based on the findings of the assessment process and conditional on the following:

- ❑ Compliance with the site specific EMPr.
- ❑ Financial provision must be made for environmental management of the contract in accordance with the specifications of the Environmental Management Programme and associated subsidiary plans. This includes provision for:
 - Alien plant control.
 - Plant rescue and site-specific rehabilitation of specified sensitive areas.
- ❑ The developer is to compile a detailed plan for the disposal of excess spoil, and the relevant specifications included in the contract documents.
- ❑ The developer is to ensure that close liaison is maintained with eThekweni's relevant departments, particularly the environmental Department, with regard to ecological issues arising.
- ❑ The developer must engage with the Department of Human Settlements, Water and Sanitation, with regard to the requirement for a Water Use Licence.
- ❑ Communication and/or permits must be obtained from eKZNW and DAFF with regard to protected species and the removal of trees.
- ❑ When working on Erf 2954, constant communication must be maintained with the school to ensure the safety of the pupils and minimisation of traffic disruption.
- ❑ A conservation servitude or similar, is developed on Erf 2957 and the open space portions of the other properties, to ensure that the ongoing management of the flora and fauna on these sites is undertaken.

12. CONCLUDING REMARKS

This draft BAR has been submitted to the competent authority, EDTEA, and made available for public review and will be finalised after consideration of comments submitted. Thereafter, the final report will be submitted to EDTEA along with the application form. Registered I&APs will be kept informed of all further submissions and EDTEA's decision making with respect to the issuing of an Environmental Authorisation (EA), as well as the appeal procedure which should be followed should a member of the public wish to appeal the EA.

VC King

NAME OF EAP:

SIGNATURE OF EAP

DATE

13. REFERENCES

eThekwini Spatial Development Framework 2018-2019.

eThekwini IDP, 2011/2012. eThekwini Municipality, Integrated Development Plan 5 Year Plan: 2011 to 2016

Mucina, L. & Rutherford, M. (eds). 2006. The vegetation of South Africa, Lesotho and Swaziland. Strelitzia 19.

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.

Statistics South Africa, 2012. Census 2011 municipal report, KwaZulu-Natal.

APPENDIX A: APPLICATION FORM, EAP DECLARATION ETC

- A1 Minutes of Pre-application meeting
- A2 EDTEA Application Form
- A3 EAP declaration
- A4 EAP CV.
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APPENDIX B: SITE PHOTOGRAPHS

APPENDIX C: ZONATION

- Land Use and Zonation.

APPENDIX D: PUBLIC PARTICIPATION DOCUMENTATION & CORRESPONDENCE

- ❑ E1 Adverts
- ❑ E2 Background Information Document
- ❑ E3 Site Notices.
- ❑ E4 Email to I&Aps
- ❑ E5 List of Registered I&APs.
- ❑ E6 Comments and Responses Report.
- ❑ E7 Stakeholder responses to BID
- ❑ E8 Authorities Correspondence and Meetings.
 - Minutes of Meeting eThekwini EPCPD (06.06.18).

APPENDIX E: SPECIALIST STUDIES

- E1 Heritage Impact Assessment Phase 1
- E2 Palaeontological Assessment
- E3 Geotechnical Report.
- E4 Riparian & Wetland Assessment
- E5 Vegetation Assessment.
- E6 Faunal Assessment
- E7 Traffic Assessment

APPENDIX F: ENVIRONMENTAL MANAGEMENT PROGRAMME (DRAFT)

- Environmental Management Programme

APPENDIX G: SCREENING REPORTS

- G1 Erf 2954
- G2 Erf 2955
- G2 Erf 2956