



6 Indwa Place, Kloof, 3610 South Africa

Tel: [+27] (31) 764 2515  
Fax: [+27] (31) 764 2515  
Mobile: [+27] 82 772 9941  
Email: [guyn@saol.com](mailto:guyn@saol.com)

VAT Registration No: 4950171530  
CC Registration No: CK 93/07200/23

# **ENVIRONMENTAL IMPACT ASSESSMENT REPORT (EIA DC22/0056/10)**

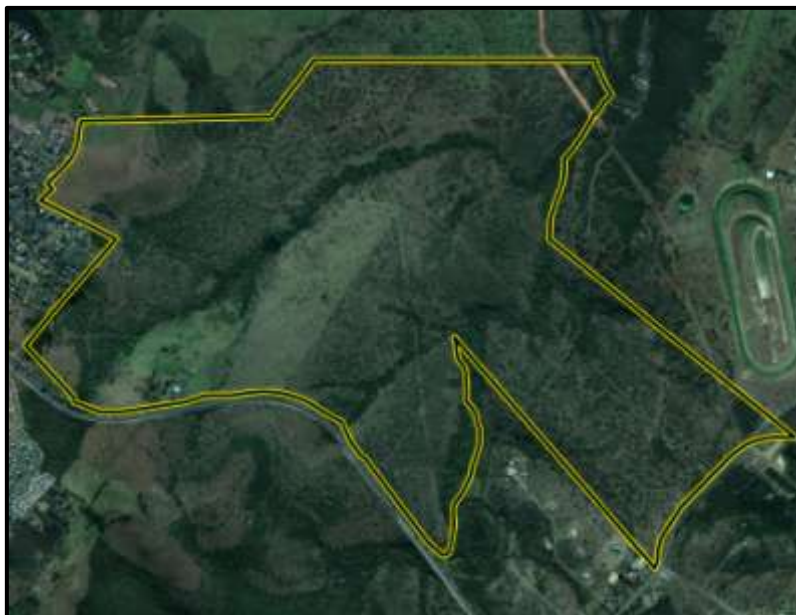
## **ON THE PROPOSED**

### **HILCOVE HILLS DEVELOPMENT**

#### **ON**

### **ERF 10119 PIETERMARITZBURG AND PORTION OF ERF 506 ASHBURTON**

**SITUATED WITHIN THE EASTERN AREA OF MSUNDUZI LOCAL  
MUNICIPALITY TO THE NORTH OF THE N3 HIGHWAY BETWEEN  
THE RESIDENTIAL AREAS BELLEVUE AND ASHBURTON WITHIN  
THE PROVINCE OF KWAZULU-NATAL**



**MAY 2012**

## **PREAMBLE: CONTEXT AND OVERVIEW OF REPORT**

This Environmental Impact Assessment (EIA) Report has been prepared by Guy Nicolson Consulting cc as the independent environmental assessment practitioner on behalf of the applicant, Hilcove Properties (Pty) Ltd for their mixed use Hilcove Hills development on 483.36 hectares of vacant land on the eastern edge of the developed area of Pietermartizburg, adjacent to the northern edge of the N3 highway.

It follows on from the acceptance of the final scoping and the approved Plan of Study for an Environmental Impact Assessment, and has been prepared in terms of the requirements of EIA Regulation : Government Notice 543 of 18 June 2010. It is a public document, submitted to the competent environmental authorities the KwaZulu-Natal Department of Agriculture, Environmental Affairs, and also to the registered interested and affected parties for comments, to be taken into account in the EIA process.

Comments may be provided to:

<b>First name &amp; Surname:</b>	Guy Nicolson		
<b>Company name:</b>	Guy Nicolson Consulting cc		
<b>Postal address:</b>	6 Indwa Place Kloof		
<b>Postal code:</b>	3610	<b>Cell:</b>	082 772 9941
<b>Telephone:</b>	031 764 2515	<b>Fax:</b>	031 764 2515
<b>Email Address:</b>	guyn@saol.com		

As indicated in the more detailed table of contents provided overleaf, this report is comprised of the following main sections:

1. Introduction on the background and nature of this application.
2. List of the activities for which the Environmental Authorization is required.
3. Explanation of the EIA process
4. Background Information on Guy Nicolson as the Environmental Assessment Practitioner.
5. Description of the site
6. Description of the proposed development
7. Overview of the legal and regulatory framework pertaining to the application
8. Description of the public participation undertaken so far.
9. Assessment of the need and desirability of the proposed development
10. Assessment of the potential environmental impacts which have been identified
11. Identifies and assesses the identified alternatives to the proposed development.
12. Provides and Environmental Impact Statement and recommendations.
13. Outlines the way forward in the EIA process.
14. Contains the illustrations pertinent to the site and development proposal.
15. Contains the appendices in support of the report, and which are referred to extensively within it. These appendices include the specialist reports which have been commissioned to describe various aspects of the site, the development and the related potential impacts and alternatives.

## **TABLE OF CONTENTS**

<b>1.</b>	<b>INTRODUCTION .....</b>	<b>7</b>
<b>2.</b>	<b>THE LISTED ACTIVITIES FOR WHICH THE ENVIRONMENTAL AUTHORIZATION IS REQUIRED.....</b>	<b>10</b>
2.1.	THE REGULATIONS AND RELATED LISTED ACTIVITIES FOR WHICH THIS APPLICATION WAS REGISTERED.....	10
<b>3.</b>	<b>EIA PROCESS FOLLOWED AND REGISTRATION OF THE EIA APPLICATION .....</b>	<b>12</b>
3.1.	OVERVIEW OF THE EIA PROCESS .....	12
3.2.	THE STAGE THAT THIS EIA PROCESS IS AT .....	13
3.3.	REGISTRATION OF THE EIA APPLICATION .....	14
<b>4.</b>	<b>EXPERTISE OF THE ENVIRONMENTAL ASSESSMENT PRACTITIONER .....</b>	<b>15</b>
<b>5.</b>	<b>DESCRIPTION OF THE PROPERTIES &amp; THE AFFECTED ENVIRONMENT .....</b>	<b>16</b>
5.1.	INTRODUCTION TO THE OVERVIEW DESCRIPTION .....	16
5.2.	LOCATION, CONTEXT AND THE SURROUNDING ENVIRONMENT .....	17
5.2.1.	GEOLOGY .....	18
5.2.2.	TOPOGRAPHY .....	19
5.2.3.	HYDROLOGY .....	20
5.2.4.	WETLAND AREAS .....	21
5.2.5.	VEGETATION AND LAND USE.....	24
5.2.6.	OVERVIEW OF THE FAUNA LIKELY TO OCCUR ON THE SITE .....	26
5.2.7.	AGRICULTURAL POTENTIAL.....	27
5.2.8.	ON SITE DEVELOPMENT AND INFRASTRUCTURE .....	28
5.2.9.	PIPELINE SERVITUDES .....	28
5.2.10.	CULTURAL HERITAGE CONSIDERATIONS.....	29
5.2.11.	VISUAL QUALITIES AND SENSE OF PLACE .....	30
<b>6.</b>	<b>DESCRIPTION OF THE PROPOSED DEVELOPMENT .....</b>	<b>31</b>
6.1.	THE MAIN AIM OF THE PLANNING AND DEVELOPMENT EXERCISE .....	31
6.2.	MARKETING VISION.....	31
6.3.	THE NEED AND DESIRABILITY FOR THE PROPOSED DEVELOPMENT .....	32
6.4.	THE PROPOSED DEVELOPED LAND USES.....	32
6.5.	PRIVATE PASSIVE OPEN SPACE AREAS.....	34
6.6.	SECURITY AND ACCESS.....	37
6.7.	COMPLIANCE WITH THE MSUNDUZI INTEGRATED DEVELOPMENT PLAN, SPATIAL DEVELOPMENT FRAMEWORK .....	37
6.8.	ENVIRONMENTAL SENSITIVITY AND CONSERVATION CONCERNS INTEGRATED INTO THE PROPOSED DEVELOPMENT PLAN.....	38
6.9.	ARCHITECTURAL DESIGN CODE.....	39
6.10.	GREEN BUILDING CODE .....	40
6.11.	CONTROLS AGAINST POTENTIALLY POLLUTING OR HAZARDOUS ACTIVITIES .....	40
6.12.	CONDITIONS OF ESTABLISHMENT .....	41
6.13.	SERVICES AGREEMENTS.....	41
6.14.	THE HOME OWNERSHIP STRUCTURE AND THE MANAGEMENT OF THE VARIOUS COMPONENTS OF THE OVERALL DEVELOPMENT .....	41
6.15.	TRAFFIC IMPACTS AND ROAD UPGRADES .....	43

---

6.16.	ENGINEERING INFRASTRUCTURAL SERVICES .....	51
6.17.	STORM WATER MANAGEMENT .....	53
6.18.	SOLID WASTE MANAGEMENT .....	54
6.19.	ELECTRICAL SUPPLY .....	54
6.20.	PHASING OF THE DEVELOPMENT .....	56
<b>7.</b>	<b>IDENTIFICATION OF THE LEGISLATION AND GUIDELINES TAKEN INTO ACCOUNT.....</b>	<b>59</b>
<b>8.</b>	<b>DETAILS OF THE PUBLIC PARTICIPATION PROCESS .....</b>	<b>64</b>
8.1.	BACKGROUND .....	64
8.1.1.	THE PUBLIC PARTICIPATION PROCEDURES THAT HAVE BEEN UNDERTAKEN SO FAR IN THIS EIA PROCESS .....	64
8.2.	REGISTER OF INTERESTED AND AFFECTED PARTIES.....	66
8.3.	RECORD OF THE ISSUES AND CONCERNS RAISED FOR FURTHER INVESTIGATION AND ASSESSMENT IN THE EIA PROCESS.....	66
<b>9.</b>	<b>ASSESSMENT OF THE NEED AND DESIRABILITY OF THE ACTIVITY ...</b>	<b>83</b>
9.1.	INTRODUCTION.....	83
9.2.	SUMMARY OF THE McCARTHY NEED AND DESIRABILITY REPORT .....	83
9.3.	SUMMARY OF THE McCARTHY ADDENDUM NEED AND DESIRABILITY REPORT .....	85
9.4.	OVERALL ASSESSMENT OF NEED AND DESIRABILITY.....	87
<b>10.</b>	<b>THE IDENTIFICATION AND ASSESSMENT OF POTENTIAL IMPACTS ...</b>	<b>88</b>
10.1.	GENERAL APPROACH TO THE ASSESSMENT OF IMPACTS.....	88
10.2.	THE IDENTIFICATION OF THE POTENTIAL ENVIRONMENTAL IMPACTS TO BE ASSESSED .....	92
10.3.	ASSESSMENT OF POTENTIAL GENERAL ENVIRONMENTAL IMPACTS ASSOCIATED WITH CONSTRUCTION ACTIVITIES .....	94
10.3.1.	THE POTENTIAL GENERAL IMPACTS ASSOCIATED WITH CONSTRUCTION ACTIVITIES.....	94
10.3.2.	ASSESSMENT OF POTENTIAL IMPACTS ASSOCIATED WITH DUST DURING CONSTRUCTION .....	99
10.3.3.	ASSESSMENT OF POTENTIAL IMPACTS ASSOCIATED WITH STORM WATER MANAGEMENT DURING CONSTRUCTION.....	101
10.3.4.	POTENTIAL IMPACTS ASSOCIATED WITH ROAD CONSTRUCTION .....	103
10.3.5.	POTENTIAL IMPACTS ASSOCIATED WITH THE PROVISION OF POTABLE WATER .....	105
10.3.6.	POTENTIAL IMPACT ASSOCIATED WITH THE SUPPLY OF ELECTRICITY .....	106
10.3.7.	POTENTIAL IMPACTS ASSOCIATED WITH THE INSTALLATION OF INFRASTRUCTURE FOR THE DISPOSAL OF WASTE WATER .....	107
10.4.	POTENTIAL IMPACTS ON THE BIOPHYSICAL ENVIRONMENT.....	109
10.4.1.	POTENTIAL IMPACTS ON WATER QUALITY .....	110
10.5.	POTENTIAL IMPACTS ON WATER QUANTITY AND DOWNSTREAM FLOW.....	114
10.5.1.	POTENTIAL IMPACTS ON WETLANDS .....	116
10.5.2.	ASSESSMENT OF THE CUMULATIVE IMPACTS ON THE CATCHMENT .....	120
10.5.3.	POTENTIAL IMPACTS ON AIR QUALITY .....	121
10.5.4.	POTENTIAL IMPACTS ON BIODIVERSITY .....	124
10.5.5.	ASSESSMENT OF THE IMPACTS OF THE PROPOSED DEVELOPMENT ON THE ECOLOGICAL GOODS AND SERVICES PROVIDED BY THE SITE .....	132
10.5.6.	ASSESSMENT OF THE IMPACTS OF THE PROPOSED DEVELOPMENT ON THE LOWER MPUSHINI VALLEY CONSERVANCY AS A PROTECTED ENVIRONMENT .....	135
10.6.	POTENTIAL VISUAL IMPACTS .....	137
10.7.	POTENTIAL IMPACTS ON THE SENSE OF PLACE .....	142
10.8.	POTENTIAL GENERAL SOCIO-ECONOMIC IMPACTS .....	150
10.9.	POTENTIAL IMPACTS ON THE LOSS OF AGRICULTURAL .....	152

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10.10.	POTENTIAL IMPACTS OF THE PROPOSED NEW ROADS ON NEIGHBOURING PROPERTIES .....	154
<b>11.</b>	<b>IDENTIFICATION AND ASSESSMENT OF ALTERNATIVES .....</b>	<b>164</b>
11.1.	INTRODUCTION TO THE CONSIDERATION OF ALTERNATIVES .....	164
11.2.	THE NO – DEVELOPMENT OPTION .....	165
11.3.	THE ALTERNATIVE USES FOR THE SITES .....	166
11.3.1.	THE ECO-ESTATE OVER THE ENTIRE SITE ALTERNATIVE .....	166
11.3.2.	THE DIVISION OF THE SITE INTO SMALLHOLDINGS .....	168
11.3.3.	THE DEVELOPMENT OF THE SITE FOR SOCIAL, LOW COST HOUSING.....	169
11.3.4.	THE DEVELOPMENT OF THE SITE FOR LIGHT INDUSTRIAL AND RELATED COMMERCIAL USE.....	171
11.3.5.	CONCLUDING COMMENTS IN REGARD TO THE CONSIDERATION OF ALTERNATIVES, AS OPPOSED TO THE PROPOSED DEVELOPMENT APPLICATION.....	172
11.4.	THE ALTERNATIVE SITE OPTION .....	173
11.5.	ALTERNATIVE TECHNOLOGIES AND APPROACHES .....	174
<b>12.</b>	<b>ENVIRONMENTAL IMPACT STATEMENT .....</b>	<b>175</b>
12.1.	INTRODUCTION.....	175
12.2.	SUMMARY OF THE ASPECTS OF POTENTIAL ENVIRONMENTAL IMPACTS AND ALTERNATIVES ASSESSED.....	175
12.3.	CONCLUDING ENVIRONMENTAL IMPACT STATEMENT .....	185
12.4.	RECOMMENDATIONS.....	185
<b>13.</b>	<b>THE NEXT STEPS IN THE EIA PROCESS.....</b>	<b>188</b>
<b>14.</b>	<b>LIST OF FIGURES.....</b>	<b>189</b>
1.	SITE LOCATION PLAN	
2.	AERIAL PHOTOGRAPH OF THE SITE WITH CONTOURS	
3.	GEOLOGY OF THE SITE	
4.	SLOPE ANALYSIS OF THE SITE	
5.	ASPECT ANALYSIS OF THE SITE	
6.	LOCATION OF THE SITE WITHIN THE MKHONDENI STREAM CATCHMENT AREA	
7.	HYDROLOGY OF THE SITE	
8.	DELINEATION OF WETLANDS EXISTING ON THE SITE	
9.	ECOLOGICAL UNITS OF THE SITE	
10.	AGRICULTURAL POTENTIAL OF THE SITE	
11.	THE PROPOSED DEVELOPMENT LAYOUT PLAN	
12.	EXAMPLES OF THE APPLICATION OF THE ARCHITECTURAL DESIGN CODE	
13.	CORE AREAS OF FLORAL CONSERVATION SUPERIMPOSED ONTO THE ORIGINAL AND AMENDED LAYOUT PLANS	
14.	CORE AREAS FOR FAUNAL CONSERVATION SUPERIMPOSED ONTO ORIGINAL AMENDED LAYOUT PLANS	
15.	CONCLUDING ANALYSIS OF THE VISUAL IMPACT ASSESSMENT REPORT	
16.	THE ECO-ESTATE ALTERNATIVE LAND USE	
17.	THE SMALL HOLDING ALTERNATIVE LAND USE	
18.	THE LOW COST SOCIAL HOUSING ALTERNATIVE LAND USE	
19.	THE COMMERCIAL AND LIGHT INDUSTRIAL LAND USE ALTERNATIVE FOR THE SITE	
20.	PLAN OF THE MOST DESIRABLE LAND USES FOR THE MKHONDENI STREAM CATCHMENT FROM THE STRATEGIC ENVIRONMENTAL ASSESSMENT REPORT	
<b>15.</b>	<b>LIST OF APPENDICES .....</b>	<b>190</b>
15.1.	PUBLIC PARTICIPATION DOCUMENTATION:	

- 15.1.1. REGISTER OF INTERESTED AND AFFECTED PARTIES AND
- 15.1.2. CORRESPONDENCE RECEIVED AFTER THE CIRCULATION OF THE FINAL SCOPING REPORT
- 15.2. COMMENTS RECEIVED FROM ORGANISATIONS WITH PIPELINE SERVITUDES
  - 15.2.1. FROM TRANSNET PIPELINES
  - 15.2.2. FROM UMGENI WATER
- 15.3. GEOTECHNICAL REPORT
- 15.4. WETLAND DELINEATION AND FUNCTIONAL ASSESSMENT REPORT
- 15.5. BIODIVERSITY ASSESSMENT REPORT
- 15.6. AGRICULTURAL POTENTIAL REPORT
- 15.7. CULTURAL HERITAGE REPORT
- 15.8. TOWN PLANNING REPORT
- 15.9. NEED AND DESIRABILITY AND SOCIO-ECONOMIC REPORT AND ADDENDUM TO NEED AND DESIRABILITY REPORT
- 15.10. BULK SERVICES – ENGINEERING SERVICES REPORT
- 15.11. STORM WATER MANAGEMENT PLAN
- 15.12. ELECTRICAL AND ANCILLARY SERVICES REPORT AND ELECTRICAL GREEN DESIGN REPORT, AND LETTER FROM ESKOM CONFIRMING ABILITY TO SUPPLY ELECTRICITY
- 15.13. GREEN BUILDING CODE
- 15.14. TRAFFIC IMPACT ASSESSMENT
- 15.15. AIR QUALITY IMPACT ASSESSMENT
- 15.16. VISUAL IMPACT ASSESSMENT REPORT
- 15.17. SENSE OF PLACE REPORT
- 15.18. PROPOSED END USE OWNERSHIP STRUCTURE
- 15.19. ARCHITECTURAL DESIGN REPORT
- 15.20. VEGETATION, WILDLIFE POTENTIAL AND MANAGEMENT GUIDELINES
- 15.21. DRAFT ENVIRONMENTAL MANAGEMENT PROGRAMME

## 1. INTRODUCTION

Guy Nicolson Consulting cc has been appointed as the independent Environmental Assessment Practitioner (EAP) by the Hicove Properties (Pty) Ltd, and also henceforth also referred to in this report as “the applicant”), to implement the required Environmental Impact Assessment (EIA) procedures on the proposed Hilcove Hills mixed use development.

This 483.36-hectare development is situated within the eastern area of the Msunduzi Local Municipality to the north of the N3 highway between the residential areas of Bellevue of the city of Pietermartizburg to the west and Ashburton residential to the east, within the province of KwaZulu-Natal, South Africa.

A more detailed description of these properties is provided below within section 5 of this report and, unless specifically referred to in regard to a particular property, these collective properties will also be referred to below within this report as “the site”.

The details of the applicant are tabulated below as follows:

**Project applicant:**

<b>Trading name :</b>	Hilcove Properties ( Pty ) Ltd		
<b>Contact person:</b>	Mr. C.P. Brink of Laurusco Developments ( Pty ) Ltd.		
<b>Physical address:</b>	15 Timeball Boulevard, Durban Point Waterfront, Durban, 4001		
<b>Postal address:</b>	PO Box 20443 Durban North		
<b>Postal code:</b>	4016	<b>Fax</b>	033 337 3412
<b>Telephone:</b>	031 337 3460	<b>Mobile:</b>	083 255 4856
<b>E-mail:</b>	neels@laurusco.com		

This Environmental Impact Assessment (EIA) report is produced in terms of the relevant EIA regulatory procedures, as elaborated on further within section 3 below, and has been circulated to the relevant state organisations and registered interested and affected parties for their consideration and comment, as is described in more detail within section 13 of this EIA report.

This EIA report follows on from the circulation of the draft and final scoping reports in the scoping phase of this project to all the relevant government organisations and registered interested and affected parties, during the scoping process which preceded the production of this EIA report.

All comments received from the relevant government organisations to the draft and final scoping reports were forwarded to the competent authority for this application, the KwaZulu-Natal Department of Agriculture, Environmental Affairs and Rural Development (DAEARD), and these comments have also been taken into account in the compilation of this environmental impact assessment (EIA) report. The comments received after the circulation the final scoping report area also included within appendix 15.1 of this EIA report, which also contains the list of registered interested and affected parties.

Any comments received on this EIA report will be provided to the DAEARD as well, and will be taken into further account in the EIA process, as will be decided upon by this competent authority.

This EIA report is a public document which may be freely copied and disseminated further to any other parties. However, this report, including all supporting documentation contained within its appendices, may not be altered or added to without the prior written consent of Guy Nicolson Consulting cc.

The details of Guy Nicolson as the independent environmental assessment practitioner (EAP) are:

<b>First name &amp; Surname</b>	Guy Nicolson		
<b>Company name:</b>	Guy Nicolson Consulting cc		
<b>Company Registration Number:</b>	Ck/ 93/07200/23		
<b>Physical address:</b>	6 Indwa Place Kloof		
<b>Postal address:</b>	6 Indwa Place Kloof		
<b>Postal code:</b>	3610	<b>Cell:</b>	082 772 9941
<b>Telephone:</b>	031 764 2515	<b>Fax:</b>	031 764 2515
<b>Email Address:</b>	guyn@saol.com		

This EIA report consists of three main components:

- This main text
- Figures: These are included after the text of the report within section 14, and illustrate the location, surroundings, features of the site and the proposed development plans for the site, the identified land use alternatives.
- Appendices : These are included as section 15, of after the illustrations, and are comprised as follows :
  - 15.1: The Public Participation documentation, containing the list of registered interested and affected parties and the comments that were received after the circulation of the final scoping report.
  - Which contains comments from the two public bodies which have pipeline servitudes over the site, these being Transnet Pipeline and Umngeni Water.
  - Appendices 15.3 to 15.21 which contain the various specialist reports which have been produced in terms of the approved plan of study for this environmental impact assessment report. Wherever appropriate, these reports describe, investigate and report on the various potential impacts which were identified in the previous environmental scoping report phase of this application. Also contained within these appendices are various other forms supporting documentation that are relevant to the consideration of this application.



The development that is the subject of this EIA application will also be subject to its obtaining its own town planning development approvals before it can be implemented. It is intended to achieve these development permissions through the implementation of the appropriate procedures under provincial Planning and Development Act (Act 6 of 2008).

These procedures are to be implemented on behalf the applicant by their professional town planners, Rob Kirby and Associates TRP. There are separate public participation procedures that will occur during this Planning and Development Act process.

## **2. THE LISTED ACTIVITIES FOR WHICH THE ENVIRONMENTAL AUTHORIZATION IS REQUIRED**

### **2.1. THE REGULATIONS AND RELATED LISTED ACTIVITIES FOR WHICH THIS APPLICATION WAS REGISTERED**

The application for an Environmental Authorization (permit) and the related EIA process is conducted in term of the EIA regulations of 18 June 2010, which have been promulgated under the National Environmental Management Act, Act 107 of 1998.

In terms of these regulations, the activities for which an Environmental Authorization is being applied for are tabulated below as follows:

#### **LIST OF ACTIVITIES BEING APPLIED FOR AUTHORIZATION**

<b>EIA Regulation</b>	<b>Activity Number</b>	<b>Explanation of activity</b>
544 of 18 June 2010	9	As it is a large site with a substantial development on it, it will be required to construct large stormwater, water and waste water pipes which fall outside of existing urban areas and road reserves, and where the total length could be more than 1000m and with a diameter in some cases of exceeding 0.36m
544 of 18 June 2010	11	There will be the construction of roads and other forms of infrastructure which will be required to cross water courses on the site, or approach within 32 m of a water course.
544 of 18 June 2010	18	In the construction of roads across the water courses on the site there will sometimes be the excavation and / or infilling of wetlands where more than 5 cubic metres of material will be involved.
544 of 18 June 2010	22	There will be the construction of some major roads in the proposed development, which will have a road reserve wider than 13.5m and / or a width of more than 8m.
545 of 18 June 2010	15	There will be the physical transformation of presently vacant to various forms of urban development (residential, commercial, institutional ) which is greater than 20 ha in area.
545 of 18 June 2010	18	There will be the construction of some roads within the development which will have more than one lane of traffic in both directions.
546 of 18 June	4 (ii)(gg)	There will be the construction of roads wider than 4

2010		metres with a reserve less than 13.5m on the site which is within 5 kilometres of the Lower Mpuhsini Valley Protected Environment, which has been proclaimed under NEMPAA
546 of 18 June 2010	13 (ii) (ff)	There will be the clearance of more than one hectare of vegetation where more than 75% of the vegetation cover constitutes indigenous vegetation, within 5 kilometres of the Lower Mpushini Valley Protected Environment.
546 of 18 June 2010	14	There will be the clearance of more than 5 hectares of vegetation where more than 75% of the vegetative cover is indigenous vegetation.
546 of 18 June 2010	16 (ii) hh	There will be the construction of buildings and infrastructure within 32 metres of a water course on the site within 5 kilometres of the Lower Mpushini Valley Protected Environment.

The activities listed above have been included on the completed and submitted *Application for Authorization* form to the KwaZulu-Natal Department of Agriculture, Environmental Affairs and Rural Development, who have accordingly acknowledged and registered the application and provided their EIA reference number to be used in correspondence, EIA DC 22/0056/10

It should be noted that it may transpire that not all these activities will be required in the proposed development, depending on its the ultimate development plan which may be influenced by, amongst other factors, by the environmental impact assessment process.

### **3. EIA PROCESS FOLLOWED AND REGISTRATION OF THE EIA APPLICATION**

#### **3.1. OVERVIEW OF THE EIA PROCESS**

As this application was registered under the EIA regulations of 18 June 2010, the procedures to be followed are as outlined below.

As prescribed in the EIA procedural regulations of Government Notice 543 of 18 June 2010, where different activities for which an Environmental Authorization occur within a single application fall within the lists of Government Notices 544, 545, and 546, then the entire application is subjected to the more comprehensive Scoping and Environmental Impact Assessment process that would apply to an activity registered under regulation 545. This process is as described in the relevant sections of Regulation 543, as applied to activities that fall under regulation 545.

As this situation of the requirement of a scoping and environmental impact assessment report applies to this particular application, the process to be followed, as prescribed in regulation 545, is as follows:

1. Submission of the Application for Authorization form to the competent authority, the KwaZulu-Natal Department of Agriculture, Environmental Affairs and Rural Development.
2. Conducting of the Public Participation Process as set out in Chapter 6 of Regulation 543.
3. Preparation of a scoping report containing all necessary information that is necessary for a proper understanding of the nature of the issues identified during scoping.
4. Submission of the scoping report to the competent authority, and making it available at the same time to all registered interested and affected parties that have been identified during the public participation process, and also to the relevant authorities who may have jurisdiction over various aspects of relevance to the application.
5. Revision, if necessary, of the scoping report in the light of comments received from the authority, relevant government organisations and interested and affected parties.
6. Consideration by the competent authority of the scoping report, after which the authority will make certain recommendations as to whether more work or amendments are required before its acceptance, to permit the next stage in the process, in terms of the Plan of Study for an Environmental Impact Assessment, which is included within the scoping report.

7. Commencement of the production of an Environmental Impact Assessment Report, after the approval of the scoping report. The Environmental Assessment report is to include any necessary specialist investigations and an assessment of all potential issues and their alternatives. Regulation 543 : 31 prescribes in detail the contents and requirements of an Environmental Impact Report.
8. Consideration of the environmental assessment report by the competent authority, with this report also being made available for comment to all registered interested and affected parties and other relevant organisations. The competent authority may require amendments, additions or supplementary reports to the Environmental Impact Assessment Report.
9. After consideration of the report by the competent authorities, and on receipt of the comments from interested and affected parties and other authorities, the competent authority provides their decision on the proposed application, in the form of an Environmental Authorization. Their decision may reject or accept the proposal. If accepted, there will be conditions of authorization associated with the Environmental Authorization which will prescribe in detail it may be constructed and operated.

These above processes are intended to ensure that all relevant parties may be informed of and be provided with an opportunity to contribute to the EIA process, and that, based on the documentation provided within the various reports mentioned above, the competent authority can make as informed a decision as is reasonably possible on whether the applied for activity should be permitted or not and, if permitted, what conditions should apply to its development.

### **3.2. THE STAGE THAT THIS EIA PROCESS IS AT**

After the submission of the final scoping report dated June 2011, a letter was received from the DAEARD as the competent authority stating that this final scoping report was found to be acceptable.

However, within this letter, the Department stated that they did require certain amendments to the proposed Plan of Study contained within this final scoping report. These additions and amendments were to do with considering a wider range of alternatives than provided in the plan of study in the final scoping report, and also additional specialist studies to be undertaken, for example in regard to green design, visual impact and sense of place reports.

The Department required that an amended Plan of Study be prepared taking into account the requirements contained in their letter. Once this amended plan of study was approved by the Department, the EAP would be required to notify all registered interested and affected parties of the availability of the amended Plan of Study.

Acting on these instructions, Guy Nicolson as the EAP prepared an amended Plan of Study which took all this Department's specified requirements into account and

submitted it to the Department. A letter dated 18 January 2012 was then received by the Department that the amended plan of study dated January 2012 was acceptable to them.

On receipt of this letter of acceptance all registered interested and affected parties were notified of the above procedures that had occurred in a covering letter, and provided them with a copy of the amended Plan of Study, either directly by email, if they had provided an email address, or by notifying them by post of the availability of a copy of the plan of study in the in the Ashburton Public Library. No comments on this amended Plan of Study were received.

It is therefore this amended Plan of Study dated January 2012 which has been accepted by the Department which forms the basis of the investigations, specialist reports and assessments which occur within this environmental impact assessment report.

### **3.3. REGISTRATION OF THE EIA APPLICATION**

In terms of regulation 4 of EIA Regulation 543 of 18 June 2010, the competent authority, the KwaZulu-Natal Department of Agriculture, Environmental Affairs and Rural Development has been provided with their application for authorization form which has been completed by the EAP and the applicant, and which includes all the activities tabulated within section 2 above.

These authorities have accepted the application and provided their EIA reference number: DC22/0056/10, which is to be quoted in all correspondence to them pertaining to this application.

#### **4. EXPERTISE OF THE ENVIRONMENTAL ASSESSMENT PRACTITIONER**

As Regulation 17 of Government Notice 543 requires that the details of the appointed independent Environmental Assessment Practitioner (EAP) who prepared the report and their expertise to carry out the EIA procedures is included in the EIA report, this is provided below:

Guy Nicolson, as the EAP, operates within the consultancy, Guy Nicolson Consulting cc (registration number CK 1993/07200/2) and holds a BSc. (Biological Sciences) BSc. Honours (Ecology), MSc. (Environmental aspects of Urban & Regional Planning), B.Ed (Postgraduate in education) from the University of Natal, and a Higher Diploma in Education (Postgraduate) from the University of South Africa.

Previous positions held by Guy Nicolson have included Chief Examiner in Biological Sciences for the Joint Matriculation Board, and Head of Biological Sciences at Edgewood College of Education. He has lectured at University of KwaZulu-Natal and the Durban University of Technology on various aspects of environmental planning and management and currently lectures in a part time specialist capacity at the University of Cape Town. He is also appointed in the capacity as a Senior Researcher at the University of Pretoria, to conduct research and publish on their behalf in the field of environmental planning and management.

He is professionally registered with:

- The South African Association of Natural Scientific Professions
- The South African Institute of Ecologists and Environmental Scientists
- International Association of Impact Assessment : South African Chapter

Guy Nicolson has practised as an environmental and planning consultant since 1987 and has been involved in this capacity in a great number of Environmental Impact Assessments of varying sizes, complexity and related controversy, as well as other strategic planning and development projects, as both the principal consultant and as an environmental specialist. He has been employed in this capacity by the national government, provincial and local authorities, organisations such as the Development Bank of South Africa, Wildlife and Environment Society of South Africa, Eskom as well as many private development companies and individuals.

Based on the above, he is considered to have the expertise to carry out the required EIA processes for this application, and has been accepted as such by the competent authority, the KwaZulu-Natal Department of Agriculture and Environmental Affairs.

## **5. DESCRIPTION OF THE PROPERTIES & THE AFFECTED ENVIRONMENT**

### **5.1. INTRODUCTION TO THE OVERVIEW DESCRIPTION**

The description below provides the main features of the site and the current status of other aspects relevant to the site, highlighting, where appropriate their implications for the proposed development, and any related environmental impacts that are required to be mitigated and / or assessed.

This description is supported by, and refers to, or summarizes from, wherever appropriate, the specialist reports contained within the appendices, which in many instances provide far more detailed descriptions within their particular areas of concern.

In particular, the following appendices are referred to the reader, where more detailed and technical information can be obtained, if they so wish :

- The Geotechnical Report within appendix 15.3
- The Wetland Delineation and Functional Assessment Report within appendix 15.4.
- The Biodiversity Assessment Report within appendix 15.5
- The Agricultural Potential Assessment Report within appendix 15.6
- The Cultural Heritage Report within appendix 15.7
- The Town Planning Report within appendix 15.8
- The Need and Desirability and Socio-economic Assessment Report within appendix 15.9.
- The Engineering Services Report within appendix 15.10
- The Stormwater Management Plan Report within appendix 11.
- The Electrical and Ancillary Services Report within appendix 15.12
- The Green Building Code Report within appendix 15.13.
- The Traffic Impact Report within appendix 15.14.
- Air Quality Impact Report within appendix 15.15.
- Visual Impact Assessment Report within appendix 15.16.
- Sense of Place Report within appendix 15.17
- The Vegetation, Wildlife Potential and Management Guidelines Report of appendix 15.20.

As well as the figures included at the end of the text of this EIA report within its section 14, these abovementioned various reports also contain many additional illustrations, in the form of plans and photographs, which also illustrate the various features of the site.



## 5.2. LOCATION, CONTEXT AND THE SURROUNDING ENVIRONMENT

The figures included after the text of this report illustrate many of the features of the site and its surrounding environment which are described below. The locality plan illustrates the location of the site within surrounding environment. The geographic co – ordinates for the approximate centre of the site are provided within table 2 below.

### THE GEOGRAPHIC COORDINATES OF THE APPROXIMATE CENTRE OF THE SITE

Latitude /Longitude	Degrees	Minutes	Seconds
South	29	38	23.5685
East	30	26	43.7825

As can be seen from the site location plan (figure 1), the N3 highway forms the southern boundary of most of the site, except where the existing residential areas of Ashburton that lie to the north of the N3 highway and west Pope Ellis Drive form an indentation into it. The present appearance of the site is illustrated in the aerial photograph of the site with contours added which is included as figure 2.

Along the lower slopes of Ashburton along the eastern bank of the Mkhondeni Stream (also known as the Small Mpushini River) a portion of Erf 506 that falls outside of the proposed development area separates the development site from the other properties in nearest, more upslope, residential areas of Ashburton. The adjacent properties of Ashburton are large sites with typically substantial houses on them, together with outbuildings and sometime stables.

To the east of the site is bordered by residential areas of Ashburton and also has a frontage with provincial main road 478, which is also known as Pope Ellis Drive within the residential area of Ashburton, and which runs in a south – north direction along a ridgeline in Ashburton. This road crosses over and forms an interchange with the N3 highway, by means of which residents of Ashburton, and the proposed Hilcove Development, could gain an access to this highway.

There is a small portion of the most northeastern corner of the site which extends to the east of Pope Ellis Drive, and is separated by this road from the rest of the site. This land is steep, and falls within the edge of the neighbouring catchment area Mpushini River.

Also in the extreme east and north east, the site is bordered by the large property on which the Ashburton Horse Training Centre is located. Except in its northeastern corner near Pope Ellis Drive the nearest part of this neighbouring property is comprised of steep hillside which slopes down to a small drainage line which is situated on the applicant site.

The most northern parts of the site are bordered by privately owned and largely open lands which border onto the Msunduzi River, and which the site itself also touches on where this river forms a sharp loop southwards.

A very substantial portion of the northwestern part of the site shares a boundary with Erf 547 New England. This neighbouring property is owned by Ukhambatini Properties cc, whose letter of comment on the draft scoping report is contained within appendix 1.

It is advised by them in their letter that their Broadleaze Farm on their property is registered with BDOCA as an organic grower, and they request that in future their lands to the north are referred to as “certified organic land”, and this request will be acceded to in the rest of the EIA reporting process. They also advise that it is their intention to continue developing their farm and, if they were to consider a development within this context, they would consider an eco-estate type of development.

The more western boundary of the site abuts onto the middle income, relatively dense Pietermaritzburg suburb of Bellevue, so that there is a very distinct and sharp edge between the urban edge of the city and the open land of the site along this boundary. The entire site is securely game fenced, and this serves to form the fence for the residential properties bordering directly onto the site.

Present road access to the site along this western boundary is obtained from the existing suburban road, Ivy Road, which leads straight to the site from Murray Road to its west, which is a main arterial road for the surrounding developed areas of Pietermaritzburg in these parts.

### **5.2.1. GEOLOGY**

The Geotechnical Report prepared by the geotechnical specialists of the Firm SSI provides a detailed description of the site and its implications for developing it in the manner proposed. Figure 3 included after the text illustrates the geology of the site of the underlying rock forms, as also briefly discussed below as to their distribution and nature:

#### **Dwyka Tillite**

Except for in the most western parts nearest the suburb of Bellevue, the site is underlain at a shallow depth by tillite of the Elandsvlei Formation of the Dwyka Group of the Karoo Super Group. The Dwyka Group underlies the undulating topography of the east, southeast and northeast of Pietermaritzburg.

On the site it varies in colour brown, through to light grey to dark grey, becoming dark bluish grey with depth unweathered fresh condition. The overlying soils consist of a mantle of dark brown to black medium to dense gravelly residual soils.

This material is useful for road subgrade, and does not typically pose founding problems. It is a hard rock, and may require blasting during a construction process.

#### **Pietermaritzburg Shale**

This occurs in the south western area of the site, and is also the most predominant rock form in the more upper areas of the Mkhondeni Stream catchment, to the south of the N3 highway.

The soils derived from this parent rock material sometimes contain clay minerals with the potential for expansiveness. Geotechnical specialist guidelines are therefore typically required for the design of founding requirements for any substantial structures. The rock is reasonably soft and can be excavated without blasting. Founding may occur at a depth of 0.7m in soil, or directly onto the shale rock.

### **Dolerite intrusions**

These intrusions of igneous rock exist within the sedimentary shale zone rocks in the south west area of the site. Hard dolerite is likely to occur at depth, and is not likely to create excavation problems. They are characterised by reddish brown soils of medium to high activity.

Within the site geotechnical input would be required in some areas of the site related to advice in regard to founding conditions but, aside from avoiding areas of steepest topography ( greater than 1 Vertical : 3 Horizontal ), no special constraints on development are identified as occurring on the site.

The geotechnical report concludes its detailed description and analysis of the site the implication for development by stating that :

- No problems of instability have been identified and no drainage problems are anticipated apart from some minor attention to seepage on the western edge.
- Most of the overlying materials are suitable for use in earthworks, with some exceptions in the Karroo dolerite. Roadworks will present little difficulty, unless in cut tillite areas, and a then pavement structure can generally be targeted.
- Phase 1, a residential zone situated on the eastern side, will be constructed first, using a septic tank disposal system for the discharge of sewage. Percolation tests have indicated that this system can be operated successfully.
- It is concluded that the development of this site is perfectly feasible.

### **5.2.2. TOPOGRAPHY**

Figure 2 of the aerial photograph of the site with 5m contour lines indicated on it illustrates its topography, whilst figure 4 is a slope analysis of the site derived from these contours. Figure 5 is an aspect analysis, showing the directions in which the various sloping surfaces of the site face.

As can be seen from these figures, the most elevated portions of the site occur along its most southern boundaries to the adjacent land uses, with the highest points at about 745m ( above mean sea level ) occurring along its south western edge with the suburb of Bellevue. There is a general descent across the site progressing northwards, downstream along the drainage lines over the site, until the lowest point at about 560m altitude is reached in the area on its northern boundary where the Mkhondeni Stream meets the Msunduzi River.

The topography of the site is a primarily a product of the erosive action of the drainage water flowing over the site in the relatively well incised drainage lines on the underlying parent rock material. This has created promontories or spurs of level land, with the steeper areas being associated with slopes leading down valley floors of the drainage lines. More level areas also occur in places along the lengths of the larger of these drainage lines. The slopes of the site are derived from the analysis of the contour lines is illustrated within figure 4, which illustrates this pattern quite well.

In terms of the site analysis, and using the criterion of steeper than 1V : 3H being undevelopable, the percentage of the site which is technically undevelopable is very low, much less than 5%.

Therefore, based on the criterion topography, the site can be seen to be developable over a very large proportion of it.

The orientation of the slopes on the site, i.e. their aspect, is illustrated in figure 5. As can be seen from this analysis, there a few rather small areas where the site is level enough to consider it not to have a distinct aspect.

Lying within the southern hemisphere, it is the northern aspects of the site which receive the most sunshine, and are generally considered to be the most favourable orientation for development, particularly of a residential nature. This situation is reflected in the colour selection within figure 5, where the “hot” colours of red, orange and yellow are the ones with north, north east and north west orientations, and the “cool” colours of blue and green indicate those with the southern, south eastern and south western orientation.

As can be seen from this colour depiction of aspect, the predominant orientation of the site is toward the sunny, northern aspects, which renders it largely desirable for residential purposes in terms of this particular consideration.

### **5.2.3. HYDROLOGY**

Figure 6 shows the location of the site within the Mkhondeni Stream catchment area. , whilst figure 7 illustrates the hydrological features of the drainage lines and their 1: 100 year flood levels.

The Mkhondeni Stream Catchment is a relatively small one which has the following characteristics:

Area of the catchment	27km <sup>2</sup>
Length of the Mkhondeni Stream	10,5km
Drainage basis number (SDF)	24
Main annual precipitation670mm (Weather Bureau station 240075 – Camperdown)	
Regional maximum flood (RMF) K Factor	5.2

The Mkhondeni Stream (also described as the Mkhondeni Spruit and the Little Mpushini River) flows from south west to north east through the catchment, rising near Richmond Road in the west, and flowing into the Msunduzi River in the east, at the western tip of a sharp oxbow bend that the Msunduzi River makes at this point, and where the site just extends to the southern extremity of this loop in the Msunduzi River.

A major feature of the catchment is the N3 highway which traverses the catchment within its northeastern sector. The N3 highway has been constructed in a series of cut and fills, and this feature separates the most northern quarter of the catchment from the remainder. The Mkhondeni Stream flows under the N3 highway and is accommodated in two 5 metre diameter Armco culverts, which have a bend within them under the N3 highway. Other minor tributaries crossing the N3 highway are accommodated in small pipes or box culverts.

A 1: 100 flood line analysis has been carried out using the Standard Flood method (SDF: Alexander 2002). Flows at regular intervals in the main spruit and also in the major tributaries have been computed and the area of flooding has been determined, and shown on the figure 7 illustrating the hydrology of the catchment area.

A study of this figure will illustrate that the flooded areas of a 1: 100 year flood line are well contained within the valley lines. This is due to the nature of the topography and the well-defined and relatively incised valley lines.

Any development would not be permitted within the 100-year floodline area. However, these are narrowly confined to the main water course and larger tributaries on the site, and would fall within areas of environmental protection for other reasons as well, for example within wetlands and their buffer zones, as is discussed in the following section below.

Based on the overview provided above of the catchment hydrology and its supporting figure 7, it can be concluded that hydrological aspects such as flooding are not likely to be an impediment to development within the catchment in general, or the site in particular.

#### **5.2.4. WETLAND AREAS**

The Wetland Delineation and Functional Assessment Report prepared by the wetland specialist Greg Mullins of the firm Sivest is included as appendix 15.4, figure 8 has been extracted from this wetlands report, and the description of the wetland below is summarised from it.

The wetlands investigation and delineation reveals that the site has mainly steeply incised stream channels, where no wetland systems could be associated with them, and that, on the total site, there were only seven potential areas where a development might impact on wetlands on it. These wetland area are found in areas 1, 2, 5 and 6, as illustrated in figure 8.

The characteristics of each of these identified wetland areas is provided below, together with the description of another wetland system on the neighbouring property to North West of the site, Erf 547 New England. This wetland system was also investigated in response to a concern of this neighbouring property owner, as there was potential for this wetland area to be affected by the proposed municipal arterial road which is aligned on the site adjacent to this wetland system, and which also traverses from the applicant site onto this neighbouring property.

#### **WETLAND AREA 1**

This system occupies a narrow, shallow valley. A change in the relatively steep topography has created a small area of inundation where poor drainage allows hydromorphic soils to develop. The system is linked strongly with the drainage down the water course and water supplied from runoff from the N3 highway and further up the catchment. The wetland areas along this drainage line are closely linked with a series of large farm dams that have since been filled, and are now dominated by emergent vegetation in these artificially created wetland areas.

Soil sampling found that the majority of the system was comprised of semi-permanent to seasonal wetland habitat. The influence of the stream associated with the wetland's generally incised channel can be seen, as certain plant species typically associated with dryer habitats were found throughout the seasonal wetland system.

#### **WETLAND AREA 2**

This system lies in a small narrow valley, and sampling indicated that it was largely temporary and seasonal in nature. A farm dam at the bottom end of this system is likely to be creating additional inundation within this system.

Vegetation within the wetland was largely dominated by hygrophilous grasses and small shrubs. Notably, large portions of the system were dominated by Kikuyu grass, a remnant of the past use of the site for cattle, and specifically dairy, production. As with the previous system, the influence of the incised channel can be seen in these, as certain species of plant typically associated with dryer habitats were found throughout the seasonal portion of this wetland.

#### **WETLAND AREA 5**

A very small and narrow wetland was identified in this shallow water course. The wetland is temporary in nature. Associated with this system is a shallow channel which supports the idea that this water course operates more as an intermittent stream rather than a true wetland.

Vegetation in this wetland was a mix of predominantly terrestrial grass and shrub species. Isolated stands of a wetland plant species, *Imperata cylindrica* did, however, provide some indication of a history of elevated wetness.

#### **WETLAND AREA 6**

This wetland unit could be considered artificial, as it is strongly linked with a small farm dam located in the watercourse. No doubt, a small wetland was always present at this site, however, the increased wetness linked with the inundation from the dam has increased the size of this system.

Vegetation within the wetland included emergent reeds at the shallow head of the dam and a fringe of hygrophilous grasses around the remainder of the system. Again, because of the generally incised nature of the stream on which the wetland is situated, certain species of plant typically associated with dryer habitats were found right up to the edge of the system.

#### **WETLAND AREA ON NEIGHBOURING ERF 547 NEW ENGLAND**

One of the planned arterial roads on the site will link the N3 highway with the Mshwati and Lincoln Mead area to the west, and would therefore exit the site at its north west corner and traverse the neighbouring property, Erf 547 New England, which is referred to in the Sivest wetlands report as the "Farm Choveaux" wetland, after the name of one of the property owners.

A small drainage line was identified on this neighbouring farm and, as such, the system was delineated in order to ensure that the road alignment did not impact on this neighbouring system.

The drainage line and its associated wetland area is illustrated in figure 4 on page 12 of the wetlands report. As also discussed in the wetlands report, the wetland delineation undertaken found a narrow, shallowly incised drainage line with a central thalweg. The system was found to be predominantly temporary in nature, with some areas of seasonal wetland associated with the central portions of the system, where local topography inhibited drainage. The wetland area was well vegetated, predominantly with riparian species.

A 50m and 100m buffer were applied to the portion of the wetland system closest to the proposed arterial road alignment to determine the likelihood of its impacts. As illustrated in figure 4 of the wetlands report, the road lies for the most part more than 100m from the edge of the wetland area identified that is relevant to the Hilcove Hills development.

#### **PLANNING RESPONSE TO THE WETLAND DELINEATION INFORMATION**

The preliminary wetland report was initially produced to ensure that wetland information could be provided to the applicant and their town planner and civil engineer within the project planning team.

The site development plan was then adjusted to ensure that all wetlands and their 30-metre buffer areas, as illustrated in the wetland report and also carried through into the Development Layout Plan, were avoided in all the planned development areas within the proposed development application.

In regard to the civil infrastructure, all roads were adjusted to avoid wetlands and their buffer areas wherever possible. Where it was unavoidable that roads crossed water courses and / or any associated wetland areas, the alignment and nature of the road crossing was such as to mitigate as far as possible, the impacts of these crossings. The two relevant road crossings in this regard are of the west – east main arterial road across the site, which unavoidably crosses over wetland areas 1 and 2.

Other aspects civil engineering, such as in waste water disposal and stormwater management have also taken the findings and recommendations of the wetland specialist into account, as elaborated on further within the their specialist reports, and within the relevant parts of section 6 of this EIA report.

### **5.2.5. VEGETATION AND LAND USE**

Within the Biodiversity Assessment Report produced by Le Roux and Grobler contained within appendix 15.5 the section on flora assessment describes the vegetation of the site, the implications of the composition of the flora on the site for floral biodiversity conservation, and assesses the potential impact of the proposed development on this floral biodiversity. Appendix 15.20 includes a Vegetation, Wildlife Potential and Management Guidelines, also produced by Le Roux and Grobler, which is relevant to this section on land use and vegetation description, and also for the following section below on the fauna of the site.

What is provided below is an overview description of the present vegetation on the site and its relationship with historical and present land uses on it.

The site is presently not actively used for farming, and is largely vacant and undeveloped. The nature of the structures and infrastructure which occurs on the site is described within the following section below.

Figure 9 shows the ecological units into which the site has been categorized, based on the work of Kelson Camp within the Strategic Environmental Assessment of the Mkhondeni Catchment.

Each ecological unit specifically outlines an area of uniform vegetation community, mostly defined by aspect, slope and altitude within the overall parameters of climate within the particular area. A soil survey is not used to define an ecological unit, but may be used to make refinements to be applied in land use planning and management.

Each of the Ecological Units can be regarded as a habitat within which a range of flora is found that also suites a range of wildlife species. For example, a bushland area will consist of three or four Acacia species plus several other tree species with a wide range of grass species and associated smaller broad leafed grassland associate species. This composition is an ideal habitat for large animals such as zebra, wildebeest, giraffe, eland, duiker and bushbuck. In addition, it would attract a wide range of bird and invertebrate species.

A brief description of each category of Ecological Unit of the area is given below, using also the nomenclature that is provided in the mapped figure provided. This also includes a list of the game animals that are suited to this unit, to serve as an example only.

#### **Grassland (G)**

Land dominated by grasses and occasional herbs, of high conservation value. Trees and shrubs may be scattered widely, either singly or in groups, but the canopy does



not exceed 2%. Fires occur frequently and are an essential management tool to maintain the grassland. Game species include eland, blue wildebeest, oribi, reedbuck and zebra. Domestic animals include Nguni cattle and beef animals.

### **Secondary Grassland (Gs)**

The original, more pristine grassland has been broken down to some form of interference or management by man. This would include ploughing and planting of crops, pastures or trees, severe overgrazing practices, which have then ceased and the grass cover allowed to return. The replacement grass consists of pioneer species usually of low grazing value. The succession to high conservation, more pristine grassland is unlikely to occur within a time period that would usually be applicable within human planning timeframes. The vegetation of these areas is less supportive of game than the grassland areas, but it can be upgraded from a game carrying capacity perspective.

### **Bushed Grassland (Bg)**

Grassland with scattered or grouped trees and / or shrubs which have a combined canopy of less than 20%. Grass cover is good and fires occur frequently and are an essential tool to maintain the habitat. Game species include the same animals listed under grassland. Additional animals are bushpig, giraffe, red hartebeest, impala, kudu, buffalo, warthog and zebra. Domestic animals include Nguni cattle, goats and beef animals.

### **Bushland (B)**

Land supporting a mixture of trees and shrubs, often dominated by shrubs, but with trees being conspicuous. Trees do not exceed 7m in height, except for occasional emergents. Grass cover is reasonable to poor and fires are infrequent and of low intensity, but can play an important role in the controlling the densification of bush. Suitable game animals are grey duiker, blue duiker, bushbuck, impala, eland, kudu, steenbok, blue wildebeest, buffalo, giraffe, white and black rhino, bushpig, warthog and zebra. Domestic animals are the same for the Bushed Grassland.

### **Bushland thicket (Bt)**

This is extreme form of bushland, having a closed canopy. Grass cover is absent or very sparse, has little grazing value and fires generally fail to enter or effect the vegetation in any way because of the low fuel load. The same list of animals as for Bushland applies, with the exception of steenbok, blue wildebeest, white rhino, warthog and zebra. Domestic animals that are suitable are goats.

### **Lands (L)**

There can be several sub-classes, including annually cultivated and cropped lands, land under permanent pasture and fallow lands. Their ecological value will vary considerably. On the site these are the central areas of land on the site, extending northwards from the N3 highway boundary, and surrounding the areas R ( residential ) where the farmhouse and other buildings are located.

### **Watercourses (W)**

This includes the bed of the stream or river and the riparian area on either side of the banks. This riparian area is identified by vegetation or soil form, and has been

broadly delineated in the wetland study and discussed above in this report. This area should not be encroached on for development.

### **Residential (R)**

This is any area on which there has been a very substantial and permanent transformation of land cover by buildings and the associated removal of indigenous vegetation. It is accepted, however, that the restoration of indigenous vegetation around buildings can have some form of ecological value.

Within the site there is one area of relatively large, pristine and high value grassland some approximately near the most western boundary of the site projecting into the adjacent to the suburb of Bellevue. This valuable vegetation habitat is recognized in the layout plan as being required to be conserved, and excluded from development.

The most eastern areas of the site, where it extends as a block of land up to Pope Ellis Drive, with the developed areas of Ashburton to its south, and the Ashburton Horse Training Centre to its north is of a moderate vegetation quality, due to previous land uses and disturbances. However, the Pietermaritzburg Aloe *Aloe pruinosa* which has a restricted distribution and is endemic to the area has been identified in this area, and their presence has been mapped in the faunal biodiversity component of the Biodiversity Report, and has been taken into account of in the planning of the development in this area.

Those floral species identified as potential species of concern which could occur on the site, in terms of the data provided from the Msunduzi Municipality's EMF, and the EKZN Wildlife data sets are listed, mapped, were provided to the floral biodiversity specialist, and are described within the floral section of the Biodiversity Report.

### **5.2.6. OVERVIEW OF THE FAUNA LIKELY TO OCCUR ON THE SITE**

Within the Biodiversity Assessment Report contained within appendix 15.5 the section on faunal assessment describes the possible animal species which could occur on the site, the implications for faunal biodiversity conservation, and assess the potential impact of the proposed development on this faunal biodiversity. What is provided below is an overview description of the present nature of larger forms of animal wildlife which are likely to occur on the site.

The Vegetation, Wildlife Potential and Management Guidelines provides further information as to the vegetation wildlife carrying capacity of the site, and the wildlife species which already occur, or which could be introduced onto the site.

Those faunal species identified as potential species of concern which could occur on the site, in terms of the data provided from the Msunduzi Municipality's EMF, and the EKZN Wildlife data sets are listed, mapped, were provided to the faunal biodiversity specialist, and are described within the faunal section of the Biodiversity Report.

### **Mammals**

A surprising spectrum of large mammal species occurs in the study area.

### **Larger mammals:**

The following larger mammals have been observed or are likely to occur naturally on within the study area.

Common Reedbuck: *Redunca arundinum*  
Grey Duiker: *Sylvicapra grimmia*  
Kudu: *Tragelaphus strepsiceros*  
Nyala: *Tragelaphus angasii*  
Bushbuck: *Tragelaphus scriptus*  
Bushpig: *Potamochoerus porcus*  
Black-backed Jackal: *Canis mesomelas*  
Caracal: *Felis caracal*  
Serval: *Felis serval*

### **Smaller mammals**

Mongoose include the large grey mongoose (*Herpestes ichneumon*),  
Slender mongoose (*Galerella sanguinea*),  
Water mongoose (*Atilax paldinosus*),  
White tailed mongoose (*Ichneumia albicauda*),  
and banded mongoose (*Mungos mungo*),  
Genets (*Genetta tigrina*),  
Porcupine (*Hystrix africaeaustralis*),  
Common scrub hare (*Lepus saxatilis*),  
Primates: Vervet monkeys (*Cercopithecus aethiops*),  
Thick tailed bush babies (*Otolemur crassicaudatus*),  
also possible are Antbear (Aardvark) and *Orycteropus afer*

The smaller mammals will include also include a variety of shrews, bats and small rodents.

There are also a wide diversity of birds, reptiles, amphibians and invertebrates resident on the site, as is be elaborated on further within the faunal component of the biodiversity report contained within appendix 15.5.

## **5.2.7. AGRICULTURAL POTENTIAL**

As the site is presently unused agricultural land which is intended to be taken out of agriculture for other land uses, an assessment of the impacts on agricultural potential is required, and the Agricultural Potential Report prepared by the specialist, Peter Le Roux, to serve this purpose, is included within appendix 15.6. Figure 10 included after the text of this report has been extracted from this Agricultural Potential Report.

Within this report, the existing qualities of the site or relevance to agricultural production are described (climate, vegetation, geology and soils, slope, biotic factors) and the relevant legislation related to the release of land from agriculture is then also outlined.

From a study of aerial imagery it is revealed that agriculture was practiced as far back as 40 to 50 years, however, there has been no cultivation on the site for the past 20 years.

In the Agricultural Potential Report the site then classified and described as to its cultivation potential and the potential agricultural land uses to which the site could be put.

The conclusions of the agricultural assessment report are that:

- In the context of Act 70 of 1970 it was calculated that the property has approximately 144ha that is suitable for cultivation.
- The areas rated as suitable for cultivation are clustered in the western and north-western parts of the property, while the areas rated unsuitable occur in the southern, central and eastern parts.
- The *Themeda* grassland in the west, together with the streams and wetlands, have high conservation value and were classed as sensitive features which should not be developed.
- The habitats (including the grasslands and wetlands) are ideal for grazing of livestock and about 80 large stock units (LSU) could be carried all year round.
- The property is suitable for a diversity of wildlife species, so the concept of a “residential” game reserve surrounding carefully situated development nodes has merit as an appropriate form of land use.

The comments of the national Department of Agriculture within the scoping report process is contained within appendix 15.1, and this is commented on within section 8, which deals with public participation in the EIA process, whilst the potential impacts of the loss of agricultural land is assessed within section 10.

#### **5.2.8. ON SITE DEVELOPMENT AND INFRASTRUCTURE**

There is very little construction or forms of infrastructure on the site. The only structures on the site are the farm buildings, comprised of silos, barns, other outhouses and the farmhouse situated near the N3 highway, and indicated by “R” on figure 9, the ecological units.

#### **5.2.9. PIPELINE SERVITUDES**

##### **TRANSNET OIL PIPELINES**

There are two Transnet oil pipeline servitudes across the site, which are also indicated on the proposed development layout plan. The older of these servitudes cuts across the mid section of the site in a south east to north west alignment. The more recently constructed one is located in the extreme northern edge of the site, close to where it meets the main water course of the Msunduzi River.

The applicant has approached Transnet Pipelines in regard to their comments on the proposed development, in relation to their oil pipelines. Their letter of response dated 11 August 2011 is included within appendix 15.2. Within this letter and its

annexures, the conditions required to be complied with in regard to any developments of constructions near the oil pipelines is prescribed.

These conditions have been provided to the project's town planner, Rob Kirby and Associates, and have been taken into account in the formulation of the proposed development layout plan of figure 11, which is the subject of this application.

### **UMNGENI WATER PIPELINE**

There is also an uMgeni Water pipeline servitude containing a bulk water pipeline servitude, the alignment of which is included in a figure that accompanies their email letter of comment dated 1 March 2012 to the applicant in response to the proposed development, and which is also contained within appendix 15.2. The alignment of the Umgeni Water pipeline servitude is also shown on the proposed site development plan.

Umgeni Water state in their letter that they have objection to the proposed development on condition that the proposed development does not encroach into Umgeni Water's servitude.

In response by the applicant to the abovementioned correspondence of Umgeni Water, the applicant confirms that they comply with the conditions of the servitude and due care will be exercised during construction.

### **5.2.10. CULTURAL HERITAGE CONSIDERATIONS**

As the farm structures on the site are likely to be over 60 years old, a heritage impact assessment is a requirement, and also, because of the scale of the site, and its generally undeveloped state, this also requires this form of assessment.

A Heritage Impact Assessment (HIA) has therefore been produced for the site by Gavin Anderson of the firm Umlando, and this is contained within appendix 15.7.

Within the HIA an overview of the requirements of the relevant legislation, the KwaZulu-Natal Heritage Act. No.4 of 2008 is provided, and then the methodology in terms of a desktop study, a description of the archaeological, architectural and paleontological resources of the site is provided.

It is stated in the report that the known archaeological sites on the property are of low significance and no further mitigation is required. However, the developer will need to obtain a permit for the destruction of two archaeological sites. It is also concluded that it is unlikely that the development will affect any paleontological material.

Two sensitive areas will need to be surveyed later, once the vegetation has been partially removed in a preconstruction phase. The other two sensitive areas identified pertain to human remains. However, two surveys undertaken could not locate any features that resembled graves.

In regard to architectural cultural resources, the farm buildings are of various ages and some are significant. The significant buildings, i.e. the barns and silos, should be protected and incorporated into the development. The main farmhouse is of low significance and the development will need to apply to KwaZulu-Natal Heritage: Built Environment, for a demolition permit.

This HIA impact report has been submitted to the local government organisation which is the custodian of heritage resources in KwaZulu-Natal, which is Heritage KwaZulu-Natal (also known as aMafa aKwaZulu-Natali) who will control all cultural heritage-permitting aspects associated with the proposed development.

#### **5.2.11. VISUAL QUALITIES AND SENSE OF PLACE**

Except for the farm buildings and silos described and assessed in the HIA report, the site is an undeveloped one, visible in several places from the adjacent N3 highway, and from the adjacent surrounding residential area of Bellevue and Ashburton to the west and east respectively. It is also visible from more open areas to the north of the site.

With the proposed development there would be the transformation of about 40% of the total area of the site from open, naturally vegetated land various forms of urban development within the proposed Hilcove Hills mixed use development. This will affect the visual qualities of the site and its related sense of place for those persons living in the surrounding areas to the site.

The visual qualities of the site, and how they would be affected by the proposed development, and the alternatives to the proposed development are described and assessed within the Visual Impact Assessment Report prepared by the firm Iyer Urban Design which is contained within appendix 15.16.

The sense of place and changes brought about and perceptions and expectations, as obtained in a survey of the residents in the surrounding suburbs is described and assessed in the Sense of Place Report prepared by Dr. Jeff McCarthy which is contained within appendix 15.17.

## **6. DESCRIPTION OF THE PROPOSED DEVELOPMENT**

### **6.1. THE MAIN AIM OF THE PLANNING AND DEVELOPMENT EXERCISE**

As stated in the Town Planning Report prepared by the project's professional town planners, Rob Kirby and Associates which is contained within appendix 15.8, the main aims of the planning exercise are to :

- Provide as safe, secure residential estate of high standards, including as well commercial and community facilities, to meet the needs of residents as well as visitor, and as well the wider sub-region within which the site is located.
- To plan for the creation of sustainable, vibrant and supportive living environments for all residents, with environmental sensitive habitats that cover a wide range of income groups and life style preferences.
- Stimulate the local economy in both the long and short terms.
- Promote environmentally sensitive and economically sustainable development.
- Ensure that the development is generally in accordance with the objectives of the IDP and SDF and does not overburden Local Authority's budget, the existing community facilities, infrastructural supply, nor restrict or compromise future growth in the area.
- Ensure that the development complements adjoining land usage as far as practically and logically possible. It is argued in the Town Planning Report that this has been achieved by rejecting land uses which are incompatible with adjoining uses. For example, commercial land uses are located adjacent to the N3 highway, conventional housing and low next to similar type homes of the Bellevue suburb in the west, and very low-density eco-estate type of residential development next to the suburb of Ashburton to the east. The central area is proposed for a lifestyle village for the elderly, and eco-estate type of units so as to provide residents with the experience of living adjacent to a game reserve.

### **6.2. MARKETING VISION**

#### **RESIDENTIAL**

The marketing vision is to provide a self contained and secure estate served by essential community facilities with all residents being able to enjoy the amenity of the game reserve, equestrian centre, conservation areas, and the full range amenity provided by shops, restaurants, wellness centre and spa and other open spaces and conservation areas controlled by a Home Owners Association.

Residents will be able to choose a full range of housing types, a range of costs and lifestyle villages, which cover all phases of the conventional life cycle, from starter homes all the way through a lifestyle “retirement” complex to frail care units.

### **COMMERCIAL**

The shops and offices will gain exposure from N3 as well as direct access to it via the proposed new N3 interchange and the proposed arterial road network of Msunduzi Municipality. The central shops will serve a local catchment area.

## **6.3. THE NEED AND DESIRABILITY FOR THE PROPOSED DEVELOPMENT**

The town planning report refers to the Need and Desirability Report prepared by Dr. Jeff McCarthy. This McCarthy report, and its addendum report is contained within appendix 15.9 of this EIA report. The McCarthy Report and its addendum report deal in detail with the need and desirability and the socio-economic impact of the development, and this is also assessed within section 9 of this EIA report.

## **6.4. THE PROPOSED DEVELOPED LAND USES**

The proposed land use development is illustrated within the development layout plan and the associated activities listed within section 2 above which is included both with the figures after the main text of this EIA report, and also within the Town Planning Report prepared by the professional town planner, Rob Kirby and Associates, which is included as appendix 15.8.

The plan submitted for approval is titled *Layout of Erven Drawing No. 2915/WD21* dated 23 April 2012 prepared by Rob Kirby and Associates.

The land use table included within this plan, and also provided overleaf, as extracted from the Town Planning Report, indicates the various proposed land uses, their number, the area which they occupy in hectares, and the percentage of the total site which is allocated to that land use.



**LAND USE TABLE FOR HILCOVE HILLS DEVELOPMENT**

<b>TP Scheme</b>	<b>Land Use</b>	<b>No. of Erven</b>	<b>No. of Units</b>	<b>Area (ha)</b>	<b>%</b>
<b>Pietermaritzburg/Msunduzi</b>	Shopping & Commercial (FAR 0,50) 72 500m <sup>2</sup> gla	2	-	14.46	3.00
	Shopping, Commercial, Tourism, Estate Maintenance & Community Facility (FAR 0,35) 14 000m <sup>2</sup> gla	2	-	4.03	0.83
	School	1	-	1.96	0.41
	Lifestyle Village	2	-	3.11	0.64
	Hospital	1	-	2.82	0.58
	Community Facility (Clubhouse, Hall, Chapel, Crèche, Sports Facilities etc)	4	-	1.25	0.26
	Office Park (FAR 0,35) 60 000m <sup>2</sup> gla	13	-	17.24	3.57
	Medical Suites (FAR 0,35) 11 500m <sup>2</sup>	1	-	3.30	0.68
	Lifestyle Village (minimum 220m <sup>2</sup> sites)	216	216	5.57	1.15
	Lifestyle Village (minimum 325m <sup>2</sup> sites)	385	385	15.35	3.18
	Single Dwelling Housing (minimum 400m <sup>2</sup> sites)	56	56	2.84	0.59
	Game Reserve Single Dwellings (minimum 1 500m <sup>2</sup> sites)	239	239	39.57	8.19
	Game Reserve Cluster Housing (@ 20 units/ha)	10	200	10.00	2.07
	Conventional Cluster Housing (@ 20 units/ha)	22	234	12.08	2.50
	Active Public Open Space (Sportsfield)	2	-	1.34	0.28
	Passive Private Open Space (Conservation/Grassland)	3	-	30.85	6.38
	Private Open Space (Conservation/Wildlife)	3	-	201.40	41.67
	Private Open Space (Conservation/Park)	6	-	30.23	6.25
	Private Open Space (Park)	92	-	10.89	2.25
	Sewage Works	(1)	-	(1.00)	-
Residential Road	10	-	16.79	3.47	
Arterial Roads	8	-	21.65	4.48	
<b>Ashburton</b>	Single Dwellings (minimum 1 600m <sup>2</sup> mini-sub)	48	48	7.70	1.59
	Community Facility & Admin/Security	3	-	1.72	0.35
	Private Open Space (Indigenous/Park)(Reservation of Land)	3	-	23.94	4.95
	Residential Road	2	-	2.50	0.52
	Arterial Road	1	-	0.77	0.16
<b>TOTAL</b>		<b>1135</b>	<b>1378</b>	<b>483.36</b>	<b>100.00</b>

The main components of these land uses are described as follows in the Town Planning Report, and are extracted from this report and provided below as follows :

**RESIDENTIAL UNITS**

The development is aimed at creating a holistic estate with a total of 1378 accommodation units varying in character from cluster units to large freestanding units covering all economic sectors ( except low cost / social housing ) and lifestyle preferences.

**COMMUNITY FACILITIES**

The full range of community facility sites, including schools, sportsfields, shops, offices and a hospital needed to serve the new residents has been provided in appropriate locations. The estate is thus a balanced community within itself, relying only on the Msunduzi Local Municipality for only for higher order facilities, such as universities, library services and fire fighting.

## **COMMERCIAL ACTIVITIES**

The areas of commercial development occur adjacent to the N3 highway and are comprised of two zones, a General Business Zone, and Office Park and Medical Suites. In this regard:

**The General Business Zone** is 14.48 ha in area, and is for shopping and commercial use, with a Floor Area Ratio of 0.5. It incorporates the opportunity for a large shopping centre of approximately 72 500m<sup>2</sup> gross lettable area.

The General Business Zone has a height restriction of 3 storeys. All other zones in the proposed development have a height restriction of 2 storeys.

**The Limited Business Zone** is 4.03 ha in area, is for shopping, commercial, tourism, estate maintenance and community facilities, has a floor area ratio of 0.35.

**Office Park** of 17.24 ha area and Floor Area Ratio of 0.35.

**Medical suites** of 3.3 ha and Floor Area Ratio of 0.35.

Besides other jobs within the residential and general management of the overall estate, these commercial areas provide job opportunities and amenities to the new residents and the existing residents of Msunduzi.

## **6.5. PRIVATE PASSIVE OPEN SPACE AREAS**

The proposed development layout plan shows the areas within which there will be no development, and which will be maintained and, where appropriate, rehabilitated to the optimal forms of indigenous vegetation, in line with biodiversity and related nature conservation objectives. These areas are the largest single land use in within the overall applicant development site of 483.36 hectares, comprising approximately 56.4 % of the total site area.

It is also to be noted that the very low density eco-estate residential component next to Pope Ellis Drive and the Ashburton suburb in the east, of an area of 39 hectares will also very largely be comprised of natural vegetation with freestanding homes dispersed amongst it at a very low density.

The nature these various passive open space components is provided below :

### **WILDLIFE CONSERVATION AREA**

This area in the central and eastern parts of the site, to the north of the main east - west arterial road which runs more or less parallel with the N3 highway for most of its length. It includes wetland and riverine area, but also a good deal of more upper slopes away from these zones.

This area will be fenced off along its boundaries with a game proof fence, and will be stocked with wildlife species, both comprised of existing species, and also new ungulate (hoofed species) depending specialist advice and on what is Ezemvelo

KwaZulu-Natal Wildlife who are the provincial permitting organization in regard to this aspect.

There will be walking and riding trails in this area, also subject to specialist planning and approval by EKZN Wildlife before implementation, and there will also be controlled access to the general public, as explained further below.

### **WILDLIFE POTENTIAL AND MANAGEMENT**

The Vegetation, Wildlife Potential and Management Guidelines prepared by Le Roux and Grobler contained within appendix 15.20 provides guidelines as to the carrying capacity, the new wildlife species which could be introduced on the site ( such as giraffe, zebra, oribi, warthog and waterbuck ).

Their report provides the following summary conclusions as to the management and introduction of wildlife onto the site:

- The proposed approximately 270ha set aside for a wildlife area has a variety of suitable habitats for wildlife.
- Although the habitats will be in the form of narrow ribbons, because of the proposed development nodes, there is minimal fragmentation of habitats and veldt condition is generally good. This makes the carrying capacity relatively high for thornveld. (See table 2 on page 7 of their report).
- Both grazers such a Zebra and Waterbuck, and browsers, such as Giraffe and Kudu, will do well, but populations need to be small in proportion to the available area.
- Introduced wildlife should be sourced from reserves where they are habituated to vehicles and people. Tala Game Reserve is an ideal locality for this.
- The introduction of wildlife needs to be well co-ordinated, because the disturbance caused by construction activities could disturb species, and encourage them to leave the property.

However, it should also be noted that any introduction of game onto the site would be subjected to the Ezemvelo KwaZulu-Natal Wildlife's permitting process, and this organisation would also be involved in the approval of any wildlife management plans for the development. It is the intention therefore of the applicant, and their appointed specialists, to engage with this organisation further in regard to all wildlife stocking and management aspects pertaining to the site.

### **GRASSLAND CONSERVATION AREA**

This area is of just over 30 hectares and is located in the most western part of the total site, adjacent to the suburb of Bellevue. It has been recognized both in previous studies and the specialist biodiversity study commissioned for this EIA application contained within appendix 15.5 to be of special plant biodiversity value. It is comprised of *Themeda* grassland and is classified by the specialists as a

“biodiversity hotspot” that combines high alpha diversity with a number of red data species, some of which were not found elsewhere on the property.

It is to be maintained as a passive open space area, with the accent on managing it to maintain floral biodiversity.

Some aspects of note in regard to the management and maintenance of this area, are as follows:

1. This area was originally proposed to be public passive open space, which would then have been then managed by the Umsunduzi Local Municipality. However, there were strong protests and representations at the public meeting, and in comments received on the draft and final scoping reports (see section 8 of this EIA report in this regard ), that there was no faith in the municipality’s ability to manage and maintain this area which, it was averred, would become, neglected, degraded, dumped on and a crime hazard. It was the strong view within the comments received, that it would be far better for this area to be maintained private open space, to be managed as part of the overall development.

Based on these representations, this area has now been has now been rezoned as private passive open space, now to be managed with the development itself.

2. It would be cut off by the arterial road which runs past its eastern boundary, and also by the neighbouring residential areas in the development. However, it is the view of the biodiversity specialists that this area is large enough to be self sustaining. Moreover, the arterial road is part of the longstanding municipal road planning for the area, independent of whether the development were to go ahead or not.
3. In the view of the specialists, it would not be desirable if this grassland area were part of the wildlife stocking area, as the accent within it was on the preservation of plant species, and this might not be in accord with the presence of large, trampling and heavily grazing large herbivores, and related management plans related to their presence on the grassland area as well.

## **PARKS**

These areas, of about 10 hectares in total extent, are situated between the N3 highway to their south, and the wildlife conservation area to the north, and are centred on the drainage line valleys connecting these two areas.

These area will be rehabilitated ( being heavily infested with alien plants in places ) back to indigenous vegetation of greater value, and will be similar in nature to the downstream wildlife areas. However, occurring upslope from the game fence, they will not have the larger forms of wildlife within them. However, smaller forms would be able to move between these two areas along the drainage line courses.

These areas will be maintained a private passive open space within the overall management of the area.

## **6.6. SECURITY AND ACCESS**

Whilst some of the villages, or neighbourhood units, within the overall development will be fenced off for security reasons and to control such issues as the poaching of game, all residents will have access to all the facilities on an equal basis, and the general public will be permitted and encouraged to visit the wildlife reserve, equestrian centre, spa, wellness centre etc on a controlled basis.

## **6.7. COMPLIANCE WITH THE MSUNDUZI INTEGRATED DEVELOPMENT PLAN, SPATIAL DEVELOPMENT FRAMEWORK**

In preparing the plan, cognizance has been taken of the Msunduzi Integrated Development (IDP) Plan and the Spatial Development Framework (SDF) Plan for the Msunduzi Municipality, all of which show the site as a mixed use, comprised of both proposed development and conservation areas.

The relevant Msunduzi Municipality town planning officials have, on two separate occasions, indicated to Rob Kirby and Associates as the project's town planner, that the broadly indicative conservation areas within their SDF, have been superseded by the more accurate conservation exclusion areas, as presented in the Strategic Environmental Assessment of the Mkhondeni River Catchment Area prepared by Guy Nicolson Consulting cc, within which the site is located.

These conservation exclusion areas have been further refined within the subsequent specialist biodiversity investigations which have occurred within the planning exercises associated with the formulation of the proposed development plan which is the subject of this application. These biodiversity investigations have taken both the Msunduzi Environmental Management Framework data, and the Ezemvelo KwaZulu-Natal Minset GIS data base into account, and have influenced the final layout of the development.

The SEA specialist investigations and reports, and the subsequent biodiversity investigations and report within this EIA process provide a very high level of detail and resolution as to the best fit final confirmation of development and conservation areas to be applied to the site, when compared to the metropolitan wide, and therefore broader brush, land use proposals within the municipal SDF.

The nature of environmental sensitivity and conservation planning based on this biodiversity and other relevant environmental information which has occurred is described further in the town planning report, as elaborated on below. This EIA report will be provided to the Msunduzi Municipality for their comments, which will be forwarded to the competent authority, the KwaZulu-Natal Department of Agriculture, Environmental Affairs and Rural Development, for their further consideration in the EIA process.

## **6.8. ENVIRONMENTAL SENSITIVITY AND CONSERVATION CONCERNS INTEGRATED INTO THE PROPOSED DEVELOPMENT PLAN**

The preparation of the development proposal has been undertaken as a multi-disciplinary exercise with specific attention being applied to environmental concerns revolving around the protection of the integrity of the indigenous woodlands, grasslands, riverine areas and wetland areas.

In this process, the further conservation and biodiversity data, over and above the SEA undertaken by Guy Nicolson Consulting cc of the Mkhondeni catchment area have been taken into account include the two geographic information system ( GIS ) conservation planning tools for the area, these being the Ezemvelo KwaZulu-Natal Minset Data Base and the Environmental Management Framework ( EMF ) for the Msunduzi Municipality which has been prepared in a collaboration between the environmental officials and their appointed specialists of the Msunduzi Municipality and the KwaZulu-Natal Department of Agriculture, Environmental Affairs and Rural Development.

This aspect is elaborated on further within the specialist Biodiversity Report prepared by Le Roux and Grobler which is contained within appendix 15.5, and the assessment of potential impacts on biodiversity and related conservation issues which is contained within section 10 of this EIA report.

As is further elaborated on these other areas of this EIA report, there has been an iterative planning process undertaken between the biodiversity specialists and the town planning and civil engineering specialists to ensure that all biodiversity concerns have been acceptably addressed within the formulation of the proposed development plan. Figures 13 and 14 which show respectively the core areas of floral and faunal conservation superimposed on the original layout plan, as presented in the scoping reports, and the amended layout plan which is now the subject of the EIA application. The adjustments in the final layout plan to avoid impacts on these core biodiversity areas is well illustrated in these figures, as is discussed within the Response Report sections of the Biodiversity report, and dealt with further in the assessment of the potential impacts on biodiversity which is contained within section 10 of this EIA report.

Also included in the layout plan is a setback buffer area of a minimum of 30m from all wetland areas, as delineated and recommended by the wetland specialist, and also a setback area of at least 30m from all riparian and drainage lines on the site.

Functional corridors have been set aside to provide the requisite links and to ensure the viability of the proposed open space system as part of the potential broader regional open space systems that is could be part of.

## **6.9. ARCHITECTURAL DESIGN CODE**

The firm of Vara Ross Architects has produced a preliminary architectural design code within their Design Report which is contained within appendix 15.19 of this EIA report, the main contents of which are summarized below.

The built environment is currently controlled in two ways, nationally it controlled by the minimum norms and standards, currently the SANS 10-400, and locally by the local authority controls and regulations (see also the Town Planning Report contained within appendix 15.8 in this latter regard).

Over about the last 15 years developers have seen fit to go beyond these minimum norms and standards and create additional controls of the built environment within a particular precinct. These controlled built environments are very popular among new developments, and Hilcove Hills will be established as a controlled environment.

The controls that will apply are then summarised within the Vara Ross Design Report, as applied to:

### **URBAN QUALITY**

Guidelines are applied in regard to :

- Roads
- The positioning of houses within the different residential precincts

### **ARCHITECTURE**

The architectural style that has been selected, as illustrated in the Design Report, is as visualized a sea of tents within an African landscape. Figure 12 provides two of the architect's sketches of the intended appearance of this architectural style within a setting typical of the site.

To achieve this the architecture would consist of :

- Simply shaped low-pitched roofs.
- Large overhanging eaves, including verges.
- Horizontal lines
- Vertical fireplace elements
- Open floor plans
- Clerestory windows.

The Design Report then provides more detail in regard to:

- Roofs
- Walls
- Base
- Landscaping

### **IMPLEMENTATION**

In the implementation of the design code, it is recommended that :

1. The guidelines would need to be compiled and then tested against the design of a building for each different area. This would then need to be refined and then included in the sales agreement.
2. Consultation and design elements that affect the built environment need to be done at this time.
3. The guidelines can then be tested under the direct control of the developer and professional team before a panel of other professionals is appointed.

## **6.10. GREEN BUILDING CODE**

It is environmental best practice to consider and integrate into planning, design, construction and operation of new developments measures which reduce demands on the environment, in terms of such criteria as the reduction of its “carbon footprint” and its overall “ecological footprint”.

This matter has therefore received proper specialist consideration in the formulation of this development proposal, and the approaches to apply to satisfy this aim, wherever technically, economically and environmentally reasonable and feasible, are therefore provided in some detail within the specialist Green Building Code Report contained within appendix 15.13 of this EIA report.

This Green Building Code Report has been prepared by the specialist firm of Iyer Urban Design Studio, and within it :

- There is an introductory overview of the regulatory framework, in the form of the A1 SANS 204 and SANS 10400 – XA standards which are to be applied to the development.
- The green design principles to be applied are articulated.
- These green design principles are then detailed in the consideration of the design of an energy efficient building.
- Water conservation measures are then also provided.
- The use of appropriate materials in construction are recommended.
- The finishes to be applied are recommended.
- Waste management approaches are recommended.
- The approaches to landscaping, in regard to both the site clearance and construction, and in the implementation of water – wise landscaping is provided.

## **6.11. CONTROLS AGAINST POTENTIALLY POLLUTING OR HAZARDOUS ACTIVITIES**

Section 2 of this EIA report lists the proposed activities for which an environmental authorization is being applied in order to permit the proposed development to occur in terms of the relevant EIA legislation.



It is of note within this application that there are no specific hazardous and / or polluting activities that are applied for in this application over and above those listed within section 2, which are related more the activities associated with “normal” residential and commercial business areas.

The rules of the Home Owners Association, and the Town Planning Scheme to be applied to the site, and the Conditions of Establishment all preclude the introduction of any form of polluting industries to the site.

## **6.12. CONDITIONS OF ESTABLISHMENT**

The development planning application is being made in terms of the KwaZulu-Natal Planning and Development Act, 2008 ( Act No.6 of 2008 ) for the development of land on Erf 10119 Pietermartizburg and Portion of Erf 506 Ashburton, to be consolidated and redesignated Erf 1 Hilcove Hills.

The conditions of establishment in terms of this Act are provided as an annexure to the Town Planning Report of Rob Kirby an Associates which is contained within appendix 15.8 of this EIA report.

This annexure to the Town Planning Report sets out such details as to the individual phases of the development, the control of the plan approvals and building processes, water supply, sewage disposal, electricity supply and the public open space areas which will transferred to the municipality, public roads to be transferred and the rezoning of the Town Planning Scheme. Details of the conditions of title are also specified for the different components of the development, including such aspects as the pipeline servitudes mentioned within section 5 above within this EIA report.

## **6.13. SERVICES AGREEMENTS**

Service agreements with the various service providers are under negotiation and will be concluded during the development planning approval process for the application.

## **6.14. THE HOME OWNERSHIP STRUCTURE AND THE MANAGEMENT OF THE VARIOUS COMPONENTS OF THE OVERALL DEVELOPMENT**

The Hilcove Hills development is a mixed use development, with various types of land uses and development components within it. The number and scale of these clusters presents certain challenges. The details of the nature of the Home Ownership Structure and the related management of the overall development that is to be applied within the development is explained and motivated by the applicant’s project manager, Laurusco Developments (Pty ) Ltd, within their memorandum which is provided within appendix 15.18 of this EIA report, and which is summarised below in this section.

Within the Hilcove Hills development there will be a Master HOA (MHOA ) established, and then individual / local HOA ( LHOA ). This in view of the nature of the shared costs which will be incurred, for example, the sewerage treatment works, and various facilities which service the entire development.

Furthermore, by having a MHOA, it is easier to establish the financial sustainability of the respective LHOA's, and it will also cover the management and operations of the Recreation Centres, Wildlife Reserve and link / major roads not handed to the municipality, as elaborated no further below.

Therefore, first and foremost, a purchaser would be obligated to join the MHOA and pay a levy thereto. This payment would be made through the LHOA, i.e. the MHOA would charge one aggregated levy to the respective LHOA on a formula agreed, but potentially pro-rata to the number of transferred sites in the case of residential clusters. This would be used to cover the common costs across Hilcove Hills.

The residential clusters are autonomous of each other, with their own access and egress, and there would be no common areas spanning across various clusters, though common areas within the respective clusters would be owned by the LHOA. The standards of internal operation would then be determined by them inside their respective areas, including road maintenance.

Within the memorandum of the applicant, the details as to the nature of the management structures and funding of the various other components of the development are elaborated on, and summarised in the conclusions to the memorandum as follows :

1. Each residential cluster will have its own LHOA
2. The commercial node will fall within one LHOA
3. Upon transfer of the respective site, each owner pays a levy to the LHOA to which they belong and becomes a member thereof.
4. This levy would also cover their membership of the MHOA, which separately bills the LHOA.
5. The also pay a one off Stabilization Levy to the LHOA, and Wildlife Levy to the MHOA.
6. In the event of re-sales, each subsequent purchaser will pay the Stabilization Levy.
7. The primary developer will control the MHOA and LHOA until such time as critical mass is reached, and the entities are financially sustainable.
8. The MHOA will own and manage shared facilities such as the Wildlife Reserve, Receation Centres, Estate Office, the Passive Open Space open grassland conservation area next to Bellevue suburb, internal roads and sewerage treatment works ( unless handed over to the municipality ).

9. Ownership of the Wildlife Reserve shall remain with the primary developer until a pre-agreed transfer trigger point is reached.
10. Non-residential members of the MHOA would not pay the Wildlife Levy, but in turn would not have unfettered access to the Wildlife Reserve.
11. There are several different classifications of open space, and these have implications as to whether their upkeep is the responsibility of the LHOA, MHOA or Municipality.

## **6.15. TRAFFIC IMPACTS AND ROAD UPGRADES**

### **OVERVIEW OF THE TRAFFIC IMPACT ASSESSMENT REPORT**

This section deals with the road traffic to and from the site, the anticipated traffic that the development will generate, and the road infrastructural upgrades which will be required within the surrounding road network in order to accommodate these increased traffic levels. The information provided within this section is derived from the comprehensive Traffic Impact Assessment ( TIA ) for the proposed development that has been prepared for the development by the traffic specialists of the firm SSI, and which is contained within appendix 15.14 of this EIA report.

In order to present the background, analysis, results and recommendations in regard to the anticipated traffic impacts of the proposed Hilcove Hills development, the TIA sets the following study objectives :

1. Assess the traffic conditions on the existing road network.
2. Assess the traffic generation effects of the proposal.
3. Superimpose ( 1 ) and ( 2 ) above and reassess the traffic operations of the road network.
4. Assess the interface conditions between the road network and the site.
5. Highlight any traffic concerns resulting from the proposed development.
6. Make recommendations.

The analysis required to meet these objectives is recorded within the TIA report and reveals that the traffic impacts associated with the proposed development are significant with regard to the localised road system. A number of road improvements will therefore be required to accommodate the traffic likely to be generated by the proposal, and these should be implemented in a phased basis in concert with the development.

The results of this analysis, and the recommendations derived from them are summarised from the SSI TIA report below :

It is noted in the TIA report that, as the study areas as recommended in the appropriate traffic manual the *Department of Transport Report RR93/635 Manual for Traffic Impact Studies* need only cover up to 1.5km from the development, due to the scale and importance of this project, the study area has been to cover a wider area, as expanded on in the TIA. The developer's responsibility in terms of contributions towards road upgrades is, however, confined to the 1.5km rule which applies in such circumstances.

It is also noted, and emphasised within the TIA that this report covers the entire proposed development. As it is highly likely that the development will be phased in response to market demand, it will take many years to reach its full traffic generation potential. The traffic impacts as identified in this report should therefore be regarded as indicative only since, with the passage of time, many other factors may influence the performance of the wider road network.

### **THE PROPOSED ROAD ACCESS TO THE DEVELOPMENT**

Access to the site is illustrated in the proposed development layout plan as follows :

#### **1. Main access of Cleland Road extension off Murray Road**

This is on the western side of the development in the area of Bellevue suburb and is via an extension of Cleland Road from Murray Road eastwards to the site. This road extension to be constructed is within a road reserve servitude that has already existed for many years within the municipal town planning scheme for the area. The road is a single lane in both directions, and occurs within an urban area, and therefore does not in its own right trigger the requirement for an environmental authorization.

It is to be noted in regard to the selection of the road access that the initial proposal to use Ivy Road was abandoned as, based on the advice of the specialists, this was considered unsuitable.

#### **2. New Bellevue Interchange with the N3**

A new interchange on the national highway route where the planned Bellevue Road distributor crosses the N3 has been approved at the planning level by the South African National Roads Agency Limited ( SANRAL ). The location of this interchange in accordance with the Msunduzi Municipality's planned future distributor road system in this area.

This road system includes the Bellevue Road distributor which extends from the N3 interchange to across the site to exit it at its north western point, where it moves onto the adjacent property, Erf 547 New England.

It is to be noted that the most northern section of this Bellevue Distributor Road that is aligned within the boundary of the site is indicated as "Future Road" within a 30m wide servitude. This is because this last section is not required to serve the adjacent residential areas of the development.

The servitude is therefore provided for if and when the municipality wishes to extend this road further to north of the site, as is indicated on their future road planning network for the area.

The other element of the municipality's proposed arterial road system is the road which traverses from the Cleland Road extension across the site in a west to east direction, roughly parallel and to the N3 highway, to intersect with the MR748 provincial main road, also known as Pope Ellis Drive, and which is described below as the Ashburton Access.

### **3. Ashburton Access of the MR478 / Pope Ellis Drive**

The continuation of the extension of Cleland Road south eastwards as a main arterial road linking the western access to the eastern one in Ashburton, to Provincial Main Road 478 ( MR478 ) also known as Pope Ellis Drive, at a point approximately nine hundred metres from the N3.

However, it is to be noted that this road access to the rest of the development to the west of this access off Pope Ellis Drive is not required for the Hilcove Hills development as such. This is because all but the most eastern, Phase 1 eco-estate type residential development is not required to be served by this access point, as the areas to the west of this Phase 1 development are intended to be accessed from the more western parts, via either the Bellevue N3 interchange, or from the Cleland Road extension.

This is why, except for the short area next to the MR478 the arterial road link which traverses past the northern boundary of Ashburton suburb is shown as a 30m wide reserve. The developer is obliged to leave this road reserve to permit a future arterial road, if and when it deemed necessary by the Msunduzi Municipality's roads and traffic officials.

However, it is to be noted that if, for any reason, the N3 interchange was not built, or delayed for many years, then this arterial road linking to the MR478 would be to the rest the development would also be required to be constructed within that area which is currently indicated on the proposed development layout plan as a Road Servitude.

### **4. Game Reserve Eco-estate residential development next to Ashburton**

Access to the very low density eco-estate residential development which comprises Phase 1 of the development is via minor road branches off the end of that part of the arterial road access onto the MR478, as described above, to serve the various components of this particular low density residential development only, and also an Administration centre located on the south west quadrant of the MR478/ new arterial road access interchange.

## **PRESENT AND FUTURE ROAD TRAFFIC CONDITIONS**

After the TIA report describes and illustrates the existing road conditions on the relevant surrounding road network, and their existing road traffic activity, the future roads planned by the road traffic authorities are described, including the N3 Bellevue interchange, and the Bellevue Distributor which extends northwards over the site, and the Cleland Road extension which traverses the

site in an east west direction, as have already been described in regard to the road access to the site above.

The traffic growth in wider area is then described, the other development proposals in the influent traffic generation surroundings are also identified and taken into account.

A detailed analysis of the traffic generation from the development is then provided, and the implications in regard to the required road and intersection upgrades is provided.

The need for public transport needs, in the form of bus and taxi lay-bys is also identified within the TIA report. These are recommended to be a minimum of 18m long with accompanying pedestrian facilities, i.e. waiting areas and sidewalks from the bus / taxi laybys, to appropriate destinations.

## **CONCLUSIONS**

### **General conclusions reached**

The following conclusions are drawn from the assessment within the TIA of the likely impact of the Hilcove Hills mixed use development :

1. Existing traffic conditions on the existing road network are mostly satisfactory, with the exception of CB Downes Road and a few intersections.
2. All roads likely to be affected by the proposed development are in reasonable physical condition.
3. The proposed development has the potential to generate large volumes of traffic, which will have a varying impact on the existing road system as it distributes throughout the network.

#### **4. The required road upgrading identified**

The existing road system will experience varying degrees of deterioration in traffic operational conditions as a result of the addition of the generated traffic. In order to retain an acceptable level of service the road system in its present configuration will require upgrading, notably at the following elements of the road network.

- a. Widening of CB Downes Road from its intersection with Shortts Retreat Road to its intersection with Market Road. ( This requirement has long been recognized by the Municipality, notwithstanding the Hilcove Hills development.
- b. Capacity improvements to the Blackburn / Cleland and Alan Paton / Fairfield intersections, and the road section between these intersections.
- c. Capacity improvements to the New England Interchange.

- d. Capacity improvements to the New England Road / Hesketh Drive intersection.
- e. Capacity improvements to the Hesketh / Murray Road intersection.
- f. Widening of portions of Murray Road to an appropriate standard.

**5. New road infrastructure that will be required to serve the development**

It is items ( g ) and ( j ) below which will, according to the road traffic guideline report mentioned above, be to the developer's account.

- g. Cleland Road extension through to the development ( incorporating the realigned upgraded Murray / Cleland Road intersection.
- h. Bellevue Interchange onto the N3.
- i. Link from Bellevue Interchange to the R103/CB Downes Road at the Shortts Retreat Road intersection ( to be provided by an adjacent development).
- j. Access to the special residential zone 7, the Phase1 Eco-estate development on the eastern edge of the development off the MR478/Pope Ellis Drive.

**ANNEXURE A : THE CAPACITY ASSESSMENT ON THE PROPOSED MURRAY ROAD AND CLELAND ROAD EXTENSION INTERSECTION FOR THE INITIAL STAGES OF THE DEVELOPMENT**

The TIA report covers the entire proposed development. As it is most probable that the development will be phased in response to market demand, it will take many years to reach its full traffic generation potential.

Annexure A of the TIA provides an analysis of the implications of the road capacity and required upgradings in relation to the proposed phasing of the development ( which is elaborated on further below within section 6.18 of this EIA report ) in regard to the capacity of a major new, signal controlled intersection at the Murray Road / Cleland Road intersection, which would serve the proposed Hillcove Hills development as well as the existing residents of Bellevue suburb.

In addition to the two legs of Murray Road on either side of this intersection (north and south ),the western leg the intersection, the existing Cleland Road is assumed to be realigned, and the eastern leg is the proposed extension of Cleland Road along the existing road reserve giving access to the proposed Hilcove Hills development. If planned by the municipal traffic authorities, this extension could eventually form an important arterial link all the way eastwards to the P478 at Ashburton.

The purpose of the assessment within Annexure A of the TIA is to identify when this intersection will approach capacity, with the ongoing development, and therefore when further road access linkages to serve the expanding Hilcove Hills development are required. This is considered below in regard to the planned phases of the development.

**Phase 1**

Eco-estate / game reserve development – access onto the MR478

**Assessment: No impact**

**Phase 2**

118 Units conventional housing and community facility

Intersection operates comfortably with all movements experiencing minimal delays (average delay 11.4s, LOS average B, lowest C).

**Assessment: Satisfactory**

**Phase 3**

98 Game Reserve cluster housing

Addition of phase 3 traffic has nominal impact (average delay 11.4s, LOS average B, lowest C).

**Assessment: Satisfactory**

**Phase 4**

116 units conventional cluster housing

44 units game reserve single dwelling

Primary school.

Addition of phase 4 traffic has little impact (average delay 13.2s LOS average B, lowest C)

**Assessment: Satisfactory**

**Phase 5**

Extension of arterial road.

**Not applicable**

**Phase 6**

52 Unit lifestyle villages (220m<sup>2</sup>)

105 Units lifestyle village (325m<sup>2</sup>)

2 erven institutional (Frail care and facilities centre)

The housing units and institutional facilities of the development can be comfortably accommodated by the intersection.

Addition of phase 6 traffic has moderate impact on the performance of the intersection (ave. Delay 14.0s, LOS ave. B, lowest C)

**Acceptable**

**Phase 7**

89 Units lifestyle village (220m<sup>2</sup>)

125units lifestyle village (325m<sup>2</sup>)

Community facility

The addition of Phase 7 has a moderate impact on the performance of the intersection (Ave. Delay 16.7s, LOS ave B, lowest C)

**Assessment: Moderate delays**



### **Phase 8**

65 units lifestyle village (220m<sup>2</sup>)  
154 units lifestyle village (325m<sup>2</sup>)

The addition of phase 8 would mean that the intersection operates under stress with individual movements experiencing increasingly restrictive degrees of delays ( Ave. Delay 23.4s, LOS Ave C, lowest D )

**Assessment: Significant delays**

### **Phase 9**

Hospital  
Medical suites

The hospital and medical suites generate considerable volumes of traffic in peak periods, and will result in certain movements at the intersection approaching capacity. Addition of Phase 9 traffic has the impact of increasing the number of movements approaching theoretical capacity, with unacceptable delays on several movements. (Ave delay 56.1s, LOS E, lowest F)

**Assessment: Unacceptable delays**

## **Conclusions in regard to new Murray Road / Cleland Road (extension) Intersection**

The following conclusions refer specifically to the traffic generated by the sequential phasing as per ascending numbering on the proposed development layout plan, Drawing No. 2915/WD21. However, they can equally be applied in alternative phasing scenarios.

The proposed signal controlled Murray Road / Cleland Road (extension) intersection will be able to accommodate traffic generated by Phases 2, 3 and 4 of the Hilcove Hills development comfortably.

Phase 5 is an extension of the arterial road, and is not applicable.

Phases 6 and 7 can also be accommodated satisfactorily, but intersection users will begin to experience delays.

Phase 8 could probably be accommodated, but with significant delays becoming increasingly regular.

The development of further phases would necessitate the provision of additional access to Hilcove Hills, with the Bellevue Interchange being the preferred option from a traffic distribution perspective.

## **ANNEXURE B: ASSESSMENT OF THE ALTERNATE POSITIONING OF INTERCHANGES ON THE N2**

The planning of the Bellevue N3 interchange has the approval of the South African National Roads Agency Limited (SANRAL). Recent, more localised planning has identified a position of an interchange at the Bellevue Distributor intersection, and as illustrated in this application's development layout plan.

As reported in the TIA report, discussions in the course of compilation of that report with the affected road authorities ( SANRAL and Msunduzi Municipality ) indicated that the planned provision of the Bellevue Interchange is still valid.

SANRAL have recently commissioned the detailed design of both the upgraded Ashburton interchange ( the existing Ashburton N3 interchange is nearing capacity in its present configuration) and a new Bellevue Interchange on the N3. In addition, as mentioned in the TIA, the Market Road interchange is also presently undergoing review with the possibility of major reconfiguration.

Notwithstanding the above, it is considered prudent , in respect of the Hilcove Hills development to consider the implications of the possibility of other alternate scenarios related to access from Hilcove Hills to the wider road network, if the expected and planned road upgrades to the national road network described above do not eventuate, or take some other configuration.

As reported on in the main body of the TI, the anticipated road network (with a Bellevue Interchange ) can adequately accommodate the full proposed Hilcove Hills development.

However if this anticipated road network were to **significantly** change and the Bellevue Interchange did not materialize, then the ability of the changed network to adequately accommodate the predicted traffic could be compromised to varying degrees, depending on the extent of the changes.

The possibility that would have the most significant effect on the proposed Hillcove Hills development would be if the planned Bellevue Interchange was not constructed.

It may be assumed that, if the Bellevue Interchange were not constructed, then the Ashburton Interchange and a reconfigured / remodelling /new interchange in the vicinity of the existing Market Road Interchange would require sufficient capacity to accommodate predicted traffic wishing to access the N3.

The vehicles that were assigned to access the Bellevue Interchange from the Hilcove Hills would increase and consequently require appropriate mitigating measures.

Therefore, in the event of a no Bellevue Interchange scenario, the provision of the Cleland Road extension from Murrury Road to the MR478 in Ashburton becomes much more important, as does the Bellevue Distributor section the Cleland Road Extension and the R103 at Shortts Retreat Road intersection.

Preliminary assessment of a “no Bellevue interchange” scenario indicates that the local road network can ( with modification ) accommodate the total Hilcove Hills development.

In summary, the full proposed Hilcove Hills development can still be accommodated without the Bellevue Interchange. However, the interface of the proposed development with both the National Route would have to be re-assessed to determine appropriate measures to accommodate the re-assigned traffic.

## **CONCLUDING COMMENTS IN REGARD TO THE TRAFFIC IMPACT ASSESSMENT**

The TIA has assessed the existing road traffic conditions, the increase in road traffic which will occur, and the required road and intersection upgradings required, and also at what point an additional access to the overall development would be required when the Murray Road / Cleland Road extension reaches capacity, and a new, additional access to the overall development would be required.

This EIA report, with its accompanying TIA within the appendices will be provided to the national, provincial and municipal road traffic authorities for their comments and these comments will be forwarded to the KwaZulu-Natal Department of Agriculture, Environmental Affairs and Rural Development for their consideration in the EIA process.

### **6.16. ENGINEERING INFRASTRUCTURAL SERVICES**

The description of the engineering infrastructural services which will be required to service the proposed Hilcove Hills mixed use development is contained within the Engineering Services prepared by the civil engineering specialists of SSI which is contained within appendix 15.10 of this EIA report. The various components of engineering services are summarised from this report as follows :

#### **ROADS**

As also described in the Traffic Impact Report, a hierarchy of road network has been planned to offer access to the site, these being the Cleland Road Extension, off Main Road 478 and the proposed N3 interchange.

As also stated in the TIA, the new N3 interchange and the two arterial roads running north and south, and east and west, through the site are part of the Msunduzi Municipality and SANRAL long term plans. The alignment of these arterials have been incorporated into the development, within 30m wide road reserves.

The areas of these arterial roads which would be built by the developer are indicated in dark brown by on the proposed development layout plan, and those parts which may be built in the future by the municipality are shown as clear road reserves.

The nature and alignment of the unavoidable road crossings of these arterial roads, and any associated wetland area, has been the subject of interactions between the roads engineer and the wetlands specialist and town planner to mitigate as far as possible any negative impacts on these wetland systems, and this is discussed in more detail within the potential impacts of the proposed development which occurs within section 10 of this EIA report.

None of the internal road systems within the development impact on riverine and or wetland areas. Within the development, the internal road system will have widths

varying from 3m to 7.4m, with all road geometry catering for the anticipated service vehicles, and will be in accordance with the national and municipal road design and construction standards. The roadways under the ownership of the homeowners associations will have standards to enhance the aesthetic feel of the villages or neighbourhood units that they are part of.

## **SANITATION**

The waste water disposal options provided below have been discussed between the SSI engineering specialist and the local municipality, and have been agreed with by the latter. The disposal of sewage will be divided into septic tanks and soakaways, and water borne sewer, as described further below.

### **Septic tanks**

The area indicated as Phase 1, the eco-estate on the eastern side of the development near Ashburton will be serviced by septic tanks and soakaways. The sites are large enough to cater for this trans-evaporation areas required, and the percolation tests undertaken by the geotechnical specialists have confirmed that the soakaways are feasible, due to the insitu material, together with the large area available for trans-evaporation.

### **Water Borne Sewer Reticulation**

Water borne sewers will be installed for all other phases of the development.

A new pump station, that will pump to an existing pump station in Morgan Road in Bellevue suburb will serve phases 2 and 3. The existing pump station and rising main will be upgraded to accommodate the additional effluent volume. This sewer will discharge through the existing gravity main to the Darvill works. The capacity of this works is planned to be increased by 2014.

For the rest of the phases, the sewage will gravitate towards the proposed Waste Water Treatment Works (WWTW ), sized to process 1.9MI/day. The WWTW has been positioned at a low point of the site, near the north eastern boundary. The geotechnical conditions and topography have been found by the geotechnical and civil engineering specialists to be adequate for this infrastructure.

The sewer pipe sizes will have a minimum diameter of 160mm with individual plot connections. Although the internal sewage reticulation on the site has been designed to cater for the Hilcove Hills development, servitude allowance will be made for a service link for this sewage, if it were to ever be required to accommodate sewage generated from other parts within its upslope catchment area.

The WWTW has also been designed to cater for the Hilcove Hills development. However, an suitable area immediately adjacent to it has been allocated to allow for an expansion of the works to receive any future upstream catchment discharge.

In regard to permitting arrangements associated with any sewage treatment plant, the following is noted, and will be complied with:

#### **1. Department of Water Affairs**

The design of the sewage treatment plant would have to comply with the requirements of the Department of Water Affairs, and the treated effluent must comply with the standards that they prescribe for the site.

## **2. The National Department of Environmental Affairs**

In terms Regulation 718 of 3 July 2009 promulgated under the National Environmental Management : Waste Act (Act 59 of 2008) a Waste Management License is required for the construction and operation of a facility for the treatment of effluent, wastewater or sewage with an annual throughput capacity of 15 000 cubic metres per annum. This capacity will be exceeded in the Hilcove Hills development.

A Waste Management License will therefore be required for the sewage plants proposed for the proposed developments. As sewage is classified as a hazardous waste, and this Department is the licensing authority for all hazardous waste management license application, the national Department of Environmental Affairs will be the licensing authority to which applications are made.

## **WATER RETICULATION ( DOMESTIC AND FIRE )**

The total estimated average daily water demand for the total development is 1.9MI day. The majority of the site can be served by the existing Murray Road reservoir (BLV/2) situated close to the western boundary of the site, within the Bellevue residential area. The elevation of the reservoir is approximately 60m higher than the eastern extremity of the site and it would therefore to supply even these areas from this reservoir.

The higher lying sites adjacent to the Bellevue/ Crestview residential area ( Phases 2 and 3 ) can be supplied by extending the existing reticulation networks supplying the existing Bellevue residential area. These networks are supplied by the Bisley reservoir, and would serve between 10% and 12.5% of the total development.

A full pressure water reticulation will be installed. Each erf will be provided with an erf connection. The individual homeowners will then apply to the local authority for a water meter.

The fire fighting water supply will be drawn from the domestic line and designed in accordance with the Msunduzi Standards for fire fighting infrastructure. Fire Hydrants will be positioned to ensure access to areas that are prone to grass fires. The management of fire is also dealt with in the Fire Management Plan which is included as a component of the EMPr which is contained within appendix 15.19.

## **6.17. STORM WATER MANAGEMENT**

The principles of stormwater management are provided within the Engineering Services Report, and these are further described in greater detail within the separate Stormwater Management Report produced by SSI which is contained within

appendix 15.11. The stormwater management proposals are summarised below from both of these reports.

A guiding principles to be applied in the management stormwater in the Hilcove Hills development are that ;

1. Stormwater run off will be attenuated on site so that pre and post development run off will be the same.
2. No attenuation dams or structures will be constructed in the valley lines and associated riparian areas.

The Stormwater management plan of appendix 15.11 provides details of storm water run off calculations for pre and post development flows, and the details of the stormwater management structures to be constructed.

Storm water management and its associated attenuation methods which apply these principles are by means of both on site and off site attenuation, as follows :

#### **ON SITE ATTENUATION**

On site attenuation will be enforced through the building code of the development. Individual site developments will be responsible for constructing an attenuation chamber which will either tie into the mid-block stormwater pipe, or the valley line, depending on the position of the site.

#### **OFF SITE ATTENUATION**

Stormwater collected from the roadways and piped to the valley lines will be constructed with attenuation chambers at the outlets. Midblock stormwater will be provided where the site is landlocked to the valley. Erosion protection will be provided at all discharge points.

### **6.18. SOLID WASTE MANAGEMENT**

Ashburton and Bellevue suburbs have a municipal waste collection service. This service will be extended to the proposed Hilcove Hills development. The road network will be designed to accommodate refuse removal trucks.

The management of waste to reduce volumes, by avoidance, reuse and recycling, as outlined in the Green Building Code and the EMPr will be applied in the development.

### **6.19. ELECTRICAL SUPPLY**

The electrical supply to the proposed Hilcove Hills development is described within the Electrical and ancillary services report and the Ancillary Services Green design report, both produced by the specialist electrical engineering consultants, BFBA Consultants, which are contained within appendix 15.12, the contents of which are summarised below.

## **BULK ELECTRICITY SUPPLY**

It is envisaged that an 11kV bulk Medium Voltage Supply Point will be provided by Eskom for Phase 1 of the development, comprised of the dwellings within this eco-estate type of development situated in the most eastern part of the site.

Following discussions with Eskom by the electrical specialist of BFBA, it was confirmed that a scoping exercise for the proposed upgrading of the existing 11kV network in Ashburton has recently been completed.

A letter from Eskom confirming their ability to supply the development with electricity is included at the back of the Electricity Supply Report.

Based on the information at hand, it is expected that the main electricity supply point for the entire development could be made available from the existing network, once the aforementioned upgrading has been completed.

The specialists have also held discussions with the Msunduzi Municipality Electricity Department with respect to the provision of electricity for the residential sites adjoining the existing Bellview Residential area. At this stage it is anticipated that sufficient capacity could be made available off the existing Bellevue reticulation network to cater for approximately 500kVA. This would be the most cost effective way of reticulating the proposed new residential units in this area, due to their proximity to the existing Bellevue suburb.

There is therefore adequate electricity supply from the surrounding electricity reticulation areas to service the development.

The electrical supply report also provides information in regard to internal lower voltage reticulation, metering, lighting protection and earthing, and street and area lighting requirements.

Ancillary services infrastructure will be provided for digital telephony and data services, and access control, security services and closed circuit television surveillance.

## **ELECTRICAL GREEN DESIGN**

The intention of the Electrical Green Design Report is to eliminate negative environmental impacts as far as possible, and to find ways to reduce load, increase efficiency and utilize renewable energy resources through skilful and sensitive design.

In order to achieve these intentions, the Electrical Green Design Report, which should read in the more general Green Building Code Report produced by Iyer Urban Design Studio which is contained within appendix 15.13, identifies the measures to be applied in the following areas of the development :

### **1. Lighting control and management :**

Where details the different measures to reduce electricity demand from this source are provided.

## **2. Phantom Loads**

The phantom electrical loads are those which consume electrical power in their ambient state when connected to an electrical source, but not necessarily switched on. Examples are from television sets, hi-fi equipment and microwaves.

## **3. Heat Pumps**

The use of heat pumps, a heat pump being basically a device which uses the ambient heat from the environment to partially heat the refrigerant, in such a manner that the overall electrical demand from the cooling device, such as a refrigerator or air conditioner has a reduced electrical demand.

## **4. Heating, ventilation and air conditioning optimization**

Methods by which devices associated heating, ventilation and air conditioning can perform optimally with the lowest energy demands are provided.

## **6.20. PHASING OF THE DEVELOPMENT**

A development of this scale will take many years to be developed fully, perhaps ten to fifteen years. The proper phasing of a development of this scale is essential to its success, and is required to be properly integrated with the such factors as market demand and infrastructure provision.

The development has been subdivided into 26 phases. It is to be emphasized that these phases do not represent a strict chronological order of implementation. Rather, as stated above, the phases are linked to a logical and cost effective incremental infrastructural services and infrastructure services provision, and it is possible they will not occur strictly in a progression in accordance with their numbering.

However, what is also important to also stress, is that no phase would be implemented before the necessary infrastructural capacity ( in the form of roads and road upgrades, waste water provision, potable water provision and electricity supply provision ) was in approved and in place to cater for a particular phase. This reliance in infrastructure provision and the implementation of a particular phase is clarified in each instance within the specialist Engineering Services and Traffic Impact Reports included in the appendices.

The details of the phasing are as follows :

**Phase 1** : The special residential area next to Ashburton and associated areas of private open space game reserve, and set within the game reserve landscape. It is a very low density development, and waste water disposal would be by means of septic tank and soakaway systems associated with each residence. It also includes an administration centre in between the access road onto Pope Ellis Drive and the adjacent area of Ashburton.



**Phases 2, 3 and 4 :** These are residential areas next to Bellevue suburb, and are a combination of individual and cluster homes. It also includes an education site, the large areas of public open space grassland of identified conservation value, and the Cleland Road Extension from Murray Road along the existing road reserve through Bellevue suburb to obtain access to the site from the west.

**Phases 5 and 6 :** These are the office park, institutional ( hospital ) and residential areas on the central spur land at about the mid point of the east – west main arterial road, and also includes that portion of this arterial road required to serve these developments.

**Phases 7 and 8 :** The more extended areas of residential land on the central spur of land, to the north of phases 5 and 6, including the lifestyle retirement village.

**Phase 9 :** Hospital, medical suites limited business office zone use zones between the N3 highway and the east-west arterial road.

**Phases 10 and 11 :** Residential areas of larger stands on within central spur of the development.

**Phases 12 and 13 :** Are the on site road connections to the proposed N3 Bellevue interchange, and that portion of the north-south arterial road between this interchange and the intersection with the west – east arterial road.

**Phase 14 :** Areas of private open space to be zoned as Conservation Parks, outside of the wildlife reserve area.

**Phase 15 :** The cluster home development adjacent to the northern edge of the west-east arterial road, opposite the general business district.

**Phase 16 :** An extension of the north south arterial road to serve the residential areas to the north of it.

**Phase 17 and 18 :** Residential areas which extend on the eastern side of the north south road to the northern boundary of the site.

**Phase 19 and 20 :** The general business districts situated on either side of the north south arterial road nearest to the N3 interchange.

**Phase 21 :** The extension of the west – east arterial road to serve phase 22.

**Phase 22** : The limited business, conference centre and office zone on the more eastern spur of land extending out from the N3 and intersected by the west – east arterial road.

**Phase 23** : Areas of private conservation open space outside of the wildlife reserve area.

**Phases 24 and 25** : Are other public roads to be constructed in the development, besides the main arterial roads.

**Phase 26** : Is the Remainder of the site, comprised of the passive open space wildlife reserve area.

## **7. IDENTIFICATION OF THE LEGISLATION AND GUIDELINES TAKEN INTO ACCOUNT**

The following environmental and land use planning legislation and guidelines are relevant to the compilation of this environmental impact assessment report and are accordingly taken into account where relevant in an appropriate manner.

In regard the most relevant overarching national legislation, the **Constitution of the Republic of South Africa (Act No. 108 of 1996)** is the most pertinent, as this is the legal source of all law within the country, including environmental law. Within the Constitution of South Africa, the Bill of Rights is fundamental, and the underlying principle behind its Section 24 is that “everyone has the right to an environment that is not harmful to their health and well-being”. Furthermore, the environment should be protected for present and future generations by preventing pollution, promoting conservation and practising ecologically sustainable development.

In regard to spatial planning and related legislation at the national level, the following legislation may be relevant:

- Physical Planning Act, (Act 125 of 1991)
- Municipal Structures Act, (Act 117 of 1998)
- Municipal Systems Act, (Act 32 of 2000)
- Development Facilitation Act, (Act 67 of 1996), in so far as the principles of development are concerned.

Of these the relevance and implications of the Municipal Systems Act is elaborated on below.

### **THE MUNICIPAL SYSTEMS ACT (MSA – ACT 32 OF 2000)**

Unlike previous times, within post 1994 South Africa the entire country is covered by “wall to wall” local municipalities. Before this, municipal area and their related planning authority was largely restricted to the areas of their town planning schemes. Therefore, land planning and related development permitting is today a municipal function (Except where the Development Facilitation Act ( DFA ) applied in particular circumstances.

Of particular note is that the Municipal Systems Act prescribes the requirements of the Integrated Development Plan ( IDP ) and the Spatial Framework Plans ( SDF ) that must be compiled by each local municipality to guide and control land use development within their areas. Therefore, land development in any part of the country may be influenced by this Act and the abovementioned IDP and SDF plans that are required to be promulgated under its auspices.

A central document within a municipality’s Integrated Development Plan is its Spatial Development Framework Plan. The main purpose of the SDF is to provide a framework to guide form and location of physical development in their areas. It therefore reflects the elements of the IDP which have a spatial implication, therefore, it is a spatial representation of the IDP. It broadly informs decision-making relating to future development and service provision. It is against this background that local municipalities have completed and adopted their IDP and SDF first plans, typically in

the early 2000's. These plans are required to be revised on a regular basis, as prescribed in the Municipal Systems Act, and should be subject to review.

**In regard to environmental legislation, at the national level the legislation with the potential to be influential is:**

- Environmental Conservation Act, (Act 73 of 1989)
- Environmental Conservation Amendment Act, (Act 50 of 2003)
- National Environmental Management Act, (Act 107 of 1998)
- NEMA : Amendment Act, (Act 8 of 2004)
- National Environmental Management : Biodiversity Act, (Act 10 of 2004)
- National Environmental Management : Protected Areas Act ( Act 57 of 2003)
- National Water Act, (Act 36 of 1998)
- National Environmental Management : Protected Areas Act, (Act 57 of 2003)
- National Heritage Resources Act, (Act of 1999)

The legislation listed above of particular relevance to this development is elaborated on further below:

**ENVIRONMENT CONSERVATION ACT (ECA – ACT 73 OF 1989)**

The Environmental Conservation Act (No. 73 of 1989) is intended to provide for the effective protection and controlled utilisation of the environment. Part five of the Act refers to the control of activities that may have a detrimental effect on the environment. Section 21 of the Act refers to the Minister being permitted to identify those activities, which in his opinion have substantially detrimental effects on the environment, whether in general or in respect of certain areas. Any change in land use from agriculture, or undetermined use, to any other land use, and any use for nature conservation or zoned open space to any other land use, is subject to a mandatory EIA (Environmental Impact Assessment).

Act No 73, 1989, Part VIII, Section 31, makes provision that, if in the opinion of the Minister (of Environmental Affairs and Tourism) the competent authority, local authority or the government institution concerned, any person performs an activity, or fails to perform any activity as a result of which the environment is, or may be, seriously damaged, endangered or detrimentally affected, the minister, competent authority, local authority or government institution, as the case may be, may be in writing direct such person to cease such activity; or to take steps that the Minister, competent authority, local authority or the government institution may deem fit within a period specified in the directive, with the view to eliminating, reducing or preventing damage, danger or detrimental effect.

**NATIONAL ENVIRONMENTAL MANAGEMENT ACT (NEMA –ACT 107 OF 1998)**

The National Environmental Management Act (No. 27 of 1998) was drawn up to provide for co-operative, environmental governance by establishing principles for decision-making on matters affecting the environment, institutions that will promote co-operative governance and procedures for co-ordinating environmental functions exercised by organs of state; and to provide for matters connected therewith.

Section 28 of the Act which falls within Chapter 7 – Compliance, Enforcement and Protection can be related to the proposed development. Part 1 of the Chapter focuses on environmental hazards and Section 28 relates to the duty care and

redemption of environmental damage. Section 28 provides that every person who causes, has caused, or may cause, significant pollution or degradation of the environment, must take reasonable measures to prevent such pollution or degradation from occurring, continuing or reoccurring or, insofar as such harm to the environment is authorised by law or cannot reasonably be avoided or stopped, to minimise and rectify such pollution or degradation of the environment.

### **NATIONAL WATER ACT (ACT 36 OF 1998)**

Because any substantial development such as the one proposed has the potential to cause pollution, it falls within the ambit of the National Water Act. This Act recognises that water is a natural resource that belongs to all the people of the country.

In regard to water and forestry, the following legislation may be of significance for the planning, permitting and operation of the proposed development:

- National Water Act, (Act 36 of 1998)
- National Forest Act, (Act 84 of 1984)
- Forestry Amendment Act, (Act 63 of 1995)
- Veld and Forest Fire Act, (Act 101 of 1998)

Of note in regard to the various aspects of the above legislation is that it prescribes requirements and prohibitions in regard to various activities which may be associated with land development, including :

- Impacts on wetlands
- Construction of dams
- Other effects streams or rivers
- Extraction of water
- Release of water and wastewater, and the licensing of sewage works.
- Cutting of natural forests or damage to specified protected indigenous trees.

In many instances, notwithstanding any environmental authorizations or planning permissions which may already be obtained from the relevant authorities, the relevant department, which departments, which are the Department of Water Affairs and the Department of Agriculture, Forestry and Fisheries, as the particular case may be, may be required to grant a permitting license before a particular activity relevant to the list above may be commenced with.

### **THE SUBDIVISION OF AGRICULTURAL LAND ACT ( ACT 70 OF 1970 )**

This act is applicable to all agricultural or undeveloped land that falls outside of town planning schemes before 1994. It is administered by the national Department of Agriculture, and permission is required from this Department for land to be released for subdivision and/or non-agricultural development.

Within KwaZulu-Natal, due to its relatively high agricultural potential in many parts, the Department looks very critically at the loss of any agricultural land identified as having high agricultural potential.

In the case of the site, because it falls outside of a municipal town-planning scheme, application is required to be made permit subdivision of this part of the site alternative uses besides agriculture.

In regard to agriculture, the following other legislation may be of relevance for the development:

- White Paper on Agriculture (1995)
- National White Paper on Agriculture (1995)
- Conservation of Agricultural Land Act (Act 108 of 1996)
- Subdivision of Agricultural Land Act Repeal Act (1998)
- National Policy on the Protection of High Potential and Unique Agricultural Land (June 2006)
- Draft Sustainable Utilization and Protection of Agricultural Land Bill (2006)

In regard to other legislation affecting land issues, the following national legislation is sometimes relevant to land development proposal.

- Alienation of land Act, (Act 103 of 1998)
- Provision of Certain Land Settlement Act, (Act 103 of 1998)
- Communal Land Rights Act, (Act 11 of 2004)
- Restitution of Land Rights Act, (Act 22 of 1994)
- Expropriation Act, (Act 63 of 1975)
- Expropriation of Mineral Rights Act, (Act 96 of 1969)
- Land Reform Labour Tenants Act, (Act 3 of 1996)
- Land Restitution and Reforms Law Amendment Act, (Act 63 of 1997)
- Upgrading of Land Tenure Rights Act, (Act 112 of 1991)
- Land Survey Act, (Act 8 of 1997)

Other national and provincial legislation of relevance to the construction and operation of the proposed development is:

1. National Environmental Management : Protected Areas Act ( Act
2. National Heritage Resources Act (Act 25 of 1999)
3. Hazardous Substance Act (Act 15 of 1973)
4. Health Act (Act 63 of 1977)
5. Atmospheric Pollution Act (Act 45 of 1965)
6. National Environmental Management : Air Quality Act (Act 39 of 2004)
7. South African National Standard SANS 1929: 2005 (Sets down standards) for some of the major pollutants in the ambient air).
8. KwaZulu-Natal Nature Conservation Act (Act 9 of 1997)
9. KwaZulu-Natal Planning and Development Act (Act 6 of 2008)

10. KwaZulu-Natal Heritage Act (Act 10 of 1997)

**ASSISTING ENVIRONMENTAL GUIDELINE DOCUMENTS**

Guidelines Compiled by the National Department of Environmental Affairs and Tourism in regard to the implementation of the regulations 385, 386 and 387 under the National Environmental Management Act are intended to assist relevant parties as to what is required in regard to EIA procedures promulgated under this act these being:

- a. Guideline 3: General Guide to Environmental Impact Assessment Regulations, 2006
- b. Guideline 4: The public participation process.
- c. Guideline 5: Assessment of Alternative and Impacts
- d. Guideline 6: Environmental Management Frameworks
- e. Guideline 8: Public Participation in the EIA process

## **8. DETAILS OF THE PUBLIC PARTICIPATION PROCESS**

### **8.1. BACKGROUND**

The public participation process reported on in this section has been undertaken in accordance with EIA Regulation 543 : 54, 55, 56 and 57 and *Guideline 8 : Public Participation* compiled by the National Department of Agriculture and Environmental Affairs, which is intended to lend clarity and elaborate on the abovementioned regulations.

All documentation produced for or derived from the public participation process up to the compilation of the final scoping report has been included within this report, which has been circulated to all registered interested and affected parties, and the competent authority, the provincial Department of Agriculture, Environmental Affairs and Rural Development. Appendix 15.1 of this EIA report contains the list of the registered interested and affected parties and the comments received after the circulation of the final scoping report.

#### **8.1.1. THE PUBLIC PARTICIPATION PROCEDURES THAT HAVE BEEN UNDERTAKEN SO FAR IN THIS EIA PROCESS**

In order to advise all potential interested and affected parties of the proposed development, provide them with suitable background information, to be to be registered as interested and/or affected parties with an opportunity to comment, and to advise them of the forthcoming public meeting, the following actions were undertaken :

1. An advertisement was placed in The Natal Witness, notifying of the EIA application, and also the forthcoming public meeting, and inviting readers to request more information and / or to be registered as an interested and / or affected party for the EIA process.
2. Two posters meeting the requirements of the EIA regulations were placed on the boundaries of the site, one in the Ivy Road area, and one in the Pope Ellis Drive area.
3. An appropriate public participation letter was posted by registered letter to all identified property owners within 100m of the site, notifying them of the EIA application, and also the forthcoming public meeting. Information on properties and their owners was obtained from project's professional land surveyor and town planners, as is a normal practice in EIA applications of this nature. Well over a hundred registered letters were sent out based on the information provided. When it became apparent during the detailed planning and design of the development that there would be the required construction of the Cleland Road extension, the properties adjacent to this road were also provided with a similar public participation letter.



However, based on responses received from interested and / or affected parties during the EIA process, there were some adjacent property owners who have been overlooked and / or were untraceable, and this was raised at the first public meeting. These properties have been followed up in the following manner :

- The rates roll of Msunduzi Municipality has been studied, and any previously untraceable property listed has been followed up to try and locate the owner and their contact details.
- Where the rates roll of the municipality does not list a property, the Valuation Department has been also approached to try and locate the property owner and their contact details.
- Where the name of a property owner has been indentified, but no contact details, there has been a phoning process of any person with the same surname to try and locate the owner of an identified property.
- Letters have been physically dropped off at some properties, where the postal address of these properties could not be found.

Where the owner of a property has been identified by these methods, they have been sent a registered letter, except where spoken to telephonically, where they may have requested to be registered as in interested and affected party in the conversation. All those additional property owners who have requested to be registered as interested and affected parties in these follow up actions are included within the register of interested and affected parties which is included within appendix 1.

The municipal councillor for the area has also been provided with an appropriate notification letter, and has been recorded as an interested and / or affected party.

Other conservation organisations, such as the Wildlife and Environment Society were also notified of the application through a Background Information Document sent to them.

4. A public meeting was held on the 16 February 2011 at 18h00 at the Martizburg Golf Club.

a. Guy Nicolson explained the background and purpose of the public meeting, and briefly described the site and the proposed development, with the assistance of the Background Information Document and Site Development Plans that were provided to all attendees of the meeting, and a power point presentation.

b. There was a questions and discussion session chaired by Guy Nicolson, the nature of which is elaborated on further below within section.

c. Guy Nicolson then explained the next steps in the EIA process, thanked the attendees and closed the meeting.

5. A draft scoping report dated April 2011 was circulated to all interested and affected parties on the 12<sup>th</sup> and 13<sup>th</sup> of April, by email to all those who had an email address. A copy of the report was also provided in the Ashburton public library, with a large scale plan of the development. Those registered interested and affected parties who do not have a email address were notified by posted

letter of the availability of the report. A copy of the report was also provided to all relevant government organisations required to provide comment on the report.

6. A final scoping report dated June 2011 was circulated in this month to all registered interested and affected parties and government organisations in a similar manner as the draft scoping report. Comments received on this final scoping report are included within appendix 15.1.
7. As described in more detail within section 3.2 above, a Revised Plan of Study for an Environmental Impact Assessment was circulated to all registered interested and affected parties and government organisations in January 2012, after it was approved by the DAEARD. No comments on this revised Plan of Study were received.

## 8.2. REGISTER OF INTERESTED AND AFFECTED PARTIES

As required within EIA regulation 453, and based on the measures provided above, a register of the public interested and affected parties has been compiled and is provided at the beginning of appendix 15.1.

This register must be considered as ongoing, as it is not unusual for interested and affected parties to be added during the EIA process.

## 8.3. RECORD OF THE ISSUES AND CONCERNS RAISED FOR FURTHER INVESTIGATION AND ASSESSMENT IN THE EIA PROCESS

As a central function of the public participation process described above, the tables below list the commentator, the comments received at the various stages of the EIA process, as outlined above in the description of the EIA procedures, and / or issues raised, and the responses to them.

These responses now take into account the contents of this EIA report and its appendices, and which have modified the responses to comments received earlier that were included in the draft and final scoping reports, before the specialist studies and other forms of additional information was available.

**TABLE OF COMMENTS RECEIVED, AND RESPONSES TO THEM UP TO THE TIME OF THE CIRCULATION OF THE DRAFT SCOPING REPORT**

<b>COMMENT-TATOR</b>	<b>COMMENT AND / OR ISSUE RAISED</b>	<b>RESPONSE</b>
Chris Ahrens	That the "passive open space" grassland conservation area be included in within the private open space of the development, as they do not have faith in the municipality to manager it properly, and it is also a security risk if it is a public open	In response to these comments, and others received in the EIA process, the applicant has acceded to these requests, and in the latest development proposals which are the subject of this EIA report, the area of grassland of conservation worth next to the suburb of Bellevue is now planned as private open space,

	space.	to be managed by the development.
	They love having open farmland next to them. Do prefer the proposal to a full urban development	Comments are noted, and also the fact that the large public open space grassland bordering the suburb of Bellevue does mean that most properties adjoining the site will still have open land next to them.
Rupert & Terri Buhr	Traffic volumes on Ivy Road	A traffic impact assessment has been undertaken and is included within appendix 15.4. However, based on preliminary investigations, it has been determined that Ivy Road is not suitable to act as a main access from the West onto the site, and therefore the alternative Cleland Road extension within an existing road reserve area has been selected.
	Would prefer grassland public open space to be private.	See comments at the beginning of this table in this regard.
Nev Durow	Serious consideration should be given to water conservation measures, e.g. rain water harvesting	This consideration is dealt with in the Green Design Report contained within appendix 15.12.
	Solar heating and photovoltaic electricity generation should be applied	This consideration is dealt with in the Green Design Report contained within appendix 15.12.
	Recommended that the game reserve should be registered as a protected environment in terms of NEMA : Protected Areas Act of 2003	This proposal will be taken into consideration at the end of the environmental and town planning permitting processes.
Mary Anne Fanner	Asks for butterfly study	This has been undertaken within the faunal biodiversity study contained within appendix 15.5., which also refers to earlier butterfly studies which had previously been undertaken for the site during the SEA study.
	Construction erosion must be managed	This issues is addressed within the measures contained in the construction EMPr.
Estelle Findlay	Does not think it desirable that the municipality look after the passive open space next to Bellevue, due to lack of capacity	See comments at the beginning off this table in this regard.
	A wider open space connecting to this grassland area should be considered	The arterial road which separates the grassland area from the wildlife conservation area is unavoidable. The biodiversity specialists do not see the existing corridor width as problematic, and consider that the grassland area is large enough to be sustainable, if properly managed. The also consider it undesirable that large herbivores should be permitted to enter this grassland area, as they would interfere with the floral conservation objectives for this area.

Patricia Foster	Does not think it desirable that the municipality look after the passive open space next to Bellevue, due to lack of capacity	See comments at the beginning of this table in this regard.
	A wider open space connecting to this grassland area should be considered	See the responses to the Estelle Findlay similar comments above.
Peter Green	Queries whether the Ashburton N3 interchange is to be upgraded, as it is not suited to carry increased traffic	A traffic impact assessment will be required to assess and report on this aspect.
Peter Hawkins	The issue of the traffic impact on Bellevue suburb	The traffic impact assessment did not identify this as a requirement related to the proposed development.
Debbie Jewitt	The Ezemvelo KZN Wildlife C Plan indicates the whole site as irreplaceable, and after development the grassland is going to be cut off, it needs to be included in the game reserve, with the connecting corridor to the rest of the game reserve being wider.	A detailed investigation of the biodiversity data base of the EKZN Wildlife has been undertaken by the biodiversity specialists.  See the responses above to the comments received from Estelle Findlay in regard to this aspect.
Mike Jewitt	Not all property owners within 100m of site had received EIA notification letters.	There has been an ongoing process of ensuring that all property owners are identified, as described above in section 8.1 above. All reasonable measures in this regard have been undertaken.
	Raised concern over the number of houses that Pietermaritzburg would require. The proposed development and others in the area far exceed actual demand. There therefore needs to be a proper specialist study to determine whether there was indeed a demand for a development of this scale.	The specialist Need and Desirability Report prepared by Dr. Jeff McCarthy which is contained within appendix 15.9 deals comprehensively with this aspect.
	Questioned who was going to administer the game reserve, and who is going to own the land.	The Proposed End Use Ownership Structure memorandum prepared by the applicant which is contained within appendix 15.18 addresses this issue.
	Asked whether the conservation areas were cast in stone, or whether they can undergo another EIA process later and be changed to another land use.	In theory this could happen later.  However, all areas of both private and public open space would require an EIA, and would tend to be the most difficult to alter as to land use because of this zoning. It is considered unlikely in practice that this would happen. The area of greatest development potential which does occur is that of grassland conservation next to Bellevue suburb. Resistance to the development of this area later would likely to be greatly resisted by the conservation and environmental authorities.
Pandora Long	A further public meeting is requested	As reported at the public meeting, it is intended to have another public meeting at an appropriate stage in the EIA process. This will occur during the comments period after the circulation of this

		EIA report, and which all registered interested and affected parties would be notified of.
	A presentation of the densities and design concepts in built areas is requested.	This is provided within the relevant sections, figures and appendices of this EIA report.
Brian McGarry	The public open space grassland area would not be able to maintain it properly, and it should included in the development.	See comments at the beginning of this table in this regard.
Msunduzi Municipality : Manager Environment	The site is a large and relatively undisturbed area with providing a diverse range of goods and services, and a detailed evaluation of environmental issues and constraints is therefore required to ensure impacts are identified, minimized and mitigated.	The issues and potential issues raised have all been addressed in this EIA report, principally in the specialist Biodiversity Assessment Report within appendix 15.5, and within the impact assessment section 10 of the main report.
	A detailed inventory and assessment of the diverse fauna and flora on the site is required.	
	Vegetation assessment should include an evaluation of plant species richness, mapping of ecological units, vegetation types and veld conditions.	
	Potential impacts on ecological processes such as dispersal of animals and plants within the site and between adjacent areas must be evaluated. The Msunduzi Ecosystem Services Plan should also be interrogated in this regard.	
Jaco Pieterse	What will happen to the existing wild game (listed ) when the game reserve is established.	These would be retained on the site. There protection during the construction process would be addressed in measures contained within construction EMP.
Mark Puttick & Associates (town planners )	Represent owners of Erf 573 to between the site and the Msunduzi River. The proposed development could be integrated with their site in an environmentally mutually compatible manner. Suggests that the applicant could contact the owners of his site.	These approaches have been forwarded to the applicant for their consideration.
SANRAL	They should be registered as an interested and affected party	SANRAL has been registered.
	It will be preferable that the development is not looked at in isolation, but includes common aspects of the Burton Heights proposed development.	The implications of the other large developments such as Burton Heights has been taken into account in the Traffic Impact Assessment Report (TIA )contained within appendix 15.14, as well as other substantial developments in the area.
Hazel Strydom	Concern about increased traffic in	This is addressed within the TIA. Ivy Road will not be used as the main access road to the

	Ivy Road and Murray Road	development.
	Include the public open space grassland area into the private game reserve area.	See comments at the beginning of this table in this regard.
Upper Mpushini Conservancy	Asking for a local area development plan for the area which would take into account  the natural limitations placed on development ( fresh water, water treatment, air quality, topography etc ), and	All these considerations have been taken into account within the relevant sections of the EIA report and its appendices.
	Impact of the development on people's livelihoods	
	Biodiversity issues & EKZN Wildlife Conservation Plan's identification of the area as irreplaceable.	
	Plan needs to take into account the predictions of climate change, including possible carbon credits.	
	Would like to see environmentally friendly building materials.  Landscaping using indigenous plants.  Offset for natural area lost.  Development should be aesthetically pleasing.	
T. Vahey	Congestion of Ivy Road	On the advice of the specialist, Ivy Road will not be used as an access to the development. Instead, the extension of Cleland Road along an existing road reserve from Murray Road to the site will be used.
Vernon Vogt	The widening of Murray Road and Cleland Road	The TIA addresses this aspect.
Wildlife & Environment Society	Scale of development is large, and it must be seen as a new development node – cumulative effects need to be considered.	Cumulative impacts are assessed within section 10 of this EIA report.
	Strategic planning considerations and the plans of the municipality, including environmental considerations, must be taken into account, and the actions of local conservation groups.	The proposed development is assessed in terms of the relevant plans and policies of the municipality within the Town Planning Report contained within appendix 15.8.
	Need and Desirability of the development must be fully justified, taking also other developments proposed in the area into account.	The specialist study commissioned to investigate and report on the need and desirability of the development has been produced by Dr. Jeff McCarthy, and is contained within appendix 15.9.
	Difficult to understand the theme of the development, as to whether it is nature based, tourism based, residential or game reserve.	The development is described as a mixed use development within this EIA report and there relevant appendices. This is the best description for the wide range of land uses, from conservation to commercial, planned in a

		manner which is most complementary to each other.
	Proposed treatment of sewage must be looked at, not only on the site, but in terms of the bigger picture of the Msunduzi / Umgeni River system.	The engineering services report addresses the issue of sewage disposal, and this will be considered by the relevant permitting authorities.  There will also be a separate Waste Management License application for the sewage works.
Malcolm Wilson	Public open space area next to Bellevue should be included in the development as private open space.	See comments at the beginning of this table in this regard.

**TABLE OF COMMENTS RECEIVED, AND RESPONSES TO THEM AFTER  
THE CIRCULATION OF THE DRAFT SCOPING REPORT**

<b>COMMENT-TATOR</b>	<b>COMMENT AND / OR ISSUE RAISED</b>	<b>RESPONSE</b>
Department of Agriculture, Forestry and Fisheries	<p>The Department confirms receipt of the application, and provides their Agriland reference number : 2011_04_0200, to be used in correspondence with the Department.</p> <p>In their second letter received, this Department state that they have no objection to the proposed development.</p> <p>Approval in terms of release of agricultural land has been granted by this Department to the application submitted by the project's town planner.</p>	<p>Response and reference number noted.</p> <p>Since then, as contained within appendix 15.1, and referred to in the EIA report, this Department has stated in their letter received after the circulation of the final scoping report, that they have no objections to the proposed development.</p>
Department of Water Affairs	This Department has no objections to the proposed development, subject to the conditions in their report.	<p>No objections in principle noted.</p> <p>Conditions of report are summarized and responded to below.</p>

	<p><b>Sewerage Treatment Plant</b></p> <p>Conditions prescribed in regard to the registering and possible licensing, and the requirement for a license if it is intended to use treated effluent for irrigation</p>	<p>The comments and requirements are note. However, it should also be noted that :</p> <ul style="list-style-type: none"> <li>• Sewage plants require a separate Waste Management License, and there will be as separate application process in this regard.</li> <li>• The earlier phases of the development, as described within section 6.3 above, phases 1, 2, 3 and parts of phase 4 can be commenced with without the installation of a sewage plant.</li> </ul>
	<p><b>Septic tanks and soakaways</b></p> <p>Noted that a geotechnical report will be needed to confirm areas are suitable for septic tanks and soakaways.</p>	<p>The necessary geotechnical report has been provided within appendix 15.3. It indicates that the site conditions and density of the developments where this form of disposal is proposed is acceptable.</p>
	<p><b>Municipal Sewage Reticulation</b></p> <p>Permission must be obtained from the municipality to use their works, which must be confirmed to have sufficient capacity to receive it, and have the appropriate back up measures.</p>	<p>These are reported on within the environmental impact report. The relevant departments of the municipality will provide comments on this aspect.</p>
	<p><b>Soil Erosion</b></p> <p>It is important to ensure that soil erosion is controlled at pre, during and post construction, with the implementation of the appropriate specified measures.</p>	<p>The requirement is noted, and are be addressed within the Environmental Managment Programe included as appendix 15.19 to this EIAreport.</p>
	<p><b>Stormwater</b></p> <p>Requirements for the management of storm water are prescribed to prevent soil erosion, pollution or any other negative effects.</p>	<p>The construction environmental management programme deals with storm water during construction, and the Storm Water Management Plan contained within appendix 15.11 deals with storm water management during the operational phase of the development.</p>
	<p><b>Sanitation during construction</b></p> <p>Toilet facilities must be provide during construction.</p>	<p>This requirement is included in the construction EMPr</p>
	<p><b>Solid waste management</b></p> <p>Solid waste must be disposed of to an approved solid waste disposal site during construction and operation phases.</p> <p>Contaminated substances and hazardous wastes must be disposed of to a hazardous waste disposal site.</p>	<p>These requirements will be complied with.</p>
	<p><b>Littering</b></p> <p>Littering is to be avoided with the provision of bins.</p>	<p>This requirement will be complied with.</p>
	<p><b>Hazardous wastes / substances</b></p> <p>Detailed information regarding chemical wastes or hazardous substances must be incorporated</p>	<p>The development of the site is restricted to residential and commercial type developments, and no industries using hazardous materials will be permitted on the site. There will be small</p>



	into the final EIA report.	amounts of hazardous wastes which may occur in the construction process, and these are identified and dealt with in the EMPr.
	<p><b>Water supply</b></p> <p>The source of water must be confirmed in the EIA report.</p>	This requirement is met within the Engineering Services Report contained within appendix 15.10. Water is to be supplied by Msunduzi Municipality.
	<p><b>Drainage lines</b></p> <p>Pollution of the drainage lines during construction and operation is to be avoided through the implementation of the appropriate measures.</p>	The protection of drainage lines in the design, construction and operational phases is described within the relevant sections and appendices of this EIA report. All drainage lines have at least a 30m buffer area.
	<p><b>Wetland</b></p> <p>A wetland specialist must be appointed to delineate and report on the wetlands.</p>	The Wetland Delineation and Functional Assessment Report deals fully with all aspects pertaining to wetlands. Wetlands are delineated and described in this report, contained in appendix 15.4, and the potential impacts of the development on the wetlands is also assessed.
	<p><b>Msunduzi and Mkondeni Rivers</b></p> <p>It is important to prevent the pollution of these rivers and their banks, and potential impacts must be dealt with in the EIA report.</p>	This concern is noted, and is addressed within the EIA report.
	<p><b>General</b></p> <p>Environmentally sensitive areas must be identified, and mitigation measures employed.</p> <p>Indigenous tree removal to be authorized by the Department of Agriculture, Forestry and Fisheries.</p> <p>Ecologically sensitive area are to be protected during construction.</p> <p>Stockpiling of soil should not be permitted near a water course, and erosion measures must be applied.</p>	<p>The layout plan has taken environmentally sensitive areas into account, and this aspect is reported on fully within the main report and its appendices, notably the Wetlands Report and the Biodiversity Report</p> <p>A license will be applied for DAFF if protected trees or areas of natural forest are affected.</p> <p>This requirement is noted, to be adhered to.</p> <p>This requirement is noted, to be adhered to.</p>
Ezemvelo KwaZulu-Natal Wildlife	<p><b>List of biodiversity important species</b></p> <p>Ezemvelo KwaZulu-Natal Wildlife has listed specific invertebrates and plant species which include a tabulated list in their letter. This list is comprised of 5 millipede, two mollusk and one annelid species.</p>	<p>The mandate of Ezemvelo KZN Wildlife is the protection and enhancement of biodiversity in the province. Therefore their requirements are noted to be adhered to, and responded to in the EIA report .</p> <p>The biodiversity specialists have been provided with all correspondence from EKZNW and have been briefed to ensure that all these biodiversity concerns are addressed within their specialist report.</p>
	<p><b>Invertebrate specialist studies of millipedes, mollusks and butterflies</b></p> <p>Surveys are required to be taken in an appropriate manner.</p>	

	<p><b>Faunal assessment</b></p> <p>Specific attention must be paid to species historically recorded on the site, and assessment must be made to cover all breeding, foraging, roosting, aestivation and hibernation habitats, which are required to be mapped.</p>	<p>This specialist report very adequately with these EKZNV requirements and, as demonstrated in their report have influences the planning of the development to ensure that biodiversity concerns are properly addressed in the development proposal.</p>
<p><b>Floral assessment</b></p> <p>Surveys must be done during the flowering season of species historically recorded on the site, and or predicted to occur on the site, which should also be mapped a prescribed.</p>		
<p><b>Assessment of the closure of open spaces</b></p> <p>The degree to which the proposed development would be likely to impact on areas of high conservation significance and or connectivity / corridors should be reported on.</p>		
<p>Msunduzi Municipality</p>	<p><b>A twelve month biodiversity assessment</b></p> <p>This is required to ensure that seasonal aspects of species and their habitats are recorded.</p>	<p>This is addressed in the Biodiversity report, and in the various previous specialist reports on the site which are reviewed within it, and which occurred over a range of seasons in the year. The submissions of these previous experts also support the fact that the full range seasonal aspects of biodiversity have been adequately covered in the investigations of the site.</p>
	<p><b>Wetland areas</b></p> <p>Wetland types A, B and C as described in this scoping report are reviewed as to their significance.</p>	<p>The comments in regard to the wetland areas and their potential significance are addressed within the wetlands report contained within appendix 15.4.</p>
	<p><b>Plant rescue programme</b></p> <p>A plant rescue programme must be conducted prior to construction, and should be included in the Construction Phase of the EMP.</p>	<p>This requirement is complied with in the relevant section of the EMPr contained within appendix 15.19.</p>
	<p><b>Alien plant programme</b></p> <p>An alien plant clearing programme should be developed and incorporated into the Construction and Operational Phase EMP's</p>	<p>This requirement is noted, and is included in the environmental management requirements of the EMPr.</p>

<p>Ukhambatini Properties cc</p>	<p>Were not included in the first list of neighbours, although they share a long common boundary.</p>	<p>The initial lack of notification is regretted, but has been apologized for, and was rectified. They were provided with the draft scoping report well in time for comment, and also a large scale hard copy of the layout plan to assist them in determining the potential impacts and issues which might pertain to them. A meeting was also held with this I &amp; APs in 2011 to ensure that their particular concerns were addressed.</p>
	<p>They believe that any sustainable development of the valley must take also take the other major landowners of Erf 547 New England ( their property ) and Erf 231 New England into account.</p>	<p>This requirement is acknowledged and is taken into account in the planning of the development.: For example in terms of open space relationships, drainage lines, the proposed road provisions which extend beyond the site, other forms of infrastructure provisions, and the potential impacts from pollution, disturbance, and other aspects related to the proposed development.</p>
	<p>The nature of their property and its Broadleaze Farm enterprise on it is explained : It is registered with BDOCA as an organic grower, and request that in the future reporting these lands to the north are referred to as "certified organic agricultural lands"</p>	<p>This description of their property has been included in section 5 of this EIA report, and taken further into account within the relevant sections of the report.</p>
	<p>It is their opinion that, due to the ecosystems of value which exist, such as the grasslands, does not permit a mixture of high and low density housing developments with a game reserve, due to several limiting factors are listed as discussed below.</p>	<p>Comments noted, as related to the limiting factors dealt with under the following sections.</p>
	<p>The lack of formal sewage is identified as probably the most significant limiting factor, the location of the proposed works is</p>	<p>These aspects are addressed within the Engineering Services Report contained within appendix 15.10.</p>

A second letter received with a	stated as unacceptable, and the capacity of the Darvill sewage works is questioned. Umgeni Water should be registered as I & APs.	
	The SDF currently indicates that the only type of land use is formal residential and restricted use.	The town planning specialist considers that the proposed development is compatible with the SDF, as reported on within their Town Planning Report contained within appendix 15.8
	The alignment of the Bellevue distributor road is not accepted, the planning basis is queried, and it is requested that the proposed layout plan be amended to reflect the alignment of the Bellevue Distributor at the boundary of Erf 547 New England and Erf 10119 Pietermaritzburg.	These comments pertaining to the background to the road and the requested road realignment were reviewed, and discussed with the traffic engineering specialist, the town planner and the applicant, and were followed up with a meeting with these I & APs in 2011. The alignment presented in the proposed development plan is considered by the traffic specialist as being the optimal alignment for this road.
	Their Erf 547 New England has fields certified as organic, which requires a suitable buffer zone, depending on the land use of the adjacent property. This issue requires consultation with themselves to determine the effect of any changes in land use of Erf 10119 Pietermaritzburg along their common boundary.	This issue was also addressed in the meeting with these I and APs. Relevant potential impacts are identified and assessed within section 10 of this EIA report.
	They request that the effect of fire on the development and the phasing of the development be assessed, as fires that start on the boundary of Lincolnmeade and spread rapidly with wind are a hazard to the properties.	The raising of this valid concern is noted, and a fire management plan, compiled with the assistance of the vegetation and agricultural specialist Peter Le Roux, is contained as appendix 1 within the EMPr included as appendix 15.21.

<p>correction in regard to certain property descriptions, which reads as provided opposite</p>	<p>“In mentioning the possibility of a development on Erf 547 New England, I incorrectly referred to Portion 506 Ashburton as the portion of the proposed development over which this concept is proposed in Hillcove Hills. I should have referred to the portion of Erf 10119 Pietermaritzburg that falls within the Ashburton Town Planning Scheme”.</p>	<p>Correction noted.</p>
<p>uMgungundlovu District Municipality</p>	<p>They have no objection to the proposed development provided that :</p> <ul style="list-style-type: none"> <li>- The application is supported by Msunduzi Local Municipality]</li> <li>- Comments are obtained from surrounding residents.</li> <li>- The Development is in line with the Msunduzi Local Municipality Spatial Development Framework.</li> </ul>	<p>The comments and provisions of the District Municipality are noted and taken into account within the EIA report.</p>
<p>Debbie Jewitt</p>	<p>States that the development proposal is not in accord with the local municipality SDF</p> <p>The entire area is shown as important for biodiversity within the EKZN Wildlife C Plan, and the proposed development will impact negatively on this.</p> <p>There are mammal species on the site such as Oribi and Blue Duiker which will go locally extinct with the proposed development.</p> <p>The option of previous development plans of low density housing should be pursued.</p>	<p>The SDF proposals in regard to the site will be described and assessed in the specialist town planning report in the EIA phase.</p> <p>Comments have been received from EKZN Wildlife as to their biodiversity concerns, and these will be investigated and reported on within the EIA phase.</p> <p>A game management assessment and plan has been compiled by specialists, and this is contained within appendix 15.20.</p> <p>The applicant has decided to apply for the development which is the subject of this application. There have also been other development proposal which were far more</p>

		<p>dense than the proposed development.</p> <p>This will be motivated for in the specialist socio-economic and town planning reports in the EIA phase.</p>
	Not all neighbours within 100m of the site have been notified.	The process of notifying all neighbours has continued with success. It has been requested that Debbie Jewitt assists in providing information on any parties she is aware of as not being contacted. Background information on those contacted and the processes involved have been provided to her.
	Urban sprawl cannot continue unabated, there is a defined urban edge of the city which should be adhered to.	The comment is noted. The need for urban expansion will be discussed within the specialist town planning and socio-economic reports.
	Cognizance needs to be taken of international agreements, such as the CBD agreement in regard to habitat transformation.	Such agreements, such as the Convention on Biological Diversity do need to be taken into account, and also by the authorizing authority, together with all the other considerations which apply to the application.
	EIA needs to study the effects of blasting on the site that will be necessary for construction.	The civil engineers have advised that, due to the geological conditions, it is not likely that there will be blasting on the site. If there is, it will very limited, and related to the construction of the main arterial roads. This is catered for in the EMPr contained within appendix 15.21.
	Current levels of degradation occurring on the site are noted with dismay, as if the owner is allowing the property to degrade in an attempt to promote the development.	Clarification of this statement was requested. Debbie Jewitt has provided a picture showing a grassland area with what appears to be Khakibos ( <i>Tagetes minuata</i> ). This information will be provided to the landowner for their response, to be included in the EIA report.
	Report does not show buffers of rivers and wetlands that the boundary of the property – only internal aquatic areas are shown.	All riverine buffer areas are shown, except in the case of the most northern boundary of with the Msunduzi River, which is falls well inside an open space area, and very distant from any proposed development.
	The site has been successfully used for grazing, and this should be used as an option.	The alternative option of a game reserve and development has been proposed. Agricultural alternatives will also be considered within the specialist agricultural report within the EIA phase.
	Grassland is listed as high biodiversity, but development proposal will leads to fragmentation and it being cut off, and suffer negative effects.	The potential effects of isolation and fragmentation are required to be assessed.
Wildlife & Environment Society of South Africa	A layout plan in a format which allows better scrutiny is requested.	A suitable layout plan is provided in the figures included in the EIA report and a full size copy is provided with the report placed in the Ashburton Library.
	The game reserve component is supported, in that it could assist in reducing impacts. Input from EKZN Wildlife is required.	EKZN Wildlife have been party to discussions on the areas during the previous SEA which included the property, and have provided comment on the scoping report. The Biodiversity Report has been prepared taking cognisance of the concerns of EKZN Wildlife,

		who will be provided with a copy of the EIA report for their comments.
	<p>The security of the game reserve component in the long term is queried. It may be vulnerable to future demands on it for development, degradation etc.</p> <p>The sustainable land use plan for the catchment area is required, and must be included in future municipal strategic, SDF and other plans</p>	<p>It is not possible to give very long term guarantees into the future.</p> <p>However, a plan approved in the EIA and town planning and zoning process will provide some security, in particular to those area now formally zoned as open space.</p> <p>It is agreed that there should be the entrenchment of the game reserve in other plans of the municipality in a manner which would ensure its long term protection and sustainability.</p>
	<p>Queries in regard to service provision, in particular in regard to sewage disposal are raised.</p>	<p>The nature of the service provision is be provided within the specialist Engineering Services Report contained within appendix 15.10, and as summarised within section 6 of the EIAreport.</p>
	<p>The project should promote every aspect of sustainability, in the use of materials, buildings resource use, urban conservation, waste management etc.</p>	<p>The desirability of these approaches is accepted to be applied where technically and financially possible in the proposed development, as outlined in the Green Design Report within appendix 15.13.</p>

**TABLE OF COMMENTS RECEIVED, AND RESPONSES TO THEM AFTER  
THE CIRCULATION OF THE FINAL SCOPING REPORT  
( The letters of comment are contained within appendix 15.1)**

<b>COMMENT-TATOR</b>	<b>COMMENT AND / OR ISSUE RAISED</b>	<b>RESPONSE</b>
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<p>Department of Agriculture, Forestry and Fisheries</p>	<p>The Department states in their letter that it has no objection to the proposed land development on the condition that the development must be incorporated into the Town Planning Scheme of Msunduzi Municipality.</p>	<p>The lack of objection to the land being removed from agriculture and used for the mixed use development is noted.</p> <p>The site will be incorporated into the Msunduzi Town Planning Scheme.</p>
<p>Department of Water Affairs</p>	<p>The Department awaits the full EIA report. The following information is outstanding :</p> <ul style="list-style-type: none"> <li>• Wetland delineation</li> <li>• Sanitation facilities</li> <li>• Geotechnical Report</li> </ul>	<p>This EIA report will be provided to the Department.</p> <p>The required information is contained within the relevant sections and appendices of the EIA report.</p>
<p>Abie &amp; Leontine Lange</p>	<p>They are longstanding residents who have never been aware that there was going to be a road constructed behind their properties.</p>	<p>The town planning scheme, and the confirmation by the traffic specialists confirm that the road reserve, within which the Cleland Road extension is planned leading to the site, has been present for a considerable period of time.</p> <p>The potential for this road to be built has therefore been considered by the municipality for some time, prior to the Hilcove Hills application.</p>
<p>Mr.D.C. Peens</p>	<p>He is not against the development, but is against the construction of the Cleland Road extension, which is on the road servitude behind his property.</p> <p>Reasons for this objection are provided in the comments made.</p>	<p>The Cleland Road extension is in an existing road reserve leading to the property, and is considered entirely suitable by the traffic specialists.</p> <p>The intersection with Murray Road will be required to be upgraded, as described in the Traffic Impact Report.</p> <p>It is unlikely that the municipality would approve an alternative use for this road reserve.</p> <p>The use of Ivy Road is considered far less suitable than the construction of the Cleland Road extension by the traffic specialists.</p>
<p>PMMB Trust Chairman Mr. M.A. Jewitt</p>	<p>There needs to be, as well as a socio-economic study a financial feasibility study taking into account the current over supply of housing, price and general economic trends.</p> <p>There should be money held in trust, to rehabilitate in the event of the development collapsing.</p> <p>The moratorium on the Msunduzi Municipality's capital expenditure program needs to be taken into</p>	<p>The Need and Desirability and socio-economic report of Dr. McCarthy does take the projected housing demand into account in some detail.</p> <p>It should be borne in mind that the development will be phased over many years, and will be dependent on demand.</p> <p>There are no holding costs in the ownership of the land, and it is not speculative in this sense.</p> <p>The development will occur in controlled phases. It is difficult to see how there will be the requirement for extensive rehabilitation. The site is already fenced, and the incremental development in a controlled way, and in terms of an EMPr which will be approved and controlled by the DAEARD is considered sufficient in this respect.f</p> <p>There is no significant cost to the municipality in regard to infrastructure provision required for the development, and the income generated from</p>



	account	the rates would be highly desirable for the future management and provision of services by the municipality.
	The value of the eco goods and services to the municipality needs to be taken into account.	This is taken into account within the assessment of the development which occurs within section 10 of this EIA report.
	An alternative study must be done on alternative land uses in keeping with the rural atmosphere of the site. These should include <ul style="list-style-type: none"> <li>1. Game Lodge type development</li> <li>2. Combined agricultural ecotourism venture</li> </ul> Which would lessen the need for highly intrusive infrastructure.	These, and other alternative land uses are identified and assessed within section 11 of this EIA report.
	In the proposed development plan, the only areas available for game are the wetlands and elements.	More than just the wetland and riparian areas are placed within the open space wildlife reserve areas, although these form the basis of the corridors. Upper slopes and some level areas far removed from the riverine areas are also included.  The wetland areas of the site are in fact very small ( far less than 10% as illustrated and described in the wetlands report, and the development proposal is seen to be a reasonable comprise between development of a strategically significant area ( as demonstrated in McCarthy's report ) and conservation objectives.  The passive open space grasslands area next to Bellevue suburb of 30.1 hectares is very well located and topographical very well suited for development, but has been set aside for primarily floral conservation in this instance.
	The road planned from Pope Ellis Drive through the "eco-estate" portion of the development needs to be moved to the centre of the site so that it does not impact on existing neighbours along the eastern boundary.  This road is only to the benefit of the developer.	As discussed within section 6 and in the Traffic Impact Report the road in question has been planned by the Msunduzi Local Municipality, independently of the development. It is not required by the developer, unless the N3 interchange was never to occur. It is for this reason shown only as a road reserve area, in the area passing Ashburton suburb.  The alignment selected has been carefully considered, taking also the comments of PMMB trust into account, by the roads, engineer, biodiversity specialists and town planner, and this indicated alignment is is considered the best fit, taking various relevant factors into account.

### THE APPLICATION OF THE ISSUES AND CONCERNS RAISED FOR FURTHER INVESTIGATION AND ASSESSMENT IN THE EIA PROCESS

The issues and concerns recorded within the table above are included into the more systematic grouping off all the potential issues and alternatives to be

considered in the rest of the EIA process occurs within the impact assessments within section 10.

It is also to be noted that some of the concerns raised by I & APs in the public participation process so far have been addressed in the EIA report, in the form of the far greater detail as to the nature of the development that has been provided, in acceding to the commonly expressed concern that the grassland conservation area next to Bellevue suburb be placed into private, as opposed to public open space, and that Ivy Road has been recognized by the traffic specialists as not being suitable to serve as a main access road.

## **9. ASSESSMENT OF THE NEED AND DESIRABILITY OF THE ACTIVITY**

### **9.1. INTRODUCTION**

Government Regulation 543 : 31 of 18 June 2010 requires that an Environmental Impact Report contains a description of the need and desirability of a proposed activity, and this is therefore provided below.

The purpose of the Need and Desirability assessment is to determine whether the Hilcove Hills mixed used development should occur in market and social desirability terms, and to also assess its projected socio-economic impacts.

The basis of the need and desirability assessment is derived from information obtained from the Town Planning Report and, in particular, the Need and Desirability and Socio-economic Impact Report and its Addendum Report which have been prepared by Dr Jeff McCarthy, and contained within appendix 15.9 of this EIA report. His main report is summarised below.

### **9.2. SUMMARY OF THE McCARTHY NEED AND DESIRABILITY REPORT**

The McCarthy Report describes the salient features of the site and the proposed development and then moves on to situate the Hilcove Hills project within the provincial and municipal development policy perspectives, and also the findings of his earlier socio-economic study commissioned as part of the Strategic Environmental Assessment ( SEA ) of the Mkhondeni Catchment area undertaken by Guy Nicolson Consulting cc completed in 2009 on behalf of the Msunduzi Municipality and the KwaZulu-Natal Department of Agriculture, Environmental Affairs and Rural Development ( DAEARD ). The applicant Hillcove Hills Site falls within the northern portion of the catchment area, to the north of the N3 highway.

The report then describes and analyses in some detail the potential need and desirability of the proposed development, in terms of employment needs, potential areas of urban expansion, and the need for a potential uptake of residential land on the eastern edge of the municipality where the Hilcove Hills site is situated.

From his review of the previous studies and the present situation, he concludes that the Hilcove Hills development is broadly responsive to the current situation, and appropriate to the recommendations of the SEA, which was approved in principle by the municipality and the DAEARD.

Although planning responsibility for the development proposal lies with the Msunduzi Municipality, typically a development of such scale – comprising as it does several hundred hectares – should entail some provincial input, and the provincial cabinet endorsed provincial spatial economic development strategy ( PSEDS ) of 2006 is discussed by McCarthy. In terms of this strategy the N3 corridor emerges as being defined primarily by its economic development potential, and its proximity to the greatest concentrations of work need.

The report then assesses the need and desirability of the Hilcove Hills within the context of the Msunduzi SDF and the current thinking of local stakeholders on the development of the N3 corridor. It can be seen within this review that there has been the lopsided development of the city towards the south west, under the influence of the group areas ACt and former homeland boundaries. In future, free choice and market forces will be likely to normalise city development towards international development spatial norms. Hence, the report projects that up to half of new development within the city will occur in the more accessible south east, where the Hilcove site lies.

The McCarthy Report provides an assessment of market trends residential and non-residential property as they pertain to the development and follows this with an assessment of the likely socio-economic cost and benefits of the development, i.e. its desirability.

The assessment reveals the very significant employment which would be created from the implementation of the development, in the form of about 1500 construction jobs sustained over about 10 years, including both on and off site jobs. Permanent jobs are projected at the completed end state of the development at about 15 000.

Another important general socio-economic impact of the development would be on local public revenue streams. The cost / benefit ratio in term of public costs and revenues is likely to be fairly good here because of the largely privately funded infrastructure provision for the development on the one hand, and the high rateable property values on the other. Rates income from the development at maturity, at current prices, of some R20 million per annum, which would be equivalent to almost 10% of the city's most recent rates income.

Overall, therefore, the socio-economic balance sheet for the Hilcove Hills development is a strongly positive one.

The McCarthy Main report then provides the following conclusions and recommendations :

In terms of spatial planning policies at variety of levels, the Hilcove Hills development is not only an obvious and logical development, but one that should likely be released first ( or at least early ) in the south eastern Msunduzi Municipality. This last inference is made on the basis of three main considerations ; urban contiguity( proximity to the city ); accessibility ; environmental sensitivity, with the provision of over half the site being retained for conservation.

In terms of projected scale, the projected volumes of both residential and non-residential use are appropriate for a project that will likely need to be released in phases in response to micro -demand forces over some ten years.

Looked at in the light of need and desirability and timing terms, an orderly and largely contiguous process and sequencing of land release will be necessary in the south east over the next two decades. The Hilcove Hills development would be consistent with such a process.

Moreover, as South Africa and Msunduzi continue to languish within a recession, stimulants of growth through government infrastructure, and the consequent spinoff effects upon private sector building confidence and derived jobs are vital.

Already by the 2001 census there had been a **38% increase** in the numbers of unemployed in the uMgungundlovu district ( already off a very high base ) and it seems likely that this rate of unemployment trends are politically unsustainable. Employment creation is recognized by central government as the number one priority.

The numbers of jobs projected to be realised through the Hilcove Hills project – 1500 during construction and about 15 000 thereafter, are a significant contribution towards that end.

### **9.3. SUMMARY OF THE McCARTHY ADDENDUM NEED AND DESIRABILITY REPORT**

Since the completion of the Need and Desirability Report by McCarthy dated February 2011 there has been the release of two important development strategy reports by national and provincial government that would assist in appreciating the current development policy context of for the proposed Hilcove Hills development. There have also been other recent policy considerations since the production of the McCarthy February 2011 report, and these are also reviewed by McCarthy, and are also summarised below.

These more recent documents are reviewed and commented on in terms of the Need and Desirability of the Hilcove Hills development within and Addendum Report which has been produced by Dr. McCarthy, and which is also contained within appendix 15.9.

#### **The November 2011 National Development Plan ( NDP )**

The National Planning Commissions 444 page *National Development Plan ( NDP )*, strikingly identifies the Durban to Gauteng N3 corridor as South Africa's single most important economic development corridor. In this regard :

- It is the only corridor in South Africa identified in bold, red on the map of South Africa's "Competitiveness Corridor", ( see figure 1 in McCarthy report) and :
- It is also pointed out in the NDP that unemployment – and especially youth unemployment – is the country's number one vulnerability development challenge.

On page 250 of the NDP there is a map entitled Proposed National Schema for Spatial Targeting which reflects the Commission's assessment of where the country needed to focus in order to address its most important goals. The NDP points out that 46% of the country's economic output derives from a narrow N3 corridor area (estimated at approximately 2% of the national land area ) and the NDP says that it :

“.. is vitally important to the future national economy and should be designated as a National Competiveness Corridor .. and would build on the Department of Transport’s 2050 vision for the Durban – Gauteng Freight corridor”.

Therefore, within the context of this EIA application, the Hilcove Hills development’s positioning astride what is South Africa’s only National Competiveness Corridor is a reminder why its timely release for mixed development, including work generating components, should be supported.

### **The KZN Provincial Growth and Development Strategy**

The second recent policy of importance comes from the Office of the Premier of KZN. There has been the release in December 2011 of the KZN provincial government’s ( more precisely the Planning Commission in the Premier’s Office) Provincial Growth and Development Strategy ( PGDS ).

As with the NDP, the Provincial Growth and Development Strategy foregrounds unemployment and the N3 corridor. On the latter, maps produced in the PGDS highlight the importance especially of the N2 and N3 freight traffic and underscores the importance of the logistics industry which is proportionately very strong in economic terms in KZN.

Being astride the high volumes of road freight traffic in the province, as the Hilcove Hills is, make sense for a mixed use development. Indeed, if anything, it might suggest a need for an even greater component of the development to be committed to general business use than is currently planned for within this EIA application. However, this could conflict with other objectives of the development, including residential and conservation components, and it is considered in the McCarthy that the currently proposed ratios of proposed land uses in the present development have the right balance.

The KZN PGDS also serves as reminder not to lose sight of the work generating components of the Hilcove Hills development, which it sees as the number one provincial planning priority. Within the PGDS the general area where Hilcove Hills is situated is identified as an “economic support area”.

### **Other recent policy considerations and concluding remarks**

The above two policy documents of national and provincial government would suggest that the Hilcove Hills project, and especially its work generating components are well targeted. Moreover, it is also likely that the project is consistent with emerging areas of economic dynamism in the province.

Research commissioned *inter alia* for the revision of the KwaZulu-Natal Provincial Spatial Economic Development Strategy ( PSEDS ), for example, has revealed that smaller to medium sized firms which are just outside but near to the established metro and larger cities in KZN are the most optimistic in terms of planning for growth.

It thus appears that in 2012 in KZN there is an emergent pattern of de-concentrated enterprise formation, poised for growth, which the Hilcove Hills development could well partially service. In terms of timing, much will depend upon trends in the national

and global economy but, at the very least, the Hilcove Hills project is also consistent with the most recent national and provincial government plans.

#### **9.4. OVERALL ASSESSMENT OF NEED AND DESIRABILITY**

It is assessed that the reports of McCarthy, as supported by relevant data and planning policy documents referred to within them, provide a cogent argument that there is a clear and strong need and desirability for the proposed Hilcove Hills development, based on its strategic location, scale and the appropriate mix of land uses, to meet the identified residential, and in particular employment, needs at the local, provincial and national levels.

## **10. THE IDENTIFICATION AND ASSESSMENT OF POTENTIAL IMPACTS**

### **10.1. GENERAL APPROACH TO THE ASSESSMENT OF IMPACTS**

Within the description and assessment of each of the identified potential environmental issues that occurs in this section 10 the general approach is outlined below. What is provided is a general framework of approach to assessment which, of necessity, may be tailored and altered where required to deal adequately with the description and assessment of a particular impact. Bearing this caveat in mind, the overall framework of assessment is as follows:

- A description of the nature of the potential issues as to its :
  - General background and context within this application
  - Causes and effect
  - Who or what will be affected
  - How it will be affected
- Assessment of the impact as to
  - Probability
  - Extent
  - Duration
  - Magnitude
  - Reversibility
- Mitigation of the potential impact in regard to the
  - Potential to mitigate any negative impacts
  - Potential to optimize any positive impacts
  - The likelihood of successful mitigation
- Overall assessment and general comments as to the predicted impacts of the development after mitigation in terms of such criteria as may be relevant to a particular impact, and which may include the following aspects :
  - The severity and permanence of the impact on either local biota or surrounding human communities
  - The size of the affected communities and their relative significance
  - The general ecological and socio – economic context within which a particular impact would occur
  - The final balance of between positive and negative impacts, and related costs and benefits to society.

The table overleaf provides a summary of the application of these criteria for potential impacts, to the extent that they are relevant to a particular impact. This is followed by an elaboration and definition of the key terms that are included in the table. In the case of the description and assessment of some aspects, the above approach is not necessarily the most appropriate, and these cases in the assessment of issues a more discursive nature, of dealing with a particular issue will be used as required.



**SUMMARY OF CRITERIA USED FOR THE ASSESSMENT OF POTENTIAL IMPACTS**

POTENTIAL IMPACTS	CRITERIA	DESCRIPTION OF ELEMENTS THAT ARE CENTRAL TO EACH ISSUE.
Description	Nature	What causes the effect?
		Who will be affected?
		What will be affected?
		How will it be affected?
Assessment	Probability	Certain/may not occur with mitigation
	Status	Positive, negative or neutral.
	Extent	Is the impact <b>site specific</b>
		Does the impact extend <b>locally</b> , i.e. to the site and its nearby surroundings.
Does the impact extend <b>regionally</b> , i.e. have an impact on the region.		
Duration	Does the impact extend <b>nationally</b> , i.e. have an impact on a national scale.	
	<b>Short term</b> , i.e. 0-5 years.	
	<b>Medium term</b> i.e. 5-11 years	
	<b>Long term</b> , i.e. impact ceases after the construction or operational life cycle.	
Magnitude	<b>Permanent</b> , i.e. mitigation either by natural process or by human intervention will not occur in such a way or in such a time span that the impact can be considered transient.	
	<b>Low</b> , i.e. natural and social functions and processes are not affected or minimally affected.	
	<b>Medium</b> , i.e. affected environment is notably altered. Natural and social functions and processes continue albeit in a modified way.	
		<b>High</b> , i.e. natural or social functions or processes could be substantially affected or altered to the extent that they could temporarily or permanently cease.
	Reversibility	Impact is reversible or irreversible.
	Cumulative or non-cumulative	Potential of two or more impacts to combine to form cumulative or synergistic impacts.
Mitigation	Potential to mitigate each of the negative impacts	Description of the mitigatory measures. Extent to which mitigatory measures could influence the significance and status of each impact.
	Potential to optimize each of the positive impacts	Description of the optimization measures. Extent to which they could influence the significance of impact.
Overall Assessment and Conclusions	Overall Assessment and concluding comments as to the predicted impacts after mitigation and there: <ul style="list-style-type: none"> <li>➤ Severity and permanence</li> <li>➤ Size and relative significance</li> <li>➤ Ecological and socio – economic context</li> <li>➤ Balance between positive and negative aspect</li> <li>➤ Cost and benefits</li> <li>➤ Acceptability / Unacceptability</li> </ul>	

## **DEFINITION OF THE TERMS USED ASSESSMENT**

Where relevant, the following terms will be used in the assessment of the various issues and alternatives that have been identified.

### **LEVEL OF PROBABILITY / CERTAINTY**

This criterion applies to the confidence of the assessor in making the assessment.

**Low:** The present degree of confidence in the making the assessment is lower than about 40%.

**Moderate:** The present degree of confidence in making the assessment is between approximately 40% and 80%.

**High:** The present degree of confidence in the relevant statement is greater than 80%.

### **IMPACT**

This criterion refers to the impact in relation to its effect on a stipulated feature or environmental quality.

**No impact:** There will be no discernible impact on the feature under consideration.

**Low:** The impact on the feature under consideration will be limited in terms of its effect or duration.

**Moderate:** The impact on the feature is such that there will be some damage done, but the feature will not be totally destroyed or degraded, and that it will recover, or will retain an moderate amount of the relevant environmental quality concerned with it.

**High:** The impact on the feature is such that the damage done will be considerable and enduring. Recovery of the feature could, at best be only partial.

**Very High:** The impact on the feature is such that the feature will be totally destroyed and that no recovery is possible.

**Unknown:** The nature of the impact on the feature is not understood or cannot be predicted in any reliable fashion.

### **SIGNIFICANCE**

This criterion refers to the effect of the impact "in the larger scheme of things". For example, if a proposed dam will inundate a particular patch of vegetation, then the impact on that patch of vegetation is very high as it will be totally destroyed. But, if the vegetation is of a common type which has a low conservation priority, then the significance of the impact is low.

**No significance:** The impact is so inconsequential that it is of no significance at all.

**Low:** The impact is of low intensity of consequence. It is probably local in effect on a feature that is common and/or widespread.

**Moderate:** The impact is of sufficient intensity to warrant concern. There will be considerable disturbance/lowering of environmental quality for natural biota and/or to humans. Ecological processes will only be slightly affected. The impact will also have a moderate length of duration.

**High:** The impact is of considerable intensity. There will be severe degradation of the environment and localized losses of entire plant and animal assemblages may occur. Ecological processes are strongly disrupted. Social impacts may be severe. Recovery will only be possible in the long term.

**Very high:** The impact is of potentially devastating intensity to both the natural environment and/or to the human residents of an area. There will be total or near total failure of ecological processes. It is unlikely that mitigation is possible in any reasonable human time scale and hence the full recovery from the impact may not be possible in any reasonable human time scale. This impact may be regarded as irreversible/permanent.

**Unknown:** The consequences of the impact are not understood or cannot be predicted in any reliable fashion.

#### **LEVELS OF SPATIAL SIGNIFICANCE**

**Site level:** The physical impacts of the activity being assessed will not extend beyond the immediate site. If relevant, visual impacts will only be apparent to viewers on or close to the site.

**Local level:** The impacts of the development may be felt or be significant at the site of the activity or within a short distance from it (defined within the context of the feature being assessed), or restricted to a narrow viewscape in the case of visual impacts.

**Regional level:** The impacts of the development may be felt or significant at a distance which is well – removed from the site. In the case of visual impacts, the viewscape may be increased to landscape width and breadth.

**Provincial level:** The impacts of the activity are sufficient so as to be significant within the context of the whole province.

**National level:** The impacts of the activity are sufficient so as to be significant throughout the whole country.

**International level:** The impacts of the development are sufficient so as to be significant beyond the borders of the country.

#### **TIME PERIODS**

**Construction Phase:** The time period during which preliminary surveys and or construction and or other work is done. It will extend to the end of the construction period and includes any associated rehabilitation work and / or landscaping that may be prescribed.

**Operational Phase:** The time period for which the operation of the activity continues to function. This is of particular relevance for developments which have a very large footprint, such as timber plantations or urban expansion, or opencast mines which keep expanding as they operate.

**Short Term:** A period of time including the Construction Phase and up to two years further. Note: This time period is defined as it is considered that it covers the period in which the footprint of the construction operation will be sustainably revegetated and wildlife will return to the disturbed areas.

**Medium Term:** A period of up to five years from the end of the Construction Phase. Note : This time period includes the criteria described for the Short Term, but includes the time necessary for certain processes, for example the establishment of woody vegetation, to become established on the development area.

**Long Term:** A period of at least ten years, possibly more, from the end of the Construction Phase or the Operational Phase. Note: This time period includes the criteria described for the Medium Term but includes the time necessary for trees to reach sufficient size to soften and screen the appearance of a low rise development.

**Permanent:** The change which would be brought about by the development cannot in any way be reversed *in situ*. The only mitigation options which may be available will be those which are conducted off the site.

## **EFFECT**

**Positive:** The impact will have, on balance, predominantly beneficial effects.

**Negative:** The impact will have, on balance, predominantly detrimental effects.

**Neutral:** There will be a change, but it cannot be described as being of either a particular positive or negative nature.

## **NEED FOR MITIGATION**

**Low:** The need for mitigation is slight but the conditions / effects require that some effort is made.

**Moderate:** The need for mitigation is definite, but there is no requirement for major and / or costly works. Any proposed mitigatory measure must have good potential to reduce the impact.

**High:** The need for mitigation is such that major and costly works are justifiable. Any proposed mitigatory measures must have definite and demonstrable potential for reduction of the impact before the proposed development may be given authorization to proceed.

**Obligatory:** The nature of the impact is such that, unless mitigation can very largely nullify the consequences, it must be regarded as a potential fatal flaw which will halt the proposed development. If such mitigation cannot be achieved, it will be necessary to modify the development so that the impact will be reduced or even obviated.

## **LOCALITY OF MITIGATION**

**On site:** the necessary mitigation must be undertaken at the site of the impact.

**Off site:** The necessary mitigation need not necessarily be at the site of the impact. Compensatory action may be undertaken at another, preferably similar, site on the property. For example, loss of a wetland due to construction or a dam may be mitigated by rehabilitation of a similar wetland in the vicinity.

## **10.2. THE IDENTIFICATION OF THE POTENTIAL ENVIRONMENTAL IMPACTS TO BE ASSESSED**

The potential issues identified below are the product of the public participation process, from the specialist reports which have been commissioned for this EIA application, the SEA conducted for the wider river catchment area within which the project is located, and from experience and literature of similar projects elsewhere.

An overview is provided below of the broad categories within which the potential environmental impacts associated with the development are further investigated and assessed within the rest of this section.

The following issues are listed below as being required to be assessed :

- Issues related to the construction process.

- Soil erosion
- Impacts on vegetation and wildlife
- Normal construction process concerns, such as to do with waste management, prevention of pollution, dust, nuisances and hazards to other parties.
- Impacts related the implementation of civil infrastructure, such as for roads, waste water disposal and electricity reticulation.
  
- Issues related to the biophysical environment
  - Soil erosion
  - Water quality
  - Water quantity and flow
  - Wetlands
  - Biodiversity and conservation
    - impacts on fauna and flora within the reserve
    - impacts on wildlife in surrounding areas and the relationships of the site to these surrounding areas.
  - Ecological processes
  
- Aesthetic considerations
  - The sense of place of the site and the implications of this sense of place on developing the site.
  - The visual impacts of the proposed development and its alternatives.
  
- Historical and cultural resources and the potential impacts of the proposed development on them.
  
- Infrastructure provision
  - Potable water
  - Waste water disposal
  - Electricity provision
  - Road infrastructure
  
- Loss of agricultural land
  
- Other socio-economic impacts

### **10.3. ASSESSMENT OF POTENTIAL GENERAL ENVIRONMENTAL IMPACTS ASSOCIATED WITH CONSTRUCTION ACTIVITIES**

#### **10.3.1. THE POTENTIAL GENERAL IMPACTS ASSOCIATED WITH CONSTRUCTION ACTIVITIES**

There are a number of potential impacts causing damage to the natural environment or nuisance and / or hazards either on the site or to neighbouring communities that are typically associated with large construction projects. These are associated with the various construction activities, which are listed and discussed in this section. There are other specific aspects related to construction of certain infrastructure on the wetland system of the site, and these are also dealt with within the context of these specific impacts within the following section 10.4.

Those identified as being generally associated with any large construction project of this nature are listed below as follows:

##### **1. Site survey.**

There is the potential for impacts on vegetation through the cutting of sight lines during the processes of detailed site surveys before construction is commenced with. Control of the survey process, and the input of the ECO and other specialists in the construction process is required.

##### **2. Site camp location and establishment**

Potential soil erosion, water pollution, hazards from potentially harmful chemicals, visual pollution, noise pollution and other problems to be associated with the setting up and operation of the site camp, before and during construction.

Due to the large nature of the site, the various individual development areas which it is comprised of, and the long time span over which the construction process for the total development will occur, there will be many site camps established within the overall development footprint for the site.

Therefore, at this stage, as included in the EMPr within the appendices, general principles that should be applied to the location of the site camp are included within it. These would be applied by the suitably qualified Environmental Control Officer who would be appointed to manage, audit and report on site camp location selection and establishment, and which may also be subject to the approval of the environmental authorities as well.

The application of this approach would ensure that site camps were not located in environmentally undesirable areas, and would also be established in an environmentally appropriate manner.

##### **3. Grubbing and clearing vegetation**

The process of clearing of vegetation, potential environmental impacts associated with them that are required to be addressed by appropriate environmental management. There is the need to dispose of vegetation in the overburden, the saving of topsoil where possible, and the prevention of dust and soil erosion, which will be potential impacts once this activity is commenced with.

As prescribed in the EMPr, all development sites will be first inspected by the ECO and a vegetation specialist, and any translocation of other special measures to mitigate damage to vegetation will be applied.

In the case of the freehold stands within Phase 1, the eco-estate, each development footprint area within the overall site will be surveyed, taped off and approved in advance by the ECO, assisted by specialists as required. The location of the permitted footprint will be adjusted to cater for any biodiversity resources which may occur on a particular site.

The same approach of preliminary survey, taping off or areas, and guidance will apply to the construction of roads, and the provision of other services such as electricity and water which will also be laid within the road reserve areas.

#### **4. Activities Impacting on wildlife**

Impacts on wildlife are potentially associated with the following activities

- Loss of habitat
- Noise and other forms of disturbance related to the construction process.
- Poaching, and hunting by construction workers and others.

There should be strict control of workers to prevent hunting, poaching and disturbance of all forms of wildlife, both on the site and on neighbouring properties. The site is a very large one, and there is ample area for wildlife to move away from any development occurring on the site, which will occur in controlled phases, probably over an extended period of time, with each phase under construction being fenced off from the rest of the property.

#### **5. Activities associated with earthworks**

Earthworks may have significant impacts associated with them due to:

- Loss and burying of topsoil
- Inadequate control of machinery causing material.
- Inadequate soil erosion measures
- The effects on water flow and stormwater drainage.
- Noise pollution effects associated with heavy machinery
- Potential pollution from heavy machinery.
- Potential pollution from dust.

They are required to be properly mitigated through measures contained within an EMPr. All of these potential impacts are associated with large construction contracts of this nature, and are not unique, or especially problematic, on this site.

#### **6. Activities associated with roadworks and other paved areas**

Over and above the potential impacts associated with earthworking activities, there are other impacts associated with roadworks and the other extensive paved areas associated with this particular types of development which are required to be mitigated, during the actual construction process.

- Increased run off and erosion from impermeable surfaces.

- Diversion and concentration of storm water runoff.
- Pollution from road construction chemicals
- Impacts on wetlands at their points of crossing.
- Effects on natural surface water flows.

There is the requirement for effective storm water management and the implementation of the appropriate measures during construction. These are included within the storm water management plan of appendix 15.13 and in the EMPr contained within appendix 15.21.

### **7. Construction of stormwater management systems**

The installation of temporary and permanent stormwater management structures have the following potential impacts associated with them:

- Soil erosion and loss of topsoil during trenching activities.
- Effects on natural surface water flows.
- Concentration of run off at point sources, with potential for scour erosion, and effects on aquatic habitats.
- Potential impacts on the wetland areas from the construction of storm water detention structures.

These potential impacts are required to be addressed during the construction process.

### **8. Construction of foundations**

Foundation construction has the potential impacts in regard to :

- Disposal of excess concrete
- Haulage activities of heavy vehicles
- Illegal obtaining of sand and stone.

Measures must be included in the EMPr to address these issues, and proper monitoring of construction and the sourcing of materials and the disposal of wastes is essential.

### **9. Construction of top structures**

Top structure constructions have potential impacts include the following:

- Dumping of rubble and waste on the site, or elsewhere.
- Pollution from hazardous chemicals ( paints, sealants, etc ).
- Illegal obtaining of sand and stone.
- Increased run off from impermeable surfaces.

To be addressed through measures contained in the EMPr, as required in all major construction projects. No special issues in regard to this particular site are identified in this regard.

### **10. Water, electricity and waste water disposal installations**

Potential impacts associated with the installation of this infrastructure includes:

- Soil erosion and loss of topsoil associated with trenching.
- Effects on natural water course and natural water flow due to trenching and pipes.



- Impacts on areas of vegetation of value.
- Pollution from materials used in construction.

These are all required to be addressed in the design of the development and the implementation of the measures prescribed in the EMPr.

### **11. Historical and cultural impacts during construction**

Measures are included in both the cultural heritage and the EMPr to deal with any items of potential cultural heritage significance which may be found during the construction process.

### **12. Vegetation rehabilitation and landscaping :**

The process of vegetation rehabilitation and landscaping has potential for some positive impacts. However, potential negative impacts to be avoided are:

- The introduction of vegetation that is not endemic to the area.
- The introduction of potentially invasive species of plants.

These potential impacts can be avoided through the formulation of appropriate landscaping protocols to be applied by the developer to the overall site, and by the owners of the purchased subdivisions on it.

### **13. Impacts of construction workers on the site**

Potential issues associated with large numbers of construction workers on site include:

- Concerns in regard to littering, pollution and health.
- Concerns in regard to safety and security.
- Social impacts, such as prostitution.
- Potential for hunting, poaching and muti gathering on the site and its surroundings.

These are normal concerns, are not especially problematic on this site, but are required to be addressed by proper worker induction and monitoring during the construction process.

## **MITIGATION MEASURES**

The mitigation measures associated with the construction activities and their associated impacts are incorporated into a Environmental Management Programme that is included within the appendices of this environmental impact assessment report.

## **OVERALL ASSESSMENT**

There is the potential for negative environmental impacts to be associated with the general construction activities. However, there is nothing special or problematic about the site, and these impacts can be effectively mitigated to be of low significance and impact.

The applicant, as the developer, will be involved in the following key aspects identified as requiring special attention during the construction process on this site, as follows :

- The potential for dust

- The potential for increased storm water run off and soil erosion.
- Potential impacts associated with the installation of civil infrastructure, in the form of
  - Potable water
  - Waste water disposal
  - Electricity supply
  - Road construction

These potential impacts are assessed within the various subsection below.

### 10.3.2. ASSESSMENT OF POTENTIAL IMPACTS ASSOCIATED WITH DUST DURING CONSTRUCTION

<b>POTENTIAL IMPACTS OF DUST DURING CONSTRUCTION</b>	
<b>CONSIDERATION</b>	<b>ASSESSMENT / COMMENT</b>
Nature	<p>There are some relatively large area of development associated with the development areas of the site, from which dust can be generated. There are also dirt roads on the site which will be used by construction vehicles which will also create dust.</p> <p>The Air Quality Impact Assessment Report contained within appendix 15.15 also identifies particulate pollution, in the form of dust during construction, as one of the most likely principal causes of air pollution.</p>
Probability/certainty	The potential for impacts associated with construction is High. Even with the best mitigation measures in place some dust is inevitable.
Status	The potential effect would be negative.
Extent	As dispersed by the prevailing winds, to neighbouring properties.
Duration	During construction process for each phase of the development.
Magnitude	Magnitude of impacts is largely dependent on care and mitigation during the construction process. However, there is likely to be unavoidable dust generated during strong winds in dry weather.
Reversibility	Will only occur during the construction process.
Cumulative/Non cumulative	Adds to particulate forms of atmospheric air pollution, but cumulative aspects in within this particular context are not considered to be significant.
Potential to mitigate	<p>The need, and potential, to mitigate is high, through such measures described in the air quality report and also from practical experience, to include:</p> <ul style="list-style-type: none"> <li>• Limited clearing and rapid covering of bare ground</li> <li>• Physical barriers</li> <li>• Traffic management</li> <li>• Earth moving management</li> <li>• Soil stockpile management</li> <li>• Chemical stabilisation</li> <li>• Hauled materials management</li> <li>• Water spraying</li> <li>• Rapid revegetation</li> <li>• Contractor management</li> </ul> <p>Mitigation measures are obligatory.</p> <p>These measures can reduce dust significantly, but not eliminate it entirely.</p>
Potential to enhance	Not directly relevant to the construction process. However, amount of dust generated from the site is likely to decrease when construction process is completed.

Overall assessment and comments	<p>The potential impacts of dust being generated from the site are assessed as being of high probability, local in area, of low significance and reversible in nature.</p> <p>The impacts of dust are not considered to be in any way a fatal flaw to approving the development, but attention to ensuring that the appropriate mitigating measures are applied must occur.</p> <p>It should be noted that any levels of dust which are generated are likely to be of a temporary, nuisance value and not of any significant danger to health or property.</p> <p><b>The overall assessment of the potential impacts of dust is negative, but of low significance, and is entirely acceptable within the context of developing the site.</b></p>
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### 10.3.3. ASSESSMENT OF POTENTIAL IMPACTS ASSOCIATED WITH STORM WATER MANAGEMENT DURING CONSTRUCTION

<b>POTENTIAL IMPACTS ASSOCIATED WITH STORM WATER DURING CONSTRUCTION</b>	
<b>CONSIDERATION</b>	<b>ASSESSMENT / COMMENT</b>
Nature	Loss of soil by wind erosion is dealt with under the assessment of dust above, and is considered to be of low significance.  Soil erosion is most likely to occur due to storm water runoff from rainfall events during the construction process on soil that has had vegetation removed during the construction process.
Probability/certainty	The potential for impacts associated with construction do occur. Even with the best mitigation measures in place some erosion impacts are probable.
Status	The potential effect would be negative.
Extent	The effect is site specific and localised and will effect drainage lines downstream of the site.
Duration	Would occur during the construction process until areas are paved and formal storm water management structures are in place, and revegetation of bare areas has occurred.
Magnitude	Magnitude of impacts is largely dependent on the care and mitigation during the construction process. Combined with mitigation measures that can be employed, magnitude is likely to be low.
Reversibility	Soil erosion is likely to be restricted to the earlier construction stages of each phase of the project.
Cumulative/Non cumulative	Erosion from the site adds to all erosion and siltation of the irrigation dam downstream of the site.
Potential to mitigate	Need for mitigation is high, and should be obligatory, as part of compliance with the EMP.
Potential to enhance	Not relevant in the construction phase. The final development could have less erosion occurring than occurred when the site was used for agriculture.

<p>Overall assessment and comments</p>	<p>The issue can be addressed through the appropriate measures being formulated and implemented.</p> <p>There will be some limited negative impacts associated with some siltation and turbidity of water, even with the most stringent and effectively implemented mitigation measures.</p> <p>The potential impacts of soil erosion due to storm water runoff in the construction process are assessed as being of high probability, but of local, moderate significance and reversible.</p> <p>The potential for soil erosion is therefore not considered to be a fatal flaw in the development proposal. However, it is something that does need proper management during construction.</p> <p><b>The assessment of the potential impacts associated with storm water runoff and soil erosion are assessed as being low negative, but entirely acceptable within the construction process.</b></p>
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**10.3.4. POTENTIAL IMPACTS ASSOCIATED WITH ROAD CONSTRUCTION**

<b>ISSUE: POTENTIAL IMPACTS RELATED TO ROAD CONSTRUCTION</b>	
<b>CONSIDERATION</b>	<b>ASSESSMENT/COMMENT</b>
<b>BACKGROUND &amp; DESCRIPTION</b>	<p>There will be road construction associated with the development, as required in terms of the traffic impact report for external road upgrades, and also on the site.</p> <p>The general impacts of roads during construction are therefore related to such aspects as :</p> <ul style="list-style-type: none"> <li>• The potential for soil erosion from storm water run off.</li> <li>• Dust from the large bare area exposed during construction.</li> <li>• The management of potentially hazardous and polluting substances such as bitumen, and the disposal of any waste from these sources.</li> <li>• Potential leaks and spillages associated with vehicles, and their refuelling on the site.</li> <li>• The obtaining of raw materials such as sand and stone</li> <li>• Management of other forms of waste.</li> <li>• The avoidance of areas of high vegetation biodiversity concern in the alignment and construction of roads wherever possible.</li> <li>• Proper site rehabilitation and vegetation cover at the end of the construction process.</li> </ul> <p>All of these impacts have the potential to be significant, but are of a generally "standard" nature and can be mitigated through the proper application of the appropriate measures within the EMP.</p>
Probability	Some negative impacts from the construction of roads is probable. The nature and extent of these impacts will depend on the efficacy of the implementation of the appropriate mitigation measures.
<b>ASSESSMENT</b>	
Status	Impacts would be negative
Extent	Localised to the area of road construction, downstream in the case of soil erosion and water pollution, and more widespread in the case of dust.
Duration	During the period of road construction.
Magnitude	Impacts are low to moderate, depending on the nature of mitigation.
Reversibility	Reversible in nature.
Cumulative/Non cumulative	Cumulative with the other similar impacts associated with construction on the site, and in the general area of the site.

<b>MITIGATION</b>	
Potential to mitigate negative impacts and the Potential to enhance positive impacts	The potential to mitigate these potentially negative impacts is high, with the application of the appropriate measures contained within the EMPr.
<b>OVERALL ASSESSMENT, CONCLUSIONS AND IMPLICATIONS</b>	
<p>There are significant potential negative impacts associated with the road construction which would occur in the development.</p> <p>These potential impacts can be well mitigated during the construction process in regard to such aspects as soil erosion, dust and pollution. Special care and advance planning will have to be taken to mitigate impacts on vegetation biodiversity.</p> <p>However, there are no fatal flaws in road construction which should prevent the development from occurring.</p>	



### 10.3.5. POTENTIAL IMPACTS ASSOCIATED WITH THE PROVISION OF POTABLE WATER

<b>POTENTIAL IMPACTS ASSOCIATED WITH THE PROVISION POTABLE WATER</b>	
<b>CONSIDERATION</b>	<b>ASSESSMENT/COMMENT</b>
<b>BACKGROUND &amp; DESCRIPTION</b>	<p>The Msunduzi Municipality is the water services provider, and they have confirmed that they can supply a potable water connection to the site.</p> <p>Water pipes will be buried within the road reserve areas at the same time as road construction, thereby reducing the amount and duration of construction disturbance which will occur.</p> <p>Potential impact are related to soil erosion connected with trenching operations, and impacts on vegetation, as well as any pollution and waste.</p>
Probability	There will be some impacts associated with the provision of the water infrastructure.
<b>ASSESSMENT</b>	
Status	Impacts will be of a negative nature.
Extent	Localised, to the area where water pipelines are to be installed, which will be within road reserves, or within development footprint areas.
Duration	Temporary in nature, related to the installation process.
Magnitude	Impacts are likely of low magnitude, in particular if mitigation measures in the EMP are properly applied.
Reversibility	Reversible in nature.
Cumulative/Non cumulative	No significant cumulative impacts identified.
<b>MITIGATION</b>	
Potential to mitigate negative impacts and the Potential to enhance positive impacts	<p>Being under pressure and not dependent on gravity, water pipelines can follow road routes, and will also cross water courses within the road reserve areas.</p> <p>The measures in the EMP in regard to erosion protection, waste management, site rehabilitation and alien plant control are adequate to control the potential construction impacts associated with the installation of water infrastructure.</p>
<b>OVERALL ASSESSMENT, CONCLUSIONS AND IMPLICATIONS</b>	
<p>The potential impacts associated with the installation of water infrastructure are assessed as being localised, of low impact, reversible and capable of mitigation, and therefore environmentally acceptable.</p>	

**10.3.6. POTENTIAL IMPACT ASSOCIATED WITH THE SUPPLY OF ELECTRICITY**

<b>ISSUE: POTENTIAL IMPACTS WITH THE SUPPLY OF ELECTRICITY</b>	
<b>CONSIDERATION</b>	<b>ASSESSMENT/COMMENT</b>
<b>BACKGROUND &amp; DESCRIPTION</b>	<p>Electricity supply has confirmed for the development by Eskom. The reticulation of the electricity supply within the development would be done by the developer.</p> <p>Potential impacts are associated with any trenching and the laying of cables that would be required. However, these would tend to occur within the road reserves.</p>
<b>ASSESSMENT</b>	
Probability	Some impacts would be likely to occur.
Status	Impacts associated with the installation of infrastructure would be negative in nature.
Extent	Very localised within the area of construction.
Duration	Of short duration related to the construction process.
Magnitude	Low in magnitude
Reversibility	Reversible
Cumulative/Non cumulative	Not of a significant cumulative nature.
<b>MITIGATION</b>	
Potential to mitigate negative impacts and the Potential to enhance positive impacts	The mitigation measures associated with the installation of the electricity reticulation would be adequately covered by the measures contained within the EMPr.
<p><b>OVERALL ASSESSMENT, CONCLUSIONS AND IMPLICATIONS</b></p> <p>As the bulk supply of electricity is from outside the development from Eskom no significant impacts are identified in this regard.</p> <p>In the case of the electricity reticulation within the development, this will be done by the developer, and any negative impacts are assessed as being of low significance and magnitude, localised and reversible in nature, and assessed as being environmentally acceptable.</p>	

**10.3.7. POTENTIAL IMPACTS ASSOCIATED WITH THE  
INSTALLATION OF INFRASTRUCTURE FOR THE DISPOSAL  
OF WASTE WATER**

<b>ISSUE: POTENTIAL IMPACTS ASSOCIATED WITH THE DISPOSAL OF WASTE WATER</b>	
<b>CONSIDERATION</b>	<b>ASSESSMENT/COMMENT</b>
<b>BACKGROUND &amp; DESCRIPTION</b>	<p>There are three types of waste water disposal associated with the development :</p> <ul style="list-style-type: none"> <li>• Septic tank and soakaway system for the eco-estate component next to Ashburton within Phase 1.</li> <li>• Reticulation to an upgraded existing pump station for phases adjacent to Bellevue suburb, and via the existing sewage reticulation of this area to the Darvill sewage works.</li> <li>• Sewage plant for the major and more central development components of the site.</li> </ul> <p>The septic tank and soakaways will have impacts associated with the excavation and trenching required for their installation.</p> <p>The reticulation associated with the pump station will required trenching for the sewer pipes. However, this will occur within the development footprint, or the road reserve areas.</p> <p>In the case of waste water plants, there is trenching to do with internal reticulation of a particular development, but this will occur within a development footprint area. There will also be the construction of a platform on which to construct the sewage plant. It is confirmed the geotechnical and engineering report that the surface and founding conditions are suitable.</p> <p>There will be also trenching of the sewer main to the plant, and from there to a natural water course of the treated effluent.</p>
<b>ASSESSMENT</b>	
Probability	Impacts associated with the installation of waste water disposal facilities are probable.
Status	Impacts would be negative
Extent	Localised to the area of construction, and downstream of them in the case of any significant soil erosion.
Duration	Temporary in regard to construction aspects.
Magnitude	Magnitude of impacts would be from low to high, depending on the the effectiveness of mitigation measures applied.
Reversibility	Construction impacts are reversible
Cumulative/Non cumulative	Impacts are cumulative, together with the installation of similar infrastructure on the site and its surroundings.

<b>MITIGATION</b>	
Potential to mitigate negative impacts and the Potential to enhance positive impacts	<p>There is a high potential to mitigate the impacts, through measures contained within the planning and construction phases of the development, which include :</p> <ul style="list-style-type: none"><li>• Initial site surveys and input from the ECO.</li><li>• Supervision of the construction process by the ECO.</li><li>• Appropriate monitoring and follow up activities associated ensuring that there are no impacts from such aspects soil erosion, or alien plant infestations of disturbed areas.</li></ul>
<b>OVERALL ASSESSMENT, CONCLUSIONS AND IMPLICATIONS</b>	
<p>There is the potential for negative impacts to be associated with the construction of waste water disposal facilities, and it is probable that some negative impacts will occur.</p> <p>However, these potential impacts can be mitigated to acceptable low and localised levels with the application of the appropriate mitigation measures, and the input from appropriate specialists.</p> <p>It is assessed that there are no fatal flaws or unacceptable impacts associated with the construction of waste water disposal facilities in the proposed development.</p> <p>However, it is to be noted that the construction of the waste water treatment works will be the subject of its own waste management license application before it can be constructed and operated, and there will be separated specialist studies, and an EMPr produced in this process specifically dealing with the construction of the waste water treatment plant.</p>	

#### **10.4. POTENTIAL IMPACTS ON THE BIOPHYSICAL ENVIRONMENT**

The biophysical environment is concerned with air, water, soil, populations of organisms within their respective communities and the ecological processes that link them all together within a particular ecosystem.

The relevant aspects of these components are assessed below within the context of the qualities of this particular site and the nature of the proposed development on it. These are dealt within in the subsections below, listed as follows :

- Potential impacts on the following aspects of the biophysical environment
  - Water quality
  - Water quantity and flow
  - Cumulative effects on river catchment within which the development is located
  - Wetlands
  - Air quality
  - Biodiversity and conservation
    - impacts on fauna and flora within the reserve
    - impacts on wildlife in surrounding areas and the relationships of the site to these surrounding areas.
  - Ecological processes and the related goods and services

The potential impacts on these aspects of the biophysical environment during the operational phase of the development ( i.e. after construction has occurred and any potential impacts of construction which have been assessed separately above ) has occurred.

**10.4.1. POTENTIAL IMPACTS ON WATER QUALITY**

<b>ISSUE: POTENTIAL IMPACTS OF THE DEVELOPMENT WATER QUALITY</b>	
<b>CONSIDERATION</b>	<b>ASSESSMENT/COMMENT</b>
<b>BACKGROUND &amp; DESCRIPTIONS RELEVANT TO THE POTENTIAL IMPACTS</b>	<p>Within the proposed development, there have been buffer areas established between all water courses and minor drainage lines on the site, of at least 30m, so that, except in the case of the road crossings associated with the arterial roads, which are part also of the municipal planning of the area, there are no direct impacts of the development on the water courses on the site. In the case of the more general impacts of the construction of the roads, these are discussed in section 10.3 above related to the assessment of construction impacts.</p> <p>The other potential impacts on water quality are identified as being derived from the following sources :</p> <ol style="list-style-type: none"> <li>1. From waste water disposal from the developments on the site, which can be from the three proposed methods of waste water disposal, these being : <ul style="list-style-type: none"> <li>• From septic tank and soakaway systems associated with the eco-estate residential development next to the suburb of Ashburton, where the very low density of the development and the findings of the geotechnical report determine that this is a suitable and feasible form of disposal for this part of the development.</li> </ul> <p>Because of these low densities, the geotechnical conditions and that all septic tanks and soakaway systems are all over 50m from any natural drainage lines, it is considered that there are no significant impacts on water quality related to this form of waste water disposal, and these are not assessed further below.</p> <ul style="list-style-type: none"> <li>• From the reticulation to the existing sewage pump station within the suburb of Bellevue.</li> </ul> <p>In regard to this form waste water disposal, there will be the upgrading of an existing sewage pump station within the existing suburb of Bellevue, and the use of the existing sewage reticulation works from there to the existing Darvill sewage works, as is described further in the Engineering Bulk Services Report contained within appendix 15.10. No significant forms of water pollution identified with this form of waste water disposal are identified.</p> <ul style="list-style-type: none"> <li>• From the proposed sewage treatment plant within the development.</li> </ul> <p>In considering the potential impacts of the sewage plant, it should be noted that this proposed waste treatment works will be subjected to its own separate Waste Management License processes which includes their own full EIA processes.</p> <p>Therefore, although the potential impacts of this waste water treatment works is assessed below, the level of detail, and any other specialist reports specifically commissioned as part of the Waste Management License application process, are not dealt with below.</p> </li> </ol>

	<p>The nature of the potential impacts associated with waste water disposal from the sewage plant are related to :</p> <ul style="list-style-type: none"> <li>• If there are any failures in the system, which would permit any raw, or only partially treated effluent, to escape into the natural environment.</li> <li>• The release of treated effluent, which contains higher levels of nutrients, in particular nitrates and phosphates, which has the potential to lead to downstream eutrophication ( over enrichment ) of natural water courses.</li> </ul> <p>However, it should also be borne in mind that, in assessing the potential impacts of waste water disposal that the potential impacts of waste water disposed from a treatment plant into the natural environment will also depend on the emission standards which are prescribed by the relevant authorities, in particular the Department of Water Affairs ( DWA ), as to whether they prescribe general limit of special limit standards to such components in the released effluent, such a phosphate levels, would be significant in assessing the potential impacts of released effluent.</p>
	<p>2. From general forms of pollution associated with run off or point sources of pollution from the developments on the site.</p> <p>However, the developed areas are less than 50% of the total site, are set well back from all water courses, and there are no potentially polluting activities (such as industrial uses, fuel filling stations ) associated with these developments.</p> <p>Moreover, the nature of the storm water run off management measures, to detain and infiltrate storm water run off within specially designed attenuation chambers ( see section 4.3 of the Stormwater Management Report within appendix 15.11 for further details in this regard ). These mitigation measures would mitigate any pollution impacts associated with the storm water run off from the proposed development.</p> <p>Therefore, general urban run off pollution from the development areas is not considered to be a significant factor.</p> <p>It should also be borne mind that the site could be used again for agricultural crop production, or for cattle feedlots, both of which could lead to significant forms of water pollution from run off, in the form of nutrients from fertilizers and / or animal excreta, pesticides and herbicides.</p>
<b>ASSESSMENT</b>	
Probability	Due to the introduction of treated waste water effluent into the natural environment, it is most probable that there will be some environmental impacts.
Status	The minor increases in water volume contributions and in increased nutrient levels may be of both negative and positive impacts.

Extent	Within the adjacent water course of the Mkhondeni Stream, and immediately downstream of this into the Msunduzi River, which is in turn a tributary of the Umgeni River.
Duration	Permanent, ongoing, related to the operation of the sewage treatment plant.
Magnitude	Dependent also on standards that are prescribed by DWA, but are likely to be of low magnitude.
Reversibility	Any impacts due to the failures in the system, leading to the escape untreated or partially treated effluent would be reversible in nature.  Any impacts due to the operation of the development would be ongoing, for the duration of the development.
Cumulative/Non cumulative	Any release of treated effluent into the natural environment tends to have a cumulative component to it, in conjunction with all other contributions of urban pollution. However, the cumulative effect of from this development, is assessed as being of a minor nature, and will be taken into account in the effluent emission standards which are applied by the Department of Water Affairs.
<b>MITIGATION</b>	
Potential to mitigate negative impacts	There is a high potential to mitigate potential negative impacts associated with the failure of the system, through such measures as : <ul style="list-style-type: none"> <li>• Emergency back generator in case of power failure.</li> <li>• Standby pump</li> <li>• Spares for all parts kept on site</li> <li>• Overflow conservancy tanks in case of temporary failure</li> <li>• The prescription of the standards to be applied to the treated effluent emissions.</li> </ul>
Potential to enhance positive impacts	No potential to enhance identified in this instance.



## **OVERALL ASSESSMENT AND CONCLUDING COMMENTS**

Overall Assessment and concluding comments as to the predicted impacts after mitigation are as follows:

- There are minor potential impacts on downstream water related to storm water run. These are mitigated by the design of the development and the nature of the proposed storm water management measures. Run off from alternative agricultural activities would also occur with alternative land use.
- There are likely to be impacts associated with the disposal of waste water from the sewage disposal site, which have the potential to be of a negative nature. These can be mitigated to some extent, the precise nature of which will be dependent on the outcome of the Waste Management License which will be required after a separate EIA process for this application.

The positive aspects of the provision of the sewage disposal system to serve those parts of the development which would required it are assessed as outweighing any negative aspects associated with the operation of the sewage plant, and the potential impacts of the disposal of waste water from the site are considered to be acceptable.

However, as stated above, the proposed waste water treatment plant associated with the development will be subject to its own Waste Management License application, where it will be subject to a more detailed investigation and assessment, and certain unknown factors, such as the standards that will prescribed, will also influence the assessment which occurs.

**10.5. POTENTIAL IMPACTS ON WATER QUANTITY AND DOWNSTREAM FLOW**

<b>POTENTIAL IMPACTS ON WATER QUANTITY AND DOWNSTREAM FLOW</b>	
<b>CONSIDERATION</b>	<b>ASSESSMENT/COMMENT</b>
<b>BACKGROUND &amp; DESCRIPTIONS RELEVANT TO THE POTENTIAL IMPACTS</b>	<p>Potential impacts on water quantity and downstream flow will be dependent on two aspects :</p> <p>1. The extent to which the development increases run off from the impermeable areas on the site</p> <p>There will be an increase in stormwater runoff from the impermeable areas on the site, from such surfaces as roofs and paved areas. This is estimated at about 140 hectares of the 483hectare site, or about 29% of the total area of the site. There is therefore the potential for there to be this proportional increase in run off from the site, due to the lack of infiltration of rain water from these areas. This would tend to increase peak flows, and reduce stream flows in between rainfall events. In mitigation of this impact is that the development areas are dispersed over the site, and not concentrated in any single area, so that the run off if of a lower magnitude, and more easily mitigated, than if it was concentrated into a single major area of development.</p> <p>In regard to this increased storm water run off, it is to be noted that that the storm water management measures prescribed in the Stormwater Management Report of appendix 15.11 are designed with the intention of pre and post development flows being the same, due to attenuation structures that are to be built into the development areas on the site. Thereby “ironing out” potential increases in run off peaks.</p> <p>Also, wherever possible, these attenuation tank structures will be designed to permit infiltration into the soil, thereby ensuring the recharge ground water in these area, and assisting in maintaining base flow to the water courses on the site.</p> <p>2. The addition of water to the natural environment on the site, from the disposal of waste water.</p> <p>In this case it would be from the release of treated waste water effluent that has been pumped from certain phases of the development closest to Bellevue suburb, and from sewage plant that is proposed to be built on the site.</p> <p>It is to be noted in this instance that the water being added back into the overall Umgeni River catchment system from the treatment of sewage has originally been drawn from this same river catchment, so that there are no inter-basin transfers of water occurring in this case.</p> <p>It is also to be noted as well that the construction and operation the proposed sewage works will be subject to its own separate Waste Management License application process, which follow the EIA procedures. More detailed studies on the potential impacts of the volume of flow discharge from the sewage works would occur during this application process.</p>

<b>ASSESSMENT</b>	
Probability	There will be some increase in the volume of flow in the affected drainage lines on the site.
Status	Increases in volume of flow in the affected water courses is assessed as having both positive and negative impacts associated with them.
Extent	In the drainage lines on the site, and downstream in the Msunduzi River which is on the northern boundary of the site.
Duration	Permanent
Magnitude	Magnitude is assessed as low
Reversibility	Changes due to the presence and operation of the development are not reversible.
Cumulative/Non cumulative	Cumulative with any other developments in the catchment area, but of a relatively minor nature.
<b>MITIGATION</b>	
Potential to mitigate negative impacts	<p>In regard to the management of storm water run off the potential to mitigate is high, related to the application of the measures contained within the specialist Storm Water Management Plan.</p> <p>In the case of the release of effluent, the potential to mitigate is low. However, water conservation measures, as outlined in the Green Building Code of appendix 15.13, would reduce to some extent the amount of waste water required to be treated in the plant.</p>
Potential to enhance positive impacts	No significant potential to enhance positive impacts is identified.
<b>OVERALL ASSESSMENT AND CONCLUDING COMMENTS</b>	
<p>Overall Assessment and concluding comments as to the predicted impacts are as follows :</p> <ul style="list-style-type: none"> <li>➤ Impacts will not be extreme or severe, but are likely to be permanent, but relatively neutral, to low negative as to their nature of impact.</li> <li>➤ Impacts will be localised on the site, and downstream of it.</li> <li>➤ The positive socio-economic impacts of permitting the development are significant, and are considered to outweigh any negative impacts associated with the related increases in water volume runoff from the site.</li> </ul> <p>The potential impacts of the proposed development on water quantity and downstream flow are assessed as being acceptable.</p>	

### **10.5.1. POTENTIAL IMPACTS ON WETLANDS**

#### **BACKGROUND AND DESCRIPTION TO THE POTENTIAL IMPACTS ON WETLANDS**

The wetland areas on the site are described and delineated, and the potential impacts of the development on them assessed within the specialist Wetland Delineation and Functional Assessment Report which is contained within appendix 15.4.

The assessment of the potential impacts of the development on wetlands below is therefore largely based on this report, and the response of the planning of the development to it, as reflected in the proposed site layout plan. There have also been meetings between the EAP, and the project's town planner and the civil engineer and the wetland specialist in order to take potential wetland impact considerations into the spatial planning and the provision of infrastructure for the development.

In the planning of the development cognisance of the presence of wetland areas on the site and, in all cases there is a buffer area of at least 30m between the uppermost boundary of an identified wetland area and the nearest edge of a proposed development area.

Within the development, the only direct impacts on wetland areas are related to the crossing of the Cleland Extension arterial road which runs in a west / east direction across the more southern part of the site, more or less parallel with the N3 highway.

On its course, this road crosses two wetland areas, Areas 1 and 2, as indicated on the figure included on page 9 of the Wetlands Report and included as figure 8 after the text of this report. These road crossings are unavoidable. However, their particular alignment in the crossings has been the subject of interactions between the roads engineer, the wetland specialist and the town planner to mitigate their impacts as far as possible.

In the case of the crossing of wetland area 1, this is situated close to the intersection of the north – south and east west arterial roads at the more south western area of the site. As described in the wetlands report, this wetland is largely artificial in nature, and associated with the farm dams on the drainage line which have become silted up.

In the case of the crossing of wetland area 2, this is associated with the crossing of the west - east arterial road with a drainage line in the south central area of the site. In this case the wetland area 2 lies in a small, narrow valley, with a farm dam down at the lower end creating additional inundation of the system. The plants in the area of the crossing are a mixture of species of plant typically associated with drier habitats, and also some more hygrophilous ( water loving ) species.

In both these cases the mitigation measures involved in the design of the crossing are to do with:

1. The roads crossing the wetlands at as close to a right angles as possible, to reduce the distance of the wetland area that is traversed.
2. Keeping the development footprints of the road and its embankments as narrow as possible.
3. Providing a base layer porous, through the use of large rocks on which the rest of the road is built. This allows the movement of ground water across a wide front, rather than restricting it to a narrow choke point.
4. Providing generously sized culverts to ensure ease of surface flow under all flow conditions.
5. Anti erosion scour protection measures downstream of the culverts, to prevent soil erosion within the downstream wetland areas.

In regard to the assessment of the impacts on the functionality of the wetlands by the proposed development, in the case of :

**Wetland area 1 :**

The proposed road crossing will have some impact on wetland functioning, from direct habitat loss and indirect services provided by wetlands, such as nutrient and toxin trapping

**Wetland area 2 :**

The impacts are very similar to those of wetland area 1.

**Other wetland areas on the site**

In the case of the other wetland areas 5, and 6, which are not directly impacted on by development, if there is proper management of construction impacts, and issues around storm water run off are properly controlled, the functional rating of these wetlands will stay roughly the same.

It is also to be noted that in the proposed development the wetland areas are all placed within areas zoned for open space conservation, and would thereby be provided with formal protection in the future, safe from, for example, inroads and impacts on them from farming, as has occurred in the past on the site.

In the conclusions to the Wetlands Report it is stated by the specialist that the impacts on the wetland systems are acceptable and manageable. The crossing of wetland area 1 was found to have the highest impact. However, as much of the current extent of the wetland in this portion can be attributed to the artificial inundation resulting from the farm dam at this point, the impact and loss of wetland services are minimised. Furthermore, correct design of the planned crossing will further limit impacts downstream.

The Wetlands Report considers that the proposed layout has acknowledged the environmental sensitivity of the site, and has provided a development option that provides sufficient mixed return, while largely avoiding impacts to the natural systems. Income generated from the proposed development can also be set aside

for the ongoing management of the open spaces and watercourses, to enhance the services provided by these areas.

Based on the background information and assessments of the wetland specialists in this regard, the more formal, structured assessment of the potential impacts of the proposed development is provided below.

<b>POTENTIAL IMPACTS OF THE DEVELOPMENT ON WETLANDS</b>	
<b>CONSIDERATION</b>	<b>ASSESSMENT/COMMENT</b>
<b>ASSESSMENT</b>	
Probability	There are some impacts related to the two wetland crossings of the west – east arterial road in the development.
Status	Impacts would be negative in nature in regard to the road crossings. Better management, rehabilitation and management of the wetland in the operation of the development would be positive.
Extent	Very localised impacts at the point of the road crossings over wetland units 1 and 2.
Duration	Permanent
Magnitude	Minor
Reversibility	Not reversible
Cumulative/Non cumulative	Cumulative with all existing impacts on the wetland areas within the catchment, but of a very minor nature.
<b>MITIGATION</b>	
Potential to mitigate negative impacts	The potential to mitigate is high. The principal potential to mitigate impacts has occurred in the spatial planning of the development and the provision of civil infrastructure. Further mitigation is also provided in the form of measures included in the design of the crossings, as listed above in the introductory section.
Potential to enhance positive impacts	There is the potential to improve the protect and enhance the existing wetland areas on the site.

## **OVERALL ASSESSMENT AND CONCLUDING COMMENTS**

Overall Assessment and concluding comments as to the predicted impacts after mitigation are :

- Potential impacts are not severe, but are permanent.
- Potential impacts are of minor, and localised significance.
- Ecological impacts are low in comparison to the socio – economic context and related benefits.
- The potential impacts are from a road that has been planned as part of the arterial municipal arterial road system, independent of the development.
- The positive aspects of the development outweigh any of the minor and local negative impacts.

The identified potential impacts on the wetlands, as also concurred by the wetland specialist, are of assessed as being acceptable and manageable, and are not fatal flaws which should prevent the development being implemented in the manner proposed.

### 10.5.2. ASSESSMENT OF THE CUMULATIVE IMPACTS ON THE CATCHMENT

Based on the various assessments concerned with the hydrological aspects above, the overall assessment of the potential cumulative aspects of the site's catchment areas and the larger uMsunduzi are as follows:

HYDROLOGICAL ASPECT	ASSESSMENT OF CUMULATIVE IMPACTS ON THE STREAM CATCHMENT
Flood attenuation and /or changes to stream flow	Flood attenuation measures are sufficient on the site, and any changes in downstream flow will be of a minimal, not significant manner.
Stream flow augmentation	There will be an increase in stream flow, but this will be of a very minor nature. The water source for the development is drawn from the same uMgeni River catchment, so that water from the development is being returned to the same system.
Sediment Load into the water courses, and any sediment trapping	There is the potential for increased sediment within the river systems, especially from soil erosion during construction. This would be of a minor nature, and would be likely to be largely contained within the water courses on the site.
Phosphate addition or removal	There is the potential for some phosphate addition. The permitted phosphate levels released from the proposed waste water treatment works will be prescribed by the Department of Water Affairs.
Nitrate removal	As for phosphates. In general, the increased levels nitrates are not considered as significant by the authorities as the phosphates.
Toxicant addition or removal	No significant levels of toxicant addition or removal are anticipated.
Soil erosion	There is the potential for soil erosion, in particular during construction. However, with the implementation of the appropriate mitigation measures, this is anticipated to be minor.
Biodiversity maintenance	The biodiversity impacts on wetlands and the rest of the site are dealt with below within the assessment of biodiversity.  There is a loss of some vegetation cover, and some related decrease in the overall biological carrying capacity of the site.
Water supply for direct human use	Any informal use of water for human consumption, or for agriculture, downstream of the site would not be significantly affected by the development. The water added to the Umgeni River system is available for extraction and use, for example from the Inanda Dam.
<b>OVERALL ASSESSMENT</b>	Any major development will have impacts on the river catchment area within which it is situated. In this case these impacts are identified as being of low significance.  Also, there are measures which can be applied to mitigate the potential negative impacts, and there are no negative impacts identified which are so significant as to prevent the development occurring in the manner proposed.



### 10.5.3. POTENTIAL IMPACTS ON AIR QUALITY

#### **BACKGROUND AND CONTEXT OF THE ASSESSMENT OF POTENTIAL AIR QUALITY IMPACTS**

The site is presently undeveloped and unused and, with the implementation of the proposed development there is the potential for there to be impacts on air quality, and the related ecological goods and services provided by the site. This concern has also been raised by interested and affected parties in the scoping process.

An Air Quality Impact Assessment Report was therefore undertaken by the air quality specialist, Duncan Bell, of Guy Nicolson Consulting cc, and this report is contained within appendix 15.15 of this EIA report.

Within this report ;

- The site is described as to location, and regional climate, with particular reference to the implications for air quality.
- The present regulatory framework for air quality is then presented.
- Previous studies conducted on air quality of relevance to the site are then reviewed, which were the Simpson Ryder and Associates study undertaken for the Mkhondeni Strategic Environmental Assessment of Guy Nicolson Consulting cc, and within the Msunduzi Municipality's Environmental Management Framework study.

Following on from this overview provided above, the Air Quality Impact Report then assesses the potential impacts that could be associated with the proposed development, discussing the various components of which it would be comprised. It is noted that the nature of the proposed land uses would not produce any significant amount of air pollution in their operation of activities, besides those associated with normal vehicle movements on the site.

The potential sources of air pollution are then identified as they would occur during the construction and operational phases of the development, and mitigation measures for both are provided. Those for the construction phase are included within the assessment of the impacts of construction on air quality which is provided in section 10.3.2. and also within the measures included in the EMP of appendix 15.21.

The Air quality Impact Assessment Report concludes that, from the analysis of the previous studies on the current and future air quality of the area surrounding the proposed development, it was observed that quality of the air is in relatively fair condition, as the site does not fall within the winter pollution problem zone.

Through the information provided about the proposed development, certain potential impacts may result. The vast majority of these impacts are associated with the construction phase and, besides the increase in traffic, little impacts are associated with the operational phase. No potentially polluting industries would be permitted to occur on the site in terms of the town planning uses which are being applied for in the proposed development.

The most significant impacts associated with this development are the release of particulate matter, in particular dust during construction. However, it is considered unlikely that dust from the construction phases would reach levels of concern to the surrounding community's health. It should also be borne in mind that the development would occur in a phased way over time, so that the amount of dust produced from any particular phase of the development would be relatively limited.

The Air Quality Report states in conclusion that no are pollution impacts of such significance as to pose serious implications for the implementation of the development in the manner proposed were identified in the study.

<b>POTENTIAL IMPACTS OF THE DEVELOPMENT ON AIR QUALITY</b>	
	<b>ASSESSMENT/COMMENT</b>
<b>ASSESSMENT</b>	
Probability	Some impacts on air quality will occur
Status	Air quality impacts are likely to be negative
Extent	On the site, and in the immediately surrounding neighbourhoods adjacent to the site
Duration	During the construction phase, which would be likely over an extended period, of perhaps 10 years. During the operational phase, permanent.
Magnitude	Magnitude of the impacts is assessed as being of low significance, in particular if there is appropriate mitigation during construction.
Reversibility	Construction impacts are reversible. Ongoing operational impacts are not.
Cumulative/Non cumulative	Cumulative with all other sources of pollution in the wider area it is located within, including vehicular pollution from the N3 highway
<b>MITIGATION</b>	
Potential to mitigate negative impacts	Potential to mitigate impacts during the construction phase is high. During the operational phase the potential to mitigate is lower, however, most significant potential impacts are during the construction phase.
Potential to enhance positive impacts	No significant potential to enhance air quality exists.

### **OVERALL ASSESSMENT AND CONCLUDING COMMENTS**

Overall Assessment and concluding comments as to the predicted impacts after mitigation on air quality are as follows :

- The most significant impacts are identified as being dust during construction, which can be mitigated. Construction will also be restricted to distinct phases.
- During operation it is from vehicle emissions, some of which would occur without the development with the construction of the N3 Bellevue interchange and the main arterial roads. Vehicle emissions cannot be significantly mitigated.
- Impacts will be local, and of low significance, and no impacts are identified which would pose as threat to the wellbeing or health of surrounding residents.

Any potential impacts of the proposed development are assessed as being acceptable, and outweighed by the socio-economic benefits of the development.

#### 10.5.4. POTENTIAL IMPACTS ON BIODIVERSITY

##### THE BIODIVERSITY SPECIALIST BRIEF AND INVESTIGATION PROCESS

The potential impacts on biodiversity of the proposed development on the site, of both a floral and faunal nature, are dealt with collectively within this specialist Biodiversity Report contained within appendix 15.5 and in this biodiversity assessment section of the EIA report.

This approach is related to the nature of the comments of potential concern expressed by the two principal commenting conservation authorities, the Conservation and Environment section of Msunduzi Municipality, and Ezemvelo KwaZulu-Natal Wildlife ( EKZN Wildlife ) and their respective geographic information system ( GIS ) computer based environmental / biodiversity based data systems, these being Msunduzi EMF and its related data subsystems, and the EKZN Wildlife Minset Data Base system respectively.

In the briefing of the two biodiversity specialist that, amongst their own and the EAP's specialist knowledge on biodiversity, special care should be taken by the biodiversity specialists, Le Roux ( floral aspects ) and Grobler ( faunal aspects ), to ensure that the concerns of these two conservation organisations had been taken fully into account in their assessment and reporting on the potential impacts of the proposed development on the existing biodiversity resources on the site.

In this process, the specialists were provided with, all previous documentation associated with the earlier specialists investigations of the site, all the correspondence generated in the EIA scoping process for this application, and also all the computer based biodiversity data contained within the abovementioned GIS data systems of these two conservation organisations.

Within their biodiversity project brief, there were three interrelated phases, reported on as follows:

##### Phase 1 Biodiversity Study Brief

- a. Review all specialist reports and all other work already undertaken that is pertinent to the study area. These considerable studies, in terms of their number, the qualities of the specialists involved, and the scope and detail of the investigations are extracted from the biodiversity report as follows :

##### REPORTS & OTHER MATERIAL REVIEWED FOR THE BIODIVERSITY STUDY

Date	Report Title	Author/Institution
December 2006	Plant biodiversity assessment of two Mpushini grasslands	Dr. C. Carbutt
April 2008	A comparative reconnaissance-level assessment of the conservation value of selected areas of grassland and wooded grassland occurring on the property known as 'Elephant Hills', Bellevue, Pietermaritzburg, KwaZulu-Natal.	Dr. J.E. Granger
October	Preparation of an Environmental Management	Institute of Natural

2008	Framework for the Msunduzi Municipality. Specialist report: Biodiversity assessment.	Resources (INR)
February 2009	Strategic Environmental Assessment of the Mkhondeni Stream catchment area	Guy Nicolson Consulting cc
2009	Msunduzi Municipality Environmental Services Plan – Areas of Biophysical Importance	D.M. Macfarlane and L. Quale (INR)
August 2009	Final Status Quo Report: Environmental Management Framework, Msunduzi Municipality.	SRK Consulting
April 2010	Vegetation investigation and assessment in regard to a portion of the overall property of Hilcove hills, Ashburton, KwaZulu-Natal	Jan Burring Environmental Services
May 2010	Final Draft Msunduzi Strategic Environmental Assessment	Guy Nicolson Consulting cc
May 2010	Final Draft Msunduzi Environmental Management Framework	SRK Consulting
May 2010	Final Draft Msunduzi Strategic Environmental Management Plan	Guy Nicolson Consulting cc
June 2011	Final Environmental Scoping Report on the proposed Hilcove Hills development	Guy Nicolson Consulting cc

- b. Use the review information, their own information, management plans and other relevant information to assess the implications of the proposed development on key biodiversity components.
- c. Compile a report on the “Status of Biodiversity” on the Hilcove Hills property based on information.
- d. Assess the extent to which the requirements of Ezemvelo KNZ Wildlife and the Msunduzi Municipality have been met, as pertains to their questions regarding the adequacy of specialist work done to date.
- e. Meet with the applicant, the appointed town planner and the EAP to discuss the implications of the biodiversity work required, and proposed mitigation if required.

### **Phase 2 Biodiversity Project Brief**

Once the additional work recommended as a result of the Phase 1 review has been undertaken, undertake the necessary detailed site investigations and compile a Biodiversity Assessment Report describing the biodiversity components of the site, the potential impacts of the proposed development, and mitigation measures if required.

The comprehensive reporting of this phase of the investigation is contained within the Biodiversity Report, together with the recommendations and conclusions derived from this study up to this point.

### **Phase 3 Biodiversity Project Brief : Response Reports**

Following on from the completion of Phase 2, the specialists produced their report which combined the findings of both Phases 1 and 2 as outlined above. Within their reports on the areas of impact between the development plan, as proposed up to that time and as represented in the scoping reports, and floral and faunal areas of concern were identified. (see Map 1 ( flora ) and Map 5 ( fauna ) within the Biodiversity Report ).

In response to the identification of areas of biodiversity value on the site which conflicted with areas of development ( i.e. falling within a development area ) there was then a replanning of the proposed development plan, and it is this resultant plan which is the subject of this EIA report ( Plan No. 2915/WD 21 ).

In this plan final proposed development layout plan, as represented in this report, the development footprint areas were adjusted by the town planners to, almost completely, avoid the areas of special biodiversity value. Figure 13 shows the core area of floral conservation superimposed onto the original and amended layout plans, and figure 14 applies the same information in regard to faunal conservation. These two figures illustrate well how adjustments to the development layout have occurred to avoid these identified areas of high biodiversity value.

Following on from this adjustment of the plan to mitigate against the identified biodiversity concerns, the specialists were requested to provide a final, **Response Report** which assessed the potential impacts on biodiversity within this final, adjusted layout plan which took the concerns and areas of previously identified areas of conflict into account.

The floral and faunal response reports produced at the end of this process are included as the last sections of the floral and faunal components of the specialist Biodiversity Report.

## **THE ASSESSMENT AND CONCLUSIONS OF THE BIODIVERSITY SPECIALISTS RESPONSE REPORTS**

### **FLORAL BIODIVERSITY COMPONENT**

In assessing the effectiveness of the final development layout, Peter Le Roux, as the floral biodiversity specialist, considered the concerns noted in the Biodiversity Report that pertained to species, habitats and ecological corridors. These are dealt with in the comments below, which are extracted and provided verbatim below :

#### **“a) Species and associated habitats.**

Sites **A, B, C, E** and **F** on the attached map ( see figure 13 and map included with response report) have been designated as ‘no development’ areas and will provide adequate habitat for the species found in these sites. Site **D** overlapped slightly into a development node and this has been satisfactorily adjusted to include the full extent of the site.

Sites **G** and **I** fell within development nodes but were considered as critically important areas for conservation of the second-largest population of the KZN

endemic *Aloe pruinosa* (listed as Vulnerable in the SANBI Red List database). The two sites (**G** and **I**) that were selected for conservation of this species were not the only sites with *Aloe pruinosa* but were considered adequate in size and suitability of habitat to ensure the survival of the species *in situ*. The revised boundaries in the attached layout indicate sites **G** and **I** as 'no development' areas and have therefore been satisfactorily adjusted.

Site **H** fortuitously fell within Site **G** so has also been catered for satisfactorily.

Also noted in the Biodiversity Report was that key riparian areas (water courses) constituted important habitats for flora and these have been adequately designated as part of the open space system; in the final layout these habitats were adequately inter-connected and large enough to remain viable (with appropriate management).

Further factors related to habitats included the Ezemvelo KZN Wildlife 'Minset' database showing 'site irreplaceability' on Hilcove Hills. My findings on these were as follows:

- a) The approximate locality and extent of KZN Hinterland Thornveld (SVs3: Mucina and Rutherford 2006) was correctly depicted. The final layout indicates that a large proportion of the 'no development' areas on the site contain this vegetation type.
- b) The approximate locality of Eastern Valley Bushveld (SVs6: Mucina and Rutherford 2006) was correctly depicted as occurring in the eastern extremity, but the extent was underestimated. The final layout indicates that the 'no development' area on eastern extremity of the site contains approximately 60% of this vegetation type, while the remaining 40% occurs within a development node.
- c) Eastern Mistbelt Forest was depicted as occurring on Hilcove Hills, but no such forest occurred on the site and the area indicated as such was mostly old croplands and a disturbed watercourse.

**b) Ecological corridors**

The final layout has addressed a number of important concerns pertaining to ecological corridors, as follows.

- The two remnants of *Themeda* grasslands on the property end on the northern boundary (areas C and D on the final layout) and could be linked to untransformed habitats on adjacent land to the north. Despite this, what is left of the *Themeda* grassland on Hilcove Hills is probably large enough to remain viable, although its future largely depends on appropriate management.
- Most of the internal corridors that form the open space network also formed viable links for plant species or vegetation types. These extended beyond the property as well, especially the riverine

vegetation linking with the Msunduzi River to the north-east and the Mkhondeni River and its catchment to the south-west.

- The main concern that arose from the analysis of corridor viability in relation to development nodes pertained to areas H and I on the final layout. It was recommended that these core areas should remain undeveloped in order (i) to ensure the viability of the vegetation community that supports the populations of *Aloe pruinosa*; and (ii) to ensure that this link remains continuous with undeveloped habitats to the east of the property. Through designating these areas as 'no development' zones in the final layout, my concerns have been satisfactorily addressed.

### c) Concluding comments

I am satisfied that the final allocation of conservation/open space areas in the final development layout has successfully covered the most important 'biodiversity hotspots' for flora on the property. This includes the *Themeda* grasslands, all wetlands and the major riparian areas.

The habitats on the property were not suitable for all the species or vegetation types predicted to occur here according to the Minset database and the EMF for the Msunduzi Municipality (Institute of Natural Resources, 2008). However, some of the plant species predicted to occur but not found during our study might occur – if so, these have a high probability of occurring within the 'hotspots' that have been designated as 'no development' or 'open space' areas.

In my opinion the final development layout has not compromised the key internal dispersal corridors for plants, nor has it compromised the linkages with adjacent untransformed areas.

It was concluded that the final layout has substantially accommodated all the flora-related concerns covered in my report”.

### FAUNAL BIODIVERSITY COMPONENT

The final Faunal Response Report by Dr. Hans Grobler is also provided verbatim below.

“This report is a response to the attached development layout for Hilcove Hills, which is the final draft after taking into account the concerns and recommendations for

In considering the effectiveness of the final development layout, the concerns noted in the Biodiversity Report that pertained to species, habitats and ecological corridor were assessed. These are dealt with in the comments below.



**a) Species and associated habitats.**

The only group of concern were the invertebrates. The localities shown for millipede, molluscs and earthworms of conservation concern were combined to demarcate the most important (core areas) for conservation at Hilcove Hills. There were ten of these sites, of which six were in the conservation (Open Space) area and thus catered for. Of concern were two in the proposed development area and two that overlapped into the development area. These were considered as “no development areas”. The details of these four sites, shown on the attached map, were as follows:

Site F. Within this site the following were recorded: Earthworms: *Microchaetus papillatus*; and Site Endemic Millipedes: *Ulodesmus major*, *Camaricoproctus planidens*, *Orthoporoides sp. n.* In the interest of these species an adjustment to the development boundaries should be considered

Site G. There is a serious conflict on this site as it contains a sparse population of earthworms, probably *Microchaetus papillatus* and *Tritogenia shawi*, (based on cast identification) and the following Site Endemic Millipedes: *Ulodesmus major*, *Camaricoproctus planidens*, *Sphaerotherium sp1* and *2*, and *Orthoporoides sp. n* Developing on this site will seriously affect these species and the development boundary should be adjusted.

Site H. There is only peripheral overlap and a slight adjustment could be made by excluding the area within which the following important species occur: Earthworms: *Microchaetus papillatus* and Site Endemic Millipedes: *Ulodesmus major*, *Spinotarsus destructus*, *Sphaerotherium sp1* and *sp2*, and *Orthoporoides sp. n.*

Site I. This is on the periphery of the development area and could be excised without difficulty. Species recorded included the following: Earthworms: *Microchaetus papillatus*; Molluscs: *Gulella euthymia* and the following Site Endemic Millipedes: *Camaricoproctus planidens*, and *Spinotarsus destructus*.

The revised boundaries in the attached layout indicates these sites and have been satisfactorily adjusted.

Also noted in the Biodiversity Report was that key riparian areas (water courses) constituted important habitats for fauna and these have been adequately designated as part of the open space system; in the final layout these habitats were adequately inter-connected and large enough to remain viable (with appropriate management).

As far as the Ezemvelo KZN Wildlife ‘Minset’ database, this was a useful guide, but the important data came from the extensive specialist invertebrates studies. The concept of ‘site irreplaceability’ on Hilcove Hills remains questionable but does not affect the outcome of the findings.

**b. Ecological corridors**

The ecological corridors for the fauna of conservation significance are linked to the protection and management of the floral components within the conservation area. These are adequately catered for in the revised layout.

**c. Concluding comments**

It was concluded that there has been excellent accommodation within the final layout plan of the faunal “no development areas” I identified in the report.”

The assessment of potential impacts biodiversity which is tabulated below is based on the biodiversity assessment process described above, and the final conclusions of the floral and faunal specialists in their Response Reports, which were compiled after the amendments to the proposed layout plan were made to take their initially identified biodiversity concerns into account.

<b>POTENTIAL IMPACTS OF THE DEVELOPMENT ON BIODIVERSITY</b>	
<b>CONSIDERATION</b>	<b>ASSESSMENT/COMMENT</b>
<b>ASSESSMENT</b>	
Probability	There is the reduction in the area of natural vegetation on the site, and therefore some impacts on plant biodiversity, and overall biological carrying capacity of indigenous species will occur.
Status	Impacts from the removal of existing vegetation are negative
Extent	Localised in nature, related to the development footprint and associated infrastructure
Duration	Permanent, except where some rehabilitation and landscaping will occur with local indigenous plants after development
Magnitude	Impacts are assessed by the specialist as being minor in nature
Reversibility	Impacts not reversible
Cumulative/Non cumulative	Cumulative within the context of the progressive loss of indigenous vegetation occurring locally, and in general.
<b>MITIGATION</b>	
Potential to mitigate negative impacts	The principal measures to mitigate have been applied in the formulation of the original development plan based, and then its amendment to take into account the further findings of the biodiversity specialists.  The measures to survey site in advance, avoid or translocate plants, and to protect biodiversity resources during the construction process will all mitigate against impacts on biodiversity resources.
Potential to enhance positive	The measures are associated with the considerable potential to rehabilitate the vegetation, and with it also the appropriate faunal habitats indigenous species

impacts	<p>on the site.</p> <p>The application of the management measures recommended in the biodiversity specialist reports included in appendices 15.5 and 15.20, and those in the EMPr contained within appendix 15.21 will further mitigate against impacts on the site.</p> <p>The zoning of the extensive areas on the site to passive open space conservation, and which include areas of special biodiversity concern within them, provides the long term protection of the site, in a manner which the present unzoned agricultural land status does not.</p>
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**OVERALL ASSESSMENT AND CONCLUDING COMMENTS**

Overall Assessment and concluding comments as to the predicted impacts after mitigation on biodiversity concerns are that :

- Negative impacts will occur that will be permanent within transformed areas
- The areas that are retained for conservation contain all of the areas of special concern, and are sufficient in area to maintain the particular species of concerns.
- The overall conformation of the open spaces provides sufficient and suitable connectivity with the surrounding natural areas off the site.
- The rehabilitation processes associated with the proposed development, and the ongoing protection of the areas of passive open space conservation
- The benefits of providing the proposed development areas and their infrastructure is assessed as outweighing any negative biodiversity impacts associated with impacts on the of the site.

The potential impacts on biodiversity are assessed as having been adequately mitigated in the development, and are assessed as being acceptable, and there are no impacts on biodiversity that are so significant as to prevent the development from occurring in the manner proposed.

### 10.5.5. ASSESSMENT OF THE IMPACTS OF THE PROPOSED DEVELOPMENT ON THE ECOLOGICAL GOODS AND SERVICES PROVIDED BY THE SITE

Ecological goods and services are provided by a site, in particular if it is an undeveloped natural vegetated one, in areas which include :

- Maintenance of good water downstream flow off the site, and the attenuation of storm water run off.
- Maintenance of good air quality.
- The maintenance of an amenable climate, and the prevention of the build up of heat islands that may be associated with urban development.
- The acting as “carbon sinks” trapping of atmospheric carbon within photosynthetic processes on the site, thereby contributing to the prevention of global warming.

These ecological goods and services are provided free to the relevant affected community, depending on the intrinsic qualities of the site, and which may be changed by proposed land uses to it, as would be the case with the implementation of this EIA application.

The identified particular goods and services, and the assessment of the potential impacts of the proposed development is provided below.

<b>ECOLOGICAL GOODS AND SERVICES ASPECT</b>	<b>ASSESSMENT OF THE IMPACTS OF THE PROPOSED DEVELOPMENT ON THIS ASPECT</b>
Maintenance of good water quality and flow	<p>As assessed in above in regard to the impacts on water flow, and the cumulative effects on the catchment, there will be no significant impacts on downstream flow from the development. No abstraction of water is intended (as would have occurred in the previous farming activities, with the presence of dams on the site, and would occur if farming was continued ).</p> <p>The development areas of the site are set well back from all riparian areas, which are retained as natural area, with the alien vegetation removed from these areas, and the impacts on of the two road crossings on wetland area on the site have minimal impact on the overall hydrological functioning of the site.</p> <p>The design of the storm water management system is such as to encourage infiltration from storm water attenuation tanks, and thereby recharging groundwater on the site.</p> <p>It is therefore the ecological service of providing water to the overall catchment system which it is part of is not significantly impacted on by the proposed development.</p>
Management of storm water run off	<p>The maintenance wide riverine corridors on the site, and the design of the storm water management system is such that pre and post development storm water run off regimes will close to the same.</p> <p>There are no additional costs to society, or significant impacts on</p>

	<p>downstream areas, identified with the proposed development.</p>
<p>Maintenance of good air quality</p>	<p>The air of the site is presently of a fair quality, due to its undeveloped and unused nature.</p> <p>There will be negative impacts on air quality from the development. The most significant identified is from dust during the construction process. However, this can be mitigated, and is unlikely to reach very unacceptable levels. During the operational phase there will be impacts on air quality, primarily from the operation of vehicles on the site.</p> <p>However, in mitigation, over half of the site is retained as undeveloped, and the areas of development occur on the more elevated ridgelines of the site, with the valley lines kept open, which is the optimal arrangement in regard to air quality impacts.</p> <p>The ability of the site to maintain the present air qualities on the site, and its affected immediate environs would therefore be diminished.</p> <p>The loss of this particular service is assessed as being of a relatively minor nature, and not of the magnitude that should prevent the development from being implemented in the manner proposed.</p>
<p>Maintenance of an amenable climate and the prevention of heat build up</p>	<p>The urban area on the site are areas of potential heat build up, as opposed to the vegetation which presently covers the proposed development footprint areas.</p> <p>However, the total development footprint area of development is less than 50% of the site. Is located on elevated spurs and, of particular significance, the areas of proposed development are in all cases interspersed with wide belts of vegetation which will be retained in the development.</p> <p>For the above reasons, the effects of the proposed development on local climate, and the causation of heat build up, is not assessed as being significant on the ability of the site to provide this particular service.</p>

<p>Acting as a carbon sink, and contributing to the prevention of global warming</p>	<p>There is the removal of photosynthetic vegetation from those areas which will be transformed in development to buildings and paved areas.</p> <p>These areas will therefore not trap carbon in their present photosynthetic processes. However, there will also not be the processes of natural respiration and decomposition occurring in these areas either, which release carbon back into the atmosphere, so that the net effect of atmospheric carbon removal is not very high in these natural areas.</p> <p>Within the Green Building Code, measures are prescribed to keep energy demand, and thereby the combustion of coal and the release of carbon dioxide in the generation of electricity. All reasonable measures to reduce the carbon emissions associated with the site would therefore be taken.</p> <p>In terms of the motivation provided in the Need and Desirability Report of McCarthy ( appendix 15.9 ) the site is optimally placed to permit the expansion of the urban edge of the city of Pietermaritzburg. It is considered likely that, if the proposed land uses were not permitted on the site, they would be likely to leapfrog over the site to further out from the urban edge, thereby increasing vehicular travel distances.</p> <p>The development will therefore loss some of its ability to act as a carbon sink, related to the approximately 20 to 30% of the area which will be transformed from vegetation to artificial surfaces. This an inevitable consequence of the transformation of any vegetated area of land.</p> <p>In this instance all reasonable measures are being taken to reduce the carbon footprint of the development, and the development is logically and conveniently located in terms of spatial planning criteria. This being the case, the reduction on the carbon sink capacity of the site is not considered to be a valid reason to prevent it occurring in the manner proposed.</p>
<p><b>OVERALL ASSESSMENT</b></p>	<p>There will be some loss of ecological goods and services from the site related to developing it in the manner. These losses are assessed as being of a minor nature, and mitigated by the nature of the proposed planning, design and operation of the proposed development.</p> <p>They are not significant enough to warrant preventing the development of the site from occurring in the manner proposed.</p>

### **10.5.6. ASSESSMENT OF THE IMPACTS OF THE PROPOSED DEVELOPMENT ON THE LOWER MPUSHINI VALLEY CONSERVANCY AS A PROTECTED ENVIRONMENT**

#### **BACKGROUND TO THE ASSESSMENT**

The Lower Mpushini Valley Conservancy has been proclaimed as a "Protected Environment" under the National Environmental Management : Protected Areas Act, No. 57 of 2003. As the most southern parts of the applicant site fall within 5 kilometers of the nearest boundaries of this protected area, there are activities which are triggered in terms of Regulation 546 of 18 June 2010, which pertain to the proposed development, and are therefore required to be assessed.

These activities which will occur on the applicant site, and which are applicable because they occur within the Mpushini Protected Environment are as follows :

#### **Activity 4 ( ii ) ( gg )**

There will be the construction of roads wider than 4 metres with a road reserve less than 13.5/

#### **Activity 13 (ii ) ( ff )**

There will be the clearance of more than one hectare of vegetation cover, where more than 75% of the vegetation cover constitutes indigenous vegetation within 5 kilometres of the protected area.

#### **THE CONTEXT OF THE ASSESSMENT**

The Lower Mpushini Valley Conservancy Protected Area ( also referred to below as simply "the protected area" is situated in the Mpushini River catchment, which is the adjacent river catchment next to the Mkhondeni River catchment ( which is also known as the Little Mpushini ). The applicant site occupies the lowest part of the Mkhondeni River catchment, and drains directly into the Msunduzi. The Mpushini River drains into the Mzunduzi River further east from the site. It is also to be noted that, in the proposed development on the applicant site, its lowermost portions are retained as a considerable area of passive open space within the wildlife reserve area of the development, so that it the site contributes significantly to retaining a green open space corridor along the southern bank Msunduzi River nearest to the site.

Between the two catchments there is the intercatchment ridgeline divide, along which runs the MR478, and the ribbon type development of Ashburton which occurs on either side of this road until the boundary of the site is reached. The undeveloped edge of the site abuts onto the edge of the MR478, and small portion triangular portion of the site projects over this road to extend into a steeply sloping piece of land within the catchment area of the Mpushini River.

Further north along the MR478 is the Ashburton Horse Training Centre, astride the ridgeline between the catchment areas of the Mkhondeni and Mpushini Rivers.

Within the proposed development plan for the Hilcove Hills development approximately 1 km long boundary of the that portion of the applicant site which abuts onto the MR478 is planned as the Phase 1 eco-estate. Except for a small

portion of about 100 metres next to Ashburton, the land within the site bordering onto the MR478 is planned to be passive open space game reserve conservation area. The small triangle of land which extends across the road into the Mpushini Catchment area is also to be zoned as passive open space.

It is therefore notable that, on the on the dividing ridgeline between the Mpushini and Mkhondeni River catchments, on which the MR478 ( Pope Ellis Drive ) runs through Ashburton, it is only this portion of the ridgeline which remains open between the two catchments, and that this open space corridor will be kept open between the two river catchments within the proposed development.

It is partially based on the presence of the wide open spaces abutting onto the Msunduzi River bank, and along the MR478 main road that the biodiversity specialists assessed that suitable and sufficient green corridors occurred in the proposed development to sustain relevant biodiversity concerns.

<b>POTENTIAL IMPACTS OF THE DEVELOPMENT ON THE LOWER MPUSHINI VALLEY CONSERVANCY AREA PROTECTED ENVIRONMENT</b>	
<b>CONSIDERATION</b>	<b>ASSESSMENT/COMMENT</b>
<b>ASSESSMENT</b>	
Probability	There are no significant impacts identified, except that the proposed development will formally entrench and maintain a desirable status quo of green corridor linkages between the two catchment area.
Status	Neutral to positive
Extent	Along the common ridgeline boundary between the two catchments
Duration	Permanent
Magnitude	No significant change, but the entrenchment of a favourable situation
Reversibility	With the formalisation of the development in the EIA and development planning approval processes, not like to be reverse.
Cumulative/Non cumulative	No significant cumulative impacts identified.
<b>MITIGATION</b>	
Potential to mitigate negative impacts and to enhance positive impacts	The planning of the development, with open space green corridors along the Msunduzi River bank, and on those parts of the site where it meets the inter-catchment ridgeline are mitigate against any negative impacts, whilst the entrenchment of this planning in the development approval process, together with the measures to ensure ongoing, sustainable management are positive mitigation measures
<b>OVERALL ASSESSMENT AND CONCLUDING COMMENTS</b>	
No significant negative impacts associated with the identified listed activities under EIA Regulation 546, or any other activities associated with the proposed development, are identified which would affect the Lower Mphushini Valley Conservancy Protected area.	



## 10.6. POTENTIAL VISUAL IMPACTS

### BACKGROUND AND CONTEXT OF THE ASSESSMENT OF POTENTIAL VISUAL IMPACTS OF THE PROPOSED DEVELOPMENT

As described in section 5, the site is visible from the N3 highway and from the surrounding neighbourhood, and is presently an undeveloped, green space of attractive indigenous vegetation, aside from a few farm buildings near the southern portion of the site adjacent to the N3 highway. Within the context of this situation, and as identified as required in the scoping process, a visual impact assessment of the proposed development, and also the various alternative developments identified for the site, has been undertaken by visual impact specialists within the firm of Iyer Urban Design, and is contained within appendix 15.16 of this EIA report.

### OVERVIEW OF THE VISUAL IMPACT REPORT

The intention of the visual impact assessment (VIA) report is to test :

- The visual impact of the development proposal, and the identified alternatives, on people travelling on the N3 highway in both directions.
- The visual impact of the proposals on people who will actually have to live with the impact, i.e. those who reside around the edges of the proposed development.

There are several components to the VIA, these being :

#### 1. A site analysis

A topographical survey has been undertaken that identifies the river and ridge system, and the landform of the site. The directions of the slope of the site have a direct impact on what is visible for specific viewpoints.

#### 2. A view shed analysis

A view shed analysis has been undertaken which identifies what can be seen from the specific viewpoints and identifies those areas that have the most visual impact.

The view shed analysis has been undertaken along the N3 freeway and from four specific positions surrounding the site which were deemed to be important from the point view of the surrounding residents.

#### 3. Simulated 3 dimensional views

Using the results of the view shed analysis, critical viewpoints were identified and 3 dimensional simulations were undertaken based on the scale and intensity of the various development options. The position of buildings on sites has been taken into account and the most logical orientation of the slope and the contours of the site and the buildings have been generated based on the most efficient and cost effective construction practices and building economics.

#### 4. An Imageability and Legibility Analysis

Visual quality is greatly influenced by the degree to which visual unity and harmony exists within the architectural and landscape components of a

development. The various identified development alternatives have been evaluated on the assumption that substantial amount of natural landscaping will occur, which will assist in integrating the development options into their natural surroundings.

It is also assumed that the architectural design code ( see the Architectural Design Report in appendix 15.19 ) will prevent “uncontrolled” development from occurring.

Visual quality can also be enhanced through the contrast between the built and the unbuilt environment.

The concept of imageability is based on studies by Kevin Lynch, an American, on how individuals perceive and organise spatial information as they navigate through cities, and in which users understood their surroundings in consistent and predictable ways. The studies identified the following five consistent elements, as elaborated on further within the visual impact assessment report

:

- Nodes
- Landmarks
- Edges
- Districts
- Paths

As pointed out in the Visual Impact Assessment Report, a separate report has been prepared by Dr. Jeff McCarthy on the issue relating to sense of place, which is a far broader subject than that covered in the Visual Impact Report.

However, as pointed out in Visual Impact Report, there are aspects relating to “sense of place” that need to be taken into account from a visual impact assessment point of view. It is pointed out that our sense of place depends not only on culture, temperament status, experience and the current purpose of the observer, but also on spatial form and quality.

“Sense of place” is identified as “the extent to which a person can recognize or recall a place as being distinct from other places, as having a vivid or unique character or its own”.

This particular concept of sense of place is also taken into account within the visual impact assessment.

The very comprehensive and visually rich Visual Impact Assessment Report then applies these concepts, approaches and related methodology to an assessment of the proposed development and the identified alternatives.

### **CONCLUSIONS OF THE VISUAL IMPACT REPORT**

In the concluding assessment of the proposed Hilcove Hills mixed use development it is stated that, as can be seen from the combined view shed analysis, less than 50% of the buildings will be visible from anywhere along the N3 highway travelling northwards of southwards.

All development is set back 20m from the freeway road reserve edge, and there are General Business, Limited Business and Offices which will be seen from the freeway.

The commercial sites are large, but have a height restriction of 3 storeys ( General Business) and 2 storeys ( Limited Business ). This zone would have moderate visual impact, due to their limited height, floor area and coverage.

The offices are likely to have moderate visual impact from both the freeway and Ashburton residential areas, as they have low coverage and height.

The proposed development adjacent to Bellevue is likely to have low visual impact, as the General Business uses are adjacent to an undeveloped site, and the cluster units have a maximum coverage of 30% and a maximum height of two storeys.

The Special Residential sites are likely to have a low visual impact from the Ashburton Residential area.

**Taken overall, the proposed Hilcove Hills mixed use development is assessed as having a moderate visual impact.**

In regard to the visual, perceived aspects of sense of place, the Visual Impact Assessment considers that a distinct node has been created consisting of institutional and office uses. There are a wide range of districts with different characteristics, and the edges respond appropriately to the adjacent residential areas and the freeway edge. **This alternative creates a high sense of place.**

In considering the visual impacts and related visual aspects of sense of place, the Visual Impact Assessment Report favours a “no development” alternative” whereas the sense of place report favours a more “complex” development option – that is one that displays diversity and interest and creates an environment that not only engages the visual aspects, but also engages the mind through its urban qualities.

The report states that quality place making is essential or human development at both an intellectual and visual level and, with these aspects taken into account, a mixed use development is considered to be the best way of creating a qualitative urban settlement which engages the viewer at a distance, but also engages the viewer as they move through, and engages with, the perceived surrounding environment.

POTENTIAL VISUAL IMPACTS	
CONSIDERATION	ASSESSMENT/COMMENT
<b>ASSESSMENT</b>	
Probability	Changes to the visual appearance of the site are certain with the proposed development.

Status	The appreciation of visual impacts is essentially subjective in nature, but the transformation of a vegetated landscape to a developed one is taken as a negative impact. In the case of sense of place, the impacts are more complex.
Extent	As described the Visual Impact Assessment Report, as visible from the N3 highway, and Bellevue and Ashburton suburbs
Duration	Permanent, as the development is constructed, probably over about 10 years.
Magnitude	The overall visual impact is assessed as moderate.
Reversibility	Impacts are irreversible, with perhaps some softening and screening over time with landscaping.
Cumulative/Non cumulative	As the site is self contained, visual impacts are not cumulative within the context of the site and the adjoining suburbs.  However, they are cumulative in terms of the development occurring on the N3, together with other development which have, or may, occur along this activity corridor.
<b>MITIGATION</b>	
Potential to mitigate negative impacts	Mitigation measures have been taken in the planning of the development, in the form of : <ul style="list-style-type: none"> <li>• The 20m setback from the edge of the N3 highway road servitude.</li> <li>• The height controls of 3 storeys for General Business, and two storeys for all other developments.</li> <li>• The limited coverages applied within development areas.</li> <li>• The separation of the development areas into distinct precincts, each surrounded by broad bands of open space</li> <li>• The architectural design code applied throughout the development, and the nature of the architectural design selected, with the use of low rooflines, muted and natural colours and materials, and other aspects of the design code.</li> </ul>
Potential to enhance positive impacts	The potential to enhance the site through the development is related to the mitigation measures above, as appreciated by the observer, and also the creation of sense of place, as discussed in the visual impact report.

## **OVERALL ASSESSMENT AND CONCLUDING COMMENTS**

Overall Assessment and concluding comments as to the predicted impacts after mitigation are that :

- There will be permanent changes to the landscape with related visual impacts
- The relative significance of these impacts assessed as being moderate.
- There is the change in the visual appreciation of sense of place, with a mixed use development of this nature being assessed as being positively instrumental in creating a new sense of place of value.

The relative significance of visual impacts that are quantified spatially in an analysis, as to whether they are positive or negative, and the magnitude of the impacts is essentially subjective in nature.

However, there is no doubt that the visual qualities will change due to the development, with the magnitude of the changes as being assessed in the specialist report as moderate.

Mitigation measures listed above in this assessment are appropriate and significant in the circumstances of the site, and the nature of the proposed development.

Based on the above, the visual impacts associated with the development, bearing in mind the positive socio-economic benefits associated with it, the visual impacts of the development are assessed as being acceptable.

## **10.7. POTENTIAL IMPACTS ON THE SENSE OF PLACE**

### **BACKGROUND AND CONTEXT OF THE ASSESSMENT OF POTENTIAL IMPACTS ON SENSE OF PLACE OF THE PROPOSED DEVELOPMENT**

The need for an assessment of the potential impacts of on “Sense of Place” was identified in the revised Plan of Study for the environmental impact assessment, and accordingly a Sense of Place Report was commissioned from Dr. Jeff McCarthy, and is contained within appendix 15.17 of this EIA report.

The concept of sense of place, and its application to an assessment of potential changes and related impacts on this sense of place is a complex issue, as elaborated and assessed within the report of Dr. McCarthy, which is summarised in some detail below.

### **OVERVIEW OF THE SENSE OF PLACE REPORT**

#### **The sense of place concept, approach adopted and methodology applied.**

As was discussed within introductory section of the McCarthy report, the concept of sense of place does overlap in some respects with the visual impact assessment, but is also different. It is different in that sense of place is a largely subjective concept comprised of individual’s cognition of their known environments, as distinct from objectively verifiable sight lines.

The sense of place concept is not always familiar, and Dr. McCarthy as the author of this specialist report has been exposed to the sense of place concept on many occasions, in his capacity as previous Professor of Human Geography, Editor of the SA. Geographical Journal, and President of the SA Geographical Society. Within his report he reviews the various concepts and interpretations of the sense of place concepts and notes that most researchers in the field consider that it is highly individualised. It is for this reason that methodologies that respect individual variability in respect of place identity are relevant when doing applied research on developments that could affect such identity.

The most individual-respecting methodology in this regard is the repertory grid methodology, and this is motivated and explained within the report. It starts from the assumption that people can only cognise what they know ( that is the “elements of experience”). In the repertory grid approach it does not supply respondents with any pre-suggestions about values or priorities, but rather it works backwards from objects of individual’s experiences towards their individual “constructs” about those objects / elements.

It is this methodology that the survey instrument included as appendix 1 of the McCarthy Report is based on, where neighbourhoods known to the respondent are used to develop their sense of ordering of such areas and their priorities about them. In this way we can know according to what constructs people in localities bordering on the Hilcove Hills site can build their own sense of place.

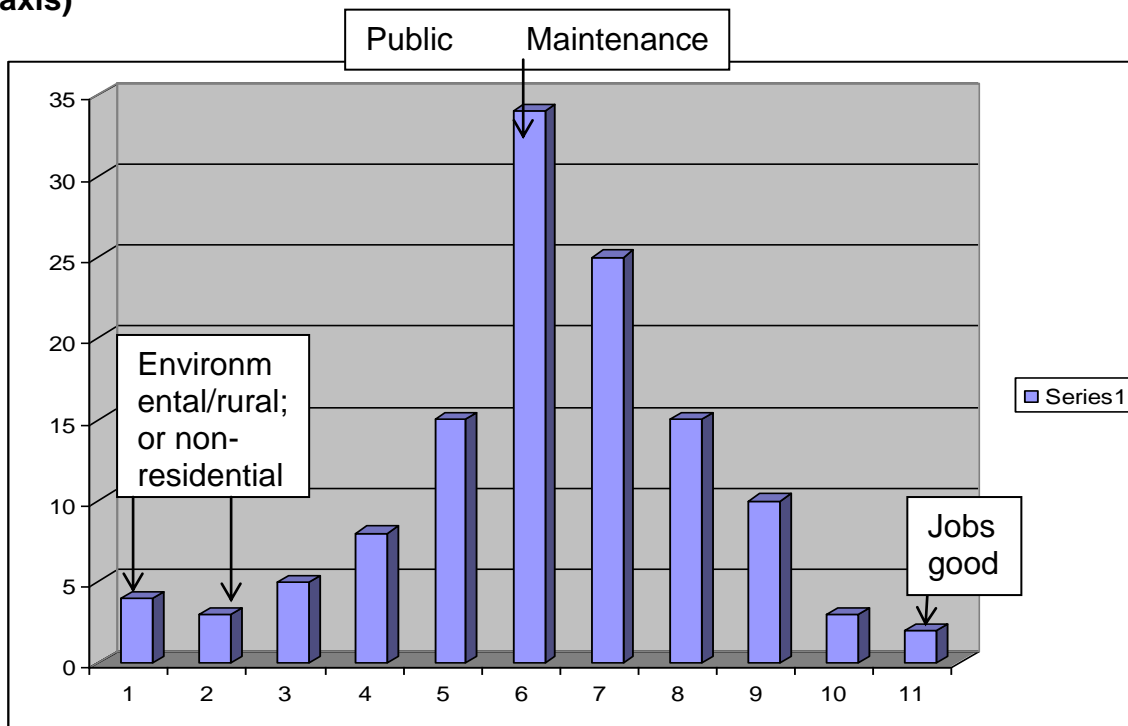
The visual impact report then provides an historical – formal definition of sense of place as applied to the Hilcove Hills site, and then describes the survey sample and

the field work which was undertaken by a work experienced senior post graduate town planning student, supervised by Dr. McCarthy. The survey sampled respondents from all the neighbourhoods surrounding the Hilcove Hills site and the results of the survey were analysed in qualitative and quantitative terms.

### The results of the sense of place survey methodology

Figure 1 below which is extracted from the sense of place report graphs the distribution of the frequency of use of such constructs by the sample as a whole.

**Figure 1: Frequency distribution of group constructs (number of mentions = x axis)**



Whilst there were minor variations in the patterns of response from different areas and categories of respondents, what is most striking is the high degree of **convergence** of constructs used, and the deviation of the most commonly used (and most highly rated ) constructs from those typically used by planning professionals, including environmentalists, architects/ urban designers, town planners and socio-economic impact analysts.

Indeed, and notably within the context of the EIA process, the constructs used bear little resemblance to those emerging out of the public participation process for the EIA.

As determined from the survey data, concepts of rural or natural environment characteristics ( which emerge in the EIA process ) are some of the least frequently mentioned. Initially, one might surmise that is due to differences in the social characteristics of those actively participating in the EIA processes by contrast with a representative sample. However, on closer inspection, this is an insufficient explanation.

It appears from the survey data that cognition of places are being constructed by those adjacent to the Hilcove Hills development according to mental “building blocks” made up ( mainly ) of something other than that which seemingly sit uppermost in most policy makers minds. Indeed, even factors which built environment professionals often prioritise – like distinctive architecture – emerge with quite low frequency.

The key point derived from these findings is that professionals and policy makers may not always know how people in areas actually start constructing their senses of place.

The second important point is about ratings of neighbourhoods at local level. It was found that that most of the sample of middle class respondents from the more ostensibly rural or subareas of Ashburton and Lincoln Meade hardly mentioned rural or natural environmental constructs when they rated their own areas, and other areas (see the last questions on the questionnaire in Appendix 1). Rather, what struck them as most valuable about their *own* areas (Ashburton and Lincoln Meade) when they are asked to “please rank your top three neighbourhood qualities or features”, most obviously, were:

- **poor municipal maintenance** (e.g. garbage which is allegedly collected only a week after it is put out, potholed roads, etc.) receiving **nine mentions**; and,
- closely followed with **eight mentions**, by perceived **crime levels**.

These frequently mentioned aspects of rating can be compared to other less identified rating features for Lincoln Meade and Ashburton, like smallholdings (only three mentions) or peacefulness (only two mentions).

Once one has absorbed these points from the survey and then takes a dispassionate camera’s eye view of some of the streetscape say in Ashburton, the ‘scars’ of artificial tunnel farming or accumulated rubbish, and razor wire on property perimeters, leap out from the ostensibly natural environment background and into the foreground.

However, as can be determined from respondents in the EIA public participation process, there is an energetic (if possibly small) group who have been defining the Hilcove Hills area in terms of bio-physical and/or rural concepts, and from this standpoint resisting all urban development change within the site, evoking environmental protection sentiments in their motivations. In this they share values in common with some peri-urban activists who oppose urban expansion throughout the world.

Such sentiments pose a challenge: Is it possible to reconcile such implied senses of place with the concerns of the sample as a whole (and those of Ashburton and parts of Lincoln Meade in particular) with poor public infrastructure maintenance and crime when it comes to what is uppermost in their place ratings?

Part of the answer may lie in Tuan’s observation quoted earlier within the Sense of Place report about the relationship of place consciousness to landscapes of fear ( a



point returned to in the recommendations ); and part may also lie in what the famous Irish sociologist Benedict Anderson once termed as the social construction of 'imagined communities'.<sup>1</sup> That is: Some of the most forceful statements of place consciousness often have little to do with the objective characteristics of place, but rather may be idealisations.

This, of course, places many a planner in something of a cleft stick. EIA methodology typically requires objective indicators of 'impact' and then the adoption of objective 'mitigation measures' where necessary. But what if:

- There are contradictory or at least competing senses of place?; and/or
- Possible mitigation measures for a subset of senses of place are not practically or legally possible?, and/or
- Because some senses of place are idealisations, practical mitigation measures may not be possible because the issues are more symbolic or even political?

The main implication of posing these questions is to indicate that the challenges of not offending (and preferably improving) senses of place in and around Hilcove Hills are complex.

They may not be completely resolved from conventional matrix evaluation approaches to the six use options under consideration for the Hilcove Hills site. This is partly because some of the more important of them are not necessarily about the actual or potential use of the Hilcove Hills site.

Rather, EIA debates or processes might set off 'triggers' pertaining to neighbourhood or even region-wide constructs or issues, like the quality of local government servicing, or crime, or grief at already eroded natural/rural qualities in peri-urban areas. Some of these concerns are more properly addressed through other external process, rather through any amendments to existing or planned use of the site.

### **The Six Site Options and Likely Impacts**

With the abovementioned observations, qualifications and complexities in mind, the Sense of Place Report turned to the task of assessing likely impacts upon senses of place of the six use options as they were set out in the Plan of Study and on pp 2-3 of the Sense of Place Report.

In the table below, Dr. McCarthy has sought to infer the implications for the four main 'clusters' of place construct that have presented themselves around Hilcove Hills. These are the majority concerns with public serving quality (construct 6 and the most frequent rating used for Asburton, Lincoln Meade) and crime challenges (construct 9 and second top rating used in Ashburton, Lincoln Meade); and substantial minority concerns with 'upmarket suburbia' (constructs 5,7,8) and minority concerns with

nature and rural characteristics (construct 1 and the Final Scoping Report record of issues).

Sometimes these implications are more obvious or direct, as in the case, say, of low income housing or industrial development on the site for those holding the rural and/or environmental cluster of values. In other cases they may be more indirect as in the implications of industry for example for municipal rates and likely servicing quality. Inevitably, the impact ratings assigned will be seen as arguable perhaps in strength, but the direction of impacts are likely less arguable.

**Table : Matrix of likely impacts on main clusters of place construct of alternative uses**

<b>USE</b>	<b>Services Quality</b>	<b>Crime concerns</b>	<b>Upmarket suburban</b>	<b>Nature, rural concerns</b>	<b>Aggregate</b>
Eco-estate	Neutral	Neutral	Mild positive	Mild positive	Neutral plus
Smallholdings	Mild negative	Neutral to negative	Neutral	Mild positive	Neutral minus
Low Cost Housing	Mild negative	Strong negative	Strong negative	Strong negative	Strong negative
Commercial & industrial	Strong positive	Mild negative	Neutral	Strong negative	Neutral minus
The Proposal	Mild positive	Neutral	Strong positive	Mild negative	Mild positive
Status Quo	Mild negative	Mild negative	Neutral	Mild Positive	Neutral minus

In terms of this matrix the least desirable option in terms of place consciousness, on aggregate, is low income housing, with all the remaining options except two being mildly negative.

Of the remaining two, eco-estate use emerges as above neutral and the Hilcove Hills mixed use development that is the subject of this EIA application as mildly positive.

The reason that even these last two cannot emerge as unambiguously strongly positive is that the prevailing place constructs in around Hilcove Hills, as we have pointed out earlier, are themselves ambiguous and sometimes contradictory.

### **Conclusions and recommendations of the Sense of Place Report**

On the evidence gathered within the Sense of Place Report, the development proposal that have been planned for Hilcove Hills (and gone through several iterations already) are likely as close as possible to not offending the majority, or aggregate, senses of place. However, several qualifications need to be made to this core conclusion, and there are practical recommendations that flow from these qualifications.

First, it has been noted earlier that a subtext to concerns about sense of place is often a fear of 'placelessness'. This is something that creative architects and urban

designers can and should address, for example in the implementation phase through use of local building materials and surfaces that integrate well with the residual elements of the natural environment. Consultation of such urban designers and architects with participants in the EIA process and others about a desirable 'look' to the development would also likely reduce adjacent activist's apparent alienation and fears.

But this is not to say that any – even highly indigenised - changes to the area will satisfy all people's sense of place, or mollify all activists. If one accepts Professor Tuan's observation about place identity being closely linked to 'landscapes of fear'; and that senses of place on the part of many are "shelters built by the mind in which human beings can rest, at least temporarily, from the siege of inchoate experience and of doubt" (Tuan), occasionally angry reactions to possible any land use change in peri-urban areas throughout the world can be made more understandable.

Indeed, this is not only true of peri-urban areas, as research shows that immanent change in or near one's neighbourhoods are usually the starting points for the effort that goes into what is sometimes known as 'neighbourhood activism' in cities.

Yet, the social construction of sense of place that often informs such leading activists may not always be representative. As this sense of place research into personal constructions of places in the Maritzburg/Msunduzi East area reveals, not only are such constructions highly individualised, but: When a representative sample of respondent's constructs as a whole are analysed, comparatively few refer to concepts deployed either by neighbourhood activists contributing to EIA processes, or environmental professionals, or indeed even urban planners. Their foci tend rather to be on issues of lack of local service delivery (especially refuse removal), and on noise, traffic and roads quality issues.

Such issues are more important to widespread senses of place in Eastern Msunduzi than are those raised in the Final Scoping Report. However, they are unlikely to be addressed in a satisfactory manner through EIA processes; save to say that if the proposed development had a Property Owners Association which (i) supplemented and augmented local public services and (ii) through private security services reduced local crime, this would likely make the area popular. Investigations into and proposals these prospects are therefore recommended.

Finally, given the atmosphere of apparent alienation of many adjacent residents from local authorities (and possibly also built environment professionals), it may be advisable for the Municipality to initiate a well-conceived public liaison strategy with the residents there. In the absence of this, developments which might otherwise be important contributors to the challenged municipal Rates base could be further misinterpreted, and become inadvertent targets of a more generalised *anomie*. The administration of EIA processes needs to be relieved of such possible burdens.

Following on the findings and recommendations of this thought provoking and revealing study on the actual, most common individual mental constructs of sense of place, a summary assessment of the potential impacts on sense of place is tabulated below, as best possible in the case of this complex and subtle concept.

<b>POTENTIAL IMPACTS ON THE SENSE OF PLACE</b>	
<b>CONSIDERATION</b>	<b>ASSESSMENT/COMMENT</b>
<b>ASSESSMENT</b>	
Probability	There will be the impact of a change of sense of place over time
Status	Although there will be strongly varied views on whether these changes are positive or negative impacts, on average the sense of place report indicates that they would be seen as mildly positive.
Extent	Within neighbourhoods surrounding the site
Duration	Permanent, evolving progressively over time
Magnitude	Moderately positive on average, but with strong minority variations
Reversibility	Not reversible with the implementation of the development for some, but likely to be progressively accepted by many initial resisters, if the mitigation measures are properly implemented.
Cumulative/Non cumulative	Cumulative with other developmental changes in the area.
<b>MITIGATION</b>	
Potential to mitigate negative impacts and enhance positive impacts	<p>The study indicates that there is a high potential to mitigate negative impacts and enhance positive ones, including the following measures which would be applied in the proposed development :</p> <ul style="list-style-type: none"> <li>• The establishment of Home Owners Associations, as elaborated on within appendix 15.18, to ensure that the urban and natural environments have financial capacity and local interest to ensure that they are properly managed.</li> <li>• The accent on a secure, safe environment, within a controlled, fenced and secure environment.</li> <li>• The inclusion of the grassland conservation area into private, as opposed to public open space, as requested by many interested and affected parties, based on their lack of faith in the municipality's capacity to manage such areas properly.</li> <li>• The implementation of a common architectural design code.</li> <li>• The establishment of a distinct neighbourhood units, each surrounded by open spaces, mitigating against a sense of urban sprawl and consequent "placelessness".</li> <li>• The creation of a mixed use land use, varying which is considered in the visual impact assessment consideration of sense of place, is the most appropriate form of land use for the development.</li> <li>• In terms of the general socio-economic benefits of the site, for individual in the creation of employment and general economic stimulation, and the contribution to the municipal finances through property rates, with little costs to themselves ( see also the following</li> </ul>

	section 10.8 ), which would enable the municipality to better carry out their urban management duties.
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**OVERALL ASSESSMENT AND CONCLUDING COMMENTS**

Overall Assessment and concluding comments as to the predicted impacts on individuals' concepts of sense of place are that there will be changes to the sense of place with the proposed development.

These changes will be perceived by the majority of residents surrounding the site as being positive, in particular if the mitigation measures to address their particular concerns are effectively applied.

However, there will be strong negative perception of the change in the sense of place by a minority of residents.

Within the context of the wider environment and community of Msunduzi, and the socio-economic benefits related to the development, and the fact that the majority of the surrounding residents are likely to consider the changes to sense of place favourably, the proposed development is assessed as being acceptable.

There are also no issues or impacts identified as being associated with the changes in sense of place which should prevent it from being implemented in the manner proposed.

## 10.8. POTENTIAL GENERAL SOCIO-ECONOMIC IMPACTS

<b>POTENTIAL SOCIO-ECONOMIC IMPACTS</b>	
<b>CONSIDERATION</b>	<b>ASSESSMENT/COMMENT</b>
<b>BACKGROUND &amp; DESCRIPTIONS RELEVANT TO THE POTENTIAL IMPACTS</b>	<p>The assessment of socio-economic impacts of the proposed development is strongly linked to the Need and Desirability report of McCarthy contained within appendix 15.9. Within this report McCarthy demonstrates the congruence of the proposed Hilcove Hills mixed use development with national and provincial development plans aimed at addressing general socio-economic upliftment in general, and the dire need to create more employment in particular.</p> <p>He then quantifies the estimated socio-economic benefits of the proposed development in terms of employment creation as follows :</p> <ul style="list-style-type: none"> <li>• 1500 construction jobs over about a ten year construction period.</li> <li>• 1500 permanent jobs at full development</li> <li>• R20 million rates payments to the municipality at current valuation prices.</li> </ul> <p>It is also to be noted that, as all infrastructural provision on the site, and those off site road upgrades identified in the Traffic Impact Report as being the responsibility of the applicant, will be paid for by the applicant and developer, there are very little costs to the municipality associated with the implementation of the development.</p>
<b>ASSESSMENT</b>	
Probability	Socio-economic impacts would be certain
Status	Impacts would be positive
Extent	To the Msunduzi Municipality and its residents quite strongly, and also at a provincial and national level, to a lesser extent.
Duration	During construction and the ongoing operation of the development
Magnitude	High magnitude
Reversibility	Not reversible, with the required approvals of the development in place.
Cumulative/Non cumulative	Cumulative with other developments in the municipality, and in the sense of fostering general economic growth and socio-economic upliftment.
<b>MITIGATION</b>	
Potential to mitigate negative impacts	The requirement of the applicant to pay for all the necessary infrastructural upgrades is a mitigation of any negative impacts.
Potential to enhance positive impacts	Related to the implementation of the development.

**OVERALL ASSESSMENT AND CONCLUDING COMMENTS IN REGARD TO THE SOCIO-ECONOMIC IMPACTS**

Overall Assessment and concluding comments as to the predicted impacts are that:

- Impacts are likely to be permanent
- Impacts to be of a positive nature and of high magnitude
- Any identified negative biophysical / ecological or visual impact or other forms of impacts are considered to be far outweighed by the positive socio-economic impacts of the proposed development.

Socio-economic impacts are therefore assessed as being not only acceptable, but highly desirable.

**10.9. POTENTIAL IMPACTS ON THE LOSS OF AGRICULTURAL**

<b>POTENTIAL IMPACTS ON THE LOSS OF AGRICULTURAL LAND</b>	
<b>CONSIDERATION</b>	<b>ASSESSMENT/COMMENT</b>
<b>BACKGROUND &amp; DESCRIPTIONS RELEVANT TO THE POTENTIAL IMPACTS</b>	<p>The site is presently vacant and unused, but has in the past been used for agriculture, as described in the Agricultural Assessment Report contained within appendix 15.6, and could be used for agriculture in the future. The loss of the agricultural potential of the site. if it was developed in the manner proposed is therefore required to be assessed as a particular socio-economic impact.</p> <p>The conclusions of the agricultural assessment report are that :</p> <ul style="list-style-type: none"> <li>• In the context of Act 70 of 1970 it was calculated that the property has at least 144ha that is suitable for cultivation.</li> <li>• The areas rated as suitable for cultivation are clustered in the western and north-western parts of the property, while the areas rated unsuitable occur in the southern, central and eastern parts.</li> <li>• The <i>Themeda</i> grassland in the west, together with the streams and wetlands, have high conservation value and were classed as sensitive features which should not be developed.</li> <li>• The habitats ( including the grasslands and wetlands ) are ideal for grazing of livestock and about about 80 large stock units ( LSU ) could be carried all year round.</li> <li>• The property is suitable for a diversity of wildlife species, so the concept of a “residential” game reserve surrounding carefully situated development nodes has merit as an appropriate form of land use.</li> </ul> <p>The scoping reports and the Agricultural Assessment Report have both been provided to the relevant agricultural Directorate of the national Department of Agriculture, Forestry and Fisheries, in terms of both the EIA application process, and also in the Act 70 of 1970 application process to allow the subdivision of agricultural land, as explained within overview of relevant legislation provided within section 7 of this EIA report, and which has been pursued on behalf of the applicant by the applicant’s town planner, Rob Kirby and Associates in regard to Erf 10119 Pietermartizburg where it is required.</p> <p>Responses from the agricultural authorities have been received in both these applications, and the responses to the EIA application process are included within appendix 1 of this EIA report. It can be seen from this response, as also recorded in section 8 of this EIA report, that the national Department of Agriculture has no objection to the proposed Hilcove Hills development, provided that property is incorporated into the Msunduzi Municipality Town Planning Scheme, who will also provide the potable water to the site, which is being complied with.</p>



	<p>Rob Kirby and Associates have also provided the information that their Act 70 of 1970 application has been approved by the national Department of Agriculture, Forestry and Fisheries in their letter to them dated 26<sup>th</sup> January 2012. There are therefore no legal impediments in terms of relevant agricultural legislation preventing the proposed Hilcove Hills development from being implemented.</p> <p>Notwithstanding the above, the impacts of the loss potential agricultural land, as included in the approved Plan of Study of Scoping is provided below.</p>
<b>ASSESSMENT</b>	
Probability	The loss of agricultural potential would certainly occur with the development.
Status	The loss of agricultural land is negative
Extent	The 144ha of cultivatable land, and the balance for grazing and browsing, except for the grassland conservation area, where large herbivores are advised to be excluded by the biodiversity specialists.
Duration	Permanent
Magnitude	Moderate
Reversibility	Not likely to be reversed in the foreseeable future
Cumulative/Non cumulative	Cumulative in conjunction with the loss of other agricultural land to development or conservation.
<b>MITIGATION</b>	
Potential to mitigate negative impacts	<p>No potential to mitigate on site.</p> <p>The retention of a about 50% of the site for a game reserve, from which in due course there will be the requirement of a game offtake to prevent overstocking is a form of mitigation.</p>
Potential to enhance positive impacts	No potential to enhance positive impacts is identified, except that potential impacts associated with intensive agriculture on the site would not occur.
<b>OVERALL ASSESSMENT AND CONCLUDING COMMENTS</b>	
<p>Overall Assessment and concluding comments as to the predicted impacts after mitigation and there:</p> <ul style="list-style-type: none"> <li>➤ Impacts on the site will be permanent</li> <li>➤ The impacts of the loss of agricultural land are negative, and of moderate significance.</li> </ul> <p>As illustrated in the Need and Desirability Report in terms of national, provincial and local growth strategies, and the very substantial socio-economic benefits predicted, the loss of agricultural land is significantly outweighed by these other positive socio-economic benefits, and therefore the proposed development is acceptable, and desirable.</p>	

## **10.10. POTENTIAL IMPACTS OF THE PROPOSED NEW ROADS ON NEIGHBOURING PROPERTIES**

### **BACKGROUND AND CONTEXT**

The Traffic Impact Assessment ( TIA ) report prepared by SSI which is contained within appendix 15.14. deals comprehensively with the estimated increases in traffic which would be caused by the proposed development, and the road and intersection upgrades which would be required to cater acceptably for these increases, as related also to the relevant phases of the development. The TIA report will be provided for comment in EIA process to the local, provincial and national traffic authorities for their comments, and any related conditions which they might impose, and these comments will be provided to the competent authorities for their consideration within the EIA process.

This assessment of the section on the assessment of the impacts of the proposed new roads on neighbouring properties is related to construction of new roads, both on and off the property which raised concerns in the EIA scoping process, as to their potential impacts that might arise from the presence of these new roads, where previously there was undeveloped land.

There are three roads where this circumstance arises, and which are assessed separately in each case below, as their particular locations and the sorts of potential impacts which arise are different in each case. These roads are :

1. The Cleland Road extension, which originates at a proposed intersection with Murray Road, and then progresses eastwards along an existing road reserve within the local Town Planning Scheme to the western boundary of the Hilcove Hills site. In the first of the impact assessments undertaken below it is the length road that traverses through the existing suburb of Bellevue, between its intersection with Murray Road and the western boundary of the site, which is the subject of the assessment.
2. This abovementioned Cleland Road extension then forms a west – east arterial road which traverses the more southern width of the site to intersect on the eastern edge of the site with the Main Road 478 ( known also in this area as Pope Ellis Drive ) to the north of the nearest properties in the suburb of Ashburton. It is that portion of this road which is aligned to the north of the nearest properties within the suburb of Ashburton which is the subject of the second impact assessment below.
3. The third road which is the subject of an impact assessment below is other main arterial road on the site which runs in a south to north direction in the more western portions of the site, to exit the site onto neighbouring farm on the property, Erf 547 New England. It the last portion of this road on the site as it runs adjacent to Erf 547 and its exit onto it which is the subject of this assessment.

<b>POTENTIAL IMPACTS ON NEIGHBOURING PROPERTIES IN BELLEVUE TO THE CLELAND ROAD EXTENSION</b>	
<b>CONSIDERATION</b>	<b>ASSESSMENT/COMMENT</b>
<b>BACKGROUND &amp; DESCRIPTIONS RELEVANT TO THE POTENTIAL IMPACTS</b>	<p>This is a straight road of about 840m in length on relatively level ground contained within an existing 30m wide municipal road reserve within the Msunduzi Municipality's Town Planning.</p> <p>The proposed road is therefore not a new planning proposal, but has been entrenched within the scheme for many years, as confirmed by the traffic specialists on enquiry of this fact with them.</p> <p>On completion of the road and intersection to the satisfaction of the municipal Roads Department, and at the cost of the developer, this road would become a municipal road, to be managed and maintained by the municipality, in the same manner as the other roads in the suburb of Bellevue.</p> <p>There are existing residential properties on relatively small suburban plots along a good deal of the length of the Cleland Road extension road reserve, and which gain their present access off Ivy, Vygie, Freesia, Statice, and Cyclamen Roads on the southern side, and Morgan, Aster and Bonanza Road on its northern side.</p> <p>At the moment these adjacent properties have vacant, vegetated land within the road reserve servitude adjacent to their property. The potential impacts associated with the presence of the road are to do with :</p> <ol style="list-style-type: none"> <li>1. Potential impacts of noise, dust, nuisance and crime associated with the construction process.</li> <li>2. Noise, the visibility of the road in places.</li> <li>3. In regard to the potential for increased noise, crime and insecurity, the proposed new road will bring the public, in the form of both vehicular traffic and pedestrians, past the site in a manner which did not happen previously. However, at the moment the adjacent properties are bordered by open, vegetated public land, which may also be a well concealed avenue for criminals at present. It is therefore very hard to predict any potential for increased crime associated with the new road.</li> </ol>
<b>ASSESSMENT</b>	
Probability	It is certain that there will be some potential impacts associated with the construction and operation of the road.
Status	For the affected property owners this will be considered to be negative impacts.
Extent	For those properties adjacent to the road servitude, and to a lesser extent those slightly further away.
Duration	During the construction phase of a few months construction for any construction impacts, and permanent for the operational phase.
Magnitude	For construction impacts are assessed as being from low to moderate During operation, impacts are assessed as being moderate.
Reversibility	Construction impacts are reversible, being of relatively short duration.

Cumulative/Non cumulative	As the road is within a developed suburban setting, the impacts of the road are not significantly cumulative.
<b>MITIGATION</b>	
Potential to mitigate negative impacts	<p>For the construction phase the measures contained within the EMPr for dust, noise, security etc. Associated with road or other major forms of construction can mitigate the impacts of road construction, which should also be only be permitted to occur during normal working hours.</p> <p>For the operational phase, the road reserve is considerably wider, at 30m than the actual road pavement of the road. There is therefore the potential for landscaping of the road reserves to soften and screen the road from the adjacent properties.</p> <p>The adjacent properties may also wish to apply their own measures to mitigate the impacts of the road, through their own measures such as landscaping, walling or fencing.</p>
Potential to enhance positive impacts	<p>As the existing residents already have access to a public road network from their properties, there is no significant potential to enhance any positive impacts associated with the proposed development.</p> <p>However, the proposed road extension onto the Hilcove Hills site does permit access to a new development area, with shops, schools, medical and other service facilities, and also would provide a convenient linkage to the N3 highway. In this sense proposed new road does provide a positive impact.</p>
<p><b>OVERALL ASSESSMENT AND CONCLUDING COMMENTS</b></p> <p>Overall Assessment and concluding comments as to the predicted impacts after mitigation are that :</p> <ul style="list-style-type: none"> <li>➤ Construction impacts will be moderate, subject to mitigation, of relatively short duration, will not occur outside of normal working hours.</li> <li>-</li> <li>➤ Operational impacts will be permanent. The road is relatively level, and within a wide road reserve, and the impacts are assessed as being low to moderate after mitigation. The road will provide access to a new areas with facilities and services, and a good new access to the N3 highway in time.</li> </ul> <p>The proposed road reserve is has been part of municipal planning for some time, as evidenced by its existence in the approved town planning scheme for the area. There are negative impacts of a road past a property where previously there was only open, vegetated land which are unavoidable.</p> <p>However, they are part of living within a suburb and in terms of what is zoned permitted within the planning for the area, and are considered acceptable within this context.</p>	

<b>POTENTIAL IMPACTS ON NEIGHBOURING PROPERTIES OF THE EASTERN END OF THE MAIN WEST EAST ARTERIAL ROAD PAST THE NEAREST PROPERTIES IN ASHBURTON</b>	
<b>CONSIDERATION</b>	<b>ASSESSMENT/COMMENT</b>
<b>BACKGROUND &amp; DESCRIPTIONS RELEVANT TO THE POTENTIAL IMPACTS</b>	<p>The west to east main arterial road extends from where the Cleland Road extension enters the western boundary site to the MR478/Pope Ellis Drive. It is a link road between Cleland Road extension to the proposed N3 Bellevue Interchange and the MR478 which is also part of the municipal future road expansion planning, independently of the presence the Hilcove Hills development proposal.</p> <p>As can be seen from the proposed development layout plan included in this EIA report ( Plan 2915/WD 21 ), there is a section of this eastern part of this proposed road about 1.2km long which is indicated as an undeveloped road reserve of 30m wide. There a small portion of this road, about 270m long, immediately adjacent to the MR478 which is proposed to be built in this latest development layout plan. This is required to provide access to the MR478 for the 48 single houses within the low density eco-estate type development.</p> <p>This differs from the development layout plan which was included in the final scoping report ( Plan 2915/WD 13 ). In this earlier scoping report plan the entire length of the road, including the 1.2km undeveloped road reserve portion near Ashburton.</p> <p>It is also to noted that the alignment of this road in the later EIA report development layout plan differs from the alignment of the road in the earlier scoping report development layout plan. The road now loops away from the boundary of the site from its nearest western point on the site with the nearest Ashburton property at this point ( which is owned by the owner of the Hilcove Hills property ) to not be immediately adjacent to the boundaries of the Ashburton properties along this part of its length to where the undeveloped road servitude ends near the MR478. At its furthest point the the nearer road reserve boundary is about 160m from the nearest boundary of an Ashburton property.</p> <p>In the earlier scoping report proposed development plan, the alignment of this portion of the arterial road was up against the boundary of the adjacent Ashburton properties for its entire length.</p> <p>The reasons for these abovementioned changes in this road between the final scoping report and this EIA report are as follows:</p> <p><b>In regard to that portion where there is planning of a road reserve rather than a road</b></p> <p>As described in more detail in the Traffic Impact Report of appendix 15.14, the construction of the road accesses to the site is related to the completion of development phases, with phase 1 of the eco-estate being required to obtain access off the MR478, as indicated on the latest development layout plan. Those following phases on the most western part of the site would then gain access from the Cleland Road extension to be built by the developer.</p>

	<p>However, subsequent phases within the more central part of the site, of both a commercial and residential nature, would rely on the construction of the N3 Bellevue interchange to be built to provide road access to the site. As and when this N3 interchange was built, this would serve all parts of the proposed development except for the eco-estate of Phase 1, which would, as described above, obtain its road access to the MR478. Therefore, with the building of the N3 interchange, there would be no need for the developer to build the area of this road which is indicated as road reserve.</p> <p>The road servitude is provided, however, because it was also part of the municipality's future road planning network. Also, if for any reason, the N3 interchange was excessively delayed, or not built at all, then the road servitude portion would be built by the developer, to provide an alternative access to the central portions of the site, as is also described within the Traffic Impact Report.</p> <p>In regard to the realignment of the road away from its previous alignment along the Ashburton property boundaries in the previous plan, to loop into the site in the manner proposed, this is the result of several factors which have been taken into account, in determining this alignment, which included ;</p> <ol style="list-style-type: none"> <li>1. The concerns expressed in the scoping process as to the proximity of this new road to the Ashburton properties.</li> <li>2. The optimal alignment of the road from an engineering topographical consideration.</li> <li>3. The finding of the biodiversity specialists report of the presence of species of conservation concern.</li> <li>4. The relationship of the road to the proposed eco-estate properties.</li> </ol> <p>The selected alignment as represented in proposed layout plan No. 2915/WD21 was considered by the projects' relevant specialists as that which best accommodated these factors which were taken into account in determining the best fit alignment for this road.</p> <p>If the road was ever built as by the developer during the construction of the overall development, due to the very long delay or lack of construction of the N3 Bellevue Interchange, then the potential impacts associated with the construction and operation of this road are identified as follows :</p> <ol style="list-style-type: none"> <li>1. Noise, nuisance and dust during the construction of this road.</li> <li>2. Visual impacts of the vehicles on this road.</li> <li>3. Noise of vehicles on this road.</li> </ol>
<b>ASSESSMENT</b>	
Probability	The potential impacts are not certain, as they will not occur with construction of the N3 Bellevue interchange within a reasonable time period. It is not in the special interest of the applicant to build this road, if the N3 interchange occurs.
Status	The impacts of the road would be negative.
Extent	For the adjacent properties in Ashburton on the ridgeline within this suburb nearest to the site.
Duration	When and if the road was built : During construction phase of several months. During the operational phase of the development.
Magnitude	The impacts of the road are assessed as being moderate, but subject to

	significant reduction with appropriate mitigation.
Reversibility	Construction impacts reversible, operational impacts long term.
Cumulative/Non cumulative	Cumulative with the construction of the eco-estate, but of a relatively minor nature.
<b>MITIGATION</b>	
Potential to mitigate negative impacts	<p>During construction the mitigation measures are as included in the EMP, and would also include construction only occurring during normal working hours.</p> <p>During operation mitigation measure to be applied include :</p> <ol style="list-style-type: none"> <li>1. The earthworks associated with construction being designed that lowering the pavement of the road slightly, so that it is slightly sunken in comparison with the surrounding land levels.</li> <li>2. The construction of an earth berm in the Ashburton side of the road reserve, to shield the affected properties from the noise and visual impacts. The road reserve is wide, and therefore should be able to accommodate such a berm.</li> <li>3. The landscaping of the berm and all of the rest of the road reserve with appropriate dense vegetation, to further screen and / or soften the impacts of the road.</li> <li>4. The development within eco-estate that the road traverses through would have all the existing indigenous vegetation retained, and this woodland type vegetation would also assist in mitigating the impacts of the road.</li> </ol> <p>It is also to be noted that, as this road traverses through an eco-estate development on the site, there is an advantage of these mitigation measures for this part of the development as well.</p> <ol style="list-style-type: none"> <li>5. It is to be noted that the alignment of the road loops away from the Ashburton properties, so that headlights of vehicles on the road do not point towards these properties. This, together with the proposed earthworking and landscaping measures would very significantly reduce any light intrusion.</li> </ol>
Potential to enhance positive impacts	The above measures intended to mitigate the impacts of the proposed road, and no measures to enhance positive impacts are identified.

## **OVERALL ASSESSMENT AND CONCLUDING COMMENTS**

Overall Assessment and concluding comments as to the predicted impacts after mitigation are that :

- Construction impacts will be moderate, subject to mitigation, of relatively short duration, will not occur outside of normal working hours. Impacts are assessed as low.
- Operational impacts will be permanent. There will be some impacts to the neighbouring properties, in the form of visual impacts and noise. The visual impacts are likely to be significantly mitigated, the noise impacts less so. Impacts are assessed as low for visual and low to moderate for noise.

The proposed road is also part of the municipality's future long term road network planning, and is not required by the Hilcove Hills development, when and if the Bellevue N3 interchange is constructed.

If it is constructed, the impacts as assessed above would be likely to occur. The impacts are not as being of high significance, and are considered to be acceptable. They are not identified as being fatal flaws which should prevent the development from occurring in the manner proposed.



<b>POTENTIAL IMPACTS ON THE NEIGHBOURING PROPERTY TO THE EXTENSION OF THE SOUTH TO NORTH MAIN ARTERIAL ROAD</b>	
<b>CONSIDERATION</b>	<b>ASSESSMENT/COMMENT</b>
<p><b>BACKGROUND &amp; DESCRIPTIONS RELEVANT TO THE POTENTIAL IMPACTS</b></p>	<p>The section of the main north – south arterial road in question is its most northern section, in the north western corner of the site. On the proposed development layout plan within this EIA report, Plan No. 2915/WD 21, this is shown as a future road of about 520 metres in length within a road servitude of 30m wide. It travels past the proposed education site for a school, and then just inside the boundary of the site adjacent to the neighbouring property Erf 547 New England, owned by Ukhambathini Properties, before leaving the site and entering this property at its northern end.</p> <p>The arterial road is also part of the future road planning network of the Msunduzi Municipality, termed the Bellevue collector road. The reason why the most northern portion of this road is shown as being an undeveloped “future road” is that it is not required for the Hilcove Hills development. However, the applicant is required to set the road reserve aside from development, to permit the municipality to extend this road further northwards, as and when it might be built by them.</p> <p>Within the scoping report the alignment of the most northern part of this road occurred on the neighbouring Erf 547 in the development plan included in the scoping report, Plan No. 2915/WD 13. However, following on from representations from the owners of Erf 547, the road has been moved back onto the applicant site.</p> <p>The owners of Erf 547 met with the EAP, the applicant and also the traffic specialist of SSI during the scoping process and also made representations over and above their written submissions in regard to;</p> <ol style="list-style-type: none"> <li>1. The potential impact of the road alignment on a drainage line and associated wetland area on their property which was adjacent to and running more or less parallel to the road alignment.</li> </ol> <p>In response to this concern, the wetland specialist included the assessment of this neighbouring property in their wetland report contained within appendix 15.4, and results of this investigation are included within section 2.3.6 of their report.</p> <p>As can be seen from the figure included within section 2.3.6 of the wetlands report, the delineated wetland boundary is at least 100m from the nearest point of the proposed road verge. This buffer area of at least 100m is considered by the specialist to more than 100m from the nearest edge of the wetland to the nearest part of the road reserve is considered to more than adequately protect the wetland area from the impacts of the road.</p> <p>It should be noted that, if and when this road is built further northward beyond the Hilcove Hills site, it will have to cross the drainage line which was assessed as described above. However, this would be well off the site, and would be the subject of its own EIA application process.</p> <ol style="list-style-type: none"> <li>2. The alignment of the road across their property nearest the exit point from the Hilcove Hills site is largely determined by this exit point, and the potential for realign the road more favourably to take this into account was suggested.</li> </ol>

	<p>The traffic specialist of SSI accordingly met with the owners on site and inspected the alignment, and the matter was also reviewed with the town planner and the applicant. It was considered that the alignment as proposed in the development layout plan included within this EIA report was the optimal one, and that there were no persuasive reasons as to why it should be adjusted, and this aspect is not assessed further below.</p> <p>3. The owners of Erf 547 have pointed out in their correspondence during the scoping report that the nature of their property and is Broadleave Farm Enterprise on it is registered BDOCA as an organic grower, and therefore in order to maintain the required standards, potential impact from the proposed development, such as from polluted storm water run off are required to be avoided. This requirement is also assessed below.</p> <p>The situation on the Hilcove Hills site and the related storm water management measures are dealt with further within the component below of this assessment dealing with mitigation measures.</p>
<b>ASSESSMENT</b>	
Probability	<p>In the case of the impacts of on the adjacent wetland the probability of significant impacts related to the road is very low.</p> <p>In regard to the potential impacts of the development on the adjacent organic farmlands, the probability of significant impacts is very low.</p>
Status	Any impacts would be negative.
Extent	On the wetland area, or on the adjacent areas of farmland next to the site
Duration	During the construction and operation of the development
Magnitude	Absent to very low
Reversibility	Reversible, if they were to occur
Cumulative/Non cumulative	Not cumulative in the context of this boundary of the site with Erf 547.
<b>MITIGATION</b>	
Potential to mitigate negative impacts	<p>In regard to the potential impacts on the wetland, the 100m buffer area is adequate. On the site the camber of the road can be such that bulk of run off can be onto the applicant site, and not the neighbouring property.</p> <p>In regard pollution of the adjacent organic farm :</p> <ol style="list-style-type: none"> <li>1. The lie of land is such that storm water run off will be downslope and into the main drainage line water course on the Hilcove Hills site, and not onto the neighbouring farmlands.</li> <li>2. The only proposed development next to Erf 547 is some residential development in the north west corner, behind a 10m wide buffer servitude to this neighbouring property. This development would not pose a pollution threat to the organic farm, and run off from it can be directed away from it.</li> </ol>

	<p>3. There are no air polluting industries on the site which could affect the activities on Erf 547.</p> <p>4. It is likely that the residential and game reserve type uses on the adjacent parts of the site would be more benign to the organic farm than if the site were used for its original use as a crop farm, with the use of herbicides, pesticides, and inorganic fertilizers and crop additives.</p>
Potential to enhance positive impacts	No significant potential to enhance is identified
<p><b>OVERALL ASSESSMENT AND CONCLUDING COMMENTS</b></p> <p>Overall Assessment and concluding comments as to the predicted impacts after mitigation are that :</p> <ul style="list-style-type: none"><li>➤ There are no significant impacts identified on the wetland areas on the adjacent Erf 547, if the proposed arterial road is built on the site by the municipality in the future.</li><li>➤ There are no significant impacts identified on the use and certification of the adjacent Erf 547 that are associated with the proposed Hilcove Hills development.</li></ul>	

## **11. IDENTIFICATION AND ASSESSMENT OF ALTERNATIVES**

### **11.1. INTRODUCTION TO THE CONSIDERATION OF ALTERNATIVES**

The identification and consideration of reasonable alternatives is a requirement within compilation of an EIA report, has also been raised in the previous scoping process, and the nature of these alternative to be considered is contained within the approved Plan of Study for this EIA report.

The consideration of these alternatives is also informed by the comment and assessment of these alternatives in certain of the relevant specialist reports, these being the Wetland and Riparian Assessment Report, the Engineering Services Report, the Visual Impact Report, and Sense of Place Report.

The alternatives approved within the Plan of Study are as follows :

#### **THE NO – DEVELOPMENT OPTION**

The consideration of this alternative involves an assessment of what the likely environmental consequences would be, whether positive, negative or neutral, if the development were not to occur.

#### **THE ALTERNATIVE USES FOR THE SITES**

Potential alternative land uses for the site are considered in contrast to the ones that are proposed within this particular application. The likelihood and potential consequences of these alternative land uses are therefore identified and assessed.

The various alternative uses for the site which are to assessed in the EIA process are listed as follows :

1. The site being developed as an eco-estate, with low density residential developments being inserted into the natural bush.
2. The division of the site into small holding / garden type lots, in a similar manner as occurs in some neighbouring areas such as Ashburton.
3. The development of the site for social ( low cost ) housing, in a similar manner as occurs in other areas of Pietermaritzburg where this occurs.
4. The development of the site for commercial and light industrial use.
5. The development of the site in terms of the proposed layout plan, as represented in the scoping report, but subject perhaps to some amendments as a result of the findings of the specialist reports.

It is possible that there could be other land uses contemplated, or combinations of those provided above, but it is considered that the above by their nature, cover the necessary wide spectrum of land uses and their related potential impacts, of both a positive and negative nature.

Therefore, with the no-development option of the previous section, and the proposed mixed use development, there will be a total of six alternative land uses proposal considered and assessed below within this section of the EIA report. Conceptual layout plans of these alternative land uses are also included with the other figures after the text of this EIA report.

### **THE ALTERNATIVE SITE OPTION**

The site and its environs are considered in regard to whether there are alternative sites to the proposed development site, and assesses the relative suitability in comparison to the applicant site. It is important in this regard to take note of the context of the proposed development within the wider overall development context which the applicant site is part of.

### **ALTERNATIVE TECHNOLOGIES AND APPROACHES**

The use of alternative technologies and approaches to reduce the demand on resources ( energy and water ) and the production and disposal of waste are required to be identified, investigated and reported on. This particular aspect will also be the subject of appropriate input in the various specialist studies which have been commissioned.

## **11.2. THE NO – DEVELOPMENT OPTION**

The consideration of this alternative involves an assessment of what the likely environmental consequences would be, whether positive, negative or neutral, if the development were not to occur.

If there was no development of the site, for example if the proposed development application was refused by the environmental and town planning authorities, and none of the alternatives was accepted, or considered desirable by either them or the applicant, then:

1. It is possible that the land would lie remain unused, or would be used agriculturally in terms of the moderate agricultural potential of the site. It is also possible that the site would remain unused, as it has been for the several years.
2. The identified negative impacts associated with the proposed development would not occur. However, none of these negative impacts have been identified in the previous EIA assessment process of section 10 as being of so high significance as to warrant the proposed development not proceeding in the manner proposed.
3. As assessed within the wetlands specialist report, the no development option would lead to continued degradation of the site. Impacts would include the increased encroachment of alien invasive species in the water courses, and further erosion of the water courses. As also pointed out in the wetlands report, the main arterial road network on the site is part of a broader municipal and provincial road network planned to run through the development, and will be developed in due course, as traffic demand increases, whether the development takes place or not. The impacts of these roads are detailed in the wetlands report.
4. In terms of its visual impacts, this alternative would have no visual impacts.

5. In regard to the sense of place as assessed in the Visual Impact Report, this alternative, the site falls between the existing edge of Pietermaritzburg and the low density residential area of Ashburton. In terms of sense of place, the site could be seen as a place in limbo. It is few linkages with the surrounding urban fabric, and has currently a low sense of place.
6. As to the impacts of this alternative on sense of place, as defined and assessed in the Sense of Place report by Dr. McCarthy, after considering the criteria of Services Quality, Crime Concerns, Upmarket Suburban, Nature and Rural Concerns, the no development alternative is assessed as having a sense of place as : Neutral Minus.
7. The very significant socio-economic benefits, to in terms of employment, the demand for goods and services, employment opportunities and income to the municipality in the form of rates, as has been quantified within the Need and Desirability Report would not occur.
8. The creation of a distinctive mixed uses development, to meet a range of residential and business demands, and the related provision of services in the form of a school and hospital would not occur.

### **11.3. THE ALTERNATIVE USES FOR THE SITES**

Potential alternative land uses for the site are considered in contrast to the ones that are proposed within this particular application. The likelihood and potential consequences of these alternative land uses are therefore identified and assessed. Within all these alternative, so ensure fair comparison, none of the development areas of the various land uses is extended into the environmentally sensitive areas, as determined in the previous Strategic Environmental Assessment of the Mkhondeni Catchment, within which the applicant site falls. The areas of the proposed development all occur within area of topography that is amenable to the proposed land uses. However, in the case of some, such as the large industrial platforms, considerable earthworks would occur in places, as is discussed further below.

The various alternative uses for the site which are to be assessed in the EIA process, as included in the final approved Plan of Study for this EIA, are listed as follows :

#### **11.3.1. THE ECO-ESTATE OVER THE ENTIRE SITE ALTERNATIVE**

As illustrated in the included layout plan for this alternative, it consists of 98 individually owned sites on approximately 2 hectares each, allowing the house and associated development footprint area to be limited to approximately 1500m<sup>2</sup> on each site, all under the control of a Home Owners Association, and planted as an extension of the existing indigenous vegetation, with no fences between plots, and the area stocked in an appropriate manner with wildlife.

In this alternative :

1. In regard to engineering requirements and any related impacts, this alternative would require no sewer plant, as the densities would be low enough to permit septic tanks and soakaways. There would be the requirement to provide an internal, relative low grade, internal road network, and other services such as electricity and water. There would still be the allowance required for the planned municipal arterial road system over the site, related also to the planned construction of the N3 Bellevue interchange. Traffic demands generated from the site would be relatively low.
2. In regard to biodiversity and general wildlife conservation, this alternative would rate highly, as the development footprint is small, and there could be free movement of game throughout the estate.
3. In regard to visual impacts, as assessed in the specialist Visual Impact Report, less than 50% of the units will be visible from anywhere along the N3 highway, travelling northwards or southwards. All development is set back 20m from the freeway edge, and there are large gaps between the buildings. Option 1 is assessed as having a very low visual impact from the N3 and the surrounding residential areas.
4. In regard to the sense of place as assessed in the Visual Impact Report, this alternative is a low density, monofunctional residential area, more suited to a remote rural location rather than the edge of an expanding city. It is perhaps not ideal for this use also on much of the site that is in close proximity to the N3 highway, which would compromise this experience in these parts.
5. It provides no amenities besides "bush" experience for a limited number of people. Due to the isolated nature of each site there are no visual orientation devices such as landmarks, nodes or districts and no clear road hierarchy. The eco-estate alternative is therefore assessed by these specialists as being the antithesis of sustainable urban development, and has a very low sense of place.
6. In considering the site within the context of its location up against the urban edge of city of Pietermaritzburg, the Need and Desirability report shows that the site is within the main development axis that is thrusting eastwards along the N3 highway. The location of an eco-estate in this particular location is contrary and inimical to these organic developmental trends, which are recognised within local, provincial and national development policies concerning the N3 highway as a primary development corridor.
7. Moreover, when one considers the wider eastern boundary of the city, as contained within the Mkhondeni Stream Catchment area, and as reflected in the SEA plan of this area of most desirable land use to occur within it, or elsewhere in the areas to east of the city further removed from it, there are far more appropriate areas for the establishment of an eco-estate type development than on over the entire area of this particular applicant site.
8. As to the impacts of this alternative on sense of place, as defined and assessed in the Sense of Place report by Dr. McCarthy, after considering the criteria of Services Quality, Crime Concerns, Upmarket Suburban, Nature and Rural Concerns, the aggregate assessment of the eco-estate alternative is assessed as : Neutral Plus.

9. In regard to the Need and Desirability of this alternative, as to whether this is an appropriate site for this sort of activity, and whether this sort of development should occur on this particular site in terms of market place demands in term of need, and whether the socio-economic costs and benefits make it desirable, the alternative of using the site for the proposed eco-estate use scores very low in terms of need and desirability.

### **11.3.2. THE DIVISION OF THE SITE INTO SMALLHOLDINGS**

This alternative consists of 98 individually owned smallholdings / garden type lots of about 2 hectares each, allowing houses limited to being within an approximately 1500m<sup>2</sup> development footprint area. There would be no encroaching within the no development zones, as determined within the previous SEA for this catchment area.

In this alternative :

1. In regard to engineering requirements and any related impacts, this alternative would require no sewer plant, as the densities would be low enough to permit septic tanks and soakaways. There would be the requirement to provide an internal, relative low grade, internal road network, and other services such as electricity and water. There would still be the allowance required for the planned municipal arterial road system over the site, related also to the planned construction of the N3 Bellevue interchange. Traffic demands generated from the site would be low.
2. In regard to the likely impacts biodiversity and conservation concerns, the impacts would be moderate to high. However, impacts would be very difficult to predict and very hard to control in the long run. Smallholdings would be fenced off, land cleared for agriculture, with the potential for soil erosion, alien plant invasion, and use of pesticides herbicides.
3. The agricultural assessment report also indicates that only about 144 hectares of the total site is cultivable for crops, so the rest of the areas would be marginal or unproductive, unless devoted to such alternative uses as greenhouses or tunnel farming, which do not rely on the natural resources of the site. These sorts of developments would also have their own visual and other impacts associated with them. In reality, the lack of economies of scale are such that very few of the smallholdings would be economically viable, which would tend encourage environmental degradation, or the use of the site for alternative uses, in the long run.
4. In regard to the visual impacts of this alternative, as assessed in the specialist Visual Impact Report, from the combined view shed analysis, less than 50% of the units will be visible from anywhere along the N3 highway, travelling northwards and southwards. All developments are set back 20 m from the highway edge, and there are large gaps between the buildings. This alternative is assessed as having a low visual impact. However, it should be taken into account that there is a tendency for smallholdings to accumulate more buildings and other structures over time, in the form of sheds, tunnels and other infrastructure and items, and to also extend the dwellings, in particular if the



agricultural activities are not productive. Therefore, the visual impact of this form of development is less predictable and certain over time.

5. In regard to the sense of place as assessed in the Visual Impact Report, this alternative is assessed as having a very low sense of place, for similar reasons as elaborated on above within the previous on the eco-estate.
6. As to the impacts of this alternative on sense of place, as defined and assessed in the Sense of Place report by Dr. McCarthy, after considering the criteria of Services Quality, Crime Concerns, Upmarket Suburban, Nature and Rural Concerns, the aggregate assessment of the smallholdings alternative is assessed as : Neutral Minus
7. In regard to the Need and Desirability of this alternative, as to whether this is an appropriate site for this sort of activity, and whether this sort of development should occur on this particular site in terms of market place demands in term of need, and whether the socio-economic costs and benefits make it desirable, the alternative of using the site for smallholdings scores very low in terms of need and desirability.

### **11.3.3. THE DEVELOPMENT OF THE SITE FOR SOCIAL, LOW COST HOUSING**

The development of the site for social ( low cost ) housing, in a similar manner as occurs in other areas of Pietermartizburg allocated to this land use. This option consists of approximately 3000 sites of 300m<sup>2</sup> and 500 high density site of approximately 120m<sup>2</sup> or flats, with associated supporting community facilities.

If this development alternative is implemented, it is assessed that :

1. There would be the requirement of a wastewater treatment works to serve all areas of the site, and the considerable amount of waste water generated from the 3000 houses. The bulk water supply would need to be supplied both from the Murray Road reservoir, and the extension of the existing water reticulation infrastructure from Ashhburton. Traffic and road access demands would be relatively high, and met through the access from Cleland Road, the MR478 and the N3 interchange.
2. As predicted in the wetlands report, the formalised social housing scheme over the whole site will result in extensive alterations to the site and the risk of siltation and erosion as a result of the earthworks and exposure of the soils to wind and rain. Runoff from the greatly increased hardened areas surfaces also poses as significant threat. However, to some extent, these impact could be mitigated by good environmental management during the construction.
3. Direct impacts on the wetlands and water courses as a result of the increased road infrastructure required to service such a development. In the nature of dense formal housing settlements, it is likely there will be an increase in grey water from urban run off, informal dumping into the open space areas, and pressure on the open space areas to be used for alternative uses, such as for informal agriculture, and the harvesting of timber and other resources.

4. The retention of the wildlife on the site in this alternative would be unlikely to occur with this alternative, and it likely that other biodiversity values would decrease over time. The necessary contributions towards the management of the retained natural areas would be unlikely to occur.
5. The specialist Visual Impact Report assesses this alternative as having a high visual impact due to the high number of buildings, and the lack of space between units to provide adequate landscaping. The visual appropriateness of the small-scale buildings on the side of a highway is also questionable, in terms of scale and amenity.
6. In regard to the sense of place as assessed in the Visual Impact Report, this alternative states that there are limited amount of “districts” within the development as the range of uses is limited. However, there are distinct landmarks, nodes and edges, with clear circulation structure. The range of unit types will add interest, but the area is largely a residential suburb isolated from its surroundings, and is likely to provide a moderate sense of place.
10. As to the impacts of this alternative on sense of place, as defined and assessed in the Sense of Place report by Dr. McCarthy, after considering the criteria of Services Quality, Crime Concerns, Upmarket Suburban, Nature and Rural Concerns, the aggregate assessment of the low cost social housing alternative is assessed as : Strong Negative.
7. The Need and Desirability report does identify the need for low cost, social housing within the municipality, and that the site is well located to serve this demand. However, this particular land use, although providing jobs during the construction phase, does not provide much in regard to providing long term, permanent employment, which is seen as the most critical of all needs. Also, the use of the site for low cost housing does not take best advantage of the particular values of strategic location of the site for commercial types of development, which also provide long term employment opportunities.
8. In regard to the Need and Desirability of this alternative, as to whether this is an appropriate site for this sort of activity, and whether this sort of development should occur on this particular site in terms of market place demands in terms of need, and whether the socio-economic costs and benefits make it desirable, the alternative of using the site for social housing development scores moderately well in regard to need and desirability in certain aspects, but less well in terms of certain critical aspects such as maximizing the benefits strategic location of the site, and the ability to provide long term employment, the rating of this alternative land use is lower.

#### **11.3.4. THE DEVELOPMENT OF THE SITE FOR LIGHT INDUSTRIAL AND RELATED COMMERCIAL USE**

This alternative consists of 98 sites, of 2 hectares each. In the included layout plan of this option, the purple colour indicates the areas of industrial development, which are in the more northern part of the site, whilst the blue colour adjacent to the N3 highway on the more southern part of the site represents the business uses.

In this alternative :

1. In regard to engineering services required, this would require a waste water treatment works, and bulk water supply would need to be from both the Murray Road reservoir and the extension of the existing infrastructure from Ashburton. Traffic demands would have to be met from the Cleland Road extension, the N3 interchange, and the MR478.
2. The necessity to create large industrial platforms, in particular in the more northern areas of the site will require extensive banks from the cutting and filling earthworks that will be required.
3. The large areas of roofs and paved areas over the extensive areas of the site will generate high storm water run off peaks. However, this could be adequately mitigated through appropriate storm water management plans.
4. The specialist Visual Impact Assessment assesses that the commercial buildings, which are closest to the highway, are two hectare sites with low coverage and height allowing views between the buildings in this distance, would have a moderate visual impact. In the case of the industrial buildings, these would be seen at a far distance but, even so, they would have a visual impact from the N3 highway and surrounding residential area. Overall, this alternative is assessed as being likely to have a moderate visual impact from the N3, but a high visual impact from the surrounding residential areas.
5. In regard to the sense of place as assessed in the Visual Impact Report, this alternative has no apparent landmarks or nodes and only two districts with limited focal points. There are edges created by the open space system but, in the case of the industrial sites, the rear of the properties abut onto the open space, which is not a positive relationship. This alternative is assessed as having a low sense of place.
6. As to the impacts of this alternative on sense of place, as defined and assessed in the Sense of Place report by Dr. McCarthy, after considering the criteria of Services Quality, Crime Concerns, Upmarket Suburban, Nature and Rural Concerns, the aggregate assessment of the commercial and industrial alternative is assessed as : Neutral Minus.
7. The Need and Desirability Report of McCarthy does identify the need for light industrial development along the N3 corridor, as well as the commercial use of the site related to the primary planning aim to create logistic hubs along, for warehousing and allied uses, and the site is well located to meet this

demand, when the N3 Bellevue interchange is constructed. It does point out however, that this light industrial / warehousing need is being met in other proposed development in the general area of the site, and considers that the land uses in the proposed development that is the subject of this application is about right.

9. In regard to the Need and Desirability of this alternative, as to whether this is an appropriate site for this sort of activity, and whether this sort of development should occur on this particular site in terms of market place demands in terms of need, and whether the socio-economic costs and benefits make it desirable, the alternative of using the site for commercial and industrial use scores high terms of need and desirability. However, as pointed out in the Need and Desirability Report, there are alternative sites and developments proposed where this need is being met and, on balance, the proposed mixed use development which is the subject of this application is probably the best balance to satisfy the full range of need and desirability criteria.

#### **11.3.5. CONCLUDING COMMENTS IN REGARD TO THE CONSIDERATION OF ALTERNATIVES, AS OPPOSED TO THE PROPOSED DEVELOPMENT APPLICATION**

The criteria for selecting the best land use for a particular site are concerned with selecting what is most needed and desirable, and ensuring that it is also environmentally and socio-economically acceptable for a particular land use to occur on that site.

Within the concluding section of the Town Planning Report it is highlighted that :

The applicant site is an undeveloped parcel of farmland adjacent to existing residential developments and is a logical extension of existing townlands.

The proposed development does incorporate sensitive environmental controls, and has been through an iterative planning process with relevant environmental specialists. The Town Planning Report states also that the development proposed was chosen from a full range of development options, as has been discussed above.

All of these alternatives were analysed in terms of the appropriateness regarding the municipal Spatial Development Framework Plan, and the various studies within the EIA process, and these have been taken into account in the formulation of the proposed plan, together with an evaluation of market demand, and it is considered that the proposed development is the best mix of the land uses for the site.

Within concluding section of the Need and Desirability report, the Hilcove Hills mixed use development is assessed, in terms of spatial planning policies at a variety of levels as the most logical and obvious development for the site, and also

one that should be released first for development. In terms of its desirability in terms of meeting socio-economic needs, this is seen as a priority.

In regard to the potential environmental impacts of the proposed alternative, these have been assessed within the preceding section 10, and no negative impacts have been identified which are significant enough to prevent the proposed development from being implemented in the manner proposed, and the proposed development, in general terms, is considered to be environmentally acceptable.

In regard to its socio-economic acceptability, for the wider community of Msunduzi, and indeed even at a provincial and national level, the proposed development is highly needed and desirable, and therefore highly acceptable.

At the more local, neighbourhood level, based on primary data from specialist surveys, although there are some widely divergent views in this regard, the general, aggregate view of those residents surveyed in surrounding neighbourhoods is that, in terms of contributing positively towards the sense of place, the proposed development scored highest of all, in comparison to the alternatives discussed in the previous section. Therefore, at the local neighbourhood level, the proposed development is the most acceptable.

In contrasting this with the discussion of the alternative land uses of the previous section, the various other alternatives demonstrate a range of positive and negative attributes some, such as the eco-estates, scoring well on “green” environmental criteria, and visually, but scoring very badly in terms of Need and Desirability and general appropriateness to the site. Others, such as social housing at the other end of the range, score badly in regard to such criteria as environmental, visual and sense of place, but do meet some, but not all socio-economic needs.

Therefore, when considered as a whole, and taken a wider spectrum of considerations into account, backed by the contributions of the various specialist reports where appropriate, the proposed Hilcove Hills mixed use development is concluded to be the most appropriate land use development alternative, in comparison to the other alternatives that were included in the approved Plan of Study, and assessed above within this EIA report.

#### **11.4. THE ALTERNATIVE SITE OPTION**

The site and its environs are considered in regard to whether there are alternative sites to the proposed development site that is the subject of this application, and assesses their relative suitability of any other sites in comparison to the applicant site.

Due to its size, single ownership and, in particular its location adjacent to the edge of the urban edge of the city of Pietermaritzburg and the N3 highway, the site is a unique one. As demonstrated in the SEA of the Mkhondeni Catchment, there is no other area along the eastern urban fringe of Pietermaritzburg which is more suitable than the applicant site to the type of development proposed.

As also discussed in the Need and Desirability report, the site is well placed, through the implementation of the proposed mixed use development, to mitigate the spatial distortions of the city form which is the legacy of the racially based Apartheid planning philosophy previously inflicted on Pietermaritzburg.

If one moves further from the eastern edge of Pietermaritzburg, there is a clear advantage for certain land uses, such as logistic hubs and light industrial developments located at the interchanges between Durban and Pietermaritzburg, and perhaps some low density residential and other land uses.

However, there is no other site as well suited to contain the proposed mixed use development as occurs on the applicant site within the greater environs of Pietermaritzburg.

## **11.5. ALTERNATIVE TECHNOLOGIES AND APPROACHES**

The use of alternative technologies and approaches to reduce the demand on resources ( energy, water and materials ) and the production and disposal of waste have been identified and recommended in the Green Building Code Report, and the application of technologies and approaches in regard to storm water management and the management of the open spaces on the site are all appropriate to the site and what is proposed on it.

It is therefore assessed that there has been a consideration of alternative technologies and approaches in the proposed development, and appropriate ones have been selected to be applied within it.

## 12. ENVIRONMENTAL IMPACT STATEMENT

### 12.1. INTRODUCTION

Based on the information and assessments of the preceding section and the supporting documentation that is contained within the appendices, and as required within the EIA regulations, an overall impact statement is provided below, comprised of the following sections

1. Firstly in the form of the summary of the various components which have been assessed within the relevant preceding sections 10 and 11 of report.
2. Secondly, a concluding statement is made
3. Recommendations are then provided as to the nature of the implementation and the associated conditions which should be applied within an implementation of the proposed development.

### 12.2. SUMMARY OF THE ASPECTS OF POTENTIAL ENVIRONMENTAL IMPACTS AND ALTERNATIVES ASSESSED

ASPECT CONSIDERED	STATEMENT OF IMPACTS
<b>CONSTRUCTION PHASE IMPACTS</b>	
<b>General impacts associated with the construction phase</b>	<p>Any large development such as this one will have negative environmental impacts associated with. However, the scale will be mitigated to some extent by the fact that it will be implemented in phases probably over an extended period of time, which also reduces the impacts on any wildlife on the site, and for which particular care should be taken in regard to any potential for poaching or disturbance, and measures are included in the Environmental Management Programme (EMPr) to address these aspects.</p> <p>In regard to flora, besides the avoidance of area of high biodiversity value in the development footprint, preconstruction specialist surveys to enable protection, avoidance or translocation prescribed in the EMPr.</p> <p>There nothing especially intrinsically problematic about the site, with development footprints in all cases being set well back from riparian and wetland areas.</p>

	<p>The measures contained within the EMPr should adequately mitigate the general impacts associated with any substantial construction activities, such as to do with pollution, waste management, erosion prevention, storm water management, noise and nuisance, and the suppression of dust.</p>
<p><b>Impacts associated with the construction of infrastructure</b></p>	<p>No special problems are identified as being associated with the provision of infrastructure and the measures to mitigate the potential impacts of infrastructure provision are included in the EMPr.</p>
<p><b>OPERATIONAL PHASE IMPACTS</b></p>	<p><b>ON THE BIOPHYSICAL ENVIRONMENT</b></p>
<p><b>Water quality</b></p>	<p>Overall Assessment and concluding comments as to the predicted impacts after mitigation are as follows:</p> <ul style="list-style-type: none"> <li>➤ There are minor potential impacts on downstream water related to storm water run. These are mitigated by the design of the development and the nature of the proposed storm water management measures. Run off from alternative agricultural activities would also occur with alternative land use.</li> <li>➤ There are likely to be impacts associated with the disposal of waste water from the sewage disposal site, which have the potential to be of a negative nature. These can be mitigated to some extent, the precise nature of which will be dependent on the outcome of the Waste Management License, which will be required after a separate EIA process for this application.</li> <li>➤ It is to be also note that any development within the greater Pietermartizburg area to provide much needed homes and businesses would generate treated waste water which would be discharged into the same Msunduzi River. Therefore, there is nothing special or problematic identified in the disposal of properly treated, to the authority prescribed standards, from being released from the site into Msunduzi River.</li> </ul> <p>The positive aspects of the provision of the sewage disposal system to serve those parts of the development which would required it are assessed as outweighing any negative aspects associated with the operation of the sewage plant, and the potential impacts of the disposal of waste water from the site</p>



	<p>are considered to be acceptable.</p>
<p><b>Water supply and downstream flow</b></p>	<p>Overall Assessment and concluding comments as to the predicted impacts are as follows :</p> <ul style="list-style-type: none"> <li>➤ Impacts will not be extreme or severe, but are likely to be permanent, but relatively neutral, as to their nature of impact.</li> <li>➤ The water supply to the development is drawn from the same overall Umgeni River catchment, so that treated effluent is being returned to the same system.</li> <li>➤ Impacts will be localised on the site, and downstream of it.</li> <li>➤ The positive socio-economic impacts of permitting the development are significant, and are considered to outweigh any negative impacts associated with the related increases in water volume runoff from the site.</li> </ul> <p>The potential impacts of the proposed development on water quantity and downstream flow are assessed as being acceptable.</p>
<p><b>Wetlands</b></p>	<p>Overall Assessment and concluding comments as to the predicted impacts after mitigation on the wetlands are related to the two arterial road crossings on the site, which are unavoidable, have been designed and planned to mitigate impacts as far as possible. Impacts of these two road crossings on the wetlands are assessed as follows;</p> <ul style="list-style-type: none"> <li>➤ Potential impacts are of minor, and localised significance.</li> <li>➤ Ecological impacts are low in comparison to the socio – economic context and related benefits.</li> <li>➤ The potential impacts are from a road that has been planned as part of the arterial municipal arterial road system, independent of the development.</li> <li>➤ The positive aspects of the development outweigh any of the minor and local negative impacts.</li> </ul> <p>The identified potential impacts on the wetlands, as also concurred by the wetland specialist, are of assessed as being acceptable and manageable, and are not fatal flaws which should prevent the development being implemented in the manner proposed.</p>
<p><b>Cumulative Catchment Impacts</b></p>	<p>Any major development will have impacts on the river catchment area within which it is situated. In this case, and after a range of criteria ar considered, these impacts are identified as</p>

	<p>being of low significance.</p> <p>Also, there are measures which can be applied to mitigate the potential negative impacts, and there are no negative impacts identified which are so significant as to prevent the development occurring in the manner proposed.</p>
<p><b>Air quality</b></p>	<p>Overall Assessment and concluding comments as to the predicted impacts after mitigation on air quality are as follows :</p> <ul style="list-style-type: none"> <li>➤ The most significant impacts are identified as being dust during construction, which can be mitigated. Construction will also be restricted to distinct phases.</li> <li>➤ During operation it is from vehicle emissions, some of which would occur without the development with the construction of the N3 Bellevue interchange and the main arterial roads. Vehicle emissions cannot be significantly mitigated.</li> <li>➤ Impacts will be local, and of low significance, and no impacts are identified which would pose as threat to the wellbeing or health of surrounding residents.</li> </ul> <p>Any potential impacts of the proposed development are assessed as being acceptable, and outweighed by the socio-economic benefits of the development.</p>
<p><b>Biodiversity</b></p>	<p>Overall Assessment and concluding comments as to the predicted impacts after mitigation on biodiversity concerns are that :</p> <ul style="list-style-type: none"> <li>➤ Negative impacts will occur that will be permanent within transformed areas within the development footprints.</li> <li>➤ The areas that are retained for conservation contain all of the areas of special species concern, and are sufficient in area to maintain the particular species of concern.</li> <li>➤ The overall conformation of the open spaces provides sufficient and suitable connectivity with the surrounding natural areas off the site.</li> <li>➤ The area of grasslands has been included as its own, separate conservation area to be managed for floral, rather wildlife, conservation. It is considered to be large enough to be sustainable in its own right. The requests of many of the interested and affected parties that it be included as private, as opposed to public, open space, has</li> </ul>

	<p>been acceded to.</p> <ul style="list-style-type: none"> <li>➤ The rehabilitation processes associated with the proposed development, and the ongoing protection of the areas of passive open space conservation</li> <li>➤ The benefits of providing the proposed development areas and their infrastructure is assessed as outweighing any negative biodiversity impacts associated with impacts on the of the site.</li> </ul> <p>The potential impacts on biodiversity are assessed as having been adequately mitigated in the development, and are assessed as being acceptable, and there are no impacts on biodiversity that are so significant as to prevent the development from occurring in the manner proposed.</p>
<p><b>Ecological goods and services</b></p>	<p>There will be some loss of ecological goods and services from the site related to developing it in the manner proposed, with the transformation of some presently vegetated areas. These losses are assessed as being of a minor nature, and mitigated by the nature of the proposed planning, design and operation of the proposed development.</p> <p>They are not significant enough to warrant preventing the development of the site from occurring in the manner proposed.</p>
<p><b>Impacts on the Lower Mpushini Valley Conservancy area</b></p>	<p>No significant negative impacts associated with the identified listed activities under EIA Regulation 546, or any other activities associated with the proposed development, are identified which would affect the Lower Mphushini Valley Conservancy Protected area.</p>
	<p><b>ON THE SOCIO-ECONOMIC ENVIRONMENT</b></p>
<p><b>Cultural Heritage</b></p>	<p>The Cultural Heritage Report indicates some of the farm buildings of value, where they would need to be incorporated into the development, of a permission obtained from Amafa for their destruction, and proceeds to be applied to the rest of the implementation of development on the site. No constraints on developing the site were identified, and the has been provided to Amafa for their comments.</p>

<b>Visual impacts</b>	<p>Overall Assessment and concluding comments as to the predicted impacts after mitigation are that :</p> <ul style="list-style-type: none"><li>➤ There will be permanent changes to the landscape with related visual impacts</li><li>➤ The relative significance of these impacts assessed as being moderate.</li><li>➤ There is the change in the visual appreciation of sense of place, with a mixed use development of this nature being assessed as being positively instrumental in creating a new sense of place of value.</li></ul> <p>The relative significance of visual impacts that are quantified spatially in an analysis, as to whether they are positive or negative, and the magnitude of the impacts is essentially subjective in nature.</p> <p>There is no doubt that the visual qualities will change due to the development, with the magnitude of the changes as being assessed in the specialist report as moderate.</p> <p>Mitigation listed above in this assessment are appropriate and significant in the circumstances of the site, and the nature of the proposed development.</p> <p>Based on the above, the visual impacts associated with the development, bearing in mind the positive socio-economic benefits associated with it, are assessed as being acceptable.</p>
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<b>Sense of place</b>	<p>Overall Assessment and concluding comments as to the predicted impacts on individuals' concepts of sense of place are that there will be changes to the sense of place with the proposed development.</p> <p>These changes will be perceived by the majority of residents surrounding the site as being positive, in particular if the mitigation measures to address their particular concerns are effectively applied.</p> <p>However, there will be strong negative perception of the change in the sense of place by a minority of residents.</p> <p>Within the context of the wider environment and community of Msunduzi, and the socio-economic benefits related to the development, and the fact that the majority of the surrounding residents are likely to consider the changes to sense of place favourably, the proposed development is assessed as being acceptable. There are also no issues or impacts associated with the changes in sense of place which should prevent it from being implemented in the manner proposed.</p>
<b>Infrastructure provision</b>	<p>The potential impact during the installation of infrastructure are dealt with under the sections dealing with construction impacts .</p> <p>The various specialist have confirmed that there is adequacy of supply, and identified that upgrades in the road and waste water disposal infrastructure that would have to occur at the developer's expense to permit certain phases of the development to occur.</p> <p>There are no problems associated with the provision of infrastructure which would prevent the development from occurring in the manner proposed.</p>

<p><b>General Socio – economic Impacts</b></p>	<p>Overall Assessment and concluding comments as to the predicted impacts are that:</p> <ul style="list-style-type: none"> <li>➤ Impacts are likely to be permanent</li> <li>➤ Impacts to be of a positive nature and high magnitude</li> <li>➤ Any identified negative biophysical / ecological or visual impact or other forms of impacts are considered to be far outweighed by the positive socio-economic impacts of the proposed development.</li> </ul> <p>Socio-economic impacts are therefore assessed as being not only acceptable, but highly desirable.</p>
<p><b>Loss of agricultural land</b></p>	<p>Overall Assessment and concluding comments as to the predicted impacts after mitigation and there:</p> <ul style="list-style-type: none"> <li>➤ Impacts on the site will be permanent</li> <li>➤ The impacts of the loss of agricultural land are negative, and of moderate significance.</li> </ul> <p>As illustrated in the Need and Desirability Report in terms of national, provincial and local growth strategies, and the very substantial socio-economic benefits predicted, the loss of agricultural land is significantly outweighed by these other positive socio-economic benefits, and therefore the proposed development is acceptable, and desirable.</p>
<p><b>Impacts of new roads on neighbouring properties</b></p>	<p><b>Of the Cleland Road Extension through Bellevue Suburb</b></p> <p>Overall Assessment and concluding comments as to the predicted impacts after mitigation are that :</p> <ul style="list-style-type: none"> <li>➤ Construction impacts will be moderate, subject to mitigation, of relatively short duration, will not occur outside of normal working hours.</li> <li>➤ Operational impacts will be permanent. The road is relatively</li> <li>➤ level, and within a wide road reserve, and the impacts are assessed as being low to moderate after mitigation. The road will provide access to a new areas with facilities and services, and a good new access to the N3 highway in time.</li> </ul> <p>The proposed road reserve is has been part of municipal planning for some time, as evidenced by its existence in the</p>

approved town planning scheme for the area. There are negative impacts of a road past a property where previously there was only open, vegetated land which are unavoidable. However, they are part of living within a suburb and in terms of what is zoned permitted within the planning for the area, and are considered acceptable within this context.

**Of the West – East arterial road on the site to the nearest properties in Ashburton**

During construction the mitigation measures are as included in the EMP, and would also include construction only occurring during normal working hours.

During operation mitigation measure to be applied include :

1. The earthworks associated with construction lowering the pavement off the road slightly, so that it is slightly sunken in comparison with the surrounding land levels.
2. The construction of an earth berm in the Ashburton side of the road reserve, to shield the affected properties from the noise and visual impacts. The road reserve is wide, and therefore should be able to accommodate such a berm.
3. The landscaping of the berm and all of the rest of the road reserve with appropriate dense vegetation, to further screen and / or soften the impacts of the road.
4. The development within eco-estate that the road traverses through would have all the existing indigenous vegetation retained, and this woodland type vegetation would also assist in mitigating the impacts of the road.

It is also to be noted that, as this road traverses through an eco-estate development on the site, there is an advantage of these mitigation measures for this part of the development as well.

5. It is to be noted that the alignment of the road loops away from the Ashburton properties, so that headlights of vehicles on the road do not point towards these properties. This, together with the proposed earthworking and landscaping measures would very significantly reduce any light intrusion.

**Of the most northern portion of the south – north arterial road on the neighbouring Erf 547 New England property**

Overall Assessment and concluding comments as to the predicted impacts after mitigation are that :

	<ul style="list-style-type: none"> <li>➤ There are no significant impacts identified on the wetland areas on the adjacent Erf 547, if the proposed arterial road is built on the site by the municipality in the future.</li> <li>➤ There are no significant impacts identified on the use and certification of the adjacent Erf 547 that are associated with the proposed Hilcove Hills development.</li> </ul>
<p><b>Recreational and educational</b></p>	<p>The site is currently private land, securely fenced off from the surrounding areas, with no permitted recreational or educational uses on the site.</p> <p>In the development there is a school site allocated close to the suburb of Bellevue, which would serve the residents of the proposed development, as well as residents in the suburb of Bellevue, if they so wished.</p> <p>An equestrian centre is planned in the development, and trails and hides within the wildlife reserve component of the development. The centre will be open to the general public, and the wildlife reserve area as well in a controlled manner, for example for members of particular groups such as Wildlife Society, Birdwatching or local conservancy members.</p> <p>The educational and recreational qualities of the site are therefore enhanced in the proposed development.</p>
<p><b>Ongoing environmental management and sustainability</b></p>	<p>As elaborated in the memorandum on the proposed end use ownership structure in appendix 15.18, there will be a properly constituted and formalised home ownership structure which will have as its responsibility the financing and management of the whole development, including the natural open space areas.</p> <p>This together with the guidelines in the operational section of the EMP, the involvement of Ezemvelo KwaZulu-Natal in the wildlife stocking and management, and other, aspects of these areas, should ensure the ongoing management and sustainability of the environmental and related conservation qualities of the site which are retained within proposed development.</p> <p>The formalisation of these environmental management aspects, in both spatial planning and operational management aspects, is to the advantage of the site.</p>



<b>In the assessment of alternatives</b>	<p><b>The assessment of alternative uses for the site</b> When considered as a whole, and taken a wider spectrum of considerations into account, backed by the contributions of the various specialist reports where appropriate, the proposed Hilcove Hills mixed use development is concluded to be the most appropriate land use development alternative, in comparison to the other alternatives that were included in the approved Plan of Study, and assessed within this report.</p> <p><b>The assessment of alternative sites</b> There assessment of potential alternative sites concludes that there is no other site as well suited to contain the proposed mixed use development as occurs on the applicant site.</p> <p><b>The assessment of alternative technologies</b> It is assessed that there has been a consideration of alternative technologies and approaches in the proposed development, and appropriate ones have been selected to be applied within it.</p>

### 12.3. CONCLUDING ENVIRONMENTAL IMPACT STATEMENT

The consideration and assessment of the alternatives, and the assessment of the proposed development permit the recommendation to be made that the proposed development is the needed and desirable land use alternative which should be implemented on the site, terms of the Site Layout Plan prepared by Rob Kirby and Associates, Plan No. 2915/WD21 dated 23 April 2012.

### 12.4. RECOMMENDATIONS

Within the implementation of the proposed development, it is recommended that :

1. The recommendations of the SSI specialist geotechnical report are applied during development implementation.
2. There are specialist follow up investigations of all development areas and other areas where infrastructure is to provided before construction occurs, and the recommendations of the vegetation specialist are to be applied in the detailed planning, construction and mitigation measures that will occur in these areas, in regard to protection and / or translocation of any species concern.
3. The recommendations and protocols prescribed in the Heritage Impact Assessment Report prepared by Umlando are reviewed in advance be the ECO with the contractor, and explained to the construction worker, to be

applied in the construction process. Any measures and conditions prescribed by Amafa are to be included in the EMPr, and also applied in the construction process.

4. The measures prescribed in the SSI Engineering Services Report be applied during the detailed planning and construction of the development.
5. The measures prescribed in the SSI Storm Water Management Report be applied in planning and construction of the development.
6. The Waste Management Licenses that will be required after for the proposed waste water treatment works from the national Department of Environment must be obtained before any construction and operation of the works may be proceeded with. All conditions of licensing associated with the Waste Management License must be adhered to.
7. That necessary road upgrades identified in the Traffic Impact Report of SSI as the developer's responsibility and cost are to be implemented in a phased way, as recommended in this report to serve the relevant phases of the development, and as identified in this Traffic Impact Report.
8. The conditions that are prescribed by the relevant traffic authorities are to be included in the design and implementation of the road upgrades are identified in the Traffic Impact Report as being the developer's responsibility.
9. The mitigation measures prescribed in the Wetlands Report of Sivest in regard to the protection and mitigation of impacts associated with road crossing, and the other measures associated with the arterial road construction to mitigate the impacts of these roads on affected properties adjacent to the site are to be applied in the design and construction of these roads.
10. No construction of those phases of the development dependent on the disposal of their waste water from the waste water disposal plant, as identified in the SSI Engineering Services Report, may occur before the granting of the Waste Management License for this works.
11. No occupation of any developments dependent on the disposal of waste water by means of the existing sewage reticulation works to the Darvil Waste Water Treatment Works may occur before the necessary sewage reticulation and sewage pump station upgrade is completed and operational.
12. The environmental sustainability and resource conservation measures provided in the Green Building Code Report produced by Iyer Urban Design be applied wherever technically and economically possible and practical in the development.
13. The design control measures and guidelines contained within the Architectural Report prepared by Vara Ross Architects be applied within the proposed development

14. That the management guidelines contained within the Vegetation Management and Wildlife Potential and Management Guidelines prepared by Le Roux and Grobler be applied to the management of all the passive open space areas of the development.
15. That all wildlife stocking of the wildlife reserve component of the development be done solely under the control and with the correct permitting processes of Ezemvelo KwaZulu-Natal Wildlife.
16. That the Agreement of Sale and Home Owners Association Rules Master Home Owners Association rules and the Local Home Owners Association Rules the various development components within the overall development, as described in the proposed End Use Ownership Structure prepared in the Memorandum by Laurusco Developments ( Pty ) Ltd have the necessary conditions included to ensure that they financially contribute in an appropriate manner to the management and maintenance of the open spaces within the development, and that there are appropriate rules which protect the wildlife reserve open space area from their behaviour ( to include, but no necessarily restricted to such aspects as : Control of lighting, not collecting, disturbing, hunting or poaching any natural resources, exclusion or management of certain pets )
17. That the measures contained in the Environmental Management Programme (EMPr) prepared by Guy Nicolson Consulting cc be applied during the implementation and operation of this proposed development.
18. That an Environmental Control Officer be appointed by the applicant, with the approval of the DAEARD, to provide guidance to and monitor , audit and report on the implementation of the measures contained within the EMPr to the KwaZulu-Natal Department of Agriculture, Environmental Affairs and Rural Development.

### **13. THE NEXT STEPS IN THE EIA PROCESS**

This EIA report will be made available to all registered interested and affected parties in the following manner:

1. For those without email addresses a copy will be placed in the Ashburton Public Library, and these parties will be advised of its availability there by post. This copy will also include a full size development layout plan of with it.
2. Email addresses are available for majority of the private interested and affected parties. Therefore, copies of the report will be provided to all these parties by email. They will also be advised of the availability of a hard copy of the report with its associated full size development layout plan at the Ashburton Library.
3. Hard copies of this EIA report will be provided to the following government organisations with a request for their comments to be provided, so that they can also be taken into account in the EIA process.
  - a. Department of Water Affairs: Directorate of Water Quality Management.
  - b. Ezemvelo KwaZulu-Natal Wildlife
  - c. KwaZulu-Natal Department of Transport
  - d. Msunduzi Local Municipality
  - e. South African Roads Agency Limited
  - f. uMgungundlovu District Municipality

Any written comments from the above parties will be requested to be provided within 30 days of receiving this EIA report. Any follow interactions and meeting with these authorities will occur as may be required.

A copy of this EIA report will also be provided to the KwaZulu-Natal Department of Agriculture, Environmental Affairs and Rural Development, as the competent authority responsible for administering the EIA process.

Any comments received on this EIA report will also be forwarded to these environmental authorities for their consideration in the EIA process.



**Guy Nicolson**

*MSc (Environmental Planning); Pr.Sci.Nat.; M.S.A.I.E & E.S*  
GUY NICOLSON CONSULTING

## **14. LIST OF FIGURES**

- 1. SITE LOCATION PLAN**
- 2. AERIAL PHOTOGRAPH OF THE SITE WITH CONTOURS**
- 3. GEOLOGY OF THE SITE**
- 4. SLOPE ANALYSIS OF THE SITE**
- 5. ASPECT ANALYSIS OF THE SITE**
- 6. LOCATION OF THE SITE WITHIN THE MKHONDENI STREAM CATCHMENT AREA**
- 7. HYDROLOGY OF THE SITE**
- 8. DELINEATION OF WETLANDS EXISTING ON THE SITE**
- 9. ECOLOGICAL UNITS OF THE SITE**
- 10. AGRICULTURAL POTENTIAL OF THE SITE**
- 11. THE PROPOSED DEVELOPMENT LAYOUT PLAN**
- 12. EXAMPLES OF THE APPLICATION OF THE ARCHITECTURAL DESIGN CODE**
- 13. CORE AREAS OF FLORAL CONSERVATION SUPERIMPOSED ONTO THE ORIGINAL AND AMENDED LAYOUT PLANS**
- 14. CORE AREAS FOR FAUNAL CONSERVATION SUPERIMPOSED ONTO ORIGINAL AMENDED LAYOUT PLANS**
- 15. CONCLUDING ANALYSIS OF THE VISUAL IMPACT ASSESSMENT REPORT**
- 16. THE ECO-ESTATE ALTERNATIVE LAND USE**
- 17. THE SMALL HOLDING ALTERNATIVE LAND USE**
- 18. THE LOW COST SOCIAL HOUSING ALTERNATIVE LAND USE**
- 19. THE COMMERCIAL AND LIGHT INDUSTRIAL LAND USE ALTERNATIVE FOR THE SITE**
- 20. PLAN OF THE MOST DESIRABLE LAND USES FOR THE MKHONDENI STREAM CATCHMENT FROM THE STRATEGIC ENVIRONMENTAL ASSESSMENT REPORT**

## **15. LIST OF APPENDICES**

- 15.1. PUBLIC PARTICIPATION DOCUMENTATION:
  - 15.1.1. REGISTER OF INTERESTED AND AFFECTED PARTIES AND**
  - 15.1.2. CORRESPONDENCE RECEIVED AFTER THE CIRCULATION OF THE FINAL SCOPING REPORT****
  
- 15.2. COMMENTS RECEIVED FROM ORGANISATIONS WITH PIPELINE SERVITUDES
  - 15.2.1. FROM TRANSNET PIPELINES**
  - 15.2.2. FROM UMGENI WATER****
  
- 15.3. GEOTECHNICAL REPORT**
  
- 15.4. WETLAND DELINEATION AND FUNCTIONAL ASSESSMENT REPORT**
  
- 15.5. BIODIVERSITY ASSESSMENT REPORT**
  
- 15.6. AGRICULTURAL POTENTIAL REPORT**
  
- 15.7. CULTURAL HERITAGE REPORT**
  
- 15.8. TOWN PLANNING REPORT**
  
- 15.9. NEED AND DESIRABILITY AND SOCIO-ECONOMIC REPORT AND ADDENDUM TO NEED AND DESIRABILITY REPORT**
  
- 15.10. BULK SERVICES – ENGINEERING SERVICES REPORT**
  
- 15.11. STORM WATER MANAGEMENT PLAN**
  
- 15.12. ELECTRICAL AND ANCILLARY SERVICES REPORT AND ELECTRICAL GREEN DESIGN REPORT, AND LETTER FROM ESKOM CONFIRMING ABILITY TO SUPPLY ELECTRICITY**
  
- 15.13. GREEN BUILDING CODE**
  
- 15.14. TRAFFIC IMPACT ASSESSMENT**
  
- 15.15. AIR QUALITY IMPACT ASSESSMENT**
  
- 15.16. VISUAL IMPACT ASSESSMENT REPORT**
  
- 15.17. SENSE OF PLACE REPORT**
  
- 15.18. PROPOSED END USE OWNERSHIP STRUCTURE**
  
- 15.19. ARCHITECTURAL DESIGN REPORT**
  
- 15.20. VEGETATION, WILDLIFE POTENTIAL AND MANAGEMENT GUIDELINES**
  
- 15.21. DRAFT ENVIRONMENTAL MANAGEMENT PROGRAMME**