

# WATER USE LICENSE APPLICATION REPORT

BY

**KROONVLEI WILDERNES ESTATE**



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# **WATER USE LICENSE APPLICATION REPORT**

**WH06092 – Licencing Kroonvlei**

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## TABLE CONTENTS

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	Page
<b>1. PROJECT DESCRIPTION .....</b>	<b>1</b>
<b>2. MERIT OF APPLICATION.....</b>	<b>2</b>
2.1 Criteria of Assessment .....	2
2.2 Engineering/Infrastructural Services .....	2
2.2.1 Electrical service .....	2
2.2.2 Civil engineering services .....	4
2.3 Geotechnical Considerations.....	8
2.4 Floodplains and Wetland Areas .....	9
2.4.1 Floodplain demarcation.....	9
2.4.2 Wetland/Sponge areas .....	10
2.5 Agricultural potential .....	11
2.6 Environmental considerations .....	12
2.6.1 Relative importance.....	12
2.6.2 Environmental issues investigated .....	13
2.6.3 Conclusions : Environmental scoping study .....	14
2.7 Official plans, policies & strategies .....	16
2.7.1 Modimolle integrated development plan.....	16
2.7.2 Modimolle spatial development framework (SDF) .....	18
2.7.3 National Water Resources strategy .....	18
<b>3. WATER USES.....</b>	<b>19</b>
<b>4. IMPACTS OF THE PROPOSED WATER USES.....</b>	<b>22</b>
<b>5. PUBLIC CONSULTATION .....</b>	<b>23</b>
<b>6. LIST OF DOCUMENTS .....</b>	<b>23</b>

## **REFERENCES**

### **FIGURES**

FIGURE 1:	Site Locality Map
FIGURE 2:	Settlement Plan of Land development Area 1
FIGURE 3:	Settlement Plan of Land development Area 2
FIGURE 4:	Stream crossings

### **TABLES**

TABLE 1:	Section 21 water uses and associated details
TABLE 2:	Water uses to be authorized

### **APPENDICES**

APPENDIX A:	CORRESPONDENCE WITH DWA
APPENDIX B:	SURFACE WATER QUALITY
APPENDIX C:	HYDROGEOLOGICAL REPORT
APPENDIX D:	ENVIRONMENTAL AUTHORISATION AND ENVIRONMENTAL MANAGEMENT PLAN
APPENDIX E:	APPROVAL OF THE DEVELOPMENT BY THE DFA TRIBUNAL
APPENDIX F:	AUTHORITIES APPROVALS
APPENDIX G:	SECTION 27 MOTIVATION
APPENDIX H:	PROPOSED RIVER CROSSING DESIGNS
APPENDIX I:	DWA FORM 758
APPENDIX J:	SECTION 21(A) FORMS DW760, DW784, DW789
APPENDIX K:	SECTION 21(C) FORMS DW763
APPENDIX L:	SECTION 21(I) FORMS DW768
APPENDIX M:	SECTION 21(F) FORMS DW766
APPENDIX N:	SECTION 21(G) FORMS DW767
APPENDIX O:	SUPPLEMENTARY FORMS DW901, DW902, DW905
APPENDIX P:	RESOLUTIONS AND ID DOCUMENTS
APPENDIX Q:	KOONVLEI WILDERNESS ESTATE LAND OWNERS ASSOCIATION NPC REGISTRATION DOCUMENTS
APPENDIX R:	TITLE DEEDS

## **WATER USE LICENCE APPLICATION REPORT**

### **1. PROJECT DESCRIPTION**

The proposed Kroonvlei Private resort is located some 20 kms west of the town of Modimolle in the Waterberg District of the Limpopo Province (see figure 1). The development will be located on the following properties, viz:

- Remainder portion of portion 1 of the farm Zuurvlei 403KR, 724.2606ha, owned by Mrs B Schreuders.
- Portion 7 (a portion of portion 6) of the farm Zuurvlei 403KR, 256.9596ha, owned by Mrs B Schreuders.
- Portion 2 of the farm Zuurvlei 403KR, 655.4683ha, owned by Mr Bruno Cigana.
- Remainder portion of portion 6 (portion of portion 1) of the farm Zuurvlei 403KR, 428.2660ha, owned by Mr Rudo Goss.

The total area is 2 064.9545ha.

The project has been divided into 2 land development areas, viz:

- Land Development area 1, consisting of 14 private dwellings, 1 corporate dwelling unit, a stand for a cultural village, 3 managers houses, staff accommodation and out buildings for maintenance and equipment required for the resort, with the remainder of the property to be used for agriculture, open space, conservation and recreation. See figure 2.
- Land Development area 2, consisting of 47 private dwellings, 3 corporate dwelling unit, 2 sites for existing graves, with the remainder of the property to be used for agriculture, open space, conservation and recreation. See figure 3.

## 2. MERIT OF APPLICATION

### 2.1. CRITERIA OF ASSESSMENT

The application is motivated by means of the assessment of the development proposal against, and / or in terms of certain fundamental criteria. The criteria employed include the following:

- \* Engineering / infrastructural services
- \* Geotechnical considerations
- \* Floodplains and wetland areas
- \* Environmental considerations
- \* Official plans, policies and strategies
- \* Chapter 1 DFA-principles
- \* Agricultural potential
- \* Tourism infrastructure

Each of these criteria are now used to measure the particular development proposal against, and a conclusion drawn with regards to its desirability and /or sustainability.

### 2.2. ENGINEERING / INFRASTRUCTURAL SERVICES

Two services reports have been compiled by the project electrical and civil engineers respectively.

#### 2.2.1. Electrical service

The document underpinning the discussion on the provision of electricity to the proposed development project was prepared by messrs Burotech Consulting Engineers in May 2006, and is titled :-

*'Services Report. Electrical Reticulation. Proposed Private Resort & Residential Development Bateleur Wilderness Estate on Portions 1, 2, 3, 6 and 7 of*

*Farm Zuurvlei – 403 KR and on a portion of the Remainder of Farm Rhenosterpoort 402 KR.*

It is confirmed in the report that ESCOM will be the service provider to the proposed development.

The existing overhead 22kV transmission lines on the eastern side of the Property will possibly not be suitable for the development, due to questionable capacity (has yet to be verified) and voltage depression problems being experienced currently. A similar overhead line on the western side of the development site can possibly be used to serve part of the development. The report states that :-

*'A new Chikadee type overhead line must be constructed for approximately 15km from the Kareefontein substation to cater for new development in the area. The costs can be shared by the various developments, such as on the Tshepe farm' (p.2)*

The project electrical engineers estimate the electrical load for the project to be around 1 500kVA, using a 5kVA After Diversity Maximum Demand (ADMD) per household and making allowance for electricity to the gatehouse, stables, clubhouse, etc. Due to the nature of the proposed development, the report states that ... *'The maximum occupancy rate can be as low as 50% which results in a maximum demand of approximately 800kVA for the total development'*.

The report states that connection points will be obtained from both existing overhead lines to the east and west of the

development site, by means of 22kV switch-gear, with a medium-voltage metering panel, from where the developer will reticulate the cables underground.

The engineers confirm that the on-site electrical reticulation system will comprise of an underground 11kV or 3,3kV low voltage system with 11kV / 415V or 3,3kV / 415V mini-substations from which 415V low-voltage will be fed inside the development area. Pre-paid metering will be available to each end-user.

**In conclusion, it is evident that the electricity will be available in bulk to the proposed development, to be supplied by, and planned in conjunction with ESKOM. Furthermore a feasible reticulation system been proved.**

#### **2.2.2. Civil engineering services**

The information here quoted was obtained from the civil services report for the project prepared by messrs PVA Consulting Engineers CC during May 2006, titled :

*‘Civil Engineering Services Report on Portions 1, 2, 3, 6 & 7 of Farm Zuurvlei 403 KR and a certain portion of Remainder of Farm Rhenosterpoort 402 KR, in the Modimolle Municipal Area, Limpopo Province. “Bateleur Wilderness Estate”.*

- \* **Water** : Bulk water will be sourced from boreholes, of which there are presently two on the development site which have been tested for the purpose. The project

engineers base their information on a specialist geohydrological report prepared by messrs WSM Leshika titled :-

*'Hydrogeological Report for the Proposed Kroonvlei Private Resort. Modimolle Area'. (March 2012)*

The boreholes tested proved a yield of 246 kilolitres per day (kl/d). The project engineers estimate the peak and off-peak water demand for the project to be around 110 kl/d and 45 kl/d respectively. (The latter is based on a 25% occupancy rate).

The yield from the two boreholes tested are considered to be adequate for purposes of the proposed development. Water storage tanks will furthermore be employed to ensure 48-hours reserve capacity at any point in time.

The above figures quoted prove the feasibility of water provision to the new development.

The geohydrological report estimates the sustainable yield from groundwater sources to be around 232m<sup>3</sup>/ day, which exceeds the peak demand (at full occupancy) of the proposed resort / estate. It furthermore confirms the quality of the water to be excellent for human consumption purposes. See Appendix C

With regards to the on-site reticulation of water, the project engineers propose two ring / circular route pipelines. The first will serve LDA 1 as well as all

communal facilities (e.g. entrance gates, cultural village, etc.), while the second will serve LDA 2.

**In conclusion, it is evident that sufficient water has been proven for the project. Water storage tanks and on-site water reticulation will be strategically positioned / installed, as per engineering design. Water quality has been found to be excellent, i.e. suitable for human consumption.**

- \* **Sewerage** : The project engineers recommend that a closed package plant system like the Lillyput system be employed at each house.

Provision will be made in the design of the system for 900 litres of sewerage effluent to be disposed of per household daily. Purified water from each treatment plant will be discharged to the closest stream, with special care to the prevention of erosion at the points of discharge.

Sewage sludge will be disposed of at the licensed Modimolle Waste site

**The proposed system provides a proven environmentally sensitized sewerage disposal method which will also in this instance ensure the long term sustainability of the project from this point of view.**

- \* **Roads** : As discussed earlier, all internal roads will remain gravel, and will only be surfaced where steep gradients are encountered, and then only in an environmentally acceptable way. All river / stream crossings are marked in figure 4 and proposed designs are given in Appendix H.

In conclusion the upgrading of, and limited extension of existing roads prove feasible for purposes of the proposed development. All stream crossings will be licensed. It is also confirmed that the use and improvement of existing accesses to the development site has been supported by the Roads Authority Limpopo (RAL) see Appendix F.

- \* **Stormwater** : Sheet-wash stormwater run-off will be discharged on the surface, with special care to potential erosion problems which could arise.

**Stormwater is hence not regarded as potentially problematic, and by handling same in accordance with sound environmental practices, this aspect of the resort / estate can also be proven feasible.**

- \* **Domestic refuse** : All refuse generated in the private resort / estate will be sorted, collected transported and disposed of at a registered / licenced municipal landfill site, by a private contractor. The Modimolle Municipality has been approached with an official request to permit their landfill / dumping site to be used for this purpose.

The Municipality has previously granted permission for similar resorts / estates to dispose of its domestic refuse at its dumping site. Should this be the case here too, **the proposed development will also prove feasible from the viewpoint of refuse removal.**

### 2.3. GEOTECHNICAL CONSIDERATIONS

A combined geotechnical and geohydrological desk-top study was conducted for the development site by messrs PVS Environmental Services in December 2005, titled :-

*‘A Geohydrological & Geotechnical Site Investigation for the proposed Bateleur Private Resort Development on Portions 1, 2, 3, 6 & 7 of the Farm Zuurvlei 403 KR and the Remainder of the Farm Rhenosterpoort 402 KR in the Modimolle Municipal Area, Limpopo Province’.*

The sub-surface geology of the terrain comprises of :-

- \* sandstone (medium to course grained)
- \* pebblestone
- \* tuffaceous greywacke
- \* siltstone
- \* shale
- \* conglomerate

The above being of the Swaershoek Formation of the Nylstroom Subgroup of the Waterberg Group and Nebo Granite of the Lebowa Granite Suite of the Bushveld Complex, consisting of :-

- \* course grained granite (grey to pink)
- \* volcanic rock
- \* sandstone
- \* quartzite

**The conclusion drawn in the report is as follows :-**

***'The area does not reflect any risk for the formation of sinkholes caused by the presence of soluble rocks (dolomite or limestone). There is no evidence of previous mining activity beneath the site'.***

Messrs Louis Kruger Geotechnics CC in July 2006 expanded the information base by their desk-top study titled :

*'Report on the reconnaissance engineering geological investigation for the proposed private resort situated on the Remainder of the Farm Rhenosterpoort 402 KR and Portions 1, 2, 3, 6 & 7 of the Farm Zuurvlei 403 KR'.*

The report makes mention of expandable soils near water drainage channels, collapsible sand over the entire property and the possibility of perched water tables which may inhibit construction activities during the rainy season. Suitable construction methods to counter differential movements caused by expansion / contraction and collapsing soils are recommended.

## **2.4. FLOODPLAINS AND WETLAND AREAS**

### **2.4.1. Floodplain demarcation**

Messrs African Innovative Solutions and Projects CC concluded a floodline study for the development site in May 2006, titled :-

*'Zuurvlei 403-KR (Bateleur) 50 & 100-year Floodline Study'.*

Based on a hydrological assessment of the development site seven (7) tributaries to the Sand River as well as the latter itself were identified and subjected to the so-called Hecras Model Output, as explained fully in the accompanying report. It was concluded that :-

- \* the floodplains, defined by the 1:50 and 1:100-year floodlines cover a small percentage of the site; and
- \* no stands in the development would fall within the 1:100 year floodlines.

Both the 1:50 and 1:100-year floodlines as prepared by these specialists are now reflected on the site layout plan. See figures 2 and 3

#### **2.4.2. Wetland / sponge areas**

Dr Buks Henning of Envirodel Ecological and Wildlife Management Services conducted a wetland demarcation exercise as part of a wider study titled :-

*‘An Environmental Report on the Agricultural Potential of Soils and Wetland Delineation on the Farm Zuurvlei 403-KR as part of the proposed Bateleur Wilderness Estate Development’ (April 2006)*

The demarcation process of wetlands on the site was informed by the requirements of the Department of Water Affairs and Forestry (DWAF), more specifically the document known as ...’A

*practical field procedure for identification and delineation of wetlands and riparian areas’.*

According to the report there are two main wetland areas prevalent on the site. The first is situated on the eastern parts of the site, closely associated with the Sand River, and the second on the south-western parts of the site, associated with the southern-most east / west tributary of the Sand River. Each of these wetlands were divided in permanent, seasonal and temporary zones, which were demarcated geographically based on a set of criteria discussed extensively in the report.

It should be noted that due cognizance was given to the presence of these wetland areas on the site, in the site layout planning process. No private lodge stands or communal buildings / structures will consequently be situated within any of these wetland areas. Where road-building or improvement of roads / tracks in the resort / estate have to traverse wetland areas, the recommendations in this regard in the report will be strictly adhered to.

**In conclusion it can be stated that the wetland areas prevalent in the land development area will be preserved / conserved and treated with great sensitivity *a pro pos* road-building. No other developments will be situated in the demarcated wetland areas.**

## **2.5. AGRICULTURAL POTENTIAL**

The same report by dr Buks Henning quoted in par 4.4 *supra*, dealt with the agricultural potential of the area under consideration for a private resort / estate.

Based on guidelines provided for determining of the agricultural potential of a property by the National Department of Agriculture a combined desk-top and field survey investigation concluded that, taking cognizance of all the required criteria in combination, the proposed land development area has **low** agricultural potential.

*‘The results indicate that the agricultural potential of soils on the development sites can be considered as low in general, due to either being shallow and rocky (central and western portions), or deep and sandy (eastern areas, excluding wetland zones) in the development zones’.*

*‘The only agricultural activity to be considered as being a viable option under the current climatic conditions is grazing by game species, especially considering the veld conditions to be quite diverse’.*

## **2.6. ENVIRONMENTAL CONSIDERATIONS**

### **2.6.1. Relative importance**

The importance of the Draft Scoping Report submitted as part of the DFA-application in term of the requirements of Regulation 31 cannot be over-emphasized. As explained earlier, the environmental evaluation / assessment of the development site, as well as other related matters lie at the core of the environmental sustainability of the proposed new residential estate. The overall development concept as well as the detailed lay-out planning of the terrain are the result of an inter-active process between the project environmentalists and the town-planning consultants.

The fact is that the expert studies by all the other consultants, as well as several sub-consultants to the environmental process *per se* have all contributed to, and informed the resultant environmental conclusions and ‘recommendations,’ the importance of which is paramount to the project.

### 2.6.2. Environmental issues investigated

The issues which were regarded as potentially most significant from the perspective of the proposed development area are as follows :

- \* Fauna and flora
- \* Geotechnical and geohydrological
- \* Archeological and cultural / historical

Potentially **negative** impacts investigated include the following:

- \* Water usage could come under additional pressure
- \* The resort / estate could change the character of the area (sense of place)
- \* Increased threat of surface and ground water pollution
- \* Deterioration of gravel roads due to increased traffic loads
- \* Potential loss of agricultural land
- \* Potential disturbance / deterioration of the on-site flora component

- \* Potential disturbance / deterioration of the fauna component and destruction of its natural habitat.

Potentially **positive** impacts identified include the following :

- \* the proposed eco-resort is commensurate with the character of the wider area in which it is situated, and will add to the prosperity of the region in general
- \* Implementing the resort / estate will generate funds for conservation of *inter alia* the wetlands areas and maintenance of the game farm (e.g. fire control)
- \* Employment opportunities will be created during the construction phase
- \* Partially destroyed wetland areas will be rehabilitated with consequent enhancement of bird and faunal life associated with same
- \* Economic advantages will result, due to capital investment, requiring e.g. purchasing of building materials locally
- \* The rates and taxes base of Modimolle Municipality will be expanded

### 2.6.3. Conclusions : Environmental Scoping Study

The following verbatim excerpt from the Executive Summary of the environmental report serves to allude to the conclusions recorded, following the requisite investigation / study :

*‘Scoping Report. Proposed Development of a Private Resort Development on Portions 1, 2, 3, 6 and 7 of the Farm Zuurvlei 403 KR and the Remainder of the farm Rhenosterpoort 402 KR in the Modimolle Municipal Area, Limpopo Province’.*

- *‘No sensitive environmental components occur within the study area that could influence the viability of the proposed resort development.*
- *It is expected that no significant negative impact that could not be mitigated to acceptable levels should occur as a result of the project.*
- *It is trusted that all measurable measures were undertaken to obtain the input from interested and affected Parties during the Public Participating Programme and that all reasonable concerns are correctly documented and satisfactorily addressed in the Environmental Scoping Report.*
- *The loss of specific areas for the houses is insignificant when compared to the opportunity to develop and maintain the larger area as a conservation unit.*

- *The Consultant is confident that additional environmental information not included in this document will not change the viability of the project and therefore trust that no further studies would be required’.*
- *An ROD from the Department of Economic Development, Environment and Tourism has been obtained and an Environmental Management plan has been set up. See Appendix D.*

## **2.7. OFFICIAL PLANS, POLICIES & STRATEGIES**

### **2.7.1. Modimolle Integrated Development Plan, 2005/6**

One of the strategic forward planning documents guiding development in the Modimolle Municipal Area, is the Modimolle Integrated Development Plan (IDP). In terms of appropriate guidelines the IDP accentuates the following aspects :

- \* subscription to the general principles of development as per Chapter 1 of the DFA;
- \* the need for job and income creation, especially for poverty–stricken communities;
- \* the need to exploit rural opportunities for tourism and recreation–related businesses and activities, without adversely affecting *inter alia* high-potential agricultural land;

- \* encouragement to farmers / developers to facilitate land ownership / tenure to labourers and other previously disadvantaged individuals / families;
- \* the tendency of substituting flailing cattle farming practices for more lucrative game farming, with or without associated tourism development, is acknowledged;
- \* the economic advantages to Modimolle town (notably the business sector) ensuing from resort and recreational developments in near-by rural areas, are acknowledged and encouraged;
- \* the *'attractive natural surroundings of the Modimolle town are, and will in future be one of the Municipality's strongest attributes. It provides a strong....marketing tool that could provide impetus to various development actions'*. (IDP, p 185);
- \* the fact that nature conservation is expensive and public sector finances restricted will require / necessitate development in rural areas to generate funding for same.

Due to its close proximity to Modimolle town ( $\pm$  20 km westwards), the latter will undoubtedly derive economic 'spin-offs' from the proposed development. Job and income creation, especially during the construction phase, will furthermore lead to another aim of the IDP being met. The proposed development will not be established on high-potential agricultural land, and will funds generated from the development be partially ploughed back into :

- \* conservation (e.g. rehabilitation of wetlands, eradication of alien species); and
- \* establishing a ‘cultural village’ for staff members, which will be transferred to a trust (± 62ha), owned by previously disenfranchised members of the community.

Previous cattle and crop farming operations have caused excessive damage to the natural environment (e.g. over grazing, crop fields in wetland and floodplain areas), which will now be restored and enhanced.

**It is therefore evident that the proposed development will conform to the appropriate guidelines extracted from the Modimolle IDP, as discussed above. As such it will make a valuable contribution to the local and regional economy, with associated job and income creating being additional advantages.**

#### **2.7.2. Modimolle Spatial Development Framework (SDF)**

It is our contention that the proposed development will be commensurate with the provisions / proposals contained in the Modimolle SDF.

#### **2.7.3. National Water Resources Strategy**

The proposed water uses fall within the National Water Resources Strategy which promotes the use of local water resources. Further the Internal Strategic Perspective for the Mogol catchment acknowledges that groundwater in the area is still underutilized. See Appendix G, Section 27 motivation.

**It is therefore evident that the proposed development will conform with the National Water Resources Strategy.**

### **3. WATER USES**

The applicant requires authorisation for the following water uses:

- (a) Section 21(a) – Taking of water (abstraction of groundwater from 2 boreholes on site);
- (b) Section 21(c) – Impeding or diverting the flow in a water course (7 river crossings have been identified);
- (c) Section 21(i) – Altering the beds, banks course or characteristics of a water course (7 river crossings have been identified where low level structures will be built);
- (d) Section 21(f) – Discharging waste or water containing waste into a water resource through a pipe, canal, sewer, sea outfall or other conduit. (Each of the 68 houses will have their own sewage package plant which will treat the effluent to DWA standards and then release the water in the closest stream);
- (e) Section 21(g) – Disposing of waste which may detrimentally impact on a water resource. (Each of the 68 houses will have their own sewage package plant which will treat the effluent to DWA standards and then release the water in the closest stream. The sludge will be disposed of at the licensed Modimolle Waste Site);

Table 1: Section 21 water uses and associated details

<b>Section 21(a) – Taking water</b>					
<b>Name of point</b>	<b>Water Resource</b>	<b>Water Use</b>	<b>Co-ordinates</b>	<b>Volume/year</b>	<b>Method</b>
ZV-1	Groundwater	Domestic	24.6862 <sup>0</sup> S 28.1958 <sup>0</sup> E	66 065m <sup>3</sup>	Submersible Pump
ZV-5	Groundwater	Domestic	24.6934 <sup>0</sup> S 28.2093 <sup>0</sup> E	23 725m <sup>3</sup>	Submersible Pump

<b>Section 21(c) – Impeding or diverting the flow in a water course</b>			
<b>Impeding Point</b>	<b>Co-ordinates</b>	<b>Impeding Structure</b>	<b>Reason for structure</b>
Stream Crossing 1	24.68761 <sup>0</sup> S 28.22489 <sup>0</sup> E	Low level causeway	Road crossing (entrance)
Stream Crossing 2	24.68481 <sup>0</sup> S 28.22462 <sup>0</sup> E	Low level causeway	Road crossing
Stream Crossing 3	24.68972 <sup>0</sup> S 28.21897 <sup>0</sup> E	Low level causeway	Road crossing
Stream Crossing 4	24.68336 <sup>0</sup> S 28.21573 <sup>0</sup> E	Low level causeway	Road crossing
Stream Crossing 5	24.69231 <sup>0</sup> S 28.20797 <sup>0</sup> E	Low level causeway	Road crossing
Stream Crossing 6	24.69343 <sup>0</sup> S 28.20925 <sup>0</sup> E	Low level causeway	Road crossing
Stream Crossing 7	24.67375 <sup>0</sup> S 28.21482 <sup>0</sup> E	Low level causeway	Road crossing

<b>Section 21(i) – Altering the beds, banks course or characteristics of a water course</b>			
<b>Impeding Point</b>	<b>Co-ordinates</b>	<b>Alteration</b>	<b>Reason for alteration</b>
Stream Crossing 1	24.68761 <sup>0</sup> S 28.22489 <sup>0</sup> E	Low level causeway through Bank and riverbed.	Road crossing (entrance)
Stream Crossing 2	24.68481 <sup>0</sup> S 28.22462 <sup>0</sup> E	Low level causeway through Bank and riverbed.	Road crossing
Stream Crossing 3	24.68972 <sup>0</sup> S 28.21897 <sup>0</sup> E	Low level causeway through Bank and riverbed.	Road crossing
Stream Crossing 4	24.68336 <sup>0</sup> S 28.21573 <sup>0</sup> E	Low level causeway through Bank and riverbed.	Road crossing
Stream Crossing 5	24.69231 <sup>0</sup> S 28.20797 <sup>0</sup> E	Low level causeway through Bank and riverbed.	Road crossing
Stream Crossing 6	24.69343 <sup>0</sup> S 28.20925 <sup>0</sup> E	Low level causeway through Bank and riverbed.	Road crossing
Stream Crossing 7	24.67375 <sup>0</sup> S 28.21482 <sup>0</sup> E	Low level causeway through Bank and riverbed.	Road crossing

<b>Section 21(f) – Discharging waste or water containing waste into a water resource through a pipe, canal, sewer, sea outfall or other conduit.</b>			
<b>Discharge Point</b>	<b>Location</b>	<b>Type of waste</b>	<b>Average volume discharged per year</b>
Downstream of all houses	See figures 2 and 3	Treated sewage effluent.	10 698m <sup>3</sup>

<b>Section 21(g) – Disposing of waste which may detrimentally impact on a water resource.</b>			
<b>Waste generation Point</b>	<b>Location</b>	<b>Type of waste</b>	<b>Location of disposal</b>
All houses	See figures 2 and 3	Sewage Sludge.	Modimolle Waste site

In summary with reference to the above, the following water uses should be authorised, as defined in Section 21 of the National Water Act, 1998 (Act 36 of 1998), associated with the Kroonvlei Wilderness Estate . These are listed below.

Table 2: Water Uses to be authorised

<b>Water Use</b>	<b>Activity</b>	<b>Type of Authorisation</b>
Section 21(a) water use	Abstraction from boreholes (ZV-1, ZV-5)	License
Section 21(c) water use	Impeding the flow in a water course at 7 road crossings	License
Section 21(i) water use	Altering the beds, banks course or characteristics of a water course at 7 road crossings	License
Section 21(f) water use	Discharging waste or water containing waste into a water resource at each house	License
Section 21(g) water use	Disposing of waste (sewage sludge) which may detrimentally impact on a water resource at Modimolle Waste Site.	License

#### 4. IMPACTS OF THE PROPOSED WATER USES

##### 4.1 Taking water from a water source – Groundwater Abstraction

If abstraction is limited to the sustainable yield as recommended the impact on neighbours should be negligible. Limiting the drawdown to 5m in normal rainfall years and to 10m in drought years should also not adversely affect the environment.

The sustainable yield taking droughts into account is estimated as 84 992 m<sup>3</sup>/annum or 232 m<sup>3</sup>/day.

The maximum demand for the development is estimated as 110 m<sup>3</sup>/day.

Based on the guidelines for groundwater abstraction this application can be classified as a category A, i.e. small scale abstraction (<60% recharge used on property). Based on the preliminary calculations above, it may be concluded that there is sufficient rainfall recharge in the sub-catchment to sustain the envisaged water supply of 110 m<sup>3</sup>/day and that the impact will be minimal.

4.2 Disposing of waste water which may detrimentally impact on the water resource

The sewage and wastewater will be treated in a closed system to DWA standards. This treated effluent will then be released into the adjacent streams.

As the soils in the area are sandy they would provide a good natural filter and the treated effluent is therefore not expected to have a significant impact on the water resources.

## 5. PUBLIC CONSULTATION

In summary, the following public consultation was undertaken as part of the environmental scoping process:

- All adjacent landowners were contacted and provided with an information letter of the proposed Kroonvlei Wilderness Estate Development
- Advertisement was placed in the local newspaper

No objections were received with regards to the proposed development.

## 6. LIST OF DOCUMENTS

The following documents are attached:

- Appendix A: Correspondence with DWA

- Appendix B: Surface Water Quality
- Appendix C: Hydrogeological Report
- Appendix D: Environmental Authorisation and Environmental Management Plan
- Appendix E: Approval of the Development by the DFA Tribunal
- Appendix F: Authorities approvals
- Appendix G: Section 27 Motivation
- Appendix H: Proposed river crossing Designs
- Appendix I: DWA form 758
- Appendix J: Section 21(a) forms DW760, DW784, DW789
- Appendix K: Section 21(c) forms DW763
- Appendix L: Section 21(i) forms DW768
- Appendix M: Section 21(f) forms DW766
- Appendix N: Section 21(g) forms DW767
- Appendix O: Supplementary forms DW901, DW902, DW905
- Appendix P: Resolutions and ID documents
- Appendix Q: Koonvlei Wilderness Estate Land Owners Association NPC registration documents
- Appendix R: Title Deeds

## APPENDICES

**APPENDIX A**  
**CORRESPONDENCE WITH DWA**

**APPENDIX B**  
**SURFACE WATER QUALITY**

**APPENDIX C**  
**HYDROGEOLOGICAL REPORT**

**APPENDIX D**  
**ENVIRONMENTAL AUTHORISATION AND ENVIRONMENTAL**  
**MANAGEMENT PLAN**

**APPENDIX E**  
**APPROVAL OF THE DEVELOPMENT BY THE DFA TRIBUNAL**

**APPENDIX F**  
**AUTHORITIES APPROVALS**

**APPENDIX G**  
**SECTION 27 MOTIVATION**

**APPENDIX H**  
**PROPOSED RIVER CROSSING DESIGNS**

**APPENDIX I**  
**DWA FORM 758**

**APPENDIX J**  
**SECTION 21(A) FORMS DW760, DW784, DW789**

**APPENDIX K**  
**SECTION 21(C) FORMS DW763**

**APPENDIX L**  
**SECTION 21(I) FORMS DW768**

**APPENDIX M**  
**SECTION 21(F) FORMS DW766**

**APPENDIX N**  
**SECTION 21(G) FORMS DW767**

**APPENDIX O**  
**SUPPLEMENTARY FORMS DW901, DW902, DW905**

**APPENDIX P**  
**RESOLUTIONS AND ID DOCUMENTS**

**APPENDIX Q**  
**KOONVLEI WILDERNESS ESTATE LAND OWNERS ASSOCIATION**  
**NPC REGISTRATION DOCUMENTS**

**APPENDIX R**  
**TITLE DEEDS**