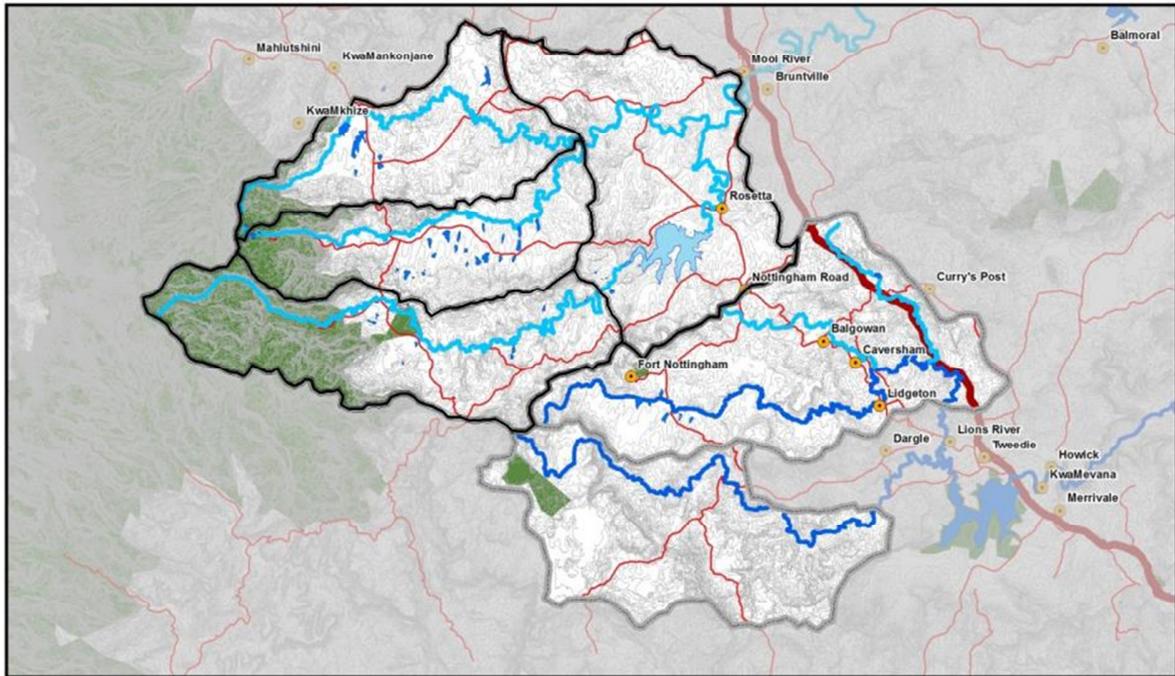


APPENDIX 2

**TABLE AND MAPS DEPICTING DATA SETS USED IN THE IDENTIFICATION AND
PRIORITIZATION OF OFFSET SITES**

Table Listing the Data Sets Used to Develop the Prioritization Matrix

GIS Coverages to inform identification and prioritization of Offset Sites					
MAIN ASPECT	DETAIL	SOURCE	SECURED	NOTES	RELEVANT OFFSET CRITERIA/ PRINCIPLE
ECOSYSTEMS					
GRASSLANDS	EKZNW grassland types and conservation status	EKZNW	✓		Offset Like for Like (LFL)
	Grassland condition - landcover categories	NLC	✓	Landcover used to extract degraded from natural grassland to get a layer showing grasslands condition.	Secure good quality sites and rehabilitate degraded, BUT not highly degraded systems.
	NFEPA	SANBI	✓	Included as background but Crane prioritization layer more appropriate as based on higher resolution analysis	Offset in high conservation priority systems
WETLANDS	Priority wetlands- cranes	KZN Crane Foundation	✓	Use category 1,3, and 4 based on following motivation: Category 1 and 2 are wetlands that are used by Wattled Cranes for breeding (Priority 1) and foraging (Priority 2). Research has shown that Wattled Crane breeding pairs hold a territory of approximately 16 km2 on average and of this, more than 50% is natural habitat of grassland and wetland. The birds therefore tend to indicate wetlands in good condition usually surrounded by large intact grassland. Priority 4 wetlands are those wetlands within 500m of breeding Blue Cranes. Blue Cranes nest in large intact grassland and usually in good condition, therefore by selecting the priority 4 wetlands we are identifying wetlands that fall within a matrix of intact grassland.	Offset in high conservation priority systems
	M&M catchments	DWA	✓	RoD requires that offsets are located within the Mooi and Mgeni catchments. Given the focus on water related ecosystem services and enhancing the quantity and quality of water transferred via MMTS II,	Offset as close to site of impact and within defined offset area.
	RIVERS	Provincial PES	Groundtruth	✓	Used to identify condition of systems.
	NFEPA	SANBI	✓	Used to identify systems with high conservation value.	Offset in high conservation priority systems
	Provincial river type classification.	EKZNW	✓	Primary coverage for selecting rivers to offset.	Offset Like for Like
	Waterfalls	Bridging study GPS co-	✓	Bridging study identified waterfalls with similar	Offset Like for Like
ECOLOGICAL PROCESS AND FUNCTION					
SPECIES MOVEMENT	EKZNW Corridors coverage	EKZNW	✓	Not a priority layer as developed at a very high resolution (provincial). Will be used if required to decide between two sites considered equal in all other requirements.	Offset in high conservation priority systems
WATER RELATED ECOSYSTEM SERVICES	Water quality	Spring Grove Dam construction WQ monitoring data	✓	Data analyzed and combined to identify sub catchments impacted by poor water quality. Focus on reducing nutrient and bacterial levels to prevent eutrophication of the impoundments and reduce treatment costs. Other focus is on trapping sediments to prolong the life span of the dam. Therefore used to identify where offsets, particularly wetland rehab will contribute to improved water quality and regulation.	Enhance purpose of MMTS II by improving water quality.
	Water regulation - grassland and wetlands	Upper Mgeni Catchment Management Plan - point source pollution map	✓	All wetlands and grasslands perform this function. Requires securing good habitat and rehabilitating degraded habitat, but focus on rehabilitation of degraded sites to improve situation in the catchment.	Enhance purpose of MMTS II by improving water regulation.
		As above			
SPECIES					
CRANES	EWT crane priority areas	EWT (DC)	✓	Cranes used as indicator species for wetland and grassland - see wetland category.	Offset in high conservation priority systems
BIODIVERSITY PLANNING					
PROVINCIAL CONSERVATION	Boundaries and current status	EKZNW C-Plan	✓	Focus in CCA 1 areas.	Offset in high conservation priority systems
EXISTING PROTECTED AREAS		EKZNW PA coverage	✓	Stewardship sites rather than formally protected (state owned) systems.	Offset in high conservation priority systems
CONTEXTUAL INFORMATION					
Cadastrals		Cogta	✓		
Roads		Cogta	✓		
Towns		Cogta	✓		
Dams	Large dams (Midmar/Spring Grove)	DWA	✓	Information used to orientate and contextualize maps.	Offset criteria not applicable
	Farm dams	DWA	✓		
Topography	Contours	Cogta	✓		
LANDOWNER COMMITMENT					
WWF Stewardship Sites	Stewardship sites - existing/planned.	EKZNW	✓	The status of securing sites under stewardship is at different points i.e. in negotiation, initial review, proclaimed sites. The more advanced the process the	
Midlands Conservancies Stewardship Sites	Stewardship sites - existing/planned.	Midlands conservancies	✓	Ownership has changed on the majority of these properties. But Eastern Wetlands has undertaken additional planning and implemented some wetland rehabilitation on several of these properties which indicates commitment the part of the new landowners.	
MMTS Bridging study properties	Properties were wetland rehabilitation was planned.	MMTS II	✓		Secure offset sites in the long term (for operational life span of the dam - 50 years).
De Beers properties	Two properties in the upper Mgeni system, nearby to Umgeni Vlei Nature Reserve	De Beers	✓	These properties have been purchased with the intention of managing them for conservation and research purposes.	
Hlatikulu Collaborative Management Area	These properties are	EWT	✓	High conservation value properties managed with a common view.	
Hlatikulu Collaborative Management Area - Potential increase to Giants Castle		EKZNW	✓	High conservation value properties managed with a common view - potential expansion to link with World Heritage Site.	
RISK ANALYSIS					
Development Plans	SDFs/LUMS/Housing projects	Mgeni and Mpofana Municipalities	✓	Required to undertake a risk assessment. Areas zoned for conservation are less likely to have development authorized.	Offset on sites with the lowest risk of future negative impact.
Mpofana Irrigation Project	Dam sites, irrigation and cultivation planned as part of the Mpofana Irrigation Project	Mooi River Farmers Association	✓		



SPRING GROVE DAM OFFSET PLANNING

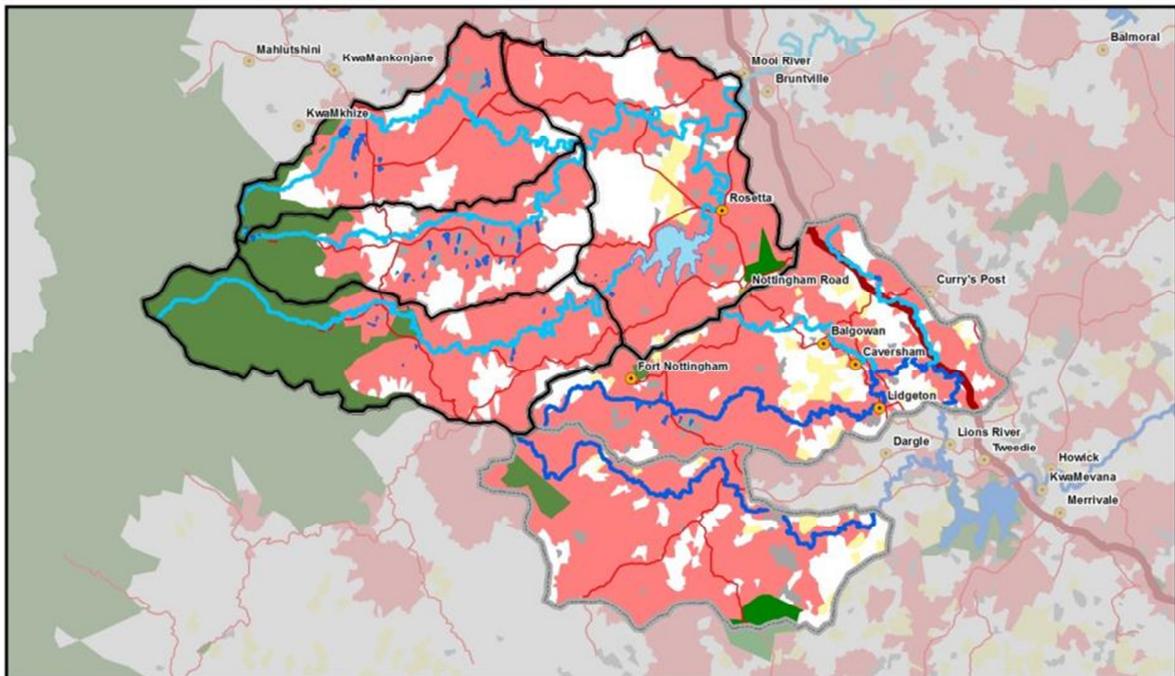
CONTEXTUAL INFORMATION COVERAGES

Legend	
Upper Mool catchment	PES Rivers
Upper Mgeni catchment	B
Places	C
SpringGrove Dam	DOT Roads
Midmar Dam	National Road
	Provincial Road
	Contours
	Protected Areas

TrueNorth
MAPPING P M B

Institute of
Natural Resources

0 1 2 3 4 5 6
Kilometers



SPRING GROVE DAM OFFSET PLANNING

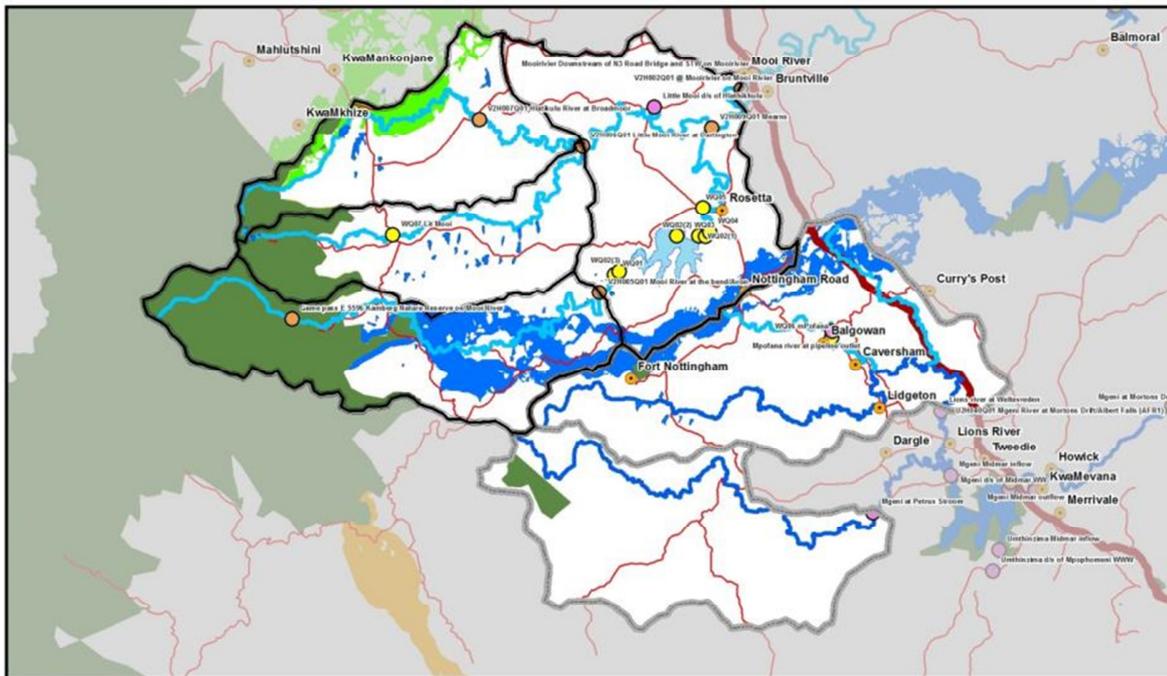
BIODIVERSITY PLANNING COVERAGES

Legend		
Upper Mool catchment	PES Rivers	Misnet
Upper Mgeni catchment	B	Existing Protected Area Network
Places	C	100% Transformed (2005 LC)
SpringGrove Dam	DOT Roads	Biodiversity Priority Area 1
Midmar Dam	National Road	Biodiversity Priority Area 2
	Provincial Road	Biodiversity Priority Area 3
	Protected Areas	

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Kilometers



SPRING GROVE DAM OFFSET PLANNING

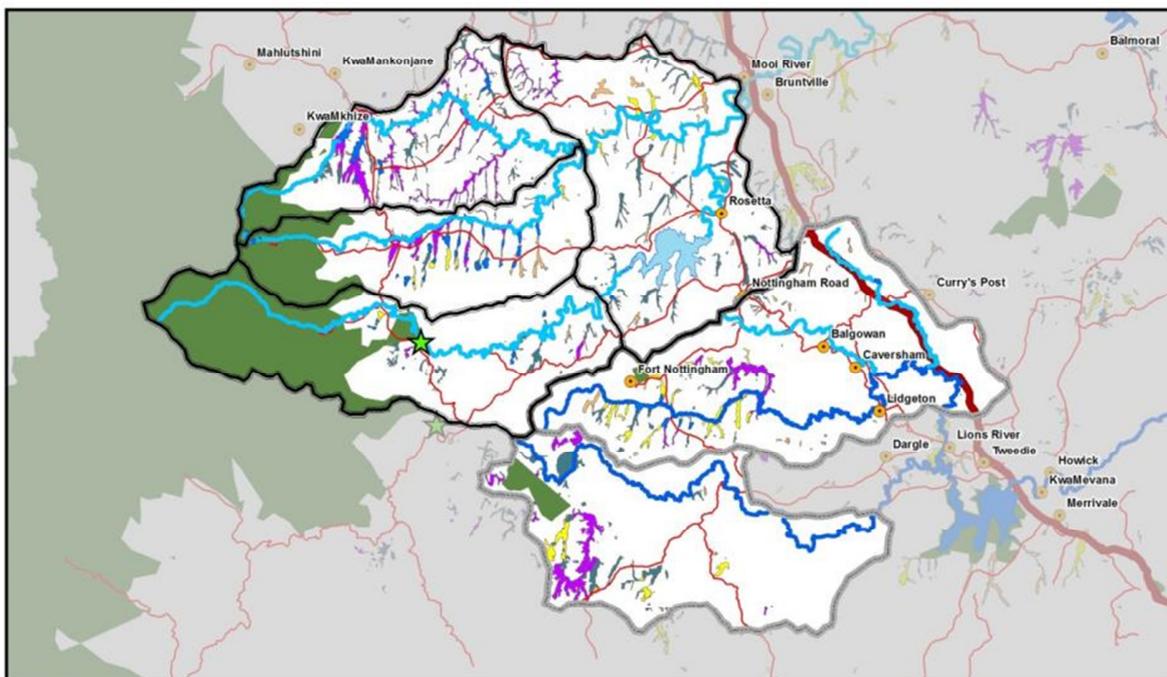
ECOLOGICAL PROCESS AND FUNCTION COVERAGES

Legend	
Upper Mool catchment	Sampling Points
Upper Mgeni catchment	Blue Sands Trading
Places	Umtsongi Water
Spring Grove Dam	WMS (DWIA data)
Malmu Dam	
PES Rivers	
B	
C	
DOT Roads	
National Road	
Provincial Road	
Protected Areas	
NZN Wildlife Corridors	
Berg Corridor	
Midlands Corridor	
Tugela Corridor	
Tugela North Corridor	

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0 1 2 3 4 5 6 Kilometers



SPRING GROVE DAM OFFSET PLANNING

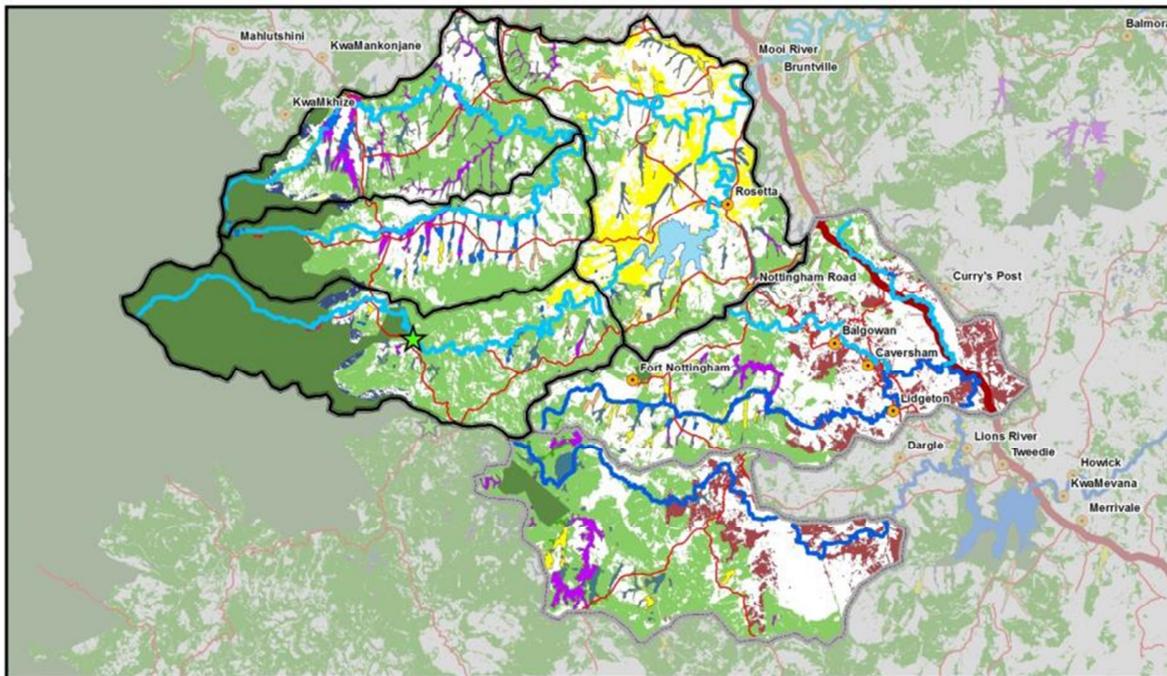
ECOSYSTEMS COVERAGES

Legend	
Upper Mool catchment	Wetlands Crane Priority
Upper Mgeni catchment	1
Places	2
Spring Grove Dam	3
Malmu Dam	4
PES Rivers	
B	
C	
DOT Roads	
National Road	
Provincial Road	
Protected Areas	
Wetlands	

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0 1 2 3 4 5 6 Kilometers



SPRING GROVE DAM OFFSET PLANNING

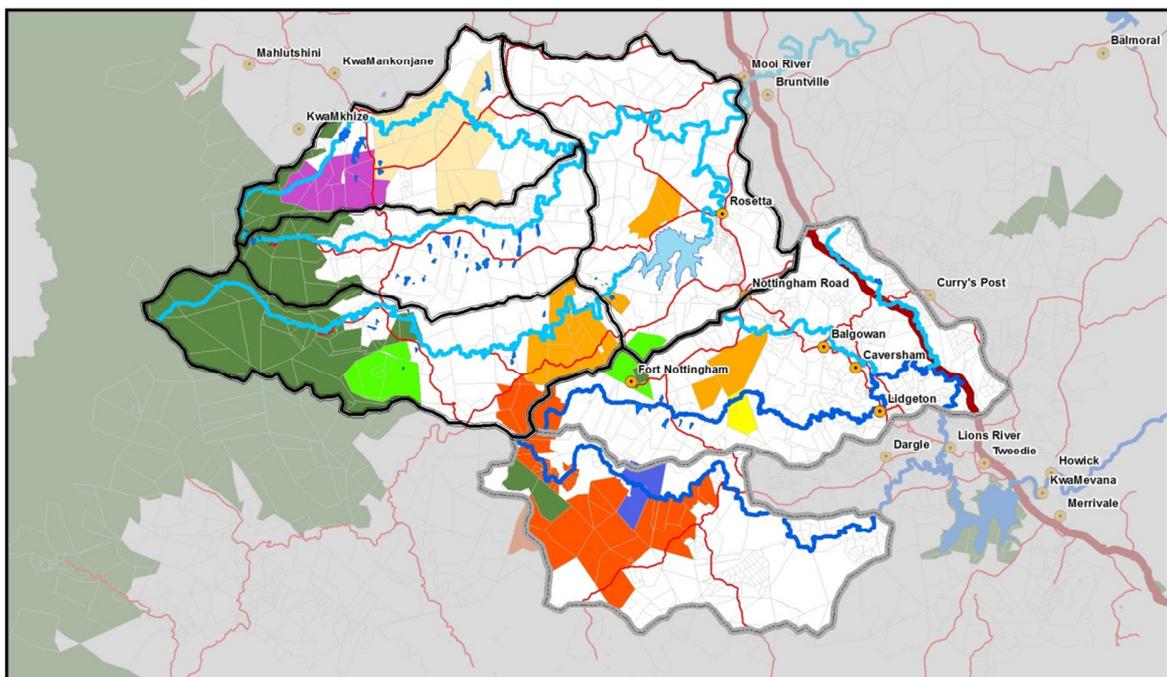
ECOSYSTEMS COVERAGES

<ul style="list-style-type: none"> Upper Mooi catchment Upper Mgeni catchment Places Spring Grove Dam Midsar Dam 	<ul style="list-style-type: none"> Waterfalls PES Rivers DOT Roads National Road Provincial Road Protected Areas 	<ul style="list-style-type: none"> Wetlands Crane Priority Grasslands Crakenberg Foothill Moist Grassland Wetlands Wetland Grassland Mooi River upland Grassland Northern Drakensberg Highland Grassland Northern KwaZulu-Natal Moist Grassland Southern Drakensberg Highland Grassland Jakhalamba Basalt Grassland All Grasslands 	<ul style="list-style-type: none"> Northern Drakensberg Highland Grassland Northern KwaZulu-Natal Moist Grassland Southern Drakensberg Highland Grassland Jakhalamba Basalt Grassland All Grasslands
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0 1 2 3 4 5 6 Kilometers



SPRING GROVE DAM OFFSET PLANNING

LANDOWNER COMMITMENT COVERAGES

<ul style="list-style-type: none"> Upper Mooi catchment Upper Mgeni catchment Places Spring Grove Dam Midsar Dam 	<ul style="list-style-type: none"> PES Rivers DOT Roads National Road Provincial Road Cadastral 	<ul style="list-style-type: none"> Landowner Willingness WWT Stewardship Sites Molweni Conservancy Stewardship Sites De Beers Properties 	<ul style="list-style-type: none"> Bringing Study Properties Habitat Collaborative Management Areas Possible HCMA Expansion to Higher-order User Properties Protected Areas
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0 1 2 3 4 5 6 Kilometers

4. Analysis of Water Quality Data

Water quality data obtained from the monitoring points in the preceding figure were obtained from Umgeni Water, DWA and the consultants responsible for monitoring pre, during and post construction. They have been analysed against the following set of standards to establish areas of water quality issues.

		50th percentile	50th Percentile	5th percentile	95th percentile	5th Percentile	50th Percentile
		PO4 (mg/L)	TIN (mg/L)	pH		Dissolved Oxygen (mg/L)	Electrical Conductivity (mS/m)
A	0 No change	<0.005	<0.25	6.5 to 8.0	6.5 to 8.0	> 8	0 ≤ 30
B	1 Small change	0.005-0.015	0.25-0.7	5.9 – 6.5	8.0 – 8.8	7 – 8	30.1 - ≤55
C	2 Moderate change	0.015-0.025	0.70-1	5.6 – 5.9	8.8 – 9.2	6 – 7	55.1 - ≤85
D	3 Large change	0.025-0.125	1.0-4	5.0 – 5.6	9.2 – 10.0	4 – 6	>85
E/F	4 Serious change	>0.125	>4.0	4.0 - 5.0	10.0 – 11.0	2 – 4	*
	5 Extreme change			<4	>11.0	0 – 2	*

The following table shows the results of analysis from monitoring points in the Mgeni catchment

Monitoring point	Co-ordinates		pH	SRP (ug/L)	TIN (mg/L)	Conductivity (mS/m)	Dissolved Oxygen (mg/L)
Midmar main basin integrated	29 29 50.0	30 12 5.0	6.95-8.2	1.5	0.08	6.90	No data
Mpofana river at pipeline outlet	29 23 14.0	30 03 49.0	7.04-7.99	No data	No data	8.6	7.54
Mgeni at Petrus Stroom	29 30 45.8	30 5 40.0	6.99-8.4	0.00502	0.26	5.63	6.90
Mgeni Midmar inflow	29 29 17.3	30 9 21.6	6.93-8.37	0.00709	0.16	7.45	6.70
Mgeni Midmar outflow	29 29 34.3	30 12 10.2	7-8.3	0.00372	0.345	7.06	6.30
Mgeni u/s of Midmar WW	29 29 49.2	30 13 19.2	6.83-8.3	0.00024	0.31	8.95	7.38
Mgeni d/s of Midmar WW	29 29 56.4	30 13 19.2	6.85-8.28	0.00425	0.30	7.71	7.38
Mgeni at Mortons Drift	29 26 31.6	30 19 47.2	7.10-8.60	0.032	0.58	9.13	7.80
Umthinzima Midmar inflow	29 32 23.0	30 11 36.0	6.99-8.10	0.077	2.38	19.01	No data