



Quarterly Water Quality Status of the Waterval River Catchment

1 July 2011 - 30 June 2012

In-stream Water Quality Guidelines

Sample Points	Sample Point Description	Ammonia	Chloride	Fluoride	Alkalinity	Nitrate	Phosphate	Sulphate	Chemical Oxygen Demand	Conductivity	pH	E.coli
WAW	Winkelhaakspruit @ Secunda 26°31'12.14"S 29° 4'17.79"E	15.00	75	0.24	235	4.20	3.90	43	42	79	7.90	
		2.30	80	0.34	155	1.80	2.80	51	54	71	7.40	
		1.70	65	0.44	180	2.50	2.00	47	41	63	7.60	
		6.70	65	0.25	180	5.80	3.00	28	39	72	7.90	
WAB	Kleinspruit @ Secunda 26°32'44.49"S 29° 7'46.66"E	0.32	29	0.43	115	1.50	<0.05	120	25	52	8.80	
		0.12	16	0.29	115	1.00	0.31	62	27	42	7.70	
		0.21	54	0.37	125	14.20	0.31	185	27	81	7.10	
		0.85	29	0.54	130	2.0	0.10	135	27	74	8.4	
WAT	Kleinspruit @ Secunda 26°33'9.73"S 29° 4'58.31"E	0.62	35	0.41	140	1.10	0.24	90	29	55	8.10	
		0.12	24	0.29	145	0.71	0.07	61	24	47	7.50	
		0.33	34	0.51	140	7.50	0.20	96	29	59	7.00	
		0.94	32	0.40	170	1.80	0.21	71	36	70	7.80	
WAR	Waterval River @ Roodebank 26°37'44.10"S 29° 1'32.31"E	7.10	44	0.33	185	0.89	1.80	82	33	65	7.70	
		0.68	67	0.49	165	1.10	0.34	84	37	73	7.50	
		0.30	43	0.45	150	1.90	0.34	60	35	61	6.80	
		3.00	38	0.38	180	2.80	0.63	64	31	47	7.80	
WAE	Waterval River @ Elandsplaagte 26°51'30.04"S 28°53'23.52"E	0.35	49	0.30	180	1.20	0.91	34	30	65	8.80	
		0.12	57	0.50	175	0.28	1.20	73	31	66	7.70	
		0.12	64	1.10	115	2.00	0.16	140	36	66	6.70	
		0.12	40	0.32	190	0.33	0.11	75	34	62	8.20	
S-EVAN_W	Evander Sewage Works 26°29'32.97"S 29° 6'54.97"E	18.00	63	0.19	205	1.30	4.20	51	98	35	7.50	816400
		8.40	77	0.34	165	3.50	3.60	42	73	71	7.30	330790
		7.90	60	1.09	240	1.40	1.40	58	58	64	7.10	882720
		12.00	38	0.40	210	0.10	2.90	31	105	65	7.50	965220
S-SEC_LOC	Embalenhle Sewage Works 26°33'21.66"S 29° 4'16.66"E	30.00	56	0.16	240	2.60	6.90	71	200	84	7.90	1058320
		32.00	53	0.15	210	0.15	7.00	21	210	90	7.40	846000
		19.00	58	0.17	195	1.80	5.80	72	90	72	7.90	80420
		21.00	63	0.25	215	0.29	8.20	65	90	83	7.60	715770
S-SEC_SEW	Secunda Sewage Works* 26°32'21.04"S 29° 8'42.00"E	1.30	51	1.20	125	1.90	0.30	78	41	60	7.30	51780
		0.35	45	0.22	135	6.50	0.33	35	115	60	7.20	220
		1.90	46	0.38	195	0.57	0.63	76	37	63	6.90	7
		0.12	42	0.20	120	1.80	0.18	58	73	62	7.60	10

*The above colour coding is as per the Waterval River Instream Water Quality Guideline and not Water Use License conditions for any mining/ industries.

Sewage Works Compliance (where applicable) to General Standard (GN 1191 Oct 1999)

Sample Points	Sample Point Description	Ammonia	Fluoride	Nitrate	Phosphate	Chemical Oxygen Demand	Conductivity	pH	E.coli			
S-EVAN_W	Evander Sewage Works 26°29'32.97"S 29° 6'54.97"E	18.00	81	0.19	190	1.30	4.20	38	98	35	7.50	816400
		8.40	63	0.34	205	3.50	3.60	51	73	73	7.30	330790
		7.80	77	1.00	165	1.50	1.40	42	58	64	7.10	882720
		12.00	60	0.40	240	0.10	2.90	58	105	65	7.50	965220
S-SEC_LOC	Embalenhle Sewage Works 26°33'21.66"S 29° 4'16.66"E	30.00	39	0.16	220	2.60	6.90	55	200	84	7.90	1058320
		32.00	56	0.15	240	0.15	7.00	71	210	90	7.40	846000
		19.00	53	0.17	210	1.80	5.80	72	90	72	7.90	80420
		21.00	63	0.25	215	0.29	8.20	72	90	83	7.60	715770

* Applicable Water Quality Standards for final effluent discharge from Secunda Sewage Works (as per DWA licence)

Sample Points	Sample Point Description	Ammonia	Fluoride	Nitrate	Phosphate	Chemical Oxygen Demand	Conductivity	pH	E.coli			
S-SEC_SEW	Secunda Sewage Works* 26°32'21.04"S 29° 8'42.00"E	1.30	48	1.20	120	1.90	0.30	72	41	60	7.30	51780
		0.35	51.00	0.22	125.00	6.50	0.33	78.00	115	80	7.20	220
		1.90	45.00	0.38	135.00	0.57	0.63	35.00	37	63	6.90	7
		0.12	46.00	0.20	155.00	1.80	0.18	76.00	73	62	7.60	10

Key

WAB	Bossiespruit @ Secunda	0.59	-	1 July 11 - 30 Sept 11
		0.12	-	1 Oct 11 - 31 Dec 11
		2.1	-	1 Jan 12 - 31 Mar 12
		0.28	-	1 Apr 12 - 30 Jun 12

Water Quality Guidelines

	-	Ideal
	-	Acceptable
	-	Tolerable
	-	Unacceptable
	-	No sample or result available

In-stream Water Quality Guidelines for the Waterval Catchment

Variables	Measured as	Ideal Catchment Background	Acceptable Management Target	Tolerable Interim Target	Unacceptable
Physical					
Conductivity	mS/m	< 10	10 - 30	30 - 45	> 45
pH	pH units	6.5 - 8.5			< 6.5; > 8.5
Organic					
Chemical Oxygen Demand (COD)	mg/l	< 10	10 - 15	15 - 20	> 20
Macro Elements					
Ammonia (NH ₄)	mg/l	< 0.2	0.2 - 0.5	0.5 - 1.0	> 1.0
Chloride (Cl)	mg/l	< 25	25 - 50	50 - 75	> 75
Fluoride (F)	mg/l	< 0.05	0.05 - 0.20	0.2 - 0.4	> 0.4
Alkalinity	CaCO ₃ mg/l	< 40	40 - 75	75 - 120	> 120
Nitrate (NO ₃)	mg/l	< 0.1	0.1 - 0.2	0.2 - 0.3	> 0.3
Phosphate (PO ₄)	mg/l	< 0.05	0.05 - 0.25	0.25 - 0.50	> 0.50
Sulphate (SO ₄)	mg/l	< 20	20 - 45	45 - 70	> 70
Bacteriological					
Faecal coliforms	counts/100ml	< 10	10 - 60	60 - 120	> 120

* Applicable Water Quality Standards for final effluent discharge from Secunda Sewage Works (as per DWA licence)

Variable	Limit
pH	5.5 - 9.5
Electrical Conductivity	≤ 70 mS/m
Chemical Oxygen Demand	≤ 75 mg/l
Ammonia as N	≤ 6 mg/l
Nitrate / Nitrite as Nitrogen	≤ 15 mg/l
Orthophosphate as P	≤ 10 mg/l
Fluoride	≤ 1 mg/l
Faecal coliform units (FCU)	0 per 100ml

Sewage Works Compliance to General Standard (GN 1191 Oct 1999)

Variables	Measured as	Acceptable Management Target	Unacceptable
Physical			
Conductivity	mS/m	< 150	≥ 150
pH	pH units	5.5 - 9.5	< 5.5; > 9.5
Organic			
Chemical Oxygen Demand (COD)**	mg/l	< 75	≥ 75
Macro Elements			
Ammonia (NH ₄)	mg/l	< 3	≥ 3
Fluoride (F)	mg/l	< 1	≥ 1
Nitrate (NO ₃)	mg/l	< 15	≥ 15
Phosphate (PO ₄)	mg/l	< 10	> 10
Bacteriological			
Faecal coliforms	counts/100ml	< 1000	≥ 1000

** After removal of algae