



Quarterly Water Quality Status of the Waterval River Catchment

1 January 2014 - 31 December 2014

In-stream Water Quality Guidelines

Sample Points	Sample Point Description	Ammonia	Chloride	Fluoride	M-Alkalinity	Nitrate	Phosphate	Sulphate	Chemical Oxygen Demand	Conductivity	pH	E. coli
WAW	Winkelhaakspruit @ Secunda 26°31'12.14"S 29° 4'17.79"E	8.50	51	0.42	210	0.94	2.50	87	43	69	7.70	
		11.00	72	0.41	195	2.60	2.20	62	42	76	7.30	
		12.00	70	0.42	215	10.00	2.30	71	25	83	7.90	
		9.00	77	0.54	215	0.74	4.10	47	57	86	7.90	
WAB	Kleinspruit @ Secunda 26°32'44.49"S 29° 7'46.66"E	0.57	20	0.45	130	0.83	0.34	120	37	61	7.90	
		0.25	20	0.64	105	3.40	0.18	98	23	46	7.70	
		0.25	15	0.40	99	1.90	0.10	78	18	41	7.80	
WAT	Kleinspruit @ Secunda 26°33'9.73"S 29° 4'58.31"E	0.72	48	0.46	140	4.90	0.21	215	30	86	7.80	
		0.62	38	0.56	140	2.40	0.20	105	26	58	7.80	
		0.65	20	0.48	130	2.20	0.20	53	26	56	7.50	
		0.12	23	0.21	130	1.80	0.22	46	23	48	7.60	
WAR	Waterval River @ Roodebank 26°37'44.10"S 29° 1'32.31"E	0.84	11	0.32	110	0.88	0.24	23	35	49	7.60	
		4.20	63	0.52	190	1.20	1.00	100	38	73	7.50	
		7.90	63	0.81	190	9.20	1.50	95	34	74	7.90	
		3.20	46	0.52	210	1.20	1.60	56	39	65	7.90	
WAE	Waterval River @ Elandslaagte 26°51'30.04"S 28°53'23.52"E	0.22	25	0.44	100	0.64	0.17	58	38	43	7.70	
		0.22	51	0.42	185	0.46	0.09	84	28	67	8.20	
		1.60	59	0.48	185	2.00	0.88	80	29	69	8.40	
		0.15	62	0.43	210	1.00	1.40	70	35	71	8.10	
S-EVAN_W	Evander Sewage Works 26°29'32.97"S 29° 6'54.97"E	13.00	50	0.63	205	1.60	3.40	37	91	74	7.60	2,000,430
		20.00	52	0.22	195	2.10	3.60	53	89	78	7.50	1,384,130
		15.00	48	0.36	215	6.60	3.00	65	125	76	7.40	2,014,170
		15.00	60	0.46	215	3.50	3.10	49	115	73	7.40	2,036,520
		22.00	53	0.29	265	0.14	4.40	61	110	86	7.80	724,260
S-SEC_LOC	Embalenhle Sewage Works 26°33'21.66"S 29° 4'16.66"E	31.00	68	0.27	290	0.26	7.50	80	115	96	7.60	431,650
		24.00	41	0.16	360	2.00	3.10	110	245	95	7.20	3,514,050
		27.00	53	0.50	340	3.50	5.10	105	185	100	8.10	380,100
		0.20	46	0.31	165	3.20	0.78	74	32	66	7.80	160
S-SEC_SEW	Secunda Sewage Works* 26°32'21.04"S 29° 8'42.00"E	0.62	62	0.30	135	3.50	0.18	84	38	64	7.40	1
		1.30	48	0.20	105	6.80	0.31	74	28	59	7.50	0
		5.30	62	0.38	150	1.40	0.30	69	35	63	8.00	1

\*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	Chloride	Fluoride	M-Alkalinity	Nitrate	Phosphate	Sulphate	Chemical Oxygen Demand	Conductivity	pH	E. coli
S-EVAN_W	Evander Sewage Works 26°29'32.97"S 29° 6'54.97"E	13.00	50	0.63	205	1.60	3.40	37	91	74	7.60	2,000,430
		20.00	52	0.22	195	2.10	3.60	53	89	78	7.50	1,384,130
		15.00	48	0.36	215	6.60	3.00	65	125	76	7.40	2,014,170
		15.00	60	0.46	215	3.50	3.10	49	115	73	7.40	2,036,520
S-SEC_LOC	Embalenhle Sewage Works 26°33'21.66"S 29° 4'16.66"E	22.00	53	0.29	265	0.14	4.40	61	110	86	7.80	724,260
		31.00	68	0.27	290	0.26	7.50	80	115	96	7.60	431,650
		24.00	41	0.16	360	2.00	3.10	110	245	95	7.20	3,514,050
		27.00	53	0.50	340	3.50	5.10	105	185	100	8.10	380,100
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		0.62	62	0.30	135	3.50	0.18	84	38	64	7.40	1
		1.30	48	0.20	105	6.80	0.31	74	28	59	7.50	0
		5.30	62	0.38	150	1.40	0.30	69	35	63	8.00	1

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

**Key**

WAB	Bossiespruit @ Secunda	0.59	-	1 Jan 14 - 31 Mar 14
		0.12	-	1 Apr 14 - 30 Jun 14
		2.1	-	1 July 14 - 30 Sept 14
		0.28	-	1 Oct 14 - 31 Dec 14

**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
<b>Physical</b>					
Conductivity	mS/m	< 10	10 - 30	30 - 45	> 45
pH	pH units	6.5 - 8.5			< 6.5; > 8.5
<b>Organic</b>					
Chemical Oxygen Demand (COD)	mg/l	< 10	10 - 15	15 - 20	> 20
<b>Macro Elements</b>					
Ammonia (NH <sub>4</sub> )	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 <sub>3</sub> mg/l	< 40	40 - 75	75 - 120	> 120
Nitrate (NO <sub>3</sub> )	mg/l	< 0.1	0.1 - 0.2	0.2 - 0.3	> 0.3
Phosphate (PO <sub>4</sub> )	mg/l	< 0.05	0.05 - 0.25	0.25 - 0.50	> 0.50
Sulphate (SO <sub>4</sub> )	mg/l	< 20	20 - 45	45 - 70	> 70
<b>Bacteriological</b>					
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	
<b>Physical</b>				
Conductivity	mS/m	<150	>=150	
pH	pH units	5.5 - 9.5	< 5.5; >9.5	
<b>Organic</b>				
Chemical Oxygen Demand (COD)**	mg/l	<75	>=75	
<b>Macro Elements</b>				
Ammonia (NH <sub>4</sub> )	mg/l	<3	>=3	
Fluoride (F)	mg/l	<1	>=1	
Nitrate (NO <sub>3</sub> )	mg/l	<15	>=15	
Phosphate (PO <sub>4</sub> )	mg/l	<10	>10	
<b>Bacteriological</b>				
Faecal coliforms	counts/100ml	<1000	>=1000	

\*\* After removal of algae