RAND WATER

Quarterly Water Quality Status of the Waterval River Catchment 01 Oct 2018 - 30 Sept 2019

Sample Points	Sample Point Description	Quarter	Ammonia	Chemical Oxygen Demand	Chloride	Conductivity	Fluoride	M-Alkalinity	Nitrate	pH	Phosphate	Sulphate
WAW	Winkelhaakspruit @ Secunda	1	7.56	72	137	112	0.62	315	4.00	7.6	2.10	74
		2	3.06	40	97	78	0.82	200	4.19	7.6	0.94	86
		3	3.25	39	70	75	0.98	200	2.00	7.5	2.15	76
	26° 31.204'S 29° 4.298'E	4	12.02	48	83	74	1.61	218	<0.50	7.8	2.25	81
WAT	Kleinspruit @ Secunda	1	0.83	28	55	65	0.69	148	1.13	7.6	0.39	94
		2	2.70	28	61	63	0.97	136	2.93	7.4	0.96	97
		3	0.90	24	46	59	0.86	153	1.19	7.7	<0.25	81
	26° 33.162'S 29° 4.972'E	4	1.60	31	53	65	0.97	163	1.36	8.0	0.68	83
WAR	Waterval River @ Roodebank	1	5.51	48	36	71	0.54	183	1.07	7.3	1.34	57
		2	2.00	31	56	42	0.81	94	2.60	7.2	0.51	89
		3	8.65	41	64	70	0.88	203	<0.50	7.5	1.55	73
	26° 37.675'S 29° 1.472'E	4	9.00	12	70	73	1.00	212	<0.50	7.7	1.25	76
WAE	Waterval River @ Elandslaagte	1	0.14	36	56	73	0.48	213	1.07	7.7	1.50	61
		2	0.25	27	33	40	0.63	99	1.60	7.6	<0.25	59
		3	0.02	24	72	69	0.90	170	<0.50	7.9	<0.25	91
	26° 51.499'S 28° 53.396'E	4	0.15	27	74	62	0.90	188	1.00	8.0	0.39	80
WATERVAL_VAAL	Waterval near confluence with Vaal River	1	1.69	32	100	87	0.61	248	<0.50	8.4	0.80	86
		2	0.60	23	43	41	0.65	86	1.30	7.5	<0.25	59
		3	0.12	24	56	57	0.85	145	<0.50	8.1	<0.25	69
	26° 57.579'S 28° 44.689'E	4	0.59	22	91	84	0.99	202	<0.50	8.1	0.26	101

Key

WAE	Waterval River @ Elandslaagte	1	0.14	- 1 Oct to 31 Dec 2018
		2	0.25	- 1 Jan to 31 Mar 2019
		3	0.02	- 1 Apr to 30 Jun 2019
	26° 51.499'S 28° 53.396'E	4	0.15	- 1 Jul to 30 Sept 2019

Water Quality Guidelines

- Ideal
- Acceptable
- Tolerable
- Unacceptable

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

Sample Points	Sample Point Description	Quarter	Ammonia	Chemical Oxygen Demand	Chloride	Conductivity	*Faecal coliforms*	Fluoride	M-Alkalinity	Nitrate	pH	Phosphate	Sulphate
S-EVAN_W	Evander Sewage Works	1	20.00	157	70	76	4 495 100	0.55	193	5.60	7.4	2.60	68
		2	16.33	56	41	72	2 245 367	0.81	213	3.70	7.4	2.83	57
		3	12.67	76	46	67	97 633	1.06	183	7.20	7.7	2.03	64
	26° 29.633'S 29° 6.950'E	4	17.23	92	50	71	1 724 867	1.06	212	2.70	7.6	2.80	63
S-SEC_LOC	Embalenhle Sewage Works	5	23.41	122	86	97	2 463	0.61	258	0.67	7.4	4.06	111
		6	16.00	54	56	87	2 370	0.87	243	1.10	7.4	5.20	90
		7	22.00	113	66	84	1 517	1.00	223	0.68	7.7	3.40	86
	26° 33.414'S 29° 4.292'E	8	31.50	248	71	108	1 010	1.48	160	<0.5	7.3	4.25	86

Key

S-EVAN_W	Evander Sewage Works	1	20.00	- 1 Oct to 31 Dec 2018
		2	16.33	- 1 Jan to 31 Mar 2019
		3	12.67	- 1 Apr to 30 Jun 2019
	26° 29.633'S 29° 6.950'E	4	17.23	- 1 Jul to 30 Sept 2019

Water Quality Guidelines

- Acceptable
- Unacceptable

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

Sample Points	Sample Point Description	Quarter	Ammonia	Chemical Oxygen Demand	Chloride	Conductivity	*Faecal coliforms*	Fluoride	M-Alkalinity	Nitrate	pH	Phosphate	Sulphate
S-SEC_SEW	Secunda Sewage Works	1	15.82	23	83	60	1	0.50	112	2.30	7.3	2.85	86
		2	0.32	20	36	62	836	0.53	158	1.96	7.6	0.26	54
		3	11.65	23	60	60	35	0.81	115	3.40	7.2	1.94	72
	26° 32.262'S 29° 8.520'E	4	6.27	29	66	61	770 004	0.81	113	2.70	7.2	0.90	70

Key

S-SEC_SEW	Secunda Sewage Works	1	15.82	- 1 Oct to 31 Dec 2018
		2	0.32	- 1 Jan to 31 Mar 2019
		3	11.65	- 1 Apr to 30 Jun 2019
	26° 32.262'S 29° 8.520'E	4	6.27	- 1 Jul to 30 Sept 2019

Water Quality Guidelines

- Acceptable
- Unacceptable

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					
E.coli	counts/100ml	< 10	10 - 60	60 - 120	> 120
Faecal coliforms	counts/100ml		< 126	126 - 1,000	> 1,000

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

Variables	Measured as	Acceptable Management Target	Unacceptable
Physical			
Conductivity	mS/m	<= 70	> 70
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	<= 6	> 6
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	0	> 0

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*

Visit http://www.reservoir.co.za/ to find the water quality status report and forum dates