RAND WATER

Quarterly Water Quality Status of the Vaal Dam Reservoir Catchment

1 Jan 2012 - 31 Dec 2012

Sample Points	Sample Point Description	Ammonia	Chloride	Fluoride	M-Alkalinity	Nitrate	Phosphate	Sulphate	Chemical Oxygen Demand	Conductivity	pH	*E. coli*
VSV	Sandspruit above Volksrust 27°14'26.03"S 29°53'21.78"E	0.12	12	0.47	65	1.40	<0.05	25	20	20	7.00	
		0.12	<10	0.30	91	0.12	<0.05	20	<10	26	7.80	
		0.12	16	0.17	28	0.41	<0.05	41	14	16	6.40	
		0.12	<10	0.18	84	0.21	<0.05	37	24	51	7.20	
VSS	Sandspruit below Vaal River @ Kliplaatsdrift 27°12'30.82"S 29°26'12.83"E	0.12	<10	0.32	110	3.70	<0.05	25	19	33	7.50	
		0.12	15	0.41	255	0.41	<0.05	32	18	54	8.20	
		0.12	13	0.33	285	0.17	0.120	40	24	53	8.30	
		0.12	<10	0.31	89	0.20	0.110	31	19	36	7.40	
KB	Klip River @ Barnardskop 27°28'12.33"S 29°36'1.76"E	0.12	<10	0.12	110	0.42	<0.05	14	17	12	6.90	
		0.12	<10	0.15	61	<0.10	0.060	<5.0	<10	15	7.50	
		0.10	<10	0.16	54	<0.10	0.420	14	14	18	6.90	
		0.12	<10	0.16	44	<0.10	0.120	9	19	17	7.00	
KW	Klip @ Winkelhaak 27°14'41.55"S 29°23'59.91"E	0.12	<10	0.18	55	1.90	<0.05	8	18	16	6.60	
		0.12	<10	0.18	115	0.34	<0.05	7	<10	26	7.60	
		4.10	<10	0.20	100	1.00	0.590	22	14	26	7.30	
		0.32	12	0.20	90	0.95	0.270	43	20	21	7.00	
KD	Klip River @ De Langesdrift 27°10'57.77"S 29°14'5.54"E	0.12	<10	0.21	93	<0.10	<0.05	14	17	24	7.10	
		0.12	<10	0.25	195	0.27	<0.05	17	<10	43	8.10	
		0.33	11	0.30	170	0.26	0.100	27	12	41	7.80	
		0.12	<10	0.29	74	0.25	0.150	22	23	26	7.10	
KSV	Spruitsonderdrift downstream of Vrede 27°21'8.15"S 29°10'16.87"E	0.12	15	0.27	185	0.51	<0.05	33	27	48	7.70	
		0.12	42	0.31	265	0.70	0.250	44	22	71	8.70	
		0.10	34	0.28	225	0.42	0.160	44	49	58	8.90	
		0.12	11	0.27	110	0.21	<0.05	47	35	54	7.90	
VDS	Vaal River downstream of Standerton 27° 0'55.97"S 29° 1'29.30"E	0.12	<10	0.43	115	1.00	<0.05	19	19	31	7.10	
		0.12	14	0.30	160	0.56	<0.05	25	21	40	8.10	
		0.31	15	0.32	155	0.92	0.120	33	22	38	7.50	
		0.25	12	0.28	105	0.39	0.080	33	24	37	7.20	
VGB	Gladdedrift Bridge @ Villiers 26°59'31.24"S 28°43'47.18"E	0.12	<10	0.28	115	1.60	<0.05	20	24	27	6.70	
		0.12	15	0.28	165	0.28	<0.05	22	17	41	8.40	
		0.12	17	0.30	185	0.41	0.100	31	19	46	8.00	
		0.12	10	0.30	85	0.58	0.120	27	22	30	7.20	
VV	Vaal @ Villiers 27° 1'20.13"S 28°36'0.32"E	0.12	<10	0.29	105	1.50	<0.05	27	20	28	6.50	84
		0.12	22	0.40	170	0.16	<0.05	50	26	77	8.40	345
		0.12	27	0.40	190	0.15	<0.05	47	19	53	8.00	94
		0.12	17	0.34	95	0.13	0.110	45	22	36	7.30	89
VD4I	Vaal Dam 4 Integrated - Vaal River upstream of Vaal Marina 26°53'27.99"S 28°15'0.16"E	0.12	13	0.54	140	<0.10	<0.05	33	29	32	7.60	2
		0.12	12	0.30	120	<0.10	<0.05	28	22	33	7.80	0
		0.21	15	0.33	120	0.21	<0.05	36	19	32	7.90	7
		0.12	16	0.38	135	0.17	0.070	45	17	42	8.10	6
WF	Wilge River @ Frankfort 27°16'18.00"S 28°29'28.41"E	0.12	<10	0.11	74	0.73	<0.05	8	13	13	6.40	275
		0.12	<10	0.13	44	0.82	<0.05	57	<10	11	7.30	69
		0.21	<10	<0.05	42	0.50	0.110	6	<10	11	6.70	88
		0.12	<10	0.22	72	0.35	0.090	17	17	23	7.30	95
VD3I	Vaal Dam 3 Integrated - Wilge River downstream of Oranjeville 26°59'1.64"S 28°13'25.08"E	0.12	<10	0.51	135	0.49	<0.05	27	17	19	6.90	3
		0.12	<10	0.15	71	0.34	0.070	16	11	18	7.30	1
		0.10	<10	0.16	66	0.48	<0.05	25	14	17	7.20	2
		0.10	<10	0.23	60	0.17	0.170	25	<10	26	7.30	12
VD2I	Vaal Dam 2 Integrated - Confluence of Vaal & Wilge 26°53'48.81"S 28°11'9.92"E	0.12	<10	0.66	135	0.19	<0.05	23	18	20	6.90	1
		0.12	<10	0.17	82	0.11	<0.05	25	<10	21	7.30	1
		0.10	<10	0.18	77	<0.10	<0.05	21	14	19	7.20	1
		0.10	<10	0.21	80	0.13	<0.05	31	<10	33	7.50	5
VD1I	Vaal Dam 1 Integrated @ RW intake 26°53'0.26"S 28° 7'14.35"E	0.12	<10	0.37	130	2.40	<0.05	30	17	20	6.90	50
		0.12	<10	0.22	82	0.12	<0.05	25	<10	21	7.30	10
		0.10	<10	0.20	78	0.14	<0.05	46	15	21	7.20	30
		0.11	<10	0.20	81	0.10	<0.05	21	<10	32	7.50	98
S-ST_NEW	Standerton Sewage Works 26°58'24.60"S 29°13'52.87"E	30.00	40	0.48	240	0.18	4.000	31	170	75	6.90	5395670
		23.00	42	0.21	260	0.22	3.400	48	175	78	7.50	5291800
		24.00	45	0.31	405	2.70	4.800	30	245	65	6.80	5295000
		18.00	42	0.38	265	0.43	3.400	50	285	73	7.00	7538870

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-ST_NEW	Standerton Sewage Works 26°58'24.60"S 29°13'52.87"E	30.00	42	0.48	270	0.18	4.000	15	170	75	6.90	5395670
		23.00	40	0.21	240	0.22	3.400	31	175	78	7.50	5291800
		24.00	42	0.31	260	2.7	4.800	48	245	65	6.80	5295000
		18.00	45	0.38	405	0.43	3.400	30	285	73	7.00	7538870

Key

VD1I	Vaal Dam 1 Integrated @ RW intake	0.12	-	
		0.12	-	1 Jan 12 - 31 Mar 12
		0.12	-	1 Apr 12 - 30 Jun 12
		0.12	-	1 July 12 - 30 Sept 12
				1 Oct 12 - 31 Dec 12

Water Quality Guidelines

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

In-stream Water Quality Guidelines for the Vaal Dam 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
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	CaCO3 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	> 0.5
Sulphate (SO_4)	mg/l	< 20	20 - 45	45 - 70	> 70
Bacteriological					
Faecal coliforms	counts/100ml	< 10	10 - 60	60 - 120	> 120

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