



RAND WATER

Quarterly Water Quality Status of the Vaal Dam Reservoir Catchment

1 July 2014 - 30 June 2015

Sample Points	Sample Point Description	Ammonia	Chloride	Fluoride	Ca-Alkalinity	Nitrate	Phosphate	Sulphate	Chemical Oxygen Demand	Conductivity	pH	T. col.
VSV	Sandspruit above Volksrust 27°14'26.03"S 29°53'21.78"E	0.25	<10	0.14	75	0.10	0.16	22	9	20	7.80	
VSS	Sandspruit below Vaal River @ Kliplaatsdrift 27°12'30.82"S 29°26'12.83"E	0.25 0.59 0.43 <0.5	<10 <10 <10 9	0.30 0.14 0.28 0.26	210 140 115 178	0.14 0.12 0.68 0.18	0.19 0.08 0.18 0.20	45 5 18 34	7 28 14 12	47 36 30 40	8.40 8.00 8.00 8.35	
KB	Klip River @ Barnardskop 27°28'12.33"S 29°36'1.76"E	<0.5 0.25 0.22 0.15 0.62	<10 <10 <10 <10 6	0.08 0.22 0.13 0.22	65 46 48 57	0.37 0.86 0.28 0.58	0.19 0.08 0.08 <0.2	22 34 9 5	7 26 14 11	15 22 15 14	8.10 7.80 7.40 7.60	
KW	Klip @ Winkelhaak 27°14'41.55"S 29°23'59.91"E	0.25 0.34	<10 12	0.20 0.26	140 135	0.25 0.44	0.32 0.05	52 26	5 16	31 34	8.00 7.90	
KD	Klip River @ De Langesdrift 27°10'57.77"S 29°14'5.54"E	0.25 0.20 0.15 <0.5	<10 10 <10 8	0.31 0.30 0.16 0.32	200 120 86 173	0.62 0.96 <0.10 0.23	0.40 0.12 0.08 <0.2	38 28 10 22	5 32 15 11	43 31 20 36	8.20 7.60 7.80 8.04	
KSV	Spruitsonderdrift downstream of Vrede 27°21'8.15"S 29°10'16.87"E	0.25 1.50 0.15 <0.5	35 24 20 23	0.44 0.37 0.34 0.31	255 215 170 182	0.24 0.85 0.14 1.60	0.32 0.43 0.08 <0.2	84 65 28 37	39 38 26 40	39 58 43 44	8.90 7.80 8.60 8.69	
VDS	Vaal River downstream of Standerton 27°05'59.97"S 29°12'9.30"E	0.25 0.18 0.15 <0.5	13 10 <10 17	0.30 0.31 0.23 0.28	150 105 105 145	0.96 0.58 0.28 1.40	0.19 0.08 0.08 <0.2	34 24 16 40	25 25 20 23	36 31 28 39	8.50 7.50 7.80 7.75	
VGB	Gladdedrift Bridge @ Villiers 28°59'31.24"S 28°43'47.18"E	0.25 0.18 0.25 <0.5	10 11 <10 12	0.30 0.26 0.30 0.31	160 115 105 145	0.42 0.90 0.18 0.56	0.14 0.35 <0.2 0.23	30 34 19 33	18 25 18 21	39 33 27 42	8.40 7.90 7.80 7.99	
VV	Vaal @ Villiers 27°12'0.13"S 28°36'0.32"E	0.69 0.18 0.25 <0.5	15 12 10 18	0.36 0.42 0.31 0.40	170 135 100 140	0.41 2.60 0.83 0.32	0.24 0.06 0.18 <0.2	25 33 23 34	18 22 21 23	43 37 27 36	8.30 8.00 7.80 8.14	89 44 140 23962
VD4I	Vaal Dam 4 Integrated - Vaal River upstream of Vaal Marina 26°53'27.99"S 28°15'0.16"E	0.25 0.18 0.25 3.40	<10 <10 12 14	0.48 0.25 0.28 0.26	69 85 105 101	0.67 0.31 0.12 0.12	0.12 0.06 0.13 <0.2	22 25 30 29	20 21 19 17	21 24 29 27	8.00 8.10 8.30 8.07	5 11 4 1
WF	Wilge River @ Frankfort 27°16'18.00"S 28°29'28.41"E	0.25 0.18 0.25 3.40	<10 <10 <10 4	0.19 0.25 0.11 0.24	46 56 52 47	0.36 2.50 0.53 0.34	0.10 0.06 0.15 0.84	7 18 9 10	9 9 14 11	11 14 13 11	7.40 7.60 7.50 7.60	290 2,210 720 624
VD3I	Vaal Dam 3 Integrated - Wilge River downstream of Oranjeville 26°59'1.64"S 28°13'25.08"E	0.25 <0.092 0.41 <0.5	<10 <10 5 10	0.28 0.18 0.08 0.16	62 61 60 61	0.91 0.36 <0.10 0.22	0.11 0.06 0.10 0.23	19 11 12 11	16 14 15 11	16 16 15 15	8.10 7.80 8.00 7.74	5 3 3 5
VD2I	Vaal Dam 2 Integrated - Confluence of Vaal & Wilge 26°53'48.81"S 28°11'9.92"E	0.20 0.13 0.40 <0.5	14 <10 <10 7	0.51 0.18 0.16 0.19	61 63 69 70	2.10 0.79 <0.10 0.22	0.08 0.06 0.13 <0.2	85 14 16 15.80	17 16 18 12	17 17 18 22	7.90 7.80 8.00 7.30	1 6 1 8
VD1I	Vaal Dam 1 Integrated @ RW intake 26°53'0.26"S 28°7'14.35"E	0.20 <0.092 0.25 <0.5	<10 <10 <10 7	0.31 0.23 0.18 0.19	64 62 65 69	1.00 2.50 0.26 0.19	0.08 0.10 0.12 0.20	34 19 17 16	20 16 10 14	18 18 18 18	8.10 7.90 8.00 7.77	3 19 4 46
C-KLIPR_VDAM	Klip River inflow to VaalDam 27°07'43.93"S 28°17'01.47"E	0.23 0.25 0.50	21 <10 14	0.40 0.25 0.29	66 66 104	1.80 0.75 0.56	0.12 0.18 0.29	38 15 27	26 96 40	17 17 26	7.60 7.90 7.90	
S-ST_NEW	Standerton Sewage Works 26°58'24.60"S 29°13'52.87"E	27.00 15.00 7.60 7.00	32 58 48 38	0.31 0.22 0.17 0.36	250 205 140 133	0.76 1.80 1.40 3.23	2.80 3.50 2.80 2.37	42 71 51 62	235 97 38 38	76 77 60 52	7.40 7.50 7.40 7.21	3,947,300 172,640 24 5163
S-DENEYSVILLE	Final Effluent of Deneysville WWTW 26°53'06.29"S 28°06'42.35"E	5.70 3.60 11.48	29 35 41	0.30 0.18 0.24	88 92 139	8.20 13.00 5.97	3.00 3.30 3.45	37 39 45	47 35 64	50 46 55	7.40 7.40 7.36	6,670 120 8559
S-FRANKF_NAMA HA	Final Effluent of Frankfort Namadi 27°15'41.58"S 28°29'29.22"E	13.00 13.00 23.00	39 42 35	0.12 0.08 0.17	170 150 189	0.91 0.64 2.65	3.60 3.50 3.95	39 39 42	50 39 55	58 50 58	8.00 7.70 7.36	10 700 54148
S-FRANKF_OXI_P	Final Effluent of Frankfort Oxidation Ponds 27°17'27.44"S 28°29'16.83"E	10.00 9.40 8.43	49 63 79	0.25 0.29 0.28	190 175 181	0.30 0.21 0.30	3.60 4.00 4.60	36 42 38	87 100 122	66 69 71	7.80 8.10 8.45	215 730 1448
S-ORANJEVILLE	Final Effluent of Oranjeville WWTW 26°58'47.06"S 28°12'35.72"E	5.40 4.40 19.50	31 30 35	0.11 0.12 0.22	82 95 139	13.00 6.00 5.21	3.40 2.90 3.48	29 28 36	36 33 77	45 40 52	7.40 7.40 7.37	1,630 14,770 801287
S-VAAL_MARINA	Final Effluent of Vaal Marina WWTW 26°53'19.35"S 28°12'50.50"E	4.20 0.25 15.15	30 35 37	0.28 0.28 0.23	130 120 143	7.30 5.80 5.44	1.90 2.85 2.33	39 45 34	28 22 30	49 48 53	7.70 7.70 7.74	365 18 847
S-VILLIERS	Final Effluent of Villiers WWTW 27°01'54.43"S 28°35'21.89"E	15.00 11.00 27.00	74 63 49	0.30 0.35 0.35	270 195 269	1.80 5.00 0.14	2.90 4.00 4.32	56 48 53	125 125 126	91 73 85	7.70 7.60 7.48	145,350 61160 294180






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	27.00	32	0.31	250	0.76	2.80	42	235	76	7.40	3,947,300
		15.00	58	0.22	205	1.8	3.50	71	97	77	7.50	172,640
		7.60	48	0.17	140	1.4	2.80	51	38	60	7.40	24
		7.00	38	0.36	133	3.233333333	2.37	62	38	52	7.21	5163
S-DENEYSVILLE	Final Effluent of Deneysville WWTW 26°53'06.29"S 28°06'42.35"E	5.70	29	0.30	88	8.2	3.00	37	47	50	7.40	6,670
		3.60	35	0.18	92	13	3.30	37	35	46	7.40	120
		11.48	41	0.24	139	5.968333333	3.45	45	64	55	7.36	6559
S-FRANKF_NAMAHA	Final Effluent of Frankfort Namadi 27°15'41.58"S 28°29'29.22"E	13.00	39	0.12	170	0.91	3.60	39	50	58	8.00	10
		13.00	42	0.08	150	0.64	3.50	39	39	50	7.70	700
		23.00	35	0.17	189	2.653333333	3.95	42	55	58	7.36	54148,25
S-FRANKF_OXI_P	Final Effluent of Frankfort Oxidation Ponds 27°17'27.44"S 28°29'16.83"E	10.00	49	0.25	190	0.3	3.60	36	87	66	7.80	215
		9.40	63	0.29	175	0.21	4.00	42	100	69	8.10	730
		8.43	79	0.28	181	0.3	4.60	38	122	71	8.45	1447,75
S-ORANJEVILLE	Final Effluent of Oranjeville WWTW 26°58'47.06"S 28°12'35.72"E	5.40	31	0.11	82	13	3.40	29	36	45	7.40	1,630
		4.40	30	0.12	95	6	2.90	28	33	40	7.40	14,770
		19.50	35	0.22	139	5.205	3.48	36	77	52	7.37	801286,6667
S-VAAL_MARINA	Final Effluent of Vaal Marina WWTW 26°53'19.35"S 28°12'50.50"E	4.20	30	0.28	130	7.3	1.90	39	28	49	7.70	365
		0.25	35	0.28	120	5.8	0.85	45	22	48	7.70	18
		15.15	37	0.23	143	5.442	2.33	34	30	53	7.74	846.5
S-VILLIERS	Final Effluent of Villiers WWTW 27°01'54.43"S 28°35'21.89"E	15.00	74	0.30	270	1.8	2.90	56	125	91	7.70	145,350
		11.00	63	0.35	195	5	4.00	48	125	73	7.60	61160
		27.00	49	0.35	269	0.135	4.32	53	126	85	7.48	294179.6

Key

VD11	Vaal Dam 1 Integrated @ RW intake	0.12	-	1 July 14 - 30 Sept 14
		0.12	-	1 Oct 14 - 31 Dec 14
		0.12	-	1 Jan 15 - 31 Mar 15
		0.12	-	1 Apr 15 - 30 Jun 15

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	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	> 0.5
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