



RAND WATER

Quarterly Water Quality Status of the Vaal Dam Reservoir Catchment

1 October 2012 - 30 September 2013

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	<10	0.16	84	0.21	<0.05	97	26	51	7.20	
		0.11	<10	0.24	57	0.29	0.050	22	18	36	7.10	
		0.77	16	0.16	66	0.83	0.170	32	<10	22	7.40	
		0.10	12	0.20	135	0.10	0.070	35	<10	36	8.30	
VSS	Sandspruit below Vaal River @ Klipplaatdrift 27°12'30.82"S 29°26'12.83"E	0.12	<10	0.31	89	0.20	0.110	31	19	36	7.40	
		0.11	<10	0.28	87	0.12	0.110	22	17	36	7.40	
		0.10	12	0.18	110	0.82	0.050	25	<10	30	7.90	
		0.10	14	0.24	115	0.14	0.050	37	10	31	8.00	
KB	Klip River @ Barnardskop 27°28'12.33"S 29°36'1.76"E	0.12	<10	0.16	44	<0.10	0.120	9	19	17	7.00	
		0.11	<10	0.13	42	0.23	0.080	14	13	12	6.90	
		0.10	<10	0.08	34	<0.10	0.050	7	<10	10	6.90	
		0.10	<10	0.08	58	<0.10	0.050	6	12	14	7.80	
KW	Klip @ Winkelhaak 27°14'41.55"S 29°23'59.91"E	0.32	12	0.20	90	0.95	0.270	43	20	21	7.00	
		0.11	<10	0.12	49	<0.10	0.070	11	18	14	6.90	
		0.10	<10	0.13	49	<0.10	0.050	11	<10	14	7.10	
		0.11	<10	0.12	49	<0.10	0.070	11	18	14	6.90	
KD	Klip River @ De Langesdrift 27°10'57.77"S 29°14'5.54"E	0.12	<10	0.29	74	0.25	0.150	22	23	26	7.10	
		0.11	<10	0.38	86	0.39	<0.05	19	17	23	7.40	
		0.10	<10	0.19	67	0.93	0.050	14	<10	77	6.90	
		0.10	<10	0.15	160	0.31	0.050	15	<10	35	8.20	
KSV	Spruitsonderdrift downstream of Vrede 27°21'8.15"S 29°10'16.87"E	0.12	11	0.27	110	0.21	<0.05	47	35	54	7.90	
		0.11	10	0.40	150	0.16	0.110	34	25	38	7.70	
		0.10	20	0.31	205	1.50	0.190	27	16	50	8.10	
		0.10	30	0.28	245	1.20	0.500	42	44	59	9.10	
VDS	Vaal River downstream of Standerton 27° 0'55.97"S 29° 1'29.30"E	0.25	12	0.28	105	0.39	0.080	33	24	37	7.20	
		0.11	<10	0.30	94	0.23	0.080	21	24	28	7.20	
		0.10	<10	0.17	115	0.17	0.050	17	13	29	7.40	
		0.10	14	0.26	155	0.80	0.130	29	19	41	7.90	
VGB	Gladdedrft Bridge @ Villiers 26°59'31.24"S 28°43'47.18"E	0.12	10	0.30	85	0.58	0.120	27	22	30	7.20	
		0.11	<10	0.29	89	0.47	<0.05	15	19	24	7.00	
		0.10	13	0.35	100	0.53	0.090	39	18	28	7.70	
		0.10	12	0.26	150	0.12	0.050	34	16	38	7.90	
VV	Vaal @ Villiers 27°1'20.13"S 28°36'0.32"E	0.12	17	0.34	95	0.13	0.110	45	22	36	7.30	89
		0.11	<10	0.28	87	1.10	0.060	18	20	22	7.20	210
		0.10	<10	0.29	105	0.11	0.050	30	14	30	7.70	14
		0.10	15	0.29	130	0.13	0.080	44	19	36	8.00	13
VD4I	Vaal Dam 4 Integrated - Vaal River upstream of Vaal Marina 26°53'27.99"S 28°15'0.16"E	0.12	16	0.38	135	0.17	0.070	45	17	42	8.10	6
		0.11	10	0.28	89	0.50	0.100	30	36	30	7.20	11
		0.10	<10	0.30	87	0.20	0.050	31	18	24	7.30	21
		0.10	<10	0.29	87	0.61	0.130	25	18	25	8.30	1
WF	Wilge River @ Frankfort 27°16'18.00"S 28°29'28.41"E	0.12	<10	0.22	72	0.35	0.090	17	17	23	7.30	95
		0.11	<10	0.16	69	0.36	0.060	7	15	16	7.00	155
		0.10	<10	0.13	49	0.32	0.050	6	<10	12	7.00	86
		0.10	<10	0.08	44	0.10	0.050	6	<10	11	7.20	71
VD3I	Vaal Dam 3 Integrated - Wilge River downstream of Oranjeville 26°59'1.64"S 28°13'25.08"E	0.10	<10	0.23	60	0.17	0.170	25	<10	26	7.30	12
		0.11	<10	0.16	60	0.18	0.080	24	29	18	7.10	8
		0.10	<10	0.21	62	0.30	0.070	15	30	17	7.20	14
		0.11	<10	0.16	60	0.18	0.080	24	29	18	7.10	8
VD2I	Vaal Dam 2 Integrated - Confluence of Vaal & Wilge 26°53'48.81"S 28°11'9.92"E	0.10	<10	0.21	80	0.13	<0.05	31	<10	33	7.50	5
		0.11	<10	0.17	72	0.12	0.060	22	11	22	7.30	3
		0.10	<10	0.21	74	0.32	0.050	23	11	18	7.30	3
		0.11	<10	0.17	72	0.12	0.060	22	11	22	7.30	3
VD1I	Vaal Dam 1 Integrated @ RW intake 26°53'0.26"S 28°7'14.35"E	0.11	<10	0.20	81	0.10	<0.05	21	<10	32	7.50	98
		0.11	<10	0.16	72	0.20	<0.05	24	<10	22	7.40	10
		0.10	<10	0.20	77	0.22	0.050	22	<10	21	7.20	165
		0.15	<10	0.24	70	1.10	0.130	21	<10	20	7.70	4
S-ST_NEW	Standerton Sewage Works 26°58'24.60"S 29°13'52.87"E	18.00	42	0.38	265	0.43	3.400	50	285	73	7.00	7538870
		29.00	42	0.40	405	<0.10	3.500	34	140	63	7.20	3971000
		36.00	42	0.40	150	<0.10	3.700	23	215	90	7.50	3,652,870
		14.00	38	0.31	175	0.19	2.700	30	455	76	7.00	5,081,670

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	18.00	42	0.38	265	0.43	3,400	50	73	7.00	7538870	
		29.00	42	0.40	405	<0.10	3,500	34	140	63	7.20	3971000
		36.00	42	0.40	150	<0.10	3,700	23	215	90	7.50	3,652,870
		14.00	38	0.31	175	0.19	2,700	30	455	76	7.00	5,081,670

Key

VD1I	Vaal Dam 1 Integrated @ RW intake	0.12	-	1 Oct 12 - 31 Dec 12
		0.12	-	1 Jan 13 - 31 Mar 13
		0.12	-	1 Apr 13 - 30 Jun 13
		0.12	-	1 July 13 - 30 Sept 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
<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
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	> 0.5
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

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