



**RAND WATER**

**Quarterly Water Quality Status of the Vaal Dam Reservoir Catchment**

1 July 2010 - 30 June 2011

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	0.15	115	0.14	<0.05	16	12	32	8.10	
		0.12	<10	0.17	93	0.13	0.050	20	16	27	7.40	
		0.12	<10	0.19	86	<0.10	<0.036	12	13	22	7.50	
		0.12	<10	0.26	115	<0.10	<0.036	24	10	30	7.70	
VSS	Sandspruit below Vaal River @ Kliplaatsdrift 27°12'30.82"S 29°26'12.83"E	0.12	<10	0.17	180	<0.10	<0.05	27	<10	43	8.40	
		0.12	<10	0.24	145	0.11	<0.036	36	15	42	7.70	
		0.12	<10	0.28	140	<0.10	<0.036	19	13	33	7.90	
		0.12	<10	0.32	190	<0.10	<0.036	38	10	43	8.20	
KB	Klip River @ Barnardskop 27°28'12.33"S 29°36'1.76"E	0.12	<10	0.11	59	<0.10	<0.05	<5.0	<10	17	7.50	
		0.12	<10	0.17	56	0.12	<0.036	12	<10	18	7.30	
		0.12	<10	0.15	56	<0.10	<0.036	<5.0	16	14	6.60	
		0.12	<10	0.19	64	0.12	<0.036	13	14	18	7.30	
KW	Klip @ Winkelhaak 27°14'41.55"S 29°23'59.91"E	0.12	<10	0.14	125	<0.10	0.190	13	<10	33	7.90	
		0.12	<10	0.16	120	<0.10	0.080	14	<10	30	7.50	
		0.12	<10	0.15	70	<0.10	<0.036	5	16	17	6.90	
		0.12	<10	0.24	105	<0.10	<0.036	14	9	26	7.50	
KD	Klip River @ De Langesdrift 27°10'57.77"S 29°14'5.54"E	0.12	<10	0.18	190	<0.10	<0.05	21	<10	46	8.30	
		0.12	<10	0.23	150	0.16	<0.036	28	14	39	7.50	
		0.12	<10	0.17	82	<0.10	<0.036	9	23	19	7.20	
		0.12	<10	0.30	165	<0.10	<0.036	26	10	38	7.90	
KSV	Spruitsonderdrift downstream of Vrede 27°21'18.15"S 29°10'16.87"E	0.12	26	0.20	205	0.13	0.260	27	33	56	8.70	
		0.23	27	0.27	165	0.25	0.580	27	22	45	8.00	
		0.12	<10	0.26	145	0.43	0.080	21	21	36	7.90	
		0.12	15	0.31	185	0.62	0.100	32	20	44	8.30	
VDS	Vaal River downstream of Standerton 27°0'55.97"S 29°1'29.30"E	0.12	11	0.17	185	<0.10	<0.05	22	14	45	8.20	
		0.43	11	0.24	105	0.65	0.070	22	21	31	7.20	
		0.12	<10	0.20	105	<0.10	0.050	11	21	26	7.50	
		0.12	11	0.28	180	0.27	<0.036	29	15	42	8.00	
VGB	Gladdesdrift Bridge @ Villiers 28°59'31.24"S 28°43'47.18"E	0.12	11	0.17	195	0.36	<0.05	24	13	48	8.00	
		0.12	14	0.37	190	0.62	<0.036	28	22	53	7.10	
		0.12	<10	0.23	94	0.13	0.180	18	18	27	6.90	
		0.12	<10	0.24	180	<0.10	0.040	22	15	40	8.40	
VV	Vaal @ Villiers 27°1'20.13"S 28°36'0.32"E	0.12	16	0.21	180	0.11	<0.05	33	17	50	7.90	
		0.12	19	0.33	185	0.43	0.090	44	22	52	7.50	38
		0.12	<10	0.26	90	0.16	0.040	18	23	26	6.90	200
		0.12	13	0.28	165	0.11	<0.036	33	16	40	8.30	98
VD4I	Vaal Dam 4 Integrated - Vaal River upstream of Vaal Marina 26°53'27.99"S 28°15'0.16"E	0.12	<10	0.21	69	0.34	<0.05	16	16	21	7.80	
		0.12	<10	0.29	68	0.38	0.050	19	17	22	7.20	65
		0.12	<10	0.22	67	0.30	<0.036	16	31	20	7.50	22
		0.12	<10	0.24	70	0.34	<0.036	15	24	20	7.60	5
WF	Wilge River @ Frankfort 27°16'18.00"S 28°29'28.41"E	0.12	<10	0.08	51	0.19	<0.05	<5.0	<10	13	7.00	
		0.12	<10	0.12	45	0.15	<0.036	5	5	12	6.80	135
		0.12	<10	0.18	70	0.19	0.040	7	22	20	6.70	29370
		0.12	<10	0.10	63	0.57	<0.036	8	14	16	7.30	48500
VD3I	Vaal Dam 3 Integrated - Wilge River downstream of Oranjeville 26°59'1.64"S 28°13'25.08"E	0.12	<10	0.17	56	0.30	<0.05	9	12	15	7.50	
		0.12	<10	0.20	61	0.24	0.090	10	9	13	7.30	19
		0.12	<10	0.21	51	0.33	0.090	11	30	16	7.20	47
		0.12	<10	0.20	57	0.30	<0.036	10	22	16	7.60	6
VD2I	Vaal Dam 2 Integrated - Confluence of Vaal & Wilge 26°53'48.81"S 28°11'9.92"E	0.12	<10	0.16	56	0.35	<0.05	11	13	16	7.40	
		0.12	<10	0.23	66	0.33	0.060	15	13	19	7.20	33
		0.12	<10	0.18	55	0.35	0.050	14	27	17	7.20	19
		0.12	<10	0.31	57	0.44	<0.036	12	21	16	7.50	8
VD1I	Vaal Dam 1 Integrated @ RW intake 26°53'0.26"S 28°7'14.35"E	0.12	<10	0.17	59	0.40	<0.05	17	11	17	7.50	
		0.12	<10	0.21	60	0.35	0.070	13	13	17	7.20	21
		0.12	<10	0.19	54	0.41	0.050	14	19	17	6.90	4
		0.12	<10	0.21	57	0.40	<0.036	13	21	17	7.50	4
S-ST_NEW	Standerton Sewage Works 26°58'24.60"S 29°13'52.87"E	28.00	64	0.20	250	<0.10	5.000	32	295	81	7.20	
		28.00	44	0.28	130	<0.10	3.800	29	285	75	7.30	2893970
		21.00	47	0.36	250	0.77	3.900	35	160	79	7.00	3491330
		32.00	44	0.23	260	<0.10	4.700	25	140	76	7.10	3505330

**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	28.00	0.20	<0.10	5.000	295	81	7.20	
		28.00	0.28	<0.10	3.800	285	75	7.30	2893970
		21.00	0.36	0.77	3.900	160	79	7.00	3491330
		32.00	0.23	<0.10	4.700	140	76	7.10	3505330

**Key**

VD1I	Vaal Dam 1 Integrated @ RW intake	0.12	-	1 Jul 2010 - 30 Sep 2010
		0.12	-	1 Oct 10 - 31 Dec 10
		0.12	-	1 Jan 11 - 31 Mar 11
		0.12	-	1 Apr 11 - 30 Jun 11

**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