



Quarterly Water Quality Status of the Vaal Dam Reservoir Catchment

1 October 2016 - 30 September 2017

Sample Points	Sample Point Description	Ammonia	Chloride	Fluoride	W-Alkalinity	Nitrate	Phosphate	Sulphate	Chemical Oxygen Demand	Conductivity	pH	E. coli
VSS	Sandspruit below Vaal River @ Kliplaatsdrift 27°12'30.82"S 29°26'12.83"E	0.20	11	0.23	69	0.21	0.10	24	24	22	7.40	
		0.20	11	0.23	69	0.21	0.10	24	24	22	7.40	
		<0.092	14	0.18	115	0.10	0.20	28	27	32	8.00	
		0.05	14	0.32	235	0.28	<0.2	47	20	56	8.35	
KB	Klip River @ Barnardskop 27°28'12.33"S 29°36'1.76"E	<0.2	6	0.23	90	<0.1	<0.1	8	12	23	7.66	
		0.20	<10	0.20	45	0.10	0.10	12	27	15	7.00	
		<0.092	<10	0.18	70	0.10	0.20	10	28	20	7.40	
		<0.05	8	0.27	62	1.10	<0.2	10	12	20	8.03	
KW	Klip @ Winkelhaak 27°14'41.55"S 29°23'59.91"E	0.20	<10	0.22	39	0.10	0.10	7	12	12	7.20	
KD	Klip River @ De Langesdrift 27°10'57.77"S 29°14'5.54"E	<0.2	11	0.33	183	<0.1	0.11	21	13	45	8.06	
		0.20	<10	0.16	42	0.10	0.10	9	27	59	6.60	
		<0.092	10	0.17	115	0.10	0.20	17	22	28	7.80	
		<0.05	12	0.28	193	0.10	<0.2	26	20	42	7.93	
KSV	Spruitsonderdrift downstream of Vrede 27°21'8.15"S 29°10'16.87"E	0.48	43	0.36	212	2.67	0.91	72	36	71	8.09	
		0.20	18	0.24	105	0.48	0.10	25	32	75	7.10	
		<0.092	30	0.26	180	1.30	0.28	34	33	48	7.90	
		0.06	39	0.31	247	1.03	0.6	45	29	62	8.83	
VDS	Vaal River downstream of Standerton 27°0'55.97"S 29°1'29.30"E	<0.2	25	0.43	132	<0.1	0.20	36	19	37	8.00	
		0.20	11	0.23	75	0.17	0.10	21	23	23	7.40	
		<0.092	13	0.22	130	0.36	0.20	22	29	34	7.80	
		0.25	17	0.30	170	0.81	<0.2	32	17	44	7.87	
VGB	Gladdesdrift Bridge @ Villiers 26°59'31.24"S 28°43'47.18"E	<0.2	13	0.27	147	<0.1	<0.1	29	22	42	8.46	
		0.34	11	0.38	72	0.15	0.10	37	24	22	7.50	
		<0.092	12	0.21	140	0.07	0.32	25	18	36	7.90	
		0.16	19	0.32	163	0.29	<0.2	35	16	45	8.27	
VV	Vaal @ Villiers 27°1'20.13"S 28°36'0.32"E	<0.2	19	0.24	127	<0.1	<0.1	44	22	40	8.28	48
		0.31	12	0.30	68	0.67	0.10	26	27	24	7.30	1370
		<0.092	19	0.23	115	0.08	0.18	30	28	33	7.90	31
		0.17	23	0.30	164	0.53	<0.2	36	18	44	7.42	26
VD4I	Vaal Dam 4 Integrated - Vaal River upstream of Vaal Marina 26°53'27.99"S 28°15'0.16"E	<0.2	15	0.31	96	1.01	6.55	31	22	27	8.16	44
		0.20	12	0.28	55	0.67	0.10	30	23	18	7.80	205
		<0.092	<10	0.19	49	0.11	0.20	16	25	15	6.70	1
		<0.05	8	0.34	60	0.32	19.33	<0.2	23	19	19	7.74
WF	Wilge River @ Frankfort 27°16'18.00"S 28°29'28.41"E	0.71	7	0.20	40	1.16	0.24	9	26	11	7.57	573
		0.20	<10	0.18	53	0.17	0.10	8	14	16	7.40	550
		<0.092	<10	0.11	55	0.22	0.18	6	12	14	7.50	145
		<0.05	6	<0.19	52	0.80	<0.2	9	15	18	7.55	803
VD3I	Vaal Dam 3 Integrated - Wilge River downstream of Oranjeville 26°59'1.64"S 28°13'25.08"E	<0.2	12	0.22	52	0.77	0.28	18	12	14	7.84	4
		0.20	11	0.25	42	0.51	0.10	25	12	12	7.90	38
		<0.092	6	0.16	43	0.15	0.21	8	16	12	7.40	1
		<0.05	15	0.40	49	0.27	13.17	<0.2	17	14	14	7.78
VD2I	Vaal Dam 2 Integrated - Confluence of Vaal & Wilge 26°53'48.81"S 28°11'9.92"E	<0.2	13	0.24	49	2.76	0.19	25	15	13	7.62	5
		0.20	<10	0.33	48	0.97	0.10	84	13	15	7.60	44
		<0.092	<10	0.18	47	0.25	0.20	10	14	14	7.50	1
		<0.05	6	0.30	50	0.33	<0.2	14	15	22	7.30	3
VD1I	Vaal Dam 1 Integrated @ RW intake 26°53'0.26"S 28°7'14.35"E	8.90	23	0.30	57	1.23	0.77	32	11	19	7.34	16
		0.20	21	0.23	50	0.80	0.10	29	10	15	7.70	12
		<0.092	<10	0.19	55	0.30	0.20	17	12	17	7.70	13
		0.05	7	0.38	52	0.57	<0.2	16	12	17	7.67	65
C-KLIPR_VDAM	Klip River inflow to VaalDam 27°07'43.93"S 28°17'01.47"E	0.20	26	0.24	62	1.60	0.10	24	26	18	7.30	
		0.12	<10	0.16	82	0.18	0.15	12	26	23	7.20	
S-ST_NEW	Standerton Sewage Works 28°58'24.60"S 29°13'52.87"E	14.07	7	0.45	83	0.24	3.20	14	26	23	7.28	
		16.53	60	0.25	170	4.60	3.03	67	50	72	7.15	80663
		18.00	65	0.58	180	6.10	1.80	74	46	61	7.20	664530
		19.00	52	0.33	250	1.70	2.90	58	18	81	7.10	595,730
S-DENEYSVILLE	Final Effluent of Deneysville WWTW 26°53'06.29"S 28°06'42.35"E	20.00	49	0.34	215	0.21	2.55	54	97	73	7.07	583265
		10.53	27	0.23	94	9.65	2.57	31	43	44	7.14	119053
		6.80	38	0.18	125	3.60	2.60	52	36	52	8.10	4170
		14.50	62	0.33	130	8.60	4.00	44	33	53	7.20	19826
S-FRANKF_NAMA HA	Final Effluent of Frankfort Namadi 27°15'41.56"S 28°29'29.22"E	15.60	41	0.33	122	8.72	3.84	39	42	54	7.49	860
		6.80	53	0.16	165	0.93	4.20	59	39	58	7.80	180
		3.40	32	0.31	120	0.82	4.60	28	28	53	7.50	285
		2.45	30	0.21	72	8.75	3.10	36	34	47	7.24	41
S-FRANKF_OXI_P	Final Effluent of Frankfort Oxidation Ponds 27°17'27.44"S 28°29'16.83"E	2.48	83	0.27	185	1.13	3.54	28	62	68	8.27	1111
S-ORANJEVILLE	Final Effluent of Oranjeville WWTW 26°58'47.06"S 28°12'35.72"E	6.80	41	0.38	230	<0.44	36.00	3	58	64	7.44	33
		15.40	26	0.30	99	7.20	3.94	23	28	44	7.15	242246
		7.40	49	0.18	125	7.60	3.40	45	46	56	7.70	110480
		21.00	36	0.37	205	0.18	3.70	18	48	60	7.20	2,253,520
S-VAAL_MARINA	Final Effluent of Vaal Marina WWTW 26°53'19.35"S 28°12'50.50"E	28.80	38	0.38	236	5.71	4.10	29	78	71	7.19	2507338
		0.21	33	0.23	46	4.00	3.40	44	18	49	7.20	1130
		0.29	51	0.21	185	5.50	1.40	49	18	69	7.60	860
		0.32	47	0.16	160	12.00	2.20	45	22	62	7.50	9
S-VILLIERS	Final Effluent of Villiers WWTW 27°01'54.43"S 28°35'21.89"E	<0.05	41	0.45	67	21.34	3.18	45	15	56	7.27	801
		32.17	96	0.34	300	0.12	2.85	60	191	108	7.37	132340
		19.00	94	0.24	175	0.30	0.36	52	82	67	7.20	196300
		18.00	60	0.33	295	0.23	2.80	31	64	87	7.20	283,120
	25.17	74	0.35	324	2.96	2.95	49	128	101	7.43	188205	






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

Sample Points	Sample Point Description	Ammonia	Chloride	Fluoride	M-Alkalinity	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	16.53	60	0.25	170	4.6	3.03	67	50	72	7.15	80663
		18.00	65	0.58	180	6.1	1.80	74	46	61	7.20	664530
		19.00	52	0.33	250	1.7	2.90	58	18	81	7.10	595,730
		20.00	49	0.34	215	0.2	2.55	54	97	73	7.07	583265
S-DENEYSVILLE	Final Effluent of Deneysville WWTW 26°53'06.29"S 28°06'42.35"E	10.53	27	0.23	94	9.7	2.57	31	43	44	7.14	119053
		6.80	38	0.18	125	3.6	2.60	52	36	52	8.10	4170
		14.50	62	0.33	130	8.6	4.00	44	33	53	7.20	19826
		15.60	41	0.33	122	8.7	3.84	39	42	54	7.49	860
S-FRANKF_NAMAHA	Final Effluent of Frankfort Namadi 27°15'41.58"S 28°29'29.22"E	6.80	53	0.16	165	0.9	4.20	59	39	58	7.80	180
		3.40	32	0.31	120	0.8	4.60	28	28	53	7.50	285
		2.45	30	0.21	72	8.8	3.10	36	34	47	7.24	41
		2.48	83	0.27	185	1.1	3.54	28	62	68	8.27	1111
S-FRANKF_OXI_P	Final Effluent of Frankfort Oxidation Ponds 27°17'27.44"S 28°29'16.83"E	6.80	41	0.38	230	<0.44	36.00	3	58	64	7.44	33
		15.40	26	0.30	99	7.2	3.94	23	28	44	7.15	242246
		7.40	49	0.18	125	7.6	3.40	45	46	56	7.70	110480
		21.00	36	0.37	205	0.2	3.70	18	48	60	7.20	2,253,520
S-ORANJEVILLE	Final Effluent of Oranjeville WWTW 26°58'47.06"S 28°12'35.72"E	28.80	38	0.38	236	5.7	4.10	29	78	71	7.19	2507338
		0.21	33	0.23	46	4.0	3.40	44	18	49	7.20	1130
		0.29	51	0.21	185	5.5	1.40	49	18	69	7.60	860
		0.32	47	0.16	160	12.0	2.20	45	22	62	7.50	9
S-VAAL_MARINA	Final Effluent of Vaal Marina WWTW 27°01'54.43"S 28°35'21.89"E	<0.05	41	0.45	67	21.3	3.18	45	15	56	7.27	801
		32.17	96	0.34	300	0.1	2.85	60	191	108	7.37	132340
		19.00	94	0.24	175	0.3	0.36	52	82	67	7.20	196300
		18.00	60	0.33	295	0.2	2.80	31	64	87	7.20	283,120
S-VILLIERS	Final Effluent of Villiers WWTW 27°01'54.43"S 28°35'21.89"E	25.17	74	0.35	324	3.0	2.95	49	128	101	7.43	188205

Key

VD11	Vaal Dam 1 Integrated @ RW intake	0.12	-	1 Oct 2016 - 31 Dec 2016
		0.12	-	1 Jan 17 - 31 Mar 17
		0.12	-	1 Apr 17- 30 Jun 17
		0.12	-	1 July 17 - 30 Sept 17

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