

# Rand Water

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

01 Apr 2017 - 31 Mar 2018



Sample Points	Sample Point Description	Ammonia	Chemical Oxygen Demand	Chloride	Conductivity	E.coli	Fluoride	M-Alkalinity	Nitrate	pH	Phosphate	Sulphate
VSS	Sandspruit below Vaal River @ Klipplaatsdrift 27° 12.508'S 29° 26.225'E	<0.092	27	14	32		0.18	115	0.10	8.0	0.20	28
		0.05	20	14	56		0.32	235	0.28	8.4	<0.2	47
		<0.092	22	22	44		0.35	165	0.44	7.6	0.20	59
		<0.05	16	11	30		0.33	133	<0.44	7.2	<0.2	21
KB	Klip River @ Barnardskop 27° 28.203'S 29° 36.032'E	<0.092	28	<10	20		0.18	70	0.10	7.4	0.20	10
		0.05	12	8	20		0.27	62	1.10	8.0	<0.2	10
		<0.092	21	11	22		0.19	79	0.44	7.5	0.20	6
		<0.05	17	6	22		<0.19	123	0.27	7.4	<0.2	30
KW	Klip @ Winkelhaak 27° 14.694'S 29° 23.996'E											
		<0.092	24	12	42		0.27	180	0.44	8.0	0.20	12
		<0.05	19	6	22		<0.19	100	<0.44	6.9	0.21	11
KD	Klip River @ De Langesdrift 27° 10.964'S 29° 14.097'E	<0.092	22	10	28		0.17	115	0.10	7.8	0.20	17
		<0.05	20	12	42		0.28	193	0.10	7.9	<0.2	26
		<0.092	21	14	34		0.28	145	0.44	7.4	0.20	27
		0.27	17	7	23		0.36	85	0.54	7.3	<0.2	15
KSV	Spruitsonderdrift downstream of Vrede 27° 21.137'S 29° 10.281'E	<0.092	33	30	48		0.26	180	1.30	7.9	0.28	34
		0.06	29	39	62		0.31	247	1.03	8.8	0.58	45
		0.51	31	40	52		0.26	200	0.98	7.4	0.60	39
		<0.05	22	21	52		0.32	198	0.29	7.6	<0.2	33
VDS	Vaal River downstream of Standerton 27° 0.933'S 29° 1.488'E	<0.092	23	13	34		0.22	130	0.36	7.8	0.20	22
		0.25	17	17	44		0.30	170	0.81	7.9	<0.2	32
		<0.092	26	22	35		0.27	110	0.44	7.1	0.20	32
		0.05	14	9	27		0.39	105	<0.1	7.7	<0.2	21
VGB	Gladdedrift Bridge @ Villiers 26° 59.521'S 28° 43.786'E	<0.092	18	12	36		0.21	140	0.07	7.9	0.32	25
		0.16	16	19	45		0.32	163	0.29	8.3	<0.2	35
		0.20	19	14	34		0.22	120	0.62	7.3	<0.2	28
		0.25	24	12	23		0.22	101	0.53	7.2	<0.2	19
VV	Vaal @ Villiers 27° 1.389'S 28° 35.631'E	<0.092	28	19	33	31	0.23	115	0.08	7.9	0.18	30
		0.17	18	23	44	26	0.30	164	0.53	7.4	<0.2	36
		0.38	24	27	34	355	0.25	120	0.74	7.2	<0.2	34
		<0.2	22	9	29	980	0.38	78	0.88	7.6	0.11	26
VD4I	Vaal Dam 4 Integrated - Vaal River upstream of Vaal Marina 26° 55.366'S 28° 17.219'E	<0.092	25	<10	15	1	0.19	49	0.11	6.7	0.20	16
		<0.05	22	8	19	1	0.34	60	0.32	7.7	19.33	<0.2
		<0.092	16	<10	26	4	0.23	77	0.44	7.7	0.20	17
		<0.05	20	15	28	2	0.26	375	<0.44	7.7	<0.2	30
WF	Wilge River @ Frankfort 27° 16.311'S 28° 29.489'E	<0.092	12	<10	14	145	0.11	55	0.22	7.5	0.18	6
		<0.05	15	6	18	803	<0.19	52	0.80	7.6	<0.2	9
		0.14	20	<10	13	7,120	0.19	50	0.44	7.0	<0.2	6
		<0.2	18	3	16	727	0.22	78	4.30	7.5	0.10	16
VD3I	Vaal Dam 3 Integrated - Wilge River downstream of Oranjeville 26° 56.208'S 28° 12.699'E	<0.092	16	<10	12	1	0.16	43	0.15	7.4	0.21	8
		<0.05	17	<10	14	98	0.40	49	0.27	7.8	13.17	<0.2
		<0.092	13	12	17	2	0.19	61	0.44	7.4	0.20	11
		<0.05	15	4	15	0	<0.19	365	<0.44	7.4	<0.2	9
VD2I	Vaal Dam 2 Integrated - Confluence of Vaal & Wilge 26° 54.484'S 28° 11.933'E	<0.092	14	<10	14	1	0.18	47	0.25	7.5	0.20	10
		<0.05	15	6	15	2	0.30	50	0.33	7.6	<0.2	14
		<0.092	14	<10	22	3	0.19	58	0.44	7.3	0.20	13
		<0.05	11	7	18	0	<0.19	335	<0.44	7.6	<0.2	14

# Rand Water

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

01 Apr 2017 - 31 Mar 2018



Sample Points	Sample Point Description	Ammonia	Chemical Oxygen Demand	Chloride	Conductivity	E.coli	Fluoride	M-Alkalinity	Nitrate	pH	Phosphate	Sulphate
VD11	Vaal Dam 1 Integrated @ RW Intake 26° 53.075'S 28° 7.329'E	<0.092	12	<10	17	13	0.19	55	0.30	7.7	0.20	17
		0.05	12	7	17	65	0.38	52	0.57	7.7	<0.2	16
		<0.092	12	13	15	3	0.19	54	0.44	7.5	0.20	51
		<0.05	11	7	19	1	<0.19	355	<0.44	7.4	<0.2	14
KLIPR_VDAM	Klip River inflow to Vaal Dam 27° 7.735'S 28° 17.028'E	0.12	26	<10	23		0.16	82	0.18	7.2	0.15	12
		14.07	26	7	23		0.45	83	0.24	7.3	3.20	14
		0.15	28	<10	29		0.19	100	0.44	7.2	<0.2	10
		<0.2	37	5	23		0.38	62	0.79	7.3	<0.1	18

### Key

VD11	Vaal Dam 1 Integrated @ RW Intake 26° 53.075'S 28° 7.329'E	<0.092	- 1 Apr to 30 Jun 2017
		0.05	- 1 Jul to 30 Sep 2017
		<0.092	- 1 Oct to 31 Dec 2017
		<0.05	- 1 Jan to 31 Mar 2018

### Water Quality Guidelines

	- Ideal
	- Acceptable
	- Tolerable
	- Unacceptable

**Rand Water**  
**Quarterly Water Quality Status of the Vaal Dam Reservoir Catchment**  
**Wastewater Treatment Works**

01 Apr 2017 - 31 Mar 2018



Sample Points	Sample Point Description	Ammonia	Chemical Oxygen Demand	Chloride	Conductivity	E.coli	Fluoride	M-Alkalinity	Nitrate	pH	Phosphate	Sulphate
S-ST_NEW	Standerton Sewage Works 26° 58.453'S 28° 12.260'E	19.00	18	52	81	595,730	0.33	250	1.70	7.1	2.90	58
		20.00	97	49	73	583,265	0.34	215	0.21	7.1	2.55	54
		21.00	63	54	69	1,019,367	0.38	193	<0.44	7.1	2.63	48
		27.67	112	50	78	1,753,833	0.51	273	<0.44	7.1	3.47	29
S-DENEYSVILLE	Final Effluent of Deneysville WWTW 26° 53.103'S 28° 6.692'E	14.50	33	62	53	19,826	0.33	130	8.60	7.2	4.00	44
		4.05	48	35	49	4,408	0.28	104	6.53	6.9	3.10	40
		3.40	28	32	53	285	0.31	120	0.82	7.5	4.60	28
S-FRANKF_NAMAHA	Final Effluent of Frankfort Namahadi 27° 15.691'S 28° 29.503'E	2.45	34	30	47	41	0.21	72	8.75	7.2	3.10	36
		9.20	62	82	54	550	0.19	160	3.40	7.1	4.20	28
		9.20	39	36	44	87	0.24	138	4.98	7.7	3.75	35
		6.80	58	41	64	33	0.38	230	<0.44	7.4	36.00	3
S-FRANKF_OXLP	Final Effluent of Frankfort Oxidation Ponds 27° 17.453'S 28° 29.276'E	6.70	86	42	57	3,660	0.26	185	0.44	7.1	2.70	35
		<0.2	56	43	54	2,324	0.28	143	0.79	8.6	1.27	28
		21.00	48	36	60	2,253,520	0.37	205	0.18	7.2	3.70	18
		28.80	78	38	71	2,507,338	0.38	236	5.71	7.2	4.10	29
S-ORANJEVILLE	Final Effluent of Oranjeville WWTW 26° 58.804'S 28° 12.597'E	12.00	43	33	50	39,860	0.19	130	6.80	6.9	3.20	26
		9.53	30	28	49	1,012,691	0.41	120	6.71	7.2	2.60	27
		0.32	22	47	62	9	0.16	160	12.00	7.5	2.20	45
		<0.05	15	41	56	801	0.45	67	21.34	7.3	3.18	45
S-VAAL_MARINA	Final Effluent of Vaal Marina WWTW 26° 53.324'S 28° 12.838'E	0.15	20	38	50	660	0.19	88	24.00	7.0	3.20	38
		1.07	20	55	59	13,614	0.30	121	8.52	7.3	3.75	38
		18.00	64	60	87	283,120	0.33	295	0.23	7.2	2.80	31
		25.17	128	74	101	188,205	0.35	324	2.96	7.4	2.95	49
S-VILLIERS	Final Effluent of Villiers WWTW 27° 1.908'S 28° 35.366'E	18.00	140	100	100	354,260	0.31	285	0.44	7.0	2.20	60
		20.00	109	83	82	499,539	0.48	199	0.49	7.3	2.95	43

**Key**

S-VAAL_MARINA	Final Effluent of Vaal Marina WWTW 26° 53.324'S 28° 12.838'E	0.32	- 1 Apr to 30 Jun 2017
		<0.05	- 1 Jul to 30 Sep 2017
		0.15	- 1 Oct to 31 Dec 2017
		1.07	- 1 Jan to 31 Mar 2018

**Water Quality Guidelines**

Blue	- Ideal
Green	- Acceptable
Yellow	- Tolerable
Red	- Unacceptable

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

Sample Points	Sample Point Description	Ammonia	Chemical Oxygen Demand	Chloride	Conductivity	Faecal coliforms	Fluoride	M-Alkalinity	Nitrate	pH	Phosphate	Sulphate
S-ST_NEW	Standerton Sewage Works 26° 58.453'S 28° 12.260'E	19.00	18	52	81	595,730	0.33	250	1.70	7.1	2.90	58
		20.00	97	49	73	583,265	0.34	215	0.21	7.1	2.55	54
		21.00	63	54	69	1,019,367	0.38	193	<0.44	7.1	2.63	48
		27.67	112	50	78	1,753,833	0.51	273	<0.44	7.1	3.47	29
S-DENEYSVILLE	Final Effluent of Deneysville WWTW 26° 53.103'S 28° 6.692'E	14.50	33	62	53	19,826	0.33	130	8.60	7.2	4.00	44
		4.05	48	35	49	4,408	0.28	104	6.53	6.9	3.10	40
		3.40	28	32	53	285	0.31	120	0.82	7.5	4.60	28
S-FRANKF_NAMAHA	Final Effluent of Frankfort Namahadi 27° 15.691'S 28° 29.503'E	2.45	34	30	47	41	0.21	72	8.75	7.2	3.10	36
		9.20	62	82	54	550	0.19	160	3.40	7.1	4.20	28
		9.20	39	36	44	87	0.24	138	4.98	7.7	3.75	35
		6.80	58	41	64	33	0.38	230	<0.44	7.4	36.00	3
S-FRANKF_OXLP	Final Effluent of Frankfort Oxidation Ponds 27° 17.453'S 28° 29.276'E	6.70	86	42	57	3,660	0.26	185	0.44	7.1	2.70	35
		<0.2	56	43	54	2,324	0.28	143	0.79	8.6	1.27	28
		21.00	48	36	60	2,253,520	0.37	205	0.18	7.2	3.70	18
		28.80	78	38	71	2,507,338	0.38	236	5.71	7.2	4.10	29
S-ORANJEVILLE	Final Effluent of Oranjeville WWTW 26° 58.804'S 28° 12.597'E	12.00	43	33	50	39,860	0.19	130	6.80	6.9	3.20	26
		9.53	30	28	49	1,012,691	0.41	120	6.71	7.2	2.60	27
		0.32	22	47	62	9	0.16	160	12.00	7.5	2.20	45
		<0.05	15	41	56	801	0.45	67	21.34	7.3	3.18	45
S-VAAL_MARINA	Final Effluent of Vaal Marina WWTW 26° 53.324'S 28° 12.838'E	0.15	20	38	50	660	0.19	88	24.00	7.0	3.20	38
		1.07	20	55	59	13,614	0.30	121	8.52	7.3	3.75	38
		18.00	64	60	87	283,120	0.33	295	0.23	7.2	2.80	31
		25.17	128	74	101	188,205	0.35	324	2.96	7.4	2.95	49
S-VILLIERS	Final Effluent of Villiers WWTW 27° 1.908'S 28° 35.366'E	18.00	140	100	100	354,260	0.31	285	0.44	7.0	2.20	60
		20.00	109	83	82	499,539	0.48	199	0.49	7.3	2.95	43

**Key**

S-VAAL_MARINA	Final Effluent of Vaal Marina WWTW 26° 53.324'S 28° 12.838'E	0.32	- 1 Apr to 30 Jun 2017
		<0.05	- 1 Jul to 30 Sep 2017
		0.15	- 1 Oct to 31 Dec 2017
		1.07	- 1 Jan to 31 Mar 2018

**Water Quality Guidelines**

Green	- Acceptable
Red	- Unacceptable

## In-stream Water Quality 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

### Organic

Chemical Oxygen Demand (COD)	mg/l	< 10	10 - 15	15 - 20	> 20
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### Macro Elements

Ammonia (NH <sub>4</sub> )	mg/l	< 0.2	0.2 - 0.5	0.5 - 1.0	> 1.0
Chloride (Cl)	mg/l	< 25	25 - 50	50 - 75	> 75
Fluoride (F)	mg/l	< 0.05	0.05 - 0.20	0.20 - 0.40	> 0.40
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	> 0.50
Sulphate (SO <sub>4</sub> )	mg/l	< 20	20 - 45	45 - 70	> 70

### Bacteriological

<i>E.coli</i>	counts/100ml	< 10	10 - 60	60 - 120	> 120
<i>Faecal coliforms</i>	counts/100ml		< 126	126 - 1000	> 1000

## 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

### Organic

Chemical Oxygen Demand (COD)*	mg/l	< 75	>= 75
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### Macro Elements

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

### Bacteriological

<i>Faecal coliforms</i>	counts/100ml	< 1,000	>= 1,000
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\*After removal of algae