

Sample Points	Sample Point Description	Quarter	Ammonia	Chemical Oxygen Demand	Chloride	Conductivity	Fluoride	M-Alkalinity	Nitrate	pH	Phosphate	Sulphate
VE	Vaal River @ Ermelo 26° 38.891'S 30° 9.072'E	1	0.08	19	12	18	0.26	45	<0.5	7.1	<0.25	17
		2	0.03	13	12	23	0.30	67	<0.5	7.5	<0.25	11
		3	0.04	22	15	26	0.34	93	<0.5	7.8	<0.25	11
		4	0.23	31	15	33	0.45	87	0.69	6.8	<0.25	23
WITPUNTSPRUIT	Witpuntspruit @ N2 near Camden 26° 35.604'S 30° 5.781'E	1	0.29	<10	17	85	0.91	<5	<0.5	3.7	<0.25	383
		2	0.20	<10	24	133	2.30	<5	<0.5	3.6	<0.25	528
		3	0.22	16	30	131	2.17	31	<0.5	4.9	<0.25	1 277
		4	0.28	25	11	45	0.86	9	0.70	5.2	<0.25	197
VAAL-DS_WITPT	Vaal River Downstream of Witpuntspruit 26° 42.123'S 30° 4.968'E	1	0.09	19	12	25	0.42	45	<0.5	7.4	<0.25	55
		2	0.49	13	15	27	0.44	68	0.54	7.7	<0.25	42
		3	0.04	40	21	45	0.63	114	<0.5	8.2	<0.25	72
		4	0.14	45	20	30	0.76	57	0.58	7.2	<0.25	76
VKV	Klein Vaal River @ Goedehoop 26° 49.209'S 30° 8.199'E	1	0.43	<10	20	16	0.43	58	0.64	7.5	0.42	27
		2										
		3										
		4	0.08	15	9	15	0.30	42	0.85	7.1	<0.25	18
VRA	Rietspruit below Amersfoort 26° 54.785'S 29° 52.320'E	1	0.11	14	9	19	0.29	61	0.80	7.3	<0.25	19
		2	0.03	14	9	22	0.33	55	0.99	7.5	<0.25	16
		3	0.14	42	13	24	0.32	69	1.22	7.6	<0.25	17
		4	0.20	45	13	42	0.51	101	0.68	7.8	<0.25	25
VKK	Brummerspruit below Ermelo 26° 30.835'S 29° 54.448'E	1	20.50	50	35	60	0.67	183	3.30	7.3	2.00	67
		2	19.00	65	38	65	0.85	198	<0.5	7.3	1.77	74
		3	26.00	93	46	80	0.97	237	<0.5	7.4	2.40	76
		4	28.67	40	37	58	0.85	134	0.77	7.4	1.13	112
VKR	Tweefontein @ Riverside 26° 37.363'S 29° 50.267'E	1	7.45	29	32	54	0.70	155	5.17	7.1	1.27	55
		2	13.17	35	34	60	0.75	177	1.06	7.3	1.16	65
		3	23.00	71	43	74	0.96	143	<0.5	7.4	2.10	75
		4	13.59	46	33	37	0.89	93	0.90	7.3	1.59	76
VK	Brummerspruit before Vaal River 26° 46.853'S 29° 48.402'E	1	0.20	29	18	35	0.53	115	1.32	7.4	0.26	38
		2	3.61	29	32	50	0.68	135	2.70	7.3	0.30	66
		3	1.01	33	45	64	0.79	167	5.53	7.8	0.79	72
		4	6.14	52	39	50	1.33	145	2.53	7.3	2.05	42
VAS	Vaal River above Standerton 26° 51.311'S 29° 41.860'E	1	0.11	23	9	19	0.35	54	<0.5	7.3	<0.25	30
		2	0.04	16	13	24	0.34	73	<0.5	7.8	<0.25	25
		3	0.06	20	11	28	0.35	77	0.50	7.8	<0.25	22
		4	0.13	23	9	27	0.43	79	0.72	7.1	<0.25	23
VGK	Geelklipspruit below Amersfoort 26° 57.893'S 29° 40.318'E	1	0.18	21	12	37	0.48	140	<0.5	7.8	<0.25	47
		2										
		3										
		4	0.18	35	8	26	0.63	67	2.00	7.3	<0.25	54
VBB	Blesbokspruit below Bethal 26° 31.866'S 29° 25.371'E	1	1.14	48	31	42	0.51	128	2.76	7.3	0.91	48
		2	9.15	48	49	61	0.70	183	0.52	7.5	1.55	48
		3	13.67	46	67	82	1.13	267	0.55	7.6	1.82	52
		4	11.53	32	69	81	1.43	252	1.90	7.8	3.27	60
VBS	Blesbokspruit @ Skaapkraal 26° 39.223'S 29° 27.056'E	1	0.10	41	26	41	0.62	135	0.59	7.7	0.70	39
		2	0.08	34	41	55	0.61	173	<0.5	7.8	0.35	48
		3	0.07	32	67	74	0.73	245	0.90	8.5	0.68	56
		4	0.06	41	73	71	0.85	265	0.59	8.1	1.04	42

**Quarterly Water Quality Status of the Grootdraai Dam Catchment 01 Jan 2019 - 31 Dec 2019**

Sample Points	Sample Point Description	Quarter	Ammonia	Chemical Oxygen Demand	Chloride	Conductivity	Fluoride	M-Alkalinity	Nitrate	pH	Phosphate	Sulphate
VB	Blesbokspruit @ Vaal River Confluence 26° 46.558'S 29° 32.485'E	1	0.12	35	26	41	0.61	145	<0.50	7.8	0.30	40
		2	0.07	35	41	55	0.63	177	<0.50	7.8	0.85	42
		3	0.05	29	57	72	0.69	242	<0.50	8.1	<0.25	63
		4	0.05	40	54	65	0.81	217	0.53	8.1	<0.25	49
ND-LEEU	Leeuspruit @ New Denmark Colliery 26° 51.277'S 29° 19.524'E	1	0.15	30	35	58	0.77	107	<0.50	7.6	<0.25	120
		2	0.04	20	30	49	0.63	103	<0.50	7.8	<0.25	83
		3	0.03	16	24	43	0.60	115	<0.50	7.9	<0.25	67
		4	1.59	19	32	49	0.75	87	<0.50	7.8	0.53	127
VS	Vaal River @ Standerton 26° 56.509'S 29° 15.835'E	1	0.04	16	18	31	0.44	95	<0.50	7.8	<0.25	45
		2	0.02	23	18	32	0.53	94	<0.50	7.7	<0.25	43
		3	0.04	24	19	34	0.56	103	<0.50	7.7	<0.25	44
		4	0.10	25	17	33	0.49	102	<0.50	7.7	<0.25	46

**Key**

VS	Vaal River @ Standerton 26° 56.509'S 29° 15.835'E	1	0.04	- 1 Jan to 31 Mar 2019
		2	0.02	- 1 Apr to 30 Jun 2019
		3	0.04	- 1 Jul to 30 Sept 2019
		4	0.10	- 1 Oct to 31 Dec 2019

**Water Quality Guidelines**

	- Ideal
	- Acceptable
	- Tolerable
	- Unacceptable



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

Sample Points	Sample Point Description	Quarter	Ammonia	Chemical Oxygen Demand	Chloride	Conductivity	Faecal coliforms	Fluoride	M-Alkalinity	Nitrate	pH	Phosphate	Sulphate
S-BETHAL	Bethal Sewage Works 26° 29.182'S 29° 27.056'E	1	16.17	71	49	79	1 814 900	0.71	253	2.40	7.6	2.78	67
		2	28.50	180	47	73	1 939 100	1.46	250	0.75	7.5	5.10	42
		3	19.52	127	59	74	21 220	1.25	169	0.66	7.3	2.05	57
		4	29.00	233	53	80	2 266 533	0.81	278	<0.5	7.3	2.76	47
S-ESW	Ermelo Sewage Works 26° 30.679'S 29° 57.863'E	1	44.50	528	50	88	2 223 400	0.84	267	6.56	7.1	4.00	73
		2	20.75	258	48	85	1 969 733	0.95	178	<0.5	7.2	1.95	87
		3	30.68	228	52	100	5 009 000	0.96	165	<0.5	7.3	2.28	110
		4	25.00	99	53	86	71 267	1.04	212	1.23	7.3	1.88	104
S-TUTU	Tutukani Sewage Works 26° 47.621'S 29° 17.514'E	1	0.86	18	56	55	4 404	0.57	135	16.34	7.8	0.30	79
		2	1.03	24	51	57	1 725	0.51	123	2.14	7.7	0.26	79
		3	1.51	20	51	59	29 269	0.63	137	1.87	7.5	0.35	83
		4	7.18	24	52	58	34	0.68	140	1.40	7.8	0.35	86
S-ND-SOUTH	New Denmark Colliery - South Shaft 26° 44.611'S 29° 18.272'E	1	1.22	30	75	85	1 575	0.65	147	6.33	7.9	1.28	85
		2	1.28	43	60	63	5 901	0.63	122	8.17	7.7	0.77	65
		3	14.67	91	85	86	434 297	1.14	230	2.30	7.5	3.03	68
		4	14.87	52	82	69	896 500	0.82	177	<0.5	7.3	2.60	71

**Key**

S-BETHAL	Bethal Sewage Works 26° 29.182'S 29° 27.056'E	1	16.17	- 1 Jan to 31 Mar 2019
		2	28.50	- 1 Apr to 30 Jun 2019
		3	19.52	- 1 Jul to 30 Sept 2019
		4	29.00	- 1 Oct to 31 Dec 2019

**Water Quality Guidelines**

	- Acceptable
	- Unacceptable

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

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<b>Variables</b>	<b>Measured as</b>	<b>Acceptable Management Target</b>	<b>Unacceptable</b>
<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>			
<i>Faecal coliforms</i>	counts/100ml	< 1,000	>= 1,000

*\*After removal of algae*

Visit  
<http://www.reservoir.co.za/> to  
find the water quality status  
report and forum dates

In-stream Water Quality Guidelines for the Grootdraai Dam Catchment					
Variables	Measured as	Leeuspruit (ND-LEEU)			
		Ideal Catchment Background	Acceptable Management Target	Tolerable Interim Target	Unacceptable
<b>Physical</b>					
Conductivity	mS/m	< 15	15 - 30	30 - 50	> 50
pH	pH units	6.4 - 8.5			< 6.4; > 8.5
<b>Organic</b>					
Chemical Oxygen Demand (COD)	mg/l	< 10	10 - 20	20 - 35	> 35
<b>Macro Elements</b>					
Ammonia (NH <sub>4</sub> )	mg/l	< 0.02	0.02 - 0.5	0.5 - 1	> 1
Chloride (Cl)	mg/l	< 10	10 - 20	20 - 30	> 30
Alkalinity	CaCO <sub>3</sub> mg/l	< 40	40 - 70	70 - 100	> 100
Fluoride (F)	mg/l	<0.05	0.05 - 0.20	0.2 - 0.4	>0.4
Nitrate (NO <sub>3</sub> )	mg/l	< 0.05	0.05 - 0.25	0.25 - 0.50	> 0.50
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	< 15	15 - 35	35 - 50	> 50
<b>Bacteriological</b>					
Faecal coliforms	counts/100ml	<10	10 - 60	60 - 120	>120

In-stream Water Quality Guidelines for the Grootdraai Dam Catchment					
Variables	Measured as	Brummerspruit (VK, VKR, VKK)			
		Ideal Catchment Background	Acceptable Management Target	Tolerable Interim Target	Unacceptable
<b>Physical</b>					
Conductivity	mS/m	< 15	15 - 30	30 - 50	> 50
pH	pH units	6.4 - 8.5			< 6.4; > 8.5
<b>Organic</b>					
Chemical Oxygen Demand (COD)	mg/l	< 10	10 - 20	20 - 35	> 35
<b>Macro Elements</b>					
Ammonia (NH <sub>4</sub> )	mg/l	< 0.02	0.02 - 0.5	0.5 - 1	> 1
Chloride (Cl)	mg/l	< 25	25 - 50	50 - 70	>70
Alkalinity	CaCO <sub>3</sub> mg/l	< 40	40 - 80	80 - 120	> 120
Fluoride (F)	mg/l	<0.05	0.05 - 0.20	0.2 - 0.4	>0.4
Nitrate (NO <sub>3</sub> )	mg/l	< 0.05	0.05 - 0.25	0.25 - 0.50	> 0.50
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 - 50	50 - 70	> 70
<b>Bacteriological</b>					
Faecal coliforms	counts/100ml	<10	10 - 60	60 - 120	>120

In-stream Water Quality Guidelines for the Grootdraai Dam Catchment					
Variables	Measured as	Schulpspruit (VKV, VRA, ZD)			
		Ideal Catchment Background	Acceptable Management Target	Tolerable Interim Target	Unacceptable
<b>Physical</b>					
Conductivity	mS/m	< 10	10 - 15	15 - 25	> 25
pH	pH units	6.4 - 8.5			< 6.4; > 8.5
<b>Organic</b>					
Chemical Oxygen Demand (COD)	mg/l	< 10	10 - 15	15 - 25	> 25
<b>Macro Elements</b>					
Ammonia (NH <sub>4</sub> )	mg/l	< 0.02	0.02 - 0.5	0.5 - 1	> 1
Chloride (Cl)	mg/l	< 10	10 - 15	15 - 20	> 20
Fluoride (F)	mg/l	<0.05	0.05 - 0.20	0.2 - 0.4	>0.4
Alkalinity	CaCO <sub>3</sub> mg/l	< 20	20 - 45	45 - 75	> 75
Nitrate (NO <sub>3</sub> )	mg/l	< 0.05	0.05 - 0.25	0.25 - 0.50	> 0.50
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	< 10	10 - 20	20 - 30	> 30
<b>Bacteriological</b>					
Faecal coliforms	counts/100ml	<10	10 - 60	60 - 120	>120

In-stream Water Quality Guidelines for the Grootdraai Dam Catchment					
Variables	Measured as	Blesbokspruit (VB, VBS, VBB)			
		Ideal Catchment Background	Acceptable Management Target	Tolerable Interim Target	Unacceptable
<b>Physical</b>					
Conductivity	mS/m	< 15	15 - 30	30 - 50	> 50
pH	pH units	6.4 - 8.5			< 6.4; > 8.5
<b>Organic</b>					
Chemical Oxygen Demand (COD)	mg/l	< 10	10 - 20	20 - 35	> 35
<b>Macro Elements</b>					
Ammonia (NH <sub>4</sub> )	mg/l	< 0.02	0.02 - 0.5	0.5 - 1	> 1
Chloride (Cl)	mg/l	< 25	25 - 50	50 - 70	>70
Alkalinity	CaCO <sub>3</sub> mg/l	< 40	40 - 80	80 - 120	> 120
Fluoride (F)	mg/l	<0.05	0.05 - 0.20	0.2 - 0.4	>0.4
Nitrate (NO <sub>3</sub> )	mg/l	< 0.05	0.05 - 0.25	0.25 - 0.50	> 0.50
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	< 15	15 - 35	35 - 50	> 50
<b>Bacteriological</b>					
Faecal coliforms	counts/100ml	<10	10 - 60	60 - 120	>120

In-stream Water Quality Guidelines for the Grootdraai Dam Catchment					
Variables	Measured as	Vaal Origin (VE)			
		Ideal Catchment Background	Acceptable Management Target	Tolerable Interim Target	Unacceptable
<b>Physical</b>					
Conductivity	mS/m	< 10	10 - 15	15 - 25	> 25
pH	pH units	6.4 - 8.5			< 6.4; > 8.5
<b>Organic</b>					
Chemical Oxygen Demand (COD)	mg/l	< 10	10 - 20	20 - 35	> 35
<b>Macro Elements</b>					
Ammonia (NH <sub>4</sub> )	mg/l	< 0.02	0.02 - 0.5	0.5 - 1	> 1
Chloride (Cl)	mg/l	< 10	10 - 15	15 - 20	>20
Alkalinity	CaCO <sub>3</sub> mg/l	< 20	20 - 45	45 - 75	> 75
Fluoride (F)	mg/l	<0.05	0.05 - 0.20	0.2 - 0.4	>0.4
Nitrate (NO <sub>3</sub> )	mg/l	< 0.05	0.05 - 0.25	0.25 - 0.50	> 0.50
Phosphate (PO <sub>4</sub> )	mg/l	< 0.05	0.05 - 0.08	0.08 - 1	>1
Sulphate (SO <sub>4</sub> )	mg/l	< 10	10 - 20	20 - 30	> 30
<b>Bacteriological</b>					
Faecal coliforms	counts/100ml	<10	10 - 60	60 - 120	>120

In-stream Water Quality Guidelines for the Grootdraai Dam Catchment					
Variables	Measured as	Majuba (VAS, VGK)			
		Ideal Catchment Background	Acceptable Management Target	Tolerable Interim Target	Unacceptable
<b>Physical</b>					
Conductivity	mS/m	< 15	15 - 30	30 - 50	> 50
pH	pH units	6.4 - 8.5			< 6.4; > 8.5
<b>Organic</b>					
Chemical Oxygen Demand (COD)	mg/l	< 10	10 - 20	20 - 35	> 35
<b>Macro Elements</b>					
Ammonia (NH <sub>4</sub> )	mg/l	< 0.02	0.02 - 0.5	0.5 - 1	> 1
Chloride (Cl)	mg/l	< 10	10 - 20	20 - 30	> 30
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 - 70	70 - 100	> 100
Nitrate (NO <sub>3</sub> )	mg/l	< 0.05	0.05 - 0.25	0.25 - 0.50	> 0.50
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	< 15	15 - 35	35 - 50	> 50
<b>Bacteriological</b>					
Faecal coliforms	counts/100ml	<10	10 - 60	60 - 120	>120