

Sample Points	Sample Point Description	Ammonia	Chloride	Fluoride	M-Alkalinity	Nitrate	Phosphate	Sulphate	Chemical Oxygen Demand	Conductivity	pH	E. coli	
VE	Vaal River @ Ermelo 26°21'46.17"S 30°6'31.15"E	0.12	18.00	0.25	67	0.12	<0.05	48.00	21	33	7.1		
		0.11	<10	0.13	50	0.13	0.07	34.00	12	18	7		
		0.10	<10	0.08	120	0.78	0.05	15.00	23	23	7.5		
		0.10	<10	0.10	89	0.27	0.05	20.00	11	26	7.8		
ZD	Zaaihoek Dam 27°09'47.0"S 29°52'42.8"E	0.12	<10	0.16	46	<0.10	<0.05	10.00	<10	12	6.7		
VKV	Klein Vaal River @ Goedehoop 26°49'12.19"S 30°8'12.00"E	0.12	<10	0.15	43	0.14	0.11	15.00	15	17	6.9		
		0.11	<10	0.16	36	0.31	0.05	32.00	24	11	6.9		
		0.10	<10	0.08	38	0.11	0.05	8.80	<10	11	7		
		6.80	19.00	0.18	70	1.70	1.50	23.00	<10	18	8.5		
VRA	Rietspruit below Amersfoort 26°54'47.20"S 29°52'19.22"E	0.12	<10	0.19	89	0.35	0.05	28.00	17	32	7.3		
		0.11	<10	0.28	87	0.29	0.07	28.00	19	27	7.3		
		0.19	11.00	0.17	155	0.28	0.08	32.00	11	41	7.8		
		0.10	19.00	0.20	200	0.89	0.07	53.00	14	51	8.5		
VKK	Brummerspruit below Ermelo 26°30'49.51"S 29°54'27.37"E	10.00	48.00	0.34	150	3.10	1.90	215.00	38	87	7.2		
		3.60	31.00	0.42	81	1.30	0.93	105.00	35	57	6.9		
		17.00	40.00	0.24	195	0.21	2.60	90.00	53	82	7.1		
		14.00	36.00	0.21	235	1.70	2.40	47.00	86	75	7.3		
VKR	Tweefontein @ Riverside 26°37'21.17"S 29°50'16.24"E	4.20	31.00	0.35	135	0.79	1.70	120.00	32	65	7.2		
		0.11	<10	0.32	105	0.33	0.29	31.00	27	38	7.3		
		8.30	32.00	0.53	150	2.00	1.00	70.00	30	69	7.1		
		21.00	43.00	0.29	230	1.50	3.80	46.00	44	75	7.5		
VK	Brummerspruit before Vaal River 26°46'51.26"S 29°48'23.51"E	2.30	35.00	0.35	110	0.24	1.10	100.00	45	56	7.1		
		0.11	<10	0.35	99	0.39	0.23	50.00	34	37	7.3		
		0.10	21.00	0.18	130	1.10	0.05	53.00	24	44	7.5		
		0.10	27.00	0.18	165	2.50	0.24	40.00	26	57	8.2		
VAS	Vaal River above Standerton 26°51'18.56"S 29°41'51.61"E	0.12	12.00	0.64	79	0.42	<0.05	94.00	19	33	7.2		
		0.11	<10	0.24	63	0.18	0.11	28.00	21	22	7.1		
		0.10	<10	0.12	82	0.16	0.05	23.00	12	27	7.4		
		0.10	14.00	0.15	120	0.25	0.12	31.00	13	35	8.6		
VGK	Geelklipspruit below Amersfoort 26°57'53.51"S 29°40'19.12"E	0.12	11.00	0.28	185	0.16	0.09	58.00	27	63	7.6		
		0.11	12.00	0.40	150	0.21	0.08	53.00	25	44	7.9		
		0.10	15.00	0.16	145	0.10	0.05	63.00	15	37	7.9		
		0.10	19.00	0.18	240	0.22	0.05	73.00	17	62	8.6		
VBB	Blesbokspruit below Bethal 26°34'2.11"S 29°26'41.21"E	5.70	41.00	0.56	185	1.20	1.90	45.00	46	63	7.4		
		3.00	24.00	0.41	145	1.40	1.00	32.00	35	44	7.3		
		4.30	45.00	0.49	190	3.20	1.40	45.00	45	63	7.3		
		10.00	46.00	0.28	265	1.90	3.30	38.00	83	79	7.7		
VBS	Blesbokspruit @ Skaapkraal 26°38'17.35"S 29°27'6.24"E	0.81	23.00	0.44	120	1.10	1.80	33.00	67	42	7.1		
		3.10	24.00	0.33	140	0.68	0.61	39.00	34	46	7.4		
		0.25	35.00	0.42	170	1.70	0.39	53.00	42	53	7.7		
		0.15	58.00	0.45	165	2.40	0.80	35.00	52	72	9.4		
VB	Blesbokspruit @ Vaal River Confluence 26°49'57.05"S 29°30'32.95"E	0.67	17.00	0.39	110	0.78	1.40	38.00	85	38	7.2		
		2.60	14.00	0.28	115	0.21	0.55	35.00	33	37	7.3		
		0.43	19.00	0.35	160	0.60	0.16	57.00	34	47	7.4		
		0.15	56.00	0.54	165	0.20	0.07	65.00	35	75	8.0		
ND-LEEU	Leeuspruit @ New Denmark Colliery 26°51'16.79"S 29°19'31.56"E	0.12	20.00	0.40	98	0.14	0.18	38.00	52	40	7.3		
		3.30	11.00	0.29	105	0.34	0.73	28.00	30	35	7.3		
		0.10	23.00	0.29	105	0.49	0.07	52.00	34	37	7.2		
		0.10	34.00	0.54	200	<0.10	0.05	73.00	21	64	8.2		
VS	Vaal River @ Standerton 26°56'51.37"S 29°15'32.09"E	0.12	12.00	0.34	91	0.12	0.08	30.00	20	32	7.1		
		0.18	<10	0.28	81	0.60	<0.05	36.00	20	26	7.3		
		0.16	<10	0.28	89	0.36	0.05	28.00	17	27	7.4		
		0.10	10.00	0.28	89	0.12	0.05	33.00	18	27	7.1		
S-BETHAL	Bethal Sewage Works 26°29'8.05"S 29°27'15.88"E	2.40	29.00	0.28	86	7.80	0.73	145.00	110	66	7.2	105	
		9.90	91.00	0.18	110	5.40	5.40	67.00	71	78	7.2	52	
		14.00	68.00	0.36	170	3.40	5.20	63.00	69	75	7.6	9,980	
		12.00	48.00	0.24	195	0.37	3.40	26.00	115.00	68.00	7.30	135,880	
S-ESW	Ermelo Sewage Works 26°30'42.84"S 29°57'51.11"E	3.30	56.00	0.22	77	8.50	1.40	145.00	60	71	6.9	7720	
		2.50	47.00	0.24	95	2.00	2.10	130.00	67	72	7.1	65840	
		13.00	53.00	0.23	195	0.68	3.10	125.00	180	80	7.4	794,930	
		9.30	36.00	0.17	165	1.70	2.80	38.00	190	55	7.4	682,000	
S-TUTU	Tutukani Sewage Works 26°47'36.70"S 29°17'30.43"E	3.40	71.00	0.30	125	1.80	0.99	65.00	39	65	7.6	215	
		13.00	63.00	0.26	110	7.70	2.30	57.00	38	64	7.5	52	
		0.10	56.00	0.36	120	8.80	1.20	66.00	20	62	7.5	20	
		0.15	88.00	0.27	90	12.00	0.84	81.00	32	67	8.8	2	
S-MAJUBA	Majuba Power Station Sewage Works 27°5'23.45"S 29°46'11.44"E	2.40	29.00	0.28	86	7.80	0.73	145.00	110	66	7.2	105	
		11.00	34.00	0.22	140	2.90	3.50	150.00	49	77	7.3	83	
		12.00	45.00	0.20	125	1.70	1.20	75.00	31	59	7.3	1,890	
		16.00	40.00	0.22	170	2.10	1.60	42.00	46	60	7.6	8,880	
S-ND-SOUTH	New Denmark Colliery - South Shaft 26°44'41.51"S 29°18'31.70"E	3.20	56.00	0.42	145	4.80	1.30	66.00	46	65	7.5	630	
		1.90	77.00	0.22	125	7.00	1.50	52.00	49	73	7.3	58	
		2.70	78.00	0.31	145	5.70	1.00	64.00	81	72	7.5	1,320	
		3.50	115.00	0.38	130	6.40	1.30	71.00	55	84	7.3	185	

Sample Points	Sample Point Description	Ammonia	Chloride	Fluoride	M-Alkalinity	Nitrate	Phosphate	Sulphate	Chemical Oxygen Demand	Conductivity	pH	E. coli
---------------	--------------------------	---------	----------	----------	--------------	---------	-----------	----------	------------------------	--------------	----	---------

Sewage Works Compliance (where applicable) to General Standard (GN 1191 Oct 1999)												
S-BETHAL	Bethal Sewage Works 26°29'8.05"S 29°27'15.88"E	2.40	29	0.28	86	7.80	0.73	145	110	66	7.2	105
		9.90	91	0.18	110	5.40	5.40	67	71	78	7.2	52
		14.00	68	0.36	170	3.40	5.20	63	69	75	7.6	9,980
		12.00	48	0.24	195	0.37	3.40	26	115	68	7.3	135,880
S-ESW	Ermelo Sewage Works 26°30'42.84"S 29°57'51.11"E	3.30	56	0.22	77	8.50	1.40	145	60	71	6.9	7720
		2.50	47	0.24	95	2.00	2.10	130	67	72	7.1	65840
		13.00	53	0.23	195	0.68	3.10	125	180	80	7.4	794,930
		9.30	36	0.17	165	1.70	2.80	38	190	55	7.4	682,000
S-TUTU	Tutukani Sewage Works 26°47'36.70"S 29°17'30.43"E	3.40	71	0.30	125	1.80	0.99	65	39	65	7.6	215
		13.00	63	0.26	110	7.70	2.30	57	38	64	7.5	52
		0.10	56	0.36	120	8.80	1.20	66	20	62	7.5	20
		0.15	88	0.27	90	12.00	0.84	81	32	67	8.8	2
S-MAJUBA	Majuba Power Station Sewage Works 27° 5'23.45"S 29°46'11.44"E	2.40	29	0.28	86	7.80	0.73	145	110	66	7.2	105
		11.00	34	0.22	140	2.90	3.50	150	49	77	7.3	83
		12.00	45	0.20	125	1.70	1.20	75	31	59	7.3	1,890
		16.00	40	0.22	170	2.10	1.60	42	46	60	7.6	8,880
S-ND-SOUTH	New Denmark Colliery - South Shaft 26°44'41.51"S 29°18'31.70"E	3.20	56	0.42	145	<0.10	1.30	66	46	65	7.5	630
		1.90	77	0.22	125	7	1.50	52	49	73	7.3	58
		2.70	78	0.31	145	5.70	1.00	64	81	72	7.5	1,320
		3.50	115	0.38	130	6.40	1.30	71	55	84	7.3	185

Key

VE	Vaal River above Standerton	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 13

Water Quality Guidelines

	-	Ideal
	-	Acceptable
	-	Tolerable
	-	Unacceptable

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			