

STEVE TSHWETE MUNICIPALITY

P.O. Box 14
MIDDELBURG
1050

CHEMICAL ANALYSIS

Date Received : 27 September 2013
Date Reported : 10 October 2013
Quantity Analyzed: 13

Our Ref: STE / 213 - 225 / D / 09 /13

Att : Me Zelda Louw / Mr Kobus Swart

D 213

	Analysis Results mg/l	Graspan WTP	SANS Standards -241 (2011) Domestic Water
			Standard Limits
Physical requirements			
	Colour as Pt-Co	<5.0	≤ 15
	Conductivity at 25° C in mS/m	104	≤ 170
	Total Dissolved Solids	832	≤ 1 200
	Odour	Not Applicable	Inoffensive
	pH-Value at 25 ° C	7.69	≥ 5.0 to ≤ 9.7
	Taste	Not Applicable	Inoffensive
	Turbidity as N.T.U.	1.02	Operational ≤ 1.0 - Aesthetic ≤ 5.0
	Total Alkalinity as CaCO ₃	119	
Macro Determinants			
	Free & Saline Ammonia NH ₃ as N	0.20	
	Calcium as Ca	92.4	
	Chlorides as Cl	32.6	≤300
	Fluoride as F	0.50	≤1.5
	Magnesium as Mg	80.7	
	Nitrate & Nitrite as N	0.18	≤ 11
	Potassium as K	12.3	
	Sodium as Na	52.4	≤ 200
	Sulphate as SO ₄	444	Acute Health ≤ 500 - Aesthetic ≤ 250
	Zinc as Zn	0.06	≤5

All heavy metal analyses have been performed on filtered samples.

Tests marked with an asterisk * are not SANAS accredited

These results are related only to the items tested

**These results must be read in conjunction
with the Uncertainty of Measurement
list as provided by Regen Waters Laboratory**

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CHEMICAL ANALYSIS

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Att : Me Zelda Louw / Mr Kobus Swart

Quantity Analyzed: 13

D 213

	Analysis Results µg/l	Graspan WTP	SANS Standards -241 (2011) Domestic Water
			Standard Limits
Micro Determinants µg/l			
	Aluminium as Al	90	≤ 300
	Antimony as Sb	2.08	≤20
	Arsenic as As	<1.0	≤10
	Cadmium as Cd	<1.0	≤3
	Total Chromium as Cr	<1.0	≤50
	Cobalt as Co	<1.0	≤500
	Copper as Cu	6.22	≤2000
	Cyanide as CN *	<70	≤70
	Iron as Fe	20	Chronic Health ≤ 2000 - Aesthetic ≤ 300
	Lead as Pb	<1.0	≤10
	Manganese as Mn	<10	Chronic Health ≤ 500 - Aesthetic ≤ 100
	Mercury as Hg	<1.0	≤6
	Nickel as Ni	3.99	≤70
	Selenium as Se	<1.0	≤10
	Vanadium as V	<1.0	≤200
Organics Determinand mg/l			
	Total Organic Carbon	7.44	≤ 10
Total Trihalomethanes mg/l			
	Phenolic Compounds	Attached	≤ 0.01

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QUALITY CONTROL CHECKS

Cation Balance	13.85
Anion Balance	12.58
% Difference	4.8
Measured TDS	832
Calculated TDS	788
Limits > 1.0 - <1.2	1.1
Calcul TDS / E.C. (0.55 - 0.70)	0.8

P.L.G. UYS (M.D.)
Technical Signatory

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Att : Me Zelda Louw / Mr Kobus Swart

D 214

	Analysis Results mg/l	Nasareth WTP	SANS Standards -241 (2011) Domestic Water
			Standard Limits
Physical requirements			
	Colour as Pt-Co	<5.0	≤ 15
	Conductivity at 25° C in mS/m	104	≤ 170
	Total Dissolved Solids	836	≤ 1 200
	Odour	Not Applicable	Inoffensive
	pH-Value at 25 ° C	7.75	≥ 5.0 to ≤ 9.7
	Taste	Not Applicable	Inoffensive
	Turbidity as N.T.U.	0.98	Operational ≤ 1.0 - Aesthetic ≤ 5.0
	Total Alkalinity as CaCO ₃	112	
Macro Determinants			
	Free & Saline Ammonia NH ₃ as N	<0.20	
	Calcium as Ca	94.2	
	Chlorides as Cl	32.1	≤300
	Fluoride as F	0.50	≤1.5
	Magnesium as Mg	78.6	
	Nitrate & Nitrite as N	0.13	≤ 11
	Potassium as K	12.4	
	Sodium as Na	52.0	≤ 200
	Sulphate as SO ₄	450	Acute Health ≤ 500 - Aesthetic ≤ 250
	Zinc as Zn	0.02	≤5

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D 214

	Analysis Results µg/l	Nasareth WTP	SANS Standards -241 (2011) Domestic Water Standard Limits
Micro Determinants µg/l			
	Aluminium as Al	80	≤ 300
	Antimony as Sb	1.93	≤20
	Arsenic as As	<1.0	≤10
	Cadmium as Cd	<1.0	≤3
	Total Chromium as Cr	<1.0	≤50
	Cobalt as Co	<1.0	≤500
	Copper as Cu	1.62	≤2000
	Cyanide as CN *	<70	≤70
	Iron as Fe	40	Chronic Health ≤ 2000 - Aesthetic ≤ 300
	Lead as Pb	<1.0	≤10
	Manganese as Mn	<10	Chronic Health ≤ 500 - Aesthetic ≤ 100
	Mercury as Hg	<1.0	≤6
	Nickel as Ni	4.14	≤70
	Selenium as Se	<1.0	≤10
	Vanadium as V	<1.0	≤200
Organics Determinand mg/l			
	Total Organic Carbon	7.42	≤ 10
Total Trihalomethanes mg/l			
	Phenolic Compounds	Attached	≤ 0.01

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QUALITY CONTROL CHECKS

Cation Balance	13.75
Anion Balance	12.55
% Difference	4.6
Measured TDS	836
Calculated TDS	789
Limits > 1.0 - <1.2	1.1
Calcul TDS / E.C. (0.55 - 0.70)	0.8



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D 215

	Analysis Results mg/l	Krugerdam WTP Final	SANS Standards -241 (2011) Domestic Water
			Standard Limits
Physical requirements			
	Colour as Pt-Co	<5.0	≤ 15
	Conductivity at 25° C in mS/m	100	≤ 170
	Total Dissolved Solids	810	≤ 1 200
	Odour	Not Applicable	Inoffensive
	pH-Value at 25 ° C	7.75	≥ 5.0 to ≤ 9.7
	Taste	Not Applicable	Inoffensive
	Turbidity as N.T.U.	1.12	Operational ≤ 1.0 - Aesthetic ≤ 5.0
	Total Alkalinity as CaCO ₃	94	
Macro Determinants			
	Free & Saline Ammonia NH ₃ as N	<0.20	
	Calcium as Ca	88.3	
	Chlorides as Cl	31.6	≤300
	Fluoride as F	0.50	≤1.5
	Magnesium as Mg	76.1	
	Nitrate & Nitrite as N	0.10	≤ 11
	Potassium as K	12.7	
	Sodium as Na	47.6	≤ 200
	Sulphate as SO ₄	434	Acute Health ≤ 500 - Aesthetic ≤ 250
	Zinc as Zn	0.02	≤5

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D 215

	Analysis Results µg/l	Krugerdam WTP Final	SANS Standards -241 (2011) Domestic Water Standard Limits
Micro Determinants µg/l			
	Aluminium as Al	110	≤ 300
	Antimony as Sb	1.58	≤20
	Arsenic as As	<1.0	≤10
	Cadmium as Cd	<1.0	≤3
	Total Chromium as Cr	<1.0	≤50
	Cobalt as Co	<1.0	≤500
	Copper as Cu	<1.0	≤2000
	Cyanide as CN *	<70	≤70
	Iron as Fe	50	Chronic Health ≤ 2000 - Aesthetic ≤ 300
	Lead as Pb	<1.0	≤10
	Manganese as Mn	<10	Chronic Health ≤ 500 - Aesthetic ≤ 100
	Mercury as Hg	<1.0	≤6
	Nickel as Ni	3.47	≤70
	Selenium as Se	<1.0	≤10
	Vanadium as V	<1.0	≤200
Organics Determinand mg/l			
	Total Organic Carbon	5.42	≤ 10
Total Trihalomethanes mg/l			
	Phenolic Compounds	Attached	≤ 0.01
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QUALITY CONTROL CHECKS

Cation Balance	13.06
Anion Balance	11.84
% Difference	4.9
Measured TDS	810
Calculated TDS	749
Limits > 1.0 - <1.2	1.1
Calcul TDS / E.C. (0.55 - 0.70)	0.7


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D 216

	Analysis Results mg/l	Presidentsrus WTP Final	SANS Standards -241 (2011) Domestic Water
			Standard Limits
Physical requirements			
	Colour as Pt-Co	<5.0	≤ 15
	Conductivity at 25° C in mS/m	117	≤ 170
	Total Dissolved Solids	906	≤ 1 200
	Odour	Not Applicable	Inoffensive
	pH-Value at 25 ° C	7.98	≥ 5.0 to ≤ 9.7
	Taste	Not Applicable	Inoffensive
	Turbidity as N.T.U.	1.97	Operational ≤ 1.0 - Aesthetic ≤ 5.0
	Total Alkalinity as CaCO ₃	152	
Macro Determinants			
	Free & Saline Ammonia NH ₃ as N	<0.20	
	Calcium as Ca	90.0	
	Chlorides as Cl	79.4	≤300
	Fluoride as F	0.75	≤1.5
	Magnesium as Mg	66.4	
	Nitrate & Nitrite as N	1.28	≤ 11
	Potassium as K	22.3	
	Sodium as Na	89.3	≤ 200
	Sulphate as SO ₄	369	Acute Health ≤ 500 - Aesthetic ≤ 250
	Zinc as Zn	0.01	≤5

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	Analysis Results µg/l	Presidentsrus WTP Final	SANS Standards -241 (2011) Domestic Water Standard Limits
Micro Determinants µg/l			
	Aluminium as Al	100	≤ 300
	Antimony as Sb	1.38	≤20
	Arsenic as As	1.26	≤10
	Cadmium as Cd	<1.0	≤3
	Total Chromium as Cr	<1.0	≤50
	Cobalt as Co	<1.0	≤500
	Copper as Cu	<1.0	≤2000
	Cyanide as CN *	<70	≤70
	Iron as Fe	110	Chronic Health ≤ 2000 - Aesthetic ≤ 300
	Lead as Pb	<1.0	≤10
	Manganese as Mn	<10	Chronic Health ≤ 500 - Aesthetic ≤ 100
	Mercury as Hg	<1.0	≤6
	Nickel as Ni	7.16	≤70
	Selenium as Se	<1.0	≤10
	Vanadium as V	2.81	≤200
Organics Determinand mg/l			
	Total Organic Carbon	9.45	≤ 10
Total Trihalomethanes mg/l			
	Phenolic Compounds	Attached	≤ 0.01
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QUALITY CONTROL CHECKS

Cation Balance	14.41
Anion Balance	13.09
% Difference	4.8
Measured TDS	906
Calculated TDS	816
Limits > 1.0 - <1.2	1.1
Calcul TDS / E.C. (0.55 - 0.70)	0.7


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	Analysis Results mg/l	Vaalbank WTP Final	SANS Standards -241 (2011) Domestic Water
			Standard Limits
Physical requirements			
	Colour as Pt-Co	<5.0	≤ 15
	Conductivity at 25° C in mS/m	104	≤ 170
	Total Dissolved Solids	860	≤ 1 200
	Odour	Not Applicable	Inoffensive
	pH-Value at 25 ° C	7.77	≥ 5.0 to ≤ 9.7
	Taste	Not Applicable	Inoffensive
	Turbidity as N.T.U.	0.75	Operational ≤ 1.0 - Aesthetic ≤ 5.0
	Total Alkalinity as CaCO ₃	103	
Macro Determinants			
	Free & Saline Ammonia NH ₃ as N	<0.20	
	Calcium as Ca	89.5	
	Chlorides as Cl	32.1	≤300
	Fluoride as F	0.50	≤1.5
	Magnesium as Mg	78.8	
	Nitrate & Nitrite as N	0.14	≤ 11
	Potassium as K	12.8	
	Sodium as Na	49.4	≤ 200
	Sulphate as SO ₄	442	Acute Health ≤ 500 - Aesthetic ≤ 250
	Zinc as Zn	0.01	≤5

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D 217

	Analysis Results µg/l	Vaalbank WTP Final	SANS Standards -241 (2011) Domestic Water Standard Limits
Micro Determinants µg/l			
	Aluminium as Al	110	≤ 300
	Antimony as Sb	1.37	≤20
	Arsenic as As	<1.0	≤10
	Cadmium as Cd	<1.0	≤3
	Total Chromium as Cr	<1.0	≤50
	Cobalt as Co	<1.0	≤500
	Copper as Cu	<1.0	≤2000
	Cyanide as CN *	<70	≤70
	Iron as Fe	240	Chronic Health ≤ 2000 - Aesthetic ≤ 300
	Lead as Pb	<1.0	≤10
	Manganese as Mn	<10	Chronic Health ≤ 500 - Aesthetic ≤ 100
	Mercury as Hg	<1.0	≤6
	Nickel as Ni	3.77	≤70
	Selenium as Se	<1.0	≤10
	Vanadium as V	<1.0	≤200
Organics Determinand mg/l			
	Total Organic Carbon	5.94	≤ 10
Total Trihalomethanes mg/l			
	Phenolic Compounds	Attached	≤ 0.01
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QUALITY CONTROL CHECKS

Cation Balance	13.43
Anion Balance	12.20
% Difference	4.8
Measured TDS	860
Calculated TDS	769
Limits > 1.0 - <1.2	1.1
Calcul TDS / E.C. (0.55 - 0.70)	0.7


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D 218

	Analysis Results mg/l	Mafube	SANS Standards -241 (2011) Domestic Water
			Standard Limits
Physical requirements			
	Colour as Pt-Co	<5.0	≤ 15
	Conductivity at 25° C in mS/m	25.6	≤ 170
	Total Dissolved Solids	188	≤ 1 200
	Odour	Not Applicable	Inoffensive
	pH-Value at 25 ° C	7.75	≥ 5.0 to ≤ 9.7
	Taste	Not Applicable	Inoffensive
	Turbidity as N.T.U.	0.24	Operational ≤ 1.0 - Aesthetic ≤ 5.0
	Total Alkalinity as CaCO ₃	131	
Macro Determinants			
	Free & Saline Ammonia NH ₃ as N	<0.20	
	Calcium as Ca	22.1	
	Chlorides as Cl	9.77	≤300
	Fluoride as F	1.24	≤1.5
	Magnesium as Mg	6.61	
	Nitrate & Nitrite as N	0.54	≤ 11
	Potassium as K	4.12	
	Sodium as Na	38.0	≤ 200
	Sulphate as SO ₄	4.90	Acute Health ≤ 500 - Aesthetic ≤ 250
	Zinc as Zn	0.03	≤5

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D 218

	Analysis Results µg/l	Mafube	SANS Standards -241 (2011) Domestic Water
			Standard Limits
Micro Determinants µg/l			
	Aluminium as Al	90	≤ 300
	Antimony as Sb	1.02	≤20
	Arsenic as As	<1.0	≤10
	Cadmium as Cd	<1.0	≤3
	Total Chromium as Cr	<1.0	≤50
	Cobalt as Co	<1.0	≤500
	Copper as Cu	<1.0	≤2000
	Cyanide as CN *	<70	≤70
	Iron as Fe	40	Chronic Health ≤ 2000 - Aesthetic ≤ 300
	Lead as Pb	<1.0	≤10
	Manganese as Mn	<10	Chronic Health ≤ 500 - Aesthetic ≤ 100
	Mercury as Hg	<1.0	≤6
	Nickel as Ni	2.70	≤70
	Selenium as Se	<1.0	≤10
	Vanadium as V	<1.0	≤200
Organics Determinand mg/l			
	Total Organic Carbon	0.17	≤ 10
Total Trihalomethanes mg/l			
	Phenolic Compounds	Attached	≤ 0.01

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QUALITY CONTROL CHECKS

Cation Balance	3.41
Anion Balance	3.10
% Difference	4.7
Measured TDS	188
Calculated TDS	169
Limits > 1.0 - <1.2	1.1
Calcul TDS / E.C. (0.55 - 0.70)	0.7

P.L.G. UYS (M.D.)
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D 219

	Analysis Results mg/l	Doornkop 1	SANS Standards -241 (2011) Domestic Water
			Standard Limits
Physical requirements			
	Colour as Pt-Co	<5.0	≤ 15
	Conductivity at 25° C in mS/m	13.9	≤ 170
	Total Dissolved Solids	114	≤ 1 200
	Odour	Not Applicable	Inoffensive
	pH-Value at 25 ° C	7.67	≥ 5.0 to ≤ 9.7
	Taste	Not Applicable	Inoffensive
	Turbidity as N.T.U.	0.21	Operational ≤ 1.0 - Aesthetic ≤ 5.0
	Total Alkalinity as CaCO ₃	69	
Macro Determinants			
	Free & Saline Ammonia NH ₃ as N	<0.20	
	Calcium as Ca	14.0	
	Chlorides as Cl	5.42	≤300
	Fluoride as F	<0.20	≤1.5
	Magnesium as Mg	7.90	
	Nitrate & Nitrite as N	1.69	≤ 11
	Potassium as K	1.5	
	Sodium as Na	11.9	≤ 200
	Sulphate as SO ₄	5.41	Acute Health ≤ 500 - Aesthetic ≤ 250
	Zinc as Zn	0.06	≤5

All heavy metal analyses have been performed on filtered samples.

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D 219

	Analysis Results µg/l	Doornkop 1	SANS Standards -241 (2011) Domestic Water Standard Limits
Micro Determinants µg/l			
	Aluminium as Al	80	≤ 300
	Antimony as Sb	<1.0	≤20
	Arsenic as As	<1.0	≤10
	Cadmium as Cd	<1.0	≤3
	Total Chromium as Cr	2.51	≤50
	Cobalt as Co	<1.0	≤500
	Copper as Cu	<1.0	≤2000
	Cyanide as CN *	<70	≤70
	Iron as Fe	50	Chronic Health ≤ 2000 - Aesthetic ≤ 300
	Lead as Pb	<1.0	≤10
	Manganese as Mn	<10	Chronic Health ≤ 500 - Aesthetic ≤ 100
	Mercury as Hg	<1.0	≤6
	Nickel as Ni	<1.0	≤70
	Selenium as Se	<1.0	≤10
	Vanadium as V	10.2	≤200
Organics Determinand mg/l			
	Total Organic Carbon	0.14	≤ 10
Total Trihalomethanes mg/l			
	Phenolic Compounds	Attached	≤ 0.01
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QUALITY CONTROL CHECKS

Cation Balance	1.91
Anion Balance	1.77
% Difference	3.8
Measured TDS	114
Calculated TDS	96
Limits > 1.0 - <1.2	1.2
Calcul TDS / E.C. (0.55 - 0.70)	0.7


P.L.G. UYS (M.D.)
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D 220

	Analysis Results mg/l	Doornkop 2	SANS Standards -241 (2011) Domestic Water
			Standard Limits
Physical requirements			
	Colour as Pt-Co	<5.0	≤ 15
	Conductivity at 25° C in mS/m	7.30	≤ 170
	Total Dissolved Solids	62	≤ 1 200
	Odour	Not Applicable	Inoffensive
	pH-Value at 25 ° C	7.15	≥ 5.0 to ≤ 9.7
	Taste	Not Applicable	Inoffensive
	Turbidity as N.T.U.	0.60	Operational ≤ 1.0 - Aesthetic ≤ 5.0
	Total Alkalinity as CaCO ₃	30	
Macro Determinants			
	Free & Saline Ammonia NH ₃ as N	<0.20	
	Calcium as Ca	6.79	
	Chlorides as Cl	4.88	≤300
	Fluoride as F	<0.20	≤1.5
	Magnesium as Mg	3.96	
	Nitrate & Nitrite as N	1.35	≤ 11
	Potassium as K	0.72	
	Sodium as Na	8.41	≤ 200
	Sulphate as SO ₄	5.92	Acute Health ≤ 500 - Aesthetic ≤ 250
	Zinc as Zn	0.10	≤5

All heavy metal analyses have been performed on filtered samples.

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These results are related only to the items tested

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STEVE TSHWETE MUNICIPALITY

P.O. Box 14
MIDDELBURG
1050

CHEMICAL ANALYSIS

Date Received : 27 September 2013

Date Reported : 10 October 2013

Quantity Analyzed: 13

Our Ref: STE / 213 - 225 / D / 09 /13

Att : Me Zelda Louw / Mr Kobus Swart

D 220

	Analysis Results µg/l	Doornkop 2	SANS Standards -241 (2011) Domestic Water Standard Limits
Micro Determinants µg/l			
	Aluminium as Al	80	≤ 300
	Antimony as Sb	<1.0	≤20
	Arsenic as As	<1.0	≤10
	Cadmium as Cd	<1.0	≤3
	Total Chromium as Cr	<1.0	≤50
	Cobalt as Co	<1.0	≤500
	Copper as Cu	5.99	≤2000
	Cyanide as CN *	<70	≤70
	Iron as Fe	50	Chronic Health ≤ 2000 - Aesthetic ≤ 300
	Lead as Pb	<1.0	≤10
	Manganese as Mn	<10	Chronic Health ≤ 500 - Aesthetic ≤ 100
	Mercury as Hg	<1.0	≤6
	Nickel as Ni	2.29	≤70
	Selenium as Se	<1.0	≤10
	Vanadium as V	2.04	≤200
Organics Determinand mg/l			
	Total Organic Carbon	0.10	≤ 10
Total Trihalomethanes mg/l			
	Phenolic Compounds	Attached	≤ 0.01
All heavy metal analyses have been performed on filtered samples. Tests marked with an asterisk * are not SANAS accredited These results are related only to the items tested			These results must be read in conjunction with the Uncertainty of Measurement list as provided by Regen Waters Laboratory

QUALITY CONTROL CHECKS

Cation Balance	1.05
Anion Balance	0.96
% Difference	4.6
Measured TDS	62
Calculated TDS	55
Limits > 1.0 - <1.2	1.1
Calcul TDS / E.C. (0.55 - 0.70)	0.8


 P.L.G. UYS (M.D.)
 Technical Signatory

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CHEMICAL ANALYSIS

Date Received : 27 September 2013
Date Reported : 10 October 2013
Quantity Analyzed: 13

Our Ref: STE / 213 - 225 / D / 09 /13

Att : Me Zelda Louw / Mr Kobus Swart

D 221

	Analysis Results mg/l	Bankfontein	SANS Standards -241 (2011) Domestic Water
			Standard Limits
Physical requirements			
	Colour as Pt-Co	<5.0	≤ 15
	Conductivity at 25° C in mS/m	27.0	≤ 170
	Total Dissolved Solids	182	≤ 1 200
	Odour	Not Applicable	Inoffensive
	pH-Value at 25 ° C	7.84	≥ 5.0 to ≤ 9.7
	Taste	Not Applicable	Inoffensive
	Turbidity as N.T.U.	0.41	Operational ≤ 1.0 - Aesthetic ≤ 5.0
	Total Alkalinity as CaCO ₃	136	
Macro Determinants			
	Free & Saline Ammonia NH ₃ as N	<0.20	
	Calcium as Ca	24.9	
	Chlorides as Cl	7.86	≤300
	Fluoride as F	2.13	≤1.5
	Magnesium as Mg	8.36	
	Nitrate & Nitrite as N	<0.1	≤ 11
	Potassium as K	1.10	
	Sodium as Na	34.8	≤ 200
	Sulphate as SO ₄	6.06	Acute Health ≤ 500 - Aesthetic ≤ 250
	Zinc as Zn	0.04	≤5

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CHEMICAL ANALYSIS

Our Ref: STE / 213 - 225 / D / 09 /13

Date Received : 27 September 2013

Date Reported : 10 October 2013

Quantity Analyzed: 13

Att : Me Zelda Louw / Mr Kobus Swart

D 221

	Analysis Results µg/l	Bankfontein	SANS Standards -241 (2011) Domestic Water
			Standard Limits
Micro Determinants µg/l			
	Aluminium as Al	80	≤ 300
	Antimony as Sb	<1.0	≤20
	Arsenic as As	<1.0	≤10
	Cadmium as Cd	<1.0	≤3
	Total Chromium as Cr	<1.0	≤50
	Cobalt as Co	<1.0	≤500
	Copper as Cu	1.01	≤2000
	Cyanide as CN *	<70	≤70
	Iron as Fe	20	Chronic Health ≤ 2000 - Aesthetic ≤ 300
	Lead as Pb	<1.0	≤10
	Manganese as Mn	<10	Chronic Health ≤ 500 - Aesthetic ≤ 100
	Mercury as Hg	<1.0	≤6
	Nickel as Ni	<1.0	≤70
	Selenium as Se	<1.0	≤10
	Vanadium as V	1.05	≤200
Organics Determinand mg/l			
	Total Organic Carbon	0.13	≤ 10
Total Trihalomethanes mg/l			
	Phenolic Compounds	Attached	≤ 0.01

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QUALITY CONTROL CHECKS

Cation Balance	3.47
Anion Balance	3.18
% Difference	4.4
Measured TDS	182
Calculated TDS	168
Limits > 1.0 - <1.2	1.1
Calcul TDS / E.C. (0.55 - 0.70)	0.6

P.L.G. UYS (M.D.)
Technical Signatory

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CHEMICAL ANALYSIS

Date Received : 27 September 2013
Date Reported : 10 October 2013
Quantity Analyzed: 13

Our Ref: STE / 213 - 225 / D / 09 /13

Att : Me Zelda Louw / Mr Kobus Swart

D 222

	Analysis Results mg/l	Kranspoort Raw	SANS Standards -241 (2011) Domestic Water
			Standard Limits
Physical requirements			
	Colour as Pt-Co	5	≤ 15
	Conductivity at 25° C in mS/m	10.9	≤ 170
	Total Dissolved Solids	88	≤ 1 200
	Odour	Not Applicable	Inoffensive
	pH-Value at 25 ° C	6.98	≥ 5.0 to ≤ 9.7
	Taste	Not Applicable	Inoffensive
	Turbidity as N.T.U.	6.97	Operational ≤ 1.0 - Aesthetic ≤ 5.0
	Total Alkalinity as CaCO ₃	44	
Macro Determinants			
	Free & Saline Ammonia NH ₃ as N	<0.20	
	Calcium as Ca	9.27	
	Chlorides as Cl	12.3	≤300
	Fluoride as F	<0.20	≤1.5
	Magnesium as Mg	5.38	
	Nitrate & Nitrite as N	<0.1	≤ 11
	Potassium as K	1.20	
	Sodium as Na	13.5	≤ 200
	Sulphate as SO ₄	8.36	Acute Health ≤ 500 - Aesthetic ≤ 250
	Zinc as Zn	0.03	≤5

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CHEMICAL ANALYSIS

Date Received : 27 September 2013

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Att : Me Zelda Louw / Mr Kobus Swart

D 222

	Analysis Results µg/l	Kranspoort Raw	SANS Standards -241 (2011) Domestic Water Standard Limits
Micro Determinants µg/l			
	Aluminium as Al	70	≤ 300
	Antimony as Sb	2.91	≤20
	Arsenic as As	<1.0	≤10
	Cadmium as Cd	<1.0	≤3
	Total Chromium as Cr	<1.0	≤50
	Cobalt as Co	<1.0	≤500
	Copper as Cu	1.01	≤2000
	Cyanide as CN *	<70	≤70
	Iron as Fe	280	Chronic Health ≤ 2000 - Aesthetic ≤ 300
	Lead as Pb	<1.0	≤10
	Manganese as Mn	20	Chronic Health ≤ 500 - Aesthetic ≤ 100
	Mercury as Hg	<1.0	≤6
	Nickel as Ni	2.23	≤70
	Selenium as Se	<1.0	≤10
	Vanadium as V	<1.0	≤200
Organics Determinand mg/l			
	Total Organic Carbon	1.65	≤ 10
Total Trihalomethanes mg/l			
	Phenolic Compounds	Attached	≤ 0.01

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QUALITY CONTROL CHECKS

Cation Balance	1.52
Anion Balance	1.40
% Difference	4.2
Measured TDS	88
Calculated TDS	77
Limits > 1.0 - <1.2	1.1
Calcul TDS / E.C. (0.55 - 0.70)	0.7


P.L.G. UYS (M.D.)
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CHEMICAL ANALYSIS

Date Received : 27 September 2013
Date Reported : 10 October 2013
Quantity Analyzed: 13

Our Ref: STE / 213 - 225 / D / 09 /13

Att : Me Zelda Louw / Mr Kobus Swart

D 223

	Analysis Results mg/l	Kranspoort	SANS Standards -241 (2011) Domestic Water
			Standard Limits
Physical requirements			
	Colour as Pt-Co	<5.0	≤ 15
	Conductivity at 25° C in mS/m	9.17	≤ 170
	Total Dissolved Solids	76	≤ 1 200
	Odour	Not Applicable	Inoffensive
	pH-Value at 25 ° C	8.82	≥ 5.0 to ≤ 9.7
	Taste	Not Applicable	Inoffensive
	Turbidity as N.T.U.	0.73	Operational ≤ 1.0 - Aesthetic ≤ 5.0
	Total Alkalinity as CaCO ₃	32	
Macro Determinants			
	Free & Saline Ammonia NH ₃ as N	<0.20	
	Calcium as Ca	9.31	
	Chlorides as Cl	15.5	≤300
	Fluoride as F	<0.20	≤1.5
	Magnesium as Mg	4.08	
	Nitrate & Nitrite as N	0.13	≤ 11
	Potassium as K	1.46	
	Sodium as Na	11.8	≤ 200
	Sulphate as SO ₄	7.14	Acute Health ≤ 500 - Aesthetic ≤ 250
	Zinc as Zn	0.07	≤5

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D 223

	Analysis Results µg/l	Kranspoort	SANS Standards -241 (2011) Domestic Water Standard Limits
Micro Determinants µg/l			
	Aluminium as Al	110	≤ 300
	Antimony as Sb	1.10	≤20
	Arsenic as As	<1.0	≤10
	Cadmium as Cd	<1.0	≤3
	Total Chromium as Cr	<1.0	≤50
	Cobalt as Co	<1.0	≤500
	Copper as Cu	1.54	≤2000
	Cyanide as CN *	<70	≤70
	Iron as Fe	250	Chronic Health ≤ 2000 - Aesthetic ≤ 300
	Lead as Pb	1.28	≤10
	Manganese as Mn	<10	Chronic Health ≤ 500 - Aesthetic ≤ 100
	Mercury as Hg	<1.0	≤6
	Nickel as Ni	1.37	≤70
	Selenium as Se	4.40	≤10
	Vanadium as V	<1.0	≤200
Organics Determinand mg/l			
	Total Organic Carbon	1.15	≤ 10
Total Trihalomethanes mg/l			
	Phenolic Compounds	Attached	≤ 0.01

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QUALITY CONTROL CHECKS

Cation Balance	1.35
Anion Balance	1.24
% Difference	4.5
Measured TDS	76
Calculated TDS	69
Limits > 1.0 - <1.2	1.1
Calcul TDS / E.C. (0.55 - 0.70)	0.8


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Date Reported : 10 October 2013
Quantity Analyzed: 13

Our Ref: STE / 213 - 225 / D / 09 /13

Att : Me Zelda Louw / Mr Kobus Swart

D 224

	Analysis Results mg/l	Loskop Raw	SANS Standards -241 (2011) Domestic Water
			Standard Limits
Physical requirements			
	Colour as Pt-Co	5	≤ 15
	Conductivity at 25° C in mS/m	47.5	≤ 170
	Total Dissolved Solids	342	≤ 1 200
	Odour	Not Applicable	Inoffensive
	pH-Value at 25 ° C	8.27	≥ 5.0 to ≤ 9.7
	Taste	Not Applicable	Inoffensive
	Turbidity as N.T.U.	3.79	Operational ≤ 1.0 - Aesthetic ≤ 5.0
	Total Alkalinity as CaCO ₃	62	
Macro Determinants			
	Free & Saline Ammonia NH ₃ as N	<0.20	
	Calcium as Ca	38.5	
	Chlorides as Cl	23.6	≤300
	Fluoride as F	0.42	≤1.5
	Magnesium as Mg	21.8	
	Nitrate & Nitrite as N	0.16	≤ 11
	Potassium as K	6.92	
	Sodium as Na	39.6	≤ 200
	Sulphate as SO ₄	152	Acute Health ≤ 500 - Aesthetic ≤ 250
	Zinc as Zn	0.02	≤5

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CHEMICAL ANALYSIS

Date Received : 27 September 2013

Date Reported : 10 October 2013

Quantity Analyzed: 13

Our Ref: STE / 213 - 225 / D / 09 / 13

Att : Me Zelda Louw / Mr Kobus Swart

D 224

	Analysis Results µg/l	Loskop Raw	SANS Standards -241 (2011) Domestic Water
			Standard Limits
Micro Determinants µg/l			
	Aluminium as Al	80	≤ 300
	Antimony as Sb	<1.0	≤20
	Arsenic as As	<1.0	≤10
	Cadmium as Cd	<1.0	≤3
	Total Chromium as Cr	<1.0	≤50
	Cobalt as Co	<1.0	≤500
	Copper as Cu	1.01	≤2000
	Cyanide as CN *	<70	≤70
	Iron as Fe	10	Chronic Health ≤ 2000 - Aesthetic ≤ 300
	Lead as Pb	<1.0	≤10
	Manganese as Mn	<10	Chronic Health ≤ 500 - Aesthetic ≤ 100
	Mercury as Hg	<1.0	≤6
	Nickel as Ni	2.35	≤70
	Selenium as Se	1.15	≤10
	Vanadium as V	<1.0	≤200
Organics Determinand mg/l			
	Total Organic Carbon	3.52	≤ 10
Total Trihalomethanes mg/l			
	Phenolic Compounds	Attached	≤ 0.01
<p>All heavy metal analyses have been performed on filtered samples. Tests marked with an asterisk * are not SANAS accredited These results are related only to the items tested</p>			<p style="color: red;">These results must be read in conjunction with the Uncertainty of Measurement list as provided by Regen Waters Laboratory</p>

QUALITY CONTROL CHECKS

Cation Balance	5.61
Anion Balance	5.10
% Difference	4.8
Measured TDS	342
Calculated TDS	322
Limits > 1.0 - <1.2	1.1
Calcul TDS / E.C. (0.55 - 0.70)	0.7


P.L.G. UYS (M.D.)
 Technical Signatory

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CHEMICAL ANALYSIS

Date Received : 27 September 2013
Date Reported : 10 October 2013
Quantity Analyzed: 13

Our Ref: STE / 213 - 225 / D / 09 /13

Att : Me Zelda Louw / Mr Kobus Swart

D 225

	Analysis Results mg/l	Loskop Final	SANS Standards -241 (2011) Domestic Water Standard Limits
Physical requirements			
	Colour as Pt-Co	<5.0	≤ 15
	Conductivity at 25° C in mS/m	48.1	≤ 170
	Total Dissolved Solids	324	≤ 1 200
	Odour	Not Applicable	Inoffensive
	pH-Value at 25 ° C	7.83	≥ 5.0 to ≤ 9.7
	Taste	Not Applicable	Inoffensive
	Turbidity as N.T.U.	0.92	Operational ≤ 1.0 - Aesthetic ≤ 5.0
	Total Alkalinity as CaCO ₃	57	
Macro Determinants			
	Free & Saline Ammonia NH ₃ as N	<0.20	
	Calcium as Ca	38.1	
	Chlorides as Cl	26.4	≤300
	Fluoride as F	0.37	≤1.5
	Magnesium as Mg	20.8	
	Nitrate & Nitrite as N	0.15	≤ 11
	Potassium as K	6.64	
	Sodium as Na	37.7	≤ 200
	Sulphate as SO ₄	152	Acute Health ≤ 500 - Aesthetic ≤ 250
	Zinc as Zn	0.03	≤5

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D 225

	Analysis Results µg/l	Loskop Final	SANS Standards -241 (2011) Domestic Water Standard Limits
Micro Determinants µg/l			
	Aluminium as Al	150	≤ 300
	Antimony as Sb	<1.0	≤20
	Arsenic as As	<1.0	≤10
	Cadmium as Cd	<1.0	≤3
	Total Chromium as Cr	<1.0	≤50
	Cobalt as Co	<1.0	≤500
	Copper as Cu	13.0	≤2000
	Cyanide as CN *	<70	≤70
	Iron as Fe	60	Chronic Health ≤ 2000 - Aesthetic ≤ 300
	Lead as Pb	<1.0	≤10
	Manganese as Mn	<10	Chronic Health ≤ 500 - Aesthetic ≤ 100
	Mercury as Hg	<1.0	≤6
	Nickel as Ni	2.49	≤70
	Selenium as Se	<1.0	≤10
	Vanadium as V	<1.0	≤200
Organics Determinand mg/l			
	Total Organic Carbon	3.27	≤ 10
Total Trihalomethanes mg/l			
	Phenolic Compounds	Attached	≤ 0.01

All heavy metal analyses have been performed on filtered samples.
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QUALITY CONTROL CHECKS

Cation Balance	5.42
Anion Balance	5.08
% Difference	3.3
Measured TDS	324
Calculated TDS	317
Limits > 1.0 - <1.2	1.0
Calcul TDS / E.C. (0.55 - 0.70)	0.7



P.L.G. UYS (M.D.)
Technical Signatory