

STEVE TSHWETE MUNICIPALITY

P.O. BOX 14
MIDDELBURG
1050

CERTIFICATE OF CHEMICAL ANALYSIS

Date Received : 13 September 2016

Date Reported : 21 September 2016

Quantity Analyzed: 2

Our Ref: STE / 96 • 99 / B / 09 / 16
Attention: Mr. P. Bouwer / Ms. Z. Louw / Mr. K. Swart

B 98

Physical requirements	LPM Method	Analysis Results mg/l	Naledi Village	SANS Standards - 241-1: (2015) Ed 2 Domestic Water	
				Risk	Standard Limits
	-	Colour as Pt-Co *	4	Aesthetic	≤ 15
	LPM 51 / B2	Conductivity at 25° C in mS/m	34.9	Aesthetic	≤ 170
	LPM 2	Total Dissolved Solids	186	Aesthetic	≤ 1 200
	LPM 51 / B2	pH-Value at 25° C	7.27	Operational	≥ 5.0 to ≤ 9.7
	LPM 23 / B1	Turbidity as N.T.U.	0.80	Operational Aesthetic	≤ 1.0 ≤ 5.0
	LPM 11 / B1	Total Alkalinity as CaCO ₃	10		
	LPM 84	Free Chlorine as Cl ₂ *	<0.1	Chronic Health	≤ 6
	-	Monochloramine *	<1.0	Chronic Health	≤ 3
Macro Determinants					
	LPM 29 / 76	Free & Saline Ammonia as N	<0.20	Aesthetic	≤ 1.5
	LPM 15	Calcium as Ca	17.5		
	LPM 30/76	Chlorides as Cl	16.3	Aesthetic	≤ 200
	LPM 27 / 76	Fluoride as F	<0.20	Chronic Health	≤ 1.5
	LPM 15	Magnesium as Mg	5.37		
	LPM 32 / 76	Nitrate NO ₃ as N	0.50	Acute Health	≤ 11
	LPM 32 / 76	Nitrite NO ₂ as N	<0.1	Acute Health	≤ 0.9
	-	Nitrite - Nitrate Ratio	<1.0		≤ 1
	LPM 15	Sodium as Na	32.9	Aesthetic	≤ 100
	LPM 28 / 76	Sulphate as SO ₄	90	Acute Health Aesthetic	≤ 600 ≤ 200
	LPM 15	Potassium as K	24.1		
	LPM 15 / 67	Zinc as Zn	0.03	Aesthetic	≤ 5

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B 98

Micro Determinants µg/l	LPM Method	Analysis Results µg/l	Naledi Village	SANS Standards -241-t: (2015) Ed 2 Domestic Water	Risk	Standard Limits
	LPM 15 / 67	Aluminium as Al	76.5		Operational	≤ 300
	LPM 15 / 67	Antimony as Sb	<1.0		Chronic Health	≤ 20
	LPM 15 / 67	Arsenic as As	<1.0		Chronic Health	≤ 10
	LPM 15 / 67	Barium as Ba	11.2		Chronic Health	≤ 700
	LPM 15 / 67	Boron as B	37.9		Chronic Health	≤ 2 400
	LPM 15 / 67	Cadmium as Cd	<1.0		Chronic Health	≤ 3
	LPM 15 / 67	Total Chromium as Cr	<1.0		Chronic Health	≤ 50
	LPM 15 / 67	Cobalt as Co	4.43			
	LPM 15 / 67	Copper as Cu	<1.0		Chronic Health	≤ 2000
	LPM 15 / 67	Cyanide as CN *	<70		Acute Health	≤ 200
	LPM 15 / 67	Iron as Fe	54.4		Chronic Health Aesthetic	≤ 2000 ≤ 300
	LPM 15 / 67	Lead as Pb	<1.0		Chronic Health	≤ 10
	LPM 15 / 67	Manganese as Mn	27.4		Chronic Health Aesthetic	≤ 400 ≤ 100
	LPM 15 / 67	Mercury as Hg	<1.0		Chronic Health	≤ 5
	LPM 15 / 67	Nickel as Ni	3.92		Chronic Health	≤ 70
	LPM 15 / 67	Selenium as Se	1.03		Chronic Health	≤ 40
	LPM 15 / 67	Uranium as U (238) *	<1.0		Chronic Health	≤ 30
	LPM 15 / 67	Vanadium as V	<1.0			
Organics Determinand						
	LPM 68	Total Organic Carbon mg/l	0.89		Chronic Health	≤ 10
	LPM 69	Total Trihalomethanes µg/l *	GC		Chronic Health	
		Mycrocytin as LR µg/l *	<1.0		Chronic Health	≤ 1
	LPM 74	Phenolic Compounds µg/l *	GC		Aesthetic	≤ 10

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	2.75
Anion Balance	2.94
% Difference	-3.5
Measured TDS	186
Calculated TDS	170
Limits > 1.0 - <1.2	1.1
Calcul TDS / E.C. (0.55 - 0.70)	0.5

P. G. VAN DER MERWE

REGEN WATERS

LABORATORY • LABORATORIUM

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CERTIFICATE OF ANALYSIS

TRIHALOMETHANE COMPOUNDS (THM)

SAMPLE INFORMATION

DATE RECEIVED	13-Sep-16	LAB NUMBER	B98.D
CLIENT	Steve Tshwete Municipality	DATE ANALYZED	19-Sep-16
SAMPLE NAME	Naledi Village	MATRIX	Water
CONTAINER	Plastic	DILUTION FACTOR	No Dilution
INSTRUMENT	Agilent 7890A GC/MS, Headspace 7697A, Solid Phase Extraction		

COMPOUND

CONCENTRATION

UNITS

Chloroform	<10	µg/liter
Trichloroethene	<10	µg/liter
Bromodichloromethane	<10	µg/liter
Dibromochloromethane	<10	µg/liter
Bromoform	<10	µg/liter

Samples stored at 5°C after acceptance by Regen Waters.

This report is only applicable to the sample provided for testing.

Regen Waters cannot be held accountable for any errors that might have been caused by improper sampling, handling or storage of samples prior to acceptance.

Trihalomethane Result Interpretation

According to the South African National Standards 241-1; Ed1 2011 the Limits for Trihalomethane content in drinking water are:

Compound	Concentration	Units
Chloroform	<300	µg/liter
Bromoform	<100	µg/liter
Dibromochloromethane	<100	µg/liter
Bromodichloromethane	<60	µg/liter
Trichloroethene*	<20	µg/liter

*Standard from the World Health Organization drinking water standard 2011 (Not technically a THM but is a frequently requested compound in conjunction with THM analysis.)

Trihalomethanes in potable water is a by-product of disinfection using chlorine and other disinfectants. The concentration of Trihalomethanes in potable water needs to be monitored, as long term consumption of high concentrations can lead to chronic ailments.

The sample, Naledi Village, complies with the standard for Trihalomethane content in drinking water.



P.L.G. Uys (M.D.)

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Attention: Mr. R. Rouwer / Ms. Z. Louw / Mr. K. Swart

B 99

Physical requirements	LPM Method	Analysis Results mg/l	Lesedi Village	SANS Standards-2471-1: (2015) Ed 2 Domestic Water	
				Risk	Standard Limits
	-	Colour as Pt-Co *	1	Aesthetic	≤ 15
	LPM 51 / 82	Conductivity at 25° C in mS/m	18.9	Aesthetic	≤ 170
	LPM 2	Total Dissolved Solids	104	Aesthetic	≤ 1 200
	LPM 51 / 82	pH-Value at 25 ° C	8.54	Operational	≥ 5.0 to ≤ 7.7
	LPM 23 / 81	Turbidity as N.T.U.	0.33	Operational Aesthetic	≤ 1.0 ≤ 5.0
	LPM 11 / 81	Total Alkalinity as CaCO ₃	63		
	LPM 84	Free Chlorine as Cl ₂ *	<0.1	Chronic Health	≤ 2
	-	Monochloramine *	<1.0	Chronic Health	≤ 3
Macro Determinants					
	LPM 29 / 76	Free & Saline Ammonia as N	<0.20	Aesthetic	≤ 1.2
	LPM 15	Calcium as Ca	12.7		
	LPM 30/76	Chlorides as Cl	7.2	Aesthetic	≤ 200
	LPM 27 / 76	Fluoride as F	<0.20	Chronic Health	≤ 1.5
	LPM 15	Magnesium as Mg	8.72		
	LPM 32 / 76	Nitrate NO ₃ as N	0.31	Acute Health	≤ 11
	LPM 32 / 76	Nitrite NO ₂ as N	<0.1	Acute Health	≤ 0.9
	-	Nitrite - Nitrate Ratio	<1.0		≤ 1
	LPM 15	Sodium as Na	13.7	Aesthetic	≤ 200
	LPM 28 / 76	Sulphate as SO ₄	18.0	Acute Health Aesthetic	≤ 500 ≤ 260
	LPM 15	Potassium as K	2.21		
	LPM 15 / 67	Zinc as Zn	0.01	Aesthetic	≤ 5

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B 99

Micro Determinants µg/l	LPM Method	Analysis Results µg/l	Lesedi Village	SANS Standards -247-1: (2015) Ed 2 Domestic Water	Risk	Standard Limits
	LPM 15 / 67	Aluminium as Al	63.2		Operational	≤ 300
	LPM 15 / 67	Antimony as Sb	<1.0		Chronic Health	≤ 20
	LPM 15 / 67	Arsenic as As	<1.0		Chronic Health	≤ 10
	LPM 15 / 67	Barium as Ba	31.7		Chronic Health	≤ 700
	LPM 15 / 67	Boron as B	13.2		Chronic Health	≤ 2 400
	LPM 15 / 67	Cadmium as Cd	<1.0		Chronic Health	≤ 3
	LPM 15 / 67	Total Chromium as Cr	<1.0		Chronic Health	≤ 50
	LPM 15 / 67	Cobalt as Co	<1.0			
	LPM 15 / 67	Copper as Cu	<1.0		Chronic Health	≤ 2000
	LPM 15 / 67	Cyanide as CN *	<70		Acute Health	≤ 200
	LPM 15 / 67	Iron as Fe	59.8		Chronic Health Aesthetic	≤ 2000 ≤ 300
	LPM 15 / 67	Lead as Pb	<1.0		Chronic Health	≤ 10
	LPM 15 / 67	Manganese as Mn	<1.0		Chronic Health Aesthetic	≤ 400 ≤ 100
	LPM 15 / 67	Mercury as Hg	<1.0		Chronic Health	≤ 6
	LPM 15 / 67	Nickel as Ni	<1.0		Chronic Health	≤ 70
	LPM 15 / 67	Selenium as Se	1.22		Chronic Health	≤ 40
	LPM 15 / 67	Uranium as U (238) *	<1.0		Chronic Health	≤ 30
	LPM 15 / 67	Vanadium as V	1.43			
Organics Determinand						
	LPM 68	Total Organic Carbon mg/l	2.38		Chronic Health	≤ 10
	LPM 69	Total Trihalomethanes µg/l *	GC		Chronic Health	
		Mycoxystin as LR µg/l *	<1.0		Chronic Health	≤ 1
	LPM 74	Phenolic Compounds µg/l *	GC		Aesthetic	≤ 10

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QUALITY CONTROL CHECKS	
Cation Balance	1.96
Anion Balance	1.93
% Difference	0.3
Measured TDS	104
Calculated TDS	100
Limits > 1.0 - <1.2	1.0
Calcul TDS / E.C. (0.56 - 0.70)	0.5



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

A SANAS Accredited Testing Laboratory No. T0156.
Opinions and Interpretations expressed herein are outside the scope of SANAS accreditation.

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SAMPLE NAME	Lesedi Village	MATRIX	Water
CONTAINER	Plastic	DILUTION FACTOR	No Dilution
INSTRUMENT	Agilent 7890A GC/MS, Headspace 7697A, Solid Phase Extraction		

COMPOUND

CONCENTRATION

UNITS

Chloroform	<10	µg/liter
Trichloroethene	<10	µg/liter
Bromodichloromethane	<10	µg/liter
Dibromochloromethane	<10	µg/liter
Bromoform	<10	µg/liter

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