

EMAKHAZENI LOCAL MUNICIPALITY

P.O. Box 17
BELFAST
1100

CERTIFICATE OF CHEMICAL ANALYSIS

Attention: MARIANNE JOUBERT

Date received : 15 March 2019

Date reported : 25 March 2019

Quantity Analyzed : 10

Our Ref : ELM / 509 - 518 / B / 03 / 19

Lab No:

B 509

Analysis Results mg/l	LPM METHOD	SANS Standards -241 - 1: 2015 Ed 2 Domestic Water	EMH 2/3/19
		Standard Limits	Water Works Inlet
Total Dissolved Solids	LPM 2	≤ 1 200	80
Suspended Solids	LPM 1		2,0
Nitrate & Nitrite as N	LPM 76		0,17
Nitrate NO ₃ as N	LPM 76	≤ 11	0,17
Nitrite NO ₂ as N	LPM 76	≤ 0.9	<0.1
Chlorides as Cl	LPM 76	≤ 300	6,29
Total Alkalinity as CaCO ₃	LPM 11/81		64
Fluoride as F	LPM 76	≤ 1.5	0,44
Sulphate as SO ₄	LPM 76	Acute Health ≤ 500 - Aesthetic ≤ 250	8,58
Total Hardness as CaCO ₃	LPM 85		62
Calcium Hardness as CaCO ₃	LPM 85		26
Magnesium Hardness as CaCO ₃	LPM 85		37
Calcium as Ca	LPM 15		10,3
Magnesium as Mg	LPM 15		8,90
Sodium as Na	LPM 15	≤ 200	6,93
Potassium as K	LPM 15		1,01
Iron as Fe	LPM 15/67	Chronic Health ≤ 2.0 - Aesthetic ≤ 0.3	0,58
Manganese as Mn	LPM 15/67	Chronic Health ≤ 0.4 - Aesthetic ≤ 0.1	<0.01
Conductivity at 25° C (mS/m)	LPM 51/82	≤ 170	14,8
pH-Value at 25° C (pH Units)	LPM 51/82	≥ 5.0 to ≤ 9.7	7,98
pHs by 21° Celsius	LPM 85		8,48
Langelier Saturation Index	LPM 85		-0.50
Turbidity as N.T.U.	LPM 23/82	Operational ≤ 1.0 - Aesthetic ≤ 5.0	7,11
Free Residual Chlorine Cl ₂ *	LPM 84		<0.1
Aluminium as Al	LPM 15/67	≤ 0.30	0,08

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

VALUES HIGHLIGHTED IN GREY ARE NOT WITHIN THE SANS 241 - 1 : 2015 LIMITS AS SPECIFIED

QUALITY CONTROL CHECKS

Cation Balance	1,60
Anion Balance	1,67
% Difference	-2,1
Measured TDS	80
Calculated TDS	83
Limits > 1.0 - <1.2	1,0
Calcul TDS / E.C. (0.55 - 0.70)	0,6

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Lab No:

B 510

Analysis Results mg/l	LPM METHOD	SANS Standards -241 - 1: 2015 Ed 2 Domestic Water	EMH 4/3/19
		Standard Limits	Water Works Outlet Final
Total Dissolved Solids	LPM 2	≤ 1 200	86
Suspended Solids	LPM 1		2,8
Nitrate & Nitrite as N	LPM 76		0,16
Nitrate NO ₃ as N	LPM 76	≤ 11	0,16
Nitrite NO ₂ as N	LPM 76	≤ 0.9	<0.1
Chlorides as Cl	LPM 76	≤ 300	11,6
Total Alkalinity as CaCO ₃	LPM 11/81		56
Fluoride as F	LPM 76	≤ 1.5	0,24
Sulphate as SO ₄	LPM 76	Acute Health ≤ 500 - Aesthetic ≤ 250	7,87
Total Hardness as CaCO ₃	LPM 85		64
Calcium Hardness as CaCO ₃	LPM 85		27
Magnesium Hardness as CaCO ₃	LPM 85		37
Calcium as Ca	LPM 15		10,9
Magnesium as Mg	LPM 15		8,92
Sodium as Na	LPM 15	≤ 200	7,66
Potassium as K	LPM 15		1,04
Iron as Fe	LPM 15/67	Chronic Health ≤ 2.0 - Aesthetic ≤ 0.3	<0.01
Manganese as Mn	LPM 15/67	Chronic Health ≤ 0.4 - Aesthetic ≤ 0.1	0,01
Conductivity at 25° C (mS/m)	LPM 51/82	≤ 170	15,9
pH-Value at 25° C (pH Units)	LPM 51/82	≥ 5.0 to ≤ 9.7	7,80
pHs by 21° Celsius	LPM 85		8,51
Langelier Saturation Index	LPM 85		-0.71
Turbidity as N.T.U.	LPM 23/82	Operational ≤ 1.0 - Aesthetic ≤ 5.0	2,05
Free Residual Chlorine Cl ₂ *	LPM 84		<0.1
Aluminium as Al	LPM 15/67	≤ 0.30	0,05

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VALUES HIGHLIGHTED IN GREY ARE NOT WITHIN THE SANS 241 - 1 : 2015 LIMITS AS SPECIFIED

QUALITY CONTROL CHECKS

Cation Balance	1,64
Anion Balance	1,63
% Difference	0,3
Measured TDS	86
Calculated TDS	83
Limits > 1.0 - <1.2	1,0
Calcul TDS / E.C. (0.55 - 0.70)	0,5

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Quantity Analyzed : 10

Our Ref : ELM / 509 - 518 / B / 03 / 19

Lab No:

B 512

Analysis Results mg/l	LPM METHOD	SANS Standards -241 - 1: 2015 Ed 2 Domestic Water	EWB 2/3/19
		Standard Limits	Water Works Inlet
Total Dissolved Solids	LPM 2	≤ 1 200	98
Suspended Solids	LPM 1		277
Nitrate & Nitrite as N	LPM 76		0,28
Nitrate NO ₃ as N	LPM 76	≤ 11	0,28
Nitrite NO ₂ as N	LPM 76	≤ 0.9	<0.1
Chlorides as Cl	LPM 76	≤ 300	6,81
Total Alkalinity as CaCO ₃	LPM 11/81		66
Fluoride as F	LPM 76	≤ 1.5	<0.20
Sulphate as SO ₄	LPM 76	Acute Health ≤ 500 - Aesthetic ≤ 250	8,42
Total Hardness as CaCO ₃	LPM 85		63
Calcium Hardness as CaCO ₃	LPM 85		26
Magnesium Hardness as CaCO ₃	LPM 85		37
Calcium as Ca	LPM 15		10,5
Magnesium as Mg	LPM 15		9,00
Sodium as Na	LPM 15	≤ 200	8,45
Potassium as K	LPM 15		1,10
Iron as Fe	LPM 15/67	Chronic Health ≤ 2.0 - Aesthetic ≤ 0.3	0,11
Manganese as Mn	LPM 15/67	Chronic Health ≤ 0.4 - Aesthetic ≤ 0.1	<0.01
Conductivity at 25° C (mS/m)	LPM 51/82	≤ 170	16,5
pH-Value at 25° C (pH Units)	LPM 51/82	≥ 5.0 to ≤ 9.7	7,77
pHs by 21° Celsius	LPM 85		8,46
Langelier Saturation Index	LPM 85		-0.69
Turbidity as N.T.U.	LPM 23/82	Operational ≤ 1.0 - Aesthetic ≤ 5.0	238
Free Residual Chlorine Cl ₂ *	LPM 84		<0.1
Aluminium as Al	LPM 15/67	≤ 0.30	0,07

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VALUES HIGHLIGHTED IN GREY ARE NOT WITHIN THE SANS 241 - 1 : 2015 LIMITS AS SPECIFIED

QUALITY CONTROL CHECKS

Cation Balance	1,67
Anion Balance	1,71
% Difference	-1,0
Measured TDS	98
Calculated TDS	86
Limits > 1.0 - <1.2	1,1
Calcul TDS / E.C. (0.55 - 0.70)	0,5

All heavy metal analyses have been performed on filtered samples.

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Our Ref : ELM / 509 - 518 / B / 03 / 19

Lab No:

B 513

Analysis Results mg/l	LPM METHOD	SANS Standards -241 - 1: 2015 Ed 2 Domestic Water	EWB 4/3/19
		Standard Limits	Water Works Outlet Final
Total Dissolved Solids	LPM 2	≤ 1 200	90
Suspended Solids	LPM 1		1,6
Nitrate & Nitrite as N	LPM 76		0,25
Nitrate NO ₃ as N	LPM 76	≤ 11	0,25
Nitrite NO ₂ as N	LPM 76	≤ 0.9	<0.1
Chlorides as Cl	LPM 76	≤ 300	11,7
Total Alkalinity as CaCO ₃	LPM 11/81		60
Fluoride as F	LPM 76	≤ 1.5	<0.20
Sulphate as SO ₄	LPM 76	Acute Health ≤ 500 - Aesthetic ≤ 250	7,81
Total Hardness as CaCO ₃	LPM 85		65
Calcium Hardness as CaCO ₃	LPM 85		27
Magnesium Hardness as CaCO ₃	LPM 85		38
Calcium as Ca	LPM 15		10,7
Magnesium as Mg	LPM 15		9,22
Sodium as Na	LPM 15	≤ 200	8,47
Potassium as K	LPM 15		1,08
Iron as Fe	LPM 15/67	Chronic Health ≤ 2.0 - Aesthetic ≤ 0.3	<0.01
Manganese as Mn	LPM 15/67	Chronic Health ≤ 0.4 - Aesthetic ≤ 0.1	<0.01
Conductivity at 25° C (mS/m)	LPM 51/82	≤ 170	17,3
pH-Value at 25° C (pH Units)	LPM 51/82	≥ 5.0 to ≤ 9.7	7,76
pHs by 21° Celsius	LPM 85		8,50
Langelier Saturation Index	LPM 85		-0.74
Turbidity as N.T.U.	LPM 23/82	Operational ≤ 1.0 - Aesthetic ≤ 5.0	1,94
Free Residual Chlorine Cl ₂ *	LPM 84		<0.1
Aluminium as Al	LPM 15/67	≤ 0.30	0,05

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VALUES HIGHLIGHTED IN GREY ARE NOT WITHIN THE SANS 241 - 1 : 2015 LIMITS AS SPECIFIED

QUALITY CONTROL CHECKS

Cation Balance	1,69
Anion Balance	1,71
% Difference	-0,5
Measured TDS	90
Calculated TDS	87
Limits > 1.0 - <1.2	1,0
Calcul TDS / E.C. (0.55 - 0.70)	0,5

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P.L.G. UYS / A.KOHRs
Technical Signatory