Environment Canada
Proficiency Testing Program

Study 0102
September 2013

Major Ions and Nutrients in Water

Environment Canada Proficiency Testing Program

Glossary of Terms and Definitions

A. Statistics listed in Data Summary (Appendix A)

1.	Assigned Value	The Robust Mean of test results for a parameter and sample [1]
2.	R-Std Dev	Robust Standard Deviation [1]
3.	Acceptable Limits	See 'Limits & Flags' and Table 1
4.	Warning Limits	See 'Limits & Flags' and Table 1
5.	Action Limits	See 'Limits & Flags' and Table 1
6.	N	The number of usable test results for calculating the assigned value

B. Calculation of Performance Statistics (Appendix A)

Laboratory Bias: Laboratory Bias [2] D = x-X, where D is the deviation, x is the test result and X is the assigned value. This deviation is normalized with the robust standard deviation (R-Std Dev) and evaluated by the z-score [3].

Limits & Flags: Acceptable Limits/No Flags: When a test result is within 2 R-Std Dev of the assigned value, flags are not assigned (see Table 1 below).

Warning Limits/Warning Flags: When a test result is between 2 and 3 R-Std Dev, the flags 'WH' or 'WL' indicate a WARNING flag, for a high or low result respectively (see Table 1 below).

Action Limits/Action Flags: When a test result deviates by more than 3 R-Std Dev from the assigned value, the flags 'AH' or 'AL' indicate an ACTION flag, high or low respectively (see Table 1 below).

Table 1 Evaluating test results, determining limits and assigning flags [2]

Criteria	Limits	Flags
Assigned value ± 2 $\hat{\sigma}$*	Acceptable Limits	No Flag
2 $\hat{\sigma}$ - 3 $\hat{\sigma}$ from assigned value	Warning Limits	Warning Flag (W)
> 3 $\hat{\sigma}$ from assigned value	Action Limits	Action Flag (A)

* $\hat{\sigma}$ is the R-Std Dev

Systemic Bias: Systemic bias is indicated when a laboratory's test results (ranked by the Youden non-parametric analysis [4] for an individual parameter) are consistently higher or lower than the assigned value. Ranks are assigned to each test result for each sample, from 1 for the lowest, to N for the highest, where N is the number of usable test results. These ranks are totalled for each laboratory (Total Rank), and divided by the number of samples ranked (No. Samples Ranked). **Total Rank** and **Average Rank** for each laboratory are displayed on page 2 of the Data Summary. The **Overall Average Rank** for each parameter is shown at the bottom of the same page. Systemic bias is identified when a laboratory's **Average Rank** falls outside of the 95% confidence interval for the **Overall Average Rank**. Systemic bias may be indicated by the Youden rankings even when the test results have not been flagged (W or A) for deviation from the assigned value.

No. Samples Ranked: This is the number of test results used to determine systemic bias. A laboratory must report results for more than half of the samples in the set to allow for evaluation of bias (not including '<'). There must be ten or more laboratories participating, with sufficient test results reported, to determine systemic bias.

The two measured components of 'systemic' bias are 1) Bias Blank and 2) Bias % Slope. These components are illustrated in Figure 1: Parameter Performance. All 'systemic' biases are correctable with the investigation of the following two analytical components.

1) Bias Blank: The first component is the y-intercept of the linear regression plot (-0.0329 in Figure 1). These bias blanks are stated in the Data Summary and Evaluations for each parameter.

2) Bias % Slope: The second measured component is the % deviation of the laboratory test results versus the assigned values for a parameter. This is calculated as [(**m-1**) x 100], where **m** is the slope of the linear regression plot (laboratory test results) and **1** is the slope of the "ideal" line (assigned values). The Bias % Slope in Figure 1 below is minus 1.55 per cent (-1.55%). For most parameters, a Bias % Slope greater than the absolute value of 5 is considered unacceptable and <u>requires action</u>.

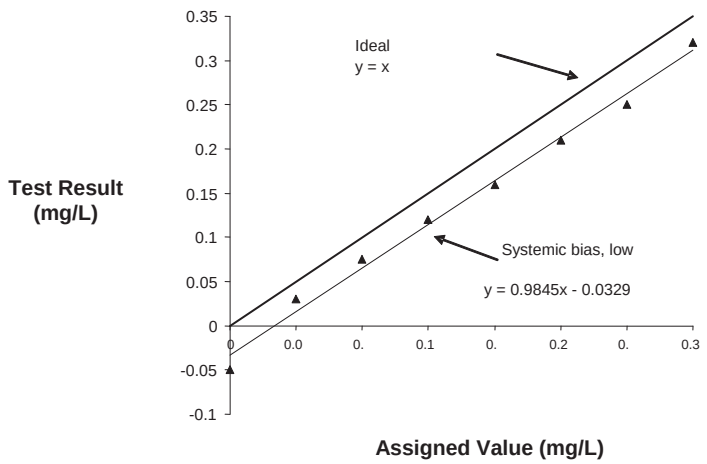

Figure 1: Parameter Performance

Bias Statement: Systemic bias is noted with the 'BIASED HIGH' or 'BIASED LOW' notations. In Table 2 of the Final Report (Laboratory Performance Scores), systemic biases are calculated as the equivalent of *five* flagged values.

Method Coding: Method codes are an important part of quality assurance. These definitions are provided on the Data Reporting Forms to assist with uniform descriptions.

C. Determination of the 'Laboratory Performance Scores' in Table 2

The 'Laboratory Performance Scores' are a combination of 50% **Systemic Bias (parameters biased)** and 50% **Flagged Results**.

- Systemic bias (50%) is calculated as,

  [(No. of Parameters Biased / No. of Parameters Analyzed) x100] / 2

- Flagged results (50%) is calculated as,

  [(No. of Flags Assigned / No. of Results Reported) x100] / 2

These percentages are summed to obtain the % Score (Sum of Parameters Biased & Flagged Results)

The Laboratory Performance Rating is assigned according to the % Score.

- Very Good: 0 to 5%;
- Good: >5 to 12.5%;

- Fair: >12.5 to 30%
- Poor: >30%.

D. Uncertainty of Assigned Values

The standard uncertainty (u_X)of the assigned value may be estimated from the statistics presented in the data summary (Appendix A),

$$u_X = 1.25 \times \text{R-Std Dev} / \sqrt{N} \qquad [5]$$

This uncertainty is not used in the performance evaluations, but may be of interest to some participants. Reporting details of the measurement uncertainty of any assigned value is a requirement of *ISO/IEC 17043:2010, Conformity assessment – General requirements for proficiency testing.*

E. Associated Laboratory Evaluations with the Final Report

1. Laboratory Proficiency Appraisal (see Table 2 in the Final Report for definitions)
2. Z-Score Summary [3]

References:

[1] ISO 13528:2005(E), Statistical Methods for the use in Proficiency Testing by Interlaboratory Comparisons, Annex C, Robust Analysis, Section C.1: Algorithm A, p64.

[2] ISO 13528:2005(E), Statistical Methods for the use in Proficiency Testing by Interlaboratory Comparisons, Calculation of Performance Statistics, Section 7.1.1 and 7.1.2, p18-19.

[3] ISO 13528:2005(E), Statistical Methods for the use in Proficiency Testing by Interlaboratory Comparisons, *z*-scores, Section 7.4.1 and 7.4.2, p25-26.

[4] Ranking Laboratories by Round-Robin Tests, W.J. Youden, Precision Measurement and Calibration, H.H. Ku, Editor, NBS Special Publication 300-Volume 1, U.S. Government Printing Office, Washington, D.C., 1969.

[5] ISO 13528:2005(E), Statistical Methods for the use in Proficiency Testing by Interlaboratory Comparisons, Standard uncertainty u_X of the assigned value , Section 5.6.2, p 9-10.

Section 2 – Major Ions and Nutrients in Natural Waters (MI)

Table 1	Participating Laboratories
Table 2	Laboratory Performance Scores
Table 3	Five-Year Historical Laboratory Performance
Table 4	Sample Design
Table 5	Summary of Interlaboratory Robust Means
Appendix A	Data Summary

2013-09-04

Program Name: FPMI

Study Code: 0102 Range of Samples: 1 to 10

Table 1 Participating Laboratories in FP PT for Major Ions & Nutrients

AGAT Laboratories, Burnaby, BC, CA
ALS Environmental, Jacksonville, FL, US
ALS Environmental, Winnipeg, MB, CA
Bay of Plenty Regional Council, Whakatane, NZ
Capital District Health Authority, QEII Lab, Halifax, NS, CA
City of Red Deer Water Treatment Plant Laboratory, AB
CSIRO Land and Water, Lucas Heights, NSW, AU
Dade County DERM Lab, Miami, FL, US
DB Environmental Labs, Rockledge, FL, US
Environment Canada, ALET, Moncton, NB, CA
Environment Canada, NLET, Burlington, ON, CA
Environment Canada, NLET, Saskatoon, SK, CA
Environment Canada, PYLET, Vancouver, BC, CA
Environment Canada, WST Calibration Lab, Burlington, ON, CA
Environment New Brunswick, Fredericton, NB, CA
Environnement Québec, CEAEQ, Gouvernement du QC, QC, CA
Environnement Québec, CEAEQ, Laval, QC, CA
Florida Spectrum Environmental Services, Inc., Ft. Lauderdale, FL, US
Florida DEP Central Lab, Tallahassee, FL, US
Florida International University, SERC, Miami, FL
Geoscience Laboratories, Sudbury, ON, CA
Kinectrics Inc., Toronto, ON, CA
Maxxam Analytics Inc., Edmonton
Minera Alumbrera, Tucuman, AR
Ministry of Agriculture, Strovolos, Nicosia, CY
Nam Theun 2 Power Company,Vientiane, LA
NIWA, Hamilton, NZ
NRCan, CDN Forestry Service, ON Region, Sault Ste.Marie, ON
Ontario Ministry of Environment, Dorset, ON, CA
Oregon State University, Corvallis, OR, US
Santé Canada - DSPA, Longueuil, QC, CA
Saskatchewan Disease Control Laboratory, Regina, SK, CA
Servicio Geologico Minero Argentino, Buenos Aires, Argentina
South Florida Water Management Dist., West Palm Beach, FL,US
TAIGA Environmental Laboratory, Yellowknife, NT, CA
TestAmerica, Savannah, GA, US
U.S. Environmental Protection Agency, FOH, Chicago, IL, US
U.S. Geological Survey, NWQL, Denver, CO, US
US EPA ORD Western Ecology Division, Corvallis, OR, US
USGS Climate Studies Lab - Boulder, CO, US
Ville de Montréal, Montréal, QC, CA

41 Laboratories.

2013-09-04

Program Name: FPMI **Number of Labs:** 47

Study Code: 0102 **Range of Samples:** 1 to 10

Table 2 Laboratory Performance Scores - FP PT for Major Ions & Nutrients

	Systemic Bias			Flagged Results			
Lab Code	No. of Parameters Analyzed	No. of Parameters Biased	Parameters Biased (50%)	No. of Results Reported	No. of Flags Assigned	Results Flagged (50%)	% Score (Sum of Parameters Biased & Results Flagged)
F004	5	0	0.00	50	0	0.00	0.00
F006	1	0	0.00	10	0	0.00	0.00
F006a	1	0	0.00	10	0	0.00	0.00
F090	2	0	0.00	20	0	0.00	0.00
F153	13	0	0.00	130	0	0.00	0.00
F158b	1	0	0.00	10	0	0.00	0.00
F221	6	0	0.00	60	0	0.00	0.00
F239	6	0	0.00	12	0	0.00	0.00
F223a	3	0	0.00	18	0	0.00	0.00
F009	10	0	0.00	100	2	1.00	1.00
F223	2	0	0.00	20	2	5.00	5.00
F003	19	2	5.26	190	0	0.00	5.26
F069	17	2	5.88	170	0	0.00	5.88
F293	17	2	5.88	170	1	0.29	6.18
F022	17	3	8.82	170	3	0.88	9.71
F015b	2	0	0.00	20	4	10.00	10.00
F290	20	4	10.00	200	1	0.25	10.25
F271	16	3	9.38	160	3	0.94	10.31
F113	14	3	10.71	140	4	1.43	12.14
F036	17	3	8.82	170	13	3.82	12.65
F248	11	3	13.64	110	0	0.00	13.64
F154	19	5	13.16	190	7	1.84	15.00
F280	3	1	16.67	30	0	0.00	16.67
F304	3	1	16.67	30	0	0.00	16.67
F326	17	2	5.88	170	37	10.88	16.76
F207	15	4	13.33	150	13	4.33	17.67
F021	15	5	16.67	150	6	2.00	18.67
F193	4	1	12.50	40	5	6.25	18.75
F297	12	3	12.50	120	16	6.67	19.17
F228	4	1	12.50	40	6	7.50	20.00
F229	5	2	20.00	50	0	0.00	20.00
F026	16	6	18.75	160	7	2.19	20.94
F158	18	7	19.44	180	15	4.17	23.61
F099	7	3	21.43	70	6	4.29	25.71
F015	19	8	21.05	190	19	5.00	26.05
F010	16	7	21.88	160	18	5.63	27.50
F270	18	6	16.67	180	54	15.00	31.67
F317	20	10	25.00	195	27	6.92	31.92
F014	12	7	29.17	120	10	4.17	33.33
F011	17	9	26.47	170	29	8.53	35.00
F292	19	12	31.58	190	25	6.58	38.16
F026a	4	3	37.50	40	1	1.25	38.75

Laboratory Performance Rating

Rating	% Score*
Very Good	0 - 5
Good	> 5 - 12.5
Fair	> 12.5 - 30
Poor	> 30

*Sum of Parameters Biased & Results Flagged

2013-09-04

Program Name: FPMI **Number of Labs:** 47

Study Code: 0102 **Range of Samples:** 1 to 10

Table 2 Laboratory Performance Scores - FP PT for Major Ions & Nutrients

	Systemic Bias			Flagged Results			
Lab Code	No. of Parameters Analyzed	No. of Parameters Biased	Parameters Biased (50%)	No. of Results Reported	No. of Flags Assigned	Results Flagged (50%)	% Score (Sum of Parameters Biased & Results Flagged)
F139	9	4	22.22	90	34	18.89	41.11
F249	5	4	40.00	50	2	2.00	42.00
F264	6	3	25.00	60	26	21.67	46.67
F011a	1	1	50.00	10	0	0.00	50.00
F213	1	1	50.00	10	10	50.00	100.00

Laboratory Performance Rating

Rating	% Score*
Very Good	0 - 5
Good	> 5 - 12.5
Fair	> 12.5 - 30
Poor	> 30

*Sum of Parameters Biased & Results Flagged

2013-09-04

Program Name: FPMI

Study Code: 0102

Table 3 Five-Year Historical Laboratory Performance - FP PT for Major Ions & Nutrients

LAB CODE	% Score Per Study (Sum of Parameters Biased & Results Flagged)										MEDIAN	RATING
	0093 Winter 2008	0094 Summer 2009	0095 Winter 2009	0096 Summer 2010	0097 Winter 2010	0098 Summer 2011	0099 Winter 2011	0100 Summer 2012	0101 Winter 2012	0102 Summer 2013		
F003	2.5	2.5	0.0	0.8	0.0	0.0	0.0	0.5	0.0	5.3	0.3	Very Good
F004	0.8	0.0	0.0	1.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	Very Good
F006	0.0	15.0	0.0	10.0	50.0	5.0	55.0	0.0	0.0	0.0	2.5	Very Good
F006a										0.0	0.0	Very Good
F009	6.4	0.9	0.9	1.8	0.9	9.6	0.9	15.9	0.5	1.0	1.0	Very Good
F010	18.4	10.3	10.9	38.2	16.6	17.5	14.7		10.8	27.5	16.6	Fair
F011	35.6	16.5	15.8	22.2	1.4	6.5	6.8	41.5	12.4	35.0	16.2	Fair
F011a									0.0	50.0	25.0	Fair
F014	0.0	7.2	0.0	0.0	4.2	5.8	2.5	2.5	37.5	33.3	3.3	Very Good
F015	12.4	5.5	11.6	10.3	4.0	13.1	6.6	4.5	9.8	26.1	10.0	Good
F015b	27.5	2.5	0.0	40.0	15.0	2.6	0.0	5.0	5.0	10.0	5.0	Very Good
F021	1.3	11.3	5.4	2.3	6.3	10.0	5.7	3.7	11.3	18.7	6.0	Good
F022	1.4	5.6	17.2	10.3	11.7	14.7	5.9	18.8	14.7	9.7	11.0	Good
F026	8.8	0.3	4.0	0.3	4.1	11.6	3.8	0.6	4.1	20.9	4.0	Very Good
F026a										38.8	38.8	Poor
F036	16.6	1.9	0.0	4.1	8.4		3.8	15.6	0.0	12.7	4.1	Very Good
F069		7.4		12.4		9.2		14.9		5.9	9.2	Good
F090	0.0	6.7	0.0	0.0	0.0	0.0	0.0	0.0	2.5	0.0	0.0	Very Good
F099		0.6		2.5		21.4		24.1		25.7	21.4	Fair
F113	5.0	10.9	17.2	6.9	17.7	17.0	9.6	7.5	3.0	12.1	10.3	Good
F139	38.8			37.2	2.2		24.4	9.5	13.3	41.1	24.4	Fair
F153						4.2	2.3		13.1	0.0	3.3	Very Good
F154		33.1	27.3	17.8	12.0	7.9	17.4	31.3	14.2	15.0	17.4	Fair
F158	8.7	8.2	6.3	10.5	2.9	7.5	17.2	3.6	3.9	23.6	7.8	Good
F158b	12.1	11.9	1.9	12.9	12.0	18.3	0.0		0.0	0.0	11.9	Good
F193	3.6	5.0	28.9	14.3	4.6	12.7	1.8	5.9	22.4	18.8	9.3	Good
F207	5.6	0.7	0.9	9.7	0.0	1.0	4.0	0.3	7.0	17.7	2.5	Very Good

Laboratory Performance Rating

Rating	% Score
Very Good	0 - 5
Good	> 5 - 12.5
Fair	> 12.5 - 30
Poor	> 30

2013-09-04

Program Name: FPMI

Study Code: 0102

Table 3 Five-Year Historical Laboratory Performance - FP PT for Major Ions & Nutrients

LAB CODE	% Score Per Study (Sum of Parameters Biased & Results Flagged)										MEDIAN	RATING
	0093 Winter 2008	0094 Summer 2009	0095 Winter 2009	0096 Summer 2010	0097 Winter 2010	0098 Summer 2011	0099 Winter 2011	0100 Summer 2012	0101 Winter 2012	0102		
F213										100.0	100.0	Poor
F221	1.0	0.0	10.0	1.0	0.0	0.8	0.7	0.8	1.7	0.0	0.8	Very Good
F223		1.4		0.0		7.3		2.1		5.0	2.1	Very Good
F223a						1.4				0.0	0.7	Very Good
F228					16.0		0.0			20.0	16.0	Fair
F229										20.0	20.0	Fair
F239						6.8		7.3		0.0	6.8	Good
F248	7.8	8.8	1.5	0.0	5.0	0.5	0.0	0.5		13.6	1.5	Very Good
F249								0.0		42.0	21.0	Fair
F264									20.2	46.7	33.4	Poor
F270							19.7			31.7	25.7	Fair
F271										10.3	10.3	Good
F280					6.7		16.7			16.7	16.7	Fair
F290							13.5	4.5	13.8	10.3	11.9	Good
F292					17.0		8.7	9.2	16.6	38.2	16.6	Fair
F293					5.8		9.7			6.2	6.2	Good
F297										19.2	19.2	Fair
F304			0.0	0.0	0.0	0.0	12.5	0.0	0.0	16.7	0.0	Very Good
F317					21.0		17.5			31.9	21.0	Fair
F326								32.4		16.8	24.6	Fair
Interlab Median	6.0	5.6	1.9	6.9	5.0	7.0	5.8	4.5	6.0	16.7		

Laboratory Performance Rating

Rating	% Score
Very Good	0 - 5
Good	> 5 - 12.5
Fair	> 12.5 - 30
Poor	> 30

Program Name: FPMI 2013-09-04

Study Code: 0102

Table 4 Sample Design - FP PT for Major Ions & Nutrients

Sample Number	Sample Name	Source
1	WASCANA-07	Saskatchewan
2	BATTLE-05	Saskatchewan
3	SOURIS-05	Manitoba
4	COLLING-96A	Ontario
5	QUETAP-MX	Quebec
6	ARROW-91	British Columbia
7	LON-07	Ontario
8	MISSION-96A	British Columbia
9	LONG-02	Ontario
10	SWIFT-05	Saskatchewan

Program Name: FPMI **Range of Samples:** 1 to 10 2013-09-04

Study Code: 0102

Table 5 Summary of Interlaboratory Robust Means - FP PT for Major Ions & Nutrients

Parameters	MI102-1 Sample 1	MI102-2 Sample 2	MI102-3 Sample 3	MI102-4 Sample 4	MI102-5 Sample 5	MI102-6 Sample 6	MI102-7 Sample 7	MI102-8 Sample 8	MI102-9 Sample 9	MI102-10 Sample 10
Ammonia (mg/L N)	0.005	0.006	0.010	0.0105	0.0000	0.0030	0.002	0.0055	0.0060	0.009
Boron (mg/L)	0.0550	0.158	0.128	0.013	0.0048	0.0000	0.0240	0.0040	0.0078	0.0704
Calcium (mg/L)	30.0	61.1	58.6	24.4	14.1	16.9	35.0	13.8	9.83	68.2
Chloride (mg/L)	21.4	19.3	22.6	5.57	24.4	0.303	22.4	0.868	38.8	7.09
Colour (Units)	13.3	29.5	66.8	2.14	2.04	3.25	2.30	7.00	24.9	15.7
Conductivity @ 25C (uS/cm)	568	882	903	190	164	117	308	101.0	204	863
Diss Inorg Carbon (mg/L C)	22.0	76.4	62.8	17.3	4.68	12.3	22.6	10.21	4.51	56.3
Diss Organic Carbon (mg/L C)	6.39	10.38	14.8	1.394	1.206	0.747	1.75	1.74	4.65	6.69
Fluoride (mg/L)	0.0786	0.210	0.146	0.0670	1.18	0.0571	0.113	0.0381	0.0549	0.219
Magnesium (mg/L)	23.9	27.9	41.8	6.37	1.58	3.62	8.85	2.68	3.11	36.8
Nitrate + Nitrite (mg/L N)	0.304	0.224	0.505	0.312	0.378	0.149	0.448	0.0924	0.121	0.234
pH (pH Units)	8.10	8.51	8.43	8.01	7.44	7.80	8.06	7.76	7.40	8.37
Potassium (mg/L)	7.81	10.24	14.9	0.846	0.995	0.601	1.56	0.592	1.044	10.39
Silicates (mg/L SiO2)	1.51	11.2	17.0	0.799	7.31	3.55	0.834	4.64	2.96	4.14
Sodium (mg/L)	46.4	98.7	77.2	3.47	13.0	0.695	12.7	1.97	22.8	65.5
Sulfate (mg/L)	159	140	199	14.6	13.1	8.21	26.3	7.04	13.5	230
Total Alkalinity (mg/L CaCO3)	90.1	320	260	71.1	19.4	49.8	91.7	41.8	18.8	230
Total Hardness (mg/L)	175	269	320	88.0	42.2	58.0	125	46.4	37.6	323
Total Kjeldahl N (mg/L N)	0.469	0.583	1.047	0.074	0.054	0.034	0.148	0.067	0.249	0.462
Total N (mg/L N)	0.742	0.777	1.50	0.375	0.407	0.171	0.576	0.139	0.357	0.676

Appendix A

PARAMETER: 07192 Ammonia mg/L N

WATER SCIENCE & TECHNOLOGY
ENVIRONMENT CANADA

FP PT for Major Ions & Nutrients

SAMPLE	1=	2=	3=	4=	5=	6=	7=	8=	9=	10=
	MI102-1	MI102-2	MI102-3	MI102-4	MI102-5	MI102-6	MI102-7	MI102-8	MI102-9	MI102-10
LAB NO	LAB RESULT	LAB RESULT	LAB RESULT	LAB RESULT	LAB RESULT	LAB RESULT	LAB RESULT	LAB RESULT	LAB RESULT	LAB RESULT
F003	0.005	<0.005	0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.008
F004	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
F010	<0.02	<0.02	<0.02	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.02 WH
F011	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
F015	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
F021	<0.002	0.007	0.016	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
F022	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
F026	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
F036	<0.002	<0.003	<0.002	<0.001	<0.001	0.00	<0.001	<0.001	<0.001	<0.001
F069	<0.010	<0.010	0.011	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
F113	0.010	0.009	0.022	<0.004	<0.004	0.006	<0.004	<0.004	0.005	0.011
F154	<0.010	<0.010	0.012	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.011
F158	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
F207	<0.005	0.007	0.014	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.005
F221	0.001	<0.001	0.003	0.001	<0.001	<0.001	0.001	0.001	0.003	<0.001
F228	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
F229	0.005	0.004	0.004	<0.0031	<0.0031	<0.0031	0.004	<0.0031	<0.0031	0.004
F270	<0.014	<0.014	<0.014	<0.014	<0.014	<0.014	<0.014	<0.014	<0.014	<0.014
F271	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
F280	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
F290	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	0.01	0.01
F292	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
F293	0.003	0.004	0.009	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.004
F317	<0.026	<0.026	<0.026	<0.026	<0.026	<0.026	<0.026	<0.026	<0.026	<0.026
F326	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
ASSIGNED VALUE *	0.005	0.006	0.010	0.0105	0.0000	0.0030	0.002	0.0055	0.0060	0.009
R-STD DEV *	0.0038	0.0025	0.0067	-	-	-	-	-	0.00409	0.0046
ACCEPTABLE LIMITS(+-) *	-	-	0.0134	-	-	-	-	-	-	0.0092
WARNING LIMITS(+-) *	-	-	.0134- .0201	-	-	-	-	-	-	.0092- .0138
ACTION LIMITS(<>) *	-	-	0.0201	-	-	-	-	-	-	0.0138
N *	5	5	9	2	0	2	2	2	3	8

* NOTE: SEE GLOSSARY FOR DEFINITIONS

LAB NO.	TOTAL RANK	AVERAGE RANK	SUMMARY OF FLAGGING	BIAS STATEMENT	NO.SAMPLES RANKED	BIAS % SLOPE	BIAS BLANK	METHOD CODING
F003	10.5	3.5			3			Colorimetry
F004	0.0	0.0			0			Salicyclate/nitropru
F010	10.0	5.0	WH		2			Skalar
F011	0.0	0.0			0			Colorimetric - Discr
F015	0.0	0.0			0			Colorimetry
F021	11.5	5.7			2			Flow injection
F022	0.0	0.0			0			Colorimetry
F026	0.0	0.0			0			Phenate
F036	1.0	1.0			1			Colorimetry
F069	5.0	5.0			1			
F113	29.5	4.9			6			Flow injection
F154	12.5	6.2			2			Colorimetry
F158	0.0	0.0			0			Colorimetry
F207	13.5	4.5			3			Flow injection
F221	6.0	1.0			6			Flow injection
F228	0.0	0.0			0			Colorimetry
F229	10.5	2.1			5			EPA 353.2
F270	0.0	0.0			0			Flow injection
F271	0.0	0.0			0			Flow injection
F280	0.0	0.0			0			Automated phenate
F290	10.0	3.3			3			Flow injection
F292	0.0	0.0			0			Flow injection
F293	9.0	2.2			4			GAS DIFFUSION-SFA
F317	0.0	0.0			0			Colorimetry
F326	0.0	0.0			0			Metrohm,861 Compact

NOTE: BIAS WAS NOT ASSESSED BECAUSE STATISTICS FOR FEWER THAN 10 LABS WERE AVAILABLE

OVERALL AVERAGE RANK IS 3.3

PARAMETER: 05091 Boron mg/L

WATER SCIENCE & TECHNOLOGY
ENVIRONMENT CANADA

FP PT for Major Ions & Nutrients

SAMPLE	1=	2=	3=	4=	5=	6=	7=	8=	9=	10=
	MI102-1	MI102-2	MI102-3	MI102-4	MI102-5	MI102-6	MI102-7	MI102-8	MI102-9	MI102-10
LAB NO	LAB RESULT	LAB RESULT	LAB RESULT	LAB RESULT	LAB RESULT	LAB RESULT	LAB RESULT	LAB RESULT	LAB RESULT	LAB RESULT
F010	0.058	0.165	0.132	0.015	0.003	<0.001	0.023	0.001	0.005 WL	0.072
F014	0.056	0.161	0.128	0.016 WH	0.010 AH	<0.010	0.024	<0.010	<0.010	0.070
F015	0.06	0.16	0.13	0.01 WL	<0.01	<0.01	0.03 AH	<0.01	<0.01	0.08
F021	0.054	0.161	0.126	0.013	<0.01	<0.01	0.024	<0.01	<0.01	0.070
F022	0.055	0.159	0.128	0.013	0.005	<0.005	0.025	<0.005	0.008	0.071
F026	0.055	0.154	0.123	<0.02	<0.02	<0.02	0.025	<0.02	<0.02	0.068
F069	0.054	0.159	0.124	0.013	0.004	<0.001	0.024	0.004	0.008	0.069
F154	0.039 AL	0.126 AL	0.103 WL	0.013	<0.010	<0.010	0.023	<0.010	<0.010	0.075
F158	0.053	0.155	0.120	0.012	<0.005	<0.005	0.023	<0.005	0.007	0.066
F249	0.050	0.151	0.119	0.012	<0.01	<0.01	0.022	<0.01	<0.01	0.065
F270	0.054	0.158	0.122	0.014	0.005	0.00	0.026	0.004	0.009	0.070
F290	0.055	0.165	0.136	0.014	0.005	<0.002	0.023	0.004	0.008	0.071
F292	0.091 AH	0.204 AH	0.167 AH	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.098 AH
F293	0.0562	0.155	0.132	0.013	0.0048	<0.0020	0.0239	0.0042	0.0082	0.0634
F317	<0.10	0.155	0.139	<0.10	<0.10	<0.10	<0.10	<0.10		<0.10
ASSIGNED VALUE *	0.0550	0.158	0.128	0.013	0.0048	0.0000	0.0240	0.0040	0.0078	0.0704
R-STD DEV *	0.00345	0.0058	0.0083	0.0014	0.00111	-	0.00141	0.00000	0.00098	0.00481
ACCEPTABLE LIMITS(+-) *	0.00690	0.0116	0.0166	0.0028	0.00222	-	0.00282	-	0.00196	0.00962
WARNING LIMITS(+-) *	.00690- .010	.0116- .0174	.0166- .0249	.0028- .0042	.00222- .003	-	.00282- .004	-	.00196- .002	.00962- .014
ACTION LIMITS(<>) *	0.01035	0.0174	0.0249	0.0042	0.00333	-	0.00423	-	0.00294	0.01443
N *	14	15	15	12	7	1	13	5	7	14

* NOTE: SEE GLOSSARY FOR DEFINITIONS

LAB NO.	TOTAL RANK	AVERAGE RANK	SUMMARY OF FLAGGING	BIAS STATEMENT	NO.SAMPLES RANKED	BIAS % SLOPE	BIAS BLANK	METHOD CODING
F010	65.5	7.2	WL		9			ICP-AES
F014	64.0	9.1	WHAH		7			ICP-AES
F015	60.0	10.0	WL AH		6			ICP-AES
F021	44.5	7.4			6			ICP-AES
F022	60.0	7.5			8			ICP-AES
F026	30.5	6.1			5			ICP-AES
F069	47.5	5.2			9			ICP-AES
F154	24.5	4.0	ALALWL		6			ICP-MS
F158	22.0	3.1		BIASED LOW	7	-3.2	-0.0008	ICP-MS
F249	11.5	1.9		BIASED LOW	6	-4.7	-0.0014	ICP-AES
F270	60.5	6.0			10			ICP-AES
F290	69.0	7.6			9			ICP-MS
F292	58.0	14.5	AHAHAH AH	INSUFFICIENT DATA	4			ICP-AES
F293	54.5	6.0			9			ICP-MS
F317	19.0	9.5		INSUFFICIENT DATA	2			ICP-AES

OVERALL AVERAGE RANK IS 6.7

PARAMETER: 20091 Calcium mg/L

WATER SCIENCE & TECHNOLOGY
ENVIRONMENT CANADA

FP PT for Major Ions & Nutrients

SAMPLE	1=	2=	3=	4=	5=	6=	7=	8=	9=	10=
	MI102-1	MI102-2	MI102-3	MI102-4	MI102-5	MI102-6	MI102-7	MI102-8	MI102-9	MI102-10
LAB NO	LAB RESULT	LAB RESULT	LAB RESULT	LAB RESULT	LAB RESULT	LAB RESULT	LAB RESULT	LAB RESULT	LAB RESULT	LAB RESULT
F003	30.2	60.8	58.1	24.9	14.3	17.1	35.6	14.1	9.87	68.5
F009	28.7	59.9	57.	24.	14.	16.	35.	14.	9.7	68.
F010	30.7	62.0	59.4	24.8	14.3	17.0	35.3	14.1	9.31	69.3
F011	32.2	63.8	62.9	26.2	15.2	18.6 WH	37.4	15.5 AH	11.4 AH	72.1
F014	31.2	62.7	60.6	25.3	14.6	17.8	37.1	14.7	10.4	71.9
F015	29.8	58.9	57.1	22.3	14.8	17.5	34.8	14.3	10.3	68.1
F021	30.8	62.2	59.5	24.8	14.5	16.9	35.5	13.9	10.0	69.1
F022	30.2	61.3	59.7	23.9	14.3	16.7	33.7	14.0	9.89	68.3
F026	29.2	57.6	55.3	24.0	13.7	16.8	33.5	13.6	9.59	63.4
F036	31.6	67.1 WH	60.1	25.0	13.7	17.8	36.8	13.2	10.2	73.6 WH
F069	30.8	62.7	59.4	25.1	14.4	17.4	35.5	14.1	10.	70.5
F113	30.9	63.3	60.8	25.1	14.3	16.9	35.7	14.0	10.0	70.9
F139	26.0 AL	52.3 AL	50.4 AL	21.0 AL	11.9 AL	14.3 AL	29.8 AL	11.8 AL	8.12 AL	57.8 AL
F153	30.	61.	59.	24.	14.	17.	35.	14.	9.6	69.
F154	28.6	62.7	58.7	24.7	13.9	16.6	34.2	13.4	10.3	67.0
F158	29.5	59.4	55.9	23.8	13.3	16.3	34.3	13.5	9.4	66.7
F207	28.9	59.9	57.2	23.3	13.2	15.7	32.4	13.1	9.2	67.3
F248	30.	63.	60.	25.	14.	17.	35.	14.	9.7	68.
F249	28.6	59.6	56.7	23.7	13.3	16.1	33.4	13.2	9.24	67.8
F270	30.6	60.7	57.5	25.2	14.7	17.6	35.7	14.3	10.0	68.6
F271	30.7	62.5	59.9	24.9	14.1	17.0	35.7	13.8	9.78	69.7
F280	29.8	59.9	57.2	23.3	14.2	16.7	34.5	13.7	9.95	67.7
F290	28.6	59.1	58.8	23.4	13.6	16.2	34.6	13.0	9.27	67.6
F292	31.4	63.3	61.2	25.9	14.7	17.7	36.5	14.4	10.1	71.6
F293	30.7	62.2	60.9	24.7	14.3	17.0	35.8	14.1	9.87	66.2
F297	29.7	59.9	58.0	24.0	13.7	16.3	34.7	13.6	9.78	67.2
F317	28.3	56.3 WL	54.7	23.	12.9	15.5	32.5	13.		62.2 WL
F326	29.5	63.0	61.6	26.3	15.8 WH	18.3	36.7	14.0	10.4	64.1
ASSIGNED VALUE *	30.0	61.1	58.6	24.4	14.1	16.9	35.0	13.8	9.83	68.2
R-STD DEV *	1.18	2.17	2.24	1.06	0.63	0.80	1.41	0.55	0.444	2.63
ACCEPTABLE LIMITS(+-) *	2.36	4.34	4.48	2.12	1.26	1.60	2.82	1.10	0.888	5.26
WARNING LIMITS(+-) *	2.36- 3.54	4.34- 6.51	4.48- 6.72	2.12- 3.18	1.26- 1.89	1.60- 2.40	2.82- 4.23	1.10- 1.65	.888- 1.332	5.26- 7.89
ACTION LIMITS(<>) *	3.54	6.51	6.72	3.18	1.89	2.40	4.23	1.65	1.332	7.89
N *	28	28	28	28	28	28	28	28	27	28

* NOTE: SEE GLOSSARY FOR DEFINITIONS

LAB NO.	TOTAL RANK	AVERAGE RANK	SUMMARY OF FLAGGING	BIAS STATEMENT	NO.SAMPLES RANKED	BIAS % SLOPE	BIAS BLANK	METHOD CODING
F003	169.0	16.9			10			ICP-AES
F009	102.5	10.2			10			ICP-MS
F010	167.5	16.7			10			ICP-AES
F011	275.0	27.5	WH AHAH	BIASED HIGH	10	4.3	0.9121	IC Dionex
F014	248.0	24.8		BIASED HIGH	10	3.8	0.1838	ICP-AES
F015	148.5	14.8			10			ICP-AES
F021	179.0	17.9			10			ICP-AES
F022	141.5	14.1			10			ICP-AES
F026	70.0	7.0			10			ICP-AES
F036	212.5	21.2	WH WH		10			AAS absorption
F069	205.0	20.5			10			ICP-AES
F113	207.5	20.7			10			ICP-AES
F139	10.0	1.0	ALALALALALALALALAL	BIASED LOW	10	-14.5	-0.0442	ICP-AES
F153	141.5	14.1			10			ICP-AES
F154	116.0	11.6			10			ICP-MS
F158	67.5	6.7		BIASED LOW	10	-2.8	-0.0394	ICP-MS
F207	52.5	5.2		BIASED LOW	10	-0.6	-0.9638	ICP-AES
F248	162.0	16.2			10			ICP-MS
F249	57.0	5.7		BIASED LOW	10	-1.0	-0.6990	ICP-AES
F270	193.5	19.3			10			ICP-AES
F271	175.0	17.5			10			AAS absorption
F280	107.5	10.7			10			AAS absorption
F290	67.5	6.7		BIASED LOW	10	-0.2	-0.7014	ICP-AES
F292	248.0	24.8		BIASED HIGH	10	4.4	0.0248	ICP-AES
F293	175.0	17.5			10			ICP-AES
F297	98.5	9.8			10			ICP-AES
F317	20.5	2.2	WL WL	BIASED LOW	9	-8.3	0.3484	ICP-AES
F326	214.0	21.4	WH		10			Metrohm,861 Compact

OVERALL AVERAGE RANK IS 14.4

PARAMETER: 17092 Chloride mg/L

WATER SCIENCE & TECHNOLOGY
ENVIRONMENT CANADA

FP PT for Major Ions & Nutrients

SAMPLE	1=	2=	3=	4=	5=	6=	7=	8=	9=	10=
	MI102-1	MI102-2	MI102-3	MI102-4	MI102-5	MI102-6	MI102-7	MI102-8	MI102-9	MI102-10
LAB NO	LAB RESULT	LAB RESULT	LAB RESULT	LAB RESULT	LAB RESULT	LAB RESULT	LAB RESULT	LAB RESULT	LAB RESULT	LAB RESULT
F003	21.2	19.2	22.4	5.66	24.2	0.28	22.3	0.87	38.3	7.19
F009	21.7	19.1	22.4	5.66	25.0	0.27	22.8	0.87	38.4	7.21
F010	21.1	19.2	22.5	5.45	24.2	0.223	22.2	0.760	38.6	6.94
F011	22.4	20.1	23.6	5.7	25.2	<0.7	23.4	0.8	40.2	7.4
F014	21.9	20.4	23.3	6.28 WH	25.2	0.377	22.4	0.887	40.0	7.91
F015	22.	20.	23.	5.7	25.	0.4	23.	0.9	41. WH	7.5
F021	21.2	19.7	23.5	5.76	24.0	0.37	22.5	1.02 WH	38.2	7.37
F022	21.4	19.4	22.6	5.7	24.5	0.258	22.5	0.85	38.4	7.25
F026	20.7	18.6	21.9	5.25	24.2	0.266	22.0	0.850	37.7	6.68
F036	21.0	19.0	22.2	5.40	24.2	0.24	22.0	0.78	38.6	6.86
F069	21.3	19.1	23.	5.5	24.4	0.287	22.4	0.898	38.7	7.14
F099	22.6	21.1 WH	24.3 WH	5.96	24.9	0.336	23.4	0.869	41.5 AH	8.1 WH
F113	21.5	19.4	22.6	5.68	24.5	0.260	22.6	0.849	38.7	7.20
F139	20.5	18.4	21.6	5.0	24.1	0.2	21.8	0.8	39.2	6.5
F153	21.	19.	23.	5.4	24.	<1.	22.	<1.	39.	7.1
F154	21.3	19.2	22.4	5.62	24.3	<0.50	22.2	0.84	38.7	7.05
F158	19.9 WL	17.8 WL	20.9 WL	5.1	23.1 WL	<1.0	20.7 AL	<1.0	36.5 WL	6.5
F207	21.2	19.3	22.3	5.6	24.2	0.2	22.1	0.9	37.8	7.0
F239	21.		24.							
F248	21.1	19.0	22.3	5.40	24.2	0.33	22.2	0.86	38.1	6.89
F270	22.2	18.0	20.8 WL	4.91 WL	23.6	0.40	21.4	1.34 AH	38.7	6.44
F271	21.8	19.3	22.5	5.77	25.1	0.34	22.9	0.93	39.6	7.36
F290	21.3	19.4	22.6	5.53	24.7	0.27	22.7	0.89	38.7	6.95
F292	20.5	18.4	21.7	4.79 WL	23.6	0.51 WH	21.7	0.85	38.4	6.18 WL
F293	21.6	19.5	22.8	5.73	24.7	0.36	22.8	0.91	38.7	7.06
F297	21.5	19.7	22.4	5.85	24.3	0.355	22.5	0.981	38.3	7.31
F317	21.1	19.	22.2	5.49	24.1	0.275	22.2	0.818	38.1	6.98
F326	22.5	24.6 AH	23.4	6.21 WH	26.2 AH	0.25	23.5	0.83	40.0	8.01 WH
ASSIGNED VALUE *	21.4	19.3	22.6	5.57	24.4	0.303	22.4	0.868	38.8	7.09
R-STD DEV *	0.61	0.67	0.73	0.306	0.56	0.0739	0.55	0.0577	0.85	0.416
ACCEPTABLE LIMITS(+-) *	1.22	1.34	1.46	0.612	1.12	0.1478	1.10	0.1154	1.70	0.832
WARNING LIMITS(+-) *	1.22- 1.83	1.34- 2.01	1.46- 2.19	.612- .918	1.12- 1.68	.1478- .2217	1.10- 1.65	.1154- .1731	1.70- 2.55	.832- 1.248
ACTION LIMITS(<>) *	1.83	2.01	2.19	0.918	1.68	0.2217	1.65	0.1731	2.55	1.248
N *	28	27	28	27	27	23	27	25	27	27

* NOTE: SEE GLOSSARY FOR DEFINITIONS

LAB NO.	TOTAL RANK	AVERAGE RANK	SUMMARY OF FLAGGING	BIAS STATEMENT	NO.SAMPLES RANKED	BIAS % SLOPE	BIAS BLANK	METHOD CODING
F003	125.5	12.5			10			IC Dionex
F009	154.5	15.4			10			IC Dionex
F010	91.0	9.1			10			IC Metrohm
F011	197.5	21.9		BIASED HIGH	9	4.0	-0.0101	IC Dionex
F014	222.5	22.2	WH	BIASED HIGH	10	2.0	0.2704	IC Dionex
F015	224.5	22.4	WH	BIASED HIGH	10	4.3	-0.1157	IC
F021	173.0	17.3	WH		10			IC Dionex
F022	150.5	15.0			10			IC Dionex
F026	60.5	6.0		BIASED LOW	10	-2.2	-0.0931	IC Dionex
F036	68.0	6.8		BIASED LOW	10	-0.6	-0.1532	IC Dionex
F069	150.5	15.0			10			IC
F099	235.5	23.5	WHWH AHWH	BIASED HIGH	10	5.8	0.0959	Flow injection
F113	155.5	15.5			10			IC Dionex
F139	52.0	5.2		BIASED LOW	10	0.2	-0.5038	IC
F153	86.0	10.7			8			IC
F154	114.0	12.6			9			IC
F158	14.5	1.8	WLWLWL WL AL WL	BIASED LOW	8	-5.5	-0.2711	IC Dionex
F207	102.5	10.2			10			IC
F239	33.0	16.5		INSUFFICIENT DATA	2			IC
F248	90.5	9.0			10			IC Dionex
F270	99.5	9.9	WLWL AH		10			IC Dionex
F271	203.0	20.3			10			IC Dionex
F290	153.5	15.3			10			IC Dionex
F292	60.5	6.0	WL WH WL	BIASED LOW	10	-1.4	-0.3838	IC
F293	189.5	18.9			10			IC
F297	174.5	17.4			10			IC Dionex
F317	80.5	8.0			10			IC Dionex
F326	218.5	21.8	AH WHAH WH	BIASED HIGH	10	4.4	0.5531	Metrohm,861 Compact

OVERALL AVERAGE RANK IS 13.8

PARAMETER: 00292 Colour Units

WATER SCIENCE & TECHNOLOGY
ENVIRONMENT CANADA

FP PT for Major Ions & Nutrients

SAMPLE	1=	2=	3=	4=	5=	6=	7=	8=	9=	10=
	MI102-1	MI102-2	MI102-3	MI102-4	MI102-5	MI102-6	MI102-7	MI102-8	MI102-9	MI102-10
LAB NO	LAB RESULT	LAB RESULT	LAB RESULT	LAB RESULT	LAB RESULT	LAB RESULT	LAB RESULT	LAB RESULT	LAB RESULT	LAB RESULT
F003	11.7	25.6	56.3	<0.5	<0.5	0.5	0.6	4.4	21.	13.5
F010	10.4	23.2	50.9	0.33	0.55	0.75	0.75	4.25	16.9	12.3
F011	14.	31.	71.	<5.	<5.	<5.	<5.	6.	25.	16.
F011a	18.	36.	76.	<2.	<2.	<2.	<2.	7.	26.	19.
F015	15.	35.	85.	13. AH	2.5	5.	2.5	10.	30.	20.
F021	15.	27.	62.	<5.	<5.	<5.	<5.	<5.	21.	15.
F036	16.2	33.6	74.2	3.4	3.8	4.8	6.0 WH	12.2 WH	36.2 WH	22.2
F154	10.6	23.9	59.5	<5.0	<5.0	<5.0	<5.0	5.8	19.4	13.0
F158	13.9	29.3	66.3	<5.0	<5.0	<5.0	<5.0	6.2	23.0	15.1
F193	12.5	29.8	67.2	1.4	<0.8	2.7	2.9	7.1	26.6	17.4
F207	12.	25.	59.	1.	1.	1.	2.	5.	25.	13.
F248	11.	24.	53.	0.84	0.91	1.3	1.3	4.8	18.	13.
F264	10.	25.	60.	1.	2.	7.	2.	6.	25.	12.
F270	10.	20.	55.	1.	1.	1.	1.	5.	25.	13.
F290	15.	33.	75.	<5.	<5.	<5.	<5.	8.	31.	20.
F292	15.	35.0	75.	<5.0	<5.0	<5.0	<5.0	10.0	30.0	15.0
F293	14.2	30.3	65.1	<2.5	<2.5	4.0	<2.5	7.8	23.0	16.4
F317	20. WH	50. AH	100. WH	10. AH	10. AH	10. WH	10. AH	20. AH	40. WH	25. WH
F326	12.	34.	76.	<5.	<5.	<5.	<5.	<5.	20.	12.
ASSIGNED VALUE *	13.3	29.5	66.8	2.14	2.04	3.25	2.30	7.00	24.9	15.7
R-STD DEV *	2.75	5.79	11.51	2.165	1.674	2.951	1.817	2.529	5.58	3.63
ACCEPTABLE LIMITS(+-) *	5.50	11.58	23.02	4.330	3.348	5.902	3.634	5.058	11.16	7.26
WARNING LIMITS(+-) *	5.50- 8.25	11.58- 17.37	23.02- 34.53	4.330- 6.495	3.348- 5.022	5.902- 8.853	3.634- 5.451	5.058- 7.587	11.16- 16.74	7.26- 10.89
ACTION LIMITS(<>) *	8.25	17.37	34.53	6.495	5.022	8.853	5.451	7.587	16.74	10.89
N *	19	19	19	9	8	11	10	17	19	19

* NOTE: SEE GLOSSARY FOR DEFINITIONS

LAB NO.	TOTAL RANK	AVERAGE RANK	SUMMARY OF FLAGGING	BIAS STATEMENT	NO.SAMPLES RANKED	BIAS % SLOPE	BIAS BLANK	METHOD CODING
F003	34.5	4.3		BIASED LOW	8	-13.0	-0.9956	Auto Analyser
F010	17.0	1.7		BIASED LOW	10	-21.8	-1.0184	Spectrophotometry
F011	65.0	10.8			6			Hach
F011a	90.5	15.0		BIASED HIGH	6	12.9	0.7450	PC Titrate
F015	126.5	12.6	AH		10			Apparent
F021	45.5	9.1			5			Apparent
F036	127.0	12.7	WHWHWH		10			True
F154	27.5	4.5			6			Spectrophotometry
F158	56.5	9.4			6			Spectrophotometry
F193	89.0	9.8			9			True
F207	55.0	5.5			10			Auto Analyser
F248	34.5	3.4		BIASED LOW	10	-19.4	-0.6394	Spectrophotometry
F264	58.0	5.8			10			
F270	40.0	4.0		BIASED LOW	10	-16.3	-0.7675	Visual Comparison
F290	88.5	14.7		BIASED HIGH	6	10.9	1.2903	Apparent
F292	85.0	14.1		BIASED HIGH	6	11.8	0.7070	True
F293	71.5	10.2			7			DISCRETE ANALYZER
F317	149.0	14.9	WHAHWHAHAHWHAHAHWHWH	BIASED HIGH	10	39.8	6.1558	Visual Comparison
F326	44.5	8.9			5			Hach,DR/2010

OVERALL AVERAGE RANK IS 8.7

PARAMETER: 00392 Conductivity @ 25C uS/cm

WATER SCIENCE & TECHNOLOGY
ENVIRONMENT CANADA

FP PT for Major Ions & Nutrients

SAMPLE	1=	2=	3=	4=	5=	6=	7=	8=	9=	10=
	MI102-1	MI102-2	MI102-3	MI102-4	MI102-5	MI102-6	MI102-7	MI102-8	MI102-9	MI102-10
LAB NO	LAB RESULT	LAB RESULT	LAB RESULT	LAB RESULT	LAB RESULT	LAB RESULT	LAB RESULT	LAB RESULT	LAB RESULT	LAB RESULT
F003	571.	891.	915.	192.	165.	117.	310.	102.	204.	871.
F004	564.	886.	904.	190.	163.	117.	310.	101.	204.	864.
F009	572.	889.	909.	190.	164.	117.	312.	100.	205.	869.
F010	618. AH	990. AH	1027. AH	196.	166.	118.	319. WH	102.	209.	981. AH
F011	568.	884.	906.	190.	164.	118.	310.	103.	205.	871.
F014	573.	868.	909.	191.	165.	119.	309.	102.	205.	870.
F015	550.	875.	880.	188.	160.	114.	304.	100.	199.	849.
F015b	570.	880.	890.	200. WH	170. WH	120.	320. WH	110. AH	210.	850.
F021	549.	859.	880.	184.	159. WL	113.	300.	97.3 WL	198.	840.
F022	574.	895.	915.	189.	165.	117.	306.	101.	205.	867.
F026	565.	820. AL	903.	172. AL	162.	116.	305.	97.1 WL	201.	860.
F036	567.	890.	909.	192.	165.	118.	309.	102.	204.	872.
F069	567.	884.	905.	189.	163.	117.	308.	101.	202.	859.
F090	572.	890.	909.	192.	166.	119.	312.	102.	206.	871.
F099	549.	848.	868. WL	192.	162.	116.	304.	99.9	202.	827. WL
F113	557.	868.	892.	187.	162.	116.	307.	101.	203.	863.
F153	570.	894.	912.	192.	163.	116.	308.	101.	203.	861.
F154	554.	855.	876.	185.	161.	116.	299.	100.	200.	841.
F158	577.	895.	913.	191.	165.	118.	313.	103.	206.	878.
F193	575.	896.	916.	191.	164.	117.	312.	100.	206.	875.
F207	616. AH	964. AH	985. AH	204. AH	174. AH	124. AH	323. AH	105. WH	214. AH	953. AH
F221	569.	888.	908.	191.	165.	117.	307.	101.	203.	865.
F239	575.		911.							
F248	573.	890.	910.	190.	165.	118.	307.	102.	204.	868.
F264	541. WL	850.	845. AL	181. WL	148. AL	108. AL	292. AL	94.9 AL	194. AL	825. WL
F270	563.	875.	895.	189.	164.	160. AH	305.	100.	204.	860.
F271	561.	871.	889.	185.	161.	115.	304.	100.	200.	853.
F290	559.	869.	884.	186.	161.	115.	306.	100.	200.	846.
F292	568.	882.	902.	188.	163.	116.	305.	98.2	201.	849.
F293	573.	900.	919.	191.	165.	118.	312.	102.	205.	878.
F297	596. WH	931. WH	945. WH	198. WH	170. WH	120.	321. WH	104.	209.	890.
F317	567.	886.	904.	190.	163.	117.	307.	100.	202.	860.
F326	566.	877.	899.	188.	163.	178. AH	309.	102.	204.	863.
ASSIGNED VALUE *	568	882	903	190	164	117	308	101.0	204	863
R-STD DEV *	9.6	18.0	16.7	3.6	2.3	2.0	4.8	1.73	3.2	15.3
ACCEPTABLE LIMITS(+-) *	19.2	36.0	33.4	7.2	4.6	4.0	9.6	3.46	6.4	30.6
WARNING LIMITS(+-) *	19.2- 28.8	36.0- 54.0	33.4- 50.1	7.2- 10.8	4.6- 6.9	4.0- 6.0	9.6- 14.4	3.46- 5.19	6.4- 9.6	30.6- 45.9
ACTION LIMITS(<>) *	28.8	54.0	50.1	10.8	6.9	6.0	14.4	5.19	9.6	45.9
N *	33	32	33	32	32	32	32	32	32	32

* NOTE: SEE GLOSSARY FOR DEFINITIONS

LAB NO.	TOTAL RANK	AVERAGE RANK	SUMMARY OF FLAGGING	BIAS STATEMENT	NO.SAMPLES RANKED	BIAS % SLOPE	BIAS BLANK	METHOD CODING
F003	224.5	22.4			10			PC Titrate
F004	159.0	15.9			10			Radiometer
F009	191.0	19.1			10			Cond. meter
F010	292.0	29.2	AHAHAH WH AH	BIASED HIGH	10	15.5	-24.0237	Cond. meter
F011	202.5	20.2			10			PC Titrate
F014	210.5	21.0			10			PC-Titrate
F015	58.0	5.8		BIASED LOW	10	-1.8	-0.5564	Cond. meter
F015b	231.5	23.1	WHWH WHAH		10			Cond. meter
F021	30.0	3.0	WL WL	BIASED LOW	10	-2.5	-1.1508	PC Titrate
F022	201.0	20.1			10			Cond. meter
F026	72.0	7.2	AL AL WL	BIASED LOW	10	-2.1	-0.6490	PC Titrate
F036	214.5	21.4			10			Auto electrode
F069	138.5	13.8			10			Cond. meter
F090	246.0	24.6			10			Radiometer
F099	71.0	7.1	WL WL	BIASED LOW	10	-4.7	6.9239	Cond. meter
F113	103.5	10.3			10			PC Titrate
F153	176.5	17.6			10			Cond. meter
F154	50.5	5.0		BIASED LOW	10	-3.1	1.9067	Radiometer
F158	261.5	26.1		BIASED HIGH	10	1.5	-0.6653	PC Titrate
F193	228.5	22.8			10			Cond. meter
F207	315.0	31.5	AHAHAHAHAHAHAHWHAHAH	BIASED HIGH	10	10.4	-8.5937	Cond. meter
F221	176.0	17.6			10			Radiometer
F239	52.5	26.2		INSUFFICIENT DATA	2			Cond. meter
F248	206.5	20.6			10			Radiometer
F264	13.0	1.3	WL ALWLALALALALALWL	BIASED LOW	10	-4.5	-2.7405	
F270	137.0	13.7	AH		10			Cond. meter
F271	66.5	6.6		BIASED LOW	10	-1.2	-0.8885	YSI
F290	66.5	6.6		BIASED LOW	10	-1.9	0.7443	PC Titrate
F292	98.5	9.8			10			PC Titrate
F293	251.5	25.1			10			PC Titrate
F297	301.5	30.1	WHWHWHWHWH WH	BIASED HIGH	10	4.8	-2.1264	Cond. meter
F317	135.0	13.5			10			PC Titrate
F326	164.0	16.4	AH		10			Hach,HQ40d

OVERALL AVERAGE RANK IS 16.6

PARAMETER: 06592 Diss Inorg Carbon mg/L C

WATER SCIENCE & TECHNOLOGY
ENVIRONMENT CANADA

FP PT for Major Ions & Nutrients

SAMPLE	1=	2=	3=	4=	5=	6=	7=	8=	9=	10=
	MI102-1	MI102-2	MI102-3	MI102-4	MI102-5	MI102-6	MI102-7	MI102-8	MI102-9	MI102-10
LAB NO	LAB RESULT	LAB RESULT	LAB RESULT	LAB RESULT	LAB RESULT	LAB RESULT	LAB RESULT	LAB RESULT	LAB RESULT	LAB RESULT
F003	20.3	73.3	59.	16.5	4.6	11.7	21.5	9.8	4.2	53.5
F010	23.4	86.7	69.5	19.9 WH	5.56 AH	13.7	25.2	11.3	5.15	63.5
F015	20.3	72.8	59.7	16.9	4.5	11.8	21.5	10.	4.2	53.4
F022	20.5	72.4	59.0	16.4	4.51	11.5	20.7	9.55	4.28	52.2
F026	23.7	81.2	66.7	17.7	4.69	13.3	23.8	11.3	4.50	59.2
F036	21.2	70.7	58.8	16.8	4.58	11.8	22.3	9.68	4.48	53.6
F154	21.1	73.5	59.6	16.5	4.7	11.2	21.9	9.6	4.5	53.2
F290	22.7	81.3	65.5	18.1	4.9	12.6	23.6	10.5	4.6	57.6
F317	23.2	79.4	65.6	17.5	4.52	12.8	22.2	10.1	4.38	56.9
F326	23.5	75.0	65.1	18.2	4.8	12.4	23.4	10.3	5.1	60.8
ASSIGNED VALUE *	22.0	76.4	62.8	17.3	4.68	12.3	22.6	10.21	4.51	56.3
R-STD DEV *	1.63	5.38	4.56	0.94	0.186	0.92	1.43	0.735	0.327	4.12
ACCEPTABLE LIMITS(+-) *	3.26	10.76	9.12	1.88	0.372	1.84	2.86	1.470	0.654	8.24
WARNING LIMITS(+-) *	3.26- 4.89	10.76- 16.14	9.12- 13.68	1.88- 2.82	.372- .558	1.84- 2.76	2.86- 4.29	1.470- 2.205	.654- .981	8.24- 12.36
ACTION LIMITS(<>) *	4.89	16.14	13.68	2.82	0.558	2.76	4.29	2.205	0.981	12.36
N *	10	10	10	10	10	10	10	10	10	10

* NOTE: SEE GLOSSARY FOR DEFINITIONS

LAB NO.	TOTAL RANK	AVERAGE RANK	SUMMARY OF FLAGGING	BIAS STATEMENT	NO.SAMPLES RANKED	BIAS % SLOPE	BIAS BLANK	METHOD CODING
F003	30.5	3.0			10			Carbon analyser
F010	97.5	9.7	WHAH	BIASED HIGH	10	12.6	-0.1492	Shimadzu
F015	32.0	3.2			10			Carbon analyser
F022	18.5	1.8		BIASED LOW	10	-5.9	-0.1097	TOC analyser
F026	82.0	8.2		BIASED HIGH	10	6.1	-0.0708	Colorimetry
F036	38.5	3.8			10			Shimadzu
F154	38.0	3.8			10			Carbon analyser
F290	77.0	7.7			10			Shimadzu
F317	60.0	6.0			10			TOC analyser
F326	76.0	7.6			10			Shimadzu TOC analyze

OVERALL AVERAGE RANK IS 5.5

PARAMETER: 06002 Diss Organic Carbon mg/L C

WATER SCIENCE & TECHNOLOGY
ENVIRONMENT CANADA

FP PT for Major Ions & Nutrients

SAMPLE LAB NO	1= MI102-1 LAB RESULT	2= MI102-2 LAB RESULT	3= MI102-3 LAB RESULT	4= MI102-4 LAB RESULT	5= MI102-5 LAB RESULT	6= MI102-6 LAB RESULT	7= MI102-7 LAB RESULT	8= MI102-8 LAB RESULT	9= MI102-9 LAB RESULT	10= MI102-10 LAB RESULT
F003	6.3	10.3	14.7	1.2	1.	0.6	1.6	1.6	4.7	6.6
F004	6.21	10.3	14.5	1.50	1.14	0.759	1.67	1.68	4.52	6.52
F010	6.08	10.0	13.8	1.13	0.936	0.440	1.41	1.44	4.33	6.43
F011	7.7 WH	13.0 AH	17.2 WH	2.7 AH	1.9 WH	1.8 AH	3.1 AH	2.6 AH	5.5 WH	9.2 AH
F015	7.2	13.5 AH	16.2	1.8	1.4	1.	2.6 AH	1.9	5.1	8.5 AH
F021	6.6	10.6	14.9	1.3	1.0	0.6	1.7	1.6	4.7	6.8
F022	5.96	9.80	13.7	1.45	1.40	0.90	1.70	1.55	4.30	6.55
F026	6.37	10.5	15.0	0.956	0.954	0.515	1.48	1.68	4.64	6.76
F036	6.1	10.2	14.3	1.1	1.0	0.6	1.6	1.5	4.2	6.6
F069	6.85	11.1	16.1	1.22	1.14	0.68	1.74	1.72	4.93	7.13
F113	6.03	9.94	14.4	1.27	1.08	0.668	1.58	1.60	4.30	6.15
F154	5.2 WL	9.6	14.5	1.9	1.4	1.1	<1.0 WL	2.1	4.7	5.9
F158	6.3	10.2	14.3	1.4	1.1	0.7	1.6	1.6	4.7	6.6
F207	6.6	10.5	13.9	2.0	1.9 WH	<1.	1.9	2.7 AH	4.6	6.6
F229	5.98	9.78	14.0	1.42	1.21	0.81	1.79	1.77	4.45	6.47
F271	6.01	10.0	14.0	1.23	1.05	0.64	1.63	1.63	4.39	6.44
F290	6.5	10.5	16.5	1.1	1.1	0.5	1.4	1.9	4.8	6.7
F292	6.9	60.2 AH	49.6 AH	1.6	1.6	1.0	2.1	2.0	4.9	38.8 AH
F293	6.66	10.3	14.6	1.31	1.14	0.76	1.74	1.69	4.85	6.60
F297	7.07	11.0	15.8	1.66	1.46	0.995	2.13	2.02	5.27	7.39
F317	5.74	9.6	13.4	1.14	<1.0	<1.0	1.93	1.57	4.47	6.13
F326	6.4	10.3	14.4	1.3	1.1	0.6	1.7	1.6	4.5	6.7
ASSIGNED VALUE *	6.39	10.38	14.8	1.394	1.206	0.747	1.75	1.74	4.65	6.69
R-STD DEV *	0.499	0.603	1.13	0.3108	0.2449	0.2287	0.261	0.236	0.312	0.447
ACCEPTABLE LIMITS(+-) *	0.998	1.206	2.26	0.6216	0.4898	0.4574	0.522	0.472	0.624	0.894
WARNING LIMITS(+-) *	.998- 1.497	1.206- 1.809	2.26- 3.39	.6216- .9324	.4898- .7347	.4574- .6861	.522- .783	.472- .708	.624- .936	.894- 1.341
ACTION LIMITS(<>) *	1.497	1.809	3.39	0.9324	0.7347	0.6861	0.783	0.708	0.936	1.341
N *	22	22	22	22	21	20	21	22	22	22

* NOTE: SEE GLOSSARY FOR DEFINITIONS

LAB NO.	TOTAL RANK	AVERAGE RANK	SUMMARY OF FLAGGING	BIAS STATEMENT	NO.SAMPLES RANKED	BIAS % SLOPE	BIAS BLANK	METHOD CODING
F003	89.0	8.9			10			Carbon analyser
F004	108.5	10.8			10			TOC analyser
F010	33.5	3.3		BIASED LOW	10	-3.7	-0.1895	Shimadzu
F011	210.5	21.0	WHAHWHAHWHAHAHAHWHAH	BIASED HIGH	10	12.6	0.8690	IR detection
F015	190.0	19.0	AH AH AH	BIASED HIGH	10	14.4	0.2313	Carbon analyser
F021	116.0	11.6			10			TOC analyser
F022	79.5	7.9			10			TOC analyser
F026	90.5	9.0			10			Technicon UV digesti
F036	56.0	5.6			10			automated
F069	148.5	14.8			10			IR detection
F113	62.0	6.2			10			UV IR
F154	103.5	11.5	WL WL		9			Carbon analyser
F158	97.0	9.7			10			UV IR
F207	135.0	15.0	WH AH		9			TOC analyser
F229	96.5	9.6			10			EPA 415.1
F271	67.0	6.7			10			Shimadzu
F290	110.5	11.0			10			Shimadzu
F292	192.5	19.2	AHAH AH	BIASED HIGH	10	336.6	-4.8504	TOC analyser
F293	133.0	13.3			10			Shimadzu
F297	185.0	18.5		BIASED HIGH	10	5.1	0.2505	TOC analyser
F317	39.5	4.9		BIASED LOW	8	-9.7	0.0998	TOC analyser
F326	99.5	9.9			10			Shimadzu TOC analyze

OVERALL AVERAGE RANK IS 11.3

PARAMETER: 09092 Fluoride mg/L

WATER SCIENCE & TECHNOLOGY
ENVIRONMENT CANADA

FP PT for Major Ions & Nutrients

SAMPLE	1=	2=	3=	4=	5=	6=	7=	8=	9=	10=
	MI102-1	MI102-2	MI102-3	MI102-4	MI102-5	MI102-6	MI102-7	MI102-8	MI102-9	MI102-10
LAB NO	LAB RESULT	LAB RESULT	LAB RESULT	LAB RESULT	LAB RESULT	LAB RESULT	LAB RESULT	LAB RESULT	LAB RESULT	LAB RESULT
F003	0.08	0.21	0.14	0.07	1.16	0.05	0.12	0.03	0.06	0.22
F010	0.065	0.180	0.121	0.053	1.12	0.040	0.092	0.027	0.042	0.194
F011	<0.1	0.2	0.2	<0.1	1.3	<0.1	0.1	<0.1	<0.1	0.2
F014	0.107 WH	0.254 WH	0.178	<0.100	1.22	<0.100	0.138	<0.100	<0.100	0.266 WH
F015	0.09	0.23	0.16	0.08	1.23	0.07	0.13	0.04	0.07	0.24
F022	0.072	0.2	0.13	0.06	1.17	0.048	0.108	0.028	0.048	0.214
F069	0.082	0.231	<0.08	0.065	1.24	0.053	0.117	<0.08	0.053	0.228
F139	0.08	0.20	0.13	0.08	1.12	0.06	0.13	0.04	0.06	0.21
F153	0.078	0.20	0.14	0.064	1.3	<0.06	0.11	<0.06	<0.06	0.22
F154	<0.10	0.19	0.11	<0.10	1.19	<0.10	0.11	<0.10	<0.10	0.20
F158	<0.20	0.24	<0.20	<0.20	1.10	<0.20	<0.20	<0.20	<0.20	0.27 WH
F248	0.082	0.209	0.150	0.065	1.14	0.053	0.114	0.034	0.049	0.225
F264	0.08	0.21	0.14	0.08	1.29	0.60 AH	0.09	0.05	0.06	0.22
F270	0.16 AH	0.22	0.26 AH	0.10 WH	1.05	<0.042	0.18 AH	<0.042	<0.042	<0.042 AL
F271	0.07	0.20	0.12	0.06	1.15	0.05	0.10	0.03	0.05	0.21
F290	0.07	0.20	0.15	0.06	1.08	0.05	0.11	0.05	0.05	0.20
F292	<0.20	0.25	0.21	<0.20	0.92 WL	<0.20	<0.20	<0.20	<0.20	0.26
F293	0.087	0.211	0.146	0.074	1.15	0.066	0.117	0.044	0.056	0.221
F317	0.0682	0.196	0.122	0.0601	1.21	0.0471	0.107	0.0291	0.0468	0.213
F326	0.02 AL	0.19	0.06 WL	0.03 WL	1.38 WH	0.11 AH	0.11	0.08 AH	0.08 WH	0.15 AL
ASSIGNED VALUE *	0.0786	0.210	0.146	0.0670	1.18	0.0571	0.113	0.0381	0.0549	0.219
R-STD DEV *	0.01208	0.0205	0.0340	0.01234	0.096	0.01372	0.0154	0.01111	0.00957	0.0220
ACCEPTABLE LIMITS(+-) *	0.02416	0.0410	0.0680	0.02468	0.192	0.02744	0.0308	0.02222	0.01914	0.0440
WARNING LIMITS(+-) *	.02416- .036	.0410- .0615	.0680- .1020	.02468- .037	.192- .288	.02744- .041	.0308- .0462	.02222- .033	.01914- .028	.0440- .0660
ACTION LIMITS(<>) *	0.03624	0.0615	0.1020	0.03702	0.288	0.04116	0.0462	0.03333	0.02871	0.0660
N *	16	20	18	15	20	13	18	12	13	19

* NOTE: SEE GLOSSARY FOR DEFINITIONS

LAB NO.	TOTAL RANK	AVERAGE RANK	SUMMARY OF FLAGGING	BIAS STATEMENT	NO.SAMPLES RANKED	BIAS % SLOPE	BIAS BLANK	METHOD CODING
F003	95.0	9.5			10			IC Dionex
F010	21.5	2.1		BIASED LOW	10	-4.0	-0.0143	IC Metrohm
F011	49.5	9.9			5			IC Dionex
F014	99.0	16.5	WHWH WH	BIASED HIGH	6	0.7	0.0338	PC-Titrate
F015	134.0	13.4			10			IC
F022	58.0	5.8			10			IC Dionex
F069	95.0	11.8			8			IC
F139	90.0	9.0			10			IC
F153	68.5	9.7			7			IC
F154	29.0	5.8			5			IC
F158	41.0	13.6	WH	INSUFFICIENT DATA	3			IC Dionex
F248	93.0	9.3			10			IC Dionex
F264	106.0	10.6	AH		10			
F270	84.0	14.0	AH AHWH AH AL		6			IC Dionex
F271	52.5	5.2			10			IC Dionex
F290	65.0	6.5			10			IC Dionex
F292	54.0	13.5	WL	INSUFFICIENT DATA	4			IC
F293	110.0	11.0			10			PC Titrate
F317	51.0	5.1		BIASED LOW	10	3.6	-0.0142	IC Dionex
F326	72.0	7.2	AL WLWLWHAH AHWHAL		10			Metrohm,861 Compact

OVERALL AVERAGE RANK IS 8.9

PARAMETER: 12091 Magnesium mg/L

WATER SCIENCE & TECHNOLOGY
ENVIRONMENT CANADA

FP PT for Major Ions & Nutrients

SAMPLE	1=	2=	3=	4=	5=	6=	7=	8=	9=	10=
	MI102-1	MI102-2	MI102-3	MI102-4	MI102-5	MI102-6	MI102-7	MI102-8	MI102-9	MI102-10
LAB NO	LAB RESULT	LAB RESULT	LAB RESULT	LAB RESULT	LAB RESULT	LAB RESULT	LAB RESULT	LAB RESULT	LAB RESULT	LAB RESULT
F003	24.5	28.3	42.5	6.46	1.59	3.69	8.94	2.73	3.11	37.4
F009	23.0	27.	39.	6.1	1.5	3.6	8.7	2.6	3.1	36.
F010	23.6	27.3	41.1	6.08	1.50	3.46	8.44	2.57	2.98	36.1
F011	25.0	29.9	43.8	7.1 AH	1.8 WH	3.8	9.3	3.0 WH	3.3	38.8
F014	25.2	28.8	43.2	6.59	1.63	3.79	9.32	2.83	3.25	38.6
F015	23.5	26.7	40.	6.2	1.6	3.5	8.8	2.7	3.1	36.
F021	24.5	28.5	42.5	6.47	1.59	3.67	8.97	2.70	3.14	37.5
F022	23.4	27.9	42.0	6.20	1.62	3.48	8.40	2.75	3.03	36.4
F026	23.1	26.2	39.4	6.10	1.47	3.47	8.51	2.55	2.95	34.4
F036	24.8	28.6	43.1	6.34	1.57	3.66	9.01	2.56	3.14	39.4
F069	24.4	28.3	42.1	6.39	1.62	3.75	8.63	2.77	3.15	37.2
F113	24.9	28.8	43.4	6.51	1.59	3.64	8.97	2.71	3.15	38.3
F139	23.8	28.9	43.0	6.38	1.62	3.70	8.84	2.81	3.19	38.6
F153	24.	28.	42.	6.6	1.6	3.7	9.0	2.7	3.2	37.
F154	23.1	27.4	41.1	6.28	1.55	3.61	8.55	2.63	2.99	34.0
F158	24.7	28.1	41.7	6.6	1.6	3.8	9.2	2.8	3.2	37.1
F207	23.6	27.7	41.0	6.3	1.5	3.5	8.6	2.6	3.0	36.5
F223a		26.5	42.3	6.15						36.8
F248	23.	28.	40.	6.5	1.5	3.6	8.7	2.6	3.0	35.
F249	22.9	27.0	40.4	6.17	1.49	3.52	8.54	2.58	2.99	36.4
F270	23.4	26.6	39.5	6.31	1.58	3.73	8.64	2.68	3.06	35.8
F271	24.2	28.5	42.1	6.33	1.57	3.61	8.76	2.38 WL	3.02	37.4
F290	23.9	27.8	42.4	6.41	1.58	3.69	9.11	2.65	3.10	37.2
F292	25.2	28.9	43.4	6.66	1.66	3.80	9.18	2.81	3.22	38.5
F293	25.4	29.4	44.3	6.62	1.67	3.80	9.37	2.84	3.20	36.6
F297	23.6	27.5	40.9	6.11	1.52	3.49	8.65	2.61	3.06	36.7
F317	22.4	25.2 WL	38.5	5.86 WL	1.42 WL	3.28 WL	8.1 WL	2.49		33.2 WL
F326	23.3	29.5	44.6	6.69	1.79 WH	2.83 AL	9.59 WH	2.83	3.43 WH	36.2
ASSIGNED VALUE *	23.9	27.9	41.8	6.37	1.58	3.62	8.85	2.68	3.11	36.8
R-STD DEV *	0.92	1.11	1.76	0.236	0.073	0.146	0.357	0.126	0.111	1.41
ACCEPTABLE LIMITS(+-) *	1.84	2.22	3.52	0.472	0.146	0.292	0.714	0.252	0.222	2.82
WARNING LIMITS(+-) *	1.84- 2.76	2.22- 3.33	3.52- 5.28	.472- .708	.146- .219	.292- .438	.714- 1.071	.252- .378	.222- .333	2.82- 4.23
ACTION LIMITS(<>) *	2.76	3.33	5.28	0.708	0.219	0.438	1.071	0.378	0.333	4.23
N *	27	28	28	28	27	27	27	27	26	28

* NOTE: SEE GLOSSARY FOR DEFINITIONS

LAB NO.	TOTAL RANK	AVERAGE RANK	SUMMARY OF FLAGGING	BIAS STATEMENT	NO.SAMPLES RANKED	BIAS % SLOPE	BIAS BLANK	METHOD CODING
F003	175.5	17.5			10			ICP-AES
F009	69.5	6.9			10			ICP-MS
F010	59.0	5.9		BIASED LOW	10	-1.5	-0.1199	ICP-AES
F011	261.5	26.1	AHWH WH	BIASED HIGH	10	5.0	0.1436	IC Dionex
F014	238.0	23.8		BIASED HIGH	10	3.9	0.0432	ICP-AES
F015	102.0	10.2			10			ICP-AES
F021	178.5	17.8			10			ICP-AES
F022	109.0	10.9			10			ICP-AES
F026	31.0	3.1		BIASED LOW	10	-6.0	0.0937	ICP-AES
F036	172.0	17.2			10			AAS absorption
F069	174.0	17.4			10			ICP-AES
F113	195.0	19.5			10			ICP-AES
F139	197.0	19.7			10			ICP-AES
F153	176.0	17.6			10			ICP-AES
F154	79.0	7.9			10			ICP-MS
F158	198.0	19.8			10			ICP-MS
F207	88.5	8.8			10			ICP-AES
F223a	41.0	10.2		INSUFFICIENT DATA	4			ICP-AES
F248	88.5	8.8			10			ICP-MS
F249	59.5	5.9		BIASED LOW	10	-2.6	-0.0609	ICP-AES
F270	98.5	9.8			10			ICP-AES
F271	129.5	12.9	WL		10			AAS absorption
F290	155.5	15.5			10			ICP-AES
F292	241.5	24.1		BIASED HIGH	10	4.2	0.0207	ICP-AES
F293	241.5	24.1		BIASED HIGH	10	3.7	0.0811	ICP-AES
F297	92.5	9.2			10			ICP-AES
F317	11.0	1.2	WL WLWLWLWL WL	BIASED LOW	9	-8.7	0.0261	ICP-AES
F326	202.5	20.2	WHALWH WH		10			Metrohm,861 Compact

OVERALL AVERAGE RANK IS 14.1

PARAMETER: 07092 Nitrate + Nitrite mg/L N

WATER SCIENCE & TECHNOLOGY
ENVIRONMENT CANADA

FP PT for Major Ions & Nutrients

SAMPLE	1=	2=	3=	4=	5=	6=	7=	8=	9=	10=
	MI102-1	MI102-2	MI102-3	MI102-4	MI102-5	MI102-6	MI102-7	MI102-8	MI102-9	MI102-10
LAB NO	LAB RESULT	LAB RESULT	LAB RESULT	LAB RESULT	LAB RESULT	LAB RESULT	LAB RESULT	LAB RESULT	LAB RESULT	LAB RESULT
F003	0.328	0.252	0.534	0.327	0.4	0.159	0.469	0.101	0.13	0.254
F004	0.327	0.246	0.524	0.327	0.393	0.158	0.464	0.100	0.129	0.252
F009	0.31	0.23	0.50	0.31	0.38	0.14	0.44	0.09	0.12	0.23
F010	0.23 WL	0.14 WL	0.19 AL	0.14 AL	0.22 AL	0.11 AL	0.31 AL	0.07 WL	0.11	0.16 WL
F011	0.34	0.42 AH	0.64 WH	0.33	0.35	0.17	0.47	0.12 WH	0.16 AH	0.39 AH
F015	0.352	0.268	0.584	0.333	0.403	0.156	0.505	0.104	0.135	0.278
F021	0.273	0.210	0.504	0.295	0.349	0.138	0.432	0.084	0.110	0.227
F022	0.307	0.234	0.520	0.316	0.380	0.147	0.460	0.087	0.126	0.234
F026	0.316	0.232	0.510	0.301	0.390	0.145	0.467	0.084	0.114	0.247
F026a	0.310	0.186	0.461	0.287	0.370	0.141	0.435	0.090	0.094 WL	0.221
F036	0.286	0.174	0.356 WL	0.287	0.367	0.146	0.399	0.091	0.117	0.194
F069	0.323	0.243	0.54	0.326	0.395	0.155	0.464	0.102	0.131	0.248
F099	0.33	0.25	0.54	0.33	0.40	0.16	0.47	0.10	0.13	0.26
F113	0.285	0.202	0.467	0.294	0.365	0.141	0.421	0.089	0.120	0.212
F139	0.279	0.130 WL	0.303 AL	0.319	0.358	0.173 WH	0.440	0.093	0.115	0.156 WL
F153	0.30	0.24	0.54	0.32	0.39	<0.20	0.47	<0.20	<0.20	0.26
F154	0.294	0.218	0.479	0.292	0.350	0.149	0.414	0.089	0.114	0.223
F158	0.23 WL	0.14 WL	0.36 WL	0.29	0.37	0.14	0.40	0.08	0.11	0.14 WL
F207	0.322	0.242	0.525	0.325	0.396	0.155	0.463	0.098	0.126	0.248
F221	0.295	0.223	0.511	0.315	0.379	0.146	0.457	0.083	0.118	0.236
F228	0.31	0.22	0.52	0.31	0.40	0.14	0.47	0.09	0.12	0.24
F229	0.345	0.251	0.570	0.338	0.407	0.150	0.481	0.103	0.128	0.262
F239	0.29		0.50							
F270	0.40 AH	0.46 AH	0.72 AH	0.40 AH	0.47 AH	0.26 AH	0.52 WH	0.21 AH	0.24 AH	0.46 AH
F271	0.309	0.239	0.507	0.309	0.376	0.150	0.445	0.094	0.124	0.241
F290	0.30	0.24	0.50	0.33	0.37	0.16	0.45	0.10	0.12	0.24
F292	0.212 AL	0.170	0.464	0.284	0.256 AL	0.126 WL	0.416	0.062 AL	0.102	0.198
F293	0.319	0.240	0.531	0.324	0.398	0.153	0.469	0.096	0.125	0.249
F297	0.280	0.236	0.496	0.311	0.375	0.149	0.430	0.0893	0.123	0.217
F304	0.310	0.232	0.513	0.312	0.378	0.147	0.449	0.091	0.120	0.241
F317	0.309	0.231	0.505	0.314	0.382	0.152	0.449	0.0962	0.125	0.24
F326	0.19 AL	0.18	0.43	0.27 WL	0.31 WL	0.12 WL	0.40	0.07 WL	0.10 WL	0.17 WL
ASSIGNED VALUE *	0.304	0.224	0.505	0.312	0.378	0.149	0.448	0.0924	0.121	0.234
R-STD DEV *	0.0295	0.0365	0.0514	0.0204	0.0233	0.0111	0.0302	0.00993	0.0103	0.0314
ACCEPTABLE LIMITS(+-) *	0.0590	0.0730	0.1028	0.0408	0.0466	0.0222	0.0604	0.01986	0.0206	0.0628
WARNING LIMITS(+-) *	.0590- .0885	.0730- .1095	.1028- .1542	.0408- .0612	.0466- .0699	.0222- .0333	.0604- .0906	.01986- .029	.0206- .0309	.0628- .0942
ACTION LIMITS(<>) *	0.0885	0.1095	0.1542	0.0612	0.0699	0.0333	0.0906	0.02979	0.0309	0.0942
N *	32	31	32	31	31	30	31	30	30	31

* NOTE: SEE GLOSSARY FOR DEFINITIONS

LAB NO.	TOTAL RANK	AVERAGE RANK	SUMMARY OF FLAGGING	BIAS STATEMENT	NO.SAMPLES RANKED	BIAS % SLOPE	BIAS BLANK	METHOD CODING
F003	255.5	25.5		BIASED HIGH	10	4.1	0.0074	AA Cadmium redn
F004	235.0	23.5			10			AA Cadmium redn
F009	131.0	13.1			10			IC Dionex
F010	21.5	2.1	WLWLALALALALWL WL	BIASED LOW	10	-58.6	0.0533	AA Hydrazine redn
F011	265.0	26.5	AHWH WHAHAH	BIASED HIGH	10	1.5	0.0582	IC Dionex
F015	286.0	28.6		BIASED HIGH	10	13.3	-0.0017	AA Cadmium redn
F021	76.5	7.6			10			IC Dionex
F022	162.0	16.2			10			IC Dionex
F026	151.0	15.1			10			AA Cadmium redn
F026a	89.5	8.9	WL		10			IC Dionex
F036	74.5	7.4	WL	BIASED LOW	10	-22.7	0.0279	AA Hydrazine redn
F069	238.5	23.8			10			
F099	263.0	26.3		BIASED HIGH	10	5.0	0.0064	Flow injection Cd
F113	86.0	8.6			10			IC Dionex
F139	103.5	10.3	WLAL WH WL		10			IC
F153	155.0	22.1			7			IC
F154	90.0	9.0			10			Flow injection Cd
F158	46.5	4.6	WLWLWL WL	BIASED LOW	10	-18.1	-0.0006	AA Hydrazine redn
F207	220.5	22.0			10			Flow injection Cd
F221	133.5	13.3			10			Flow injection Cd
F228	166.0	16.6			10			AA Cadmium redn
F229	270.5	27.0		BIASED HIGH	10	11.4	-0.0047	EPA 353.2
F239	22.0	11.0		INSUFFICIENT DATA	2			IC
F270	309.0	30.9	AHAHAHAHAHAHWHAHAHAH	BIASED HIGH	10	0.0	0.1373	IC Dionex
F271	161.5	16.1			10			AA Cadmium redn
F290	180.0	18.0			10			IC Dionex
F292	37.0	3.7	AL ALWL AL	BIASED LOW	10	-8.6	-0.0240	Flow injection Cd
F293	219.0	21.9			10			Flow injection Cd
F297	121.5	12.1			10			NO3 IC as N
F304	160.0	16.0			10			Flow injection Cd
F317	169.5	16.9			10			Flow injection Cd
F326	31.0	3.1	AL WLWLWL WLWLWL	BIASED LOW	10	-12.0	-0.0197	Metrohm,861 Compact

OVERALL AVERAGE RANK IS 15.9

PARAMETER: 01092 pH pH Units

WATER SCIENCE & TECHNOLOGY
ENVIRONMENT CANADA

FP PT for Major Ions & Nutrients

SAMPLE	1=	2=	3=	4=	5=	6=	7=	8=	9=	10=
	MI102-1	MI102-2	MI102-3	MI102-4	MI102-5	MI102-6	MI102-7	MI102-8	MI102-9	MI102-10
LAB NO	LAB RESULT	LAB RESULT	LAB RESULT	LAB RESULT	LAB RESULT	LAB RESULT	LAB RESULT	LAB RESULT	LAB RESULT	LAB RESULT
F003	8.2	8.53	8.44	8.03	7.47	7.87	8.09	7.83	7.43	8.4
F009	8.34	8.68	8.59	8.01	6.98 WL	7.75	8.11	7.50	7.06 WL	8.51
F010	8.18	8.58	8.46	8.01	7.47	7.88	8.08	7.80	7.42	8.39
F011	8.12	8.43	8.34	7.95	7.38	7.80	8.00	7.77	7.38	8.28
F014	8.28	8.64	8.54	8.12	7.54	8.02	8.21	7.94	7.5	8.5
F015	8.1	8.56	8.48	8.11	7.54	7.93	8.18	7.91	7.51	8.44
F015b	8.19	8.53	8.45	8.03	7.49	7.84	8.11	7.81	7.44	8.39
F021	8.23	8.58	8.49	8.15	7.62	8.02	8.22	7.96	7.58	8.48
F022	7.91	8.45	8.33	7.89	7.3	7.63	7.97	7.64	7.3	8.26
F026	8.1	8.68	8.64	8.31 WH	7.75	8.16	8.35 WH	8.11	7.73 WH	8.59
F036	7.97	8.40	8.32	7.92	7.37	7.78	8.01	7.75	7.35	8.30
F069	8.2	8.5	8.5	8.1	7.6	7.8	8.1	7.9	7.5	8.4
F090	8.16	8.47	8.38	7.95	7.38	7.84	8.02	7.76	7.33	8.31
F099	7.91	8.46	8.42	8.08	7.43	7.95	8.12	7.88	7.51	8.29
F113	8.12	8.52	8.45	8.06	7.52	7.91	8.13	7.86	7.49	8.45
F139	7.97	8.64	8.56	8.03	7.28	7.72	8.06	7.7	7.29	8.41
F153	8.0	8.5	8.4	8.0	7.4	7.7	7.9	7.7	7.4	8.3
F154	8.25	8.57	8.46	8.00	7.44	7.83	8.07	7.79	7.41	8.42
F158	8.27	8.58	8.51	8.23 WH	7.70	8.10	8.29	8.04	7.71 WH	8.52
F193	7.95	8.32	8.24	7.67 AL	6.92 WL	7.42	7.74 WL	7.34 WL	6.86 AL	8.18
F221	8.06	8.54	8.45	8.09	7.56	7.87	8.07	7.86	7.45	8.37
F239	8.2		8.4							
F248	8.00	8.30	8.27	7.90	7.36	7.56	7.92	7.72	7.41	8.29
F264	8.20	8.51	8.40	8.00	6.41 AL	7.05 AL	7.94	6.92 AL	6.77 AL	8.34
F270	7.78 WL	8.25 WL	8.16 WL	7.61 AL	7.02 WL	7.33 WL	7.68 WL	7.35 WL	7.03 WL	8.13 WL
F271	8.2	8.6	8.6	8.1	7.5	8.0	8.2	7.9	7.5	8.5
F290	8.00	8.40	8.32	7.89	7.30	7.74	7.93	7.69	7.29	8.24
F292	8.17	8.52	8.46	8.05	7.42	7.91	8.12	7.83	7.47	8.38
F297	7.93	8.37	8.35	7.78 WL	8.16 AH	7.56	7.83	7.45	7.24	8.29
F317	8.1	8.41	8.32	8.	7.46	7.83	8.04	7.79	7.34	8.26
F326	8.0	8.5	8.4	8.0	7.6	7.6	8.0	7.6	7.4	8.4
ASSIGNED VALUE *	8.10	8.51	8.43	8.01	7.44	7.80	8.06	7.76	7.40	8.37
R-STD DEV *	0.141	0.109	0.108	0.107	0.177	0.194	0.133	0.181	0.141	0.110
ACCEPTABLE LIMITS(+-) *	0.282	0.218	0.216	0.214	0.354	0.388	0.266	0.362	0.282	0.220
WARNING LIMITS(+-) *	.282- .423	.218- .327	.216- .324	.214- .321	.354- .531	.388- .582	.266- .399	.362- .543	.282- .423	.220- .330
ACTION LIMITS(<>) *	0.423	0.327	0.324	0.321	0.531	0.582	0.399	0.543	0.423	0.330
N *	31	30	31	30	30	30	30	30	30	30

* NOTE: SEE GLOSSARY FOR DEFINITIONS

LAB NO.	TOTAL RANK	AVERAGE RANK	SUMMARY OF FLAGGING	BIAS STATEMENT	NO.SAMPLES RANKED	BIAS % SLOPE	BIAS BLANK	METHOD CODING
F003	188.0	18.8			10			pH Stirred
F009	176.5	17.6	WL WL		10			pH Stirred
F010	186.5	18.6			10			pH Stirred
F011	106.5	10.6			10			PC Titrate
F014	266.0	26.6		BIASED HIGH	10	0.3	0.1204	PC-Titrate
F015	231.0	23.1			10			pH Stirred
F015b	186.0	18.6			10			pH Stirred
F021	266.5	26.6		BIASED HIGH	10	-11.5	1.0647	pH Stirred
F022	64.0	6.4		BIASED LOW	10	3.4	-0.3944	pH Stirred
F026	283.5	28.3	WH WH WH	BIASED HIGH	10	-16.0	1.5313	pH Stirred
F036	89.5	8.9			10			pH Stirred
F069	212.0	21.2			10			
F090	121.5	12.1			10			pH unstirred
F099	168.5	16.8			10			pH Stirred
F113	207.0	20.7			10			pH Stirred
F139	145.0	14.5			10			pH Stirred
F153	104.5	10.4			10			pH unstirred
F154	182.0	18.2			10			pH Stirred
F158	281.0	28.1	WH WH	BIASED HIGH	10	-20.2	1.8180	pH Stirred
F193	25.0	2.5	ALWL WLWLAL	BIASED LOW	10	34.2	-3.0539	pH Stirred
F221	187.5	18.7			10			pH unstirred
F239	36.5	18.2		INSUFFICIENT DATA	2			pH unstirred
F248	72.5	7.2		BIASED LOW	10	-10.4	0.7181	pH Stirred
F264	87.5	8.7	ALAL ALAL		10			
F270	18.0	1.8	WLWLWLALWLWLWLWLWLWL	BIASED LOW	10	15.4	-1.5874	pH Stirred
F271	251.5	25.1		BIASED HIGH	10	2.5	-0.0760	pH unstirred
F290	64.5	6.4		BIASED LOW	10	-0.8	-0.0480	PC Titrate
F292	190.0	19.0			10			pH Stirred
F297	74.5	7.4	WLAH		10			pH unstirred
F317	112.5	11.2			10			pH Stirred
F326	126.5	12.6			10			pH meter(WTW pH197i)

OVERALL AVERAGE RANK IS 15.6

PARAMETER: 19091 Potassium mg/L

WATER SCIENCE & TECHNOLOGY
ENVIRONMENT CANADA

FP PT for Major Ions & Nutrients

SAMPLE	1=	2=	3=	4=	5=	6=	7=	8=	9=	10=
	MI102-1	MI102-2	MI102-3	MI102-4	MI102-5	MI102-6	MI102-7	MI102-8	MI102-9	MI102-10
LAB NO	LAB RESULT	LAB RESULT	LAB RESULT	LAB RESULT	LAB RESULT	LAB RESULT	LAB RESULT	LAB RESULT	LAB RESULT	LAB RESULT
F003	8.02	10.7	15.2	0.87	1.02	0.62	1.6	0.62	1.09	10.8
F009	7.6	10.	14.	0.86	0.99	0.61	1.6	0.60	1.1	10.
F010	7.78	10.1	14.7	0.797	0.947	0.607	1.51	0.565	1.13	10.4
F011	8.0	10.6	15.2	0.8	1.0	0.6	1.6	0.6	1.0	10.8
F014	7.7	9.9	15.	0.92	1.0	0.61	1.6	0.61	1.1	10.
F015	7.2	9.3 WL	13.4 WL	0.8	1.	0.6	1.4	0.6	1.	9.7
F021	8.26	10.7	15.4	0.934	1.10 AH	0.699 AH	1.65	0.647	1.09	10.7
F022	7.68	10.1	14.8	0.839	1.01	0.612	1.52	0.613	1.01	10.5
F026	7.90	10.2	14.6	0.828	0.976	0.600	1.53	0.601	1.03	10.2
F036	7.84	10.1	15.2	0.820	0.990	0.610	1.49	0.555	0.950	10.4
F069	7.88	10.5	15.1	0.868	0.998	0.602	1.55	0.6	1.05	10.9
F113	8.24	10.8	15.7	0.902	1.01	0.646	1.62	0.636	1.08	11.0
F139	7.07 WL	9.38	13.6	0.97 WH	1.15 AH	0.66 WH	1.95 AH	0.66	1.25 AH	9.54
F153	7.7	10.	15.	<1.15	<1.15	<1.15	1.6	<1.15	<1.15	10.
F154	7.39	9.81	14.0	0.814	0.961	0.607	1.44	0.535	0.981	10.0
F158	7.8	10.1	14.4	0.9	1.0	0.6	1.6	0.6	1.0	10.4
F207	7.6	10.1	14.5	0.8	1.0	0.6	1.5	0.6	1.0	10.2
F223	7.77	10.2	14.8	0.77	0.92 WL	0.54 WL	1.49	0.55	0.96	10.5
F223a	7.67			<5.	<5.	<5.	<5.	<5.	<5.	
F248	7.9	10.	15.	0.89	1.0	0.61	1.6	0.62	1.0	10.
F249	7.33	9.72	13.9	0.84	0.99	0.62	1.52	0.60	1.02	10.1
F270	9.21 AH	13.1 AH	17.5 AH	0.84	1.04	0.57	1.68	0.56	1.14	12.8 AH
F271	7.99	10.5	14.8	0.87	1.03	0.61	1.59	0.62	1.08	10.4
F290	7.8	10.2	15.2	0.9	1.0	0.6	1.6	0.6	1.1	10.5
F292	8.1	10.5	15.3	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	10.7
F293	7.95	10.2	15.1	0.81	1.00	0.53 WL	1.67	0.58	0.99	10.0
F297	8.23	12.0 AH	16.8 WH	0.722 WL	0.890 AL	0.509 AL	1.50	0.511 WL	1.01	11.9 AH
F317	7.42	9.97	14.4	0.776	0.892 AL	0.544 WL	1.44	0.552		9.8
F326	8.12	10.8	15.6	0.85	0.98	0.51 AL	1.55	0.52	1.05	10.9
ASSIGNED VALUE *	7.81	10.24	14.9	0.846	0.995	0.601	1.56	0.592	1.044	10.39
R-STD DEV *	0.327	0.438	0.67	0.0569	0.0316	0.0258	0.081	0.0383	0.0646	0.484
ACCEPTABLE LIMITS(+-) *	0.654	0.876	1.34	0.1138	0.0632	0.0516	0.162	0.0766	0.1292	0.968
WARNING LIMITS(+-) *	.654- .981	.876- 1.314	1.34- 2.01	.1138- .1707	.0632- .0948	.0516- .0774	.162- .243	.0766- .1149	.1292- .1938	.968- 1.452
ACTION LIMITS(<>) *	0.981	1.314	2.01	0.1707	0.0948	0.0774	0.243	0.1149	0.1938	1.452
N *	29	28	28	26	26	26	27	26	25	28

* NOTE: SEE GLOSSARY FOR DEFINITIONS

LAB NO.	TOTAL RANK	AVERAGE RANK	SUMMARY OF FLAGGING	BIAS STATEMENT	NO.SAMPLES RANKED	BIAS % SLOPE	BIAS BLANK	METHOD CODING
F003	211.5	21.1			10			ICP-AES
F009	121.5	12.1			10			ICP-MS
F010	111.0	11.1			10			ICP-AES
F011	157.0	15.7			10			IC Dionex
F014	153.0	15.3			10			ICP-MS
F015	58.5	5.8	WLWL	BIASED LOW	10	-9.5	0.0651	ICP-AES
F021	239.5	23.9	AHAH	BIASED HIGH	10	3.3	0.0599	ICP-AES
F022	144.5	14.4			10			ICP-AES
F026	124.0	12.4			10			ICP-AES
F036	111.5	11.1			10			AAS absorption
F069	160.5	16.0			10			ICP-AES
F113	235.5	23.5		BIASED HIGH	10	5.6	-0.0073	ICP-AES
F139	161.0	16.1	WL WHAHWHAH AH		10			ICP-AES
F153	58.5	11.7			5			ICP-AES
F154	56.0	5.6		BIASED LOW	10	-5.2	0.0092	ICP-MS
F158	133.0	13.3			10			ICP-MS
F207	96.0	9.6			10			ICP-AES
F223	78.0	7.8	WLWL		10			IC Dionex
F223a	8.0	8.0		INSUFFICIENT DATA	1			ICP-AES
F248	149.0	14.9			10			ICP-MS
F249	99.0	9.9			10			ICP-AES
F270	213.5	21.3	AHAHAH AH		10			ICP-AES
F271	179.5	17.9			10			AAS absorption
F290	169.0	16.9			10			ICP-AES
F292	87.5	21.8		INSUFFICIENT DATA	4			ICP-AES
F293	125.0	12.5	WL		10			ICP-AES
F297	128.0	12.8	AHWHWLALAL WL AH		10			ICP-AES
F317	38.0	4.2	ALWL	BIASED LOW	9	-3.4	-0.0554	ICP-AES
F326	153.0	15.3	AL		10			Metrohm,861 Compact

OVERALL AVERAGE RANK IS 13.9

PARAMETER: 14091 Silicates mg/L SiO2

WATER SCIENCE & TECHNOLOGY
ENVIRONMENT CANADA

FP PT for Major Ions & Nutrients

SAMPLE	1=	2=	3=	4=	5=	6=	7=	8=	9=	10=
	MI102-1	MI102-2	MI102-3	MI102-4	MI102-5	MI102-6	MI102-7	MI102-8	MI102-9	MI102-10
LAB NO	LAB RESULT	LAB RESULT	LAB RESULT	LAB RESULT	LAB RESULT	LAB RESULT	LAB RESULT	LAB RESULT	LAB RESULT	LAB RESULT
F003	1.49	10.9	16.8	0.79	7.15	3.44	0.84	4.49	2.9	3.98
F011	1.58	11.8	18.6	0.820	7.69	3.54	0.865	4.89	2.97	4.41
F015	1.49	11.2	18.4	0.813	7.51	3.63	0.898	4.70	3.03	4.30
F022	1.74 WH	11.7	17.9	0.819	7.45	3.65	0.889	4.71	3.28 WH	4.39
F026	1.44	10.5	15.8	0.70 WL	7.00	3.35	0.76	4.50	2.76	3.87
F026a	1.37	10.3	15.9	0.718	6.76	3.29	0.764	4.32	2.70	3.72
F036	1.62	11.3	17.5	0.856	7.32	3.60	0.856	4.62	3.00	4.19
F069	1.45	10.4	16.	0.769	6.8	3.46	0.797	4.41	2.78	3.89
F099	1.56	11.7	17.7	0.829	7.49	3.66	0.894	4.73	3.06	4.23
F113	1.55	12.8 WH	18.7	0.803	8.23 WH	3.83	0.839	4.99	3.09	4.51
F153	1.5	11.	17.	<1.	7.4	3.6	<1.	4.7	2.8	4.1
F154	1.6	11.3	17.1	0.833	7.6	3.9 WH	0.872	5.1 WH	3.2	4.5
F158	1.4	11.0	16.7	<1.0	7.2	3.5	<1.0	4.6	2.8	4.0
F158b	1.5	11.1	16.8	<1.0	7.3	3.6	<1.0	4.6	3.0	4.1
F207	1.50	11.3	17.2	0.78	7.23	3.49	0.82	4.56	2.92	4.08
F221	1.52	11.3	16.9	0.770	7.62	3.57	0.813	4.77	3.00	4.32
F229	1.42	10.9	16.1	0.757	6.99	3.46	0.786	4.41	2.83	3.96
F270	2.00 AH	13.0 AH	19.6 WH	0.93 WH	8.03 WH	3.93 WH	1.33 AH	5.30 AH	4.33 AH	4.97 AH
F271	1.50	11.0	16.7	0.81	7.23	3.51	0.81	4.58	2.95	4.04
F290	1.51	11.2	16.9	0.76	7.41	3.55	0.80	4.66	2.96	4.14
F292	1.57	11.5	17.3	0.87	7.5	3.66	0.88	4.77	3.08	4.40
F293	1.54	11.6	17.7	0.79	7.42	3.68	0.86	4.80	3.02	4.15
F297	1.44	10.8	16.2	0.758	6.97	3.40	0.811	4.45	2.87	3.95
F317	1.46	10.7	16.3	0.775	7.03	3.42	0.813	4.45	2.87	3.92
F326	1.48	10.4	11.0 AL	0.86	6.96	3.38	0.77	4.47	2.96	3.9
ASSIGNED VALUE *	1.51	11.2	17.0	0.799	7.31	3.55	0.834	4.64	2.96	4.14
R-STD DEV *	0.078	0.54	1.03	0.0490	0.329	0.148	0.0519	0.205	0.149	0.253
ACCEPTABLE LIMITS(+-) *	0.156	1.08	2.06	0.0980	0.658	0.296	0.1038	0.410	0.298	0.506
WARNING LIMITS(+-) *	.156- .234	1.08- 1.62	2.06- 3.09	.0980- .1470	.658- .987	.296- .444	.1038- .1557	.410- .615	.298- .447	.506- .759
ACTION LIMITS(<>) *	0.234	1.62	3.09	0.1470	0.987	0.444	0.1557	0.615	0.447	0.759
N *	25	25	25	22	25	25	22	25	25	25

* NOTE: SEE GLOSSARY FOR DEFINITIONS

LAB NO.	TOTAL RANK	AVERAGE RANK	SUMMARY OF FLAGGING	BIAS STATEMENT	NO.SAMPLES RANKED	BIAS % SLOPE	BIAS BLANK	METHOD CODING
F003	89.0	8.9			10			ICP-AES
F011	192.0	19.2			10			Colorimetric - Discr
F015	170.5	17.0			10			ICP-AES
F022	197.5	19.7	WH WH	BIASED HIGH	10	4.6	0.0107	Molybdosilicate
F026	32.5	3.2	WL	BIASED LOW	10	-6.7	0.0375	Molybdosilicate
F026a	14.0	1.4		BIASED LOW	10	-6.6	-0.0529	ICP-AES
F036	164.5	16.4			10			Molybdosilicate
F069	41.5	4.1		BIASED LOW	10	-6.5	0.0311	ICP-AES
F099	190.5	19.0			10			Flow injection
F113	207.0	20.7	WH WH	BIASED HIGH	10	12.1	-0.1110	Flow injection
F153	99.0	12.3			8			ICP-AES
F154	203.5	20.3	WH WH	BIASED HIGH	10	-0.2	0.2154	Heteropolyblue
F158	64.5	8.0			8			Molybdosilicate
F158b	103.0	12.8			8			Auto Molybdate
F207	114.5	11.4			10			Flow injection
F221	152.0	15.2			10			Flow injection
F229	50.5	5.0		BIASED LOW	10	-4.6	0.0172	EPA 366.0
F270	243.0	24.3	AHAHWHWHWHWHAHAHAHAH	BIASED HIGH	10	13.2	0.2376	Molybdosilicate
F271	103.5	10.3			10			Auto Molybdate
F290	120.5	12.0			10			Auto Molybdate
F292	196.0	19.6		BIASED HIGH	10	1.6	0.0713	Flow injection
F293	174.0	17.4			10			ICP-AES
F297	54.5	5.4		BIASED LOW	10	-4.5	0.0132	ICP-AES
F317	65.5	6.5			10			ICP-AES
F326	63.0	6.3	AL		10			Spectroquant(1.14794

OVERALL AVERAGE RANK IS 12.7

PARAMETER: 11091 Sodium mg/L

WATER SCIENCE & TECHNOLOGY
ENVIRONMENT CANADA

FP PT for Major Ions & Nutrients

SAMPLE	1=	2=	3=	4=	5=	6=	7=	8=	9=	10=
	MI102-1	MI102-2	MI102-3	MI102-4	MI102-5	MI102-6	MI102-7	MI102-8	MI102-9	MI102-10
LAB NO	LAB RESULT	LAB RESULT	LAB RESULT	LAB RESULT	LAB RESULT	LAB RESULT	LAB RESULT	LAB RESULT	LAB RESULT	LAB RESULT
F003	47.4	99.6	78.6	3.44	12.9	0.7	12.7	1.97	22.8	66.4
F009	45.0	99.	76.	3.5	13.	0.71	13.	1.9	23.	65.
F010	46.4	98.5	76.7	3.38	12.7	0.68	12.3	1.91	22.3	65.7
F011	47.6	101.	79.0	3.5	13.3	0.7	13.1	2.0	23.5	67.8
F014	48.0	99.3	79.2	3.53	13.5	0.64	13.3	2.01	24.1	68.1
F015	47.3	108. AH	83.3 WH	3.6	13.6	0.7	13.2	2.1	23.6	73.1 WH
F021	48.3	98.3	78.2	3.70	13.9	0.732	13.5	2.11	24.3	67.1
F022	46.3	98.7	79.3	3.53	13.0	0.897 WH	12.6	2.16	22.6	66.8
F026	46.7	98.3	78.0	3.39	12.8	0.669	12.0	1.88	21.8	65.0
F036	46.3	99.1	77.2	3.42	13.1	0.690	12.6	1.85	22.8	64.6
F069	47.1	99.6	78.1	3.52	13.1	0.704	12.8	1.99	23.	67.
F113	48.8	104.	81.	3.61	13.6	0.73	13.3	2.07	24.4	69.3
F139	39.6 AL	86.5 AL	67.0 AL	2.99 WL	10.7 AL	<0.72	10.5 AL	1.75	18.5 AL	55.9 AL
F153	48.	101.	79.	3.5	14.	<1.25	13.	1.9	24.	68.
F154	45.3	100.	76.0	3.21	12.4	0.658	11.6	1.83	21.0	62.3
F158	46.6	97.6	75.0	3.4	12.9	0.6	12.7	2.0	22.6	64.4
F207	45.5	97.2	76.3	3.3	12.6	0.5 WL	12.4	1.8	22.3	65.0
F223	46.3	98.5	76.7	<5.	13.1	<5.	12.8	<5.	22.9	66.3
F223a	45.9	96.4	75.7	<10.		<10.		<10.		65.1
F248	44.	96.	74.	3.6	13.	0.67	12.	2.0	22.	62.
F249	42.1 WL	93.4	71.6 WL	3.19	11.7	0.64	11.5	1.84	20.9	61.9
F270	46.4	100.	76.4	3.80	13.1	0.99 AH	13.1	2.17	22.5	66.7
F271	45.8	88.8 AL	70.6 WL	3.45	12.2	0.70	12.5	1.99	21.9	61.0
F290	46.3	97.2	76.9	3.6	13.5	0.8	13.1	2.0	23.4	65.4
F292	48.9	103.	81.5	3.77	13.9	0.78	13.5	2.15	23.8	69.6
F293	48.9	101.	79.6	3.66	13.7	0.77	13.7	2.11	23.6	64.9
F297	44.1	98.7	76.5	3.18	12.1	0.630	12.4	1.80	21.6	66.4
F317	44.6	89.4 AL	74.7	3.37	12.	0.701	11.9	1.91		61.7
F326	45.8	101.	78.8	3.47	13.5	0.59	13.3	1.96	24.1	65.7
ASSIGNED VALUE *	46.4	98.7	77.2	3.47	13.0	0.695	12.7	1.97	22.8	65.5
R-STD DEV *	1.71	2.72	2.60	0.183	0.69	0.0711	0.66	0.132	1.13	2.74
ACCEPTABLE LIMITS(+-) *	3.42	5.44	5.20	0.366	1.38	0.1422	1.32	0.264	2.26	5.48
WARNING LIMITS(+-) *	3.42- 5.13	5.44- 8.16	5.20- 7.80	.366- .549	1.38- 2.07	.1422- .2133	1.32- 1.98	.264- .396	2.26- 3.39	5.48- 8.22
ACTION LIMITS(<>) *	5.13	8.16	7.80	0.549	2.07	0.2133	1.98	0.396	3.39	8.22
N *	29	29	29	27	28	25	28	27	27	29

* NOTE: SEE GLOSSARY FOR DEFINITIONS

LAB NO.	TOTAL RANK	AVERAGE RANK	SUMMARY OF FLAGGING	BIAS STATEMENT	NO.SAMPLES RANKED	BIAS % SLOPE	BIAS BLANK	METHOD CODING
F003	155.0	15.5			10			ICP-AES
F009	130.0	13.0			10			ICP-MS
F010	109.0	10.9			10			ICP-AES
F011	198.0	19.8			10			IC Dionex
F014	206.0	20.6			10			ICP-AES
F015	230.5	23.0	AHWH WH	BIASED HIGH	10	9.5	-0.6371	ICP-AES
F021	226.0	22.6		BIASED HIGH	10	0.2	0.6981	ICP-AES
F022	178.5	17.8	WH		10			ICP-AES
F026	100.0	10.0			10			ICP-AES
F036	123.0	12.3			10			AAS absorption
F069	176.5	17.6			10			ICP-AES
F113	246.5	24.6		BIASED HIGH	10	5.3	0.0165	ICP-AES
F139	9.0	1.0	ALALALWLAL AL ALAL	BIASED LOW	9	-12.6	-0.5993	ICP-AES
F153	188.5	20.9			9			ICP-AES
F154	70.0	7.0		BIASED LOW	10	-0.1	-0.7823	ICP-MS
F158	105.0	10.5			10			ICP-MS
F207	69.0	6.9	WL	BIASED LOW	10	-1.1	-0.1773	ICP-AES
F223	103.5	14.7			7			IC Dionex
F223a	37.0	9.2		INSUFFICIENT DATA	4			ICP-AES
F248	90.0	9.0			10			ICP-MS
F249	32.5	3.2	WL WL	BIASED LOW	10	-5.8	-0.3726	ICP-AES
F270	194.5	19.4	AH		10			ICP-AES
F271	76.5	7.6	ALWL		10			AAS absorption
F290	170.5	17.0			10			ICP-AES
F292	259.5	25.9		BIASED HIGH	10	4.9	0.1632	ICP-AES
F293	230.0	23.0		BIASED HIGH	10	1.8	0.3299	ICP-AES
F297	74.0	7.4			10			ICP-AES
F317	55.5	6.1	AL	BIASED LOW	9	-7.0	0.3350	ICP-AES
F326	167.0	16.7			10			Metrohm,861 Compact

OVERALL AVERAGE RANK IS 14.4

PARAMETER: 16092 Sulfate mg/L

WATER SCIENCE & TECHNOLOGY
ENVIRONMENT CANADA

FP PT for Major Ions & Nutrients

SAMPLE	1=	2=	3=	4=	5=	6=	7=	8=	9=	10=
	MI102-1	MI102-2	MI102-3	MI102-4	MI102-5	MI102-6	MI102-7	MI102-8	MI102-9	MI102-10
LAB NO	LAB RESULT	LAB RESULT	LAB RESULT	LAB RESULT	LAB RESULT	LAB RESULT	LAB RESULT	LAB RESULT	LAB RESULT	LAB RESULT
F003	156.	138.	194.	14.4	13.1	8.22	26.2	7.04	13.6	226.
F009	152.	138.	190.	14.5	13.1	8.23	26.4	7.05	13.6	228.
F010	158.	140.	194.	14.3	12.9	7.94	26.4	6.77	13.4	220.
F011	165.	148.	207.	16. WH	14.	9. WH	29. AH	8. AH	15. WH	241.
F014	174.	141.	201.	16.1 WH	14.7 WH	9.27 AH	25.6	7.37	14.2	258. WH
F015	162.	137.	205.	14.5	12.9	7.9	26.	6.7	13.6	224.
F021	154.	138.	228. AH	14.6	12.6	8.22	26.0	6.96	13.0	226.
F022	157.	139.	196.	14.3	13.1	8.11	26.4	6.92	13.6	228.
F026	169.	144.	205.	14.1	13.6	8.48	26.4	7.20	13.5	236.
F036	159.	140.	196.	14.2	12.8	8.20	26.0	6.95	13.5	226.
F069	164.	144.	208.	14.4	12.9	8.01	26.5	6.81	13.4	238.
F113	158.	141.	201.	15.4	13.7	8.84 WH	27.7	7.83 WH	14.1	235.
F139	193. AH	172. AH	247. AH	16.5 WH	13.9	8.38	28.6 WH	7.13	14.2	292. AH
F153	156.	140.	197.	14.	13.	8.1	26.	7.5	13.	228.
F154	155.	137.	193.	14.6	13.3	8.12	26.3	6.62	14.1	224.
F158	146.	132.	175. WL	14.0	12.3	8.1	25.5	6.7	12.8	197. WL
F207	155.	140.	194.	15.3	13.0	8.0	25.9	7.0	13.2	216.
F213	194. AH	166. AH	224. WH	17.1 AH	15.3 AH	9.69 AH	31.1 AH	8.73 AH	16.9 AH	254. WH
F239	166.		194.							
F248	152.	135.	189.	14.2	12.9	8.06	25.8	6.93	13.3	221.
F270	156.	139.	204.	13.6	12.4	8.01	24.6 WL	6.93	12.9	240.
F271	160.	143.	202.	15.1	13.4	8.50	27.1	7.29	14.2	237.
F280	148.	137.	190.	14.4	12.6	8.0	25.1	7.0	13.1	221.
F290	156.	137.	195.	14.7	13.2	8.2	26.6	7.1	13.6	229.
F292	157.	141.	192.	12.9 WL	11.4 AL	6.73 AL	25.5	5.62 AL	11.9 WL	236.
F293	155.	133.	194.	14.8	13.4	8.50	26.0	7.25	13.8	224.
F297	154.	134.	191.	14.4	12.8	8.24	26.6	7.13	13.3	163. AL
F317	154.	139.	196.	14.3	12.9	8.03	26.	6.84	13.1	227.
F326	175. WH	153. WH	217. WH	14.8	13.2	7.94	28.6 WH	6.73	13.8	247.
ASSIGNED VALUE *	159	140	199	14.6	13.1	8.21	26.3	7.04	13.5	230
R-STD DEV *	7.5	4.5	8.8	0.65	0.54	0.281	0.83	0.315	0.55	11.8
ACCEPTABLE LIMITS(+-) *	15.0	9.0	17.6	1.30	1.08	0.562	1.66	0.630	1.10	23.6
WARNING LIMITS(+-) *	15.0- 22.5	9.0- 13.5	17.6- 26.4	1.30- 1.95	1.08- 1.62	.562- .843	1.66- 2.49	.630- .945	1.10- 1.65	23.6- 35.4
ACTION LIMITS(<>) *	22.5	13.5	26.4	1.95	1.62	0.843	2.49	0.945	1.65	35.4
N *	29	28	29	28	28	28	28	28	28	28

* NOTE: SEE GLOSSARY FOR DEFINITIONS

LAB NO.	TOTAL RANK	AVERAGE RANK	SUMMARY OF FLAGGING	BIAS STATEMENT	NO.SAMPLES RANKED	BIAS % SLOPE	BIAS BLANK	METHOD CODING
F003	136.5	13.6			10			IC Dionex
F009	134.0	13.4			10			IC Dionex
F010	105.5	10.5			10			IC Metrohm
F011	254.0	25.4	WH WHAHAHWH	BIASED HIGH	10	4.1	0.8072	IC Dionex
F014	225.5	22.5	WHWHAH WH	BIASED HIGH	10	7.3	-0.8512	IC Dionex
F015	116.5	11.6			10			IC
F021	122.5	12.2	AH		10			IC Dionex
F022	140.0	14.0			10			IC Dionex
F026	192.5	19.2			10			IC Dionex
F036	126.0	12.6			10			IC Dionex
F069	161.0	16.1			10			IC
F113	219.5	21.9	WH WH		10			IC Dionex
F139	256.0	25.6	AHAHAHWH WH AH	BIASED HIGH	10	26.1	-2.9601	IC
F153	129.5	12.9			10			IC
F154	121.5	12.1			10			IC
F158	31.0	3.1	WL WL	BIASED LOW	10	-12.3	1.8687	IC Dionex
F207	110.0	11.0			10			IC
F213	277.0	27.7	AHAHWHAHAHAHAHAHWH	BIASED HIGH	10	13.3	1.7930	Turbidimetry
F239	34.0	17.0		INSUFFICIENT DATA	2			IC
F248	67.5	6.7		BIASED LOW	10	-4.5	0.3628	IC Dionex
F270	96.5	9.6	WL		10			IC Dionex
F271	221.0	22.1			10			IC Dionex
F280	63.0	6.3		BIASED LOW	10	-4.5	0.1835	IC
F290	158.5	15.8			10			IC Dionex
F292	69.5	6.9	WLALAL ALWL	BIASED LOW	10	0.8	-1.6969	IC
F293	147.5	14.7			10			IC
F297	104.5	10.4	AL		10			IC Dionex
F317	100.0	10.0			10			IC Dionex
F326	197.5	19.7	WHWHWH WH		10			Metrohm,861 Compact

OVERALL AVERAGE RANK IS 14.6

PARAMETER: 06192 Total Alkalinity mg/L CaCO3

WATER SCIENCE & TECHNOLOGY
ENVIRONMENT CANADA

FP PT for Major Ions & Nutrients

SAMPLE	1=	2=	3=	4=	5=	6=	7=	8=	9=	10=
	MI102-1	MI102-2	MI102-3	MI102-4	MI102-5	MI102-6	MI102-7	MI102-8	MI102-9	MI102-10
LAB NO	LAB RESULT	LAB RESULT	LAB RESULT	LAB RESULT	LAB RESULT	LAB RESULT	LAB RESULT	LAB RESULT	LAB RESULT	LAB RESULT
F003	90.3	324.	265.	71.2	18.2	48.8	92.	41.5	18.2	233.
F009	90.1	317.	261.	71.6	19.2	49.1	91.0	41.4	18.9	228.
F011	86.6	309.	251.	68.8	17.1	48.5	88.6	40.5	16.5	222.
F014	89.4	313.	258.	69.9	18.1	50.0	91.3	41.5	17.7	226.
F015	90.2	318.	239. WL	66. WL	16.3	45.4 WL	82.7 AL	37.9 WL	16.4	220.
F021	86.8	309.	253.	69.4	<20.	48.4	89.3	41.0	<20.	224.
F022	90.	321.	262.	72.	19.7	50.9	92.7	42.2	20.1	237.
F026	90.1	327.	267.	70.5	19.3	50.8	94.0	42.1	18.6	234.
F036	81.2 AL	291. AL	236. AL	64.0 AL	18.1	45.8	83.0 AL	38.1 WL	17.1	209. AL
F069	91.9	327.	266.	73.4	21.2	51.7	94.3	43.4	20.5	235.
F099	90.6	321.	262.	72.2	20.5	50.3	92.3	42.4	19.7	230.
F113	92.1	324.	246.	71.1	20.8	50.7	90.8	43.1	21.1	227.
F153	88.	318.	259.	69.	<20.	48.	90.	40.	<20.	231.
F154	92.	325.	265.	73.	22.	52.	94.	43.	21.	234.
F158	89.8	321.	262.	72.0	20.3	50.0	92.7	42.5	17.7	230.
F193	89.3	321.	259.	69.8	18.3	48.4	90.9	40.3	17.6	231.
F207	89.	318.	258.	71.	18.	50.	91.	42.	17.	228.
F239	94.		264.							
F248	90.	320.	260.	70.	19.	50.	93.	42.	20.	230.
F264	102. AH	344. AH	270.	75.	33.8 AH	68. AH	102. AH	46.6 AH	22.2	238.
F270	86.0	320.	260.	72.0	18.0	48.0	90.0	42.0	18.0	224.
F271	91.2	322.	262.	72.2	19.9	50.5	92.4	42.2	19.5	231.
F290	92.	321.	279. WH	74.	20.	52.	93.	43.	21.	231.
F292	94.7	333.	272.	74.9	22.5	53.4	98.1 WH	45.7 WH	22.5	245. WH
F293	92.9	328.	256.	73.3	20.5	51.5	94.5	43.1	17.2	235.
F297	90.3	323.	263.	71.0	18.3	49.4	91.8	41.0	17.7	232.
F317	85.2	302. WL	253.	66.7	17.1	46.6	86.5	39.1	16.2	216. WL
ASSIGNED VALUE *	90.1	320	260	71.1	19.4	49.8	91.7	41.8	18.8	230
R-STD DEV *	2.77	6.9	7.3	2.32	1.84	2.03	2.60	1.52	2.03	6.1
ACCEPTABLE LIMITS(+-) *	5.54	13.8	14.6	4.64	3.68	4.06	5.20	3.04	4.06	12.2
WARNING LIMITS(+-) *	5.54- 8.31	13.8- 20.7	14.6- 21.9	4.64- 6.96	3.68- 5.52	4.06- 6.09	5.20- 7.80	3.04- 4.56	4.06- 6.09	12.2- 18.3
ACTION LIMITS(<>) *	8.31	20.7	21.9	6.96	5.52	6.09	7.80	4.56	6.09	18.3
N *	27	26	27	26	24	26	26	26	24	26

* NOTE: SEE GLOSSARY FOR DEFINITIONS

LAB NO.	TOTAL RANK	AVERAGE RANK	SUMMARY OF FLAGGING	BIAS STATEMENT	NO.SAMPLES RANKED	BIAS % SLOPE	BIAS BLANK	METHOD CODING
F003	144.0	14.4			10			PC Titrate
F009	113.5	11.3			10			Titration
F011	43.0	4.3		BIASED LOW	10	-3.2	-0.6152	PC Titrate
F014	89.0	8.9			10			PC-Titrate
F015	36.0	3.6	WLWL WLALWL	BIASED LOW	10	-2.6	-2.9480	Titration
F021	44.5	5.5		BIASED LOW	8	-3.2	0.3922	PC Titrate
F022	169.0	16.9			10			PC Titrate
F026	172.0	17.2			10			PC Titrate
F036	22.5	2.2	ALALALAL ALWL AL	BIASED LOW	10	-9.2	-0.0158	Titroprocessor
F069	220.0	22.0		BIASED HIGH	10	1.8	0.9872	
F099	163.5	16.3			10			Titration
F113	157.0	15.7			10			PC Titrate
F153	60.0	7.5			8			Potentiometry
F154	213.5	21.3		BIASED HIGH	10	1.1	1.4798	Radiometer
F158	145.5	14.5			10			PC Titrate
F193	92.0	9.2			10			Titration
F207	90.0	9.0			10			Mettler
F239	45.0	22.5		INSUFFICIENT DATA	2			Titration
F248	129.5	12.9			10			Titration
F264	254.0	25.4	AHAH AHAHAHAH	BIASED HIGH	10	2.7	7.6900	
F270	88.0	8.8			10			Titration
F271	167.0	16.7			10			PC Titrate
F290	202.0	20.2	WH		10			PC Titrate
F292	250.0	25.0	WHWH WH	BIASED HIGH	10	3.9	2.2009	PC Titrate
F293	191.5	19.1			10			PC Titrate
F297	133.0	13.3			10			Mettler
F317	27.0	2.7	WL WL	BIASED LOW	10	-4.4	-1.1692	PC Titrate

OVERALL AVERAGE RANK IS 13.4

PARAMETER: 10692 Total Hardness mg/L

WATER SCIENCE & TECHNOLOGY
ENVIRONMENT CANADA

FP PT for Major Ions & Nutrients

SAMPLE	1=	2=	3=	4=	5=	6=	7=	8=	9=	10=
	MI102-1	MI102-2	MI102-3	MI102-4	MI102-5	MI102-6	MI102-7	MI102-8	MI102-9	MI102-10
LAB NO	LAB RESULT	LAB RESULT	LAB RESULT	LAB RESULT	LAB RESULT	LAB RESULT	LAB RESULT	LAB RESULT	LAB RESULT	LAB RESULT
F003	176.	268.	320.	88.8	42.3	57.8	126.	46.3	37.5	325.
F011	184.	282.	338.	94.9	45.4	62.0	132.	50.8	42.2 WH	340.
F014	182.	275.	329.	90.4	43.2	60.1	131.	48.3	39.3	338.
F015	171.	258.	308.	81.4	43.5	58.4	123.	46.9	38.8	319.
F022	172.	268.	322.	85.3	42.3	55.9	119.	46.3	37.2	320.
F026a	168.	252.	300.	85.0	40.4	56.1	119.	44.6	36.1	300.
F099	173.	270.	319.	87.0	41.5	56.5	122.	45.5	37.5	327.
F153	173.	270.	318.	88.	42.	57.	124.	46.	37.	326.
F154	167.	269.	316.	87.7	41.1	56.4	121.	44.3	38.0	307.
F158	175.	264.	311.	86.5	39.8	56.3	123.	45.2	36.6	319.
F207	169.	264.	311.	84.	39.	54.	116.	43.	35.	318.
F228	185.	278.	329.	106. AH	54. AH	74. AH	140. WH	60. AH	51. AH	339.
F264	196. AH	287. WH	344.	95.4	49.6 AH	74. AH	157. AH	58.2 AH	36.4	312.
F270	173.	261.	306.	88.9	43.2	59.3	125.	46.7	37.6	319.
F271	176.	273.	323.	88.3	41.7	57.3	125.	44.2	36.8	328.
F290	170.	262.	321.	85.	40.	56.	124.	43.	36.	322.
F292	182.	277.	332.	92.1	43.6	59.8	129.	47.5	38.6	337.
F293	181.	277.	334.	89.0	42.7	58.1	128.	47.0	37.8	316.
F317	172.	264.	311.	82.6	39.3	51.1 WL	118.	45.2	35.4	315.
F326	173.	271.	318.	87.	42.	60.	125.	48.	42. WH	328.
ASSIGNED VALUE *	175	269	320	88.0	42.2	58.0	125	46.4	37.6	323
R-STD DEV *	6.6	8.5	11.9	4.15	2.22	2.88	5.7	2.44	1.80	11.4
ACCEPTABLE LIMITS(+-) *	13.2	17.0	23.8	8.30	4.44	5.76	11.4	4.88	3.60	22.8
WARNING LIMITS(+-) *	13.2- 19.8	17.0- 25.5	23.8- 35.7	8.30- 12.45	4.44- 6.66	5.76- 8.64	11.4- 17.1	4.88- 7.32	3.60- 5.40	22.8- 34.2
ACTION LIMITS(<>) *	19.8	25.5	35.7	12.45	6.66	8.64	17.1	7.32	5.40	34.2
N *	20	20	20	20	20	20	20	20	20	20

* NOTE: SEE GLOSSARY FOR DEFINITIONS

LAB NO.	TOTAL RANK	AVERAGE RANK	SUMMARY OF FLAGGING	BIAS STATEMENT	NO.SAMPLES RANKED	BIAS % SLOPE	BIAS BLANK	METHOD CODING
F003	115.5	11.5			10			calculated ICP
F011	185.0	18.5	WH	BIASED HIGH	10	4.6	1.8430	CALCULATED
F014	163.5	16.3		BIASED HIGH	10	3.4	0.1915	calculated ICP
F015	84.5	8.4			10			calculated ICP
F022	81.5	8.1			10			calculated ICP
F026a	32.0	3.2		BIASED LOW	10	-7.1	2.2634	calculated ICP
F099	93.0	9.3			10			Titration (EDTA)
F153	98.5	9.8			10			calculated ICP
F154	66.0	6.6			10			calculated ICP
F158	67.0	6.7			10			calculated ICP
F207	29.5	2.9		BIASED LOW	10	-1.1	-3.4216	calculated ICP
F228	190.0	19.0	AHAHAHWHAHAH	BIASED HIGH	10	-1.1	14.7959	calculated ICP
F264	164.5	16.4	AHWH AHAHAHAH	BIASED HIGH	10	0.4	12.0196	
F270	101.0	10.1			10			calculated ICP
F271	109.0	10.9			10			calculated AAS
F290	57.5	5.7			10			calculated ICP
F292	162.0	16.2		BIASED HIGH	10	3.9	-0.3960	calculated ICP
F293	136.5	13.6			10			calculated ICP
F317	37.0	3.7	WL	BIASED LOW	10	-1.5	-2.8185	Titration (EDTA)
F326	126.5	12.6	WH		10			Titration (EDTA)

OVERALL AVERAGE RANK IS 10.5

PARAMETER: 07392 Total Kjeldahl N mg/L N

WATER SCIENCE & TECHNOLOGY
ENVIRONMENT CANADA

FP PT for Major Ions & Nutrients

SAMPLE	1=	2=	3=	4=	5=	6=	7=	8=	9=	10=
	MI102-1	MI102-2	MI102-3	MI102-4	MI102-5	MI102-6	MI102-7	MI102-8	MI102-9	MI102-10
LAB NO	LAB RESULT	LAB RESULT	LAB RESULT	LAB RESULT	LAB RESULT	LAB RESULT	LAB RESULT	LAB RESULT	LAB RESULT	LAB RESULT
F003	0.468	0.585	1.03	0.078	0.032	0.015	0.138	0.035	0.238	0.451
F026a	0.413	0.488	0.801	0.045	0.015	0.019	0.095	0.033	0.25	0.4
F036	0.439	0.541	0.982	0.063	0.051	0.043	0.153	0.073	0.215	0.443
F069	0.518	0.612	1.11	0.092	0.087	0.09	0.172	<0.07	0.289	0.482
F154	0.41	0.52	1.15	<0.20	<0.20	<0.20	<0.20	<0.20	0.20	0.46
F207	0.49	0.61	1.03	0.08	0.06	<0.05	0.16	<0.05	0.24	0.47
F228	0.35	0.56	0.87	<0.08	<0.08	<0.08	0.14	0.10	0.23	0.47
F270	0.56	0.63	1.35 WH	<0.07	<0.07	<0.07	0.18	<0.07	0.28	0.41
F290	0.43	0.56	0.98	0.06	0.06	<0.05	0.10	<0.05	0.26	0.46
F292	0.55	0.63	1.07	<0.10	<0.10	<0.10	0.15	0.10	0.31	0.50
F293	0.497	0.640	1.07	0.116	0.100	<0.080	0.165	0.092	0.213	0.487
F304	0.439	0.563	0.977	0.066	0.029	0.018	0.123	0.039	0.215	0.446
F317	0.518	0.623	1.25	<0.15	<0.15	<0.15	0.219	<0.15	0.297	0.676 AH
ASSIGNED VALUE *	0.469	0.583	1.047	0.074	0.054	0.034	0.148	0.067	0.249	0.462
R-STD DEV *	0.0659	0.0504	0.1453	0.0223	0.0330	0.0282	0.0356	0.0353	0.0404	0.0353
ACCEPTABLE LIMITS(+-) *	0.1318	0.1008	0.2906	0.0446	0.0660	-	0.0712	0.0706	0.0808	0.0706
WARNING LIMITS(+-) *	.1318- .1977	.1008- .1512	.2906- .4359	.0446- .0669	.0660- .0990	-	.0712- .1068	.0706- .1059	.0808- .1212	.0706- .1059
ACTION LIMITS(<>) *	0.1977	0.1512	0.4359	0.0669	0.0990	-	0.1068	0.1059	0.1212	0.1059
N *	13	13	13	8	8	5	12	7	13	13

* NOTE: SEE GLOSSARY FOR DEFINITIONS

LAB NO.	TOTAL RANK	AVERAGE RANK	SUMMARY OF FLAGGING	BIAS STATEMENT	NO.SAMPLES RANKED	BIAS % SLOPE	BIAS BLANK	METHOD CODING
F003	46.5	4.6			10			block digestion
F026a	21.0	2.1		BIASED LOW	10	-19.2	-0.0017	calculated
F036	42.0	4.2			10			Kjeldahl digestion
F069	79.5	8.8			9			Kjeldahl digestion
F154	22.5	4.5			5			block digestion
F207	57.5	7.1			8			block digestion
F228	32.5	4.6			7			Kjeldahl digestion
F270	60.5	10.0	WH	BIASED HIGH	6	30.9	-0.0769	Kjeldahl digestion
F290	37.5	4.6			8			calculated
F292	69.5	9.9		BIASED HIGH	7	0.2	0.0397	Kjeldahl digestion
F293	73.5	8.1			9			block digestion
F304	36.0	3.6		BIASED LOW	10	-3.8	-0.0151	calculated
F317	69.5	11.5	AH	BIASED HIGH	6	14.6	0.0324	block digestion

OVERALL AVERAGE RANK IS 6.1

PARAMETER: 07293 Total N mg/L N

WATER SCIENCE & TECHNOLOGY
ENVIRONMENT CANADA

FP PT for Major Ions & Nutrients

SAMPLE	1=	2=	3=	4=	5=	6=	7=	8=	9=	10=
	MI102-1	MI102-2	MI102-3	MI102-4	MI102-5	MI102-6	MI102-7	MI102-8	MI102-9	MI102-10
LAB NO	LAB RESULT	LAB RESULT	LAB RESULT	LAB RESULT	LAB RESULT	LAB RESULT	LAB RESULT	LAB RESULT	LAB RESULT	LAB RESULT
F003	0.773	0.796	1.44	0.413	0.434	0.164	0.599	0.135	0.361	0.684
F004	0.790	0.807	1.53	0.400	0.433	0.181	0.597	0.143	0.364	0.709
F006	0.727	0.790	1.47	0.355	0.392	<0.200	0.530	<0.200	0.331	0.671
F006a	0.730	0.769	1.42	0.349	0.375	<0.200	0.522	<0.200	0.346	0.656
F010	0.80	0.92	1.60	0.40	0.41	0.20	0.56	0.12	0.35	0.86
F011	0.63	0.66	1.26	0.33	0.25 AL	0.19	0.46 WL	0.14	0.31	0.57
F015	0.66	0.71	1.4	0.36	0.36	0.15	0.5	0.08 AL	0.25 WL	0.54
F021	0.67	0.66	1.56	0.39	0.42	0.18	0.58	0.14	0.34	0.60
F026	0.729	0.720	1.31	0.346	0.405	0.164	0.562	0.116	0.364	0.647
F036	0.746	0.779	1.46	0.374	0.430	0.172	0.574	0.146	0.336	0.675
F069	0.739	0.797	1.54	0.395	0.409	0.161	0.587	0.129	0.35	0.685
F113	0.754	0.799	1.51	0.384	0.423	0.158	0.565	0.145	0.351	0.68
F158	0.67	0.63	1.36	0.38	0.41	0.17	0.56	0.13	0.32	0.55
F221	0.761	0.802	1.48	0.388	0.416	0.172	0.577	0.142	0.356	0.688
F229	0.72	0.74	1.41	0.38	0.45	0.19	0.58	0.14	0.30	0.67
F270	0.96 AH	1.09 AH	2.07 AH	0.40	0.47	0.26 AH	0.70 WH	0.21 AH	0.52 AH	0.87 WH
F271	0.83	0.87	1.67	0.43	0.45	0.19	0.65	0.15	0.38	0.78
F290	0.73	0.79	1.48	0.38	0.43	0.16	0.55	0.12	0.38	0.70
F292	0.76	0.80	1.53	0.28 AL	0.26 AL	0.13	0.56	0.17	0.42	0.70
F304	0.749	0.795	1.49	0.378	0.407	0.165	0.572	0.130	0.335	0.687
F317	0.827	0.854	1.76	0.314 WL	0.382	<0.25	0.668	<0.25	0.422	0.916 WH
F326	0.68	0.71	1.73	0.37	0.33	0.12 WL	0.83 AH	0.34 AH	0.46 WH	0.48 WL
ASSIGNED VALUE *	0.742	0.777	1.50	0.375	0.407	0.171	0.576	0.139	0.357	0.676
R-STD DEV *	0.0614	0.0788	0.136	0.0296	0.0384	0.0206	0.0490	0.0186	0.0434	0.0933
ACCEPTABLE LIMITS(+-) *	0.1228	0.1576	0.272	0.0592	0.0768	0.0412	0.0980	0.0372	0.0868	0.1866
WARNING LIMITS(+-) *	.1228- .1842	.1576- .2364	.272- .408	.0592- .0888	.0768- .1152	.0412- .0618	.0980- .1470	.0372- .0558	.0868- .1302	.1866- .2799
ACTION LIMITS(<>) *	0.1842	0.2364	0.408	0.0888	0.1152	0.0618	0.1470	0.0558	0.1302	0.2799
N *	22	22	22	22	22	19	22	19	22	22

* NOTE: SEE GLOSSARY FOR DEFINITIONS

LAB NO.	TOTAL RANK	AVERAGE RANK	SUMMARY OF FLAGGING	BIAS STATEMENT	NO.SAMPLES RANKED	BIAS % SLOPE	BIAS BLANK	METHOD CODING
F003	136.5	13.6			10			autoclaved
F004	165.0	16.5			10			Persulfate dig.
F006	57.5	7.1			8			Combustion chem.
F006a	52.5	6.5			8			combustion chem.
F010	147.5	14.7			10			Hydrazine
F011	42.5	4.2	AL WL	BIASED LOW	10	-17.1	0.0060	Pyrolysis/chemilumen
F015	30.5	3.0	ALWL	BIASED LOW	10	-4.8	-0.0436	autoclaved
F021	103.5	10.3			10			Hydrazine
F026	68.0	6.8			10			autoclaved
F036	110.0	11.0			10			chemiluminescence Hi
F069	118.5	11.8			10			Persulfate dig.
F113	122.0	12.2			10			Flow injection
F158	61.5	6.1			10			Persulfate dig.
F221	136.0	13.6			10			Flow injection
F229	101.0	10.1			10			ASTM D-5176
F270	208.0	20.8	AHAHAH AHWHAHAHWH	BIASED HIGH	10	38.1	-0.0347	calculated
F271	190.0	19.0		BIASED HIGH	10	11.9	-0.0003	Persulfate dig.
F290	106.5	10.6			10			Combustion - IR
F292	110.0	11.0	ALAL		10			calculated
F304	102.5	10.2			10			Flow injection
F317	130.0	16.2	WL WH		8			calculated
F326	104.5	10.4	WLAHAHWHWL		10			Spectroquant(Crack S

OVERALL AVERAGE RANK IS 11.2