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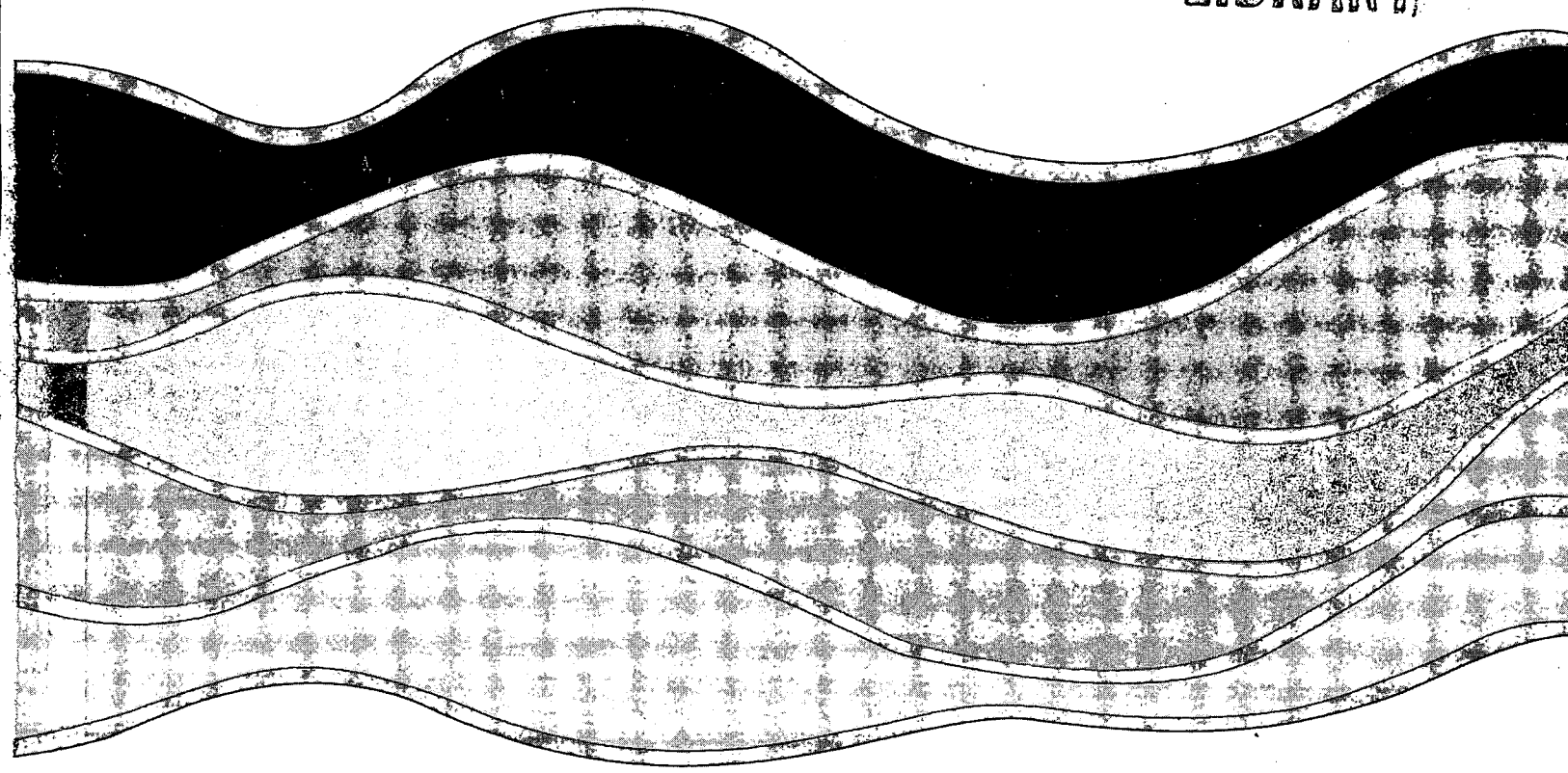

LRTAP INTERLABORATORY STUDY L-37 FOR MAJOR IONS AND NUTRIENTS

by

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LE PLAN VERT DU CANADA
CANADA'S GREEN PLAN

Canada Centre for Inland Waters
P.O. Box 5050, 867 Lakeshore Road
Burlington, Ontario
L7R 4A6

January 16th, 1995

Dear Participant:

Re: LRTAP Interlaboratory Comparability Study L-37

Selected Major Ions, Nutrients and Physical Measurements in Water.

The LRTAP Quality Assurance Subgroup of the RMCC has now completed its thirty seventh round robin. Enclosed are the results reported by all participants accompanied by our evaluation.

The evaluation was made from summary sheets on which results are ranked and flagged. Copies of these sheets are enclosed. From them you can compare your results with those of other Laboratories.

Medians were used as target values in flagging results. This is because true values are unknown, and a panel of reference laboratories using proven bias-free methods, is not available.

A glossary of terms used in our evaluation of results is enclosed. It is designated Appendix A.

We would like to thank all participants in Study L-37 for their cooperation. Participants should recognize that their laboratory codes are confidential. Access to these codes is possible but only with the permission of the relevant laboratory head or program authority. Laboratory heads are encouraged to discuss the attached report openly with those who manage their programs and those who use their laboratory data.

Should you have any questions or comments regarding this study, please direct them to Nabil Arafat at the National Water Research Institute, telephone (905)336-4645.

In particular we urge any laboratory experiencing difficulty with a measurement to contact Nabil Arafat for referral to a laboratory which has demonstrated satisfactory performance.

The comments specific to your laboratory's performance are on the attached page.

Sincerely yours,

John Lawrence Co-Chairman

Serge Villard Co-Chairman

Attachments:
(1) Laboratory Appraisal
(2) Table 1 List of Samples
(3) Table 2 Summary of Interlaboratory Medians
(4) Table 3 Comparison of Laboratory Performance
(5) Table 4 Relative Performance
(6) Table 5 Comparison of Interlaboratory Median Values Between Studies
(7) List of Participants
(8) Appendix A Glossary of Terms
(9) Appendix 1 Laboratory data

TABLE 1

LRTAP STUDY #37

SAMPLE IDENTIFICATION LIST

SAMPLE NO.	SAMPLE IDENTIFICATION	Sample Description	Sample Previous Usage
1	SUPER-01	Lake Superior, 1992	L33,L35
2	TROIS-02A	Trois Rivieres, 1994	none
3	DD-11	Dorset Bog Water, 1993	L36
4	TRKY-S4	Turkey Lakes	L25,L26,L27,L31, L34
5	GRM-05	Grimsby Rainwater, 1993	L36
6	GRM-01	Grimsby Rainwater	L25,L28,L29,L32, L34
7	TRKY-94	Turkey Lakes & Grimsby Rainwater mix, 1994	none
8	AUD-05A	Halls Lake, 1994	none
9	GRM-07	Grimsby Rainwater, 1994	none
10	AUD-01A	Plastic Lake, 1994	none

TABLE 2

SUMMARY OF INTERLABORATORY MEDIAN VALUES FOR LRTAP STUDY 0037

PARAMETER		SAMPLE NUMBER						
		SUPER-01 SAMPLE 1	TROIS-02A SAMPLE 2	DD-11 SAMPLE 3	TRKY-S4 SAMPLE 4	GRM-05 SAMPLE 5	GRM-01 SAMPLE 6	TRKY-94 SAMPLE 7
Colour	HAZEN UNIT	1.6400	37.000	608.500	5.2500	2.6000	2.5000	4.7500
Specific Conductance	UMHO/CM	97.000	32.200	46.600	46.530	22.800	118.000	40.000
ACIDITY TO PH 8.3	MG/LCACO3	1.4000	1.7000	23.666	1.4400	1.4000	6.5100	1.4500
pH	PH UNITS	7.8000	6.6000	4.1730	7.2750	6.9000	4.2500	7.0000
Diss Organic Carbon	MG C/L	1.9000	6.0400	57.000	2.4500	.5900	1.6190	1.4500
ALKALINITY-FIXED ENDPT. PH4.5	MG/L CACO3	42.900	6.7950	-	15.425	8.0750	-	8.8200
ALKALINITY-GRAN,INFLEC,EXTRAP	MG/L CACO3	41.890	4.8000	-5.1650	13.610	6.4000	-3.5800	7.1000
GRAN TITRA ALK	MG/LCAC03	42.110	5.1400	-3.8950	14.100	6.5000	-3.1950	7.3000
Diss Inorg Carbon	MG C/L	10.260	1.5000	1.0500	3.6050	1.8700	.3000	1.9800
Nitrate + Nitrite	MG N/L	.3090	.0700	.0100	.1380	.3900	4.2200	.8500
Nitrate-IC	mgN/L	.2900	.0700	.0045	.1400	.3970	4.2800	.8460
Ammonia	MG N/L	.0050	.0290	.0800	.1000	.0590	.9000	.2860
Total Kjeldahl N	MG N/L	.1000	.2300	1.3850	.2240	.1085	1.0060	.3730
Sodium	MG/L	1.3700	2.1940	.9300	.8235	.1115	.2000	.5510
Magnesium	MG/L	2.8035	.6035	.5920	.6315	.5835	2.6885	.8240
Aluminum	MG/L	.0066	.0710	.5700	.0105	.0066	.1700	.0220
REACTIVE SILICA	MG SI/L	1.1200	2.0000	2.5305	1.8300	.2155	.1095	.7755
SULFATE,IC METHOD	MG/L	3.4500	4.5900	1.0265	5.8500	1.8700	23.150	5.7755
SULFATE NON IC METHODS	MG/L	3.4700	5.0400	20.080	5.5750	1.8200	22.050	5.6250
CHLORIDE IC	MG/L	1.4330	1.6680	.8950	.3860	.2005	.9200	.4800
CHLORIDE NON IC METHODS	MG/L	1.5000	1.8000	3.7650	.4400	.2115	.9290	.5110
Potassium	MG/L	.5000	.5000	.4100	.2850	.1730	.3225	.1900
Calcium	MG/L	13.500	2.5550	2.8010	6.7600	2.8700	8.8000	4.6000

		AUD-05A SAMPLE 8	GRM-07 SAMPLE 9	AUD-01A SAMPLE 10
Colour	HAZEN UNIT	4.0000	3.1700	2.0200
Specific Conductance	UMHO/CM	30.800	29.200	21.800
ACIDITY TO PH 8.3	MG/LCACO3	1.5100	1.5945	1.4300
pH	PH UNITS	6.7100	6.9950	6.2600
Diss Organic Carbon	MG C/L	2.6450	1.0500	2.2000
ALKALINITY-FIXED ENDPT. PH4.5	MG/L CACO3	4.8850	7.4100	2.8250
ALKALINITY-GRAN,INFLEC,EXTRAP	MG/L CACO3	3.2300	5.8000	1.0000
GRAN TITRA ALK	MG/LCAC03	3.3850	5.8100	1.0090
Diss Inorg Carbon	MG C/L	1.0150	1.6550	.5000
Nitrate + Nitrite	MG N/L	.0500	.5595	.0060
Nitrate-IC	mgN/L	.0490	.5360	.0030
Ammonia	MG N/L	.0171	.2900	.0170
Total Kjeldahl N	MG N/L	.1750	.4225	.1485
Sodium	MG/L	.9495	.2770	.6000
Magnesium	MG/L	.6875	1.0000	.4760
Aluminum	MG/L	.0100	.0550	.0125
REACTIVE SILICA	MG SI/L	.6500	.0800	.3400
SULFATE,IC METHOD	MG/L	6.8200	3.7460	5.9930
SULFATE NON IC METHODS	MG/L	6.6950	3.3750	6.1500
CHLORIDE IC	MG/L	1.0260	.4630	.5000
CHLORIDE NON IC METHODS	MG/L	1.0685	.4820	.5105
Potassium	MG/L	.4645	.1505	.2300
Calcium	MG/L	2.9200	2.6200	1.9500

TABLE 3

COMPARISON OF LABORATORY PERFORMANCE (STUDY 0037)
LRTAP

	BIAS				FLAGS		
LAB CODE	NO. OF PARAMETERS ANALYZED	NO. OF PARAMETERS BIASED	PERCENTAGE OF PARAMETERS BIASED (%)	NO. OF RESULTS RANKED	NO. OF FLAGS ASSIGNED	PERCENTAGE OF RESULTS FLAGGED (%)	SUM OF % BIAS AND % FLAGS SCORE
L002	16	2	12.50	143	19	13.29	25.79
L003	13	3	23.08	124	24	19.35	42.43
L004	13	4	30.77	128	20	15.63	46.39
L005	4	1	25.00	39	0	0.00	25.00
L006	17	4	23.53	170	16	9.41	32.94
L007	9	4	44.44	88	30	34.09	78.54
L008	12	5	41.67	120	50	41.67	83.33
L010	16	0	0.00	153	8	5.23	5.23
L011	9	0	0.00	86	6	6.98	6.98
L013	9	0	0.00	76	1	1.32	1.32
L014	12	2	16.67	120	23	19.17	35.83
L021	9	1	11.11	86	16	18.60	29.72
L023	17	2	11.76	141	15	10.64	22.40
L024	14	3	21.43	134	20	14.93	36.35
L029	14	4	28.57	137	31	22.63	51.20
L030	14	2	14.29	137	20	14.60	28.88
L031	18	4	22.22	174	24	13.79	36.02
L032	15	3	20.00	141	23	16.31	36.31
L033	14	4	28.57	119	12	10.08	38.66
L034	11	4	36.36	109	24	22.02	58.38
L047	5	3	60.00	41	34	82.93	142.93
L049	15	3	20.00	150	37	24.67	44.67
L057	9	6	66.67	88	36	40.91	107.58
L061	10	0	0.00	99	2	2.02	2.02
L063	16	1	6.25	158	17	10.76	17.01
L073	2	0	0.00	20	0	0.00	0.00
L078	2	1	50.00	20	1	5.00	55.00
L081	13	2	15.38	130	24	18.46	33.85
L082	16	4	25.00	156	34	21.79	46.79
L086	6	0	0.00	56	2	3.57	3.57
L088	12	4	33.33	118	21	17.80	51.13
L090	11	0	0.00	108	5	4.63	4.63
L091	15	2	13.33	146	7	4.79	18.13
L093	15	6	40.00	147	25	17.01	57.01
L094	16	2	12.50	160	33	20.62	33.12
L099	15	4	26.67	137	9	6.57	33.24
L102	14	3	21.43	132	18	13.64	35.06
L104	4	2	50.00	36	16	44.44	94.44
L109	9	0	0.00	88	1	1.14	1.14
L112	3	0	0.00	28	1	3.57	3.57
L114	7	1	14.29	61	18	29.51	43.79
L116	15	8	53.33	139	34	24.46	77.79
L119	7	0	0.00	64	1	1.56	1.56
L126	10	6	60.00	97	18	18.56	78.56
L128	18	7	38.89	167	47	28.14	67.03

THE FOLLOWING PARAMETERS WERE USED IN THE ANALYSIS

Cond	pH	DOC	ALKA-GR,IN	GRAN ALK	DIC
NO3 /2	NH3	TKN	Na	Mg	REAC SI
SO4 (NON-I	CL (NON-IC	K	Ca	NO3	SO4-IC
CL-IC	Al	ACIDITY	ALKA-FE. P	ACIDITY	

THE FOLLOWING PARAMETERS WERE EXCLUDED

Colour

TABLE 3A

COMPARISON OF LABORATORY PERFORMANCE (STUDY 0037)

LRTAP

	BIAS				FLAGS		
LAB CODE	NO. OF PARAMETERS ANALYZED	NO. OF PARAMETERS BIASED	PERCENTAGE OF PARAMETERS BIASED (%)	NO. OF RESULTS RANKED	NO. OF FLAGS ASSIGNED	PERCENTAGE OF RESULTS FLAGGED (%)	SUM OF % BIAS AND % FLAGS SCORE
L073	2	0	0.00	20	0	0.00	0.00
L109	9	0	0.00	88	1	1.14	1.14
L013	9	0	0.00	76	1	1.32	1.32
L119	7	0	0.00	64	1	1.56	1.56
L061	10	0	0.00	99	2	2.02	2.02
L086	6	0	0.00	56	2	3.57	3.57
L112	3	0	0.00	28	1	3.57	3.57
L090	11	0	0.00	108	5	4.63	4.63
L010	16	0	0.00	153	8	5.23	5.23
L011	9	0	0.00	86	6	6.98	6.98
L063	16	1	6.25	158	17	10.76	17.01
L091	15	2	13.33	146	7	4.79	18.13
L023	17	2	11.76	141	15	10.64	22.40
L005	4	1	25.00	39	0	0.00	25.00
L002	16	2	12.50	143	19	13.29	25.79
L030	14	2	14.29	137	20	14.60	28.88
L021	9	1	11.11	86	16	18.60	29.72
L006	17	4	23.53	170	16	9.41	32.94
L094	16	2	12.50	160	33	20.62	33.12
L099	15	4	26.67	137	9	6.57	33.24
L081	13	2	15.38	130	24	18.46	33.85
L102	14	3	21.43	132	18	13.64	35.06
L014	12	2	16.67	120	23	19.17	35.83
L031	18	4	22.22	174	24	13.79	36.02
L032	15	3	20.00	141	23	16.31	36.31
L024	14	3	21.43	134	20	14.93	36.35
L033	14	4	28.57	119	12	10.08	38.66
L003	13	3	23.08	124	24	19.35	42.43
L114	7	1	14.29	61	18	29.51	43.79
L049	15	3	20.00	150	37	24.67	44.67
L004	13	4	30.77	128	20	15.63	46.39
L082	16	4	25.00	156	34	21.79	46.79
L088	12	4	33.33	118	21	17.80	51.13
L029	14	4	28.57	137	31	22.63	51.20
L078	2	1	50.00	20	1	5.00	55.00
L093	15	6	40.00	147	25	17.01	57.01
L034	11	4	36.36	109	24	22.02	58.38
L128	18	7	38.89	167	47	28.14	67.03
L116	15	8	53.33	139	34	24.46	77.79
L007	9	4	44.44	88	30	34.09	78.54
L126	10	6	60.00	97	18	18.56	78.56
L008	12	5	41.67	120	50	41.67	83.33
L104	4	2	50.00	36	16	44.44	94.44
L057	9	6	66.67	88	36	40.91	107.58
L047	5	3	60.00	41	34	82.93	142.93

THE FOLLOWING PARAMETERS WERE USED IN THE ANALYSIS

Cond	pH	DOC	ALKA-GR,IN	GRAN ALK	DIC
NO3 /2	NH3	TKN	Na	Mg	REAC SI
SO4 (NON-I	CL (NON-IC	K	Ca	NO3	SO4-IC
CL-IC	Al	ACIDITY	ALKA-FE. P	ACIDITY	

THE FOLLOWING PARAMETERS WERE EXCLUDED

Colour

TABLE 4

SUMMARY OF STUDY TO STUDY PERFORMANCE

LAB CODE	%BIAS AND %FLAGS ON STUDIES															MEDIAN SCORE	COMMENTS
	0023	0024	0025	0026	0027	0028	0029	0030	0031	0032	0033	0034	0035	0036	0037		
L002	10.3	9.5	5.0	2.5	5.2	2.6	2.6	24.8	39.3	32.2	30.4	20.6	31.8	51.7	25.8	20.6	SATISFACTORY
L003	4.5	21.4	19.4	25.0	40.1	20.2	36.7	-	57.4	54.5	64.9	27.4	77.8	48.8	42.4	38.4	MODERATE
L004	50.3	-	71.4	57.1	12.0	30.1	10.7	16.0	23.4	8.7	13.1	30.1	-	-	46.4	26.7	MODERATE
L005	22.0	33.3	15.5	30.6	32.5	11.1	10.2	3.4	10.6	6.5	15.6	32.4	33.3	27.7	25.0	22.0	SATISFACTORY
L006	27.1	13.1	46.5	30.0	44.1	47.1	25.9	28.8	24.7	14.1	15.6	27.2	12.8	26.5	32.9	27.1	MODERATE
L007	-	43.1	36.8	30.8	43.4	45.8	94.0	78.2	64.9	-	50.5	68.4	75.8	63.0	78.5	63.0	POOR
L008	-	-	106.9	81.1	91.0	-	131.8	118.2	67.5	96.9	100.8	147.5	-	92.7	83.3	96.9	POOR
L010	60.0	34.2	82.0	116.4	63.1	42.7	62.5	59.2	54.6	58.5	43.2	32.3	41.5	21.5	5.2	54.6	MODERATE
L011	12.0	69.2	33.0	32.1	21.4	48.7	15.4	40.8	31.1	21.0	24.3	24.6	39.3	21.8	7.0	24.6	SATISFACTORY
L013	1.9	3.6	4.0	3.6	20.4	5.7	7.5	31.5	3.8	1.9	3.6	7.0	1.9	47.9	1.3	3.8	SATISFACTORY, WELL DONE
L013C	-	-	-	-	-	-	-	-	-	48.4	7.9	3.9	15.1	3.9	-	7.9	SATISFACTORY, WELL DONE
L014	-	-	-	-	66.9	68.1	36.9	-	16.9	60.0	45.6	61.2	21.7	47.5	35.8	46.6	MODERATE
L021	16.2	13.1	10.3	16.2	64.2	37.2	15.3	33.7	25.8	53.4	33.7	10.3	32.8	47.3	29.7	29.7	MODERATE
L022	13.5	41.0	-	35.7	-	30.3	6.3	-	-	55.0	31.7	-	-	-	-	31.7	MODERATE
L023	29.6	82.5	73.3	53.0	49.1	36.0	46.1	44.4	55.8	29.5	25.0	51.6	40.8	25.4	22.4	44.4	MODERATE
L024	20.7	16.7	49.3	36.0	29.3	22.7	22.8	24.1	17.6	6.0	26.1	4.3	26.1	29.4	36.4	24.1	SATISFACTORY
L025	27.0	14.0	30.0	23.2	14.9	31.4	24.8	24.7	29.2	38.4	7.4	26.2	23.4	30.4	-	25.5	MODERATE
L029	46.8	31.0	-	-	33.8	42.2	-	60.8	30.9	26.9	14.0	35.6	38.2	17.0	51.2	34.7	MODERATE
L030	22.2	13.4	69.1	31.0	3.4	13.3	3.8	2.6	56.7	1.3	0.0	22.5	21.4	32.1	28.9	21.4	SATISFACTORY
L031	34.7	18.8	15.0	42.9	-	23.9	34.4	35.0	23.3	23.9	22.2	35.7	62.2	41.7	36.0	34.6	MODERATE
L032	63.3	-	67.9	102.2	57.5	44.5	25.5	-	50.9	37.7	25.7	41.7	66.3	17.9	39.0	44.5	MODERATE
L033	28.9	7.5	15.2	9.1	25.4	50.9	56.6	37.8	20.3	15.7	4.3	38.3	23.4	37.8	38.7	25.4	MODERATE
L034	12.4	2.2	61.4	27.0	24.6	70.9	25.8	63.0	41.6	25.7	20.5	77.0	61.0	47.5	58.4	41.6	MODERATE
L047	94.0	84.6	-	107.8	-	98.5	139.9	84.3	-	-	-	96.1	98.5	138.4	142.9	98.5	POOR
L048	12.4	-	33.5	3.9	50.8	56.2	16.2	21.2	27.7	67.1	107.9	53.9	-	-	-	33.5	MODERATE
L049	90.1	45.9	110.3	37.2	92.8	36.1	62.4	77.0	58.3	85.3	45.0	34.6	44.4	92.5	44.7	58.3	MODERATE
L057	29.0	25.0	63.7	-	54.0	12.5	37.2	83.5	17.8	36.7	70.0	84.2	127.8	63.7	107.6	58.8	MODERATE
L061	0.0	10.0	2.0	12.1	20.4	2.2	13.2	17.4	2.1	1.0	1.0	3.1	2.1	3.1	2.0	2.2	SATISFACTORY, WELL DONE
L063	12.3	30.1	23.4	38.3	10.8	17.4	41.8	30.2	31.5	25.0	22.6	40.6	26.1	41.7	17.0	26.1	MODERATE
L073	10.0	0.0	18.6	1.0	5.8	0.0	0.0	2.2	0.0	-	0.0	-	11.1	4.4	0.0	1.0	SATISFACTORY, WELL DONE
L078	0.0	0.0	55.0	5.0	0.0	5.0	5.0	0.0	10.0	20.0	0.0	10.0	0.0	50.0	55.0	5.0	SATISFACTORY, WELL DONE
L081	31.6	48.4	5.7	4.4	3.4	29.2	4.2	36.7	19.2	33.8	23.7	3.8	23.1	25.0	33.8	23.7	SATISFACTORY
L082	42.9	21.9	54.1	67.0	38.5	36.7	24.7	24.0	15.4	35.4	37.9	6.9	27.2	25.4	46.8	35.4	MODERATE
L083	-	-	-	-	-	-	-	-	96.6	89.7	92.3	-	-	-	-	92.3	POOR
L086	-	56.3	9.7	47.9	25.8	39.7	52.8	33.6	33.2	34.9	25.2	31.0	1.8	19.0	3.6	32.1	MODERATE
L088	2.7	3.4	42.3	31.3	29.3	30.8	27.3	35.9	82.5	70.0	17.3	-	61.5	47.7	51.1	33.6	MODERATE
L090	4.2	-	42.7	26.8	40.0	25.8	25.8	11.7	7.5	44.5	29.1	33.6	9.3	15.5	4.6	25.8	MODERATE
L091	37.6	28.9	31.6	39.1	35.1	38.0	13.6	1.4	16.6	24.9	19.5	28.9	9.5	20.7	18.1	24.9	SATISFACTORY
L092	40.0	32.8	29.9	48.0	58.8	52.5	60.3	75.9	-	-	-	-	-	-	-	50.2	MODERATE
L093	40.7	36.4	25.3	-	-	-	-	-	73.8	53.8	54.0	27.4	38.7	33.3	57.0	39.7	MODERATE
L094	24.7	55.7	40.9	44.5	29.3	55.6	58.7	84.4	53.3	74.0	70.0	37.7	52.1	37.0	33.1	52.1	MODERATE
L095	23.0	34.5	-	13.0	26.4	32.5	12.6	26.2	45.3	74.0	36.6	-	-	-	-	29.4	MODERATE
L096	61.2	-	65.0	78.0	67.5	95.8	113.3	112.2	87.8	175.0	170.0	-	-	-	-	91.8	POOR
L097	-	-	-	-	83.0	-	70.6	-	48.9	-	-	-	-	-	-	70.6	POOR
L099	-	-	-	-	-	-	-	-	25.7	33.0	29.4	19.1	73.5	65.4	33.2	33.0	MODERATE
L102	27.7	39.5	25.8	15.4	43.6	33.2	30.8	43.6	23.8	29.0	13.3	28.1	40.7	25.6	35.1	29.0	MODERATE
L104	0.0	0.0	20.8	12.5	3.6	36.1	0.0	25.0	0.0	102.8	132.1	0.0	0.0	91.0	94.4	12.5	SATISFACTORY
L105	49.5	70.2	58.8	49.4	79.2	75.7	38.1	53.2	65.6	47.5	96.0	53.6	-	-	-	56.2	MODERATE
L108	-	63.0	68.4	52.5	64.0	-	63.7	39.4	28.6	49.0	-	51.5	-	-	-	52.5	MODERATE
L109	-	0.0	1.0	1.1	3.2	11.8	3.2	4.2	10.0	4.4	5.0	5.1	12.3	20.2	1.1	4.3	SATISFACTORY, WELL DONE
L112	-	-	57.3	10.0	13.3	20.0	13.3	26.7	26.7	0.0	13.3	21.4	70.0	13.8	3.6	13.8	SATISFACTORY
L113	-	-	90.4	105.3	74.3	47.1	67.9	93.8	53.4	-	-	-	-	-	-	74.3	POOR
L114	-	-	-	76.0	46.7	91.1	10.0	54.0	85.0	76.4	54.3	66.1	42.0	61.3	43.8	57.8	MODERATE
L116	-	-	-	-	-	43.3	16.7	3.1	16.4	78.2	-	42.6	41.6	40.0	77.8	41.6	MODERATE
L118	-	-	-	-	-	12.9	56.0	77.8	51.6	86.1	48.6	-	-	-	-	53.8	MODERATE
L119	-	-	-	-	-	-	35.9	39.7	33.9	13.2	-	21.5	32.9	25.1	1.6	29.0	MODERATE
L120	-	-	-	-	-	66.8	33.3	81.7	46.7	57.0	42.4	-	-	-	-	51.9	MODERATE
L121	-	-	-	-	-	-	42.9	48.0	-	-	-	38.9	-	26.7	-	40.9	MODERATE
L122	-	-	-	-	-	-	-	105.5	49.2	-	86.1	38.0	29.8	70.9	-	60.0	POOR
L123	-	-	-	-	-	-	-	-	93.0	110.0	101.5	-	-	-	-	101.5	POOR
L126	-	-	-	-	-	-	-	-	-	-	-	20.0	17.8	27.5	78.6	23.7	SATISFACTORY
L127	-	-	-	-	-	-	-	-	-	42.7	26.2	22.4	19.8	-	-	24.3	SATISFACTORY
L128	-	-	-	-	-	-	-	-	-	-	-	64.8	48.0	60.9	67.0	62.8	POOR
L131	-	-	-	-	-	-	-	-	-	-	-	-	-	16.7	-	-	-
INTERLAB MEDIAN	22.2	22.3	36.4	32.1	32.5	33.2	27.3	35.9	30.9	38.4	26.2	31.0	32.9	32.1	35.8		

THE FOLLOWING CODES WERE EXCLUDED
00292 01089 16092 17092 56091 09092 20292 01091 06192

CODES INCLUDED FOR STUDY 0023
00392 01092 06002 06194 07092 07192 11091 12091 14092 16001
17001 19091 20091 16000 17000 06282 06193 06592 13091 01090
07392

CODES INCLUDED FOR STUDY 0024
00392 01092 06002 06282 07092 07192 07392 11091 12091 14092
16001 17001 19091 20091 16000 17000 06193 06592 06194 01090

CODES INCLUDED FOR STUDY 0025
00392 01092 06194 06282 07092 07192 07392 11091 12091 14092
16001 17001 19091 20091 16000 17000 06193 06002 06592 13091
01090

CODES INCLUDED FOR STUDY 0026
06194 06282 11091 12091 14092 16001 17001 19091 20091 01092
07092 07192 16000 17000 00392 06002 06592 06193 13091 01090
07392

CODES INCLUDED FOR STUDY 0027
06194 06282 11091 12091 14092 16001 17001 19091 20091 01092
07092 07192 16000 17000 00392 06002 06193 06592 13091 01090
07392

CODES INCLUDED FOR STUDY 0028
06194 06282 11091 12091 14092 16001 17001 19091 20091 01092
07093 07192 16000 17000 00392 06002 06592 06193 07092 13091
01090 07392

CODES INCLUDED FOR STUDY 0029
06194 06282 11091 12091 14092 16001 17001 19091 20091 01092
07093 07192 16000 17000 00392 06002 06592 06193 07092 13091
01090 07392

CODES INCLUDED FOR STUDY 0030
00392 01092 06194 06282 07092 07192 11091 12091 14092 16001
17001 19091 20091 07093 16000 17000 06002 06193 06592 13091
01090 07392

CODES INCLUDED FOR STUDY 0031
00392 01092 06002 06193 06282 07092 07192 07392 11091 12091
14092 16001 17001 19091 20091 07093 16000 17000 06592 06194
13091 01090

CODES INCLUDED FOR STUDY 0032
00392 01092 06002 06194 07092 07192 07392 11091 12091 14092
16001 17001 19091 20091 07093 16000 17000 06282 06592 06193
13091 01090

CODES INCLUDED FOR STUDY 0033
00392 01092 06002 06194 06282 06592 07092 07192 07392 11091
12091 14092 16001 17001 19091 20091 07093 16000 17000 06193
13091 01090 07492

CODES INCLUDED FOR STUDY 0034
00392 01092 06002 06194 06282 07092 07192 07392 11091 12091
14092 16001 17001 19091 20091 07093 16000 17000 06193 06592
13091 01090

CODES INCLUDED FOR STUDY 0035
00392 01092 06002 06194 06282 06592 07092 07192 07392 11091
12091 14092 16001 17001 19091 20091 07093 16000 17000 13091
01090 06193

CODES INCLUDED FOR STUDY 0036
00392 01092 06002 06194 06282 06592 07092 07192 07392 11091
12091 14092 16001 17001 19091 20091 16000 17000 13091 07093
01090 06193

CODES INCLUDED FOR STUDY 0037
00392 01092 06002 06194 06282 06592 07092 07192 07392 11091
12091 14092 16001 17001 19091 20091 07093 16000 17000 13091
01090 06193

STUDY DATES: 0023(16-JAN-90),0024(16-MAY-90),0025(21-SEP-90),0026(21-JAN-91),0027(21-MAY-91),0028(12-DEC-91),
0029(18-FEB-92),0030(13-MAY-92),0031(21-SEP-92),0032(28-JAN-93),0033(19-MAY-93),0034(19-SEP-93),
0035(21-JAN-94),0036(10-MAY-94),0037(20-SEP-94),

TABLE 5

COMPARISON OF INTERLABORATORY MEDIAN VALUES BETWEEN STUDIES

PARAMETER		PREVIOUS DATA (STUDY NO./SAMPLE NUMBER)				
		LRTAP	SUPER-01			
	STUDY NO. / SAMPLE NO.	0033 / 7	0035 / 7	0037 / 1	AVG. MED.	STD. DEV.
Colour	HAZEN UNIT	2.240	2.200	1.640	2.027	.3355
Specific Conductance	UMHO/CM	96.900	95.950	97.000	96.617	.5795
ACIDITY TO PH 8.3	MG/LCACO3	1.500	1.190	1.400	1.363	.1582
pH	PH UNITS	7.800	7.770	7.800	7.790	.0173
Diss Organic Carbon	MG C/L	1.800	2.005	1.900	1.902	.1025
ALKALINITY-FIXED ENDPT. PH4.5	MG/L CACO3	42.500	42.500	42.900	42.633	.2309
ALKALINITY-GRAN, INFLEC, EXTRAP	MG/L CACO3	41.685	41.000	41.890	41.525	.4661
GRAN TITRA ALK	MG/LCAC03	41.350	41.800	42.110	41.753	.3821
Diss Inorg Carbon	MG C/L	10.000	10.195	10.260	10.152	.1353
Nitrate + Nitrite	MG N/L	.325	.320	.309	.318	.0082
Nitrate-IC	mgN/L	.320	.313	.290	.308	.0157
Ammonia	MG N/L	.005	.002	.005	.004	.0017
Total Kjeldahl N	MG N/L	.102	.081	.100	.094	.0116
Sodium	MG/L	1.350	1.376	1.370	1.365	.0136
Magnesium	MG/L	2.780	2.792	2.803	2.792	.0118
Aluminum	MG/L	.006	.005	.007	.006	.0009
REACTIVE SILICA	MG SI/L	1.100	1.130	1.120	1.117	.0153
SULFATE, IC METHOD	MG/L	3.480	3.500	3.450	3.477	.0252
SULFATE NON IC METHODS	MG/L	3.400	3.497	3.470	3.456	.0501
CHLORIDE IC	MG/L	1.428	1.417	1.433	1.426	.0081
CHLORIDE NON IC METHODS	MG/L	1.400	1.500	1.500	1.467	.0577
Potassium	MG/L	.502	.505	.500	.502	.0025
Calcium	MG/L	13.200	13.400	13.500	13.367	.1528

DATES: 0033(19-MAY-93), 0035(21-JAN-94), 0037(20-SEP-94),

TABLE 5A

COMPARISON OF INTERLABORATORY MEDIAN VALUES BETWEEN STUDIES

PARAMETER		PREVIOUS DATA (STUDY NO./SAMPLE NUMBER)						
				LRTAP	TRKY-84			
	STUDY NO.	0025	0026	0027	0031	0034	0037	AVG.
	SAMPLE NO.	8	2	10	7	5	4	MED.
Colour	HAZEN UNIT	7.720	6.200	7.000	6.000	6.150	5.250	6.387
Specific Conductance	UMHO/CM	45.000	45.500	45.800	46.000	46.900	46.530	45.955
GRAN ACIDITY	MG/LCACO3	.430	0.000	0.000	-	-	-	.143
ACIDITY TO PH 8.3	MG/LCACO3	1.900	1.820	1.580	1.760	1.710	1.440	1.702
pH	PH UNITS	7.160	7.149	7.300	7.320	7.355	7.275	7.260
Diss Organic Carbon	MG C/L	2.500	2.400	2.360	2.200	2.265	2.450	2.362
ALKALINITY-FIXED ENDPT. PH4.5	MG/L CACO3	14.565	14.900	15.000	14.960	15.200	15.425	15.008
ALKALINITY-GRAN,INFLEC,EXTRAP	MG/L CACO3	13.400	13.780	13.590	13.500	13.850	13.610	13.622
GRAN TITRA ALK	MG/LCACO3	13.395	13.780	13.700	13.600	13.850	14.100	13.737
Diss Inorg Carbon	MG C/L	3.340	3.300	3.400	3.485	3.475	3.605	3.434
Nitrate + Nitrite	MG N/L	.103	.103	.110	.140	.143	.138	.123
Nitrate-IC	mgN/L	-	-	-	.140	.140	.140	.140
Ammonia	MG N/L	.049	.052	.051	.058	.085	.100	.066
Total Kjeldahl N	MG N/L	.197	.200	.205	.184	.213	.224	.204
Sodium	MG/L	.800	.814	.808	.820	.820	.823	.814
Magnesium	MG/L	.610	.620	.620	.626	.630	.631	.623
Aluminum	MG/L	.017	.007	.009	.010	.006	.011	.010
REACTIVE SILICA	MG SI/L	1.815	1.800	1.800	1.800	1.800	1.830	1.807
SULFATE,IC METHOD	MG/L	5.780	5.735	5.755	5.830	5.830	5.850	5.797
SULFATE NON IC METHODS	MG/L	5.825	6.000	5.925	6.070	5.720	5.575	5.852
CHLORIDE IC	MG/L	.390	.390	.378	.380	.397	.386	.387
CHLORIDE NON IC METHODS	MG/L	.482	.400	.455	.400	.390	.440	.428
Potassium	MG/L	.280	.280	.287	.290	.295	.285	.286
Calcium	MG/L	6.525	6.480	6.530	6.605	6.625	6.760	6.587

		STD. DEV.
Colour	HAZEN UNIT	.8586
Specific Conductance	UMHO/CM	.6883
GRAN ACIDITY	MG/LCACO3	.2483
ACIDITY TO PH 8.3	MG/LCACO3	.1674
pH	PH UNITS	.0858
Diss Organic Carbon	MG C/L	.1130
ALKALINITY-FIXED ENDPT. PH4.5	MG/L CACO3	.2902
ALKALINITY-GRAN,INFLEC,EXTRAP	MG/L CACO3	.1687
GRAN TITRA ALK	MG/LCACO3	.2381
Diss Inorg Carbon	MG C/L	.1109
Nitrate + Nitrite	MG N/L	.0194
Nitrate-IC	mgN/L	0.0000
Ammonia	MG N/L	.0214
Total Kjeldahl N	MG N/L	.0137
Sodium	MG/L	.0089
Magnesium	MG/L	.0080
Aluminum	MG/L	.0039
REACTIVE SILICA	MG SI/L	.0125
SULFATE,IC METHOD	MG/L	.0467
SULFATE NON IC METHODS	MG/L	.1842
CHLORIDE IC	MG/L	.0071
CHLORIDE NON IC METHODS	MG/L	.0369
Potassium	MG/L	.0058
Calcium	MG/L	.1002

DATES: 0025(21-SEP-90), 0026(21-JAN-91), 0027(21-MAY-91), 0031(21-SEP-92), 0034(19-SEP-93), 0037(20-SEP-94),

NATIONAL WATER RESEARCH INSTITUTE
Burlington, Ontario

LRTAP INTERLABORATORY STUDIES PROGRAM
LIST OF PARTICIPANTS
STUDY L37

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Appendix A
Glossary of Terms

GLOSSARY OF TERMS USED IN THE

EVALUATION OF INTERLABORATORY RESULTS

Satisfactory: Quite acceptable, "good results".
Erratic: A set of results for a given characteristic is deemed erratic when both high and low flags are assigned.
Out of Control: An analytical system is said to be out of control when it has demonstrated the ability to perform adequately and produces an extreme result or results. For an example, consider this set of results obtained by laboratory #3 on total phosphorus for Study #24.

Sample No.	Report Value	Median	Difference
1	9	9.5	-0.5
2	5	4.5	0.5
3	2T	3	-1
4	8	8	0
5	2T	2.5	-0.5
6	9	8	1
7	28	28	0
8	18	17	1
9	23	23.7	-0.7
10	16	15	1
11	35	35.8	-0.8
12	75	78.7	-3.8
13	58	59	-1
14	110	90	20

Given the excellent results obtained on samples 1 through 13, the result on sample 14 indicates that the analytical system was out of control.

Bias: A set of results is said to be biased when the set exhibits a tendency to be either higher or lower than some standard- the standard which has been used in the analysis of our studies thus far has been the performance of all other participating laboratories. The ranking procedure employed in testing for bias is described in W.J. Youden's paper, "Ranking Laboratories by Round-Robin Tests" from $Precision Measurement and Calibration$, H.H. Ku, Editor, NBS Special Publication 300-Volume 1, U.S. Government Printing Office, Washington, D.C., 1969. In this paper, Youden established the rationale for evaluating laboratories' performance by ranking results. In our use of the procedure there is about 1 chance in 20 of deeming a set of results biased when in fact it is not, that is, =0.05

W: A "W" code is used with a reported result when no measurement was possible due to no response of the instrument to the sample. The "W" is preceded by the smallest determinative division that can be used in the units used in reporting.

T: The "T" code is used with values between the Criterion of Detection and the "W" value. The Criterion of Detection is commonly thought of by many as the limit of detection.

Lower Limit for Use of Basic Acceptable Error, Basic Acceptable Error, and Concentration Error Increment:

These terms define the acceptable differences from median of results (target value) that is allowed without a result being flagged either low or high. For a sample whose target value is at or below the lower limit for use of basic acceptable error, the basic acceptable is used to determine the range of acceptable deviations.

For example: Suppose that the lower limit for use of basic acceptable error has been set a 10 ug/L and the basic acceptable error is 1.0 ug/L, if a target (median) value for a sample is 5 ug/L, then any reported result within the range 5+ 1.0 or 4.0 to 6.0 ug/L would be considered acceptable.

Since for almost all substances it appears that the variability of results increases in concentration, an allowance is made for the increased variability for those samples whose

target values are above the lower limit for use of basic acceptable error. The allowance is added to the basic acceptable error, and it is calculated by multiplying the $concentration error increment$ by the difference between the target value and the lower limit for use of basic acceptable error.

For example: If a target value for a sample is 21 ug/L, and the lower limit for use of basic accepteble error is 10 ug/L, the difference between them is 21-10=11 ug/L. Multiplying the difference by the concentration increment, 11 ug/L x 0.10, gives 1.1 ug/L to determine the acceptable difference 21.0 +2.1 or 18.9 to 23.1 ug/L would be considered acceptable and would not be flagged.

In general, the values chosen for the basic acceptable error and the concentration error increment are selected so than several of the participating laboratories will have demonstrated the ability to do the analyses satisfactorily. In a sense these values represent state of the art for analysis of the Round-Robin samples.

Flag: A result is flagged H high when its value is greater than the median (target) value plus the acceptable difference but not greater than the median plus 1.5 times; a result greater then 1.5 times the acceptable difference is flagged with VH (very high). Similarly, a result less than the median minus 1.5 times the acceptable difference is flagged L (low). A lower result is flagged VL (very low).

Acceptable Difference of Acceptable Deviation: The absolute values of the maximun difference between a result and the target value which will not be flagged.

APPENDIX A: GLOSSARY OF TERMS

Reference: 1983 ASTM Volume 11.01 water 1, Section II,pg D4210-83

Appendix 1
Laboratory Data

RESULTS REPORTED-INTERLABORATORY STUDY L-37

CONSTITUENT	Page No.
Colour	1
Specific Conductance	3
Gran Acidity	7
Acidity to pH 8.3	8
pH	9
Dissolved Organic Carbon	13
Alkalinity to fixed end point pH 4.5	16
Alkalinity (gran, extrapolation, inflection)	18
Alkalinity (gran)	20
Dissolved Inorganic Carbon	22
Nitrate + Nitrite	24
Nitrate I.C.	27
Ammonia	30
TKN	34
Sodium	36
Magnesium	40
Aluminum	43
Reactive Silica	46
Sulphate (IC method)	49
Suphate (non-IC methods)	52
Chloride (IC method)	53
Chloride (non-IC methods)	56
Potassium	58
Calcium	61

LAB NO.	TOTAL RANK	AVERAGE RANK	NO.OF SAMPLES RANKED	SUMMARY OF FLAGGING	BIAS STATEMENT	METHOD CODING
L002	18.50	9.250	2		INSUFFICIENT DATA	
L003	5.50	2.750	2		INSUFFICIENT DATA	02011
L005	14.50	4.833	3		INSUFFICIENT DATA	02021
L011	37.00	4.625	8	EH	INSUFFICIENT DATA	VISUAL COMP
L023	6.50	3.250	2	L		TRUE COLOUR
L024	54.50	5.450	10			COLOURIMETRY
L030	80.00	8.000	10	VH	BIASED LOW	
L047	59.50	5.950	10			AA
L057	39.00	3.900	10		BIASED LOW	HELLIGE
L063	82.00	8.200	10			SPEC
L086	61.50	8.786	7		INSUFFICIENT DATA	METER
L091	82.00	8.200	10			
L099	10.00	1.000	10	VL VL VLL L		
L112	78.00	7.800	10			
L128	19.50	6.500	3			
OVERALL AVERAGE RANK IS		6.056				

LAB NO.	TOTAL RANK	AVERAGE RANK	NO.OF SAMPLES RANKED	SUMMARY OF FLAGGING	BIAS STATEMENT	METHOD CODING
L099	10.00	1.000	10	VLVLVLLL	BIASED LOW	HELLIGE
L003	5.50	2.750	2		INSUFFICIENT DATA	02011
L023	6.50	3.250	2	L	INSUFFICIENT DATA	VISUAL COMP
L057	39.00	3.900	10		BIASED LOW	
L011	37.00	4.625	8	EH	INSUFFICIENT DATA	02021
L005	14.50	4.833	3			TRUE COLOUR
L024	54.50	5.450	10		INSUFFICIENT DATA	METER
L047	59.50	5.950	10			SPEC
L128	19.50	6.500	3			COLOURIMETRY
L112	78.00	7.800	10			
L030	80.00	8.000	10	VH		AA
L091	82.00	8.200	10		INSUFFICIENT DATA	
L063	82.00	8.200	10			
L086	61.50	8.786	7			
L002	18.50	9.250	2			
OVERALL AVERAGE RANK IS		6.056				

Colour

PARAMETER: 00292 Colour HAZEN UNIT

AQUATIC ECOSYSTEM PROTECTION BRANCH
NATIONAL WATER RESEARCH INSTITUTE
BURLINGTON ONTARIO

LRTAP STUDY NO. 37 MAJOR IONS IN WATER

LOWER LIMIT FOR USE OF BASIC ACCEPTABLE ERROR= 5.0000 BASIC ACCEPTABLE ERROR= 3.0000 CONCENTRATION ERROR INCREMENT= .2000

SAMPLE	1		2		3		4		5		6	
LAB NO	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK
L002	<5.	0.00	40.	10.50	615.	8.00	<5.	0.00	<5.	0.00	<5.	0.00
L003		0.00	30.	3.50	560.	2.00	<5.	0.00	<5.	0.00	<5.	0.00
L005	5.W	0.00	35.	5.50	600.	4.50	5.	4.50	5.W	0.00	5.W	0.00
L011	25. EH	9.00	30.	3.50	600.	4.50	2.5W	0.00	2.5W	0.00	2.5	5.00
L023	5.W	0.00	25. L	2.00	>50.	0.00	5.	4.50	5.W	0.00	5.W	0.00
L024	1.4T	3.00	41.	12.00	690.	11.00	5.8	8.00	1.9T	2.00	1.4T	2.00
L030	2.0	6.50	37.0	8.00	836. VH	14.00	6.6	10.00	2.6	5.00	2.6	6.00
L047	3.0T	8.00	36.	7.00	602.	7.00	3.0T	2.00	3.0T	7.00	3.0T	8.50
L057	1.T	2.00	35.	5.50	600.	4.50	5.	4.50	2.T	3.00	2.T	4.00
L063	1.5	4.00	45.0	15.00	639.	10.00	5.5	7.00	3.5	9.00	2.7	7.00
L086	3.0W	0.00	39.0	9.00	635.	9.00	7.0	11.00	3.0	7.00	3.0W	0.00
L091	2.	6.50	42.	14.00	717.	13.00	6.	9.00	3.	7.00	3.	8.50
L099	0.00	1.00	20. VL	1.00	500.	1.00	0.00 VL	1.00	0.00	1.00	0.00	1.00
L112	1.64	5.00	41.8	13.00	698.	12.00	7.09	12.00	2.40	4.00	1.45	3.00
L128	5.0W	0.00	40.0	10.50	600.	4.50	5.0	4.50	5.0W	0.00	5.0W	0.00
MEDIAN CONC.	1.6400		37.0000		608.5000		5.2500		2.6000		2.5000	

SAMPLE	7		8		9		10	
LAB NO	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK
L002	<5.	0.00	<5.	0.00	<5.	0.00	<5.	0.00
L003	<5.	0.00	<5.	0.00	<5.	0.00	<5.	0.00
L005	5.W	0.00	5.W	0.00	5.W	0.00	5.W	0.00
L011	2.5	2.00	2.5	3.00	2.5	3.00	2.5	7.00
L023	5.W	0.00	5.W	0.00	5.W	0.00	5.W	0.00
L024	4.3	4.00	4.0	5.50	2.6	4.00	1.4T	3.00
L030	5.0	7.50	5.6	10.00	3.8	7.00	2.2	6.00
L047	3.0T	3.00	3.0T	4.00	3.0T	5.00	3.0T	8.00
L057	5.	7.50	2.T	2.00	2.T	2.00	2.T	4.00
L063	4.5	5.00	4.5	7.00	4.0	9.00	3.5	9.00
L086	5.00	7.50	5.0	9.00	4.0	9.00	3.0W	0.00
L091	5.	7.50	4.	5.50	4.	9.00	1.	2.00
L099	0.00 VL	1.00	0.00 L	1.00	0.00 L	1.00	0.00	1.00
L112	5.40	10.00	4.84	8.00	3.34	6.00	2.02	5.00
L128	5.0W	0.00	5.0W	0.00	5.0W	0.00	5.0W	0.00
MEDIAN CONC.	4.7500		4.0000		3.1700		2.0200	

LRTAP STUDY 0037 DATA SUMMARY

PARAMETER: 00392 Specific Conductance UMHO/CM

AQUATIC ECOSYSTEM PROTECTION BRANCH
NATIONAL WATER RESEARCH INSTITUTE
BURLINGTON ONTARIO

LRTAP STUDY NO. 37 MAJOR IONS IN WATER

LOWER LIMIT FOR USE OF BASIC ACCEPTABLE ERROR=10.0000 BASIC ACCEPTABLE ERROR= 1.4000 CONCENTRATION ERROR INCREMENT= .0215

SAMPLE	1		2		3		4		5		6	
LAB NO	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK
L002	97.4	25.50	33.4	38.00	46.6	21.00	46.8	23.50	23.3	32.50	120.	33.50
L003	96.	14.50	32.	17.00	47.	24.00	46.	12.00	23.	27.00	118.	21.00
L004	94.1	7.00	31.4	9.50	47.8	33.50	46.3	15.00	22.6	17.50	121.5	38.00
L005	98.0	31.00	32.2	22.00	47.6	30.00	47.0	27.50	22.7	19.50	119.9	31.50
L006	94.9	10.00	32.2	22.00	47.4	27.00	46.6	22.00	23.0	27.00	116.1	12.50
L007	94.8	9.00	31.8	12.50	45.9	9.00	46.0	12.00	22.5	14.50	116.1	12.50
L008	83.8 EL	1.00	27.4 EL	1.00	40.6 EL	1.00	40.3 EL	1.00	19.7 VL	1.00	103.5 EL	2.00
L010	97.2	22.50	33.0	34.00	47.5	28.50	47.9	37.00	23.8	37.50	117.	15.50
L011	96.1	16.00	31.7	11.00	44.5	6.00	45.3	8.00	22.9	23.00	115.	8.50
L014	97.	20.50	32.	17.00	46.	11.50	47.	27.50	23.	27.00	116.	10.50
L021	97.6	28.00	32.0	17.00	47.0	24.00	47.0	27.50	22.8	21.00	119.9	31.50
L023	97.4	25.50	32.2	22.00	47.7	31.50	46.3	15.00	22.3	11.00	123. H	39.00
L024	92. VL	4.00	31.	8.00	46.	11.50	45.	4.00	22.	8.50	112. VL	4.50
L029	97.9	29.50	32.2	22.00	46.8	22.00	47.0	27.50	22.9	23.00	117.0	15.50
L030	100.	37.00	32.5	29.00	42.3 VL	4.00	46.9	25.00	23.1	30.50	114. L	6.00
L031	97.	20.50	30.9	6.50	46.3	17.00	46.0	12.00	21.5	5.00	119.	28.00
L032	99.3	34.00	33.0	34.00	47.8	33.50	47.5	32.00	23.8	37.50	120.	33.50
L033	99.5	35.00	32.4	26.50	48.5	38.00	47.1	30.00	23.0	27.00	121.1	37.00
L034	96.	14.50	33.	34.00	46.	11.50	48.	38.00	24.	39.00	116.	10.50
L047	116. EH	41.00	38. EH	41.00	53. EH	41.00	54. EH	41.00	26. VH	41.00	134. EH	41.00
L049	86.7 EL	2.00	29.5 L	3.00	40.8 EL	2.00	42.1 EL	2.50	20.9 L	4.00	101. EL	1.00
L057	107. EH	40.00	37.4 EH	40.00	50.0 VH	40.00	49.4 H	40.00	25.5 VH	40.00	121.	36.00
L061	96.2	17.50	31.9	14.50	46.3	17.00	46.3	15.00	22.7	19.50	118.2	24.00
L063	98.75	33.00	32.90	31.50	46.1	14.00	47.8	35.50	23.5	34.50	118.3	25.00
L073	97.2	22.50	32.3	25.00	47.3	26.00	47.7	33.00	22.4	12.50	117.3	18.00
L078	93.7 L	6.00	30.8	5.00	46.0	11.50	45.3	8.00	21.9	7.00	114.9	7.00
L081	93.1 L	5.00	30.9	6.50	47.9	35.50	45.3	8.00	22.4	12.50	119.	28.00
L082	94.3	8.00	31.4	9.50	46.2	15.00	45.7	10.00	22.2	10.00	118.6	26.00
L086	95.5	12.50	32.5	29.00	47.5	28.50	46.5	20.00	22.9	23.00	119.0	28.00
L088	98.735	32.00	33.15	36.00	48.09	37.00	47.75	34.00	23.5	34.50	120.65	35.00
L090	101. H	38.50	32.9	31.50	46.4	19.00	47.3	31.00	23.1	30.50	118.	21.00
L091	101. H	38.50	33.4	38.00	49.1 H	39.00	49.1 H	39.00	23.6	36.00	124. VH	40.00
L093	97.5	27.00	32.4	26.50	43.8 L	5.00	46.4	18.00	23.0	27.00	117.1	17.00
L094	97.9	29.50	33.4	38.00	46.3	17.00	46.4	18.00	23.3	32.50	119.4	30.00
L099	95.5	12.50	32.2	22.00	47.0	24.00	45.2	6.00	22.0	8.50	117.7	19.00
L102	99.7	36.00	32.5	29.00	47.7	31.50	47.8	35.50	20.3 L	2.00	112.0 VL	4.50
L109	97.38	24.00	32.18	19.00	46.48	20.00	46.53	21.00	22.58	16.00	115.0	8.50
L112	96.2	17.50	31.8	12.50	45.6	8.00	46.4	18.00	22.6	17.50	116.4	14.00
L114	95.4	11.00	31.9	14.50	47.9	35.50	46.8	23.50	22.5	14.50	118.0	21.00
L116	96.8	19.00	30.70	4.00	45.4	7.00	45.10	5.00	21.6	6.00	118.1	23.00
L128	89.4 EL	3.00	29.1 VL	2.00	42.0 EL	3.00	42.1 EL	2.50	20.4 L	3.00	106. EL	3.00
MEDIAN CONC.	97.0000		32.2000		46.6000		46.5300		22.8000		118.0000	

PARAMETER: 00392 Specific Conductance UMHO/CM

SAMPLE	7		8		9		10	
LAB NO	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK
L002	40.8	33.50	31.8	35.50	30.2	36.00	22.5	34.50
L003	40.	20.50	31.	24.00	29.	17.50	22.	26.00
L004	40.5	30.00	29.6	5.50	28.2	10.00	20.8	6.00
L005	38.2	4.00	30.8	20.00	28.4	12.00	21.8	20.00
L006	40.0	20.50	31.1	26.50	29.3	25.00	22.1	29.50
L007	39.4	12.00	30.3	11.00	32.5 VH	40.00	21.5	12.00
L008	34.5 EL	1.00	26.6 EL	1.00	25.3 EL	1.00	18.8 VL	1.00
L010	40.8	33.50	31.7	33.50	29.9	32.00	22.9	37.00
L011	40.3	28.50	30.7	17.50	29.3	25.00	21.7	17.50
L014	40.	20.50	31.	24.00	30.	34.00	22.	26.00
L021	40.2	26.00	31.1	26.50	29.2	21.00	21.7	17.50
L023	39.5	14.00	30.4	12.50	28.6	13.00	21.8	20.00
L024	39.	8.50	30.	10.00	29.	17.50	22.	26.00
L029	41.0	36.00	32.7 H	39.00	30.0	34.00	24.1 H	39.00
L030	39.3	11.00	30.8	20.00	28.9	15.50	22.4	32.50
L031	39.2	10.00	29.9	9.00	28.0	7.50	20.4	5.00
L032	40.9	35.00	31.3	31.00	30.8	38.00	21.6	15.00
L033	40.7	31.50	31.4	32.00	29.6	28.50	21.9	22.50
L034	40.	20.50	31.	24.00	30.	34.00	22.	26.00
L047	48. EH	41.00	36. EH	41.00	35. EH	41.00	26. EH	41.00
L049	36.2 VL	2.00	28.7 L	4.00	26.5 L	4.00	20.2	3.50
L057	43.2 VH	40.00	32.9 H	40.00	31.9 H	39.00	24.7 VH	40.00
L061	39.5	14.00	30.6	15.50	28.9	15.50	22.0	26.00
L063	40.7	31.50	31.8	35.50	29.8	30.00	22.5	34.50
L073	40.3	28.50	30.8	20.00	29.1	19.00	21.8	20.00
L078	38.8	7.00	29.8	8.00	28.0	7.50	20.9	7.00
L081	39.5	14.00	30.4	12.50	28.0	7.50	21.5	12.00
L082	39.0	8.50	29.7	7.00	28.3	11.00	21.1	8.50
L086	40.1	23.00	30.9	22.00	29.4	27.00	21.9	22.50
L088	41.075	37.00	31.86	37.00	29.885	31.00	22.575	36.00
L090	40.2	26.00	31.2	29.50	29.3	25.00	21.2	10.00
L091	41.9	38.50	32.3	38.00	30.4	37.00	22.4	32.50
L093	39.8	18.00	31.2	29.50	29.2	21.00	22.1	29.50
L094	41.9	38.50	31.7	33.50	29.6	28.50	23.1	38.00
L099	38.4	5.50	30.5	14.00	27.9	5.00	21.6	15.00
L102	39.6	16.50	28.4 L	3.00	26.3 VL	3.00	20.2	3.50
L109	40.12	24.00	31.12	28.00	29.28	23.00	22.20	31.00
L112	39.6	16.50	30.6	15.50	28.8	14.00	21.5	12.00
L114	40.2	26.00	30.7	17.50	29.2	21.00	21.6	15.00
L116	38.4	5.50	29.6	5.50	28.00	7.50	21.1	8.50
L128	36.3 VL	3.00	27.2 VL	2.00	25.9 VL	2.00	19.4 L	2.00
MEDIAN CONC.	40.0000		30.8000		29.2000		21.8000	

LAB NO.	TOTAL RANK	AVERAGE RANK	NO.OF SAMPLES RANKED	SUMMARY OF FLAGGING	BIAS STATEMENT	METHOD CODING
L002	313.50	31.350	10			
L003	203.50	20.350	10			02041
L004	172.00	17.200	10			CPQ002E2
L005	217.50	21.750	10			02041
L006	222.00	22.200	10			RADIOMETER
L007	144.50	14.450	10	VH		
L008	11.00	1.100	10	ELELELELVLELELELELVL	BIASED LOW	METER
L010	311.00	31.100	10			AUTO COND METER
L011	161.00	16.100	10			
L014	218.50	21.850	10			
L021	240.00	24.000	10			RADIOMETER 25C
L023	203.50	20.350	10	H		POTENTIOMETRIC
L024	102.50	10.250	10	VL VL		COND METER
L029	287.50	28.750	10	H H		
L030	210.50	21.050	10	VL L		COND METER 25C
L031	120.50	12.050	10			
L032	323.50	32.350	10			
L033	308.00	30.800	10			
L034	252.00	25.200	10			
L047	410.00	41.000	10	EHEHEHEHVHEHEHEHEHEH	BIASED HIGH	
L049	28.00	2.800	10	ELL ELELL ELVLL L	BIASED LOW	
L057	395.00	39.500	10	EHEHVHH VH VHH H VH	BIASED HIGH	
L061	178.50	17.850	10			
L063	305.00	30.500	10			
L073	224.50	22.450	10			Microcell
L078	74.00	7.400	10	L	BIASED LOW	Radiometer 22
L081	141.50	14.150	10	L		Meter
L082	113.50	11.350	10			Electropot.
L086	235.50	23.550	10			Cond. Meter
L088	349.50	34.950	10		BIASED HIGH	Wheat. Bridge
L090	262.00	26.200	10	H		YSI METER 25
L091	376.50	37.650	10	H H H VH	BIASED HIGH	
L093	218.50	21.850	10	L		YSI COND
L094	303.50	30.350	10			COND. METER
L099	131.50	13.150	10			METER
L102	164.50	16.450	10	L VL L VL		
L109	214.50	21.450	10			RADIOMETER
L112	145.50	14.550	10			RADIOMETER
L114	199.50	19.950	10			
L116	91.00	9.100	10		BIASED LOW	ELECTROPOT.
L128	25.50	2.550	10	ELVLELELL ELVLVLVLL	BIASED LOW	COND.METER

OVERALL AVERAGE RANK IS 21.000

LAB NO.	TOTAL RANK	AVERAGE RANK	NO.OF SAMPLES RANKED	SUMMARY OF FLAGGING	BIAS STATEMENT	METHOD CODING
L008	11.00	1.100	10	ELELELELVLELELELELVL	BIASED LOW	METER
L128	25.50	2.550	10	ELVLELELLELVLVLVLL	BIASED LOW	COND.METER
L049	28.00	2.800	10	ELLELELLELVLLL	BIASED LOW	
L078	74.00	7.400	10	L	BIASED LOW	Radiometer 22
L116	91.00	9.100	10		BIASED LOW	ELECTROPOT.
L024	102.50	10.250	10	VLVL		COND METER
L082	113.50	11.350	10			Electropot.
L031	120.50	12.050	10			
L099	131.50	13.150	10			METER
L081	141.50	14.150	10	L		Meter
L007	144.50	14.450	10	VH		
L112	145.50	14.550	10			RADIOMETER
L011	161.00	16.100	10			
L102	164.50	16.450	10	LVLLVL		
L004	172.00	17.200	10			CPQ002E2
L061	178.50	17.850	10			

L114	199.50	19.950	10			
L023	203.50	20.350	10	H		POTENTIOMETRIC
L003	203.50	20.350	10			02041
L030	210.50	21.050	10	VLL		COND METER 25C
L109	214.50	21.450	10			RADIOMETER
L005	217.50	21.750	10			02041
L014	218.50	21.850	10			
L093	218.50	21.850	10	L		YSI COND
L006	222.00	22.200	10			RADIOMETER
L073	224.50	22.450	10			Microcell
L086	235.50	23.550	10			Cond. Meter
L021	240.00	24.000	10			RADIOMETER 25C
L034	252.00	25.200	10			
L090	262.00	26.200	10	H		YSI METER 25
L029	287.50	28.750	10	HH		
L094	303.50	30.350	10			COND. METER
L063	305.00	30.500	10			
L033	308.00	30.800	10			
L010	311.00	31.100	10			AUTO COND METER
L002	313.50	31.350	10			
L032	323.50	32.350	10			
L088	349.50	34.950	10		BIASED HIGH	Wheat. Bridge
L091	376.50	37.650	10	HHHVH	BIASED HIGH	
L057	395.00	39.500	10	EHEHVHHVHVHHHVH	BIASED HIGH	
L047	410.00	41.000	10	EHEHEHEHVHEHEHEHEHEH	BIASED HIGH	

OVERALL AVERAGE
RANK IS 21.000

Specific Conductance

LRTAP STUDY 0037 DATA SUMMARY

PARAMETER: 01089 GRAN ACIDITY MG/LCACO3

AQUATIC ECOSYSTEM PROTECTION BRANCH
NATIONAL WATER RESEARCH INSTITUTE
BURLINGTON ONTARIO

LRTAP STUDY NO. 37 MAJOR IONS IN WATER

LOWER LIMIT FOR USE OF BASIC ACCEPTABLE ERROR= 1.8000 BASIC ACCEPTABLE ERROR= .4400 CONCENTRATION ERROR INCREMENT= .1320

SAMPLE	1		2		3		4		5		6	
LAB NO	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK
L032	.444	1.00	1.053	1.00	21.65	1.00	.546	1.00	.558	1.00	5.208	1.00
MEDIAN CONC.												

SAMPLE	7		8		9		10	
LAB NO	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK
L032	.622	1.00	.556	1.00	.522	1.00	.685	1.00
MEDIAN CONC.								

LAB NO.	TOTAL RANK	AVERAGE RANK	NO.OF SAMPLES RANKED	SUMMARY OF FLAGGING	BIAS STATEMENT	METHOD CODING
L032	10.00	1.000	10			
OVERALL AVERAGE RANK IS		1.000				

LAB NO.	TOTAL RANK	AVERAGE RANK	NO.OF SAMPLES RANKED	SUMMARY OF FLAGGING	BIAS STATEMENT	METHOD CODING
L032	10.00	1.000	10			
OVERALL AVERAGE RANK IS		1.000				

GRAN ACIDITY

LRTAP STUDY 0037 DATA SUMMARY

PARAMETER: 01090 ACIDITY TO PH 8.3 MG/LCACO3

AQUATIC ECOSYSTEM PROTECTION BRANCH
NATIONAL WATER RESEARCH INSTITUTE
BURLINGTON ONTARIO

LRTAP STUDY NO. 37 MAJOR IONS IN WATER

LOWER LIMIT FOR USE OF BASIC ACCEPTABLE ERROR= 1.0000 BASIC ACCEPTABLE ERROR= .5000 CONCENTRATION ERROR INCREMENT= .5000

SAMPLE	1		2		3		4		5		6	
LAB NO	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK
L011	1.42	4.00	2.17	4.00	25.0	5.00	1.42	2.00	1.42	4.00	6.61	4.00
L023	1.0	1.00	1.6	2.00	23.5	3.00	1.2	1.00	1.1	1.00	6.4	2.00
L057	1.4	3.00	3.1 VH	5.00	21.9	1.00	1.6	4.00	1.4	3.00	6.0	1.00
L063	2.433 H	5.00	1.341	1.00	23.832	4.00	2.582 VH	5.00	1.539	5.00	7.100	5.00
L082	1.32	2.00	1.70	3.00	25.12	6.00	1.44	3.00	1.39	2.00	6.41	3.00
L128	2.0W	0.00	2.0W	0.00	23.0	2.00	2.0W	0.00	2.0W	0.00	7.7	6.00
MEDIAN CONC.	1.4000		1.7000		23.6660		1.4400		1.4000		6.5100	

SAMPLE	7		8		9		10	
LAB NO	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK
L011	1.42	2.00	1.51	3.00	1.60	4.00	1.42	2.00
L023	1.3	1.00	1.3	1.00	1.1	1.00	1.4	1.00
L057	1.8	5.00	1.8	5.00	2.1	5.00	1.5	4.00
L063	1.787	4.00	1.539	4.00	1.589	3.00	1.539	5.00
L082	1.45	3.00	1.41	2.00	1.40	2.00	1.43	3.00
L128	2.0W	0.00	2.0W	0.00	3.80 EH	6.00	2.0W	0.00
MEDIAN CONC.	1.4500		1.5100		1.5945		1.4300	

LAB NO.	TOTAL RANK	AVERAGE RANK	NO.OF SAMPLES RANKED	SUMMARY OF FLAGGING	BIAS STATEMENT	METHOD CODING
L011	34.00	3.400	10			
L023	14.00	1.400	10		BIASED LOW	POTENTIOMETRIC
L057	36.00	3.600	10	VH		
L063	41.00	4.100	10	H VH		
L082	29.00	2.900	10			Electropot.
L128	14.00	4.667	3	EH	INSUFFICIENT DATA	TITRATION

OVERALL AVERAGE RANK IS 3.170

LAB NO.	TOTAL RANK	AVERAGE RANK	NO.OF SAMPLES RANKED	SUMMARY OF FLAGGING	BIAS STATEMENT	METHOD CODING
L023	14.00	1.400	10		BIASED LOW	POTENTIOMETRIC
L082	29.00	2.900	10			Electropot.
L011	34.00	3.400	10			
L057	36.00	3.600	10	VH		
L063	41.00	4.100	10	HVH		
L128	14.00	4.667	3	EH	INSUFFICIENT DATA	TITRATION

OVERALL AVERAGE RANK IS 3.170

LAB NO.	TOTAL RANK	AVERAGE RANK	NO.OF SAMPLES RANKED	SUMMARY OF FLAGGING	BIAS STATEMENT	METHOD CODING
L002	223.50	22.350	10	H		UNSTIRRED
L003	273.50	27.350	10			10301; STIRRED
L004	221.00	22.100	10	H L		CPQ004E0
L006	59.50	5.950	10	L L L L	BIASED LOW	RADIOMETER;STIRRED
L007	388.00	38.800	10	EH H VHVHVHVHH EH	BIASED HIGH	
L008	47.00	4.700	10	ELELELELELELELELEL	BIASED LOW	STIRRED
L010	156.00	15.600	10			AUTO PH/ALK SYS.;S
L011	155.50	15.550	10	EL		STIRRED
L013	51.00	25.500	2		INSUFFICIENT DATA	
L014	385.50	38.550	10	H EH VHEH VHVHVHEH	BIASED HIGH	
L021	70.50	8.813	8	EL VLVLVL		ROSS; STIRRED
L023	78.00	7.800	10	L L L	BIASED LOW	ELECTROMETRIC
L024	280.50	28.050	10	H		RADIOMETER pH;STIR
L029	293.00	29.300	10	H VH VH		
L030	158.50	15.850	10			pH METER; STIRRED
L031	207.50	20.750	10	L		NON AGITE
L032	263.00	26.300	10			
L033	197.00	21.889	9	EH H L		
L034	274.00	27.400	10			
L047	109.50	10.950	10	EL EL ELELEL		
L049	92.50	9.250	10	VL EL L L L	BIASED LOW	
L057	331.50	33.150	10	H H H H H	BIASED HIGH	
L061	303.00	30.300	10	VH H		
L063	161.00	16.100	10	ELVH EL EL VLH		
L073	215.50	21.550	10			Combined Elec.
L078	195.00	19.500	10			Fisher 22
L081	305.50	30.550	10	H H H H H H		
L082	232.00	23.200	10			Electropot.
L086	107.50	10.750	10	L		pH Meter
L088	143.00	14.300	10	L		Automated
L090	193.00	19.300	10			pH METER
L091	139.00	13.900	10			
L093	109.00	10.900	10	L		pH METER
L094	186.50	18.650	10			IONALYZER
L099	293.50	29.350	10	H H		METER
L109	248.00	24.800	10			RADIOMETER
L112	214.00	21.400	10			HACH.COMB.ELE
L114	154.00	15.400	10	L VH		
L116	222.00	22.200	10			ELECTROPOT.
L119	211.00	21.100	10	H		STIRRED
L128	213.50	21.350	10	EH EL EL H		pH METER UNST
OVERALL AVERAGE RANK IS		20.456				

LAB NO.	TOTAL RANK	AVERAGE RANK	NO.OF SAMPLES RANKED	SUMMARY OF FLAGGING	BIAS STATEMENT	METHOD CODING
L008	47.00	4.700	10	ELELELELELELELELEL	BIASED LOW	STIRRED
L006	59.50	5.950	10	LLLL	BIASED LOW	RADIOMETER;STIRRED
L023	78.00	7.800	10	LLL	BIASED LOW	ELECTROMETRIC
L021	70.50	8.813	8	ELVLVLVL		ROSS; STIRRED
L049	92.50	9.250	10	VLELLLL	BIASED LOW	
L086	107.50	10.750	10	L		pH Meter
L093	109.00	10.900	10	L		pH METER
L047	109.50	10.950	10	ELELELELEL		
L091	139.00	13.900	10			
L088	143.00	14.300	10	L		Automated
L114	154.00	15.400	10	LVH		
L011	155.50	15.550	10	EL		STIRRED
L010	156.00	15.600	10			AUTO PH/ALK SYS.;S
L030	158.50	15.850	10			pH METER; STIRRED
L063	161.00	16.100	10	ELVHELELVLH		
L094	186.50	18.650	10			IONALYZER
L090	193.00	19.300	10			pH METER
L078	195.00	19.500	10			Fisher 22
L031	207.50	20.750	10	L		NON AGITE
L119	211.00	21.100	10	H		STIRRED
L128	213.50	21.350	10	EHELELH		pH METER UNST
L112	214.00	21.400	10			HACH.COMB.ELE
L073	215.50	21.550	10			Combined Elec.
L033	197.00	21.889	9	EHHL		
L004	221.00	22.100	10	HL		CPQ004E0
L116	222.00	22.200	10			ELECTROPOT.
L002	223.50	22.350	10	H		UNSTIRRED
L082	232.00	23.200	10			Electropot.
L109	248.00	24.800	10			RADIOMETER
L013	51.00	25.500	2		INSUFFICIENT DATA	
L032	263.00	26.300	10			
L003	273.50	27.350	10			10301; STIRRED
L034	274.00	27.400	10			
L024	280.50	28.050	10	H		RADIOMETER pH;STIR
L029	293.00	29.300	10	HVHVH		
L099	293.50	29.350	10	HH		METER
L061	303.00	30.300	10	VHH		
L081	305.50	30.550	10	HHHHHH		
L057	331.50	33.150	10	HHHHH	BIASED HIGH	
L014	385.50	38.550	10	HEHVHEHVHVHVHEH	BIASED HIGH	
L007	388.00	38.800	10	EHHVHVHVHVHHEH	BIASED HIGH	

OVERALL AVERAGE RANK IS 20.456

pH

L033	1.10	5.00	2.50	7.00	.73	5.00	1.99	6.00
L034	2.4 VH	22.00	3.3 H	21.00	1.8 H	19.50	2.8 H	20.00
L049	.97	3.00	2.51	8.00	.67	4.00	1.54 L	1.00
L063	1.49	12.00	2.66	12.00	1.05	11.00	2.16	11.00
L081	1.40	10.00	3.40 H	22.00	1.0	9.50	2.30	15.50
L082	.70 L	1.00	2.10	1.00	.39 L	1.00	2.20	12.00
L091	1.60	14.00	2.73	14.00	1.15	14.00	2.27	13.50
L093	1.66	15.00	2.75	15.00	1.07	12.00	2.27	13.50
L094	1.57	13.00	2.95	18.00	1.63 H	18.00	3.18 VH	22.00
L099	1.70	16.50	2.92	17.00	1.28	15.00	2.43	18.00
L102	1.10	5.00	2.20	3.00	1.0W	0.00	1.80	4.50
L116	.93	2.00	2.17	2.00	.57	2.00	1.67	2.00
L128	1.79	18.00	2.83	16.00	1.40	17.00	2.35	17.00
MEDIAN CONC.	1.4500		2.6450		1.0500		2.2000	

LAB NO.	TOTAL RANK	AVERAGE RANK	NO.OF SAMPLES RANKED	SUMMARY OF FLAGGING	BIAS STATEMENT	METHOD CODING
L002	66.50	6.650	10	EL		
L003	145.50	14.550	10	L H EH		SHIMADZU
L004	95.00	9.500	10	EH L		
L005	100.50	10.050	10			06104
L006	88.50	8.850	10			AUTOANALYSER
L010	154.50	15.450	10	EH		COMBUSTION-IR
L014	175.00	17.500	10	EHVHH		
L023	68.00	22.667	3	EHEH EH	INSUFFICIENT DATA	IR ANALYZER
L031	36.00	3.600	10	ELL	BIASED LOW	CONDUCTIV
L032	127.00	14.111	9	VLL H VH		
L033	72.00	7.200	10			
L034	189.00	18.900	10	H EHVHH VHH H H	BIASED HIGH	
L049	36.00	3.600	10	L VLELL L L	BIASED LOW	
L063	104.00	10.400	10			
L081	120.50	12.050	10	EL H		Colorimetric A
L082	54.50	5.450	10	VL EHVLL L L	BIASED LOW	AA Technicon
L091	128.00	12.800	10			
L093	155.00	15.500	10	EH		DOHRMANN
L094	172.00	17.200	10	H H VH H VH		PERS.OXID.
L099	153.00	15.300	10			INSTRUMENTAL
L102	45.50	5.688	8	VLEL		AUTO COLOR
L116	42.50	4.722	9	EL EHL	BIASED LOW	AA
L128	185.50	18.550	10	VHVHVHEH H	BIASED HIGH	TOC ANALYZER

OVERALL AVERAGE RANK IS 11.479

LRTAP STUDY 0037 DATA SUMMARY

PARAMETER: 06002 Diss Organic Carbon MG C/L

AQUATIC ECOSYSTEM PROTECTION BRANCH
NATIONAL WATER RESEARCH INSTITUTE
BURLINGTON ONTARIO

LRTAP STUDY NO. 37 MAJOR IONS IN WATER

LOWER LIMIT FOR USE OF BASIC ACCEPTABLE ERROR= .7000 BASIC ACCEPTABLE ERROR= .5000 CONCENTRATION ERROR INCREMENT= .0321

SAMPLE	1		2		3		4		5		6	
LAB NO	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK
L002	1.9	11.50	5.4	4.50	29.3 EL	1.00	2.5	13.50	.2	2.50	1.4	6.50
L003	1.3 L	5.00	6.4	18.00	59.3	16.00	2.6	16.00	.80	13.00	2.2 H	19.50
L004	6.46 EH	22.00	6.25	14.00	56.70	9.00	1.81 L	4.00	.57	9.00	1.61	10.00
L005	1.98	15.00	5.80	7.00	55.5	6.00	2.43	11.00	.619	11.00	1.55	9.00
L006	1.80	8.50	6.04	12.00	57.2	13.00	2.19	6.00	.454	6.00	1.51	8.00
L010	2.0	16.50	6.5	19.50	65.1 EH	21.00	2.8	18.00	.5	7.50	2.0	17.00
L014	1.920	13.00	6.120	13.00	59.160	15.00	4.200 EH	22.00	1.560 VH	19.00	2.160 H	18.00
L023	5.0W	0.00	7.5 EH	23.00	67.8 EH	22.00	5.0W	0.00	5.0W	0.00	5.0W	0.00
L031	1.6	6.00	5.4	4.50	49. EL	3.00	1.8 L	3.00	.2	2.50	1.2	2.00
L032	1.0 VL	3.00	5.2 L	3.00	57.	11.50	2.5	13.50	<1.0	0.00	1.9	16.00
L033	1.76	7.00	5.87	10.00	57.73	14.00	2.4	9.00	.27	4.00	1.38	5.00
L034	2.5 H	20.00	6.3	16.00	57.	11.50	3.8 EH	20.00	1.5 VH	18.00	2.4 H	21.00
L049	1.27 L	4.00	4.72 VL	1.00	50.0 EL	4.00	1.85 L	5.00	.31	5.00	.92 L	1.00
L063	1.86	10.00	5.97	11.00	56.40	8.00	2.21	7.00	.59	10.00	1.62	12.00
L081	1.90	11.50	6.50	19.50	52.0 EL	5.00	2.4	9.00	.5T	7.50	1.618	11.00
L082	.93 VL	2.00	5.85	9.00	72.0 EH	23.00	1.40 VL	1.00	0.0W L	1.00	1.30	3.50
L091	1.80	8.50	6.29	15.00	56.2	7.00	2.62	17.00	.695	12.00	1.71	13.00
L093	2.16	19.00	6.36	17.00	64.08 EH	20.00	2.55	15.00	.84	14.50	1.77	14.00
L094	2.03	18.00	5.84	8.00	60.0 H	17.00	2.81	19.00	1.24 H	17.00	2.48 VH	22.00
L099	1.95	14.00	6.51	21.00	56.94	10.00	2.47	12.00	.84	14.50	1.79	15.00
L102	2.0	16.50	5.0 VL	2.00	47.1 EL	2.00	2.40	9.00	1.0W	0.00	1.30	3.50
L116	.70 EL	1.00	5.56	6.00	62.0 EH	19.00	1.63 L	2.00		0.00	1.40	6.50
L128	2.88 VH	21.00	7.10 VH	22.00	61.5 VH	18.00	4.08 EH	21.00	1.01	16.00	2.20 H	19.50
MEDIAN CONC.	1.9000		6.0400		57.0000		2.4500		.5900		1.6190	

PARAMETER: 06002 Diss Organic Carbon MG C/L

SAMPLE	7		8		9		10	
LAB NO	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK
L002	1.2	7.00	2.4	6.00	.9	7.00	2.0	7.00
L003	1.8	19.50	2.7	13.00	2.6 EH	21.00	1.8	4.50
L004	1.30	8.00	2.33	5.00	.88	6.00	2.02	8.00
L005	1.41	11.00	2.63	11.00	1.00	9.50	2.12	10.00
L006	1.36	9.00	2.53	9.00	.903	8.00	2.06	9.00
L010	1.7	16.50	2.6	10.00	1.1	13.00	2.3	15.50
L014	1.920	21.00	3.000	19.00	1.320	16.00	2.520	19.00
L023	5.0W	0.00	5.0W	0.00	5.0W	0.00	3.3 EH	23.00
L031	1.1	5.00	2.3	4.00	.6	3.00	1.7	3.00
L032	1.8	19.50	3.2	20.00	1.8 H	19.50	3.1 VH	21.00

LRTAP STUDY 0037 DATA SUMMARY

PARAMETER: 06193 ALKALINITY-FIXED ENDPT. PH4.5 MG/L CACO3

AQUATIC ECOSYSTEM PROTECTION BRANCH
NATIONAL WATER RESEARCH INSTITUTE
BURLINGTON ONTARIO

LRTAP STUDY NO. 37 MAJOR IONS IN WATER

LOWER LIMIT FOR USE OF BASIC ACCEPTABLE ERROR= 1.5000 BASIC ACCEPTABLE ERROR= .8500 CONCENTRATION ERROR INCREMENT= .0231

SAMPLE	1		2		3		4		5		6	
LAB NO	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK
L023	43.3	7.00	6.39	2.00		0.00	15.2	4.00	7.60	3.00		0.00
L024	43.	6.00	6.9	7.00		0.00	16.	8.00	8.4	7.00		0.00
L029	45.71 VH	10.00	9.12 EH	10.00		0.00	18.41 EH	10.00	10.17 EH	9.00		0.00
L030	42.2	2.50	6.19	1.00	0.	1.50	15.1	3.00	7.52	2.00	0.	1.50
L033	43.9	9.00	7.0	8.00	0.W	0.00	16.32	9.00	8.60	8.00	0.W	0.00
L057	41.0 L	1.00	7.2	9.00	.5W	0.00	13.9 L	1.00	8.2	6.00	.5W	0.00
L082	42.8	5.00	6.45	3.00	0.0W	0.00	15.40	5.00	7.95	5.00	0.0W	0.00
L086	43.60	8.00	6.46	4.00	0.0	1.50	15.45	6.00	7.88	4.00	0.00	1.50
L116	42.2	2.50	6.82	6.00		0.00	14.9	2.00	7.44	1.00		0.00
L128	42.5	4.00	6.77	5.00	.5W	0.00	15.5	7.00	27.1 EH	10.00	.5W	0.00
MEDIAN CONC.	42.9000		6.7950				15.4250		8.0750			

SAMPLE	7		8		9		10	
LAB NO	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK
L023	8.46	3.00	4.79	5.00	7.25	4.00	2.54	4.00
L024	8.9	6.00	5.3	8.00	7.9	8.00	3.	6.00
L029	10.57 VH	10.00	7.67 EH	10.00	10.19 EH	10.00	5.04 EH	10.00
L030	8.45	2.00	4.54	3.00	7.10	2.50	2.35	2.00
L033	9.48	8.00	5.02	7.00	7.99	9.00	3.17	7.00
L057	9.0	7.00	4.5	2.00	7.1	2.50	3.3	8.00
L082	8.74	5.00	4.98	6.00	7.53	6.00	2.65	5.00
L086	8.66	4.00	4.71	4.00	7.29	5.00	2.49	3.00
L116	8.21	1.00	4.30	1.00	6.78	1.00	2.21	1.00
L128	9.67	9.00	5.80	9.00	7.73	7.00	3.87 H	9.00
MEDIAN CONC.	8.8200		4.8850		7.4100		2.8250	

LAB NO.	TOTAL RANK	AVERAGE RANK	NO.OF SAMPLES RANKED	SUMMARY OF FLAGGING	BIAS STATEMENT	METHOD CODING
L023	32.00	4.000	8			POTENTIOMETRIC AUTO TITRATION
L024	56.00	7.000	8			
L029	79.00	9.875	8	VHEH EHEH VHEHEHEH	BIASED HIGH	
L030	21.00	2.100	10		BIASED LOW	AUTO MICRO COMP
L033	65.00	8.125	8		BIASED HIGH	
L057	36.50	4.563	8	L L		
L082	40.00	5.000	8			
L086	41.00	4.100	10			Electropot. Potentiometric
L116	15.50	1.938	8		BIASED LOW	ELECTROPOT. TITRATION
L128	60.00	7.500	8	EH H		
OVERALL AVERAGE RANK IS		5.310				

LAB NO.	TOTAL RANK	AVERAGE RANK	NO.OF SAMPLES RANKED	SUMMARY OF FLAGGING	BIAS STATEMENT	METHOD CODING
L031	36.00	3.600	10	ELL	BIASED LOW	CONDUCTIV
L049	36.00	3.600	10	LVLELLLL	BIASED LOW	
L116	42.50	4.722	9	ELEHL	BIASED LOW	AA
L082	54.50	5.450	10	VLEHVLLLL	BIASED LOW	AA Technicon
L102	45.50	5.688	8	VLEL		AUTO COLOR
L002	66.50	6.650	10	EL		
L033	72.00	7.200	10			
L006	88.50	8.850	10			AUTOANALYSER
L004	95.00	9.500	10	EHL		
L005	100.50	10.050	10			06104
L063	104.00	10.400	10			
L081	120.50	12.050	10	ELH		Colorimetric A
L091	128.00	12.800	10			
L032	127.00	14.111	9	VLLHVH		
L003	145.50	14.550	10	LHEH		SHIMADZU
L099	153.00	15.300	10			INSTRUMENTAL
L010	154.50	15.450	10	EH		COMBUSTION-IR
L093	155.00	15.500	10	EH		DOHRMANN
L094	172.00	17.200	10	HHVHHVH		PERS.OXID.
L014	175.00	17.500	10	EHVHH		
L128	185.50	18.550	10	VHVHVHEHH	BIASED HIGH	TOC ANALYZER
L034	189.00	18.900	10	HEHVHHVHHHH	BIASED HIGH	
L023	68.00	22.667	3	EHEHEH	INSUFFICIENT DATA	IR ANALYZER

OVERALL AVERAGE RANK IS 11.479

Diss Organic Carbon

LAB NO.	TOTAL RANK	AVERAGE RANK	NO.OF SAMPLES RANKED	SUMMARY OF FLAGGING	BIAS STATEMENT	METHOD CODING
L116	15.50	1.938	8			
L030	21.00	2.100	10		BIASED LOW	ELECTROPOT.
L023	32.00	4.000	8		BIASED LOW	AUTO MICRO COMP
L086	41.00	4.100	10			POTENTIOMETRIC
L057	36.50	4.563	8	LL		Potentiometric
L082	40.00	5.000	8			
L024	56.00	7.000	8			Electropot.
L128	60.00	7.500	8	EHH		AUTO TITRATION
L033	65.00	8.125	8			TITRATION
L029	79.00	9.875	8	VHEHEHEHVHEHEHEH	BIASED HIGH	
					BIASED HIGH	
OVERALL AVERAGE RANK IS		5.310				

ALKALINITY-FIXED ENDPT. PH4.5

LRTAP STUDY 0037 DATA SUMMARY

PARAMETER: 06194 ALKALINITY-GRAN,INFLEC,EXTRAP MG/L CACO3

AQUATIC ECOSYSTEM PROTECTION BRANCH
NATIONAL WATER RESEARCH INSTITUTE
BURLINGTON ONTARIO

LRTAP STUDY NO. 37 MAJOR IONS IN WATER

LOWER LIMIT FOR USE OF BASIC ACCEPTABLE ERROR= 1.0000 BASIC ACCEPTABLE ERROR= .3500 CONCENTRATION ERROR INCREMENT= .0080

SAMPLE	1		2		3		4		5		6	
LAB NO	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK
L002	40.8 VL	1.00	5.7 EH	9.00		0.00	13.5	3.00	7.6 EH	9.00		0.00
L004	41.01 L	2.00	4.72	3.00	-5.06	3.00	13.61	5.00	6.18	1.00	-3.58	2.00
L006	42.280	9.00	4.700	2.00	-5.165T	2.00	13.470	2.00	6.230	3.00	-3.035T VH	3.00
L010	42.0	7.00	4.8	5.00	<.5	0.00	13.9	8.00	6.2	2.00	<.5	0.00
L011	41.9	6.00	4.37 L	1.00	.50W	0.00	13.2	1.00	6.49	7.00	.50W	0.00
L014	42.2	8.00	5.1	7.00	-10.0 EL	1.00	14.1 H	9.00	6.5	8.00	-10.0 EL	1.00
L031	41.3	4.00	4.9	6.00	.1W	0.00	13.8	6.00	6.4	5.00	.1W	0.00
L063	41.89	5.00	5.11	8.00	.50W	0.00	13.81	7.00	6.42	6.00	.50W	0.00
L112	41.1 L	3.00	4.74	4.00		0.00	13.6	4.00	6.36	4.00		0.00
MEDIAN CONC.	41.8900		4.8000		-5.1650		13.6100		6.4000		-3.5800	

SAMPLE	7		8		9		10	
LAB NO	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK
L002	8.0 EH	9.00	3.7 H	9.00	6.3 H	8.00	1.6 VH	9.00
L004	6.93	3.00	3.10	3.50	5.78	3.00	1.01	6.00
L006	6.850	2.00	3.020	1.00	5.500	1.00	.8500	2.00
L010	7.2	6.50	3.1	3.50	5.8	4.50	.9	3.00
L011	6.49 VL	1.00	3.36	6.00	5.60	2.00	1.23	8.00
L014	7.2	6.50	3.4	7.50	5.8	4.50	1.0	4.50
L031	7.1	5.00	3.4	7.50	5.9	7.00	1.0	4.50
L063	7.93 EH	8.00	3.06	2.00	6.31 H	9.00	.54 L	1.00
L112	7.08	4.00	3.23	5.00	5.88	6.00	1.04	7.00
MEDIAN CONC.	7.1000		3.2300		5.8000		1.0000	

LAB NO.	TOTAL RANK	AVERAGE RANK	NO.OF SAMPLES RANKED	SUMMARY OF FLAGGING	BIAS STATEMENT	METHOD CODING
L002	57.00	7.125	8	VLEH EH EHH H VH	BIASED HIGH	
L004	31.50	3.150	10	L		
L006	27.00	2.700	10	VH	BIASED LOW	TITROPROCESSOR
L010	39.50	4.938	8			AUTO TITRATION
L011	32.00	4.000	8	L VL		
L014	57.00	5.700	10	ELH EL		
L031	45.00	5.625	8			TITR CONDUCT
L063	46.00	5.750	8	EH H L		
L112	37.00	4.625	8	L		EXT.pH

OVERALL AVERAGE RANK IS 4.769

LAB NO.	TOTAL RANK	AVERAGE RANK	NO.OF SAMPLES RANKED	SUMMARY OF FLAGGING
L006	27.00	2.700	10	VH
L004	31.50	3.150	10	L
L011	32.00	4.000	8	LVL
L112	37.00	4.625	8	L
L010	39.50	4.938	8	
L031	45.00	5.625	8	
L014	57.00	5.700	10	ELHEL
L063	46.00	5.750	8	EHHL
L002	57.00	7.125	8	VLEHEHEHHHVH

OVERALL AVERAGE RANK IS 4.769

BIAS STATEMENT	METHOD CODING
BIASED LOW	TITROPROCESSOR
	EXT.pH
	AUTO TITRATION
	TITR CONDUCT
BIASED HIGH	

ALKALINITY-GRAN, INFLEC, EXTRAP

LRTAP STUDY 0037 DATA SUMMARY

PARAMETER: 06282 GRAN TITRA ALK MG/LCAC03

AQUATIC ECOSYSTEM PROTECTION BRANCH
NATIONAL WATER RESEARCH INSTITUTE
BURLINGTON ONTARIO

LRTAP STUDY NO. 37 MAJOR IONS IN WATER

LOWER LIMIT FOR USE OF BASIC ACCEPTABLE ERROR= 1.0000 BASIC ACCEPTABLE ERROR= .3500 CONCENTRATION ERROR INCREMENT= .0080

SAMPLE	1		2		3		4		5		6	
LAB NO	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK
L002		0.00		0.00	-3.97	5.00		0.00		0.00	-3.18	9.00
L003	40.2 EL	2.00	5.1	4.50	-3.3 VH	11.00	13.6 L	2.50	6.4	4.00	-3.35	3.00
L014	42.2	7.00	5.1	4.50	-10.0 EL	1.00	14.1	5.50	6.5	5.50	-10.0 EL	1.00
L030	41.0 VL	4.00	4.81	1.00	-4.3 L	4.00	13.6 L	2.50	6.06 L	1.00	-3.2	6.00
L032	42.11	6.00	5.28	10.00	-3.41 H	10.00	14.12	7.00	6.50	5.50	-3.21	5.00
L081	43.3 VH	9.00	5.53 H	11.00	4.21 EH	12.00	14.6 H	10.00	6.81	11.00	3.22 EH	12.00
L088	40.30 EL	3.00	5.18	7.00	-3.72	8.00	13.67	4.00	6.14	3.00	-3.19	7.50
L090	42.47	8.00	5.14	6.00	-4.34 L	3.00	14.23	8.00	6.57	7.00	-3.30	4.00
L091	41.9	5.00	5.25	9.00	-3.69	9.00	14.3	9.00	6.7	9.00	-2.9	11.00
L093	39.8 EL	1.00	4.86	2.00	-3.95	6.00	13.46 L	1.00	6.13	2.00	-3.11	10.00
L094	44.65 EH	11.00	5.245	8.00	-5.212 EL	2.00	14.62 H	11.00	6.738	10.00	-3.517	2.00
L099	44.5 EH	10.00	4.98	3.00	-3.84	7.00	14.1	5.50	6.60	8.00	-3.19	7.50
MEDIAN CONC.	42.1100		5.1400		-3.8950		14.1000		6.5000		-3.1950	

SAMPLE	7		8		9		10	
LAB NO	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK
L002		0.00		0.00		0.00		0.00
L003	6.83 L	2.00	3.1	1.00	5.67	3.00	.59 L	1.00
L014	7.2	5.00	3.4	8.00	5.8	4.50	1.0	5.00
L030	6.97	4.00	3.13	2.00	5.64	2.00	.85	2.00
L032	7.41	8.00	3.39	7.00	5.89	7.00	1.03	7.00
L081	7.64	11.00	3.70	11.00	6.29 H	11.00	1.28	11.00
L088	6.70 L	1.00	3.43	9.00	5.81	6.00	.88	3.00
L090	7.31	7.00	3.38	5.00	5.95	8.00	1.04	8.50
L091	7.55	10.00	3.57	10.00	6.25 H	10.00	1.24	10.00
L093	6.89 L	3.00	3.20	3.00	5.54	1.00	.96	4.00
L094	7.424	9.00	3.385	6.00	6.101	9.00	1.009	6.00
L099	7.30	6.00	3.33	4.00	5.80	4.50	1.04	8.50
MEDIAN CONC.	7.3000		3.3850		5.8100		1.0090	

LAB NO.	TOTAL RANK	AVERAGE RANK	NO.OF SAMPLES RANKED	SUMMARY OF FLAGGING
L002	14.00	7.000	2	
L003	34.00	3.400	10	EL VHL L L
L014	47.00	4.700	10	EL EL
L030	28.50	2.850	10	VL L L L
L032	72.50	7.250	10	H
L081	109.00	10.900	10	VHH EHH EH H
L088	51.50	5.150	10	EL L
L090	64.50	6.450	10	L
L091	92.00	9.200	10	H
L093	33.00	3.300	10	EL L L
L094	74.00	7.400	10	EH ELH
L099	64.00	6.400	10	EH

OVERALL AVERAGE RANK IS 6.107

LAB NO.	TOTAL RANK	AVERAGE RANK	NO.OF SAMPLES RANKED	SUMMARY OF FLAGGING
L030	28.50	2.850	10	VLLLL
L093	33.00	3.300	10	ELLL
L003	34.00	3.400	10	ELVHLLL
L014	47.00	4.700	10	ELEL
L088	51.50	5.150	10	ELL
L099	64.00	6.400	10	EH
L090	64.50	6.450	10	L
L002	14.00	7.000	2	
L032	72.50	7.250	10	H
L094	74.00	7.400	10	EHELH
L091	92.00	9.200	10	H
L081	109.00	10.900	10	VHHEHHEHH

OVERALL AVERAGE RANK IS 6.107

BIAS STATEMENT	METHOD CODING
INSUFFICIENT DATA	
BIASED LOW	10110
BIASED LOW	AUTO MICRO COMP
BIASED HIGH	Auto Titrator
	Radiometer
	GRAN-ENDPOINT
BIASED HIGH	
BIASED LOW	TIT. METER
	TITRATOR
	TITRATION

BIAS STATEMENT	METHOD CODING
BIASED LOW	AUTO MICRO COMP
BIASED LOW	TIT. METER
BIASED LOW	10110
	Radiometer
	TITRATION
	GRAN-ENDPOINT
INSUFFICIENT DATA	
	TITRATOR
BIASED HIGH	
BIASED HIGH	Auto Titrator

GRAN TITRA ALK

LRTAP STUDY 0037 DATA SUMMARY

PARAMETER: 06592 Diss Inorg Carbon MG C/L

AQUATIC ECOSYSTEM PROTECTION BRANCH
NATIONAL WATER RESEARCH INSTITUTE
BURLINGTON ONTARIO

LRTAP STUDY NO. 37 MAJOR IONS IN WATER

LOWER LIMIT FOR USE OF BASIC ACCEPTABLE ERROR= .5000 BASIC ACCEPTABLE ERROR= .3000 CONCENTRATION ERROR INCREMENT= .0439

SAMPLE	1		2		3		4		5		6	
LAB NO	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK
L002	11.0 H	17.00	1.2	2.00	<.1 EL	0.00	2.9 VL	2.00	1.6	3.00	<.1	0.00
L003	10.4	11.00	1.4	5.00	.90	7.00	3.6	9.00	1.8	7.00		0.00
L004	4.41 EL	1.00	.01W EL	1.00	2.90 EH	13.00	3.07 L	3.00	1.11 EL	1.00	.01W	0.00
L006	10.14	8.00	1.38	4.00	.587 L	4.00	3.38	6.00	1.72	5.00	.244	3.00
L010	10.5	12.50	1.5	9.00	1.2	8.00	3.7	13.50	2.0	15.00	<.5	0.00
L014	10.560	14.00	1.440	7.50	.480 VL	3.00	3.840	16.00	1.920	14.00	.240	2.00
L023	14.8 EH	18.00	5.0W	0.00	5.0W	0.00	5.4 EH	18.00	5.0W	0.00	5.0W	0.00
L030	9.57	3.00	1.53	10.00	1.30	10.00	3.53	7.00	1.87	9.00	.30	6.00
L031	10.5	12.50	1.7	15.00	1.8 EH	12.00	3.7	13.50	1.9	11.50	.3	6.00
L033	9.74	4.00	1.44	7.50	1.W	0.00	2.77 VL	1.00	1.82	8.00	1.W	0.00
L063	10.25	9.00	1.75	16.00	.46 VL	2.00	3.68	11.00	1.90	11.50	.28	4.00
L082	10.27	10.00	1.548	11.00	0.0W EL	1.00	3.696	12.00	1.908	13.00	0.0W	1.00
L091	9.92	5.50	1.56	12.00	1.26	9.00	3.61	10.00	1.89	10.00	.344	9.00
L093	10.97	16.00	1.66	14.00	.62 L	5.00	3.80	15.00	2.11	16.00	.56	11.00
L094	7.05 EL	2.00	1.41	6.00	1.39 H	11.00	3.15 L	4.00	1.46 L	2.00	.329	8.00
L099	10.93	15.00	1.96 H	17.00	3.01 EH	14.00	3.88	17.00	2.14	17.00	.46	10.00
L116	10.1	7.00	1.64	13.00		0.00	3.57	8.00	1.78	6.00		0.00
L128	9.92	5.50	1.25	3.00	.64 L	6.00	3.29	5.00	1.68	4.00	.30	6.00
MEDIAN CONC.	10.2600		1.5000		1.0500		3.6050		1.8700		.3000	

SAMPLE	7		8		9		10	
LAB NO	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK
L002	1.7	4.00	.6 L	1.00	1.3 L	2.00	<.1 L	0.00
L003	2.0	10.50	1.0	7.50		0.00	13.8 EH	15.00
L004	1.42 VL	1.00	.70	2.00	1.32	3.00	.08T L	1.00
L006	1.78	5.50	.917	4.00	1.49	5.50	.387	2.00
L010	2.1	15.00	1.1	13.00	1.8	12.50	.5	7.50
L014	2.040	13.00	1.080	12.00	1.800	12.50	.600	12.00
L023	5.0W	0.00	5.0W	0.00	5.0W	0.00	5.0W	0.00
L030	1.90	7.00	.99	6.00	1.60	7.00	.47	5.00
L031	2.0	10.50	1.0	7.50	1.7	10.00	.5	7.50
L033	1.63	3.00	1.W	0.00	1.06 VL	1.00	1.W	0.00
L063	2.02	12.00	1.07	11.00	1.78	11.00	.49	6.00
L082	2.098	14.00	1.195	15.00	1.807	14.00	1.564 EH	14.00
L091	1.98	9.00	1.05	10.00	1.68	9.00	.509	9.00
L093	2.28	17.00	1.31	16.00	2.00	16.00	.77	13.00
L094	1.61 L	2.00	.756	3.00	1.33	4.00	.426	3.00
L099	2.15	16.00	1.15	14.00	1.81	15.00	.58	11.00
L116	1.97	8.00	1.03	9.00	1.63	8.00	.53	10.00
L128	1.78	5.50	.94	5.00	1.49	5.50	.46	4.00
MEDIAN CONC.	1.9800		1.0150		1.6550		.5000	

LAB NO.	TOTAL RANK	AVERAGE RANK	NO.OF SAMPLES RANKED	SUMMARY OF FLAGGING	BIAS STATEMENT	METHOD CODING
L002	31.00	4.429	7	H ELVL L L L		
L003	72.00	9.000	8	EH		SHIMADZU
L004	26.00	2.889	9	ELELEHL EL VL L	BIASED LOW	
L006	47.00	4.700	10	L	BIASED LOW	AUTOANALYSER
L010	106.00	11.778	9			COMBUSTION-IR
L014	106.00	10.600	10	VL		
L023	36.00	18.000	2	EH EH	INSUFFICIENT DATA	IR ANALYZER
L030	70.00	7.000	10			COLOURIMETRY
L031	106.00	10.600	10	EH		CONDUCTIV
L033	24.50	4.083	6	VL VL	BIASED LOW	
L063	93.50	9.350	10	VL		
L082	105.00	10.500	10	EL EH		AA Technicon
L091	92.50	9.250	10			
L093	139.00	13.900	10	L	BIASED HIGH	DOHRMANN
L094	45.00	4.500	10	EL H L L L	BIASED LOW	CO2 GEN.
L099	146.00	14.600	10	H EH	BIASED HIGH	INSTRUMENTAL
L116	69.00	8.625	8			ELECTROPOT.
L128	49.50	4.950	10	L		TOC ANALYZER
OVERALL AVERAGE RANK IS		8.579				

LAB NO.	TOTAL RANK	AVERAGE RANK	NO.OF SAMPLES RANKED	SUMMARY OF FLAGGING	BIAS STATEMENT	METHOD CODING
L004	26.00	2.889	9	ELELEHLELVLL	BIASED LOW	
L033	24.50	4.083	6	VLVL	BIASED LOW	
L002	31.00	4.429	7	HELVLLLL		
L094	45.00	4.500	10	ELHLLL	BIASED LOW	CO2 GEN.
L006	47.00	4.700	10	L	BIASED LOW	AUTOANALYSER
L128	49.50	4.950	10	L		TOC ANALYZER
L030	70.00	7.000	10			COLOURIMETRY
L116	69.00	8.625	8			ELECTROPOT.
L003	72.00	9.000	8	EH		SHIMADZU
L091	92.50	9.250	10			
L063	93.50	9.350	10	VL		
L082	105.00	10.500	10	ELEH		AA Technicon
L031	106.00	10.600	10	EH		CONDUCTIV
L014	106.00	10.600	10	VL		
L010	106.00	11.778	9			COMBUSTION-IR
L093	139.00	13.900	10	L	BIASED HIGH	DOHRMANN
L099	146.00	14.600	10	HEH	BIASED HIGH	INSTRUMENTAL
L023	36.00	18.000	2	EHEH	INSUFFICIENT DATA	IR ANALYZER
OVERALL AVERAGE RANK IS		8.579				

Diss Inorg Carbon

LRTAP STUDY 0037 DATA SUMMARY

PARAMETER: 07092 Nitrate + Nitrite MG N/L

AQUATIC ECOSYSTEM PROTECTION BRANCH
NATIONAL WATER RESEARCH INSTITUTE
BURLINGTON ONTARIO

LRTAP STUDY NO. 37 MAJOR IONS IN WATER

LOWER LIMIT FOR USE OF BASIC ACCEPTABLE ERROR= .0800 BASIC ACCEPTABLE ERROR= .0300 CONCENTRATION ERROR INCREMENT= .0444

SAMPLE	1		2		3		4		5		6	
LAB NO	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK
L002	.316	17.50	.069	8.50	.019	13.00	.131	5.50	.365	4.00	1.71 EL	1.00
L004	.30	6.00	.07	13.00	.01T	9.50	.11	2.00	.35	2.00	3.98 L	3.00
L005	.316	17.50	.073	19.00	.020	14.50	.145	17.00	.410	19.50	4.29	14.00
L006	.301	8.00	.064	3.50	.006	4.00	.131	5.50	.392	13.00	4.46 H	20.00
L010	.302	9.50	.068	6.00	.003	2.50	.138	11.50	.395	14.00	4. L	5.00
L014	.326	22.00	.070	13.00	.017	12.00	.139	13.50	.379	5.00	4.099	7.00
L023	.30	6.00	.08	22.00	.10W	0.00	.15	19.50	.40	16.00	4.22	11.50
L024	.321	21.00	.07	13.00		0.00	.146	18.00	.418	22.00	4.32	16.00
L029	.314	15.50	.072	18.00	.009T	7.50	.133	8.00	.384	8.50	3.99 L	4.00
L030	.309	12.00	.074	20.00	.027	16.00	.153	21.00	.409	18.00	4.11	8.00
L031	.30	6.00	.06	2.00	.04	17.00	.14	15.50	.41	19.50	4.4	18.50
L032	.32	19.50	.07	13.00	<.05	0.00	.15	19.50	.42	23.00	4.5 H	21.50
L033	.313	14.00	.068	6.00	.013	11.00	.139	13.50	.401	17.00	4.31	15.00
L034	.32	19.50	.07	13.00	.03W	0.00	.14	15.50	.39	12.00	4.21	9.00
L047		0.00		0.00		0.00		0.00		0.00		0.00
L049	.314	15.50	.077	21.00	.009	7.50	.158	22.00	.384	8.50	4.50 H	21.50
L063	.302	9.50	.064	3.50	.008	5.50	.115	3.00	.362	3.00	4.230	13.00
L086	.273	2.00	.068	6.00	.010	9.50	.138	11.50	.389	11.00	4.40	18.50
L094	.308	11.00	.070	13.00	.002	1.00	.135	9.50	.386	10.00	4.34	17.00
L102	.312	13.00	.07	13.00	.02T	14.50	.128	4.00	.38	6.00	4.08	6.00
L104	.15 EL	1.00	.03T L	1.00	.01W	0.00	.06T EL	1.00	.19 EL	1.00	2.26 EL	2.00
L119	.289	3.00	.071	17.00	.008	5.50	.132	7.00	.397	15.00	4.218	10.00
L126	.296	4.00	.069	8.50	.003	2.50	.135	9.50	.383	7.00		0.00
L128	.332	23.00	.082	23.00	.02W	0.00	.159	23.00	.416	21.00	4.22	11.50
MEDIAN CONC.	.3090		.0700		.0100		.1380		.3900		4.2200	

PARAMETER: 07092 Nitrate + Nitrite MG N/L

SAMPLE	7		8		9		10	
LAB NO	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK
L002	.821	5.00	.045	6.50	.540	3.00	<.010	0.00
L004	.77 L	2.00	.04	2.50	.55	6.50	.01W	0.00
L005	.837	8.00	.052	19.00	.553	8.50	.01T	10.50
L006	.890	22.00	.051	17.00	.559	12.00	.008	9.00
L010	.853	14.00	.049	10.50	.565	16.00	.004	4.50
L014	.864	18.50	.044	5.00	.550	6.50	.002	1.00
L023	.85	12.50	.05	13.50	.57	18.50	.01W	0.00
L024	.82	4.00	.051	17.00	.57	18.50	.01W	0.00
L029	.849	11.00	.047	9.00	.555	10.00	.002W	0.00
L030	.841	10.00	.049	10.50	.564	15.00	.003T	2.50

L031	.88	21.00	.04	2.50	.58	21.00	.02W	0.00
L032	.93 H	23.00	.05	13.50	.60	23.00	<.05	0.00
L033	.864	18.50	.051	17.00	.571	20.00	.006	7.00
L034	.85	12.50	.05	13.50	.56	13.50	.01T	10.50
L047		0.00		0.00	.62 H	24.00		0.00
L049	.825	6.00	.053	20.00	.560	13.50	.004	4.50
L063	.827	7.00	.043	4.00	.539	2.00	.007	8.00
L086	.871	20.00	.050	13.50	.568	17.00	.005	6.00
L094	.856	15.00	.056	22.50	.553	8.50	.017	12.00
L102	.84	9.00	.055	21.00	.556	11.00	.02T	13.00
L104	.41 EL	1.00	.02T	1.00	.28 EL	1.00	.01W	0.00
L119	.857	16.00	.046	8.00	.546	4.50		0.00
L126	.813	3.00	.045	6.50	.546	4.50	.003	2.50
L128	.863	17.00	.056	22.50	.588	22.00	.02W	0.00
MEDIAN CONC.	.8500		.0500		.5595		.0060	

LAB NO.	TOTAL RANK	AVERAGE RANK	NO.OF SAMPLES RANKED	SUMMARY OF FLAGGING	BIAS STATEMENT	METHOD CODING
L002	64.00	7.111	9	EL		
L004	46.50	5.167	9	L L	BIASED LOW	
L005	147.50	14.750	10			07110
L006	114.00	11.400	10	H		AUTOANALYSER
L010	93.50	9.350	10	L		AUTO CD REDUCTION
L014	103.50	10.350	10			
L023	119.50	14.938	8			FIA
L024	129.50	16.188	8			AUTO COLORIMETRIC
L029	91.50	10.167	9	L		
L030	133.00	13.300	10			COLOURIMETRY
L031	123.00	13.667	9			HYDR SULF
L032	156.00	19.500	8	H H	BIASED HIGH	
L033	139.00	13.900	10			
L034	119.00	13.222	9			
L047	24.00	24.000	1	H	INSUFFICIENT DATA	
L049	140.00	14.000	10	H		
L063	58.50	5.850	10		BIASED LOW	
L086	115.00	11.500	10			AA-Azo Dye
L094	119.50	11.950	10			COLORIMETRIC
L102	110.50	11.050	10			AUTO Cd. REDUCT.
L104	9.00	1.125	8	ELL ELELELEL EL	BIASED LOW	IC
L119	86.00	9.556	9			DIONEX
L126	48.00	5.333	9		BIASED LOW	
L128	163.00	20.375	8		BIASED HIGH	AA
OVERALL AVERAGE RANK IS		11.463				

LAB NO.	TOTAL RANK	AVERAGE RANK	NO.OF SAMPLES RANKED	SUMMARY OF FLAGGING	BIAS STATEMENT	METHOD CODING
L104	9.00	1.125	8	ELLELELELELEL	BIASED LOW	IC
L004	46.50	5.167	9	LL	BIASED LOW	
L126	48.00	5.333	9		BIASED LOW	
L063	58.50	5.850	10		BIASED LOW	
L002	64.00	7.111	9	EL		
L010	93.50	9.350	10	L		AUTO CD REDUCTION
L119	86.00	9.556	9			DIONEX
L029	91.50	10.167	9	L		
L014	103.50	10.350	10			
L102	110.50	11.050	10			AUTO Cd. REDUCT.
L006	114.00	11.400	10	H		AUTOANALYSER
L086	115.00	11.500	10			AA-Azo Dye
L094	119.50	11.950	10			COLORIMETRIC
L034	119.00	13.222	9			
L030	133.00	13.300	10			COLOURIMETRY
L031	123.00	13.667	9			HYDR SULF
L033	139.00	13.900	10			
L049	140.00	14.000	10	H		
L005	147.50	14.750	10			07110
L023	119.50	14.938	8			FIA
L024	129.50	16.188	8			AUTO COLORIMETRIC
L032	156.00	19.500	8	HH	BIASED HIGH	
L128	163.00	20.375	8		BIASED HIGH	AA
L047	24.00	24.000	1	H	INSUFFICIENT DATA	

OVERALL AVERAGE RANK IS 11.463

Nitrate + Nitrite

LRTAP STUDY 0037 DATA SUMMARY

PARAMETER: 07093 Nitrate-IC mgN/L

AQUATIC ECOSYSTEM PROTECTION BRANCH
NATIONAL WATER RESEARCH INSTITUTE
BURLINGTON ONTARIO

LRTAP STUDY NO. 37 MAJOR IONS IN WATER

LOWER LIMIT FOR USE OF BASIC ACCEPTABLE ERROR= .0800 BASIC ACCEPTABLE ERROR= .0300 CONCENTRATION ERROR INCREMENT= .0444

SAMPLE	1		2		3		4		5		6	
LAB NO	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK
L003	.25 L	2.00	.07	15.50	<.02	0.00	.14	13.00	.40	18.00	4.2	6.50
L007	.31	26.00	.10 H	27.00	.03W	0.00	.17	28.00	.42	26.00	4.50 H	24.50
L008	.31	26.00	.09	26.00	0.00T	1.50	.16	26.00	.44	27.00	4.46	22.00
L010	.282	5.00	.069	11.50	.002	4.00	.138	5.50	.396	12.00	4.28	13.00
L011	.26	3.00	.06	3.50	.02W	0.00	.14	13.00	.39	6.50	4.38	18.00
L013	.297	19.00	.065	5.00	.007W	0.00	.142	18.00	.393	10.00	4.15	4.00
L021	.295	18.00	.071	20.00	.002W	0.00	.139	8.00	.389	4.00	4.400	19.50
L024	.305	23.00	.068	9.00	.025T	14.00	.145	21.50	.417	25.00	4.32	16.00
L029	.29	13.50	.068	9.00	.003T	5.50	.145	21.50	.382	2.50	4.27	11.00
L031	.30	20.00	.06	3.50	.02W	0.00	.14	13.00	.39	6.50	4.2	6.50
L049	.310	26.00	.077	24.00	.009	13.00	.138	5.50	.441	28.00	4.50 H	24.50
L061	.29	13.50	.07	15.50	.004T	7.00	.14	13.00	.40	18.00	4.44	21.00
L063	.318	28.00	.078	25.00	.008	10.50	.147	24.50	.411	24.00	4.478	23.00
L081	.292	16.00	.073	23.00	.008T	10.50	.142	18.00	.400	18.00	4.24	10.00
L082	.287	8.00	.070	15.50	.005	8.00	.142	18.00	.397	14.00	4.006 L	3.00
L088	.287	8.00	.07	15.50	0.0W	0.00	.14	13.00	.394	11.00	4.22	9.00
L090	.29	13.50	.07	15.50	.001W	0.00	.14	13.00	.39	6.50	4.40	19.50
L091	.287	8.00	.067	7.00	0.00	1.50	.137	4.00	.391	9.00	4.33	17.00
L093	.293	17.00	.072	22.00	0.00W	0.00	.143	20.00	.400	18.00	4.625 VH	26.00
L094	.302	21.00	.112 H	28.00	.001	3.00	.168	27.00	.397	14.00	4.79 EH	27.00
L099	.288	10.00	.069	11.50		0.00	.146	23.00	.402	21.00	4.28	13.00
L102	.285	6.00	.071	20.00	.008	10.50	.139	8.00	.390	6.50	4.28	13.00
L104	.14 EL	1.00	.03T L	1.00	.01W	0.00	.06T EL	1.00	.19 EL	1.00	2.26 EL	1.00
L109	.308	24.00	.066	6.00	.002W	0.00	.139	8.00	.404	22.00	4.17	5.00
L116	.29	13.50	.07	15.50		0.00	.14	13.00	.40	18.00	4.00 L	2.00
L119	.289	11.00	.071	20.00	.008	10.50	.132	2.00	.397	14.00	4.218	8.00
L126	.278	4.00	.068	9.00	.003	5.50	.135	3.00	.382	2.50		0.00
L128	.303	22.00	.04	2.00	.05W	0.00	.147	24.50	.409	23.00	4.29	15.00
MEDIAN CONC.	.2900		.0700		.0045		.1400		.3970		4.2800	

PARAMETER: 07093 Nitrate-IC mgN/L

SAMPLE	7		8		9		10	
LAB NO	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK
L003	.88	24.50	.05	18.00	.57	26.50	<.02	0.00
L007	.88	24.50	.08 H	27.00	.55	21.00	.03W	0.00
L008	.90	27.00	.06	26.00	.57	26.50	.06 VH	13.00
L010	.832	8.00	.047	11.00	.540	17.00	.003	5.50
L011	.84	10.50	.04	2.50	.56	23.50	.02W	0.00
L013	.824	7.00	.047	11.00	.52	5.50	.007W	0.00
L021	.872	22.00	.038	13.50	.526	8.50	.003	5.50
L024	.815	4.00	.05T	18.00	.542	19.00	.01W	0.00
L029	.795	2.00	.045	6.00	.506	2.00	.002T	3.00
L031	.86	19.50	.04	2.50	.56	23.50	.02W	0.00

L049	.929 H	28.00	.053	25.00	.590 H	28.00	.003	5.50
L061	.86	19.50	.05	18.00	.54	17.00	.004T	8.00
L063	.890	26.00	.047	11.00	.563	25.00	.007	10.50
L081	.85	16.00	.046	8.00	.539	15.00	.008T	12.00
L082	.833	9.00	.048	13.50	.530	11.50	.005	9.00
L088	.845	13.50	.052	24.00	.526	8.50	0.0W	0.00
L090	.84	10.50	.05	18.00	.53	11.50	.001W	0.00
L091	.854	17.00	.046	8.00	.528	10.00	0.00	1.00
L093	.866	21.00	.051	22.50	.546	20.00	0.00W	0.00
L094	.823	6.00	.093 H	28.00	.512	3.00	.001	2.00
L099	.841	12.00	.051	22.50	.525	7.00	.003W	0.00
L102	.847	15.00	.05	18.00	.532	13.00	.007	10.50
L104	.41 EL	1.00	.02T	1.00	.25 EL	1.00	.01W	0.00
L109	.879	23.00	.044	4.50	.551	22.00	.002W	0.00
L116	.82	5.00	.05	18.00	.54	17.00		0.00
L119	.857	18.00	.046	8.00	.520	5.50		0.00
L126	.808	3.00	.044	4.50	.517	4.00	.003	5.50
L128	.845	13.50	.05T	18.00	.533	14.00	.05W	0.00
MEDIAN CONC.	.8460		.0490		.5360		.0030	

LAB NO.	TOTAL RANK	AVERAGE RANK	NO.OF SAMPLES RANKED	SUMMARY OF FLAGGING	BIAS STATEMENT	METHOD CODING
L003	124.00	15.500	8	L		07315; DIONEX
L007	204.00	25.500	8	H H H	BIASED HIGH	
L008	221.00	22.100	10	VH	BIASED HIGH	IC
L010	92.50	9.250	10			DIONEX
L011	80.50	10.063	8			
L013	79.50	9.938	8			IC
L021	119.00	13.222	9			AUTO COLORIMETRIC
L024	149.50	16.611	9			
L029	76.00	7.600	10			
L031	95.00	11.875	8			
L049	207.50	20.750	10	H H H		
L061	150.50	15.050	10			
L063	207.50	20.750	10			
L081	146.50	14.650	10			Ion Chromatog.
L082	109.50	10.950	10	L		C.I.
L088	102.50	12.813	8			Dionex
L090	108.00	13.500	8			IC DIONEX
L091	82.50	8.250	10			
L093	166.50	20.813	8	VH		DIONEX IC
L094	159.00	15.900	10	H EH H		ION CHROM.
L099	120.00	15.000	8			IC
L102	120.50	12.050	10			IC
L104	8.00	1.000	8	ELL ELELELEL EL	BIASED LOW	IC
L109	114.50	14.313	8			WATERS
L116	102.00	12.750	8	L		C.I.
L119	97.00	10.778	9			DIONEX
L126	41.00	4.556	9		BIASED LOW	
L128	132.00	16.500	8			IC
OVERALL AVERAGE RANK IS		13.664				

LAB NO.	TOTAL RANK	AVERAGE RANK	NO.OF SAMPLES RANKED	SUMMARY OF FLAGGING	BIAS STATEMENT	METHOD CODING
L104	8.00	1.000	8	ELLELELELELEL	BIASED LOW	IC
L126	41.00	4.556	9		BIASED LOW	
L029	76.00	7.600	10			
L091	82.50	8.250	10			
L010	92.50	9.250	10			DIONEX
L013	79.50	9.938	8			
L011	80.50	10.063	8			
L119	97.00	10.778	9			DIONEX
L082	109.50	10.950	10	L		C.I.
L031	95.00	11.875	8			
L102	120.50	12.050	10			IC
L116	102.00	12.750	8	L		C.I.
L088	102.50	12.813	8			Dionex
L021	119.00	13.222	9			IC
L090	108.00	13.500	8			IC DIONEX
L109	114.50	14.313	8			WATERS
L081	146.50	14.650	10			Ion Chromatog.
L099	120.00	15.000	8			IC
L061	150.50	15.050	10			
L003	124.00	15.500	8	L		07315; DIONEX
L094	159.00	15.900	10	HEHH		ION CHROM.
L128	132.00	16.500	8			IC
L024	149.50	16.611	9			AUTO COLORIMETRIC
L063	207.50	20.750	10			
L049	207.50	20.750	10	HHH		
L093	166.50	20.813	8	VH		DIONEX IC
L008	221.00	22.100	10	VH	BIASED HIGH	IC
L007	204.00	25.500	8	HHH	BIASED HIGH	

OVERALL AVERAGE RANK IS 13.664

Nitrate-IC

LRTAP STUDY 0037 DATA SUMMARY

PARAMETER: 07192 Ammonia MG N/L

AQUATIC ECOSYSTEM PROTECTION BRANCH
NATIONAL WATER RESEARCH INSTITUTE
BURLINGTON ONTARIO

LRTAP STUDY NO. 37 MAJOR IONS IN WATER

LOWER LIMIT FOR USE OF BASIC ACCEPTABLE ERROR= .0050 BASIC ACCEPTABLE ERROR= .0250 CONCENTRATION ERROR INCREMENT= .0424

SAMPLE	1		2		3		4		5		6	
LAB NO	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK
L002	<.005	0.00	.024	3.50	.050 L	3.00	.094	11.00	.047	3.00	.924	23.00
L004	.009T	10.00	.043	28.00	.102	23.00	.108	28.00	.058	15.00	.998 VH	32.00
L005	.005W	0.00	.017	1.00	.057	5.00	.078	1.00	.045	2.00	.950	30.00
L006	.0011	4.00	.0242	5.00	.0737	14.00	.0892	4.00	.0525	11.00	.9156	21.00
L008	.05T VH	14.00	.11 EH	29.00	1.06 EH	33.00	.15 VH	32.00	.07	30.00	.98 H	31.00
L010	<.002	0.00	.026	8.00	.106	25.00	.093	8.50	.049	4.00	.935	26.00
L013	.005W	0.00	.026	8.00	.107	26.00	.094	11.00	.058	15.00	.926	24.00
L014	0.00	1.50	.03	19.50	.11 H	27.50	.10	19.50	.06	19.50	.87	8.50
L021	.008W	0.00	.025	6.00	.067	8.50	.106	27.00	.059	17.00	.892	15.00
L023	.003	7.00	.031	24.00	.113 H	29.00	.102	25.00	.061	22.00	.928	25.00
L024	.01W	0.00	.029T	15.50	.10	22.00	.102	25.00	.062	23.00	.904	18.50
L029	.005T	8.00	.027	10.50	.066	6.50	.090	6.00	.064	25.50	.889	14.00
L030	.001W	0.00	.031	24.00	.075	15.50	.100	19.50	.060	19.50	.895	16.00
L031	.01W	0.00	.03	19.50	.07	11.00	.10	19.50	.05	6.50	.87	8.50
L032	<.01	0.00	.030	19.50	.18 EH	31.00	.096	13.50	.064	25.50	.88	11.50
L033	.001W	0.00	.026	8.00	.067	8.50	.096	13.50	.054	12.00	.860	4.00
L047	.20T EH	15.00	.20T EH	30.00	.20T EH	32.00	.20T EH	33.00	.20T EH	33.00	.92	22.00
L049	.013	11.00	.034	26.00	.147 EH	30.00	.090	6.00	.052	10.00	.938	27.00
L061	.02W	0.00	.03	19.50	.08	17.50	.10	19.50	.06	19.50	.90	17.00
L063	.002	5.50	.030	19.50	.086	19.00	.102	25.00	.063	24.00	.947	29.00
L081	0.00T	1.50	.028	13.00	.087	20.00	.137 H	31.00	.071	32.00	1.14 EH	33.00
L082	.002T	5.50	.028	13.00	.103	24.00	.094	11.00	.06	19.50	.883	13.00
L086	.02W	0.00	.03	19.50	.07	11.00	.10	19.50	.05	6.50	.87	8.50
L091	<.038	0.00	<.038	0.00	.08	17.50	.09	6.00	.05	6.50	.87	8.50
L093	0.00W	0.00	.028	13.00	.075	15.50	.087	2.50	.055	13.00	.848	1.00
L094	.001	3.00	.024	3.50	.091	21.00	.097	15.00	.066	27.50	.868	6.00
L099	.027W	0.00	.027W	0.00	.066T	6.50	.100	19.50	.07T	30.00	.863	5.00
L102	0.0W	0.00	.027	10.50	.043 L	2.00	.087	2.50	.051	9.00	.852	3.00
L104	.04T H	13.00	.04T	27.00	.07T	11.00	.12T	30.00	.07T	30.00	.91	20.00
L116		0.00	.02	2.00	.11 H	27.50	.10	19.50	.05	6.50	.85	2.00
L119		0.00		0.00	.071	13.00	.100	19.50	.058	15.00	.880	11.50
L126	.006T	9.00	.029	15.50	.055	4.00	.093	8.50	.037	1.00	.904	18.50
L128	.033 H	12.00	.031	24.00	.02W EL	1.00	.11	29.00	.066	27.50	.94	28.00
MEDIAN CONC.	.0050		.0290		.0800		.1000		.0590		.9000	

PARAMETER: 07192 Ammonia MG N/L

SAMPLE	7		8		9		10	
LAB NO	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK
L002	.286	17.50	.017	12.00	.289	16.00	.016	14.00
L004	.312	31.00	.019	18.50	.315	31.00	.022	22.00
L005	.259	3.00	.010	2.00	.257	3.00	.007	2.00
L006	.2733	7.00	.0173	15.00	.2780	7.50	.0124	11.00
L008	.28	11.00	.03T	26.00	.28	9.00	.02T	19.50
L010	.281	12.50	.018	16.50	.282	10.50	.019	16.50
L013	.284	15.00	.013	3.00	.284	12.00	.009	3.50
L014	.29	21.00	.02	21.50	.29	18.50	.01	5.50
L021	.292	24.00	.015	8.50	.296	23.00	.011	7.50
L023	.303	30.00	.015	8.50	.297	24.50	.011	7.50
L024	.30	27.50	.017T	12.00	.303	28.00	.015T	12.50
L029	.287	19.00	.022	24.00	.276	6.00	.019	16.50
L030	.285	16.00	.017	12.00	.290	18.50	.020	19.50
L031	.27	5.50	.02	21.50	.02 EL	1.00	.28 EH	29.00
L032	.29	21.00	.025	25.00	.30	26.50	.026	24.50
L033	.260	4.00	.014	5.50	.270	5.00	.012	9.50
L047	.33 H	32.00	.20T EH	28.00	.33 H	32.00	.20T EH	28.00
L049	.286	17.50	.014	5.50	.278	7.50	.024	23.00
L061	.30	27.50	.02	21.50	.31	30.00	.02T	19.50
L063	.291	23.00	.017	12.00	.291	21.00	.017	15.00
L081	.372 EH	33.00	.018	16.50	.335 H	33.00	.12 EH	27.00
L082	.283	14.00	.014	5.50	.286	14.00	.009	3.50
L086	.27	5.50	.02W	0.00	.26	4.00	.02W	0.00
L091	.29	21.00	<.039	0.00	.29	18.50	<.038	0.00
L093	.197 EL	1.00	.009	1.00	.287	15.00	.005	1.00
L094	.275	9.50	.017	12.00	.297	24.50	.028	26.00
L099	.274	8.00	.027W	0.00	.285	13.00	.027W	0.00
L102	.275	9.50	.014	5.50	.293	22.00	.012	9.50
L104	.30	27.50	.02T	21.50	.30	26.50	.02T	19.50
L116	.23 VL	2.00		0.00	.24 L	2.00	.01	5.50
L119	.295	25.00		0.00	.305	29.00		0.00
L126	.281	12.50	.019	18.50	.282	10.50	.015	12.50
L128	.30	27.50	.039	27.00	.29	18.50	.026	24.50
MEDIAN CONC.	.2860		.0171		.2900		.0170	

LAB NO.	TOTAL RANK	AVERAGE RANK	NO.OF SAMPLES RANKED	SUMMARY OF FLAGGING
L002	103.00	11.444	9	L
L004	238.50	23.850	10	VH
L005	49.00	5.444	9	
L006	99.50	9.950	10	
L008	234.50	23.450	10	VHEHEHVH H
L010	127.50	14.167	9	
L013	117.50	13.056	9	

BIAS STATEMENT

BIASED LOW

METHOD CODING

07540
AUTOANALYSER
TECHNICON
AUTO PHENOL HYPOCH

L014	162.50	16.250	10	H			
L021	136.50	15.167	9				IC
L023	202.50	20.250	10	H			AUTO PHENATE
L024	184.00	20.444	9				AUTO COLORIMETRIC
L029	136.00	13.600	10				
L030	160.50	17.833	9				COLOURIMETRY
L031	122.00	13.556	9		ELEH		BERTHELOT
L032	198.00	22.000	9	EH			
L033	70.00	7.778	9				
L047	285.00	28.500	10	EHEHEHEHEH	H EHH EH	BIASED HIGH	
L049	163.50	16.350	10	EH			
L061	191.50	21.278	9				
L063	193.00	19.300	10				
L081	240.00	24.000	10	H	EHEH H EH		Coloimetric A
L082	123.00	12.300	10				F.I.A
L086	74.50	10.643	7				AA-Bertholot
L091	78.00	13.000	6				
L093	63.00	7.000	9		EL	BIASED LOW	TECHNICON
L094	148.00	14.800	10				COLORIMETRIC
L099	82.00	13.667	6				ICP
L102	73.50	8.167	9	L			BERTHOLOT
L104	226.00	22.600	10	H			IC
L116	67.00	8.375	8	H	VL L		F.I.A.
L119	113.00	18.833	6				DIONEX
L126	110.50	11.050	10				
L128	219.00	21.900	10	H EL			AA

OVERALL AVERAGE
RANK IS 15.973

LAB NO.	TOTAL RANK	AVERAGE RANK	NO.OF SAMPLES RANKED	SUMMARY OF FLAGGING	BIAS STATEMENT	METHOD CODING
L005	49.00	5.444	9		BIASED LOW	07540
L093	63.00	7.000	9	EL	BIASED LOW	TECHNICON
L033	70.00	7.778	9			
L102	73.50	8.167	9	L		BERTHOLOT
L116	67.00	8.375	8	HVLL		F.I.A.
L006	99.50	9.950	10			AUTOANALYSER
L086	74.50	10.643	7			AA-Bertholot
L126	110.50	11.050	10			
L002	103.00	11.444	9	L		
L082	123.00	12.300	10			F.I.A
L091	78.00	13.000	6			
L013	117.50	13.056	9			
L031	122.00	13.556	9	ELEH		BERTHELOT
L029	136.00	13.600	10			
L099	82.00	13.667	6			ICP
L010	127.50	14.167	9			AUTO PHENOL HYPOCH
L094	148.00	14.800	10			COLORIMETRIC
L021	136.50	15.167	9			IC
L014	162.50	16.250	10	H		
L049	163.50	16.350	10	EH		
L030	160.50	17.833	9			COLOURIMETRY
L119	113.00	18.833	6			DIONEX

L063	193.00	19.300	10			
L023	202.50	20.250	10	H		AUTO PHENATE
L024	184.00	20.444	9			AUTO COLORIMETRIC
L061	191.50	21.278	9			
L128	219.00	21.900	10	HEL		AA
L032	198.00	22.000	9	EH		
L104	226.00	22.600	10	H		IC
L008	234.50	23.450	10	VHEHEHVHH		TECHNICON
L004	238.50	23.850	10	VH		
L081	240.00	24.000	10	HEHEHHEH		Coloimetric A
L047	285.00	28.500	10	EHEHEHEHEHHEHHEH	BIASED HIGH	

OVERALL AVERAGE
RANK IS 15.973

Ammonia

LRTAP STUDY 0037 DATA SUMMARY

PARAMETER: 07392 Total Kjeldahl N MG N/L

AQUATIC ECOSYSTEM PROTECTION BRANCH
NATIONAL WATER RESEARCH INSTITUTE
BURLINGTON ONTARIO

LRTAP STUDY NO. 37 MAJOR IONS IN WATER

LOWER LIMIT FOR USE OF BASIC ACCEPTABLE ERROR= .1000 BASIC ACCEPTABLE ERROR= .0600 CONCENTRATION ERROR INCREMENT= .0384

SAMPLE	1		2		3		4		5		6	
LAB NO	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK
L002	.080	3.00	.234	6.00	1.54 H	8.00	.225	5.00	.107	4.00	1.07	7.00
L008	.02T L	2.00	.01T EL	1.00	.86 EL	1.00	.01T EL	1.00	0.00T VL	1.00	.49 EL	1.00
L014	-.03 EL	1.00	.19	3.00	1.42	6.00	.17	2.00	.03 L	2.00	.94	3.00
L023	.20W	0.00	.20W	0.00	1.29	2.00	.20W	0.00	.20W	0.00	.91 L	2.00
L024	.10	5.00	.23	4.50	1.35	5.00	.23	6.00	.12	6.00	1.10	8.00
L032	<.02 L	0.00	.13 VL	2.00	1.34	4.00	<.02 EL	0.00	<.02 L	0.00	1.02	6.00
L033	.10	5.00	.24	7.00	1.49	7.00	.24	7.00	.10	3.00	1.11 H	9.00
L049	.200 VH	7.00	.267	8.00	1.559 VH	9.00	.223	4.00	.204 VH	8.00	.992	5.00
L102	.10	5.00	.23	4.50	1.33	3.00	.20	3.00	.11	5.00	.98	4.00
L128	.266 EH	8.00	.368 EH	9.00	1.74 EH	10.00	.405 EH	8.00	.186 H	7.00	1.16 VH	10.00
MEDIAN CONC.	.1000		.2300		1.3850		.2240		.1085		1.0060	

SAMPLE	7		8		9		10	
LAB NO	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK
L002	.366	5.00	.150	1.50	.425	6.00	.147	4.00
L008	.35	3.50	.20	6.00	.51 H	9.00	.36 EH	8.00
L014	.21 EL	1.00	.16	3.50	.28 VL	1.00	.15	5.00
L023	.33	2.00	.20W	0.00	.32 L	3.00	.20W	0.00
L024	.43	9.00	.16	3.50	.44	8.00	.14	2.50
L032	.35	3.50	<.02 EL	0.00	.30 VL	2.00	<.02 EL	0.00
L033	.38	6.00	.15	1.50	.42	5.00	.11	1.00
L049	.420	7.50	.203	7.00	.363	4.00	.194	6.00
L102	.42	7.50	.19	5.00	.43	7.00	.14	2.50
L128	.493 VH	10.00	.223	8.00	.528 H	10.00	.226 H	7.00
MEDIAN CONC.	.3730		.1750		.4225		.1485	

LAB NO.	TOTAL RANK	AVERAGE RANK	NO.OF SAMPLES RANKED	SUMMARY OF FLAGGING	BIAS STATEMENT	METHOD CODING
L002	49.50	4.950	10	H		
L008	33.50	3.350	10	L ELELELVLEL H EH		TECHNICON
L014	27.50	2.750	10	EL L EL VL	BIASED LOW	
L023	9.00	2.250	4	L L	INSUFFICIENT DATA	AUTO
L024	57.50	5.750	10			DIG/COLORIMETRIC
L032	17.50	3.500	5	L VL ELL ELVLEL		
L033	51.50	5.150	10	H		
L049	65.50	6.550	10	VH VH VH		
L102	46.50	4.650	10			H2SO4 DIG.
L128	87.00	8.700	10	EHEHEHEHH VHVH H H	BIASED HIGH	DISTIL-COLOR

OVERALL AVERAGE RANK IS 5.000

LAB NO.	TOTAL RANK	AVERAGE RANK	NO.OF SAMPLES RANKED	SUMMARY OF FLAGGING	BIAS STATEMENT	METHOD CODING
L023	9.00	2.250	4	LL	INSUFFICIENT DATA	AUTO
L014	27.50	2.750	10	ELLELVL	BIASED LOW	
L008	33.50	3.350	10	LELELELVLELHEH		TECHNICON
L032	17.50	3.500	5	LVLELLELVLEL		
L102	46.50	4.650	10			H2SO4 DIG.
L002	49.50	4.950	10	H		
L033	51.50	5.150	10	H		
L024	57.50	5.750	10			DIG/COLORIMETRIC
L049	65.50	6.550	10	VHVHVH		
L128	87.00	8.700	10	EHEHEHEHHVHVHHH	BIASED HIGH	DISTIL-COLOR
OVERALL AVERAGE RANK IS		5.000				

Total Kjeldahl N

LRTAP STUDY 0037 DATA SUMMARY

PARAMETER: 11091 Sodium MG/L

AQUATIC ECOSYSTEM PROTECTION BRANCH
NATIONAL WATER RESEARCH INSTITUTE
BURLINGTON ONTARIO

LRTAP STUDY NO. 37 MAJOR IONS IN WATER

LOWER LIMIT FOR USE OF BASIC ACCEPTABLE ERROR= .2000 BASIC ACCEPTABLE ERROR= .0700 CONCENTRATION ERROR INCREMENT= .0286

SAMPLE	1		2		3		4		5		6	
LAB NO	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK
L002	1.40	28.50	2.24	27.50	.93	17.50	.83	21.00	.11	15.50	.21	26.50
L003	1.40	28.50	2.30	32.50	.96	28.50	.86	30.50	.08	5.50	.22	33.50
L004	1.39	25.00	2.20	22.00	.941	25.00	.821	17.00	.094T	8.00	.194	11.00
L006	1.363	15.00	2.194	19.00	.903	12.00	.803	13.00	.116	22.00	.216	30.00
L007	1.38	22.00	2.16	11.00	.97	30.50	.85	27.50	.12	28.00	.20	18.00
L008	1.33	11.00	2.11	6.00	.98	33.50	.82	16.00	.12	28.00	.20	18.00
L010	1.4	28.50	2.2	22.00	.9	10.00	.8	11.00	.1	10.50	.2	18.00
L011	1.37	19.00	2.20	22.00	.93	17.50	.84	26.00	.08	5.50	.21	26.50
L013	1.359	13.00	2.178	13.00	.918	15.00	.823	18.00	.112	19.50	.198	13.50
L021	1.384	24.00	2.332 H	35.00	.940	23.00	.835	24.00	.126	32.00	.218	31.00
L023	1.38	22.00	2.18	14.50	.95	26.00	.85	27.50	.13	33.50	.21	26.50
L024	1.44	35.00	2.3	32.50	.96	28.50	.89	35.00	.13T	33.50	.22T	33.50
L029	1.26 L	2.00	2.19	16.50	.87	4.00	.76	5.00	.100	10.50	.180	6.50
L030	1.42	34.00	2.34 H	37.00	.975	32.00	.855	29.00	.115	21.00	.200	18.00
L031	1.4	28.50	2.2	22.00	.93	17.50	.88	34.00	.12	28.00	.22	33.50
L032	1.52 H	37.00	2.29	31.00	.94	23.00	.79	8.50	.10	10.50	.18	6.50
L033	1.29	3.00	2.12	7.50	1.W	0.00	1.W	0.00	1.W	0.00	1.W	0.00
L034	1.40	28.50	2.25	29.50	.94	23.00	.83	21.00	.12	28.00	.21	26.50
L049	1.32	8.00	2.12	7.50	.88	6.00	.79	8.50	.11	15.50	.21	26.50
L057	1.38	22.00	2.06 L	2.50	.88	6.00	.75	3.50	.07	4.00	.20	18.00
L061	1.367	16.50	2.190	16.50	.915	14.00	.812	14.00	.112	19.50	.200	18.00
L063	1.411	33.00	2.192	18.00	.904	13.00	.813	15.00	.133	35.00	.198	13.50
L081	1.30	5.00	2.20	22.00	.84	1.50	.74	1.50	.10	10.50	.18	6.50
L082	1.367	16.50	2.064 L	4.00	.867	3.00	.774	6.00	.058	2.00	.124 L	2.00
L088	1.32	8.00	2.06 L	2.50	.90	10.00	.80	11.00	.12	28.00	.10 L	1.00
L090	1.32	8.00	2.18	14.50	.98	33.50	.87	33.00	.12	28.00	.22	33.50
L091	1.37	19.00	2.23	26.00	.93	17.50	.83	21.00	.12	28.00	.21	26.50
L093	1.23 L	1.00	2.15	9.50	.84	1.50	.74	1.50	.11	15.50	.17	4.00
L094	1.361	14.00	2.175	12.00	.988	35.00	.824	19.00	.119	24.00	.197	12.00
L099	1.30	5.00	2.10	5.00	.90	10.00	.80	11.00	.09	7.00	.18	6.50
L102	1.33	11.00	2.15	9.50	.89	8.00	.91	36.00	.11	15.50	.19	9.00
L109	1.37	19.00	2.22	25.00	.937	21.00	.832	23.00	.106	13.00	.206	22.00
L114	1.33	11.00	2.25	29.50	1.04 H	36.00	.78	7.00	.04W L	1.00	.20	18.00
L116	1.30	5.00	2.05 L	1.00	.88	6.00	.75	3.50	.06	3.00	.15	3.00
L119	1.409	32.00	2.309	34.00	.932	20.00	.836	25.00	.111	18.00	.192	10.00
L126	1.475 H	36.00	2.333 H	36.00	.959	27.00	.861	32.00	.117	23.00	.208	23.00
L128	1.40	28.50	2.24	27.50	.97	30.50	.86	30.50	.14	36.00	.23	36.00
MEDIAN CONC.	1.3700		2.1940		.9300		.8235		.1115		.2000	

LRTAP STUDY 0037 DATA SUMMARY

PARAMETER: 01092 pH PH UNITS

AQUATIC ECOSYSTEM PROTECTION BRANCH
NATIONAL WATER RESEARCH INSTITUTE
BURLINGTON ONTARIO

LRTAP STUDY NO. 37 MAJOR IONS IN WATER

LOWER LIMIT FOR USE OF BASIC ACCEPTABLE ERROR= 4.5000 BASIC ACCEPTABLE ERROR= .1200 CONCENTRATION ERROR INCREMENT= .0307

SAMPLE	1		2		3		4		5		6	
LAB NO	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK
L002	7.81	21.00	6.78	30.00	4.20	31.00	7.32	24.50	6.87	12.50	4.40 H	40.00
L003	7.90	30.50	6.68	25.00	4.18	24.00	7.39	31.00	6.98	26.00	4.33	36.50
L004	7.96	36.50	6.83 H	33.00	4.08	4.00	7.34	26.50	7.04	31.00	4.13 L	3.00
L006	7.55 L	4.00	6.54	11.00	4.09	5.50	7.02 L	6.00	6.75	3.50	4.18	4.50
L007	7.98	38.00	6.99 EH	37.00	4.24	38.00	7.56 H	39.00	7.26 VH	38.00	4.43 VH	41.00
L008	6.72 EL	1.00	6.18 EL	1.00	3.82 EL	1.00	6.80 EL	4.00	6.50 EL	1.00	3.92 EL	1.00
L010	7.70	12.00	6.54	11.00	4.15	16.50	7.23	15.50	6.90	19.50	4.24	18.50
L011	7.79	16.50	6.59	16.50	4.14	13.50	7.31	23.00	6.86	11.00	4.22	12.00
L013		0.00		0.00	4.189	27.00		0.00		0.00	4.254	24.00
L014	8.12 H	39.00	7.21 EH	40.00	4.21	35.50	7.65 VH	40.00	7.35 EH	39.00	4.31	35.00
L021		0.00	6.42	3.00	4.18	24.00	6.84 EL	5.00		0.00	4.24	18.50
L023	7.65	8.50	6.52	8.00	4.13	10.50	7.06 L	7.00	6.83	8.50	4.20	7.50
L024	7.9	30.50	6.6	20.00	4.2	31.00	7.4	33.00	6.9	19.50	4.3	33.00
L029	7.94	35.00	6.57	13.50	4.13	10.50	7.53 H	37.50	7.23 VH	37.00	4.26	25.50
L030	7.65	8.50	6.66	23.00	4.15	16.50	7.21	13.00	6.91	22.00	4.22	12.00
L031	7.83	23.00	6.47	5.00	4.14	13.50	7.36	28.50	7.01	29.00	4.23	15.00
L032	7.86	25.50	6.72	27.00	4.18	24.00	7.37	30.00	7.01	29.00	4.24	18.50
L033	7.895	28.00	6.995 EH	38.00	4.26	39.00	7.164	8.00	7.105 H	33.00	4.23	15.00
L034	7.90	30.50	6.53	9.00	4.22	37.00	7.45	35.00	6.89	17.50	4.28	30.50
L047	7.28 EL	3.00	6.45	4.00	4.21	35.50	6.79 EL	3.00	6.79	6.00	4.34	38.00
L049	7.71	13.00	6.74	28.00	3.94 VL	2.00	7.17	9.50	6.88	14.50	4.00 EL	2.00
L057	7.9	30.50	6.8 H	32.00	4.2	31.00	7.4	33.00	7.1 H	32.00	4.3	33.00
L061	7.93	33.50	6.88 VH	35.00	4.20	31.00	7.36	28.50	7.13 H	35.00	4.26	25.50
L063	7.098 EL	2.00	6.946 VH	36.00	4.276	40.00	6.688 EL	2.00	6.758	5.00	4.261	27.00
L073	7.80	19.00	6.58	15.00	4.18	24.00	7.32	24.50	6.89	17.50	4.25	21.50
L078	7.78	15.00	6.59	16.50	4.18	24.00	7.23	15.50	6.88	14.50	4.25	21.50
L081	7.96	36.50	6.79 H	31.00	4.14	13.50	7.52 H	36.00	7.18 H	36.00	4.21	9.50
L082	7.86	25.50	6.68	25.00	4.10	7.00	7.40	33.00	7.01	29.00	4.18	4.50
L086	7.80	19.00	6.60	20.00	4.06	3.00	7.23	15.50	6.81	7.00	4.20	7.50
L088	7.66	10.00	6.50	6.00	4.20	31.00	7.27	19.50	6.75	3.50	4.30	33.00
L090	7.72	14.00	6.51	7.00	4.12	8.50	7.28	21.50	6.91	22.00	4.27	28.50
L091	7.67	11.00	6.54	11.00	4.17	20.00	7.23	15.50	6.87	12.50	4.23	15.00
L093	7.635	7.00	6.593	18.00	4.151	18.00	7.188	12.00	6.853	10.00	4.220	12.00
L094	7.79	16.50	6.65	22.00	4.20	31.00	7.18	11.00	6.83	8.50	4.28	30.50
L099	7.93	33.50	6.75	29.00	4.14	13.50	7.53 H	37.50	7.11 H	34.00	4.21	9.50
L109	7.80	19.00	6.60	20.00	4.20	31.00	7.28	21.50	6.91	22.00	4.27	28.50
L112	7.87	27.00	6.57	13.50	4.16	19.00	7.26	18.00	6.93	24.00	4.24	18.50
L114	7.61	5.50	6.33 L	2.00	4.12	8.50	7.17	9.50	6.74	2.00	4.33	36.50
L116	7.82	22.00	6.68	25.00	4.09	5.50	7.34	26.50	7.00	27.00	4.19	6.00
L119	7.839	24.00	6.838 H	34.00	4.173	21.00	7.270	19.50	6.889	16.00	4.251	23.00
L128	7.61	5.50	7.12 EH	39.00	4.28	41.00	6.58 EL	1.00	6.97	25.00	4.36	39.00
MEDIAN CONC.	7.8000		6.6000		4.1730		7.2750		6.9000		4.2500	

PARAMETER: 01092 pH PH UNITS

SAMPLE	7		8		9		10	
LAB NO	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK
L002	6.98	18.50	6.74	25.00	6.88	11.00	6.16	10.00
L003	7.07	26.00	6.75	27.50	7.05	28.50	6.25	18.50
L004	7.11	33.50	6.70	17.50	7.02	23.50	6.20	12.50
L006	6.79 L	6.00	6.51 L	4.00	6.81	8.00	6.09	7.00
L007	7.33 VH	39.00	7.06 VH	39.00	7.25 H	39.00	6.70 EH	40.00
L008	6.20 EL	1.00	6.16 EL	2.00	6.42 EL	2.00	6.42	33.00
L010	6.97	17.00	6.64	12.00	6.93	17.50	6.23	16.50
L011	7.00	20.50	6.70	17.50	4.02 EL	1.00	6.30	24.00
L013		0.00		0.00		0.00		0.00
L014	7.36 VH	40.00	7.05 VH	38.00	7.33 VH	40.00	6.64 EH	39.00
L021	6.62 VL	5.00	6.38 VL	3.00	6.66 VL	4.00	6.12	8.00
L023	6.84	7.00	6.52 L	5.50	6.79 L	6.50	6.14	9.00
L024	7.1	31.50	6.8	33.00	7.2 H	36.50	6.2	12.50
L029	7.08	27.50	6.88	35.00	7.16	34.50	6.53 VH	37.00
L030	7.04	22.00	6.66	14.50	6.92	16.00	6.17	11.00
L031	7.09	29.50	6.75	27.50	7.09	33.00	6.06 L	3.50
L032	7.11	33.50	6.79	32.00	7.03	25.00	6.25	18.50
L033	6.865	8.00		0.00	7.001	22.00	6.08 L	6.00
L034	7.15	36.00	6.75	27.50	7.05	28.50	6.28	22.50
L047	6.44 EL	2.00	6.08 EL	1.00	6.59 EL	3.00	6.21	14.00
L049	6.92	10.00	6.52 L	5.50	6.79 L	6.50	6.04 L	1.50
L057	7.1	31.50	6.9 H	36.00	7.2 H	36.50	6.5 H	36.00
L061	7.13	35.00	6.76	30.50	7.05	28.50	6.26	20.50
L063	6.536 EL	3.00	6.538	7.00	6.698 VL	5.00	6.441 H	34.00
L073	7.08	27.50	6.73	23.00	7.00	21.00	6.28	22.50
L078	7.00	20.50	6.71	19.50	6.94	19.00	6.37	29.00
L081	7.26 H	38.00	6.91 H	37.00	7.22 H	38.00	6.38	30.00
L082	7.09	29.50	6.72	21.00	7.06	32.00	6.31	25.50
L086	6.94	13.00	6.56	8.00	6.88	11.00	6.06 L	3.50
L088	6.95	14.00	6.60	11.00	6.90	13.50	6.04 L	1.50
L090	7.06	24.50	6.73	23.00	7.02	23.50	6.26	20.50
L091	6.96	15.50	6.58	10.00	6.90	13.50	6.22	15.00
L093	6.914	9.00	6.563	9.00	6.845	9.00	6.070 L	5.00
L094	6.93	11.00	6.71	19.50	6.99	20.00	6.23	16.50
L099	7.18	37.00	6.83	34.00	7.16	34.50	6.39	31.00
L109	7.06	24.50	6.75	27.50	7.05	28.50	6.31	25.50
L112	6.96	15.50	6.73	23.00	7.05	28.50	6.35	27.00
L114	6.98	18.50	6.67	16.00	6.93	17.50	6.60 VH	38.00
L116	7.05	23.00	6.76	30.50	7.05	28.50	6.36	28.00
L119	6.939	12.00	6.660	14.50	6.916	15.00	6.395	32.00
L128	6.57 EL	4.00	6.65	13.00	6.88	11.00	6.45 H	35.00
MEDIAN CONC.	7.0000		6.7100		6.9950		6.2600	

PARAMETER: 11091 Sodium MG/L

SAMPLE	7		8		9		10	
LAB NO	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK
L002	.56	24.50	.95	19.00	.27	14.50	.60	17.50
L003	.58	33.50	1.00	31.00	.26	11.00	.61	24.00
L004	.543	14.00	.949	18.00	.266	13.00	.571	9.00
L006	.563	28.00	.966	22.00	.285	25.50	.6070	21.00
L007	.56	24.50	.97	24.00	.29	28.50	.62	27.00
L008	.54	12.00	.92	10.00	.28	21.50	.59	13.50
L010	.5	7.50	.9	8.50	.3	32.50	.6	17.50
L011	.58	33.50	1.00	31.00	.28	21.50	.59	13.50
L013	.548	15.00	.948	17.00	.279	19.00	.601	20.00
L021	.577	30.50	.968	23.00	.300	32.50	.628	29.00
L023	.58	33.50	.98	25.00	.30	32.50	.62	27.00
L024	.58	33.50	1.01	33.00	.29	28.50	.64	34.00
L029	.51	9.50	.88	6.00	.26	11.00	.56	6.50
L030	.560	24.50	.988	27.00	.275	18.00	.810 EH	36.00
L031	.57	29.00	1.02	35.00	.27	14.50	.62	27.00
L032	.49	5.00	1.00	31.00	.25	8.00	.55	5.00
L033	1.W	0.00	1.W	0.00	1.W	0.00	1.W	0.00
L034	.55	17.00	.93	13.00	.29	28.50	.60	17.50
L049	.54	12.00	.93	13.00	.29	28.50	.59	13.50
L057	.49	5.00	.90	8.50	.21	1.00	.63	31.00
L061	.549	16.00	.939	15.00	.280	21.50	.608	22.50
L063	.559	21.00	.926	11.00	.307	35.00	.580	10.50
L081	.50	7.50	.86	3.00	.25	8.00	.56	6.50
L082	.475	2.00	.863	4.00	.212	2.00	.518 L	1.00
L088	.48	3.00	.83 L	1.00	.22	4.00	.54	3.50
L090	.56	24.50	1.03	36.00	.31	36.00	.63	31.00
L091	.56	24.50	.96	21.00	.28	21.50	.60	17.50
L093	.49	5.00	.84 L	2.00	.24	6.00	.54	3.50
L094	.551	18.50	.982	26.00	.271	16.00	.642	35.00
L099	.51	9.50	.89	7.00	.25	8.00	.57	8.00
L102	.54	12.00	.93	13.00	.26	11.00	.59	13.50
L109	.551	18.50	.951	20.00	.274	17.00	.608	22.50
L114	.62	36.00	.94	16.00	.22	4.00	.58	10.50
L116	.47 L	1.00	.87	5.00	.22	4.00	.53	2.00
L119	.558	20.00	.994	29.00	.285	25.50	.619	25.00
L126	.577	30.50	1.013	34.00	.283	24.00	.635	33.00
L128	.56	24.50	.99	28.00	.30	32.50	.63	31.00
MEDIAN CONC.	.5510		.9495		.2770		.6000	

LAB NO.	TOTAL RANK	AVERAGE RANK	NO.OF SAMPLES RANKED	SUMMARY OF FLAGGING	BIAS STATEMENT	METHOD CODING
L002	212.00	21.200	10			
L003	258.50	25.850	10			11103
L004	162.00	16.200	10			
L006	207.50	20.750	10			PLAME AA
L007	241.00	24.100	10			
L008	169.50	16.950	10			ICP-MS
L010	166.00	16.600	10			ICP
L011	216.00	21.600	10			
L013	163.00	16.300	10			
L021	284.00	28.400	10	H		IC
L023	268.00	26.800	10			FLAME AA/ICP
L024	327.00	32.700	10		BIASED HIGH	ICP
L029	77.50	7.750	10	L	BIASED LOW	
L030	276.50	27.650	10	H EH		AAS
L031	269.00	26.900	10			PLASMA-AES
L032	165.50	16.550	10	H		
L033	10.50	5.250	2		INSUFFICIENT DATA	
L034	232.50	23.250	10			
L049	139.00	13.900	10			
L057	101.50	10.150	10	L		
L061	173.50	17.350	10			
L063	205.00	20.500	10			
L081	72.00	7.200	10		BIASED LOW	Flame AA
L082	42.50	4.250	10	L L L	BIASED LOW	ICP
L088	72.00	7.200	10	L L L	BIASED LOW	Flame AA
L090	278.00	27.800	10			FLAME-AAS
L091	222.50	22.250	10			
L093	49.50	4.950	10	L L	BIASED LOW	AA 2380 FLAME
L094	211.50	21.150	10			FLAME-AA
L099	77.00	7.700	10		BIASED LOW	ICP
L102	138.50	13.850	10			ICP
L109	201.00	20.100	10			WATERS
L114	169.00	16.900	10	H L		ICP
L116	33.50	3.350	10	L L	BIASED LOW	ICP
L119	238.50	23.850	10			DIONEX
L126	298.50	29.850	10	H H	BIASED HIGH	
L128	305.00	30.500	10		BIASED HIGH	ICP

OVERALL AVERAGE RANK IS 18.602

LAB NO.	TOTAL RANK	AVERAGE RANK	NO.OF SAMPLES RANKED	SUMMARY OF FLAGGING	BIAS STATEMENT	METHOD CODING
L116	33.50	3.350	10	LL	BIASED LOW	ICP
L082	42.50	4.250	10	LLL	BIASED LOW	ICP
L093	49.50	4.950	10	LL	BIASED LOW	AA 2380 FLAME
L033	10.50	5.250	2		INSUFFICIENT DATA	
L081	72.00	7.200	10		BIASED LOW	Flame AA
L088	72.00	7.200	10	LLL	BIASED LOW	Flame AA
L099	77.00	7.700	10		BIASED LOW	ICP
L029	77.50	7.750	10	L	BIASED LOW	

L057	101.50	10.150	10	L		
L102	138.50	13.850	10			ICP
L049	139.00	13.900	10			
L004	162.00	16.200	10			
L013	163.00	16.300	10			
L032	165.50	16.550	10	H		
L010	166.00	16.600	10			ICP
L114	169.00	16.900	10	HL		ICP
L008	169.50	16.950	10			ICP-MS
L061	173.50	17.350	10			
L109	201.00	20.100	10			WATERS
L063	205.00	20.500	10			
L006	207.50	20.750	10			FLAME AA
L094	211.50	21.150	10			FLAME-AA
L002	212.00	21.200	10			
L011	216.00	21.600	10			
L091	222.50	22.250	10			
L034	232.50	23.250	10			
L119	238.50	23.850	10			DIONEX
L007	241.00	24.100	10			
L003	258.50	25.850	10			11103
L023	268.00	26.800	10			FLAME AA/ICP
L031	269.00	26.900	10			PLASMA-AES
L030	276.50	27.650	10	HEH		AAS
L090	278.00	27.800	10			FLAME-AAS
L021	284.00	28.400	10	H		IC
L126	298.50	29.850	10	HH	BIASED HIGH	
L128	305.00	30.500	10		BIASED HIGH	ICP
L024	327.00	32.700	10		BIASED HIGH	ICP

OVERALL AVERAGE
RANK IS 18.602

Sodium

LRTAP STUDY 0037 DATA SUMMARY

PARAMETER: 12091 Magnesium MG/L

AQUATIC ECOSYSTEM PROTECTION BRANCH
NATIONAL WATER RESEARCH INSTITUTE
BURLINGTON ONTARIO

LRTAP STUDY NO. 37 MAJOR IONS IN WATER

LOWER LIMIT FOR USE OF BASIC ACCEPTABLE ERROR= .1000 BASIC ACCEPTABLE ERROR= .0200 CONCENTRATION ERROR INCREMENT= .0354

SAMPLE	1		2		3		4		5		6	
LAB NO	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK
L002	2.76	15.00	.61	20.00	.58	12.50	.62	13.00	.58	15.50	2.62	13.00
L003	2.68 L	6.00	.58	4.00	.55 L	5.00	.59 L	2.50	.55	6.00	2.59	8.00
L004	2.93 H	27.50	.633	26.00	.606	27.00	.648	22.00	.597	22.00	2.76	28.00
L006	2.8215	19.00	.6470 H	28.00	.6185	30.00	.6585	28.00	.5985	23.00	2.7230	25.00
L007	2.54 EL	1.00	.69 EH	33.00	.60	22.50	.65	24.50	.61	28.00	2.40 EL	2.00
L008	2.66 L	3.00	.60	14.50	.60	22.50	.61	8.50	.55	6.00	2.46 EL	4.00
L010	2.7	8.00	.6	14.50	.6	22.50	.6	5.50	.6	25.00	2.7	20.00
L013	2.885	25.00	.630	24.00	.594	18.00	.643	20.50	.595	21.00	2.768	29.00
L021	2.975 H	29.00	.768 EH	34.00	.673 EH	34.00	.756 EH	34.00	.737 EH	34.00	2.714	23.00
L023	2.85	22.50	.63	24.00	.60	22.50	.64	19.00	.60	25.00	2.71	22.00
L024	3.0 VH	30.50	.65 H	30.50	.63 H	31.50	.67	32.00	.61	28.00	3.0 EH	34.00
L029	3.75 EH	34.00	.60	14.50	.54 L	2.50	.62	13.00	.55	6.00	2.42 EL	3.00
L030	2.77	16.00	.655 H	32.00	.630 H	31.50	.670	32.00	.625 H	32.00	2.72	24.00
L031	2.9	26.00	.64	27.00	.61	28.50	.65	24.50	.59	19.50	2.9 VH	33.00
L032	3.03 VH	32.00	.60	14.50	.58	12.50	.62	13.00	.57	11.00	2.88 VH	31.50
L034	3.0 VH	30.50	.6	14.50	.6	22.50	.6	5.50	.5 EL	1.00	2.8	30.00
L049	2.71	9.50	.60	14.50	.60	22.50	.65	24.50	.59	19.50	2.75	26.50
L057	2.73	13.00	.59	8.00	.54 L	2.50	.59 L	2.50	.56	8.00	2.59	8.00
L061	2.807	18.00	.616	21.00	.586	15.00	.628	17.00	.582	17.00	2.680	16.50
L063	2.650 L	2.00	.577	2.00	.561	8.00	.652	27.00	.570	11.00	2.566 L	6.00
L081	2.83	20.00	.620	22.00	.595	19.00	.643	20.50	.600	25.00	2.70	20.00
L082	2.732	14.00	.597	11.00	.552 L	6.00	.593	4.00	.526 VL	2.00	2.606	11.00
L088	2.84	21.00	.63	24.00	.64 H	33.00	.65	24.50	.61	28.00	1.74 EL	1.00
L090	2.85	22.50	.59	8.00	.59	16.50	.635	18.00	.585	18.00	2.70	20.00
L091	2.67 L	4.50	.59	8.00	.58	12.50	.62	13.00	.58	15.50	2.60	10.00
L093	2.72	11.50	.59	8.00	.58	12.50	.61	8.50	.57	11.00	2.68	16.50
L094	3.05 EH	33.00	.65 H	30.50	.61	28.50	.67	32.00	.62	31.00	2.88 VH	31.50
L099	2.67 L	4.50	.58	4.00	.57	9.00	.61	8.50	.57	11.00	2.59	8.00
L102	2.72	11.50	.59	8.00	.56	7.00	.62	13.00	.57	11.00	2.65	14.00
L109	2.80	17.00	.608	19.00	.573	10.00	.625	16.00	.579	14.00	2.67	15.00
L114	2.685 L	7.00	.607	18.00	.603	26.00	.664	30.00	.615	30.00	2.474 VL	5.00
L116	2.71	9.50	.58	4.00	.54 L	2.50	.61	8.50	.54 L	3.50	2.61	12.00
L126	2.854	24.00	.649 H	29.00	.590	16.50	.660	29.00	.641 VH	33.00	2.697	18.00
L128	2.93 H	27.50	.57	1.00	.54 L	2.50	.58 L	1.00	.54 L	3.50	2.75	26.50
MEDIAN CONC.	2.8035		.6035		.5920		.6315		.5835		2.6885	

PARAMETER: 12091 Magnesium MG/L

SAMPLE	7		8		9		10	
LAB NO	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK
L002	.82	16.50	.68	14.50	1.00	15.50	.47	14.50
L003	.77 L	3.50	.66	8.00	.95	6.00	.45	7.00
L004	.857	25.00	.716	28.00	1.03	27.50	.475	16.50
L006	.8455	22.00	.7060	26.00	1.0035	19.00	.4785	21.00
L007	.89 H	32.50	.72	29.50	1.03	27.50	.50	30.50
L008	.81	10.50	.66	8.00	.94 L	5.00	.46	11.00
L010	.8	7.00	.7	23.00	1.	15.50	.5	30.50
L013	.850	23.50	.708	27.00	1.028	26.00	.479	22.00
L021	.971 EH	34.00	.846 EH	34.00	1.181 EH	34.00	.622 EH	34.00
L023	.85	23.50	.70	23.00	1.02	24.00	.45	7.00
L024	.88 H	30.00	.75 VH	32.50	1.1 VH	33.00	.51 H	33.00
L029	.80	7.00	.67	10.50	.97	8.00	.45	7.00
L030	.865	28.00	.695	19.00	1.02	24.00	.485	23.50
L031	.84	21.00	.70	23.00	1.0	15.50	.49	26.00
L032	.82	16.50	.68	14.50	1.09 VH	32.00	.46	11.00
L034	.75 VL	1.00	.7	23.00	1.0	15.50	.5	30.50
L049	.86	27.00	.72	29.50	1.00	15.50	.49	26.00
L057	.79	5.00	.64 L	4.50	1.00	15.50	.44 L	2.50
L061	.828	18.00	.690	18.00	1.007	20.00	.478	19.50
L063	.814	14.00	.625 VL	2.00	.992	12.00	.478	19.50
L081	.833	20.00	.700	23.00	1.01	22.00	.475	16.50
L082	.815	15.00	.652	6.00	.911 VL	1.00	.441 L	4.00
L088	.89 H	32.50	.1 EL	1.00	1.08 VH	31.00	.49	26.00
L090	.83	19.00	.685	17.00	1.02	24.00	.485	23.50
L091	.81	10.50	.68	14.50	.98	10.50	.47	14.50
L093	.81	10.50	.68	14.50	.97	8.00	.46	11.00
L094	.87 H	29.00	.75 VH	32.50	1.06 H	30.00	.50	30.50
L099	.80	7.00	.66	8.00	.97	8.00	.45	7.00
L102	.81	10.50	.67	10.50	.98	10.50	.45	7.00
L109	.813	13.00	.673	12.00	.927 L	2.00	.465	13.00
L114	.885 H	31.00	.696	20.00	1.008	21.00	.477	18.00
L116	.76 L	2.00	.64 L	4.50	.93 L	3.50	.44 L	2.50
L126	.859	26.00	.723	31.00	1.054 H	29.00	.494	28.00
L128	.77 L	3.50	.63 L	3.00	.93 L	3.50	.42 VL	1.00
MEDIAN CONC.	.8240		.6875		1.0000		.4760	

LAB NO.	TOTAL RANK	AVERAGE RANK	NO.OF SAMPLES RANKED	SUMMARY OF FLAGGING
L002	150.00	15.000	10	
L003	56.00	5.600	10	L L L L
L004	249.50	24.950	10	H
L006	241.00	24.100	10	H
L007	231.00	23.100	10	ELEH ELH
L008	93.00	9.300	10	L EL L
L010	171.50	17.150	10	
L013	236.00	23.600	10	
L021	324.00	32.400	10	H EHEHEHEH EHEHEHEH
L023	212.50	21.250	10	
L024	315.00	31.500	10	VHH H EHH VHVHH
L029	105.50	10.550	10	EH L EL

BIAS STATEMENT	METHOD CODING
BIASED LOW	12107
	FLAME AA
	ICP-MS
	ICP
BIASED HIGH	IC
	FLAME AA/ICP
BIASED HIGH	ICP

L030	262.00	26.200	10	H H H		AAS
L031	244.00	24.400	10	VH		PLASMA-AES
L032	188.50	18.850	10	VH VH VH		
L034	174.00	17.400	10	VH EL VL		
L049	215.00	21.500	10			
L057	69.50	6.950	10	L L L L	BIASED LOW	
L061	180.00	18.000	10			
L063	103.50	10.350	10	L L VL		
L081	208.00	20.800	10			Flame AA
L082	74.00	7.400	10	L VL VLL	BIASED LOW	ICP
L088	222.00	22.200	10	H ELH ELVH		Flame AA
L090	186.50	18.650	10			FLAME-AAS
L091	113.50	11.350	10	L		
L093	112.00	11.200	10			AA 2380 FLAME
L094	308.50	30.850	10	EHH VHH VHH	BIASED HIGH	FLAME-AA
L099	75.00	7.500	10	L	BIASED LOW	ICP
L102	103.00	10.300	10			ICP
L109	131.00	13.100	10	L		AAS VARIAN
L114	206.00	20.600	10	L VLH		ICP
L116	52.50	5.250	10	L L L L L L	BIASED LOW	ICP
L126	263.50	26.350	10	H VH H		
L128	73.00	7.300	10	H L L L L L L VL	BIASED LOW	ICP

OVERALL AVERAGE
RANK IS 17.500

LAB NO.	TOTAL RANK	AVERAGE RANK	NO.OF SAMPLES RANKED	SUMMARY OF FLAGGING	BIAS STATEMENT	METHOD CODING
L116	52.50	5.250	10	LLLLLL	BIASED LOW	ICP
L003	56.00	5.600	10	LLLL	BIASED LOW	12107
L057	69.50	6.950	10	LLLL	BIASED LOW	
L128	73.00	7.300	10	HLLLLLLVL	BIASED LOW	ICP
L082	74.00	7.400	10	LVLVLL	BIASED LOW	ICP
L099	75.00	7.500	10	L	BIASED LOW	ICP
L008	93.00	9.300	10	LELL		ICP-MS
L102	103.00	10.300	10			ICP
L063	103.50	10.350	10	LLVL		
L029	105.50	10.550	10	EHLEL		
L093	112.00	11.200	10			AA 2380 FLAME
L091	113.50	11.350	10	L		
L109	131.00	13.100	10	L		AAS VARIAN
L002	150.00	15.000	10			
L010	171.50	17.150	10			ICP
L034	174.00	17.400	10	VHELVL		
L061	180.00	18.000	10			
L090	186.50	18.650	10			FLAME-AAS
L032	188.50	18.850	10	VHVHVH		
L114	206.00	20.600	10	LVLH		ICP
L081	208.00	20.800	10			Flame AA
L023	212.50	21.250	10			FLAME AA/ICP
L049	215.00	21.500	10			
L088	222.00	22.200	10	HELHELVH		Flame AA
L007	231.00	23.100	10	ELEHELH		
L013	236.00	23.600	10			
L006	241.00	24.100	10	H		FLAME AA
L031	244.00	24.400	10	VH		PLASMA-AES
L004	249.50	24.950	10	H		
L030	262.00	26.200	10	HHH		AAS
L126	263.50	26.350	10	HVHH		
L094	308.50	30.850	10	EHHVHHVHH	BIASED HIGH	FLAME-AA
L024	315.00	31.500	10	VHHHEHHVHVHH	BIASED HIGH	ICP
L021	324.00	32.400	10	HEHEHEHEHEHEHEHEH	BIASED HIGH	IC

OVERALL AVERAGE
RANK IS 17.500

Magnesium

LRTAP STUDY 0037 DATA SUMMARY

PARAMETER: 13091 Aluminum MG/L

AQUATIC ECOSYSTEM PROTECTION BRANCH
NATIONAL WATER RESEARCH INSTITUTE
BURLINGTON ONTARIO

LRTAP STUDY NO. 37 MAJOR IONS IN WATER

LOWER LIMIT FOR USE OF BASIC ACCEPTABLE ERROR= .0100 BASIC ACCEPTABLE ERROR= .0200 CONCENTRATION ERROR INCREMENT= .0300

SAMPLE	1		2		3		4		5		6	
LAB NO	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK
L006	.0066	9.00	.0859	18.00	.6447 EH	19.00	.0113	11.00	.0076	10.00	.1899	17.00
L008	0.00T	3.00	.07	10.50	.56	11.00	.01T	8.50	0.00T	3.00	.16	5.00
L010	<.002	0.00	.055	7.00	.53 L	6.50	<.002	0.00	<.002	0.00	.20 H	19.50
L023	.010W	0.00	.080	15.50	.665 EH	20.00	.010W	0.00	.010W	0.00	.188	16.00
L029	-.01T	1.00	-.01T EL	1.00	-.01T EL	1.00	-.01T L	2.00	-.01T	2.00	.20 H	19.50
L030	.002W	0.00	.070	10.50	.551	9.00	.006T	4.50	.002W	0.00	.168	9.00
L031	.01	11.50	.08	15.50	.58	12.00	.02	16.00	.01	12.50	.17	11.50
L032	.006	7.50	.0516	6.00	.600	16.00	.0099	7.00	.0063	8.00	.180	13.50
L049	.006	7.50	.100 H	21.00	.64 VH	18.00	.012	12.00	.006	7.00	.16	5.00
L057	-.001T	2.00	.05	4.50	.53 L	6.50	-.024T VL	1.00	-.018T L	1.00	.15	1.50
L081	.009T	10.00	.074	13.00	.517 L	4.50	.009T	6.00	.009T	11.00	.168	9.00
L082	.101 EH	17.00	.044 L	2.00	.517 L	4.50	.037 H	18.00	.031 H	16.00	.168	9.00
L088	.02	14.00	.072	12.00	.559	10.00	.019	15.00	.007	9.00	.157	3.00
L090	.01T	11.50	.083	17.00	.596	15.00	.01T	8.50	.01T	12.50	.184	15.00
L091	.021	15.00	.097 H	20.00	.592	14.00	.015	14.00	.013	14.00	.167	7.00
L093	.004	6.00	.094 H	19.00	.677 EH	21.00	.011	10.00	.002	4.00	.195 H	18.00
L094	.019	13.00	.112 VH	22.00	.442 EL	2.00	.013	13.00	.003	5.50	.220 EH	21.00
L099	.020W	0.00	.077	14.00	.610 H	17.00	.020W	0.00	.020W	0.00	.180	13.50
L102	.01W	0.00	.05	4.50	.50 VL	3.00	.01W	0.00	.01W	0.00	.16	5.00
L114	.0038	5.00	.0476 L	3.00	.7417 EH	22.00	.0049T	3.00	.0008W	0.00	.3560 EH	22.00
L116	.10 EH	16.00	.06	8.00	.55	8.00	.03	17.00	.02	15.00	.15	1.50
L128	.003	4.00	.067	9.00	.59	13.00	.006	4.50	.003	5.50	.17	11.50
MEDIAN CONC.	.0066		.0710		.5700		.0105		.0066		.1700	

PARAMETER: 13091 Aluminum MG/L

SAMPLE	7		8		9		10	
LAB NO	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK
L006	.0275	15.00	.0154	15.00	.0678	21.00	.0150	14.00
L008	.02T	8.50	.01T	11.00	.06	14.50	.01T	6.50
L010	.020	8.50	.008	7.00	.055	11.50	.005	3.00
L023	.017	6.00	.010W	0.00	.055	11.50	.011	8.00
L029	-.01T VL	1.00	-.01T	2.00	.06	14.50	-.01T L	2.00
L030	.017	6.00	.006T	5.00	.050	10.00	.008T	5.00
L031	.03	18.50	.02	16.50	.08 H	22.00	.02	18.00
L032	.0231	13.00	.0095	8.00	.0497	9.00	.016	15.00
L049	.03	18.50	.010	11.00	.049	8.00	.017	16.50

L057	-.008T L	2.00	-.038T EL	1.00	.06	14.50	-.021T VL	1.00
L081	.022	10.50	.069 EH	19.00	.060	14.50	.014	12.50
L082	0.0W	0.00	.023	18.00	0.0W EL	1.00	0.0W	0.00
L088	.023	12.00	.01	11.00	.038	5.00	.012	9.00
L090	.022	10.50	.01T	11.00	.064	19.50	.014	12.50
L091	.031	20.00	.010	11.00	.064	19.50	.013	10.50
L093	.028	16.50	.006	5.00	.063	18.00	.013	10.50
L094	.028	16.50	.014	14.00	.041	6.00	.017	16.50
L099	.027T	14.00	.02W	0.00	.061T	17.00	.02W	0.00
L102	.01	3.00	.01W	0.00	.015 VL	3.00	.01W	0.00
L114	.0147	4.00	.0033T	3.00	.0365	4.00	.0067T	4.00
L116		0.00	.02	16.50	.01 EL	2.00		0.00
L128	.017	6.00	.006	5.00	.045	7.00	.010	6.50
MEDIAN CONC.	.0220		.0100		.0550		.0125	

LAB NO.	TOTAL RANK	AVERAGE RANK	NO.OF SAMPLES RANKED	SUMMARY OF FLAGGING	BIAS STATEMENT	METHOD CODING
L006	149.00	14.900	10	EH		ICP
L008	81.50	8.150	10			ICP-MS
L010	63.00	9.000	7	L H		GF
L023	77.00	12.833	6	EH		GFAA
L029	46.00	4.600	10	ELELL H VL L	BIASED LOW	
L030	59.00	7.375	8			COLOURIMETRY
L031	154.00	15.400	10	H		PLASMA-AES
L032	103.00	10.300	10			
L049	124.50	12.450	10	H VH		
L057	35.00	3.500	10	L VLL L EL VL	BIASED LOW	
L081	110.00	11.000	10	L EH		GRAPHITE
L082	85.50	10.688	8	EHL L H H EL		ICP
L088	100.00	10.000	10			GRAPH FUR
L090	133.00	13.300	10			FURNACE
L091	145.00	14.500	10	H		
L093	128.00	12.800	10	H EH H		HGA 300 FURNACE
L094	129.50	12.950	10	VHEL EH		FLAME-AA
L099	75.50	15.100	5	H		ICP
L102	18.50	3.700	5	VL VL	BIASED LOW	ICP
L114	70.00	7.778	9	L EH EH		AAGF
L116	84.00	10.500	8	EH EL		ICP
L128	72.00	7.200	10			GFAA

OVERALL AVERAGE RANK IS 10.423

LAB NO.	TOTAL RANK	AVERAGE RANK	NO.OF SAMPLES RANKED	SUMMARY OF FLAGGING	BIAS STATEMENT	METHOD CODING
L057	35.00	3.500	10	LVLLLELVL	BIASED LOW	
L102	18.50	3.700	5	VLVL	BIASED LOW	ICP
L029	46.00	4.600	10	ELELLHVLL	BIASED LOW	
L128	72.00	7.200	10			GFAA
L030	59.00	7.375	8			COLOURIMETRY
L114	70.00	7.778	9	LEHEH		AAGF
L008	81.50	8.150	10			ICP-MS
L010	63.00	9.000	7	LH		GF
L088	100.00	10.000	10			GRAPH FUR
L032	103.00	10.300	10			
L116	84.00	10.500	8	EHEL		ICP
L082	85.50	10.688	8	EHLLHHEL		ICP
L081	110.00	11.000	10	LEH		GRAPHITE
L049	124.50	12.450	10	HVH		
L093	128.00	12.800	10	HEHH		HGA 300 FURNACE
L023	77.00	12.833	6	EH		GFAA
L094	129.50	12.950	10	VHELEH		FLAME-AA
L090	133.00	13.300	10			FURNACE
L091	145.00	14.500	10	H		
L006	149.00	14.900	10	EH		ICP
L099	75.50	15.100	5	H		ICP
L031	154.00	15.400	10	H		PLASMA-AES
OVERALL AVERAGE RANK IS		10.423				

Aluminum

LRTAP STUDY 0037 DATA SUMMARY

PARAMETER: 14092 REACTIVE SILICA MG SI/L

AQUATIC ECOSYSTEM PROTECTION BRANCH
NATIONAL WATER RESEARCH INSTITUTE
BURLINGTON ONTARIO

LRTAP STUDY NO. 37 MAJOR IONS IN WATER

LOWER LIMIT FOR USE OF BASIC ACCEPTABLE ERROR= .0100 BASIC ACCEPTABLE ERROR= .0400 CONCENTRATION ERROR INCREMENT= .0354

SAMPLE	1		2		3		4		5		6	
LAB NO	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK
L002	1.147	18.00	2.00	11.50	2.524	11.00	1.833	14.00	.216	12.00	.103	9.00
L003	1.05	1.50	1.956	9.00	2.484	9.00	1.802	8.00	.233	22.00	.135	20.00
L006	1.1280	13.00	2.0022	13.00	2.5709	16.00	1.8424	16.00	.2233	17.00	.1184	16.00
L010	1.12	10.50	1.93	5.50	2.47	8.00	1.83	11.50	.21	6.00	.18 VH	22.00
L014	1.170	20.00	2.040	17.50	2.590	17.00	1.870	17.50	.218	13.00	.111	15.00
L023	1.12	10.50	2.01	15.00	2.57	14.50	1.87	17.50	.23	20.00	.09	4.00
L024	1.10	6.50	2.00	11.50	2.60	18.00	1.90	19.00	.23	20.00	.12	17.00
L029	1.12	10.50	1.95	7.00	2.40 L	4.50	1.79	5.00	.215	11.00	.110	13.00
L031	1.14	16.50	2.04	17.50	2.57	14.50	3.71 EH	22.00	.22	15.00	.10	6.50
L033	1.13	14.50	2.01	15.00	2.73 VH	21.00	1.83	11.50	.220	15.00	.13	18.50
L034	1.1	6.50	1.9	3.00	2.4 L	4.50	1.8	6.50	.2	3.50	.1	6.50
L049	1.15	19.00	1.93	5.50	2.45	7.00	1.84	15.00	.21	6.00	.11	13.00
L063	1.118	8.00	1.955	8.00	2.537	12.00	1.805	9.00	.212	9.00	.105	10.00
L082	1.088	5.00	1.906	4.00	2.411	6.00	1.748	2.00	.211	8.00	.109	11.00
L088	1.35 EH	22.00	2.34 EH	21.00	3.01 EH	22.00	2.14 EH	21.00	.23	20.00	.13	18.50
L091	1.13	14.50	2.01	15.00	2.49	10.00	1.80	6.50	.20	3.50	.09	4.00
L093	1.266 VH	21.00	2.096	20.00	2.726 VH	20.00	1.963 H	20.00	.213	10.00	.076	1.00
L094	1.12	10.50	2.06	19.00	2.61	19.00	1.83	11.50	.225	18.00	.101	8.00
L099	1.08	3.50	2.40 EH	22.00	1.90 EL	1.00	1.76	4.00	.21	6.00	.11	13.00
L102	1.05	1.50	1.89	2.00	2.36 L	2.00	1.74	1.00	.191	2.00	.081	2.00
L116	1.08	3.50	1.87 L	1.00	2.37 L	3.00	1.75	3.00	.19	1.00	.09	4.00
L128	1.14	16.50	1.97	10.00	2.54	13.00	1.83	11.50	.22	15.00	.15	21.00
MEDIAN CONC.	1.1200		2.0000		2.5305		1.8300		.2155		.1095	

PARAMETER: 14092 REACTIVE SILICA MG SI/L

SAMPLE	7		8		9		10	
LAB NO	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK
L002	.771	11.00	.653	14.00	.066	4.00	.343	14.00
L003	.705 L	2.00	.583 L	2.00	.098	19.00	.364	20.00
L006	.7614	9.00	.6533	15.00	.0874	15.00	.3478	15.00
L010	.79	16.50	.63	7.00	.09	17.00	.33	7.00
L014	.790	16.50	.667	19.00	.077	9.00	.358	18.00
L023	.79	16.50	.65	12.00	.09	17.00	.33	7.00
L024	.78	13.00	.66	17.00	.07T	7.00	.34	11.50
L029	.77	10.00	.64	9.50	.08	12.00	.34	11.50
L031	.78	13.00	.66	17.00	.07	7.00	.35	16.50
L033	.79	16.50	.67	20.00	.08	12.00	.36	19.00
L034	.8	19.00	.6	3.50	.1	20.00	.3	1.00

L049	.78	13.00	.66	17.00	.08	12.00	.34	11.50
L063	.755	7.00	.650	12.00	.068	5.00	.329	5.00
L082	.742	5.00	.623	5.00	.083	14.00	.333	9.00
L088	.89 VH	22.00	.73 H	21.00	.12	21.00	.39	22.00
L091	.75	6.00	.63	7.00	.06	3.00	.33	7.00
L093	.832	21.00	.740 H	22.00	.450 EH	22.00	.382	21.00
L094	.739	3.00	.650	12.00	.079	10.00	.324	4.00
L099	.74	4.00	.63	7.00	.07	7.00	.34	11.50
L102	.546 EL	1.00	.582 L	1.00	.045	1.00	.305	2.00
L116	.76	8.00	.60	3.50	.05	2.00	.32	3.00
L128	.81	20.00	.64	9.50	.09	17.00	.35	16.50
MEDIAN CONC.	.7755		.6500		.0800		.3400	

LAB NO.	TOTAL RANK	AVERAGE RANK	NO.OF SAMPLES RANKED	SUMMARY OF FLAGGING	BIAS STATEMENT	METHOD CODING
L002	118.50	11.850	10			
L003	112.50	11.250	10	L L		14109
L006	145.00	14.500	10			AUTOANALYSER
L010	111.00	11.100	10	VH		ICP
L014	162.50	16.250	10			
L023	134.00	13.400	10			AUTO MOLYBDOSILICA
L024	140.50	14.050	10			MOLYBDATE
L029	94.00	9.400	10	L		
L031	145.50	14.550	10	EH		COLORIMETRIE
L033	163.00	16.300	10	VH		
L034	74.00	7.400	10	L		
L049	119.00	11.900	10			
L063	85.00	8.500	10			
L082	69.00	6.900	10			F.I.A
L088	210.50	21.050	10	EHEHEHEH VHH	BIASED HIGH	Molybdate
L091	76.50	7.650	10			
L093	178.00	17.800	10	VH VHH H EH	BIASED HIGH	
L094	115.00	11.500	10			COLORIMETRIC
L099	79.00	7.900	10	EHEL		COLORIMETRIC
L102	15.50	1.550	10	L ELL	BIASED LOW	AC ASCORBIC
L116	32.00	3.200	10	L L	BIASED LOW	F.I.A.
L128	150.00	15.000	10			ICP

OVERALL AVERAGE RANK IS 11.500

LAB NO.	TOTAL RANK	AVERAGE RANK	NO. OF SAMPLES RANKED	SUMMARY OF FLAGGING	BIAS STATEMENT	METHOD CODING
L102	15.50	1.550	10	LELL	BIASED LOW	AC ASCORBIC
L116	32.00	3.200	10	LL	BIASED LOW	F.I.A.
L082	69.00	6.900	10			F.I.A
L034	74.00	7.400	10	L		
L091	76.50	7.650	10			
L099	79.00	7.900	10	EHEL		COLORIMETRIC
L063	85.00	8.500	10			
L029	94.00	9.400	10	L		
L010	111.00	11.100	10	VH		ICP
L003	112.50	11.250	10	LL		14109
L094	115.00	11.500	10			COLORIMETRIC
L002	118.50	11.850	10			
L049	119.00	11.900	10			
L023	134.00	13.400	10			AUTO MOLYBDOSILICA
L024	140.50	14.050	10			MOLYBDATE
L006	145.00	14.500	10			AUTOANALYSER
L031	145.50	14.550	10	EH		COLORIMETRIE
L128	150.00	15.000	10			ICP
L014	162.50	16.250	10			
L033	163.00	16.300	10	VH		
L093	178.00	17.800	10	VHVHHHEH	BIASED HIGH	
L088	210.50	21.050	10	EHEHEHEHVHH	BIASED HIGH	Molybdate

OVERALL AVERAGE RANK IS 11.500

REACTIVE SILICA

LRTAP STUDY 0037 DATA SUMMARY

PARAMETER: 16000 SULFATE, IC METHOD MG/L

AQUATIC ECOSYSTEM PROTECTION BRANCH
NATIONAL WATER RESEARCH INSTITUTE
BURLINGTON ONTARIO

LRTAP STUDY NO. 37 MAJOR IONS IN WATER

LOWER LIMIT FOR USE OF BASIC ACCEPTABLE ERROR= 1.0000 BASIC ACCEPTABLE ERROR= .2000 CONCENTRATION ERROR INCREMENT= .0219

SAMPLE	1		2		3		4		5		6	
LAB NO	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK
L003	3.35	5.00	4.70	26.50	1.03	18.50	6.15	32.00	1.80	4.50	4.8 EL	1.00
L006	3.4725	18.00	4.6620	24.00	.9880	10.00	5.8820	19.00	1.8600	11.50	23.0950	15.00
L007	3.28	2.00	4.49	4.00	1.03	18.50	5.80	10.00	1.82	7.00	25.58 EH	29.00
L008	3.56	27.00	4.62	21.00	2.01 EH	32.00	5.94	25.00	1.98	32.00	24.41 VH	26.00
L010	3.3	3.50	4.5	6.50	1.05	23.50	5.7	4.00	1.9	23.50	23.5	19.50
L011	3.63	32.00	4.55	13.00	1.08	28.00	5.84	14.00	1.82	7.00	23.1	16.00
L013	3.395	8.00	4.517	11.00	.946	6.00	5.822	12.00	1.869	14.00	22.373 L	6.00
L014	3.44	15.00	4.61	20.00	.78 L	2.00	5.89	21.00	1.94	30.00	22.83	8.00
L021	3.511	23.00	4.630	22.00	1.040	21.50	5.943	26.00	1.896	20.00	23.596	21.00
L024	3.50	21.00	4.70	26.50	1.00T	12.50	6.00	29.00	1.90T	23.50	23.	12.50
L029	3.43	12.50	4.50	6.50	1.05	23.50	5.71	5.00	1.90	23.50	23.5	19.50
L030	3.40	9.50	4.50	6.50	.70 VL	1.00	5.65	3.00	1.90	23.50	26.8 EH	32.00
L031	3.3	3.50	4.3 L	2.00	.9	3.50	5.4 L	1.50	1.7	1.00	22. VL	4.00
L032	3.576	30.00	4.867	32.00	1.034	20.00	6.153	33.00	1.930	28.00	23.06	14.00
L034	3.4	9.50	4.5	6.50	.9	3.50	5.4 L	1.50	1.8	4.50	22.9	10.00
L049	8.09 EH	33.00	4.46	3.00	.95	7.00	5.84	14.00	1.78	3.00	201.4 EH	33.00
L061	3.53	24.00	4.70	26.50	1.04	21.50	5.96	27.00	1.90	23.50	23.60	22.00
L063	3.439	14.00	4.755	31.00	1.029	17.00	5.760	6.00	1.906	27.00	25.049 EH	27.00
L081	3.50	21.00	4.71	29.00	1.01	14.00	5.77	7.00	1.87	16.00	22.9	10.00
L082	3.377	7.00	4.503	9.00	.973	8.00	5.860	18.00	1.864	13.00	22.04 VL	5.00
L088	3.413	11.00	4.583	16.00	1.055	25.00	5.893	22.00	1.849	10.00	22.65	7.00
L090	3.58	31.00	4.59	17.00	1.31 H	30.00	5.85	16.50	2.03	33.00	26.1 EH	30.00
L091	3.45	16.50	4.57	15.00	.98	9.00	5.85	16.50	1.82	7.00	23.0	12.50
L093	3.21	1.00	4.24 L	1.00	.94	5.00	6.08	30.00	1.71	2.00	21.42 EL	2.00
L094	3.37	6.00	4.53	12.00	1.23 H	29.00	5.78	8.50	1.87	16.00	26.6 EH	31.00
L099	3.45	16.50	4.60	18.50		0.00	5.78	8.50	1.84	9.00	22.90	10.00
L102	3.55	25.00	4.65	23.00	1.07	27.00	5.84	14.00	1.87	16.00	23.7	23.00
L104	3.5	21.00	4.7	26.50	1.0	12.50	5.9	23.00	1.90	23.50	24.3 VH	25.00
L109	3.554	26.00	4.515	10.00	1.018	15.00	5.886	20.00	1.890	18.50	23.15	17.00
L116	3.49	19.00	4.60	18.50	.99	11.00	5.97	28.00	1.89	18.50	21.80 VL	3.00
L119	3.563	28.00	4.752	30.00	1.024	16.00	5.921	24.00	1.936	29.00	23.378	18.00
L126	3.573	29.00	4.879 H	33.00	1.059	26.00	6.137	31.00	1.941	31.00	24.091 H	24.00
L128	3.43	12.50	4.56	14.00	1.37 VH	31.00	5.82	11.00	1.86	11.50	25.4 EH	28.00
MEDIAN CONC.	3.4500		4.5900		1.0265		5.8500		1.8700		23.1500	

PARAMETER: 16000 SULFATE,IC METHOD MG/L

SAMPLE	7		8		9		10	
LAB NO	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK
L003		0.00	7.1	30.00	3.8	25.00	6.0	18.00
L006	5.8125	21.00	6.8755	22.00	3.7310	15.00	6.0195	20.00
L007	5.72	12.50	6.72	8.00	3.62	5.00	5.99	16.00
L008	6.09 H	30.00	7.19 H	31.00	4.00	33.00	7.33 EH	33.00
L010	5.7	9.50	6.7	6.50	3.7	11.50	5.9	6.00
L011	5.70	9.50	6.48 L	2.00	3.72	14.00	5.94	11.00
L013	5.751	16.00	6.761	11.00	3.666	9.00	5.912	8.00
L014	5.80	17.50	6.82	18.00	3.79	21.50	6.03	21.00
L021	5.850	23.00	6.932	25.00	3.764	19.00	6.085	26.00
L024	6.10 H	31.00	7.00	27.00	3.80	25.00	6.30	31.00
L029	5.56	4.00	6.61	3.50	3.64	6.50	5.76	5.00
L030	5.90	25.50	6.85	21.00	3.75	18.00	5.75	4.00
L031	5.8	17.50	6.7	6.50	3.5	3.00	5.6 L	3.00
L032	6.036	29.00	7.067	29.00	3.868	30.00	6.004	19.00
L034	5.5	3.00	6.4 L	1.00	3.4 L	1.00	5.5 VL	2.00
L049	5.37 L	2.00	6.66	5.00	3.58	4.00	5.28 EL	1.00
L061	5.87	24.00	6.93	24.00	3.80	25.00	6.19	29.00
L063	5.688	8.00	7.742 EH	33.00	3.880	31.00	5.910	7.00
L081	5.93	27.00	6.74	9.00	3.78	20.00	6.08	25.00
L082	5.807	19.00	6.806	15.00	3.741	16.00	5.993	17.00
L088	5.731	14.00	6.789	14.00	3.663	8.00	5.966	12.00
L090	5.64	5.00	6.82	18.00	3.86	29.00	5.98	15.00
L091	5.81	20.00	6.94	26.00	3.71	13.00	6.07	24.00
L093	5.23 VL	1.00	6.61	3.50	3.47 L	2.00	6.20	30.00
L094	5.65	6.00	6.81	16.00	3.64	6.50	5.930	10.00
L099	5.71	11.00	6.77	12.00	3.70	11.50	5.92	9.00
L102	5.75	15.00	6.75	10.00	3.80	25.00	5.97	13.50
L104	5.90	25.50	6.9	23.00	3.80	25.00	6.10	27.00
L109	5.824	22.00	6.82	18.00	3.746	17.00	6.048	23.00
L116	5.67	7.00	6.84	20.00	3.79	21.50	6.04	22.00
L119	6.025	28.00	7.042	28.00	3.845	28.00	6.177	28.00
L126	6.104 H	32.00	7.274 H	32.00	3.910	32.00	6.364 H	32.00
L128	5.72	12.50	6.78	13.00	3.68	10.00	5.97	13.50
MEDIAN CONC.	5.7755		6.8200		3.7460		5.9930	

LAB NO.	TOTAL RANK	AVERAGE RANK	NO.OF SAMPLES RANKED	SUMMARY OF FLAGGING	BIAS STATEMENT	METHOD CODING
L003	160.50	17.833	9	EL		16309; DIONEX
L006	175.50	17.550	10			DIONEX
L007	112.00	11.200	10	EH		
L008	290.00	29.000	10	EH VHH H EH	BIASED HIGH	IC
L010	114.00	11.400	10			DIONEX
L011	146.50	14.650	10	L		
L013	101.00	10.100	10	L		
L014	174.00	17.400	10	L		
L021	226.50	22.650	10			IC
L024	239.00	23.900	10	H		IC
L029	109.50	10.950	10			
L030	144.00	14.400	10	VL EH		IC
L031	45.50	4.550	10	L L VL L	BIASED LOW	
L032	264.00	26.400	10		BIASED HIGH	
L034	42.50	4.250	10	L L L VL	BIASED LOW	
L049	105.00	10.500	10	EH EHL EL		
L061	246.50	24.650	10			
L063	201.00	20.100	10	EH EH		
L081	178.00	17.800	10			Ion Chrom.
L082	127.00	12.700	10	VL		C.I.
L088	139.00	13.900	10			Dionex

L090	224.50	22.450	10	H	EH	
L091	159.50	15.950	10			
L093	77.50	7.750	10	L	ELVL L	
L094	141.00	14.100	10	H	EH	
L099	106.00	11.778	9			
L102	191.50	19.150	10			
L104	232.00	23.200	10		VH	
L109	186.50	18.650	10			
L116	168.50	16.850	10		VL	
L119	257.00	25.700	10			
L126	302.00	30.200	10	H	H H H H	
L128	157.00	15.700	10	VH	EH	

OVERALL AVERAGE
RANK IS 16.902

LAB NO.	TOTAL RANK	AVERAGE RANK	NO.OF SAMPLES RANKED	SUMMARY OF FLAGGING	BIAS STATEMENT	METHOD CODING
L034	42.50	4.250	10	LLLVL	BIASED LOW	IC DIONEX
L031	45.50	4.550	10	LLVLL	BIASED LOW	
L093	77.50	7.750	10	LELVLL	BIASED LOW	DIONEX IC
L013	101.00	10.100	10	L		
L049	105.00	10.500	10	EHEHLEL		
L029	109.50	10.950	10			
L007	112.00	11.200	10	EH		
L010	114.00	11.400	10			DIONEX
L099	106.00	11.778	9			IC
L082	127.00	12.700	10	VL		C.I.
L088	139.00	13.900	10			Dionex
L094	141.00	14.100	10	HEH		ION CHROM.
L030	144.00	14.400	10	VLEH		IC
L011	146.50	14.650	10	L		
L128	157.00	15.700	10	VHEH		IC
L091	159.50	15.950	10			
L116	168.50	16.850	10	VL		C.I.
L014	174.00	17.400	10	L		
L006	175.50	17.550	10			DIONEX
L081	178.00	17.800	10			Ion Chrom.
L003	160.50	17.833	9	EL		16309; DIONEX
L109	186.50	18.650	10			WATERS
L102	191.50	19.150	10			IC
L063	201.00	20.100	10	EHEH		
L090	224.50	22.450	10	HEH		IC DIONEX
L021	226.50	22.650	10			IC
L104	232.00	23.200	10	VH		IC
L024	239.00	23.900	10	H		IC
L061	246.50	24.650	10			
L119	257.00	25.700	10			DIONEX
L032	264.00	26.400	10		BIASED HIGH	
L008	290.00	29.000	10	EHVHHHEH	BIASED HIGH	IC
L126	302.00	30.200	10	HHHHH	BIASED HIGH	

OVERALL AVERAGE
RANK IS 16.902

SULFATE, IC METHOD

LRTAP STUDY 0037 DATA SUMMARY

PARAMETER: 16001 SULFATE NON IC METHODS MG/L

AQUATIC ECOSYSTEM PROTECTION BRANCH
NATIONAL WATER RESEARCH INSTITUTE
BURLINGTON ONTARIO

LRTAP STUDY NO. 37 MAJOR IONS IN WATER

LOWER LIMIT FOR USE OF BASIC ACCEPTABLE ERROR= 2.0000 BASIC ACCEPTABLE ERROR= .3000 CONCENTRATION ERROR INCREMENT= .2000

SAMPLE	1		2		3		4		5		6	
LAB NO	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK
L002	3.6	5.50	5.3	5.00		0.00	6.3	6.00	1.9	5.00	22.1	4.00
L004	3.2	2.00	4.9	3.00	16.7	2.00	5.8	5.00	.1W EL	1.00	20.7	2.00
L006	3.54	4.00	5.18	4.00	23.46	3.00	5.54	3.00	1.84	4.00	22.60	5.00
L023	3.07	1.00	4.87	2.00	27.9 VH	4.00	5.61	4.00	1.93	6.00	22.0	3.00
L031	3.4	3.00	4.4	1.00	.4 EL	1.00	5.4	2.00	1.8	3.00	23.	6.00
L033	3.6	5.50	5.4	6.00		0.00	4.1 L	1.00	1.2 EL	2.00	20.2	1.00
MEDIAN CONC.	3.4700		5.0400		20.0800		5.5750		1.8200		22.0500	

SAMPLE	7		8		9		10	
LAB NO	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK
L002	6.4	6.00	7.4	6.00	4.2 H	6.00	6.6	6.00
L004	5.1	2.00	6.3	2.00	2.9	1.00	5.5	1.00
L006	5.78	5.00	7.10	5.00	3.89	5.00	6.51	5.00
L023	5.65	4.00	6.99	4.00	3.45	4.00	6.30	4.00
L031	5.6	3.00	6.4	3.00	3.3	3.00	5.8	2.00
L033	4.5 L	1.00	5.9	1.00	3.1	2.00	6.0	3.00
MEDIAN CONC.	5.6250		6.6950		3.3750		6.1500	

LAB NO.	TOTAL RANK	AVERAGE RANK	NO.OF SAMPLES RANKED	SUMMARY OF FLAGGING	BIAS STATEMENT	METHOD CODING
L002	49.50	5.500	9	H	BIASED HIGH	
L004	21.00	2.100	10	EL	BIASED LOW	
L006	43.00	4.300	10			AUTOANALYSER
L023	36.00	3.600	10	VH		FIA
L031	27.00	2.700	10	EL		CALMAGITE
L033	22.50	2.500	9	L EL L		

OVERALL AVERAGE RANK IS 3.431

LAB NO.	TOTAL RANK	AVERAGE RANK	NO.OF SAMPLES RANKED	SUMMARY OF FLAGGING	BIAS STATEMENT	METHOD CODING
L004	21.00	2.100	10	EL	BIASED LOW	
L033	22.50	2.500	9	LELL		
L031	27.00	2.700	10	EL		CALMAGITE
L023	36.00	3.600	10	VH		FIA
L006	43.00	4.300	10			AUTOANALYSER
L002	49.50	5.500	9	H	BIASED HIGH	

OVERALL AVERAGE RANK IS 3.431

LRTAP STUDY 0037 DATA SUMMARY

PARAMETER: 17000 CHLORIDE IC MG/L

AQUATIC ECOSYSTEM PROTECTION BRANCH
NATIONAL WATER RESEARCH INSTITUTE
BURLINGTON ONTARIO

LRTAP STUDY NO. 37 MAJOR IONS IN WATER

LOWER LIMIT FOR USE OF BASIC ACCEPTABLE ERROR= .8710 BASIC ACCEPTABLE ERROR= .1000 CONCENTRATION ERROR INCREMENT= .0377

SAMPLE	1		2		3		4		5		6	
LAB NO	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK
L003	1.35	4.00	1.59	4.50	1.00 H	26.50	.46	29.00		0.00	.85	6.00
L006	1.4070	12.50	1.6680	16.00	.8555	7.00	.3500	4.00	.1560	2.00	.9090	12.00
L007	1.18 EL	1.00	1.50 L	1.50	.83	4.00	.36	5.50	.19	10.00	.85	6.00
L008	1.55	29.00	1.67	17.50	.73 VL	1.00	.17 EL	1.00	0.00T EL	1.00	.75 VL	2.50
L010	1.50	27.00	1.69	24.50	1.00 H	26.50	.43	25.00	.23	22.00	.95	24.00
L011	1.47	22.00	1.73	28.00	.86	9.00	.39	18.00	.53 EH	30.00	1.01	30.00
L013	1.391	9.00	1.656	15.00	.879	12.00	.382	15.00	.200	14.00	.927	18.00
L014	1.39	7.00	1.64	11.50	.88	13.50	.36	5.50	.18	7.50	.97	25.00
L021	1.592 H	30.00	1.732	29.00	1.017 H	28.00	.410	22.00	.214	20.00	.912	14.00
L029	1.40	10.50	1.62	6.50	.84	6.00	.40	20.50	.19	10.00	.91	13.00
L030	1.40	10.50	1.69	24.50	.86	9.00	.38	12.50	.17	3.00	.92	16.50
L031	1.6 H	31.00	2.0 EH	31.00	.9	16.50	.6 EH	31.00	.3	28.00	1.0	29.00
L032	1.427	14.00	1.590	4.50	.901	18.00	.448	27.00	.256	26.00	.938	20.00
L034	1.3 L	2.00	1.5 L	1.50	.8	3.00	.3	3.00	.18	7.50	.75 VL	2.50
L049	1.44	17.50	1.62	6.50	.76 L	2.00	.262 L	2.00	.177	5.50	.833	4.00
L061	1.39	7.00	1.68	19.50	.88	13.50	.37	8.50	.20	14.00	.85	6.00
L063	1.443	19.00	1.687	22.00	.906	19.00	.390	18.00	.201	16.00	.992	28.00
L081	1.46	20.00	1.63	8.50	.96	25.00	.45	28.00	.29	27.00	.1 EL	1.00
L082	1.407	12.50	1.681	21.00	.920	21.00	.428	24.00	.228	21.00	.987	27.00
L088	1.344	3.00	1.561	3.00	.837	5.00	.386	16.00	.231	23.00	.852	8.00
L090	1.49	25.00	1.67	17.50	.90	16.50	.40	20.50	.21	17.50	.93	19.00
L091	1.38	5.00	1.64	11.50	.86	9.00	.38	12.50	.21	17.50	.92	16.50
L093	1.47	22.00	1.63	8.50	.95	23.00	.38	12.50	.19	10.00	.86	9.00
L094	1.47	22.00	1.68	19.50	1.04 H	29.00	.376	10.00	.241	25.00	.918	15.00
L099	1.39	7.00	1.71	27.00		0.00	.362	7.00	.171	4.00	.948	23.00
L102	1.43	15.00	1.65	13.00	.935	22.00	.380	12.50	.200	14.00	.94	21.50
L109	1.508	28.00	1.639	10.00	.871	11.00	.420	23.00	.177	5.50	.878	10.00
L116	1.48	24.00	1.69	24.50	.89	15.00	.39	18.00	.33 H	29.00	.94	21.50
L119	1.433	16.00	1.652	14.00	.912	20.00	.370	8.50	.197	12.00	.904	11.00
L126	1.499	26.00	1.734	30.00	.955	24.00	.432	26.00	.213	19.00	.978	26.00
L128	1.44	17.50	1.69	24.50	1.16 EH	30.00	.49 H	30.00	.24	24.00	1.10 VH	31.00
MEDIAN CONC.	1.4330		1.6680		.8950		.3860		.2005		.9200	

PARAMETER: 17000 CHLORIDE IC MG/L

SAMPLE	7		8		9		10	
LAB NO	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK
L003	.55	29.00	.97	6.00	.50	28.50	.50	15.00
L006	.4730	11.00	1.0260	16.00	.4490	6.50	.4845	8.00
L007	.46	5.50	1.00	8.50	.46	13.50	.45	2.50
L008	.36 L	1.00	.95	2.00	.27 VL	1.00	.99 EH	31.00
L010	.49	19.50	1.05	25.00	.48	22.00	.49	10.50
L011	.48	14.50	1.15 H	30.00	.47	17.50	.52	22.50
L013	.488	18.00	1.027	17.00	.457	10.00	.498	13.00
L014	.46	5.50	1.00	8.50	.44	5.00	.48	6.00
L021	.512	27.00	1.068	27.00	.473	19.00	.538	28.00
L029	.48	14.50	.96	4.00	.48	22.00	.49	10.50
L030	.47	9.00	1.01	13.00	.49	27.00	.51	18.50
L031	.6 H	31.00	1.2 VH	31.00	.5	28.50	.6 H	30.00
L032	.508	24.50	1.038	20.50	.482	24.50	.516	21.00
L034	.43	3.00	.9 L	1.00	.4	3.50	.4 L	1.00
L049	.502	23.00	.953	3.00	.530	30.00	.542	29.00
L061	.48	14.50	1.02	15.00	.46	13.50	.50	15.00
L063	.456	4.00	1.049	24.00	.478	20.00	.458	4.00
L081	.56	30.00	1.00	8.50	6.49 EH	31.00	.52	22.50
L082	.508	24.50	1.038	20.50	.482	24.50	.522	24.00
L088	.493	22.00	.966	5.00	.463	16.00	.500	15.00
L090	.49	19.50	1.06	26.00	.48	22.00	.53	25.50
L091	.48	14.50	1.01	13.00	.46	13.50	.51	18.50
L093	.47	9.00	1.04	22.00	.45	8.00	.51	18.50
L094	.520	28.00	1.00	8.50	.342 L	2.00	.533	27.00
L099	.483	17.00	1.03	18.00	.470	17.50	.492	12.00
L102	.476	12.00	1.041	23.00	.449	6.50	.489	9.00
L109	.461	7.00	1.032	19.00	.456	9.00	.474	5.00
L116	.47	9.00	1.09	29.00	.46	13.50	.51	18.50
L119	.491	21.00	1.003	11.00	.458	11.00	.481	7.00
L126	.511	26.00	1.077	28.00	.488	26.00	.530	25.50
L128	.42	2.00	1.01	13.00	.40	3.50	.45	2.50
MEDIAN CONC.	.4800		1.0260		.4630		.5000	

LAB NO.	TOTAL RANK	AVERAGE RANK	NO.OF SAMPLES RANKED	SUMMARY OF FLAGGING	BIAS STATEMENT	METHOD CODING
L003	148.50	16.500	9	H		17209; DIONEX
L006	95.00	9.500	10			DIONEX
L007	58.00	5.800	10	ELL	BIASED LOW	
L008	87.00	8.700	10	VLELELVLL VLEH		IC
L010	226.00	22.600	10	H		DIONEX
L011	221.50	22.150	10	EH H		
L013	141.00	14.100	10			
L014	95.00	9.500	10			
L021	244.00	24.400	10	H H		IC
L029	117.50	11.750	10			
L030	143.50	14.350	10			IC
L031	287.00	28.700	10	H EH EH H VH H	BIASED HIGH	
L032	200.00	20.000	10			
L034	28.00	2.800	10	L L VL L L	BIASED LOW	
L049	122.50	12.250	10	L L		
L061	126.50	12.650	10			
L063	174.00	17.400	10			
L081	201.50	20.150	10	EL EH		Ion Chrom.
L082	220.00	22.000	10			C.I.
L088	116.00	11.600	10			Dionex
L090	209.00	20.900	10			IC DIONEX
L091	131.50	13.150	10			
L093	142.50	14.250	10			DIONEX IC
L094	186.00	18.600	10	H L		ION CHROM.

L099	132.50	14.722	9			IC
L102	148.50	14.850	10			IC
L109	127.50	12.750	10			WATERS
L116	202.00	20.200	10	H		C.I.
L119	131.50	13.150	10			DIONEX
L126	256.50	25.650	10		BIASED HIGH	
L128	178.00	17.800	10	EHH VH		IC

OVERALL AVERAGE
RANK IS 15.903

LAB NO.	TOTAL RANK	AVERAGE RANK	NO.OF SAMPLES RANKED	SUMMARY OF FLAGGING	BIAS STATEMENT	METHOD CODING
L034	28.00	2.800	10	LLVLLL	BIASED LOW	
L007	58.00	5.800	10	ELL	BIASED LOW	
L008	87.00	8.700	10	VLELELVLLVLEH		IC
L006	95.00	9.500	10			DIONEX
L014	95.00	9.500	10			
L088	116.00	11.600	10			Dionex
L029	117.50	11.750	10			
L049	122.50	12.250	10	LL		
L061	126.50	12.650	10			
L109	127.50	12.750	10			WATERS
L091	131.50	13.150	10			
L119	131.50	13.150	10			DIONEX
L013	141.00	14.100	10			
L093	142.50	14.250	10			DIONEX IC
L030	143.50	14.350	10			IC
L099	132.50	14.722	9			IC
L102	148.50	14.850	10			IC
L003	148.50	16.500	9	H		17209; DIONEX
L063	174.00	17.400	10			
L128	178.00	17.800	10	EHHVH		IC
L094	186.00	18.600	10	HL		ION CHROM.
L032	200.00	20.000	10			
L081	201.50	20.150	10	ELEH		Ion Chrom.
L116	202.00	20.200	10	H		C.I.
L090	209.00	20.900	10			IC DIONEX
L082	220.00	22.000	10			C.I.
L011	221.50	22.150	10	EHH		
L010	226.00	22.600	10	H		DIONEX
L021	244.00	24.400	10	HH		IC
L126	256.50	25.650	10		BIASED HIGH	
L031	287.00	28.700	10	HEHEHHVHH	BIASED HIGH	

OVERALL AVERAGE
RANK IS 15.903

CHLORIDE IC

LRTAP STUDY 0037 DATA SUMMARY

PARAMETER: 17001 CHLORIDE NON IC METHODS MG/L

AQUATIC ECOSYSTEM PROTECTION BRANCH
NATIONAL WATER RESEARCH INSTITUTE
BURLINGTON ONTARIO

LRTAP STUDY NO. 37 MAJOR IONS IN WATER

LOWER LIMIT FOR USE OF BASIC ACCEPTABLE ERROR= .8700 BASIC ACCEPTABLE ERROR= .4000 CONCENTRATION ERROR INCREMENT= .0377

SAMPLE	1		2		3		4		5		6	
LAB NO	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK
L002	1.51	8.00	1.90	8.00		0.00	.40	2.50	.26	7.00	.73	2.00
L004	1.19	1.00	1.55	1.00	3.25 L	4.00	.34	1.00	.13	1.00	.72	1.00
L006	1.46	3.00	1.86	7.00	4.28 H	5.00	.516	7.00	.245	6.00	.938	6.00
L023	1.5	6.00	2.0	9.50	4.8 EH	7.00	.6	8.00	.2	2.50	1.0	8.50
L024	1.50	6.00	1.70	3.00	1.10 EL	3.00	.44	5.00	.21T	4.00	.92	5.00
L031	1.4	2.00	1.6	2.00	.9 EL	1.00	.4	2.50	.2	2.50	.9	3.50
L033	1.5	6.00	1.8	5.50		0.00	.5W	0.00	.5W	0.00	.9	3.50
L047	2.6 EH	10.00	2.0T	9.50	7.1 EH	8.00	2.0T EH	9.00	2.0T EH	8.00	2.0T EH	10.00
L086	1.6	9.00	1.8	5.50	4.7 VH	6.00	.5	6.00	.3W	0.00	1.0	8.50
L126	1.499	4.00	1.734	4.00	.955 EL	2.00	.432	4.00	.213	5.00	.978	7.00
MEDIAN CONC.	1.5000		1.8000		3.7650		.4400		.2115		.9290	

SAMPLE	7		8		9		10	
LAB NO	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK
L002	.51	3.50	1.06	4.50	.45	3.00	.47	2.00
L004	.36	1.00	.84	1.00	.41	2.00	.45	1.00
L006	.541	6.00	1.06	4.50	.476	5.00	.511	6.00
L023	.6	7.50	1.1	8.00	.5	8.00	.6	8.00
L024	.51	3.50	1.10	8.00	.46	4.00	.51	5.00
L031	.5	2.00	1.0	2.50	.4	1.00	.5	3.50
L033	.5W	0.00	1.0	2.50	.5	8.00	.5	3.50
L047	2.0T EH	9.00	2.0T EH	10.00	2.0T EH	10.00	2.0T EH	10.00
L086	.6	7.50	1.1	8.00	.5	8.00	.7	9.00
L126	.511	5.00	1.077	6.00	.488	6.00	.530	7.00
MEDIAN CONC.	.5110		1.0685		.4820		.5105	

LAB NO.	TOTAL RANK	AVERAGE RANK	NO.OF SAMPLES RANKED	SUMMARY OF FLAGGING
L002	40.50	4.500	9	
L004	14.00	1.400	10	L
L006	55.50	5.550	10	H
L023	73.00	7.300	10	EH
L024	46.50	4.650	10	EL
L031	22.50	2.250	10	EL
L033	29.00	4.833	6	
L047	93.50	9.350	10	EH EHEHEHEHEHEHEHEH
L086	67.50	7.500	9	VH
L126	50.00	5.000	10	EL

OVERALL AVERAGE RANK IS 5.234

BIAS STATEMENT	METHOD CODING
BIASED LOW	AUTOANALYSER
	FIA
	THIOCYANATE
BIASED LOW	TITR CONDUCT
BIASED HIGH	AA-Thyocynate

LAB NO.	TOTAL RANK	AVERAGE RANK	NO.OF SAMPLES RANKED	SUMMARY OF FLAGGING	BIAS STATEMENT	METHOD CODING
L004	14.00	1.400	10	L	BIASED LOW	
L031	22.50	2.250	10	EL	BIASED LOW	TITR CONDUCT
L002	40.50	4.500	9			
L024	46.50	4.650	10	EL		THIOCYANATE
L033	29.00	4.833	6			
L126	50.00	5.000	10	EL		
L006	55.50	5.550	10	H		AUTOANALYSER
L023	73.00	7.300	10	EH		FIA
L086	67.50	7.500	9	VH		AA-Thyocynate
L047	93.50	9.350	10	EHEHEHEHEHEHEHEHEH	BIASED HIGH	

OVERALL AVERAGE RANK IS 5.234

CHLORIDE NON IC METHODS

LRTAP STUDY 0037 DATA SUMMARY

PARAMETER: 19091 Potassium MG/L

AQUATIC ECOSYSTEM PROTECTION BRANCH
NATIONAL WATER RESEARCH INSTITUTE
BURLINGTON ONTARIO

LRTAP STUDY NO. 37 MAJOR IONS IN WATER

LOWER LIMIT FOR USE OF BASIC ACCEPTABLE ERROR= .1000 BASIC ACCEPTABLE ERROR= .0330 CONCENTRATION ERROR INCREMENT= .0384

SAMPLE	1		2		3		4		5		6	
LAB NO	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK
L002	.48	8.00	.51	25.00	.43	26.50	.29	22.00	.17	13.50	.34	30.00
L003	.50	18.00	.55 H	34.50	.46 H	32.00	.32	34.50	.21 H	34.00	.41 EH	36.00
L004	.544	34.00	.550 H	34.50	.464 H	33.00	.312	33.00	.188	29.00	.325	19.00
L006	.496	15.00	.497	15.00	.412	20.00	.284	17.00	.166	7.50	.319	17.00
L007	.45 L	4.00	.45 L	4.00	.36 L	4.00	.22 VL	2.00	.10 EL	1.00	.26 VL	3.00
L008	.53	30.50	.50	18.00	.48 VH	34.00	.30	28.50	.19	31.00	.35	34.00
L010	.5	18.00	.5	18.00	.4	12.50	.3	28.50	.2	33.00	.3	6.50
L011	.53	30.50	.50	18.00	.41	17.50	.29	22.00	.18	25.50	.34	30.00
L013	.489	12.00	.489	11.00	.395	9.00	.280	13.50	.173	18.00	.312	15.00
L021	.520	27.50	.522	30.00	.424	25.00	.298	25.00	.179	22.00	.332	25.50
L023	.53	30.50	.51	25.00	.42	23.50	.30	28.50	.18	25.50	.34	30.00
L024	.50	18.00	.49	13.00	.44	29.50	.28	13.50	.17	13.50	.35	34.00
L029	.48	8.00	.49	13.00	.40	12.50	.28	13.50	.18	25.50	.32	18.00
L030	.530	30.50	.535	32.00	.435	28.00	.300	28.50	.175	19.50	.335	27.00
L031	.50	18.00	.50	18.00	.43	26.50	.30	28.50	.19	31.00	.34	30.00
L032	.49	13.50	.51	25.00	.40	12.50	.28	13.50	.18	25.50	.31	12.00
L033	.47	5.50	.48	7.00	.38	5.00	.26	5.00	.16	5.50	.31	12.00
L034	.65 EH	36.00	.53	31.00	.45	31.00	.32	34.50	.19	31.00	.34	30.00
L049	.52	27.50	.51	25.00	.41	17.50	.29	22.00	.17	13.50	.33	22.50
L057	.60 EH	35.00	.35 EL	1.00	.56 EH	35.00	.30	28.50	.39 EH	35.00	.35	34.00
L061	.505	22.50	.507	22.00	.411	19.00	.289	20.00	.180	25.50	.326	20.50
L063	.514	26.00	.512	28.00	.416	22.00	.292	24.00	.176	21.00	.331	24.00
L081	.47	5.50	.47	5.00	.39	7.00	.27	7.50	.17	13.50	.31	12.00
L082	.406 VL	2.00	.383 EL	3.00	.297 EL	1.00	.201 EL	1.00	.144	3.00	.231 EL	2.00
L088	.49	13.50	.48	7.00	.40	12.50	.25	4.00	.12 L	2.00	.30	6.50
L090	.483	10.00	.485	10.00	.407	15.00	.285	18.00	.169	10.00	.314	16.00
L091	.51	24.50	.51	25.00	.42	23.50	.28	13.50	.18	25.50	.31	12.00
L093	.50	18.00	.49	13.00	.39	7.00	.28	13.50	.17	13.50	.31	12.00
L094	.503	21.00	.484	9.00	.398	10.00	.266	6.00	.166	7.50	.307	9.00
L099	.48	8.00	.48	7.00	.39	7.00	.27	7.50	.16	5.50	.29	5.00
L102	.485	11.00	.50	18.00	.311 EL	3.00	.275	9.00	.168	9.00	.304	8.00
L109	.505	22.50	.504	21.00	.409	16.00	.277	10.00	.175	19.50	.332	25.50
L114	.35W EL	1.00	.38W	0.00	.49W	0.00	.39W	0.00	.27W	0.00	.21W EL	1.00
L116	.42 VL	3.00	.37 EL	2.00	.30 EL	2.00	.24 L	3.00	.15	4.00	.28 L	4.00
L126	.510	24.50	.515	29.00	.414	21.00	.286	19.00	.171	17.00	.326	20.50
L128	.54	33.00	.54	33.00	.44	29.50	.31	32.00	.17	13.50	.33	22.50
MEDIAN CONC.	.5000		.5000		.4100		.2850		.1730		.3225	

PARAMETER: 19091 Potassium MG/L

SAMPLE	7		8		9		10	
LAB NO	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK
L002	.20	28.00	.45	10.50	.15	16.00	.23	19.50
L003	.24 H	34.00	.50	32.50	.20 H	33.50	.25	31.50
L004	.193	22.00	.486	29.00	.149	12.50	.225	15.00
L006	.189	15.00	.454	14.00	.149	12.50	.216	10.00
L007	.12 VL	2.00	.42	4.50	.08 EL	1.00	.32 EH	34.00
L008	.22	33.00	.48	25.00	.17	30.00	.24	29.00
L010	.2	28.00	.4 L	2.50	.1 L	3.00	.2	6.00
L011	.20	28.00	.48	25.00	.16	23.50	.22	13.00
L013	.185	14.00	.458	15.00	.151	19.00	.218	11.00
L021	.200	28.00	.485	28.00	.162	27.00	.234	25.00
L023	.20	28.00	.48	25.00	.17	30.00	.23	19.50
L024	.17	6.50	.47	20.00	.17	30.00	.19 L	4.50
L029	.95 EH	36.00	.45	10.50	.15	16.00	.23	19.50
L030	.145 L	4.00	.535 VH	34.00	.150	16.00	.555 EH	35.00
L031	.20	28.00	.49	30.50	.20 H	33.50	.24	29.00
L032	.19	17.50	.46	17.50	.16	23.50	.22	13.00
L033	.16	5.00	.40 L	2.50	.12	5.50	.17 VL	3.00
L034	.21	32.00	.50	32.50	.17	30.00	.25	31.50
L049	.19	17.50	.48	25.00	.16	23.50	.23	19.50
L057	.36 EH	35.00	.74 EH	36.00	.50 EH	35.50	.27 H	33.00
L061	.196	24.00	.471	21.00	.161	26.00	.235	26.00
L063	.194	23.00	.477	22.00	.154	20.50	.229	16.00
L081	.19	17.50	.44	7.50	.15	16.00	.21	8.50
L082	.130 VL	3.00	.397 L	1.00	.087 VL	2.00	.158 VL	1.00
L088	.18	10.50	.42	4.50	.11 L	4.00	.16 VL	2.00
L090	.191	20.50	.469	19.00	.170	30.00	.233	24.00
L091	.19	17.50	.48	25.00	.16	23.50	.24	29.00
L093	.18	10.50	.45	10.50	.14	8.00	.23	19.50
L094	.181	13.00	.439	6.00	.146	11.00	.237	27.00
L099	.18	10.50	.44	7.50	.14	8.00	.21	8.50
L102	.176	8.00	.451	13.00	.140	8.00	.207	7.00
L109	.170	6.50	.459	16.00	.142	10.00	.231	23.00
L114	.05W EL	1.00	.59T EH	35.00	.50T EH	35.50	.34W	0.00
L116	.18	10.50	.45	10.50	.12	5.50	.19 L	4.50
L126	.191	20.50	.460	17.50	.154	20.50	.220	13.00
L128	.20	28.00	.49	30.50	.15	16.00	.23	19.50
MEDIAN CONC.	.1900		.4645		.1505		.2300	

LAB NO.	TOTAL RANK	AVERAGE RANK	NO.OF SAMPLES RANKED	SUMMARY OF FLAGGING	BIAS STATEMENT	METHOD CODING
L002	199.00	19.900	10			
L003	320.50	32.050	10	H H H EHH H	BIASED HIGH	19103
L004	261.00	26.100	10	H H		
L006	143.00	14.300	10			FLAME AA
L007	59.50	5.950	10	L L L VLELVLVL ELEH	BIASED LOW	
L008	293.00	29.300	10	VH	BIASED HIGH	ICP-MS
L010	156.00	15.600	10	L L		ICP
L011	233.00	23.300	10			
L013	137.50	13.750	10			
L021	263.00	26.300	10			IC
L023	265.50	26.550	10			FLAME AA
L024	182.50	18.250	10	L		AAS
L029	172.50	17.250	10	EH		
L030	254.50	25.450	10	L VH EH		AAS
L031	273.00	27.300	10	H		PLASMA-AES
L032	173.50	17.350	10			
L033	56.00	5.600	10	L VL	BIASED LOW	

L034	319.50	31.950	10	EH	BIASED HIGH	
L049	213.50	21.350	10			
L057	308.00	30.800	10	EHELEH EH EHEHEHH	BIASED HIGH	
L061	226.50	22.650	10			
L063	226.50	22.650	10			Flame AA
L081	100.00	10.000	10		BIASED LOW	I.C.P.
L082	19.00	1.900	10	VLELELEL ELVLL VLVL	BIASED LOW	Flame AA
L088	66.50	6.650	10	L L VL		FLAME-AAS
L090	172.50	17.250	10			
L091	219.00	21.900	10			AA 2380 FLAME
L093	125.50	12.550	10			FLAME-AA
L094	119.50	11.950	10		BIASED LOW	AA FLAME
L099	74.50	7.450	10			IC
L102	94.00	9.400	10	EL		WATERS
L109	170.00	17.000	10			ICP
L114	73.50	14.700	5	EL ELELEHEH	BIASED LOW	ICP
L116	49.00	4.900	10	VLELELL L L		
L126	202.50	20.250	10			AE
L128	257.50	25.750	10			

OVERALL AVERAGE
RANK IS 18.254

LAB NO.	TOTAL RANK	AVERAGE RANK	NO.OF SAMPLES RANKED	SUMMARY OF FLAGGING	BIAS STATEMENT	METHOD CODING
L082	19.00	1.900	10	VLELELELELVLLVLVL	BIASED LOW	I.C.P.
L116	49.00	4.900	10	VLELELLLL	BIASED LOW	ICP
L033	56.00	5.600	10	LVL	BIASED LOW	
L007	59.50	5.950	10	LLLVLELVLVLELEH	BIASED LOW	
L088	66.50	6.650	10	LLVL	BIASED LOW	Flame AA
L099	74.50	7.450	10		BIASED LOW	AA FLAME
L102	94.00	9.400	10	EL		IC
L081	100.00	10.000	10			Flame AA
L094	119.50	11.950	10			FLAME-AA
L093	125.50	12.550	10			AA 2380 FLAME
L013	137.50	13.750	10			
L006	143.00	14.300	10			FLAME AA
L114	73.50	14.700	5	ELELELEHEH		ICP
L010	156.00	15.600	10	LL		ICP
L109	170.00	17.000	10			WATERS
L090	172.50	17.250	10			FLAME-AAS
L029	172.50	17.250	10	EH		
L032	173.50	17.350	10			
L024	182.50	18.250	10	L		AAS
L002	199.00	19.900	10			
L126	202.50	20.250	10			
L049	213.50	21.350	10			
L091	219.00	21.900	10			
L063	226.50	22.650	10			
L061	226.50	22.650	10			
L011	233.00	23.300	10			
L030	254.50	25.450	10	LVHEH		AAS
L128	257.50	25.750	10			AE
L004	261.00	26.100	10	HH		
L021	263.00	26.300	10			IC
L023	265.50	26.550	10			FLAME AA
L031	273.00	27.300	10	H		PLASMA-AES
L008	293.00	29.300	10	VH	BIASED HIGH	ICP-MS
L057	308.00	30.800	10	EHELEHEHEHEHEHH	BIASED HIGH	
L034	319.50	31.950	10	EH	BIASED HIGH	
L003	320.50	32.050	10	HHHEHHH	BIASED HIGH	19103

OVERALL AVERAGE
RANK IS 18.254

Potassium

LRTAP STUDY 0037 DATA SUMMARY

PARAMETER: 20091 Calcium MG/L

AQUATIC ECOSYSTEM PROTECTION BRANCH
NATIONAL WATER RESEARCH INSTITUTE
BURLINGTON ONTARIO

LRTAP STUDY NO. 37 MAJOR IONS IN WATER

LOWER LIMIT FOR USE OF BASIC ACCEPTABLE ERROR= .1900 BASIC ACCEPTABLE ERROR= .0800 CONCENTRATION ERROR INCREMENT= .0364

SAMPLE	1		2		3		4		5		6	
LAB NO	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK
L002	13.5	16.00	2.52	11.00	2.75	7.00	6.71	15.00	2.86	12.00	8.72	14.00
L003	13.40	12.00	2.52	11.00	2.80	15.00	6.60	6.50	2.87	16.00	8.70	12.50
L004	13.9	23.50	2.64	26.50	2.93	25.00	7.04	27.50	2.96	27.50	9.00	24.00
L006	15.06 EH	31.00	2.71	32.00	2.98 H	31.00	7.20 H	30.00	2.96	27.50	9.29 H	29.00
L007	12.23 EL	3.00	2.64	26.50	2.78	9.50	6.60	6.50	2.80	5.00	8.32 L	3.00
L008	13.67	20.00	2.60	23.50	2.97	29.50	6.76	17.00	2.95	25.00	8.59	10.00
L010	13.5	16.00	2.5	9.00	2.8	15.00	6.7	13.50	2.9	21.00	8.8	17.00
L013		0.00	2.578	21.00	2.800	15.00		0.00	2.958	26.00		0.00
L023	13.3	10.00	2.52	11.00	2.79	11.00	6.65	12.00	2.85	9.50	8.74	15.00
L024	14.1 H	26.00	2.6	23.50	3.0 H	32.50	6.9	22.50	3.0	30.00	9.6 EH	33.00
L029	12.7 L	6.00	2.39	3.00	2.63	2.00	6.50	3.00	2.60 VL	2.00	8.70	12.50
L030	12.3 EL	4.00	2.68	31.00	3.10 VH	34.00	7.42 EH	32.00	3.04	31.00	8.43	5.00
L031	13.9	23.50	2.6	23.50	3.0 H	32.50	6.8	20.00	2.9	21.00	9.5 VH	31.00
L032	14.60 VH	30.00	2.66	28.00	2.97	29.50	7.05	29.00	2.94	24.00	9.56 VH	32.00
L033	13.27	9.00	2.46	6.00	2.67	3.00	6.61	8.50	2.88	19.00	8.45	7.00
L034	14.3 H	28.00	2.6	23.50	2.8	15.00	6.9	22.50	2.9	21.00	9.4 VH	30.00
L049	12.6 VL	5.00	2.43	4.50	2.70	5.00	6.85	21.00	2.85	9.50	8.67	11.00
L057	13.4	12.00	2.43	4.50	2.68	4.00	6.62	10.50	2.85	9.50	8.41	4.00
L061	13.49	14.00	2.568	19.00	2.822	23.00	6.798	19.00	2.870	16.00	8.810	18.50
L063	13.77	22.00	2.526	13.00	2.798	12.00	6.970	25.00	2.867	13.00	8.877	20.00
L081	13.6	19.00	2.55	17.00	2.81	19.50	6.98	26.00	2.92	23.00	8.95	22.00
L082	13.131	8.00	2.720	33.00	2.932	26.50	6.299 L	2.00	2.822	6.00	9.038	25.00
L088	14.32 H	29.00	2.48	8.00	2.74	6.00	6.73	16.00	2.84	7.00	9.11	27.00
L090	13.7	21.00	2.54	16.00	2.77	8.00	6.70	13.50	2.87	16.00	8.55	9.00
L091	13.4	12.00	2.57	20.00	2.82	21.50	6.59	5.00	2.77	4.00	8.99	23.00
L093	12.21 EL	2.00	2.56	18.00	2.78	9.50	6.61	8.50	2.87	16.00	8.31 L	2.00
L094	16.06 EH	32.00	2.53	14.50	2.82	21.50	7.04	27.50	3.05 H	32.00	7.84 EL	1.00
L099	13.5	16.00	2.53	14.50	2.80	15.00	6.78	18.00	2.87	16.00	8.79	16.00
L102	2.7 EL	1.00	2.37 L	2.00	2.62 L	1.00	6.62	10.50	2.76	3.00	8.44	6.00
L109	13.51	18.00	2.474	7.00	2.802	18.00	6.588	4.00	2.850	9.50	8.537	8.00
L114	14.124 H	27.00	2.669	29.00	2.932	26.50	7.345 VH	31.00	3.074 H	33.00	9.184	28.00
L116	12.93 L	7.00	2.34 L	1.00	2.81	19.50	6.16 VL	1.00	2.43 EL	1.00	8.90	21.00
L126		0.00	2.800 H	34.00	2.842	24.00	7.452 EH	33.00	3.452 EH	34.00	8.810	18.50
L128	14.0	25.00	2.67	30.00	2.95	28.00	6.95	24.00	2.99	29.00	9.05	26.00
MEDIAN CONC.	13.5000		2.5550		2.8010		6.7600		2.8700		8.8000	

PARAMETER: 20091 Calcium MG/L

SAMPLE	7		8		9		10	
LAB NO	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK	REPORTED VALUE	RANK
L002	4.52	14.00	2.88	10.00	2.60	13.50	1.95	17.50
L003	4.60	18.50	2.92	16.00	2.62	17.00	1.94	15.00
L004	4.75	27.00	3.04	28.00	2.74	29.00	1.94	15.00
L006	4.89 H	32.00	3.11 H	32.00	2.77	30.00	2.09	30.00
L007	4.49	11.00	2.92	16.00	2.59	10.50	1.91	10.50
L008	4.85 H	30.00	3.05	29.00	2.63	20.00	1.97	22.00
L010	4.5	12.00	2.9	13.00	2.6	13.50	1.9	8.50
L013	4.663	23.00	2.998	24.00	2.693	27.00	1.956	19.00
L023	4.60	18.50	2.87	7.00	2.59	10.50	1.92	12.00
L024	4.9 H	33.00	3.1 H	31.00	2.6	13.50	2.1 H	31.00
L029	4.46	10.00	2.73 L	1.50	2.39 L	2.00	1.80 L	2.00
L030	4.91 H	34.00	2.98	23.00	2.69	26.00	2.08	29.00
L031	4.6	18.50	3.0	25.50	2.7	28.00	2.0	26.00
L032	4.84	29.00	3.07	30.00	2.90 VH	32.00	2.12 H	32.00
L033	4.36	5.50	2.88	10.00	2.46	3.00	1.83	4.00
L034	4.7	26.00	3.0	25.50	2.6	13.50	1.9	8.50
L049	4.60	18.50	2.93	18.50	2.51	7.00	1.94	15.00
L057	4.45	9.00	2.86	6.00	2.57	9.00	1.86	5.00
L061	4.681	24.00	2.942	20.00	2.643	23.50	1.997	25.00
L063	4.630	22.00	2.977	22.00	2.643	23.50	1.950	17.50
L081	4.57	15.50	2.97	21.00	2.62	17.00	1.97	22.00
L082	4.351 L	4.00	2.875	8.00	2.506	6.00	1.891	7.00
L088	4.57	15.50	2.93	18.50	2.67	25.00	1.96	20.00
L090	.54 EL	1.00	2.88	10.00	2.62	17.00	1.91	10.50
L091	4.42	8.00	2.85	5.00	2.49	5.00	1.93	13.00
L093	4.51	13.00	2.90	13.00	2.63	20.00	1.97	22.00
L094	4.17 VL	2.00	2.90	13.00	2.63	20.00	2.01	27.00
L099	4.61	21.00	2.92	16.00	2.64	22.00	1.98	24.00
L102	4.32 L	3.00	2.74 L	3.00	2.47	4.00	1.82	3.00
L109	4.409	7.00	2.838	4.00	2.561	8.00	1.885	6.00
L114	4.683	25.00		0.00		0.00		0.00
L116	4.36	5.50	2.73 L	1.50	2.31 VL	1.00	1.74 L	1.00
L126	4.879 H	31.00	3.195 VH	33.00	2.908 VH	33.00	2.144 H	33.00
L128	4.79	28.00	3.02	27.00	2.78	31.00	2.03	28.00
MEDIAN CONC.	4.6000		2.9200		2.6200		1.9500	

LAB NO.	TOTAL RANK	AVERAGE RANK	NO.OF SAMPLES RANKED	SUMMARY OF FLAGGING	BIAS STATEMENT	METHOD CODING
L002	130.00	13.000	10			
L003	139.50	13.950	10			20110
L004	253.00	25.300	10			
L006	304.50	30.450	10	EH H H H H H	BIASED HIGH	FLAME AA
L007	101.50	10.150	10	EL L		
L008	226.00	22.600	10	H		ICP-MS
L010	138.50	13.850	10			ICP
L013	155.00	22.143	7			
L023	116.50	11.650	10			FLAME AA/ICP
L024	276.00	27.600	10	H H EHH H H	BIASED HIGH	ICP
L029	44.00	4.400	10	L VL L L L	BIASED LOW	
L030	249.00	24.900	10	EL VHEH H		AAS
L031	249.50	24.950	10	H VH		PLASMA-AES
L032	295.50	29.550	10	VH VH VHH	BIASED HIGH	
L033	75.00	7.500	10		BIASED LOW	
L034	213.50	21.350	10	H VH		
L049	115.00	11.500	10	VL		
L057	73.50	7.350	10		BIASED LOW	
L061	202.00	20.200	10			
L063	190.00	19.000	10			
L081	202.00	20.200	10			Flame AA
L082	125.50	12.550	10	L L		I.C.P.
L088	172.00	17.200	10	H		Flame AA

L090	122.00	12.200	10	EL		FLAME-ASS
L091	116.50	11.650	10			
L093	124.00	12.400	10	EL L		AA 2380 FLAME
L094	190.50	19.050	10	EH H ELVL		FLAME-AA
L099	178.50	17.850	10			ICP
L102	36.50	3.650	10	ELL L L L	BIASED LOW	ICP
L109	89.50	8.950	10			AAS VARIAN
L114	199.50	28.500	7	H VHH	BIASED HIGH	
L116	59.50	5.950	10	L L VLEL L VLL	BIASED LOW	ICP
L126	273.50	30.389	9	H EHEH H VHVHH	BIASED HIGH	
L128	276.00	27.600	10		BIASED HIGH	ICP

OVERALL AVERAGE RANK IS 17.156

LAB NO.	TOTAL RANK	AVERAGE RANK	NO.OF SAMPLES RANKED	SUMMARY OF FLAGGING	BIAS STATEMENT	METHOD CODING
L102	36.50	3.650	10	ELLLLL	BIASED LOW	ICP
L029	44.00	4.400	10	LVLLLL	BIASED LOW	
L116	59.50	5.950	10	LLVLELLVLL	BIASED LOW	ICP
L057	73.50	7.350	10		BIASED LOW	
L033	75.00	7.500	10		BIASED LOW	
L109	89.50	8.950	10			AAS VARIAN
L007	101.50	10.150	10	ELL		
L049	115.00	11.500	10	VL		
L023	116.50	11.650	10			FLAME AA/ICP
L091	116.50	11.650	10			
L090	122.00	12.200	10	EL		FLAME-ASS
L093	124.00	12.400	10	ELL		AA 2380 FLAME
L082	125.50	12.550	10	LL		I.C.P.
L002	130.00	13.000	10			
L010	138.50	13.850	10			ICP
L003	139.50	13.950	10			20110
L088	172.00	17.200	10	H		Flame AA
L099	178.50	17.850	10			ICP
L063	190.00	19.000	10			
L094	190.50	19.050	10	EHHELVL		FLAME-AA
L081	202.00	20.200	10			Flame AA
L061	202.00	20.200	10			
L034	213.50	21.350	10	HVH		
L013	155.00	22.143	7			
L008	226.00	22.600	10	H		ICP-MS
L030	249.00	24.900	10	ELVHEHH		AAS
L031	249.50	24.950	10	HVH		PLASMA-AES
L004	253.00	25.300	10			
L024	276.00	27.600	10	HHEHHHH	BIASED HIGH	ICP
L128	276.00	27.600	10		BIASED HIGH	ICP
L114	199.50	28.500	7	HVHH	BIASED HIGH	
L032	295.50	29.550	10	VHVHVHH	BIASED HIGH	
L126	273.50	30.389	9	HEHEHHVHVHH	BIASED HIGH	
L006	304.50	30.450	10	EHHHHHH	BIASED HIGH	FLAME AA

OVERALL AVERAGE RANK IS 17.156

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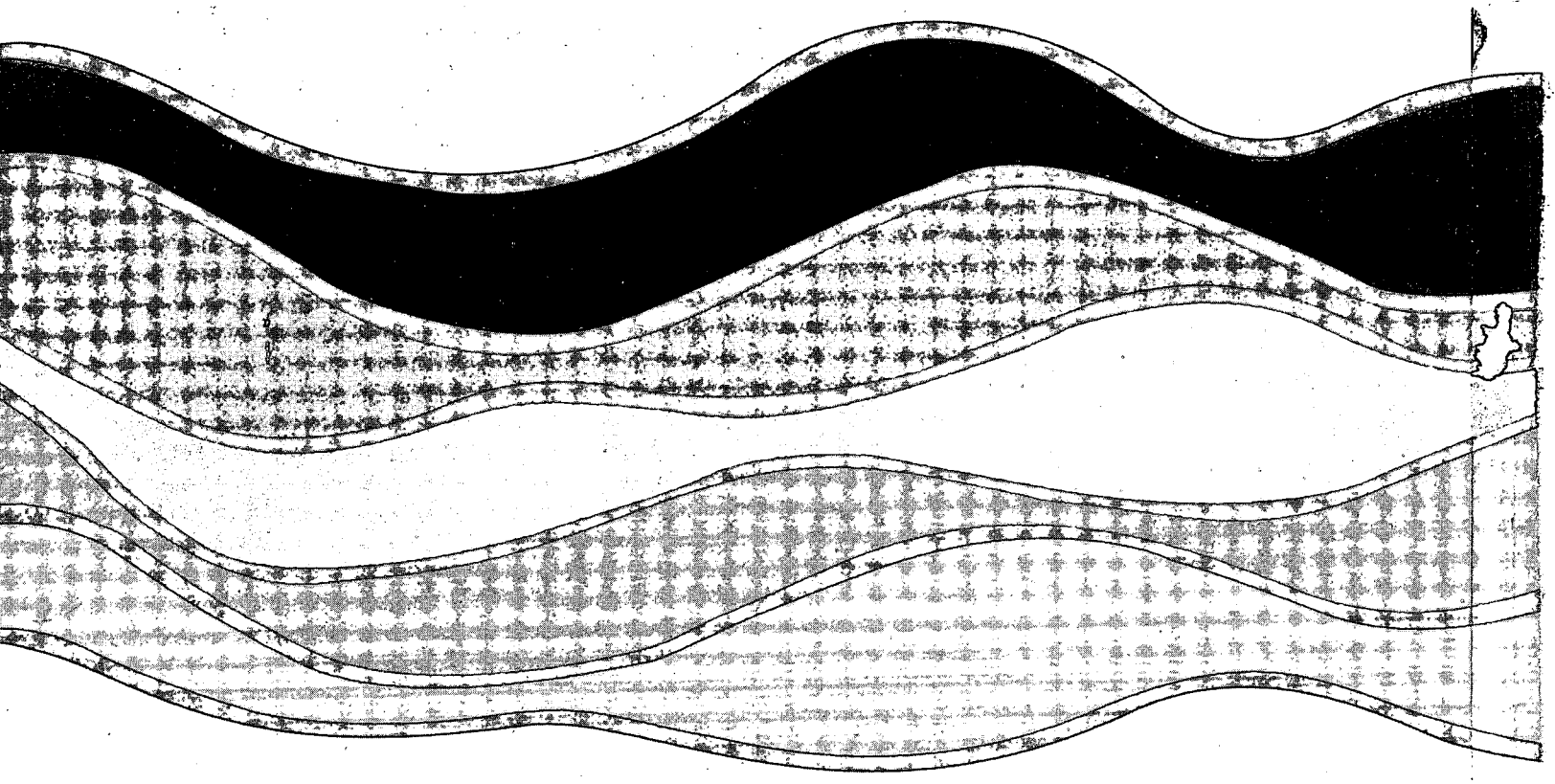

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