Maitland Valley
Conservation Authority

Working for a Healthy Environment

2010 Stream Sampling
ACLA-MVCA

The 2010 sampling marked the tenth year of a cooperative arrangement between the Ashfield-Colborne Lakefront Association and the Maitland Valley Conservation Authority. Since 2003, the annual program has had the purpose of general monitoring of the major watercourses sampled in 2001.

Sampling in 2010 was conducted every other week from April 20th to November 16 for a total of 16 sampling events. The samples were analyzed by ALS Laboratory Group, London. Samples were tested for Escherichia coli (E. coli), nitrate and total phosphorus. The results are on the following pages.

Key findings as a result of the 2010 sampling include:

- The geometric mean for all but 2 sample location exceeded the recreation limit of 100cfu/100mL.
- Sample location A6 (Griffins Creek) had the highest geometric mean for E. coli for the 2010 sample season.
- None of the E. coli samples from A6 tested lower than the recreation limit of 100cfu/100mL
- Griffins Creek (A6) also had the highest levels of Nitrate and Total Phosphorus.
- Overall Griffins Creek (A6) ranked the worst in water quality for the 2010 sample season.
- Grades have been assigned to the sample locations based upon the Watershed Report Card criteria established by Conservation Ontario. These will assist in detecting changes through time.
- Extensive road work occurred in the summer of 2010 which accounts for some discrepancy in sampling effort.

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Ashfield-Colborne Lakefront Association Sampling 2010

E.COLI (cfu/100ml)

Stream Name	Site	Date: Apr 20/10	May 5/10	May 18/10	Jun 1/10	Jun 15/10	Jun 29/10	Jul 13/10	Jul 27/10	Aug 11/10	Aug 24/10	Sep 7/10	Sep 21/10	Oct 7/10	Oct 19/10	Nov 10/1	Nov 16/10	Total	GeoMean	Percentage of Samples above: 100CFU/100mL	1000cfu/100mL	Grade	Rank
Boyd Creek	A1	10	70	20	5740	160	270	200	250	310	70	80	130	3070	50	30	30	16	128.332	50%	13%	C	7
Eighteen Mile River	A2	10	10	10	4280	140	1420		90	420	250	180	70	30	50	10	90	15	87.579	7%	13%	B	2
Kintail Creek	A3	10		10	19300	290	390	130	350	380		190	60	80	50	30	60	14	127.792	7%	7%	C	6
Kerry's Creek	A4	20	80	40	1930	280	1260	510	360	480	40	120	40	100	10	40	60	16	119.672	50%	13%	C	5
Near Kingsbridge	A5	10	80	50	3070	650	1230	4450	650	890	280		10	260	100	80	360	15	240.776	67%	20%	C	10
Griffins Creek	A6	130	320	560	1720	540	1180	2640	1280	3100	2610	760	770	3950	1680	1420	1040	16	1090.566	100%	63%	D	12
Near Midhuron	A7	90	340	290	960	190	140	1240	280	880	40	280	130	130	30	60	20	16	169.671	69%	6%	C	9
Nine Mile River	A8	10	50	20	840	100	650	4770	50	300	270	290	80	20	10	40	50	16	99.866	44%	6%	B	3
Boundary Creek	A9	140	130	90	360	530	890	3890		430								8	383.233	88%	13%	C	11
Bogies Road Creek	C1	10	110	40	450	310	390	620	200	160	40	40	240	170	90	40	40	16	109.802	56%	0%	C	4
Allans Creek	C2	50	10	100		260	370	920	300	320	310	190	1040	30	40	70	40	15	134.724	60%	7%	C	8
Maitland River	C3	10	70	10	40	30	460	80	50	60	20	50	50	60	10	20	10	16	35.204	6%	0%	B	1
GeoMean		22.448784	71.34966	43.56772	1341.153	223.511	580.69	848.233	230.816	410.4309	129.9204	154.399	107.3538	145.139	46.63316	50.541	62.63676						

Exceeds recreation limit (100cfu/100ml) but less than 1000.
Exceeds limit for recreation by 10x.
Microbiologists often consider an order of magnitude (10 fold) as a significant difference.
Less than the detection limit of 10
Geometric mean across all sites was 146.5 cfu/100mL

NITRATE as N (mg/l)

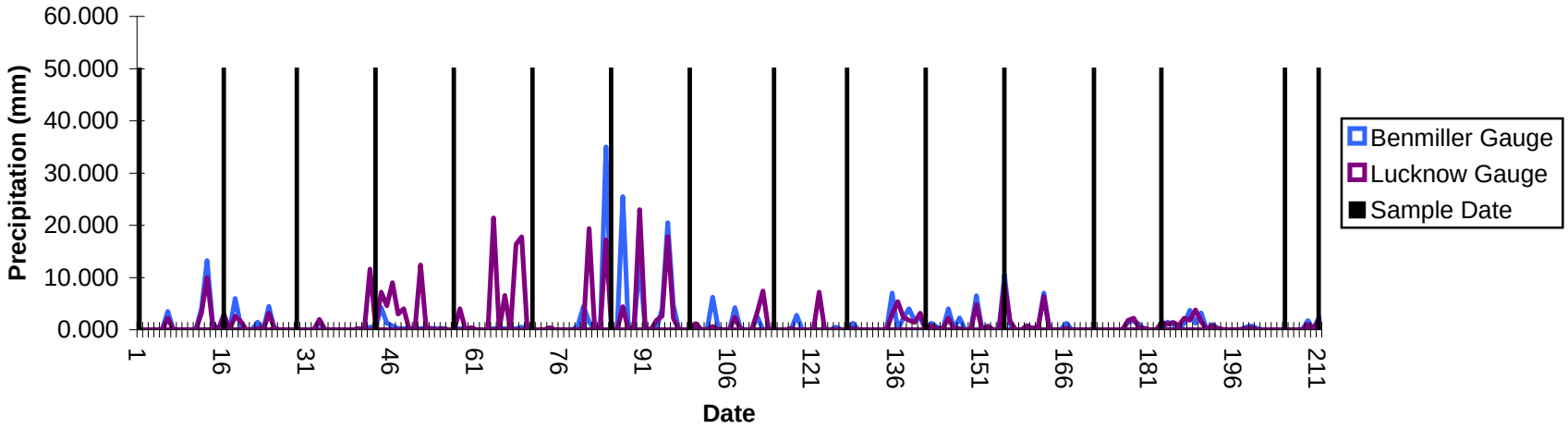
Stream Name	Site	Date: Apr 20/10	May 5/10	May 18/10	Jun 1/10	Jun 15/10	Jun 29/10	Jul 13/10	Jul 27/10	Aug 10/10	Aug 24/10	Sep 7/10	Sep 21/10	Oct 7/10	Oct 19/10	Nov 10/1	Nov 16/10	Total	75th Percentile	Percent of samples above: Aquatic Protection Limit (2.93 mg/L as N)	Drinking Water Guideline (10 mg/L as N)	Grade	Rank
Boyd Creek	A1	3.37	1.46	9.27	37.5	16.9	9.22	6.03	5.13	1.31	0.1	0.1	2.24	5.82	4.27	7.14	5.4	16	7.66	69%	6%	C	11
Eighteen Mile River	A2	2.23	1.59	6.58	14.1	9.02	5.68		3.6	2.2	1.43	1.82	1.65	3.83	2.27	4.22	3.52	15	4.95	47%	0%	B	3
Kintail Creek	A3	0.75		5.54	23.2	11.7	10.5	1.1	3.28	0.3		0.1	0.1	1.49	0.3	2.72	5.02	14	5.41	43%	14%	B	6
Kerry's Creek	A4	3.21	3.01	6.12	7.66	9.55	7.74	4.85	4.55	3.12	2.53	2.14	2.33	3.89	2.78	4.34	4.03	16	5.17	69%	0%	B	4
Near Kingsbridge	A5	3.28	5.49	6.91	9.21	11.5	10.1	6.06	5.37	1.25	0.1		0.026	1.94	1.73	4.42	6.88	15	6.90	67%	13%	B	10
Griffins Creek	A6	3.47	6.58	7.71	1.62	13.1	14.6	8.12	7.76	3.64	1.12	1.52	1.92	4.54	3.12	5.44	6.77	16	7.72	75%	13%	C	12
Near Midhuron	A7	1.14	5.75	6.03	1.17	11.8	12.6	8.13	5.65	1.91	0.1	0.14	0.1	4.01	4.17	4.74	4.81	16	5.82	63%	13%	B	8
Nine Mile River	A8	1.2	1.33	1.38	0.8	2.18	1.98	2.58	1.35	1.19	1.26	1.04	1.11	1.3	1.24	1.49	1.51	16	1.50	6%	0%	A	1
Boundary Creek	A9	1.64	2.86	3.42	1.02	5.42	7.33	6.68		2.46								8	5.74	70%	0%	B	7
Bogies Road Creek	C1	2.09	4.14	5.64	0.76	7.29	11.5	9.48	6.6	0.37	0.1	0.1	0.1	1.24	0.79	2.81	3.47	16	5.88	44%	6%	B	9
Allans Creek	C2	2.74	5.41	6.18		7.56	10.2	0.87	1.72	0.55	0.28	0.63	0.62	5	1.27	4.74	2.8	15	5.21	33%	7%	B	5
Maitland River	C3	2.98	3.3	6.46	1.05	8.63	7.6	3.07	4.15	1.96	1.15	0.82	1.06	2.93	1.93	4.75	3.28	16	4.30	63%	0%	B	2
75th Percentile		3.2275	5.45	6.6625	11.655	11.725	10.75	7.4	5.51	2.265	1.2325	1.4	1.785	4.275	2.95	4.745	5.21						

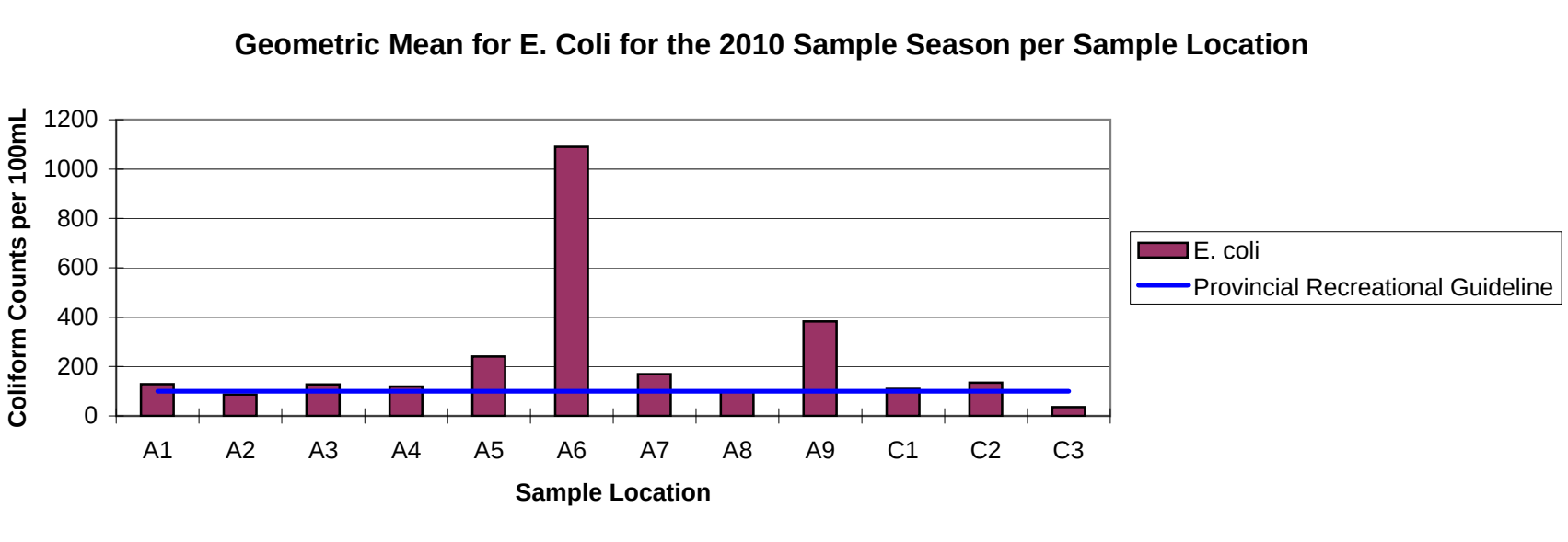
Exceeds proposed Canadian Aquatic Objective of 2.9 mg/l of nitrate as N
Exceeds Drinking Water Guidelines of 10 mg/L of nitrate as N
Less than the detection limit.
75th percentile across all sites was 5.925 mg/L

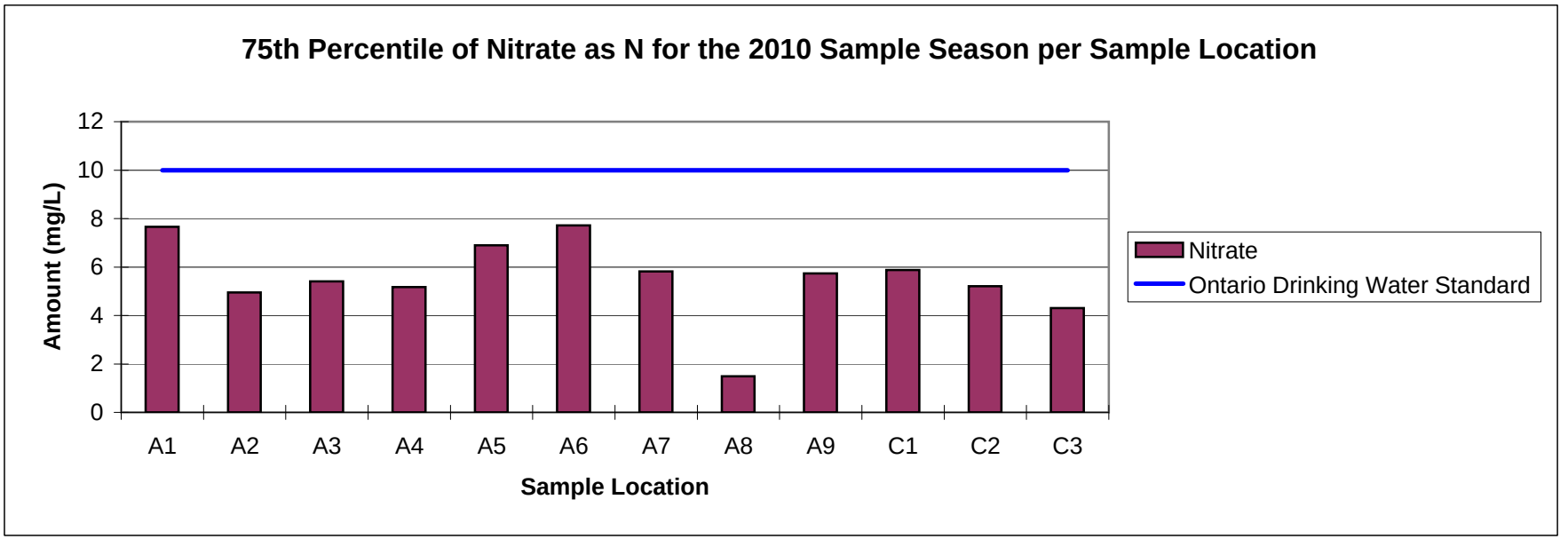
TOTAL PHOSPORUS P (mg/l)

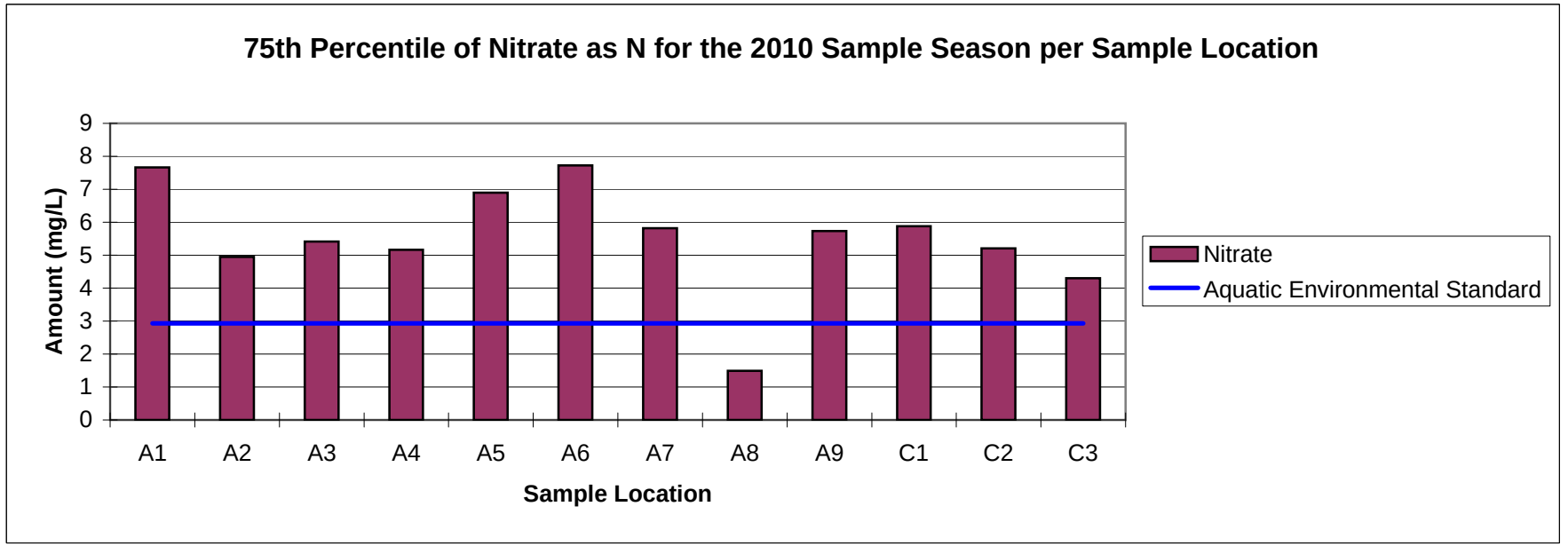
Stream Name	Site	Date: Apr 20/10	May 5/10	May 18/10	Jun 1/10	Jun 15/10	Jun 29/10	Jul 13/10	Jul 27/10	Aug 11/10	Aug 24/10	Sep 7/10	Sep 21/10	Oct 7/10	Oct 19/10	Nov 10/1	Nov 16/10	Total	75th Percentile	Percent of samples above: Provincial Water Quality Objective (0.03mg/L)	Grade	Rank
Boyd Creek	A1	0.0127	0.0102	0.0197	0.231	0.0148	0.0382	0.0354	0.0222	0.0317	0.0195	0.0253	0.0195	0.015	0.0252	0.0077	0.013	16	0.0269	25%	A	5
Eighteen Mile River	A2	0.0139	0.0154	0.017	0.321	0.0073	0.111		0.0381	0.0185	0.0389	0.0104	0.0124	0.0119	0.0098	0.0063	0.0067	15	0.0283	27%	A	6
Kintail Creek	A3	0.0269		0.0184	0.0648	0.0386	0.0436	0.0677	0.0839	0.0746		0.143	0.0241	0.021	0.0158	0.0118	0.0138	14	0.0670	50%	B	11
Kerry's Creek	A4	0.0173	0.0213	0.0107	0.0616	0.0165	0.152	0.0151	0.025	0.0227	0.0242	0.019	0.0207	0.0182	0.013	0.0086	0.0116	16	0.0231	13%	A	3
Near Kingsbridge	A5	0.0106	0.0206	0.0166	0.0537	0.0325	0.152	0.105	0.0804	0.0404	0.0731		0.026	0.0435	0.0104	0.0118	0.0416	15	0.0634	60%	B	10
Griffins Creek	A6	0.0219	0.0206	0.0094	0.0697	0.0395	0.123	0.18	0.065	0.157	0.0992	0.0606	0.0335	0.0235	0.0236	0.0198	0.0173	16	0.0771	50%	B	12
Near Midhuron	A7	0.0182	0.0108	0.0388	0.0325	0.0176	0.0554	0.0551	0.0344	0.103	0.105	0.0542	0.0552	0.0187	0.0165	0.0215	0.0161	16	0.0551	50%	B	9
Nine Mile River	A8	0.0097	0.0179	0.016	0.0288	0.0101	0.0642	0.0728	0.039	0.0205	0.0172	0.0126	0.0111	0.0094	0.0048	0.0071	0.0049	16	0.0226	19%	A	2
Boundary Creek	A9	0.0191	0.0174	0.0501	0.0456	0.021	0.0477	0.072		0.0342								8	0.0483	63%	B	8
Bogies Road Creek	C1	0.012	0.0095	0.0173	0.0597	0.0146	0.025	0.0509	0.0106	0.0257	0.0233	0.0291	0.0256	0.0115	0.0084	0.008	0.0097	16	0.0256	13%	A	4
Allans Creek	C2	0.0165	0.0155	0.0202		0.0168	0.054	0.0302	0.0278	0.0401	0.0311	0.022	0.0212	0.0141	0.0099	0.009	0.0097	15	0.0290	27%	A	7
Maitland River	C3	0.0103	0.0212	0.021	0.0093	0.0054	0.0693	0.0092	0.0305	0.0059	0.0091	0.0051	0.006	0.011	0.0047	0.0038	0.003	16	0.0135	13%	A	1
75th Percentile		0.018425	0.0206	0.0204	0.06725	0.02388	0.114	0.0724	0.052	0.04895	0.06455	0.04793	0.0258	0.01985	0.01615	0.0118	0.01495						

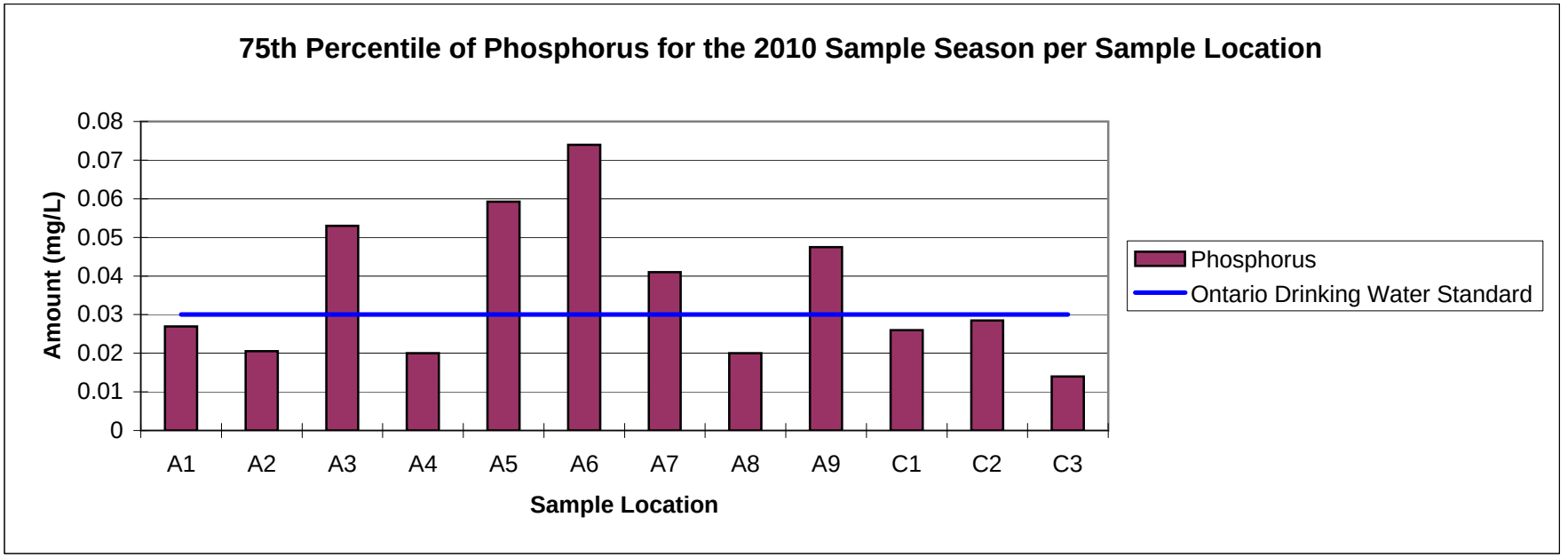
Exceeds MVCA target to avoid excessive algae growth of .03mg/L Total Phosphorus as P (Intrim Prov. Water Quality objective for streams and rivers is .03mg/L)
Less than the detection limit
75th percentile across all sites was 0.03895 mg/L

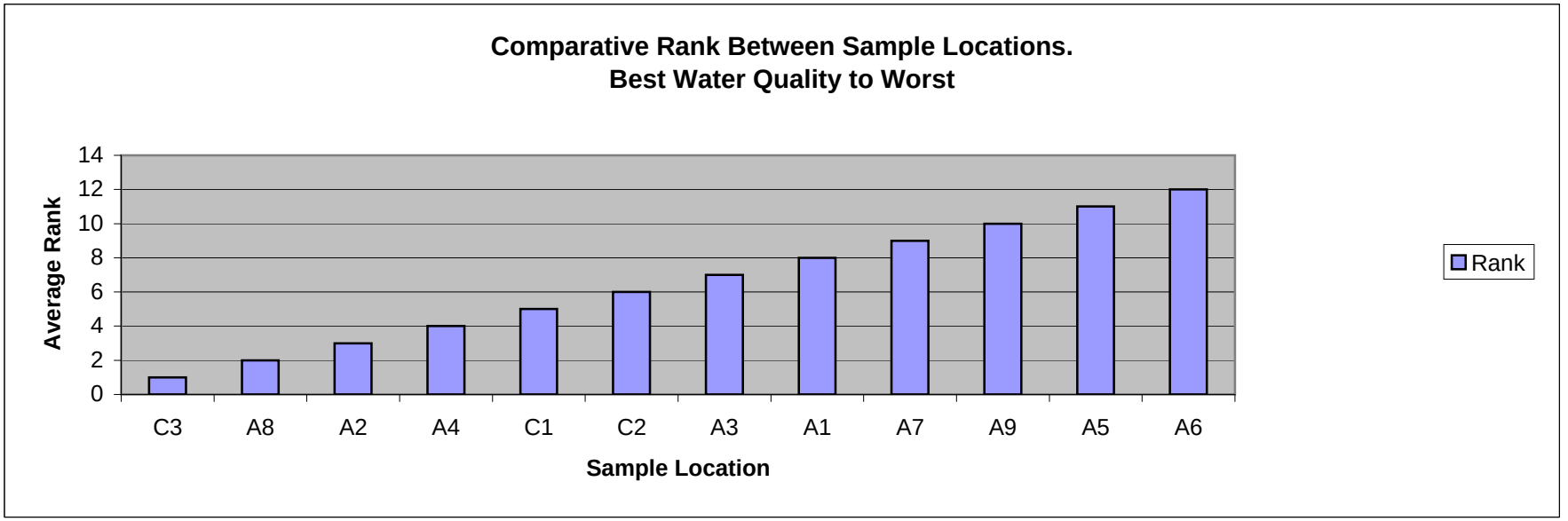

Daily Total Precipitation Throughout the 2010 Sample Season
Precipitation (mm)
60.000
50.000
40.000
30.000
20.000
10.000
0.000
1
16
31
46
61
76
91
106
121
136
151
166
181
196
211
Date
Benmiller Gauge
Lucknow Gauge
Sample Date


Geometric Mean for E. Coli for the 2010 Sample Season per Sample Location
Coliform Counts per 100mL
1200
1000
800
600
400
200
0
A1
A2
A3
A4
A5
A6
A7
A8
A9
C1
C2
C3
Sample Location
E. coli
Provincial Recreational Guideline


75th Percentile of Nitrate as N for the 2010 Sample Season per Sample Location
Amount (mg/L)
0
2
4
6
8
10
12
A1
A2
A3
A4
A5
A6
A7
A8
A9
C1
C2
C3
Sample Location
Nitrate
Ontario Drinking Water Standard


75th Percentile of Nitrate as N for the 2010 Sample Season per Sample Location
Amount (mg/L)
0
1
2
3
4
5
6
7
8
9
A1
A2
A3
A4
A5
A6
A7
A8
A9
C1
C2
C3
Sample Location
Nitrate
Aquatic Environmental Standard


75th Percentile of Phosphorus for the 2010 Sample Season per Sample Location
Amount (mg/L)
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0
A1
A2
A3
A4
A5
A6
A7
A8
A9
C1
C2
C3
Sample Location
Phosphorus
Ontario Drinking Water Standard


Comparative Rank Between Sample Locations.
Best Water Quality to Worst
Average Rank
14
12
10
8
6
4
2
0
C3
A8
A2
A4
C1
C2
A3
A1
A7
A9
A5
A6
Sample Location
Rank