Info # 4

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Environment

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August 5, 2010

Halifax Regional Municipality
Sustainable Environment Management Office
PO Box 1749
Halifax, Nova Scotia
B3J 3A5

Attention: Mr. Cameron Deacoff

Dear Mr. Deacoff,

RE: Final Report: Water Quality Monitoring within Bedford West, Sub Areas 3 & 4, Bedford, Nova Scotia – May 2010 Sampling Event

1. INTRODUCTION

SNC-Lavalin Inc., Environment Division (SLE) was retained by the Halifax Regional Municipality (HRM) to conduct water quality monitoring within Bedford West Sub-Areas 3 & 4. Water samples were collected from nine (9) specified locations during the May 2010 sampling event. The purpose of the program is to determine water quality for watersheds impacted by the proposed development in Bedford West. The Paper Mill Lake watershed is the primary watershed in the area. Testing shall take place prior to construction and shall detect any impacts on and changes to water quality during and after construction of the development project.

This report presents water quality data from Kearney Lake, Kearney Lake Run, Highway 102, Lakeshore Drive and Paper Mill Lake, collected on May 31, 2010. The water quality test locations are presented on Figure 1.

2. METHODOLOGY

The May 2010 monitoring event consisted of the sampling and analysis of RCAp, Total Phosphorous, Total Suspended Solids, Fecal Coliform Bacteria and Chlorophyll-a from nine (9) specified sampling locations. Standard field measurements (pH, temperature, dissolved oxygen and conductivity) were measured at all nine specified sampling locations for the May 2010 monitoring event. The field measurements were taken using Hach intelliCAL

probes for pH, conductivity and dissolved oxygen (Product Numbers pHC30101, CDC40101 and LDO10101, respectively). For previous SLE sampling events (2009), Oakton Portable Waterproof Meters were used for collecting field measurements (Dissolved Oxygen Meter – 35601-Series; pH and Conductivity – 35630-00 and 35630-02, respectively). The samples and field parameter readings were collected from a 1.0 metre depth.

The field parameters and site conditions for each sampling location were recorded on a field report. The field reports are attached in Attachment 1. Photographs of each sampling location are attached in Attachment 2.

A new pair of latex gloves was used at each sample location. Surface water samples were collected and placed in clean laboratory-supplied jars and stored in a chilled container together with a chain of custody record for transport to the laboratory. All surface water samples, collected from the nine sampling locations, were submitted to Maxxam Analytics Inc., located in Bedford, Nova Scotia.

Secchi depth measurements were not obtained due to windy conditions.

3. ASSESSMENT STANDARDS

The CCME guidelines for water are broken down based on water use including Freshwater Aquatic Life, Marine Water Aquatic Life, Irrigation, Livestock Watering, Recreation and Aesthetics and Drinking Water. The surface water quality results were compared to the CCME Freshwater Aquatic Life guidelines since the specified sampling locations are located at and/or near adjacent freshwater bodies.

Analytical data for Total Suspended Solids (TSS) and Turbidity are compared to the Canadian Council of Ministers of the Environment (CCME) for the Protection of Aquatic Life (CCME Narrative Total Particulate Matter – Table 1 Suspended Sediments and Turbidity, High Flow Conditions, 1999, updated 2002).

For TSS, the guideline value is equal to a maximum increase of 25 mg/L from background levels at any time when background levels are between 25 and 250 mg/L. Or the concentration should not increase more than 10% of background levels when background is greater than 250 mg/L.

The CCME Guidelines for Canadian Recreational Water Quality (revised 2004) were used as referenced guidelines. The guidelines indicate that the clarity of the water should be sufficiently clear that a Secchi disk is visible at a minimum of 1.2 metres. For Turbidity a limit of 50 Nephelometric Turbidity Units (NTU) is suggested.

4. RESULTS OF THE INVESTIGATION

4.1. FIELD MEASUREMENTS

Field Parameters were measured at all nine (9) specified sampling locations during the May 2010 monitoring event. Field measurements of dissolved oxygen, pH, conductivity and temperature are presented in Table 1. A dissolved oxygen reading of 4.91 mg/L was recorded at sample location HWY102-1, which is outside the CCME guideline range of 5.5 - 9.5 mg/L. All other dissolved oxygen readings for the remaining eight sample locations were within the applied CCME guideline range.

4.2. LABORATORY ANALYTICAL RESULTS

4.2.1. GENERAL CHEMISTRY

The analytical results reported pH levels outside the CCME guideline range in sample HWY102-1 (pH = 5.48). The pH level at HWY102-1 was also outside the CCME guideline range during the June, August and October 2009 sampling rounds.

Turbidity concentrations at all sample locations were reported to be within the referenced CCME Recreational Water Quality guideline of 50 NTU.

Analytical results reported TSS concentrations ranging from less than 2 mg/L in KL4 and HWY102-1 to 36 mg/L in sample HWY102-2. Background concentrations for TSS were not obtained prior to the 2009 monitoring event, based on the analytical results it is unlikely that the TSS concentrations will be a source of concern.

General Chemistry results have been provided in Table 1. Laboratory certificates have been provided in Attachment 3.

4.2.2. METALS

Analytical results reported Total Aluminum concentrations of above the CCME Freshwater Aquatic Life Guideline of 5-100 µg/L at KL1, KL2, KL3, KL4, HWY102-1, HWY102-2, LSD, PML1 and PML2 (Total Aluminum: 289 µg/L, 175 µg/L, 124 µg/L, 125 µg/L, 169 µg/L, 189 µg/L, 349 µg/L, 665 µg/L, and 1030 µg/L, respectively). The analytical results reported Total Cadmium concentrations of above the CCME Freshwater Aquatic Life Guideline of 0.017 µg/L at KL1, KL2, KL3, KL4, HWY102-1, HWY102-2, LSD, PML1 and PML2 (Total Cadmium: 0.053 µg/L, 0.018 µg/L, 0.030 µg/L, 0.031 µg/L, 0.043 µg/L, 0.051 µg/L, 0.018 µg/L, 0.032 µg/L, and 0.037 µg/L, respectively). Total Copper and Total Lead concentrations were reported above the CCME FWAL guidelines at KL1 (5.8 µg/L and 10.3 µg/L, respectively). Total Iron concentrations were also reported above the CCME FWAL guideline at KL1, HWY102-2, LSD, PML1 and PML2 (313 µg/L, 1380 µg/L, 554 µg/L, 837 µg/L, and 1090 µg/L, respectively). All other metals parameters were reported to be within the applied guidelines.

Surface water metals results have been provided in Table 1. Laboratory certificates have been provided in Attachment 3.

4.2.3. MICROBIOLOGICAL

The laboratory analytical results reported E. Coli concentrations in exceedance of the applicable guideline of 200 CFU/100 ml for sample KL2. Total Coliforms concentrations exceeded the applicable guideline of 200 CFU/100 ml at KL1, KL2, HWY102-1, HWY102-2, LSD, PML1 and PML2 (all results >250 CFU/100 ml). All other E. Coli and Total Coliform laboratory analytical results were reported to be within the applied guidelines.

Surface water microbiological results have been provided in Table 1. Laboratory certificates have been provided in Attachment 3.

5. CONCLUSIONS

Water quality monitoring within the Bedford West Sub-Areas 3 & 4 was conducted on May 31, 2010 and included the collection of field parameters (pH, temperature, dissolved oxygen and specific conductivity) and the collection and analysis of RCAp, Total Phosphorous, Total Suspended Solids and Total Coliform and Chlorophyll-a.

A dissolved oxygen reading of 4.91 mg/L was recorded at sample location HWY102-1, which is outside the CCME guideline range of 6.0-9.5.

The analytical results reported pH levels outside the CCME guideline range in sample HWY102-1 (pH = 5.48). The pH level at HWY102-1 was also outside the CCME guideline range during the June, August and October 2009 sampling rounds.

Turbidity concentrations at all sample locations were reported to be within the referenced CCME Recreational Water Quality guideline of 50 NTU.

Two to five metals parameters exceeded CCME Freshwater Aquatic Life Guidelines at each of the nine sample locations.

The laboratory analytical results reported E. Coli concentrations in exceedance of the applicable guideline of 200 CFU/100 ml for sample KL2. Total Coliforms concentrations exceeded the applicable guideline of 200 CFU/100 ml at KL1, KL2, HWY102-1, HWY102-2, LSD, PML1 and PML2 (all results >250 CFU/100 ml).

If you have any questions or require anything further, please contact the undersigned at (902) 492-4544.

Yours truly,

SNC ♦ LAVALIN ENVIRONMENT

Derek Heath, P.Geo.
Project Manager

DH/ap

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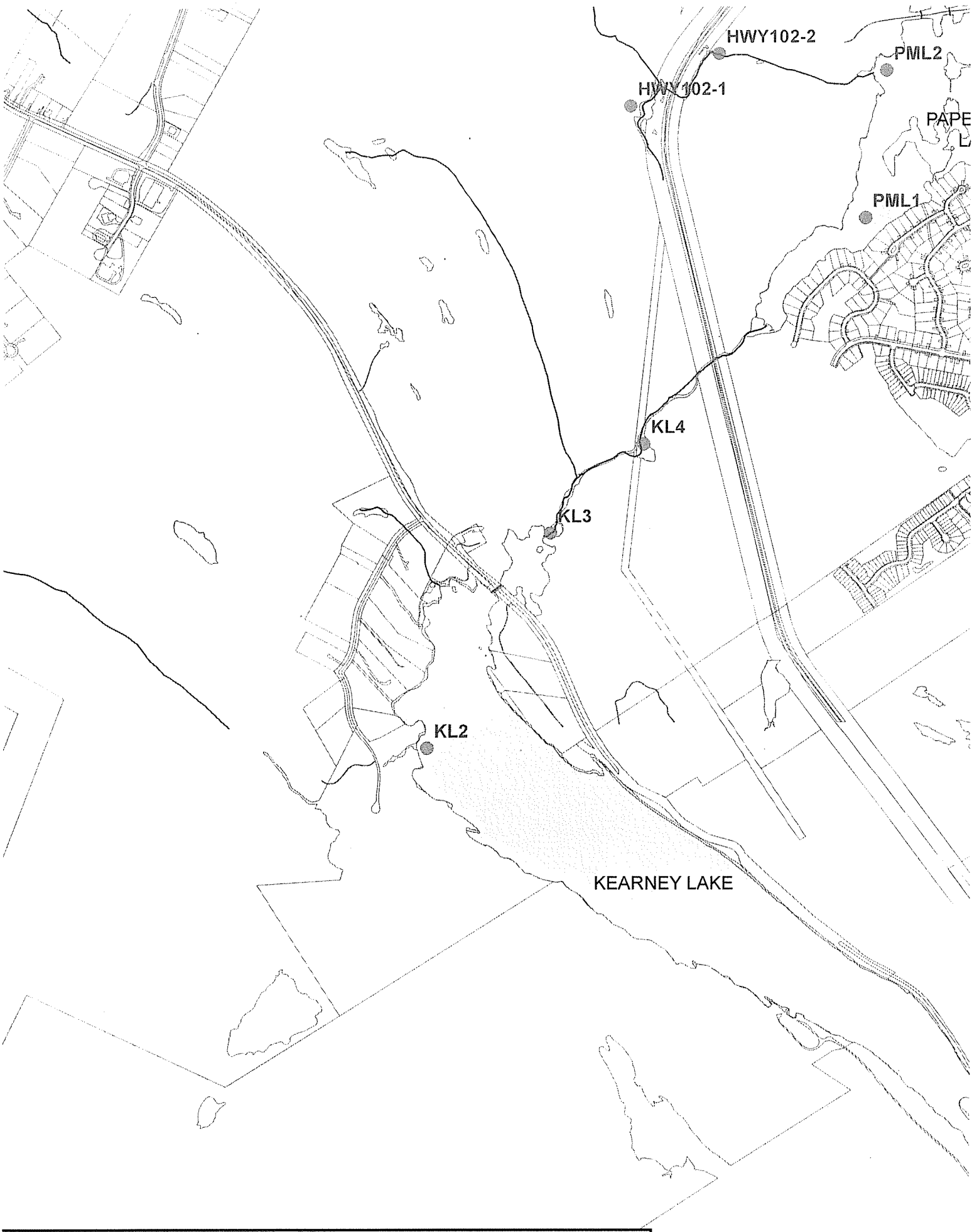

nd

		KL1				KL2				KL3					KL4				
		2009-06-29	2009-08-13	2009-10-01	2010-05-31	2009-06-29	2009-08-13	2009-10-01	2010-05-31	2009-06-29	2009-08-13	2009-10-01	2010-05-31		2009-06-29	2009-08-13	2009-10-01	2010-05-31	
		08:00	11:45	08:30	11:00	11:00	10:30	10:45	10:15	09:00	11:00	09:30	11:30		10:00	11:30	10:00	11:20	
1.2	--	4.1	4.2	5.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		N/A	N/A	N/A	N/A	--
--	--	13.99	22.20	16.70	12.90	16.82	18.20	15.40	13.50	13.95	21.60	17.30	14.70		13.35	21.90	17.30	14.5	--
--	5.5-9.5		8.20	7.00	9.13		8.50	5.70	6.28		8.00	8.00	9.26			8.10	8.30	9.01	--
--	--	6.20	6.76	6.67	7.23	6.33	6.35	6.19	6.61	7.27	6.74	6.97	7.27		8.00	6.71	6.94	7.19	--
--	--	0.263	299	261	248	0.046	106	89	199	0.095	282	246	220		0.771	262	247	224	--
--	--	18	18	16	26	99	74	110	61	22	20	20	28		22.0	18	20	27	--
--	--	310	290	250	240	76	100	74	90	250	250	240	220		260	250	230	220	220
--	--	81	74	64	62	17	23	16	21	66	63	60	55		67	65	60	56	--
--	--	14	13	12	11	<2	<2	<2	3	11	12	12	10		11	12	11	10	--
--	13000	0.18	--	--	0.21	0.06	--	--	0.10	0.14	--	--	0.24		0.2	--	--	0.23	--
--	60	<0.01	--	--	<0.01	<0.01	--	--	<0.01	<0.01	--	--	<0.01		<0.01	--	--	<0.01	--
--	--	0.18	0.09	0.12	0.21	0.06	0.11	<0.05	0.10	0.14	0.12	0.14	0.24		0.15	0.12	0.14	0.23	--
--	19	<0.05	<0.05	<0.05	<0.05	<0.05	0.06	<0.05	<0.05	<0.05	0.06	<0.05	<0.05		<0.05	<0.05	<0.05	<0.05	--
--	--	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		<0.01	<0.01	<0.01	<0.01	--
0-9.0	6.5-9	6.94	6.65	6.68	6.91		6.58	6.61	6.59		6.67	6.82	6.82		6.6	6.75	6.83	6.83	6.83
--	--	2.6	2.2	2.3	2.9	3.3	4.5	4.4	2.0	2.7	2.6	2.6	3.2		2.7	2.6	2.6	3.1	--
--	--	6	8	8	7	<5	8	<5	5	<5	7	7	6		5	7	7	6	--
--	--	9.2	8.5	7.2	7.72	2.8	4.2	2.9	3.44	6.7	7.1	6.8	6.81	6.95	7	7.7	7	6.81	--
--	--	1.5	1.4	1.2	1.42	0.7	1.1	0.7	0.921	1.2	1.2	1.11	1.22	1.24	1	1.3	1.2	1.22	--
--	--	2.4	2.9	4.7	3.3	8.2	7.2	9.9	4.8	2.6	3.9	4.3	3.6		3	2.6	4	3.3	--
--	--	<0.02	<0.02	<0.002	0.009	<0.02	0.04	0.034	0.009	<0.02	<0.02	0.005	0.005		<0.02	<0.02	<0.002	0.004	--
--	--	1.1	0.9	1.3	0.876	0.6	0.8	0.7	0.716	0.9	1.1	0.9	0.791	0.8	1	1	1	0.807	--
--	--	51	46	37	31.8	11	15	9.9	10.7	38	38	35	28.3	28.6	39	41	37	28.5	--
--	--	1	1	<1	4	<2	2	5	6	<1	1	1	2		<1	1	<1	<2	--
50	--	0.7	0.8	1	1.3	0.3	7.6	1	17	0.7	1.4	0.6	0.3		0.5	1	0.3	0.3	--
--	--	2.72	2.52	2.23	2.12	0.49	0.820	0.450	0.770	2.11	2.17	2.08	1.90		2.2	2.22	2.09	1.91	--
--	--	6	8	8	7	<1	8	<1	5	<1	7	7	6		5.0	7	7	6	--
--	--	166	151	131	123	36	55	35	46	128	130	123	110		132.0	135	125	111	--
--	--	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1		<1	<1	<1	<1	--
--	--	2.85	2.57	2.12	1.92	0.71	0.990	0.670	0.740	2.12	2.16	1.99	1.69		2.2	2.32	2.07	1.70	--
--	--	29	27	23	25	10	15	10	12	22	23	22	22		22.0	25	22	22	--
--	--	2.33	0.980	2.53	4.95	18.3	9.39	19.6	1.99	0.24	0.230	2.21	5.85		1.6	2.20	0.480	5.82	--
--	--	-2.68	-2.87	-2.94	-2.72	NC	-3.20	NC	-3.44	NC	-3.00	-2.89	-2.92		-3.21	-2.89	-2.84	-2.92	--
--	--	-2.93	-3.12	-3.19	-2.97	NC	-3.45	NC	-3.70	NC	-3.25	-3.14	-3.17		-3.46	-3.14	-3.09	-3.17	--
--	--	9.62	9.52	9.62	9.63	NC	9.78	NC	10.0	NC	9.67	9.71	9.74		9.82	9.64	9.67	9.75	--
--	--	9.87	9.77	9.87	9.88	NC	10.0	NC	10.3	NC	9.92	9.96	9.99		10.10	9.89	9.92	10.0	--
--	5-100		--	--	**289**		--	--	**175**		--	--	**124**	**125**		--	--	**125**	--
--	--	<2	--	--	<1.0	<2	--	--	<1.0	<2	--	--	<1.0	<1.0	<2	--	--	<1.0	--
--	5	<2	--	--	<1.0	<2	--	--	<1.0	<2	--	--	<1.0	<1.0	<2	--	--	<1.0	--
--	--	16	--	--	18.5	9	--	--	11.7	16	--	--	15.7	15.9	16	--	--	16.6	--
--	--	<2	--	--	<1.0	<2	--	--	<1.0	<2	--	--	<1.0	<1.0	<2	--	--	<1.0	--
--	--	<2	--	--	<2.0	<2	--	--	<2.0	<2	--	--	<2.0	<2.0	<2	--	--	<2.0	--
--	--	8	--	--	11.4	8	--	--	14.7	6	--	--	7.8	8.4	6	--	--	8.6	--
--	0.017	<0.3	--	--	**0.053**	<0.3	--	--	**0.018**	<0.3	--	--	**0.030**	**0.035**	<0.3	--	--	**0.031**	--
--	1	<2	--	--	<1.0	<2	--	--	<1.0	<2	--	--	<1.0	<1.0	<2	--	--	<1.0	--
--	--	1	--	--	0.54	<1	--	--	<0.40	<1	--	--	<0.40	<0.40	<1	--	--	<0.40	--
--	2.0-4.0	<2	--	--	**5.8**	<2	--	--	<2.0	<2	--	--	<2.0	<2.0	<2	--	--	<2.0	--
--	300	130	--	--	**313**	250	--	--	227	94	--	--	73	75	86	--	--	82	--
--	1.0-7.0	<0.5	--	--	**10.3**	<0.5	--	--	1.01	<0.5	--	--	0.60	0.56	<0.5	--	--	3.23	--
--	--	100	--	--	79.2	26	--	--	43.2	57	--	--	36.8	37.9	51	--	--	34.5	--
--	73	<2	--	--	<2.0	<2	--	--	<2.0	<2	--	--	<2.0	<2.0	<2	--	--	<2.0	--
--	25-150	5	--	--	3.2	<2	--	--	<2.0	3	--	--	2.0	2.1	3	--	--	2.0	--
--	1	<2	--	--	<1.0	<2	--	--	<1.0	<2	--	--	<1.0	<1.0	<2	--	--	<1.0	--
--	0.1	<0.5	--	--	<0.10	<0.5	--	--	0.42	<0.5	--	--	<0.10	<0.10	<0.5	--	--	<0.10	--
--	--	46	--	--	39.1	14	--	--	17.8	34	--	--	33.5	34.1	34	--	--	33.1	--
--	0.8	<0.1	--	--	<0.10	<0.1	--	--	<0.10	<0.1	--	--	<0.10	<0.10	<0.1	--	--	<0.10	--
--	--	<2	--	--	<2.0	<2	--	--	<2.0	<2	--	--	<2.0	<2.0	<2	--	--	<2.0	--
--	--	11	--	--	6.4	2	--	--	<2.0	6	--	--	<2.0	<2.0	<2	--	--	<2.0	--
--	--	0.1	--	--	0.11	<0.1	--	--	<0.10	<0.1	--	--	<0.10	<0.10	<0.1	--	--	<0.10	--
--	--	<2	--	--	<2.0	<2	--	--	<2.0	<2	--	--	<2.0	<2.0	<2	--	--	<2.0	--
--	30	27	--	--	14.4	8	--	--	5.4	14	--	--	9.7	12.0	14	--	--	10.4	--
--	200	39	24	--	9		100	--	**>250**	1	17	--	2	--	4	33	--	1	--
--	200	200	65	--	**>250**		170	--	**>250**	120	24	--	190	--	28	58	--	100	--
--	200	--	--	<1	--	--	--	1	--	--	--	1	--	--	--	--	<1	--	--
--	--	0.53	0.79	1.11	1.73	0.82	6.05	1.97	0.73	1.04	1.11	1.18	--	1.30	0.78	1.11	1.06	--	0.92
--	--	0.48	0.69	1.17	1.61	0.87	5.97	1.95	0.66	0.94	0.97	1.21	--	1.09	0.69	0.96	1.11	--	0.77

Tested.
linisters of the Environment Freshwater Aquatic Life Guideline for the protection of the environment and
ntration exceeds CCME FWAL Guideline - Present Result.
ntration exceeds CCME FWAL Guideline - Previous Result.

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Guideline reational Quality erence)	CCME Guideline FWAL (Applied)	Highway 102									Lake Shore Drive				Paper Mill Lake					
		HWY102-1				HWY102-2					LSD				PML1					
		2009-06-29	2009-08-13	2009-10-01	2010-05-31	2009-06-29	2009-08-13	2009-10-01	2010-05-31		2009-06-29	2009-08-13	2009-10-01	2010-05-31	2009-06-29	2009-08-13	2009-10-01	2010-05-31	2009-06-29	2009-08-13
		07:00	12:45	08:00	13:00	12:30	12:15	12:30	12:40		12:00	09:30	11:45	09:00	13:45	13:00	13:00	13:35	13:15	13:40
1.2	--	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	--	N/A	N/A	N/A	N/A	3.2	N/A	N/A	N/A	2.8	2.2
--	--	11.82	18.80	15.70	14.90	16.66	19.20	16.40	17.20	--	13.11	16.70	15.30	13.40	15.71	17.10	16.20	13.20	14.75	24.20
--	5.5-9.5		5.80		8.18		5.90		**4.91**	--		5.70	5.50	8.60		8.10	6.90	8.76		8.30
--	--	7.98	5.35	5.25	6.31	6.57	5.71	5.40	6.33	--	7.88	6.74	6.34	6.42	7.39	6.57	6.64	7.06	6.36	6.82
--	--	0.194	153	104	135	0.037	457	162	415	--	0.723	210	168	218	0.561	279	223	265	0.267	264
--	--	67.0	68	57	37	120.0	190	91	96	--	32.0	27	37	20	54.0	15	21	19	22.0	17
--	--	100	140	92	130	85	290	310	590	--	170	150	140	200	170	250	230	260	240	250
--	--	24	38	24	32	21	82	83	170	--	41	34	31	49	39	64	58	67	63	63
--	--	5	3	3	8	<2	3	8	11	--	6	4	5	7	13	11	11	13	11	11
--	13000	<0.05	--	--	0.69	<0.05	--	--	0.10	--	0.1	--	--	0.23	0.5	--	--	0.42	0.1	--
--	60	<0.01	--	--	<0.01	<0.01	--	--	<0.01	--	<0.01	--	--	<0.01	<0.01	--	--	<0.01	<0.01	--
--	--	<0.05	<0.05	<0.05	0.69	<0.05	<0.05	<0.05	0.10	--	0.14	0.14	0.06	0.23	0.49	0.1	0.17	0.42	0.14	0.07
--	19	<0.05	0.29	<0.05	<0.05	<0.05	0.06	<0.05	<0.05	--	<0.05	0.06	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
--	--	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	--	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
)-9.0	6.5-9				**5.48**				6.05	--	6.7	6.69	6.93	7.1		6.75	6.79	6.63	6.5	6.81
--	--	2.5	2.2	2	1.1	2.2	4.4	4	3.0	--	3.1	4.2	4	3.2	4.5	2.6	2.8	3.8	2.6	2.5
--	--	<5	<5	<5	<5	<5	<5	7	6	--	13	16	12	13	6	7	7	7	5	7
--	--	2	1.8	1.6	4.93	2	4	4.8	7.44	--	7	6.9	5.4	7.99	5	6.9	6.4	8.37	6	7.1
--	--	0	0.5	0.5	1.08	0	0.7	0.9	0.963	--	1	1.6	1.3	1.99	1	1.1	1	1.25	1	1.1
--	--	7	10	7.7	4.7	9	13	13	7.2	--	5	3.8	6.8	3.7	7	3.6	4.7	0.7	4	2.6
--	--	0	0.14	0.02	0.006	<0.02	0.04	0.034	0.010	0.010	<0.02	0.03	0.009	0.018	<0.02	<0.02	0.002	0.018	<0.02	<0.02
--	--	1	1.2	0.7	1.14	1	0.8	1.1	0.984	--	1	1.1	1.3	1.18	1	0.9	0.9	1.16	1	1
--	--	15	25	13	15.9	15	51	55	83.7	--	24	21	18	24.8	25	38	34	35.2	35	40
--	--	7	80	2	<2	<2	58	62	34	36	16	98	5	6	<2	3	9	7	2	3
50	--	14.0	35	0.9	1.4	0.7	3.8	4.2	2.6	--	0.6	12	2.5	12	0.4	0.5	0.6	8.2	0.8	0.7
--	--	0.8	1.12	0.730	1.11	0.6	2.37	2.62	5.13	--	1.6	0.820	1.22	1.80	1.5	2.18	1.99	2.3	2.1	2.17
--	--	<1	<1	<1	<1	<1	<1	7	6	--	13.0	8	12	13.0	6.0	7	7	7.0	5.0	7
--	--	50.0	73	45	67	42.0	150	165	282	--	92.0	55	74	104	93.0	129	118	137.0	123.0	131
--	--	<1	<1	<1	<1	<1	<1	<1	<1	--	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
--	--	0.8	1.32	0.740	1.06	0.8	2.65	2.89	4.17	--	1.5	0.990	1.20	1.7	1.4	2.11	1.89	2.1	1.9	2.23
--	--	6.0	6	6	17	6.0	13	16	23	--	22.0	15	19	28	14.0	22	20	26.0	20.0	22
--	--	4.4	8.20	0.680	2.30	14.9	5.58	4.90	10.3	--	1.0	9.39	0.830	3.15	3.8	1.63	2.58	5.2	4.2	1.36
--	--	NC	NC	NC	NC	NC	NC	-3.57	-3.72	--	-2.74	-3.20	-2.60	-2.22	-3.57	-2.90	-2.94	-2.96	-3.33	-2.83
--	--	NC	NC	NC	NC	NC	NC	-3.82	-3.97	--	-2.99	-3.45	-2.85	-2.47	-3.82	-3.15	-3.19	-3.21	-3.59	-3.08
--	--	NC	NC	NC	NC	NC	NC	9.87	9.77	--	9.43	9.78	9.53	9.32	9.93	9.65	9.73	9.59	9.83	9.64
--	--	NC	NC	NC	NC	NC	NC	10.1	10.0	--	9.68	10.0	9.78	9.57	10.20	9.90	9.98	9.84	10.10	9.89
--	5-100		--	--	**169**		--	--	**189**		99	--	--	**349**		--	--	**665**		--
--	--	<2	--	--	<1.0	<2	--	--	<1.0		<2	--	--	<1.0	<2	--	--	<1.0	<2	--
--	5	<2	--	--	<1.0	<2	--	--	<1.0		<2	--	--	<1.0	<2	--	--	<1.0	<2	--
--	--	22	--	--	52.9	20	--	--	53.1		14	--	--	15.3	23	--	--	35.3	16	--
--	--	<2	--	--	<1.0	<2	--	--	<1.0		<2	--	--	<1.0	<2	--	--	<1.0	<2	--
--	--	<2	--	--	<2.0	<2	--	--	<2.0		<2	--	--	<2.0	<2	--	--	<2.0	<2	--
--	--	<5	--	--	11.4	<5	--	--	7.9		13	--	--	41.4	8	--	--	11.3	5	--
--	0.017	<0.3	--	--	**0.043**	<0.3	--	--	**0.051**		<0.3	--	--	**0.018**	<0.3	--	--	**0.032**	<0.3	--
--	1	<2	--	--	<1.0	<2	--	--	<1.0		<2	--	--	<1.0	<2	--	--	<1.0	<2	--
--	--	<1	--	--	0.50	<1	--	--	0.66		<1	--	--	<0.40	<1	--	--	0.96	<1	--
--	2.0-4.0	2	--	--	3.4	2	--	--	2.0		<2	--	--	<2.0	<2	--	--	2.0	<2	--
--	300		--	--	146		--	--	**1380**		180	--	--	**554**	140	--	--	**837**	100	--
--	1.0-7.0		--	--	2.37		--	--	1.61		<0.5	--	--	3.02	<0.5	--	--	1.73	<0.5	--
--	--	40	--	--	55.3	110	--	--	387		51	--	--	113	17	--	--	142	58	--
--	73	<2	--	--	<2.0	<2	--	--	<2.0		<2	--	--	<2.0	<2	--	--	<2.0	<2	--
--	25-150	<2	--	--	<2.0	<2	--	--	<2.0		<2	--	--	<2.0	<2	--	--	<2.0	2	--
--	1	<2	--	--	<1.0	<2	--	--	<1.0		<2	--	--	<1.0	<2	--	--	<1.0	<2	--
--	0.1	<0.5	--	--	<0.10	<0.5	--	--	<0.10		<0.5	--	--	<0.10	<0.5	--	--	<0.10	<0.5	--
--	--	11	--	--	29.1	11	--	--	37.4		30	--	--	36.3	18	--	--	36.3	30	--
--	0.8	<0.1	--	--	<0.10	<0.1	--	--	<0.10		<0.1	--	--	<0.10	<0.1	--	--	<0.10	<0.1	--
--	--	<2	--	--	<2.0	<2	--	--	<2.0		<2	--	--	<2.0	<2	--	--	<2.0	<2	--
--	--	6	--	--	<2.0	4	--	--	<2.0		<2	--	--	7.2	<2	--	--	7.8	<2	--
--	--	<0.1	--	--	<0.10	<0.1	--	--	<0.10		<0.1	--	--	<0.10	<0.1	--	--	<0.10	<0.1	--
--	--	<2	--	--	<2.0	<2	--	--	<2.0		<2	--	--	<2.0	<2	--	--	<2.0	<2	--
--	30	21	--	--	16.4	12	--	--	13.6		7	--	--	7.2	8	--	--	10.0	12	--
--	200	54		--	12	4		--	9	--	22	24	--	4	33	45	--	19	10	31
--	200	84		--	**>250**	28		--	**>250**	--	53		--	**>250**	200	73	--	**>250**	49	40
--	200	--	--	<1	--	--	--	1	--	--	--	--	<1	--	--	--	<1	--	--	--
--	--	15.40	19.29	0.70	18.12	0.90	82.63	48.17	0.85	--	1.46	10.70	4.68	1.21	0.62	2.31	0.57	0.82	1.15	1.36
--	--	17.50	19.60	0.84	17.62	0.91	81.20	52.50	0.85	--	1.85	11.10	5.62	1.32	0.64	2.21	0.64	0.74	1.22	1.33

ATTACHMENT 1

Field Reports

SLE FIELD REPORT

Project:	Water Quality Monitoring-Bedford West Sub-Areas 3 & 4	
Client:	Halifax Regional Municipality	
Site: Lakeshore Drive	**Location:** Kingswood Subdivision	**Site ID:** LSD
Monitoring Well ☐Pumping Well ☒ Surface Water ☐Spring/Seep ☐Discharge Pipe ☐Other:		
SLEI Personnel On-Site:	Allain Thebeau & Meghann Kerr	

Site Conditions

Weather:	Sunny with clouds, windy, 11°C
Site Accessibility: Accessible	Off Lakeshore Drive

Field Parameter Data

	Remarks
Date (d.m.y)	31.05.10
Sample Depth (m)	1.0 m
pH	6.42
Dissolved Oxygen	8.6 mg/L
Secchi Depth (m)	N/A (too windy)
Temperature (degrees Celcius)	13.4°C
Conductivity (µs/cm)	217.8
Photo Taken?	Yes

Additional Comments / Notes

Report Completed by: Meghann Kerr	Date: June 02, 2010

SLE FIELD REPORT

Project:	Water Quality Monitoring-Bedford West Sub-Areas 3 & 4	
Client:	Halifax Regional Municipality	
Site: Kearney Lake	**Location:** Kearney Lake Road	**Site ID:** KL1
Monitoring Well ☐Pumping Well ☒ Surface Water ☐Spring/Seep ☐Discharge Pipe ☐Other:		
SLEI Personnel On-Site:	Allain Thebeau & Meghann Kerr	

Site Conditions

Weather:	Sunny with clouds, windy, 11°C
Site Accessibility: Accessible	Off Kearney Lake Road

Field Parameter Data

	Remarks
Date (d.m.y)	31.05.10
Sample Depth (m)	1.0 m
pH	7.23
Dissolved Oxygen	9.13 mg/L
Secchi Depth (m)	N/A (too windy)
Temperature (degrees Celcius)	12.9°C
Conductivity (µs/cm)	248
Photo Taken?	Yes

Additional Comments / Notes

Report Completed by: Meghann Kerr	Date: June 02, 2010

SLE FIELD REPORT

Project:	Water Quality Monitoring-Bedford West Sub-Areas 3 & 4	
Client:	Halifax Regional Municipality	
Site: Kearney Lake	**Location:** Collins Road	**Site ID:** KL2
Monitoring Well ☐Pumping Well ☒ Surface Water ☐Spring/Seep ☐Discharge Pipe ☐Other:		
SLEI Personnel On-Site:	Allain Thebeau and Meghann Kerr	

Site Conditions

Weather:	Sunny with clouds, windy, 11°C
Site Accessibility: Accessible	Off Collins Road, through wooded area

Field Parameter Data

	Remarks
Date (d.m.y)	31.05.10
Sample Depth (m)	1.0 m
pH	6.61
Dissolved Oxygen	6.28 mg/L
Secchi Depth (m)	N/A (too windy)
Temperature (degrees Celcius)	13.5°C
Conductivity (µs/cm)	198.5
Photo Taken?	Yes

Additional Comments / Notes

Report Completed by: Meghann Kerr	Date: June 02, 2010

SLE FIELD REPORT

Project:	Water Quality Monitoring-Bedford West Sub-Areas 3 & 4	
Client:	Halifax Regional Municipality	
Site: Kearney Lake Run	**Location:** Kearney Lake Road	**Site ID:** KL3
Monitoring Well ☐Pumping Well ☒ Surface Water ☐Spring/Seep ☐Discharge Pipe ☐Other:		
SLEI Personnel On-Site:	Allain Thebeau and Meghann Kerr	

Site Conditions

Weather:	Sunny, breezy, 14°C
Site Accessibility: Accessible	Off Kearney Lake Road, through woods just past dam

Field Parameter Data

	Remarks
Date (d.m.y)	31.05.10
Sample Depth (m)	1.0 m
pH	7.27
Dissolved Oxygen	9.26 mg/L
Secchi Depth (m)	N/A (too windy)
Temperature (degrees Celcius)	14.7°C
Conductivity (µs/cm)	220
Photo Take?	Yes

Additional Comments / Notes

Report Completed by: Meghann Kerr	Date: June 02, 2010

SLE FIELD REPORT

Project:	Water Quality Monitoring-Bedford West Sub-Areas 3 & 4	
Client:	Halifax Regional Municipality	
Site: Kearney Lake Run	**Location:** Kearney Lake Road	**Site ID:** KL4
Monitoring Well ☐Pumping Well ☒ Surface Water ☐Spring/Seep ☐Discharge Pipe ☐Other:		
SLEI Personnel On-Site:	Allain Thebeau and Meghann Kerr	

Site Conditions

Weather:	Sunny, breezy, 14°C
Site Accessibility: Accessible	Off Kearney Lake Road, through woods along walking path, beyond dam

Field Parameter Data

	Remarks
Date (d.m.y)	31.05.10
Sample Depth (m)	1.0 m
pH	7.19
Dissolved Oxygen	9.01 mg/L
Secchi Depth (m)	N/A (too windy)
Temperature (degrees Celcius)	14.5°C
Conductivity (µs/cm)	224
Photo Taken?	Yes

Additional Comments / Notes

Report Completed by: Meghann Kerr	Date: June 02, 2010

SLE FIELD REPORT

Project:	Water Quality Monitoring-Bedford West Sub-Areas 3 & 4	
Client:	Halifax Regional Municipality	
Site: Highway 201	**Location:** Highway 102, south of Exit 3	**Site ID:** HWY102-1
Monitoring Well ☐Pumping Well ☒ Surface Water ☐Spring/Seep ☐Discharge Pipe ☐Other:		
SLEI Personnel On-Site:	Allain Thebeau and Meghann Kerr	

Site Conditions

Weather:	Sunny with clouds, windy, 15°C
Site Accessibility: Accessible	Off Highway 102, southbound

Field Parameter Data

	Remarks
Date (d.m.y)	31.05.10
Sample Depth (m)	1.0 m
pH	6.31
Dissolved Oxygen	8.18 mg/L
Secchi Depth (m)	N/A (too windy)
Temperature (degrees Celcius)	14.9°C
Conductivity (µs/cm)	135
Photo Taken?	Yes

Additional Comments / Notes

Report Completed by: Meghann Kerr	Date: June 02, 2010

SLE FIELD REPORT

Project:	Water Quality Monitoring-Bedford West Sub-Areas 3 & 4	
Client:	Halifax Regional Municipality	
Site: Highway 102	**Location:** Highway 102, south of Exit 3	**Site ID:** HWY102-2
Monitoring Well ☐Pumping Well ☒ Surface Water ☐Spring/Seep ☐Discharge Pipe ☐Other:		
SLEI Personnel On-Site:	Allain Thebeau and Meghann Kerr	

Site Conditions

Weather:	Sunny with clouds, windy, 15°C
Site Accessibility: Accessible	Off Highway 102, Northbound

Field Parameter Data

	Remarks
Date (d.m.y)	31.05.10
Sample Depth (m)	1.0 m
pH	6.33
Dissolved Oxygen	4.91 mg/L
Secchi Depth (m)	N/A (too windy)
Temperature (degrees Celcius)	17.2°C
Conductivity (µs/cm)	415
Photo Taken?	Yes

Additional Comments / Notes

Report Completed by: Meghann Kerr	Date: June 02, 2010

SLE FIELD REPORT

Project:	Water Quality Monitoring-Bedford West Sub-Areas 3 & 4	
Client:	Halifax Regional Municipality	
Site: Paper Mill Lake	**Location:** Off Lake Dr.	**Site ID:** PML1
Monitoring Well ☐Pumping Well ☒ Surface Water ☐Spring/Seep ☐Discharge Pipe ☐Other:		
SLEI Personnel On-Site:	Allain Thebeau and Meghann Kerr	

Site Conditions

Weather:	Sunny with clouds, windy, 15°C
Site Accessibility: Accessible	Site accessible through wooded area off Lake Dr.

Field Parameter Data

	Remarks
Date (d.m.y)	31.05.10
Sample Depth (m)	1.0 m
pH	7.06
Dissolved Oxygen	8.76 mg/L
Secchi Depth (m)	N/A (too windy)
Temperature (degrees Celcius)	13.2°C
Conductivity (µs/cm)	265
Photo Taken?	Yes

Additional Comments / Notes

Report Completed by: Meghann Kerr	Date: June 02, 2010

SLE FIELD REPORT

Project:	Water Quality Monitoring-Bedford West Sub-Areas 3 & 4	
Client:	Halifax Regional Municipality	
Site: Paper Mill Lake	**Location:** Off Ahmadi Cr.	**Site ID:** PML2
Monitoring Well ☐Pumping Well ☒ Surface Water ☐Spring/Seep ☐Discharge Pipe ☐Other:		
SLEI Personnel On-Site:	Allain Thebeau and Meghann Kerr	

Site Conditions

Weather:	Sunny with clouds, windy, 15°C
Site Accessibility: Accessible	Site accessible from Ahmadi Crescent, off Moirs Mill Road

Field Parameter Data

	Remarks
Date (d.m.y)	31.05.10
Sample Depth (m)	1.0 m
pH	7.09
Dissolved Oxygen	8.78 mg/L
Secchi Depth (m)	N/A (too windy)
Temperature (degrees Celcius)	17.8°C
Conductivity (µs/cm)	237
Photo Taken?	Yes

Additional Comments / Notes

Report Completed by: Meghann Kerr	Date: June 02, 2010

ATTACHMENT 2

Site Photographs

Photo 1: View of sample location HW102-1.

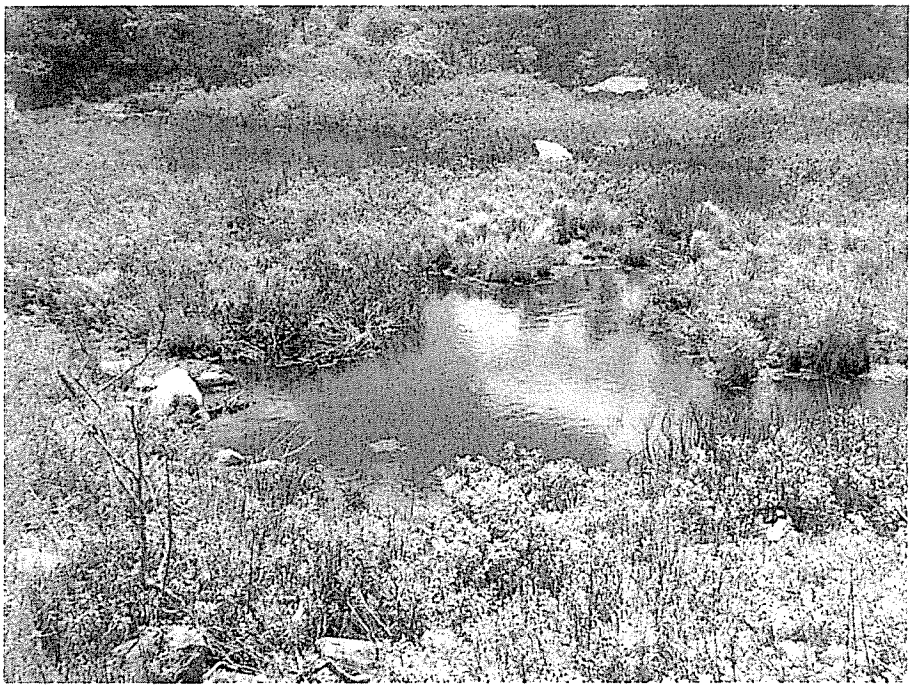

Photo 2: View of sample location HW102-2.

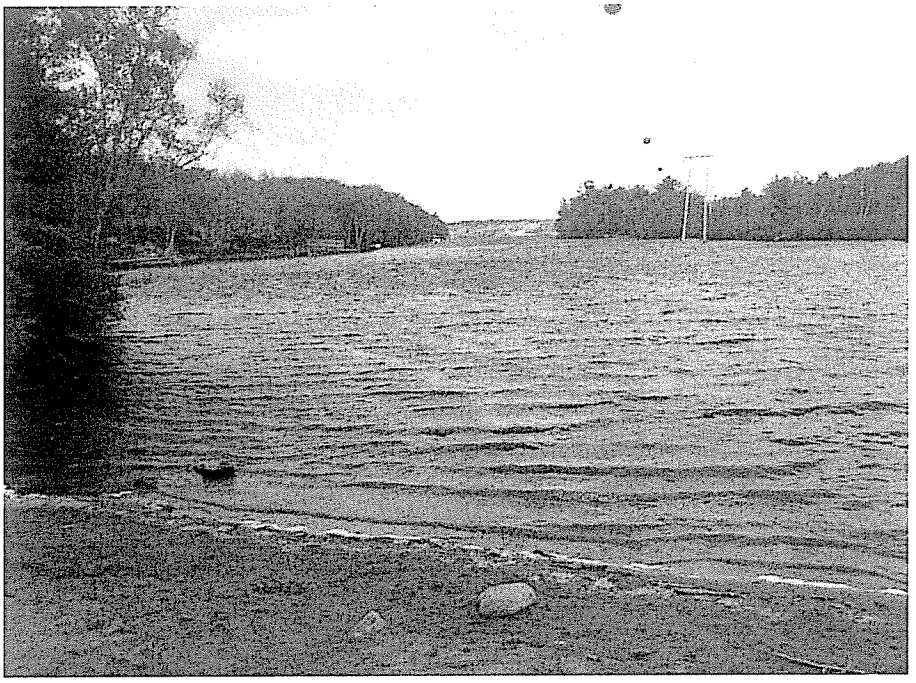

Photo 3: View of sample location KL1.

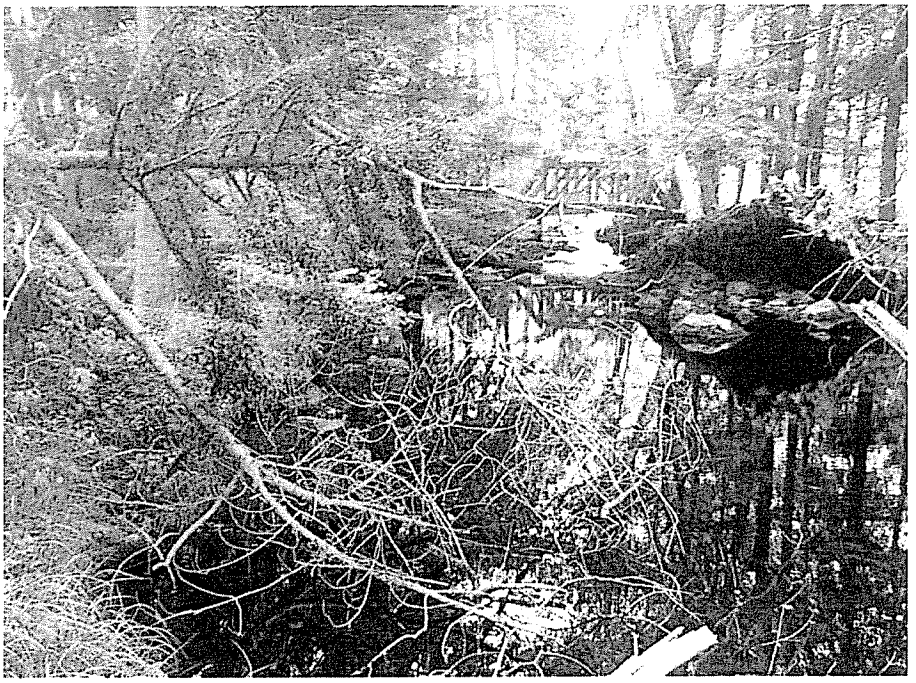

Photo 4: View of sample location KL2.

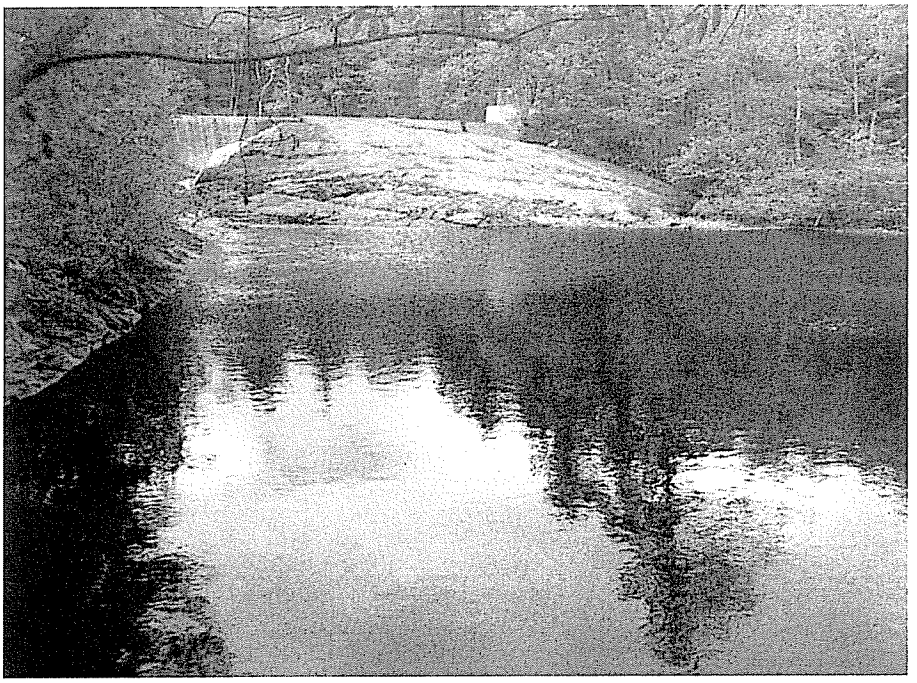

Photo 5: View of sample location KL3.

Photo 6: View of sample location KL4, looking downstream.

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Photo 7: View of sample location LSD, at Black Duck Pond off Lake Shore Drive.

Photo 8: View of sample location PML1 off of French Mast Lane in Bedford.

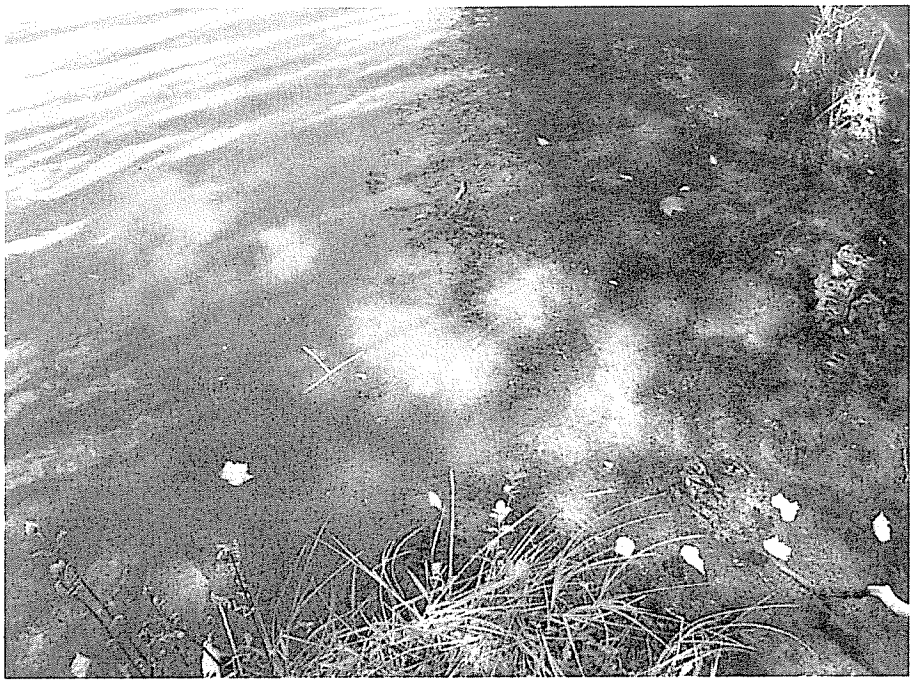

Photo 9: View of sample location PML2.

ATTACHMENT 3

Laboratory Certificates of Analysis

Your Project #: 020331-0002
Site: BEDFORD WEST
Your C.O.C. #: N/A

Attention: Derek Heath
SNC Lavalin Inc, Environment Division
5657 Spring Garden Rd
Suite 200
Halifax, NS
B3J 3R4

Report Date: 2010/06/10

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B068678
Received: 2010/05/31, 14:50

Sample Matrix: Water
Samples Received: 9

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Method Reference
Carbonate, Bicarbonate and Hydroxide	9	N/A	2010/06/03		
Alkalinity	9	N/A	2010/06/07	ATL SOP 00013 R4	Based on EPA310.2
Chloride	6	N/A	2010/06/04	ATL SOP 00014 R6	Based on SM4500-Cl-
Chloride	3	N/A	2010/06/07	ATL SOP 00014 R6	Based on SM4500-Cl-
Total coliform and Ecoli water	9	N/A	2010/05/31	ATL SOP 00096 R3	Based MOE3407, SM21
Colour	6	N/A	2010/06/03	ATL SOP 00020 R3.	Based on SM2120C
Colour	3	N/A	2010/06/08	ATL SOP 00020 R3.	Based on SM2120C
Conductance - water	5	N/A	2010/06/02	ATL SOP 00004 R5/00006 R4	Based on SM2510B
Conductance - water	4	N/A	2010/06/03	ATL SOP 00004 R5/00006 R4	Based on SM2510B
Hardness (calculated as CaCO3)	9	N/A	2010/06/03	ATL SOP 00048	Based on SM2340B
Metals Water Total Collision Cell MS	9	2010/06/01	2010/06/02	ATL SOP 00058 R2	Based on EPA6020A
Ion Balance (% Difference)	6	N/A	2010/06/08		
Ion Balance (% Difference)	3	N/A	2010/06/09		
Anion and Cation Sum	9	N/A	2010/06/08		
Nitrogen Ammonia - water	8	N/A	2010/06/07	ATL SOP 00015 R5	Based on USEPA 350.1
Nitrogen Ammonia - water	1	N/A	2010/06/08	ATL SOP 00015 R5	Based on USEPA 350.1
Nitrogen - Nitrate + Nitrite	6	N/A	2010/06/04	ATL SOP 00016 R4	Based on USGS - Enz
Nitrogen - Nitrate + Nitrite	3	N/A	2010/06/08	ATL SOP 00016 R4	Based on USGS - Enz
Nitrogen - Nitrite	6	N/A	2010/06/04	ATL SOP 00017 R4	Based on USEPA 354.1
Nitrogen - Nitrite	3	N/A	2010/06/08	ATL SOP 00017 R4	Based on USEPA 354.1
Nitrogen - Nitrate (as N)	9	N/A	2010/06/08	ATL SOP 00018 R3	Based on ASTMD3867
pH	5	N/A	2010/06/02	ATL SOP 00003 R5/00005 R7	Based on SM4500H+
pH	4	N/A	2010/06/03	ATL SOP 00003 R5/00005 R7	Based on SM4500H+
Phosphorus - ortho	6	N/A	2010/06/04	ATL SOP 00021 R3	Based on USEPA 365.1
Phosphorus - ortho	3	N/A	2010/06/08	ATL SOP 00021 R3	Based on USEPA 365.1
Sat. pH and Langelier Index (@ 20C)	6	N/A	2010/06/08		
Sat. pH and Langelier Index (@ 20C)	3	N/A	2010/06/09		
Sat. pH and Langelier Index (@ 4C)	6	N/A	2010/06/08		
Sat. pH and Langelier Index (@ 4C)	3	N/A	2010/06/09		
Reactive Silica	6	N/A	2010/06/03	ATL SOP 00022 R3	Based on EPA 366.0
Reactive Silica	3	N/A	2010/06/07	ATL SOP 00022 R3	Based on EPA 366.0
Sulphate	9	N/A	2010/06/07	ATL SOP 00023 R3	Based on EPA 375.4
Chlorophyll A (Sub from Bedford)	9	2010/05/31	2010/06/08		
Total Dissolved Solids (TDS calc)	6	N/A	2010/06/08		

/2

This document is in electronic format, hard copy is available on request.

Your Project #: 020331-0002
Site: BEDFORD WEST
Your C.O.C. #: N/A

Attention: Derek Heath
SNC Lavalin Inc, Environment Division
5657 Spring Garden Rd
Suite 200
Halifax, NS
B3J 3R4

Report Date: 2010/06/10

CERTIFICATE OF ANALYSIS

Sample Matrix: Water
Samples Received: 9

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Method Reference
Total Dissolved Solids (TDS calc)	3	N/A	2010/06/09		
Organic carbon - Total (TOC)	9	N/A	2010/06/08	ATL SOP 00037 R4	Based on SM5310C
Total Phosphorus (Colourimetric) @	9	2010/06/07	2010/06/08	CAM SOP-00407	APHA 4500 P,B,F
Total Suspended Solids	4	N/A	2010/06/01	ATL SOP 00007 R3	based on EPA 160.2
Total Suspended Solids	5	N/A	2010/06/02	ATL SOP 00007 R3	based on EPA 160.2
Turbidity	6	N/A	2010/06/02	ATL SOP 00011 R4	based on EPA 180.1
Turbidity	3	N/A	2010/06/04	ATL SOP 00011 R4	based on EPA 180.1

* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

(1) This test was performed by Dalhousie Department of Oceano
(2) This test was performed by Maxxam Analytics Mississauga

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.

MICHELLE HILL, Project Manager
Email: Michelle.Hill@maxxamanalytics.com
Phone# (902) 420-0203

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Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

Total cover pages: 2

This document is in electronic format, hard copy is available on request.

Maxxam Job #: B068678
Report Date: 2010/06/10

SNC Lavalin Inc, Environment Division
Client Project #: 020331-0002
Project name: BEDFORD WEST

RESULTS OF ANALYSES OF WATER

Maxxam ID		GA6227		GA6238		GA6239		
Sampling Date		2010/05/31 9:00		2010/05/31 11:00		2010/05/31 10:15		
COC Number		N/A		N/A		N/A		
	Units	**LSD-31.05.10**	**RDL**	**KL1-31.05.10**	**RDL**	**KL2-31.05.10**	**RDL**	**QC Batch**
Calculated Parameters								
Anion Sum	me/L	1.80	N/A	2.12	N/A	0.770	N/A	2165100
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	13	1	7	1	5	1	2165097
Calculated TDS	mg/L	104	1	123	1	46	1	2165103
Carb. Alkalinity (calc. as CaCO3)	mg/L	<1	1	<1	1	<1	1	2165097
Cation Sum	me/L	1.69	N/A	1.92	N/A	0.740	N/A	2165100
Hardness (CaCO3)	mg/L	28	1	25	1	12	1	2165098
Ion Balance (% Difference)	%	3.15	N/A	4.95	N/A	1.99	N/A	2165099
Langelier Index (@ 20C)	N/A	-2.22		-2.72		-3.44		2165101
Langelier Index (@ 4C)	N/A	-2.47		-2.97		-3.70		2165102
Nitrate (N)	mg/L	0.23	0.05	0.21	0.05	0.10	0.05	2164972
Saturation pH (@ 20C)	N/A	9.32		9.63		10.0		2165101
Saturation pH (@ 4C)	N/A	9.57		9.88		10.3		2165102
Inorganics								
Total Alkalinity (Total as CaCO3)	mg/L	13	5	7	5	5	5	2169358
Dissolved Chloride (Cl)	mg/L	49	1	62	1	21	1	2169270
Colour	TCU	20	5	26	5	61	30	2169364
Nitrate + Nitrite	mg/L	0.23	0.05	0.21	0.05	0.10	0.05	2169369
Nitrite (N)	mg/L	<0.01	0.01	<0.01	0.01	<0.01	0.01	2169245
Nitrogen (Ammonia Nitrogen)	mg/L	<0.05	0.05	<0.05	0.05	<0.05	0.05	2171726
Total Organic Carbon (C)	mg/L	3.7	0.5	3.3	0.5	4.8	0.5	2173063
Orthophosphate (P)	mg/L	<0.01	0.01	<0.01	0.01	<0.01	0.01	2169311
pH	pH	7.10	N/A	6.91	N/A	6.59	N/A	2168601
Total Phosphorus	mg/L	0.018	0.002	0.009	0.002	0.009	0.002	2171573
Reactive Silica (SiO2)	mg/L	3.2	0.5	2.9	0.5	2.0	0.5	2169278
Total Suspended Solids	mg/L	6	2	4	1	6	2	2167435
Dissolved Sulphate (SO4)	mg/L	7	2	11	2	3	2	2169360
Turbidity	NTU	12	0.1	1.3	0.1	17	0.1	2168563
Conductivity	uS/cm	200	1	240	1	90	1	2168615
Subcontracted Analysis								
Subcontract Parameter	N/A	ATTACHED	N/A	ATTACHED	N/A	ATTACHED	N/A	2165759

N/A = Not Applicable
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Analytics International Corporation o/a Maxxam Analytics 200 Bluewater Rd, Suite 105, Bedford, Nova Scotia Canada B4B 1G9 Tel:902-420-0203 Toll-free:800-565-7227 Fax:902-420-8612 www.maxxamanalytics.com

Maxxam Job #: B068678
Report Date: 2010/06/10

SNC Lavalin Inc, Environment Division
Client Project #: 020331-0002
Project name: BEDFORD WEST

RESULTS OF ANALYSES OF WATER

Maxxam ID		GA6239		GA6240	GA6241	GA6241		
Sampling Date		2010/05/31 10:15		2010/05/31 11:30	2010/05/31 11:20	2010/05/31 11:20		
COC Number		N/A		N/A	N/A	N/A		
	Units	**KL2-31.05.10 Lab-Dup**	**RDL**	**KL3-31.05.10**	**KL4-31.05.10**	**KL4-31.05.10 Lab-Dup**	**RDL**	**QC Batch**
Calculated Parameters								
Anion Sum	me/L		N/A	1.90	1.91		N/A	2165100
Bicarb. Alkalinity (calc as CaCO3)	mg/L		1	6	6		1	2165097
Calculated TDS	mg/L		1	110	111		1	2165103
Carb. Alkalinity (calc. as CaCO3)	mg/L		1	<1	<1		1	2165097
Cation Sum	me/L		N/A	1.69	1.70		N/A	2165100
Hardness (CaCO3)	mg/L		1	22	22		1	2165098
Ion Balance (% Difference)	%		N/A	5.85	5.82		N/A	2165099
Langelier Index (@ 20C)	N/A			-2.92	-2.92			2165101
Langelier Index (@ 4C)	N/A			-3.17	-3.17			2165102
Nitrate (N)	mg/L		0.05	0.24	0.23		0.05	2164972
Saturation pH (@ 20C)	N/A			9.74	9.75			2165101
Saturation pH (@ 4C)	N/A			9.99	10.0			2165102
Inorganics								
Total Alkalinity (Total as CaCO3)	mg/L		5	6	6		5	2169358
Dissolved Chloride (Cl)	mg/L		1	55	56		1	2169270
Colour	TCU		30	28	27		5	2169364
Nitrate + Nitrite	mg/L		0.05	0.24	0.23		0.05	2169369
Nitrite (N)	mg/L		0.01	<0.01	<0.01		0.01	2169245
Nitrogen (Ammonia Nitrogen)	mg/L		0.05	<0.05	<0.05		0.05	2171726
Total Organic Carbon (C)	mg/L		0.5	3.6	3.3		0.5	2173063
Orthophosphate (P)	mg/L		0.01	<0.01	<0.01		0.01	2169311
pH	pH		N/A	6.82	6.83	6.83	N/A	2168601
Total Phosphorus	mg/L		0.002	0.005	0.004		0.002	2171573
Reactive Silica (SiO2)	mg/L		0.5	3.2	3.1		0.5	2169278
Total Suspended Solids	mg/L	6	2	2	<2		2	2167435
Dissolved Sulphate (SO4)	mg/L		2	10	10		2	2169360
Turbidity	NTU		0.1	0.3	0.3		0.1	2168563
Conductivity	uS/cm		1	220	220	220	1	2168615
Subcontracted Analysis								
Subcontract Parameter	N/A		N/A	ATTACHED	ATTACHED		N/A	2165759

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Maxxam Job #: B068678
Report Date: 2010/06/10

SNC Lavalin Inc, Environment Division
Client Project #: 020331-0002
Project name: BEDFORD WEST

RESULTS OF ANALYSES OF WATER

Maxxam ID		GA6242			GA6244	GA6244		
Sampling Date		2010/05/31 13:00			2010/05/31 12:40	2010/05/31 12:40		
COC Number		N/A			N/A	N/A		
	Units	**HWY102-1-31.05.10**	**RDL**	**QC Batch**	**HWY102-2-31.05.10**	**HWY102-2-31.05.10 Lab-Dup**	**RDL**	**QC Batch**
Calculated Parameters								
Anion Sum	me/L	1.11	N/A	2165100	5.13		N/A	2165100
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	<1	1	2165097	6		1	2165097
Calculated TDS	mg/L	67	1	2165103	282		1	2165103
Carb. Alkalinity (calc. as CaCO3)	mg/L	<1	1	2165097	<1		1	2165097
Cation Sum	me/L	1.06	N/A	2165100	4.17		N/A	2165100
Hardness (CaCO3)	mg/L	17	1	2165098	23		1	2165098
Ion Balance (% Difference)	%	2.30	N/A	2165099	10.3		N/A	2165099
Langelier Index (@ 20C)	N/A	NC		2165101	-3.72			2165101
Langelier Index (@ 4C)	N/A	NC		2165102	-3.97			2165102
Nitrate (N)	mg/L	0.69	0.05	2164972	0.10		0.05	2164972
Saturation pH (@ 20C)	N/A	NC		2165101	9.77			2165101
Saturation pH (@ 4C)	N/A	NC		2165102	10.0			2165102
Inorganics								
Total Alkalinity (Total as CaCO3)	mg/L	<5	5	2169358	6		5	2171519
Dissolved Chloride (Cl)	mg/L	32	1	2169270	170		5	2171532
Colour	TCU	37	5	2169364	96		30	2171543
Nitrate + Nitrite	mg/L	0.69	0.05	2169369	0.10		0.05	2171548
Nitrite (N)	mg/L	<0.01	0.01	2169245	<0.01		0.01	2171549
Nitrogen (Ammonia Nitrogen)	mg/L	<0.05	0.05	2171726	<0.05		0.05	2171726
Total Organic Carbon (C)	mg/L	4.7	0.5	2173063	7.2		0.5	2173063
Orthophosphate (P)	mg/L	<0.01	0.01	2169311	<0.01		0.01	2171544
pH	pH	5.48	N/A	2169297	6.05		N/A	2169297
Total Phosphorus	mg/L	0.006	0.002	2171573	0.010	0.010	0.002	2171573
Reactive Silica (SiO2)	mg/L	1.1	0.5	2169278	3.0		0.5	2171535
Total Suspended Solids	mg/L	<2	2	2166727	34	36	10	2166727
Dissolved Sulphate (SO4)	mg/L	8	2	2169360	11		2	2171534
Turbidity	NTU	1.4	0.1	2168563	2.6		0.1	2170396
Conductivity	uS/cm	130	1	2169309	590		1	2169309
Subcontracted Analysis								
Subcontract Parameter	N/A	ATTACHED	N/A	2165759	ATTACHED		N/A	2165759

N/A = Not Applicable
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QC Batch = Quality Control Batch

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Maxxam Job #: B068678
Report Date: 2010/06/10

SNC Lavalin Inc, Environment Division
Client Project #: 020331-0002
Project name: BEDFORD WEST

RESULTS OF ANALYSES OF WATER

Maxxam ID		GA6247	GA6249		
Sampling Date		2010/05/31 13:35	2010/05/31 14:30		
COC Number		N/A	N/A		
	Units	**PML1-31.05.10**	**PML2--31.05.10**	**RDL**	**QC Batch**
Calculated Parameters					
Anion Sum	me/L	2.34	2.07	N/A	2165100
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	7	6	1	2165097
Calculated TDS	mg/L	137	120	1	2165103
Carb. Alkalinity (calc. as CaCO3)	mg/L	<1	<1	1	2165097
Cation Sum	me/L	2.11	1.88	N/A	2165100
Hardness (CaCO3)	mg/L	26	23	1	2165098
Ion Balance (% Difference)	%	5.17	4.81	N/A	2165099
Langelier Index (@ 20C)	N/A	-2.96	-3.06		2165101
Langelier Index (@ 4C)	N/A	-3.21	-3.31		2165102
Nitrate (N)	mg/L	0.42	0.19	0.05	2164972
Saturation pH (@ 20C)	N/A	9.59	9.72		2165101
Saturation pH (@ 4C)	N/A	9.84	9.97		2165102
Inorganics					
Total Alkalinity (Total as CaCO3)	mg/L	7	6	5	2171519
Dissolved Chloride (Cl)	mg/L	67	62	1	2171532
Colour	TCU	19	20	5	2171543
Nitrate + Nitrite	mg/L	0.42	0.19	0.05	2171548
Nitrite (N)	mg/L	<0.01	<0.01	0.01	2171549
Nitrogen (Ammonia Nitrogen)	mg/L	<0.05	<0.05	0.05	2171726
Total Organic Carbon (C)	mg/L	0.7	3.2	0.5	2173063
Orthophosphate (P)	mg/L	<0.01	<0.01	0.01	2171544
pH	pH	6.63	6.66	N/A	2169297
Total Phosphorus	mg/L	0.018	0.010	0.002	2171573
Reactive Silica (SiO2)	mg/L	3.8	2.6	0.5	2171535
Total Suspended Solids	mg/L	7	15	2	2166727
Dissolved Sulphate (SO4)	mg/L	13	10	2	2171534
Turbidity	NTU	8.2	1.0	0.1	2170396
Conductivity	uS/cm	260	230	1	2169309
Subcontracted Analysis					
Subcontract Parameter	N/A	ATTACHED	ATTACHED	N/A	2165759

N/A = Not Applicable
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QC Batch = Quality Control Batch

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Maxxam Job #: B068678
Report Date: 2010/06/10

SNC Lavalin Inc, Environment Division
Client Project #: 020331-0002
Project name: BEDFORD WEST

ELEMENTS BY ICP/MS (WATER)

Maxxam ID		GA6227	GA6238	GA6239	GA6240	GA6240		
Sampling Date		2010/05/31 9:00	2010/05/31 11:00	2010/05/31 10:15	2010/05/31 11:30	2010/05/31 11:30		
COC Number		N/A	N/A	N/A	N/A	N/A		
	Units	**LSD-31.05.10**	**KL1-31.05.10**	**KL2-31.05.10**	**KL3-31.05.10**	**KL3-31.05.10 Lab-Dup**	**RDL**	**QC Batch**
Metals								
Total Aluminum (Al)	ug/L	349	289	175	124	125	5.0	2167561
Total Antimony (Sb)	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	2167561
Total Arsenic (As)	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	2167561
Total Barium (Ba)	ug/L	15.3	18.5	11.7	15.7	15.9	1.0	2167561
Total Beryllium (Be)	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	2167561
Total Bismuth (Bi)	ug/L	<2.0	<2.0	<2.0	<2.0	<2.0	2.0	2167561
Total Boron (B)	ug/L	41.4	11.4	14.7	7.8	8.4	5.0	2167561
Total Cadmium (Cd)	ug/L	0.018	0.053	0.018	0.030	0.035	0.017	2167561
Total Calcium (Ca)	ug/L	7990	7720	3440	6810	6950	100	2167561
Total Chromium (Cr)	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	2167561
Total Cobalt (Co)	ug/L	<0.40	0.54	<0.40	<0.40	<0.40	0.40	2167561
Total Copper (Cu)	ug/L	<2.0	5.8	<2.0	<2.0	<2.0	2.0	2167561
Total Iron (Fe)	ug/L	554	313	227	73	75	50	2167561
Total Lead (Pb)	ug/L	3.02	10.3	1.01	0.60	0.56	0.50	2167561
Total Magnesium (Mg)	ug/L	1990	1420	921	1220	1240	100	2167561
Total Manganese (Mn)	ug/L	113	79.2	43.2	36.8	37.9	2.0	2167561
Total Molybdenum (Mo)	ug/L	<2.0	<2.0	<2.0	<2.0	<2.0	2.0	2167561
Total Nickel (Ni)	ug/L	<2.0	3.2	<2.0	2.0	2.1	2.0	2167561
Total Phosphorus (P)	ug/L	<100	<100	<100	<100	<100	100	2167561
Total Potassium (K)	ug/L	1180	876	716	791	800	100	2167561
Total Selenium (Se)	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	2167561
Total Silver (Ag)	ug/L	<0.10	<0.10	0.42	<0.10	<0.10	0.10	2167561
Total Sodium (Na)	ug/L	24800	31800	10700	28300	28600	100	2167561
Total Strontium (Sr)	ug/L	36.3	39.1	17.8	33.5	34.1	2.0	2167561
Total Thallium (Tl)	ug/L	<0.10	<0.10	<0.10	<0.10	<0.10	0.10	2167561
Total Tin (Sn)	ug/L	<2.0	<2.0	<2.0	<2.0	<2.0	2.0	2167561
Total Titanium (Ti)	ug/L	7.2	6.4	<2.0	<2.0	<2.0	2.0	2167561
Total Uranium (U)	ug/L	<0.10	0.11	<0.10	<0.10	<0.10	0.10	2167561
Total Vanadium (V)	ug/L	<2.0	<2.0	<2.0	<2.0	<2.0	2.0	2167561
Total Zinc (Zn)	ug/L	7.2	14.4	5.4	9.7	12.0	5.0	2167561

N/A = Not Applicable
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Maxxam Job #: B068678
Report Date: 2010/06/10

SNC Lavalin Inc, Environment Division
Client Project #: 020331-0002
Project name: BEDFORD WEST

ELEMENTS BY ICP/MS (WATER)

Maxxam ID		GA6241		GA6242	GA6244	GA6247		
Sampling Date		2010/05/31 11.20		2010/05/31 13.00	2010/05/31 12.40	2010/05/31 13.35		
COC Number		N/A		N/A	N/A	N/A		
	Units	**KL4-31.05.10**	**QC Batch**	**HWY102-1-31.05.10**	**HWY102-2-31.05.10**	**PML1-31.05.10**	**RDL**	**QC Batch**
Metals								
Total Aluminum (Al)	ug/L	125	2167561	169	189	665	5.0	2167566
Total Antimony (Sb)	ug/L	<1.0	2167561	<1.0	<1.0	<1.0	1.0	2167566
Total Arsenic (As)	ug/L	<1.0	2167561	<1.0	<1.0	<1.0	1.0	2167566
Total Barium (Ba)	ug/L	16.6	2167561	52.9	53.1	35.3	1.0	2167566
Total Beryllium (Be)	ug/L	<1.0	2167561	<1.0	<1.0	<1.0	1.0	2167566
Total Bismuth (Bi)	ug/L	<2.0	2167561	<2.0	<2.0	<2.0	2.0	2167566
Total Boron (B)	ug/L	8.6	2167561	11.4	7.9	11.3	5.0	2167566
Total Cadmium (Cd)	ug/L	0.031	2167561	0.043	0.051	0.032	0.017	2167566
Total Calcium (Ca)	ug/L	6810	2167561	4930	7440	8370	100	2167566
Total Chromium (Cr)	ug/L	<1.0	2167561	<1.0	<1.0	<1.0	1.0	2167566
Total Cobalt (Co)	ug/L	<0.40	2167561	0.50	0.66	0.96	0.40	2167566
Total Copper (Cu)	ug/L	<2.0	2167561	3.4	2.0	2.0	2.0	2167566
Total Iron (Fe)	ug/L	82	2167561	146	1380	837	50	2167566
Total Lead (Pb)	ug/L	3.23	2167561	2.37	1.61	1.73	0.50	2167566
Total Magnesium (Mg)	ug/L	1220	2167561	1080	963	1240	100	2167566
Total Manganese (Mn)	ug/L	34.5	2167561	55.3	387	142	2.0	2167566
Total Molybdenum (Mo)	ug/L	<2.0	2167561	<2.0	<2.0	<2.0	2.0	2167566
Total Nickel (Ni)	ug/L	2.0	2167561	<2.0	<2.0	<2.0	2.0	2167566
Total Phosphorus (P)	ug/L	<100	2167561	<100	<100	<100	100	2167566
Total Potassium (K)	ug/L	807	2167561	1140	984	1160	100	2167566
Total Selenium (Se)	ug/L	<1.0	2167561	<1.0	<1.0	<1.0	1.0	2167566
Total Silver (Ag)	ug/L	<0.10	2167561	<0.10	<0.10	<0.10	0.10	2167566
Total Sodium (Na)	ug/L	28500	2167561	15900	83700	35200	100	2167566
Total Strontium (Sr)	ug/L	33.1	2167561	29.1	37.4	36.3	2.0	2167566
Total Thallium (Tl)	ug/L	<0.10	2167561	<0.10	<0.10	<0.10	0.10	2167566
Total Tin (Sn)	ug/L	<2.0	2167561	<2.0	<2.0	<2.0	2.0	2167566
Total Titanium (Ti)	ug/L	<2.0	2167561	<2.0	<2.0	7.8	2.0	2167566
Total Uranium (U)	ug/L	<0.10	2167561	<0.10	<0.10	<0.10	0.10	2167566
Total Vanadium (V)	ug/L	<2.0	2167561	<2.0	<2.0	<2.0	2.0	2167566
Total Zinc (Zn)	ug/L	10.4	2167561	16.4	13.6	10.0	5.0	2167566

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RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Maxxam Job #: B068678
Report Date: 2010/06/10

SNC Lavalin Inc, Environment Division
Client Project #: 020331-0002
Project name: BEDFORD WEST

ELEMENTS BY ICP/MS (WATER)

Maxxam ID		GA6249		
Sampling Date		2010/05/31 14:30		
COC Number		N/A		
	Units	**PML2--31.05.10**	**RDL**	**QC Batch**
Metals				
Total Aluminum (Al)	ug/L	1030	5.0	2167566
Total Antimony (Sb)	ug/L	<1.0	1.0	2167566
Total Arsenic (As)	ug/L	<1.0	1.0	2167566
Total Barium (Ba)	ug/L	23.0	1.0	2167566
Total Beryllium (Be)	ug/L	<1.0	1.0	2167566
Total Bismuth (Bi)	ug/L	<2.0	2.0	2167566
Total Boron (B)	ug/L	8.2	5.0	2167566
Total Cadmium (Cd)	ug/L	0.037	0.017	2167566
Total Calcium (Ca)	ug/L	7170	100	2167566
Total Chromium (Cr)	ug/L	<1.0	1.0	2167566
Total Cobalt (Co)	ug/L	0.65	0.40	2167566
Total Copper (Cu)	ug/L	3.3	2.0	2167566
Total Iron (Fe)	ug/L	1090	50	2167566
Total Lead (Pb)	ug/L	2.39	0.50	2167566
Total Magnesium (Mg)	ug/L	1250	100	2167566
Total Manganese (Mn)	ug/L	159	2.0	2167566
Total Molybdenum (Mo)	ug/L	<2.0	2.0	2167566
Total Nickel (Ni)	ug/L	2.2	2.0	2167566
Total Phosphorus (P)	ug/L	<100	100	2167566
Total Potassium (K)	ug/L	984	100	2167566
Total Selenium (Se)	ug/L	<1.0	1.0	2167566
Total Silver (Ag)	ug/L	<0.10	0.10	2167566
Total Sodium (Na)	ug/L	31100	100	2167566
Total Strontium (Sr)	ug/L	34.7	2.0	2167566
Total Thallium (Tl)	ug/L	<0.10	0.10	2167566
Total Tin (Sn)	ug/L	<2.0	2.0	2167566
Total Titanium (Ti)	ug/L	21.3	2.0	2167566
Total Uranium (U)	ug/L	0.10	0.10	2167566
Total Vanadium (V)	ug/L	<2.0	2.0	2167566
Total Zinc (Zn)	ug/L	18.3	5.0	2167566

N/A = Not Applicable
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Maxxam Job #: B068678
Report Date: 2010/06/10

SNC Lavalin Inc, Environment Division
Client Project #: 020331-0002
Project name: BEDFORD WEST

MICROBIOLOGY (WATER)

Maxxam ID		GA6227	GA6238	GA6239	GA6240	GA6241		
Sampling Date		2010/05/31 9:00	2010/05/31 11:00	2010/05/31 10:15	2010/05/31 11:30	2010/05/31 11:20		
COC Number		N/A	N/A	N/A	N/A	N/A		
	Units	**LSD-31.05.10**	**KL1-31.05.10**	**KL2-31.05.10**	**KL3-31.05.10**	**KL4-31.05.10**	**RDL**	**QC Batch**
Microbiological								
Escherichia coli	CFU/100mL	4	9	>250	2	1	1	2165780
Total Coliforms	CFU/100mL	>250	>250	>250	190	100	1	2165780

N/A = Not Applicable
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam ID		GA6242	GA6244	GA6247	GA6249		
Sampling Date		2010/05/31 13:00	2010/05/31 12:40	2010/05/31 13.35	2010/05/31 14:30		
COC Number		N/A	N/A	N/A	N/A		
	Units	**HWY102-1-31.05.10**	**HWY102-2-31.05.10**	**PML1-31.05.10**	**PML2--31.05.10**	**RDL**	**QC Batch**
Microbiological							
Escherichia coli	CFU/100mL	12	9	19	69	1	2165780
Total Coliforms	CFU/100mL	>250	>250	>250	>250	1	2165780

N/A = Not Applicable
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QC Batch = Quality Control Batch

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SNC Lavalin Inc, Environment Division
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GENERAL COMMENTS

Sample GA6240-01: RCAp Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

Sample GA6241-01: RCAp Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

Sample GA6244-01: Poor RCAp Ion Balance due to sample matrix. Cation values verified by repeat analysis.

Sample GA6247-01: RCAp Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

Results relate only to the items tested.

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SNC Lavalin Inc, Environment Division
Attention: Derek Heath
Client Project #: 020331-0002
P.O. #:
Project name: BEDFORD WEST

Quality Assurance Report

Maxxam Job Number: DB068678

QA/QC Batch Num Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	Units	QC Limits
2165780 ODE	Method Blank	Escherichia coli	2010/05/31	<1		CFU/100mL	
		Total Coliforms	2010/05/31	<1		CFU/100mL	
2166727 JDW	QC Standard	Total Suspended Solids	2010/06/01		99	%	80 - 120
	Method Blank	Total Suspended Solids	2010/06/01	<1		mg/L	
	RPD [GA6244-01]	Total Suspended Solids	2010/06/01	NC		%	25
2167435 JDW	QC Standard	Total Suspended Solids	2010/06/02		100	%	80 - 120
	Method Blank	Total Suspended Solids	2010/06/02	<1		mg/L	
	RPD [GA6239-01]	Total Suspended Solids	2010/06/02	NC		%	25
2167561 MLB	Matrix Spike						
	[GA6241-01]	Total Aluminum (Al)	2010/06/02		NC	%	80 - 120
		Total Antimony (Sb)	2010/06/02		105	%	80 - 120
		Total Arsenic (As)	2010/06/02		102	%	80 - 120
		Total Barium (Ba)	2010/06/02		NC	%	80 - 120
		Total Beryllium (Be)	2010/06/02		113	%	80 - 120
		Total Bismuth (Bi)	2010/06/02		101	%	80 - 120
		Total Boron (B)	2010/06/02		117	%	80 - 120
		Total Cadmium (Cd)	2010/06/02		105	%	80 - 120
		Total Calcium (Ca)	2010/06/02		NC	%	80 - 120
		Total Chromium (Cr)	2010/06/02		98	%	80 - 120
		Total Cobalt (Co)	2010/06/02		97	%	80 - 120
		Total Copper (Cu)	2010/06/02		97	%	80 - 120
		Total Iron (Fe)	2010/06/02		100	%	80 - 120
		Total Lead (Pb)	2010/06/02		99	%	80 - 120
		Total Magnesium (Mg)	2010/06/02		NC	%	80 - 120
		Total Manganese (Mn)	2010/06/02		NC	%	80 - 120
		Total Molybdenum (Mo)	2010/06/02		106	%	80 - 120
		Total Nickel (Ni)	2010/06/02		96	%	80 - 120
		Total Phosphorus (P)	2010/06/02		105	%	80 - 120
		Total Potassium (K)	2010/06/02		NC	%	80 - 120
		Total Selenium (Se)	2010/06/02		103	%	80 - 120
		Total Silver (Ag)	2010/06/02		99	%	80 - 120
		Total Sodium (Na)	2010/06/02		NC	%	80 - 120
		Total Strontium (Sr)	2010/06/02		NC	%	80 - 120
		Total Thallium (Tl)	2010/06/02		101	%	80 - 120
		Total Tin (Sn)	2010/06/02		106	%	80 - 120
		Total Titanium (Ti)	2010/06/02		100	%	80 - 120
		Total Uranium (U)	2010/06/02		107	%	80 - 120
		Total Vanadium (V)	2010/06/02		101	%	80 - 120
		Total Zinc (Zn)	2010/06/02		NC	%	80 - 120
	Spiked Blank	Total Aluminum (Al)	2010/06/02		112	%	80 - 120
		Total Antimony (Sb)	2010/06/02		104	%	80 - 120
		Total Arsenic (As)	2010/06/02		101	%	80 - 120
		Total Barium (Ba)	2010/06/02		101	%	80 - 120
		Total Beryllium (Be)	2010/06/02		105	%	80 - 120
		Total Bismuth (Bi)	2010/06/02		102	%	80 - 120
		Total Boron (B)	2010/06/02		107	%	80 - 120
		Total Cadmium (Cd)	2010/06/02		105	%	80 - 120
		Total Calcium (Ca)	2010/06/02		103	%	80 - 120
		Total Chromium (Cr)	2010/06/02		99	%	80 - 120
		Total Cobalt (Co)	2010/06/02		99	%	80 - 120
		Total Copper (Cu)	2010/06/02		107	%	80 - 120
		Total Iron (Fe)	2010/06/02		101	%	80 - 120
		Total Lead (Pb)	2010/06/02		101	%	80 - 120
		Total Magnesium (Mg)	2010/06/02		101	%	80 - 120
		Total Manganese (Mn)	2010/06/02		106	%	80 - 120

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SNC Lavalin Inc, Environment Division
Attention: Derek Heath
Client Project #: 020331-0002
P.O. #:
Project name: BEDFORD WEST

Quality Assurance Report (Continued)

Maxxam Job Number: DB068678

QA/QC Batch Num Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	Units	QC Limits
2167561 MLB	Spiked Blank	Total Molybdenum (Mo)	2010/06/02		102	%	80 - 120
		Total Nickel (Ni)	2010/06/02		99	%	80 - 120
		Total Phosphorus (P)	2010/06/02		101	%	80 - 120
		Total Potassium (K)	2010/06/02		102	%	80 - 120
		Total Selenium (Se)	2010/06/02		104	%	80 - 120
		Total Silver (Ag)	2010/06/02		101	%	80 - 120
		Total Sodium (Na)	2010/06/02		111	%	80 - 120
		Total Strontium (Sr)	2010/06/02		106	%	80 - 120
		Total Thallium (Tl)	2010/06/02		103	%	80 - 120
		Total Tin (Sn)	2010/06/02		105	%	80 - 120
		Total Titanium (Ti)	2010/06/02		103	%	80 - 120
		Total Uranium (U)	2010/06/02		106	%	80 - 120
		Total Vanadium (V)	2010/06/02		99	%	80 - 120
		Total Zinc (Zn)	2010/06/02		144 (1)	%	80 - 120
	Method Blank	Total Aluminum (Al)	2010/06/02	<5.0		ug/L	
		Total Antimony (Sb)	2010/06/02	<1.0		ug/L	
		Total Arsenic (As)	2010/06/02	<1.0		ug/L	
		Total Barium (Ba)	2010/06/02	<1.0		ug/L	
		Total Beryllium (Be)	2010/06/02	<1.0		ug/L	
		Total Bismuth (Bi)	2010/06/02	<2.0		ug/L	
		Total Boron (B)	2010/06/02	<5.0		ug/L	
		Total Cadmium (Cd)	2010/06/02	<0.017		ug/L	
		Total Calcium (Ca)	2010/06/02	<100		ug/L	
		Total Chromium (Cr)	2010/06/02	<1.0		ug/L	
		Total Cobalt (Co)	2010/06/02	<0.40		ug/L	
		Total Copper (Cu)	2010/06/02	<2.0		ug/L	
		Total Iron (Fe)	2010/06/02	<50		ug/L	
		Total Lead (Pb)	2010/06/02	<0.50		ug/L	
		Total Magnesium (Mg)	2010/06/02	<100		ug/L	
		Total Manganese (Mn)	2010/06/02	<2.0		ug/L	
		Total Molybdenum (Mo)	2010/06/02	<2.0		ug/L	
		Total Nickel (Ni)	2010/06/02	<2.0		ug/L	
		Total Phosphorus (P)	2010/06/02	<100		ug/L	
		Total Potassium (K)	2010/06/02	<100		ug/L	
		Total Selenium (Se)	2010/06/02	<1.0		ug/L	
		Total Silver (Ag)	2010/06/02	<0.10		ug/L	
		Total Sodium (Na)	2010/06/02	<100		ug/L	
		Total Strontium (Sr)	2010/06/02	<2.0		ug/L	
		Total Thallium (Tl)	2010/06/02	<0.10		ug/L	
		Total Tin (Sn)	2010/06/02	<2.0		ug/L	
		Total Titanium (Ti)	2010/06/02	<2.0		ug/L	
		Total Uranium (U)	2010/06/02	<0.10		ug/L	
		Total Vanadium (V)	2010/06/02	<2.0		ug/L	
		Total Zinc (Zn)	2010/06/02	<5.0		ug/L	
	RPD [GA6240-01]	Total Aluminum (Al)	2010/06/02	1.4		%	25
		Total Antimony (Sb)	2010/06/02	NC		%	25
		Total Arsenic (As)	2010/06/02	NC		%	25
		Total Barium (Ba)	2010/06/02	1.2		%	25
		Total Beryllium (Be)	2010/06/02	NC		%	25
		Total Bismuth (Bi)	2010/06/02	NC		%	25
		Total Boron (B)	2010/06/02	NC		%	25
		Total Cadmium (Cd)	2010/06/02	NC		%	25
		Total Calcium (Ca)	2010/06/02	2.1		%	25
		Total Chromium (Cr)	2010/06/02	NC		%	25
		Total Cobalt (Co)	2010/06/02	NC		%	25

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Attention: Derek Heath
Client Project #: 020331-0002
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Project name: BEDFORD WEST

Quality Assurance Report (Continued)

Maxxam Job Number: DB068678

QA/QC Batch Num Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	Units	QC Limits
2167561 MLB	RPD [GA6240-01]	Total Copper (Cu)	2010/06/02	NC		%	25
		Total Iron (Fe)	2010/06/02	NC		%	25
		Total Lead (Pb)	2010/06/02	NC		%	25
		Total Magnesium (Mg)	2010/06/02	1.8		%	25
		Total Manganese (Mn)	2010/06/02	3.1		%	25
		Total Molybdenum (Mo)	2010/06/02	NC		%	25
		Total Nickel (Ni)	2010/06/02	NC		%	25
		Total Phosphorus (P)	2010/06/02	NC		%	25
		Total Potassium (K)	2010/06/02	1.2		%	25
		Total Selenium (Se)	2010/06/02	NC		%	25
		Total Silver (Ag)	2010/06/02	NC		%	25
		Total Sodium (Na)	2010/06/02	1.3		%	25
		Total Strontium (Sr)	2010/06/02	1.6		%	25
		Total Thallium (Tl)	2010/06/02	NC		%	25
		Total Tin (Sn)	2010/06/02	NC		%	25
		Total Titanium (Ti)	2010/06/02	NC		%	25
		Total Uranium (U)	2010/06/02	NC		%	25
		Total Vanadium (V)	2010/06/02	NC		%	25
		Total Zinc (Zn)	2010/06/02	NC		%	25
2167566 MLB	Matrix Spike	Total Aluminum (Al)	2010/06/02		NC	%	80 - 120
		Total Antimony (Sb)	2010/06/02		101	%	80 - 120
		Total Arsenic (As)	2010/06/02		101	%	80 - 120
		Total Barium (Ba)	2010/06/02		NC	%	80 - 120
		Total Beryllium (Be)	2010/06/02		105	%	80 - 120
		Total Bismuth (Bi)	2010/06/02		99	%	80 - 120
		Total Boron (B)	2010/06/02		113	%	80 - 120
		Total Cadmium (Cd)	2010/06/02		106	%	80 - 120
		Total Calcium (Ca)	2010/06/02		NC	%	80 - 120
		Total Chromium (Cr)	2010/06/02		100	%	80 - 120
		Total Cobalt (Co)	2010/06/02		97	%	80 - 120
		Total Copper (Cu)	2010/06/02		95	%	80 - 120
		Total Iron (Fe)	2010/06/02		100	%	80 - 120
		Total Lead (Pb)	2010/06/02		98	%	80 - 120
		Total Magnesium (Mg)	2010/06/02		NC	%	80 - 120
		Total Manganese (Mn)	2010/06/02		NC	%	80 - 120
		Total Molybdenum (Mo)	2010/06/02		105	%	80 - 120
		Total Nickel (Ni)	2010/06/02		96	%	80 - 120
		Total Phosphorus (P)	2010/06/02		107	%	80 - 120
		Total Potassium (K)	2010/06/02		NC	%	80 - 120
		Total Selenium (Se)	2010/06/02		105	%	80 - 120
		Total Silver (Ag)	2010/06/02		96	%	80 - 120
		Total Sodium (Na)	2010/06/02		NC	%	80 - 120
		Total Strontium (Sr)	2010/06/02		NC	%	80 - 120
		Total Thallium (Tl)	2010/06/02		103	%	80 - 120
		Total Tin (Sn)	2010/06/02		98	%	80 - 120
		Total Titanium (Ti)	2010/06/02		98	%	80 - 120
		Total Uranium (U)	2010/06/02		107	%	80 - 120
		Total Vanadium (V)	2010/06/02		103	%	80 - 120
		Total Zinc (Zn)	2010/06/02		98	%	80 - 120
	Spiked Blank	Total Aluminum (Al)	2010/06/02		110	%	80 - 120
		Total Antimony (Sb)	2010/06/02		103	%	80 - 120
		Total Arsenic (As)	2010/06/02		102	%	80 - 120
		Total Barium (Ba)	2010/06/02		104	%	80 - 120
		Total Beryllium (Be)	2010/06/02		106	%	80 - 120
		Total Bismuth (Bi)	2010/06/02		104	%	80 - 120

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Attention: Derek Heath
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Quality Assurance Report (Continued)

Maxxam Job Number: DB068678

QA/QC Batch Num Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	Units	QC Limits
2167566 MLB	Spiked Blank	Total Boron (B)	2010/06/02		114	%	80 - 120
		Total Cadmium (Cd)	2010/06/02		104	%	80 - 120
		Total Calcium (Ca)	2010/06/02		106	%	80 - 120
		Total Chromium (Cr)	2010/06/02		102	%	80 - 120
		Total Cobalt (Co)	2010/06/02		102	%	80 - 120
		Total Copper (Cu)	2010/06/02		102	%	80 - 120
		Total Iron (Fe)	2010/06/02		103	%	80 - 120
		Total Lead (Pb)	2010/06/02		102	%	80 - 120
		Total Magnesium (Mg)	2010/06/02		105	%	80 - 120
		Total Manganese (Mn)	2010/06/02		107	%	80 - 120
		Total Molybdenum (Mo)	2010/06/02		103	%	80 - 120
		Total Nickel (Ni)	2010/06/02		101	%	80 - 120
		Total Phosphorus (P)	2010/06/02		108	%	80 - 120
		Total Potassium (K)	2010/06/02		109	%	80 - 120
		Total Selenium (Se)	2010/06/02		108	%	80 - 120
		Total Silver (Ag)	2010/06/02		101	%	80 - 120
		Total Sodium (Na)	2010/06/02		231 (2)	%	80 - 120
		Total Strontium (Sr)	2010/06/02		107	%	80 - 120
		Total Thallium (Tl)	2010/06/02		104	%	80 - 120
		Total Tin (Sn)	2010/06/02		108	%	80 - 120
		Total Titanium (Ti)	2010/06/02		117	%	80 - 120
		Total Uranium (U)	2010/06/02		106	%	80 - 120
		Total Vanadium (V)	2010/06/02		102	%	80 - 120
		Total Zinc (Zn)	2010/06/02		132 (1)	%	80 - 120
	Method Blank	Total Aluminum (Al)	2010/06/02	<5.0		ug/L	
		Total Antimony (Sb)	2010/06/02	<1.0		ug/L	
		Total Arsenic (As)	2010/06/02	<1.0		ug/L	
		Total Barium (Ba)	2010/06/02	<1.0		ug/L	
		Total Beryllium (Be)	2010/06/02	<1.0		ug/L	
		Total Bismuth (Bi)	2010/06/02	<2.0		ug/L	
		Total Boron (B)	2010/06/02	<5.0		ug/L	
		Total Cadmium (Cd)	2010/06/02	<0.017		ug/L	
		Total Calcium (Ca)	2010/06/02	<100		ug/L	
		Total Chromium (Cr)	2010/06/02	<1.0		ug/L	
		Total Cobalt (Co)	2010/06/02	<0.40		ug/L	
		Total Copper (Cu)	2010/06/02	<2.0		ug/L	
		Total Iron (Fe)	2010/06/02	<50		ug/L	
		Total Lead (Pb)	2010/06/02	<0.50		ug/L	
		Total Magnesium (Mg)	2010/06/02	<100		ug/L	
		Total Manganese (Mn)	2010/06/02	<2.0		ug/L	
		Total Molybdenum (Mo)	2010/06/02	<2.0		ug/L	
		Total Nickel (Ni)	2010/06/02	<2.0		ug/L	
		Total Phosphorus (P)	2010/06/02	<100		ug/L	
		Total Potassium (K)	2010/06/02	<100		ug/L	
		Total Selenium (Se)	2010/06/02	<1.0		ug/L	
		Total Silver (Ag)	2010/06/02	<0.10		ug/L	
		Total Sodium (Na)	2010/06/02	159, RDL=100 (3)		ug/L	
		Total Strontium (Sr)	2010/06/02	<2.0		ug/L	
		Total Thallium (Tl)	2010/06/02	<0.10		ug/L	
		Total Tin (Sn)	2010/06/02	<2.0		ug/L	
		Total Titanium (Ti)	2010/06/02	<2.0		ug/L	
		Total Uranium (U)	2010/06/02	<0.10		ug/L	
		Total Vanadium (V)	2010/06/02	<2.0		ug/L	
		Total Zinc (Zn)	2010/06/02	<5.0		ug/L	
	RPD	Total Phosphorus (P)	2010/06/02	NC		%	25

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SNC Lavalin Inc, Environment Division
Attention: Derek Heath
Client Project #: 020331-0002
P.O. #:
Project name: BEDFORD WEST

Quality Assurance Report (Continued)

Maxxam Job Number: DB068678

QA/QC Batch Num	Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	Units	QC Limits
2168563	ARS	QC Standard	Turbidity	2010/06/02		99	%	80 - 120
		Method Blank	Turbidity	2010/06/02	<0.1		NTU	
		RPD	Turbidity	2010/06/02	NC		%	25
2168601	ARS	QC Standard	pH	2010/06/02		101	%	80 - 120
		Method Blank	pH	2010/06/02	5.67		pH	
		RPD [GA6241-01]	pH	2010/06/02	0		%	25
2168615	ARS	QC Standard	Conductivity	2010/06/02		103	%	80 - 120
		Method Blank	Conductivity	2010/06/02	<1		uS/cm	
		RPD [GA6241-01]	Conductivity	2010/06/02	0.5		%	25
2169245	SMT	Matrix Spike	Nitrite (N)	2010/06/04		67 (4)	%	80 - 120
		QC Standard	Nitrite (N)	2010/06/04		102	%	80 - 120
		Spiked Blank	Nitrite (N)	2010/06/04		109	%	80 - 120
		Method Blank	Nitrite (N)	2010/06/04	<0.01		mg/L	
		RPD	Nitrite (N)	2010/06/04	NC		%	25
2169270	SMT	Matrix Spike	Dissolved Chloride (Cl)	2010/06/04		98	%	80 - 120
		QC Standard	Dissolved Chloride (Cl)	2010/06/04		99	%	80 - 120
		Spiked Blank	Dissolved Chloride (Cl)	2010/06/04		102	%	80 - 120
		Method Blank	Dissolved Chloride (Cl)	2010/06/04	<1		mg/L	
		RPD	Dissolved Chloride (Cl)	2010/06/04	0.5		%	25
2169278	ABU	Matrix Spike	Reactive Silica (SiO2)	2010/06/03		64 (4)	%	80 - 120
		QC Standard	Reactive Silica (SiO2)	2010/06/03		99	%	75 - 125
		Spiked Blank	Reactive Silica (SiO2)	2010/06/03		95	%	80 - 120
		Method Blank	Reactive Silica (SiO2)	2010/06/03	<0.5		mg/L	
		RPD	Reactive Silica (SiO2)	2010/06/03	NC		%	25
2169297	ARS	QC Standard	pH	2010/06/03		100	%	80 - 120
		Method Blank	pH	2010/06/03	5.58		pH	
		RPD	pH	2010/06/03	2.1		%	25
2169309	ARS	QC Standard	Conductivity	2010/06/03		103	%	80 - 120
		Method Blank	Conductivity	2010/06/03	<1		uS/cm	
		RPD	Conductivity	2010/06/03	0		%	25
2169311	SMT	Matrix Spike	Orthophosphate (P)	2010/06/04		88	%	80 - 120
		QC Standard	Orthophosphate (P)	2010/06/04		104	%	80 - 120
		Spiked Blank	Orthophosphate (P)	2010/06/04		99	%	80 - 120
		Method Blank	Orthophosphate (P)	2010/06/04	<0.01		mg/L	
		RPD	Orthophosphate (P)	2010/06/04	NC		%	25
2169358	MCN	Matrix Spike	Total Alkalinity (Total as CaCO3)	2010/06/07		NC	%	80 - 120
		QC Standard	Total Alkalinity (Total as CaCO3)	2010/06/07		105	%	80 - 120
		Spiked Blank	Total Alkalinity (Total as CaCO3)	2010/06/07		107	%	80 - 120
		Method Blank	Total Alkalinity (Total as CaCO3)	2010/06/07	<5		mg/L	
		RPD	Total Alkalinity (Total as CaCO3)	2010/06/07	NC		%	25
2169360	JOA	Matrix Spike	Dissolved Sulphate (SO4)	2010/06/07		107	%	80 - 120
		QC Standard	Dissolved Sulphate (SO4)	2010/06/07		102	%	80 - 120
		Spiked Blank	Dissolved Sulphate (SO4)	2010/06/07		103	%	80 - 120
		Method Blank	Dissolved Sulphate (SO4)	2010/06/07	<2		mg/L	
		RPD	Dissolved Sulphate (SO4)	2010/06/07	NC		%	25
2169364	SMT	QC Standard	Colour	2010/06/03		109	%	80 - 120
		Method Blank	Colour	2010/06/03	<5		TCU	
		RPD	Colour	2010/06/03	NC		%	25
2169369	SMT	Matrix Spike	Nitrate + Nitrite	2010/06/04		103	%	80 - 120
		QC Standard	Nitrate + Nitrite	2010/06/04		99	%	80 - 120
		Spiked Blank	Nitrate + Nitrite	2010/06/04		104	%	80 - 120
		Method Blank	Nitrate + Nitrite	2010/06/04	<0.05		mg/L	
		RPD	Nitrate + Nitrite	2010/06/04	NC		%	25
2170396	ARS	QC Standard	Turbidity	2010/06/04		97	%	80 - 120
		Method Blank	Turbidity	2010/06/04	<0.1		NTU	

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SNC Lavalin Inc, Environment Division
Attention: Derek Heath
Client Project #: 020331-0002
P.O. #:
Project name: BEDFORD WEST

Quality Assurance Report (Continued)

Maxxam Job Number: DB068678

QA/QC Batch Num	Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	Units	QC Limits
2170396	ARS	RPD	Turbidity	2010/06/04	NC		%	25
2171519	ABU	Matrix Spike	Total Alkalinity (Total as CaCO3)	2010/06/07		NC	%	80 - 120
		QC Standard	Total Alkalinity (Total as CaCO3)	2010/06/07		101	%	80 - 120
		Spiked Blank	Total Alkalinity (Total as CaCO3)	2010/06/07		104	%	80 - 120
		Method Blank	Total Alkalinity (Total as CaCO3)	2010/06/07	<5		mg/L	
		RPD	Total Alkalinity (Total as CaCO3)	2010/06/07	4.3		%	25
2171532	MCN	Matrix Spike	Dissolved Chloride (Cl)	2010/06/07		NC	%	80 - 120
		QC Standard	Dissolved Chloride (Cl)	2010/06/07		104	%	80 - 120
		Spiked Blank	Dissolved Chloride (Cl)	2010/06/07		106	%	80 - 120
		Method Blank	Dissolved Chloride (Cl)	2010/06/07	<1		mg/L	
		RPD	Dissolved Chloride (Cl)	2010/06/07	0.6		%	25
2171534	MCN	Matrix Spike	Dissolved Sulphate (SO4)	2010/06/07		105	%	80 - 120
		QC Standard	Dissolved Sulphate (SO4)	2010/06/07		107	%	80 - 120
		Spiked Blank	Dissolved Sulphate (SO4)	2010/06/07		110	%	80 - 120
		Method Blank	Dissolved Sulphate (SO4)	2010/06/07	<2		mg/L	
		RPD	Dissolved Sulphate (SO4)	2010/06/07	NC		%	25
2171535	JOA	Matrix Spike	Reactive Silica (SiO2)	2010/06/07		NC	%	80 - 120
		QC Standard	Reactive Silica (SiO2)	2010/06/07		99	%	75 - 125
		Spiked Blank	Reactive Silica (SiO2)	2010/06/07		93	%	80 - 120
		Method Blank	Reactive Silica (SiO2)	2010/06/07	<0.5		mg/L	
		RPD	Reactive Silica (SiO2)	2010/06/07	1		%	25
2171543	SMT	QC Standard	Colour	2010/06/08		110	%	80 - 120
		Method Blank	Colour	2010/06/08	<5		TCU	
		RPD	Colour	2010/06/08	NC		%	25
2171544	SMT	Matrix Spike	Orthophosphate (P)	2010/06/08		96	%	80 - 120
		QC Standard	Orthophosphate (P)	2010/06/08		101	%	80 - 120
		Spiked Blank	Orthophosphate (P)	2010/06/08		101	%	80 - 120
		Method Blank	Orthophosphate (P)	2010/06/08	<0.01		mg/L	
		RPD	Orthophosphate (P)	2010/06/08	NC		%	25
2171548	SMT	Matrix Spike	Nitrate + Nitrite	2010/06/08		100	%	80 - 120
		QC Standard	Nitrate + Nitrite	2010/06/08		98	%	80 - 120
		Spiked Blank	Nitrate + Nitrite	2010/06/08		105	%	80 - 120
		Method Blank	Nitrate + Nitrite	2010/06/08	<0.05		mg/L	
		RPD	Nitrate + Nitrite	2010/06/08	1.7		%	25
2171549	MCN	Matrix Spike	Nitrite (N)	2010/06/08		91	%	80 - 120
		QC Standard	Nitrite (N)	2010/06/08		97	%	80 - 120
		Spiked Blank	Nitrite (N)	2010/06/08		102	%	80 - 120
		Method Blank	Nitrite (N)	2010/06/08	<0.01		mg/L	
		RPD	Nitrite (N)	2010/06/08	NC (5)		%	25
2171573	VRO	Matrix Spike [GA6244-03]	Total Phosphorus	2010/06/08		100	%	80 - 120
		QC Standard	Total Phosphorus	2010/06/08		109	%	85 - 115
		Spiked Blank	Total Phosphorus	2010/06/08		104	%	85 - 115
		Method Blank	Total Phosphorus	2010/06/08	0.003, RDL=0.002		mg/L	
		RPD [GA6244-03]	Total Phosphorus	2010/06/08	NC		%	20
2171726	MCN	Matrix Spike	Nitrogen (Ammonia Nitrogen)	2010/06/07		NC	%	80 - 120
		QC Standard	Nitrogen (Ammonia Nitrogen)	2010/06/08		105	%	80 - 120
		Spiked Blank	Nitrogen (Ammonia Nitrogen)	2010/06/07		98	%	N/A
		Method Blank	Nitrogen (Ammonia Nitrogen)	2010/06/07	<0.05		mg/L	
		RPD	Nitrogen (Ammonia Nitrogen)	2010/06/07	10.5		%	25
2173063	SSI	Matrix Spike	Total Organic Carbon (C)	2010/06/08		104	%	80 - 120
		QC Standard	Total Organic Carbon (C)	2010/06/08		102	%	80 - 120
		Spiked Blank	Total Organic Carbon (C)	2010/06/08		100	%	80 - 120
		Method Blank	Total Organic Carbon (C)	2010/06/08	<0.5		mg/L	
		RPD	Total Organic Carbon (C)	2010/06/08	2.8		%	25

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Quality Assurance Report (Continued)

Maxxam Job Number: DB068678

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.
Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.
QC Standard: A blank matrix to which a known amount of the analyte has been added. Used to evaluate analyte recovery.
Spiked Blank: A blank matrix to which a known amount of the analyte has been added. Used to evaluate analyte recovery.
Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.
NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spiked amount was not sufficiently significant to permit a reliable recovery calculation.
NC (RPD): The RPD was not calculated. The level of analyte detected in the parent sample and its duplicate was not sufficiently significant to permit a reliable calculation.
(1) Elevated recovery due to low level lab contamination. Minimal impact on data quality.
(2) Elevated recovery due to memory effects.
(3) Elevated sodium due to memory effects. No impact on data quality.
(4) Poor spike recovery due to sample matrix.
(5) Elevated RDL due to sample matrix. Unacceptable matrix spike recovery noted on undiluted sample.

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Dalhousie University
Department of Oceanography
Halifax, N.S.
B3H 4J1

08-June-10 Maxxam Analytics Inc., 200 Bluewater Road, Bedford, NS, B4B 1G9

Attention: Michelle Hill Re: Determination of chlorophyll a in algae by fluorescence

Maxxam Project#: B068678

Acidification Technique:

Maxxam ID	Client ID	Chl a (µg/L)
GA6227-02R	LSD-31.05.10	1.21
GA6238-02R	KL1-31.05.10	1.73
GA6239-02R	KL2-31.05.10	0.73
GA6240-02R	KL3-31.05.10	1.30
GA6241-02R	KL4-31.05.10	0.92
GA6242-02R	HWY102-1-31.05	18.12
GA6244-02R	HWY102-2-31.05	0.85
GA6247-02R	PML1-31.05.10	0.82
GA6249-02R	PML2-31.05.10	3.50

Welschmeyer Technique:

Maxxam ID	Client ID	Chl a (µg/L)
GA6227-02R	LSD-31.05.10	1.32
GA6238-02R	KL1-31.05.10	1.61
GA6239-02R	KL2-31.05.10	0.66
GA6240-02R	KL3-31.05.10	1.09
GA6241-02R	KL4-31.05.10	0.77
GA6242-02R	HWY102-1-31.05	17.62
GA6244-02R	HWY102-2-31.05	0.85
GA6247-02R	PML1-31.05.10	0.74
GA6249-02R	PML2-31.05.10	3.39

phone: (902)494-6663 fax: (902)494-2039

- CHl a = chlorophyll a
- An underestimation of chl a occurs by the fluorescence acidification technique in the presence of Chl b. Since chl b containing chlorophytes are often present in freshwater ecosystems another technique (welschmeyer) was also employed.
- Reference for Welschmeyer technique Limnol. Oceanogr., 39(8) 1994, 1985-1992

Received: 02-June-10
Completed: 03-June-10

Cathy Ryan

Cathy Ryan

phone: (902)494-6663 fax: (902)494-2039