

Real Time Water Quality Monthly Report Waterford River March 2006

General

 Data from the Waterford River monitoring station is monitored by the Water Resources Management Division staff on a monthly basis.

Maintenance and Calibration of Instrumentation

• The following table displays the dates when the Datasonde was removed for routine cleaning, maintenance and calibration and when it was redeployed during the month of March.

Table 1: Table of Datasonde removal and installation dates

Date Installed	Date Removed				
	March 16, 2006				
March 17, 2006					

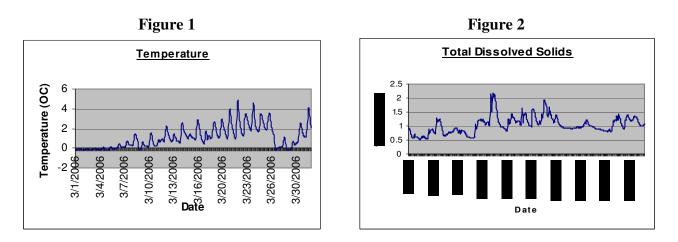
• Water quality readings were taken with a Minisonde at the time of removal for comparison purposes. The Minisonde was calibrated prior to use.

Data Interpretation

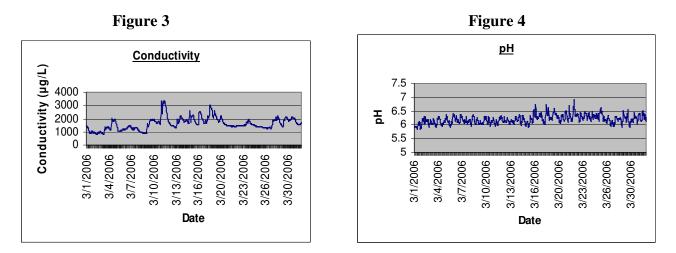
- Areas in the graphs where the data lines go abruptly down to the x axis and show no readings occur when the datasonde is removed for routine cleaning, maintenance and calibration. The dates where this occurs correspond to Table 1 above.
- In general, water quality parameters were stable during the month of March with expected daily/nightly (diurnal) and seasonal changes occurring.
- Water temperatures fluctuated in response to daily maximum and minimum air temperatures. This is demonstrated by comparing the graph in **Figure 1** to the air temperature data in **Table 2**. A warming trend was experienced during the second half of the month.

	Daily Data Report for March 2006										
Day	<u>Max</u> <u>Temp</u>	<u>Min</u> <u>Temp</u>	<u>Mean</u> <u>Temp</u>	<u>Heat</u> <u>Deg</u> Days	<u>Cool</u> <u>Deg</u> <u>Days</u>	<u>Total</u> <u>Rain</u>	<u>Total</u> <u>Snow</u>	<u>Total</u> <u>Precip</u>	<u>Snow</u> <u>on</u> <u>Grnd</u>	<u>Dir of</u> <u>Max</u> <u>Gust</u>	<u>Spd</u> <u>of</u> <u>Max</u>
	°C	°C	°C	с	с	mm	cm	mm	cm	10's Deg	<u>Gust</u> km/h
<u>01†</u>	-0.1	-11	-5.6	23.6	0	0.6	16.2	16.8	80	11	74
<u>02†</u>	-0.5	-7.4	-4	22	0	0	6.6	6	95	26	83
<u>03†</u>	-2	-7.9	-5	23	0	0	12.5	12	96	26	59
<u>04†</u>	-2.4	-7.7	-5.1	23.1	0	0	т	т	106	26	67
<u>05†</u>	-0.8	-6	-3.4	21.4	0	0	0.8	0.8	104	22	67
<u>06†</u>	0.8	-2.2	-0.7	18.7	0	0	т	т	100	24	41
<u>07†</u>	-1.2	-3.9	-2.6	20.6	0	0	1	1	96	36	43
<u>08†</u>	2	-3.8	-0.9	18.9	0	0	9	8.6	93		<31
<u>09†</u>	-2.3	-3.9	-3.1	21.1	0	1.4	4.8	5.2	97	36	57
<u>10†</u>	-0.9	-8	-4.5	22.5	0	0	т	т	96	33	48
<u>11†</u>	0.7	-4.3	-1.8	19.8	0	14.4	3.4	17.8	90	16E	56E
<u>12†</u>	1.2	-3	-0.9	18.9	0	0	0	0	79	29E	48E
<u>13†</u>	0.3	-3.9	-1.8	19.8	0	0	5.2	4.8	76	29	44
<u>14†</u>	0.5	-2.6	-1.1	19.1	0	0	0.6	0.4	78	31	61
<u>15†</u>	1.6	-2.6	-0.5	18.5	0	13	0.2	13.2	75	25E	61E
<u>16†</u>	3	-1.9	0.6	17.4	0	0	3.2	1.8	68	18	33
<u>17†</u>	0.4	-4.5	-2.1	20.1	0	0	4.4	4.4	67		<31
<u>18†</u>	0.3	-5.7	-2.7	20.7	0	0	6.6	6.6	66	12	44
<u>19†</u>	0.3	-3.4	-1.6	19.6	0	5	0	5	66	1	35
<u>20†</u>	0.7	-2.9	-1.1	19.1	0	0	0.4	0.4	63	20E	56E
<u>21†</u>	0.4	-3.9	-1.8	19.8	0	0	0	0	61		<31
<u>22†</u>	2.3	-5.5	-1.6	19.6	0	0	0	0	59		<31
<u>23†</u>	0.6	-4.5	-2	20	0	0.4	0	0.4	51	2	41
<u>24†</u>	2.1	-1	0.6	17.4	0	0	0.4	0.4	49	2	32
<u>25†</u>	1.8	-1.3	0.3	17.7	0	0	т	т	46		<31
<u>26†</u>	2.5	-1.9	0.3	17.7	0	0	т	т	40	7	44
<u>27†</u>	-1	-2.5	-1.8	19.8	0	1.4	17.8	17.4	38	6E	67E
<u>28†</u>	-1.1	-4.2	-2.7	20.7	0	0	13.8	13.8	54		<31
<u>29†</u>	-0.6	-3.5	-2.1	20.1	0	3.2	1.8	5	65		<31
<u>30†</u>	2	-1.1	0.5	17.5	0	0.4	т	0.4	62		<31
<u>31†</u>	2.9	-0.5	1.2	16.8	0	0	т	т	57		<31
Sum				615	0	39.8	108.7	142.2			
Avg	0.4	-4.1	-1.8								

Table 2: Weather information for St. John's, NL provided by Environment Canada for March 2006



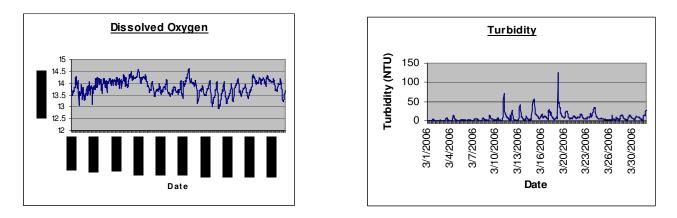
• Total dissolved solids levels reflected the changes in conductivity as observed in Figure 2. Conductivity measurements are a good indication of total dissolved solids and total dissolved ion concentrations, although this is not an exact linear relationship.



- Conductivity levels fluctuated throughout the month as observed in Figure 3. The higher conductivity
 readings usually occurred in response to precipitation events and warmer temperatures causing runoff from
 melting snow.
- The pH levels for the month of March ranged from 5.82 to 6.92. There were some instances where the pH measurements were outside the CCME recommended Canadian Water Quality Guidelines for the Protection of Aquatic Life of 6.5 to 9 (Figure 4). The average pH level for March was 6.20. (Table 3).



Figure 6



- Dissolved oxygen levels ranged between 12.93 mg/L to 14.60 mg/L during the period of measurement (Figure 5). During the month of March, dissolved oxygen measurements were consistently above the CCME recommended maximum guideline of 9.5 mg/L. The average DO level for the period of measure was 13.85 mg/L (Table 3).
- Turbidity levels fluctuated and had several spikes noted throughout the month. The turbidity spikes (Figure 6) are normally in response to precipitation events. The high turbidity readings can be attributed to warm air temperatures causing snow melt and subsequent runoff and precipitation events. Several turbidity spikes exceeded the CCME recommended maximum of 8 NTU above background levels.

Additional Information

 Table 3 provides summary statistics on water quality parameters for Waterford River during the month of March 2006.

	Water Temperature	рН	Conductance	Dissolved Solids	% Saturated	Dissolved Oxygen	Turbidity
Max	4.84	6.92	3387.00	2.17	103.90	14.60	126.30
Min	-0.22	5.82	786.00	0.50	89.30	12.93	0.00
Average	1.09	6.20	1621.29	1.04	98.28	13.85	8.15
Standard							
Deviation	1.10	0.16	470.15	0.30	2.47	0.31	11.36

Table 3: Summary statistics for March 2006.

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