

**Real Time Water Quality Monthly Report
Waterford River - St. John's NL
November 2009**

General

- Data from the Waterford River monitoring station is monitored by the Water Resources Management Division staff.

Maintenance and Calibration of Instrumentation

- The following table displays the dates when the Waterford River water quality probe was installed and removed during this deployment period for routine cleaning, maintenance and calibration.

Table 1: Table of Water Quality Probe Installation and Removal

Date Installed	Date Removed
October 22, 2009	November 26, 2009

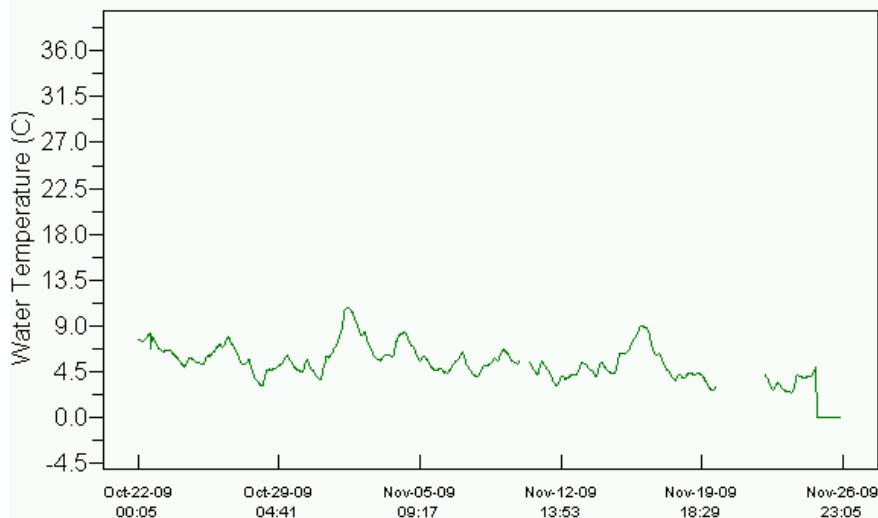
- Water quality readings were taken with a second water quality instrument at the time of installation and removal for QAQC comparison. The QAQC instrument was calibrated prior to each use.

Data Interpretation

- **Water temperature** is shown in **Figure 1** below. Water temperatures demonstrated diurnal fluctuations and a seasonal decreasing trend during this deployment. This is further illustrated by comparing the graph in **Figure 1** below, to the air temperature data in **Appendix 1** at the end of this report. Water temperatures ranged between 2.46 and 10.81°C, which is within the expected range for this station at this time of year.

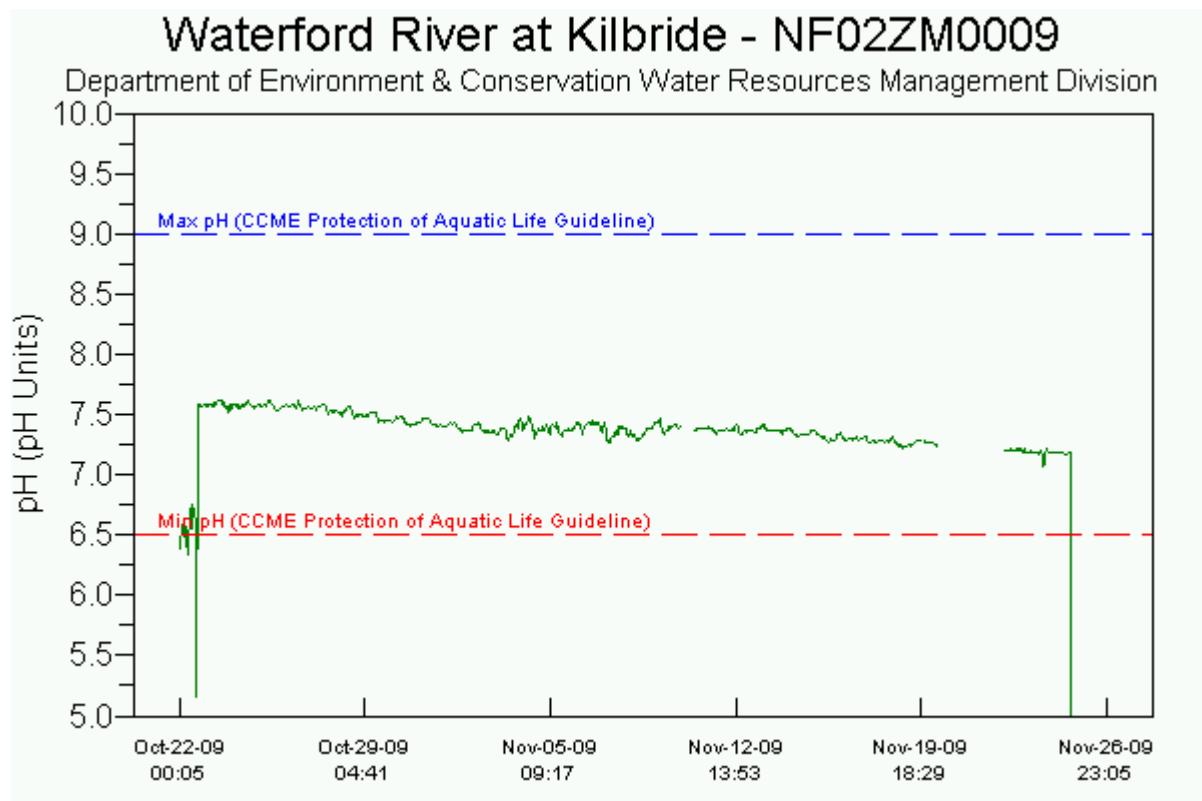
**Figure 1: Water Temperature
Waterford River at Kilbride - NF02ZM0009**

Department of Environment & Conservation Water Resources Management Division



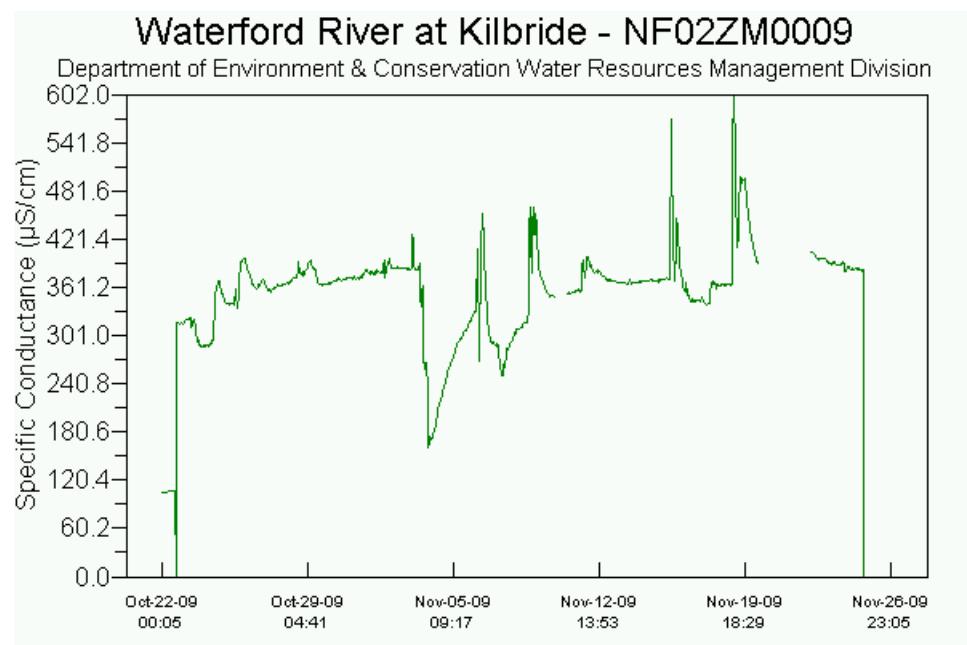
- The **dissolved oxygen** (DO) sensor was malfunctioning during this deployment and the DO data is unreliable for the period of this report.
- **pH** levels ranged from 7.07 to 7.62 units, as seen in **Figure 2** below. All pH values were within the range recommended by the Canadian Water Quality Guidelines for the Protection of Aquatic Life of 6.5 to 9 pH units (**Figure 2**).

Figure 2: pH Levels



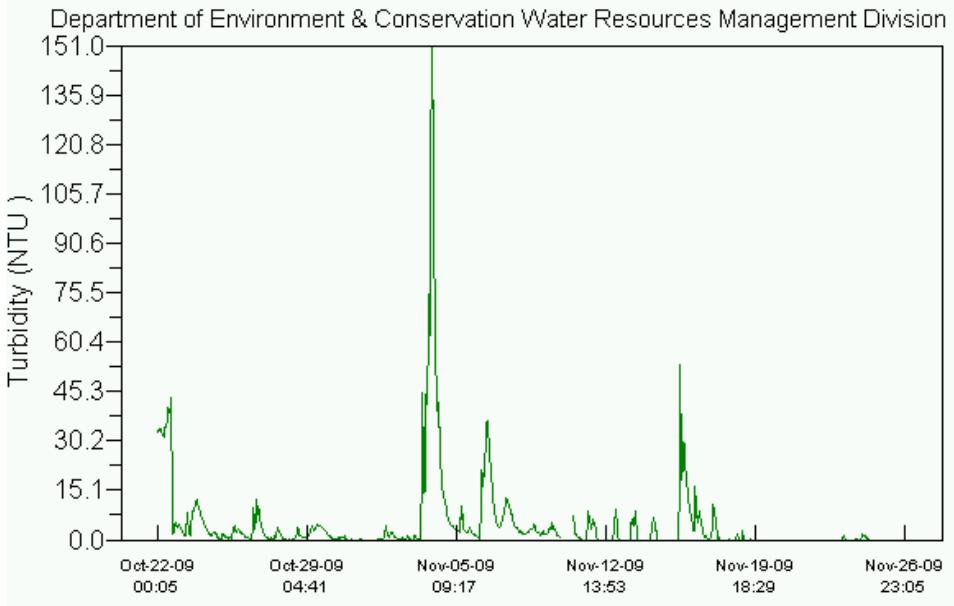
- **Specific conductance levels** are shown in **Figure 3** below. Specific conductance ranged between 161 and 602 μ S/cm during this deployment. Sudden drops in conductance levels generally correspond with rainfall events, with the rainfall having a dilution effect on conductivity, lowering its values. This dilution effect is seasonal for urban streams, since freezing temperatures initiate road salting operations in urban environments, and precipitation run-off subsequently causes spikes in specific conductance. Specific conductance levels can be compared to **stage** levels shown in **Figure 3**, and precipitation events, which are shown in **Appendix 1** at the end of this report. Specific conductance values are within the expected range for this station at this time of year.

Figure 3: Specific Conductance



Turbidity levels are displayed in Figure 4, below. Turbidity remained near background levels for most of this deployment, with the exception of peaks which occurred near November 3rd-4th, 6th and 14th-17th. Each of these peaks appears to be the result of precipitation events, which are recorded in Appendix 1 at the end of this report. Turbidity ranged between 0 and 151 NTUs during this deployment period.

Figure 4: Turbidity
Waterford River at Kilbride - NF02ZM0009



APPENDIX 1: Weather information for St. John's, NL provided by Environment Canada for November 2009:

Daily Data Report for November 2009

Day	Max Temp °C	Min Temp °C	Mean Temp °C	Heat Deg Days °C	Cool Deg Days °C	Total Rain mm	Total Snow cm	Total Precip mm	Snow on Grnd cm	Dir of Max Gust 10's Deg	Spd of Max Gust km/h
<u>01</u>	17.1	6.7	11.9	6.1	0.0	2.8	0.0	2.8	0	25E	85E
<u>02</u>	6.7	1.1	3.9	14.1	0.0	0.0	0.0	0.0	0	7E	32E
<u>03</u>	12.5	1.3	6.9	11.1	0.0	24.0	0.0	24.0	0	21E	54E
<u>04</u>	14.8	2.3	8.6	9.4	0.0	15.4	0.0	15.4	0	28E	52E
<u>05</u>	5.2	-1.6	1.8	16.2	0.0	0.0	0.0	0.0	0	29E	59E
<u>06</u>	5.1	-0.6	2.3	15.7	0.0	13.2	2.2	15.4	0	M	M
<u>07</u>	5.6	-1.3	2.2	15.8	0.0	3.4	0.4	3.8	0	34E	74E
<u>08</u>	6.5	-2.2	2.2	15.8	0.0	2.6	0.0	2.6	T	24E	46E
<u>09</u>	7.7	3.5	5.6	12.4	0.0	0.6	0.0	0.6	0	28E	56E
<u>10</u>	7.7	-2.5	2.6	15.4	0.0	0.0	0.0	0.0	0		<31
<u>11</u>	5.2	-2.8	1.2	16.8	0.0	T	1.8	1.8	0	35E	44E
<u>12</u>	3.2	-2.8	0.2	17.8	0.0	0.0	0.0	0.0	1	M	M
<u>13</u>	5.6	0.2	2.9	15.1	0.0	T	T	T	T	M	M
<u>14</u>	7.4	-1.0	3.2	14.8	0.0	0.0	0.0	0.0	0	27E	46E
<u>15</u>	10.0	3.9	7.0	11.0	0.0	9.4	0.0	9.4	0	27E	57E
<u>16</u>	13.2	4.2	8.7	9.3	0.0	5.4	0.0	5.4	0	25E	61E
<u>17</u>	4.4	-0.9	1.8	16.2	0.0	1.0	0.8	1.8	0	29E	70E
<u>18</u>	3.6	-2.1	0.8	17.2	0.0	0.2	0.0	0.2	T	30E	54E
<u>19</u>	2.9	-3.5	-0.3	18.3	0.0	T	T	T	0	34E	61E
<u>20</u>	6.7	-2.7	2.0	16.0	0.0	0.0	0.0	0.0	0	27E	52E
<u>21</u>	12.1	3.5	7.8	10.2	0.0	3.0	0.0	3.0	0	24E	69E
<u>22</u>	4.8	-2.1	1.4	16.6	0.0	0.2	0.8	0.8	0	33E	37E
<u>23</u>	3.0	-3.9	-0.5	18.5	0.0	0.0	0.0	0.0	T	27E	59E
<u>24</u>	5.6	0.9	3.3	14.7	0.0	0.0	0.0	0.0	T	27E	56E
<u>25</u>	6.0	1.8	3.9	14.1	0.0	0.0	0.0	0.0	0		<31
<u>26</u>	13.9	5.7	9.8	8.2	0.0	8.8	0.0	8.8	0	22E	59E
<u>27</u>	12.9	5.5	9.2	8.8	0.0	17.2	0.0	17.2	0	19E	52E
<u>28</u>	14.6	8.6	11.6	6.4	0.0	1.4	0.0	1.4	0	19E	59E
<u>29</u>	9.9	0.9	5.4	12.6	0.0	0.6	0.4	1.0	0	26E	67E
<u>30</u>	11.8	1.0	6.4	11.6	0.0	3.8	T	3.8	0	27E	82E
Sum				406.2	0.0	113.0	6.4	119.2			
Avg	8.2	0.7	4.5								
Xtrm	17.1	-3.9							25*	85*	

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