

Real Time Water Quality Monthly Report Come by Chance River November-December, 2007

General

- The Water Resources Management Division staff monitors the real-time web page on a daily basis.
- Newfoundland and Labrador Refining Company will be informed of any significant water quality events in the form of a monthly report.

Maintenance and Calibration of Instrumentation

- The datasonde was deployed on November 16, 2007. A second set of data readings was collected at the time of installation, using a similar, freshly calibrated instrument. Data readings from both instruments were compared and their variability was ranked, as part of QA/QC protocol.
- The QA/QC rankings when comparing water quality data from both instruments at the time of installation are indicated in **Table 1**, below. All parameters ranked as either “excellent” or “good” which meets the Departments protocol for QA/QC comparisons and indicates a high degree of confidence in the accuracy of data collected during this deployment period.

Table 1: QA/QC Data Comparison Rankings upon reinstallation on November 16th, 2007

Station	Date	Action	Minisonde vs. Datasonde Comparison Ranking			
			Temperature	pH	Conductivity	Dissolved Oxygen
Come by Chance River	November 16	Installation	Excellent	Good	Excellent	Excellent

- The Come by Chance instrument was deployed until December 11th, 2007 at which point it was removed for routine maintenance and calibration. A second set of data readings was collected at the time of removal using a similar, freshly calibrated instrument. Data readings from both instruments were compared and their variability was ranked, as part of QA/QC protocol.

Table 2: QA/QC Data Comparison Rankings upon removal on December 11th, 2007

Station	Date	Action	Minisonde vs. Datasonde Comparison Ranking			
			Temperature	pH	Conductivity	Dissolved Oxygen
Come by Chance River	December 11	Removal	Good	Good	Excellent	Excellent

- Rankings of “good” and “excellent” were achieved when comparing parameter readings from an instrument that had been deployed for 25 days with a clean freshly calibrated instrument, thus indicating a high level of confidence in the accuracy of data collected from the deployed instrument.

Data Interpretation

- This monthly report interprets the data from the Come by Chance River RTWQ station for the period of November 16th-December 11th, 2007.

- Data gaps appear to occur sporadically and will continue to be monitored and investigated until this issue is resolved.
- The water temperature data for this deployment period indicated a decreasing trend, as expected, in response to seasonally decreasing air temperatures. Water temperatures ranged between 7.46°C and -0.30°C. Diurnal fluctuations in water temperature are visible in the graph, as water temperature is typically higher during the day and lower at night. Less variability is seen as water temperatures hovered near freezing.

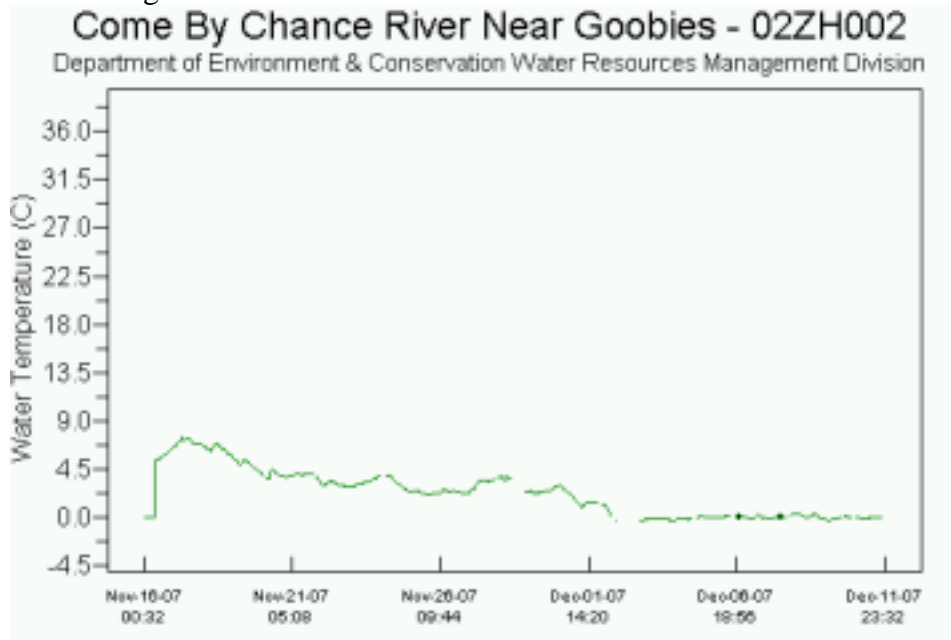


Figure 1

- The dissolved oxygen values (**Figure 2**) showed an increasing trend during this deployment period, in response to seasonally decreasing water temperatures. Colder water can hold more dissolved oxygen than warmer water. Dissolved oxygen (DO) values ranged from 11.41 to 13.93mg/L and all values were above the minimum DO concentrations recommended by the Canadian Council of Ministers of the Environment (CCME) Protection of Freshwater Aquatic Life guidelines (cold water/other life stages – above 6.5; warm water/other life stages – above 5.5; warm water/early life stages – above 6; cold water/early life stages – above 9.5 mg/L).

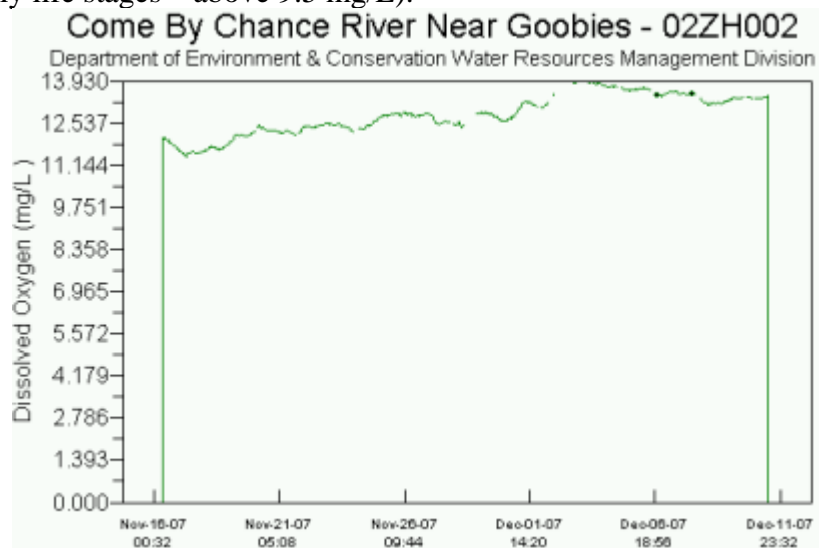


Figure 2

- The pH values (**Figure 3**) for Come by Chance River remained relatively stable throughout the deployment period. The pH values ranged from 6.09-6.64 pH units with most values falling below the optimum pH range recommended by the CCME Protection of Freshwater Aquatic Life guidelines of 6.5 – 9.0. Fresh water bodies in NL frequently have pH values below the CCME recommended range, which may result from the typically acidic nature of the surrounding terrain. Sudden decreases in pH values occurred November 21st and 27th, as shown in figure 3, below. These lower pH values correspond with significant precipitation events that occurred on the same dates. Daily climate data is found in **Appendix 1**, at the end of this report.

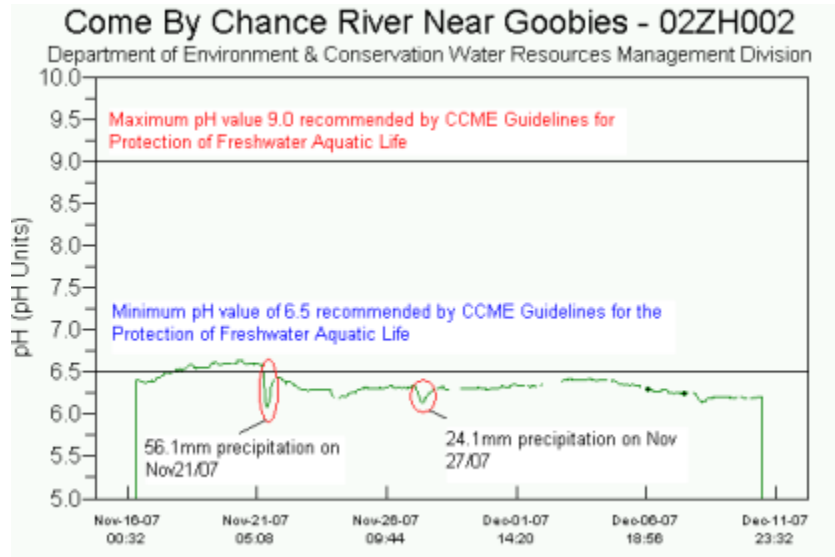


Figure 3

- Specific conductivity values (Figure 4), ranged from 44 to 77.9 μ S/cm throughout the reported period. Fluctuations in conductivity values can be influenced by precipitation events, which can have a dilution effect causing a decrease in conductivity, or can increase conductivity depending on the characteristics of the land run-off. Significant precipitation events that occurred on November 21st and 27th had an immediate dilution effect on conductivity values in Come by Chance River, followed by an increase in conductivity, probably influenced by road salt being washed into the river from land run-off.

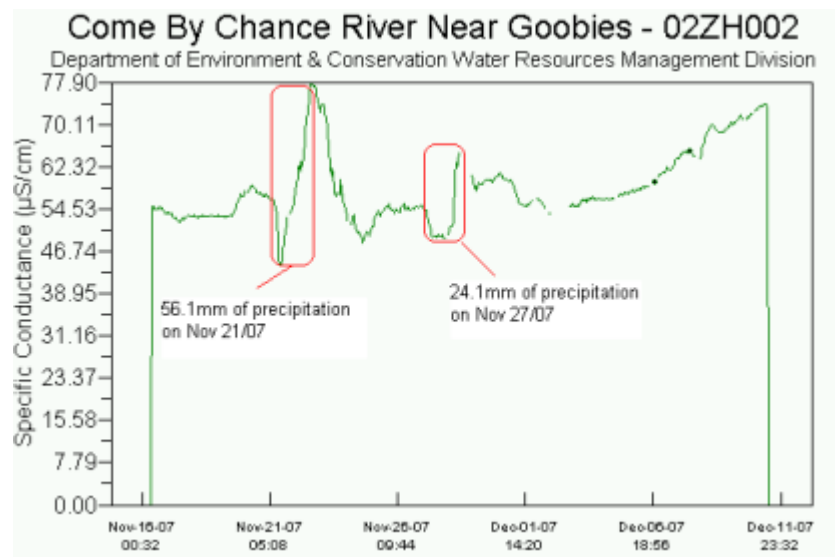


Figure 4

- Turbidity values spiked from 0 to 28 NTU on November 21st and from 0 to 4.1 NTU on December 3rd, as shown below in **Figure 5**. Significant precipitation events on those dates, as well as wind gusts up to 102km/h on December 3rd, as indicated in Appendix A (below), may have influenced the turbidity values. Turbidity values remained at 0 NTU for most of the deployment period.

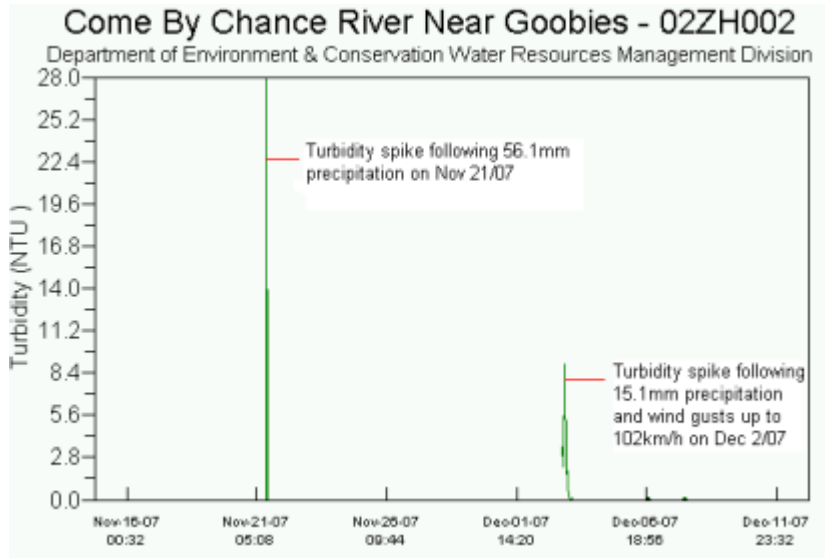


Figure 5

- Stage height fluctuated during the deployment period, as shown in **Figure 6** below. Increases in stage height appear to coincide with rainfall events, as highlighted in the Daily Climate Data Report in **Appendix A**, below.

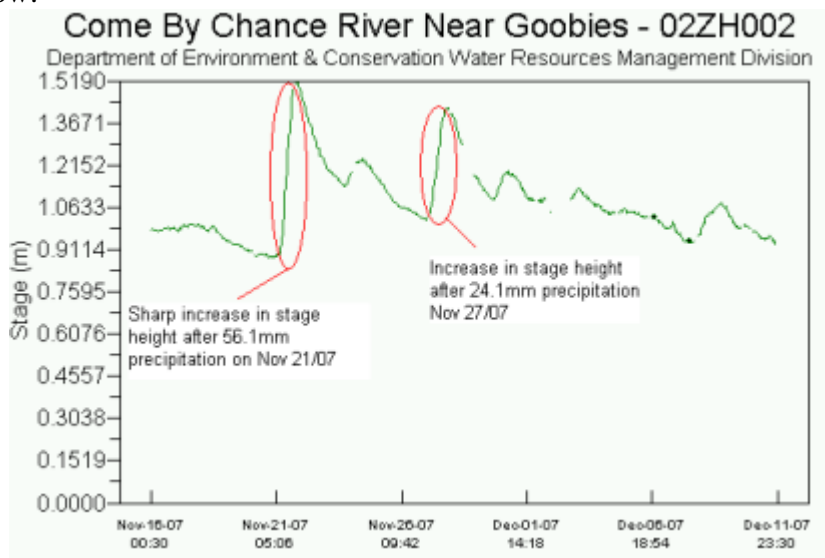


Figure 6

Prepared by: Joanne Sweeney
Environmental Scientist
Water Resources Management Division
Department of Environment and Conservation
Ph: (709) 729-0351

Appendix A: Climate Data for Argentina, NL (November-December 2007)

Daily Data Report for November 2007					
D a y	Max Temp °C	Min Temp °C	Mean Temp °C	Total Precip mm	Spd of Max Gust km/h
16†	17.0	10.7	13.9	1.3	72
17†	14.3	5.4	9.9	5.7	96
18†	7.4	0.4	3.9	0.0	37
19†	1.6	-1.8	-0.1	0.0	41
20†	2.7	-1.5	0.6	3.4	48
21†	6.1	1.5	3.8	56.1	61
22†	4.0	0.8	2.4	0.0	<31
23†	11.5	1.0	6.3	2.4	37
24†	10.6	0.2	5.4	16.0	74
25†	4.0	-0.3	1.9	0.0	54
26†	6.5	2.6	4.6	1.3	59
27†	12.3	4.5	8.4	21.4	87
28†	8.7	-0.7	4.0	0.0	87
29†	4.4	-2.3	1.1	0.0	57
30†	8.9	0.0	4.5	6.3	76

Daily Data Report for December 2007					
D a y	Max Temp °C	Min Temp °C	Mean Temp °C	Total Precip mm	Spd of Max Gust km/h
01†	2.0E	-0.2E	0.9E	M	69E
02†	2.0	0.3	1.2	15.1	102
03†	3.2	-0.4	1.4	0.7	83
04†	3.9	-1.1	1.4	4.5	56
05†	4.8	1.5	3.2	0.6	54
06†	3.1	0.4	1.8	6.3	52
07†	1.0	-3.0	-1.0	0.0	46
08†	6.7	-0.9	2.9	2.6	74
09†	2.3	-7.3	-2.5	1.2	69
10†	-3.0	-6.8	-4.9	0.0	67
11†	-2.8	-4.8	-3.8	0.0	54