# Real Time Water Quality Monthly Report
# Come by Chance River
# July 2007—September 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 future in the form of a monthly report.

## Maintenance and Calibration of Instrumentation

- The Datasonde was reinstalled on July 13th, 2007.
- The QA/QC rating for temperature is listed as 'good' (**Table 1**). This is likely due to the fact that the first transmission from the Datasonde was recorded half an hour after installation at mid-day (during which time water temperature may have increased the recorded difference of ~0.2°C). This is supported by the rating of 'excellent' that was achieved at the time of removal (**Table 2**).

**Table 1: QA/QC Data Comparison Rankings upon reinstallation on July 13th, 2007**

| Station | Date | Action | Minisonde vs. Datasonde Comparison Ranking | | | |
|---|---|---|---|---|---|---|
| | | | Temperature | pH | Conductivity | Dissolved Oxygen |
| Come by Chance River | July 13th | Installation | Good | Excellent | Excellent | Excellent |

- The Come by Chance instrument was deployed until September 4th, 2007 (a 54-day deployment period) at which point it was removed for maintenance and calibration. The extended deployment period was due to staff availability.

**Table 2: QA/QC Data Comparison Rankings upon removal on September 4th, 2007**

| Station | Date | Action | Minisonde vs. Datasonde Comparison Ranking | | | |
|---|---|---|---|---|---|---|
| | | | Temperature | pH | Conductivity | Dissolved Oxygen |
| Come by Chance River | September 4th | Removal | Excellent | Good | Good | Excellent |

- Due to a continued communications problem, data gaps exist for the reporting period, most significantly for the August 2 – August 21, 2007 period. This problem continues to be looked into by staff. Data for the time period without transmission has been downloaded from the datalogger directly and supplied to WRMD staff.

## Data Interpretation

- This monthly report interprets the data from the Come by Chance River RTWQ station for the period of July 13th, 2007 – September 4th, 2007.

- The water temperature **(Figure 1)** readings for Come by Chance River remained fairly consistent over the recorded deployment period. Values were as expected at this time of the year with a temperature range of 16.51 – 23.35°C.

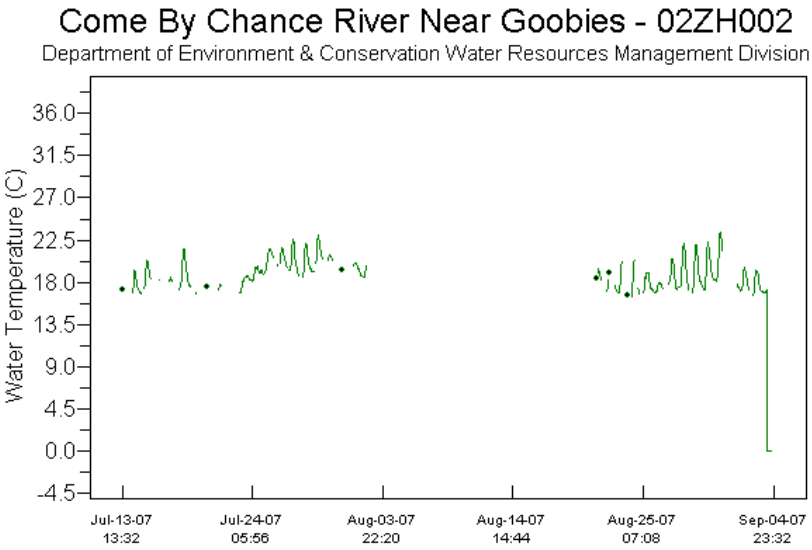


**Figure 1**

- The dissolved oxygen values (**Figure 2**) remained fairly stable over the deployment period. The recorded dissolved oxygen values ranged from 8.25 mg/L to 9.39 mg/L and are in line with the recommended CCME Protection of Aquatic Life guidelines for dissolved oxygen (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 – 9.5 mg/L). Only the most conservative CCME guideline (9.5 mg/L for cold water/early life stages) was not met. Two events occurred that caused the reading to drop to zero (0). These were likely a result of sensor malfunction. The event on August 1st, 2007 coincides with an increase in stage that was a response to an extreme precipitation event (see **Appendix A** for climatological data).

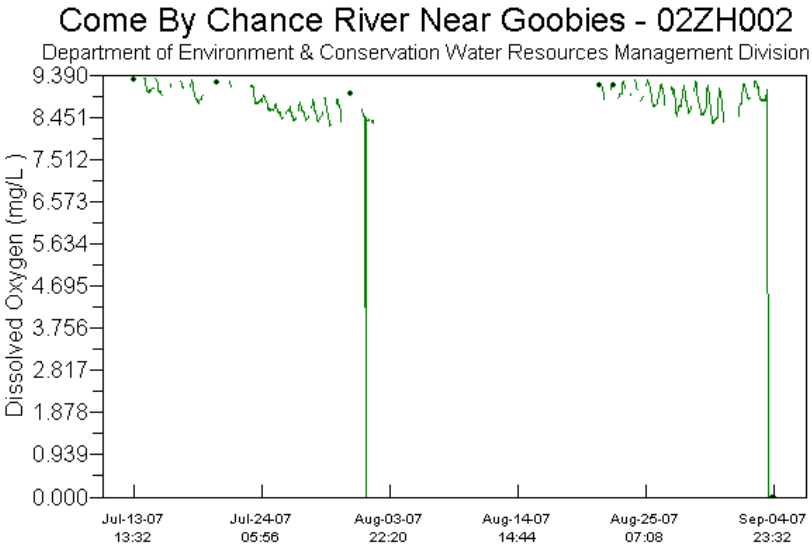


**Figure 2**

- The pH values **(Figure 3)** for Come by Chance River remained relatively stable throughout the deployment period. The pH values ranged from 5.95 – 6.54 with an average value of 6.31 which is under the lower limit of the recommended range (6.5 – 9.0) for the CCME Protection of Aquatic Life guidelines. Low pH values are largely attributed to the natural acidity of NL waters.

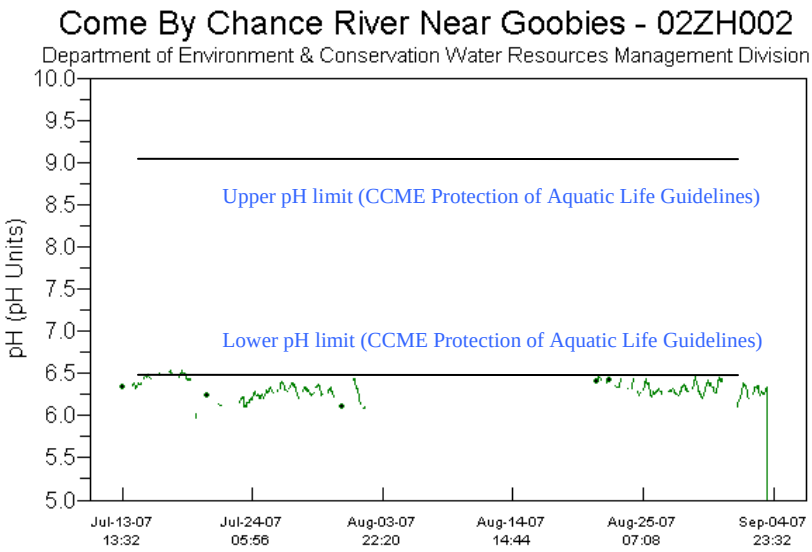


**Figure 3**

- The specific conductivity values (**Figure 4)** varied throughout the reported period. The variation may be a response to the variations in stage (**Figure 6**), but were not extreme. There was sharp decline in conductivity values (decrease to zero) prior to removal of the Datasonde, which is likely a result of sensor obstruction or malfunction, as seen with the sudden drop in dissolved oxygen (**Figure 2**). Outside of this event, values ranged from 48.4 – 73.1 µS/cm.

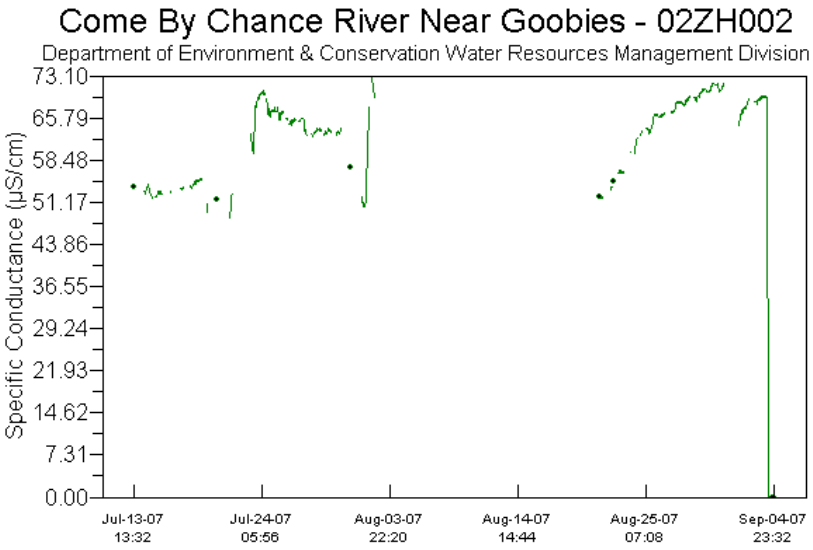


**Figure 4**

- Aside from the most extreme turbidity reading of 862 NTU (**Figure 5**), recorded values ranged from 0 - 471 NTU throughout the deployment period, with the majority of readings below100 NTU. The value of 862 NTU is inconsistent with the other readings and may have been due to sensor obstruction (i.e. debris). It coincides with a rainfall event (see **Appendix A** for climatological data), and a slight increase in stage (**Figure 6**). It is also noted that the readings towards the end of the deployment period began to significantly increase. This may be attributed to the possible obstruction previously mentioned, fouling of the sensor, and loss of instrument calibration attributed to the deployment period. Concurrently, mild rainfall events in early September may have contributed to these readings.

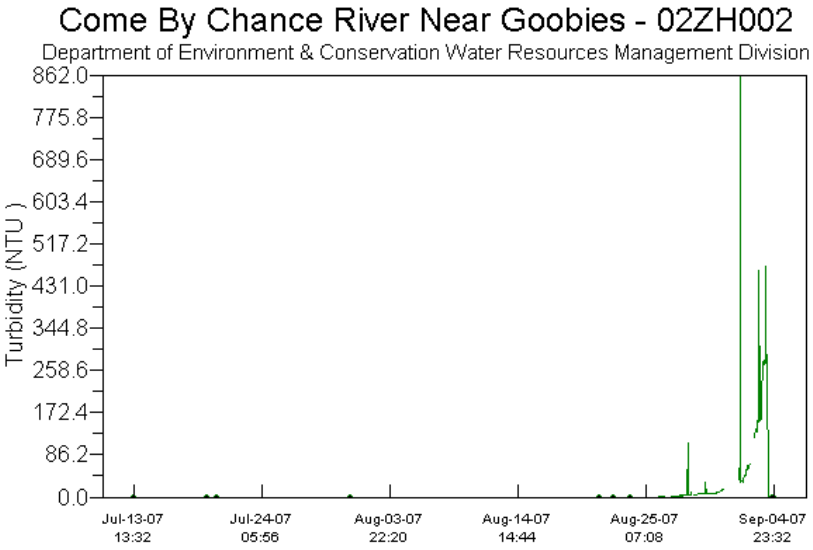


**Figure 5**

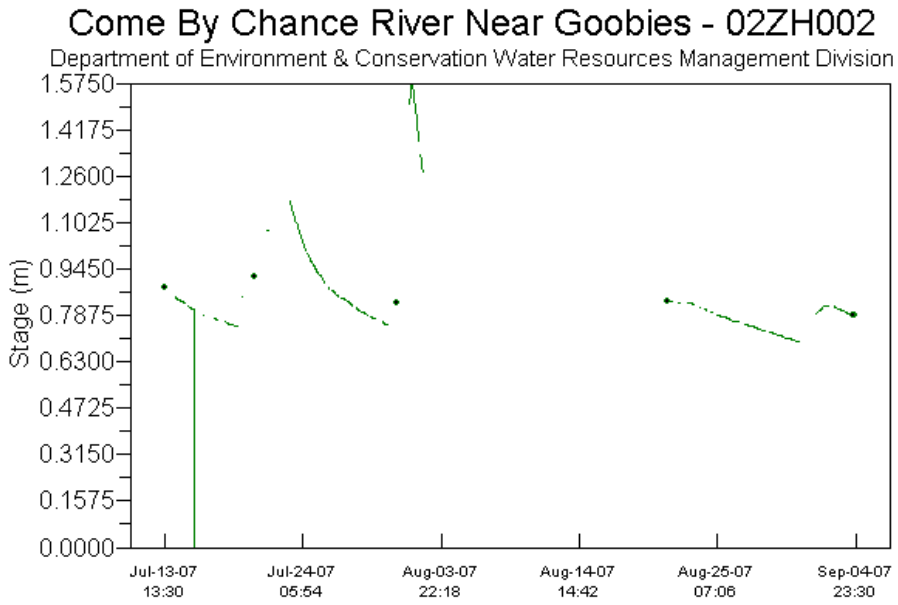


**Figure 6**

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Appendix A – Climate Data for Argentia, NL (July 2007 - September 2007)

| Daily Data Report for July 2007 | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 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 |
| 01 | 11.8 | 7.6 | 9.7 | 8.3 | 0.0 | | | 0.0 | 0 | | |
| 02 | 14.3 | 7.6 | 11.0 | 7.0 | 0.0 | | | 0.0 | 0 | | |
| 03 | 11.0 | 7.6 | 9.3 | 8.7 | 0.0 | | | 0.0 | 0 | | |
| 04 | 12.9 | 7.3 | 10.1 | 7.9 | 0.0 | | | 0.0 | 0 | | |
| 05 | 14.3 | 8.3 | 11.3 | 6.7 | 0.0 | | | 1.8 | 0 | | |
| 06 | 15.8 | 10.6 | 13.2 | 4.8 | 0.0 | | | 62.1 | 0 | | |
| 07 | 16.2 | 10.4 | 13.3 | 4.7 | 0.0 | | | 11.7 | 0 | | |
| 08 | 12.8 | 9.5 | 11.2 | 6.8 | 0.0 | | | 15.1 | 0 | | |
| 09 | 12.8 | 8.5 | 10.7 | 7.3 | 0.0 | | | 0.0 | 0 | | |
| 10 | 13.0 | 7.9 | 10.5 | 7.5 | 0.0 | | | 0.0 | 0 | | |
| 11 | 14.7 | 9.6 | 12.2 | 5.8 | 0.0 | | | 0.0 | 0 | | |
| 12 | 19.0 | 9.5 | 14.3 | 3.7 | 0.0 | | | 1.4 | 0 | | |
| 13 | 17.6 | 12.7 | 15.2 | 2.8 | 0.0 | | | 1.3 | 0 | | |
| 14 | 14.5 | 11.2 | 12.9 | 5.1 | 0.0 | | | 0.0 | 0 | | |
| 15 | 18.6 | 11.6 | 15.1 | 2.9 | 0.0 | | | 0.0 | 0 | | |
| 16 | 19.8 | 11.6 | 15.7 | 2.3 | 0.0 | | | 9.1 | 0 | | |
| 17 | 14.3 | 12.3 | 13.3 | 4.7 | 0.0 | | | 2.1 | 0 | | |
| 18 | 17.4 | 11.3 | 14.4 | 3.6 | 0.0 | | | 2.3 | 0 | | |
| 19 | 18.9 | 12.9 | 15.9 | 2.1 | 0.0 | | | 15.1 | 0 | | |
| 20 | 15.6 | 13.6 | 14.6 | 3.4 | 0.0 | | | 0.6 | 0 | | |
| 21 | 16.3 | 14.4 | 15.4 | 2.6 | 0.0 | | | 0.0 | 0 | | |
| 22 | 15.3 | 13.6 | 14.5 | 3.5 | 0.0 | | | 16.1 | 0 | | |
| 23 | 18.1 | 11.9 | 15.0 | 3.0 | 0.0 | | | 0.0 | 0 | | |
| 24 | 16.4 | 12.9 | 14.7 | 3.3 | 0.0 | | | 0.6 | 0 | | |
| 25 | 16.1 | 13.9 | 15.0 | 3.0 | 0.0 | | | 0.0 | 0 | | |
| 26 | 16.6 | 13.2 | 14.9 | 3.1 | 0.0 | | | 1.6 | 0 | | |
| 27 | 19.7 | 11.5 | 15.6 | 2.4 | 0.0 | | | 0.0 | 0 | | |
| 28 | 18.2 | 13.6 | 15.9 | 2.1 | 0.0 | | | 0.0 | 0 | | |
| 29 | 18.6 | 15.4 | 17.0 | 1.0 | 0.0 | | | 0.6 | 0 | | |
| 30 | 20.0 | 15.2 | 17.6 | 0.4 | 0.0 | | | 3.3 | 0 | | |
| 31 | 19.3 | 16.0 | 17.7 | 0.3 | 0.0 | | | 189.3E | 0 | | |
| **Sum** | | | | **130.8** | **0.0** | | | **334.1E** | | | |
| **Avg** | **16.1** | **11.4** | **13.8** | | | | | | | | |
| **Xtrm** | **20.0** | **7.3** | | | | | | | | | |

| Daily Data Report for August 2007 | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 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 |
| 01† | 21.1 | 13.6 | 17.4 | 0.6 | 0.0 | M | M | 8.2 | | 32 | 41 |
| 02† | 17.5 | 11.8 | 14.7 | 3.3 | 0.0 | M | M | 0.0 | | | <31 |
| 03† | 16.7 | 11.7 | 14.2 | 3.8 | 0.0 | M | M | 0.0 | | | <31 |
| 04† | 19.8 | 11.8 | 15.8 | 2.2 | 0.0 | M | M | 0.0 | | 18 | 37 |
| 05† | 19.4 | 13.4E | 16.4E | 1.6E | 0.0E | M | | 0.0 | | M | M |
| 06† | 19.2 | 12.6 | 15.9 | 2.1 | 0.0 | M | M | 0.0 | | 21 | 37 |
| 07† | 19.1 | 12.6E | 15.9E | 2.1E | 0.0E | M | M | 0.7E | | M | M |
| 08† | 20.4 | 16.1 | 18.3 | 0.0 | 0.3 | M | M | 0.0 | | 17 | 46 |
| 09† | 20.3 | 13.2 | 16.8 | 1.2 | 0.0 | M | M | 18.8 | | 18 | 67 |
| 10† | 17.9 | 12.2 | 15.1 | 2.9 | 0.0 | M | M | 0.0 | | 32 | 69 |
| 11† | 18.4 | 14.1 | 16.3 | 1.7 | 0.0 | M | M | 0.0 | | 21 | 39 |
| 12† | 17.9 | 12.2 | 15.1 | 2.9 | 0.0 | M | M | 0.0 | | 21 | 32 |
| 13† | 19.1 | 11.1 | 15.1 | 2.9 | 0.0 | M | M | 0.0 | | 18 | 33 |
| 14† | 23.1 | 13.7 | 18.4 | 0.0 | 0.4 | M | M | 0.0 | | 15 | 41 |
| 15† | 21.4 | 14.0 | 17.7 | 0.3 | 0.0 | M | M | 0.0 | | 19 | 32 |
| 16† | 18.5 | 15.5 | 17.0 | 1.0 | 0.0 | M | M | 0.0 | | 21 | 39 |
| 17† | 19.3 | 15.8 | 17.6 | 0.4 | 0.0 | M | M | 35.0 | | 21 | 61 |
| 18† | 21.1 | 16.3 | 18.7 | 0.0 | 0.7 | M | M | 16.5 | | 20 | 72 |
| 19† | 17.2 | 13.8 | 15.5 | 2.5 | 0.0 | M | M | 0.0 | | 23 | 80 |
| 20† | 16.6 | 13.2 | 14.9 | 3.1 | 0.0 | M | M | 0.0 | | 26 | 54 |
| 21† | 17.0 | 13.1 | 15.1 | 2.9 | 0.0 | M | M | 0.0 | | 24 | 33 |
| 22† | 16.6 | 10.4 | 13.5 | 4.5 | 0.0 | M | M | 0.0 | | 25 | 32 |
| 23† | 16.5 | 9.5 | 13.0 | 5.0 | 0.0 | M | M | 0.0 | | | <31 |
| 24† | 17.5 | 11.0 | 14.3 | 3.7 | 0.0 | M | M | 0.0 | | 22 | 32 |
| 25† | 18.8 | 10.4 | 14.6 | 3.4 | 0.0 | M | M | 0.0 | | | <31 |
| 26† | 18.8 | 12.7 | 15.8 | 2.2 | 0.0 | M | M | 0.0 | | 15 | 32 |
| 27† | 18.6 | 14.5 | 16.6 | 1.4 | 0.0 | M | M | 0.0 | | | <31 |
| 28† | 19.1 | 14.3 | 16.7 | 1.3 | 0.0 | M | M | 0.0 | | | <31 |
| 29† | 19.3 | 14.1 | 16.7 | 1.3 | 0.0 | M | M | 0.0 | | 22 | 33 |
| 30† | 19.0 | 14.6 | 16.8 | 1.2 | 0.0 | M | M | 0.0 | | 21 | 35 |
| 31† | 20.3 | 16.4 | 18.4 | 0.0 | 0.4 | M | M | 0.0 | | | <31 |
| **Sum** | | | | **61.5E** | **1.8E** | **M** | **M** | **79.2E** | | | |
| **Avg** | **18.9** | **13.2E** | **16.05E** | | | | | | | | |
| **Xtrm** | **23.1** | **9.5E** | | | | | | | | **23*** | **80*** |

| Daily Data Report for September 2007 | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 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 |
| 01† | 20.8 | 13.5 | 17.2 | 0.8 | 0.0 | M | M | 9.9 | | 19 | 78 |
| 02† | 17.8 | 10.7 | 14.3 | 3.7 | 0.0 | M | M | 0.0 | | 36 | 56 |
| 03† | 16.6 | 9.8 | 13.2 | 4.8 | 0.0 | M | M | 0.0 | | 21 | 46 |
| 04† | 16.1 | 13.4 | 14.8 | 3.2 | 0.0 | M | M | 3.5 | | 21 | 48 |