

**Real Time Water Quality Deployment Report
NF02ZK0023 - Rattling Brook below Bridge (Vale Inco)
December 2008 – January 2009**

General

- The Water Resources Management Division staff monitors the real-time web page on a daily basis.
- Vale Inco will be informed of any significant water quality events in the form of a monthly report.
- This monthly report interprets the data from the Rattling Brook River RTWQ station for the period of December 1st, 2008 to January 6th, 2009.
- Throughout the deployment period, there were several instances where the data did not transmit successfully, resulting in data gaps. The transmission of the data ceased on Dec. 20th, therefore the data analyzed in this report is from Dec. 1st – 20th, 2008. This transmission issue will be addressed by the Water Survey of Canada staff in the spring when they can transport in new equipment for replacement purposes. Until the transmission issues are corrected, the water quality data will be logged internally on the instrument and will be available in the upcoming deployment reports. Real-time water quality data will not be available on the web page until this transmission problem is rectified.

Maintenance and Calibration of Instrumentation

- The Rattling Brook instrument was deployed on December 1st, 2008 and removed on January 6th, 2009. A second set of data readings were collected at the time of installation and 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 (as seen in **Table 1**).
- The QA/QC rankings upon comparing water quality data from both instruments for the installation at the start of the deployment period and removal at the end of the deployment period are both indicated in **Table 1**. Upon installation, rankings of “good” and “excellent” were achieved for all parameters except pH, which ranked as “fair”. In this particular instance, the problem was likely a result of the QA sonde used which did not calibrate for pH effectively. Upon removal, the rankings ranged from “Fair” to “Excellent”. The “Fair” ranking for turbidity may have been a result of the field sonde sitting in an area of fast flow where air bubbles were being trapped and affecting the turbidity readings.

Table 1: QA/QC Data Comparison Rankings upon installation on December 1st, 2008 and removal on January 6th, 2009

Station	Date	Action	Instrument Comparison Ranking				
			Temperature	pH	Conductivity	Dissolved Oxygen	Turbidity
Rattling Brook (Long Harbour)	Dec. 1, 2008	Installation	Excellent	Fair	Good	Excellent	NA*
	Jan. 6, 2009	Removal	Excellent	Marginal	Excellent	Good	Fair

* QA/Qc reading for turbidity not available due to use of Minisonde as QA/QC sonde

Data Interpretation

- With the data gaps in the graph, it is very difficult to fully analyse the water temperature results. However, it appears as though water temperature values (**Figure 1**) for the deployment period displayed diurnal fluctuations and showed a slight decrease as expected for the fall/winter season. Water temperature ranged between 1.22 and 8.17°C.

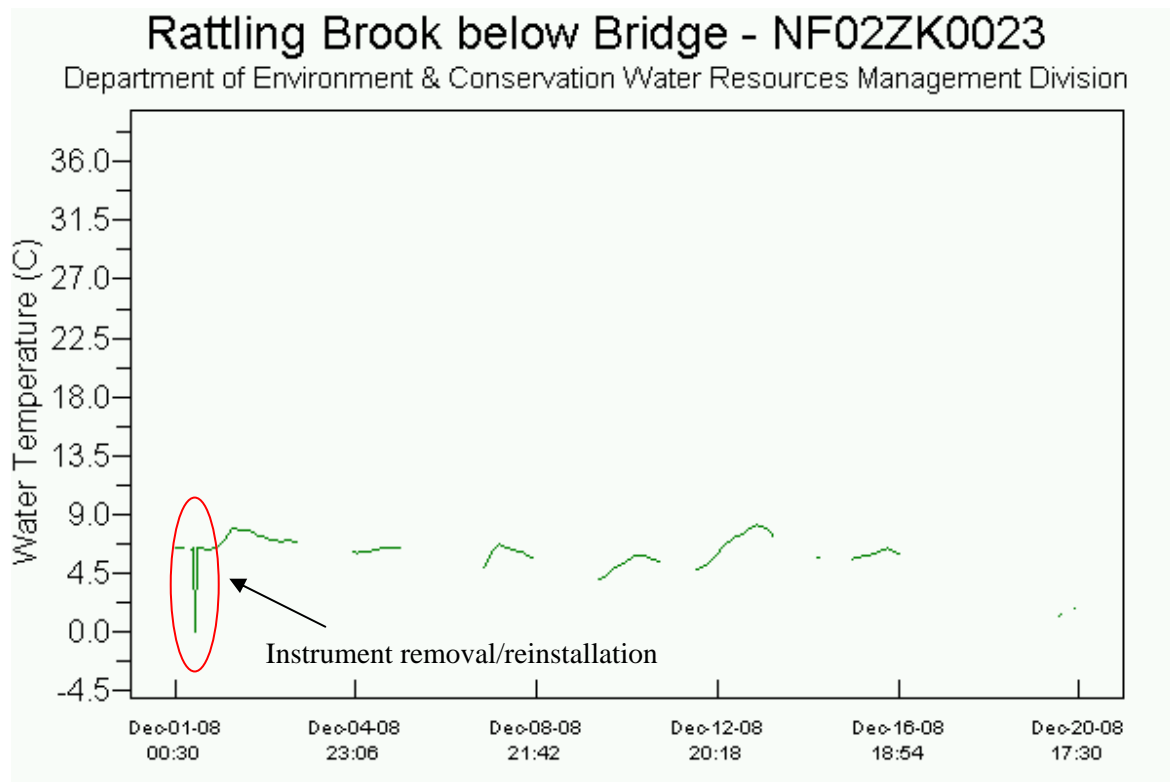


Figure 1

- With the data gaps in the graph, it is very difficult to fully analyse the dissolved oxygen results. Dissolved oxygen (DO) values (**Figure 2**) for the deployment period were somewhat variable. As the water temperature decreased the dissolved oxygen concentration increased. This inverse relationship is evident from the water temperature and dissolved oxygen graphs. DO values ranged from 11.48 to 13.68 mg/L, all 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).

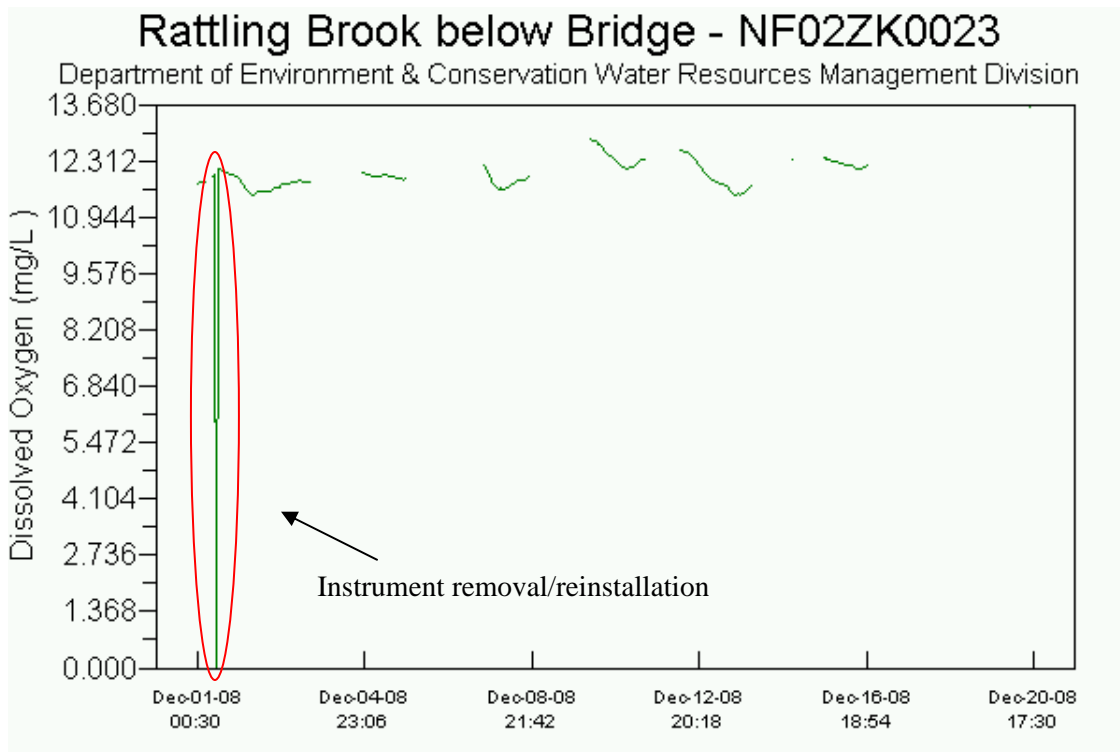


Figure 2

- With the data gaps in the graph, it is very difficult to fully analyse the pH results. pH values (**Figure 3**) were consistent over the deployment period. pH values ranged between 6.04 and 6.3. All values fell just below the minimum pH level of 6.5 recommended by the CCME Guidelines for the Protection of Freshwater Aquatic Life (due to the naturally acidic nature of NL waters).

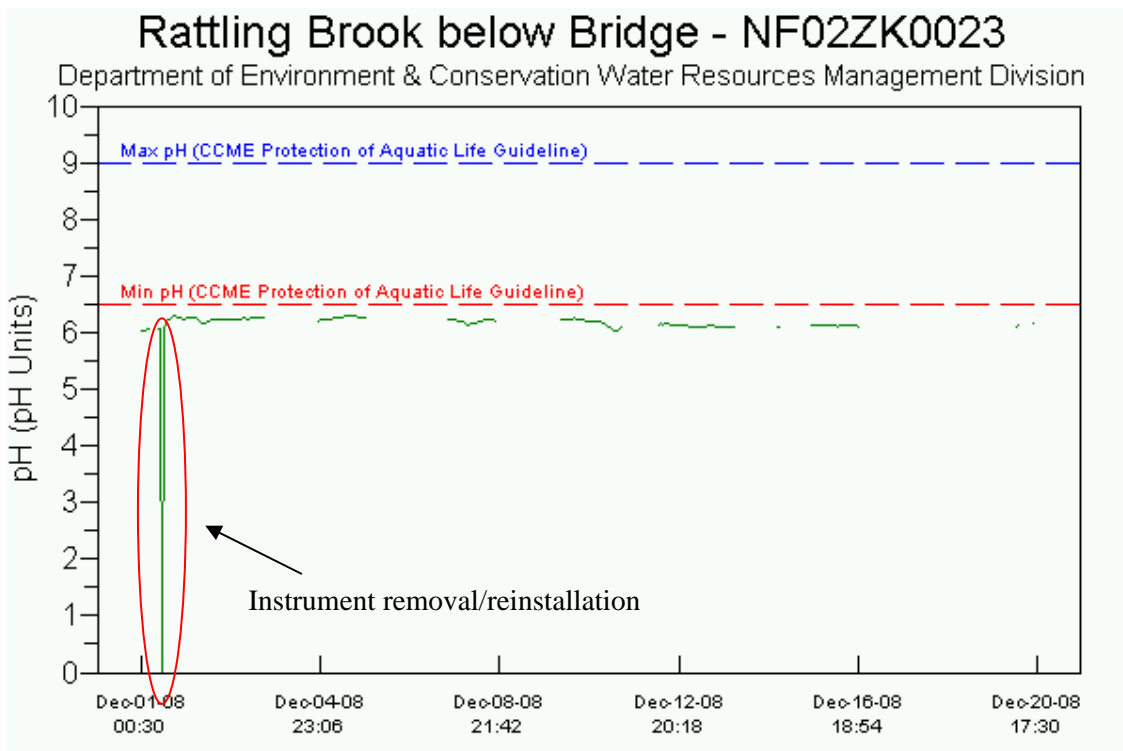


Figure 3

- With the data gaps in the graph, it is very difficult to fully analyse the specific conductance results. Specific conductance values (**Figure 4**) were consistent over the deployment period with a slight decrease over time. Values ranged from 30 to 31.9 μ S/cm which is typical for this station.

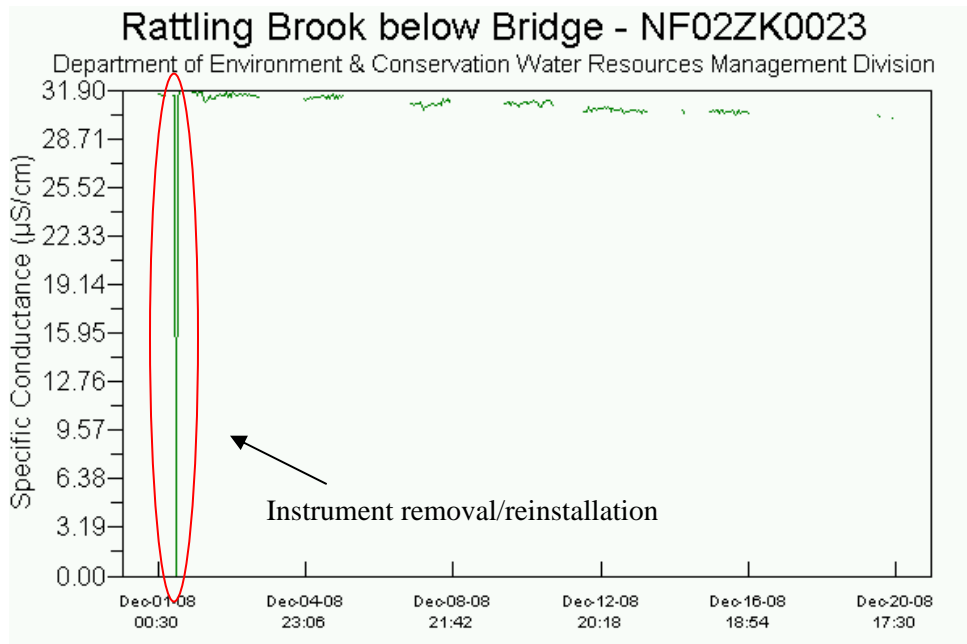


Figure 4

- With the data gaps in the graph, it is very difficult to fully analyse the turbidity results. Turbidity values (**Figure 5**) were variable over the deployment period. The variability of the values are likely due to the fact that the Datasonde was placed in an area of fast flowing water, thus air was being trapped and affecting the turbidity readings. It is also possible that some of the increases in turbidity were due to precipitation events (see Appendix A). There was a maximum turbidity value of 122 NTU recorded during the deployment period.

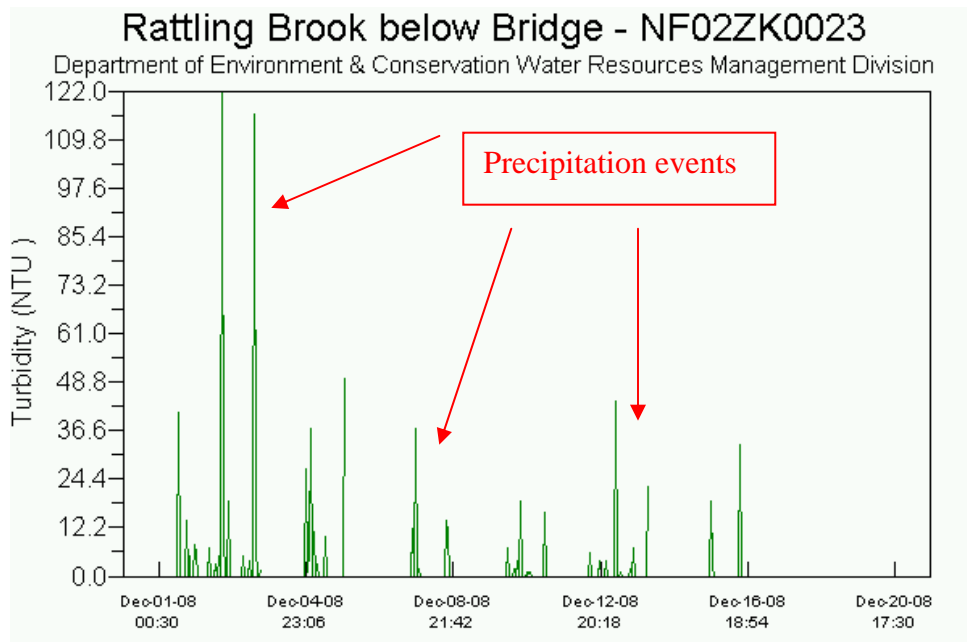


Figure 5

- With the data gaps in the graph, it is very difficult to fully analyse the stage results. Stage readings (**Figure 6**) were consistent with precipitation events in this area (Appendix A). The height of the river ranged from 1.643 to 2.032m.

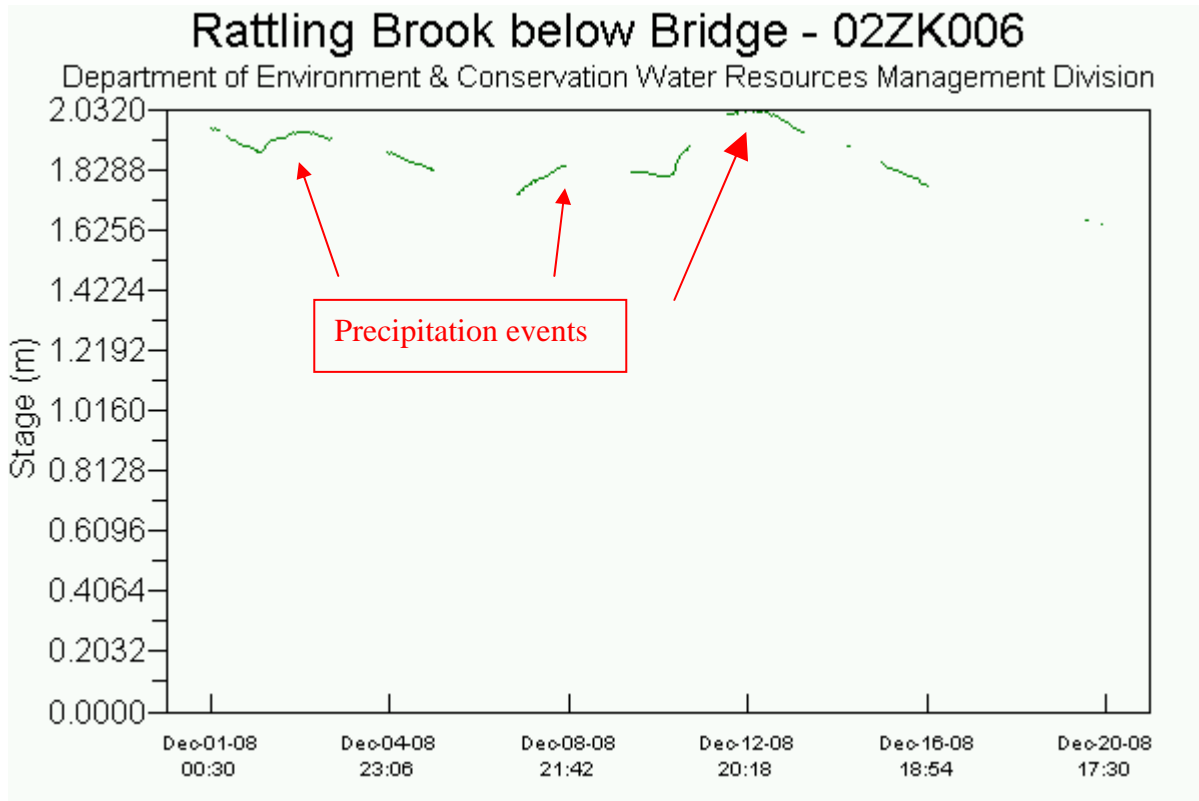


Figure 6

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