

Real Time Water Quality Deployment Report
NF02ZK0023 - Rattling Brook below Bridge (Vale Inco)
March – April 2008

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 March 28 to April 24, 2008.

Maintenance and Calibration of Instrumentation

- The Rattling Brook instrument was deployed on March 28, 2008. A second set of data readings were 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 upon comparing water quality data from both instruments for the removal before the start of the deployment period and the installation at the start of the deployment period are both indicated in **Table 1**. Rankings of “good” and “excellent” were achieved on installation for all parameters except temperature which ranked “fair”. The “fair” temperature ranking may be attributed to a delay between QA and field instrument measurements.

Table 1: QA/QC Data Comparison Rankings upon removal on March 26th, 2008 and installation on March 28th, 2008

Station	Date	Action	Instrument Comparison Ranking			
			Temperature	pH	Conductivity	Dissolved Oxygen
Rattling Brook (Long Harbour)	Mar. 26, 2008	Removal	Good	Excellent	Excellent	Excellent
	Mar. 28, 2008	Installation	Fair	Good	Good	Excellent

- Due to problems with site transmission, data was not available on-line past mid-April. The Rattling Brook instrument was subsequently removed April 24th after a period of 27 days. A second set of data readings were 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.
- The QA/QC rankings upon comparing water quality data from both instruments for the removal at the end of the deployment period and the installation after the deployment period are both indicated in **Table 2**. Rankings of “excellent” and “good” on removal were achieved for all parameters, including temperature which ranked “fair” on installation validating the earlier assumption. The “excellent” and “good” rankings on removal indicate a high degree of accuracy in the data obtained.

Table 2: QA/QC Data Comparison Rankings upon removal on April 24th, 2008 and installation on May 14th, 2008

Station	Date	Action	Instrument Comparison Ranking			
			Temperature	pH	Conductivity	Dissolved Oxygen
Rattling Brook (Long Harbour)	Apr. 24, 2008	Removal	Good	Excellent	Good	Excellent
	May. 14, 2008	Installation	Excellent	Good	Good	Excellent

Data Interpretation

- Water temperature values (**Figure 1**) for the deployment period displayed diurnal fluctuations and generally increased, typical for the spring season. Water temperature ranged between -0.4 and 6.1°C.

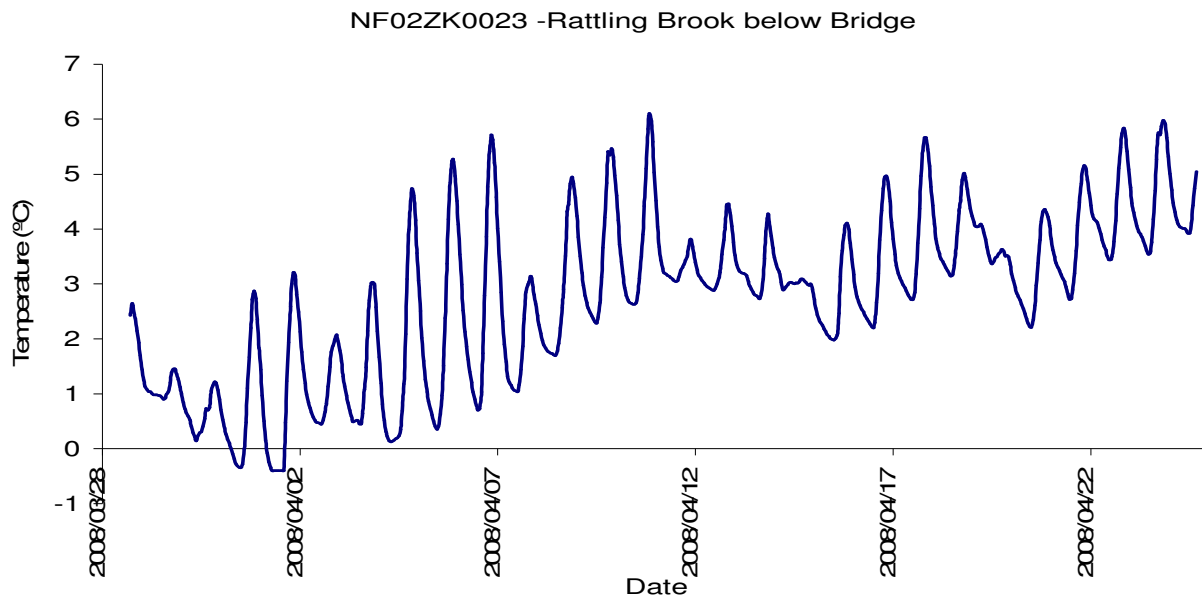


Figure 1

- Dissolved oxygen (DO) values (**Figure 2**) for the deployment period generally decreased, corresponding with the increase in water temperature. DO values ranged from 12.18 to 14.29 mg/L, all values 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).

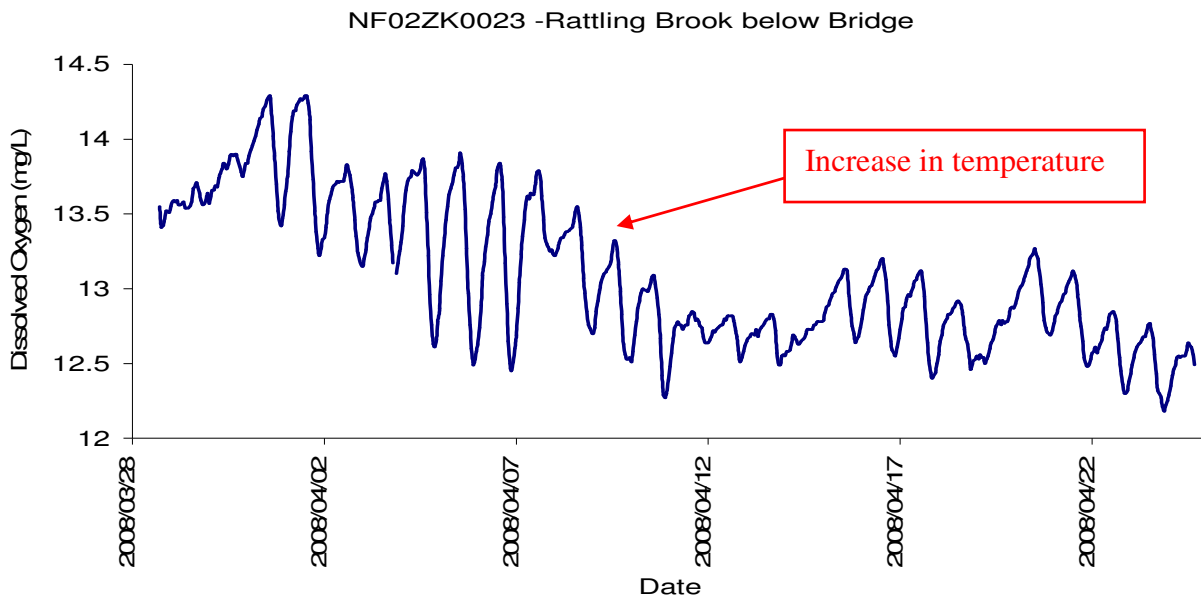


Figure 2

- pH values (Figure 3) were consistent over the deployment period. pH values ranged between 5.71 and 6.07, all values 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).

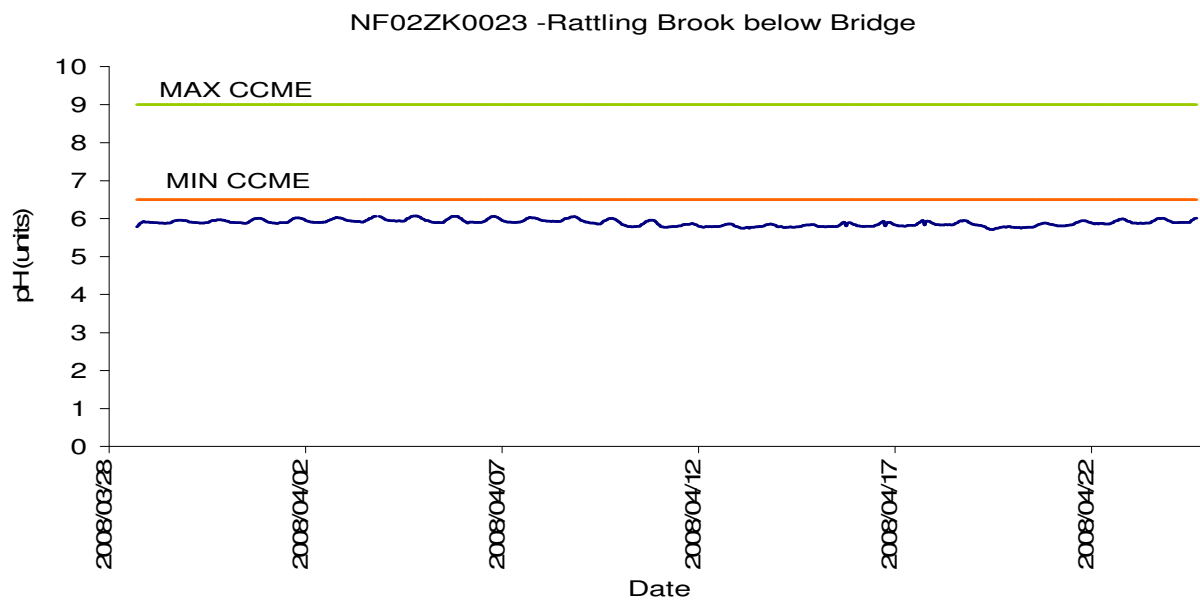


Figure 3

- Specific conductance values (Figure 4) were consistent over the first half of the deployment period but then show a general decrease corresponding to a rise in stage. Specific conductance ranged from 26.1 to 28.2 $\mu\text{S}/\text{cm}$

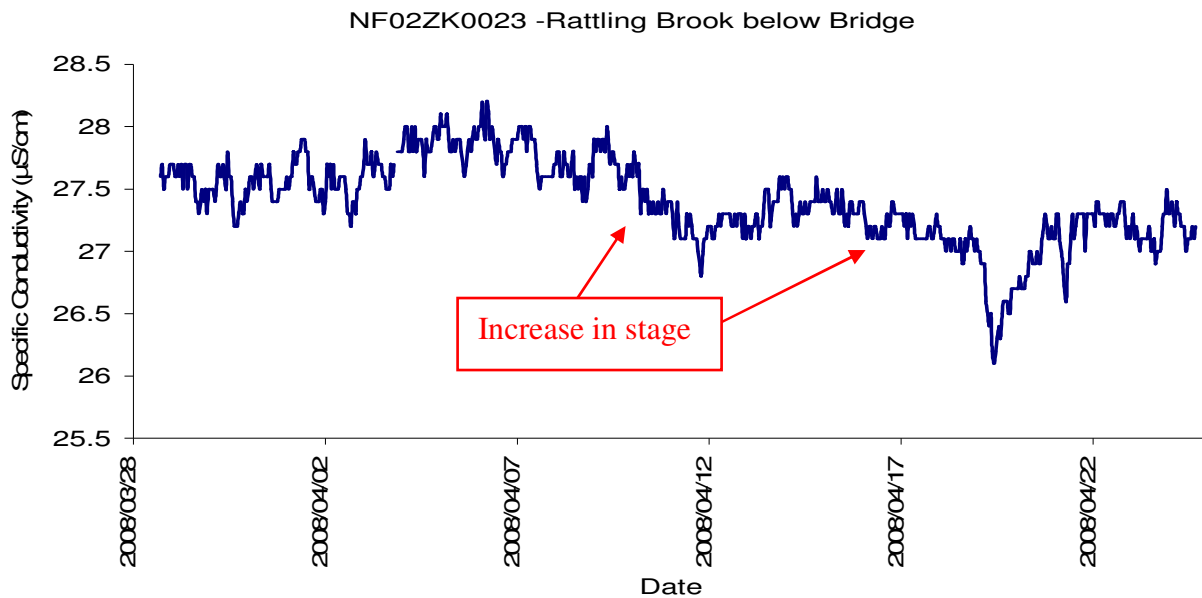


Figure 4

- Generally, turbidity values (**Figure 5**) were at zero NTU for the deployment period, yet spikes in turbidity can be seen over the period. Turbidity spikes may be explained by precipitation events at the same time or sensor interference, such as debris on the turbidity sensor window at the time of measurement. The maximum turbidity value recorded for the deployment period was 48.9 NTU.

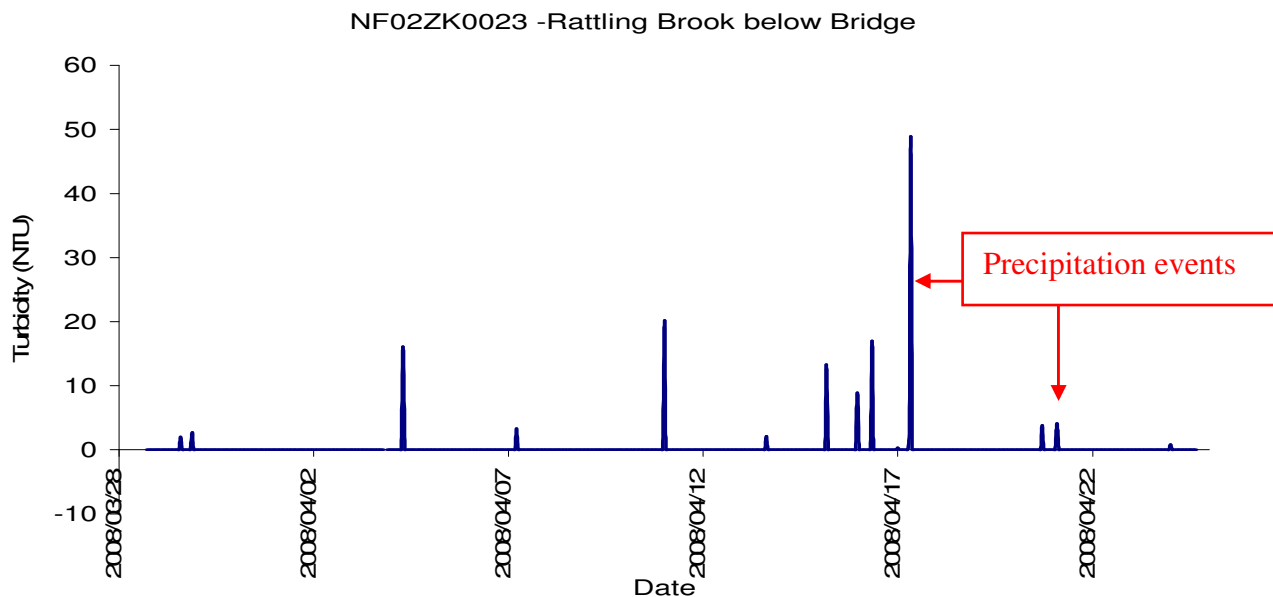


Figure 5

- Stage values (**Figure 6**) were generally stable in the first half of the deployment period, two distinct increases in stage are apparent in the second half. Precipitation events (**Appendix A**) on April 11th and 13th are attributed to the first rise in stage and a heavier period of precipitation on April 18th is attributed to the second rise in stage. Stage values ranged between 1.478 and 1.904 meters.

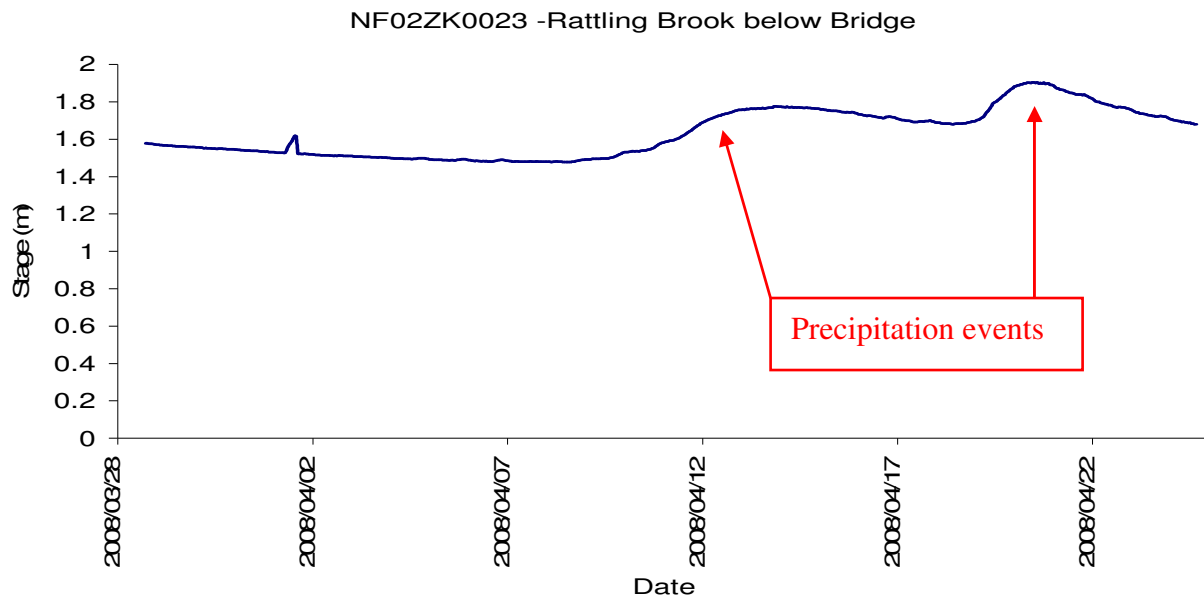


Figure 6

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Appendix A – Climate Data for Argentia, NL (March 28 to April 24, 2008)

Daily Data Report for March 2008											
D a y	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
28†	1.4	-2.3	-0.5	18.5	0.0	M	M	0.0		25	46
29†	0.3	-4.9	-2.3	20.3	0.0	0.0	M	1.9		4	44
30†	-1.3	-7.2	-4.3	22.3	0.0	0.0	M	3.0		2	57
31†	-4.2	-9.7	-7.0	25.0	0.0	M	M	0.0		1	52

Daily Data Report for April 2008											
D a y	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†	-0.9	-9.8	-5.4	23.4	0.0	M	M	0.8		13	63
02†	4.9	-1.7	1.6	16.4	0.0	M	M	5.6		14	85
03†	-0.1	-3.7	-1.9	19.9	0.0	M	M	0.6		25	76
04†	1.6	-2.0	-0.2	18.2	0.0	M	M	1.0		26	63
05†	4.4	-2.2	1.1	16.9	0.0	M	M	0.6		8	32
06†	4.8	-2.6	1.1	16.9	0.0	M	M	0.6		3	46
07†	2.6	-1.9	0.4	17.6	0.0	M	M	3.8		3	56
08†	9.2	1.2	5.2	12.8	0.0	M	M	0.0		3	43
09†	9.2	1.5	5.4	12.6	0.0	M	M	0.0			<31
10†	5.3	1.3	3.3	14.7	0.0	M	M	0.0			<31
11†	5.3	1.3	3.3	14.7	0.0	M	M	6.0		13	37
12†	3.7	0.2	2.0	16.0	0.0	M	M	0.0		21	32
13†	4.1	0.1	2.1	15.9	0.0	M	M	4.2		21	35
14†	2.1	0.0	1.1	16.9	0.0	M	M	0.0		26	70
15†	3.2	-0.1	1.6	16.4	0.0	M	M	1.0		27	70
16†	5.4	-0.5	2.5	15.5	0.0	M	M	0.0		22	43
17†	4.8	0.7	2.8	15.2	0.0	M	M	0.0		21	50
18†	8.9	1.4	5.2	12.8	0.0	M	M	29.2		21	33
19†	4.5	-2.4	1.1	16.9	0.0	M	M	2.4		3	56
20†	6.2	-3.3	1.5	16.5	0.0	M	M	0.0		25	41
21†	5.6	-1.1	2.3	15.7	0.0	M	M	0.0		27	41
22†	4.1	-1.5	1.3	16.7	0.0	M	M	0.0		8	32
23†	3.2	-2.6	0.3	17.7	0.0	M	M	0.0			<31
24†	3.6	-2.3	0.7	17.3	0.0	M	M	0.0			<31