Real Time Water Quality Monthly Report
Rattling Brook below Bridge (VBNC)
May 2007—July 2007

General

- The Water Resources Management Division staff monitors the real-time web page on a daily basis.
- Voisey's Bay Nickel Company (VBNC) will be informed of any significant water quality events in the future in the form of a monthly report.
- The initial installation of the RTWQ instrumentation at Rattling Brook below Bridge occurred on December 12th, 2006.

Maintenance and Calibration of Instrumentation

- The instrument was reinstalled on May 18th, 2007
- On May 15th, reprogramming of the datalogger was performed with an incorrect parameter order, resulting in graphs that show what appear to be anomalous values for dissolved oxygen, specific conductivity, percent saturation and turbidity. Parameter values for the period were, however, normal. In order to deal with this issue, the erroneous parameter order was obtained and data was adjusted for the sake of QA/QC. Explanations of incident are described with the parameter graphs in the data interpretation section of the April-May monthly report for the station. The parameter order was reprogrammed correctly on June 14th, 2007.

Table 1: QA/QC Data Comparison Rankings upon reinstallation on May 18th, 2007

Station	Date	Action	Minisonde vs. Datasonde Comparison Ranking			
			Temperature	pH	Conductivity	Dissolved Oxygen
Rattling Brook (Long Harbour)	May 18th	Reinstallation	Excellent	Fair	Excellent	Excellent

- The Rattling Brook instrument was deployed until July 12th, 2007 (55-day deployment period) at which point it was removed for maintenance and calibration. It was left at the site for longer than normal due to availability of staff and a delay in calibration solution supply.

Table 2: QA/QC Data Comparison Rankings upon removal on July 12th, 2007

Station	Date	Action	Minisonde vs. Datasonde Comparison Ranking			
			Temperature	pH	Conductivity	Dissolved Oxygen
Rattling Brook (Long Harbour)	July 12th	Removal	Good	Good	Excellent	Excellent

Data Interpretation

- This monthly report interprets the data from the Rattling Brook RTWQ station in Long Harbour for the period of May 18thth, 2007 – July 12thth, 2007

- The water temperature **(Figure 1)** readings for Rattling Brook remained fairly consistent over the deployment period with a gradual increase in temperatures. This is expected at this time of the year with a temperature range of 7.9– 22.17^{o}C.

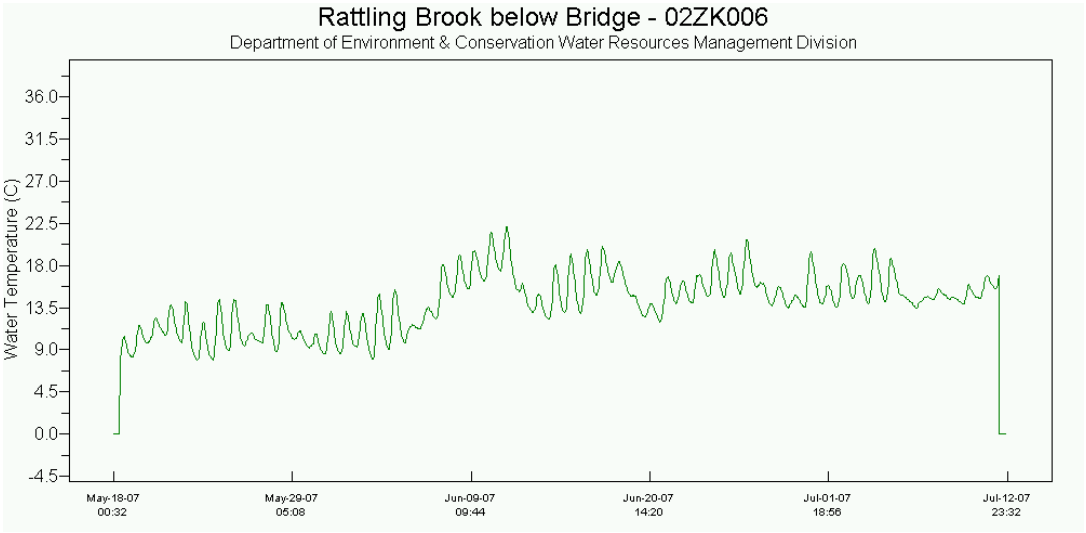

Figure 1

- The dissolved oxygen (DO) values (**Figure 2**) remained fairly consistent over the deployment period with a gradual decrease in values. This is consistent with the increase in temperature seen in **Figure 1**. On May 15th, the datalogger was reprogrammed with an incorrect parameter order, and data for DO values can be found in the specific conductivity graph for the period of May 18th to June 14th. The dissolved oxygen values ranged from 8.45 mg/L to 12.16 mg/L. For the most part, these values fall within 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). Some of the values were below the most conservative CCME guideline of 9.5 mg/L.

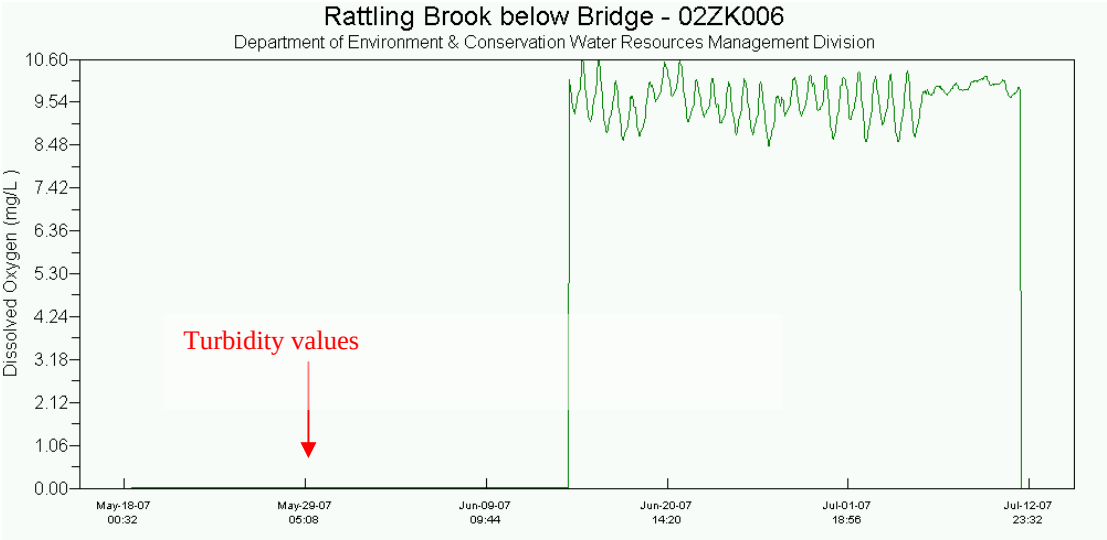

Figure 2

- The pH values **(Figure 3)** for Rattling Brook station remained consistent throughout the deployment period. The pH values ranged from 5.08 – 6.47 with all values falling outside the recommended range (6.5 – 9.0) for the CCME Protection of Aquatic Life guidelines due to the naturally acidic nature of NL waters. The gradual decrease in values is attributed to sensor drift, due to the extended deployment period.

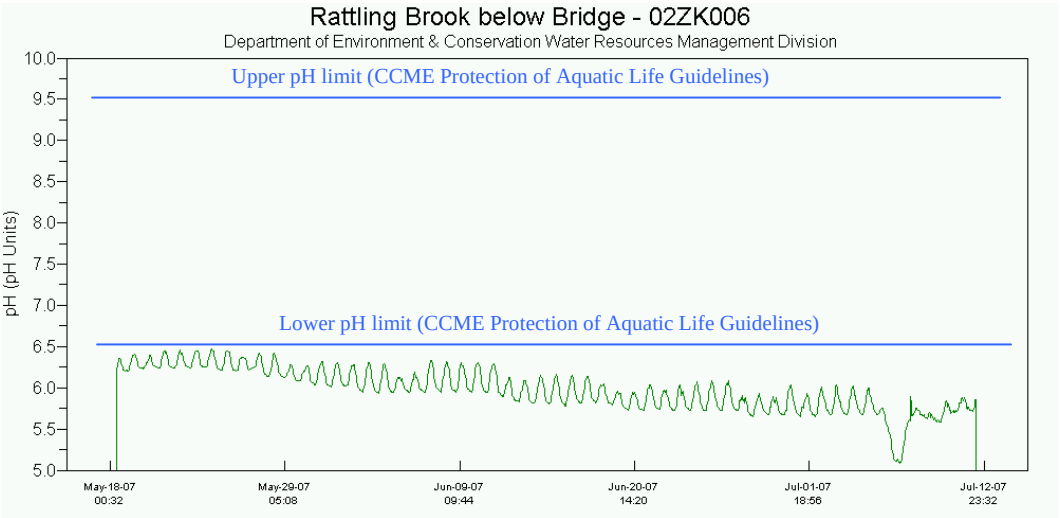

Figure 3

- On May 15th, the datalogger was reprogrammed with an incorrect parameter order, and data for specific conductivity values were logged as percent saturation for the period of May 18th to June 14th. The specific conductivity values (**Figure 4)** remained consistent throughout the deployment period with values ranged from 34.6– 41.1 µS/cm.

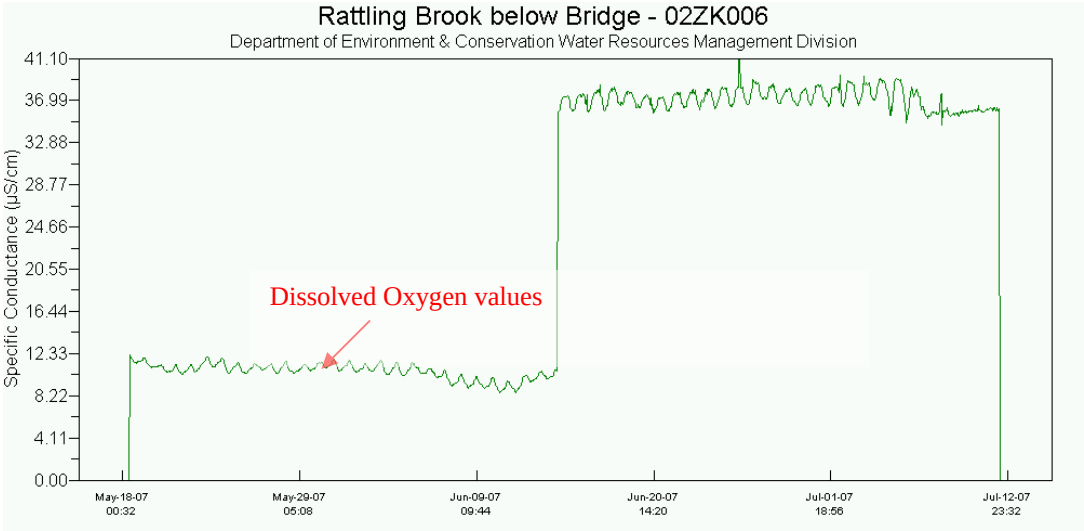

Figure 4

- On May 15th, the datalogger was reprogrammed with an incorrect parameter order, and data for turbidity values can be found in the dissolved oxygen graph for the period of May 18th to June 14th. The turbidity values (**Figure 5**) ranged between 0 -2545 NTU throughout the deployment period. The very high values are likely a result of an obstruction on the turbidity sensor, such as a leaf, as no other parameters were affected. The highest values occurred after a gradual increase in turbidity values and are concurrent with heavy rainfall (see **Appendix A** for climatological data). With the exception of this event, the majority of readings were under 50 NTU.

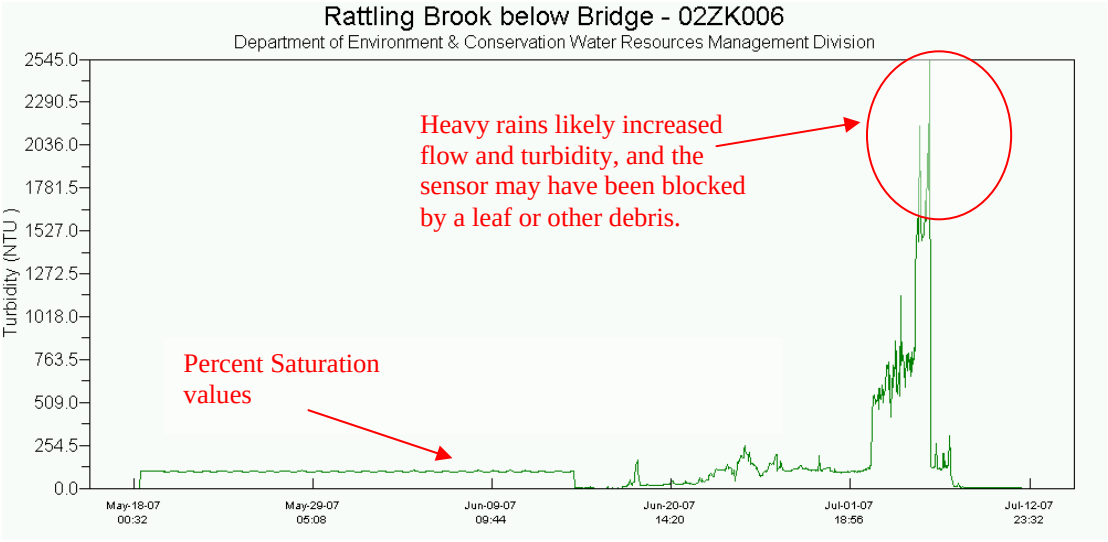

Figure 5

Prepared by: Jennifer Bonnell
Regional Water Quality Officer
Department of Environment and Conservation
PH: (709) 729-4048
FX: (709) 729-0320

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

Daily Data Report for May 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	7.0	2.8	4.9	13.1	0.0			15.8	0		
02	4.1	1.3	2.7	15.3	0.0			0.7	0		
03	3.2	-0.3	1.5	16.5	0.0			0.0	0		
04	2.8	0.8	1.8	16.2	0.0			1.9	0		
05	5.8	1.1	3.5	14.5	0.0			0.0	0		
06	6.4	1.8	4.1	13.9	0.0			0.0	0		
07	5.8	1.4	3.6	14.4	0.0			0.0	0		
08	10.2	1.8	6.0	12.0	0.0			0.0	0		
09	8.5	2.7	5.6	12.4	0.0			0.0	0		
10	14.6	2.8	8.7	9.3	0.0			0.0	0		
11	11.4	3.6	7.5	10.5	0.0			0.6	0		
12	9.1	3.5	6.3	11.7	0.0			9.2	0		
13	8.5	0.1	4.3	13.7	0.0			0.0	0		
14	7.3	0.4	3.9	14.1	0.0			0.0	0		
15	6.1	-1.5	2.3	15.7	0.0			0.7	0		
16	8.8	2.8	5.8	12.2	0.0			0.0	0		
17	6.5	0.5	3.5	14.5	0.0			11.1	0		
18	9.6	1.6	5.6	12.4	0.0			0.0	0		
19	13.5	1.5	7.5	10.5	0.0			2.5	0		
20	16.8	5.5	11.2	6.8	0.0			3.6	0		
21	12.0	4.8	8.4	9.6	0.0			0.0	0		
22	6.7	3.0	4.9	13.1	0.0			0.6	0		
23	8.1	1.6	4.9	13.1	0.0			0.0	0		
24	10.1	-0.6	4.8	13.2	0.0			0.0	0		
25	18.0	1.8	9.9	8.1	0.0			1.4	0		
26	6.9	3.4	5.2	12.8	0.0			6.8	0		
27	12.3	3.8	8.1	9.9	0.0			0.0	0		
28	8.2	3.2	5.7	12.3	0.0			4.7	0		
29	9.3	4.2	6.8	11.2	0.0			0.7	0		
30	8.6	3.5	6.1	11.9	0.0			0.0	0		
31	11.1	2.6	6.9	11.1	0.0			0.0	0		
Sum				**386.0**	**0.0**			**60.3**			
Avg	**8.9**	**2.1**	**5.5**								
Xtrm	**18.0**	**-1.5**									

Daily Data Report for June 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	8.7	3.1	5.9	12.1	0.0			9.2	0		
02	9.1	4.7	6.9	11.1	0.0			0.0	0		
03	7.6	1.2	4.4	13.6	0.0			0.0	0		
04	9.6	1.8	5.7	12.3	0.0			0.0	0		
05	12.6	4.2	8.4	9.6	0.0			0.6	0		
06	16.8	7.9	12.4	5.6	0.0			4.4	0		
07	20.8	8.4	14.6	3.4	0.0			0.0	0		
08	20.6	7.1	13.9	4.1	0.0			0.0	0		
09	16.2	9.9	13.1	4.9	0.0			0.0	0		
10	14.3	9.2	11.8	6.2	0.0			0.0	0		
11	21.7	8.9	15.3	2.7	0.0			0.0	0		
12	11.9	7.0	9.5	8.5	0.0			0.0	0		
13	12.6	6.3	9.5	8.5	0.0			0.0	0		
14	9.7	5.5	7.6	10.4	0.0			0.0	0		
15	7.6	4.6	6.1	11.9	0.0			0.0	0		
16	12.6	5.0	8.8	9.2	0.0			0.6	0		
17	15.6	8.1	11.9	6.1	0.0			0.0	0		
18	17.4	8.5	13.0	5.0	0.0			7.6	0		
19	11.2	9.7	10.5	7.5	0.0			5.2	0		
20	11.2	7.5	9.4	8.6	0.0			0.6	0		
21	17.2	7.9	12.6	5.4	0.0			0.0	0		
22	16.2	8.6	12.4	5.6	0.0			0.0	0		
23	18.0	8.3	13.2	4.8	0.0			1.3	0		
24	14.6	7.9	11.3	6.7	0.0			0.0	0		
25	14.1	10.5	12.3	5.7	0.0			0.0	0		
26	13.7	8.1	10.9	7.1	0.0			0.0	0		
27	12.2	8.5	10.4	7.6	0.0			2.3	0		
28	13.2	8.3	10.8	7.2	0.0			3.2	0		
29	12.6	9.2	10.9	7.1	0.0			4.0	0		
30	11.7	7.6	9.7	8.3	0.0			0.7	0		
Sum				**226.8**	**0.0**			**39.7**			
Avg	**13.7**	**7.1**	**10.4**								
Xtrm	**21.7**	**1.2**									

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	M	M	0.7		21	39
02†	14.3	7.6	11.0	7.0	0.0	M	M	0.0			<31
03†	10.7	7.3	9.0	9.0	0.0	M	M	0.0			<31
04†	12.9	7.6	10.3	7.7	0.0	M	M	0.0		22	39
05†	14.2	8.4	11.3	6.7	0.0	M	M	0.0		23	46
06†	15.8	11.7	13.8	4.2	0.0	M	M	50.7		21	70
07†	16.2	9.5	12.9	5.1	0.0	M	M	24.8		20	61
08†	12.8	9.5	11.2	6.8	0.0	M	M	2.0		20	44
09†	12.8	8.0	10.4	7.6	0.0	M	M	13.1		4	37
10†	13.0	7.9	10.5	7.5	0.0	M	M	0.0		21	32
11†	14.7	9.5	12.1	5.9	0.0	M	M	0.0		21	32
12†	18.2	9.6	13.9	4.1	0.0	M	M	0.0		23	32
13†	19.0	11.2	15.1	2.9	0.0	M	M	2.6		21	48
14†	14.5	11.2	12.9	5.1	0.0	M	M	0.0		20	35
15†	18.5	11.6	15.1	2.9	0.0	M	M	0.0		20	33
16†	19.8	12.3	16.1	1.9	0.0	M	M	9.1		20	44
Sum				92.7*	0.0*	M	M	103.0*			
Avg	15*	9.4*	12.2*								
Xtrm	19.8*	7.3*								21*	70*