Real Time Water Quality Report
Southwest Brook below Southwest Pond
(Conne River)
2008-12-10 to 2009-04-23

General

- This station is operated cooperatively with the Miawapukek First Nation (Conne River) as a Pilot Project for Drinking Water Source Monitoring. This is the only known application of Real Time Water Quality Monitoring for a drinking water source for any First Nations community in Canada.
- The Water Resources Management Division's (WRMD) staff monitors the real-time web page on a daily basis. Any unusual observations are investigated, with site visits being carried out as warranted.
- Operators at Conne River are informed of any significant water quality events or instrumentation problems by WRMD.
- Site visits for QA/QC purposes are conducted by WRMD approximately four times per year.
- Monthly calibration and maintenance is undertaken by operators at the Conne River Water Treatment Plant.
- Raw (uncorrected) data has been used in the preparation of the graphs and subsequent discussion below.

Maintenance and Calibration of Instrumentation

- Following regular cleaning and calibration of the DataSonde at the Water Treatment Plant in Conne River, the instrument was installed in Southwest Brook over the course of three separate deployment periods:

  2008-12-10 to 2009-02-04 (56 day period)
  2009-02-06 to 2009-03-10 (33 day period)
  2009-03-13 to 2009-04-23 (42 day period)

- There was a loss of data transmission from 2008-12-31 until 2009-02-06. Accordingly, no data can be shown of the graphs below for this period.
- Following 2009-04-23 the both the DataSonde and MiniSonde were returned to the vendor for Performance Testing and Evaluation. These instruments were out of service until 2009-06-28.
- The vertical lines on some of the graphs below correspond to times when there was a loss of data transmission, or when the instruments were removed from service.
- *In-situ* measurements of ambient water quality were undertaken with a freshly calibrated MiniSonde each time a DataSonde was installed or removed for QA/QC purposes.
- The comparative results between the MiniSonde and DataSonde values at the beginning and end of each deployment period are shown in Table 1.

Southwest Brook below Southwest Pond (NF02ZE0033)				
Date (yyyy-mm-dd)	**Parameter**	**MiniSonde® Data**	**DataSonde® Data**	**Rating**
2008-12-10 Installation	Temp (°C)	3.90	3.96	Excellent
	pH (units)	4.91	4.64	Good
	Sp. Conductivity (uS/cm)	10.3	19.8	Good
	Dissolved Oxygen (mg/L)	12.94	12.89	Excellent
	Turbidity (NTU)	0.0	0.0	Excellent
2009-02-04 Removal	Temp (°C)	0.73	n/a	n/a
	pH (units)	4.59	n/a	n/a
	Sp. Conductivity (uS/cm)	36.4	n/a	n/a
	Dissolved Oxygen (mg/L)	13.88	n/a	n/a
	Turbidity (NTU)	0.0	n/a	n/a
2009-02-06 Installation	Temp (°C)	0.69	0.80	Excellent
	pH (units)	4.19	4.11	Excellent
	Sp. Conductivity (uS/cm)	31.0	36.6	Good
	Dissolved Oxygen (mg/L)	13.08	13.90	Marginal
	Turbidity (NTU)	0.0	0.0	Excellent
2009-03-10 Removal	Temp (°C)	1.49	1.05	Good
	pH (units)	3.47	4.60	Poor
	Sp. Conductivity (uS/cm)	25.9	31.2	Good
	Dissolved Oxygen (mg/L)	14.00	14.17	Excellent
	Turbidity (NTU)	43.5	0.0	Poor
2009-03-13 Installation	Temp (°C)	-0.03	-0.16	Excellent
	pH (units)	3.72	4.03	Good
	Sp. Conductivity (uS/cm)	14.26	14.11	Excellent
	Dissolved Oxygen (mg/L)	14.26	14.11	Excellent
	Turbidity (NTU)	0.0	0.0	Excellent
2009-04-13 Removal	Temp (°C)	n/a	6.84	n/a
	pH (units)	n/a	4.91	n/a
	Sp. Conductivity (uS/cm)	n/a	23.1	n/a
	Dissolved Oxygen (mg/L)	n/a	11.92	n/a
	Turbidity (NTU)	n/a	0.0	n/a

Table 1

Data Interpretation

- The water temperature (**Figure 1**) increased over the deployment period. Temperature values ranged from a minimum of -0.18 ˚C to a maximum of 10.69 ˚C.

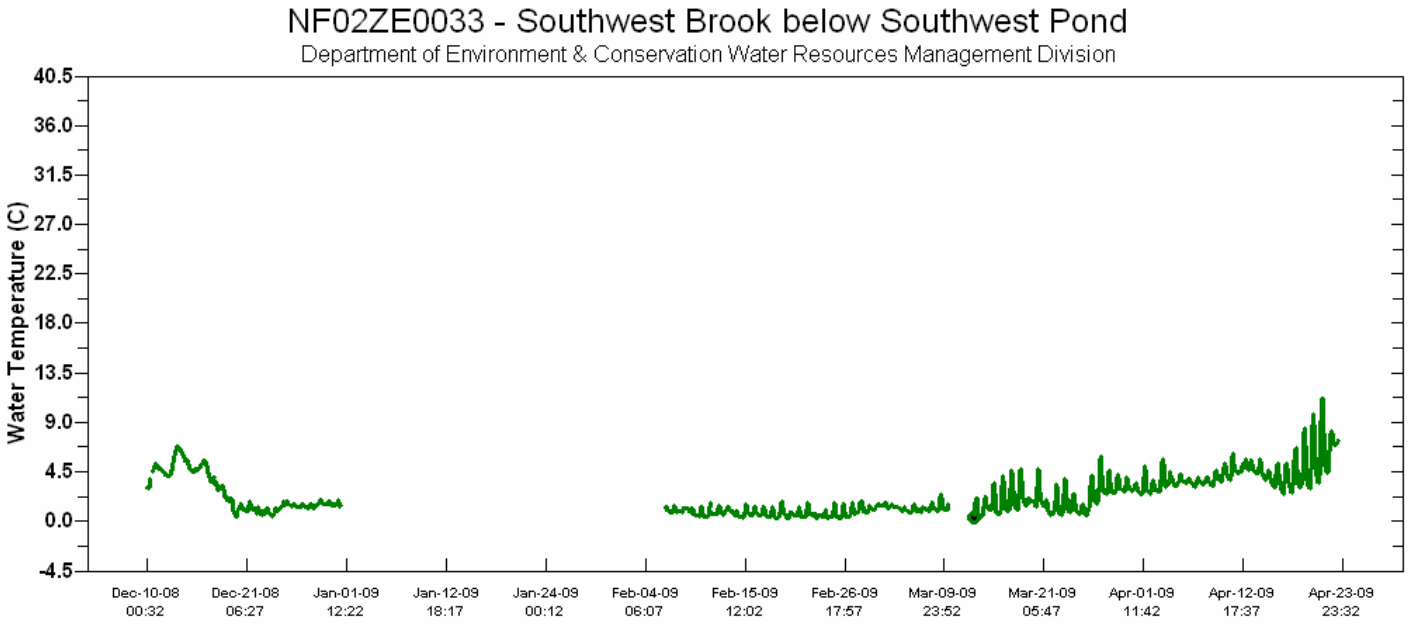

Figure 1

- Throughout the deployment period pH values (**Figure 2**) ranged from a minimum of 4.03 to a maximum of 5.14 with all values falling below the recommended range (6.5 – 9.0) for the CCME *Canadian Water Quality Guidelines for the Protection of Aquatic Life*. The background pH of this stream is normally lower than the recommended range.

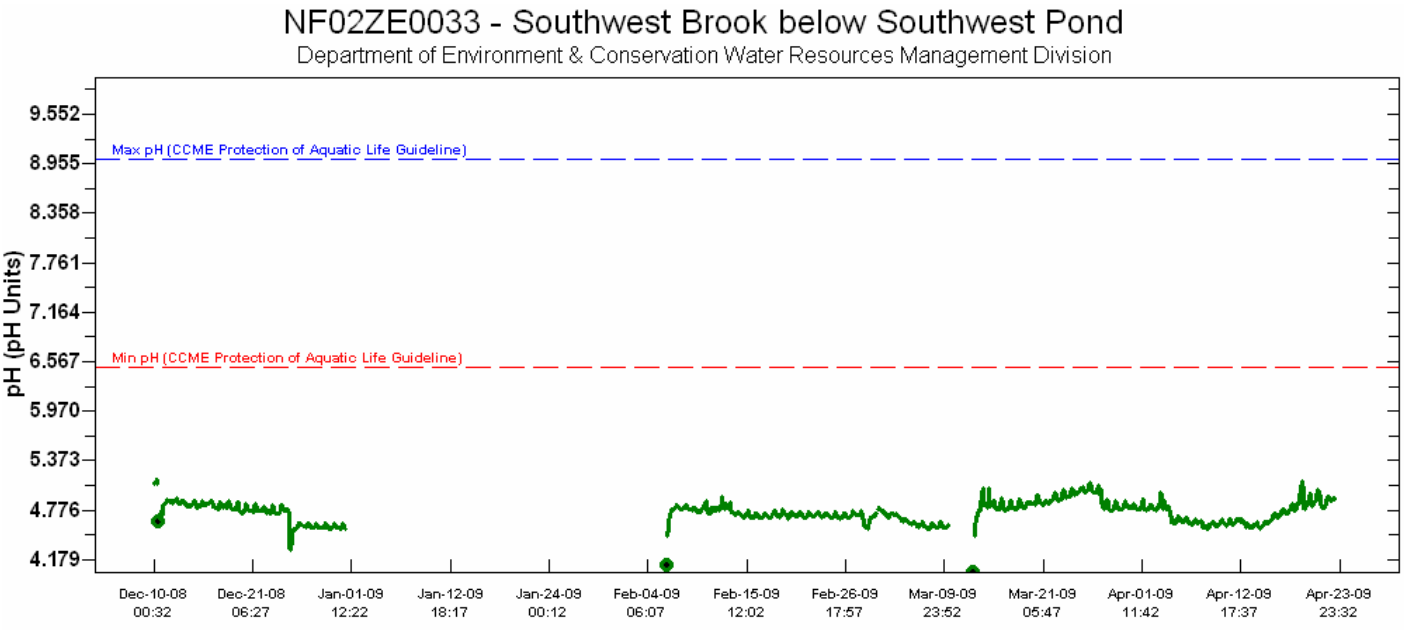

Figure 2

- The specific conductance **(Figure 3)** ranged from a minimum of 16.3 µS/cm to a maximum of 72.4 µS/cm over the deployment period. The highest peak during the last week of December corresponds to a high stage which is likely the result of a significant precipitation event.

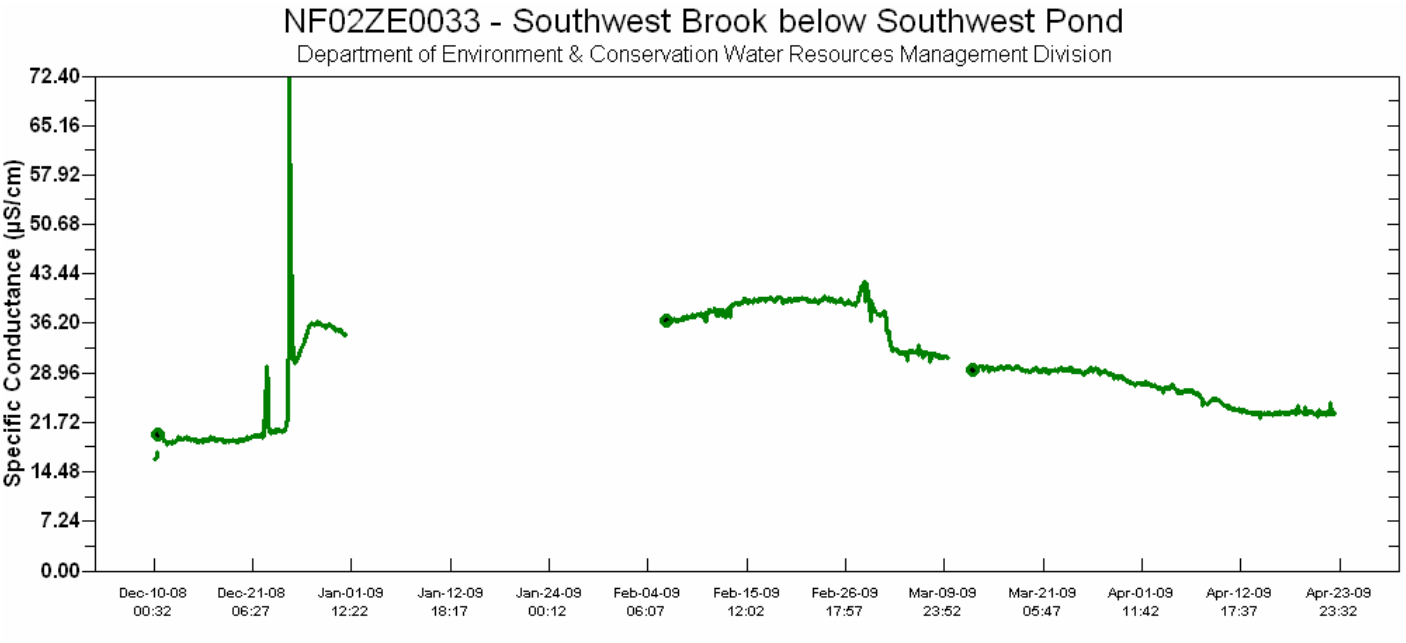

Figure 3

- The dissolved oxygen (**Figure 4**) values ranged from a minimum of 11.4 mg/L to a maximum of 14.51 mg/L over the deployment period. Dissolved oxygen is inversely proportional to water temperature. Throughout the deployment period, all dissolved oxygen values fell above the limits recommended by CCME *Canadian Water Quality Guidelines for the Protection of Aquatic Life* (cold water/other life stages – above 6.5 mg/L; cold water/early life stages – above 9.5 mg/L).

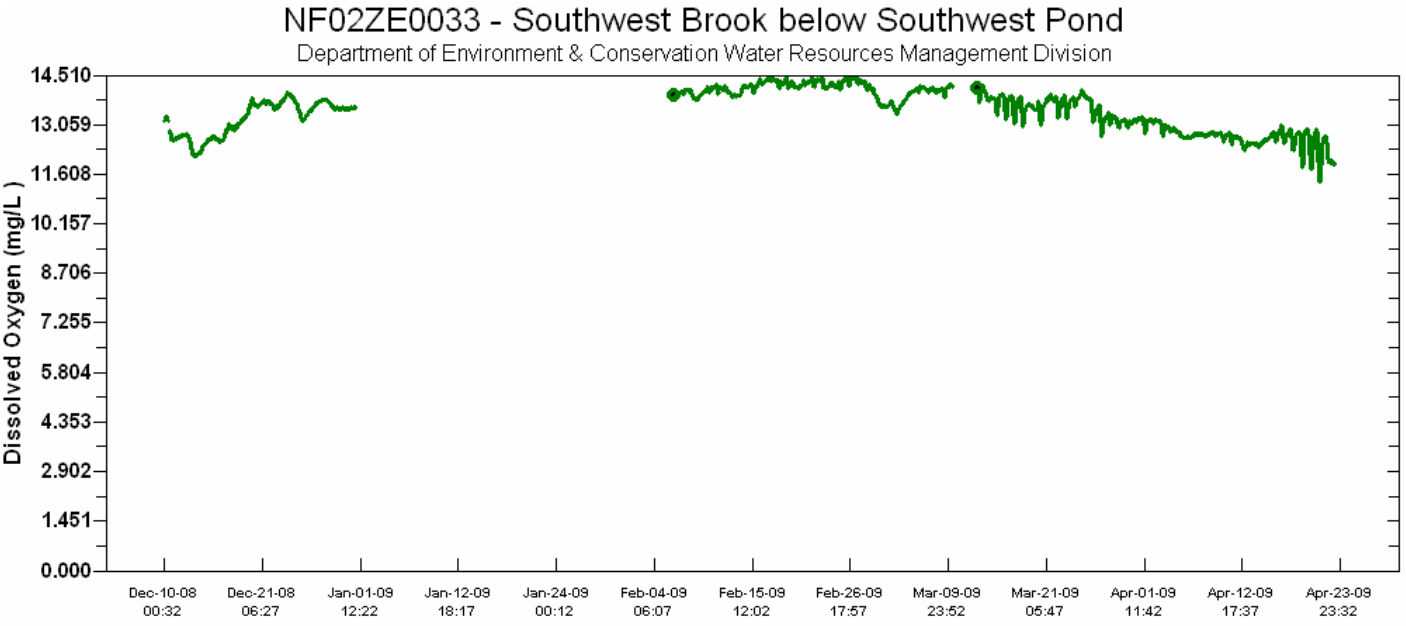

Figure 4

- The turbidity values **(Figure 5)** ranged from a minimum of 0.0 NTU to a maximum of 260.3 NTU. Most of the sustained spikes correspond to higher stage; others are likely the result of an accumulation of algae, leafy debris or biofilm on the sensor.

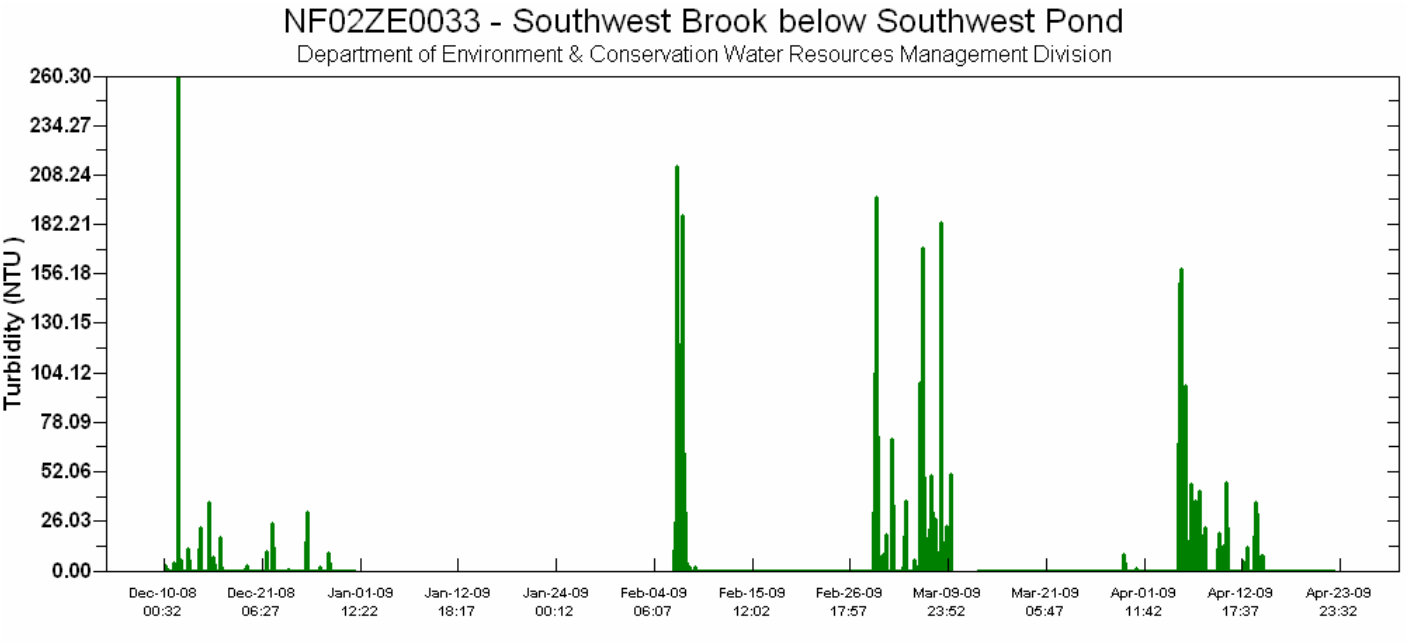

Figure 5

- The stage (**Figure 6)** or water level ranged from a minimum of 0.90 m to a maximum of 1.37 m with the highest peaks corresponding to precipitation events.

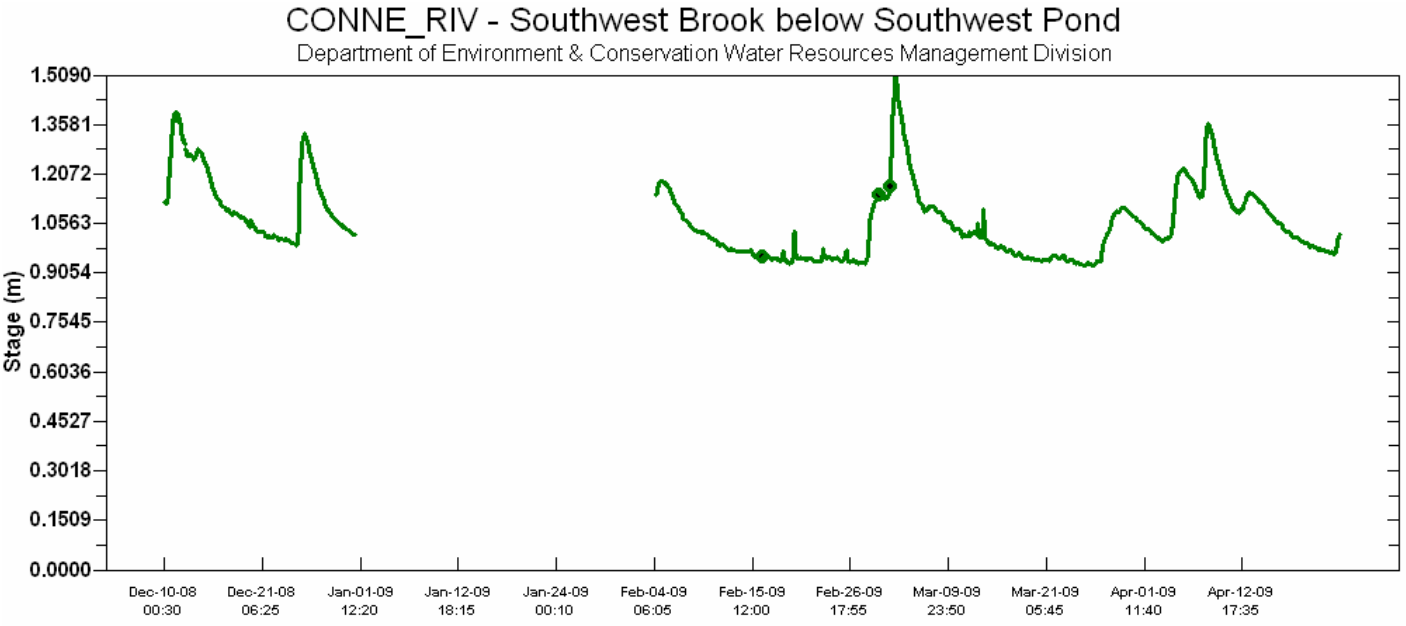

Figure 6

Prepared by:

Robert Wight
Environmental Scientist
Water Resources Management Division
Department of Environment and Conservation
Tel: 709-292-4280
Fax: 709-292-4365
e-mail: robertwight@gov.nl.ca