

Real Time Water Quality Monthly Report for Voisey's Bay Nickel Company Ltd. July - August 2007

General

- The hydrometric data from Reid Brook at Outlet of Reid Pond has not transmitted since July 25th, 2007. Environment Canada staff will download the data from the datalogger and fix the transmission problem in their trip in September.

Maintenance and Calibration of Instrumentation

- VBNC staff removed instruments from Camp Pond Brook, Tributary to Lower Reid Brook, Lower Reid Brook and Upper Reid Brook for cleaning and calibration on August 20th (after 48 day deployment period). VBNC staff cleaned and calibrated the instruments and returned them to all four stations on September 1st.
- Upon redeployment on July 4th, Minisonde readings were taken for QA/QC purposes. The results from comparing the Minisonde values to the Datasonde values can be seen in **Table 1**.

Table 1: QA/QC Data Comparison Rankings upon reinstallation on July 4th, 2007

Station	Date	Action	Minisonde vs. Datasonde Comparison Ranking			
			Temperature	pH	Conductivity	Dissolved Oxygen
Upper Reid Brook	July 4 th , 2007	Installation	Poor	Poor	NA*	Fair
Lower Reid Brook	July 4 th , 2007	Installation	Good	Poor	NA*	Marginal
Tributary to Lower Reid Bk	July 4 th , 2007	Installation	Fair	Good	NA*	Excellent
Camp Pond Brook	July 4 th , 2007	Installation	Excellent	Good	NA*	Good

*Conductivity probe on Minisonde was not working properly.

- Upon removal and redeployment, Minisonde readings were taken for QA/QC purposes. The results from comparing the Minisonde values to the Datasonde values can be seen in **Table 2**.

Table 2: QA/QC Data Comparison Rankings upon removal and reinstallation in August/Sept., 2007

Station	Date	Action	Minisonde vs. Datasonde Comparison Ranking			
			Temperature	pH	Conductivity	Dissolved Oxygen
Upper Reid Brook	Aug. 20 th , 2007	Removal	Excellent	Good	NA*	Excellent
	Sept. 1 st , 2007	Installation	Excellent	Poor	NA*	Excellent
Lower Reid Brook	Aug. 20 th , 2007	Removal	Excellent	Marginal	NA*	Poor
	Sept. 1 st , 2007	Installation	Excellent	Excellent	NA*	Good
Tributary to Lower Reid Bk	Aug. 20 th , 2007	Removal	Excellent	Excellent	NA*	Good
	Sept. 1 st , 2007	Installation	Excellent	Excellent	NA*	Excellent
Camp Pond Brook	Aug. 20 th , 2007	Removal	Excellent	Excellent	NA*	Poor
	Sept. 1 st , 2007	Installation	Good	Excellent	NA*	Fair

* Conductivity probe on Minisonde was not working properly.

Data Interpretation

REID BROOK AT OUTLET OF REID POND (UPPER REID BROOK)

- The water temperature (**Figure 1**) showed an increase and then decreasing pattern throughout the deployment period. Corresponding, dissolved oxygen (**Figure 2**) showed a decrease and then increase throughout the deployment. This pattern is expected during the months of July and August.

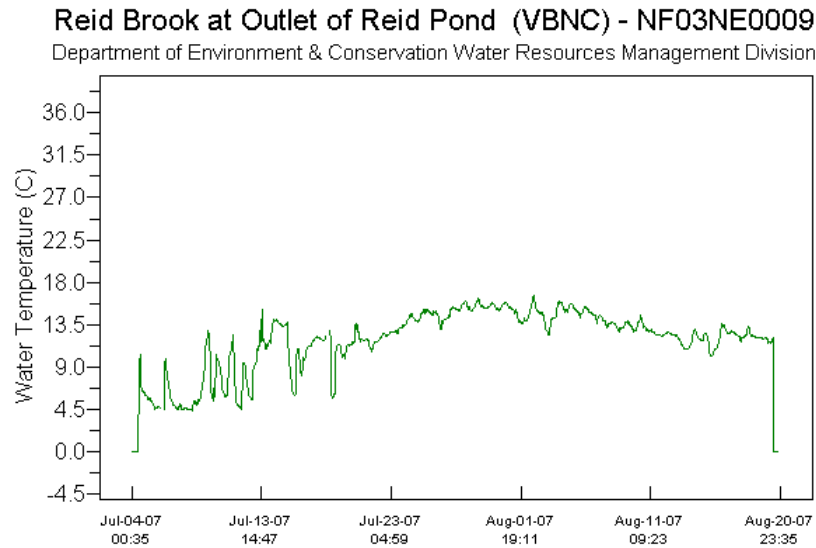


Figure 1

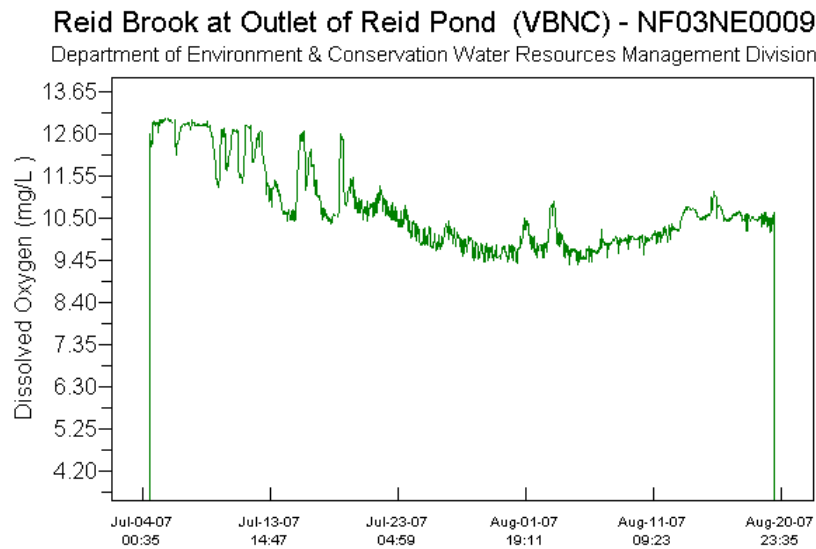
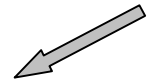
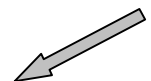


Figure 2



- The conductivity (**Figure 3**) remained very consistent throughout the deployment period.

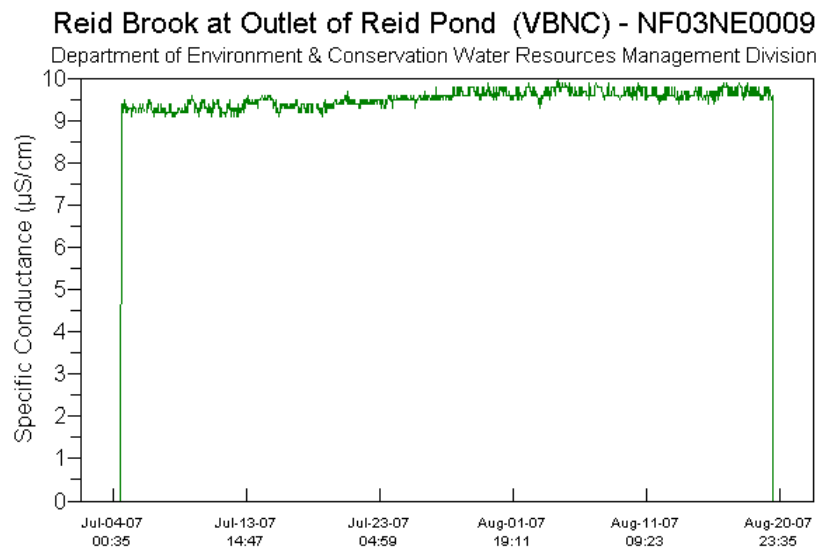
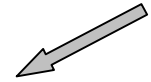


Figure 3



- The pH (**Figure 4**) values remained consistent throughout the deployment period and within CCME Water Quality Guidelines for Aquatic Life (6.5 – 9.0). The first reading after installation was likely due to an erroneous value that was recorded before the pH sensor had time to adjust to the river conditions. This type of occurrence happens occasionally when the instrument is installed close to the same time as a reading is taken by the datalogger.

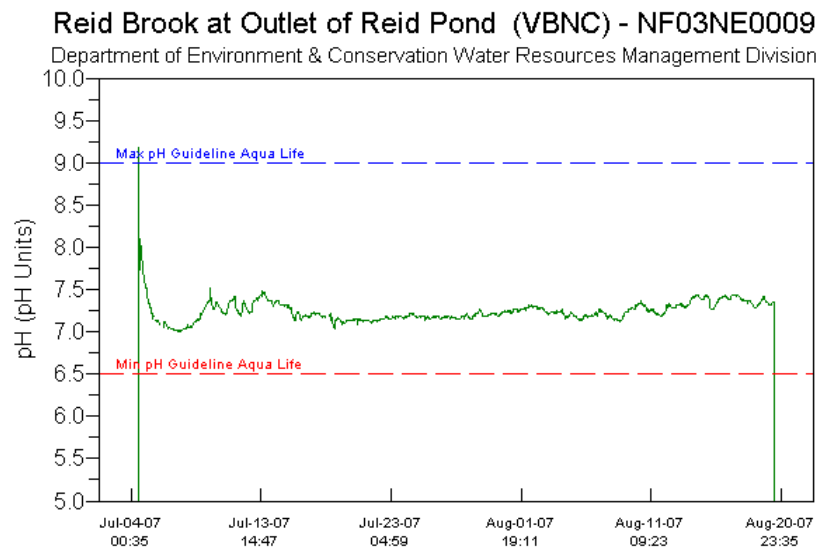
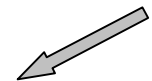


Figure 4



- Turbidity values (**Figure 5**) relatively consistently throughout the deployment period. There was one water quality incident which occurred July 12th – 13th which showed a maximum value of 75.3 NTU. This station is not affected by activities at the VBNC site and is likely due to natural conditions.

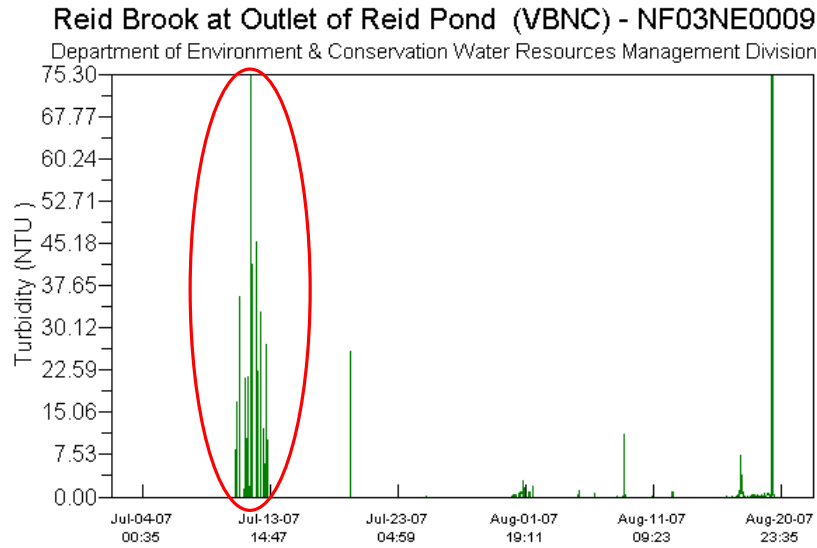


Figure 5

CAMP POND BROOK BELOW CAMP POND

- Water temperature and dissolved oxygen (**Figures 6 & 7**) remained relatively stable during the deployment period of July to August.

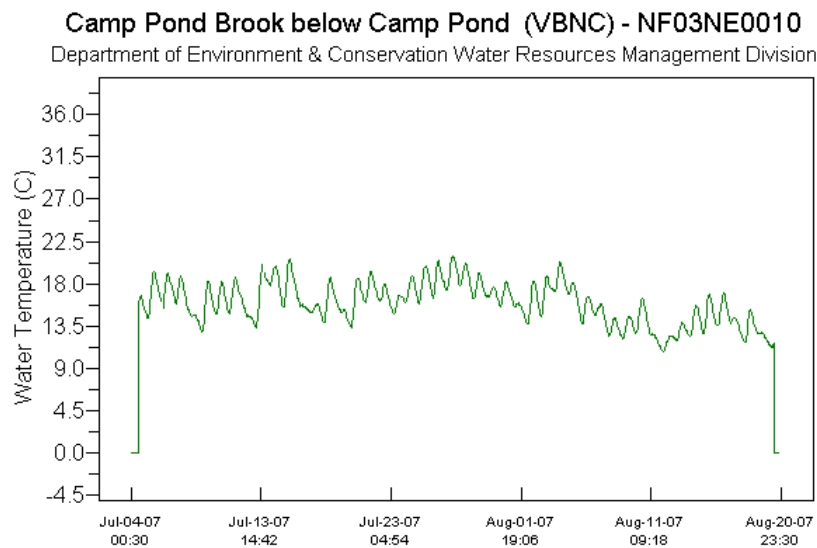


Figure 6

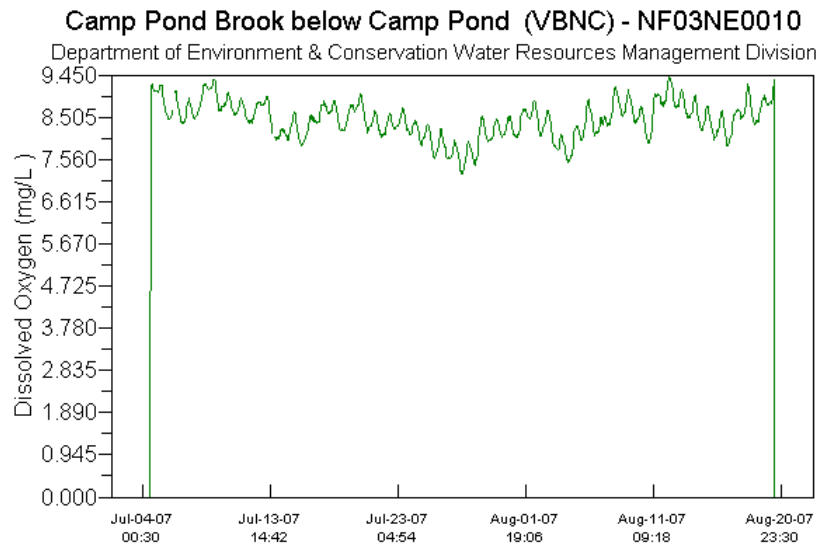
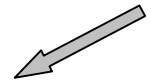


Figure 7



- pH (**Figure 8**) remained very consistent throughout the deployment period and within CCME Water Quality Guidelines for Aquatic Life (6.5 – 9.0).

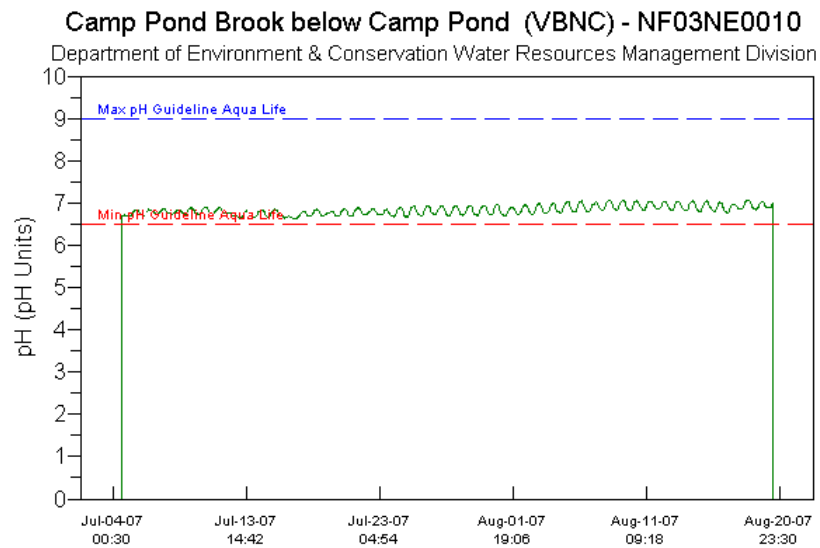
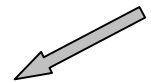


Figure 8



- The specific conductivity values (**Figure 9**) showed a slight increase throughout the deployment period with values ranging from 22.9uS/cm to 39.3uS/cm. This is consistent with a slight decrease in stage (**Figure 10**) throughout the same period of time. It is typical for conductivity to increase when stage decreases due to ions becoming more concentrated and increasing the conductivity values.

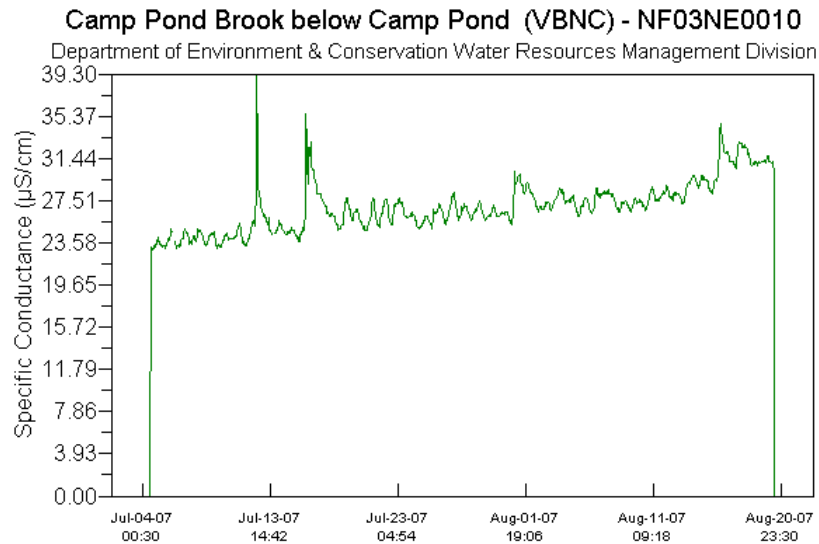


Figure 9

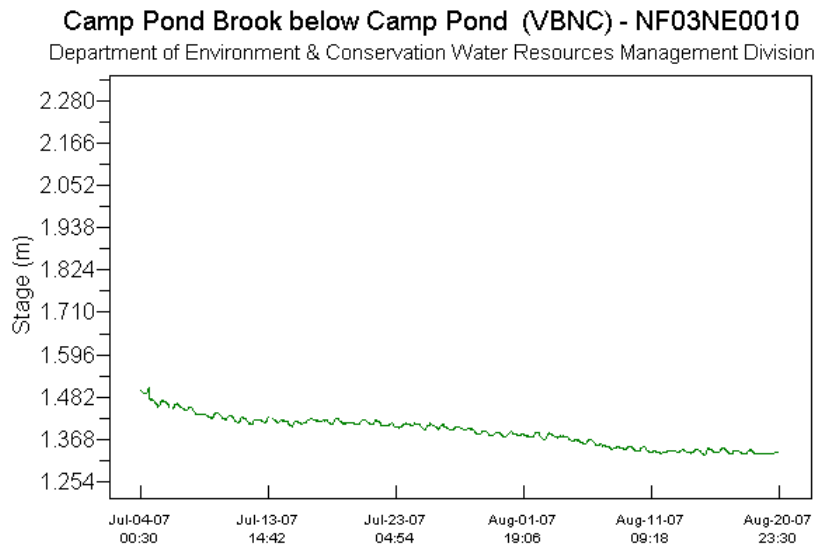
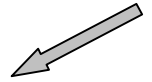
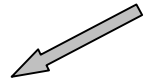


Figure 10



- The turbidity values (**Figure 11**) remained at fairly constant background levels for this station over the deployment period with the exception of one incident where turbidity values went to the instruments Hydrolab maximum of 3000 NTU. These spikes were seen at three different one-hour intervals and are likely due to erroneous readings due to the fact that occurred with one-hour time intervals and reached the maximum sensor reading of 3000 NTU.

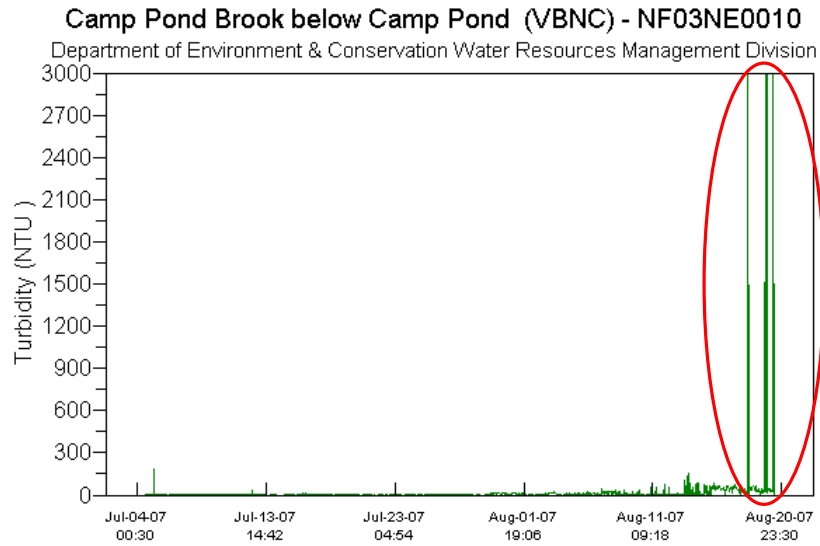
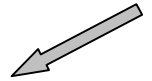


Figure 11



LOWER REID BROOK BELOW TRIBUTARY

- The water temperature (**Figure 12**) showed an increase and then decreasing pattern throughout the deployment period. Corresponding, dissolved oxygen (**Figure 13**) showed a decrease and then increase throughout the deployment. This pattern is expected during the months of July and August.

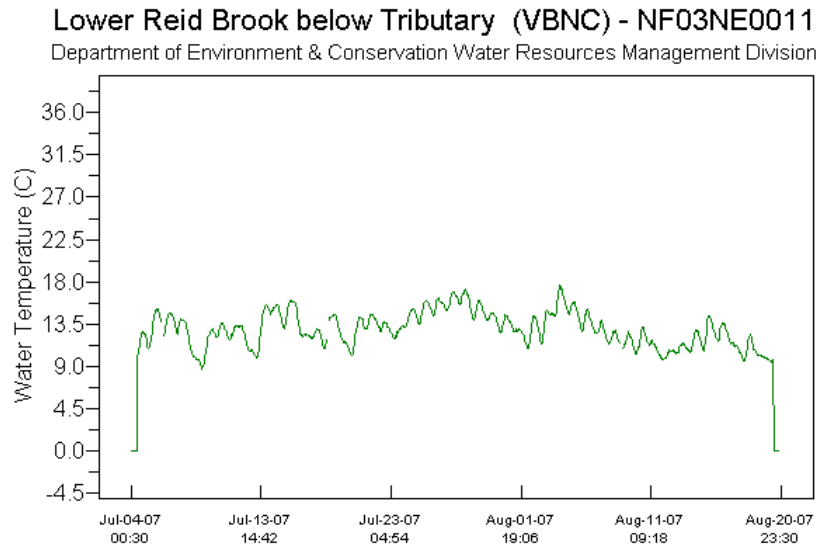
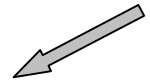


Figure 12



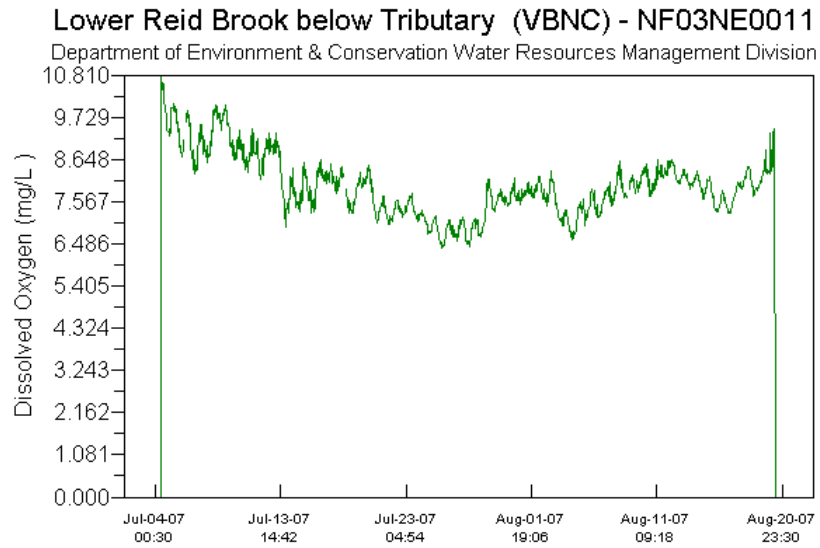
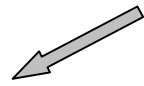


Figure 13



- pH (**Figure 14**) remained very consistent throughout the deployment period and within CCME Water Quality Guidelines for Aquatic Life (6.5 – 9.0).

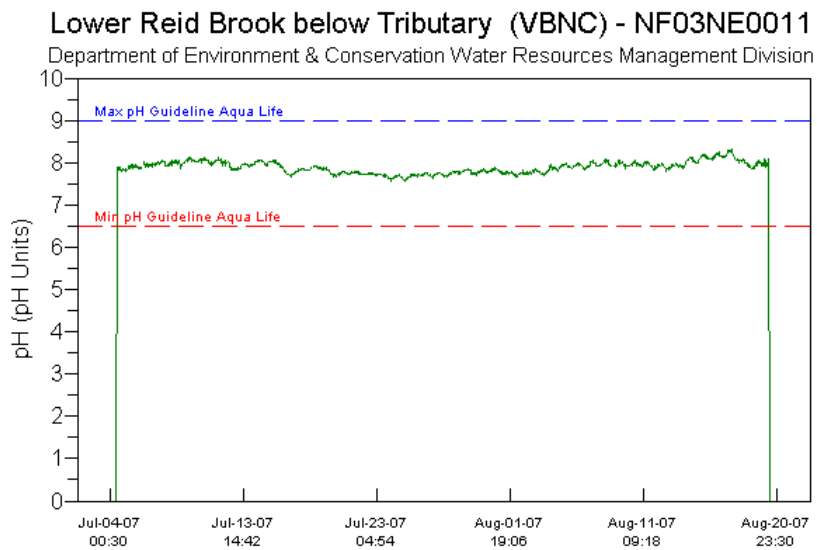
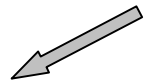


Figure 14



- The specific conductivity values (**Figure 15**) showed a slight increase throughout the deployment period. This is consistent with a slight decrease in stage (**Figure 16**) throughout the same period of time. It is typical for conductivity to increase when stage decreases due to ions becoming more concentrated and increasing the conductivity values.

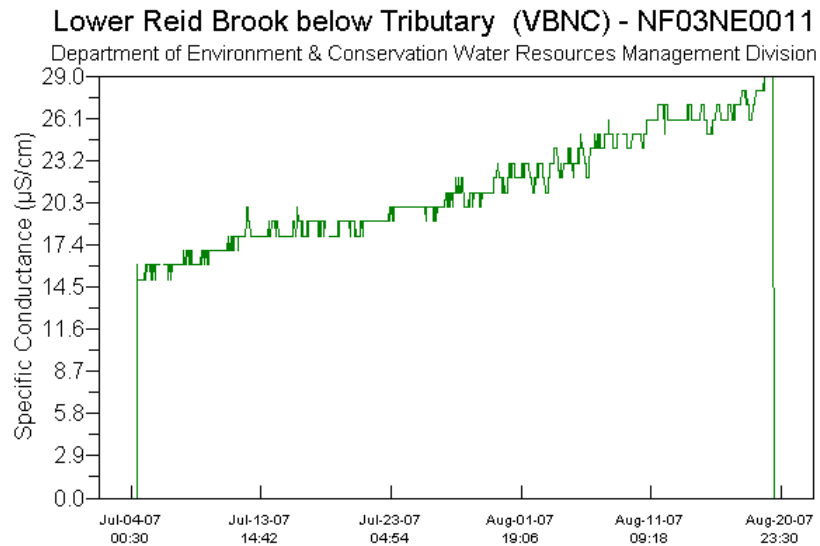


Figure 15

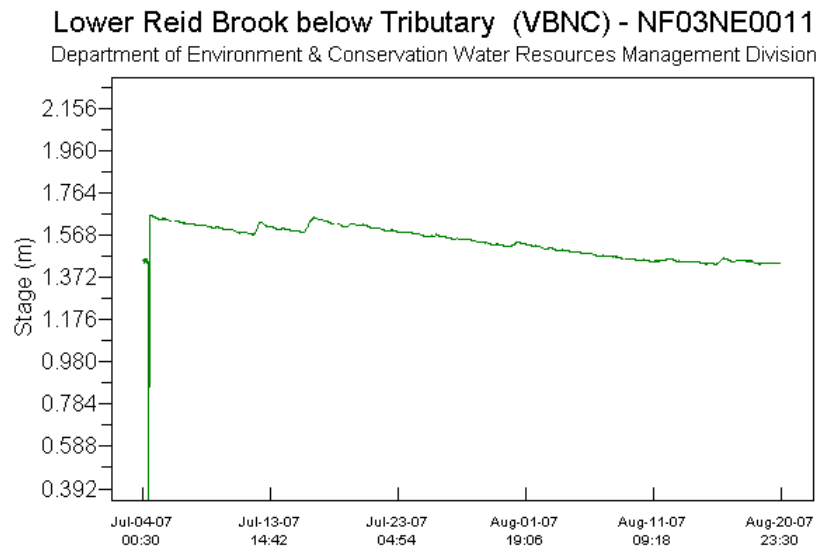
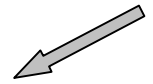
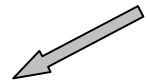


Figure 16



- Turbidity values (**Figure 17**) remained relatively stable with the exception of two incidents on July 23rd – 27th (maximum 200 NTU) and August 1st – 5th (maximum 116 NTU). Both incidences showed turbidity values increasing over a period of a couple of days and then decreasing to background levels over the period of a couple of hours. When the Hydrolab was removed by VBNC staff on August 20th, it was observed that there was significant evidence of disturbances in the sediment around the Hydrolab. This may have been the cause of the increased turbidity during the two incidences. A new deployment technique may have to be considered at this site. Turbidity values at this site will be examined to see if these type of occurrences are regularly seen at Lower Reid Brook.

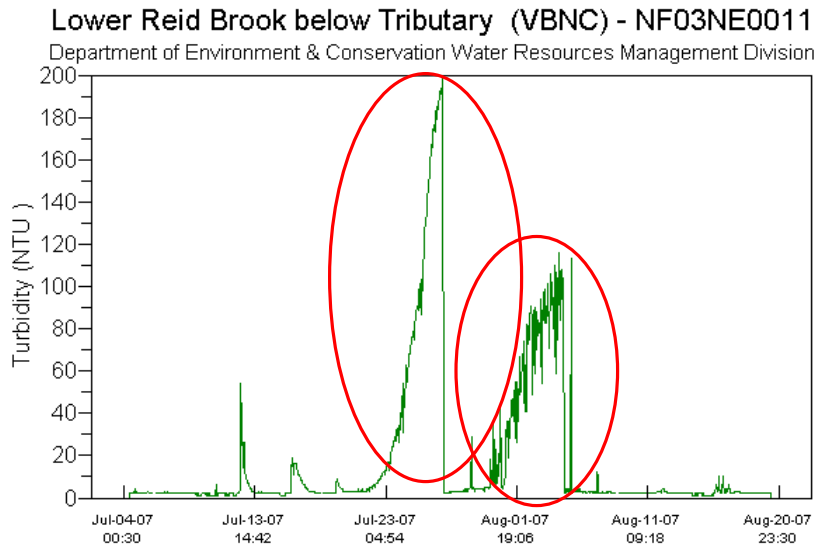
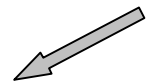


Figure 17



TRIBUTARY TO REID BROOK

- Water temperature and dissolved oxygen (**Figures 18 & 19**) remained relatively stable during the deployment period of July to August.

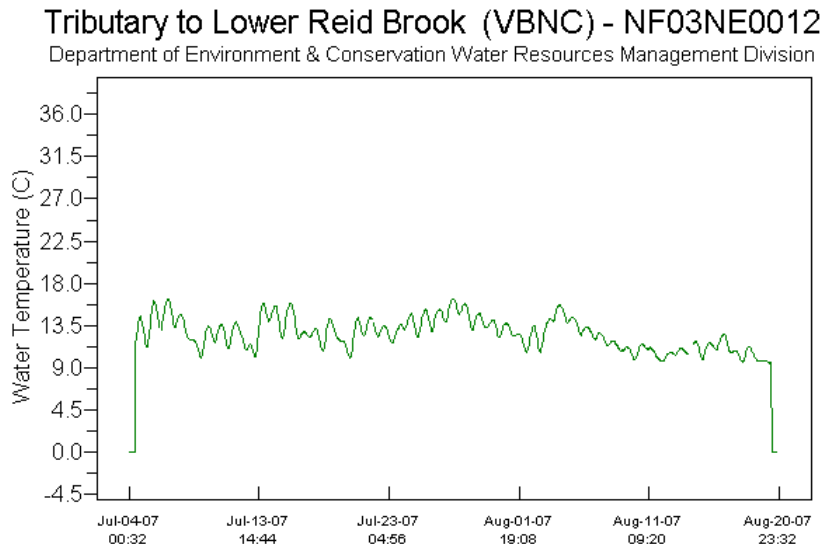
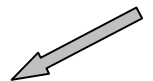


Figure 18



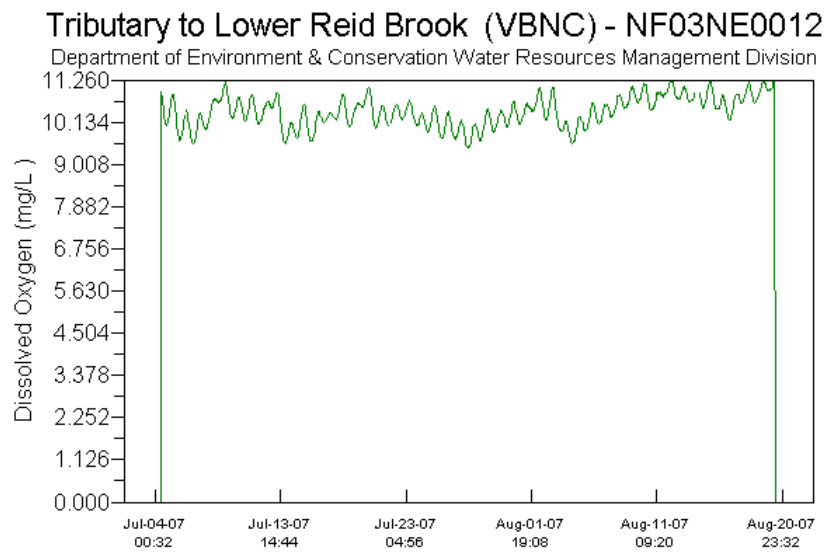
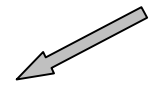


Figure 19



- The pH (Figure 20) remained at fairly constant background levels and within CCME Water Quality Guidelines for Aquatic Life (6.5 – 9.0) over the deployment period.

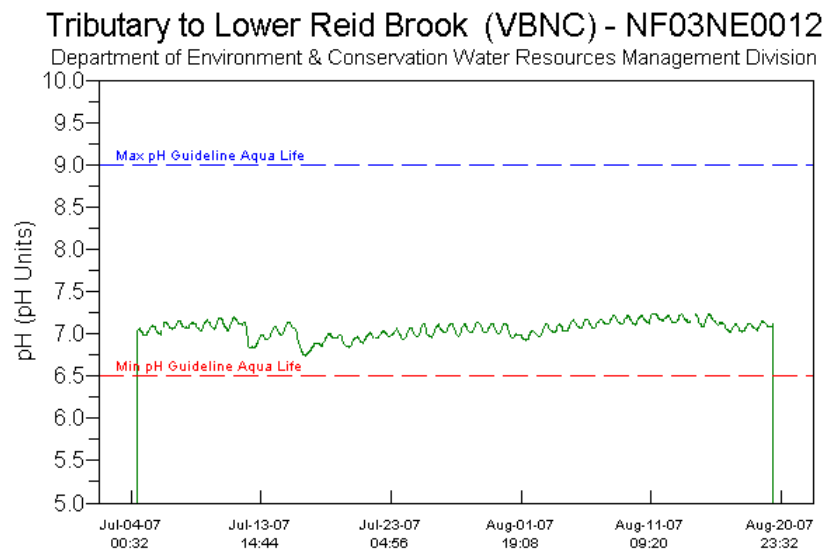
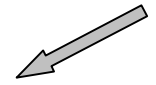


Figure 20



- Turbidity values (**Figure 21**) remained relatively stable throughout the deployment period with the exception of one incident which occurred August 18th – 20th. At this time it is unknown why this increase in turbidity occurred. Turbidity at this site will be closely examined to try and explain this occurrence.

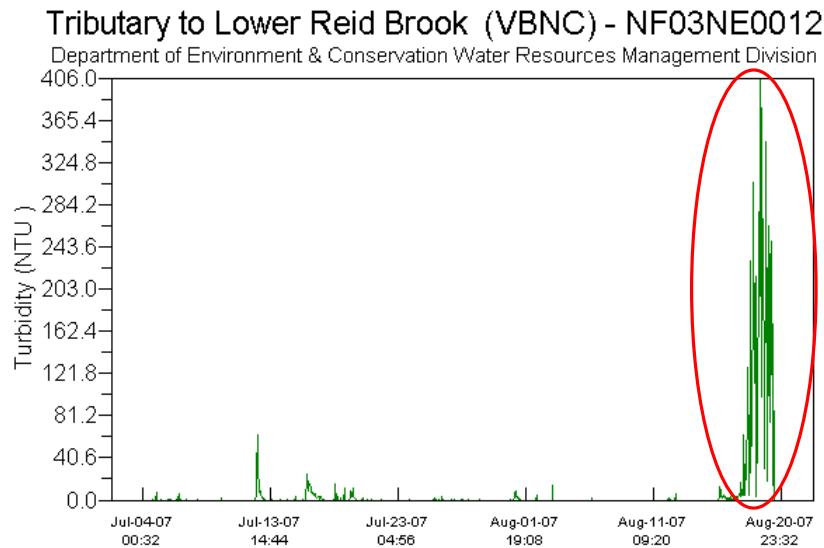
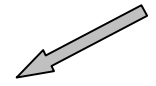


Figure 21



- The specific conductivity values (**Figure 22**) showed a slight increase throughout the deployment period. This is consistent with a slight decrease in stage (**Figure 23**) throughout the same period of time. It is typical for conductivity to increase when stage decreases due to ions becoming more concentrated and increasing the conductivity values. During the period of July 11th – 20th the conductivity fluctuated between 10.7 and 13.1. This was likely due to the two significant peaks in stage during the same time period. All conductivity values remained below 16uS/cm which is background levels for Tributary to Lower Reid Brook.

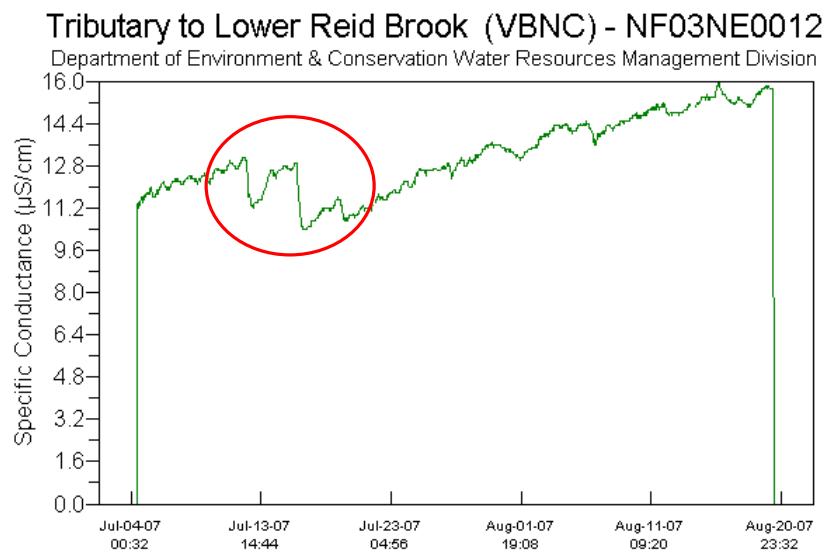
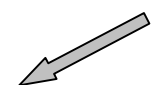


Figure 22



Tributary to Lower Reid Brook (VBNC) - NF03NE0012

Department of Environment & Conservation Water Resources Management Division

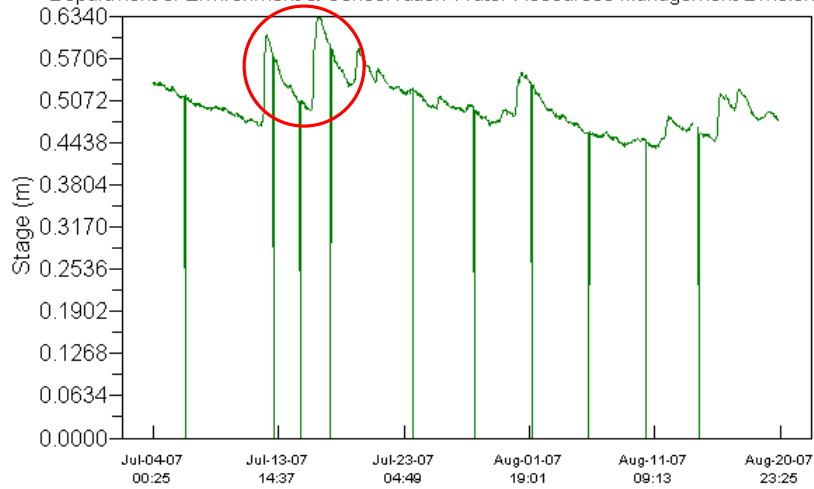
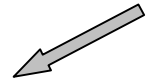


Figure 23



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