Government of Newfoundland and Labrador

# Real Time Water Quality Monthly Report for Voisey's Bay Nickel Company Ltd. October 2004

## General

- The Water Resources Management Division staff analyses the real-time web page on a daily basis.
- Voisey's Bay Nickel Company Ltd. will continue to be informed of any significant water quality events in the future in the form of a monthly report.

## Maintenance and Calibration of Instrumentation

- As noted in the previous monthly report, the three Datasondes were retrieved from the sites and brought back to the office for cleaning and maintenance on September 23rd, 2004. The instruments were calibrated on September 24th, 2004 and returned to the water. A DOEC staff member (Joanne Sweeney) was present on-site to oversee these tasks.
- All necessary QA/QC protocols were followed when retrieving and deploying the instruments. All required forms were completed and sent to the Department of Environment and Conservation on September 28th, 2004.
- Normally, the instruments are retrieved from the water for maintenance and calibration on a monthly basis (thus the end of October would have been the expected retrieval time), however, it was decided to leave the instruments in the water for a longer deployment period throughout the month of October and into November. It is expected that the ice conditions at the sites will force the removal of the instruments by early to mid November. Also, the instruments are reading very well and showing very little drift thus permitting a slightly longer deployment period.
- It should be noted that during the month of October, the instrument at the Camp Pond Brook station was removed and shipped to St. John's for use in a two-day Advanced Hydrolab Training course that was attended by both government officials and three VBNC environmental staff members. This instrument will remain out of the water for the winter months.
- When the remaining two instruments are removed in November, they too will be stored for the winter months. All three instruments will be redeployed in the spring when the ice breaks up in the rivers.

## Data Interpretation

- Throughout the month of October, there was very little activity with respect to water quality at the control station – Upper Reid Brook.
- As expected, due to a drop in the water temperature over the month, the amount of dissolved oxygen in the water slightly increased (Figure 1 and 2).

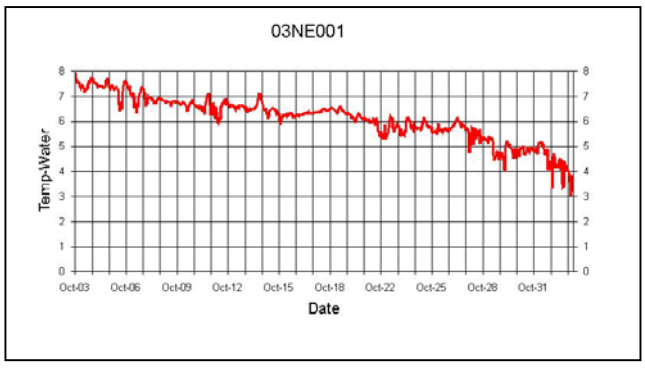


**Figure 1**

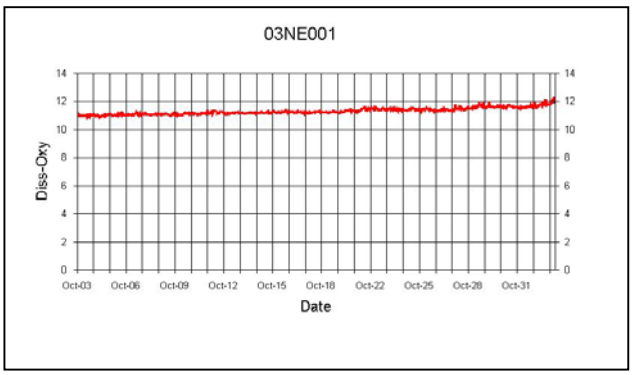


**Figure 2**

- The pH, conductivity, % saturation and total dissolved solids remained very steady at background levels throughout October (Figures 3, 4, 5 and 6).

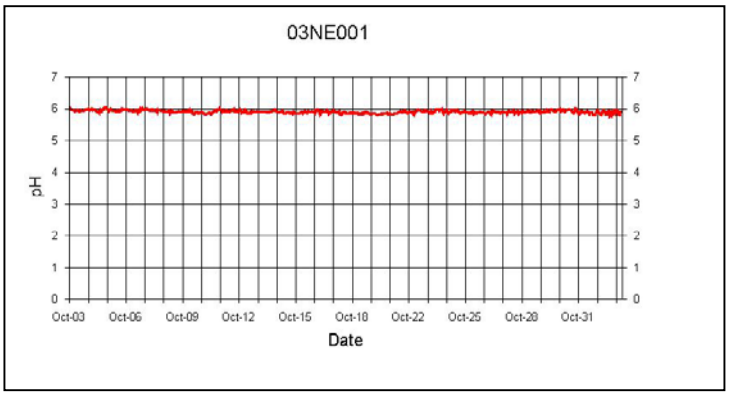


**Figure 3**

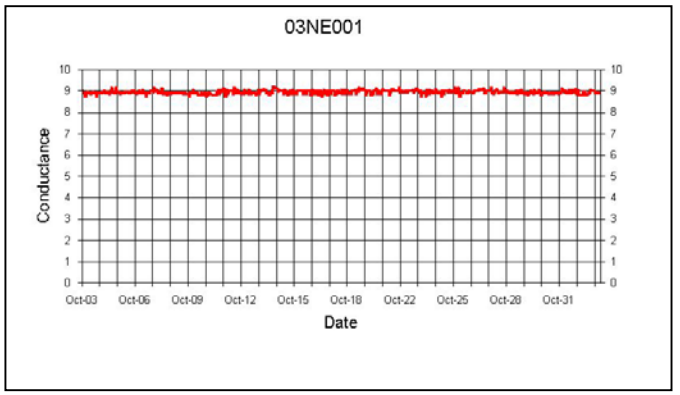


**Figure 4**

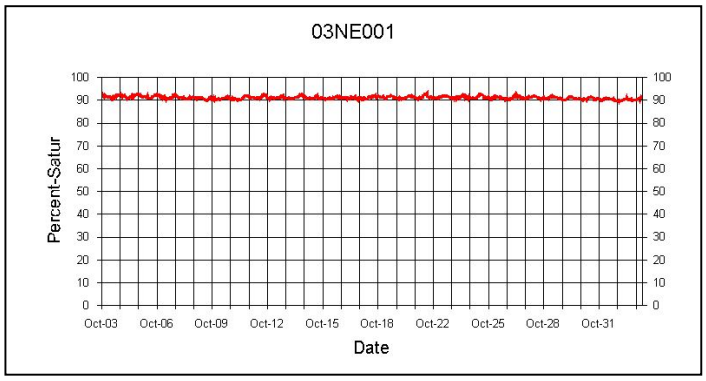


**Figure 5**

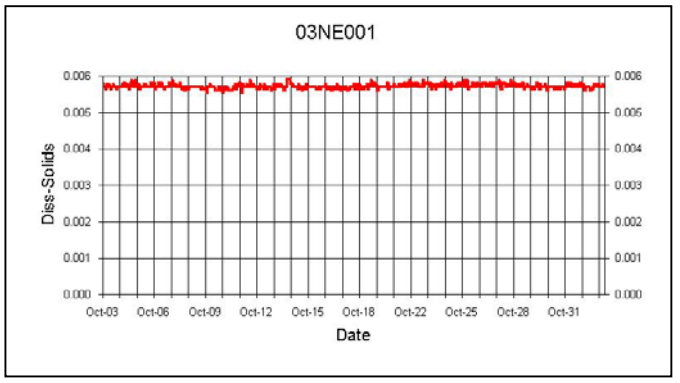


**Figure 6**

- As stated previously, the instrument at the Camp Pond Brook station was removed in mid-October for use in a training course, thus the graph dropped to zero on October 15th, 2004. Throughout the early part of October, the pH and dissolved oxygen remained very steady (Figure 7 and 8).

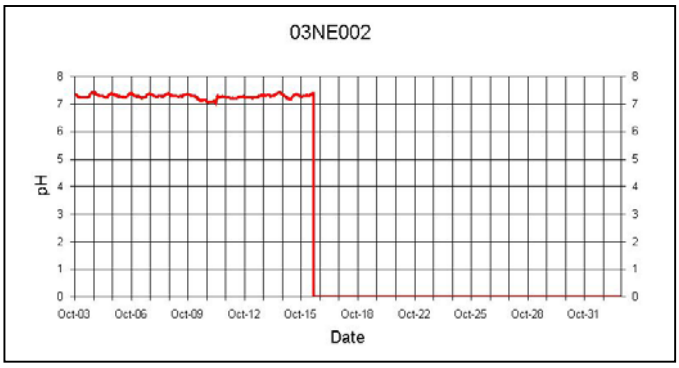


**Figure 7**

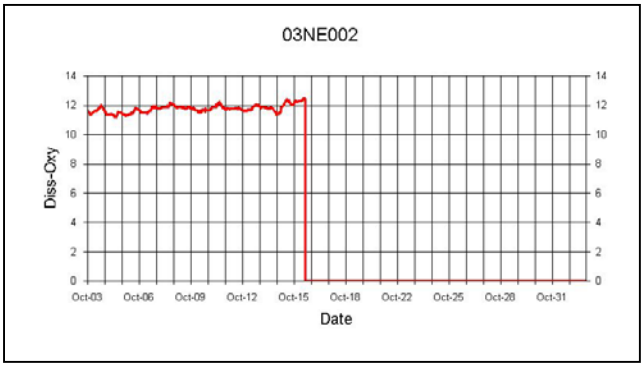


**Figure 8**

- There was one water quality event on October 10th and 11th, 2004 at Camp Pond Brook that can be clearly seen on the conductivity, total dissolved solids and turbidity graphs (Figures 9, 10 and 11). The turbidity values spiked most noticeably to a value of 657 NTU but then dropped significantly in a one-hour period. The spikes in the graphs are all related to a failure of the generator used to power pumps located in the temporary sumps near Camp Pond Brook. It is important to note that this was a short water quality episode. The mechanical problem was rectified quickly.

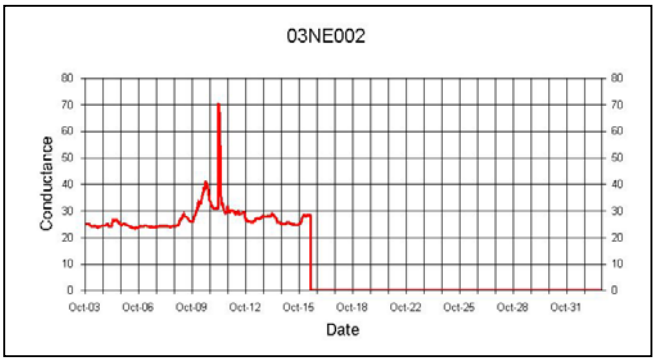


**Figure 9**

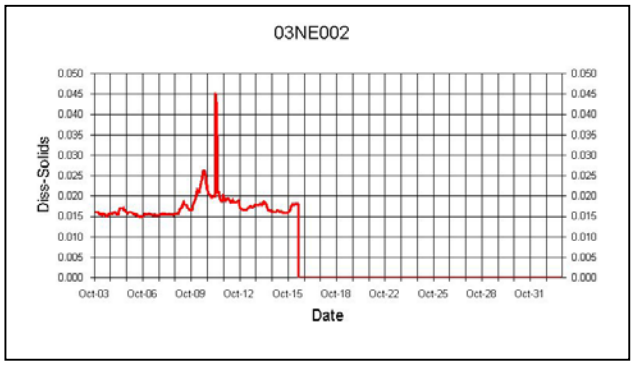


**Figure 10**

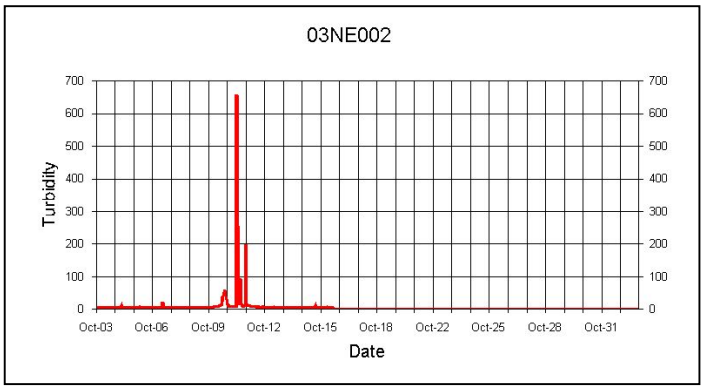


**Figure 11**

- Finally, the instrument at Lower Reid Brook showed some water quality events throughout the past month. While some parameters remained constant such as pH and dissolved oxygen (Figures 12 and 13), others such as turbidity and conductivity (Figure 14 and 15) fluctuated. The maximum turbidity value was recorded on October 22nd at 575 NTU. The turbidity values did not stay elevated in this range. It is unlikely that any development caused these spikes but rather that the increased rainfall amount (Figure 16) at this time really stirred up the soft sediment bottom where the instrument is located. It is planned that upon deployment in the spring, a new structure will be installed to lift the instrument off the bottom of the river to minimize the impact from the natural sediment. The spike in conductivity to a value of 45.9 us/cm on November 2nd may also be a result of increased rainfall amounts.

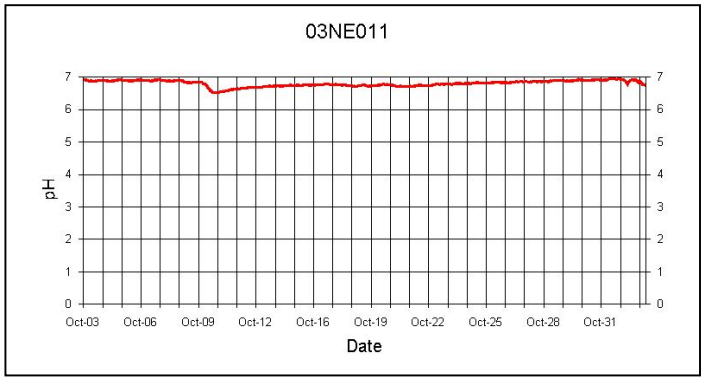


**Figure 12**

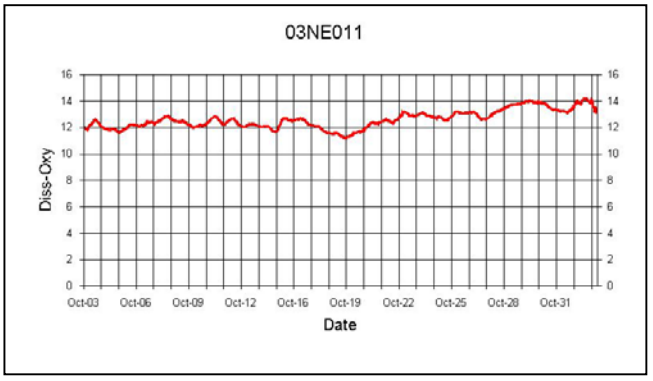


**Figure 13**

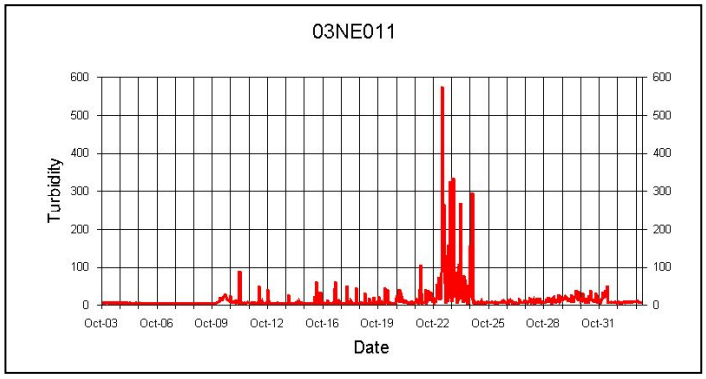


**Figure 14**

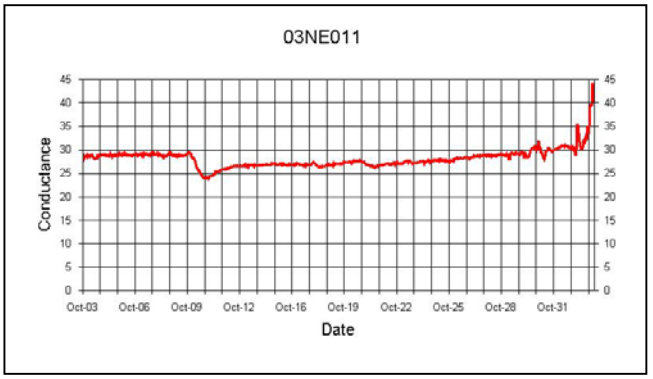


**Figure 15**

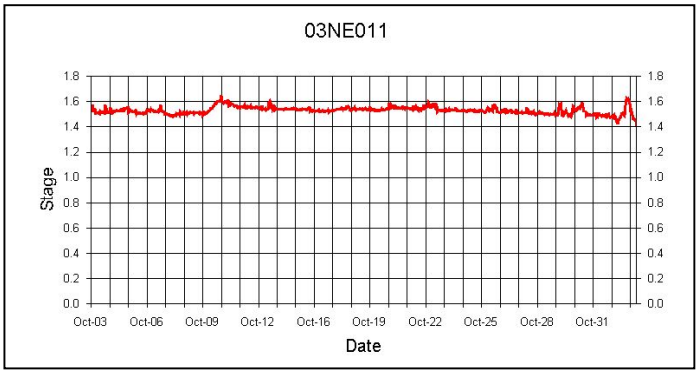


**Figure 16**

**Prepared by:** Renée Paterson
Regional Water Quality Officer
Department of Environment and Conservation
November 3rd, 2004
PH: (709) 729-1159
FX: (709) 729-0320