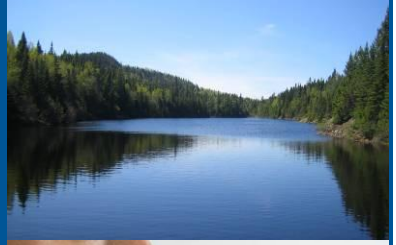








Real-Time Water Quality Deployment Report

Leary's Brook at Prince Philip Drive

January 30, 2013 to February 26, 2013

Newfoundland Labrador

Government of Newfoundland & Labrador

Department of Environment and Conservation

General

- Department of Environment and Conservation staff monitors the real-time web pages consistently.

Maintenance and Calibration of Instrument

- As part of the Quality Assurance and Quality Control protocol (QAQC), an assessment of the reliability of data recorded by an instrument is made at the beginning and end of the deployment period. The procedure is based on the approach used by the United States Geological Survey.
- Field sonde DO values were questionable throughout the deployment period.
- Depending on the degree of difference between each parameter from the Field and QAQC sondes a qualitative rank is assigned (See Table 1). The possible ranks, from most to least desirable, are: Excellent, Good, Fair, Marginal, and Poor.
- A grab sample was also taken for additional confirmation of conditions at deployment and to allow for future modelling studies.

Table 1: Qualitative QAQC Ranking

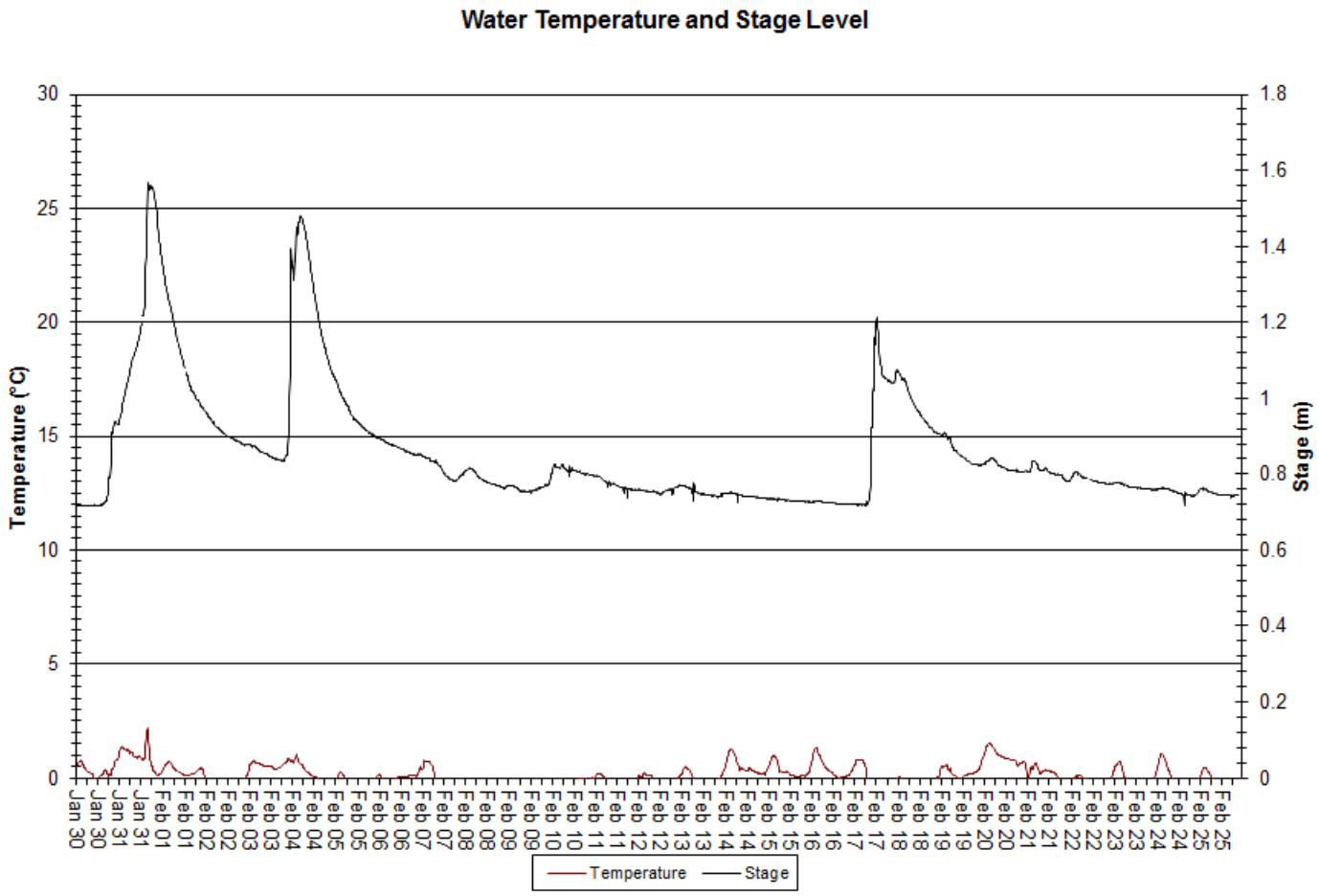
Station	Date	Action	Comparison Ranking				
			Temperature	pH	Conductivity	Dissolved Oxygen	Turbidity
Leary's Brook at Prince Philip Drive	Jan 30,2013	Deployment	Fair	Fair	Excellent	NA	Good
	Feb 26, 2013	Removal	Excellent	Excellent	Excellent	NA	Excellent

- The DO values were questionable for the field sonde at the time of removal. It was later identified that the cap for DO sensor needed to be replaced.
- Ranking for all remainder parameters were "Excellent" during field sonde removal.
- The maximum, minimum, median and mean for Temperature, pH, Specific Conductivity, Dissolved Oxygen and Turbidity is shown below in table 2.

Table 2: Parameter Statistics during deployment period

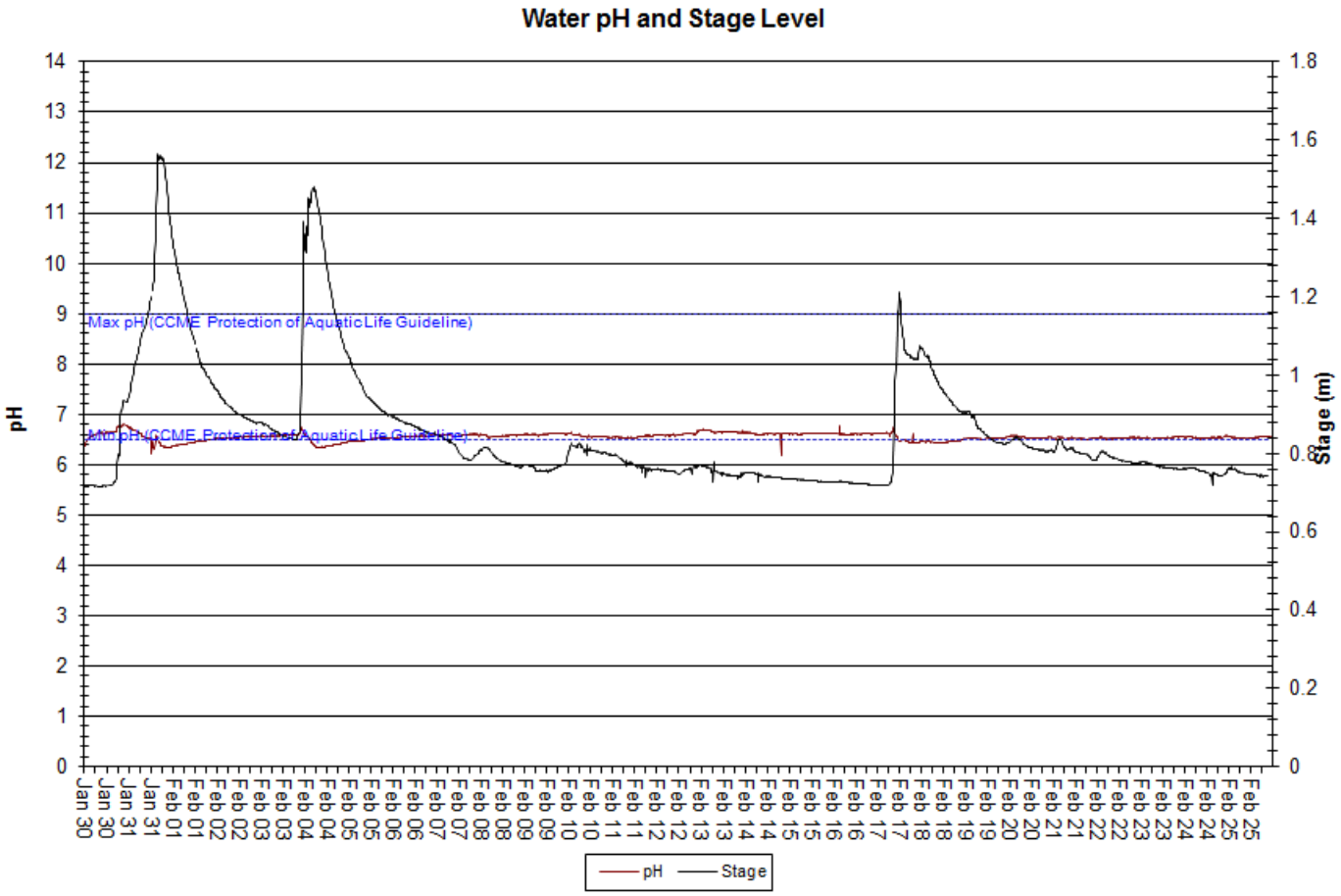
Parameter	Max	Min	Median	Mean
Temperature('C)	2.20	-1.30	0.02	0.03
pH	6.82	6.17	6.55	6.55
Specific Conductivity (µS/cm)	11621.0	387.0	1037.9	1347.2
TDS (g/ml)	7.4400	0.2480	0.6640	0.8622
Dissolved Oxygen (%-Sat)	98.1	89.7	94.3	94.6
Dissolved Oxygen (mg/l)	14.23	12.98	13.69	13.76
Turbidity (NTU)	641.0	0.0	0.0	15.0
Stage (m)	1.57	0.72	0.80	0.86
Flow (m)	7.78	0.47	0.77	1.19

Data Interpretation

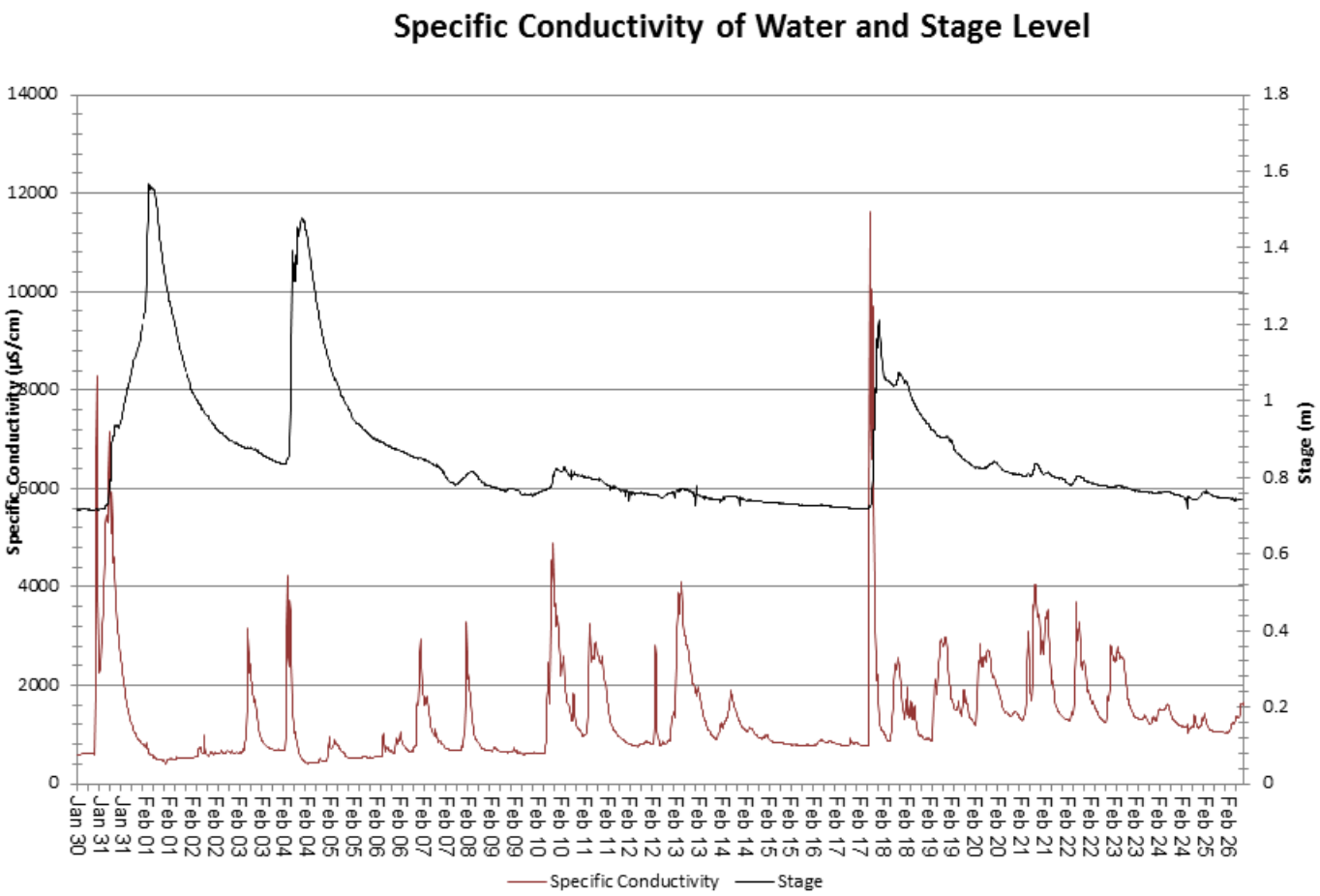


- Overall, the temperature was stable at Leary's Brook from late January to late February with values hovering around 0 ^{o}C.

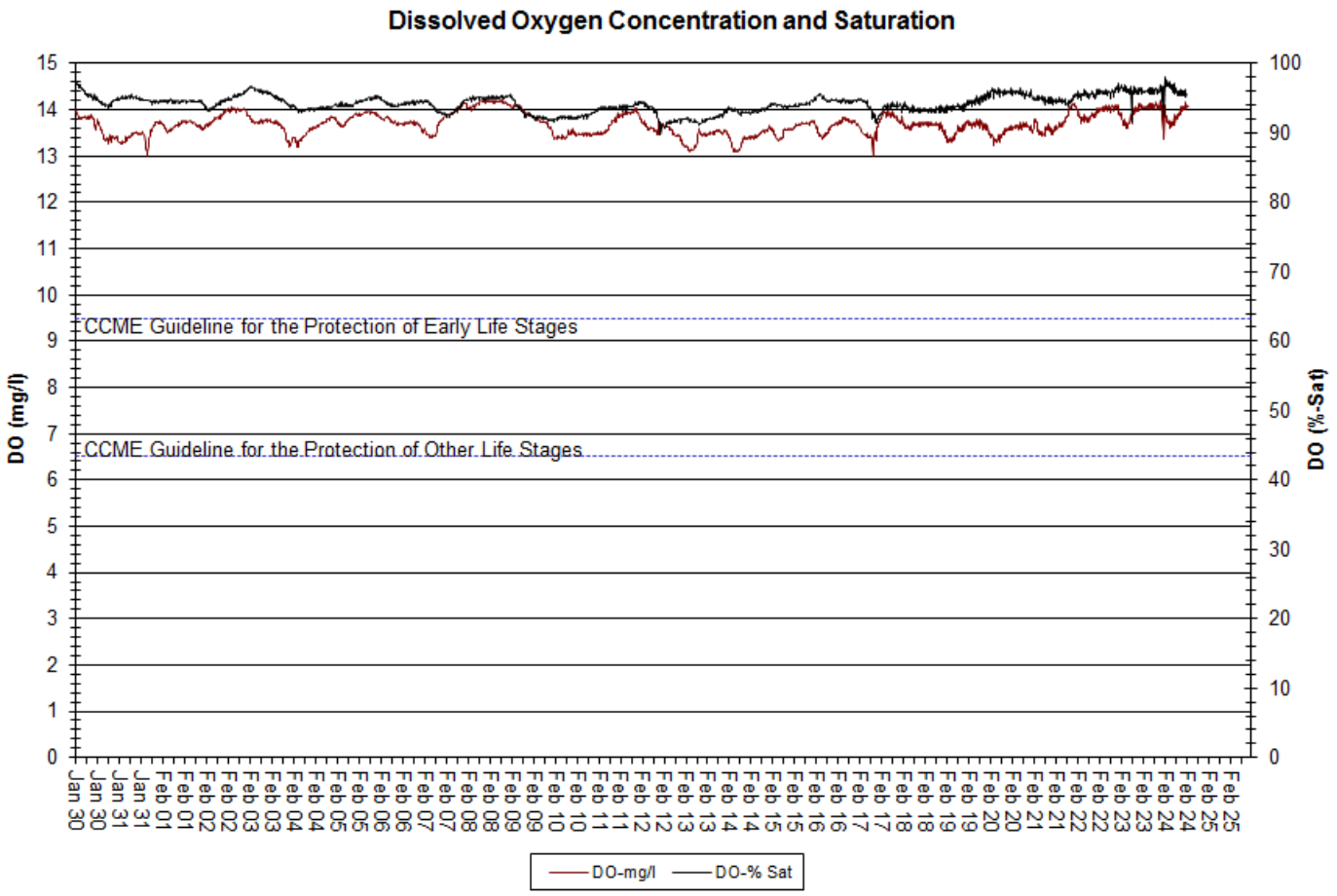
- Water temperature ranged from -1.3^{o}C to 2.2^{o}C (median value: 0.02^{o}C).



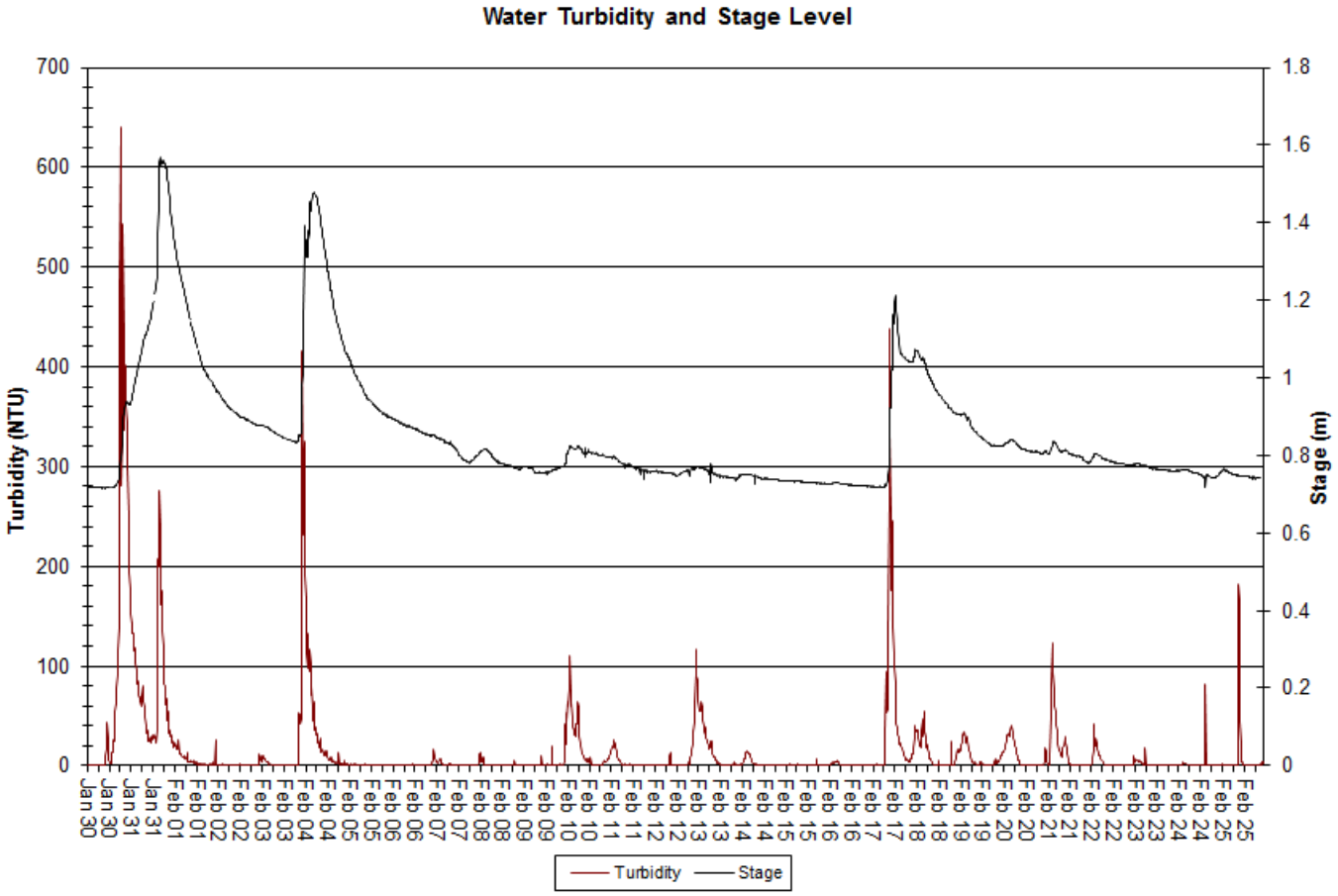
- Generally speaking, NL waters are slightly acidic which is reflected in the pH values lying closer to the lower CCME Protection of Aquatic Life guideline value of 6.5.
- During the period of increased stage level (January 30 – February 2, February 3-5 and February 17-20) there was a corresponding noticeable decrease in the pH values.
- pH ranged from 6.17 to 6.82 (Median: 6.55).



- There were two high spikes for specific conductance (above 8000 µs/cm) both related to increased stage level in addition to road salt runoff after increased precipitation.
- Other conductivity spikes ranging 2000 - 6000 µs/cm were observed throughout the deployment period.
- Conductivity ranged 387 µs/cm to 11621.0 µs/cm (the median is 1037.9 µs/cm).
- The conductivity during January and February is higher due to the application of road salts. (The median conductivity was 597 µs/cm in the last deployment period).



- DO values remained stable and did not drop below the Guideline for the Protection of Other Life Stage biota or Protection of Early Life Stages.
- The DO values fluctuated highly on the last day of the deployment period. It was later identified at removal that the cap for the DO sensor needs replacement. As a result the DO values were removed for February 25th.
- Concentrations ranged from 12.98 mg/l to 14.23 mg/l (median value: 13.69 mg/l) for DO while 89.7% to 98.1% (median value 94.3%) for percent saturation.



- The three high turbidity spikes are directly related to increased stage level.
- Other smaller spikes are related to a combination of stage level, increased precipitation due to snow and rainfall as well as snowmelt due to rise in temperature.
- Turbidity ranged between 0.0 NTU and 641 NTU (median value: 0.0 NTU) during this deployment period.

Conclusions

- The existing field sonde was replaced by the QA/QC sonde at the time of deployment since the DO sensor for the field sonde was showing questionable values resulting from a damaged sensor cap. The DO values for February 25th were removed as a result.

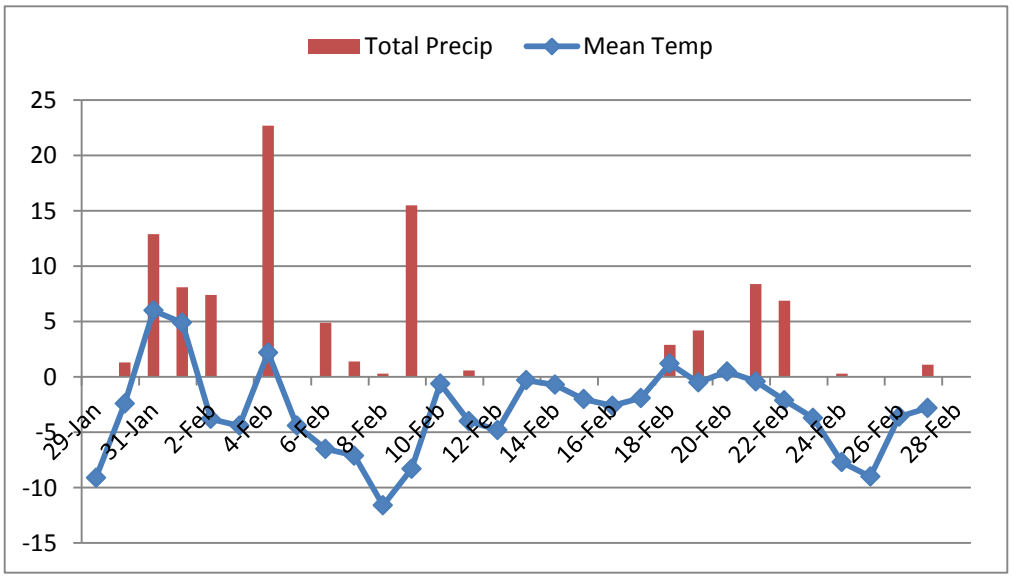
- There were high fluctuations in conductivity due to the application of road salts and snowmelts during the winter months.

- Most of the turbidity fluctuations were related to stage levels.

- During the period of increased stage level (January 30 – February 2, February 3-5 and February 17-20) there was a corresponding noticeable decrease in the pH values.

Appendix

The graph below shows the daily temperature and total precipitation taken from Environment Canada for St. John's West Climate.



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