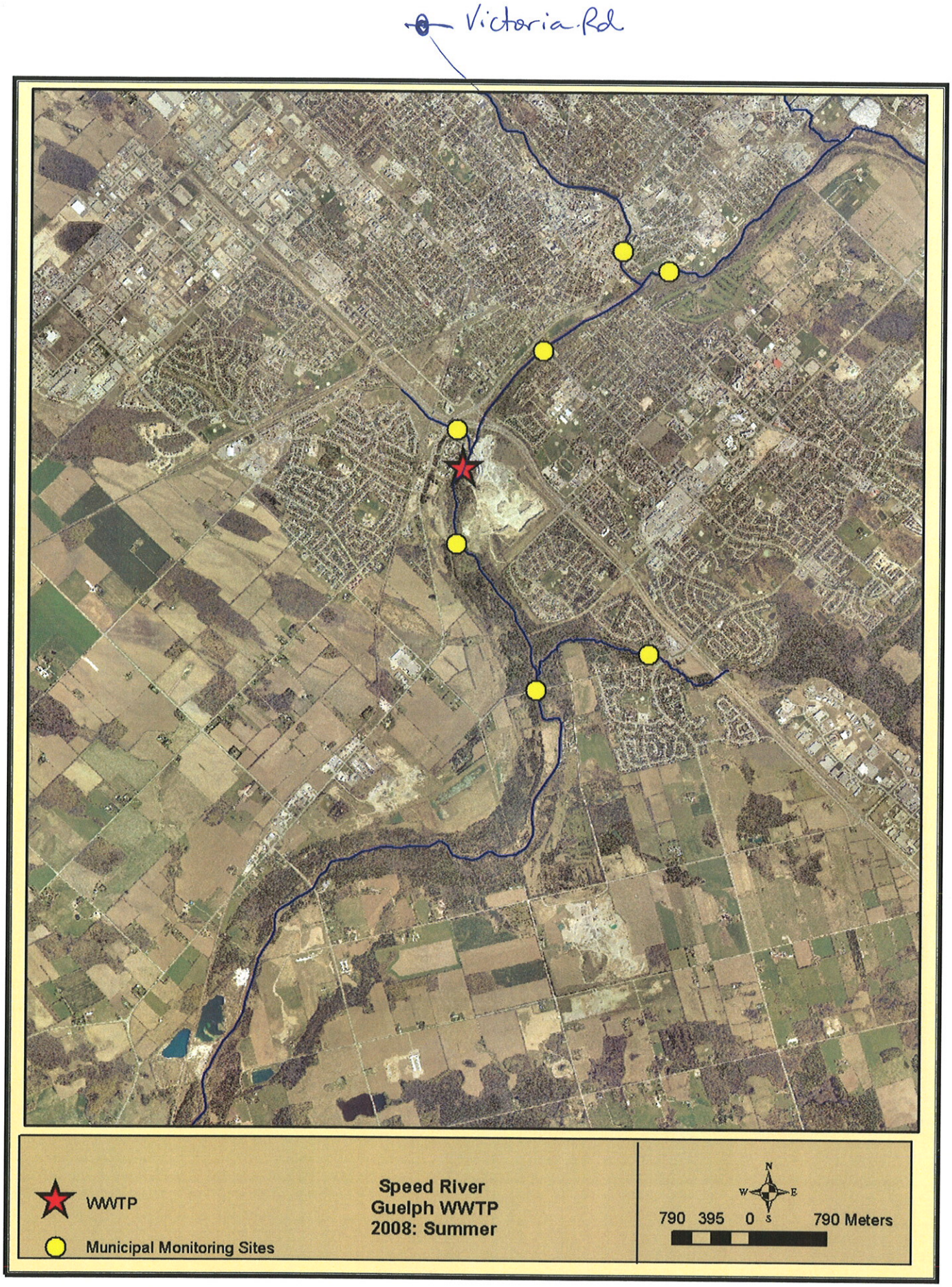
Victoria Rd
WWTP
Municipal Monitoring Sites
Speed River
Guelph WWTP
2008: Summer
N
W
E
S
790 395 0 790 Meters

GRAND RIVER CONSERVATION AUTHORITY

MEMORANDUM

TO: Sandra Cooke **DATE: May 6, 2009**
FROM: Heather Loomer **FILE:**
CC: Mark Anderson
RE: Winter and Spring Speed River Sampling

REMARKS: ☐ *Urgent* ☒ *For your review* ☐ *Reply ASAP* ☐ *Please Comment*

Below are the provisional water quality data from the winter/spring 2008 & 2009 monitoring efforts on the Nith River.

Monitoring Program

Exert from, MEM_ City of Guelph Speed River monitoring progress report, March. 16, 2009 prepared by Tim Kuntz

All river samples were submitted for analysis to an approved Laboratory for the following parameters with the corresponding detection limits:

- total suspended solids (TSS) [detection limit = 1.0 mg/L] **
- total Kjeldahl nitrogen (TKN) [detection limit = 0.10 mg/L] **
- total phosphorus (TP) [detection limit = 0.002 mg/L] **
- biochemical oxygen demand (BOD) [detection limit = 2.0 mg/L]
- total ammonia nitrogen [detection limit = 0.05 mg/L]
- orthophosphate [detection limit = 0.01 mg/L]
- total nitrates [detection limit = 0.10 mg/L] **
- total nitrites [detection limit = 0.01 mg/L]
- chloride [detection limit = 1.0 mg/L] **

****** parameters analyzed for automated samples.

Summary of winter sampling

Winter sampling began on January 19, 2009. When possible all 8 sites were sampled on the same day, or over the course of 2 consecutive days. In general, the river did not completely freeze over during the winter with the main channel remaining open. Exceptions to this were at the Edinburgh Road site were 100% ice cover was briefly recorded and at the Eramosa River at Victoria Street, where 100% ice cover set in for a couple weeks.

Winter sampling was interrupted on February 12 but a major run-off event. However the river returned to winter conditions approximately 1 week after this event and winter sampling was briefly resumed. The timing of sampling compared to the river flow can be seen in figure 1.

Samples Collected (As of March 2)

5-331-001 – Speed at Victoria
Sampled January 19, 29; February 3, 9, 11, 24, 26
Notes: no ice cover at this site

Total of 7 samples under winter conditions

5-332-003 – Speed at York
Sampled January 21, 28; February 3, 9, 11, 24, 26
Notes: ice cover prevented sampling on right side until after Feb 12, ice free following this.

Total of 7 samples under winter conditions

5-333-004 – Speed at Edinburgh
Sampled January 20, 28; February 3, 9, 11, 24, 26
Notes: river froze over briefly in early Feb, until the thaw on Feb 12, but was ice free after that.

Total of 7 samples under winter conditions

5-340-004 – Hanlon Cr at Downey
Sampled January 20, 28; February 3, 9, 11, 24, 26
Notes: very little ice cover at this site

Total of 7 samples under winter conditions

5-341-008 – Speed at Niska
Sampled January 20, 28; February 3, 9, 11, 24, 26
Notes: no ice cover at this site

Total of 7 samples under winter conditions

5-333-005 – Northwest drain near STP
Sampled January 20, 29; February 3, 9, 11, 24, 26
Notes: little ice cover at this site

Total of 7 samples under winter conditions

5-335-001 – Eramosa at Victoria
Sampled January 29; February 9, 11, 24, 26
Notes: alternative site 16018410202 (Eramosa at Watson Rd) taken due to ice on Feb 3. River froze completely from Jan 29 until Feb 12 thaw.

Total of 6 samples under winter conditions

5-340-002 – Speed downstream STP
Sampled January 21 29; February 3, 9, 11, 24, 26
Notes: no ice cover at this site.

Total of 7 samples under winter conditions

Summary of high flow sampling

There were 2 major run-off events that were characterized in the spring/high flow sampling. The first began on Feb 11 and the second began on Mar 7. During the first event the flow peaked quickly on Feb 12. During the second event the flow increased more gradually until a peak on Mar 11. The flows remained high for approximately 1 week following the run off events. The peak flow rate during the first run-off event was approximately 1.5 times greater than the second.

Samples Collected (As of March 16, 2009)

5-331-001 – Speed at Victoria
Sampled Feb 17, 19; March 9, 10, 11, 12
Notes:

Total of 6 samples under high flow conditions

5-332-003 – Speed at York
Sampled Feb 17, 19; March 7, 9, 10, 11, 12
Notes:

Total of 7 samples under high flow conditions
5-333-004 – Speed at Edinburgh
Sampled Feb 17, 19; March 7, 9, 10, 11, 12
Notes:

Total of 7 samples under high flow conditions

5-340-004 – Hanlon Cr at Downey
Sampled Feb 17, 19; March 9, 10, 11, 12
Notes:

Total of 6 samples under high flow conditions

5-341-008 – Speed at Niska
Sampled Feb 17, 19; March 9, 10, 11, 12
Notes:

Total of 6 samples under high flow conditions

5-333-005 – Northwest drain near STP
Sampled Feb 17, 19; March 9, 10, 11, 12
Notes:

Total of 6 samples under high flow conditions

5-335-001 – Eramosa at Victoria
Sampled Feb 17, 19; March 7, 9, 10, 11, 12
Notes:

Total of 7 samples under high flow conditions

5-340-002 – Speed downstream STP
Sampled Feb 17, 19; March 9, 11, 12
Notes: unable to sample this site on March 10 due to flooding

Total of 5 samples under high flow conditions

Automated sampling

ISCO automated samplers were installed in the continuous monitoring stations at Wellington Road 32 and Hanlon (Edinburg Road) to sample the start of the second major run-off event from March 7-9. Sampling began to 0:00 on March 7 and samples were collected every 6 hours until 6:00 on March 9,

for a total of 10 samples. The sampling protocol was identical at both stations. Figure 2 shows the timing of samples compared to river flow.

Results

Winter Conditions

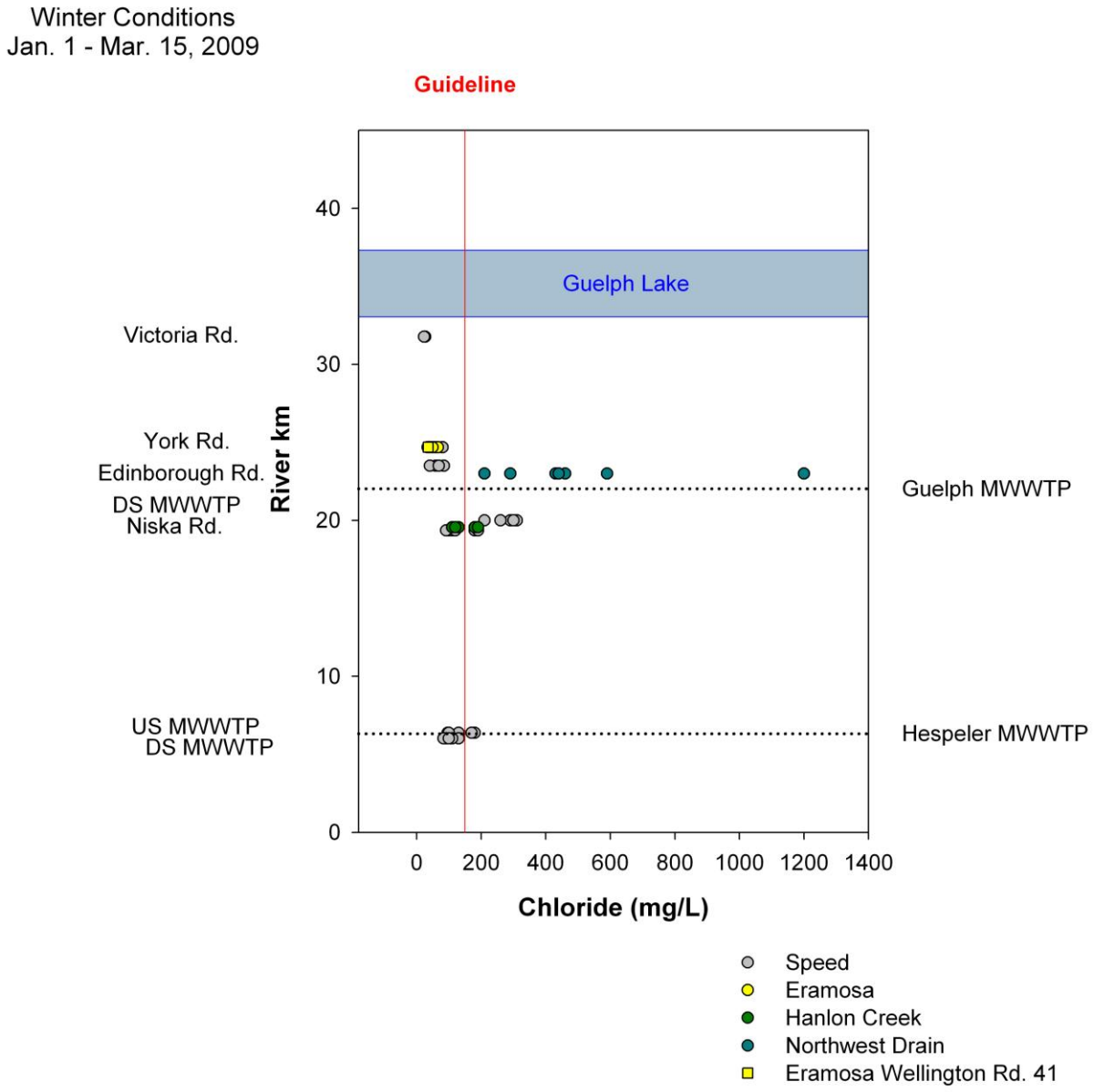

Figure 1: Chloride concentrations during winter conditions in the Speed River between January and March, 2009.

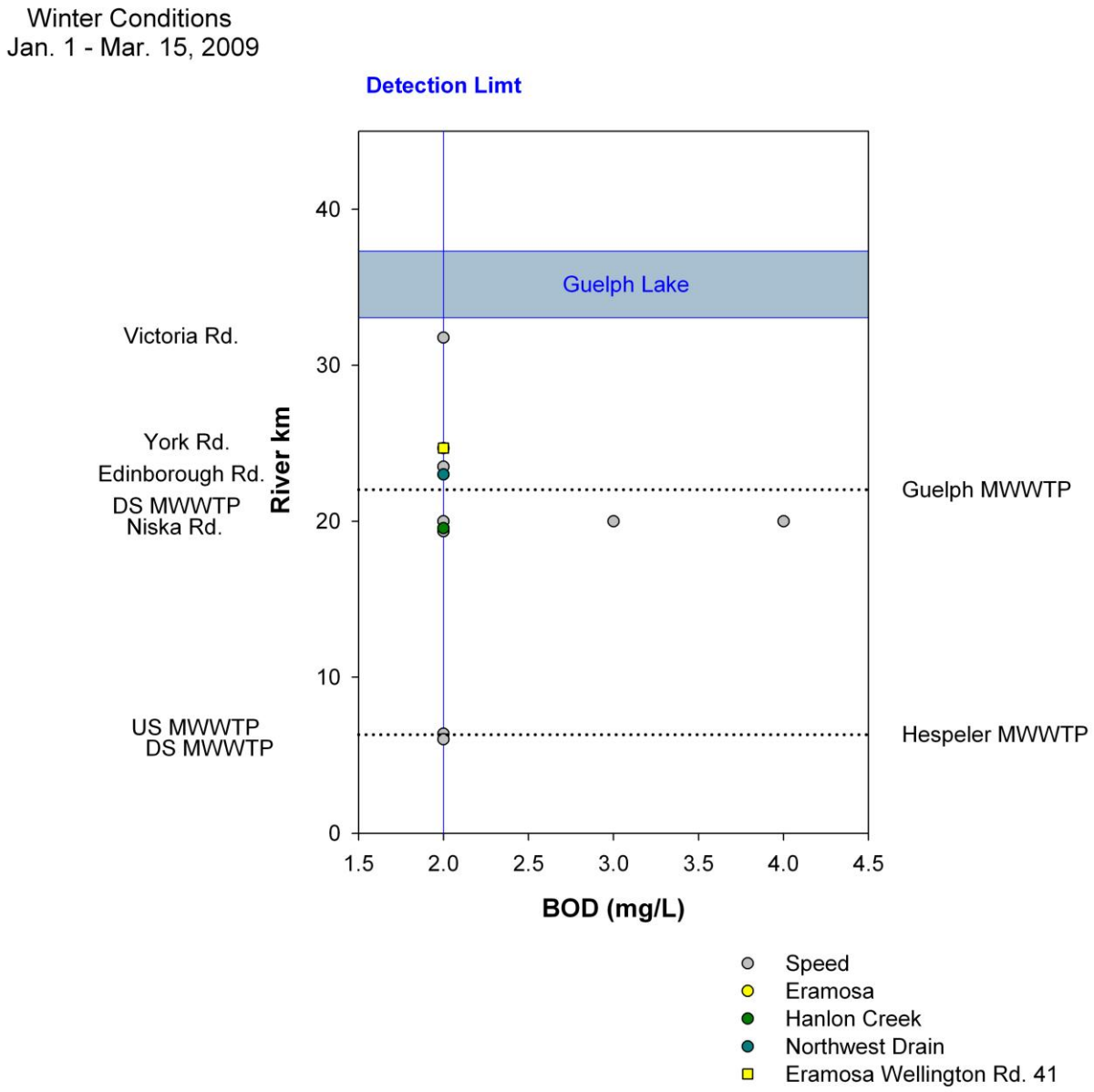

Figure 2: Biological oxygen demand of samples during winter conditions in the Speed River between January and March, 2009.

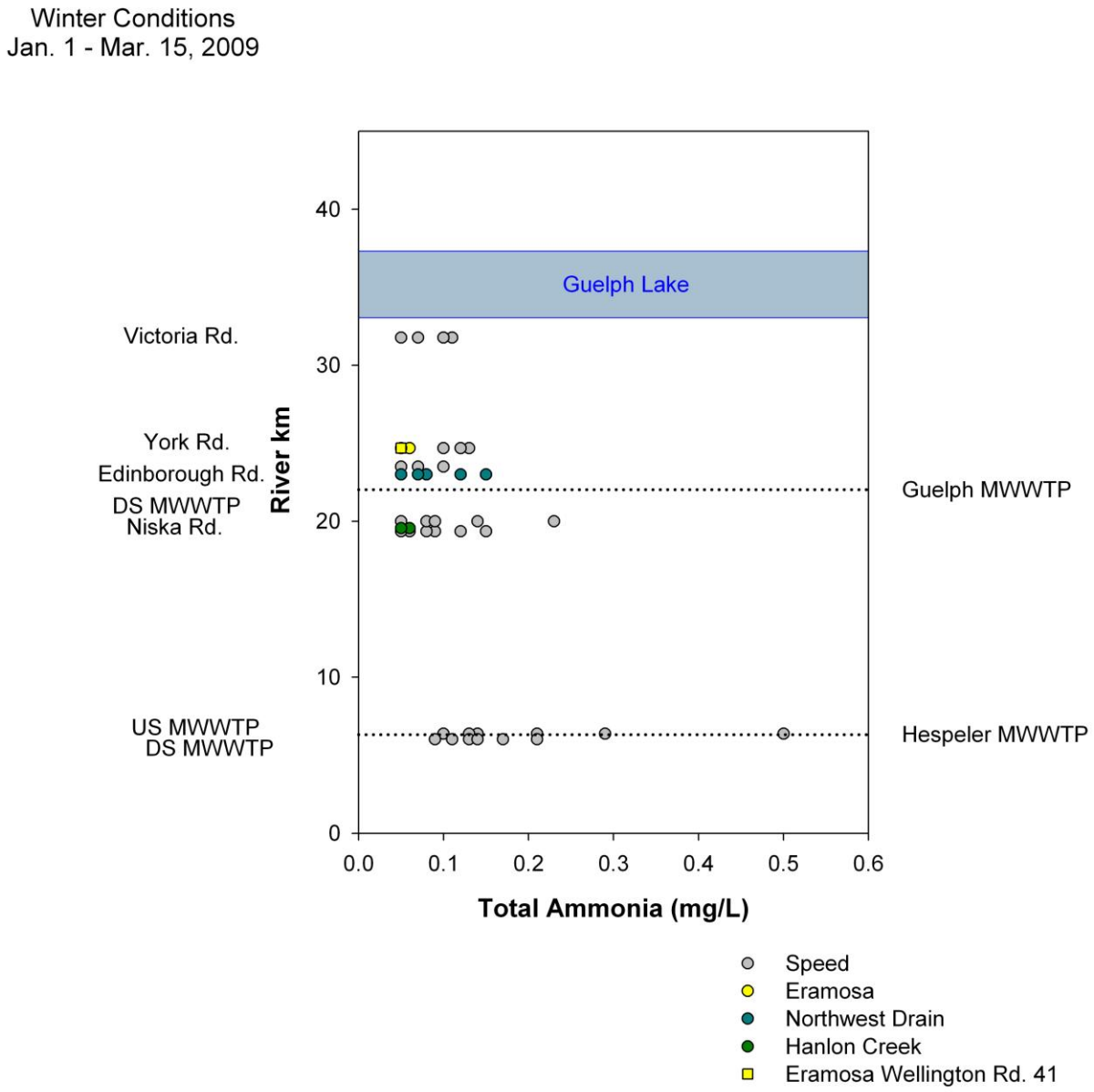

Figure 3: Total ammonia concentrations during winter conditions in the Speed River between January and March, 2009.

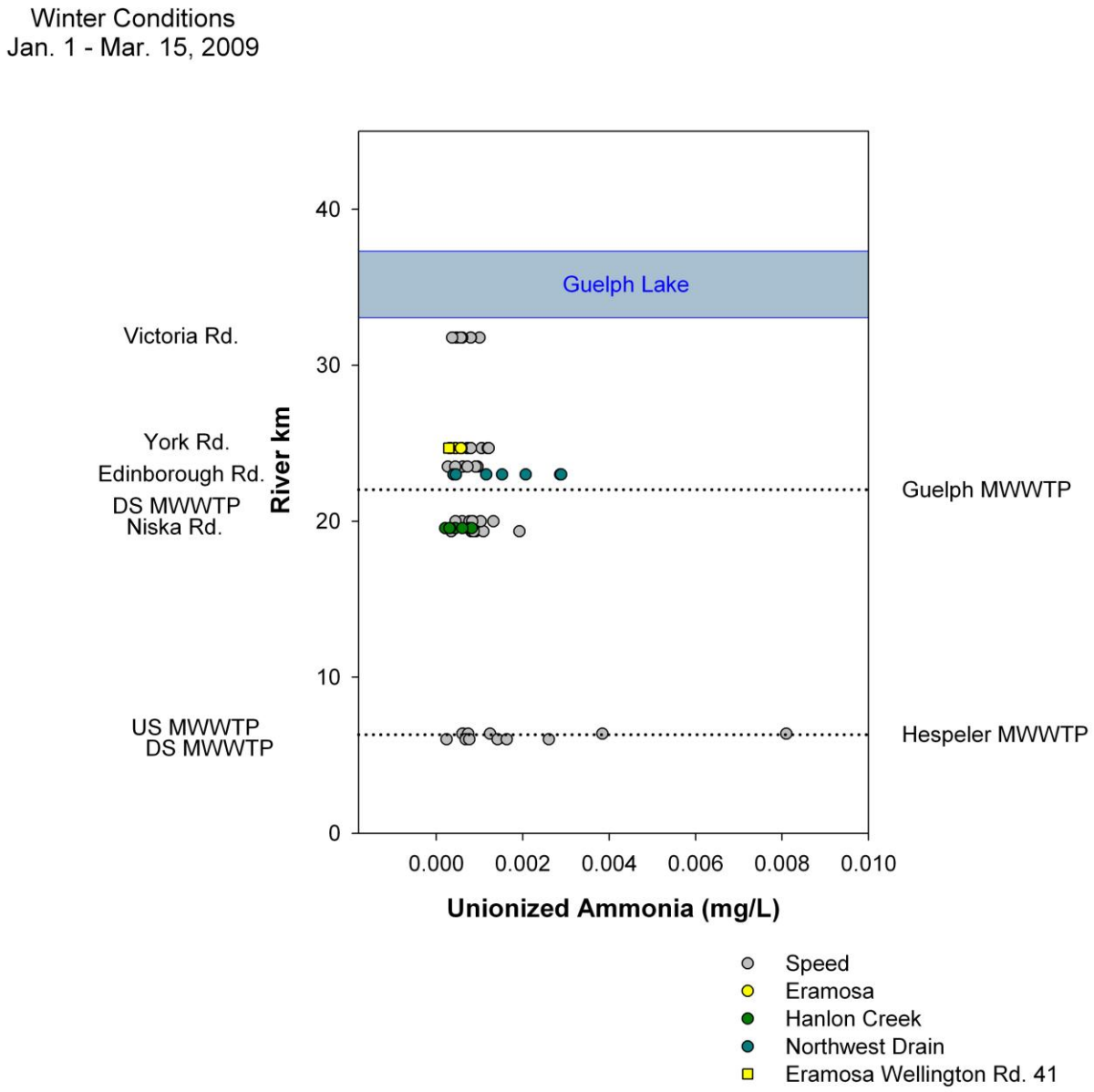

Figure 4: Unionized ammonia concentrations during winter conditions in the Speed River between January and March, 2009.

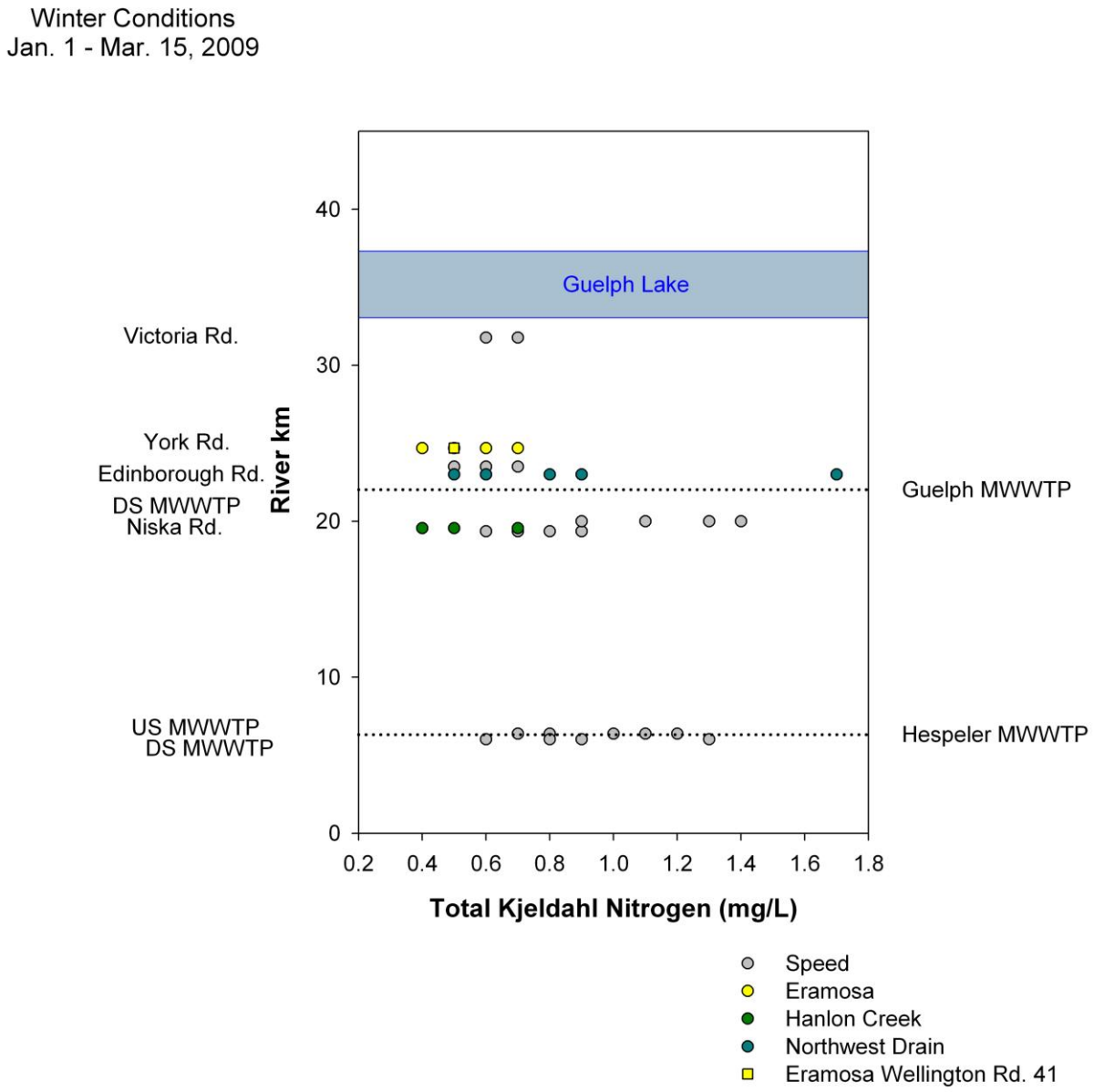

Figure 5: Total kjeldahl nitrogen concentrations during winter conditions in the Speed River between January and March, 2009.

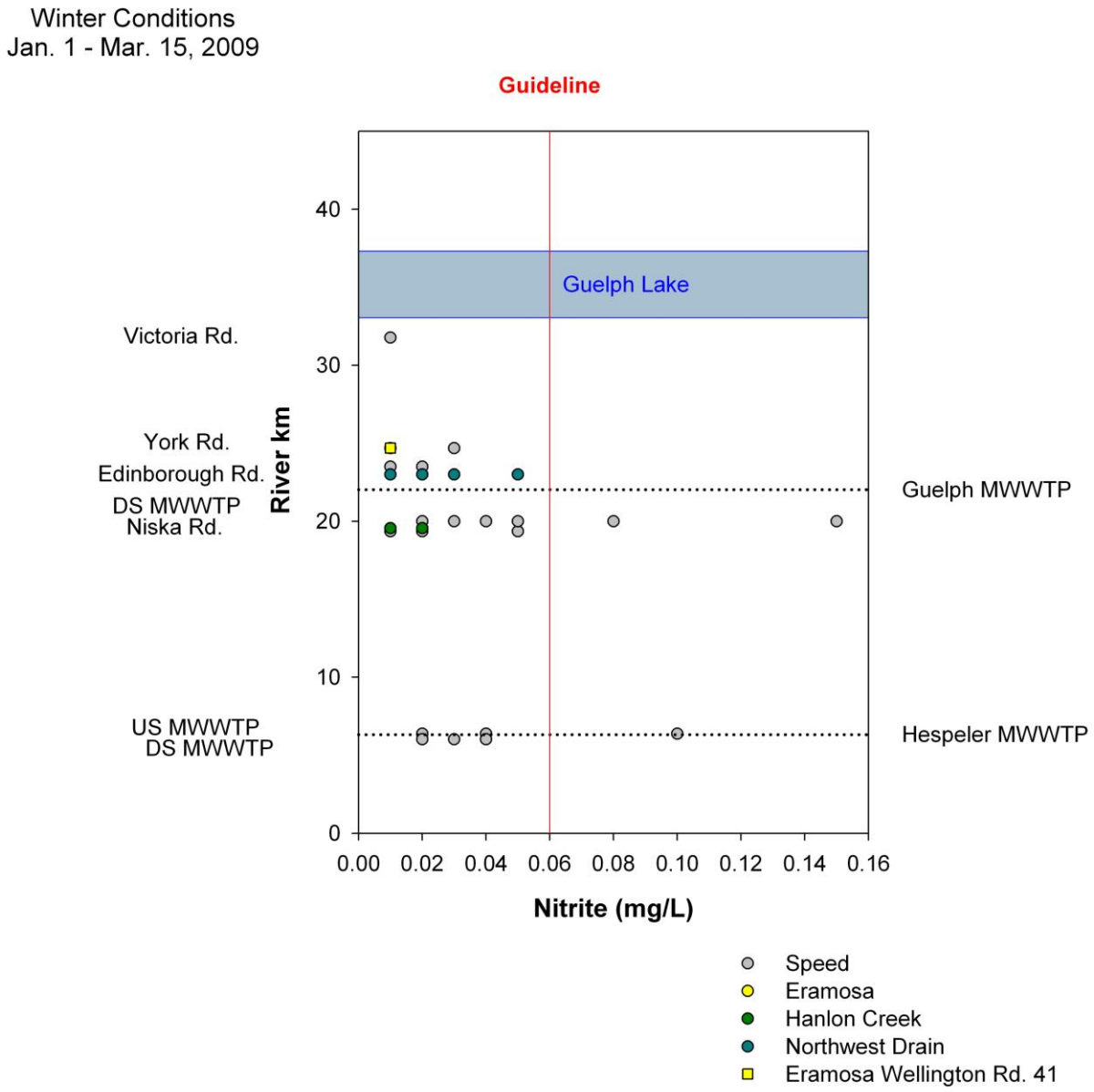

Figure 6: Nitrite concentrations during winter conditions in the Speed River between January and March, 2009.

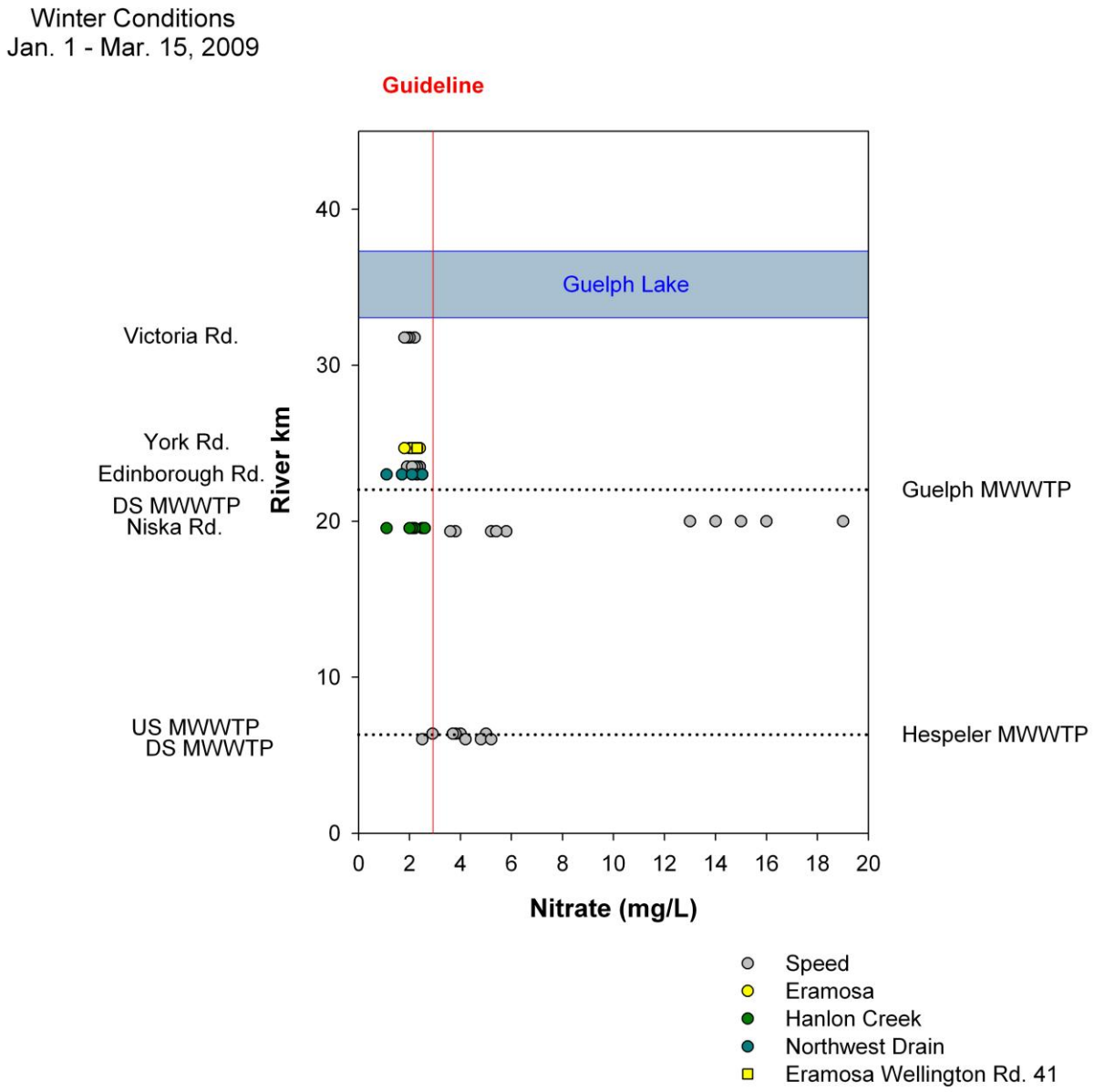

Figure 7: Nitrate concentrations during winter conditions in the Speed River between January and March, 2009.

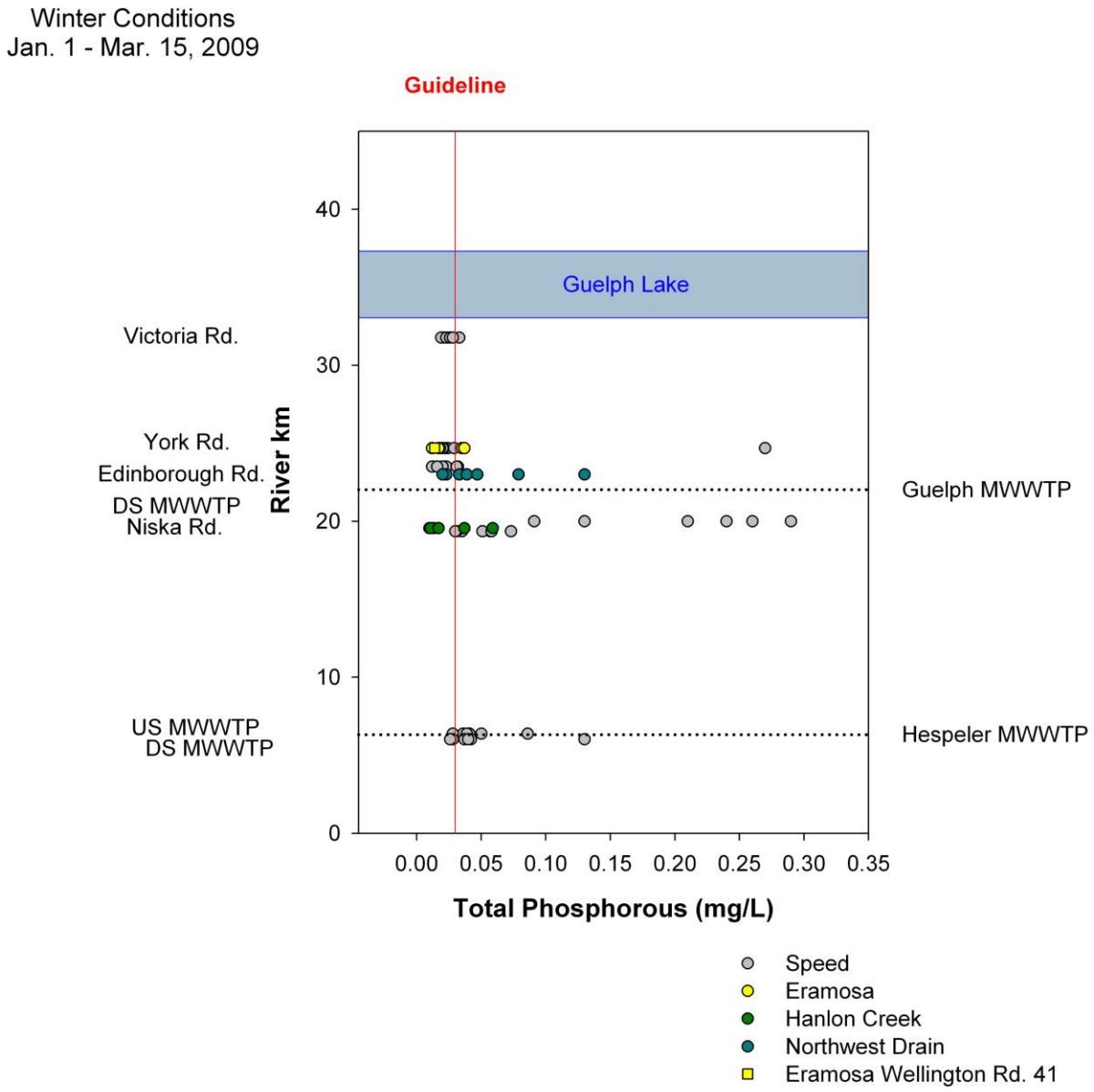

Figure 8: Total phosphorous concentrations during winter conditions in the Speed River between January and March, 2009.

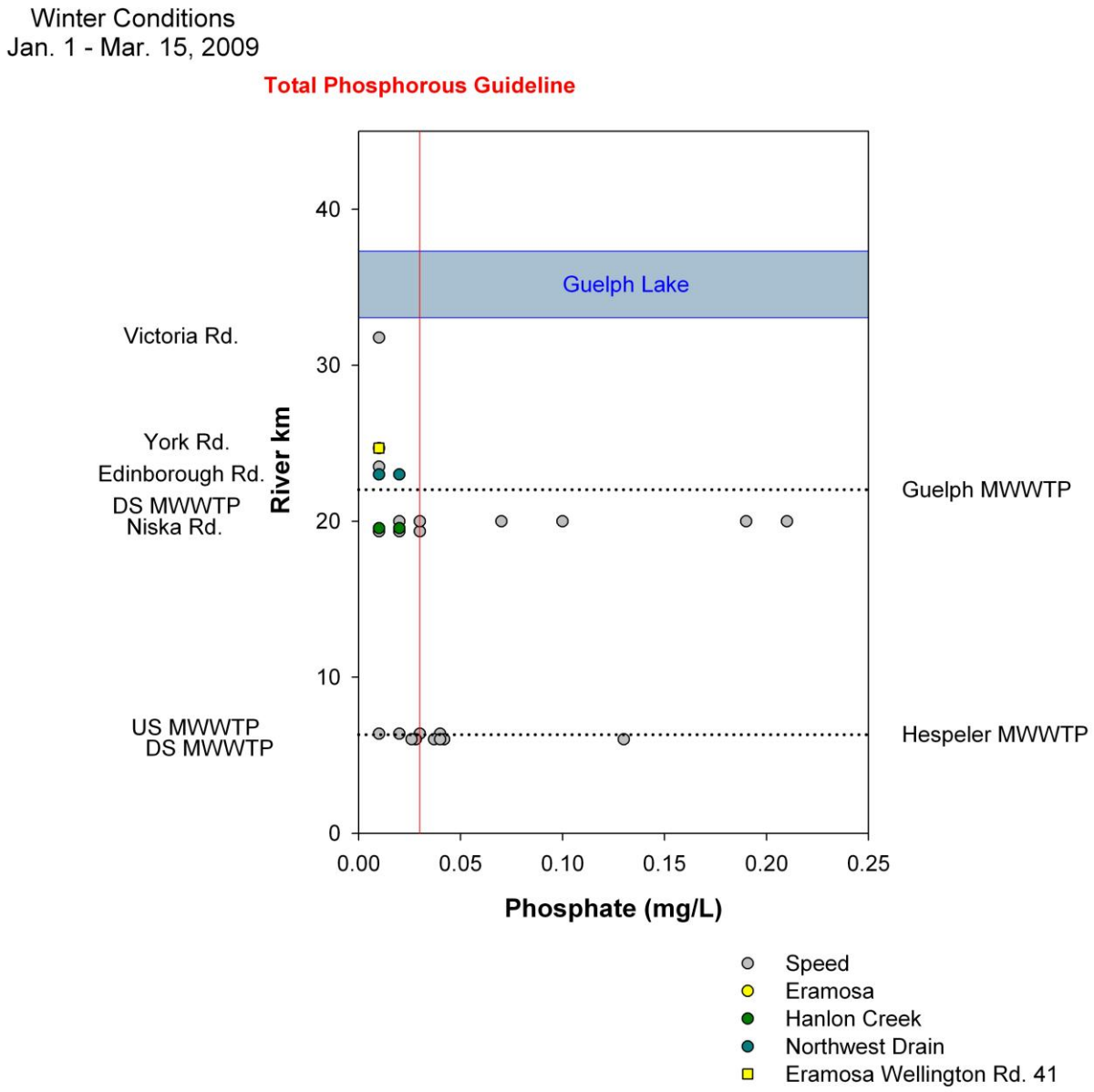

Figure 9: Phosphate concentrations during winter conditions in the Speed River between January and March, 2009.

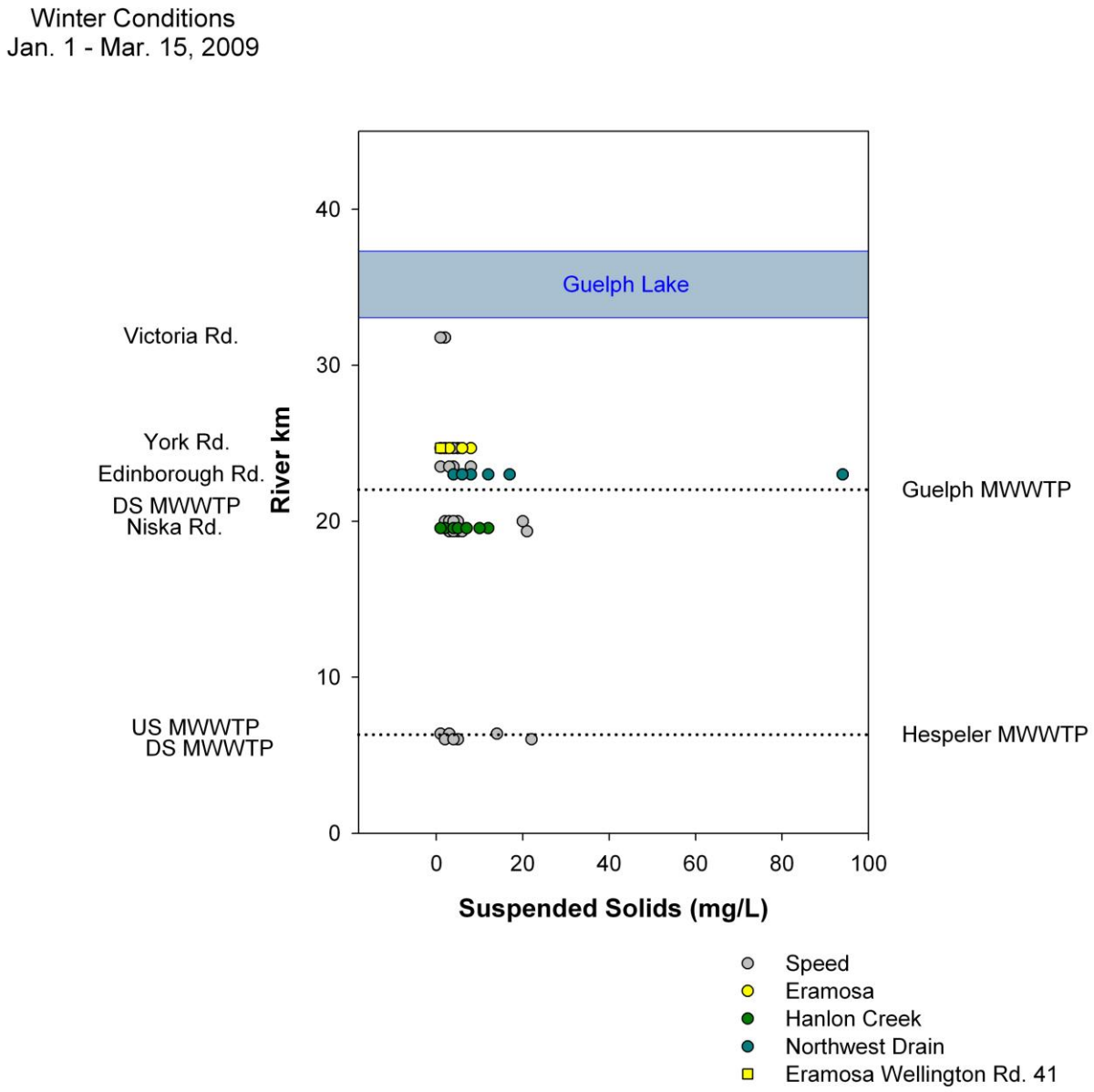

Figure 10: Suspended solids concentrations during winter conditions in the Speed River between January and March, 2009.

Spring Conditions

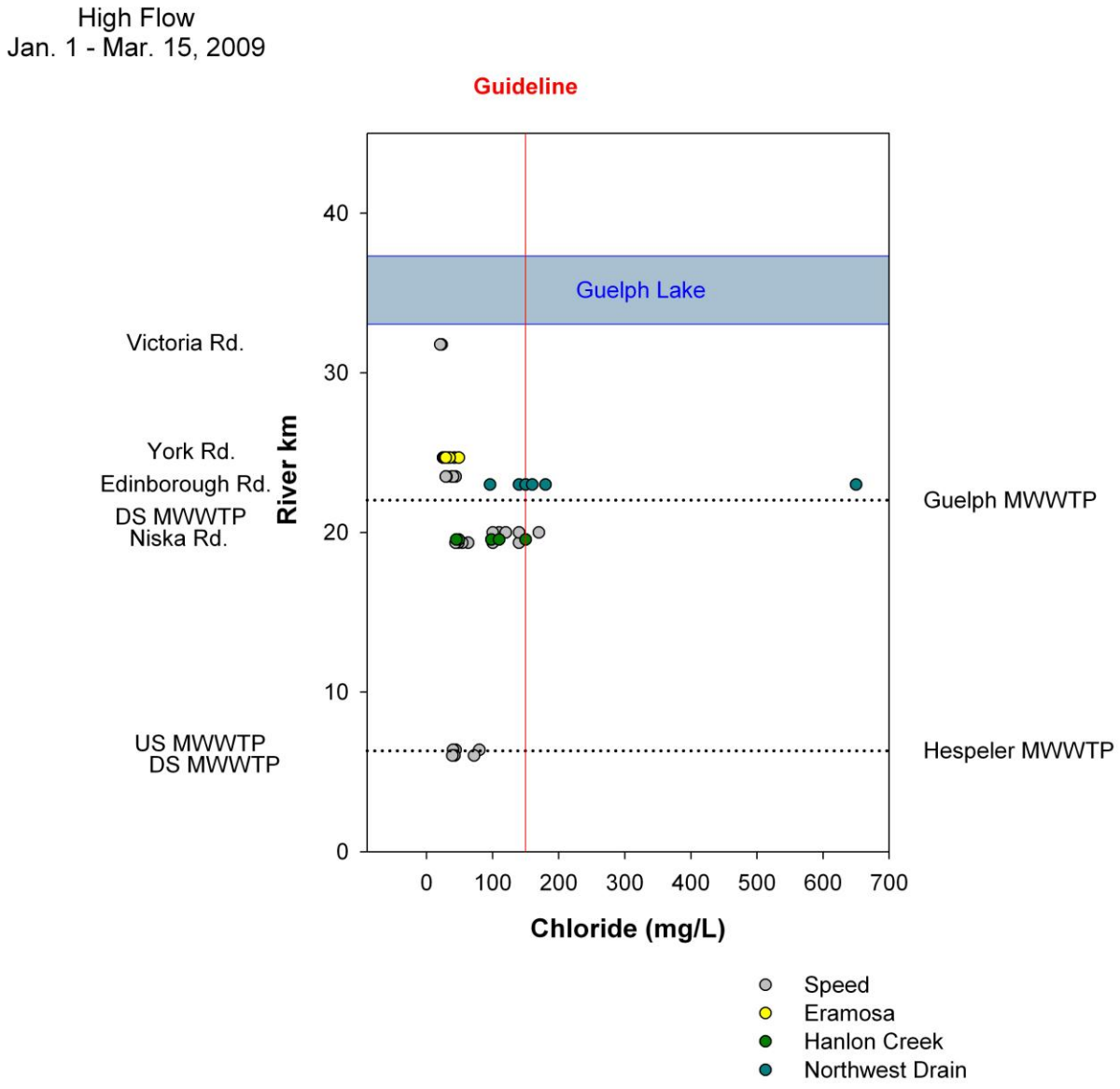

Figure 11: Chloride concentrations during high flow conditions in the Speed River between January and March, 2009.

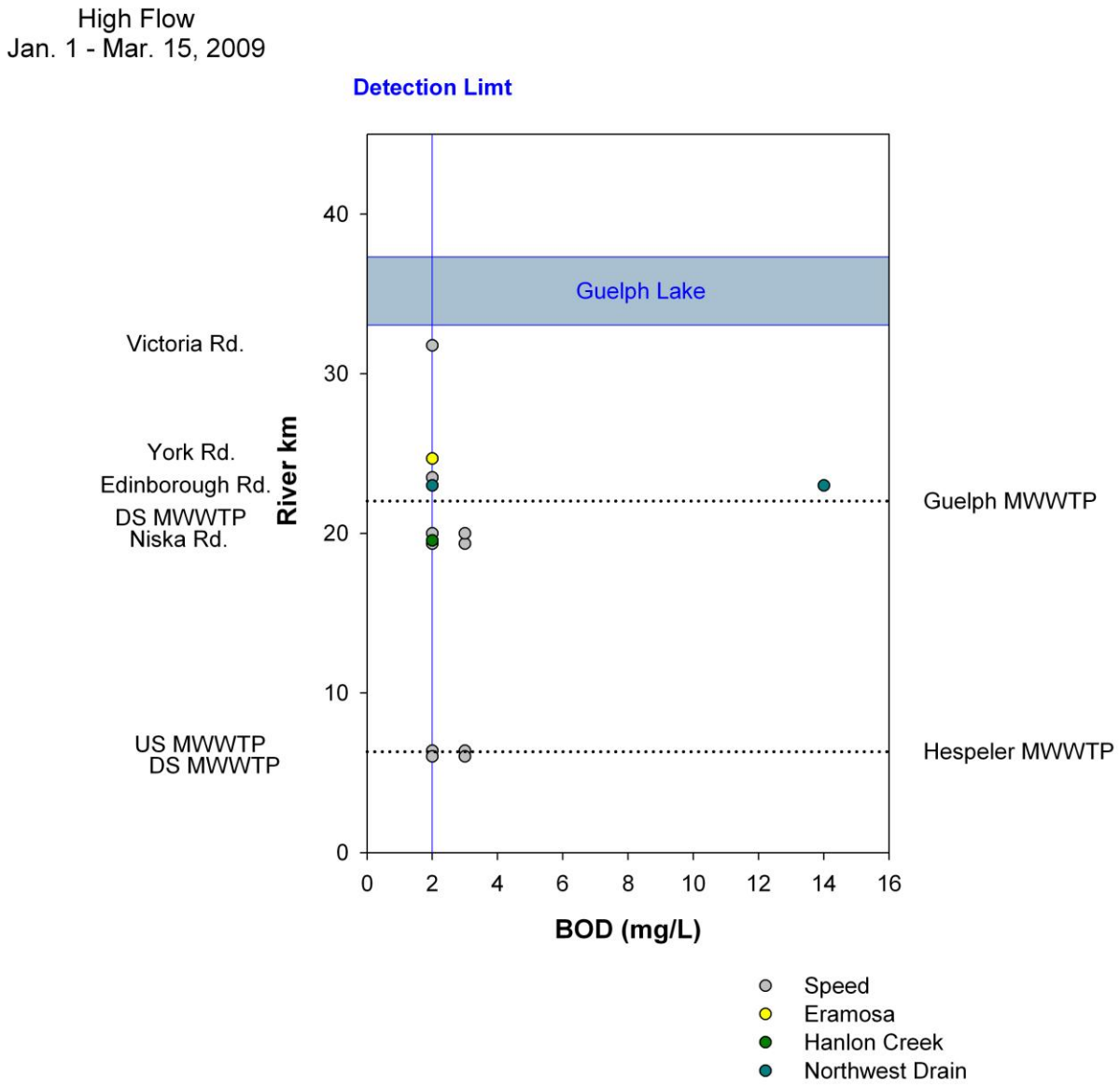

Figure 12: Biological oxygen demand of samples collected during high flow conditions in the Speed River between January and March, 2009.

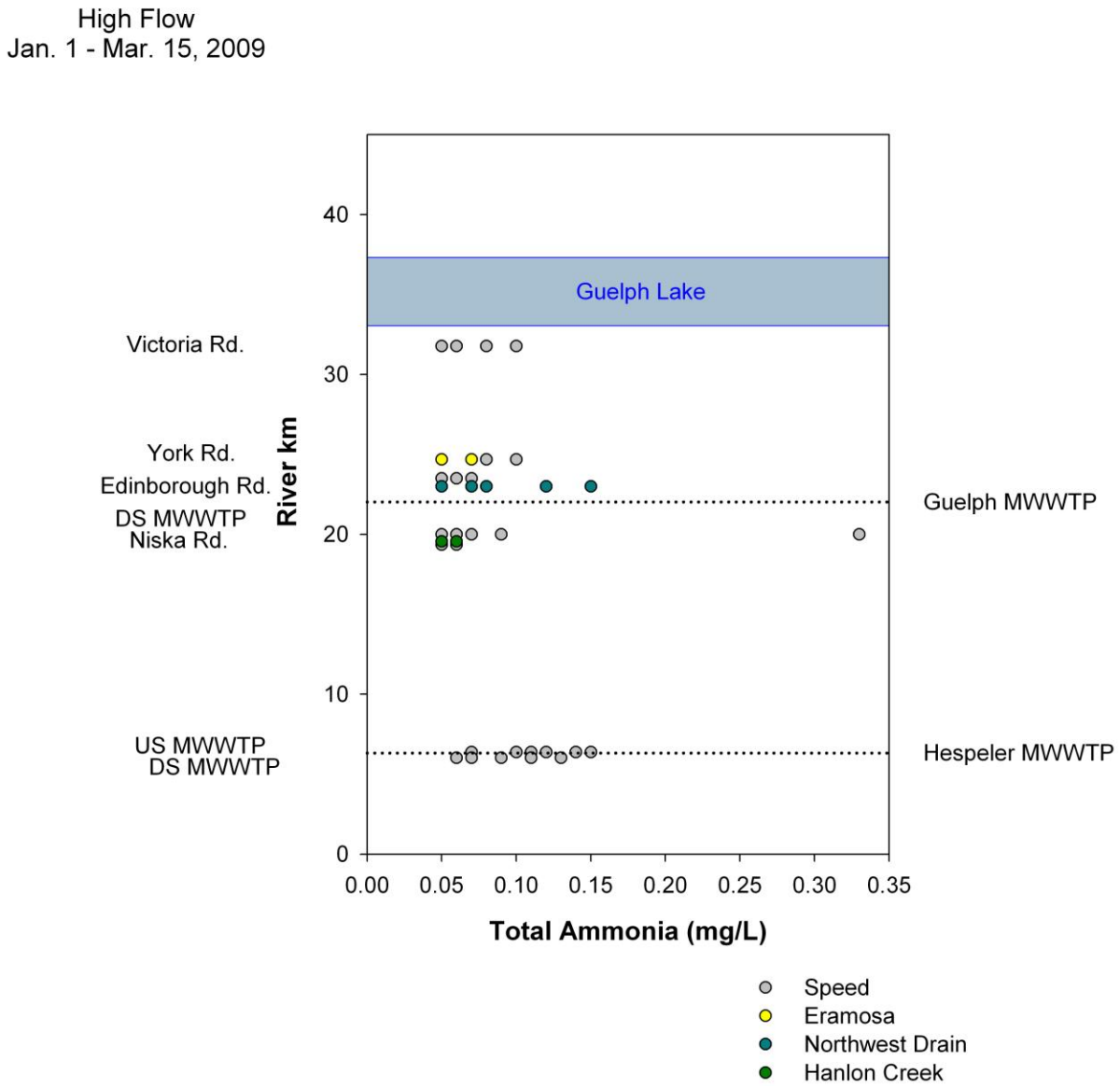

Figure 13: Total ammonia concentrations during high flow conditions in the Speed River between January and March, 2009.

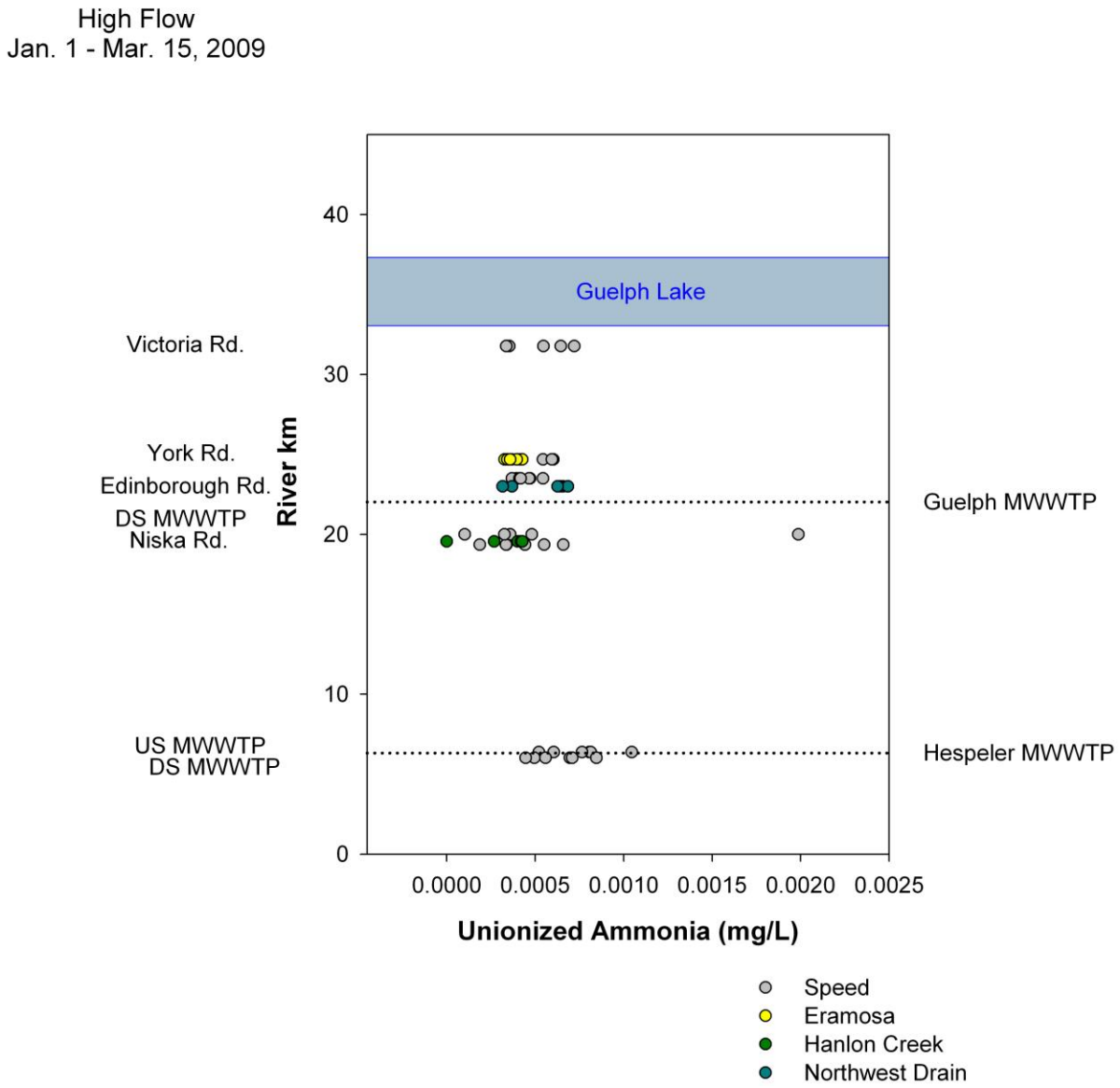

Figure 14: Unionized ammonia concentrations during high flow conditions in the Speed River between January and March, 2009.

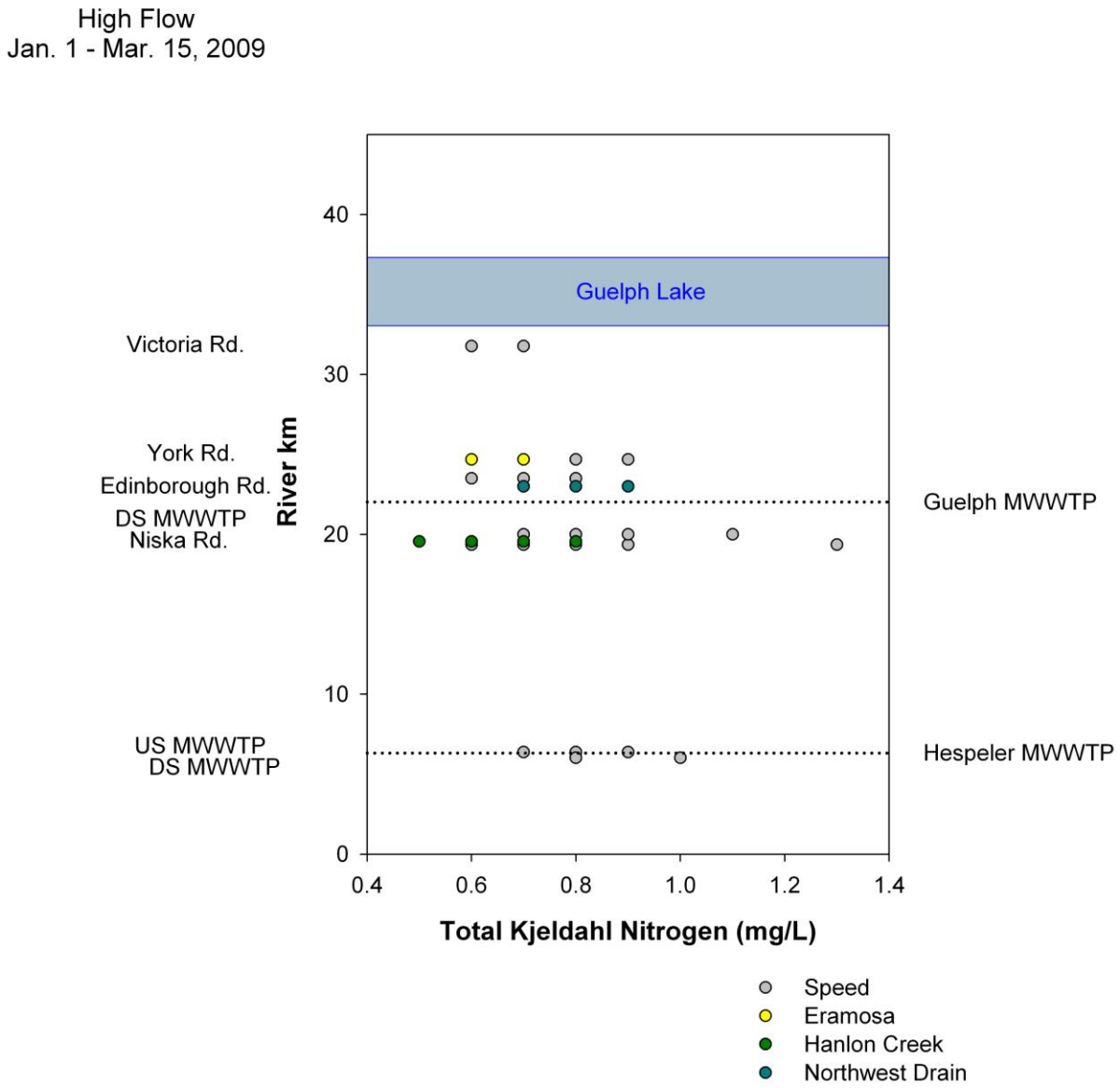

Figure 15: Total kjeldahl nitrogen concentrations during high flow conditions in the Speed River between January and March, 2009.

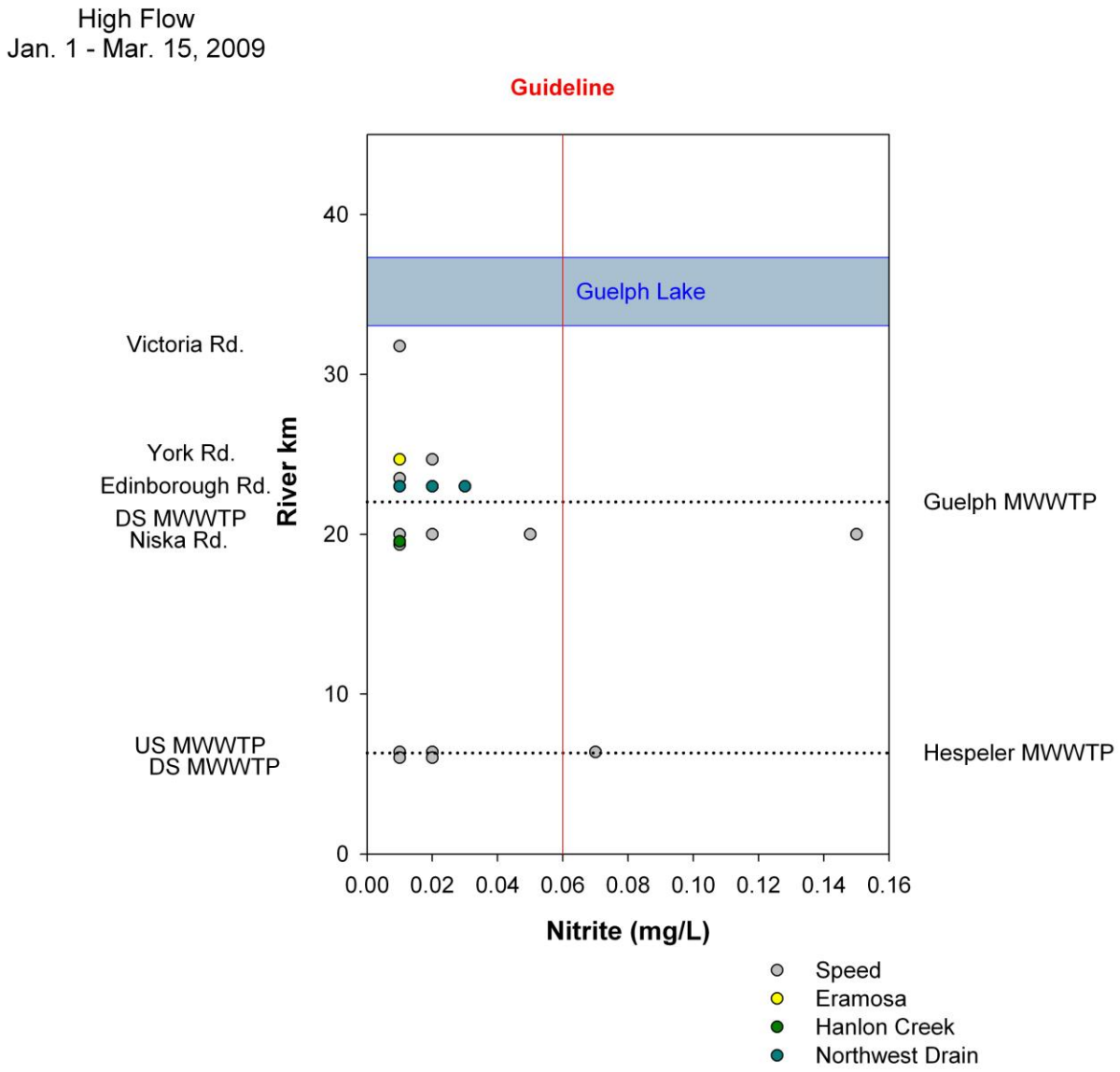

Figure 16: Nitrite concentrations during high flow conditions in the Speed River between January and March, 2009.

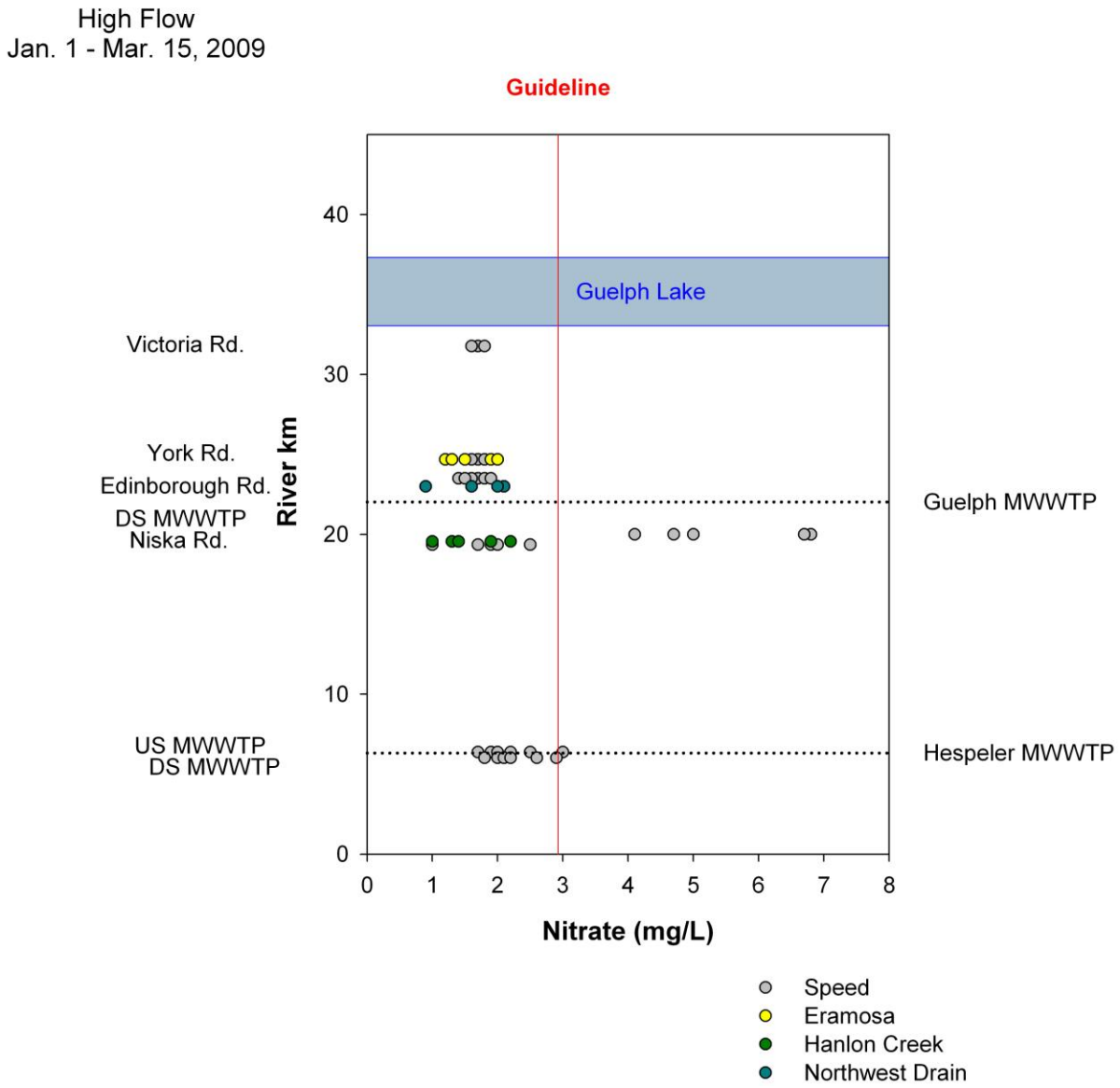

Figure 17: Nitrate concentrations during high flow conditions in the Speed River between January and March, 2009.

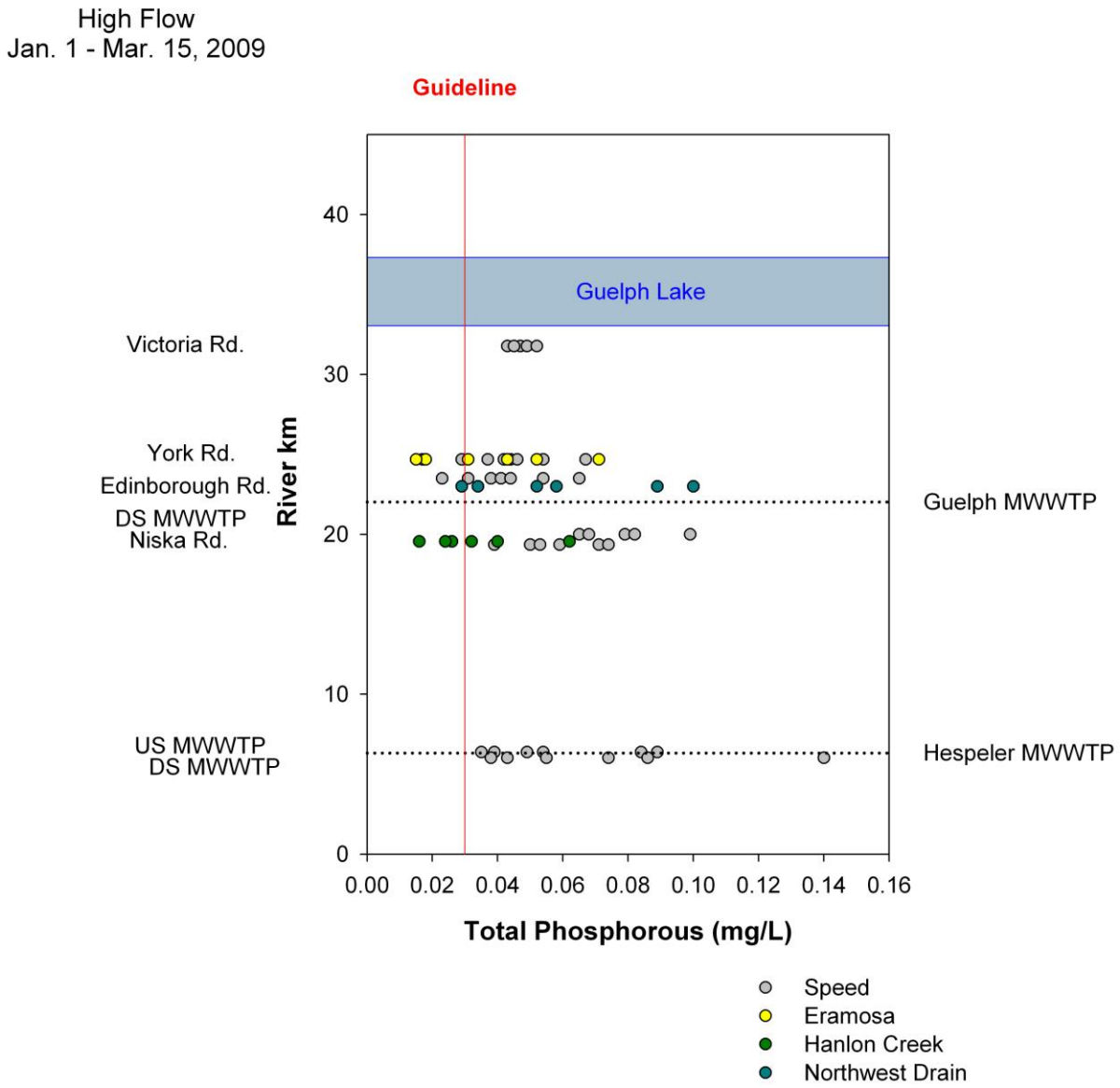

Figure 18: Total phosphorous concentrations during high flow conditions in the Speed River between January and March, 2009.

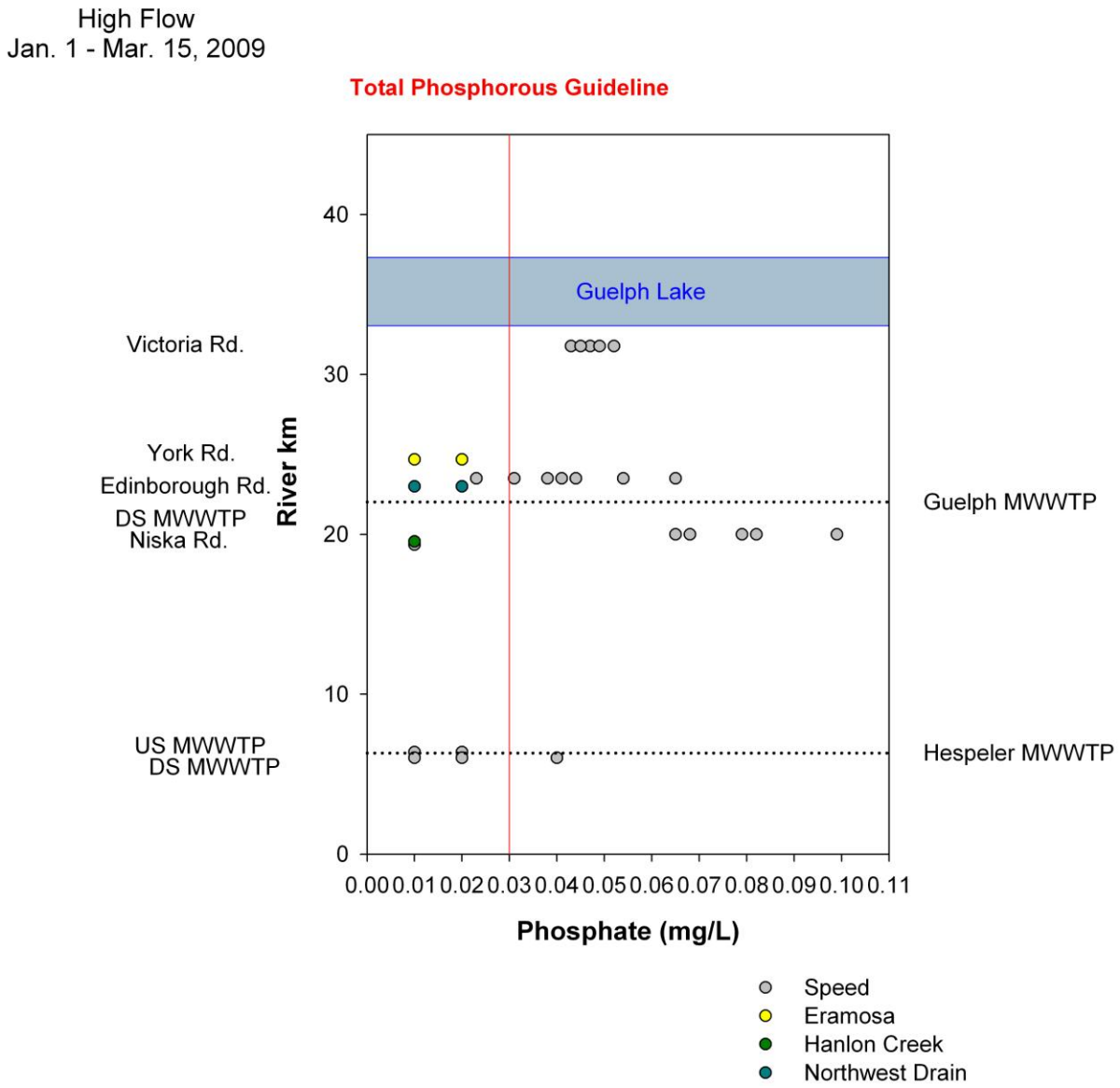

Figure 19: Phosphate concentrations during high flow conditions in the Speed River between January and March, 2009.

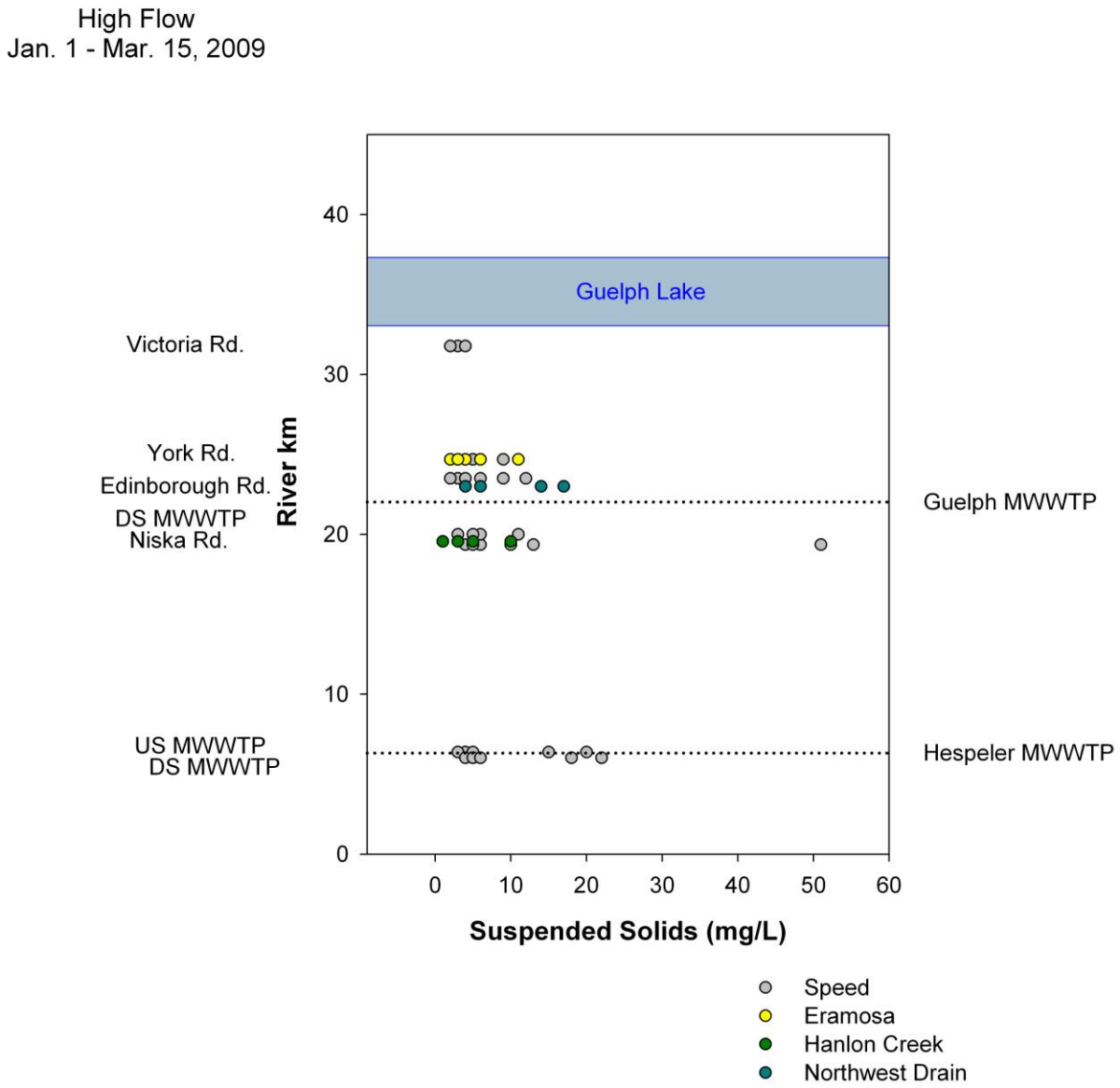

Figure 20: Suspended solids concentrations during high flow conditions in the Speed River between January and March, 2009.

ISCO Sampling

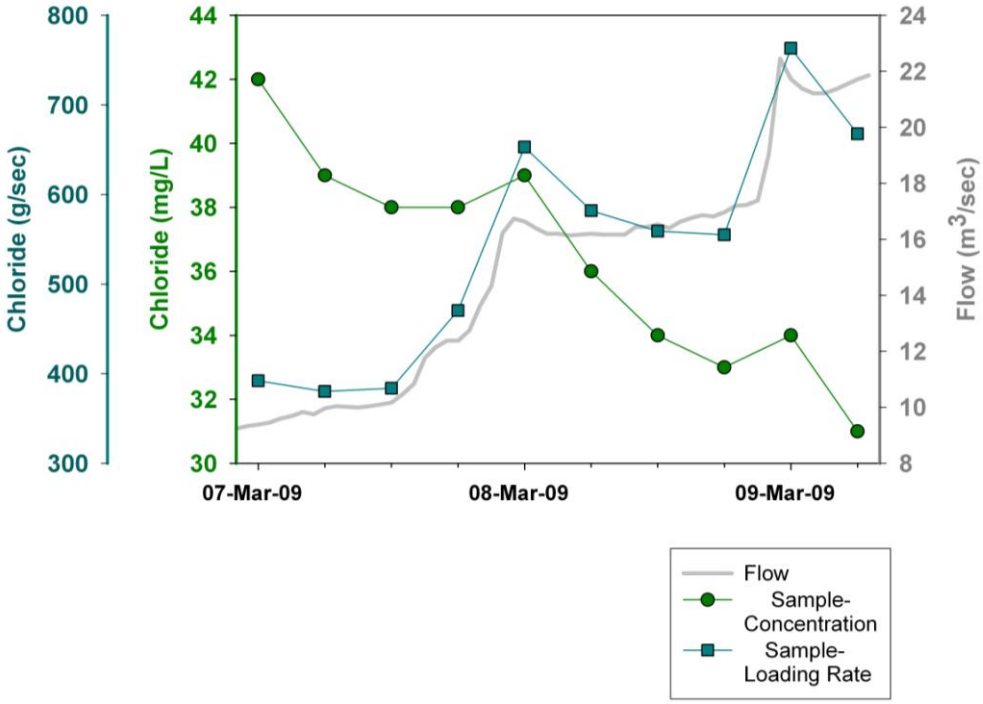

Figure 21: Chloride concentration and loading rate relative to stream flow at the Hanlon GRCA continuous monitoring station between March 6 and 8, 2009.

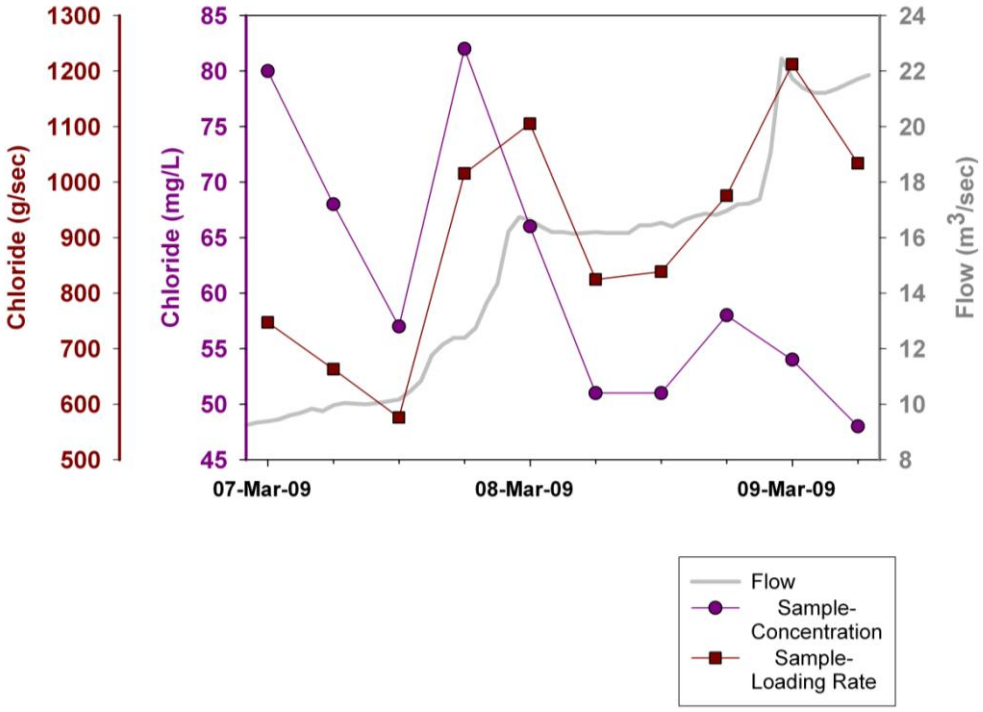

Figure 22: Chloride concentration and loading rate measured at the Wellington Rd. 32 GRCA continuous monitoring station relative to stream flow at the Hanlon flow gauge between March 6 and 8, 2009.

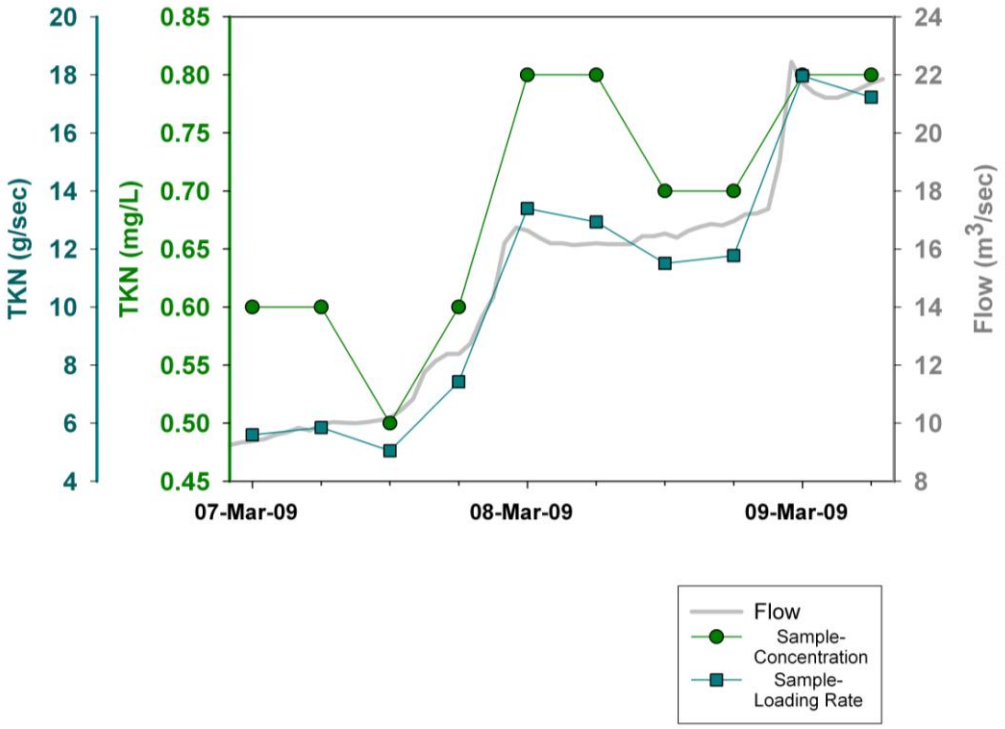

Figure 23: Total kjeldahl nitrogen (TKN) concentration and loading rate relative to stream flow at the Hanlon GRCA continuous monitoring station between March 6 and 8, 2009.

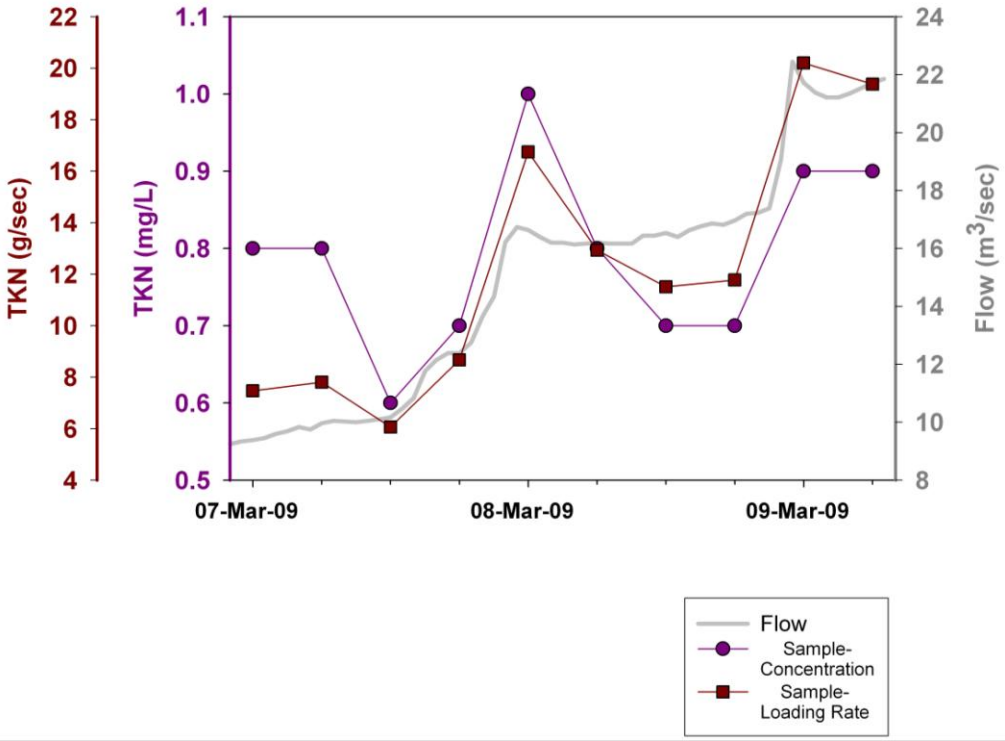

Figure 24: Total kjeldahl nitrogen (TKN) concentration and loading rate measured at the Wellington Rd. 32 GRCA continuous monitoring station relative to stream flow at the Hanlon flow gauge between March 6 and 8, 2009.

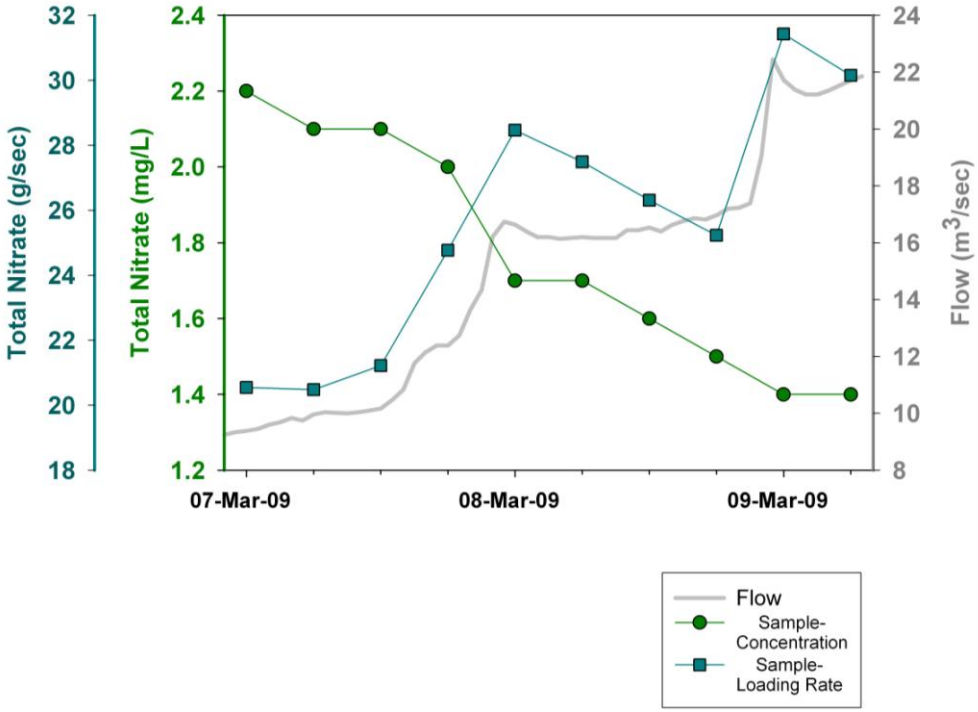

Figure 25: Total nitrate concentration and loading rate relative to stream flow at the Hanlon GRCA continuous monitoring station between March 6 and 8, 2009.

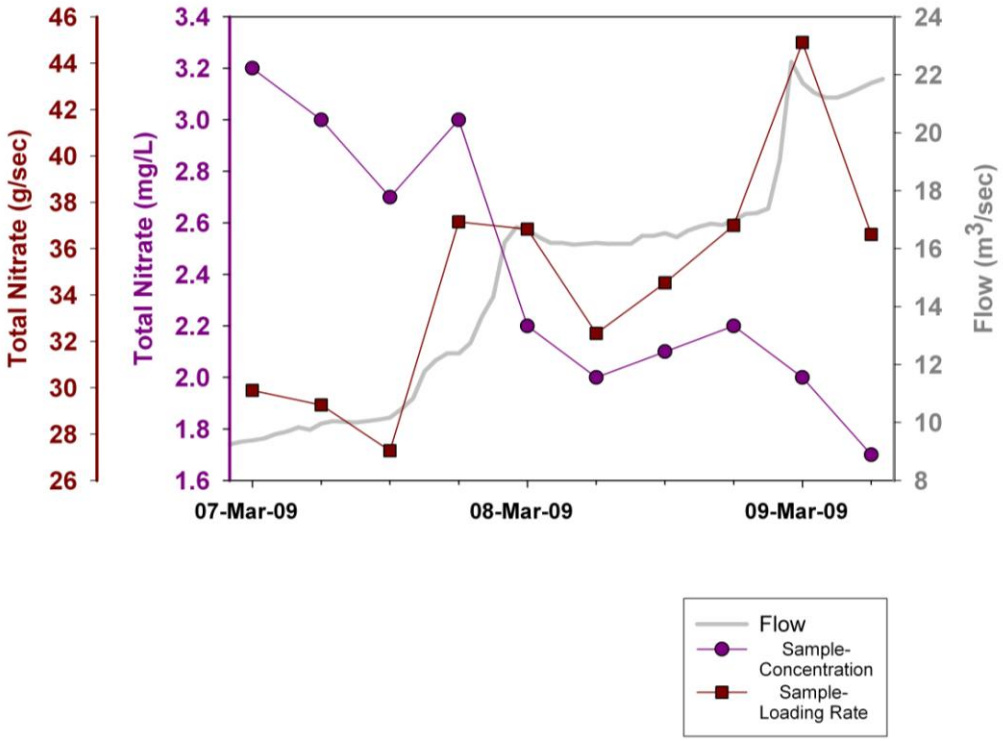

Figure 26: Total nitrate concentration and loading rate measured at the Wellington Rd. 32 GRCA continuous monitoring station relative to stream flow at the Hanlon flow gauge between March 6 and 8, 2009.

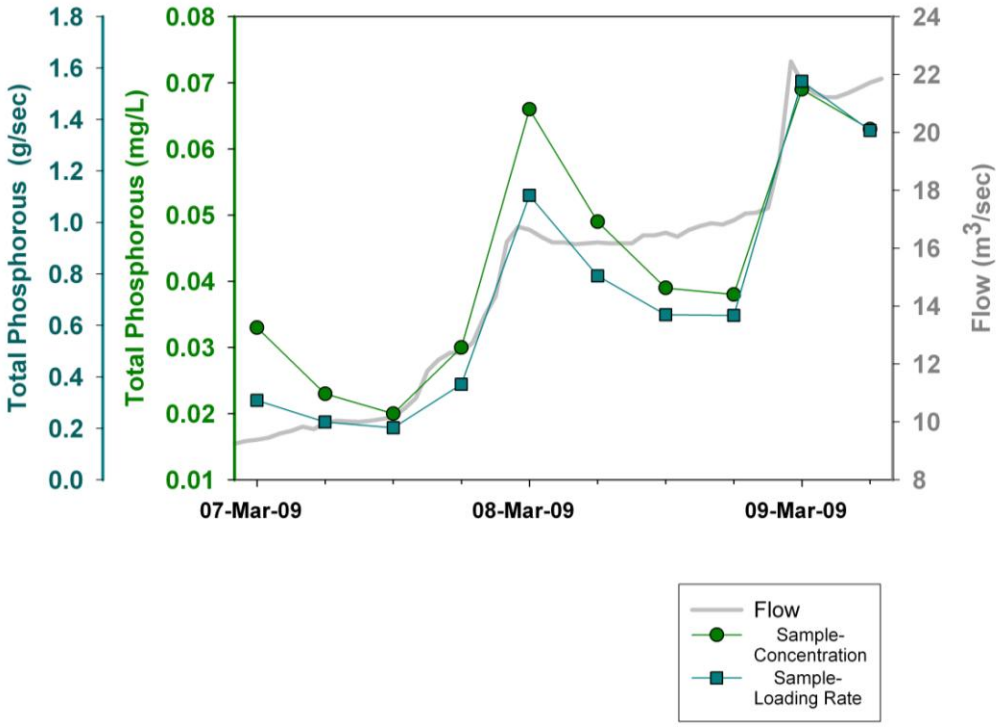

Figure 27: Total phosphorous concentration and loading rate relative to stream flow at the Hanlon GRCA continuous monitoring station between March 6 and 8, 2009.

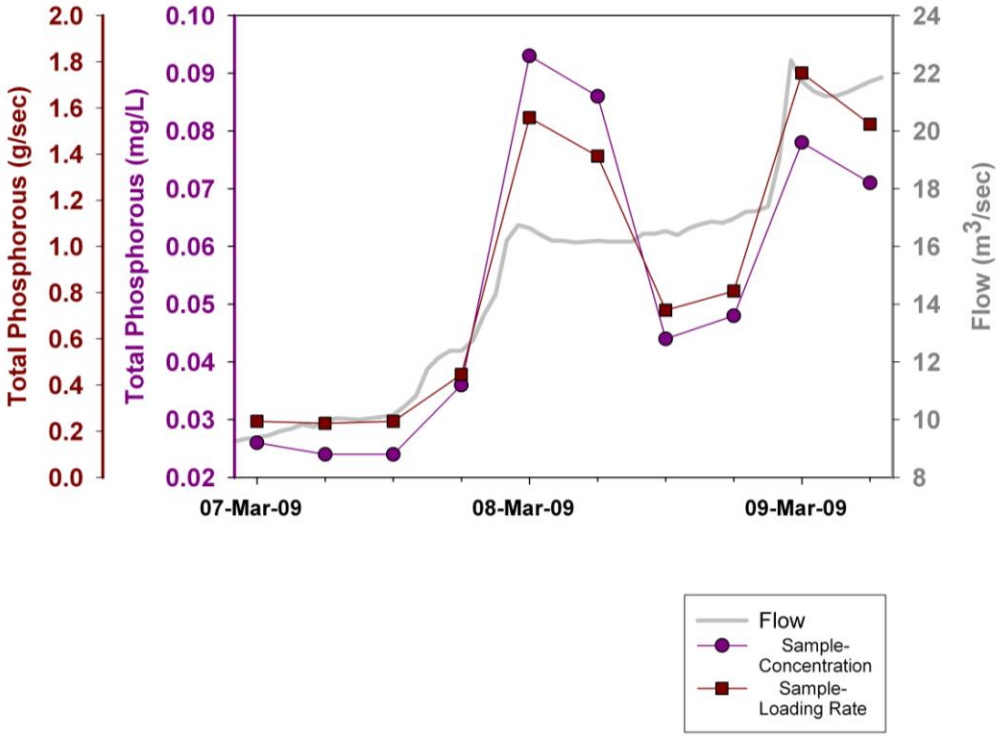

Figure 28: Total phosphorous concentration and loading rate measured at the Wellington Rd. 32 GRCA continuous monitoring station relative to stream flow at the Hanlon flow gauge between March 6 and 8, 2009.

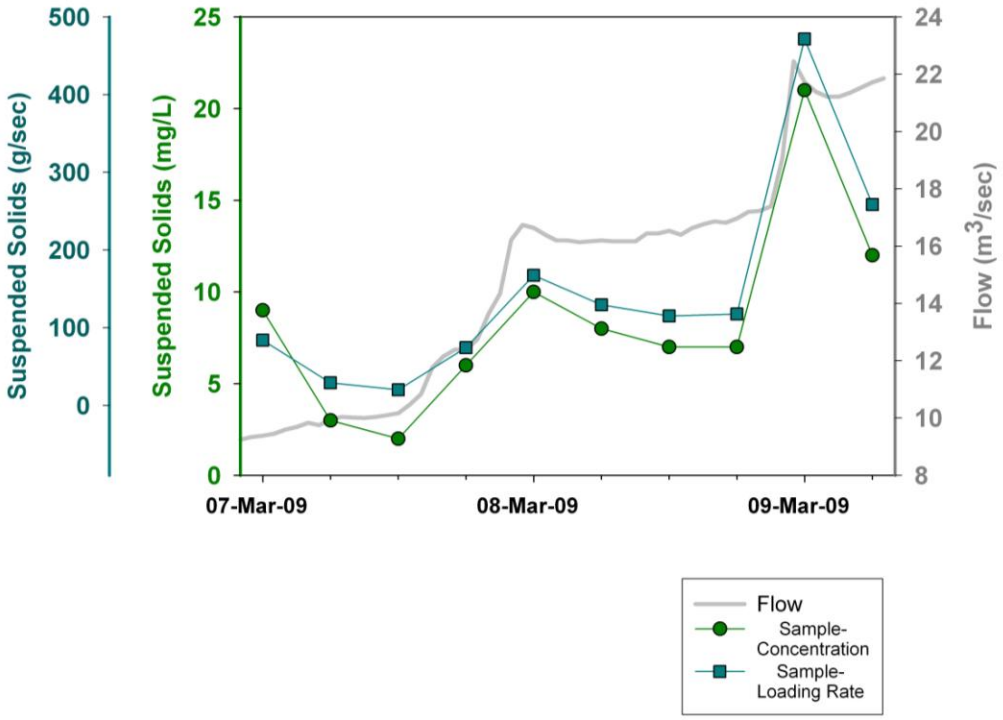

Figure 29: Suspended solid concentration and loading rate relative to stream flow at the Hanlon GRCA continuous monitoring station between March 6 and 8, 2009.

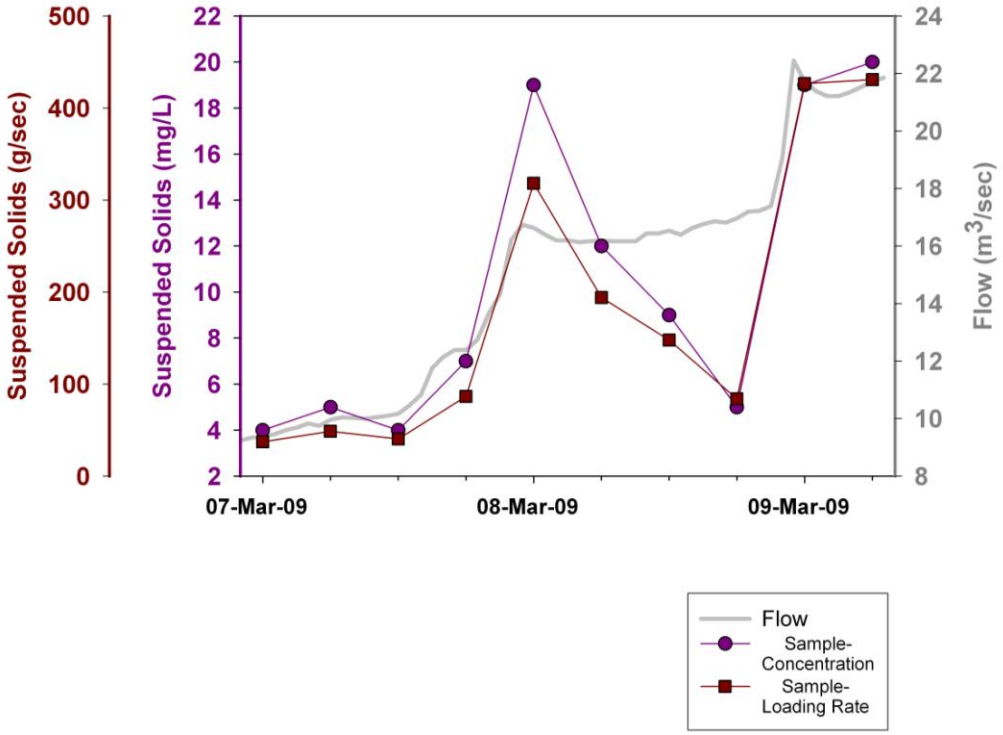

Figure 30: Suspended solid concentration and loading rate measured at the Wellington Rd. 32 GRCA continuous monitoring station relative to stream flow at the Hanlon flow gauge between March 6 and 8, 2009.