

JBT01 tile drain monitoring station

PROJECT NO.

15-309

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Assessment of Tile Drainage Systems in the Jewett Brook Watershed:

May 2017 Monitoring Summary

May 2017 Monitoring Summary

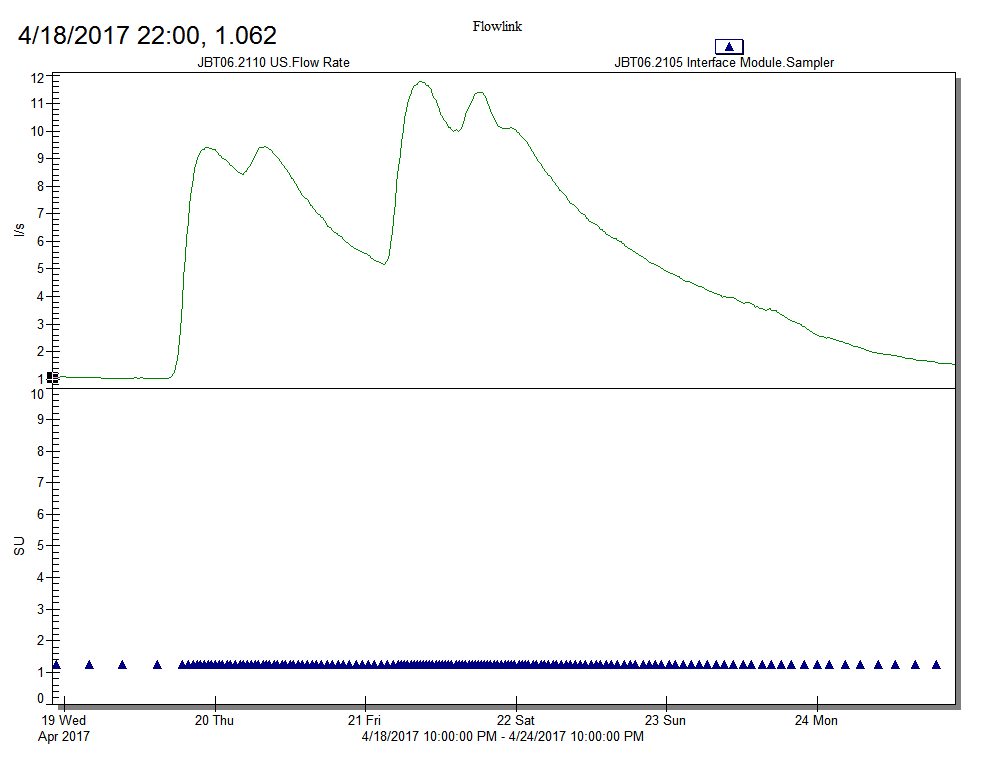
The purpose of this report is to document monitoring activities performed last month, in May 2017, at 12 selected tile drain outlets in the Jewett Brook watershed in St. Albans, Vermont.

All 12 stations are operational. In late March 2017, flow data collection began at several sites. Sample collection commenced in April 2017. Table 1 identifies the start dates for monitoring activities at each station. On April 5, 2017, autosampling programs were initiated at 8 of the 12 stations (JBT01, JBT02, JBT04, JBT06, JBT07, JBT11, JBT14, and JBT16). The following week, on April 11, 2017 the first set of weekly composite samples was collected and processed in accordance with the project Quality Assurance Project Plan, Version 1.0, Amendment 1. Immediately after sample collection on April 11, autosamplers were restarted at the first eight stations and sampling was initiated at station JBT13. Flow monitoring and sample collection began at JBT05 on April 20 and at JBT18 and JBT19 on April 22, 2017.

Upon start up, it became apparent that the JBT05 flowmeter was malfunctioning. A substitute ISCO 2150 area-velocity flowmeter has been installed to minimize data losses, until the Waterflux 3000 flowmeter can be replaced. We are currently waiting to receive shipment of a replacement Waterflux 3000 meter.

Every 30 minutes, flow and sampling data are transmitted to Stone’s server. These data are checked periodically to assess whether the sampling program is working as intended. Figure 1 displays an example of flow data (top panel) at station JBT05, along with the time each sample aliquot was dispensed to the sample carboys (bottom panel).

Figure . Example flow rate and sampling marks from Station JBT05



To date, ten rounds of sampling have been performed at the tile drain monitoring sites. Flow-pacing settings are adjusted at the start of each sampling round, based on recently measured flow rates and considering the weather forecast, with the goal of producing between 5-L and 10-L of composite sample at each site. Our subcontractor, the Friends of Northern Lake Champlain, is performing the sample processing.

Composite samples collected at the tile drain monitoring stations are analyzed by the Vermont Agriculture and Environmental Laboratory for concentrations of total phosphorus (TP), total dissolved phosphorus (TDP), and total nitrogen (TN). Table 2 presents these data for all approved analyses. Only results classified as Approved are presented. Only the TP concentration results are available for the May 9, 2017 samples. Results are not yet available for samples collected since May 9, 2017.

We are currently in the process of developing a database to allow efficient extraction and summary of interval flow data and constituent concentrations and calculated loads.

Table : Start dates for monitoring activities at each station

| Station | Start flow monitoring | Start autosampling |
| --- | --- | --- |
| JBT01 | 3/23/17 | 4/5/17 |
| JBT02 | 3/23/17 | 4/5/17 |
| JBT04 | 4/3/17 | 4/5/17 |
| JBT05 | 4/20/17 | 4/20/17 |
| JBT06 | 4/5/17 | 4/5/17 |
| JBT07 | 3/30/17 | 4/5/17 |
| JBT11 | 4/5/17 | 4/5/17 |
| JBT13 | 4/3/17 | 4/11/17 |
| JBT14 | 4/5/17 | 4/5/17 |
| JBT16 | 3/30/17 | 4/5/17 |
| JBT18 | 4/22/17 | 4/22/17 |
| JBT19 | 4/22/17 | 4/22/17 |

Table : TP, TDP, and TN concentrations in composite samples collected through May 9, 2017

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **JBT01** | | | | **JBT02** | | | | **JBT04** | | | |
| Sample Date | Sample ID | TN (mg/L) | TP (µg/L) | TDP (µg/L) | Sample ID | TN (mg/L) | TP (µg/L) | TDP (µg/L) | Sample ID | TN (mg/L) | TP (µg/L) | TDP (µg/L) |
| 4/11/2017 | JBT01-041117-1 | 4.81 | 491 | 258 | JBT02-041117-1 | 7.19 | 976 | 678 | JBT04-041117-1 | 4.89 | 798 | 120 |
| 4/18/2017 | JBT01-041817-1 | 4.77 | 55.1 | 21.1 | JBT02-041817-1 | 8.52 | 242 | 93.6 | JBT04-041817-1 | 4.33 | 115 | 38.6 |
| 4/25/2017 | JBT01-042517-1 | 5.24 | 77.3 | 17.6 | JBT02-042517-1 | 8.68 | 491 | 142 | JBT04-042517-1 | 4.86 | 133 | 45.4 |
| 5/2/2017 | JBT01-050217-1 | 5.63 | 333 | 81.2 | JBT02-050217-1 | 8.58 | 805 | 492 | JBT04-050217-1 | 5.43 | 500 | 79.2 |
| 5/9/2017 | JBT01-050917-1 | P | 208 | P | JBT02-050917-1 | P | 585 | P | JBT04-050917-1 | P | 303 | P |
| 5/9/2017 | JBT01-050917-2+3 | P | 236 | P | JBT02-050917-2 | P | 868 | P | JBT04-050917-2+3 | P | 404 | P |
| 5/9/2017 | NS | NS | NS | NS | JBT02-050917-3 | P | 868 | P | NS | NS | NS | NS |
|  | **JBT05** | | | | **JBT06** | | | | **JBT07** | | | |
| Sample Date | Sample ID | TN (mg/L) | TP (µg/L) | TDP (µg/L) | Sample ID | TN (mg/L) | TP (µg/L) | TDP (µg/L) | Sample ID | TN (mg/L) | TP (µg/L) | TDP (µg/L) |
| 4/11/2017 | NS | NS | NS | NS | JBT06-041117-1 | 33.47 | 195 | 131 | JBT07-041117-1 | 7.52 | 708 | 159 |
| 4/18/2017 | NS | NS | NS | NS | JBT06-041817-1 | 20.71 | 192 | 76.3 | JBT07-041817-1 | 4.81 | 45 | 14.1 |
| 4/25/2017 | JBT05-042517-1 | 24.78 | 68.7 | 53.7 | JBT06-042517-1+2 | 24.03 | 117 | 70.1 | JBT07-042517-1 | 5.79 | 103 | 27.4 |
| 5/2/2017 | JBT05-050217-1 | 20.6 | 226 | 108 | JBT06-050217-1 | 25.2 | 321 | 164 | JBT07-050217-1 | 6.72 | 279.6 | 58 |
| 5/9/2017 | JBT05-050917-1 | P | 132 | P | JBT06-050917-1 | P | 150 | P | JBT07-050917-1 | P | 126 | P |
| 5/9/2017 | NS | NS | NS | NS | JBT06-050917-2 | P | 135 | P | JBT07-050917-2+3 | P | 230 | P |
|  | **JBT11** | | | | **JBT13** | | | | **JBT14** | | | |
| Sample Date | Sample ID | TN (mg/L) | TP (µg/L) | TDP (µg/L) | Sample ID | TN (mg/L) | TP (µg/L) | TDP (µg/L) | Sample ID | TN (mg/L) | TP (µg/L) | TDP (µg/L) |
| 4/11/2017 | JBT11-041117-1 | 3.35 | 39.5 | 57.8 | NS | NS | NS | NS | JBT14-041117-1 | 7.43 | 248 | 66.5 |
| 4/18/2017 | JBT11-041817-1 | 2.59 | 11.5 | 16.2 | JBT13-041817-1 | 6.12 | 63.8 | 23.2 | JBT14-041817-1 | 8.25 | 70.5 | 33.2 |
| 4/25/2017 | JBT11-042517-1+2 | 2.45 | 14.7 | 9.73 | JBT13-042517-1 | 6.44 | 113 | 26.1 | JBT14-042517-1 | 7.62 | 145 | 51.5 |
| 4/25/2017 | NS | NS | NS | NS | NS | NS | NS | NS | JBT14-042517-2 | 8.22 | 46.3 | 35.2 |
| 5/2/2017 | JBT11-050217-1 | 2.04 | 46.5 | 16.1 | JBT13-050217-1 | 5.25 | 560 | 41.1 | JBT14-050217-1 | 7.2 | 342 | 59.3 |
| 5/9/2017 | JBT11-050917-1 | P | 28.8 | P | JBT13-050917-1+2 | P | 120 | P | JBT14-050917-1+2 | P | 177 | P |
| 5/9/2017 | JBT11-050917-2 | P | 39.0 | P | NS | NS | NS | NS | NS | NS | NS | NS |
|  | JBT16 | | | | JBT18 | | | | JBT19 | | | |
| Sample Date | Sample ID | TN (mg/L) | TP (µg/L) | TDP (µg/L) | Sample ID | TN (mg/L) | TP (µg/L) | TDP (µg/L) | Sample ID | TN (mg/L) | TP (µg/L) | TDP (µg/L) |
| 4/11/2017 | JBT16-041117-1+2 | 5.77 | 105 | 72.7 | NS | NS | NS | NS | NS | NS | NS | NS |
| 4/18/2017 | JBT16-041817-1 | 5.12 | 28.2 | 22.4 | NS | NS | NS | NS | NS | NS | NS | NS |
| 4/25/2017 | JBT16-042517-1 | 4.48 | 28.5 | 21.5 | JBT18-042517-1 | 1.16 | 87.4 | 46.1 | JBT19-042517-1 | 1 | 27.2 | 31.7 |
| 5/2/2017 | JBT16-050217-1 | 3.89 | 256.2 | 25.5 | JBT18-050217-1 | 1.26 | 170 | 42.3 | JBT19-050217-1 | 1.1 | 56.0 | 21.1 |
| 5/9/2017 | JBT16-050917-1+2 | P | 31.3 | P | JBT18-050917-1 | P | 140 | P | JBT19-050917-1 | P | 40.1 | P |
| 5/9/2017 | NS | NS | NS | NS | JBT18-050917-2 | P | 77.5 | P | JBT19-050917-2 | P | 20.9 | P |
| 5/9/2017 | NS | NS | NS | NS | JBT18-050917-3 | P | 159 | P | JBT19-050917-3+4 | P | 55.2 | P |
| 5/9/2017 | NS | NS | NS | NS | JBT18-050917-4 | P | 199 | P | NS | NS | NS | NS |
| NS= no sample collected; P=result pending | | | | | | | | | | | | |