

Table 1.UBE. Upper Bevens Creek Monitoring Station Information



Station Address: 7312 Maplewood Road, Cologne, MN 55322
County: Carver
Major Basin: Minnesota River Basin
Watershed: Bevens Creek
Drainage Area: 90.2 square miles

Station Operator: Metropolitan Council Environmental Services

Metropolitan Council Environmental Services Contact Information:

Contact Person: Tim Pattock or Mike Ahlf
Address: 2400 Childs Road
St. Paul, MN 55106
Phone: 651-602-8084 (Tim) or 651-602-8082 (Mike)
E-mail: timothy.pattock@metc.state.mn.us
mike.ahlf@metc.state.mn.us

Watershed District or Watershed Management Organization:

Station Overview: MCES has conducted water quality monitoring of Upper Bevens Creek since 1992. The monitoring station is located in Cologne, Minnesota, 5.0 miles upstream from the creek confluence with the Minnesota River. MCES staff maintain the rating curve at this station. There is no rain gauge at this station; however, precipitation data are obtained from the Minnesota Climatology Working Group, Jordan Station Number 214176.

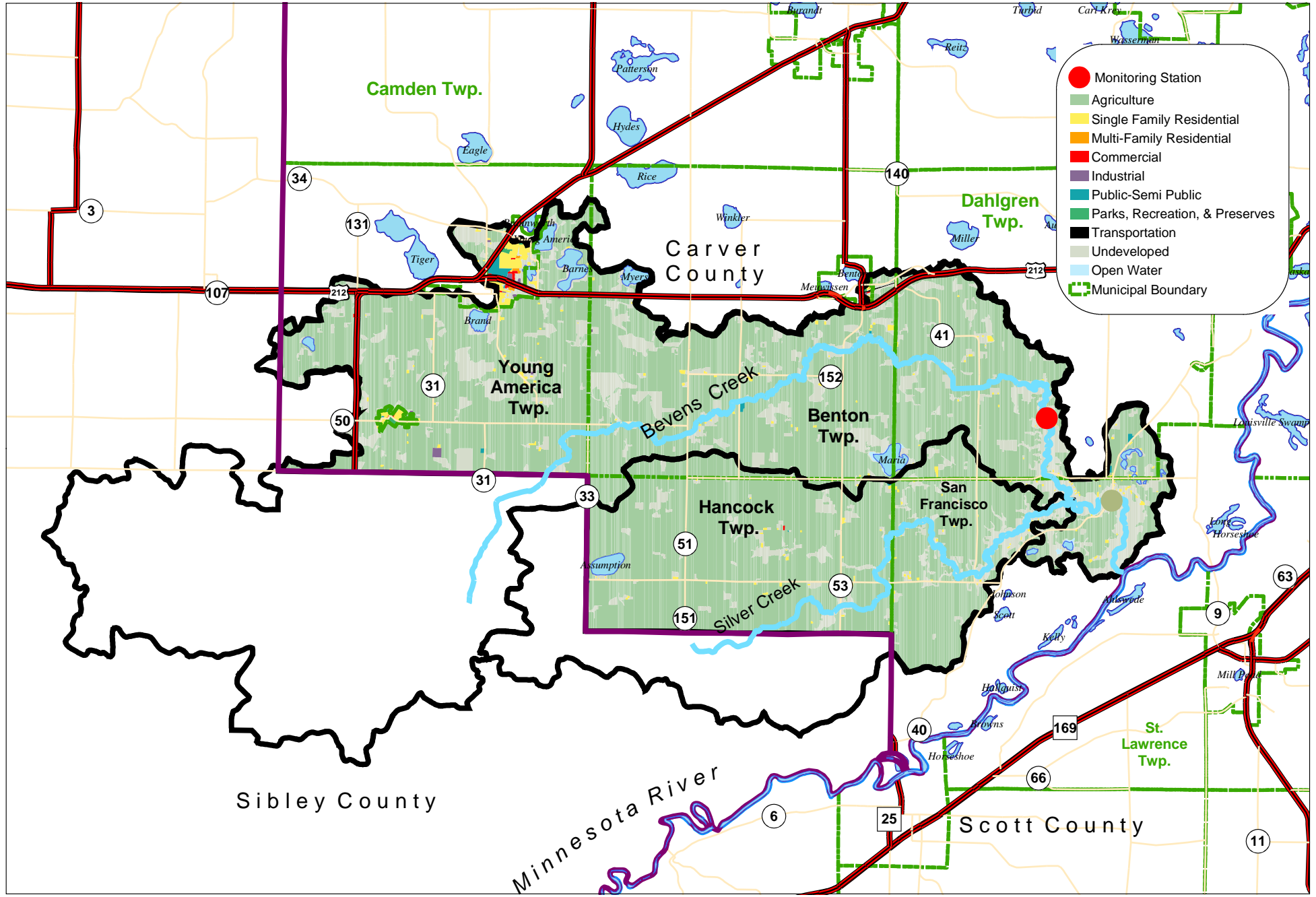
2002 Monitoring Year: Snowmelt had a limited impact on Upper Bevens Creek flow during the spring of 2002. Daily average flows were estimated prior to the ice out date, which occurred on approximately April 7, 2002.

Runoff event-based composite sampling began in early April and continued into mid October 2002. The peak daily average flow of 480 cfs, with a stage of 4.67 feet, occurred on August 7, 2002. This runoff event also produced the highest total suspended solids (TSS) concentration (536 mg/l) and the highest total phosphorus (TP) concentration (1.25 mg/l) measured at this station in 2002.

Thirty-one samples were collected for water quality analysis during 2002, including 22 composite samples and 9 grab samples. Samples were obtained throughout the year during varying stream flow conditions to most accurately characterize Upper Bevens Creek water quality. The MCES annual water quality monitoring plan includes 12 monthly baseflow (“non-event”) grab samples and approximately 10 to 15 flow-weighted composite samples collected during all runoff events in the open water season (March-November). The 2002 sampling scheme did not entirely meet the goals of the MCES monitoring work plan. Baseflow grab samples could not be obtained in February and March because Bevens Creek was frozen at this location.

For additional stream monitoring information and monitoring methods regarding this site, see www.metrocouncil.org/environment/RiversLakes.

Figure 1. UBE. Upper Bevens Creek Monitoring Station Location and Watershed Characteristics



- Monitoring Station
- Agriculture
- Single Family Residential
- Multi-Family Residential
- Commercial
- Industrial
- Public-Semi Public
- Parks, Recreation, & Preserves
- Transportation
- Undeveloped
- Open Water
- Municipal Boundary

0 0.5 1 2 Miles



Figure 2.UBE. Upper Bevens Creek 2002 Hydrograph, Precipitation and Sampling Information

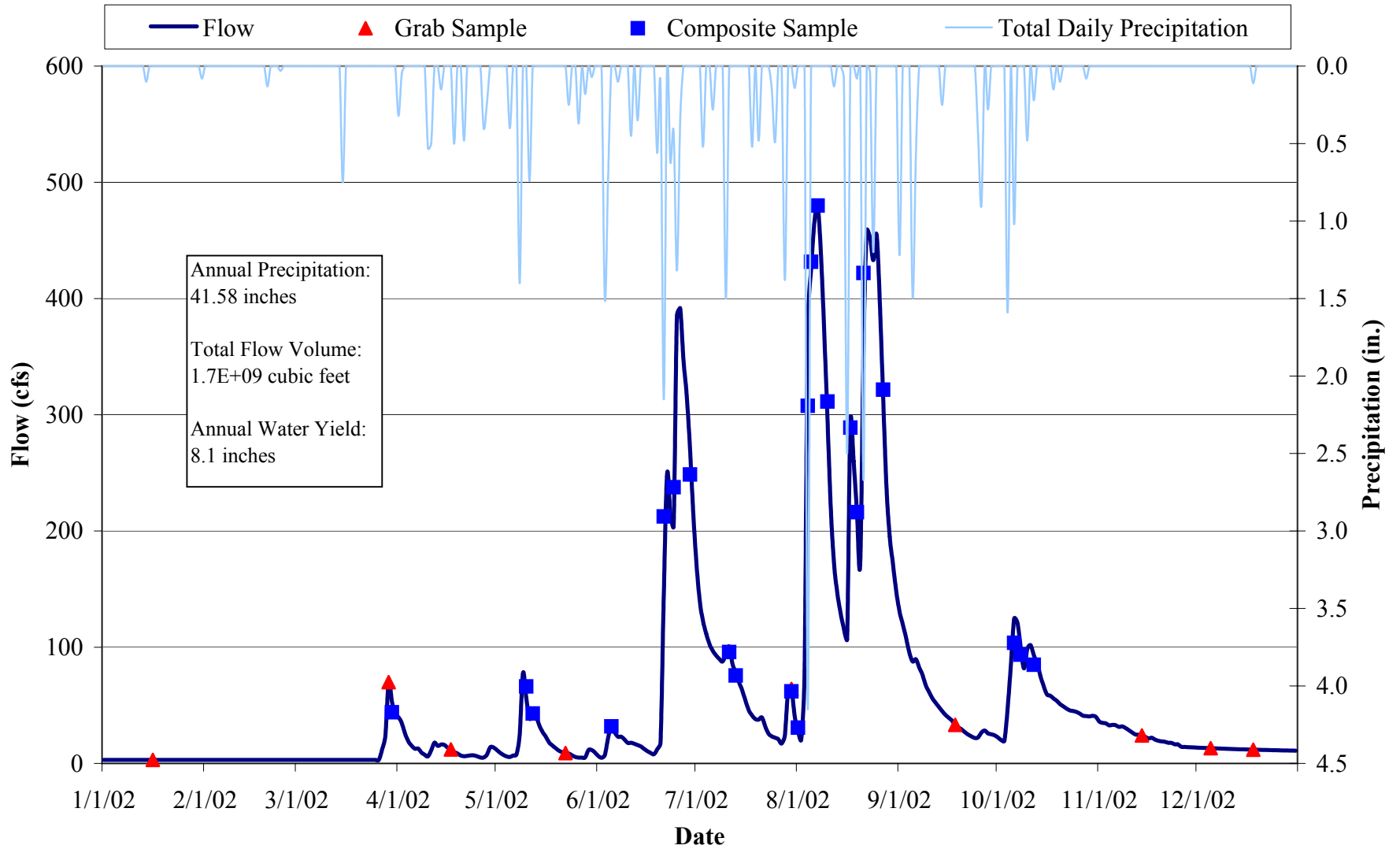


Table 2.UBE. Upper Bevens Creek 2002 Water Chemistry Information

Variable	N	Mean	Median	Minimum	Maximum	25%	75%	STD
Chloride, mg/L	32	40	26	8	309	16	45	53
Hardness, mg/L	3	283	na	140	436	na	na	na
Cadmium, ug/L	3	0.2	na	0.1	0.4	na	na	na
Chromium, ug/L	3	3.7	na	0.4	9.2	na	na	na
Copper, ug/L	3	6.3	na	2.2	13.4	na	na	na
Lead, ug/L	3	3.7	na	0.1	9.7	na	na	na
Nickel, ug/L	3	8.7	na	4.7	15.7	na	na	na
Zinc, ug/L	3	20.3	na	4.2	48.0	na	na	na
Nitrogen, Total Kjeldahl, mg/L	32	2.23	2.10	1.20	3.90	1.88	2.55	0.68
Nitrogen, Total Nitrate, mg/L	30	7.28	6.27	2.05	18.30	4.33	9.02	4.06
Phosphorus, Total, mg/L	32	0.72	0.62	0.21	3.02	0.47	0.80	0.50
Phosphorus, Total Dissolved, mg/L	32	0.60	0.47	0.01	3.45	0.33	0.53	0.70
Solids, Total Suspended, mg/L	31	114	71	2	764	40	129	158
Solids, Volatile Suspended, mg/L	31	16	10	1	96	6	19	21
Turbidity, NTU	32	31	20	2	160	12	35	39

na: Data are insufficient to calculate these statistics.

N: Sample Count

25%, 75%: 25th and 75th Percentiles

STD: Standard Deviation

Table 3.UBE. Upper Bevens Creek 2002 Annual Loading Information* for Suspended Solids and Nutrients

Variable	Annual Load (tons)	Annual Yield (lbs/acre)	Annual Normalized Yield (lbs/acre/in of water)	Flow Weighted Mean Concentration (mg/L)
Solids, Total Suspended	6,960	241	30	132
Phosphorus, Total	38.0	1.32	0.16	0.72
Phosphorus, Total Dissolved	23.0	0.80	0.10	0.44
Nitrogen, Total Nitrate	343	11.9	1.47	6.51

* 2002 Annual Loading Information is provisional and may be subject to minor revisions.

Figure 3.UBE. Upper Bevens Creek 2002 Hydrograph with Total Suspended Solids and Nitrate Nitrogen Concentrations

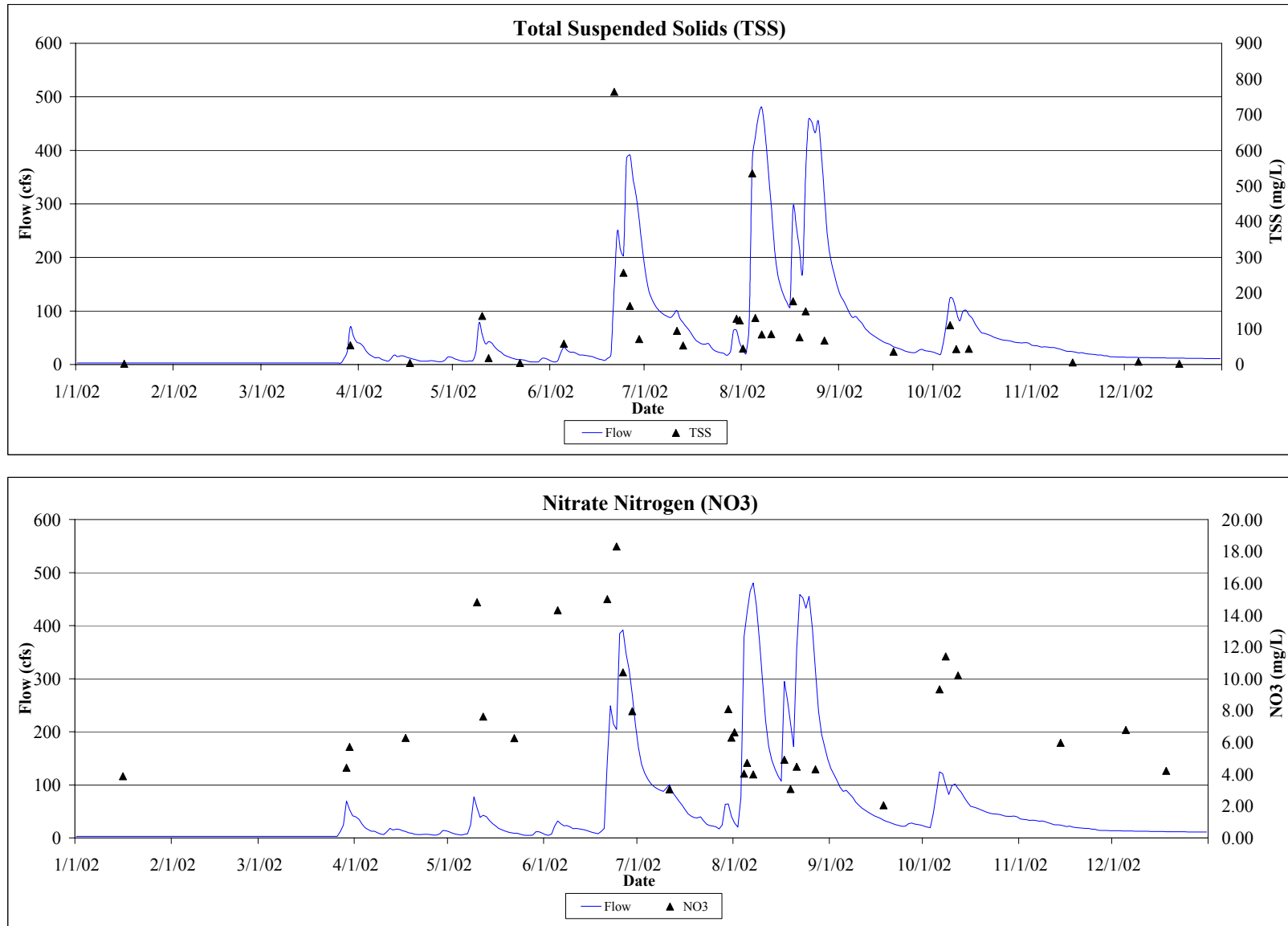


Figure 4.UBE. Upper Bevens Creek 2002 Hydrograph with Total and Dissolved Phosphorus Concentrations

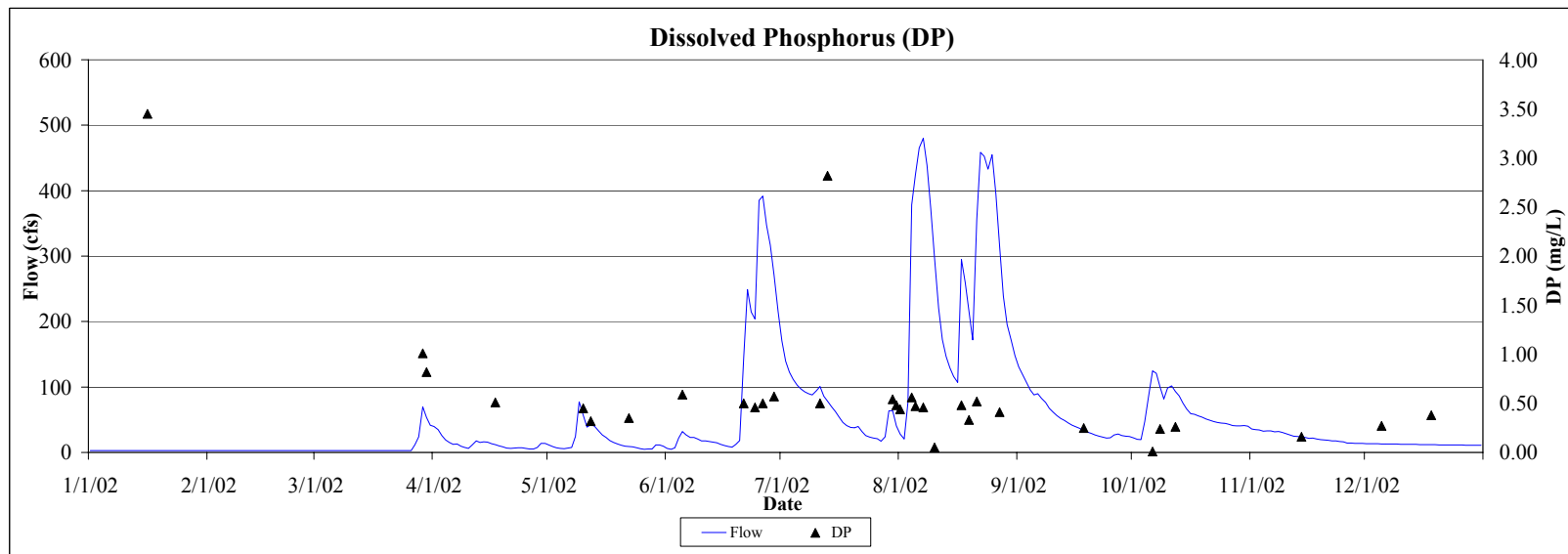
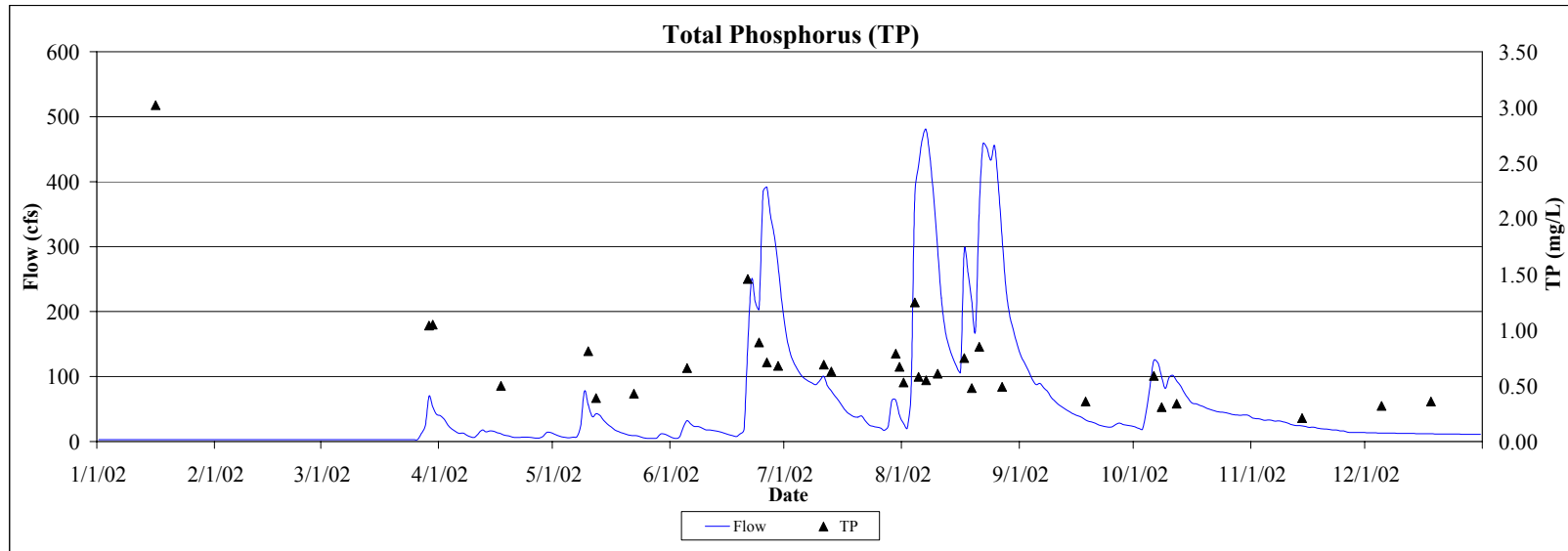


Table 4.UBE. Upper Bevens Creek: Comparison of 2001-2002 Hydrology and Water Chemistry

	2001	2002
Hydrology		
Total Precipitation (in)	31.97	41.58
Water Yield (in)	8.1	8.1
Total Volume (cf)	1.7E+09	1.7E+09
Annual Load (tons)		
Total Suspended Solids	8,520	6,960
Total Phosphorus	34.6	38.0
Total Dissolved Phosphorus	23.7	23.0
Total Nitrate Nitrogen	747	343
Annual Yield (lbs/acre)		
Total Suspended Solids	295	241
Total Phosphorus	1.20	1.32
Total Dissolved Phosphorus	0.82	0.80
Total Nitrate Nitrogen	25.9	11.9
Annual Normalized Yield (lbs/acre/in of water)		
Total Suspended Solids	36	30
Total Phosphorus	0.15	0.16
Total Dissolved Phosphorus	0.10	0.10
Total Nitrate Nitrogen	3.20	1.47
Flow-Weighted Mean Concentration (mg/L)		
Total Suspended Solids	161	132
Total Phosphorus	0.65	0.72
Total Dissolved Phosphorus	0.45	0.44
Total Nitrate Nitrogen	14.2	6.51

Table 5.UBE. Upper Bevens Creek 2002 Macroinvertebrate Monitoring Results and Metrics

Monitoring Date 5/31/2002

Class	Order	Family	Common Name	Life Stage	Organism Count
Crustacea	Amphipoda		Scuds	Adult	15
Gastropoda			Snails	Adult	119
Insecta	Coleoptera	Dryopidae	Longtoed Water Beetles	Adult	7
Insecta	Coleoptera	Elmidae	Riffle Beetles	Larvae	5
Insecta	Coleoptera	Hydrophilidae	Water Scavenger Beetles	Adult	1
Insecta	Diptera	Chironomidae	Midges	Larvae	32
Insecta	Diptera	Simuliidae	Black Flies	Larvae	17
Insecta	Diptera	Tipulidae	Crane Flies	Larvae	4
Insecta	Diptera		True Flies	Pupa	9
Insecta	Ephemeroptera	Baetidae	Small Minnow Mayflies	Larvae	134
Insecta	Ephemeroptera	Caenidae	Small Squaregills	Larvae	9
Insecta	Ephemeroptera	Heptageniidae	Flatheaded Mayflies	Larvae	27
Insecta	Hemiptera	Pleidae	Pygmy Backswimmer	Adult	1
Insecta	Odonata	Calopterygidae	Broadwinged Damselflies	Larvae	1
Insecta	Plecoptera	Perlidae	Comon Stoneflies	Larvae	4
Insecta	Trichoptera	Hydropsychidae	Common Netspinners	Larvae	11
Insecta	Trichoptera	Limnephilidae	Northern Case Makers	Larvae	47

Macroinvertebrate Taxa Metrics

Total Taxa	16
EPT Taxa	6
% EPT Taxa	38
Diptera Taxa	3
% Diptera Taxa	19
Mean Tolerance Value	4.7

Macroinvertebrate Organism Metrics

Total Organisms	443
EPT Individuals	232
% EPT Individuals	52
Diptera Individuals	53
% Diptera Individuals	12
Chironomidae Individuals	32
% Chironomidae Individuals	7

Water Quality

Degree of Organic Pollution

Family-Level Biotic Index	5.2	Fair	Fairly substantial pollution likely
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