

**Table 1.SA. Sand Creek Monitoring Station Information**



**Station Address:** 102 Creek Lane South, Jordan, MN 55352  
**County:** Scott  
**Major Basin:** Minnesota River Basin  
**Watershed:** Sand Creek  
**Drainage Area:** 254.8 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 Sand Creek since 1989. The monitoring station is located in Jordan, Minnesota, 8.2 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. During the 1989-1990 period, MCES also operated a second monitoring station on Sand Creek in Louisville Swamp, near the creek confluence with the Minnesota River (Mile 1.6). 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 Sand Creek flow during the spring of 2002. Daily average flows were estimated prior to the ice out date, which occurred on approximately March 29, 2002.

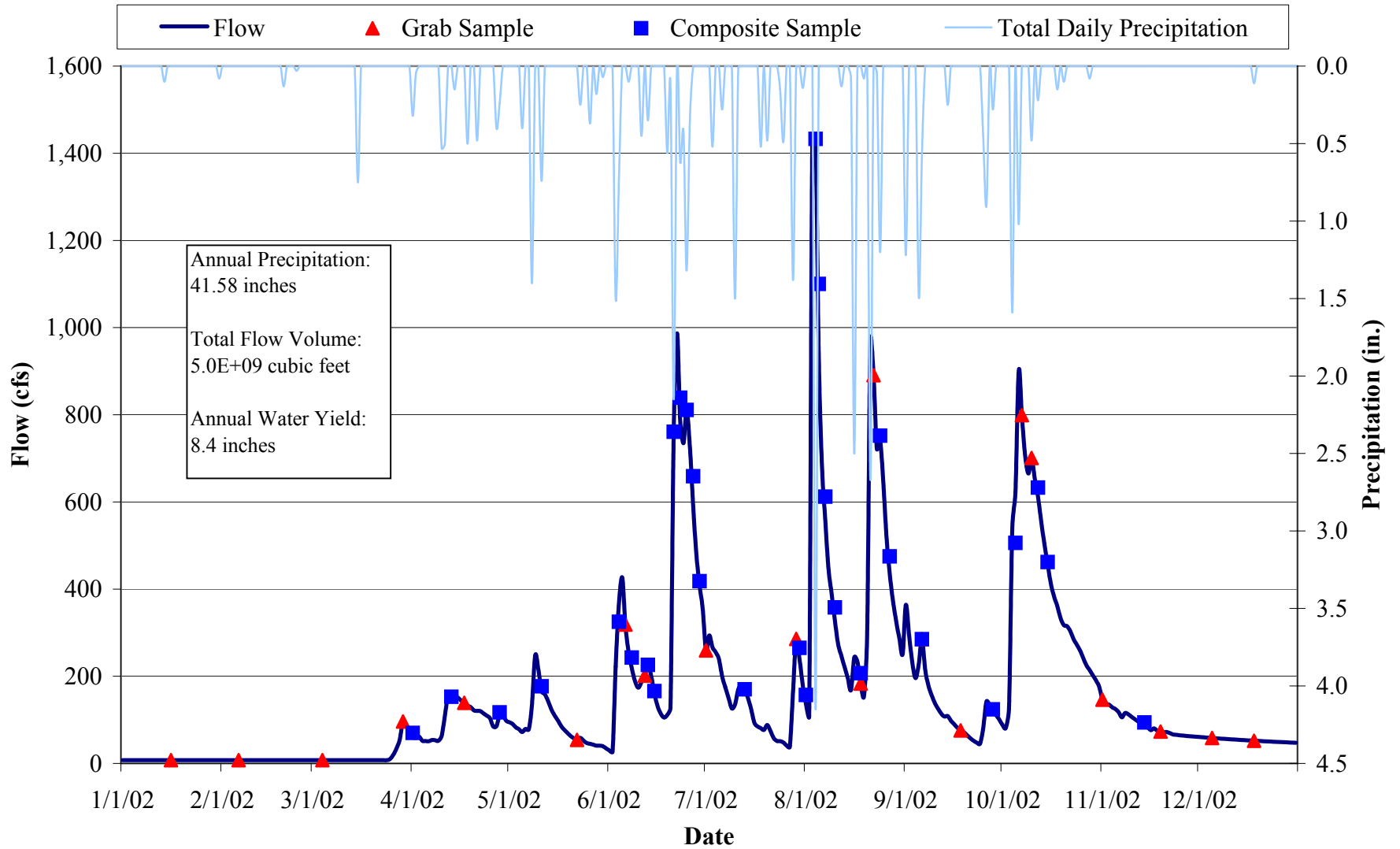
Runoff event-based composite sampling began in early April and continued into mid November 2002. The peak daily average flow of 1,439 cfs, with a stage of 3.89 feet, occurred on August 3, 2002. This runoff event also produced the highest total suspended solids (TSS) concentration (3,220 mg/l) and the highest total phosphorus (TP) concentration (1.54 mg/l) measured at this station in 2002.

Forty-nine samples were collected for water quality analysis during 2002, including 29 composite samples and 20 grab samples. Samples were obtained throughout the year during varying stream flow conditions to most accurately characterize Sand 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 met the goals of the MCES monitoring work plan.

**For additional stream monitoring information and monitoring methods regarding this site, see [www.metrocouncil.org/environment/RiversLakes](http://www.metrocouncil.org/environment/RiversLakes).**



**Figure 2.SA. Sand Creek 2002 Hydrograph, Precipitation and Sampling Information**



**Table 2.SA. Sand Creek 2002 Water Chemistry Information**

Variable	N	Mean	Median	Minimum	Maximum	25%	75%	STD
Chloride, mg/L	48	38	27	11	216	20	35	41
Hardness, mg/L	4	217	na	120	260	na	na	na
Cadmium, ug/L	4	0.2	na	0.1	0.6	na	na	na
Chromium, ug/L	4	6.1	na	0.4	15.8	na	na	na
Copper, ug/L	4	10.0	na	2.0	22.6	na	na	na
Lead, ug/L	4	7.6	na	0.1	21.9	na	na	na
Nickel, ug/L	4	12.6	na	4.3	27.8	na	na	na
Zinc, ug/L	4	33.1	na	2.2	82.0	na	na	na
Nitrogen, Total Kjeldahl, mg/L	49	2.29	2.30	1.00	4.10	1.80	2.80	0.77
Nitrogen, Total Nitrate, mg/L	44	5.21	4.23	1.59	18.90	3.05	6.59	3.50
Phosphorus, Total, mg/L	49	0.52	0.49	0.10	1.54	0.33	0.68	0.28
Phosphorus, Total Dissolved, mg/L	46	0.27	0.27	0.01	0.88	0.18	0.33	0.16
Solids, Total Suspended, mg/L	47	205	101	1	3220	48	200	476
Solids, Volatile Suspended, mg/L	47	26	17	1	200	10	28	33
Turbidity, NTU	46	41	25	2	290	14	40	54

na: Data are insufficient to calculate these statistics.

N: Sample Count

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

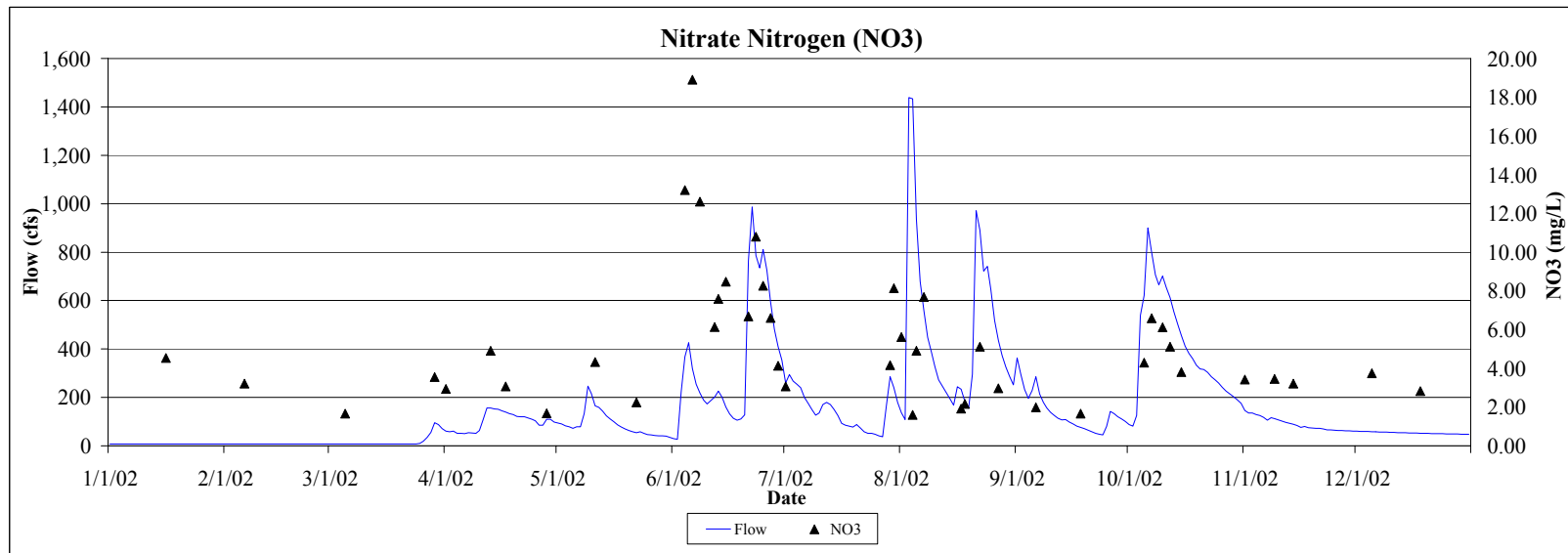
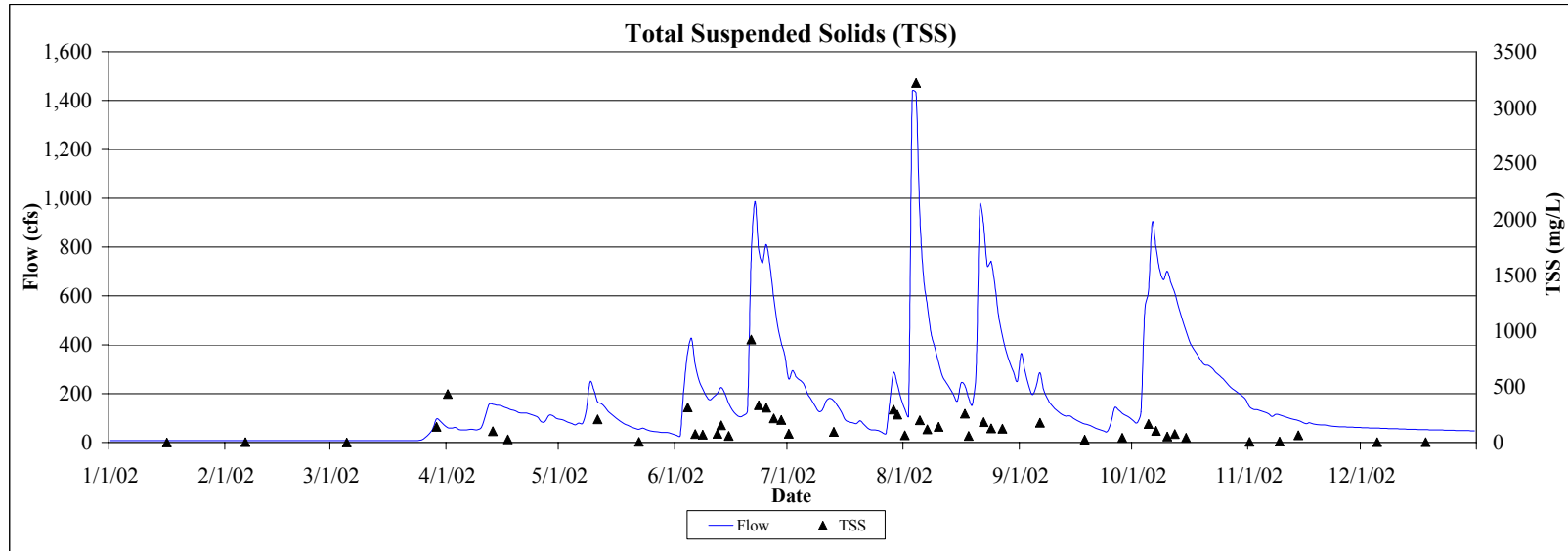
STD: Standard Deviation

**Table 3.SA. Sand Creek 2002 Annual Loading Information\* for Suspended Solids and Nutrients**

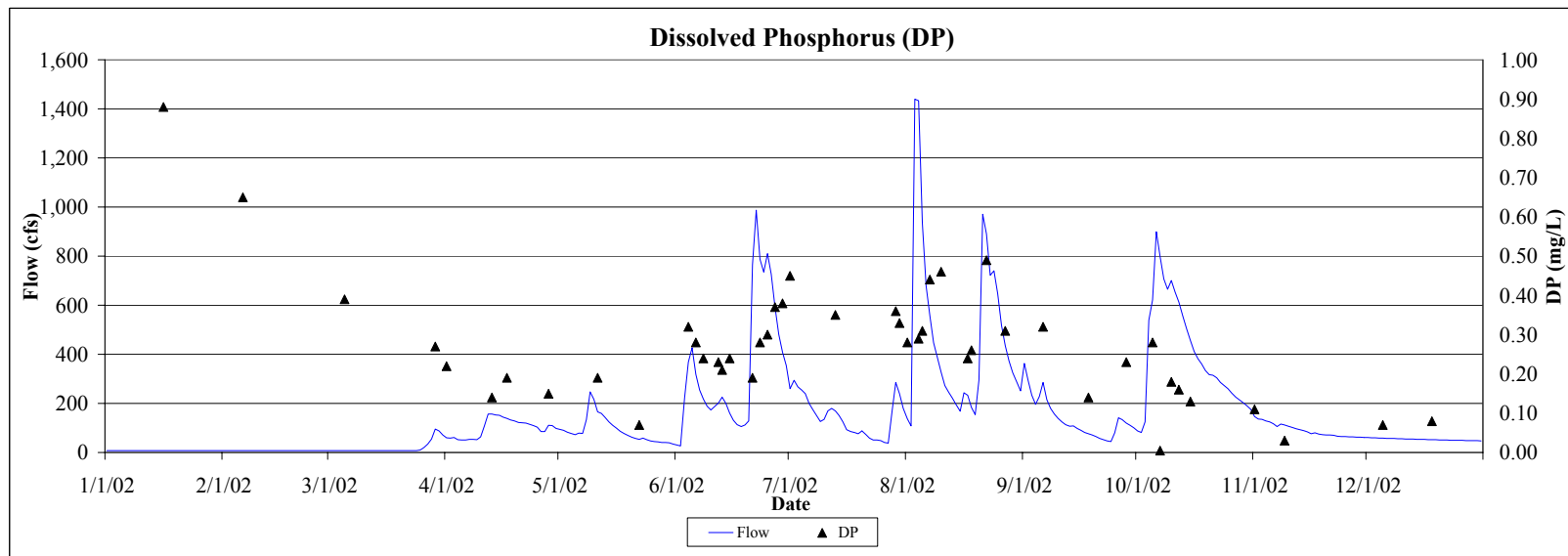
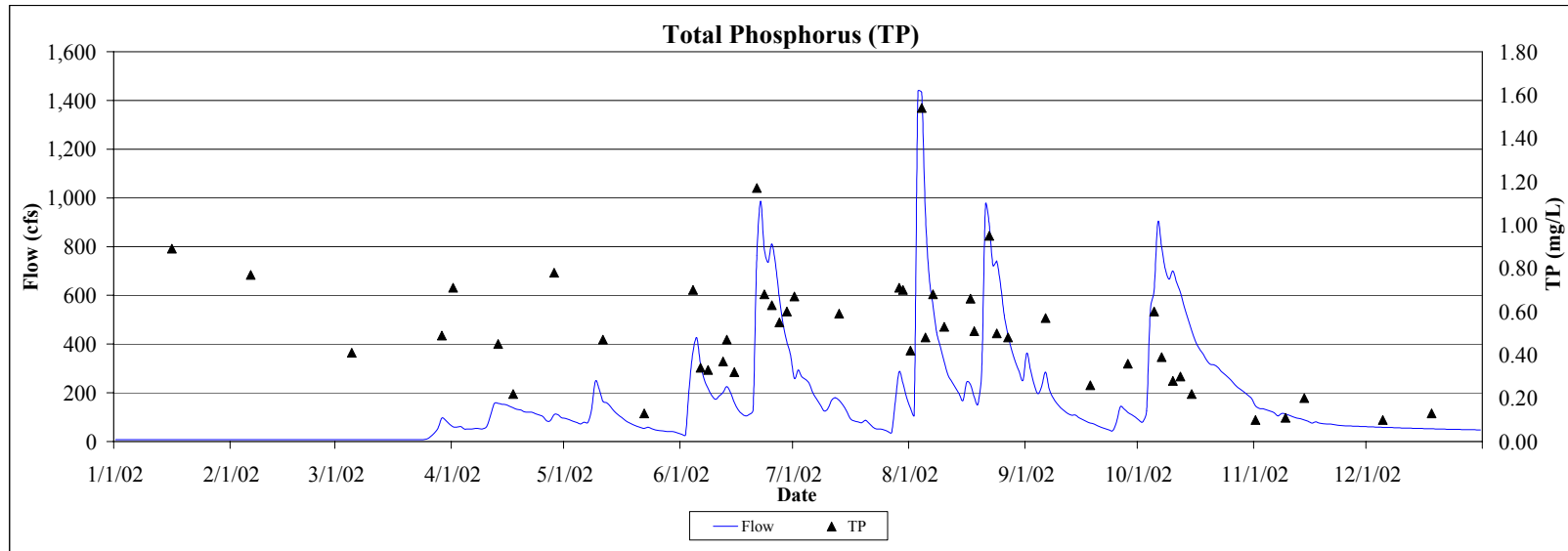
Variable	Annual Load (tons)	Annual Yield (lbs/acre)	Annual Normalized Yield (lbs/acre/in of water)	Flow Weighted Mean Concentration (mg/L)
Solids, Total Suspended	48,400	594	71	312
Phosphorus, Total	87.4	1.07	0.13	0.56
Phosphorus, Total Dissolved	42.5	0.52	0.06	0.27
Nitrogen, Total Nitrate	817	10.0	1.19	5.26

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

**Figure 3.SA. Sand Creek 2002 Hydrograph with Total Suspended Solids and Nitrate Nitrogen Concentrations**



**Figure 4.SA. Sand Creek 2002 Hydrograph with Total and Dissolved Phosphorus Concentrations**



**Table 4.SA. Sand Creek: Comparison of 2001-2002 Hydrology and Water Chemistry**

	<b>2001</b>	<b>2002</b>
<b>Hydrology</b>		
<b>Total Precipitation (in)</b>	27.57	41.58
<b>Water Yield (in)</b>	7.8	8.4
<b>Total Volume (cf)</b>	4.6E+09	5.0E+09
<b>Annual Load (tons)</b>		
<b>Total Suspended Solids</b>	24,700	48,400
<b>Total Phosphorus</b>	55.9	87.4
<b>Total Dissolved Phosphorus</b>	28.3	42.5
<b>Total Nitrate Nitrogen</b>	1,040	817
<b>Annual Yield (lbs/acre)</b>		
<b>Total Suspended Solids</b>	303	594
<b>Total Phosphorus</b>	0.69	1.07
<b>Total Dissolved Phosphorus</b>	0.35	0.52
<b>Total Nitrate Nitrogen</b>	12.8	10.0
<b>Annual Normalized Yield (lbs/acre/in of water)</b>		
<b>Total Suspended Solids</b>	39	71
<b>Total Phosphorus</b>	0.09	0.13
<b>Total Dissolved Phosphorus</b>	0.04	0.06
<b>Total Nitrate Nitrogen</b>	1.64	1.19
<b>Flow-Weighted Mean Concentration (mg/L)</b>		
<b>Total Suspended Solids</b>	171	312
<b>Total Phosphorus</b>	0.39	0.56
<b>Total Dissolved Phosphorus</b>	0.20	0.27
<b>Total Nitrate Nitrogen</b>	7.20	5.26

**Table 5.SA. Sand Creek 2002 Macroinvertebrate Monitoring Results and Metrics**

**Monitoring Date 5/31/2002**

<b>Class</b>	<b>Order</b>	<b>Family</b>	<b>Common Name</b>	<b>Life Stage</b>	<b>Organism Count</b>
Crustacea	Amphipoda		Scuds	Adult	1
Gastropoda			Snails	Adult	1
Insecta	Coleoptera	Elmidae	Riffle Beetles	Larvae	4
Insecta	Diptera	Chironomidae	Midges	Larvae	17
Insecta	Diptera		True Flies	Pupa	5
Insecta	Ephemeroptera	Heptageniidae	Flatheaded Mayflies	Larvae	66
Insecta	Ephemeroptera	Baetidae	Small Minnow Mayflies	Larvae	10
Insecta	Ephemeroptera	Caenidae	Small Squaregills	Larvae	2
Insecta	Hemiptera	Pleidae	Pygmy Backswimmer	Adult	1
Insecta	Hemiptera	Corixidae	Water Boatman	Adult	7
Insecta	Trichoptera	Hydropsychidae	Common Netspinners	Larvae	11
Insecta	Trichoptera	Limnephilidae	Northern Case Makers	Larvae	1

**Macroinvertebrate Taxa Metrics**

Total Taxa	11
EPT Taxa	5
% EPT Taxa	45
Diptera Taxa	1
% Diptera Taxa	9
Mean Tolerance Value	5.1

**Macroinvertebrate Organism Metrics**

Total Organisms	126
EPT Individuals	90
% EPT Individuals	71
Diptera Individuals	22
% Diptera Individuals	17
Chironomidae Individuals	17
% Chironomidae Individuals	13

**Water Quality**

**Degree of Organic Pollution**

<b>Family-Level Biotic Index</b>	4.4	<b>Water Quality</b>	Good	<b>Degree of Organic Pollution</b>	Some organic pollution probable
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