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POSTOPERATIVE INVESTIGATION
CARR CREEK TRIBUTARY TO THE EAU GALLE RIVER
WOODVILLE POTW

September 21, 1989

Paul LaLiberte

The Woodville POTW formerly discharged to Carr Creek, an intermittent tributary to the Eau Galle River classified as supporting marginal aquatic life at the discharge point (see stream classification dated October 1976). A study of preoperative conditions was conducted before the POTW was converted to groundwater discharge. The discharge maintained a continuous aquatic environment for a short distance below the outfall. The water quality and macroinvertebrate community of this continuous aquatic environment was poor. Both above and below this reach, the stream dried up seasonally and supported a seasonal macroinvertebrate community indicative of "fair" to "good" water quality.

On 10-26-88, after the discharge had been eliminated, macroinvertebrate sampling was again conducted in the study reach. Since sites 1 and 2 (see map) had no flowing water, sampling was done only at site 3, about 2.3 miles below the former outfall site.

METHODS

Macroinvertebrate samples were collected and processed utilizing the procedures for sampling and sorting adopted by the Department in 1983. The preoperative samples were sorted using procedures comparable to the postoperative samples with the exception that an effort was made to pick no more than 25 individuals from a single taxon. To a limited extent, this may have affected metrics other than the biotic index. The biometrics applied were those of Hilsenhoff (1987) and Szczytko (1988). Table 1 lists Hilsenhoff's biotic index classification categories.

TABLE 1. HILSENHOFF WATER QUALITY CATEGORIES

BIOTIC INDEX	WATER QUALITY	DEGREE OF ORGANIC POLLUTION
0.00-3.50	EXCELLENT	NO APPARENT ORGANIC POLLUTION
3.51-4.50	VERY GOOD	POSSIBLE SLIGHT ORGANIC POLLUTION
4.51-5.50	GOOD	SOME ORGANIC POLLUTION
5.51-6.50	FAIR	FAIRLY SIGNIFICANT ORGANIC POLLUTION
6.51-7.50	FAIRLY POOR	SIGNIFICANT ORGANIC POLLUTION
7.51-8.50	POOR	VERY SIGNIFICANT ORGANIC POLLUTION
8.51-10.00	VERY POOR	SEVERE ORGANIC POLLUTION

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RESULTS

The data appear in Table 2. The biometrics applied to the data were the Hilsenhoff biotic index (HBI), Margalef diversity index and per cent ephemeroptera, plecoptera and trichoptera (%EPT). The HBI at site 3 indicated "fair" to "good" water quality both before and after upgrading the POTW (Table 2). Diversity and %EPT also indicated comparable macroinvertebrate communities. The impact of the former POTW discharge appears to have been limited to the stream reach immediately below the outfall (site 2). The current seasonal macroinvertebrate community in this reach probably resembles that of site 1 (5-15-79 sample) and site 3. Postoperative sampling in May would be necessary to confirm this.

TABLE 2. MACROINVERTEBRATE DATA FOR SITE 3

DATE	HBI	DIVERSITY	%EPT
5-15-79	5.9	3.0	53
10-31-79	5.8	3.0	57
10-26-88	5.4	2.3	65

REFERENCES

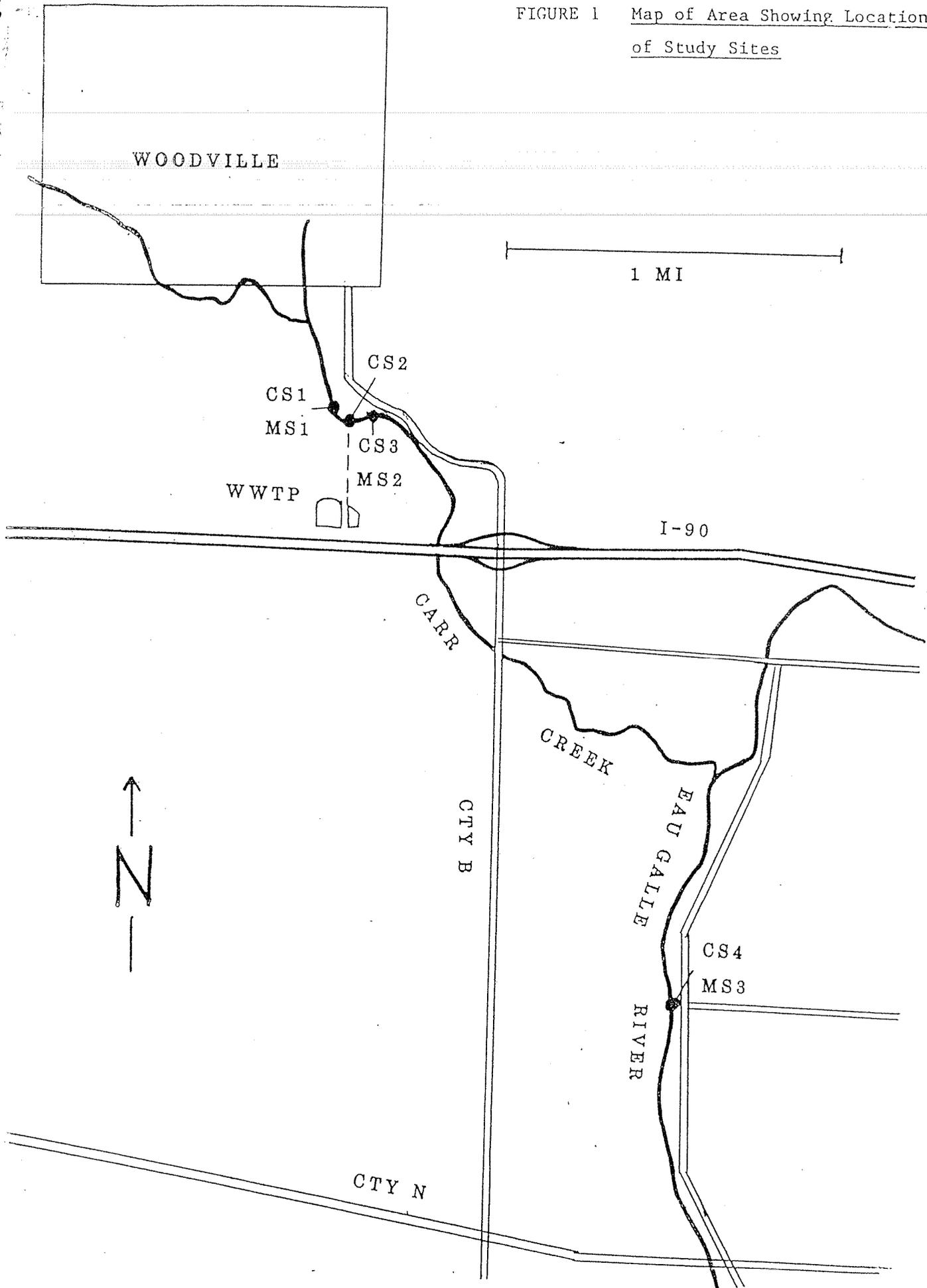
- Hilsenhoff, W. L. 1987. An Improved Biotic Index of Organic Stream Pollution. Great Lakes Entomologist. Vol. 20, #1, page 31.
- Szczytko, S. 1988. Investigation of New Interpretive Techniques for Assessing Biomonitoring Data and Stream Water Quality in Wisconsin. Report to DNR. 85pp.

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FIGURE 1 Map of Area Showing Location
of Study Sites



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Sample
Statistics

District Samplenum Rep	Species Richness	Sample Statistics				EPT Plecoptera Ephemeropt. Trichoptera	Margelef's Diversity Index
		FBI	HBI	Total			
District 790515-56-04 Rep 1	Species 17 Genera 17	Value Count %EPT	5.412 97 52%	5.760 96 52%	125 40%	Plecop. 0 Epheme. 50 Trichop. 0 EPT 50	2.838
District 790515-56-05 Rep 1	Species 15 Genera 15	Value Count %EPT	6.539 76 0%	6.640 75 0%	102 0%	Plecop. 0 Epheme. 0 Trichop. 0 EPT 0	2.968
District 790515-56-06 Rep 1	Species 18 Genera 17	Value Count %EPT	5.487 115 54%	5.879 107 58%	117 53%	Plecop. 0 Epheme. 62 Trichop. 0 EPT 62	2.970
District 791031-56-01 Rep 1	Species 1 Genera 1	Value Count %EPT	4.000 6 100%	5.000 6 100%	8 75%	Plecop. 0 Epheme. 6 Trichop. 0 EPT 6	0.000
District 791031-56-02 Rep 1	Species 9 Genera 9	Value Count %EPT	7.696 102 3%	9.416 101 3%	107 3%	Plecop. 0 Epheme. 2 Trichop. 1 EPT 3	1.577
District 791031-56-03 Rep 1	Species 21 Genera 19	Value Count %EPT	5.119 84 64%	5.821 78 69%	95 57%	Plecop. 0 Epheme. 27 Trichop. 27 EPT 54	2.999
District 881026-56-01 Rep 1	Species 20 Genera 18	Value Count %EPT	4.378 119 72%	5.186 118 73%	119 72%	Plecop. 0 Epheme. 5 Trichop. 81 EPT 86	2.073
District 881026-56-01 Rep 2	Species 18 Genera 18	Value Count %EPT	5.136 132 58%	5.718 110 69%	132 58%	Plecop. 0 Epheme. 4 Trichop. 72 EPT 76	2.466

WOODVILLE, ST. CROIX COUNTY

WASTEWATER RECEIVING STREAM CLASSIFICATION

Receiving stream - Carr Creek tributary to Eau Galle River, Q_{7,10} at discharge site = 0.00 CFS.

Effluent from Woodville WWSP is discharged to Carr Creek. Headwaters of this stream is a marsh north of Woodville. Flow in Carr Creek is intermittent and effluent dries up below the outfall as well. Stream bed is rocky and maintains isolated pools downstream. Carr Creek joins Eau Galle River about two miles below the outfall. Eau Galle River has intermittent flow and intermediate aquatic life from that point downstream to CTH N. Eau Galle River below CTH N is continuous, fish and aquatic life.



Dis charge pipe from Woodville WWSP

RECOMMENDATIONS:

Carr Creek from point of receiving Woodville WWSP discharge to its confluence with Eau Galle River shall be classified noncontinuous, marginal surface water. Eau Galle River from juncture with Carr Creek downstream to CTH N is classified noncontinuous, intermediate aquatic life. Below CTH N Eau Galle River is continuous, fish and aquatic life.

EVALUATION DATE: August 25, 1975 and October 22, 1976

PERSONNEL:

Louis A. Seymour - Environmental Engineer - WCD - (8/25/75)
Bert J. Apelgren - Area Fish Manager - Menomonie Area (8/25/75)
Terry A. Moe - Water Pollution Biologist - WCD (8/25/75, 10/22/76)
Ronald Martin - Biologist - Water Quality Evaluation - Madison (8/25/75)

CUMBERLAND SD M.
9.6 MI. TO WISCONSIN 64

20 R. 16 W.

141000 FEET

92° 15'



Noncontinuous
Marginal

Noncontinuous
Intermediate
Aq. Life

Continuous
Fish & Aq.
Life

(KNAPP)