

CORRESPONDENCE/MEMORANDUM

DATE: January 26, 2004

FILE REF:

TO: Laura Bub - WT/2
Pat Oldenburg – Eau Claire
Paul LaLiberte – Eau Claire
Eric Donaldson – Wausau
Tom Jerow – Wisconsin Rapids

FROM: Mark Hazuga - Wausau

SUBJECT: Stream Classification Surveys on Unnamed Ditch and Creek for Spencer WWTP for Phase II

The Village of Spencer owns and operates a biological treatment system. Primary treatment consists of screening and grit removal. This is followed by an oxidation ditch, which is operated in extended aeration mode, chemical phosphorus removal (ferric chloride) and final clarification. During the survey period effluent flows averaged 0.160 MGD. The discharge is located in the Little Eau Pleine River Watershed (UW14) of the Upper Wisconsin River Drainage Basin located in Marathon County.

The receiving stream is Unnamed Ditch 8-1 which travels approximately 2000 feet before emptying into Unnamed Creek 9-4 in the Northeast corner of T26N R2E Sec 8. Unnamed Creek 9-4 from this point flows approximately 1.2 miles before joining Unnamed Creek 10-16. Unnamed Creek 10-16 then flows approximately 1.2 miles before joining the Little Eau Pleine River. The entire reach from the Spencer outfall to the confluence with the Little Eau Pleine River is classified as Limited Aquatic Life. The Little Eau Pleine River receives the default classification of Full Fish and Aquatic Life (Figure 1).

Streams were surveyed on August 27, 2003 with sites located a few hundred yards below the outfall on Unnamed Ditch 8-1 (off Adams St.) and on Unnamed Creek 10-16 at CTH F using baseline monitoring protocol (Figure 1).

Unnamed Creek 10-16 – Site 1

Unnamed Creek 10-16 is a four mile long warm water tributary to the Little Eau Pleine River. According to the 7.5 minute QUAD map, the stream is mostly ditched and has perennial flow except near the headwaters. The survey was completed in a natural stream reach with ditching further upstream and downstream of the site. Most of the riparian landuse immediately surrounding the stream is wetland.

An electro-fishing survey started 40 meters upstream CTH F to avoid a large bridge pool and continued upstream for 100 meters. The site was located approximately 1.5 miles downstream from the Spencer outfall. Fishery survey results found 189 individuals represented by 11 species. The percent of fish tolerant to low dissolved oxygen was 86%. The dominant fish

species collected include central mudminnow, green sunfish, creek chub and northern red bellied dace (Appendix 1).

The stream channel had some meanders and was overgrown with reed canary grass. Average channel width was approximately 5 feet and water depth in runs and small pools averaged 7 inches and 14 inches, respectively. Substrate consisted mostly of sand and silt with some cobble, gravel and detritus. Gravel and cobble were exposed in some areas and entirely embedded in most other segments. Forage fish cover was provided by the over hanging reed canary grass. Instantaneous dissolved oxygen and temperature readings at 10:00 am were 6.6 mg/l and 16.1 degrees Celsius. Stream gradient measured at the site was 8 feet per mile. This stream reach would be characterized as being low gradient due to the lack of riffles and gradient less than 16 feet per mile. The stream had a small but continuous streamflow, which was likely a result of the Spencer discharge. Most small streams in the area stopped flowing due to severe summer drought conditions during the summer. The Spencer discharge contributed most if not all of the water to maintain streamflow.

Unnamed Ditch 8-1 – Site 2

Unnamed Ditch 8-1 does not appear on the 7.5 minute QUAD map but is a connected waterway to Unnamed Creek 9-4 which is a tributary to Unnamed Creek 10-16. The ditch travels east through a residential area of Spencer approximately 0.2 of a mile before emptying into Unnamed Creek 9-4.

A electro-fishing survey was completed a few hundred yards downstream the Spencer outfall off Adams Street. Fishery survey results found 189 total fish represented by 11 species within a 100 meter station. The percent of fish tolerant to low dissolved oxygen was 78%. The dominant fish species collected include central mudminnow, black bullhead, green sunfish, northern red bellied dace and fathead minnow (Appendix 2). The survey also found a few species that are not tolerant of low dissolved oxygen including blacknose shiner, pumpkinseed, common shiner, creek chub and white sucker. Stream shocking efficiency was not optimal due to high conductivity. Many fish were observed in larger pools but could not be captured.

Observations completed in August 1993 by the previous biologist indicate four dead 6 inch northern pike were found in the ditch (Appendix 3). According to his notes, several hundred feet of the ditch east of STH 13 were dredged just prior to his visit. His notes also indicate that the operator found a number of pike when the ditch was first cleaned. Northern pike of this size are young of the year or juvenile fish and their presence suggests adult pike will migrate to this area for spawning activities.

The stream channel has been historically ditched and receives some urban runoff from Spencer. The channel is essentially straight with a few sharp bends and associated deeper pools. Water depth ranged from 10 to 24 inches in pools and 6 to 8 inches in runs. Average stream width was approximately 8 feet. Substrate consisted of cobble, gravel, sand and silt. Fine silty sediment embedded coarse substrate (gravel, cobble) except in a few small riffle areas. Aquatic plants and filamentous algae were abundant especially in sunlit areas. Forage fish cover consisted of some woody debris and pools. Stream gradient measured at the site was 14 feet per mile indicating

this reach would be characterized as low gradient. On the day of the survey, the discharge contributed 100% of the streamflow since no water was observed upstream from the treatment plant outfall. Riparian land use surrounding the station consisted of wetland on the north side and residential homes on the south side.

Discussion

Currently, the entire reach from the Spencer outfall downstream to the confluence with the Little Eau Pleine River is classified as Limited Aquatic Life. This would include Unnamed Ditch 8-1 from the outfall to the confluence with Unnamed Creek 9-4, from this point to the confluence with Unnamed Creek 10-16 and from this point to the confluence with the Little Eau Pleine River. Based on surveys completed in August 2003, this reach should be removed from NR 104 allowing the default classification of Full Fish and Aquatic Life to become effective (Figure 2).

According to the Use Designation document, a Full Fish and Aquatic Life stream is one that has the potential to contain a fishery represented by gamefish or several species of non gamefish with a significant number of individuals (5 to 25%) not tolerant to low dissolved oxygen. The Use Designation document describes using a 75 to 95% range of individual fish or macroinvertebrates tolerant to low dissolved oxygen for determining the existing fish and aquatic life use classification. The appropriate percent of individuals tolerant of low dissolved oxygen to use in determining the existing use (75 to 95%) is a function of the relative abundance of dissolved oxygen tolerant fish, disturbed habitat tolerant fish and other fish species present. The guidance uses three primary examples to illustrate the application of the low dissolved oxygen range. The following text is copied directly from the Use Designation Guidance and applies to the fish community found during these surveys (Table 1).

Table 1. Interpretation of Low Dissolved Oxygen Tolerant Range with Intolerant Species

<i>If the community contains more than two species not listed as tolerant to low DO or disturbed habitat the percent used should be closer to 95 percent individuals tolerant to low DO to be tolerant defined a DFAL community. The relative number of species and number of individuals not tolerant to low DO or disturbed habitat in the community can be used to decide if the appropriate percent should be 95 or somewhat higher</i>	
<i>Narrative interpretation:</i>	
IF	<i>Most of the fish collected belong to species that are tolerant to low DO and fish tolerant to disturbed habitat.</i>
And IF	<i>The fish community includes three or more other species (i.e. other than the species listed as tolerant to low DO or disturbed habitat).</i>
And IF	<i>The percent individuals tolerant to low DO is >95</i>
Then	<i>Existing Use is TFAL Or Limited Forage Fish</i>
Else	<i>Existing Use is DFAL Or Full Fish and Aquatic Life</i>

Fish survey results from the two sites indicate the appropriate use designation for these streams should be Full Fish and Aquatic life (FFAL) or Diverse Fish and Aquatic Life (DFAL) (Table 2). Both stream surveys found fish communities with high percentages of individuals tolerant of low dissolved oxygen and disturbed habitat. However, both stream surveys also found several **other species** that are not considered tolerant of low dissolved oxygen and disturbed habitat. The above guidelines indicate the appropriate percentage of fish tolerant low dissolved oxygen should be > 95% to designate these streams as Limited Forage Fish or Tolerant Fish and Aquatic Life. The percentage of fish tolerant of low dissolved oxygen was 86 and 78% at Sites 1 and 2 respectively indicating the stream classification should be Full Fish and Aquatic Life.

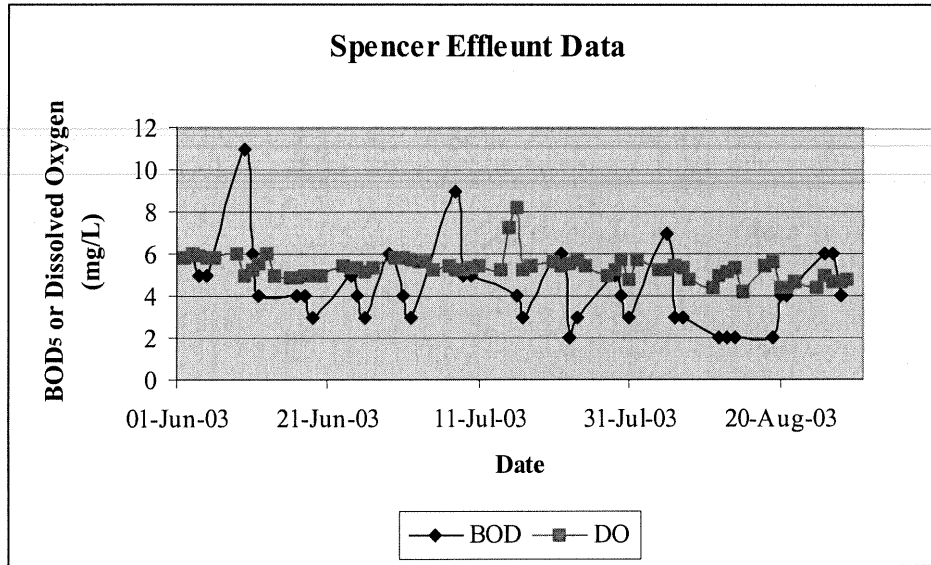
Table 2. Summary of Fish Survey Results for Unnamed Ditch 8-1 and Creek 10-16

Sample Location	# of fish species	# of low D.O. tolerant species	# of fish species tolerant to disturbed habitat	# of fish species not tolerant to low D.O. & disturbed habitat	% of fish tolerant to low D.O.
Ditch 8-1 off Adams St.	11	5	2	4	78
Creek 10-16 at CTH F	11	5	1	5	86

Field notes from the previous biologist document the presence of young of the year northern pike in Unnamed Ditch 8-1. The documentation and potential for northern pike to migrate and successfully spawn and reproduce in these streams also warrants the Full Fish and Aquatic Life designation.

Surveys completed in August 2003 were completed during severe summer drought conditions and many small streams in the area were dry or only contained water in unconnected pools. Streamflow in Unnamed Ditch 8-1 was entirely effluent discharged by the Spencer WWTP since the channel was dry upstream from the outfall. Streamflow in Unnamed Creek 10-16 was likely mostly or all effluent since streamflow was minimal and appeared equal to or less than found in Unnamed Ditch 8-1. Current summer effluent quality from the treatment plants appears adequate to maintain the FFAL community found in both streams (Figure 3).

Figure 3. Effluent Data from Spencer WWTP



*Obtained from SWAMP

Recommended Stream Classification

Existing Classification in NR 104

*From the Spencer STP to the tributary in the NE corner of Sec 8, T26N, R2E – Effluent Ditch
Limited Aquatic Life.*

*From the above location downstream to the Little Eau Pleine River – Non continuous Limited
Aquatic Life.*

Proposed Classification

From the Spencer outfall in T26N R2E Sec 8 NW NE downstream to the confluence with the Little Eau Pleine River in T26N R2E Sec 10 SE SE should be removed from NR 104 allowing the default classification of Full Fish and Aquatic Life to become effective.

Literature Review

Lyons, John. 1992. Using the Index of Biotic Integrity (IBI) to Measure Environmental Quality in Warm Water Streams of Wisconsin. U.S. Forest Service General Technical Report NC-149.

Oldenburg, Pat. 2003. Draft Memo. Wisconsin Department of Natural Resources. Eau Claire, WI.

WDNR. 2003 Draft. Guidelines for Designating Fish and Aquatic Life Uses for Wisconsin Surface Waters.

Appendix 1. Unnamed Creek 10-16 Fish Survey Results

IBI Calculator for Central and Southern WI (Lyons 1992) and Use Designation Guidelines (REV. 2/3/2004)

Sample Date: 08/27/2003

SITE: Unnamed Creek 10-16 - 40 yards upstream CTH F

PERSONNEL: Hazuga, Donaldson

MATRIX	VALUE	SCORE	Equipment Type =	Back Pack
total # of fish	196	n/a	Stream width (m) =	1.5
total # of native spp.	11	10	Ln stream width (m) =	0.41
total # of darter spp.	1	2	Distance shocked (m)	100
total # of sucker spp.	0	2	Is your sample site greater than 8 km from a lake? y	
total # of sunfish spp. < 8km from la	0	0		
total # of sunfish spp. >8km from lak	2	10		
total # of intolerant spp.	0	2		
total # of tolerant fish	174	0		
total # of omnivores	5	10		
total # of insectivores	170	10	% of tolerant spp.	89
total # of top carnivores	0	0	% of omnivorous spp.	3
total # of simple lithophilous	5	0	% of insectivores	87
subtotal		46	% of carnivores	0
			% of simple lithophilous	3
Correction Factors		46	Correction Factors	
total # of DELT fish	0	46	# of nontolerant fish per 300m	66
Total after correction factors =		46	% DELT	0
IBI SCORE =		46		

Biotic Integrity Rating: FAIR

** STREAM WIDTH BELOW IBI MODEL CALIBRATION (<2.5m or 8.2 ft.)

- 126 Central Mudminnow
- 31 Green Sunfish
- 12 Creek Chub
- 8 Northern Redbelly Dace
- 5 Common Shiner
- 5 Fathead Minnow
- 3 Black Bullhead
- 2 Johnny Darter
- 2 Pumpkinseed
- 1 Brassy Minnow
- 1 Brook Stickleback

Stream Class Guidance (8/2003) Tolerance Summary Data	
Total # of game-fish species with more than 2 individuals	1
Total # of DO tolerant fish	166
Total # of DO tolerant fish per 100 meter stream length	166
% forage fish belonging to spp. that are tolerant to low DO	86 %
Total # of fish tolerant to disturbed habitat	12
Total # of fish tolerant to disturbed habitat per 100m. st	12
% of fish species that are tolerant to disturbed habitats	6 %
% of DO fish AND tolerant to disturbed habitat fish spp.	92 %
Total # of DO tolerant species =	5
Total # of Disturbed habitat species =	1
Total # of fish species collected =	11
Total # of fish collected =	196
Stream length shocked (m) =	100
Macroinvertebrates collected (mm/dd/yyyy)	
Overall sample HBI score and rating	
Total # of macroinvertebrates with HBI tolerance values <=5.00 =	
Total # of macroinvertebrates with HBI tolerance values >5.00 =	
% of macroinvertebrates with HBI Tol. Values >5.00 =	#DIV/0! %

Fish and Aquatic Life Minimum Expectations Evaluation	
% forage fish belonging to spp. that are tolerant to low DO	
See Guidance Doc. Sec. 2.8	
% of macroinvertebrates with HBI Tol. Values >5.00 =	

Stenothermal Coolwater Fish Species	
Total # of coolwater fish species	2
Total # of coolwater fish	9
% of coolwater fish =	5 %

Stenothermal Coldwater Fish Species	
Total # of coldwater fish species	0
Total # of coldwater fish	0
% of coldwater fish =	0 %

Appendix 2. Unnamed Ditch 8-1 Fish Survey Results

IBI Calculator for Central and Southern WI (Lyons 1992) and Use Designation Guidelines (AUC (REV. 2/3/2004)

Sample Date: 08/27/2003

SITE: Unnamed Ditch 8-1 - a few hundred yards downstream Spencer Outfall - Adjacent to Adams Street

PERSONNEL: Hazuga, Donaldson

MATRIX	VALUE	SCORE	Equipment Type =	Back Pack
total # of fish	189	n/a	Stream width (m) =	2.29
total # of native spp.	11	5	Ln stream width (m) =	0.83
total # of darter spp.	0	0	Distance shocked (m)	100
total # of sucker spp.	1	2	Is your sample site greater than 8 km from a l y	
total # of sunfish spp. < 8km from lak	0	0		
total # of sunfish spp. >8km from lak	2	10		
total # of intolerant spp.	1	2		
total # of tolerant fish	116	0		
total # of omnivores	18	10		
total # of insectivores	145	10	% of tolerant spp.	61
total # of top carnivores	0	0	% of omnivorous spp.	10
total # of simple lithophils	5	0	% of insectivores	77
subtotal		39	% of carnivores	0
			% of simple lithophilous	3
Correction Factors		39	Correction Factors	
total # of DELT fish	0	39	# of nontolerant fish per 300m	219
Total after correction factors =		39	% DELT	0
IBI SCORE =		39		

Biotic Integrity Rating: **FAIR**

** STREAM WIDTH BELOW IBI MODEL CALIBRATION (<2.5m or 8.2 ft.)

of fish Fish species

- 59 Central Mudminnow
- 36 Black Bullhead
- 32 Green Sunfish
- 19 Northern Redbelly Dace
- 15 Fathead Minnow
- 9 Blacknose Shiner
- 7 Creek Chub
- 5 Pumpkinseed
- 3 White Sucker
- 2 Brook Stickleback
- 2 Common Shiner

Total # of game-fish species with more than 2 individuals	1
Total # of DO tolerant fish	144
Total # of DO tolerant fish per 100 meter stream length	144
% forage fish belonging to spp. that are tolerant to low DO	78 %
Total # of fish tolerant to disturbed habitat	10
Total # of fish tolerant to disturbed habitat per 100m. stre	10
% of fish species that are tolerant to disturbed habitats	5 %
% of DO fish AND tolerant to disturbed habitat fish spp.	83 %
Total # of DO tolerant species =	5
Total # of Disturbed habitat species =	2
Total # of fish species collected =	11
Total # of fish collected =	189
Stream length shocked (m) =	100
Macroinvertebrates collected (mm/dd/yyyy)	
Overall sample HBI score and rating	
Total # of macroinvertebrates with HBI tolerance values <=5.00 =	
Total # of macroinvertebrates with HBI tolerance values >5.00 =	
% of macroinvertebrates with HBI Tol. Values >5.00 =	#DIV/0! %

% forage fish belonging to spp. that are tolerant to low DO	
See Guidance Doc. Sec. 2.8	
% of macroinvertebrates with HBI Tol. Values >5.00 =	

Total # of coolwater fish species	1
Total # of coolwater fish	19
% of coolwater fish =	10 %

Total # of coldwater fish species	0
Total # of coldwater fish	0
% of coldwater fish =	0 %

Appendix 3 is not available electronically. It is a Copy of a Field Sheet completed by Bill Jaeger from file
The field sheet contains hand written notes regarding observations of recent ditch dredging and
finding four six inch dead northern pike in Unnamed Ditch 8-1.
He also indicates that the operator found a number of these in the ditch just after dredging.

Figure 1. Monitoring Sites and Current NR 104 Classification

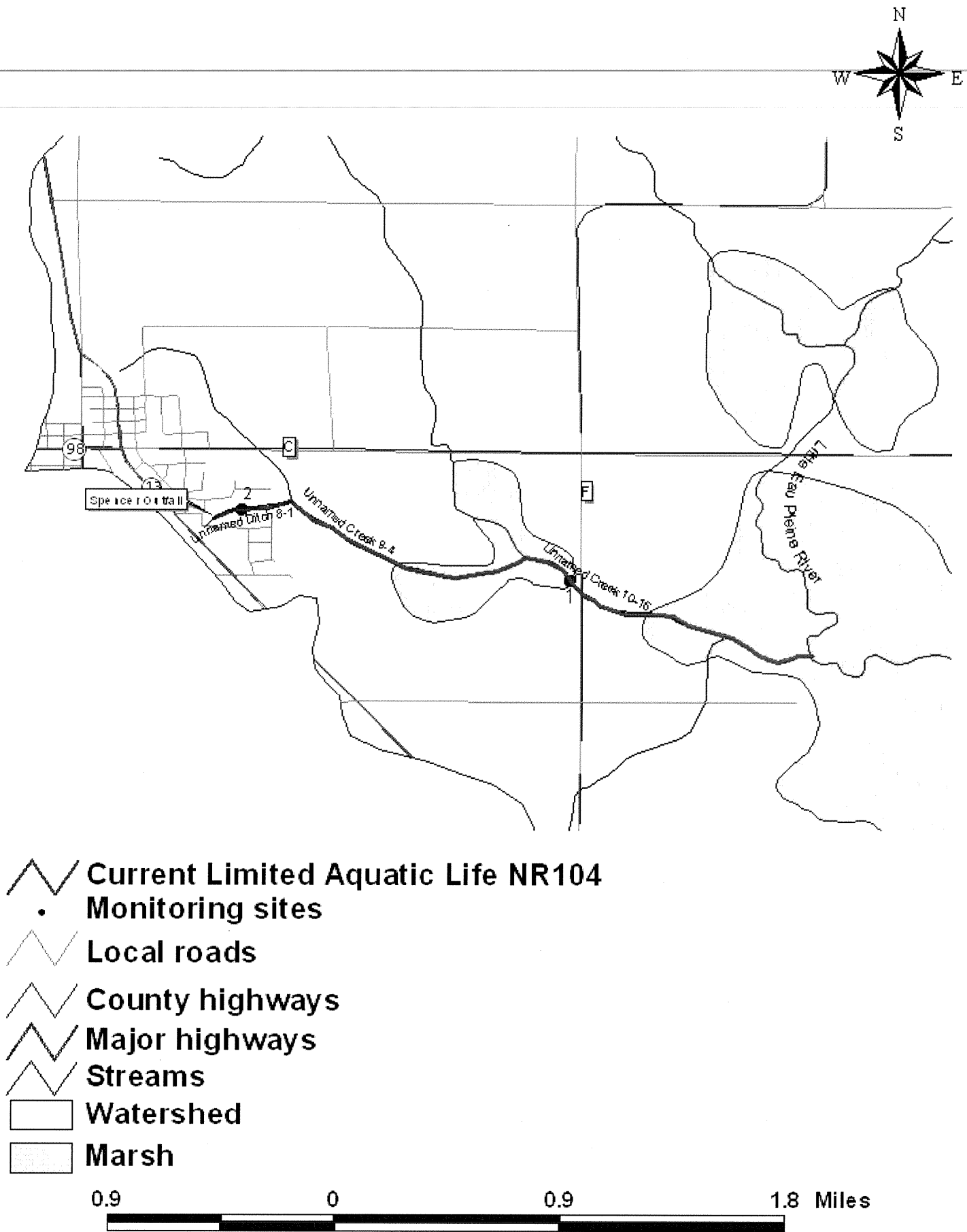
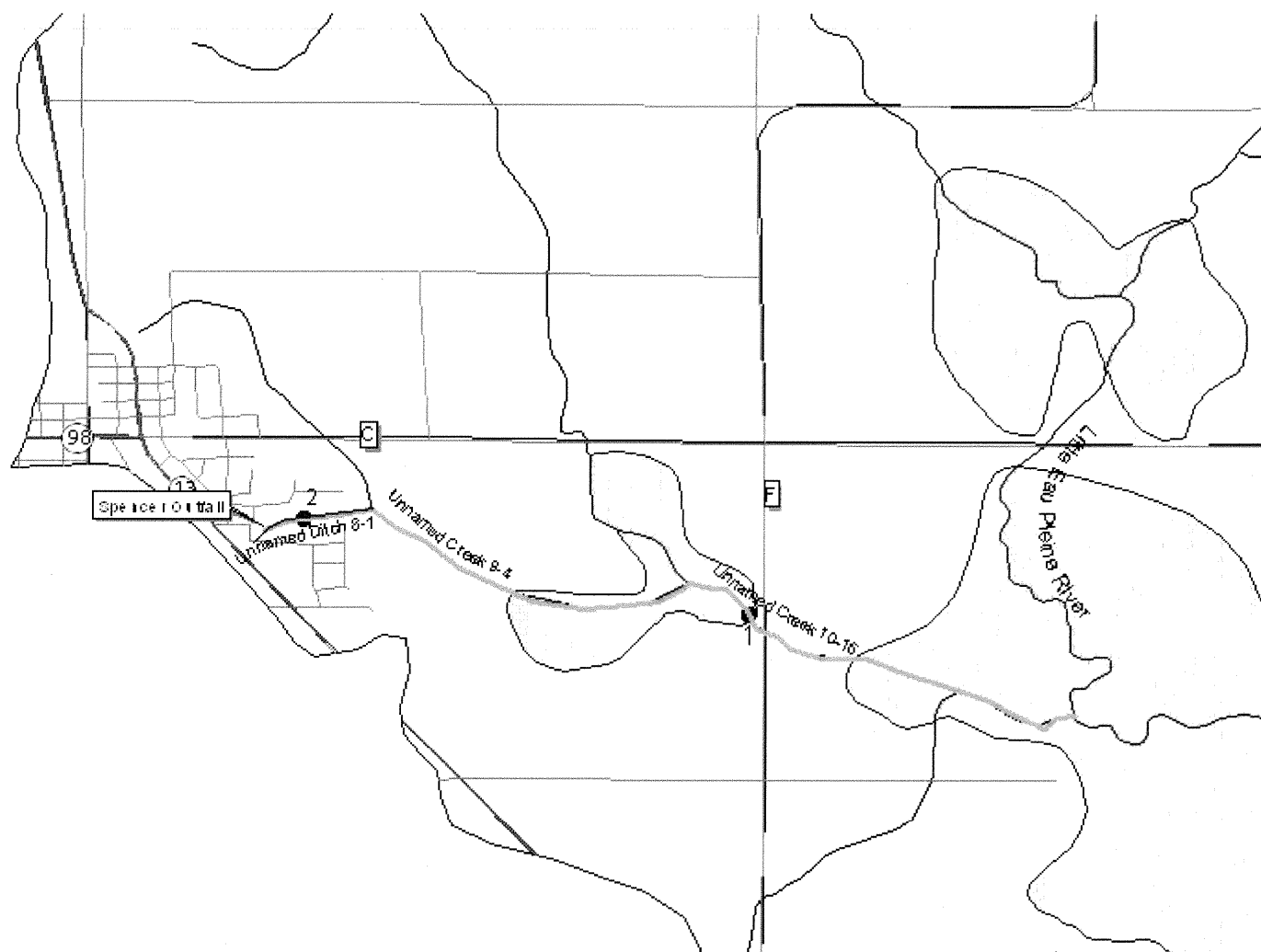
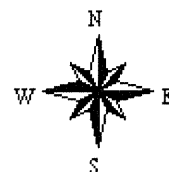


Figure 2. Proposed Stream Classification for Spencer Discharge



-  **Proposed Full Fish and Aquatic Life**
-  **Monitoring sites**
-  **Local roads**
-  **County highways**
-  **Major highways**
-  **Open water**
-  **Streams**
-  **Watershed**
-  **Marsh**

0.9 0 0.9 1.8 Miles



BASIN: _____

STREAM: ^{Named Tributary to} Little Eau Pleine River COUNTY ^{from N. Harzaga} Marquette

PRIMARY STATION NO. _____ LOCATION: 1/4, NE 1/4, S 8, T 26 N, R 2E WATERSHED _____

DATE: 8/24/93 From Spencer STP to 3/4 mile downstream

Chemical Sample? yes

Reach length .75 mi

13:00 TIME (24 hr)

AT SAMPLE SITE: 6 AVG. WIDTH (ft) 8 Max width 4 Min

DO (mg/l)

0.7 AVG. DEPTH (ft) 1.5 Max 0.2 Min

TEMP (°C)

AVG. VELOCITY (measured fps)

pH (s.u.)

EST. VELOCITY (fps) 1. very slow (.2) 2. slow

CONDUCTIVITY (umhos)

(.2-.5); 3. moderate (.5-1.5); 4. fast (1.5)

SUBSTRATE AT SITE LOCATION (%):

Bedrock _____ Rubble (2 1/2 - 10" dia.) 10 Sand _____ Clay _____ Muck _____
Boulders (10" dia.) _____ Gravel (1/10 - 2 1/2" dia.) 85 Silt _____ Detritus _____ Debris & Vegetation _____

AQUATIC VEGETATION: 3% of Total Stream Channel at Sample Site

OBSERVED INSTREAM CONDITIONS AT SAMPLING SITE LIMITING W.Q.

	not present	slight	moderate	significant	Comments
Sludge Deposits	<u>sl</u>	sl	m	s	
Silt & Sediment Deposits	<u>sl</u>	sl	m	<u>s</u>	
Turbidity	n	<u>sl</u>	m	s	
Chlorine or Toxic Scour	<u>sl</u>	sl	m	s	
Macrophytes	n	sl	m	<u>s</u>	<i>elodea, pondweed, sagittaria</i>
Filamentous Algae	n	<u>sl</u>	m	s	
Planktonic Algae	<u>sl</u>	sl	m	s	
Slimes	<u>sl</u>	sl	m	s	
Iron Bacteria	<u>sl</u>	sl	m	s	

FACTORS WHICH MAY BE AFFECTING SAMPLING SITE

degree of influence:	General Watershed			At Site	Comments
	not present	possible	important	direct impact	
Livestock Pasturing	np	<u>pos</u>	imp	di	
Barnyard Runoff	np	<u>pos</u>	imp	di	
Cropland Runoff	np	<u>pos</u>	imp	di	
Tile Drains	np	<u>pos</u>	imp	di	
Septic Systems	np	<u>pos</u>	imp	di	
Streambank Erosion	np	<u>pos</u>	imp	di	
Channel Ditching & Straightening	np	pos	imp	<u>di</u>	<i>entire stream reach is ditched</i>
Downstream Impoundment	<u>np</u>	pos	imp	di	
Upstream Impoundment	<u>np</u>	pos	imp	di	
Low Flow	np	<u>pos</u>	imp	di	
Wetlands	np	pos	<u>imp</u>	di	
Urban Runoff	np	pos	imp	di	
Construction Runoff	np	<u>pos</u>	imp	di	
Point Source (specify type) _____	np	pos	imp	<u>di</u>	
Other (specify) _____	np	pos	imp	di	

PERCEIVED WATER QUALITY: 1. Excellent 2. Good 3. Fair 4. Poor 5. Very Poor

Entire length is a ditch. ~~The~~ Several hundred feet immediately east of Hwy. 13 dredged in last few weeks. Most or ditch bottom soft silt, no sludge. Part of ditchbank wooded wetland (hardwoods). The majority of ditchbank reach canopy meadow. No live fish sighted but found four dead esocids about 6" long. Sides barred but rounded tails. STP operator said they found a number of them when ditch was cleaned. They may have been surviving in immediate outfall area where oxygen is maintained. Saw some frogs and water strider.

Stream Unnamed Tributary Reach Location From STH 13 to 3/4 mile east Reach Score/Rating Poor
 County Marathon Date 8/24/93 Evaluator W. Jaeger Classification _____

Rating Item	Category			
	Excellent	Good	Fair	Poor
Watershed Erosion	No evidence of significant erosion. Stable forest or grass land. Little potential for future erosion. 8	Some erosion evident. No significant "raw" areas. Good land mgmt. practices in area. Low potential for significant erosion. 10	Moderate erosion evident. Erosion from heavy storm events obvious. Some "raw" areas. Potential for significant erosion. 14	Heavy erosion evident. Probable erosion from any run off. 16
Watershed Nonpoint Source	No evidence of significant source. Little potential for future problem. 8	Some potential sources (roads, urban area, farm fields). 10	Moderate sources (small wetlands, tile fields, urban area, intense agriculture). 14	Obvious sources (major wetland drainage, high use urban or industrial area, feed lots, impoundment). 16
Bank Erosion, Failure <i>ditch</i>	No evidence of significant erosion or bank failure. Little potential for future problem. 4	Infrequent, small areas, mostly healed over. Some potential in extreme floods. 8	Moderate frequency and size. Some "raw" spots. Erosion potential during high flow. 16	Many eroded areas. "Raw" areas frequent along straight sections and bends. 20
Bank Vegetative Protection	90% plant density. Diverse trees, shrubs, grass. Plants healthy with apparently good root system. 6	70-90% density. Fewer plant species. A few barren or thin areas. Vegetation appears generally healthy. 9	50-70% density. Dominated by grass, sparse trees and shrubs. Plant types and conditions suggest poorer soil binding. 15	<50% density. Many raw areas. Thin grass, few if any trees and shrubs. 18
Lower Bank Channel Capacity	Ample for present peak flow plus some increase. Peak flow contained. W/D ratio <7. 8	Adequate. Overbank flows rare. W/D ratio 8-15. 10	Barely contains present peaks. Occasional overbank flow. W/D ratio 15-25. 14	Inadequate, overbank flow common. W/D ratio >25. 16
Lower Bank Deposition	Little or no enlargement of channel or point bars. 6	Some new increase in bar formation, mostly from coarse gravel. 9	Moderate deposition of new gravel and coarse sand on old and some new bars. 15	Heavy deposits of fine material, increased bar development. 18
Bottom Scouring and Deposition	Less than 5% of the bottom affected by scouring and deposition. 4	5-30% affected. Scour at constrictions and where grades steepen. Some deposition in pools. 8	30-50% affected. Deposits and scour at obstructions, constrictions and bends. Some filling of pools. 16	More than 50% of the bottom changing nearly year long. Pools almost absent due to deposition. 20
Bottom Substrate/ Available Cover	Greater than 50% rubble, gravel or other stable habitat. 2	30-50% rubble, gravel or other stable habitat. Adequate habitat. 7	10-30% rubble, gravel or other stable habitat. Habitat availability less than desirable. 17	Less than 10% rubble gravel or other stable habitat. Lack of habitat is obvious. 22
Avg. Depth Riffles and Runs	Cold >1' 0 Warm >1.5' 0	6" to 1' 6 10" to 1.5' 6	3" to 6" 18 6" to 10" 18	<3" 24 <6" 24
Avg. Depth of Pools	Cold >4' 0 Warm >5' 0	3' to 4' 6 4' to 5' 6	2' to 3' 18 3' to 4' 18	<2' 24 <3' 24
Flow, at Rep. Low Flow	Cold >2 cfs 0 Warm >5 cfs 0	1-2 cfs 6 2-5 cfs 6	.5-1 cfs 18 1-2 cfs 18	<.5 cfs 24 <1 cfs 24
Pool/Riffle, Run/Bend Ratio (distance between riffles ÷ stream width)	5-7. Variety of habitat. Deep riffles and pools. 4	7-15. Adequate depth in pools and riffles. Bends provide habitat. 8	15-25. Occasional riffle or bend. Bottom contours provide some habitat. 16	>25. Essentially a straight stream. Generally all flat water or shallow riffle. Poor habitat. 20
Aesthetics	Wilderness characteristics, outstanding natural beauty. Usually wooded or un-pastured corridor. 8	High natural beauty. Trees, historic site. Some development may be visible. 10	Common setting, not offensive. Developed but uncluttered area. 14	Stream does not enhance aesthetics. Condition of stream is offensive. 16

Column Totals: _____ 19 _____ 58 _____ 152

Column Scores E 0 +G 19 +F 58 +P 152 = 229 = Score

<70 = Excellent, 71-129 = Good, 130-200 = Fair, >200 = Poor

Spencer, Marathon County

Wastewater Receiving Stream Classification

The stream receiving the discharge from the Spencer sewage treatment plant is a small unnamed tributary to the Little Eau Pleine River. Its length is only 2.5 miles and its source is a small marsh near the sewage treatment plant. The stream flows through marsh and woodland, has been channelized into a straight ditch to speed drainage, flows intermittently, and has very little potential for a good aquatic community.

Recommendations: The unnamed tributary to the Little Eau Pleine River which receives the Spencer sewage treatment plant discharge should have the effluent ditch hydrologic classification to where it meets the intermittent tributary in the northeast corner of Section 8, T26N, R2E. From that point on, it should be classified noncontinuous. The entire stream from the outfall to the Little Eau Pleine River should have the marginal water quality classification.

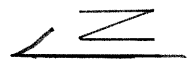
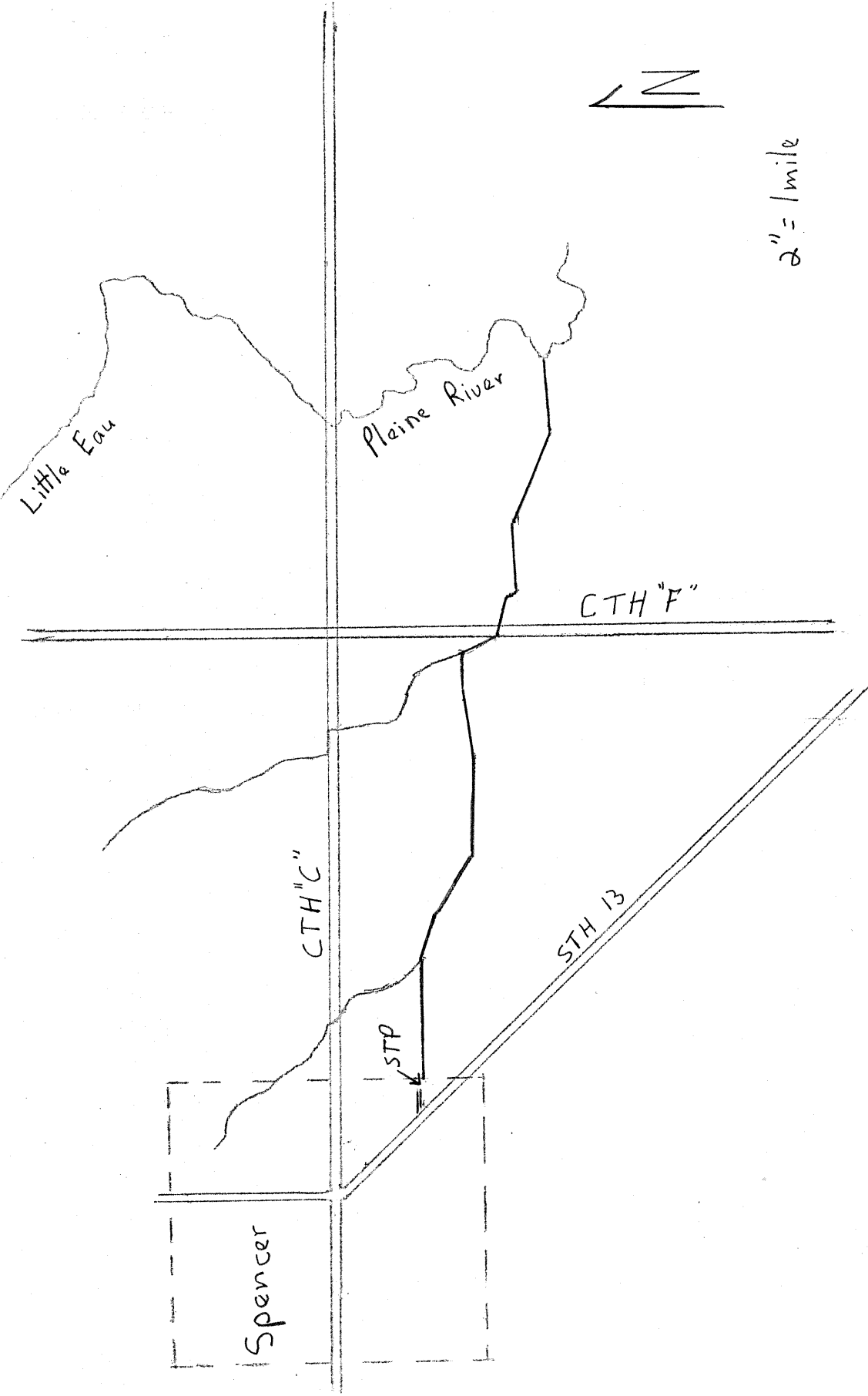


Spencer Tributary above STP discharge.

12/10/76
R. D. [unclear]



Spencer tributary at CTH "F".



2" = 1 mile

Little Eau

Plaine River

CTH "F"

CTH "C"

STH 13

STP

Spencer

Field Survey Dates: Preliminary 10/19/76
Primary 10/21/76

Survey Crew: Al Hauber, Fish Management
Bill Jaeger, E. P. Biologist