

CORRESPONDENCE/MEMORANDUM

STATE OF WISCONSIN

Date: October 27, 1981 File Ref: 3200
To: Central Office - Madison (M. Tusler - WQM/2)

From: Frank J. Koshere
F. J. Koshere

Subject: Stream Classification of Bluff Creek, Douglas County

Description

Bluff Creek is a small red clay tributary to Allouez Bay on the southeast side of the City of Superior. The stream receives wastewater discharges at two points from service buildings in the Burlington Northern railroad yard located just north and essentially parallel to the stream. The affected stream reach is located in T47N, R13W, Sec. 5, 6, and 7. Copies of portions of the Superior and Sunnyside quadrangle maps showing the stream are attached.

The upstream waste outfall is located near the section line between Sec. 6 and 7. The effluent pipe terminates at the edge of the rail yard in a natural ravine tributary to Bluff Creek. The effluent travels overland in the ravine approximately one-quarter mile to the stream.

Bluff Creek at this point is small with steep sided, eroded, red clay banks with many short turns and bends. The stream bottom consists of closely spaced intermittent rock-riffle areas between fine sediment pool areas. Undercut banks, exposed tree roots, toppled trees and signs of frequent flooding well above bank levels are common. Estimated stream flow at the time of observation was less than .1 cfs.

The downstream waste outfall is located approximately one-half mile straight-line distance below the first outfall, near the middle of the western half of section 5, just upstream of the power line crossing.

The stream characteristics change to a larger stream channel with lesser gradient. The banks are steep and often eroded with toppled trees and erosion exposed roots. The stream channel becomes a continuous pool with average depths estimated at <24 inches. Red clay turbidity is high, no aquatic macrophytes were observed, little detritus or organic sediments are present. Schools of small minnows were observed. Evidence of extreme flooding is abundant. Field notes with dissolved oxygen measurements and a habitat rating form are attached.

Recommendation

The ravine receiving effluent from the upstream outfall shall be classified diffused surface water (NR104.02(1)(b)) and be placed in the marginal (NR104.02(3)(b)) variance category.

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2.

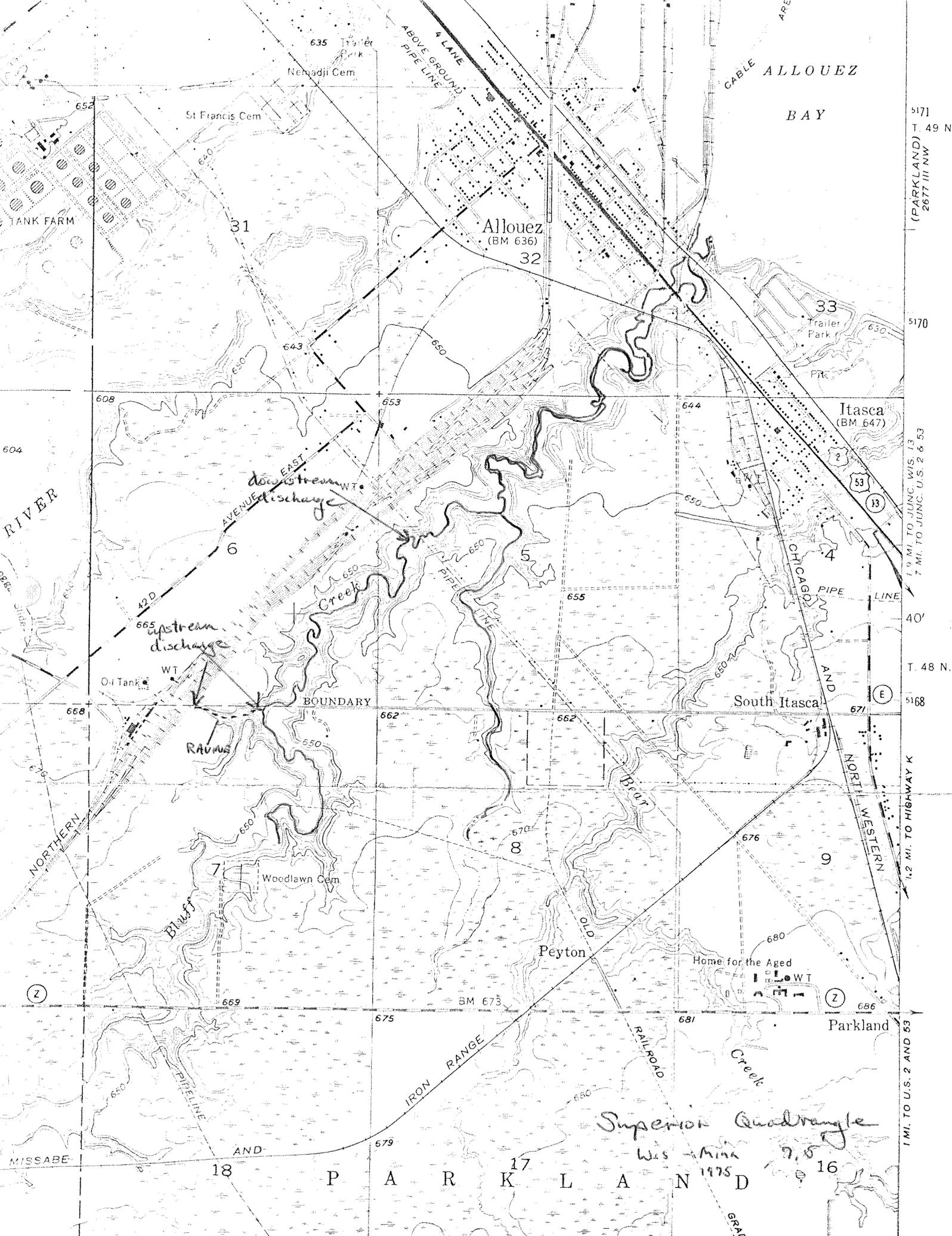
Bluff Creek shall be classified a continuous stream (NR104.02(1)(f)) and placed in the intermediate aquatic life (NR104.02(3)(a)) variance category from the point receiving the upstream effluent downstream to it's confluence with the tributary joining in T48N, R13W, Sec. 5. The remainder of the stream to it's mouth into Allouez Bay shall meet standards for fish and aquatic life (NR104.10(2)).

Variances from fish and aquatic life standards are recommended primarily because of naturally occurring physical habitat limitations preventing development of a healthy and diverse biological community. These limitations include low flow, flood flows, severe bank erosion, channel scouring and poor substrate. Existing water quality is good and does not appear to be a limiting factor to the biota. Water quality is not a factor in recommending a variance from fish and aquatic life standards.

Attachments

FJK:mj

cc: J. Lund - Pattison State Park



TANK FARM

St Francis Cem

635 Trailer Park
Nehadji Cem

Allouez
(BM 636)

ALLOUEZ BAY

33 Trailer Park

Itasca
(BM 647)

RIVER

downstream discharge
Avenue East

upstream discharge

BOUNDARY

RAVINE

Woodlawn Cem

Peyton

South Itasca

Home for the Aged

Parkland

Superior Quadrangle

Wis. 1975

5171 T. 49 N
(PARKLAND)
2677 III NW

5170

1.9 MI. TO JUNC. WIS. 13
7 MI. TO JUNC. U.S. 2 & 53

40'

T. 48 N.

5168

1.2 MI. TO HIGHWAY K

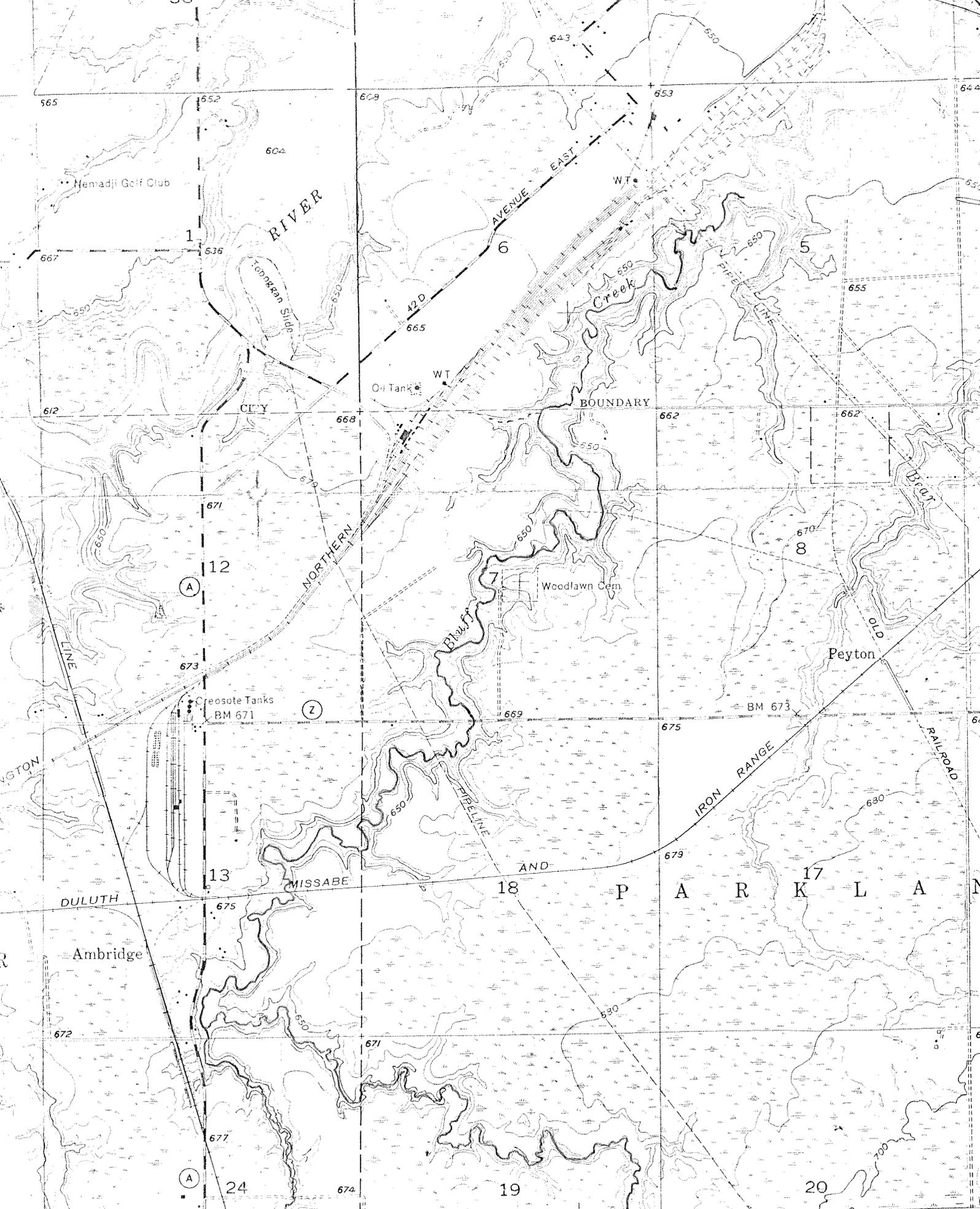
1 MI. TO U.S. 2 AND 53

MISSABE

18

P A R K L A N D

16



R. 14 W. 971

(SUNNYSIDE)
2577 II SE

573

2'30"

R. 13 W 270 000 FEET (MINN.)

SCALE 1:24 000

1 MILE

*Superior Quadrangle
W.S. Ann. 7.5*

ROAD

SUNNYSIDE QUADRANGLE
WISCONSIN-DOUGLAS CO.
7.5 MINUTE SERIES (TOPOGRAPHIC)
SE/4 SUPERIOR 15' QUADRANGLE

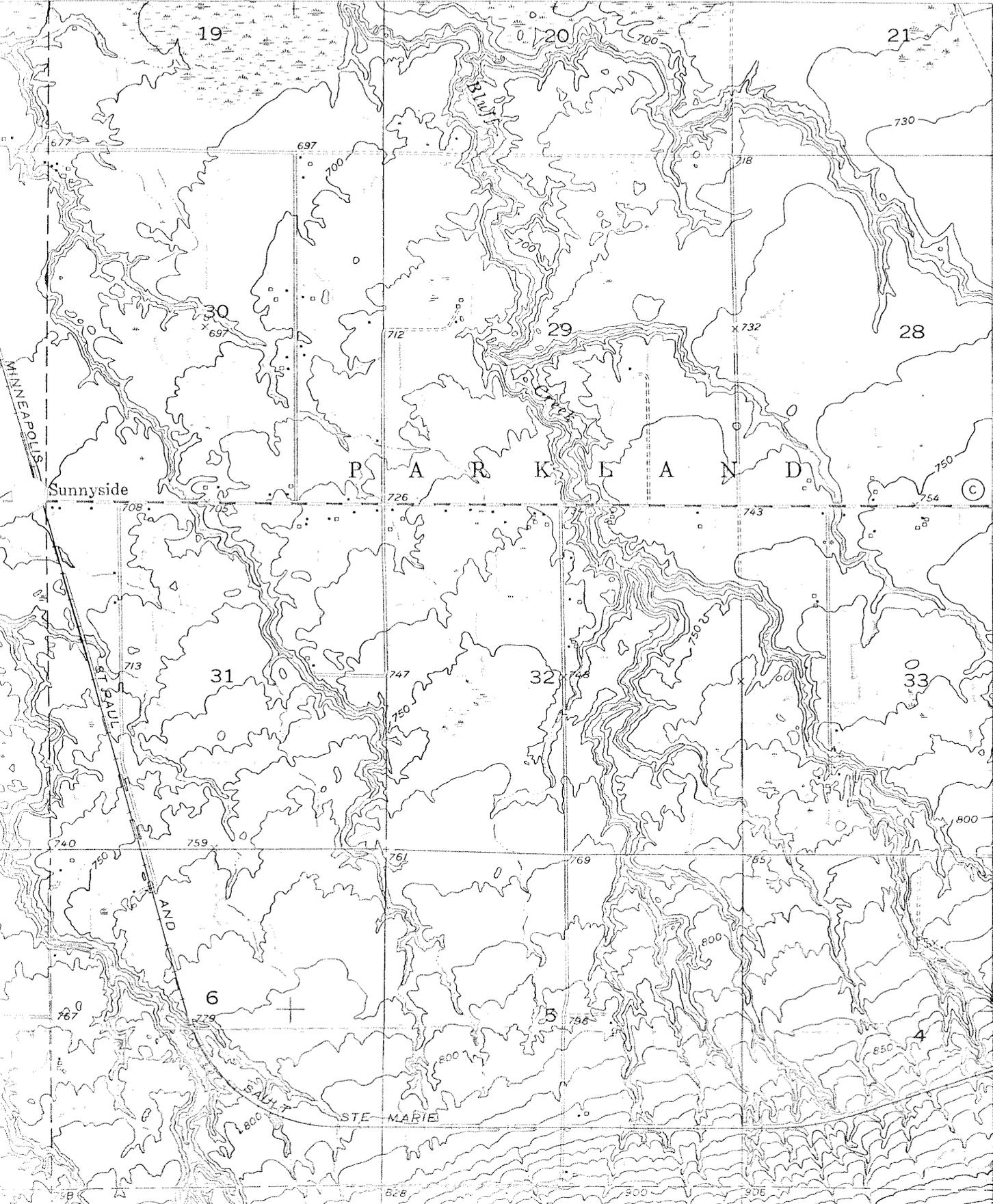
(PARKLAND)

14 W. R. 13 W.

2'30"

1 490 000 FEET

92°00' 46°37'30"



MINNEAPOLIS

Sunnyside

P A R K L A N D

ST PAUL

S A N D

STE MARIE

SOUTH RANGE 0.9 MI.

530 000 FEET

T. 48 N.

T. 47 N.

35'

STREAM SYSTEM HABITAT RATING FORM

Stream Bluff Creek Reach Location T48 N, R13W, Sec 567

Reach Score/Rating _____

County Douglas Date 9/10/81 Evaluator F. Koshere
L. Aron

Classification _____

Rating Item A = Above discharge B = Below "	Category							
	Excellent	Good	Fair	Poor				
1. <u>Erosion</u> A = 12 B = 16	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 runoff.	16
2. <u>Nonpoint Source</u> A = 6 B = 6	No evidence of significant source. Little potential for future problem.	4	Some potential sources. (roads, urban area, farm fields).	8	Moderate sources. (Small wetlands, tile fields, urban area, intense agriculture).	16	Obvious sources. (Major wetland drainage, high use urban or industrial area, feed lots, impoundment).	20
3. <u>Erosion, Failure</u> A = 13 B = 18	No evidence of significant erosion or bank failure. Little potential for future problem.	6	Infrequent, small areas, mostly healed over. Some potential in extreme floods.	9	Moderate frequency and size. Some "raw" spots. Erosion potential during high flow.	15	Many eroded areas. "Raw" areas frequent along straight sections and bends.	18
4. <u>Vegetative Protection</u> A = 7 B = 9	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
5. <u>Channel Capacity</u> A = 16 B = 16	Ample for present plus some increase. Peak flows 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 to 25.	14	Inadequate, overbank flow common. W/D ratio > 25.	16
6. <u>Deposition</u> A = 9 B = 16	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
7. <u>Scouring and Deposition</u> A 12 20	Less than 5% of the bottom affected by scouring and deposition.	4	5 to 30% affected. Scour at constrictions and where grades steepen. Some deposition in pools.	8	30 to 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

Rating Item	Category								
	Excellent		Good		Fair		Poor		
Bottom	8. <u>Substrate</u> A = 12 B = 22	Greater than 50% rubble, gravel or other stable habitat.	2	30 to 50% rubble, gravel or other stable habitat. Adequate habitat.	7	10 to 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
	9. <u>Average Depth</u> Est. Q7,2 A = 24 B = 0	Greater than 24".	0	12" to 24".	6	6" to 12".	18	Less than 6".	24
	10. <u>Flow Q7,2</u> Est. A = 24 B = 24	Warm water, >5 cfs. Cold water, greater than 2 cfs.	0	Warm water, 2 to 5 cfs. Cold water, 1 to 2 cfs.	6	Warm water, .5 to 2 cfs. Cold water, .5 to 1 cfs. Continuous flow.	18	Less than .5 cfs. Stream may cease to flow in very dry years.	24
	11. <u>Pool/Riffle, Pool/Bend Ratio</u> Est. A = ? B = 8	5 to 7. Variety of habitat. Deep riffles and pools.	4	7 to 15. Adequate depth in pools and riffles. Bends provide habitat.	8	15 to 25. Occasional riffle or bend. Bottom contours provide some habitat.	16	Greater than 25. Essentially a straight stream. Generally all "flat water" or shallow riffle. Poor habitat.	20
Stream	12. <u>Aesthetics</u> A = 9 B = 11	Wilderness characteristics, outstanding natural beauty. Usually wooded or unpastured 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 Total --

Add column scores E ____ + G ____ + F ____ + P ____ Total Reach Score A = 149 , B = 166

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

Field Notes	Time	Temp	D.O	pH	Comments
1. Above first discharge	11:20	14.0	5.8	7.4	Basically sterile, no rooted macrophytes. Few sand caddis cases, fewer hydroptil cases, some filamentous algae in pool. ≈ 95% shade cover.
2. Approx. 75 yds bl first discharge	12:00	14.3	9.5	7.6	Stream flow mostly from effluent
3. Below 2nd outfall, ≈ 150 yds upstream of power line	13:10	14.5	7.7	7.3	Schools of small (1") minnows present. Macroinvertebrates noted - Gomphidae, leech, Gerridae. Turbidity limits visibility to ≈ 6"