

DATE: Sept. 7, 2022

FILE REF: Village of Rewey WWTF Discharge to Williams-Rewey Branch

TO: Sarah Luck, WPDES Permit Limits Calculator

FROM: Camille Bruhn, Water Quality Biologist, South Central Region; Kristi Minahan, Water Quality Standards Specialist; Nathan Wells, Engineer

SUBJECT: DRAFT Williams-Rewey Branch (WBIC 932100) Stream Classification, Rewey WWTF Visit Summary

Overview of issue

A site visit was conducted on June 14, 2022, to determine the stream classification of Williams-Rewey Branch where the Rewey Wastewater Treatment Facility (WWTF) discharges. The permit is set to expire in September of 2022, and the stream classification needed to be assessed before the next permit reissuance. Currently, Williams-Rewey Branch is not listed in NR 104 but the facility is receiving some LAL limits based on a 1983 classification report. The entire stretch of Williams-Rewey Branch is Class II trout waters in the 1980 Trout Book (and currently), which means that its official designated use is Coldwater per ch. NR 102, Wis. Adm. Code. We were asked to assess the fish and habitat within Williams-Rewey Branch that receives discharge from the Rewey Wastewater Treatment Facility. Rewey is a small facility and a very low-flow discharger. The design flow is 0.025 MGD, but the actual discharge during the day of the visit was reported as 0.001 MGD. The Village has LAL limits for BOD, DO, TSS, and TP.

*Note: The previous permits listed an “unnamed tributary to Williams-Rewey Branch” as the direct receiving water. In the department’s current mapping system, the entire waterbody WBIC 932100 is named Williams-Rewey Branch, so the permit can be updated to show Williams-Rewey Branch as the direct receiving water.

Summary of recommendations

- Segment 1 (from the 6” corrugated pipe outfall downstream about 0.6 miles):
 - Codified designated use: Class II trout waters, per 1980 Trout Book, which lists “All” of “Williams-Rewey Creek” as Class II trout water. However, from the map in the 1980 Trout Book, it is unclear whether the original intent was to include as far upstream as this dry portion. The upstream extent of Williams-Rewey Branch may have been lengthened in later years due to updated mapping capabilities, which could have inadvertently resulted in extending the trout portion up into the dry run. It is also possible that the Trout Book intended to include the “North Fork” (unnamed trib WBIC 5038538), where major springs are located, rather than the West Fork dry run. During mapping upgrades, the department assigned stream names that followed the longest mapped extent, but this may not have been appropriate in this case. The most recent trout layer on the Surface Water Data Viewer includes “All” of the extent of Williams-Rewey Branch, including the dry West Fork, but this may be an artifact of an automated mapping extension of the classification into the dry portion upstream.
 - Classification used for previous permit issuance: LAL (Limited Aquatic Life), although they also have phosphorus limits in their previous permit.
 - Previous stream class recommendations: LAL from stream classification reports from 2004, 1983 and 1981.

- The 1981 report was written by Roger Schlessler, Water Quality Management Specialist, based on field surveys done prior to establishment of Rewey's discharge. It said the portion from the proposed discharge site to the juncture with the North Fork (at NEQ, SWQ, S9, T4N, R1E) was a dry run with very little, if any, macroinvertebrate or fishery value, and should be classified as marginal (then known as class "E"). Major springs are located in the North Fork providing the flow for Williams-Rewey Branch.
- In 1983 Roger Schlessler completed a second site visit after establishment of Rewey's discharge. A habitat rating form was completed at that time for the portion from the outfall to NEQ, SEQ, S9, T4N, R1E, which resulted in a "Poor" score and confirmed a classification of marginal ("E").
- In 2004, based on the 1983 & 1981 reports, the stretch "from the WWTP outfall in the SWQ NEQ T4N R1E S8 to the confluence with the Williams Branch of the Pecatonica River" was proposed to be codified as LAL, but that code effort was not completed.
- Modeled Natural Community: Cool-Cold Headwater (CCHW)
- New recommended Natural Community and Designated Use (including whether LAL/LFF may be appropriate): During the June 2022 site visit by Camille Bruhn and Nathan Wells, no water was found in order to perform a fish or habitat survey; the stream is ephemeral where the discharge enters the channel. This is consistent with previous findings from the 1980s documentation. We concur that LAL is the appropriate classification for this stretch of stream, and recommend the following:
 - Permit limits based on LAL should be continued for the upcoming permit term, with downstream protection limits based on the Trout Class 2 water (coldwater) where the North Fork joins the West Fork.
 - Water resources biologists initiate discussion with fisheries biologists to propose redefining the extent of the Class 2 Trout water to rectify the conflicting use designation information.
 - If chapter NR 104, Wis. Adm. Code is updated in the future, consider codifying the stretch identified above as LAL. However, note that under future code revisions, other classifications such as "Macroinvertebrate water" may apply instead of LAL.

If needed, monitoring could be done to see where the water consistently starts to flow in Williams-Rewey Branch. However, due to the low flow rates and distance from the discharge to consistently flowing water, the effects from the WWTF discharge are most likely mitigated.

Site Observations (see map and photos)

- The western site (1 on map) is where effluent from the Rewey Wastewater Treatment Facility flows into a manhole in the pasture and splits between a 4" pipe to a cattle tank ~10-20 feet south of the manhole and a 6" corrugated pipe to a dry run of Williams-Rewey Branch. During the visit, water was dripping from the 4" pipe into the ~150 gallon cattle watering tank at a very slow rate. At this point there is no defined channel for Williams-Rewey Branch, even though a stream line is represented on the Surface Water Data Viewer map.
- The eastern site (2 on map) is a 6" corrugated plastic pipe outfall. Terrestrial vegetation is growing here and it is usually dry. The only time this channel flows is during a big storm event, flowing overland through the defined channel. No water was here during the visit.
- There are a couple springs downstream of the outfall (3 on map), but even these do not provide consistent flow to the headwaters of Williams-Rewey Branch. Flow most likely increases where the small Unnamed Tributary 5038538 (5 on map) joins Williams-Rewey Branch just before the pond (6 on map). Williams-Rewey Branch is likely ephemeral upstream of the confluence with the "North Fork", Unnamed Tributary 5038538. Although the 2022 site visit did not extend down to the North Fork, springs in the North Fork were reported in the 1980s to contribute the majority of the flow to Williams-Rewey Branch.

Discussion

The Rewey Wastewater Treatment Facility discharges to a cattle watering tank and to a dry run channel of Williams-Rewey Branch. The discharge to the dry run channel does not provide a consistent flow and often does not flow at all. Due to very little or no water being found in Williams-Rewey Branch where the discharge is located, fish and habitat surveys were not conducted. Williams-Rewey Branch is likely an ephemeral stream until the “North Fork”, Unnamed Tributary 5038538, flows into the main channel and more springs appear.

Both brook and brown trout have been found downstream in the stretch above Bromley Road in the past. Williams-Rewey Branch is a Class II trout stream for the portions where water is consistently flowing.

The current LAL limits apply to the Rewey Wastewater Treatment Facility because the discharges are located in a cattle watering tank and a dry headwater area of Williams-Rewey Branch. The discharge flow is extremely low and is a lengthy distance from consistently flowing water. As explained in the earlier sections of this memo, we think it likely that the extension of the trout water classification to this section of Williams-Rewey Branch may be in error, and recommend further discussions with fisheries biologists to determine whether the Trout Class 2 portion should be redefined. We therefore support continuing the LAL limits for this permit term and, once the issue of the trout water extent is resolved, consideration of adding this stretch to the code as LAL (or the appropriate classification at the time of code revision). Downstream protection limits would need to be included to protect the flowing downstream trout water (coldwater).

Fish survey results (if available)

A fish survey was not completed in 2022 because consistently flowing water was not found directly downstream of the WWTF outfall. Fish surveys were conducted in 2020 at the Bromley Rd and Sandhill Rd downstream crossings. Both surveys found brook trout and confirm that Williams-Rewey Branch is a Cool-Cold Headwater stream. A fish survey done in the vicinity of the confluence of Williams-Rewey with the North Fork in 1981 indicated an “excellent” biotic condition except for sediment impacts and indicated that it was being managed as a trout water.

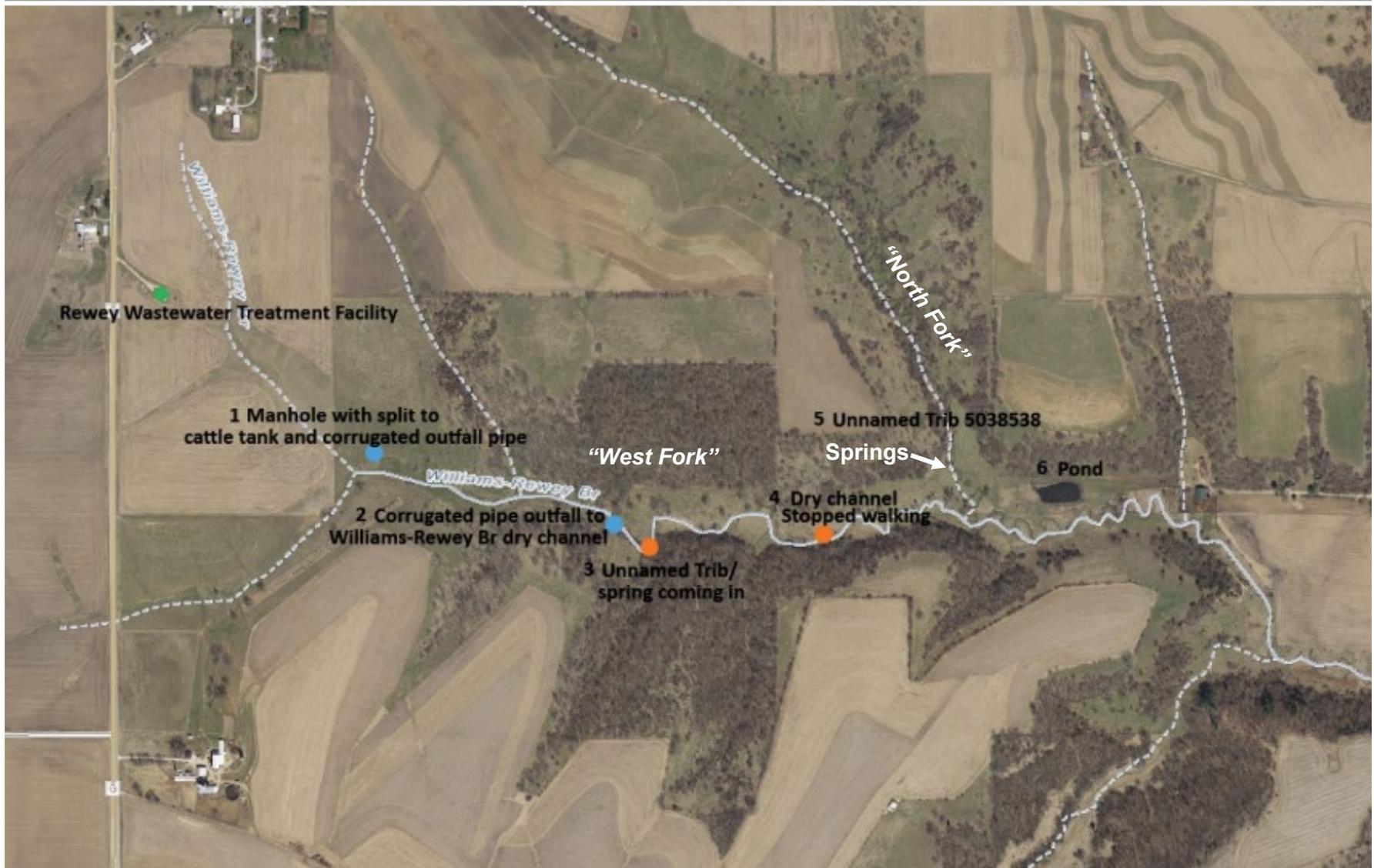
Habitat survey results (if available)

A habitat survey was not completed in 2022 directly downstream of the WWTF due to the lack of consistently flowing water. A habitat survey done in 1983 of the “dry run” stretch resulted in a “Poor” rating; while below the confluence with the North Fork the habitat score was “Good”.

Site overview map and photos



Surface Water Data Viewer Map





3 on map- Unnamed Tibutary/spring
flowing out of the hill into Williams-
Rewey Branch



4 on map- Dry channel of Williams-
Rewey Branch



Region SCR **County** Iowa **Report Date** 11/1983 **Classification** LAL

Water Body: Williams - Rewey Branch

Discharger: Rewey WWTP

If stream is classified as Limited Forage Fish (LFF) or Limited Aquatic Life (LAL), check any of the following Use Attainability Analysis factors that are identified in the classification report:

- Naturally occurring pollutant concentrations prevent the attainment of use
- Natural, ephemeral, intermittent or low flow conditions or water levels prevent the attainment of the use, unless these conditions may be compensated for by the discharge of sufficient volume of effluent discharges without violating State water conservation requirements to enable uses to be met
- Human caused conditions or sources of pollution prevent the attainment of the use and cannot be remedied or would cause more environmental damage to correct than to leave in place
- Dams, diversions or other types of hydrologic modifications preclude the attainment of the use, and it is not feasible to restore the water body to its original condition or operate such modification in a way that would result in the attainment of the use
- Physical conditions related to the natural features of the water body, such as the lack of a proper substrate, cover, flow, depth, pools, riffles, and the like, unrelated to water quality, preclude attainment of aquatic life protection uses
- Controls more stringent than those required by sections 301(b) and 306 of the Act would result in substantial and widespread economic and social impact

Supporting Evidence in the report (include comments on how complete/thorough data is)

- Biological Data (fish/invert)
- Chemical Data (temp, D.O., etc.)
- Physical Data (flow, depth, etc.)
- Habitat Description
- Site Description/Map
- Other: photos (photocopies)

Historical Reports in file:

- 11/7/1983 - Roger Schlessel
- 9/10/1981 - Roger Schlessel

Additional Comments/How to improve report:

- 83 report doesn't include a formal classification recommendation
- dowe need to consider WWTP flow to dry run?
- 81 report suggests LFF b/c of low flow
- creek ~~will~~ region to see if this situation still holds true.

Stream Reclassification

Rewey STP

Iowa County

November 17, 1983

Williams-Rewey Branch

The Rewey WWTP is located on the southeast edge of the Village. The effluent is piped approximately $\frac{1}{2}$ mile before it is discharged to the Williams-Rewey Branch.

The headwaters of the Williams-Rewey Branch is composed of two main forks; a west fork and a north fork (see attached map). The west fork (which the effluent is discharged to) is basically a dry run with unstable bed and banks. The effluent would flow approximately $\frac{1}{2}$ mile before the juncture with the north fork. The major springs which feed the Williams-Rewey Branch are located on the north fork. Very high quality groundwater enters the west fork at this point.

There was very little sedimentation in the northerly fork, but below the juncture with the west fork, sediment was much more evident on the stream bed. The substrate would be mostly gravel if the sedimentation of the stream was alleviated.

Most of the stream is buffered by semi-wooded pasture, which is not a large contributor of sediment. Some sediment enters the stream from agricultural crops and a barn yard located on the west fork. Also, cattle

A fish survey was also conducted on September 10, 1981. The fish population was both diverse and abundant. A summary of the fish captured is contained in Table II.

The macroinvertebrate sample was taken adjacent to the Robert Ogden buildings on September 10, 1981. The results of the biotic index are contained in Table III. The Biotic Index used (which is an indicator of water quality) was developed by Dr. Hilsenhoff and is published in DNR Technical Bulletin Number 100. Actual biotic index values were taken from the updated report of November 1980.

With a biotic index value of 2.31 the stream was considered to have "good" water quality. With Cheumatopsyche spp. not being included in the biotic index, the value would be 2.14. This would put the stream in the "very good" water quality category. Cheumatopsyche spp. is presently only identified to the genus level. Some species are probably more intolerant than the three value which is given to the genus Cheumatopsyche spp. and would consequently lower the biotic index value of 2.31.

The sample had a good diversity of macroinvertebrates. The dominant species was Gammarus pseudolimneus 32 percent, with Symphitopsyce slossonae 14 percent, Cheumatopsyche spp. 20 percent, and Baetis brunneicolor 14 percent of the total sample. Many other species were present but in small numbers.

With a reduction of sediment and organic material entering the stream, the macroinvertebrate community would substantially improve. Considering the quality of groundwater which enters the stream, it should have a biotic index indicating "excellent" water quality.

Table I

Water Quality Data: Williams-Rewey Branch, 1,200 ft. below juncture of the two forks

September 10, 1981

Time - 11:25 a.m. D. O. - 9.5 mg/l
Temp. - 14.9° C (59° F)
Air Temp. - 28° C (82° F)
Cloud Cover - 5%

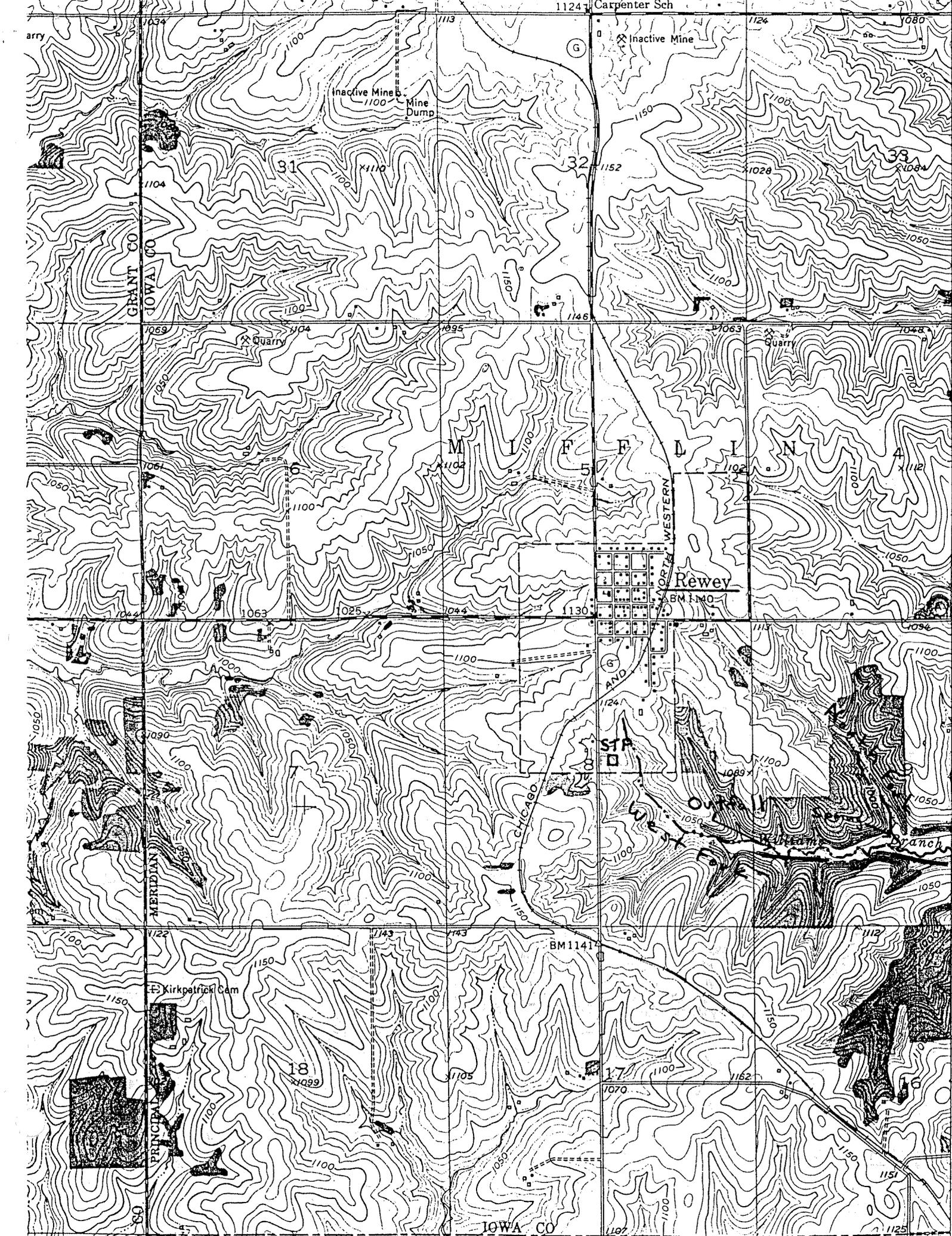
Time - 11:27 a.m. pH - 7.7 (su)

Table II

Fish Survey - Williams-Rewey Branch, Robert Ogden farm upstream to approximately 250' above juncture with the West Fork

September 10, 1981

<u>Fish Species</u>	<u>Population</u>
Bluntnose Minnow	Abundant
Creek Chubs	Abundant
Stonerollers	Abundant
Southern Red Belly Dace	Abundant
White Suckers	Common
Common Shiners	Common
Darter sp.	Common
Brook Stickleback	Common





Williams-Rewey Branch -

Just upstream from juncture
of the two forks - West Fork,
Note unvegetated bed and banks
highly erodible



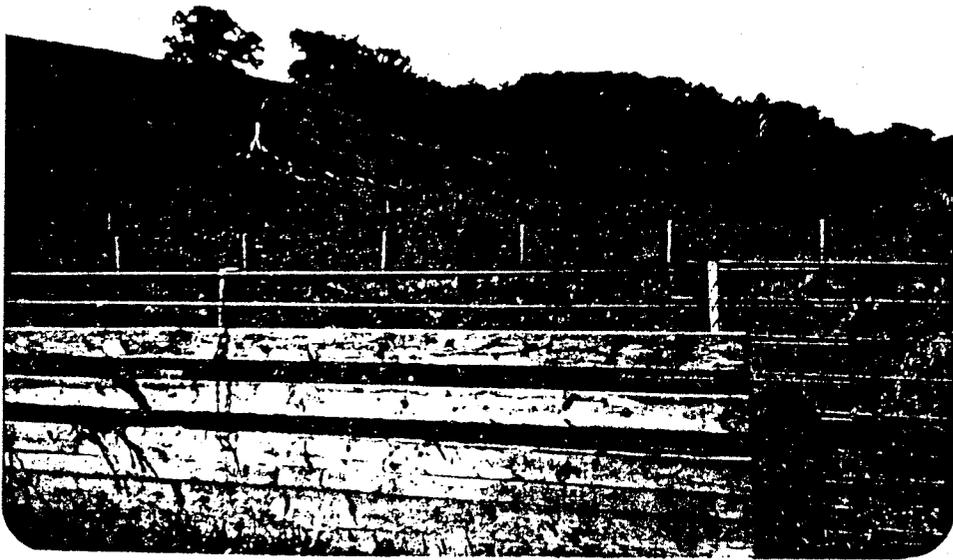
Williams-Rewey Branch -

Large spring located on North
Fork



Williams-Rewey Branch -

North Fork



Williams-Rewey Branch -

Upstream from Robert Ogden farm



Williams-Rewey Branch -

Robert Ogden farm

APPENDIX: Stream System Habitat Rating Form

Williams-
 Reach Rewey Reach Location Outfall to NE 1/4 SW 1/4, Sec. 9, T4N, R1E Reach Score/Rating 211
 County Iowa Date 11/17/83 Evaluator Roger Schlessler Classification "E"
STP - Rewey

Rating Item	Category			
	Excellent	Good	Fair	Poor
Waterbed 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. 12	Heavy erosion evident. Probable erosion from any runoff. 16
Waterbed Nonpoint Source	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). 10	Obvious sources. (Major wetland drainage, high use urban or industrial area, feed lots, impoundment). 20
Bank Erosion, Failure	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
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 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 15-25. 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	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
Average Depth at Rep. Low Flow	Greater than 24 inches. 0	12 inches to 24 inches. 6	6 inches to 12 inches. 18	Less than 6 inches. 24
Flow, at Rep. Low Flow	Warm water >5 cfs. Cold water >2 cfs. 0	Warm water 2-5 cfs. Cold water 1-2 cfs. 6	Warm water 0.5-2 cfs. Cold water 0.5-1 cfs. Continuous blow. 18	Less than 0.5 cfs. Stream may cease to flow in very dry years. 24
Pool/Riffle, Run/Bend Ratio	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 inches or shallow riffle. Poor habitat. 20
Aesthetics	Wilderness characteristics, outstanding natural beauty. Usually wooded or unspaced 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 Without Effluent —
 Column Total With Effluent —
 Column Scores Without Effluent, E 0 + G 0 + F 53 + P 158 = Reach Score
 Column Scores With Effluent, E 0 + G 0 + F 53 + P 158 = Reach Score
 0 = Excellent, 71-129 = Good, 130-200 = Fair, >200 = Poor

APPENDIX: Stream System Habitat Rating Form

County Williams Rewey Reach Location Below NE 1/4 SW 1/4, Sec. 9, T4N, R1E Reach Score/Rating 114
 County Iowa Date 11/17/83 Evaluator Roger Schlessler Classification "A"
STP - Rewey

Rating Item	Category			
	Excellent	Good	Fair	Poor
Waterbed 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. 12	Heavy erosion evident. Probable erosion from any runoff. 16
Waterbed Nonpoint Source	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). 10	Obvious sources. (Major wetland drainage, high use urban or industrial area, feed lots, impoundment). 20
Bank Erosion, Failure	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. 10	Many eroded areas. "Raw" areas frequent along straight sections and bends. 18
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. 10	<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 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 15-25. 12	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. 12	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	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
Average Depth at Rep. Low Flow	Greater than 24 inches. 0	12 inches to 24 inches. 6	6 inches to 12 inches. 10	Less than 6 inches. 24
Flow, at Rep. Low Flow	Warm water >5 cfs. Cold water >2 cfs. 0	Warm water 2-5 cfs. Cold water 1-2 cfs. 6	Warm water 0.5-2 cfs. Cold water 0.5-1 cfs. Continuous blow. 18	Less than 0.5 cfs. Stream may cease to flow in very dry years. 24
Pool/Riffle, Run/Bend Ratio	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 inches or shallow riffle. Poor habitat. 20
Aesthetics	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 Without Effluent — —
 Column Total With Effluent — —
 Column Scores Without Effluent, E 2 +G 22 +F 90 +P 0 = Reach Score
 Column Scores With Effluent, E 2 +G 22 +F 90 +P 0 = Reach Score

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

Rewey

Iowa County

September 10, 1981

Stream Classification

Williams-Rewey Branch

The Village of Rewey has proposed the construction of a wastewater treatment plant on the southeast side of the village. The proposed discharge site is in the SW $\frac{1}{4}$, NE $\frac{1}{4}$, T. 4 N., R. 1 E., Sec. 8. The effluent would be discharged into the headwater area of the Williams-Rewey Branch. The effluent would enter a grassy ravine which eventually evolves into bed and banks due to surface water runoff. This section could be considered a stream, yet it does not carry perennial flow and has very little, if any, macroinvertebrate or fishery value. The bed and banks are very unstable with any significant flow in the channel carrying sediment into the perennial flow section of the Williams-Rewey Branch.

The major springs which feed the Williams-Rewey Branch are actually located on a northerly fork (see attached map). The stream, which the effluent would be discharged to (west fork), joins the northerly fork in the NE $\frac{1}{4}$, SW $\frac{1}{4}$, Sec. 9, T. 4 N., R. 1 E. On the day of the survey the northerly fork had a good flow of very high quality groundwater.

There was very little sedimentation in the northerly fork, but below the juncture with the west fork, sediment was much more evident on the stream bed. The substrate would be mostly gravel if the sedimentation of the stream was alleviated.

Most of the stream is buffered by semi-wooded pasture, which is not a large contributor of sediment. Some sediment enters the stream from agricultural crops and a barn yard located on the west fork. Also cattle have caused some problems with the elimination of vegetation on the stream banks. But the most significant source of sediment to the Williams-Rewey Branch is linked to the unstable bed and banks of the west fork. Surface water runoff easily erodes these unstable bed and banks.

The stream banks below the juncture of the two forks are approximately 70 percent vegetated. Some erosion of the upper bank was quite evident with a loss of soil occurring during high flows but the lower bank was generally in good shape. Much of the stream was totally shaded by vegetation, including watercress, smartweed, sedges, rushes, terrestrial grasses and jewelweed.

Some scouring and deposition of the stream bottom has occurred, but it is not a critical problem. The stream bed was considered to be relatively stable.

The Q_{710} at the mouth of Williams-Rewey Branch is 0.54 cfs. The stream is relatively small in its headwaters but has some large pools which provide for good fish habitat.

The stream is presently managed as brown trout water but considering the size and the quality of the springs located in the headwaters, a brook trout fishery in this area is a possibility. A stream water temperature taken on September 10, 1981, at 11:25 a.m. approximately 1,200 feet below the two forks was 59° F. with an air temperature of 82° F. This is an indication of the high quality water which enters the stream. A summary of the water quality data is located in Table I.

A fish survey was also conducted on September 10, 1981. The fish population was both diverse and abundant. A summary of the fish captured is contained in Table II.

The macroinvertebrate sample was taken adjacent to the Robert Ogden buildings on 9/10/81. The results of the biotic index are contained in Table III. The Biotic Index used (which is an indicator of water quality) was developed by Dr. Hilsenhoff and is published in DNR Technical Bulletin Number 100. Actual biotic index values were taken from the updated report of November 1980.

With a biotic index value of 2.31 the stream was considered to have "good" water quality. With Cheumatopsyche spp. not being included in the biotic index, the value would be 2.14. This would put the stream in the "very good" water quality category. Cheumatopsyche spp. is presently only identified to the genus level. Some species are probably more intolerant than the three value which is given to the genus Cheumatopsyche spp and would consequently lower the biotic index value of 2.31.

The sample had a good diversity of macroinvertebrates. The dominant species was Gammarus pseudolimneus 32 percent, with Symphitopsyche slossonae 14 percent, Cheumatopsyche spp. 20 percent, and Baetis Brunneicolor 14 percent of the total sample. Many other species were present but in small numbers.

With a reduction of sediment and organic material entering the stream, the macroinvertebrate community would substantially improve. Considering the quality of groundwater which enters the stream, it should have a biotic index indicating "excellent" water quality.

There is some concern with the proposed discharge at this site. The primary concern is the possible thermal problems connected with a discharge. This is a critical factor in protecting the Williams-Rewey Branch, especially during low flow periods. An increase in water temperatures would have a very detrimental effect on the trout water.

Also, a landowner is considering putting an erosion control dam in the valley the discharge would be in. Problems could arise with the effluent being held within this structure and then released. Also, Doug Knox, from the Iowa County SCS, has looked at the site in regard to the dam and was concerned with the possible bed and bank erosion that would occur in the west fork where there presently is no permanent flow, but would contain flow with a discharge. The bed and banks are presently unstable and additional erosion in this area would further contribute to sedimentation of the trout water section, which could significantly reduce the spawning success of trout. The stream is too valuable of a trout resource to not be totally protected.

Classification Recommendations

The West fork,
From the proposed discharge site downstream to the juncture with the north fork ~~the west fork~~ should be classified as marginal. This section of stream is basically a dry run. The stream use class should be class "E".

The Williams-Rewey Branch at this point has an influx of high quality groundwater. With a reduction of sediment and organic material entering the stream, it should have a biotic index indicating "excellent" water quality. It is also presently managed as trout water. For these reasons the Williams-Rewey Branch from the juncture of the west and north forks downstream, should be classified as fish and aquatic life. The stream use class should be class "A".


Roger Schlessner
Water Quality Management Specialist

Table I

Water Quality Data: Williams-Rewey Branch, 1,200 ft. below juncture of the two forks

September 10, 1981

Time - 11:25 a.m. D. O. - 9.5 mg/l
Temp. - 14.9° C (59° F)
Air Temp. - 28° C (82° F)
Cloud Cover - 5%

Time - 11:27 a.m. pH - 7.7 (su)

Table II

Fish Survey - Williams-Rewey Branch, Robert Ogden farm upstream to approximately 250' above juncture with the West Fork

September 10, 1981

<u>Fish Species</u>	<u>Population</u>
Bluntnose Minnow	Abundant
Creek Chubs	Abundant
Stonerollers	Abundant
Southern Red Belly Dace	Abundant
White Suckers	Common
Common Shiners	Common
Darter sp.	Common
Brook Stickleback	Common

TABLE III

Taxonomic List of Macroinvertebrates for MS - 1 - September 10, 1981

Taxa	n	a	nxa
COLEOPTERA			
<u>Optioservus</u> spp. (larvae)	14	2	28
DIPTERA			
CHIRONOMIDAE			
<u>Parametricnemus</u> spp.	2	3	6
<u>Polypedilum</u> sp.	1	3	3
<u>Tanytarsus</u> sp.	1	3	3
SIMULIIDAE			
<u>Simulium vittatum</u>	5	4	20
TABANIDAE			
<u>Chrysops</u> sp.	1	3	3
TIPULIDAE			
<u>Hexatoma</u> sp.	1	3	3
EPHEMEROPTERA			
<u>Baetis brunneicolor</u>	19	2	38
MEGALOPTERA			
<u>Sialis</u> spp.	2	2	4
TRICHOPTERA			
<u>Cheumatopsyche</u> spp.	26	3	78
<u>Symphitopsyche slossonae</u>	18	2	36
AMPHIPODA			
<u>Gammarus pseudolimneus</u>	43	2	86
Total =	<u>133</u>		<u>308</u>

$$\text{Biotic Index} = \frac{308}{133} = 2.31$$



Williams-Rewey Branch -
Upper end of watershed,
West Fork



Williams-Rewey Branch -
Upper end of watershed,
West Fork



Williams-Rewey Branch -
Looking upstream from juncture
of the two forks - West Fork



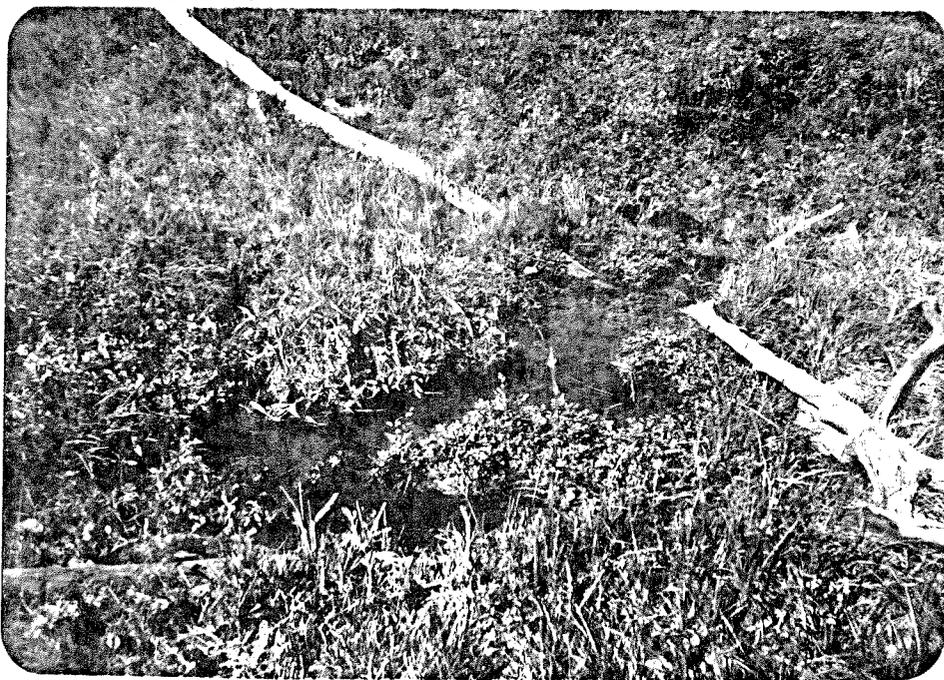
Williams-Rewey Branch -

Just upstream from juncture
of the two forks - West Fork,
Note unvegetated bed and banks -
highly erodible



Williams-Rewey Branch -

Large spring located on North
Fork



Williams-Rewey Branch -

North Fork



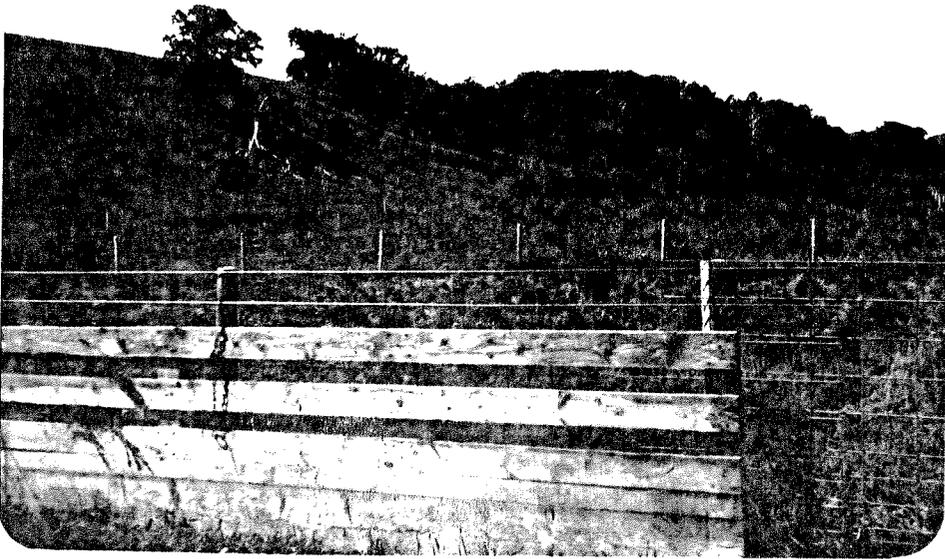
Williams-Rewey Branch -
Juncture of two forks, West
Fork enters on lower left
hand corner



Williams-Rewey Branch -
Below juncture

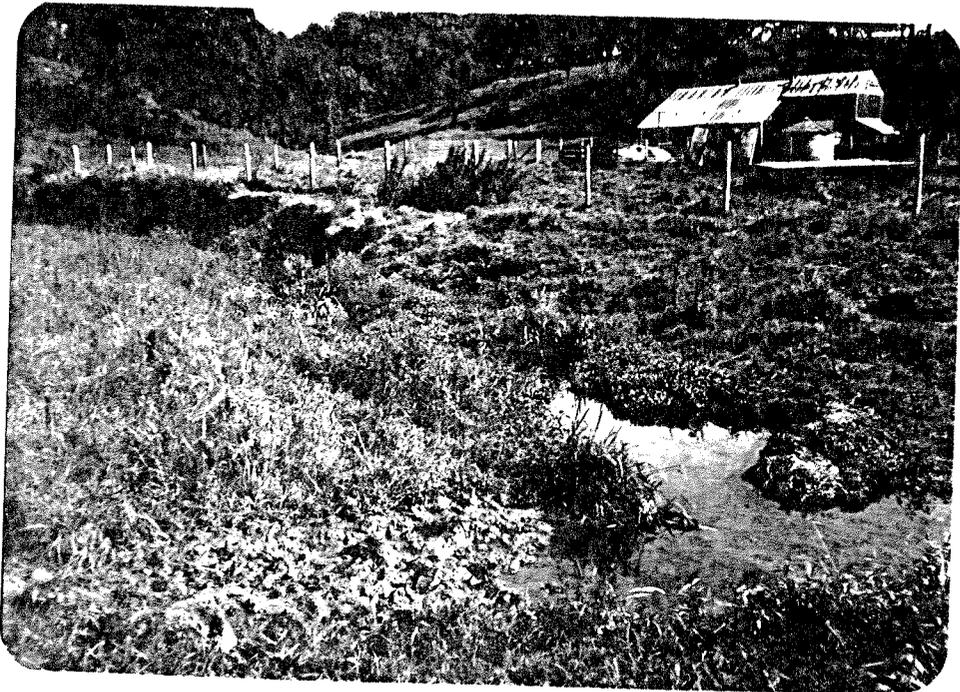


Williams-Rewey Branch -
Below juncture



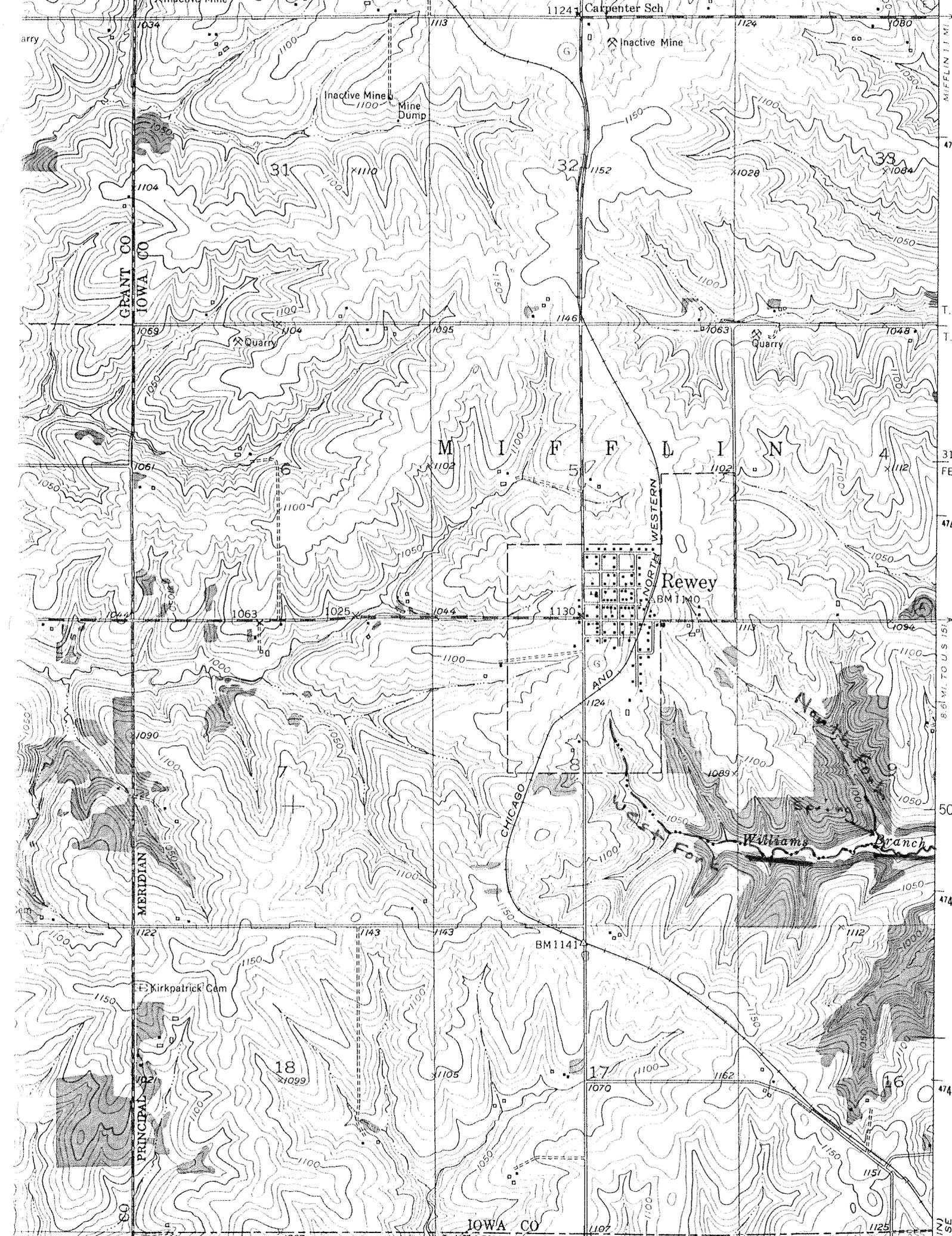
Williams-Rewey Branch -

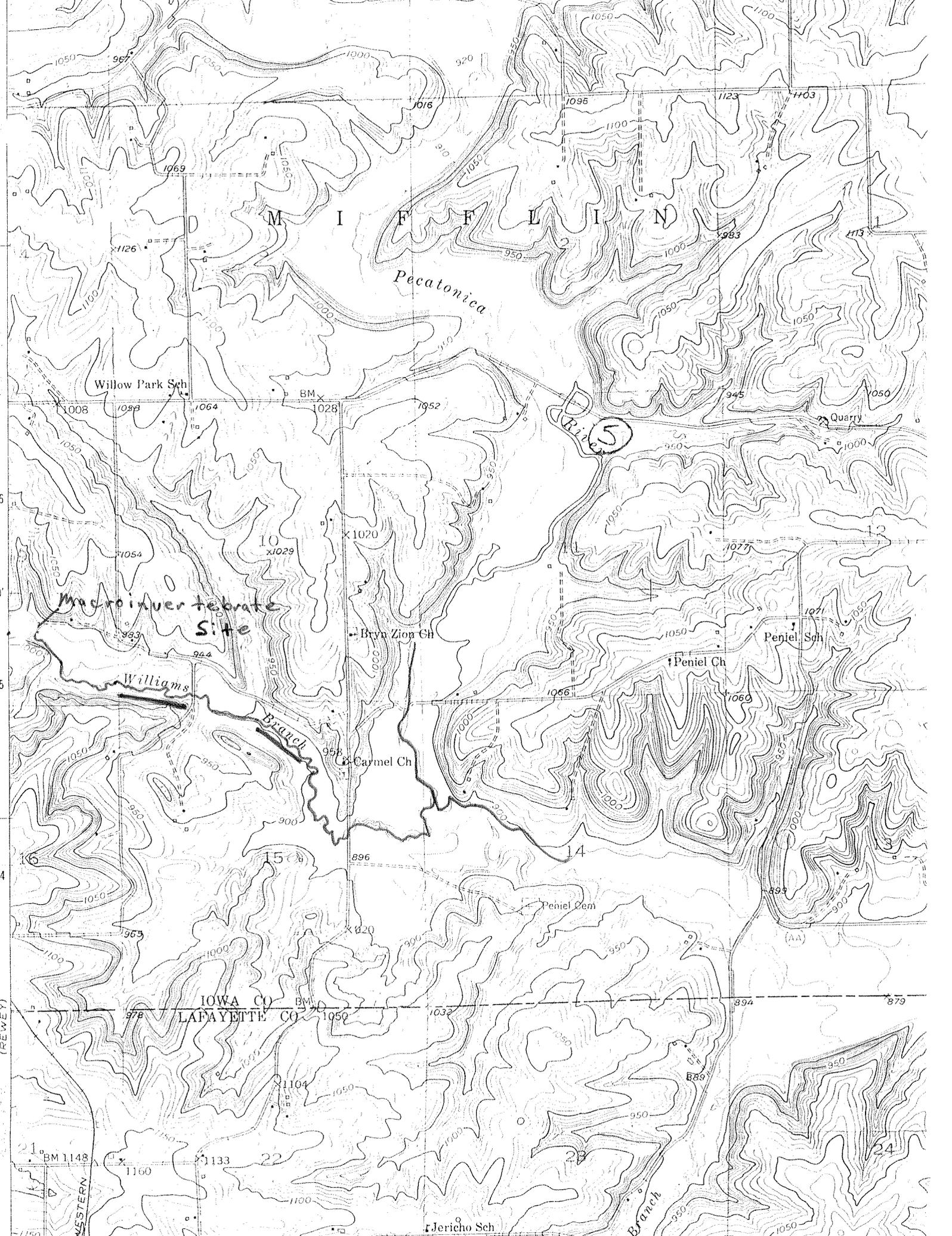
Upstream from Robert Ogden farm



Williams-Rewey Branch -

Robert Ogden farm





M I F F L I N

Pecatonica

Willow Park Sch

BM

D
R
i
v
e
5

Quarry

Macroinvertebrate
Site

Bryn Zion Ch

Peniel Sch

Williams

Branch

Carmel Ch

Peniel Ch

Peniel Cem

IOWA CO
LAFAYETTE CO

Jericho Sch

Branch

(REWEY)