

DATE: September 17, 2001

TO: Pete Pfefferkorn – Wisconsin Rapids  
Paul La Liberte – Eau Claire  
Pat Oldenburg – Eau Claire  
Tom Jerow – Wisconsin Rapids  
Greg Searle – WT/2

FROM: Mark Hazuga - Wausau

SUBJECT: Stream Classification of Hemlock Creek and Unnamed Tributary 13-8

On June 6, 2001, the Village of Vesper was issued a Notice of Violation for violations of effluent limits in their WPDES permit. The current wastewater treatment system consists of aerated lagoons that are unable to provide sufficient treatment for ammonia, especially in the winter months. According to the Notice of Violation, there were also BOD5 and suspended solids violations. A compliance schedule meeting was held on June 27<sup>th</sup> at the Wisconsin Rapids DNR office to discuss the Notice of Violation. An outcome of the meeting was to establish a compliance schedule, which included a Facility Plan Amendment. As part of the Facility Planning Process, the Department conducted stream classification surveys following the new draft guidance to determine the appropriate stream classification for the Village's discharge.

Currently, the WWTP discharges to unnamed creek 13-8 in T23N R4E Sec 13 SE NW. From this point, the creek flows approximately 1,500 feet and empties into Hemlock Creek. The current stream classifications listed in NR 104 for Unnamed Creek 13-8 and Hemlock Creek are Limited Aquatic Life and Limited Forage Fish, respectively. Effluent limits for Vesper are based on the Limited Forage Fish classification of Hemlock Creek due to the short distance from the discharge to the confluence with Hemlock Creek.

Department staff conducted in-stream surveys on Hemlock Creek and Unnamed Creek 13-8 during the summer of 2001. Surveys were also completed at several other sites in the Hemlock Creek Watershed following the baseline monitoring protocol. Following are results of surveys completed during the summer.

### **Unnamed Creek 13-8**

Unnamed Creek 13-8 is approximately two miles in length and is identified as intermittent on the USGS 7.5 minute Quadrangle Map. Fishery surveys were completed on the stream at Hemlock Road and STH 186 bridge crossings. The survey completed at Hemlock Road found 12 species of fish with 18% belonging to species that are tolerant of low dissolved oxygen. Redside Dace, a species identified on the special concern list, was also found at the site. Habitat conditions at Hemlock Road included a diverse habitat with well developed riffles and shallow pools. Substrate consisted mostly of gravel and cobble with some fine sediment deposition in pools.

Streamflow on the day of the survey was 0.054 cfs. Approximately 1000 feet upstream from the site, habitat conditions change substantially. The stream channel appeared ditched with no riffles or pools present. Substrate was dominated by soft sediment, which supported abundant submersed and emergent aquatic plant growth. These habitat conditions persisted upstream to the next site at STH 186.

The survey completed at STH 186 (approximately ½ mile upstream of Hemlock Road) found four species of fish with 33% belonging to species that are tolerant of low dissolved oxygen. A total of six fish were captured in 106 meters and included species of fathead minnow, creek chub, central mudminnow and common shiner. Streamflow on the day of the survey was 0.03 cfs. In-stream habitat at STH 186 was limited by shallow water depth, few riffles and pools and lack of forage fish cover. Substrate composition was dominated by fine sediment. A few rocky shallow pools supporting blacknose dace were found upstream at Vesper Park, however the stream channel was mostly a shallow run with brook stickleback, central mudminnow and fathead minnow being the dominant species. On the day of the surveys, the stream upstream of the park at CTH HH appeared dry with reed canary grass growing in the channel. The stream at this location appeared ditched.

### **Hemlock Creek**

Hemlock Creek was surveyed at several locations in the watershed following the baseline wadable stream protocol. The stream was surveyed just upstream from the confluence with Unnamed Creek 13-8 which receives the Vesper WWTP discharge. Survey results found a total of 1,813 fish represented by 24 species. The percent of fish considered tolerant of low dissolved oxygen was 4%. Most species collected at the site represented a non-game fish community, however largemouth bass, yellow perch, bluegill and pumpkinseed were found which was likely a result of downstream movement from the Vesper Millpond. Redside Dace, a species identified on the Special Concern List, was also found at the site. An in-stream habitat survey was completed the previous day and measured streamflow was 6.8 cfs. Approximately three weeks prior to this survey streamflow was as low as 0.2 cfs during an extreme dry period. The stream has diverse habitat with riffles, runs and shallow pools. Cover for adult gamefish was limited; however, pools, woody debris and boulders provided suitable cover for forage fish. The streambed was very rocky and consisted of boulders, cobble and gravel. Fine sediment embedded the gravel and cobble. The stream also supported abundant populations of crayfish (including Rusty Crayfish), mussels, frogs and tadpoles.

Surveys were completed on Hemlock Creek at Jefferson Road downstream of the Vesper WWTP discharge. Survey results found a total of 766 fish represented by 19 species. The percent of fish considered tolerant of low dissolved oxygen was 10%. Most species collected represented a non-game fish community, however largemouth bass, yellow perch and bluegill were found which was likely a result of downstream movement from the Vesper Millpond. Redside Dace was also found at the site. In-stream habitat was similar to conditions found at the upstream site.

## Recommended Stream Classifications

### Unnamed Creek 13-8

**Currently Unnamed Creek 13-8 is classified as Limited Aquatic Life from the Vesper discharge to the confluence with Hemlock Creek. Based on surveys completed in 2001, the stream should receive two classifications. The stream from Hemlock Road T23N R4E Sec13 SW NE downstream to the mouth T23N R4E Sec 13 SE NW should receive the default classification of Full Fish and Aquatic Life, therefore the reach below the discharge should be removed from NR 104.** Habitat conditions in the reach support a diverse forage fish community that is represented by 12 species. The percent of low dissolved oxygen tolerant fish is 18%, which is well below 75% listed in guidance.

**The fish community upstream from Hemlock Road T23N R4E Sec 13 SW NE would be best described as a Limited Forage Fishery.** A short distance upstream of Hemlock Road, habitat conditions change substantially. In-stream habitat was limited by past ditching, deposition of fine sediment, lack of coarse substrate, lack of cover for forage fish and shallow water depth. The survey completed at STH 186 found six total fish represented by four species. The percent of fish tolerant to low dissolved oxygen was 33%, however very few fish were collected. **Due to very low fish density and limited potential of stream habitat improvement, a limited forage fishery best describes this reach.**

Discharge to the Limit Forage Fish (LFF) reach with LFF effluent limits would not be protective of downstream Fish and Aquatic Life water due to short travel time. Pat Oldenburg determined travel time in Unnamed Creek 13-8 from STH 186 to Hemlock Road was approximately four hours. Such a short travel time would not allow sufficient time for assimilation of BOD if effluent were treated to meet Limited Forage Fish limits. Therefore, a discharge in this reach should have effluent limits that would be protective of downstream Fish and Aquatic Life water.

Since a discharge to the LFF reach of Unnamed Creek 13-8 would require effluent limits based on downstream Full Fish and Aquatic Life waters, is it necessary to promulgate the LFF classification in NR 104. When determining effluent limits for a discharge, the classification of this reach would not be pertinent since the downstream classification takes precedence.

### Hemlock Creek

**Currently, Hemlock Creek is classified as a Limited Forage Fishery in NR 104. Based on surveys completed in 2001 following the new stream classification guidance, Hemlock Creek should be classified as Full Fish and Aquatic Life. Therefore, the Limited Forage Fish classification listed in NR 104 should be removed allowing the default classification of Fish and Aquatic Life to become effective.**

Cc: Greg Searle  
Pete Pfefferkorn  
Paul Laliberte  
Tom Jerow  
Pat Oldenburg

Region <u>WCR</u>	County <u>Wood</u>	Report Date <u>10/1976</u>	Classification <u>LAL/LFF</u>
Water Body: <u>Hemlock Creek, Trib to</u>			
Discharger: <u>Vespe: STP</u>			

**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

**Historical Reports in file:**

- 10/8/76 - Ken Schreiber
- 11/76 - Ken Schreiber

**Additional Comments/How to improve report:**

- need to check w/ region on classification
- extremely minimal data available

Department of Natural Resources

INTRA-DEPARTMENT

MEMORANDUM

Wisconsin Rapids

Station

Date October 8, 1976

IN REPLY REFER TO: 3410

TO: File  
FROM: Kenneth W. Schreiber  
SUBJECT: Hemlock Creek in Vesper

On September 28, 1976 the writer conducted a survey of the subject a KA

The tributary which carries effluent from Vesper STP to Hemlock Cree was dry at road to STP. A very slight flow in the tributary was not above the STP outfall, probably due to seepage from lagoons.

A small amount (approximately 3-5 gal/min) of clear effluent from the lagoon was entering the tributary.

The tributary discharge rate was measured to be approximately 0.02 CFS upon entering Hemlock Creek.

The discharge of Hemlock Creek approximately 1,000 yards downstream from where the tributary enters was determined as 0.057 CFS.

*Kenneth W. Schreiber*  
Kenneth W. Schreiber

KWS:dls

NOTED:

\_\_\_\_\_  
Date

DNR NOV 22 1976

Vesper, Wood County

Wastewater Receiving Stream Classification

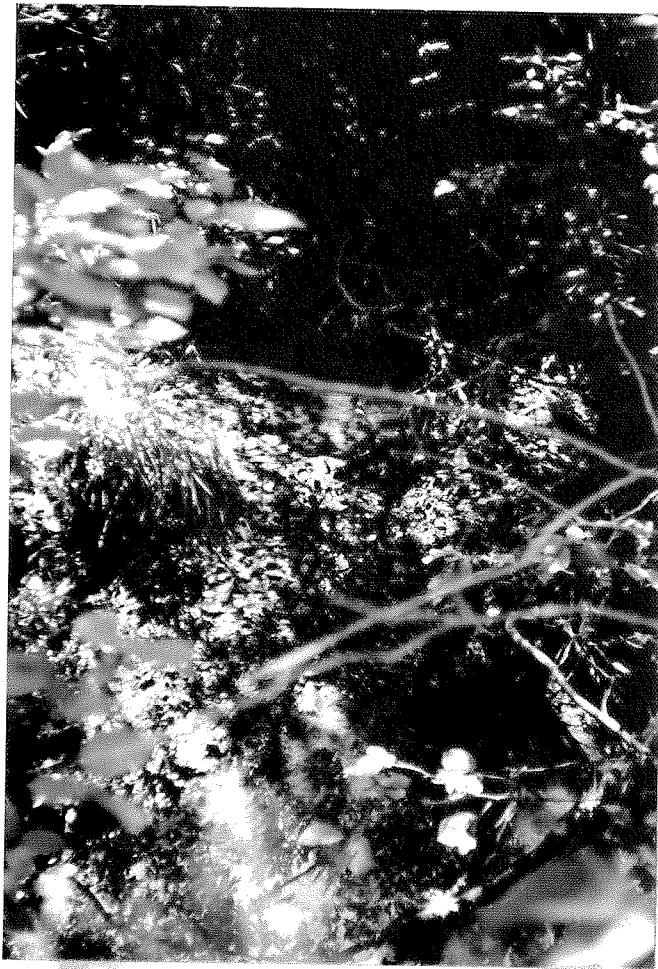
The Vesper sewage treatment lagoons discharge to a small, unnamed drainageway to Hemlock Creek. The receiving stream is only 1.5 miles long, is normally dry, and has a drainage area of about one square mile.

The Vesper outfall is about 500 feet upstream from the confluence with Hemlock Creek. The 7 day  $Q_{10}$  of Hemlock Creek at Vesper is less than 0.01 cfs despite a drainage area of 40 square miles. During most of the summer and fall of 1976, there has been no flow over the Vesper dam. Hemlock Creek in this area averages 30 or 40 feet wide and during low flow conditions is just a series of wide shallow pools. Even though Arpin and Vesper discharge wastewater to the stream, this is quickly lost to evaporation and transpiration so no water flows between the pools.

Hemlock Creek flows through wooded and agricultural land. The agricultural areas contribute nutrients from cropland and pastured areas. The stream has an annual algae bloom and probably suffers from wide diurnal oxygen fluctuation. Hemlock Creek continues unchanged for about 3.5 miles at which point it becomes wider, deeper and it meets two sizeable tributaries named Dawes Creek and Little Hemlock Creek.

Some fish are found in this part of Hemlock Creek but they are mostly minnow species. Jack Zimmermann, the Area Fish Manager, says largemouth bass were stocked in the Vesper Pond but their status is unknown and are not likely to be found elsewhere in the stream. Northern pike may make spring spawning runs up the stream.

Recommendations: The small stream receiving the Vesper discharge should be classified noncontinuous and "marginal" but the Vesper discharge must be based on the classification of Hemlock Creek because of the short distance from the outfall. Hemlock Creek from the Vesper Dam to Dawes Creek should have the noncontinuous hydrologic classification and the "not supporting a balanced aquatic community" water quality classification.



Tributary to Hemlock Creek that receives Vesper discharge.

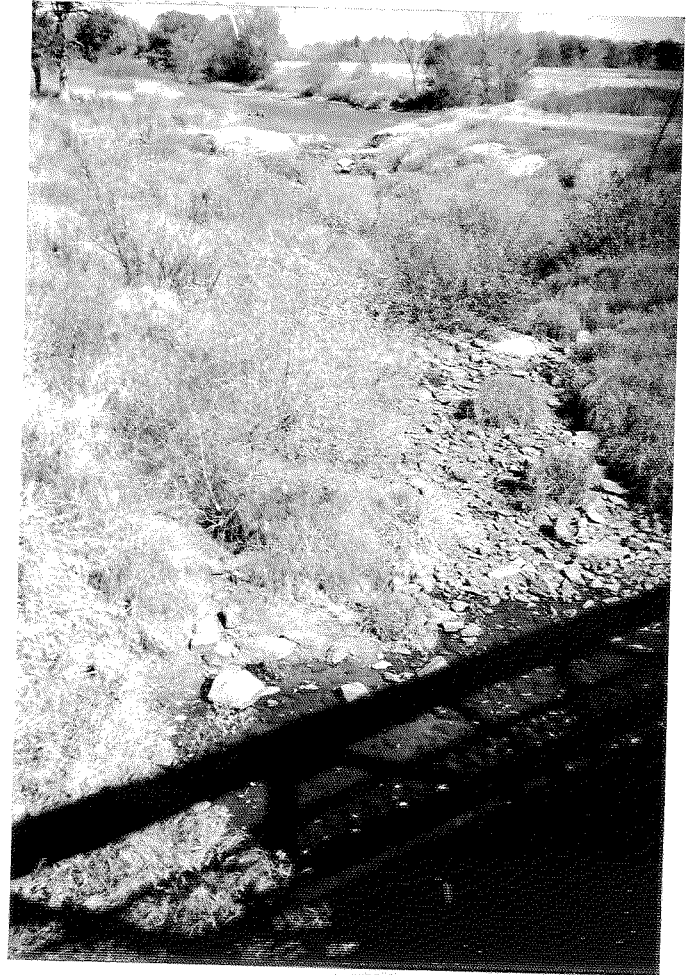


Hemlock Creek at entrance of Vesper tributary.





Hemlock Creek at first Town road crossing below  
Vesper.



Hemlock Creek at STH 13.

PITTSVILLE QUADRANGLE  
WISCONSIN—WOOD CO.  
15 MINUTE SERIES (TOPOGRAPHIC)

UNITED STATES  
DEPARTMENT OF THE INTERIOR  
GEOLOGICAL SURVEY

