

## FERRYVILLE WWTF FACT SHEET

GENERAL INFORMATION	
<b>Permit Number:</b> WI-0020974-09	<b>FID:</b> 612006340
<b>Permittee:</b> Village of Ferryville, 170 Pine Street, PO Box 236, Ferryville, WI 54628	
<b>Discharge Location:</b> Ferryville Wastewater Treatment Facility, Lagoon Road, Ferryville, WI 54628	
<b>Receiving Waters:</b> Sugar Creek in the Rush Creek Watershed of the Bad Axe / La Crosse Rivers Basin located in Crawford County	
<b>Flows:</b>	<u>0.035 MGD Annual Average Discharge Design</u> <u>0.013 MGD Actual Annual Average Discharge (2013)</u>
<b>Discharge Type:</b> fill & draw, discharges twice per year (late spring and fall)	
<b>Stream Classification:</b> Cold Water, Non-public water supply	<b>Q<sub>(7,10)</sub>:</b> 7.2 cfs

## FACILITY DESCRIPTION

<p><b>Facility Description:</b> The Village of Ferryville owns and operates a three cell aerated lagoon facility that receives only domestic wastewater. The annual average design flow is 0.035 MGD (million gallons per day). The actual annual average flow for 2013 was 0.013 MGD. The facility is a fill and draw type facility, and discharges twice annually, under normal conditions usually late spring and fall to Sugar Creek. Discharge periods are approximately 30 days and have a maximum flow limit of 0.050 MGD. No significant operational changes occurred during the last permit term. Significant monitoring and/or limit changes proposed for the upcoming permit term are as follows: 1) addition of sludge PCB monitoring once during the permit term, and 2) the addition of effluent phosphorus monitoring.</p>
<p><b>Publishing Newspaper:</b> The Courier Press, PO Box 149, Prairie Du Chien, WI 53821</p>
<p><b>Significant Industrial Loading?</b> No</p>

## SUBSTANTIAL COMPLIANCE DETERMINATION - OVERALL

	Compliance	Comments
<b>Discharge Limits</b>	Yes	Two significant events occurred during the permit term, including failure of the control manhole which caused a major discharge from the ponds in 2010, as well as the flooding event of 2013. Current 2014 spring discharge was without CBOD exceedances due to tighter control of lab data prior to discharge as well as temperature monitoring for pond turnover.
<b>Sampling/testing requirements</b>	Yes	
<b>Groundwater standards</b>	N/A	
<b>Reporting requirements</b>	Yes	
<b>Compliance schedules</b>	Yes	
<b>Other:</b>	None	
<b>Enforcement considerations</b>	No	
<b>Operator at Proper Grade?</b>	Yes	
<b>In substantial compliance? Yes</b>	<b>Name:</b> Julia A. Stephenson <span style="float: right;"><b>Date:</b> 07/30/2014</span>	

## SUBSTANTIAL COMPLIANCE DETERMINATION – LAND APPLICATION

	Compliance	Comments
<b>Discharge Limits</b>	Yes	
<b>Sampling/testing requirements</b>	Yes	
<b>Groundwater standards</b>	N/A	
<b>Reporting requirements</b>	Yes	
<b>Compliance schedules</b>	N/A	
<b>Other:</b>	N/A	
<b>Enforcement considerations</b>	Yes	
<b>In substantial compliance? Yes</b>	<b>Name:</b> Leanne Hinke	<b>Date:</b> 08/01/2013

## PERMIT MONITORING – INFLUENT

<b>Sample Pt No:</b> 701	<b>Sample Description:</b> Representative influent samples shall be collected from the manhole adjacent to lift station #4.		
PARAMETER	UNIT	SAMPLE FREQ.	SAMPLE TYPE
<b>Flow Rate</b>	MGD	Continuous	Total Daily
<b>BOD<sub>5</sub> Total</b>	mg/L	Weekly	24 Hr Comp
<b>Total Suspended Solids</b>	mg/L	Weekly	24 Hr Comp
<b>Explanation of influent changes from previous permit:</b> None			

## PERMIT MONITORING AND LIMITATIONS – EFFLUENT

<b>Outfall Location:</b> 250 ft North of the lagoon			
<b>Outfall No:</b> 001	<b>Sample Description:</b> Representative effluent samples shall be collected from the effluent flow monitoring manhole, prior to discharge to Sugar Creek. During discharge, the Goulds metering pump measures effluent flow at .050 gallons per day.		
PARAMETER	LIMITATION	SAMPLE FREQ	SAMPLE TYPE
<b>Flow Rate</b>	0.05 MGD	Daily	Measure
<b>CBOD<sub>5</sub></b>	25 mg/L monthly Avg, 40 mg/L weekly Avg	Weekly	Grab
<b>Total Suspended Solids</b>	60 mg/L Monthly Avg	Weekly	Grab
<b>Fecal Coliform (May-Sept)</b>	400#/100 ml Monthly Geo Mean	Weekly	Grab
<b>pH Field</b>	9.0 su Daily Max, 6.0 su Daily Min	5/Week	Grab
<b>Phosphorus, Total</b>	mg/L	Monthly	Grab
<b>Total Ammonia, Nitrogen Variable Limit<sup>1</sup></b>	Variable daily max limit, see table below	Weekly	Grab
<sup>1</sup> The following daily maximum ammonia limits that vary with effluent pH apply.			

Effluent pH (s.u.)	NH <sub>3</sub> -N Limit (mg/L)	Effluent pH (s.u.)	NH <sub>3</sub> -N Limit (mg/L)
pH ≤ 7.5	No Limit	8.2 < pH ≤ 8.3	9.4
7.5 < pH ≤ 7.6	34*	8.3 < pH ≤ 8.4	7.8
7.6 < pH ≤ 7.7	29*	8.4 < pH ≤ 8.5	6.4
7.7 < pH ≤ 7.8	24*	8.5 < pH ≤ 8.6	5.3
7.8 < pH ≤ 7.9	20*	8.6 < pH ≤ 8.7	4.4
7.9 < pH ≤ 8.0	17	8.7 < pH ≤ 8.8	3.7
8.0 < pH ≤ 8.1	14	8.8 < pH ≤ 8.9	3.1
8.1 < pH ≤ 8.2	11	8.9 < pH ≤ 9.0	2.6

\* When possible total ammonia (NH<sub>3</sub>-N) sampling shall occur on the same day pH levels are monitored. Report the applicable variable limit on the Discharge Monitoring Report (DMR) in the Ammonia Variable Limit column. If a limit does not apply use the 'greater than' (>) sign to report the variable limit. During the "summer months" of May through October, if the pH is less than or equal to 7.9 there is no daily maximum limit for NH<sub>3</sub>-N. In this case, report ">20 mg/L" as the daily maximum variable limit when the pH is < 7.9 s.u. During the "winter months" of November through April, report "> 34 mg/L" as the daily maximum variable limit when pH is < 7.5 s.u.

**Explanation of effluent changes from last permit: 1)** The addition of monthly phosphorus monitoring. For additional information see the July 18, 2014 limits memo from Pat Oldenburg to Holly Heldstab entitled "Water Quality-Based Effluent Limitations for the Village of Ferryville (WI-0020974)".

**CBOD<sub>5</sub>:** After conducting paired BOD & CBOD effluent monitoring during 2009, the permittee was granted approval for substitution of the BOD limits with CBOD limits.

**Total Suspended Solids:** A suspended solids variance of 60 mg/L due to algae is reapproved for the upcoming permit term under the authority of NR 210.07(2). The aerated lagoon is the principal treatment process and the TSS values are not due to increased loadings or build-up of lagoon solids leading to less efficient operation.

**Ammonia:** Ammonia limits are still a concern to manage through winter and spring months. Weekly monitoring with daily maximum limits that vary with effluent pH are included in the permit. See table above for more info.

**Phosphorus:** Recent changes to chs. NR 102 and 217 include new phosphorus criteria and related procedures for calculating water quality based effluent limitations for phosphorus. Data from Sugar Creek indicates that Sugar Creek is likely below the 0.075 mg/L water quality criterion. The calculated water-quality based limit is 6.4 mg/L. Calculations from recent effluent phosphorus data submitted as part of the permit application indicate the 30-day P99 is 2.8 mg/L, therefore a permit limit is not required, routine monitoring during the permit term is required in order to have sufficient data to evaluate effluent levels for the next permit reissuance.

**Temperature:** Recent changes to chs. NR 102 and 106 (effective 10/01/2010) include new temperature criteria and related procedures for calculating water quality based effluent limitations for temperature. The lowest calculated limit is 112°F daily maximum, and there is no reasonable potential for this limit to be exceeded, therefore no temperature monitoring or limits are required.

## BIOMONITORING REQUIREMENTS

**Is biomonitoring required at this outfall?** None is recommended based on Chapter 1.11 of the Whole Effluent Toxicity (WET) Testing Program Guidance Document.

**If the stream class at the discharge point is other than Fish and Aquatic Life, how far down stream is the next Fish and Aquatic Life stream?** It is Fish and Aquatic Life beginning at HWY 35.

### DISINFECTION

<b>Is disinfection required for this discharge?</b> No.	
<b>Frequency:</b> N/a	<b>Type of disinfection:</b> None
<b>Discussion:</b> The facility has been able to meet the fecal limit without the addition of chlorine because of the 180 day detention time.	

### LAGOON SLUDGE

**All sludge management requirements were determined ch. NR 204, Wis. Adm. Code**

<b>Sample No:</b> 002	<b>Short Description:</b> Representative liquid sludge samples shall be collected once in 2015 from Pond #1 and monitored for List 1 and PCBs.
<b>Will sludge be removed from the ponds in this permit term?</b> No	

### COMPLIANCE SCHEDULES

None
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### SPECIAL REPORTING REQUIREMENTS

None
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### OTHER COMMENTS

None
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**Proposed expiration date:** 09/30/19

**Prepared by:** Holly Heldstab

**Date:** 08/20/2014

**CORRESPONDENCE / MEMORANDUM**

**State of Wisconsin**

DATE: July 18, 2014

TO: Angela Parkhurst - WCR

FROM: Pat Oldenburg - WCR

SUBJECT: Water Quality-Based Effluent Limitations for the Village of Ferryville (WI-0020974)

This is in response to your request for an evaluation of water quality-based effluent limitations using chs. NR 102, 105, 106, and 217 of the Wisconsin Administrative Code (where applicable), for the Village of Ferryville's discharge to Sugar Creek. The discharge is located in the Rush Creek Watershed of the Bad Axe River Basin in Crawford County.

Based on our review, the following recommendations are made on a chemical-specific basis:

Parameter	Limit Type	Limit and Units	Notes
Flow Rate	Daily Max	0.05 MGD	1
CBOD <sub>5</sub>	Monthly Avg	25 mg/L	1
CBOD <sub>5</sub>	Weekly Avg	40 mg/L	1
Suspended Solids, Total	Monthly Avg	60 mg/L	1
pH Field	Daily Min	6.0 su	1
pH Field	Daily Max	9.0 su	1
Nitrogen, Ammonia (NH <sub>3</sub> -N) Total	Daily Max - Variable	mg/L	1,2
Fecal Coliform	Geometric Mean	400 #/100 ml	1,3

- Continued from current permit.
- Daily maximum ammonia limits:

Effluent pH (s.u.)	NH <sub>3</sub> -N Limit (mg/L)	Effluent pH (s.u.)	NH <sub>3</sub> -N Limit (mg/L)
pH ≤ 7.5	No Limit	8.2 < pH ≤ 8.3	9.4
7.5 < pH ≤ 7.6	34*	8.3 < pH ≤ 8.4	7.8
7.6 < pH ≤ 7.7	29*	8.4 < pH ≤ 8.5	6.4
7.7 < pH ≤ 7.8	24*	8.5 < pH ≤ 8.6	5.3
7.8 < pH ≤ 7.9	20*	8.6 < pH ≤ 8.7	4.4
7.9 < pH ≤ 8.0	17	8.7 < pH ≤ 8.8	3.7
8.0 < pH ≤ 8.1	14	8.8 < pH ≤ 8.9	3.1
8.1 < pH ≤ 8.2	11	8.9 < pH ≤ 9.0	2.6

- Limits and monitoring effective May-Sept annually.

Recent changes to chs. NR 102 and 106 include new temperature criteria and related procedures for calculating water quality based effluent limitations for temperature. These rule changes became effective on October 1st, 2010. The lowest calculated limit is 112°F daily maximum, there is no reasonable potential for this limit to be exceeded, and therefore no temperature monitoring or limits are recommended at this time.

Recent changes to chs. NR 102 and 217 include new phosphorus criteria and related procedures for calculating water quality based effluent limitations for phosphorus. Data from Sugar Creek indicates that Sugar Creek is likely below the 0.075 mg/L water quality criterion:

SWIMS ID	10009074
Station Name	Sugar Creek #3- Bridge On Chevold Rd
Sample Count	5
First Sample	16-May-12
Last Sample	09-Oct-12
Mean	.022
Median	.022
NR 217 Median	.022

In these situations, phosphorus limits are calculated using a mass balance approach:

$$\text{Limit} = \frac{\text{WQC} * (\text{Qs} + (1 - f) * \text{Qe}) - (\text{Qs} - f * \text{Qe}) * \text{Cs}}{\text{Qe}}$$

Where:

- Limit = water quality based limitation
- WQC = water quality criterion
- Cs = background stream concentration
- f = fraction of flow withdrawn from the receiving water
- Qs = stream flow (7Q2)
- Qe = effluent design flow

The calculated water-quality based limitation is 6.4 mg/L. Recent effluent phosphorus data were submitted as part of the permit application process. The 30-day P99 of that data is 2.8 mg/L, therefore a limit is not warranted at this time. Routine monitoring is at the discretion of the permit drafter and basin staff,

Based on the guidance provided in Chapter 1.11 the July 1, 2008 *Whole Effluent Toxicity Program Guidance Document - Revision #8*, no WET testing is recommended due to the low potential for effluent toxicity.

If there are any questions or comments, please contact Pat Oldenburg at (715) 831-3262 or via e-mail at [Patrick.Oldenburg@wisconsin.gov](mailto:Patrick.Oldenburg@wisconsin.gov).

- e-cc: Julia Stephenson - La Crosse
- Kurt Rasmussen - La Crosse
- Diane Figiel – WT/3
- Amanda Minks – WT/3

**Effluent limit calculations for:**

Village of Ferryville  
 WPDES Permit #: 0020974  
 Permit Drafter: Angela Parkhurst  
 Basin Engineer: Julia Stephenson - La Crosse  
 WQ Reviewer: Kurt Rasmussen - La Crosse

**Receiving Water Information:**

Receiving Water: Sugar Creek  
 Watershed: Rush Creek Watershed  
 Basin: Bad Axe River Basin  
 County: Crawford  
 Classification: Cold Water, Non-public Water Supply

Flows:	7Q10	7Q2	90Q10	Estimated Harmonic Mean	Basin Area (mi <sup>2</sup> )
	7.2	9.2		13	25.1

% Used For Mixing = 25  
 Hardness = 294 PPM

Background Metals Data Source: Rattlesnake Creek at Beetown

Substance	Result
Cadmium	0.017
Chromium	0.784
Copper	0.960
Lead	0.814
Mercury	
Zinc	3.152

Effluent Information:	Daily Average Flow		
Outfall Number	f	(mgd)	(cfs)
001		0.05	0.08
			Max discharge rate

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<b>Σ</b>	0	0.05	0.08
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Effluent Hardness = 249 PPM  
 Effluent Dilution due to ZID = NA  
 7Q10:Qe = 93.1 :1

**CALCULATION OF EFFLUENT LIMITATIONS BASED ON ATC (ug/L)**

SUBSTANCE	Ref. Hard. or pH	ATC	Daily Effl. Limit	1/5 of Effl. Limit	Mean Effl. Conc.	1- day P99	1-day Max. Conc.
Chlorine		19.03	38.06	7.61			
Arsenic		339.80	679.60	135.92	1.19		
Cadmium	249	29.35	58.70	11.74	0.192		
Chromium (+3)	249	3806.23	7612.46	1522.49	0.99		
Copper	249	36.70	73.40		4.9	21.1	10.7
Lead	249	258.16	516.32	103.26	<0.27		
Nickel	249	985.61	1971.22	394.24	2.17		
Zinc	249	267.31	534.62	106.92	49.4		
Chloride (mg/L)		757	1514.00		113.5		142

**CALCULATION OF EFFLUENT LIMITATIONS BASED ON CTC (ug/L)**

Receiving Water Flow = 1.8 cfs

SUBSTANCE	Ref. Hard. or pH	CTC	Mean Back- ground	Weekly Effl. Limit	1/5 of Effl. Limit	Mean Effl. Conc.	4- day P99	4-day Max. Conc.
Chlorine		7.28		176.66	35.33			
Arsenic		152.20		3693.41	738.68	1.19		
Cadmium	175	3.82	0.017	92.29	18.46	0.19		
Chromium (+3)	294	319.53	0.784	7735.73	1547.15	0.99		
Copper	294	26.05	0.960	609.81		4.89	11.8	
Lead	294	79.39	0.814	1907.59	381.52	<0.27		
Nickel	268	120.18		2916.38	583.28	2.17		
Zinc	294	309.11	3.152	7427.77	1485.55	49.4		
Chloride (mg/L)		395		9585.39		113.5		

**CALCULATION OF EFFLUENT LIMITATIONS BASED ON HTC (ug/L)**

Receiving Water Flow = 3.37 cfs

SUBSTANCE	Ref. Hard. or pH	HTC	Mean Back- ground	Monthly Effl. Limit	1/5 of Effl. Limit	Mean Effl. Conc.	30- day P99	30- day Max. Conc.
Cadmium		370	0.0174	16507	3301	0.19		
Chromium (+3)		3.82E+06	0.784	1.70E+08	3.41E+07	0.99		
Lead		140	0.8144	6211	1242	<0.27		
Nickel		4.30E+04		1.92E+06	3.84E+05	2.17		

**CALCULATION OF EFFLUENT LIMITATIONS BASED ON HCC (ug/L)**

Receiving Water Flow = 3.37 cfs

SUBSTANCE	Ref. Hard. or pH	HCC	Mean Back- ground	Monthly Effl. Limit	1/5 of Effl. Limit	Mean Effl. Conc.	30- day P99	30- day Max. Conc.
Arsenic		13.3		593	119	1.19		

Date	Cu	Date	Cl-	Date	Hardness (mg/L as
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	(µg/L)		(mg/L)		CaCO <sub>3</sub> )
02-Apr-13	10.2	02-Apr-13	142	09-Mar-04	267
05-Apr-13	10.2	05-Apr-13	134	16-Mar-04	252
09-Apr-13	10.7	09-Apr-13	100	23-Mar-04	267
16-Apr-13	9.2	16-Apr-13	78	30-Mar-04	214
21-Jun-13	4.61				
21-Oct-13	1.66				
25-Oct-13	1.25				
29-Oct-13	1.04				
01-Nov-13	1.57				
05-Nov-13	2.15				
08-Nov-13	1.23				

Date	Effluent Total Phosphorous (mg/L)	Total Monthly Effluent Flow (MG)	Phosphorous Discharged (lb./month)
02-Apr-13	6.24		
09-Apr-13	4.26		
16-Apr-13	3.26	0.719	27
22-Oct-13	0.295		
29-Oct-13	0.421	0.300	1
05-Nov-13	0.481		
12-Nov-13	0.496		
19-Nov-13	0.527		
26-Nov-13	0.996	0.450	2
08-Apr-14	1.95		
15-Apr-14	1.48		
22-Apr-14	1.23	0.400	5

### Temperature limits for receiving waters with unidirectional flow

(calculation using default ambient temperature data)

<b>Facility:</b>	Ferryville	<b>Data Range</b>	<b>7Q10 or 4Q3:</b>	7.2 cfs
<b>Outfall(s):</b>	001	<b>Start:</b>	05/10/09	<b>Dilution:</b>
<b>Date Prepared:</b>	7-Jul-14	<b>End:</b>	11/27/13	<b>f:</b>
<b>Design Flow (Qe):</b>	0.05	mgd		<b>Stream type:</b>
				Cold water community
				<b>Qs:Qe ratio:</b>
				23.3 :1
				<b>Calculation Needed?</b>
				YES

Month	Water Quality Criteria			Receiving Water Flow Rate (Qs) (cfs)	Representative Highest Effluent Flow Rate (Qe)		Representative Highest Monthly Effluent Temperature		99th Percentile of Representative Data		Calculated Effluent Limits	
	Ta (default) (°F)	Sub-Lethal WQC (°F)	Acute WQC (°F)		7-day Rolling Ave (Qesl) (mgd)	Daily Max Flow Rate (Qea) (mgd)	Weekly Ave (°F)	Daily Max (°F)	Weekly Ave (°F)	Daily Max* (°F)	Weekly Ave Limit (°F)	Daily Max Limit (°F)
JAN	35	47	68	1.80	0.000	0.000					-	-
FEB	36	47	68	1.80	0.000	0.000					-	-
MAR	39	51	69	1.80	0.117	0.817					-	112
APR	47	57	70	1.80	0.048	0.048					-	120
MAY	56	63	72	1.80	0.048	0.048					-	120
JUN	62	67	72	1.80	0.033	0.048					-	120
JUL	64	67	73	1.80	0.000	0.000					-	-
AUG	63	65	73	1.80	0.000	0.000					-	-
SEP	57	60	72	1.80	0.048	0.048					-	120
OCT	49	53	70	1.80	0.050	0.050					-	120
NOV	41	48	69	1.80	0.048	0.050					-	120
DEC	37	47	69	1.80	0.043	0.048					-	120

\*NA - Indicates that there are greater than 100 daily maximum values, therefore 99th percentile would be a value less than the recorded daily maximum.