Permit Fact Sheet

General Information

Permit Number:	WI-0036021-08-0	
Permittee Name:	Fontana Walworth Water Pollution Control Commission	
Address:	N840 Chilson Road	
City/State/Zip:	Walworth, WI 53184-0850	
Discharge Location:	Effluent channel that flows into the Piscasaw Creek	
Receiving Water:	Piscasaw Creek (Piscasaw Creek Watershed, Kishwaukee River Basin) in Walworth County	
StreamFlow ($Q_{7,10}$):	7-Q10 = 0.57 cfs (cubic feet per second) 7-Q2 = 1.09 cfs 90-Q10 = 0.93 cfs	
Stream Classification:	Warm water sport fish community, non-public water supply	
Discharge Type:	Existing, continuous	
Design Flow(s)	Daily Maximum	NA
	Weekly Maximum	3.68 MGD
	Monthly Maximum	NA
	Annual Average	1.774 MGD
Significant Industrial Loading?	Kikkoman, USG Interiors Inc. (gypsum board), Iseli Co, Onvoy - Division of Badger Plug Co., Dalco Metals, Max Pax LLC, Novares (previously "Miniature Precision Components"), and Poly-Flex Inc.	
Operator at Proper Grade?	Yes. Doug York, OIC, is advanced certified in all plant's subclasses. Fontana-Walworth is an advanced plant in A1, B, C, D, P & SS. Cayla Renwick is the OIC for L subclass.	
Approved Pretreatment Program?	N/A	

Facility Description

Fontana Walworth Water Pollution Control Commission operates a 1.774 million gallon per day (MGD) design flow activated sludge wastewater treatment facility that serves the Village of Fontana, the Village of Walworth, and several industries. Treatment consists of screening, extended aeration (oxidation ditch), final clarification, ultraviolet disinfection (seasonally), and cascade aeration before it is discharged to the Piscasaw Creek. Waste activated sludge is concentrated in a gravity thickening tank and stored in two sludge storage tanks with propeller style mixers. Liquid sludge is being land applied by injection onto Department approved agricultural fields. Approximately 225 US tons of liquid sludge is generated annually.

Substantial Compliance Determination

Enforcement During Last Permit:

The Department issued a notice of noncompliance on November 22, 2023 for exceeding weekly average effluent limits for chloride and not implementing all chloride source reduction measures. The department received the requested materials on December 21, 2023, January 19, 2024, and February 21, 2024.

After a desk top review of discharge monitoring reports, CMARs, land application reports, compliance schedule items, and a site visit on June 1, 2023 completed by Nick Lent, DNR Wastewater Engineer, this facility has been found to be in substantial compliance with their current permit, WI-0036021-07-0.

Sample Point Designation		
Sample Point Number	**Discharge Flow, Units, and Averaging Period**	**Sample Point Location, Waste Type/Sample Contents and Treatment Description (as applicable)**
701	1.26 MGD (1/1/2019 – 5/31/2023)	INFLUENT: 24-hour flow proportional composite sampler intake located in the influent channel downstream of the bar screen in the screening building. Sidestream or recycled flows not included in influent samples.
001	1.25 MGD (1/1/2019 – 5/31/2023)	EFFLUENT: 24-hour flow proportional composite sampler intake located upstream of ultraviolet (UV) light disinfection system. Grab samples and composite samples for whole effluent toxicity (WET) testing shall be collected downstream of UV light disinfection, following cascade aeration.
002	225 U.S tons (Permit Reissuance Application)	SLUDGE: Class B, gravity thickened liquid sludge. Sample collected after mixing at the end pipe off the storage tank.
104	N/A	FIELD BLANK: collect total recoverable mercury field blanks using standard sampling handling procedures.

1 Influent – Monitoring Requirements

Sample Point Number: 701- INFLUENT TO PLANT

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Flow Rate		MGD	Daily	Continuous	
BOD5, Total		mg/L	4/Week	24-Hr Flow Prop Comp	
Suspended Solids, Total		mg/L	4/Week	24-Hr Flow Prop Comp	
Mercury, Total Recoverable		ng/L	Quarterly	24-Hr Flow Prop Comp	See 'Mercury Monitoring' permit section.

Changes from Previous Permit:

Influent monitoring requirements were re-evaluated for the proposed permit term and TSS and BOD_5 sampling frequency was decreased. The proposed monitoring requirements for these parameters (TSS and BOD_5) is reduced from 5x/week to 4x/week based upon the continuation of a strong compliance history and a lack of limit violations during the current permit term.

Explanation of Limits and Monitoring Requirements

BOD_5 and Total Suspended Solids (TSS): Monitoring of influent flow, BOD5 and total suspended solids (TSS) is required by s. NR 210.04(2), Wis. Adm. Code, to assess wastewater strengths and volumes and to demonstrate the percent removal requirement for BOD_5 and TSS in s. NR 210.05(1)(a) and (b), Wis. Adm. Code, and in the Standard Requirements section of the permit.

Mercury, Total Recoverable: Mercury monitoring is included in the proposed permit pursuant to s. NR 106.145, Wis. Adm. Code. Required field blanks for Mercury monitoring per ss. NR 106.145(9) and (10), Wis. Adm. Code, requirements. The permittee shall collect a mercury field blank for each set of mercury samples (a set of samples may include a combination of influent, effluent or other samples all collected on the same day).

2 Inplant - Monitoring and Limitations

Sample Point Number: 104- Field Blanks

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Mercury, Total Recoverable		ng/L	Quarterly	Blank	See 'Mercury Monitoring' permit section.

Changes from Previous Permit:

Inplant monitoring requirements were re-evaluated for the proposed permit term and no changes were made from the previous permit.

Explanation of Limits and Monitoring Requirements

Mercury, Total Recoverable: Mercury monitoring is included in the proposed permit pursuant to s. NR 106.145, Wis. Adm. Code. Required field blanks for Mercury monitoring per ss. NR 106.145(9) and (10), Wis. Adm. Code, requirements. The permittee shall collect a mercury field blank for each set of mercury samples (a set of samples may include a combination of influent, effluent or other samples all collected on the same day).

3 Surface Water - Monitoring and Limitations

Sample Point Number: 001- EFFLUENT TO PISCASAW CREEK

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Flow Rate		MGD	Continuous	Continuous	
BOD5, Total	Weekly Avg	10 mg/L	4/Week	24-Hr Flow Prop Comp	Effective in October - April.

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
BOD5, Total	Weekly Avg	8.8 mg/L	4/Week	24-Hr Flow Prop Comp	Effective in May.
BOD5, Total	Weekly Avg	7.3 mg/L	4/Week	24-Hr Flow Prop Comp	Effective in June.
BOD5, Total	Weekly Avg	7.2 mg/L	4/Week	24-Hr Flow Prop Comp	Effective in July - August.
BOD5, Total	Weekly Avg	7.9 mg/L	4/Week	24-Hr Flow Prop Comp	Effective in September.
BOD5, Total	Monthly Avg	10 mg/L	4/Week	24-Hr Flow Prop Comp	Effective in October - April.
BOD5, Total	Monthly Avg	8.8 mg/L	4/Week	24-Hr Flow Prop Comp	Effective in May.
BOD5, Total	Monthly Avg	7.3 mg/L	4/Week	24-Hr Flow Prop Comp	Effective in June.
BOD5, Total	Monthly Avg	7.2 mg/L	4/Week	24-Hr Flow Prop Comp	Effective in July - August.
BOD5, Total	Monthly Avg	7.9 mg/L	4/Week	24-Hr Flow Prop Comp	Effective in September.
Suspended Solids, Total	Monthly Avg	10 mg/L	4/Week	24-Hr Comp	
Suspended Solids, Total	Weekly Avg	10 mg/L	4/Week	24-Hr Comp	
pH Field	Daily Min	6.0 su	5/Week	Grab	
pH Field	Daily Max	9.0 su	5/Week	Grab	
Dissolved Oxygen	Daily Min	7.0 mg/L	5/Week	Grab	
E. coli	Geometric Mean - Monthly	126 #/100 ml	2/Week	Grab	Limit effective May through September annually.
E. coli	% Exceedance	10 Percent	Monthly	Calculated	Limit effective May through September annually. See 'E. coli Percent Limit' permit section. Enter the results in the DMR on the last day of the month.
Nitrogen, Ammonia (NH3-N) Total	Daily Max	9.8 mg/L	4/Week	24-Hr Comp	Year-round limit.

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Nitrogen, Ammonia (NH3-N) Total	Weekly Avg	9.8 mg/L	4/Week	24-Hr Comp	Effective in November - March.
Nitrogen, Ammonia (NH3-N) Total	Weekly Avg	6.9 mg/L	4/Week	24-Hr Comp	Effective in April.
Nitrogen, Ammonia (NH3-N) Total	Weekly Avg	5.2 mg/L	4/Week	24-Hr Comp	Effective in May.
Nitrogen, Ammonia (NH3-N) Total	Weekly Avg	4.0 mg/L	4/Week	24-Hr Comp	Effective in June.
Nitrogen, Ammonia (NH3-N) Total	Weekly Avg	3.4 mg/L	4/Week	24-Hr Comp	Effective in July.
Nitrogen, Ammonia (NH3-N) Total	Weekly Avg	3.5 mg/L	4/Week	24-Hr Comp	Effective in August.
Nitrogen, Ammonia (NH3-N) Total	Weekly Avg	4.9 mg/L	4/Week	24-Hr Comp	Effective in September.
Nitrogen, Ammonia (NH3-N) Total	Weekly Avg	9.7 mg/L	4/Week	24-Hr Comp	Effective in October.
Nitrogen, Ammonia (NH3-N) Total	Monthly Avg	4.5 mg/L	4/Week	24-Hr Comp	Effective in December - January.
Nitrogen, Ammonia (NH3-N) Total	Monthly Avg	4.6 mg/L	4/Week	24-Hr Comp	Effective in February, March, and November.
Nitrogen, Ammonia (NH3-N) Total	Monthly Avg	2.9 mg/L	4/Week	24-Hr Comp	Effective in April.
Nitrogen, Ammonia (NH3-N) Total	Monthly Avg	2.4 mg/L	4/Week	24-Hr Comp	Effective in May.
Nitrogen, Ammonia (NH3-N) Total	Monthly Avg	2.0 mg/L	4/Week	24-Hr Comp	Effective in June.
Nitrogen, Ammonia (NH3-N) Total	Monthly Avg	1.6 mg/L	4/Week	24-Hr Comp	Effective in July.
Nitrogen, Ammonia (NH3-N) Total	Monthly Avg	1.5 mg/L	4/Week	24-Hr Comp	Effective in August.
Nitrogen, Ammonia (NH3-N) Total	Monthly Avg	2.3 mg/L	4/Week	24-Hr Comp	Effective in September.
Nitrogen, Ammonia (NH3-N) Total	Monthly Avg	4.0 mg/L	4/Week	24-Hr Comp	Effective in October.
Phosphorus, Total	Monthly Avg	1.0 mg/L	4/Week	24-Hr Flow Prop Comp	Limit effective throughout the permit term, as it represents a minimum

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
					control level. See Water Quality Trading (WQT) sections for more information.
Phosphorus, Total		lbs/day	4/Week	Calculated	Report daily mass discharged using Equation 1a. in the Water Quality Trading (WQT) section.
WQT Credits Used (TP)		lbs/month	Monthly	Calculated	Report WQT TP Credits used per month using Equation 2b. in the Water Quality Trading (WQT) section. Available TP Credits are specified in Table 2 and in the approved Water Quality Trading Plan.
WQT Computed Compliance (TP)	6-Month Avg	0.075 mg/L	Monthly	Calculated	Value entered on the last day of June and December. Compliance with the six-month average limit is evaluated at the end of the six-month period on June 30 and Dec 31.
WQT Computed Compliance (TP)	Monthly Avg	0.225 mg/L	Monthly	Calculated	Report the WQT TP Computed Compliance value using Equation 4a. in the Water Quality Trading (WQT) section. Value entered on the last day of the month.
Chloride	Weekly Avg	560 mg/L	4/Month	24-Hr Flow Prop Comp	This is an interim limit. Sampling shall be done on four consecutive days per month. See Chloride Variance permit section and the Schedules section for applicable chloride target value.
Chloride		lbs/day	4/Month	Calculated	
Nitrogen, Total Kjeldahl		mg/L	Quarterly	24-Hr Flow Prop Comp	

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Nitrogen, Nitrite + Nitrate Total		mg/L	Quarterly	24-Hr Flow Prop Comp	
Nitrogen, Total		mg/L	Quarterly	Calculated	Total Nitrogen shall be calculated as the sum of reported values for Total Kjeldahl Nitrogen and Total Nitrite + Nitrate Nitrogen.
PFOS		ng/L	1/ 2 Months	Grab	Monitoring only; once every two months. See PFOS/PFOA Minimization Plan Determination of Need schedule.
PFOA		ng/L	1/ 2 Months	Grab	Monitoring only; once every two months. See PFOS/PFOA Minimization Plan Determination of Need schedule.
Acute WET		TUa	See Listed Qtr(s)	24-Hr Flow Prop Comp	Annual in rotating quarters. See WET permit section.
Chronic WET	Monthly Avg	1.2 TUc	See Listed Qtr(s)	24-Hr Flow Prop Comp	Annual in rotating quarters. See WET permit section.
Mercury, Total Recoverable		ng/L	Quarterly	Grab	See 'Mercury Monitoring' permit section.
Temperature Maximum		deg F	Weekly	Continuous	Monitoring in calendar year 2028 (January 1 - December 31).

Changes from Previous Permit

Bacteria: Fecal coliform monitoring and limits have been replaced with Escherichia coli (E. coli) limits. See additional explanation of limits under "Explanation of Limits and Monitoring Requirements" below.

E. coli limits of 126 #/100 ml as a monthly geometric mean that may not be exceeded and 410 #/100 ml as a daily maximum that may not be exceeded more than 10 percent of the time in any calendar month will apply**.**

PFOS and PFOA: Monitoring once every two months is included in the permit in accordance with s. NR 106.98(2)(c), Wis. Adm. Code.

Ammonia: Daily maximum limit changed from 17 mg/L to 9.8 mg/L and weekly average limit from November – March changed from 11 mg/L to 9.8 mg/L.

BOD_5, TSS, and Ammonia: Sampling frequency decreased from 5x/week to 4x/week.

Explanation of Limits and Monitoring Requirements

Monitoring Frequencies: Taking into consideration guidance and requirements in administrative code, effluent monitoring frequencies for the Fontana Walworth Water Pollution Control Commission's permit were reevaluated. TSS and BOD_5 sampling frequency was decreased. The proposed monitoring requirements for these parameters (TSS, BOD_5, and ammonia) is reduced from 5x/week to 4x/week based upon the continuation of a strong compliance history and a lack of limit violations during the current permit term.

BOD_5, Total Suspended Solids, pH, and Dissolved Oxygen: Standard municipal wastewater requirements for total suspended solids and pH are included based on ch. NR 210, Wis. Adm. Code, 'Sewage Treatment Works' requirements for discharges to fish and aquatic life streams. Tracking of BOD_5 and total suspended solids are required for percent removal requirements found in s. NR 210.05, Wis. Adm. Code and in the Standard Requirements section of the permit. Chapter NR 102, Wis. Adm. Code, 'Water Quality Standards for Surface Waters' also specifies requirements for pH for fish and aquatic life streams.

Water Quality Based Limits
Refer to the "Water Quality-Based Effluent Limitations for Fontana Walworth Water Pollution Control Commission" dated August 09, 2023 and prepared by Nicole Krueger, which was used for this reissuance.

Expression of Limits: In accordance with the federal regulation 40 CFR 122.45(d) and s. NR 205.065, Wis. Adm. Code. limits in this permit are to be expressed as weekly average and monthly average limits whenever practicable.

E. coli: Revisions to bacteria surface water quality criteria to protect recreational uses and accompanying E. coli WPDES permit implementation procedures became effective May 1, 2020. The new rule requires that WPDES permits for facilities with required disinfection include monitoring for E. coli while facilities are disinfecting during the recreation period and establish effluent limitations for E. coli established in s. NR 210.06 (2), Wis. Adm Code. The administrative code rule changes included the following actions: revised the bacteria water quality criteria from fecal coliform to E. coli to protect recreation in ch. NR 102, Wis. Adm. Code.; removed fecal coliform criteria for certain individual waters from ch. NR 104, Wis. Adm. Code.; revised permit requirements for publicly and privately owned sewage treatment works in ch. NR 210, Wis. Adm. Code.; and, updated approved analytical methods for bacteria in ch. NR 219, Wis. Adm. Code.

Ammonia Nitrogen: Current acute and chronic ammonia toxicity criteria for the protection of aquatic life are included in Tables 2C and 4B of ch. NR 105, Wis. Adm. Code. Subchapter IV of ch. NR 106 establishes the procedure for calculating water quality based effluent limitations (WQBELs) for ammonia. The daily limit and weekly limit from November to March was changed to comply with the expression of limits requirements in ss. NR 106.07 and NR 205.065(7), Wis. Adm. Code.

Phosphorus: Phosphorus requirements are based on the Phosphorus Rules that became effective December 1, 2010 as detailed in NR 102 Water Quality Standards and NR 217 Effluent Standards and Limitations for Phosphorus. Chapter NR 217 of the Wis. Adm. Code addresses point source dischargers of phosphorus to surface waters. Currently in NR 217 Wis. Adm. Code there are two methods used to determine if a phosphorus limit is needed: a technology based effluent limit (TBEL) and a water quality based effluent limit (WQBEL). Based on the size and classification of the stream, the water quality criteria for the Piscasaw Creek is 0.075 mg/L. In this case, *the WQBELs are 0.225 mg/L (monthly average) and 0.075 mg/L (6-month average).* For the reasons explained in the April 30, 2012 paper entitled 'Justification for Use of Monthly, Growing Season and Annual Average Periods for Expression of WPDES Permit Limits for Phosphorus Discharges in Wisconsin', WDNR has determined that it is impracticable to express the 217.13, Wis. Adm. Code phosphorus WQBEL for the permittee as a maximum daily, weekly or monthly value if it is less than 0.3mg/L. The final effluent limit for phosphorus is expressed as a six-month average. It is also expressed as a monthly average equal to three times the derived WQBEL (which equates to 0.225 mg/L). This final effluent limit was derived from and complies with the applicable water quality criterion. A phosphorus concentration limit is necessary to prevent backsliding during the term of the permit. The TBEL limit of 1.0 mg/L will be retained in the permit. The wastewater treatment facility is not able to meet the WQBEL. This permit authorizes the use of trading as a tool to demonstrate compliance with the phosphorus WQBELs. This permit includes terms and conditions related to the Water Quality Trading Plan (WQT-2024-0015) or approved amendments thereof. The total 'WQT TP Credits' available are designated in the approved WQT Plan.

The Commission has established and maintained cover crops, edge of field buffer strips, and grassed waterways on Commission owned lands near the wastewater treatment facility and has completed the construction necessary to convert two lagoons that had been idled next to the treatment plant into chemically enhanced stormwater sedimentation basins.

Additional WQT subsections in the permit provide information on compliance determinations, annual reporting and re-opening of the permit.

Chloride: The calculated 4-day P99 is above the applicable weekly average limitation of 477 mg/L, so a weekly average limit (based on chronic toxicity criteria) needs to be continued for the reissued permit. However, the permittee has re-applied for a variance from the chronic weekly average WQBEL, which requires EPA approval. An interim limit of 560 mg/L is included. As a condition of this variance the implementation of chloride source reduction measures, intended to lead to compliance with the target value by the end of the permit term, are also included in the proposed permit. See the schedules section for the chloride compliance schedule. Acute and chronic chloride toxicity criteria for the protection of aquatic life are included in Tables 1 and 5 of ch. NR 105, Wis. Adm. Code; Subchapter IV of ch. NR 106 establishes the procedure for calculating water quality based effluent limitations (WQBELs) for chloride.

Chloride Source Reduction Measures:

1. Continue to sample and monitor commercial and industrial customers for high chloride discharges.
2. Continue annual chloride sampling at customer wells and track trends/changes.
3. Locate manholes for industrial sampling to identify potential high strength chloride contributors. Sample and test annually or as needed for compliance.
4. Collect background chloride concentrations and flow volume data from each water supply well for the three customers (Village of Fontana, Village of Walworth, and Kikkoman Foods Inc (KMI)).
5. Obtain pertinent information from the shared village inspector on demand-based water softener use within the villages.
6. Manhole inspection for clearwater inflow and infiltration (I&I).
7. Continue to work directly with KFI and document source reduction measures being considered for implementation.
8. Incorporate an ordinance revision that imposes installation restrictions so that outside house bibs are on unsoftened water.
9. Incorporate an ordinance revision that adds a requirement for new and replacement softeners to be metered demand type, with a higher, greater than 3350 gains of hardness exchange per pound of salt, efficiency capability.
10. Add numeric standards, compliance schedules, and possible enforcement actions for chloride discharges to the collection system to the local sewer use ordinances, if adopted.
11. Distribute educational fliers to villages via water bills and post information on official village websites.
12. Perform annual inspections with industrial representatives with the villages specifically focused on each industry's current method of softening and the mass of salt used annually.
13. Distribute updated questionnaire to largest users.

TKN, Nitrite+Nitrate, and Total Nitrogen: The Department has included effluent monitoring for Total Nitrogen in the permit through the authority under §§ 283.55(1)(e), Wis. Stats., which allows the department to require the permittee to submit information necessary to identify the type and quantity of any pollutants discharged from the point source, and through s. NR 200.065(1)(h), Wis. Adm. Code, which allows for this monitoring to be collected during the permit term. More information on the justification to include total nitrogen monitoring in wastewater permits can be found in the "Guidance for Total Nitrogen Monitoring in Wastewater Permits" dated October 1, 2019.

PFOS and PFOA: NR 106 Subchapter VIII – Permit Requirements for PFOS and PFOA Dischargers became effective on August 1, 2022. At the first reissuance of a WPDES permit after August 1, 2022, the new rule requires WPDES permits for major municipal dischargers with an average flow rate greater than 1 MGD but less than 5 MGD, at a minimum sample effluent once every two-months for PFOS and PFOA pursuant s. NR 106.98(2)(b), Wis. Adm. Code.

A sample frequency of 1/2 months means one sample is taken during any two-month period. Examples of 1/2 month sample would be every other month (Jan, March, May, etc.) or back-to-back months with a break in between (February & March, May & June, Aug & Sept, etc.). DMR Short Forms will be generated for the following time periods: January-February, March-April, May-June, July-August, September-October, and November-December. At a minimum one sample result will be present on each form.

The initial determination of the need for sampling shall be conducted for up to two years in order to determine if the permitted discharge has the reasonable potential to cause or contribute to an exceedance of the PFOS or PFOA standards under s. NR 102.04(8)(d)1, Wis. Adm. Code.

Whole Effluent Toxicity: Whole effluent toxicity (WET) testing requirements and limits (if applicable) are determined in accordance with ss. NR 106.08 and NR 106.09 Wis. Adm. Code, as revised August 2016. (See the current version of the Whole Effluent Toxicity Program Guidance Document and checklist and WET information, guidance and test methods at http://dnr.wi.gov/topic/wastewater/wet.html).

Acute and chronic tests are required the following quarters: April – June 2025; July – September 2026; October – December 2027; April – June 2028; January – March 2029

Mercury: Representative data shows there is no reasonable potential for Fontana Walworth to exceed the water quality-based 1.3 ng/L monthly average limit, therefore no mercury limit is in the proposed permit. Quarterly mercury monitoring is retained in the proposed permit. Requirements for mercury are included in s. NR 106.145, Wis. Adm. Code

Temperature: Surface water quality standards for temperature took effect on October 1, 2010. These regulations are detailed in chs. NR 102 (Subchapter II – Water Quality Standards for Temperature) and NR 106 (Subchapter V – Effluent Limitations for Temperature) of the Wisconsin Administrative Code. One year of monitoring in year 2028, is recommended in the proposed permit.

4 Land Application - Monitoring and Limitations

Municipal Sludge Description						
Sample Point	**Sludge Class (A or B)**	**Sludge Type (Liquid or Cake)**	**Pathogen Reduction Method**	**Vector Attraction Method**	**Reuse Option**	**Amount Reused/Disposed (Dry Tons/Year)**
002	B	Liquid	Fecal Coliform	Incorporation and injection	Land Application	225 Dry U.S. Tons
Does sludge management demonstrate compliance? Yes						
Is additional sludge storage required? No						
Is Radium-226 present in the water supply at a level greater than 2 pCi/liter? No						
Is a priority pollutant scan required? No						

Sample Point Number: 002- SLUDGE

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Solids, Total		Percent	Annual	Composite	
Arsenic Dry Wt	Ceiling	75 mg/kg	Annual	Composite	
Arsenic Dry Wt	High Quality	41 mg/kg	Annual	Composite	
Cadmium Dry Wt	Ceiling	85 mg/kg	Annual	Composite	
Cadmium Dry Wt	High Quality	39 mg/kg	Annual	Composite	
Copper Dry Wt	Ceiling	4,300 mg/kg	Annual	Composite	
Copper Dry Wt	High Quality	1,500 mg/kg	Annual	Composite	
Lead Dry Wt	Ceiling	840 mg/kg	Annual	Composite	
Lead Dry Wt	High Quality	300 mg/kg	Annual	Composite	
Mercury Dry Wt	Ceiling	57 mg/kg	Annual	Composite	
Mercury Dry Wt	High Quality	17 mg/kg	Annual	Composite	
Molybdenum Dry Wt	Ceiling	75 mg/kg	Annual	Composite	
Nickel Dry Wt	Ceiling	420 mg/kg	Annual	Composite	
Nickel Dry Wt	High Quality	420 mg/kg	Annual	Composite	
Selenium Dry Wt	Ceiling	100 mg/kg	Annual	Composite	
Selenium Dry Wt	High Quality	100 mg/kg	Annual	Composite	
Zinc Dry Wt	Ceiling	7,500 mg/kg	Annual	Composite	
Zinc Dry Wt	High Quality	2,800 mg/kg	Annual	Composite	
Nitrogen, Total Kjeldahl		Percent	Annual	Composite	
Nitrogen, Ammonium (NH4-N) Total		Percent	Annual	Composite	
Phosphorus, Total		Percent	Annual	Composite	
Phosphorus, Water Extractable		% of Tot P	Annual	Composite	
Potassium, Total Recoverable		Percent	Annual	Composite	
PCB Total Dry Wt	Ceiling	50 mg/kg	Once	Composite	Once in 2026.
PCB Total Dry Wt	High Quality	10 mg/kg	Once	Composite	Once in 2026.
PFOA + PFOS		ug/kg	Annual	Calculated	Report the sum of PFOA and PFOS. See PFAS

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
					Permit Sections for more information.
PFAS Dry Wt			Annual	Grab	Perfluoroalkyl and Polyfluoroalkyl Substances based on updated DNR PFAS List. See PFAS Permit Sections for more information.

Changes from Previous Permit:

PCB sampling year updated. Annual PFAS monitoring is included in the permit pursuant s. NR 204.06(2)(b)9., Wis. Adm. Code.

Explanation of Limits and Monitoring Requirements

Requirements for land application of municipal sludge are determined in accordance with ch. NR 204 Wis. Adm. Code. Ceiling and high quality limits for metals in sludge are specified in s. NR 204.07(5). Requirements for pathogens are specified in s. NR 204.07(6) and in s. NR 204.07 (7) for vector attraction requirements. Limitations for PCBs are addressed in s. NR 204.07(3)(k). Radium requirements are addressed in s. NR 204.07(3)(n).

PFAS- The presence and fate of PFAS in municipal and industrial sludges is an emerging public health concern. EPA is currently developing a risk assessment to determine future land application rates and expects to release this risk assessment by the end of 2024. In the interim, the department has developed the "Interim Strategy for Land Application of Biosolids and Industrial Sludges Containing PFAS".

Collecting sludge data on PFAS concentrations from a wide range of wastewater treatment facilities will help protect public health from exposure to elevated levels of PFAS and determine the department's implementation of EPA's recommendations. To quantitate this risk, PFAS sampling has been included in the proposed WPDES permit pursuant to ss. NR 214.18(5)(b) and NR 204.06(2)(b)9., Wis. Adm. Code.

Water Extractable Phosphorus- Water extractable phosphorus (WEP) is the coefficient for determining plant available phosphorus from measured total phosphorus. In Wisconsin, the Penn State Method is utilized and is expressed in percent. While a total P may be significant, the WEP may show that only a small percentage of the P is available to plants because of factors such as treatment processes and chemical addition that "tie-up" phosphorus limiting the amount of phosphorus that is plant available. As part of the Wisconsin's nutrient management plan (NMP) requirements, the accounting of all fertilizers must be included over the NMP cycle. The fertilizer value of the waste needs to be communicated to the farmer and accounted for in the NMP.

5 Schedules

5.1 Annual Water Quality Trading (WQT) Report

Required Action	Due Date
Annual WQT Report: Submit an annual WQT report that shall cover the first year of the permit term. The WQT Report shall include: The number of pollutant reduction credits (lbs/month) used each month of the previous year to	01/31/2025

demonstrate compliance; The source of each month's pollutant reduction credits by identifying the approved water quality trading plan that details the source; A summary of the annual inspection of each nonpoint source management practice that generated any of the pollutant reduction credits used during the previous year; and Identification of noncompliance or failure to implement any terms or conditions of this permit with respect to water quality trading that have not been reported in discharge monitoring reports.	
Annual WQT Report #2: Submit an annual WQT report that shall cover the previous year.	01/31/2026
Annual WQT Report #3: Submit an annual WQT report that shall cover the previous year.	01/31/2027
Annual WQT Report #4: Submit an annual WQT report that shall cover the previous year.	01/31/2028
Annual WQT Report #5: Submit the annual WQT report.	01/31/2029
Revised WQT Plan: If the permittee wishes to continue to comply with phosphorus limits through WQT in subsequent permit terms, the permittee shall submit a revised WQT plan including a demonstration of credit need, compliance record of the existing WQT, and any additional practices needed to maintain compliance over time.	06/30/2029
Annual WQT Report Required After Permit Expiration: In the event that this permit is not reissued by the expiration date, the permittee shall continue to submit annual WQT reports by January 31 each year covering the total number of pollutant credits used, the source of the pollution reduction credits, a summary of annual inspection reports performed, and identification of noncompliance or failure to implement any terms or conditions of the approved water quality trading plan for the previous calendar year.	

5.1.1 Explanation of Annual Water Quality Trading (WQT) Report Schedule

Reports are required, starting in 2025, that include the following information:

- Verification that site inspections occurred;
- Brief summary of site inspection findings;
- Identification of noncompliance or failure to implement any terms or conditions of the permit or trading plan that have not been reported in discharge monitoring reports;
- Any applicable notices of termination or management practice registration; and
- A summary of credits used each month over the calendar year

5.2 Chloride Source Reduction Measures (Target Value)

As a condition of the variance to the water quality based effluent limitation(s) for chloride granted in accordance with s. NR 106.83(2), Wis. Adm. Code, the permittee shall perform the following actions.

Required Action	Due Date
Annual Chloride Progress Report: Submit an annual chloride progress report related to the source reduction activities for the previous year. The annual chloride progress report shall: Indicate which chloride source reduction measures or activities in the Source Reduction Plan have been implemented and state which, if any, source reduction measures from the Source Reduction Plan were not pursued and why. Include an assessment of whether each implemented source reduction measure appears to be effective or ineffective at reducing pollutant discharge concentrations and	01/31/2025

identify actions planned for the upcoming year; Include an analysis of trends in weekly, monthly and annual average chloride concentrations and total mass discharge of chloride based on chloride sampling and flow data; and Include an analysis of how effluent chloride varies with time and with significant loadings of chloride. Note that the interim limitation listed in the Surface Water section of this permit remains enforceable until new enforceable limits are established in the next permit issuance. The first annual chloride progress report is to be submitted by the Date Due.	
Annual Chloride Progress Report #2: Submit the chloride progress report, related to the source reduction activities for the previous year, as defined above.	01/31/2026
Annual Chloride Progress Report #3: Submit the chloride progress report, related to the source reduction activities for the previous year, as defined above.	01/31/2027
Annual Chloride Progress Report #4: Submit the chloride progress report, related to the source reduction activities for the previous year, as defined above.	01/31/2028
Annual Chloride Progress Report #5: Submit the chloride progress report, related to the source reduction activities for the previous year, as defined above.	01/31/2029
Final Chloride Report: Submit the final chloride report documenting the success in meeting the chloride target value of 510 mg/L, as well as the anticipated future reduction in chloride sources and chloride effluent concentrations. The report shall: Summarize chloride source reduction measures that have been implemented during the current permit term and state which, if any, source reduction measures from the Source Reduction Plan were not pursued and why; Include an assessment of which source reduction measures appear to have been effective or ineffective. Evaluate any needed changes to the pollutant reduction strategy accordingly; Include an analysis of trends in weekly, monthly and annual average chloride concentrations and total mass discharge of chloride based on chloride sampling and flow data during the current permit term; and Include an analysis of how influent and effluent chloride varies with time and with significant loadings of chloride as identified in the source reduction plan. If the permittee intends to reapply for a chloride variance, for the reissued permit, proposed target limits and a detailed source reduction measures plan, outlining the source reduction activities proposed for the upcoming permit term, shall also be included per ss. NR 106.90 (5) and NR 106.83 (4), Wis. Adm. Code. An updated source reduction measures plan shall: Include an explanation of why or how each source reduction measure will result in reduced discharge of the target pollutant; and Evaluate any available information on pollutant sources, timing, and concentration to update the mass balance assumptions and expected sources of the pollutant, and Identify any information needs that would help to better determine pollutant sources and make plans to collect that information. Note that the target value is the benchmark for evaluating the effectiveness of the chloride source reduction measures but is not an enforceable limitation under the terms of this permit.	06/30/2029

Annual Chloride Reports After Permit Expiration: In the event that this permit is not reissued by the date the permit expires the permittee shall continue to submit annual chloride reports for the previous year following the due date of Annual Chloride Progress Reports listed above. Annual Chloride Progress Reports shall include the information as defined above.	

5.2.1 Explanation of Chloride Source Reduction Measures (Target Value) Schedule

This compliance schedule is a condition of receiving a variance from the weekly average water quality based chloride limit of 477 mg/L. Since a compliance schedule is being granted, an interim limit is required, and the limit is established as 560 mg/L. The schedule requires that annual reports shall indicate which source reduction measures Fontana Walworth Water Pollution Control Commission has implemented during each calendar year, and an analysis of chloride concentration and mass discharge data based on chloride sampling and flow data. The annual reports shall document progress made towards meeting the chloride target value of 510 mg/L by the end of the permit term.

5.3 PFOS/PFOA Minimization Plan Determination of Need

Required Action	Due Date
Report on Effluent Discharge: Submit a report on effluent PFOS and PFOA concentrations and include an analysis of trends in monthly and annual average PFOS and PFOA concentrations. This analysis should also include a comparison to the applicable narrative standard in s. NR 102.04(8)(d), Wis. Adm. Code. This report shall include all additional PFOS and PFOA data that may be collected including any influent, intake, in-plant, collection system sampling, and blank sample results.	12/31/2025
Report on Effluent Discharge and Evaluation of Need: Submit a final report on effluent PFOS and PFOA concentrations and include an analysis of trends in monthly and annual average PFOS and PFOA concentrations of data collected over the last 24 months. The report shall also provide a comparison on the likelihood of the facility needing to develop a PFOS/PFOA minimization plan. This report shall include all additional PFOS and PFOA data that may be collected including any influent, intake, in-plant, collection system sampling, and blank sample results. The permittee shall also submit a request to the department to evaluate the need for a PFOS/PFOA minimization plan. If the Department determines a PFOS/PFOA minimization plan is needed based on a reasonable potential evaluation, the permittee will be required to develop a minimization plan for Department approval no later than 90 days after written notification was sent from the Department. The Department will modify or revoke and reissue the permit to include PFOS/PFOA minimization plan reporting requirements along with a schedule of compliance to meet WQBELs. Effluent monitoring of PFOS and PFOA shall continue as specified in the permit until the modified permit is issued. If, however, the Department determines there is no reasonable potential for the facility to discharge PFOS or PFOA above the narrative standard in s. NR 102.04(8)(d), Wis. Adm. Code, no further action is required and effluent monitoring of PFOS and PFOA shall continue as specified in the permit.	12/31/2026

5.3.1 Explanation of PFOS/PFOA Minimization Plan Determination of Need Schedule

As stated above, NR 106 Subchapter VIII – Permit Requirements for PFOS and PFOA Dischargers became effective on August 1, 2022. S. NR 106.98, Wis. Adm. Code, specifies steps to generate data in order to determine the need for reducing PFOS and PFOA in the discharge. Data generated per the effluent monitoring requirements will be used to determine the need for developing a PFOS/PFOA minimization plan. As part of the schedule, the permittee is required to submit two annual Reports on Effluent Discharge.

If the department determines that a minimization plan is needed, the permit will be modified or revoked/reissued to include additional requirements.

Special Reporting Requirements

NA

Other Comments:

NA

Attachments:

Water Quality Based Effluent Limits, dated August 9, 2023, updated April 1, 2024
Water Quality Trading Plan May 10, 2024
Water Quality Trading Approval Letter dated June 6, 2024
Chloride Variance Documents
    Chloride SRM dated August 2023, updated July 2024
    EPA Data Sheet

Expiration Date:

December 31, 2029

Justification Of Any Waivers From Permit Application Requirements

No waivers were requested or given.

Prepared By: Victoria Ziegler Wastewater Specialist **Date:** June 10, 2024

CORRESPONDENCE/MEMORANDUM

State of Wisconsin

DATE: 08/09/2023 updated 04/01/2024 for TMDL typo

TO: Melanie Burns – SER

FROM: Nicole Krueger – SER Nicole Krueger

SUBJECT: Water Quality-Based Effluent Limitations for Fontana Walworth Water Pollution Control Commission
WPDES Permit No. WI-0036021-08

This is in response to your request for an evaluation of the need for water quality-based effluent limitations (WQBELs) using chapters NR 102, 104, 105, 106, 207, 210, 212, and 217 of the Wisconsin Administrative Code (where applicable), for the discharge from Fontana Walworth in Walworth County. This municipal wastewater treatment facility (WWTF) discharges to the Piscasaw Creek, located in the Piscasaw Creek Watershed in the Kishwaukee River Basin. The evaluation of the permit recommendations is discussed in more detail in the attached report.

The following recommendations are made on a chemical-specific basis at Outfall 001:

Parameter	Daily Maximum	Daily Minimum	Weekly Average	Monthly Average	Six-Month Average	Footnotes
Flow Rate						1,2
BOD_5 October – April May June July – August September			 10 mg/L 8.8 mg/L 7.3 mg/L 7.2 mg/L 7.9 mg/L	 **10 mg/L** **8.8 mg/L** **7.3 mg/L** **7.2 mg/L** **7.9 mg/L**		1,3
TSS			10 mg/L	**10 mg/L**		1,3
pH	9.0 s.u.	6.0 s.u.				1
Dissolved Oxygen		7.0 mg/L				1
Bacteria *E. coli*				126 #/100 mL geometric mean		4
Ammonia Nitrogen	9.8 mg/L		Variable	Variable		3,5
Phosphorus TBEL NR 217.13				 1.0 mg/L 0.225 mg/L	 0.075 mg/L	
Chloride			477 mg/L 7,060 lbs/day			6
TKN, Nitrate+Nitrite, and Total Nitrogen						7
PFOS and PFOA						8
Acute WET						9,10
Chronic WET				1.2 TUc		9,10
Mercury						2
Temperature						2

Footnotes:

1. No changes from the current permit.
2. Monitoring only.
3. Additional limits to comply with the expression of limits requirements in ss. NR 106.07 and NR 205.065(7), Wis. Adm. Code, are included in bold.
4. Bacteria limits apply during the disinfection season of May through September. Additional final limit: No more than 10 percent of *E. coli* bacteria samples collected in any calendar month may exceed 410 count/100 mL.
5. The weekly and monthly average ammonia limits are shown below:

	Weekly Average mg/L	Monthly Average mg/L
January	**9.8**	4.5
February	**9.8**	4.6
March	**9.8**	4.6
April	6.9	2.9
May	5.2	2.4
June	4.0	2.0
July	3.4	1.6
August	3.5	1.5
September	4.9	2.3
October	9.7	4.0
November	**9.8**	4.6
December	**9.8**	4.5

6. This is the WQBEL for chloride. An alternative effluent limitation of 560 mg/L (the upper 99th percentile of the permittee's 4−day average of the representative data available during the current permit term) as a weekly average may be included in the permit in place of this limit if the chloride variance application that was submitted is approved by EPA. If the variance is not approved, a wet weather mass limit of 14,600 lbs/day would also be required.
7. As recommended in the Department's October 1, 2019 Guidance for Total Nitrogen Monitoring in Wastewater Permits, quarterly total nitrogen monitoring is recommended for all municipal major permittees. Total Nitrogen is the sum of nitrate (NO_3), nitrite (NO_2), and total kjeldahl nitrogen (TKN) (all expressed as N).
8. Monitoring is required in accordance with s. NR 106.98(2), Wis. Adm. Code once every two months.
9. Annual acute and chronic WET testing is recommended. The Instream Waste Concentration (IWC) to assess chronic test results is 83%. According to the *State of Wisconsin Aquatic Life Toxicity Testing Methods Manual* (s. NR 219.04, Table A, Wis. Adm. Code), chronic testing shall be performed using a dilution series of 100%, 75%, 50%, 25% & 12.5% and the dilution water used in WET tests conducted on Outfall 001 shall be a grab sample collected from the Piscasaw Creek.
10. Sampling WET concurrently with any chemical-specific toxic substances is recommended. Tests should be done in rotating quarters, to collect seasonal information about this discharge and should continue after the permit expiration date (until the permit is reissued).

Please consult the attached report for details regarding the above recommendations. If there are any questions or comments, please contact Nicole Krueger at Nicole.Krueger@wisconsin.gov or Diane Figiel at Diane.Figiel@wisconsin.gov.

Attachments (3) – Narrative, Map, & Thermal Table

PREPARED BY: Nicole Krueger, Water Resource Engineer – SER

E-cc: Nick Lent, Wastewater Engineer – SER
Diane Figiel, Water Resources Engineer – WY/3
Kari Fleming, Environmental Toxicologist – WY/3
Michael Polkinghorn, Water Resources Engineer – NOR/Rhinelander Service Center
Laura Dietrich, Wastewater Specialist – WY/Waukesha

Attachment #1

Water Quality-Based Effluent Limitations for
Fontana Walworth Water Pollution Control Commission

WPDES Permit No. WI-0036021-08

Prepared by: Nicole Krueger

PART 1 – BACKGROUND INFORMATION

Facility Description

Fontana Walworth Water Pollution Control Commission operates a 1.774 million gallon per day (MGD) wastewater treatment facility that serves the Village of Fontana, the Village of Walworth, and several industries. Treatment consists of screening, extended aeration (oxidation ditch), final clarification, ultraviolet disinfection (seasonally), and cascade aeration before it is discharged to the Piscasaw Creek. Biosolids processes include gravity thickening and aerobic digestion in two sludge storage tanks before being land applied by injection onto Department approved agricultural fields. Approximately 219 US tons of liquid sludge is generated annually.

Attachment #2 is a map of the area showing the approximate location of Outfall 001.

Existing Permit Limitations

The current permit, expiring on 12/31/2023, includes the following effluent limitations and monitoring requirements.

Parameter	Daily Maximum	Daily Minimum	Weekly Average	Monthly Average	Six-Month Average	Footnotes
Flow Rate						1
BOD_5 October – April May June July – August September			 10 mg/L 8.8 mg/L 7.3 mg/L 7.2 mg/L 7.9 mg/L	 **10 mg/L** **8.8 mg/L** **7.3 mg/L** **7.2 mg/L** **7.9 mg/L**		2,3
TSS			10 mg/L	**10 mg/L**		2,3
pH	9.0 s.u.	6.0 s.u.				2
Dissolved Oxygen		7.0 mg/L				2
Fecal Coliform May – September			**656#/100 mL** **geometric mean**	400#/100 mL geometric mean		3
Ammonia Nitrogen	17 mg/L		Variable	Variable		4
Phosphorus Interim Final				 1.0 mg/L 0.225 mg/L	 0.075 mg/L	5
Chloride			560 mg/L			6
TKN, Nitrate+Nitrite, and Total Nitrogen						1
Acute WET						7

Attachment #1

Parameter	Daily Maximum	Daily Minimum	Weekly Average	Monthly Average	Six-Month Average	Footnotes
Chronic WET				1.2 TUc		7
Mercury						1
Temperature						1

Footnotes:

1. Monitoring only.
2. These limitations are not being evaluated as part of this review. Because the water quality criteria (WQC), reference effluent flow rates, and receiving water characteristics have not changed, limitations for these water quality characteristics do not need to be re-evaluated at this time.
3. Additional limits to comply with the expression of limits requirements in ss. NR 106.07 and NR 205.065(7), Wis. Adm. Code, are included in bold.
4. Weekly and monthly average ammonia limits:

	Weekly Average mg/L	Monthly Average mg/L
January	11	4.5
February	11	4.6
March	11	4.6
April	6.9	2.9
May	5.2	2.4
June	4.0	2.0
July	3.4	1.6
August	3.5	1.5
September	4.9	2.3
October	9.7	4.0
November	11	4.6
December	11	4.5

5. The final phosphorus limits became effective November 1, 2020. Fontana Walworth is showing compliance through water quality trading.
6. This is an interim variance limit.
7. Acute and chronic WET tests are required 1x/year. The IWC for chronic WET was 81%.

Receiving Water Information

- Name: Piscasaw Creek
- Waterbody Identification Code (WBIC): 788900
- Classification used in accordance with chs. NR 102 and 104, Wis. Adm. Code: Warm Water Sport Fish (WWSF) community, non-public water supply.
- Low flows used in accordance with chs. NR 106 and 217, Wis. Adm. Code: The following 7-Q_{10} and 7-Q_2 values are from where Outfall 001 is located.

  7-Q_{10} = 0.57 cfs (cubic feet per second)
  7-Q_2 = 1.09 cfs
  90-Q_{10} = 0.93 cfs
  Harmonic Mean Flow = 2.1 cfs using a drainage area of 7.97 mi^2

  The Harmonic Mean has been estimated based on average flow and the 7-Q_{10} using an equation from U.S. EPA's *Technical Support Document for Water Quality-Based Toxics Control* (March 1991, EPA/505/2-90-001, pgs. 88-89).

Attachment #1

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
7-Q_{10} (cfs)	0.69	0.71	0.71	0.88	1.11	1.07	0.92	0.77	0.65	0.81	0.79	0.69
7-Q_2 (cfs)	1.2	1.38	1.57	1.75	1.95	2.35	1.83	1.4	1.38	1.55	1.48	1.33

- Hardness = 372 mg/L as $CaCO_3$. This value represents the geometric mean of data from 04/02/2019 – 06/07/2022 from chronic WET testing.
- % of low flow used to calculate limits in accordance with s. NR 106.06(4)(c)5., Wis. Adm. Code: 100%. Fontana Walworth completed a mixing zone study in 2018 which was approved for 100% mixing.
- Source of background concentration data: Metals data from the Rock River at Waupun is used for this evaluation because there is no data available for the Piscasaw Creek. The Rock River is within the same ecological landscape so ambient water quality characteristics are expected to be similar. The numerical values are shown in the tables below. If no data is available, the background concentration is assumed to be negligible and a value of zero is used in the computations. Background data for calculating effluent limitations for ammonia nitrogen are described later.
- Multiple dischargers: None.
- Impaired water status: The receiving water is not 303(d) listed as impaired for any pollutants. The downstream water flows into Illinois.

Effluent Information

- Design flow rate(s):
  Annual Average = 1.774 MGD
  Peak weekly = 3.68 MGD
  The peak weekly design flow is estimated from the annual average design flow and a peaking factor based on data from 01/01/2019 – 05/31/2023.
  For reference, the actual average flow from 01/01/2019 – 05/31/2023 was 1.25 MGD.
- Hardness = 318 mg/L as $CaCO_3$. This value represents the geometric mean of data from the permit reissuance application from 04/03/2023 – 04/13/2023.
- Acute dilution factor used in accordance with s. NR 106.06(3)(c), Wis. Adm. Code: Not applicable – this facility does not have an approved Zone of Initial Dilution (ZID).
- Water source: Domestic wastewater with water supply from wells with contributions from 8 industries.
- Additives: Ferric chloride is used for phosphorus removal and a polymer is added for coagulation.
- Effluent characterization: This facility is categorized as a major municipal, so the permit application required effluent sample analyses for all the "priority pollutants" except for the Dioxins and Furans as specified in s. NR 200.065, Table 1, Wis. Adm. Code. The permit-required monitoring for phosphorus, ammonia, chloride, and mercury is used in this evaluation.
- Effluent data for substances for which a single sample was analyzed is shown in the tables in Part 2 below, in the column titled "MEAN EFFL. CONC.". Otherwise, substances with multiple effluent data are shown in the tables below or in their respective parts in this evaluation.

Copper Effluent Data

Sample Date	Copper µg/L	Sample Date	Copper µg/L	Sample Date	Copper µg/L
04/03/2023	10.5	04/18/2023	12.5	05/01/2023	14.1
04/06/2023	10.4	04/21/2023	12.2	05/04/2023	13.7
04/10/2023	9.9	04/24/2023	11.4	05/08/2023	13.3

Attachment #1

Sample Date	Copper µg/L	Sample Date	Copper µg/L	Sample Date	Copper µg/L
04/13/2023	11.8	04/27/2023	13.9		
1-day P_{99} = 16 µg/L					
4-day P_{99} = 14 µg/L					

Chloride Effluent Data

	Chloride mg/L
1-day P_{99}	671
4-day P_{99}	563
30-day P_{99}	501
Mean	468
Std	75.6
Sample size	233
Range	280 – 740

The following table presents the average concentrations and loadings at Outfall 001 from 01/01/2019 – 05/31/2023 for all parameters with limits in the current permit to meet the requirements of s. NR 201.03(6), Wis. Adm. Code:

Parameter Averages with Limits

	Average Measurement	Average Mass Discharged
BOD_5	1.04 mg/L*	
TSS	2.67 mg/L*	
pH field	7.7 s.u.	
Phosphorus	0.51 mg/L	5.37 lbs/day
Ammonia Nitrogen	0.05 mg/L*	
Chloride	468 mg/L	
Fecal Coliform	22.2 #/100 mL	
Dissolved Oxygen	9.1 mg/L	

*Results below the level of detection (LOD) were included as zeroes in calculation of average.

PART 2 – WATER QUALITY-BASED EFFLUENT LIMITATIONS FOR TOXIC SUBSTANCES – EXCEPT AMMONIA NITROGEN

Permit limits for toxic substances are required whenever any of the following occur:

1. The maximum effluent concentration exceeds the calculated limit (s. NR 106.05(3), Wis. Adm. Code)
2. If 11 or more detected results are available in the effluent, the upper 99th percentile (or P_{99}) value exceeds the comparable calculated limit (s. NR 106.05(4), Wis. Adm. Code)
3. If fewer than 11 detected results are available, the mean effluent concentration exceeds 1/5 of the calculated limit (s. NR 106.05(6), Wis. Adm. Code)

Acute Limits based on 1-Q_{10}

Daily maximum effluent limitations for toxic substances are based on the acute toxicity criteria (ATC), listed in ch. NR 105, Wis. Adm. Code. Previously daily maximum limits for toxic substances were calculated as two times the ATC. However, changes to ch. NR 106, Wis. Code, (September 1, 2016) require the Department to calculate acute limitations using the same mass balance equation as used for other limits along with the 1-Q_{10} receiving water low flow to determine if more restrictive effluent limitations are needed to protect the receiving stream from discharges which may cause or contribute to an exceedance of the acute water quality standards. The mass balance equation is provided below.

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

Where:

WQC =Acute toxicity criterion or secondary acute value according to ch. NR 105, Wis. Adm. Code.

Qs = average minimum 1-day flow which occurs once in 10 years (1-day Q_{10}) if the 1-day Q_{10} flow data is not available = 80% of the average minimum 7-day flow which occurs once in 10 years (7-day Q_{10}).

Qe = Effluent flow (in units of volume per unit time) as specified in s. NR 106.06(4)(d), Wis. Adm. Code.

f = Fraction of the effluent flow that is withdrawn from the receiving water, and

Cs = Background concentration of the substance (in units of mass per unit volume) as specified in s. NR 106.06(4)(e), Wis. Adm. Code.

If the receiving water is effluent dominated under low stream flow conditions, the 1-Q_{10} method of limit calculation produces the most stringent daily maximum limitations and should be used while making reasonable potential determinations. This is the case for Fontana Walworth.

The following tables list the calculated WQBELs for this discharge along with the results of effluent sampling for all the detected substances. All concentrations are expressed in terms of micrograms per Liter (µg/L), except for hardness and chloride (mg/L) and mercury (ng/L).

Daily Maximum Limits based on Acute Toxicity Criteria (ATC)

RECEIVING WATER FLOW = 0.46 cfs, (1-Q_{10} (estimated as 80% of 7-Q_{10})), as specified in s. NR 106.06(3)(bm), Wis. Adm. Code.

SUBSTANCE	REF. HARD.* mg/L	ATC	MEAN BACK-GRD.	MAX. EFFL. LIMIT**	1/5 OF EFFL. LIMIT	MEAN EFFL. CONC.	1-day P_{99}	1-day MAX. CONC.
Arsenic		340		396	79.3	0.25		
Cadmium	318	38.9	0.11	45.3	9.06	<0.15		
Chromium	301	4446	2.43	5184	1037	<2.3		
Copper	318	46.2	2.12	53.5			16	14.1
Lead	318	327		381	76.3	<0.16		
Mercury (ng/L)		830	1.3	968			1.63	1.3
Nickel	268	1080	2.5	1259	252	4.4		
Zinc	318	331	1	386	77.2	16.6		
Phenol***		150731		175772	35154	8.4		
Chloride (mg/L)		757		883			671	740

* The indicated hardness may differ from the effluent hardness because the effluent hardness exceeded the maximum range in ch. NR 105, Wis. Adm. Code, over which the acute criteria are applicable. In that case, the maximum of the range is used to calculate the criterion.
** Per the changes to s. NR 106.07(3), Wis. Adm. Code, effective 09/01/2016 consideration of ambient concentrations and 1-Q_{10} flow rates yields a more restrictive limit than the 2 × ATC method of limit calculation.
*** The limit for this substance is based on a secondary value. Acute limits are set equal to the secondary value rather than two times or using the 1-Q_{10} s. NR 106.06(3)(b)2 and s. NR 105.05(2)(f)6), Wis. Adm Code.

Weekly Average Limits based on Chronic Toxicity Criteria (CTC)

RECEIVING WATER FLOW = 0.57 cfs (100% of the 7-Q_{10}), as specified in s. NR 106.06(4)(c), Wis. Adm. Code

SUBSTANCE	REF. HARD.* mg/L	CTC	MEAN BACK-GRD.	WEEKLY AVE. LIMIT	1/5 OF EFFL. LIMIT	MEAN EFFL. CONC.	4-day P_{99}
Arsenic		152		184	36.8	0.25	
Cadmium	175	3.82	0.11	4.59	0.92	<0.15	
Chromium	301	326	2.43	393	78.6	<2.3	
Copper	395	31.9	2.12	38.0			14
Lead	356	95.5		115	23.1	<0.16	
Mercury (ng/L)		440	1.3	531			1.19
Nickel	268	120	2.5	145	28.9	4.4	
Zinc	333	345	1	416	83.2	16.6	
Phenol		49000		59175	11835	8.4	
Chloride (mg/L)		395		477			**563**

* The indicated hardness may differ from the receiving water hardness because the receiving water hardness exceeded the maximum range in ch. NR 105, Wis. Adm. Code, over which the chronic criteria are applicable. In that case, the maximum of the range is used to calculate the criterion.

Monthly Average Limits based on Wildlife Criteria (WC)

RECEIVING WATER FLOW = 0.93 cfs (100% of the 90-Q_{10}), as specified in s. NR 106.06(4), Wis. Adm. Code

SUBSTANCE	WC	MEAN BACK-GRD.	MO'LY AVE. LIMIT	1/5 OF EFFL. LIMIT	MEAN EFFL. CONC.	30-day P_{99}
Mercury (ng/L)	1.3	1.3	1.3			0.76

Monthly Average Limits based on Human Threshold Criteria (HTC)

RECEIVING WATER FLOW = 2.14 cfs (100% of Harmonic Mean), as specified in s. NR 106.06(4), Wis. Adm. Code.

SUBSTANCE	HTC	MEAN BACK-GRD.	MO'LY AVE. LIMIT	1/5 OF EFFL. LIMIT	MEAN EFFL. CONC.	30-day P_{99}
Cadmium	370	0.11	658	131.7	<0.15	
Chromium (+3)	3818000	2.43	6794549	1358910	<2.3	
Lead	140		249	49.8	<0.16	
Mercury	1.5	1.3	1.7			0.76
Nickel	43000	2.5	76521	15304	4.4	
Phenol	3712		6606	1321	8.4	

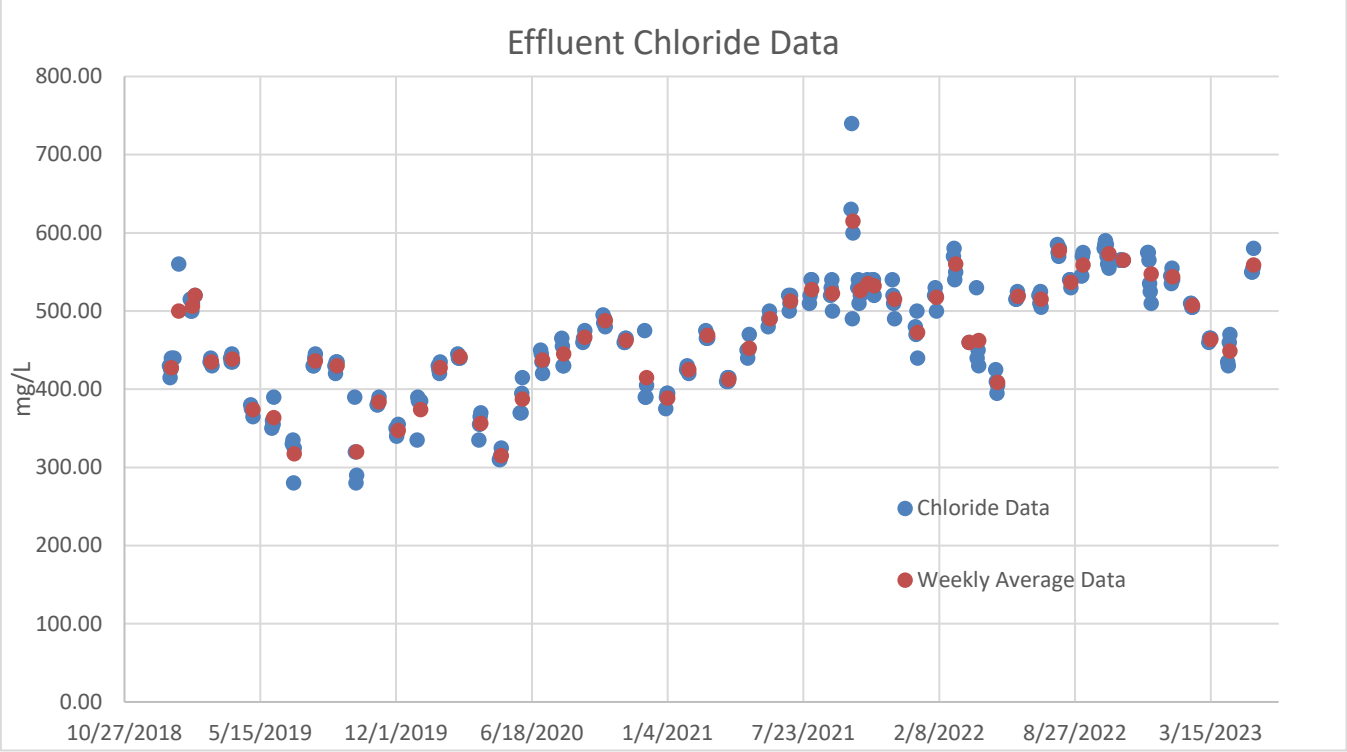
Monthly Average Limits based on Human Cancer Criteria (HCC)
RECEIVING WATER FLOW = 2.14 cfs (100% of Harmonic Mean), as specified in s. NR 106.06(4), Wis. Adm. Code.

SUBSTANCE	HCC	MEAN BACK-GRD.	MO'LY AVE. LIMIT	1/5 OF EFFL. LIMIT	MEAN EFFL. CONC.
Arsenic	13.3		23.7	4.73	0.25

In addition to evaluating the need for limits for each individual substance for which HCC exist, s. NR 106.06(8), Wis. Adm. Code, requires the evaluation of the cumulative cancer risk. Because no effluent limits are needed based on HCC, determination of the cumulative cancer risk is not needed per s. NR 106.06(8), Wis. Adm. Code.

Conclusions and Recommendations
Based on a comparison of the effluent data and calculated effluent limitations, effluent limitations are required for chloride.

Chloride – Considering available effluent data from the current permit term (01/01/2019 – 05/31/2023), the 1-day P_{99} chloride concentration is 671 mg/L, and the 4-day P_{99} of effluent data is 563 mg/L. Because the 4-day P_{99} exceeds the calculated weekly average WQBEL, an effluent limit is needed in accordance with s. NR 106.05(4)(b), Wis. Adm. Code. The chloride data from the current permit term and the weekly averages are shown in the graph below:



Subchapter VII of ch. NR 106, Wis. Adm. Code, provides for a variance from water quality standards for this substance, and Fontana Walworth has requested such a variance. That variance may be granted subject to the following conditions:

1) The permit shall include an "Interim" limitation intended to prevent an increase in the discharge of Chloride;
2) The permit shall specify "Source Reduction Measures" to be implemented during the permit term, with periodic progress reports; and
3) The permit shall include a "Target Limit" or "Target Value" to gage the effectiveness of the Source Reduction Measures, and progress toward the WQBELs.

Interim Limit for Chloride

Section NR 106.82(9), Wis. Adm. Code, defines a "Weekly average interim limitation" as either the 4-day P_{99} concentration or 105% of the highest weekly average concentration of the representative data. The current interim limit of 560 mg/L is based on the 4-day P_{99} from the data reported during the previous permit term (May 2013-December 2017).

An interim limit of 560 mg/L is recommended to continue in the reissued permit, which is equal to the current 4-day P_{99} rounded to two significant figures. This is equivalent to the current interim limit.

A target limit and permit language for Source Reduction Measures are not recommended as part of this evaluation. These should follow contact with Fontana Walworth. Though if the Department and the Fontana Walworth are unable to reach agreement on all the terms of a Chloride Variance, the calculated limits described earlier should be included in the permit, in accordance with s. NR 106.83(3), Wis. Adm. Code.

Chloride Monitoring Recommendations

Four samples per month (on consecutive days) are recommended. This allows for averaging of the results to compare with the interim limit and allows the use of the average in determining future interim limits, and degree of success with chloride reduction measures.

In the absence of a variance, Fontana Walworth would be subject to the WQBEL of 477 mg/L as a weekly average; the weekly average mass limit of 7,060 lbs/day (477 mg/L × 1.774 MGD × 8.34); and an alternative wet weather mass limit of 14,600 lbs/day (477 mg/L × 3.68 MGD × 8.34) based on the estimated weekly design flow.

Mercury – The WQBEL for total recoverable mercury is set equal to the most stringent criterion of 1.3 ng/L, according to s. NR 106.06(6), Wis. Adm. Code, because the background concentration in the receiving water and similar inland streams is known to exceed 1.3 ng/L.

A total of 17 effluent sampling results are available from 06/12/2019 – 03/22/2023 for total recoverable mercury. The average concentration was 0.56 ng/L, and the maximum was 1.3 ng/L. Because the 30-day P_{99} of available data (0.76 ng/L) is less than the most stringent WQBEL of 1.3 ng/L, **no WQBEL for mercury is required for permit reissuance. Monitoring is recommended to continue in the reissued permit.**

PFOS and PFOA – The need for PFOS and PFOA monitoring is evaluated in accordance with s. NR 106.98(2), Wis. Adm. Code. Previous monitoring produced a PFOS result of 0.899 ng/L and a PFOA result of 3.75 ng/L. These results are less than one fifth of the respective criteria for each substance.

Based on the effluent flow rate, **PFOS and PFOA monitoring is recommended once every two months**.

PART 3 – WATER QUALITY-BASED EFFLUENT LIMITATIONS FOR AMMONIA NITROGEN

The State of Wisconsin promulgated revised water quality standards for ammonia nitrogen in ch. NR 105, Wis. Adm. Code, effective March 1, 2004 which includes criteria based on both acute and chronic toxicity to aquatic life. The current permit has daily maximum, weekly average and monthly average limits. These limits are re-evaluated at this time due to the following changes:

- Subchapter IV of ch. NR 106, Wis. Adm. Code allows limits based on available dilution instead of limits set to twice the acute criteria.
- Section NR 106.07(3), Wis. Adm. Code requires weekly and monthly average limits for municipal treatment plants.
- The maximum expected effluent pH has changed

Daily Maximum Limits based on Acute Toxicity Criteria (ATC)

Daily maximum limitations are based on acute toxicity criteria in ch. NR 105, Wis. Adm. Code, which are a function of the effluent pH and the receiving water classification. The acute toxicity criterion (ATC) for ammonia is calculated using the following equation:

$$\text{ATC in mg/L} = [A \div (1 + 10^{(7.204 - pH)})] + [B \div (1 + 10^{(pH - 7.204)})]$$

Where:

A = 0.411 and B = 58.4 for a Warm Water Sport fishery, and
pH (s.u.) = that characteristic of the effluent.

The effluent pH data was examined as part of this evaluation. A total of 1368 sample results were reported from 01/02/2019 – 05/31/2023. The maximum reported value was 8.3 s.u. (Standard pH Units). The effluent pH was 8.0 s.u. or less 99% of the time. The 1-day P_{99}, calculated in accordance with s. NR 106.05(5), Wis. Adm. Code, is 8.1 s.u. The mean plus the standard deviation multiplied by a factor of 2.33, an estimate of the upper ninety ninth percentile for a normally distributed dataset, is 8.1 s.u. Therefore, a value of 8.0 s.u. is believed to represent the maximum reasonably expected pH, and therefore most appropriate for determining daily maximum limitations for ammonia nitrogen. Substituting a value of 8.0 s.u. into the equation above yields an ATC = 8.4 mg/L.

Daily Maximum Ammonia Nitrogen Effluent Limitations Calculation Method

In accordance with s. NR 106.32(2), Wis. Adm. Code daily maximum ammonia limitations are either set equal to two times the nitrogen limits if it is determined that the previous method of acute ammonia limit calculation (2×ATC) is not sufficiently protective of the fish and aquatic life. The more restrictive calculated limits shall apply.

The calculated daily maximum ammonia nitrogen effluent limits using the mass balance approach with the 1-Q_{10} (estimated as 80 % of 7-Q_{10}) and the 2×ATC approach are shown below.

Daily Maximum Ammonia Nitrogen Determination

	Ammonia Nitrogen Limit mg/L
2×ATC	17
1-Q_{10}	9.8

The 1-Q_{10} method yields the most stringent limit for Fontana Walworth.

Weekly and Monthly Average Limits based on Chronic Toxicity Criteria (CTC)
The weekly and monthly average ammonia nitrogen limits calculation from the previous memo do not change because there have been no changes in the effluent and receiving water flow rates. The calculations from the previous WQBEL memo are shown in Attachment #2. The current weekly and monthly average concentrations are shown below:

	Weekly Average mg/L	Monthly Average mg/L
January	11	4.5
February	11	4.6
March	11	4.6
April	6.9	2.9
May	5.2	2.4
June	4.0	2.0
July	3.4	1.6
August	3.5	1.5
September	4.9	2.3
October	9.7	4.0
November	11	4.6
December	11	4.5

Effluent Data
The following table evaluates the statistics based upon ammonia data reported from 04/18/2019 – 05/18/2023.

Ammonia Nitrogen mg/L	April - May	June - September	October - March
1-day P_{99}	2.56	0.102	0.93
4-day P_{99}	1.66	0.041	0.59
30-day P_{99}	0.78	0.015	0.27
Mean*	0.14	0.0038	0.046
Std	1.85	0.038	0.72
Sample size	203	323	557
Range	<0.05 – 9.64	<0.05 – 0.21	<0.05 – 4.73

*Values lower than the level of detection were substituted with a zero

Based on this comparison, there is no reasonable potential for the discharge to exceed any of the calculated ammonia nitrogen limits.

The permit currently has daily maximum, weekly average, and monthly average limits year-round. **Where there are existing ammonia nitrogen limits in the permit, the limits must be retained regardless of reasonable potential, consistent with s. NR 106.33(1)(b), Wis. Adm. Code:**

(b) If a permittee is subject to an ammonia limitation in an existing permit, the limitation shall be included in any reissued permit. Ammonia limitations shall be included in the permit if the permitted facility will be providing treatment for ammonia discharges.

Expression of Limits

Revisions to ch. NR 106, Wis. Adm. Code, in September 2016 aligned Wisconsin's WQBELs with 40 CFR § 122.45(d), which specifies that effluent limits for continuous dischargers must be expressed as weekly and monthly averages for publicly owned treatment works and as daily maximums and monthly averages for all other dischargers, unless shown to be impracticable. Because a daily maximum ammonia limit is necessary for Fontana Walworth, weekly and monthly average limits are also required under this code revision.

The methods for calculating limitations for municipal treatment facilities to conform to 40 CFR 122.45(d) are specified in s. NR 106.07(3), Wis. Adm. Code, and are as follows:

> Whenever a daily maximum limitation is determined necessary to protect water quality, a weekly and monthly average limitation shall also be included in the permit and set equal to the daily maximum limit unless a more restrictive limit is already determined necessary to protect water quality.

The current weekly average limits for January, February, Mach, November, and December are less stringent than the calculated daily maximum limit of 9.8 mg/L. Therefore, the weekly average limits for these months are recommended to be equal to the daily maximum limit.

Conclusions and Recommendations

In summary, after rounding to two significant figures, the following ammonia nitrogen limitations are recommended. No mass limitations are recommended in accordance with s. NR 106.32(5), Wis. Adm. Code. Additional limits to meet the requirements in s. NR 106.07, Wis. Adm. Code, are shown in bold in the table below.

Final Ammonia Nitrogen Limits

	Daily Maximum mg/L	Weekly Average mg/L	Monthly Average mg/L
January	9.8	**9.8**	4.5
February	9.8	**9.8**	4.6
March	9.8	**9.8**	4.6
April	9.8	6.9	2.9
May	9.8	5.2	2.4
June	9.8	4.0	2.0
July	9.8	3.4	1.6
August	9.8	3.5	1.5
September	9.8	4.9	2.3
October	9.8	9.7	4.0
November	9.8	**9.8**	4.6
December	9.8	**9.8**	4.5

PART 4 – WATER QUALITY-BASED EFFLUENT LIMITATIONS FOR BACTERIA

On May 1, 2020, revisions to chs. NR 102 and NR 210, Wis. Adm. Code, became effective which replace fecal coliform limits with new *Escherichia coli* (*E. coli*) limits for protection of recreational uses. Section NR 210.06(2)(a)1, Wis. Adm. Code, includes two limits which must be included in permits for facilities which are required to disinfect:

1. The geometric mean of *E. coli* bacteria in effluent samples collected in any calendar month may not exceed 126 counts/100 mL.
2. No more than 10 percent of *E. coli* bacteria samples collected in any calendar month may exceed 410 counts/100 mL.

E. coli monitoring is recommended at the same frequency that fecal coliform monitoring is required in the current permit. Because Fontana Walworth's permit requires 2x/week monitoring, the 410 counts/100 mL limit will effectively function as a daily maximum limit unless the facility performs additional monitoring. Any additional monitoring beyond what is required by the permit must also be reported on the DMR as required in the standard requirements section of the permit.

These limits are required during May through September. No changes are recommended to the current recreational period and the required disinfection season.

Effluent Data
Fontana Walworth has monitored effluent *E. coli* from 05/03/2022 – 09/27/2022 and a total of 35 results are available using membrane filtration. A geometric mean of 126 counts/100 mL was not exceeded, with a maximum monthly geometric mean of 44 counts/100 mL. The maximum reported value was 68 counts/100 mL. **Based on this effluent data it appears that the facility can meet new *E. coli* limits and a compliance schedule is not needed in the reissued permit.**

PART 5 – PHOSPHORUS

Technology-Based Effluent Limit
Subchapter II of Chapter NR 217, Wis. Adm. Code, requires municipal wastewater treatment facilities that discharge greater than 150 pounds of Total Phosphorus per month to comply with a monthly average limit of 1.0 mg/L, or an approved alternative concentration limit.

Because Fontana Walworth currently has a limit of 1.0 mg/L, this limit should be included in the reissued permit. This limit remains applicable unless a more stringent WQBEL is given.

In addition, the need for a WQBEL for phosphorus must be considered.

Water Quality-Based Effluent Limits (WQBEL)
Revisions to administrative rules regulating phosphorus took effect on December 1, 2010. These rule revisions include additions to s. NR 102.06, Wis. Adm. Code, which establish phosphorus standards for surface waters. Subchapter III of NR 217, Wis. Adm. Code, establishes procedures for determining WQBELs for phosphorus, based on the applicable standards in ch. NR 102, Wis. Adm. Code.

Section NR 102.06(3)(a), Wis. Adm. Code, specifically names river segments for which a phosphorus criterion of 0.100 mg/L applies. For other stream segments that are not specified in s. NR 102.06(3)(a),

Wis. Adm. Code, s. NR 102.06(3)(b), Wis. Adm. Code, specifies a phosphorus criterion of 0.075 mg/L. The phosphorus criterion of 0.075 mg/L applies for Piscasaw Creek.

The conservation of mass equation is described in s. NR 217.13(2)(a), Wis. Adm. Code, for phosphorus WQBELs and includes variables of water quality criterion (WQC), receiving water flow rate (Qs), effluent flow rate (Qe), and upstream phosphorus concentrations (Cs) provided below.

$$\text{Limitation} = [(WQC)(Qs+(1-f)\ Qe) - (Qs-f\ Qe)\ (Cs)]/Qe$$

Where:

WQC = 0.075 mg/L for Piscasaw Creek
Qs = 100% of the 7-Q_2 of 1.09 cfs
Cs = background concentration of phosphorus in the receiving water pursuant to s. NR 217.13(2)(d), Wis. Adm. Code
Qe = effluent flow rate = 1.774 MGD = 2.745 cfs
f = the fraction of effluent withdrawn from the receiving water = 0

Section NR 217.13(2)(d), Wis. Adm. Code, specifies that the background phosphorus concentration used in the limit calculation formula shall be calculated as a median using the procedures specified in s. NR 102.07(1)(b) to (c), Wis. Code. All representative data from the most recent 5 years shall be used, but data from the most recent 10 years may be used if representative of current conditions.

A previous evaluation resulted in a WQBEL of 0.075 mg/L using background concentrations from two locations (Jackson Creek and Little Turtle Creek) which had background concentrations of 0.206 mg/L and 0.138 mg/L. Section NR 217.13(2)(d), Wis. Adm. Code, states that the determination of upstream concentrations shall be evaluated at each permit reissuance. Additional data were considered in estimating the background phosphorus concentration.

There is not available data from Piscasaw Creek. Data collected from the Little Turtle Creek is used in this evaluation because it's in the same ecological landscape. The data collected from this creek is summarized below:

SWIMS ID	10021352
Station Name	Little Turtle Creek at Lake Shore Rd
Waterbody	Little Turtle Creek
Sample Count	34
First Sample	05/22/2015
Last Sample	0815/2022
Mean	0.318 mg/L
Median	0.110 mg/L

Substituting a background concentration above criteria into the limit calculation equation above would result in a calculated limit that is less than the applicable criterion of 0.075 mg/L. However, s. NR 217.13(7), Wis. Adm. Code, specifies that "if the WQBEL calculated pursuant to the procedures in this section is less than the phosphorus criterion specified in s. NR 102.06, Wis. Adm. Code, for the water body, the effluent limit shall be set equal to the criterion."

Effluent Data
The following table summarizes effluent total phosphorus monitoring data from 01/01/2019 – 05/30/2023.

Total Phosphorus Effluent Data

	Phosphorus mg/L	Phosphorus lbs/day
1-day P_{99}	1.23	14.0
4-day P_{99}	0.82	9.07
30-day P_{99}	0.61	6.56
Mean	0.51	5.37
Std	0.22	2.59
Sample size	895	895
Range	0.11 – 1.95	1.33 – 21.3

Reasonable Potential Determination
The calculated WQBEL of 0.075 mg/L is less than the current technology-based limit of 1.0 mg/L, so the WQBEL must be included in the permit per s. NR 217.15(2), Wis. Adm. Code.

In accordance with s. NR 217.15(1), Wis. Adm. Code, there is reasonable potential for the discharge to cause or contribute to an exceedance of the water quality criteria. The data suggest that a compliance schedule will be necessary for the facility to meet the given phosphorus limits.

Limit Expression
According to s. NR 217.14(2), Wis. Adm. Code, because the calculated WQBEL is less than or equal to 0.3 mg/L, the effluent limit of 0.075 mg/L may be expressed as a six-month average. If a concentration limitation expressed as a six-month average is included in the permit, a monthly average concentration limitation of 0.225 mg/L, equal to three times the WQBEL calculated under s. NR 217.13, Wis. Adm. Code shall also be included in the permit. The six-month average should be averaged during the months of May – October and November – April.

Fontana Walworth is currently complying with the final WQBELs through water quality trading which will continue in the reissued permit along with the current end of pipe TBEL of 1.0 mg/L as a monthly average.

PART 6 – WATER QUALITY-BASED EFFLUENT LIMITATIONS FOR THERMAL

Surface water quality standards for temperature took effect on October 1, 2010. These regulations are detailed in chs. NR 102 (Subchapter II – Water Quality Standards for Temperature) and NR 106 (Subchapter V – Effluent Limitations for Temperature) of the Wisconsin Administrative Code. Daily maximum and weekly average temperature criteria are available for the 12 different months of the year depending on the receiving water classification.

In accordance with s. NR 106.53(2)(b), Wis. Adm. Code, the highest daily maximum flow rate for a calendar month is used to determine the acute (daily maximum) effluent limitation. In accordance with s. NR 106.53(2)(c), Wis. Adm. Code, the highest 7-day rolling average flow rate for a calendar month is used to determine the sub-lethal (weekly average) effluent limitation. These values were based off actual

flow reported from 01/01/2019 – 05/31/2023.

The table below summarizes the maximum temperatures reported during monitoring from 01/01/2022 – 12/31/2022.

Monthly Temperature Effluent Data & Limits

Month	Representative Highest Monthly Effluent Temperature		Calculated Effluent Limit	
	Weekly Maximum (°F)	Daily Maximum (°F)	Weekly Average Effluent Limitation (°F)	Daily Maximum Effluent Limitation (°F)
JAN	41	45	54	87
FEB	43	44	55	84
MAR	52	53	55	84
APR	55	57	57	85
MAY	65	67	67	88
JUN	74	77	80	89
JUL	74	76	85	89
AUG	74	76	85	88
SEP	72	75	75	84
OCT	65	66	**64**	85
NOV	60	62	**52**	88
DEC	50	51	53	86

Reasonable Potential

Permit limits for temperature are recommended based on the procedures in s. NR 106.56, Wis. Adm. Code.

- An acute limit for temperature is recommended for each month in which the representative daily maximum effluent temperature for that month exceeds the acute WQBEL. The representative daily maximum effluent temperature is the greater of the following:
  (a) The highest recorded representative daily maximum effluent temperature
  (b) The projected 99th percentile of all representative daily maximum effluent temperatures
- A sub−lethal limitation for temperature is recommended for each month in which the representative weekly average effluent temperature for that month exceeds the weekly average WQBEL. The representative weekly average effluent temperature is the greater of the following:
  (a) The highest weekly average effluent temperature for the month.
  (b) The projected 99th percentile of all representative weekly average effluent temperatures for the month

Comparing the representative highest effluent temperature to the calculated effluent limits determines the reasonable potential of exceeding the effluent limits. The months in which limitations are recommended are shown in bold. Based on this analysis, weekly average temperature maximum limits are necessary for the months of October and November.

In November 2013, Fontana Walworth completed a dissipative cooling study which demonstrated the existence of a zone of free passage at the outfall on the opposite shore of the discharge. Here, the temperature data did not exceed the water quality criteria. Right at the outfall, the stream exceeded criteria by 2 degrees and met criteria within 300' downstream of the outfall. Because Fontana Walworth has demonstrated there is a zone of free passage and rapid cooling, **no temperature limits are recommended in the reissued permit. Monitoring is recommended to continue in the reissued permit.**

Future WPDES Permit Reissuance
Dissipative cooling requests must be re-evaluated every permit reissuance. The permittee is responsible for submitting an updated DC request prior to permit reissuance. Such a request must either include:
a) A statement by the permittee that there have been no substantial changes in operation of, or thermal loadings to, the treatment facility and the receiving water; or
b) New information demonstrating DC to supplement the information used in the previous DC determination. If significant changes in operation or thermal loads have occurred, additional DC data must be submitted to the Department.

PART 7 – WHOLE EFFLUENT TOXICITY (WET)

WET testing is used to measure, predict, and control the discharge of toxic materials that may be harmful to aquatic life. In WET tests, organisms are exposed to a series of effluent concentrations for a given time and effects are recorded. Decisions below related to the selection of representative data and the need for WET limits were made according to ss. NR 106.08 and 106.09, Wis. Adm. Code. WET monitoring frequency and toxicity reduction evaluation (TRE) recommendations were made using the best professional judgment of staff familiar with the discharge after consideration of the guidance in the *Whole Effluent Toxicity (WET) Program Guidance Document (2022).*

- Acute tests predict the concentration that causes lethality of aquatic organisms during a 48 to 96-hour exposure. To assure that a discharge is not acutely toxic to organisms in the receiving water, WET tests must produce a statistically valid LC_{50} (Lethal Concentration to 50% of the test organisms) greater than 100% effluent, according to s. NR 106.09(2)(b), Wis. Adm Code.
- Chronic tests predict the concentration that interferes with the growth or reproduction of test organisms during a seven-day exposure. To assure that a discharge is not chronically toxic to organisms in the receiving water, WET tests must produce a statistically valid IC_{25} (Inhibition Concentration) greater than the instream waste concentration (IWC), according to s. NR 106.09(3)(b), Wis. Adm Code. The IWC is an estimate of the proportion of effluent to total volume of water (receiving water + effluent). The IWC of **83%** shown in the WET Checklist summary below was calculated according to the following equation, as specified in s. NR 106.03(6), Wis. Adm Code:

$$IWC\ (as\ \%) = Q_e \div \{(1 - f)\ Q_e + Q_s\} \times 100$$

Where:
Q_e = annual average flow = 1.774 MGD = 2.745 cfs
f = fraction of the Q_e withdrawn from the receiving water = 0
Q_s = 100% of the 7-Q_{10} = 0.57 cfs

The IWC in the current permit is 81% due to a calculation error in the 2018 WQBEL memo.

- According to the *State of Wisconsin Aquatic Life Toxicity Testing Methods Manual* (s. NR 219.04,

Table A, Wis. Adm. Code), a synthetic (standard) laboratory water may be used as the dilution water and primary control in acute WET tests, unless the use of different dilution water is approved by the Department prior to use. The primary control water must be specified in the WPDES permit.

- According to the *State of Wisconsin Aquatic Life Toxicity Testing Methods Manual* (s. NR 219.04, Table A, Wis. Adm. Code), receiving water must be used as the dilution water and primary control in chronic WET tests, unless the use of different dilution water is approved by the Department prior to use. The dilution water used in WET tests conducted on Outfall 001 shall be a grab sample collected from the receiving water location, upstream and out of the influence of the mixing zone and any other known discharge. The specific receiving water location must be specified in the WPDES permit.
- Shown below is a tabulation of all available WET data for Outfall 001. Efforts are made to ensure that decisions about WET monitoring and limits are made based on representative data, as specified in s. NR 106.08(3), Wis. Adm Code. Data which is not believed to be representative of the discharge was not included in reasonable potential calculations. The table below differentiates between tests used and not used when making WET determinations. Significant changes were made to WET test methods in 2004 and these changes were assumed to be fully implemented by certified labs by no later than June 2005. Data prior to July 1, 2005 was excluded from this evaluation.

WET Data History

Date Test Initiated	Acute Results LC_{50} %				Chronic Results IC_{25} %				Footnotes or Comments
	C. dubia	Fathead minnow	Pass or Fail?	Used in RP?	*C. dubia*	Fathead Minnow	Pass or Fail?	Use in RP?	
08/23/2005	>100	>100	Pass	Yes	>100	>100	Pass	Yes	
02/07/2006	>100	>100	Pass	Yes	>100	>100	Pass	Yes	
04/11/2006					>100	>100	Pass	Yes	
05/22/2007	>100	>100	Pass	Yes	>100	>100	Pass	Yes	
07/15/2008	>100	>100	Pass	No	>100	>100	Pass	No	1
04/30/2009	>100	>100	Pass	No	>100	>100	Pass	No	1
07/30/2013	>100	>100	Pass	Yes	>100	>100	Pass	Yes	
05/20/2014	>100	>100	Pass	Yes	>100	>100	Pass	Yes	
10/13/2015	>100	>100	Pass	Yes	99.3	>100	Pass	Yes	
08/09/2016	>100	>100	Pass	Yes	32	>100	Fail	Yes	
10/04/2016					>100	>100	Pass	Yes	
10/25/2016					>100	>100	Pass	Yes	
02/14/2017	>100	>100	Pass	Yes	>100	>100	Pass	Yes	
04/02/2019	>100	>100	Pass	Yes	>100	>100	Pass	Yes	
07/21/2020	>100	>100	Pass	Yes	>100	>100	Pass	Yes	
10/05/2021	>100	>100	Pass	Yes	>100	>100	Pass	Yes	
06/07/2022	>100	>100	Pass	Yes	58.4	>100	Fail	Yes	
07/26/2022					82.8	>100	Pass	Yes	
08/16/2022					>100	>100	Pass	Yes	
05/16/2023	>100	>100	Pass	Yes	>100	>100	Pass	Yes	

Footnotes:

1. *Tests done by S-F Analytical, July 2008 – March 2011.* The DNR has reason to believe that WET tests completed by SF Analytical Labs from July 2008 through March 31, 2011 were not performed using proper test methods. Therefore, WET data from this lab during this period has been disqualified and was not included in the analysis.

- According to s. NR 106.08, Wis. Adm. Code, WET reasonable potential is determined by multiplying the highest toxicity value that has been measured in the effluent by a safety factor, to predict the likelihood (95% probability) of toxicity occurring in the effluent above the applicable WET limit. The safety factor used in the equation changes based on the number of toxicity detects in the dataset. The fewer detects present, the higher the safety factor, because there is more uncertainty surrounding the predicted value. **WET limits must be given, according to s. NR 106.08(6), Wis. Adm. Code, whenever the applicable Reasonable Potential equation results in a value greater than 1.0.**

  Acute Reasonable Potential = [(TUa effluent) (B)(AMZ)]
  Chronic Reasonable Potential = [(TUc effluent) (B)(IWC)]

  According to s. NR 106.08(6)(d), Wis. Adm. Code, TUa and TUc effluent values are equal to zero whenever toxicity is not detected (i.e. when the LC_{50}, IC_{25} or $IC_{50} \geq 100\%$).

  Acute Reasonable Potential = $0 < 1.0$, reasonable potential is not shown, and a limit is not required.

  Chronic Reasonable Potential = [(TU_c effluent) (B)(IWC)]

Chronic WET Limit Parameters

TUc (maximum) $100/IC_{25}$	**B** (multiplication factor from s. NR 106.08(6)(c), Wis. Adm. Code, Table 4)	IWC
100/32 = 3.125	2.6 Based on 4 detects	83%

[(TUc effluent) (B)(IWC)] = 6.58 > 1.0

Therefore, reasonable potential is shown for chronic WET limits using the procedures in s. NR 106.08(6) and representative data from 08/23/2005 – 05/16/2023.

Expression of WET limits
Chronic WET limit = [100/IWC] TU_c = 1.2 TU_c expressed as a monthly average

The WET checklist was developed to help DNR staff make recommendations regarding WET limits, monitoring, and other related permit conditions. The checklist indicates whether acute and chronic WET limits are needed, based on requirements specified in s. NR 106.08, Wis. Adm. Code. The checklist steps the user through a series of questions, assesses points based on the potential for effluent toxicity, and suggests monitoring frequencies based on points accumulated during the checklist analysis. As toxicity potential increases, more points accumulate, and more monitoring is recommended to ensure that toxicity is not occurring. A summary of the WET checklist analysis completed for this permittee is shown in the table below. Staff recommendations based on best professional judgment are provided below the summary table. For guidance related to reasonable potential and the WET checklist, see Chapter 1.3 of the WET Guidance Document: https://dnr.wisconsin.gov/topic/Wastewater/WET.html.

WET Checklist Summary

	Acute	**Chronic**
AMZ/IWC	Not Applicable.	IWC = 83%.

Attachment #1

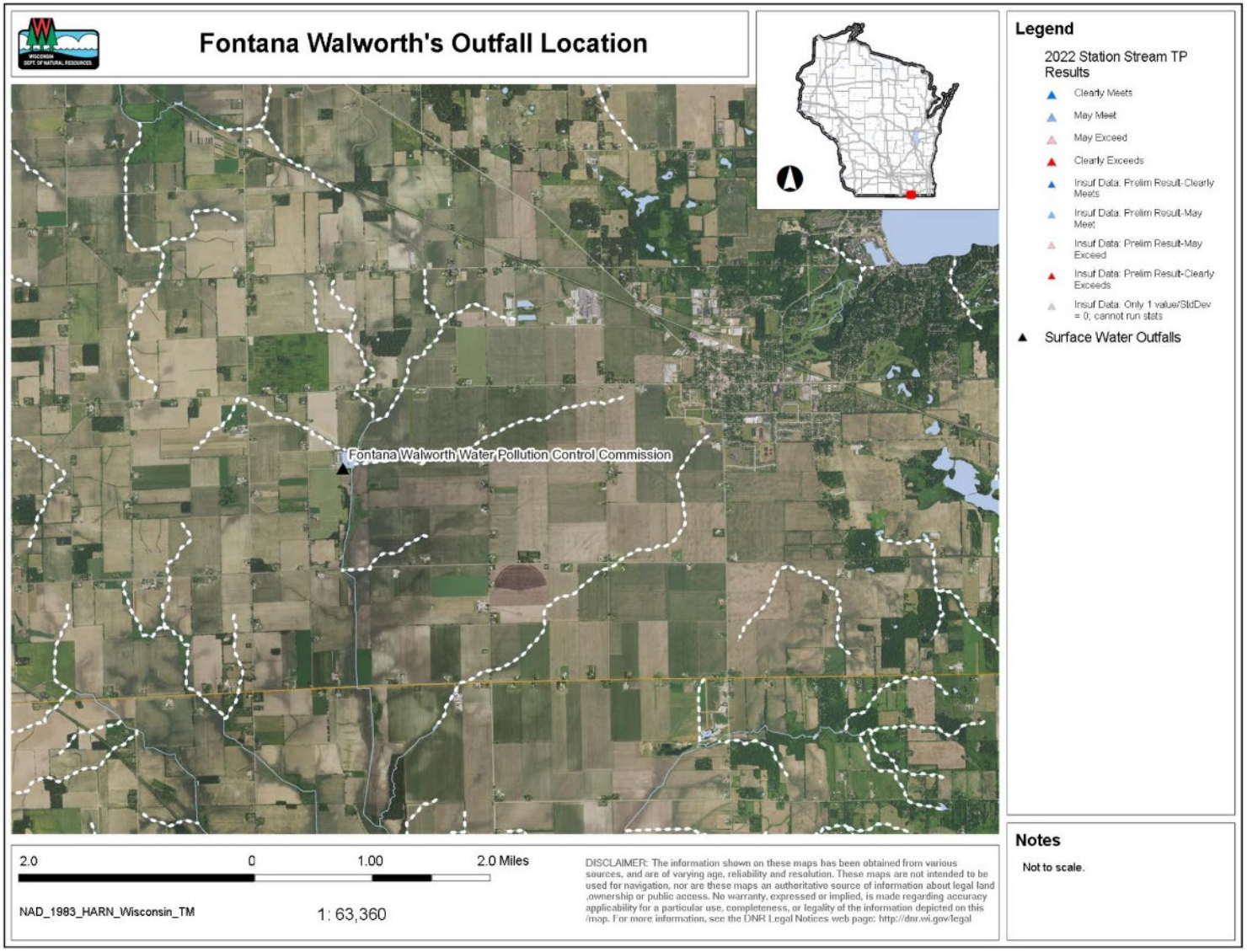
	Acute	Chronic
	0 Points	**15 Points**
Historical Data	13 tests used to calculate RP. No tests failed. **0 Points**	18 tests used to calculate RP. 2 tests failed. **0 Points**
Effluent Variability	Little variability, no violations or upsets, consistent WWTF operations. **0 Points**	Same as Acute. **0 Points**
Receiving Water Classification	Warmwater sport fish. **5 Points**	Same as Acute. **5 Points**
Chemical-Specific Data	Reasonable potential for limits for no parameters based on ATC; Ammonia nitrogen limit carried over from the current permit. Arsenic, copper, mercury, nickel, zinc, chloride, and ammonia detected. Additional Compounds of Concern: Phenol **5 Points**	Reasonable potential for limits for chloride based on CTC; Ammonia nitrogen limit carried over from the current permit. Arsenic, copper, mercury, nickel, zinc, and ammonia detected. Additional Compounds of Concern: Phenol **10 Points**
Additives	0 Biocides and 2 Water Quality Conditioners added. Permittee has proper P chemical SOPs in place: Yes. **2 Points**	All additives used more than once per 4 days. **2 Points**
Discharge Category	8 Industrial Contributors. **12 Points**	Same as Acute. **12 Points**
Wastewater Treatment	Secondary. **0 Points**	Same as Acute. **0 Points**
Downstream Impacts	No impacts known. **0 Points**	Same as Acute. **0 Points**
Total Checklist Points:	**24 Points**	**44 Points**
Recommended Monitoring Frequency (from Checklist):	1x yearly	1x yearly
Limit Required?	No	Yes Limit = 1.2 TU_c
TRE Recommended? (from Checklist)	No	No

- After consideration of the guidance provided in the Department's WET Program Guidance Document (2022) and other information described above, annual acute and chronic WET tests are recommended in the reissued permit. Tests should be done in rotating quarters to collect seasonal information about this discharge. WET testing should continue after the permit expiration date (until the permit is reissued).
- According to the requirements specified in s. NR 106.08, Wis. Adm. Code, a chronic WET limit is required. **The chronic WET limit shall be expressed as 1.2 TUc as a monthly average in the**

effluent limits table of the permit.

- A minimum of annual chronic monitoring is required because a chronic WET limit is required. Federal regulations in 40 CFR Part 122.44(i) require that monitoring occur at least once per year when a limit is present.
- A minimum of annual chronic monitoring is recommended because Fontana Walworth is a major municipal discharger with a design flow greater than 1.0 MGD. Federal regulations at 40 CFR Part 122.21(j) require at least 4 acute and chronic WET tests with each permit application on samples collected since the previous reissuance.

Attachment #2



Attachment #3

Temperature limits for receiving waters with unidirectional flow

(calculation using default ambient temperature data)

						Temp Dates	Flow Dates
Facility:	Fontana Walworth		**7-Q_{10}:**	0.57	cfs		
Outfall(s):	001		**Dilution:**	100%		**Start:**	01/01/22	01/01/19
Date Prepared:	6/22/2023		**f:**	0		**End:**	12/31/22	05/31/23
Design Flow (Qe):	1.77	MGD	**Stream type:**	Small warm water sport or forage fish co			
Storm Sewer Dist.	0	ft	**Qs:Qe ratio:**	0.2	:1		
			Calculation Needed?	YES			

Month	Water Quality Criteria			Receiving Water Flow Rate (Qs)	Representative Highest Effluent Flow Rate (Qe)		f	Representative Highest Monthly Effluent Temperature		Calculated Effluent Limit	
	Ta (default)	Sub-Lethal WQC	Acute WQC		7-day Rolling Average (Qesl)	Daily Maximum Flow Rate (Qea)		Weekly Average	Daily Maximum	Weekly Average Effluent Limitation	Daily Maximum Effluent Limitation
	(°F)	(°F)	(°F)	(cfs)	(MGD)	(MGD)		(°F)	(°F)	(°F)	(°F)
JAN	33	49	76	0.69	1.455	1.706	0	41	45	54	87
FEB	34	50	76	0.71	1.542	2.289	0	43	44	55	84
MAR	38	52	77	0.71	1.851	2.410	0	52	53	55	84
APR	48	55	79	0.88	1.728	3.191	0	55	57	57	85
MAY	58	65	82	1.11	2.100	2.656	0	65	67	67	88
JUN	66	76	84	1.07	1.689	2.282	0	74	77	80	89
JUL	69	81	85	0.92	1.967	2.179	0	74	76	85	89
AUG	67	81	84	0.77	1.562	2.193	0	74	76	85	88
SEP	60	73	82	0.65	2.597	3.860	0	72	75	75	84
OCT	50	61	80	0.81	2.057	3.040	0	65	66	**64**	85
NOV	40	49	77	0.79	1.494	1.680	0	60	62	**52**	88
DEC	35	49	76	0.69	1.398	1.908	0	50	51	53	86

Report for
Fontana-Walworth
Water Pollution Control Commission
Water Pollution Control Facilities
Walworth, Wisconsin

Water Quality Trading Plan

Prepared by:

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TABLE OF CONTENTS

APPENDICES

BACKGROUND INFORMATION

A. Purpose of Plan

This updated Water Quality Trading Plan (Plan) was prepared as required to meet the compliance schedule for stringent total phosphorus (TP) effluent limits in the Fontana-Walworth Water Pollution Control Commission's (FWWPCC) Wisconsin Pollutant Discharge Elimination System (WPDES) permit (WI-0036021-07-0). The initial Plan was submitted to the Wisconsin Department of Natural Resources (WDNR) on February 16, 2018, and subsequently approved.

B. Facility Processes and Operations

The Fontana-Walworth Water Pollution Control Facility (WPCF) serves the Village of Walworth, the Village of Fontana-on-Geneva Lake, and Kikkoman Foods, Inc. located in the Town of Walworth. The WPCF is an advanced secondary system providing treatment of domestic and industrial wastewater. The treated final effluent from this WPCF is discharged into a drainage ditch where it flows approximately 500 feet and discharges into the Piscasaw Creek.

The WPCF currently uses the approved Plan in combination with chemical phosphorus removal (CPR) to meet its effluent TP limits. The WPCF phosphorus water quality-based effluent TP limits (WQBELs) for TP include 0.075 milligrams per liter (mg/L) (6-month average) and 0.225 mg/L (monthly average). These WQBELS are presented in Table 1.

Limit	Total Phosphorus Concentration (mg/L)
Current WQBELs	
6-Month Average[1]	0.075
Monthly Average	0.225

[1]Averaging periods are January to June and July to December.

Table 1 WPDES Permit Phosphorus Effluent Limits

A process schematic of the WPCF is provided in Figure 1. The WPCF design flows and loadings are provided in Table 2.

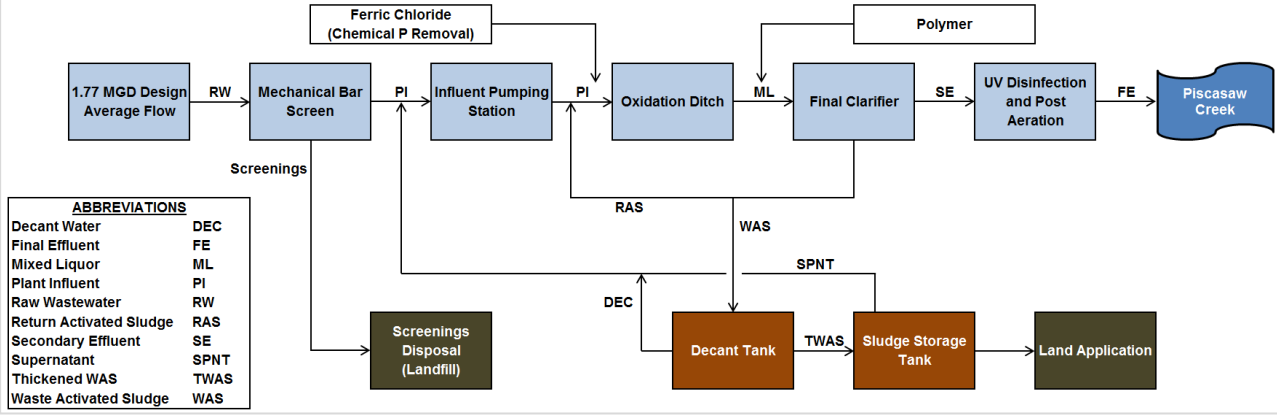


Figure 1 WPCF Process Schematic

Design Flows (MGD)	
Average Day	1.77
Peak Month	2.64
Peak Hour	6.33
Design Average Influent Loadings (lb/day)	
BOD_5	2,467
TSS	2,970
Peak Monthly Average Influent Loadings (lb/day)	
BOD_5	4,271
TSS	5,061
Ammonia Nitrogen	353
TP	165

BOD_5=five-day biochemical oxygen demand
TSS=total suspended solids
MGD=million gallons per day
lb/day=pounds per day

Table 2 WPCF Design Flows and Loadings

WATER QUALITY TRADING (WQT)

A. Overview

Given the considerable costs associated with advanced wastewater treatment technologies to meet stringent TP effluent limits as documented in the April 28, 2017, Final Compliance Alternatives Plan, the FWWPCC established WQT for meeting these stringent limits while continuing to operate the existing

CPR system at the WPCF. The two WDNR-approved water quality trades are described in the following, along with a potential future trade that may be pursued (but not part of this 5-year Plan).

B. Water Quality Trade No. 1–WDNR-Approved North Drainage Basin Wet Detention Ponds

1. North Drainage Basin Wet Detention Basin Trading Description

The north drainage basin drains from northwest to the southeast through a grassed waterway, enters FWWPCC property, and drains east on the north end of two wet detention (sedimentation) ponds. Stormwater running in this ditch is captured by the Influent Flow Structure that includes a grit removal forebay to reduce heavier solids from entering the wet detention basins. The entering stormwater is then flow-metered and sampled, and a coagulant is added to the stormwater to enhance TP removal. The stormwater then flows through the two wet detention basins operating in series for settling of solids and removal of TP. The treated stormwater is then discharged into the Effluent Flow Structure where it is again flow-metered and sampled before discharging to a ditch which flows to the adjacent Piscasaw Creek.

2. Future South Drainage Basin Description/Trading Concept

The south basin also drains from the northwest to the southeast, crosses Chilson Road near the WPCF driveway, enters FWWPCC property and flows on the south side of the driveway in an open ditch to the east until it reaches Piscasaw Creek. This ditch also receives treated WPCF effluent and conveys it to Piscasaw Creek.

The south basin water quality trading concept generally involves identification of the annual TP load that will runoff, directing this load into a new wet detention basin located on FWWPCC property, and discharging the treated stormwater back into the ditch where it will continue on to the Piscasaw Creek.

A small enclosure would be located near the south basin receiving box to house coagulant storage and chemical metering pumps to meter coagulant into the stormwater for enhanced TP removal. An asphalt driveway would be necessary for accessing the new enclosure. Additional site improvement costs are included with the new wet detention basin, including fencing, a structure to assist in periodic sludge removal, and other items.

The WPCF, portions of the north and south drainage basins, and the wet detention ponds are generally shown in Figure 2. Additionally, a supplemental surface water data viewer map showing the WPCF outfall and the north drain basin wet detention pond outfall to Piscasaw Creek is included in Appendix H.

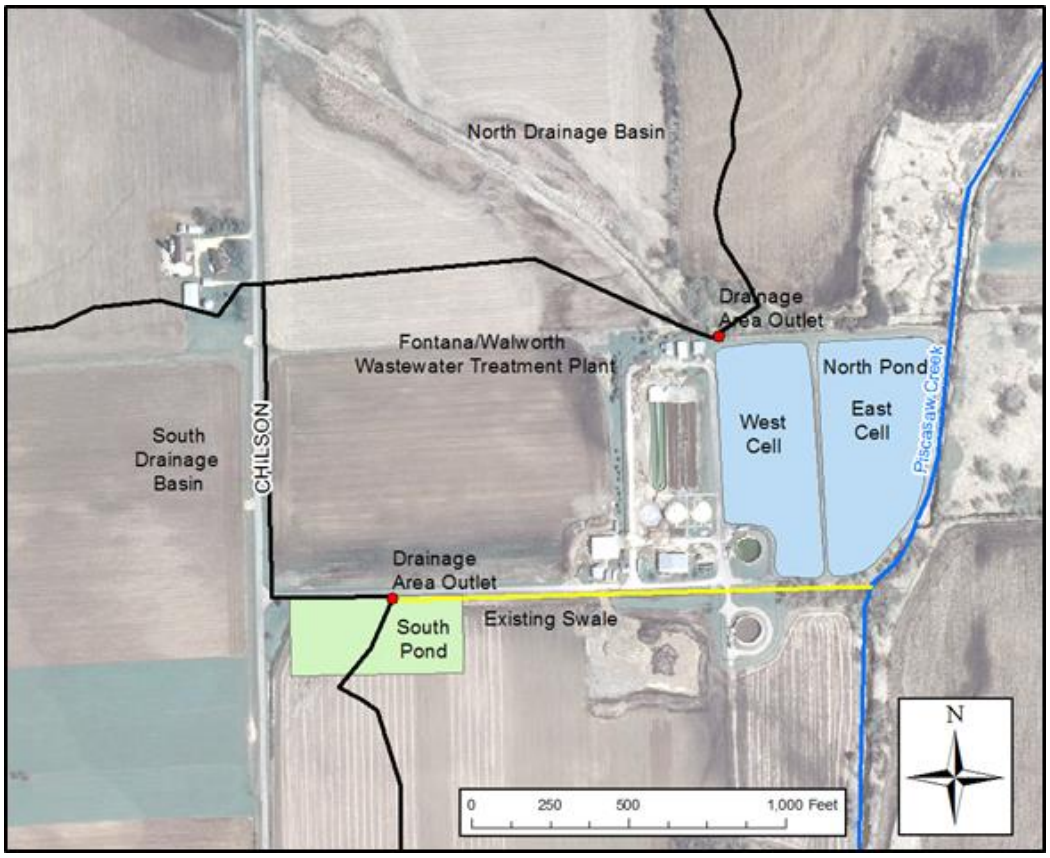


Figure 2 Location Map

3. Drainage Basin Modeling Approach Using SnapPlus and P8 Models for Wet Detention Ponds

A two-step modeling process was conducted, based on feedback from WDNR staff, to estimate the phosphorus removal potential of wet detention ponds used for stormwater treatment on FWWPCC land. The first step of the evaluation involved development of a SnapPlus model to calculate the approximate TP runoff from farm fields from both drainage basins based on local tillage, nutrient application, and cropping practices. The second step of the evaluation involved development of a P8 model to estimate the potential TP reduction achieved by routing the stormwater flow through the wet detention ponds for treatment.

The design details for both the north and south wet detention ponds are summarized in Table 3.

Drainage Basin	Pond	Permanent Storage Area (acres)	Temporary Storage Area (acres)	Bottom Area (acres)	Permanent Storage Volume (ac-ft)	Temporary Storage Volume (ac-ft)	Total Storage Volume (ac-ft)
North	East Cell	5.35	5.77	4.66	25.00	16.67	41.68
	West Cell	4.50	4.92	3.82	20.77	14.12	34.89
South	South	3.16	3.39	2.80	14.87	6.31	21.18

ac-ft=acre feet

Table 3 Conceptual Wet Detention Pond Design Details

Delineating the drainage basins was accomplished by analyzing available surface contours and hydrologic unit code-12 (HUC) information provided by the WDNR. The total areas were 917.3 acres and 528.7 acres for the north and south basins, respectively. For this Plan, the SnapPlus model was run for the north drainage basin only, which calculated the TP loading from the basin. Information required for SnapPlus includes field locations, crop rotations, fertilizer and other nutrient applications, downstream slope conditions, and background nutrient concentrations.

Land use values for the basins were taken from the Multi-Resolution Land Characteristics Consortium (MLRC) 2011 National Land Cover Database. This information was then manually enhanced to delineate roads, homesteads, farms, woodlands, and industrial areas. Specific farm fields were separated based on parcel boundaries, crop rotation differences from aerial photographs, and geographic obstacles such as roads and tree lines. SnapPlus uploaded the field spatial information and calculated soil type and slope. The fields were organized into four crop rotations: Corn–Soybeans, Corn–Soybeans–Alfalfa, Corn Silage–Alfalfa, and Tree Farm (north basin only). Figures included in Appendix A and Appendix B show the crop rotations for each basin. The specific crops chosen for each year in the rotations are shown in Table 4. SnapPlus requires 2 preceding years of obtaining steady-state conditions before it generates a TP load. The model simulated crop years from 2022 to 2029, which allowed for 5 years (2025, 2026, 2027, 2028, and 2029) of runoff information. A tree farm in the northeast section of the north drainage basin was originally modeled as corn grain because SnapPlus does not recognize commercial landscape tree production. Corn grain was chosen at that time because it most closely represents the heavy tillage and fertilizer application practices of the farm.

However, the tree farm was sold in late 2023, and the trees and shrubs began to be removed from the property. As a result of this land-use change, the WDNR decided the land should be modeled as a “blueberry” crop because the land activity most closely resembled that practice. During spring 2024, the new owner indicated it intends to continue clearing the tree farm, grinding stumps, and row crop the land beginning in spring 2025. Therefore, the tree farm property will be modeled as a corn-soybean rotation in 2025.

Rotation[1,2]	Crop Year							
	2022	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**
Corn–Soybeans	Soybeans 15- to 20-Inch Row	Corn Grain	Soybeans 15- to 20-Inch Row	Corn Grain	Soybeans 15- to 20-Inch Row	Corn Grain	Soybeans 15- to 20-Inch Row	Corn Grain
Corn–Soybeans–Alfalfa	Alfalfa	Alfalfa (grassy, 3 years or more)	Corn Grain	Soybeans 15- to 20-Inch Row	Alfalfa Seeding Spring	Alfalfa	Alfalfa	Alfalfa (grassy, 3 years or more)
Corn Silage–Alfalfa	Alfalfa Seeding Spring	Alfalfa	Alfalfa	Alfalfa (grassy, 3 years or more)	Corn Silage	Alfalfa Seeding Spring	Alfalfa	Alfalfa
Tree Farm	Blueberry	Blueberry	Blueberry	Soybeans 15- to 20-inch row	Corn Grain	Soybeans 15- to 20-inch row	Corn Grain	Soybean 15- to 20-inch row

[1]Initially consulted in 2018 with Susan Porter, Wisconsin Manure Management Advisory System
[2]Initially consulted in 2018 with Brian Smetana, Walworth County Agricultural Conservation

Table 4 Crop Rotations

The Wisconsin Soil Test Summary published background phosphorus and potassium levels of 53 and 134 parts per million (ppm), respectively. Manual nutrient applications (fertilizer, biosolids from the WPCF, manure) information was provided by the FWWPCC, as well as Susan Porter (Wisconsin Manure Management Advisory System) and Brian Smetana (Walworth County Agricultural Conservation). The two sources of supplemental nutrients applied within both basins are biosolids and manure. Several dairy operations applied manure to the fields via cow herds. The WPCF applies stabilized biosolids from the wastewater treatment process to fields in both basins. Figures included in Appendix A and Appendix B show the supplemental nutrient application areas for each basin. Crops were uniformly tilled throughout both basins with fall chisel, no disk, and spring cultivation being the major practices. The tillage and fertilizer application practices for each crop are summarized in Table 5.

Crop	Tillage Practice	Fertilizer
Alfalfa	None	None
Alfalfa (grassy, 3 years or more)	None	None
Alfalfa Seeding Spring	Fall chisel, no disk	None
Corn Grain	Spring cultivation	28%/32% UAN
Corn Silage	Spring cultivation	28%/32% UAN
Soybeans 15-20 inch row	Fall chisel, no disk	None

UAN=urea ammonium nitrate

Table 5 Farming Practices for Each Crop

The SnapPlus phosphorus trading reports for the north and south basins are included in Appendix A and Appendix B, respectively. The 5-year average annual TP loading (2025 through 2029) was 4,489 pounds for the north drainage basin and 1,100 pounds for the south drainage

basin. This phosphorus was assumed to originate from only the farm fields. Other land uses such as roads, homesteads, and woodlands were modeled separately in P8 while draining into the same ponds.

As with SnapPlus, two P8 models were created, one for the north basin and the other for the south. Climate and particle data for both P8 models included daily mean temperature, hourly rainfall depths, and particle size distributions, respectively. Predetermined climate data sets were programmed in the model instead of new ones to reduce build time. Climate data for Madison, Wisconsin, was used for both basins with an average year specified by the WDNR. Each model had two watersheds, one for the farm fields with SnapPlus TP loading and the other for extraneous land uses such as roads and homesteads. The P8 phosphorus outflow for the farm watersheds for both basins was calibrated to the SnapPlus output via a pollutant scaling factor. Phosphorus runoff from the nonfarm watershed was calculated in P8 using a curve number and area.

Detention ponds were modeled in P8 using the POND device option. Pond inputs included the permanent and temporary storage volumes and surface areas. The north pond system was two existing ponds modeled in series from the west cell to the east cell, which is then discharged to an existing drainage ditch that conveys to the Piscasaw Creek. The potential future south pond drains to an existing drainage ditch before flow enters the Piscasaw Creek. The pond was modeled as a trapezoidal swale using the SWALE function with 2:1 H:V side slopes, 4-foot bottom width, and a 0.035 Manning's constant. Infiltration for each device was disabled.

The use of a coagulant is planned to enhance TP removal within the wet detention basins to a higher removal rate than that what is predicted by the P8 model. Bench scale testing of stormwater samples dosed with ferric chloride was subsequently conducted by FWWPCC staff as described in the following section.

The P8 modeling output is included in Appendix I.

4. Bench Scale Testing of Coagulant Addition

The FWWPCC staff collected stormwater samples from the ditches in both drainage basins during an October 26, 2016, wet weather event. Figure 3 shows where the treated wastewater effluent mixes with the stormwater flowing in the ditch during the October 26, 2016, wet weather event. The wastewater effluent TSS on that day was less than 5 mg/L, while the stormwater exhibited a TSS concentration of approximately 2,000 mg/L.

Figure 3 Treated Wastewater Effluent Mixing with Stormwater

Bench scale testing was conducted by FWWPCC laboratory staff on both stormwater samples to predict the increase in TP removal efficiency that would result by dosing ferric chloride to the stormwater entering the wet detention basin.

The north drainage basin stormwater sample exhibited TP concentrations ranging from 1.0 to 4.0-mg/L TP. The high end of this range is similar to the TP concentration of raw wastewater. The TSS concentration of the stormwater was also tested and ranged from 395 to 1,406 mg/L. This stormwater was then dosed with 37 to 42 percent ferric chloride solution (0.25, 0.50, and 0.75 milliliters [mL]), mixed thoroughly, and allowed to settle for 180 minutes. A stormwater sample without any ferric chloride dose was also included in the test for comparative purposes. Samples of the supernatant in the test jar were collected at 0, 60, 120, and 180 minutes and analyzed for TP and TSS. In summary, it was generally observed the vast majority of TP and TSS removal occurred in the sample collected at 60 minutes. Additionally, the introduction of ferric chloride substantially enhanced the removal of both TP and TSS from the stormwater sample. After 60 minutes of settling, the stormwater sample without ferric chloride addition had removed 62.5 percent of the TP. In comparison, the stormwater sample dosed with 0.25 mL of ferric chloride removed 97.9 percent of TP after 60 minutes. Therefore, the addition of ferric chloride represents an approximate 57 percent improvement in TP removal when compared to the nondosed sample.

The south drainage basin stormwater sample exhibited TP concentrations ranging from 4.6 to 5.3 mg/L. These concentrations are actually higher than the TP concentrations in the raw wastewater received at FWWPCC. The TSS concentrations ranged from 1,660 to 2,056 mg/L.

This stormwater sample underwent the same testing procedure described above and exhibited more definitive trends. Similar to the north drainage basin stormwater, test results, the vast majority of the settling occurred at the 60-minute sample mark. The addition of ferric chloride once again substantially improved the TP removal. After 60 minutes of settling, the stormwater sample without ferric chloride addition had removed 70.0 percent of the TP. In comparison, the stormwater sample dosed with 0.25 mL of ferric chloride removed 96.7 percent of the TP. Therefore, the addition of ferric chloride represents an approximate 38 percent improvement in TP removal when compared to the nondosed sample.

A summary of the results of this bench scale testing is shown in Table 6. The entire bench scale testing data is shown graphically in Figures 4 through 7. The bench scale testing data is included in Appendix D.

North Drainage Stormwater Sample	
TP removal without ferric	62.5%
TP removal with ferric	97.9%
Increase in removal Efficiency	57%
South Drainage Stormwater Sample	
TP removal without ferric	70.0%
TP removal with ferric	96.7%
Increase in removal Efficiency	38%

Table 6 Bench Scale Testing Results

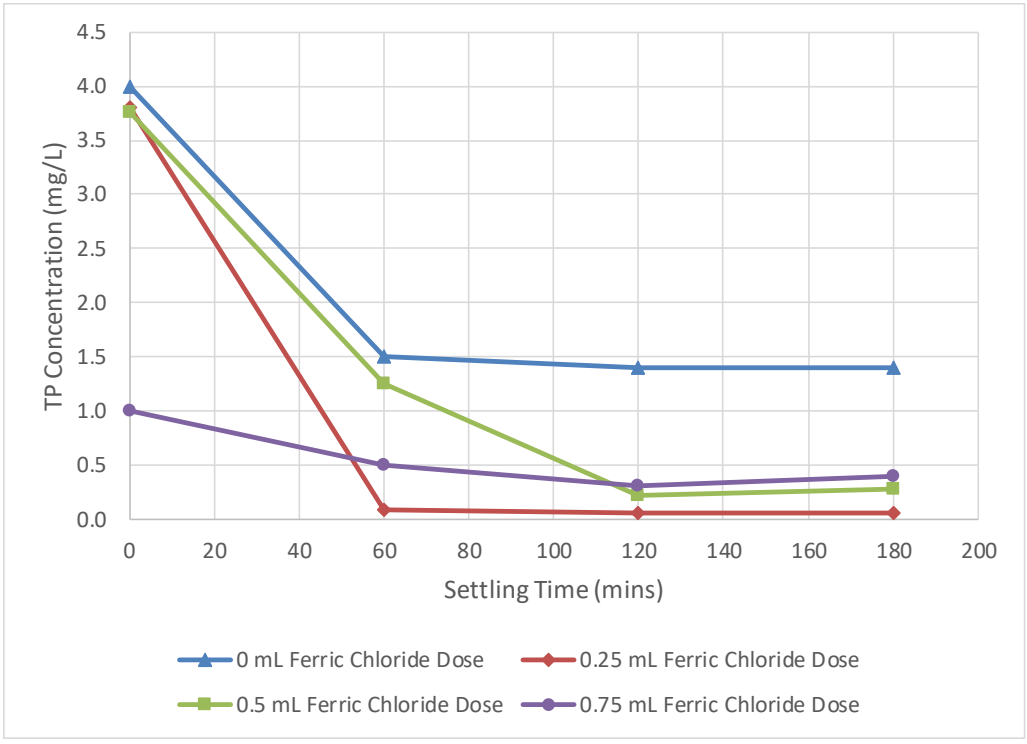


Figure 4 North Drainage Basin TP Settling Results

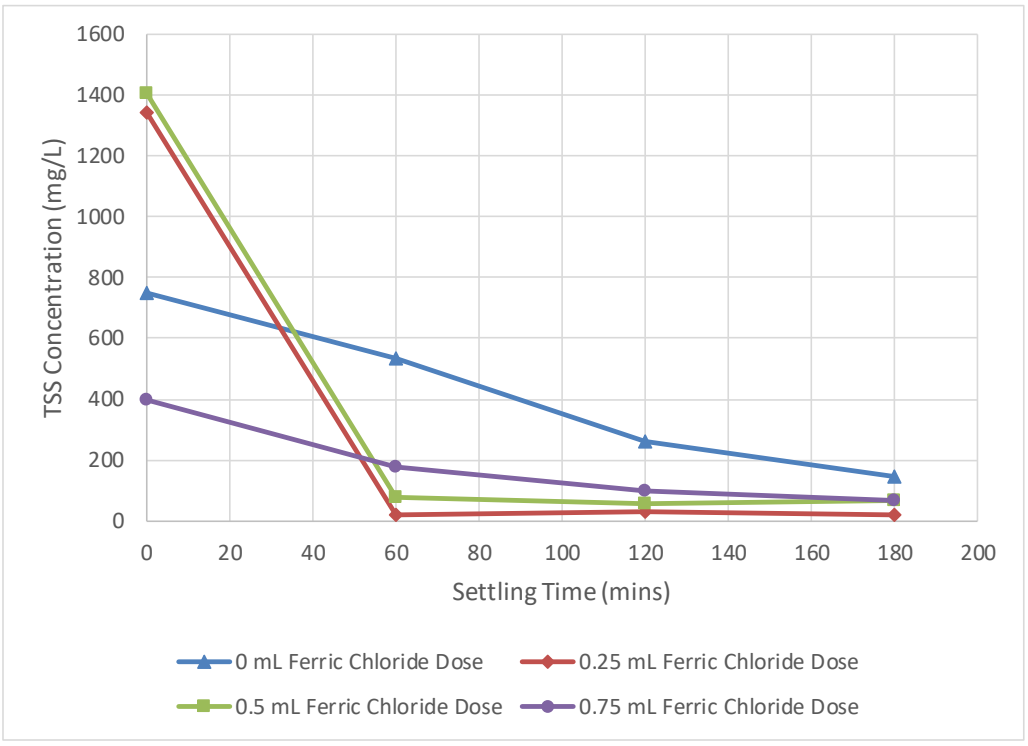


Figure 5 North Drainage Basin TSS Settling Results

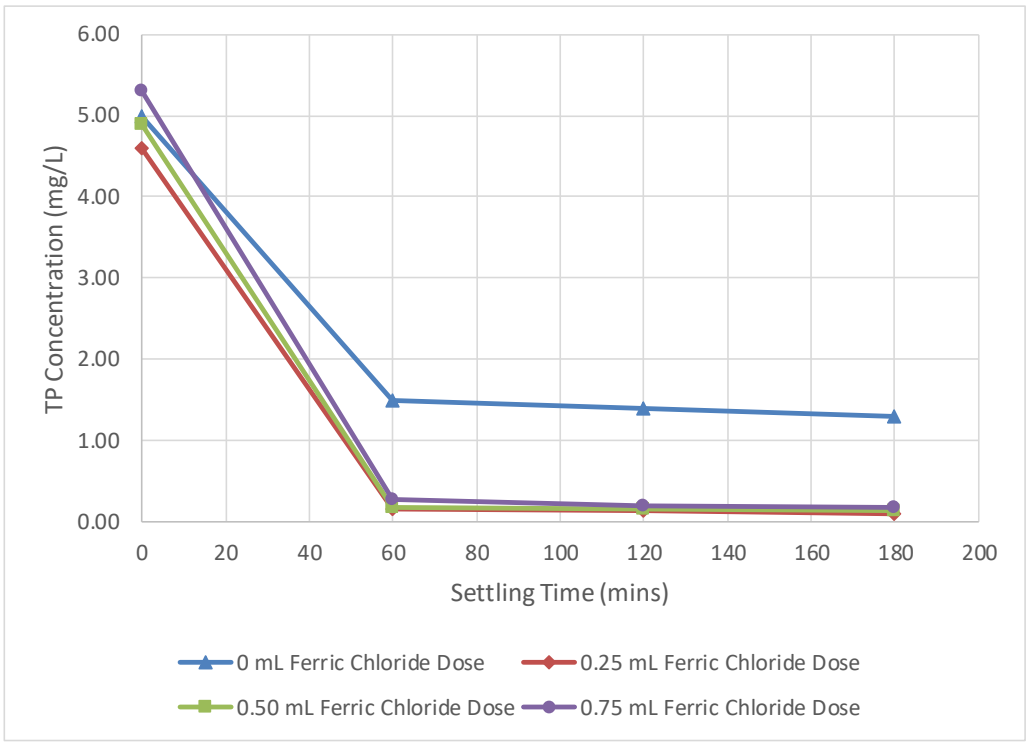


Figure 6 South Drainage Basin TP Settling Results

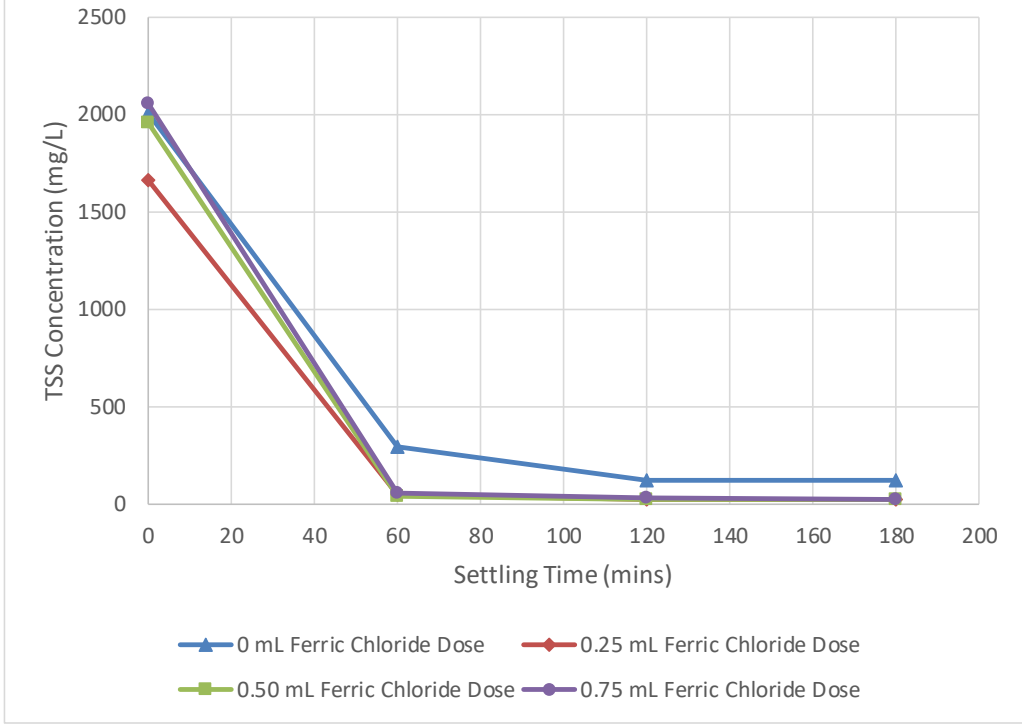


Figure 7 South Drainage Basin TSS Settling Results

C. Water Quality Trade No. 2–FWWPCC-Owned Farmland Modifications

1. FWWPCC-Owned Farmland Description/Trading Concept

The FWWPCC currently owns approximately 211 acres that includes the area occupied by the WPCF. The parcel information for the FWWPCC land is represented on a figure in Appendix C. Stabilized biosolids generated from the wastewater treatment process were applied to the FWWPCC farmland as a soil fertilizer until the year 2018. The FWWPCC farmland is leased to a local farmer who, at the time, grew row crops for silage until the year 2018, which are highly vulnerable to erosion. The total acreage currently farmed by the leasing farmer is 156 acres. Each field includes an identification number including 3-1N, 3-1S, 5-1A, 5-1B, 5-1C, 5-1D, 5-1E, 5-1F, 5-2W, 5-2E, and 6-3. Fields 6-1, 6-2, and 6-4 are no longer proposed to be included in this Plan since these fields are frequently determined by the leasing farmer to be too wet. The WQT concept involves restricting the leasing farmer to plant only an alfalfa rotation in lieu of the original row-cropping practices.

2. Modeling Approach Using SnapPlus for FWWPCC-Owned Farmland Modifications

The FWWPCC farmland was remodeled to determine the TP load reduction that would be generated by changing farming practices from the original row cropping practices to an alfalfa cover crop. Alfalfa is a 5-year rotational crop with one seeding year, three years of alfalfa, and

one corn silage year. A winter rye crop is planted in late summer, following the corn silage harvest. The winter rye is harvested for silage the following spring and alfalfa is again planted. The only tillage used for this rotation is when the fields are chisel plowed prior to planting the corn. Sludge is no longer applied to these fields. Liquid ammonia fertilizer was applied as needed to the corn to achieve the yield goal.

The SnapPlus program was first used to generate the TP load from the past row cropping practices. Information concerning soil tests, crop rotation practices, sludge applications, and field locations were supplied by FWWPCC. Soil tests for fields 3-1, 5-1, and 5-2 were performed by the UW Soil & Analysis Laboratory in 2011 and 2014 and by the Soil & Forage Analysis Laboratory in 2015. Soil tests for fields 6-1 through 6-4 were conducted in 2014 by the A&L Great Lakes Laboratories. Soil textures and field topographic information were determined using SnapMaps. The past rotation was exclusively corn silage, with chisel plowing, disking, and field cultivation before planting in the spring. Biosolids nutrient concentrations were averaged using the 2016 and 2017 sample results. Refer to the original 2018 WDNR-approved Plan for the assumed biosolids applications if the WQT had not been implemented (the baseline scenario). The leasing farmer uses supplemental liquid ammonia fertilizer to the farm fields he leases to match the University of Wisconsin (UW) recommendation.

The SnapPlus program was then used to generate the TP load based on the current farmland practice for the approved WQT (alfalfa rotation described above). Both filter strips and grassed waterways have been established and are reflected in the current SnapPlus modeling. The difference between these two SnapPlus modeling results (back in 2018) suggested that an estimated 1,049 lb/year of TP (based on a 5-year average before trade ratio is applied) is reduced by switching the FWWPCC farmland from the original row-crop practices to an alfalfa rotation. After WDNR-approval of the original 2018 Plan, the FWWPCC entered into a 10-year lease with a farmer to follow the farming practices identified in the Plan.

D. Trade Ratios

Trade Ratios are calculated using the following formula:

$$Trade\ Ratio = (Delivery + Downstream + Equivalency + Uncertainty - Habitat\ Adjustment): 1$$

Each factor is assigned a value based on the WDNR's *Guidance for Implementing Water Quality Trading in WPDES Permits* (Guidance). Because the WDNR-approved trades occur within the same HUC 12 watershed and the properties are upstream and adjacent to the WPCF effluent outfall, both delivery and downstream factors are zero. The Equivalency factor is assigned a value of zero for phosphorus trades, while the Uncertainty factor is assigned a value of 2.0 for a wet detention basin and a 3.0 for planting a cover crop according to Table 4 of the Guidance. Habitat Adjustment is assigned a value of zero since there are no known aquatic habitat restoration efforts for either trade. Therefore, the Trade Ratio for the wet detention basin trade and the cover crop trade is calculated as:

$$North\ Basin\ Wet\ Detention\ Pond\ Trade\ Ratio = (0 + 0 + 0 + 2 - 0): 1 = 2: 1$$

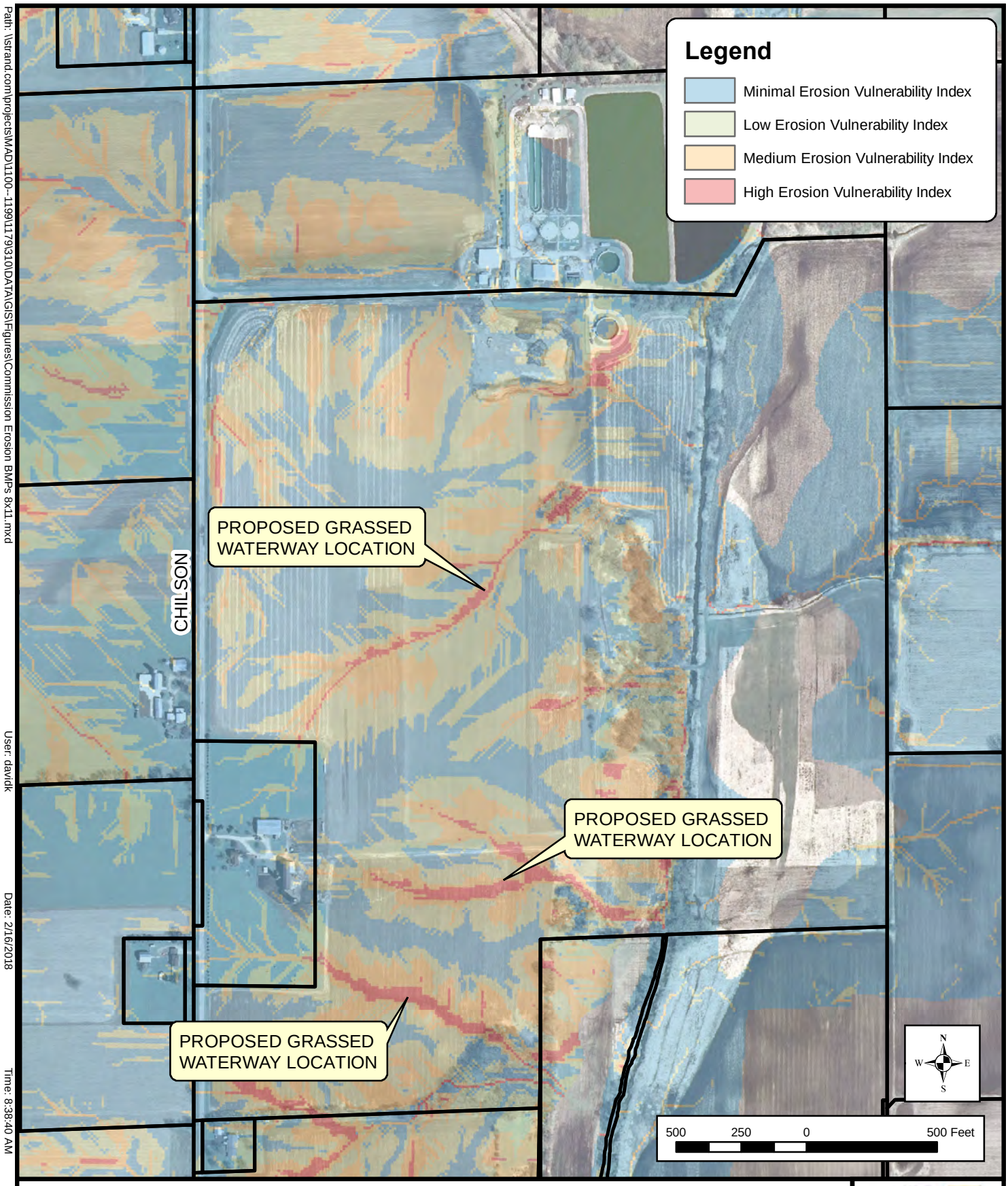
$$FWWPCC - Owned\ Farmland\ Modifications\ Trade\ Ratio = (0 + 0 + 0 + 3 - 0): 1 = 3: 1$$

Discussions with WDNR staff have suggested a lower uncertainty factor may be justified for wet detention ponds where a coagulant is applied to the influent during storm events to promote increased TP (and TSS) removal efficiency. Once a wet detention pond is established, sampling of the influent and treated effluent during storm events and subsequent calculation of removal efficiencies through the basin could be used in justifying a lower uncertainty factor of 1.5 or less. Unfortunately, since the infrastructure for the north drainage basin trade was completed in 2021, there has been minimal storm events realized at the FWWPCC that have allowed this data to be collected to justify a lower trade ratio than 2. Therefore, this Plan will assume a trade ratio of 2.

Additionally, according to the Guidance, an uncertainty factor of 2.0 or lower may be justified if filter strips and/or grassed waterways are used in support of and in compliance with NR 151.02 and NR 151.04, which require fields to have a soil erosion rate equal to, or less than, the tolerable soil erosion rate (T) for the soil and to have an average phosphorus index (PI) (in units of pound per acre per year [lb/ac/yr]) value of 6 or less and may not exceed an index of 12 in any given year. The WDNR Erosion Vulnerability Assessment for Agricultural Lands (EVAAL) was used during development of the prior 2018 Plan to determine the location of best management practices for FWWPCC-owned land as mandated by the WDNR. EVAAL is a python-based geographical information system (GIS) toolset which allows the user to find erosion prone areas. Three locations were found on the FWWPCC-owned land, each west of the Piscasaw Creek and south of the WPCF. These locations were verified by the FWWPCC as being high erosion risk. Figure 8 shows the originally recommended locations of these proposed waterways. Grassed waterways were subsequently established in these areas to reduce sediment loading into the creek in order to justify a more favorable trade ratio. These waterways were inspected by Walworth County's Brian Smetana during their establishment, and the inspection reports are included in Appendix J.

T is the tolerable soil loss in tons per acre per year (t/ac/yr). It is the maximum rate of soil loss that would permit an indefinite and economical agricultural use. Typical values are between 1 and 5. It is calculated independently for each soil type and the critical soil is used for the Annual Soil Loss Report. The annual soil loss is calculated by the Revised Universal Soil Loss Equation, Version 2 (RUSLE2) within the SnapPlus program. RUSLE2 is a Natural Resources Conservation Services (NRCS) and Agricultural Research Service (ARS) program that uses the field's location, slope, slope length, and critical soil type to calculate soil loss.

Soil erosion rates were modeled using SnapPlus. The tolerable soil loss for each of the FWWPCC-owned parcels that were modeled is 5. With the installation of the grassed waterways and filter strips, the average soil erosion rate over the full crop rotation (2024 through 2028) remains consistently below the tolerable soil erosion rate of 5 thereby satisfying NR 151.02. Soil erosion rates with grassed waterways and filter strips for the proposed alternating cover crop rotations during the permit term, are listed in Table 7.



Path: \\strand.com\projects\MAD\1100--1199\1179\310\DATA\GIS\Figures\Commission Erosion BMPs 8x11.mxd

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COMMISSION OWNED LAND

PROPOSED EROSION CONTROL BEST MANAGEMENT PRACTICES

STORMWATER MODELING FOR WATER QUALITY TRADING

FONTANA WALWORTH WATER POLLUTION CONTROL COMMISSION

WALWORTH COUNTY, WISCONSIN

STRAND ASSOCIATES®

FIGURE 8

1179.310

	Tolerable T (t/ac/yr)	Annual Soil Loss (t/ac/yr)							
		2022	2023	2024	2025	2026	2027	2028	2024 to 2028
Field	Crop	Alfalfa (grassy, 3 years or more)	Corn silage	Alfalfa Seeding Spring	Alfalfa	Alfalfa	Alfalfa (grassy, 3 years or more)	Corn silage	Average
3-1 N	**5**	0.3	5.2	2.8	1.8	1.8	1.1	6.0	**2.7**
3-1 S	**5**	0.3	2.7	1.9	1.6	1.6	1.0	3.1	**2.0**
5-1 A	**5**	0.3	3.2	2.3	1.9	1.9	1.2	3.7	**2.2**
5-1 B	**5**	0.4	4.0	2.8	2.4	2.4	1.5	4.7	**2.8**
5-1 C	**5**	0.3	3.2	2.2	1.9	1.9	1.2	3.7	**2.2**
5-1 D	**5**	0.1	1.8	1.0	0.6	0.6	0.4	2.0	**0.9**
5-1 E	**5**	0.2	3.9	2.1	1.3	1.3	0.8	4.4	**2.0**
5-1 F	**5**	0.3	6.4	3.4	2.2	2.2	1.3	7.3	**3.3**
5-2 E	**5**	0.3	5.1	2.7	1.8	1.7	1.1	5.8	**2.6**
5-2 W	**5**	0.2	3.7	2.0	1.3	1.3	0.8	4.3	**2.0**
6-3	**5**	0.1	0.5	0.4	0.3	0.3	0.2	0.6	**0.4**

Table 7 Annual Soil Loss on FWWPCC-Owned Land

Current average PI values for each field are consistently below 12 over a full crop rotation (for example, 5 years from 2024 to 2028). Additionally, no fields in individual years exceed 12. During the previous 2018 Plan modeling, Field 5-1F had shown exceedances of the 12 threshold during the corn silage years. Additionally, there are only two fields that exceed a PI value of 6 (Fields 5-1F and 5-2E during the corn silage years) in the current modeling. In comparison, during the previous 2018 Plan modeling, there were five fields which exceeded a PI value of 6 (Fields 3-1N, 5-1D, 5-1E, 5-1F, and 5-2E). Over the 2024 to 2028 Plan period, the combined properties will have an average total PI value between 1.1 to 5.2. Therefore, given this overall improvement of the PI values, it appears the fields currently meet the intent of the Wisconsin NR 151.04 requirement and as a result, a lower uncertainty value of 1.5 is justifiable for the FWWPCC-owned land trade. Total PI values are listed in Table 8.

Field	Total Phosphorus Index (Particulate and Soluble) (lb/ac/yr)							
	2022	2023	2024	2025	2026	2027	2028	2024 to 2028
Crop	Alfalfa (grassy, 3 years or more)	Corn silage	Alfalfa Seeding Spring	Alfalfa	Alfalfa	Alfalfa (grassy, 3 years or more)	Corn silage	Average
3-1 N	0.9	4.7	3.3	2.3	2.3	1.7	5.9	3.1
3-1 S	0.8	2.0	1.9	1.7	1.7	1.3	2.4	1.8
5-1 A	0.9	1.9	2.1	1.9	1.9	1.5	2.6	2.0
5-1 B	1.1	2.2	2.1	1.9	1.9	1.5	2.6	2.0
5-1 C	0.8	1.9	2.1	1.9	1.9	1.5	2.6	2.0
5-1 D	0.8	4.1	3.0	2.1	2.1	1.5	5.4	2.8
5-1 E	0.7	3.6	3.0	2.1	2.1	1.5	5.4	2.8
5-1 F	1.2	8.6	5.5	3.4	3.4	2.4	11.1	5.2
5-2 E	0.5	5.6	5.5	3.4	3.4	2.4	11.1	5.2
5-2 W	0.2	2.2	3.0	2.1	2.1	1.5	5.4	2.8
6-3	0.7	1.3	1.2	1.1	1.1	0.9	1.4	1.1

Table 8 Annual Phosphorus Index on FWWPCC-Owned Land

The FWWPCC-owned land has now established both grassed waterways and filter strips which have been inspected by Walworth County's Brian Smetana. The leasing farmer has a nutrient management plan for the FWWPCC-owned land (see Appendix J). The annual soil loss average for all FWWPCC-owned land is below the required threshold (see Table 7). The average PI for the FWWPCC-owned land is well below the required maximum average of 6 and none of the farm fields exceed a PI of 12 at any time (see Table 8). Finally, the soil phosphorus concentrations are stable over the time period shown (see Table 9). Based upon the above, Strand Associates, Inc.® (Strand) requested and the WDNR recognized a trade ratio of 1.5 for the FWWPCC-owned land trade (except Fields 3-1N and 3-1S), as summarized in Table 11.

Field	Acres	Average Soil Test P (ppm) 2011	2014	2015	2023 NMP
3-1 N	8.9	135	143	NA	
3-1 S	9.1	135	143	NA	
5-1 A	10.9	99	NA	126	
5-1 B	13.7	103	NA	161	
5-1 C	10.8	80	NA	118	
5-1 D	6.0	111	NA	142	
5-1 E	13.0	121	NA	121	
5-1 F	10.9	118	NA	156	
5-2 E	8.7	66	NA	60	
5-2 W	12.6	75	NA	57	
6-3	4.1	NA	72	NA	
Weighted Average	——	109	130	118	120

NMP=Nutrient Management Plan

Table 9 Soil Phosphorus Concentrations

E. WQT Modeling Results/Credit Generation Calculations

Based on the WQT modeling results, the FWWPCC can generate a substantial portion of the 3,200 to 4,100 lb/year of phosphorus credits by continuing the north drainage basin wet detention pond and FWWPCC-owned land modifications trades. The south drainage basin wet detention pond could potentially be implemented as a future trade if necessary.

The modeling results for the North Drainage Basin wet detention pond and the FWWPCC-owned land modifications trades are presented separately in Table 10 and Table 11 at the currently identified trade ratios of 2.0 and 2.0/1.5, respectively. Additionally, Tables 11A and 11B have been added to this Plan to differentiate between the fields having a DNR-approved trade ratio of 2.0 (Fields 3-1N and 3-1S) and the remaining fields which have a trade ratio of 1.5. The annual credits vary each year because of the differences in biosolid applications, tillage practices, and specific crops in any given year.

FWWPCC-owned fields 6-1, 6-2, and 6-4 are not currently included in the Plan. The only FWWPCC-owned field known to have drain tiles is Field 6-1.

Because of a change in ownership, the tree farm within the north drainage basin is modeled in this Plan (2024) as a blueberry crop as this practice most closely models the current use of the tree farm and its farming practice. However, the new owner plans to clear the remaining trees and shrubs in 2024 and begin a corn-soybean rotation in 2025. This change of land use is reflected in the SnapPlus modeling.

Table 10 shows the P8 results for each year. The model included both agricultural loading from SnapPlus and nonfarm loading from the homesteads and roadways in the north drainage basin. The model showed a 47.5 percent reduction for each year.

Year	2024	2025	2026	2027	2028	2029
Acres Modeled	822	822	822	822	822	822
Baseline Agricultural Load (lb/year)	3,597	5,494	3,525	5,114	3,334	4,979
Baseline Nonfarm Load (lb/year)	198	198	198	198	198	198
Total Baseline Load (lb/year)	3,795	5,692	3,723	5,312	3,532	5,177
Non-Removed Load (lb/year)	1,992	2,988	1,955	2,789	1,854	2,718
Reduction in Ponds (lb/year)	1,803	2,704	1,768	2,523	1,678	2,459
Enhanced Reduction*	2,831	4,245	2,776	3,961	2,634	3,861
Trade Ratio	2.0	2.0	2.0	2.0	2.0	2.0
Credits Generated (lb/year)	1,416	2,123	1,388	1,981	1,317	1,930
Avg Credit (lb/year) (2025 to 2029)	1,748	1,748	1,748	1,748	1,748	1,748

Table 10 North Drainage Basin Wet Detention Pond WQT Credits Generated with a 2.0 Trade Ratio

Year	2024	2025	2026	2027	2028	2029
Baseline Crop	**Corn Silage**	**Corn Silage**	**Corn Silage**	**Corn Silage**	**Corn Silage**	**Corn Silage**
Predicted Crop	Alfalfa Seeding (spring)	Alfalfa	Alfalfa	Alfalfa (grassy, 3 years or more)	Corn Silage	Alfalfa Seeding (spring)
Acres Modeled	109	109	109	109	109	109
Baseline load[1] (lb/year)	1,231	1,270	1,305	1,349	1,384	1,430
Predicted Load[1] (lb/year)	278	208	207	155	446	284
Reduction[1] (lb/year)	953	1,062	1,098	1,194	938	1,146
Trade Ratio[1]	1.5 or 2.0	1.5 or 2.0	1.5 or 2.0	1.5 or 2.0	1.5 or 2.0	1.5 or 2.0
Credits Generated[1] (lb/yr)	602	667	692	750	588	718
Avg Credit[1] (lb/year) (2025 to 2029)	683	683	683	683	683	683

[1]See Tables 11A and 11B for additional supporting data.

Table 11 FWWPCC-Owned Land Modifications WQT Credits Generated with a 1.5 or 2.0 Trade Ratio

Year	2024	2025	2026	2027	2028	2029
Field 3-1N	124	138	134	149	144	160
Field 3-1S	127	141	137	152	148	164
Total Pre-Trade Baseline Phosphorus Load (lb/year)	251	279	271	301	292	324
Field 3-1N	29	20	20	15	52	30
Field 3-1S	17	15	15	12	22	17
Total Post-Trade Phosphorus Load (lb/year)	46	35	35	27	74	47
Reduction (lb/year)	205	244	236	274	218	277
Trade Ratio	2.0	2.0	2.0	2.0	2.0	2.0
Credits Generated (lb/year)	103	122	118	137	109	139
Average Credit (lb/year) (2025 to 2029)	125	125	125	125	125	125

Table 11A FWWPCC-Owned Land Modifications WQT Credits Generated for Fields 3-1N and 3-1S with a 2.0 Trade Ratio

Year	2024	2025	2026	2027	2028	2029
Field 5-1A	131	129	138	135	144	141
Field 5-1B	176	173	184	181	192	189
Field 5-1C	131	129	138	135	144	142
Field 5-1D	70	69	73	72	76	75
Field 5-1E	136	133	142	140	149	146
Field 5-1F	143	141	149	147	156	153
Field 5-2E	82	93	90	102	99	112
Field 5-2W	94	108	104	120	116	132
Field 6-3	17	17	16	16	16	16
Total Pre-Trade Baseline Phosphorus Load (lb/year)	980	992	1034	1,048	1,092	1,106
Field 5-1A	21	18	18	14	26	21
Field 5-1B	26	23	23	17	33	26
Field 5-1C	20	18	18	14	26	21
Field 5-1D	18	13	12	9	32	18
Field 5-1E	39	27	27	20	70	40
Field 5-1F	36	25	25	18	64	36
Field 5-2E	29	20	20	15	51	29
Field 5-2W	38	26	26	19	67	39
Field 6-3	4	4	4	3	4	8
Total Post-Trade Phosphorus Load (lb/year)	231	174	173	129	373	238
Reduction (lb/year)	749	818	861	919	719	868
Trade Ratio	1.5	1.5	1.5	1.5	1.5	1.5
Credits Generated (lb/year)	499	545	574	613	479	579
Average Credit (lb/year) (2025 to 2029)	558	558	558	558	558	558

Table 11B FWWPCC-Owned Land Modifications WQT Credits Generated for Fields with a 1.5 Trade Ratio

The modeling results indicate a combined average of 2,431 lb/year of phosphorus credits will be generated over the 5-year permit modeling period (2025 to 2029) from the north drainage basin wet detention pond and the FWWPCC-owned farmland modifications at the prescribed trade ratios. Since these credits do not account for total desired credits of 3,200 to 4,100 lb/year, the FWWPCC will remove the additional necessary credits by adding more coagulant with the existing CPR system. The amount of additional credits necessary to be removed in any given year with the CPR system would depend on the average annual flow rate. For example, at the annual average 2021 flow rate of 1.12 MGD, the targeted average effluent TP concentration for the CPR system would be 0.74 mg/L. The average effluent TP target concentration gets even more stringent as the effluent flow rate increases and would need to be 0.59 mg/L at an annual average flow of 1.44 MGD which was the highest annual average flow rate of the last 5 years (2019 through partial year 2023). The most stringent effluent TP target concentration at the current WPCF Average Design Flow of 1.77 MGD would be 0.50 mg/L. These new effluent TP target concentrations are presented in Table 12 as a guide for the FWWPCC operations staff.

Year Range	2025 to 2029
Average Commission Land Credits (lb/year)	683
Average North Drainage Basin Credits (lb/year)	1,748
Total Credits (lb/year)	2,431
Necessary Credits at 1.12 MGD (lb/year)	3,154
Resulting TP Target Concentration (mg/L)	**0.79**
Necessary Credits at 1.44 MGD (lb/year)	4,055
Resulting TP Target Concentration (mg/L)	**0.63**
Necessary Credits at 1.77 MGD (lb/year)	4,984
Resulting TP Target Concentration (mg/L)	**0.53**

Table 12 Summary of WQT Annual Credits Generated and Resulting TP Effluent Target Concentrations

A full-scale CPR pilot study was conducted from January to April 2013 by the FWWPCC staff to determine the lowest TP concentration that could be achieved by adding more coagulant with the existing CPR system. The effluent TP concentrations during the pilot test are shown in Figure 9. This pilot test indicated that a 0.4 to 0.5 mg/L effluent target TP concentration could be consistently achieved by the WPCF with the existing CPR system. The results of this 4-month pilot test were confirmed over the current 5-year permit term (2019 through partial year 2023) as the annual average effluent TP concentration has ranged from 0.46 to 0.58 mg/L and the FWWPCC has consistently met its effluent TP limit.

The WPCF could experience a period of sludge bulking which can cause higher than normal TSS concentrations in the final effluent and correspondingly higher TP concentrations. Therefore, the strategy will be to avoid having to meet an effluent target concentration more stringent than 0.5 mg/L as flows at the WPCF increase over time. A lower trade ratio for the current north drainage basin trade will be pursued if future data collection supports this request. Additionally, new trades will be screened to increase phosphorus credits and keep the target concentration attainable, including the potential south drainage basin trade generally described in this Plan.

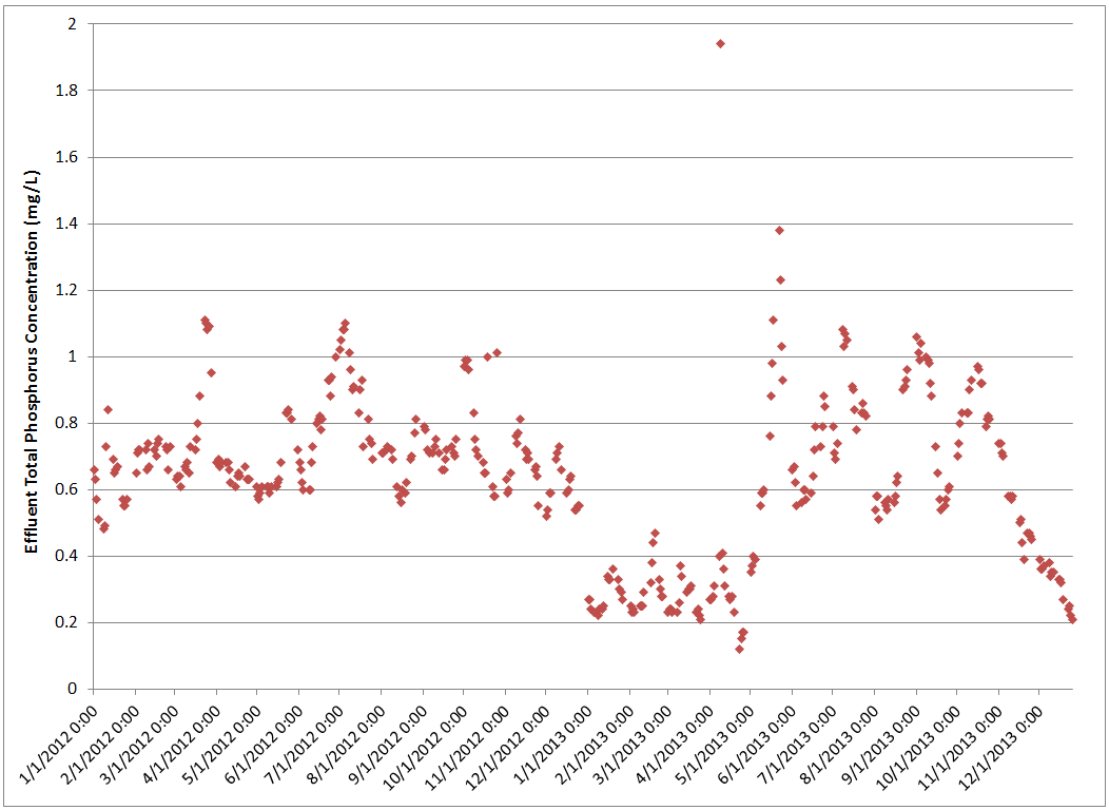


Figure 9 Effluent TP Concentration for 2012 and 2013 During Chemical Phosphorus Removal Pilot Testing

F. History of Compliance and Credit Usage

The FWWPCC annual average effluent flow during the current WPDES permit term from January 1, 2019, through partial year in 2023) has ranged from 1.12 to 1.44 MGD. The annual average effluent TP discharged over the same timeframe ranged from 0.46 to 0.58 mg/L. The FWWPCC has consistently been in compliance with the effluent TP limits during the current WPDES permit term as documented in the annual WQT reports submitted to the WDNR. Figures have been added showing data from 2012 through 2023 for effluent TP concentrations (Figure 10), effluent flow rate (Figure 11), and effluent TP mass (Figure 12).

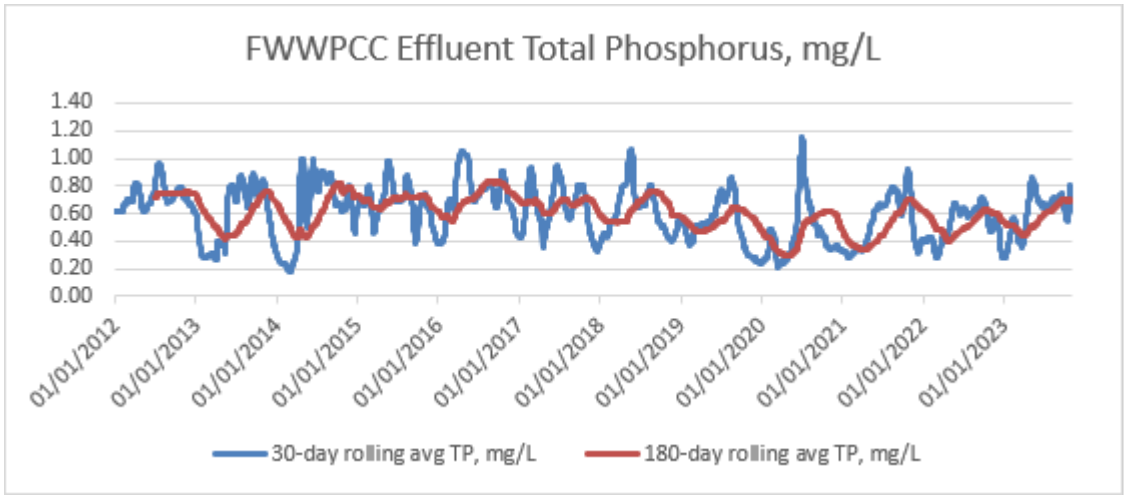


Figure 10 Effluent TP Concentrations from 2012 to 2023

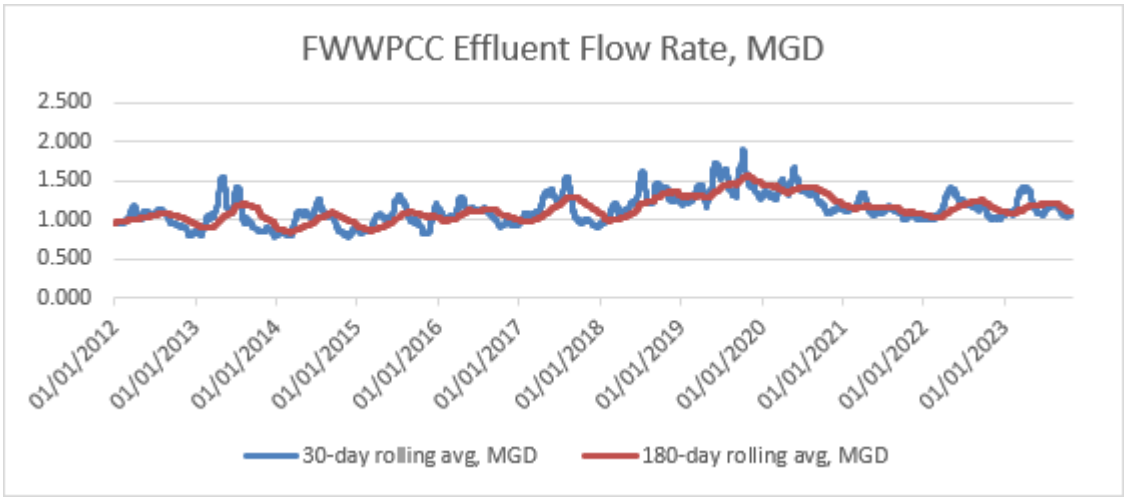


Figure 11 Effluent Flow Rate from 2012 to 2023

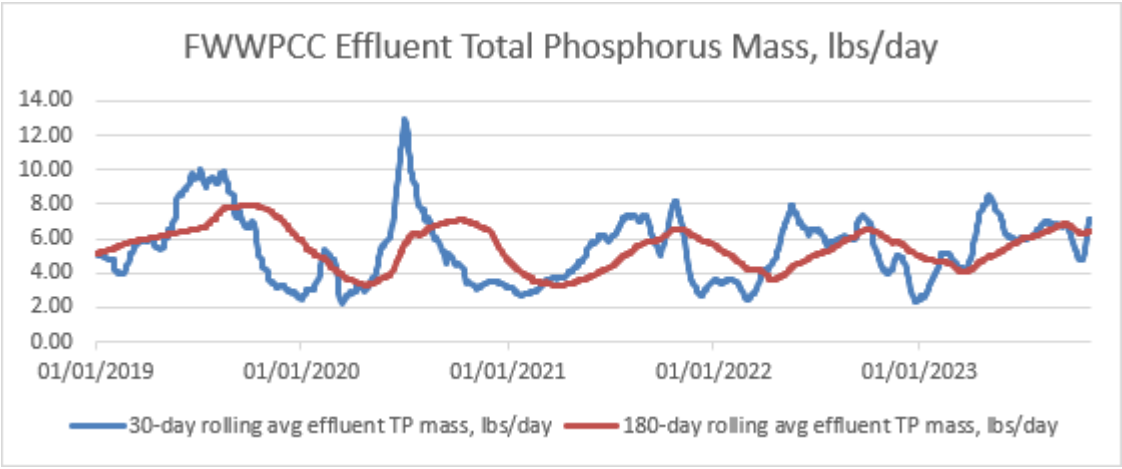


Figure 12 Effluent TP Mass from 2012 to 2023

G. Operation and Maintenance (O&M)

The FWWPCC is responsible for O&M of the north drainage basin wet detention ponds and structures located on FWWPCC-owned land in accordance with the NRCS Code 350. The FWWPCC has the ability to apply ferric chloride to enhance the removal of TP and TSS from the stormflow and settle the solids within the wet detention basin. Because the models used in predicting the TP removal within the detention basin cannot account for an enhanced removal realized with the addition of a coagulant, the FWWPCC intends to monitor the stormwater entering the wet detention basin and the treated effluent exiting the basin in order to justify an uncertainty value (trade ratio) less than 2.0 as indicated in Appendix H of the June 2020 *Guidance for Implementing Water Quality Trading in WPDES Permits*.

The leasing farmer signed a 10-year lease with the FWWPCC to implement the original June 2018 WQT plan for the FWWPCC-owned farmland. The leasing farmer is responsible for authoring and implementing a NMP in accordance with NRCS 590 and maintaining the three grassed waterways and filter strips on FWWPCC-owned land, in accordance with NRCS Code 412. The leasing farmer is responsible for establishing an alfalfa crop rotation on the FWWPCC-owned farmland in accordance with NRCS 340. The grassed waterways and alfalfa were inspected at regular intervals by Walworth County's Brian Smetana and brief inspection reports are included in Appendix J.

The FWWPCC will continue to arrange for an annual inspection by a third party selected by the FWWPCC that has applicable knowledge and is licensed or certified to practice in Wisconsin, or is otherwise accepted by WDNR to verify proper installation, and O&M. The inspector will inspect the fields generating the TP credits to confirm proper maintenance of the grassed waterways. The inspector will take note of ecological health of plantings, confirm that the filter strips remain in compliance with appropriate standards, and identify potential problems, such as erosion. The FWWPCC (or the leasing farmer) will be responsible for correcting any problems, in accordance with NRCS standards and the trade agreement. Inspection reports will be included in future Annual Water Quality Trading Reports.

H. Inspections and Reporting

A new 5- to 10-year lease will be drafted when the current 10-year lease expires in 2028. The future lease will continue to include the necessary language to constitute a Water Quality Trading Agreement between the FWWPCC and the leasing farmer. The leasing farmer will be responsible for establishing the alfalfa cover crop in accordance with NRCS 340.

Strand understands that since a Registration Form 3400-207 for Water Quality Trading Management Practice Registration was already submitted during the previous WQT plan for both the FWWPCC-owned farmland modifications trade as well as the north drainage basin wet detention pond trade, that a new form does not need to be completed.

Each month, the FWWPCC will certify that each trade is being operated and maintained according to the Plan or provide a statement noting noncompliance with the plan. This certification of compliance will be included as a comment in the monthly discharge monitoring report:

> *I certify that management practices identified in the approved water quality trading plan as the source of pollutant reduction credits are installed, established, and properly maintained.*

The FWWPCC will submit an *Annual Water Quality Treatment Report* to the WDNR by January 31 of each year of the permit term. This report will reference the approved Plan and include the number of TP credits (lb/month) used each month of the previous year to demonstrate compliance, O&M inspection reports from the past year, and identification of noncompliance or failure to implement any terms or conditions of WPDES permit WI-0036021-07-0 with respect to WQT that have not been reported in discharge monitoring reports.

In the event the phosphorus reduction credits used or intended for use by the FWWPCC are not being generated as defined in the approved Plan, the FWWPCC will initially notify the WDNR within 24 hours of discovery and will provide a written report to the WDNR within five days. The written report will include the reason the credits are not being generated, a timeline to correct the situation, and an assessment as to whether the existing CPR system could be used to generate the necessary credits in the interim period.

Any duly authorized officer, employee, or representative of the WDNR shall have the right to access and inspect the FWWPCC as per Wis. Stat. 283.55(2) as long as the approved Water Quality Trading Plan remains in effect.

CONCLUSIONS, RECOMMENDATIONS, AND TIMELINE

The FWWPCC intends to continue the WQT described within this report. Although the WQT options described will not generate all of the necessary phosphorus credits, the resulting more stringent WPCF effluent target TP concentration that would result is typically achievable at the FWWPCC with the existing CPR system. The WQT phosphorus credits will continue to be generated starting in 2024 based on the modeling contained within this report and the following schedule.

1. July 2023–FWWPCC applies for WPDES permit reissuance.

2. January 1, 2024–Begin generating TP credits as Identified in this Plan.

3. Third Quarter 2024–Receive new WPDES permit which recognizes the following schedule.

4. May 30, 2024–FWWPCC arranges for third party inspection of grassed waterways and established crop in accordance with this Plan.

5. January 31, 2025–Commission prepares and submits annual WQT Report No. 1. Leasing farmer updates NMP as necessary.

6. May 30, 2025–Commission arranges for third party inspection of grassed waterways and established crop in accordance with this Plan.

7. January 31, 2026–Commission prepares and submits Annual WQT Report No. 2. Leasing farmer updates NMP as necessary.

8. May 30, 2026–Commission arranges for third party inspection of grassed waterways and established crop in accordance with this Plan.

9. January 31, 2027–Commission prepares and submits annual WQT Report No. 3. Leasing farmer updates NMP as necessary.

10. May 30, 2027–Commission arranges for third party inspection of grassed waterways and established crop in accordance with this Plan.

11. January 31, 2028–Commission prepares and submits annual WQT Report No. 4. Leasing farmer updates NMP as necessary.

12. May 30, 2028–Commission arranges for third party inspection of grassed waterways and established crop in accordance with this Plan.

13. January 31, 2029–Commission prepares and submits the annual WQT Report No. 5. Leasing farmer updates NMP as necessary.

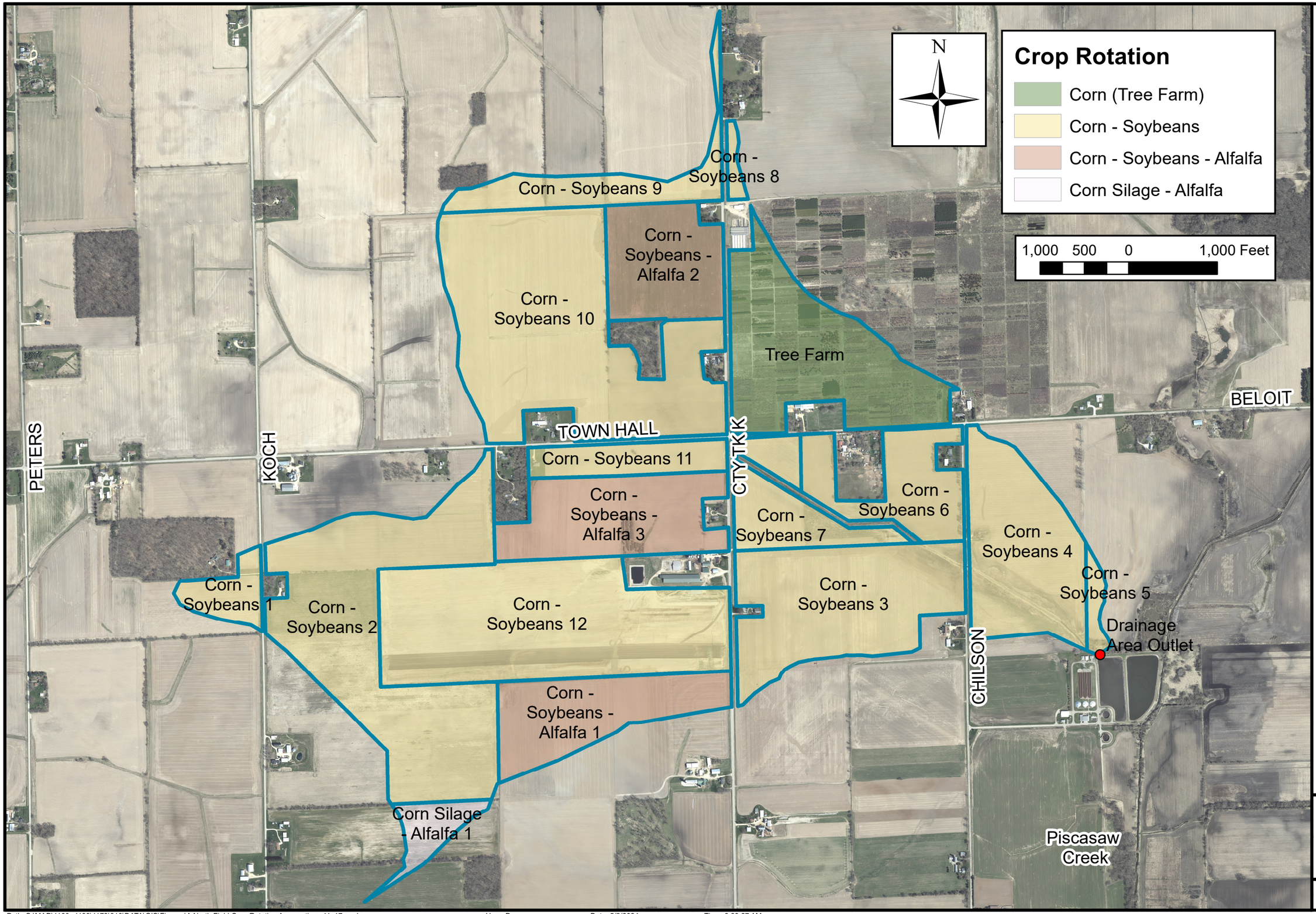
14. May 30, 2029–Commission arranges for a third-party inspection of grassed waterways and established crop, in accordance with this Plan.

15. June 30, 2029–Prepare a revised WQT plan for the next permit term (2029 to 2033). Analyze wet detention basin monitoring data for removal efficiency of TP and TSS. Submit a request for a lower trade ratio for the wet detention basin trade as applicable. Continue to evaluate the potential for lower trade ratios or need for additional credits as the FWWPCF flows and loads increase.

16. June 30, 2029–FWWPCC Prepares a new 5- to 10-year lease (beginning on January 1, 2029) containing the necessary language to constitute a WQT Agreement between the FWWPCC and the leasing farmer for the Commission-owned land trade. Review lease language with leasing farmer. Submit to the WDNR for review/approval.

17. June 30, 2029–FWWPCC prepares a new WPDES permit application.

APPENDIX A
NORTH DRAINAGE BASIN FIGURES AND SNAPPLUS MODELING OUTPUT



CROP ROTATION ASSUMPTIONS

STORMWATER MODELING FOR WATER QUALITY TRADING
FONTANA WALWORTH WATER POLLUTION CONTROL COMMISSION
WALWORTH COUNTY, WISCONSIN

STRAND ASSOCIATES®

FIGURE A1

Path: S:\MAD\1100--1199\1179\310\DATA\GIS\Figures\A North Field Crop Rotation Assumptions 11x17.mxd User: Danc Date: 5/9/2024 Time: 9:29:27 AM

N

Supplementary Nutrient Application

- Biosolid
- Manure
- None

1,000 500 0 1,000 Feet

Corn - Soybeans 9

Corn - Soybeans 8

Corn - Soybeans - Alfalfa 2

Corn - Soybeans 10

Tree Farm

TOWN HALL

Corn - Soybeans 11

Corn - Soybeans - Alfalfa 3

Corn - Soybeans 7

Corn - Soybeans 6

Corn - Soybeans 4

Corn - Soybeans 5

Corn - Soybeans 1

Corn - Soybeans 2

Corn - Soybeans 12

Corn - Soybeans 3

Drainage Area Outlet

Corn - Soybeans - Alfalfa 1

Corn Silage - Alfalfa 1

Piscasaw Creek

PETERS

KOCH

CTY TKK

CHILSON

BELOIT

SUPPLEMENTARY NUTRIENT APPLICATION ASSUMPTIONS

STORMWATER MODELING FOR WATER QUALITY TRADING
FONTANA WALWORTH WATER POLLUTION CONTROL COMMISSION
WALWORTH COUNTY, WISCONSIN

STRAND ASSOCIATES®

FIGURE A2

NM1: Narrative and Crops Report

Starting Year	**2022**
Reported For	**Fontana/Walworth North Drainage Basin**
Printed	**2024-05-07**
Plan Completion/Update Date:	**2014-06-12**
SnapPlus Version 20.4 built on 2021-06-03	
C:\Users\randyl\Desktop\Fontana\North Drainage Area.snapDb	

Prepared for:
Fontana/Walworth North Drainage Basin
attn:Fontana/Walworth
N840 Chilson Road
Walworth, 53184

Farm has 17 fields totalling 822.2 cropped acres.
Farm Narrative: None

Annual Farm Notes:

No Annual Farm Notes

Spreader Calibration Methods: No spreader calibration rate documentation has been selected.

Narrative and Crops:

Field Name	Field Acres	2022	2023	2024	2025	2026	2027	2028	2029
Corn - Soybeans - Alfalfa 1	42.3	Alfalfa None 0-0 ton/acre	Alfalfa (grassy, yr 3+) None 0-0 ton/acre	Corn grain Spring Cultivation 71-90 bu/acre	Soybeans 15-20 inch row Fall Chisel, no disk 15-25 bu/acre	Alfalfa Seeding Spring Spring Cultivation 0-0 ton/acre	Alfalfa None 0-0 ton/acre	Alfalfa None 0-0 ton/acre	Alfalfa (grassy, yr 3+) None 0-0 ton/acre
Corn - Soybeans - Alfalfa 2	38.2	Alfalfa None 0-0 ton/acre	Alfalfa (grassy, yr 3+) None 0-0 ton/acre	Corn grain Spring Cultivation 71-90 bu/acre	Soybeans 15-20 inch row Fall Chisel, no disk 15-25 bu/acre	Alfalfa Seeding Spring Spring Cultivation 0-0 ton/acre	Alfalfa None 0-0 ton/acre	Alfalfa None 0-0 ton/acre	Alfalfa (grassy, yr 3+) None 0-0 ton/acre
Corn - Soybeans - Alfalfa 3	48.5	Alfalfa None 0-0 ton/acre	Alfalfa (grassy, yr 3+) None 0-0 ton/acre	Corn grain Spring Cultivation 71-90 bu/acre	Soybeans 15-20 inch row Fall Chisel, no disk 15-25 bu/acre	Alfalfa Seeding Spring Spring Cultivation 0-0 ton/acre	Alfalfa None 0-0 ton/acre	Alfalfa None 0-0 ton/acre	Alfalfa (grassy, yr 3+) None 0-0 ton/acre

Field Name	Field Acres	2022	2023	2024	2025	2026	2027	2028	2029
Corn - Soybeans 1	11.6	Soybeans 15-20 inch row Fall Chisel, no disk 15-25 bu/acre	Corn grain Spring Cultivation 71-90 bu/acre	Soybeans 15-20 inch row Fall Chisel, no disk 15-25 bu/acre	Corn grain Spring Cultivation 71-90 bu/acre	Soybeans 15-20 inch row Fall Chisel, no disk 15-25 bu/acre	Corn grain Spring Cultivation 71-90 bu/acre	Soybeans 15-20 inch row Fall Chisel, no disk 15-25 bu/acre	Corn grain Spring Cultivation 71-90 bu/acre
Corn - Soybeans 10	130	Soybeans 15-20 inch row Fall Chisel, no disk 15-25 bu/acre	Corn grain Spring Cultivation 71-90 bu/acre	Soybeans 15-20 inch row Fall Chisel, no disk 15-25 bu/acre	Corn grain Spring Cultivation 71-90 bu/acre	Soybeans 15-20 inch row Fall Chisel, no disk 15-25 bu/acre	Corn grain Spring Cultivation 71-90 bu/acre	Soybeans 15-20 inch row Fall Chisel, no disk 15-25 bu/acre	Corn grain Spring Cultivation 71-90 bu/acre
Corn - Soybeans 11	18.5	Soybeans 15-20 inch row Fall Chisel, no disk 15-25 bu/acre	Corn grain Spring Cultivation 71-90 bu/acre	Soybeans 15-20 inch row Fall Chisel, no disk 15-25 bu/acre	Corn grain Spring Cultivation 71-90 bu/acre	Soybeans 15-20 inch row Fall Chisel, no disk 15-25 bu/acre	Corn grain Spring Cultivation 71-90 bu/acre	Soybeans 15-20 inch row Fall Chisel, no disk 15-25 bu/acre	Corn grain Spring Cultivation 71-90 bu/acre
Corn - Soybeans 12	114.1	Soybeans 15-20 inch row Fall Chisel, no disk 15-25 bu/acre	Corn grain Spring Cultivation 71-90 bu/acre	Soybeans 15-20 inch row Fall Chisel, no disk 15-25 bu/acre	Corn grain Spring Cultivation 71-90 bu/acre	Soybeans 15-20 inch row Fall Chisel, no disk 15-25 bu/acre	Corn grain Spring Cultivation 71-90 bu/acre	Soybeans 15-20 inch row Fall Chisel, no disk 15-25 bu/acre	Corn grain Spring Cultivation 71-90 bu/acre
Corn - Soybeans 2	114.8	Soybeans 15-20 inch row Fall Chisel, no disk 15-25 bu/acre	Corn grain Spring Cultivation 71-90 bu/acre	Soybeans 15-20 inch row Fall Chisel, no disk 15-25 bu/acre	Corn grain Spring Cultivation 71-90 bu/acre	Soybeans 15-20 inch row Fall Chisel, no disk 15-25 bu/acre	Corn grain Spring Cultivation 71-90 bu/acre	Soybeans 15-20 inch row Fall Chisel, no disk 15-25 bu/acre	Corn grain Spring Cultivation 71-90 bu/acre
Corn - Soybeans 3	72.4	Soybeans 15-20 inch row Fall Chisel, no disk 15-25 bu/acre	Corn grain Spring Cultivation 71-90 bu/acre	Soybeans 15-20 inch row Fall Chisel, no disk 15-25 bu/acre	Corn grain Spring Cultivation 71-90 bu/acre	Soybeans 15-20 inch row Fall Chisel, no disk 15-25 bu/acre	Corn grain Spring Cultivation 71-90 bu/acre	Soybeans 15-20 inch row Fall Chisel, no disk 15-25 bu/acre	Corn grain Spring Cultivation 71-90 bu/acre
Corn - Soybeans 4	57.6	Soybeans 15-20 inch row Fall Chisel, no disk 15-25 bu/acre	Corn grain Spring Cultivation 71-90 bu/acre	Soybeans 15-20 inch row Fall Chisel, no disk 15-25 bu/acre	Corn grain Spring Cultivation 71-90 bu/acre	Soybeans 15-20 inch row Fall Chisel, no disk 15-25 bu/acre	Corn grain Spring Cultivation 71-90 bu/acre	Soybeans 15-20 inch row Fall Chisel, no disk 15-25 bu/acre	Corn grain Spring Cultivation 71-90 bu/acre
Corn - Soybeans 5	4.9	Soybeans 15-20 inch row Fall Chisel, no disk 15-25 bu/acre	Corn grain Spring Cultivation 71-90 bu/acre	Soybeans 15-20 inch row Fall Chisel, no disk 15-25 bu/acre	Corn grain Spring Cultivation 71-90 bu/acre	Soybeans 15-20 inch row Fall Chisel, no disk 15-25 bu/acre	Corn grain Spring Cultivation 71-90 bu/acre	Soybeans 15-20 inch row Fall Chisel, no disk 15-25 bu/acre	Corn grain Spring Cultivation 71-90 bu/acre

Field Name	Field Acres	2022	2023	2024	2025	2026	2027	2028	2029
Corn - Soybeans 6	38.3	Soybeans 15-20 inch row Fall Chisel, no disk 15-25 bu/acre	Corn grain Spring Cultivation 71-90 bu/acre	Soybeans 15-20 inch row Fall Chisel, no disk 15-25 bu/acre	Corn grain Spring Cultivation 71-90 bu/acre	Soybeans 15-20 inch row Fall Chisel, no disk 15-25 bu/acre	Corn grain Spring Cultivation 71-90 bu/acre	Soybeans 15-20 inch row Fall Chisel, no disk 15-25 bu/acre	Corn grain Spring Cultivation 71-90 bu/acre
Corn - Soybeans 7	30.8	Soybeans 15-20 inch row Fall Chisel, no disk 15-25 bu/acre	Corn grain Spring Cultivation 71-90 bu/acre	Soybeans 15-20 inch row Fall Chisel, no disk 15-25 bu/acre	Corn grain Spring Cultivation 71-90 bu/acre	Soybeans 15-20 inch row Fall Chisel, no disk 15-25 bu/acre	Corn grain Spring Cultivation 71-90 bu/acre	Soybeans 15-20 inch row Fall Chisel, no disk 15-25 bu/acre	Corn grain Spring Cultivation 71-90 bu/acre
Corn - Soybeans 8	2.9	Soybeans 15-20 inch row Fall Chisel, no disk 15-25 bu/acre	Corn grain Spring Cultivation 71-90 bu/acre	Soybeans 15-20 inch row Fall Chisel, no disk 15-25 bu/acre	Corn grain Spring Cultivation 71-90 bu/acre	Soybeans 15-20 inch row Fall Chisel, no disk 15-25 bu/acre	Corn grain Spring Cultivation 71-90 bu/acre	Soybeans 15-20 inch row Fall Chisel, no disk 15-25 bu/acre	Corn grain Spring Cultivation 71-90 bu/acre
Corn - Soybeans 9	27	Soybeans 15-20 inch row Fall Chisel, no disk 15-25 bu/acre	Corn grain Spring Cultivation 71-90 bu/acre	Soybeans 15-20 inch row Fall Chisel, no disk 15-25 bu/acre	Corn grain Spring Cultivation 71-90 bu/acre	Soybeans 15-20 inch row Fall Chisel, no disk 15-25 bu/acre	Corn grain Spring Cultivation 71-90 bu/acre	Soybeans 15-20 inch row Fall Chisel, no disk 15-25 bu/acre	Corn grain Spring Cultivation 71-90 bu/acre
Corn Silage - Alfalfa 1	10.9	Alfalfa Seeding Spring Spring Cultivation 0-0 ton/acre	Alfalfa None 2.6-3.5 ton/acre	Alfalfa None 0-0 ton/acre	Alfalfa (grassy, yr 3+) None 3.6-4.5 ton/acre	Corn silage Spring Cultivation 20.1-25 ton/acre	Alfalfa Seeding Spring Spring Cultivation 0-0 ton/acre	Alfalfa None 2.6-3.5 ton/acre	Alfalfa None 2.6-3.5 ton/acre
Tree Farm	72.2	Blueberry Cultivation 1000-7000 lb/acre	Blueberry Cultivation 1000-7000 lb/acre	Blueberry Cultivation 1000-7000 lb/acre	Soybeans 15-20 inch row Fall Chisel, no disk 15-25 bu/acre	Corn grain Spring Cultivation 71-90 bu/acre	Soybeans 15-20 inch row Fall Chisel, no disk 15-25 bu/acre	Corn grain Spring Cultivation 71-90 bu/acre	Soybeans 15-20 inch row Fall Chisel, no disk 15-25 bu/acre

Summary by Crop:
NOTE: Yields calculated using the midpoint of the SnapPlus yield goal range for each crop.

Crops Grouped By Category		2022	2023	2024	2025	2026	2027	2028	2029
Alfalfa	Acres ton	129 0	11 34	11 0			129 0	140 0	11 34
Alfalfa (grassy, yr 3+)	Acres ton		129 0		11 45				129 0

Crops Grouped By Category		2022	2023	2024	2025	2026	2027	2028	2029
Alfalfa Seeding Spring	Acres ton	11 0				129 0	11 0		
Corn grain	Acres bu		623 50,152	129 10,385	623 50,152	72 5,796	623 50,152	72 5,796	623 50,152
Soybeans 15-20 inch row	Acres bu	623 12,460		623 12,460	201 4,020	623 12,460	72 1,440	623 12,460	72 1,440
Corn silage	Acres ton					11 248			
Blueberry	Acres lb	72 288,000	72 288,000	72 288,000					

WQ1: P Trade Report

Reported For	Fontana/Walworth North Drainage Basin
Printed	2024-05-07
Plan Completion/Update Date	2014-06-12
SnapPlus Version 20.4 built on 2021-06-03	
C:\Users\randyl\Desktop\Fontana\North Drainage Area.snapDb	

Prepared for:
Fontana/Walworth North Drainage Basin
attn:Fontana/Walworth
N840 Chilson Road
Walworth, 53184

The P Trade Report estimates the annual pounds of phosphorus (P) in surface runoff from cropland entering surface waters. These P loss calculations are based on a field's soil test P concentration, crops, tillage, nutrient management practices and estimates of average runoff and sheet and rill erosion for the predominant soil type. Losses from concentrated flow channel or gully erosion with a field are not included in these calculations. Field runoff losses are calculated for each year as **PTP** (lb P/field/yr). Fields are only included if there are at least 2 years of crops before the selected start year. Before using this report as part of a Water Quality Trade activity, phosphorus losses (PTP) must be converted into 'P credits' according to DNR guidance.

For more information go to **http://dnr.wi.gov/** and type keyword: **Water Quality Trading**

Questions? Please contact DNRphosphorus@wisconsin.gov

This report was developed for Wisconsin DNR Water Quality Trading and Adaptive Management purposes and cannot be used to demonstrate compliance with NR 151 or NRCS 590 NM plan requirements.

P Trade Report				PTP					
Field Name	Soil Series	Soil Symbol	Acres	2024	2025	2026	2027	2028	2029
Corn - Soybeans - Alfalfa 1	DODGE	DdA	42	25	70	82	44	36	20
Corn - Soybeans - Alfalfa 2	DODGE	DdA	38	23	63	74	40	32	18
Corn - Soybeans - Alfalfa 3	MIAMI	MyB	48	59	180	205	94	69	31
Corn - Soybeans 1	MIAMI	MyB	12	59	80	59	79	58	78
Corn - Soybeans 10	MIAMI	MyB	130	680	1,189	679	1,187	678	1,186
Corn - Soybeans 11	DODGE	DdA	18	42	84	42	84	42	84
Corn - Soybeans 12	MIAMI	MyB	111	581	1,016	580	1,014	580	1,013

P Trade Report				PTP					
Field Name	Soil Series	Soil Symbol	Acres	2024	2025	2026	2027	2028	2029
Corn - Soybeans 2	DODGE	DdA	115	256	338	252	333	249	327
Corn - Soybeans 3	MIAMI	MyB	72	486	1,152	509	851	515	859
Corn - Soybeans 4	MIAMI	MyB	57	931	612	440	605	436	599
Corn - Soybeans 5	MIAMI	MyB	5	33	44	32	44	32	43
Corn - Soybeans 6	DODGE	DdA	32	88	116	86	114	85	112
Corn - Soybeans 7	MIAMI	MyB	28	180	314	179	314	179	313
Corn - Soybeans 8	DODGE	DdA	3	7	9	6	8	6	8
Corn - Soybeans 9	DODGE	DdA	27	61	80	60	79	59	78
Corn Silage - Alfalfa 1	MIAMI	MyB	11	15	7	11	34	19	14
Tree Farm	DODGE	DdA	72	73	140	226	189	258	195
Total			**822**	**3,597**	**5,494**	**3,525**	**5,114**	**3,334**	**4,979**

APPENDIX B
SOUTH DRAINAGE BASIN FIGURES AND SNAPPLUS MODELING OUTPUT

SnapPlus Narrative and Crops Report

Starting Year	**2010**
Reported For	**Fontana-Walworth South Drainage Basin**
Printed	**2017-09-08**
Plan Completion/Update Date:	**2001-01-01**
SnapPlus Version 16.3 built on 2016-10-31	
S:\MAD\1100--1199\1179\310\DATA\Snap Plus\South Drainage Area.snapDb	

Prepared for:
Fontana-Walworth South Drainage Basin
attn:Fontana-Walworth
N840 Chilson Road
Walworth, 53184

Farm has 19 fields totalling 483.8 acres
Farm Narrative: None
Concentrated Flow Notes: None

Field Name	Acres	2010	2011	2012	2013	2014	2015	2016
Corn - Soybeans - Alfalfa 1	88.2	Soybeans 15-20 inch row Fall Chisel, no disk 46-55 bu/acre	Corn grain Spring Cultivation 171-190 bu/acre	Soybeans 15-20 inch row Fall Chisel, no disk 46-55 bu/acre	Alfalfa Seeding Spring Fall Chisel, no disk 0-0 ton/acre	Alfalfa None 0-0 ton/acre	Alfalfa None 0-0 ton/acre	Alfalfa (grassy, yr 3+) None 0-0 ton/acre
Corn - Soybeans 1	46.2	Corn grain Spring Cultivation 171-190 bu/acre	Soybeans 15-20 inch row Fall Chisel, no disk 46-55 bu/acre	Corn grain Spring Cultivation 171-190 bu/acre	Soybeans 15-20 inch row Fall Chisel, no disk 46-55 bu/acre	Corn grain Spring Cultivation 171-190 bu/acre	Soybeans 15-20 inch row Fall Chisel, no disk 46-55 bu/acre	Corn grain Spring Cultivation 171-190 bu/acre
Corn - Soybeans 10	12.3	Corn grain Spring Cultivation 171-190 bu/acre	Soybeans 15-20 inch row Fall Chisel, no disk 46-55 bu/acre	Corn grain Spring Cultivation 171-190 bu/acre	Soybeans 15-20 inch row Fall Chisel, no disk 46-55 bu/acre	Corn grain Spring Cultivation 171-190 bu/acre	Soybeans 15-20 inch row Fall Chisel, no disk 46-55 bu/acre	Corn grain Spring Cultivation 171-190 bu/acre
Corn - Soybeans 11	45.8	Corn grain Spring Cultivation 171-190 bu/acre	Soybeans 15-20 inch row Fall Chisel, no disk 46-55 bu/acre	Corn grain Spring Cultivation 171-190 bu/acre	Soybeans 15-20 inch row Fall Chisel, no disk 46-55 bu/acre	Corn grain Spring Cultivation 171-190 bu/acre	Soybeans 15-20 inch row Fall Chisel, no disk 46-55 bu/acre	Corn grain Spring Cultivation 171-190 bu/acre
Corn - Soybeans 12	4.9	Corn grain Spring Cultivation 171-190 bu/acre	Soybeans 15-20 inch row Fall Chisel, no disk 46-55 bu/acre	Corn grain Spring Cultivation 171-190 bu/acre	Soybeans 15-20 inch row Fall Chisel, no disk 46-55 bu/acre	Corn grain Spring Cultivation 171-190 bu/acre	Soybeans 15-20 inch row Fall Chisel, no disk 46-55 bu/acre	Corn grain Spring Cultivation 171-190 bu/acre

Field Name	Acres	2010	2011	2012	2013	2014	2015	2016
Corn - Soybeans 13	35.6	Corn grain Spring Cultivation 171-190 bu/acre	Soybeans 15-20 inch row Fall Chisel, no disk 46-55 bu/acre	Corn grain Spring Cultivation 171-190 bu/acre	Soybeans 15-20 inch row Fall Chisel, no disk 46-55 bu/acre	Corn grain Spring Cultivation 171-190 bu/acre	Soybeans 15-20 inch row Fall Chisel, no disk 46-55 bu/acre	Corn grain Spring Cultivation 171-190 bu/acre
Corn - Soybeans 14	9	Corn grain Spring Cultivation 171-190 bu/acre	Soybeans 15-20 inch row Fall Chisel, no disk 46-55 bu/acre	Corn grain Spring Cultivation 171-190 bu/acre	Soybeans 15-20 inch row Fall Chisel, no disk 46-55 bu/acre	Corn grain Spring Cultivation 171-190 bu/acre	Soybeans 15-20 inch row Fall Chisel, no disk 46-55 bu/acre	Corn grain Spring Cultivation 171-190 bu/acre
Corn - Soybeans 15	11.8	Corn grain Spring Cultivation 171-190 bu/acre	Soybeans 15-20 inch row Fall Chisel, no disk 46-55 bu/acre	Corn grain Spring Cultivation 171-190 bu/acre	Soybeans 15-20 inch row Fall Chisel, no disk 46-55 bu/acre	Corn grain Spring Cultivation 171-190 bu/acre	Soybeans 15-20 inch row Fall Chisel, no disk 46-55 bu/acre	Corn grain Spring Cultivation 171-190 bu/acre
Corn - Soybeans 2	61.2	Corn grain Spring Cultivation 171-190 bu/acre	Soybeans 15-20 inch row Fall Chisel, no disk 46-55 bu/acre	Corn grain Spring Cultivation 171-190 bu/acre	Soybeans 15-20 inch row Fall Chisel, no disk 46-55 bu/acre	Corn grain Spring Cultivation 171-190 bu/acre	Soybeans 15-20 inch row Fall Chisel, no disk 46-55 bu/acre	Corn grain Spring Cultivation 171-190 bu/acre
Corn - Soybeans 3	31.8	Corn grain Spring Cultivation 171-190 bu/acre	Soybeans 15-20 inch row Fall Chisel, no disk 46-55 bu/acre	Corn grain Spring Cultivation 171-190 bu/acre	Soybeans 15-20 inch row Fall Chisel, no disk 46-55 bu/acre	Corn grain Spring Cultivation 171-190 bu/acre	Soybeans 15-20 inch row Fall Chisel, no disk 46-55 bu/acre	Corn grain Spring Cultivation 171-190 bu/acre
Corn - Soybeans 4	2.6	Corn grain Spring Cultivation 171-190 bu/acre	Soybeans 15-20 inch row Fall Chisel, no disk 46-55 bu/acre	Corn grain Spring Cultivation 171-190 bu/acre	Soybeans 15-20 inch row Fall Chisel, no disk 46-55 bu/acre	Corn grain Spring Cultivation 171-190 bu/acre	Soybeans 15-20 inch row Fall Chisel, no disk 46-55 bu/acre	Corn grain Spring Cultivation 171-190 bu/acre
Corn - Soybeans 5	30.3	Corn grain Spring Cultivation 171-190 bu/acre	Soybeans 15-20 inch row Fall Chisel, no disk 46-55 bu/acre	Corn grain Spring Cultivation 171-190 bu/acre	Soybeans 15-20 inch row Fall Chisel, no disk 46-55 bu/acre	Corn grain Spring Cultivation 171-190 bu/acre	Soybeans 15-20 inch row Fall Chisel, no disk 46-55 bu/acre	Corn grain Spring Cultivation 171-190 bu/acre
Corn - Soybeans 6	0.2	Corn grain Spring Cultivation 171-190 bu/acre	Soybeans 15-20 inch row Fall Chisel, no disk 46-55 bu/acre	Corn grain Spring Cultivation 171-190 bu/acre	Soybeans 15-20 inch row Fall Chisel, no disk 46-55 bu/acre	Corn grain Spring Cultivation 171-190 bu/acre	Soybeans 15-20 inch row Fall Chisel, no disk 46-55 bu/acre	Corn grain Spring Cultivation 171-190 bu/acre

Field Name	Acres	2010	2011	2012	2013	2014	2015	2016
Corn - Soybeans 7	33.8	Corn grain Spring Cultivation 171-190 bu/acre	Soybeans 15-20 inch row Fall Chisel, no disk 46-55 bu/acre	Corn grain Spring Cultivation 171-190 bu/acre	Soybeans 15-20 inch row Fall Chisel, no disk 46-55 bu/acre	Corn grain Spring Cultivation 171-190 bu/acre	Soybeans 15-20 inch row Fall Chisel, no disk 46-55 bu/acre	Corn grain Spring Cultivation 171-190 bu/acre
Corn - Soybeans 8	15.9	Corn grain Spring Cultivation 171-190 bu/acre	Soybeans 15-20 inch row Fall Chisel, no disk 46-55 bu/acre	Corn grain Spring Cultivation 171-190 bu/acre	Soybeans 15-20 inch row Fall Chisel, no disk 46-55 bu/acre	Corn grain Spring Cultivation 171-190 bu/acre	Soybeans 15-20 inch row Fall Chisel, no disk 46-55 bu/acre	Corn grain Spring Cultivation 171-190 bu/acre
Corn - Soybeans 9	33.2	Corn grain Spring Cultivation 171-190 bu/acre	Soybeans 15-20 inch row Fall Chisel, no disk 46-55 bu/acre	Corn grain Spring Cultivation 171-190 bu/acre	Soybeans 15-20 inch row Fall Chisel, no disk 46-55 bu/acre	Corn grain Spring Cultivation 171-190 bu/acre	Soybeans 15-20 inch row Fall Chisel, no disk 46-55 bu/acre	Corn grain Spring Cultivation 171-190 bu/acre
Corn Silage - Alfalfa 1	6.8	Alfalfa (grassy, yr 3+) None 0-0 ton/acre	Corn silage Spring Cultivation 20.1-25 ton/acre	Alfalfa Seeding Spring Fall Chisel, no disk 0-0 ton/acre	Alfalfa None 0-0 ton/acre	Alfalfa None 0-0 ton/acre	Alfalfa None 0-0 ton/acre	Corn silage Spring Cultivation 25.1-30 ton/acre
Corn Silage - Alfalfa 2	9.5	Alfalfa (grassy, yr 3+) None 0-0 ton/acre	Corn silage Spring Cultivation 20.1-25 ton/acre	Alfalfa Seeding Spring Fall Chisel, no disk 0-0 ton/acre	Alfalfa None 0-0 ton/acre	Alfalfa None 0-0 ton/acre	Alfalfa None 0-0 ton/acre	Alfalfa (grassy, yr 3+) None 0-0 ton/acre
Corn Silage - Alfalfa 3	5	Alfalfa (grassy, yr 3+) None 0-0 ton/acre	Corn silage Spring Cultivation 20.1-25 ton/acre	Alfalfa Seeding Spring Fall Chisel, no disk 0-0 ton/acre	Alfalfa None 0-0 ton/acre	Alfalfa None 0-0 ton/acre	Alfalfa None 0-0 ton/acre	Alfalfa (grassy, yr 3+) None 0-0 ton/acre

Summary by Crop:

NOTE: Yields calculated using the midpoint of the SnapPlus yield goal range for each crop.

Crops Grouped By Category		2010	2011	2012	2013	2014	2015	2016
Alfalfa	Acres ton				21 0	109 0	109 0	
Alfalfa (grassy, yr 3+)	Acres ton	21 0						103 0

Crops Grouped By Category		2010	2011	2012	2013	2014	2015	2016
Alfalfa Seeding Spring	Acres ton			21 0	88 0			
Corn grain	Acres bu	374 67,507	88 15,884	374 67,507		374 67,507		374 67,507
Soybeans 15-20 inch row	Acres bu	88 4,444	374 18,887	88 4,444	374 18,887		374 18,887	
Corn silage	Acres ton		21 474					7 193

SnapPlus P Trade Report

Reported For	Fontana-Walworth South Drainage Basin
Printed	2016-04-28
Plan Completion/Update Date	2001-01-01
SnapPlus Version 15.1 built on 2015-12-18	
S:\MAD\1100--1199\1179\310\DATA\Snap Plus\South Drainage Area.snapDb	

Prepared for:
Fontana-Walworth South Drainage Basin
attn:Fontana-Walworth
N840 Chilson Road
Walworth, 53184

The P Trade Report estimates the annual pounds of phosphorus (P) in surface runoff from cropland entering surface waters. These P loss calculations are based on a field's soil test P concentration, crops, tillage, nutrient management practices and estimates of average runoff and sheet and rill erosion for the predominant soil type. Losses from concentrated flow channel or gully erosion with a field are not included in these calculations. Field runoff losses are calculated for each year as **PTP** (lb P/field/yr). Fields are only included if there are at least 2 years of crops before the selected start year. Before using this report as part of a Water Quality Trade activity, phosphorus losses (PTP) must be converted into 'P credits' according to DNR guidance.

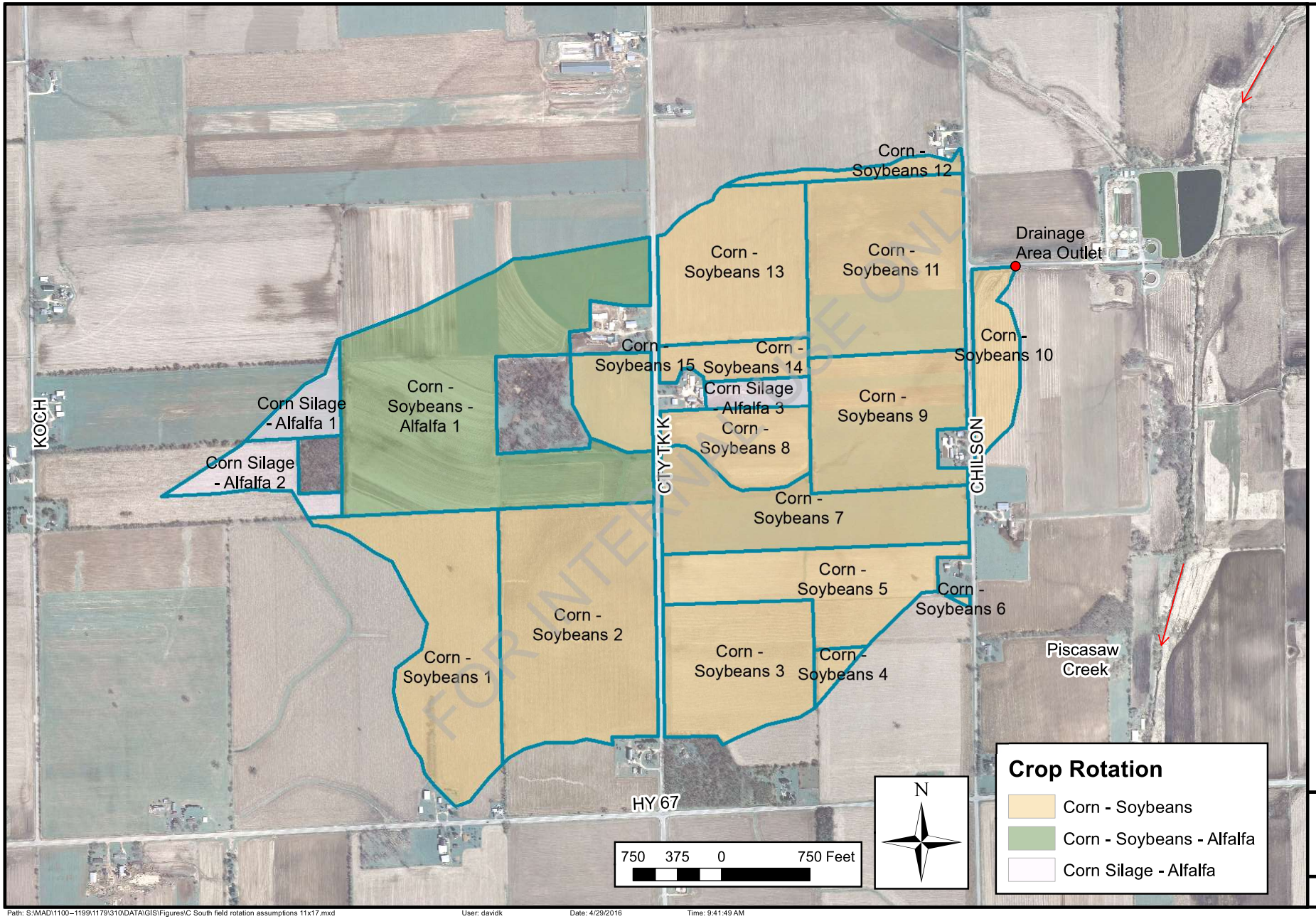
For more information go to **http://dnr.wi.gov/** and type keyword: **Water Quality Trading**

Questions? Please contact DNRphosphorus@wisconsin.gov

This report was developed for Wisconsin DNR Water Quality Trading and Adaptive Management purposes and cannot be used to demonstrate compliance with NR 151 or NRCS 590 NM plan requirements.

P Trade Report				PTP				
Field Name	Soil Series	Soil Symbol	Acres	2012	2013	2014	2015	2016
Corn - Soybeans - Alfalfa 1	MIAMI	DdA	88	93	192	98	77	41
Corn - Soybeans 1	MIAMI	DdA	46	78	47	74	45	70
Corn - Soybeans 10	MIAMI	MyB	12	64	45	70	41	58
Corn - Soybeans 11	MIAMI	MyB	46	198	147	239	143	199
Corn - Soybeans 12	MIAMI	MyA	5	11	5	8	7	8
Corn - Soybeans 13	MIAMI	MyB	36	195	91	148	111	148
Corn - Soybeans 14	MIAMI	MyB	9	38	23	36	22	35

P Trade Report				PTP				
Field Name	Soil Series	Soil Symbol	Acres	2012	2013	2014	2015	2016
Corn - Soybeans 15	FLAGG VARIANT	DdA	12	20	12	19	12	18
Corn - Soybeans 2	MIAMI	DdA	61	103	62	98	60	93
Corn - Soybeans 3	MIAMI	MyB	32	133	80	128	77	124
Corn - Soybeans 4	MIAMI	DdA	3	4	3	4	3	4
Corn - Soybeans 5	MIAMI	DdA	30	51	31	48	30	46
Corn - Soybeans 6	DODGE	DdA	0	0	0	0	0	0
Corn - Soybeans 7	MIAMI	DdA	34	57	34	54	33	51
Corn - Soybeans 8	MIAMI	MyB	16	67	40	64	39	62
Corn - Soybeans 9	MIAMI	MyB	33	139	83	134	81	130
Corn Silage - Alfalfa 1	MIAMI	MyB	7	35	16	12	9	24
Corn Silage - Alfalfa 2	MIAMI	MyB	10	49	23	17	12	9
Corn Silage - Alfalfa 3	MIAMI	MyB	5	26	12	9	6	4
Total			**484**	**1,361**	**946**	**1,262**	**807**	**1,125**



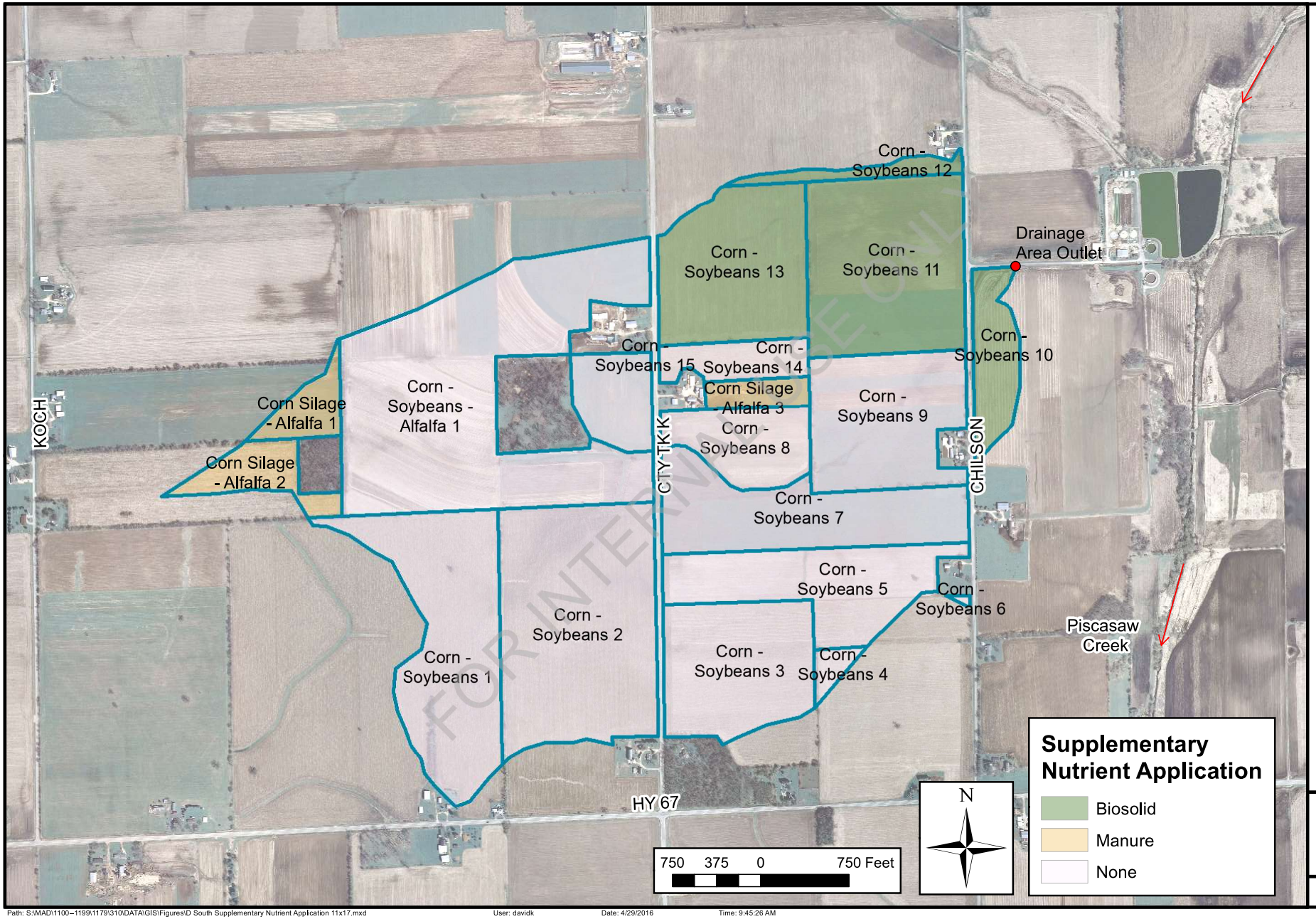
CROP ROTATION ASSUMPTIONS

STORMWATER MODELING FOR WATER QUALITY TRADING
FONTANA WALWORTH WATER POLLUTION CONTROL COMMISSION
WALWORTH COUNTY, WISCONSIN

STRAND ASSOCIATES®

FIGURE B1

Path: S:\MAD\1100–1199\1179\310\DATA\GIS\Figures\C South field rotation assumptions 11x17.mxd User: davidk Date: 4/29/2016 Time: 9:41:49 AM



SUPPLEMENTARY NUTRIENT APPLICATION ASSUMPTIONS

STORMWATER MODELING FOR WATER QUALITY TRADING
FONTANA WALWORTH WATER POLLUTION CONTROL COMMISSION
WALWORTH COUNTY, WISCONSIN

STRAND ASSOCIATES®

FIGURE B2

Path: S:\MAD\1100–1199\1179\310\DATA\GIS\Figures\D South Supplementary Nutrient Application 11x17.mxd User: davidk Date: 4/29/2016 Time: 9:45:26 AM

APPENDIX C
COMMISSION-OWNED LAND FIGURE AND SNAPPLUS MODELING OUTPUT

COMMISSION OWNED LAND

STORMWATER MODELING FOR WATER QUALITY TRADING
FONTANA WALWORTH WATER POLLUTION CONTROL COMMISSION
WALWORTH COUNTY, WISCONSIN

STRAND ASSOCIATES®

FIGURE C-1
1179.310

This is the SnapPlus model run for the post-trade conditions.

NM1: Narrative and Crops Report

Starting Year	**2022**
Reported For	**Commission Land**
Printed	**2024-05-07**
Plan Completion/Update Date:	**2016-04-29**
SnapPlus Version 20.4 built on 2021-06-03	
C:\Users\randyl\Desktop\Fontana\Commission land_BMP_Grass swales.snapdb	

Prepared for:
Commission Land
attn:fwwpcc

Farm has 11 fields totalling 108.7 cropped acres.
Farm Narrative: This farm is commission owned land with existing rotations.

Annual Farm Notes:

No Annual Farm Notes

Spreader Calibration Methods: No spreader calibration rate documentation has been selected.

Narrative and Crops:

Field Name	Field Acres	2022	2023	2024	2025	2026	2027	2028	2029
3-1 N	8.9	Alfalfa None 5.6-6.5 ton/acre	Alfalfa (1st cut) to Corn silage to small grain cover Spring Chisel, no disk, cover crop no till 20.1-25 ton/acre	Small grain silage underseeded with alfalfa No Till 2.0-3.5 ton/acre	Alfalfa None 5.6-6.5 ton/acre	Alfalfa None 0-0 ton/acre	Alfalfa None 0-0 ton/acre	Alfalfa (1st cut) to Corn silage to small grain cover Spring Chisel, no disk, cover crop no till 10-15 ton/acre	Small grain silage underseeded with alfalfa No Till 2.0-3.5 ton/acre
3-1 S	9.1	Alfalfa None 5.6-6.5 ton/acre	Alfalfa (1st cut) to Corn silage to small grain cover Spring Chisel, no disk, cover crop no till 20.1-25 ton/acre	Small grain silage underseeded with alfalfa No Till 2.0-3.5 ton/acre	Alfalfa None 5.6-6.5 ton/acre	Alfalfa None 0-0 ton/acre	Alfalfa None 0-0 ton/acre	Alfalfa (1st cut) to Corn silage to small grain cover Spring Chisel, no disk, cover crop no till 10-15 ton/acre	Small grain silage underseeded with alfalfa No Till 2.0-3.5 ton/acre

Field Name	Field Acres	2022	2023	2024	2025	2026	2027	2028	2029
5-1A	10.9	Alfalfa None 5.6-6.5 ton/acre	Alfalfa (1st cut) to Corn silage to small grain cover Spring Chisel, no disk, cover crop no till 20.1-25 ton/acre	Small grain silage underseeded with alfalfa No Till 2.0-3.5 ton/acre	Alfalfa None 5.6-6.5 ton/acre	Alfalfa None 0-0 ton/acre	Alfalfa None 0-0 ton/acre	Alfalfa (1st cut) to Corn silage to small grain cover Spring Chisel, no disk, cover crop no till 10-15 ton/acre	Small grain silage underseeded with alfalfa No Till 2.0-3.5 ton/acre
5-1B	13.7	Alfalfa None 5.6-6.5 ton/acre	Alfalfa (1st cut) to Corn silage to small grain cover Spring Chisel, no disk, cover crop no till 20.1-25 ton/acre	Small grain silage underseeded with alfalfa No Till 2.0-3.5 ton/acre	Alfalfa None 5.6-6.5 ton/acre	Alfalfa None 0-0 ton/acre	Alfalfa None 0-0 ton/acre	Alfalfa (1st cut) to Corn silage to small grain cover Spring Chisel, no disk, cover crop no till 10-15 ton/acre	Small grain silage underseeded with alfalfa No Till 2.0-3.5 ton/acre
5-1C	10.8	Alfalfa None 5.6-6.5 ton/acre	Alfalfa (1st cut) to Corn silage to small grain cover Spring Chisel, no disk, cover crop no till 20.1-25 ton/acre	Small grain silage underseeded with alfalfa No Till 2.0-3.5 ton/acre	Alfalfa None 5.6-6.5 ton/acre	Alfalfa None 0-0 ton/acre	Alfalfa None 0-0 ton/acre	Alfalfa (1st cut) to Corn silage to small grain cover Spring Chisel, no disk, cover crop no till 10-15 ton/acre	Small grain silage underseeded with alfalfa No Till 2.0-3.5 ton/acre
5-1D	6	Alfalfa None 5.6-6.5 ton/acre	Alfalfa (1st cut) to Corn silage to small grain cover Spring Chisel, no disk, cover crop no till 20.1-25 ton/acre	Small grain silage underseeded with alfalfa No Till 2.0-3.5 ton/acre	Alfalfa None 5.6-6.5 ton/acre	Alfalfa None 0-0 ton/acre	Alfalfa None 0-0 ton/acre	Alfalfa (1st cut) to Corn silage to small grain cover Spring Chisel, no disk, cover crop no till 10-15 ton/acre	Small grain silage underseeded with alfalfa No Till 2.0-3.5 ton/acre
5-1E	13	Alfalfa None 5.6-6.5 ton/acre	Alfalfa (1st cut) to Corn silage to small grain cover Spring Chisel, no disk, cover crop no till 20.1-25 ton/acre	Small grain silage underseeded with alfalfa No Till 2.0-3.5 ton/acre	Alfalfa None 5.6-6.5 ton/acre	Alfalfa None 0-0 ton/acre	Alfalfa None 0-0 ton/acre	Alfalfa (1st cut) to Corn silage to small grain cover Spring Chisel, no disk, cover crop no till 10-15 ton/acre	Small grain silage underseeded with alfalfa No Till 2.0-3.5 ton/acre

Field Name	Field Acres	2022	2023	2024	2025	2026	2027	2028	2029
5-1F	10.9	Alfalfa None 5.6-6.5 ton/acre	Alfalfa (1st cut) to Corn silage to small grain cover Spring Chisel, no disk, cover crop no till 20.1-25 ton/acre	Small grain silage underseeded with alfalfa No Till 2.0-3.5 ton/acre	Alfalfa None 5.6-6.5 ton/acre	Alfalfa None 0-0 ton/acre	Alfalfa None 0-0 ton/acre	Alfalfa (1st cut) to Corn silage to small grain cover Spring Chisel, no disk, cover crop no till 10-15 ton/acre	Small grain silage underseeded with alfalfa No Till 2.0-3.5 ton/acre
5-2E	8.7	Alfalfa None 5.6-6.5 ton/acre	Alfalfa (1st cut) to Corn silage to small grain cover Spring Chisel, no disk, cover crop no till 20.1-25 ton/acre	Small grain silage underseeded with alfalfa No Till 2.0-3.5 ton/acre	Alfalfa None 5.6-6.5 ton/acre	Alfalfa None 0-0 ton/acre	Alfalfa None 0-0 ton/acre	Alfalfa (1st cut) to Corn silage to small grain cover Spring Chisel, no disk, cover crop no till 10-15 ton/acre	Small grain silage underseeded with alfalfa No Till 2.0-3.5 ton/acre
5-2W	12.6	Alfalfa None 5.6-6.5 ton/acre	Alfalfa (1st cut) to Corn silage to small grain cover Spring Chisel, no disk, cover crop no till 20.1-25 ton/acre	Small grain silage underseeded with alfalfa No Till 2.0-3.5 ton/acre	Alfalfa None 5.6-6.5 ton/acre	Alfalfa None 0-0 ton/acre	Alfalfa None 0-0 ton/acre	Alfalfa (1st cut) to Corn silage to small grain cover Spring Chisel, no disk, cover crop no till 10-15 ton/acre	Small grain silage underseeded with alfalfa No Till 2.0-3.5 ton/acre
6-3	4.1	Alfalfa None 5.6-6.5 ton/acre	Alfalfa (1st cut) to Corn silage to small grain cover Spring Chisel, no disk, cover crop no till 20.1-25 ton/acre	Small grain silage underseeded with alfalfa No Till 2.0-3.5 ton/acre	Alfalfa None 5.6-6.5 ton/acre	Alfalfa None 0-0 ton/acre	Alfalfa None 0-0 ton/acre	Alfalfa (1st cut) to Corn silage to small grain cover Spring Chisel, no disk, cover crop no till 10-15 ton/acre	Small grain silage underseeded with alfalfa No Till 2.0-3.5 ton/acre

Summary by Crop:

NOTE: Yields calculated using the midpoint of the SnapPlus yield goal range for each crop.

Crops Grouped By Category		2022	2023	2024	2025	2026	2027	2028	2029
Alfalfa	Acres ton	109 659			109 659	109 0	109 0		

Crops Grouped By Category		2022	2023	2024	2025	2026	2027	2028	2029
Alfalfa (1st cut) to Corn silage to small grain cover	Acres ton		109 2,458					109 1,363	
Small grain silage underseeded with alfalfa	Acres ton			109 300					109 300

This is the SnapPlus model run for the post-trade conditions.

WQ1: P Trade Report

Reported For	Commission Land
Printed	2024-05-07
Plan Completion/Update Date	2016-04-29
SnapPlus Version 20.4 built on 2021-06-03	
C:\Users\randyl\Desktop\Fontana\Commission land_BMP_Grass swales.snapdb	

Prepared for:
Commission Land
attn:fwwpcc

The P Trade Report estimates the annual pounds of phosphorus (P) in surface runoff from cropland entering surface waters. These P loss calculations are based on a field's soil test P concentration, crops, tillage, nutrient management practices and estimates of average runoff and sheet and rill erosion for the predominant soil type. Losses from concentrated flow channel or gully erosion with a field are not included in these calculations. Field runoff losses are calculated for each year as **PTP** (lb P/field/yr). Fields are only included if there are at least 2 years of crops before the selected start year. Before using this report as part of a Water Quality Trade activity, phosphorus losses (PTP) must be converted into 'P credits' according to DNR guidance.

For more information go to **http://dnr.wi.gov/** and type keyword: **Water Quality Trading**

Questions? Please contact DNRphosphorus@wisconsin.gov

This report was developed for Wisconsin DNR Water Quality Trading and Adaptive Management purposes and cannot be used to demonstrate compliance with NR 151 or NRCS 590 NM plan requirements.

P Trade Report				PTP					
Field Name	Soil Series	Soil Symbol	Acres	2024	2025	2026	2027	2028	2029
3-1 N	MIAMI	MyB	9	29	20	20	15	52	30
3-1 S	MIAMI	MyB	9	17	15	15	12	22	17
5-1A	MIAMI	MyB	11	21	18	18	14	26	21
5-1B	MIAMI	MyB	14	26	23	23	17	33	26
5-1C	MIAMI	MyB	11	20	18	18	14	26	21
5-1D	MIAMI	MyB	6	18	13	12	9	32	18
5-1E	MIAMI	MyB	13	39	27	27	20	70	40

P Trade Report				PTP					
Field Name	Soil Series	Soil Symbol	Acres	2024	2025	2026	2027	2028	2029
5-1F	MIAMI	MyB	11	36	25	25	18	64	36
5-2E	MIAMI	MyB	9	29	20	20	15	51	29
5-2W	MIAMI	MyB	13	38	26	26	19	67	39
6-3	PELLA	Ph	4	4	4	4	3	4	8
Total			**109**	**278**	**208**	**207**	**155**	**446**	**284**

This is the SnapPlus model run for the pre-trade conditions.

NM1: Narrative and Crops Report

Starting Year	**2022**
Reported For	**Commission Land**
Printed	**2024-05-07**
Plan Completion/Update Date:	**2016-04-29**
SnapPlus Version 20.4 built on 2021-06-03	
C:\Users\randyl\Desktop\Fontana\Commission land_Exist.snapdb	

Prepared for:
Commission Land
attn:fwwpcc

Farm has 11 fields totalling 108.7 cropped acres.
Farm Narrative: This farm is commission owned land with existing rotations.

Annual Farm Notes:

No Annual Farm Notes

Spreader Calibration Methods: No spreader calibration rate documentation has been selected.

Narrative and Crops:

Field Name	Field Acres	2022	2023	2024	2025	2026	2027	2028	2029
3-1 N	8.9	Corn silage Spring Chisel, disked 10-15 ton/acre	Corn silage Spring Chisel, disked 10-15 ton/acre	Corn silage Spring Chisel, disked 10-15 ton/acre	Corn silage Spring Chisel, disked 10-15 ton/acre	Corn silage Spring Chisel, disked 10-15 ton/acre	Corn silage Spring Chisel, disked 10-15 ton/acre	Corn silage Spring Chisel, disked 10-15 ton/acre	Corn silage Spring Chisel, disked 10-15 ton/acre
3-1 S	9.1	Corn silage Spring Chisel, disked 10-15 ton/acre	Corn silage Spring Chisel, disked 10-15 ton/acre	Corn silage Spring Chisel, disked 10-15 ton/acre	Corn silage Spring Chisel, disked 10-15 ton/acre	Corn silage Spring Chisel, disked 10-15 ton/acre	Corn silage Spring Chisel, disked 10-15 ton/acre	Corn silage Spring Chisel, disked 10-15 ton/acre	Corn silage Spring Chisel, disked 10-15 ton/acre
5-1A	10.9	Corn silage Spring Chisel, disked 10-15 ton/acre	Corn silage Spring Chisel, disked 10-15 ton/acre	Corn silage Spring Chisel, disked 10-15 ton/acre	Corn silage Spring Chisel, disked 10-15 ton/acre	Corn silage Spring Chisel, disked 10-15 ton/acre	Corn silage Spring Chisel, disked 10-15 ton/acre	Corn silage Spring Chisel, disked 10-15 ton/acre	Corn silage Spring Chisel, disked 10-15 ton/acre

Field Name	Field Acres	2022	2023	2024	2025	2026	2027	2028	2029
5-1B	13.7	Corn silage Spring Chisel, disked 10-15 ton/acre	Corn silage Spring Chisel, disked 10-15 ton/acre	Corn silage Spring Chisel, disked 10-15 ton/acre	Corn silage Spring Chisel, disked 10-15 ton/acre	Corn silage Spring Chisel, disked 10-15 ton/acre	Corn silage Spring Chisel, disked 10-15 ton/acre	Corn silage Spring Chisel, disked 10-15 ton/acre	Corn silage Spring Chisel, disked 10-15 ton/acre
5-1C	10.8	Corn silage Spring Chisel, disked 10-15 ton/acre	Corn silage Spring Chisel, disked 10-15 ton/acre	Corn silage Spring Chisel, disked 10-15 ton/acre	Corn silage Spring Chisel, disked 10-15 ton/acre	Corn silage Spring Chisel, disked 10-15 ton/acre	Corn silage Spring Chisel, disked 10-15 ton/acre	Corn silage Spring Chisel, disked 10-15 ton/acre	Corn silage Spring Chisel, disked 10-15 ton/acre
5-1D	6	Corn silage Spring Chisel, disked 10-15 ton/acre	Corn silage Spring Chisel, disked 10-15 ton/acre	Corn silage Spring Chisel, disked 10-15 ton/acre	Corn silage Spring Chisel, disked 10-15 ton/acre	Corn silage Spring Chisel, disked 10-15 ton/acre	Corn silage Spring Chisel, disked 10-15 ton/acre	Corn silage Spring Chisel, disked 10-15 ton/acre	Corn silage Spring Chisel, disked 10-15 ton/acre
5-1E	13	Corn silage Spring Chisel, disked 10-15 ton/acre	Corn silage Spring Chisel, disked 10-15 ton/acre	Corn silage Spring Chisel, disked 10-15 ton/acre	Corn silage Spring Chisel, disked 10-15 ton/acre	Corn silage Spring Chisel, disked 10-15 ton/acre	Corn silage Spring Chisel, disked 10-15 ton/acre	Corn silage Spring Chisel, disked 10-15 ton/acre	Corn silage Spring Chisel, disked 10-15 ton/acre
5-1F	10.9	Corn silage Spring Chisel, disked 10-15 ton/acre	Corn silage Spring Chisel, disked 10-15 ton/acre	Corn silage Spring Chisel, disked 10-15 ton/acre	Corn silage Spring Chisel, disked 10-15 ton/acre	Corn silage Spring Chisel, disked 10-15 ton/acre	Corn silage Spring Chisel, disked 10-15 ton/acre	Corn silage Spring Chisel, disked 10-15 ton/acre	Corn silage Spring Chisel, disked 10-15 ton/acre
5-2E	8.7	Corn silage Spring Chisel, disked 10-15 ton/acre	Corn silage Spring Chisel, disked 10-15 ton/acre	Corn silage Spring Chisel, disked 10-15 ton/acre	Corn silage Spring Chisel, disked 10-15 ton/acre	Corn silage Spring Chisel, disked 10-15 ton/acre	Corn silage Spring Chisel, disked 10-15 ton/acre	Corn silage Spring Chisel, disked 10-15 ton/acre	Corn silage Spring Chisel, disked 10-15 ton/acre
5-2W	12.6	Corn silage Spring Chisel, disked 10-15 ton/acre	Corn silage Spring Chisel, disked 10-15 ton/acre	Corn silage Spring Chisel, disked 10-15 ton/acre	Corn silage Spring Chisel, disked 10-15 ton/acre	Corn silage Spring Chisel, disked 10-15 ton/acre	Corn silage Spring Chisel, disked 10-15 ton/acre	Corn silage Spring Chisel, disked 10-15 ton/acre	Corn silage Spring Chisel, disked 10-15 ton/acre
6-3	4.1	Corn silage Spring Chisel, disked 10-15 ton/acre	Corn silage Spring Chisel, disked 10-15 ton/acre	Corn silage Spring Chisel, disked 10-15 ton/acre	Corn silage Spring Chisel, disked 10-15 ton/acre	Corn silage Spring Chisel, disked 10-15 ton/acre	Corn silage Spring Chisel, disked 10-15 ton/acre	Corn silage Spring Chisel, disked 10-15 ton/acre	Corn silage Spring Chisel, disked 10-15 ton/acre

Summary by Crop:
NOTE: Yields calculated using the midpoint of the SnapPlus yield goal range for each crop.

Crops Grouped By Category		2022	2023	2024	2025	2026	2027	2028	2029
Corn silage	Acres	109	109	109	109	109	109	109	109
	ton	1,363	1,363	1,363	1,363	1,363	1,363	1,363	1,363

This is the SnapPlus model run for the pre-trade conditions.

WQ1: P Trade Report

Reported For	Commission Land
Printed	2024-05-07
Plan Completion/Update Date	2016-04-29
SnapPlus Version 20.4 built on 2021-06-03	
C:\Users\randyl\Desktop\Fontana\Commission land_Exist.snapdb	

Prepared for:
Commission Land
attn:fwwpcc

The P Trade Report estimates the annual pounds of phosphorus (P) in surface runoff from cropland entering surface waters. These P loss calculations are based on a field's soil test P concentration, crops, tillage, nutrient management practices and estimates of average runoff and sheet and rill erosion for the predominant soil type. Losses from concentrated flow channel or gully erosion with a field are not included in these calculations. Field runoff losses are calculated for each year as **PTP** (lb P/field/yr). Fields are only included if there are at least 2 years of crops before the selected start year. Before using this report as part of a Water Quality Trade activity, phosphorus losses (PTP) must be converted into 'P credits' according to DNR guidance.

For more information go to **http://dnr.wi.gov/** and type keyword: **Water Quality Trading**

Questions? Please contact DNRphosphorus@wisconsin.gov

This report was developed for Wisconsin DNR Water Quality Trading and Adaptive Management purposes and cannot be used to demonstrate compliance with NR 151 or NRCS 590 NM plan requirements.

P Trade Report				PTP					
Field Name	Soil Series	Soil Symbol	Acres	2024	2025	2026	2027	2028	2029
3-1 N	MIAMI	MyB	9	124	138	134	149	144	160
3-1 S	MIAMI	MyB	9	127	141	137	152	148	164
5-1A	MIAMI	MyB	11	131	129	138	135	144	141
5-1B	MIAMI	MyB	14	176	173	184	181	192	189
5-1C	MIAMI	MyB	11	131	129	138	135	144	142
5-1D	MIAMI	MyB	6	70	69	73	72	76	75
5-1E	MIAMI	MyB	13	136	133	142	140	149	146
5-1F	MIAMI	MyB	11	143	141	149	147	156	153

P Trade Report				PTP					
Field Name	Soil Series	Soil Symbol	Acres	2024	2025	2026	2027	2028	2029
5-2E	MIAMI	MyB	9	82	93	90	102	99	112
5-2W	MIAMI	MyB	13	94	108	104	120	116	132
6-3	PELLA	Ph	4	17	17	16	16	16	16
Total			**109**	**1,231**	**1,270**	**1,305**	**1,349**	**1,384**	**1,430**

APPENDIX D
BENCH SCALE TESTING OF STORMWATER SAMPLES

North Drainage Basin
Stormwater Settling Results (from Oct 26, 2016 Rain Event)
(with increasing coagulant dosages)

	Ferric Chloride Dose (mL)							
	0		0.25		0.5		0.75	
Settling Time	TP (mg/L)	Removal (%)	TP (mg/L)	Removal (%)	TP (mg/L)	Removal (%)	TP (mg/L)	Removal (%)
0	4.0	0	3.8	0	3.8	0	1.0	0
60	1.5	62.5%	0.08	97.9%	1.25	66.8%	0.50	50.0%
120	1.4	65.0%	0.06	98.4%	0.22	56.0%	0.30	70.0%
180	1.4	65.0%	0.05	98.7%	0.28	44.0%	0.40	60.0%

	Ferric Chloride Dose (mL)							
	0		0.25		0.5		0.75	
Settling Time	TSS (mg/L)	Removal (%)	TSS (mg/L)	Removal (%)	TSS (mg/L)	Removal (%)	TSS (mg/L)	Removal (%)
0	750	0	1341	0	1406	0	395	0
60	536	28.5%	21	98.4%	78	94.5%	177	55.2%
120	260	65.3%	28	97.9%	57	95.9%	97	75.4%
180	144	80.8%	18	98.7%	67	95.2%	68	82.8%

South Drainage Basin
Stormwater Settling Results (from Oct 26, 2016 Rain Event)
(with increasing coagulant dosages)

	Ferric Chloride Dose (mL)							
	0		0.25		0.5		0.75	
Settling Time	TP (mg/L)	Removal (%)	TP (mg/L)	Removal (%)	TP (mg/L)	Removal (%)	TP (mg/L)	Removal (%)
0	5.00	0	4.60	0	4.90	0	5.30	0
60	1.50	70.0%	0.15	96.7%	0.18	96.3%	0.27	94.9%
120	1.40	72.0%	0.13	97.2%	0.15	96.9%	0.19	96.4%
180	1.30	74.0%	0.10	97.8%	0.13	97.3%	0.17	96.8%

	Ferric Chloride Dose (mL)							
	0		0.25		0.5		0.75	
Settling Time	TSS (mg/L)	Removal (%)	TSS (mg/L)	Removal (%)	TSS (mg/L)	Removal (%)	TSS (mg/L)	Removal (%)
0	2010	0	1660	0	1961	0	2056	0
60	296	85.3%	47	97.2%	35	98.2%	57	97.2%
120	120	94.0%	23	98.6%	22	98.9%	32	98.4%
180	120	94.0%	19	98.9%	24	98.8%	24	98.8%

APPENDIX E
NOTICE OF INTENT TO CONDUCT WATER QUALITY TRADING

State of Wisconsin
Department of Natural Resources
101 South Webster Street
Madison, WI 53707

Notification that Water Quality Trading Will Be Used to Comply with WQBELs
Form 8700-nnn (R10/12)

Applicant Information

Permittee Name	Permit Number	Facility Site Number
Fontana/Walworth Water Pollution Control Commission	WI- 0036021-06-0	unknown

Facility Address	City	State	ZIP Code
N840 Chilson Rd	Walworth	WI	53184

Project Contact Name(if applicable)	*Address*	*City*	*State*	*Zip Code*
Doug York, Superintendent	N840 Chilson Rd	Walworth	WI	53184

Project Name: Preliminary Compliance Alternatives Plan

Receiving Water Name	Parameter(s) being traded	HUC 12
Piscasaw Creek	Phosphorus + possibly others	unknown

Is the permittee in a point or nonpoint source dominated watershed? *(See PRESTO results- http://dnr.wi.gov/topic/surfacewater/presto.html)*
- ☐ Point source dominated
- ☒ Nonpoint source dominated

Credit Generator Information

Credit generator type (check all that apply):
- ☒ Permitted Discharge (non-MS4)
- ☐ Permitted MS4
- ☐ CAFOs
- ☐ Non-permitted urban discharge
- ☐ Agricultural nonpoint source discharge
- ☐ Other- Specify: _____

Are any of the credit generators in a different HUC 12 than the applicant?
- ☐ Yes; HUC 12: _____
- ☒ No
- ☐ Unsure

Are any of the credit generators downstream of the applicant?
- ☐ Yes
- ☒ No
- ☐ Unsure

Will a broker/exchange be used to facilitate trade?
- ☐ Yes; Broker Name: _____
- ☐ No
- ☒ Unsure

Permitted Discharge Information (Traditional Municipal/Industrial Discharge, MS4, CAFO):

Discharge Type	Permit Number	Name	Contact Address	Is the PS currently in compliance with their permit requirements?
☒ Traditional ☐ MS4 ☐ CAFO	WI-0036021-06-0	Fontana/Walworth Water Pollution Control Commission	N840 Chilson Rd Walworth, WI 53184	☒ Yes ☐ No ☐ Unsure
☐ Traditional ☐ MS4 ☐ CAFO				☐ Yes ☐ No ☐ Unsure
☐ Traditional ☐ MS4 ☐ CAFO				☐ Yes ☐ No ☐ Unsure
☐ Traditional ☐ MS4 ☐ CAFO				☐ Yes ☐ No ☐ Unsure
☐ Traditional ☐ MS4 ☐ CAFO				☐ Yes ☐ No ☐ Unsure

Other Information:

Will other improvements be made to improve effluent quality towards permit compliance?

- ☐ Yes *(if yes, please attach a description of these improvements)*
- ☐ No
- ☒ Unsure

Practices that will be used to generate credits:

There will be potentially three practices that will generate water quality trading credits for phosphorus (and possibly other) parameters. These potential practices were identified in the April, 2016 Preliminary Compliance Alternatives Plan submitted to WDNR. The feasibility of Water Quality Trading to the Fontana/Walworth WPCC will depend on the ultimate trade ratio among other factors. The three WQT practices are generally described as follows:

1) North Drainage Basin – This is a 917 acre drainage basin that drains thru Commission property and into the Piscasaw Creek. Stormwater will be captured in a grassed waterway and routed by gravity to two existing wastewater ponds that are no longer utilized. These ponds will be modified to act as sedimentation basins for phosphorus and solids removal.

Method for quantifying credits generated:

- ☐ Monitoring
- ☒ Modeling, Names: SnapPlus for generating phosphorus load from farmland ~~P8 Model for predicting phosphorus removal in new sedimentation basins.~~
- ☐ Other: _____

Projected date credits will be available: Year 2022

The preparer and owner certify all of the following:

- I am familiar with the specifications submitted for this application, and I believe all applicable items in this checklist have been addressed.
- I have completed this document to the best of my knowledge and have not excluded pertinent information.
- I certify that the information in this document is true to the best of my knowledge.

Signature of Preparer	Date Signed
Bradley J. Tuke	6-3-2016

2) South Drainage Basin – This is a 529 acre drainage basin that drains thru Commission property and into the Piscasaw Creek. Stormwater in a ditch will be routed to a new sedimentation basin designed to remove phosphorus and suspended solids. A coagulant could be added to the stormwater entering the sedimentation basins to enhance removal.

3) Modification of Farm Practices on Commission-owned Land

The Commission owns farmland adjacent to the WWTP upon which biosolids are applied as a fertilizer. The Commission leases this land to interested farmers annually who have traditionally farmed highly erodable row crops. The Commission could require a cover crop be farmed by the renter resulting in substantially less erodable land.

APPENDIX F
WATER QUALITY TRADING CHECKLIST (FORM 3400-208)

State of Wisconsin
Department of Natural Resources
101 South Webster Street
Madison WI 53707-7921
dnr.wi.gov

Water Quality Trading Checklist

Form 3400-208 (1/14)

Notice: Pursuant to s. 283.84, Wis. Stats., this form must be completed by any WPDES permittee that intends to pursue pollutant trading as a method of complying with a permit limitation. Failure to complete this form would not result in penalties. Personal information collected will be used for administrative purposes and may be provided to requesters to the extent required by Wisconsin's Open Records Law (ss. 19.31 - 19.39, Wis. Stats.).

Applicant Information

Permittee Name	Permit Number	Facility Site Number
Fontana-Walworth WPCC	WI- 0036021-06-0	6530

Facility Address	City	State	ZIP Code
N840 Chilson Road	Walworth	WI	53184

Project Contact Name (if applicable)	Address	City	State	ZIP Code
Doug York	N840 Chilson Road	Walworth	WI	53184

Project Name
Final Phosphorus Compliance Alternatives Plan

Receiving Water Name	Parameter(s) being traded	HUC 12(s)
Piscasaw Creek	Phosphorus and TSS	070900060303

Credit Generator Information

Credit generator type (select all that apply):
- ☐ Permitted Discharge (non-MS4CAFO)
- ☐ Permitted MS4
- ☐ Permitted CAFO
- ☐ Urban nonpoint source discharge
- ☒ Agricultural nonpoint source discharge
- ☐ Other - Specify: _____

Are any of the credit generators in a different HUC 12 than the applicant?
- ○ Yes; HUC 12: _____
- ◉ No

Are any of the credit generators downstream of the applicant?
- ○ Yes
- ◉ No

Will a broker/exchange be used to facilitate trade?
- ○ Yes *(include description and contact information in WQT plan)*
- ◉ No

Point to Point Trades (Traditional Municipal / Industrial, MS4, CAFO)

Are each of the point source credit generators identified in this section in compliance with their WDPES permit requirements?
- ○ Yes
- ○ No

Discharge Type	Permit Number	Name	Contact Information	Trade Agreement Number
○ Traditional ○ MS4 ○ CAFO				
○ Traditional ○ MS4 ○ CAFO				
○ Traditional ○ MS4 ○ CAFO				
○ Traditional ○ MS4 ○ CAFO				
○ Traditional ○ MS4 ○ CAFO				

Point to Point Trades (Traditional Municipal / Industrial, MS4, CAFO) *cont.*

Does plan have a narrative that describes:			Plan Section
a. Summary of discharge and existing treatment including optimization	○ Yes	○ No	
b. Amount of credit being generated	○ Yes	○ No	
c. Timeline for credits and agreements	○ Yes	○ No	
d. Method for quantifying credits	○ Yes	○ No	
e. Tracking and verification procedures	○ Yes	○ No	
f. Location of credit generator in proximity to receiving water and credit user	○ Yes	○ No	
g. Other: _____	○ Yes	○ No	

Point to Nonpoint Trades (Non-Permitted Urban, Agricultural, Other)

Discharge Type	Practices Used to Generate Credits	Method of Quantification	Trade Agreement Number	Have the practice(s) been formally registered?
○ Urban NPS ◉ Agricultural NPS ○ Other	Wet Detention Pond (WDNR Tech Standard 1001)	Modeling: SnapPlus P Trade Report/P8		○ Yes ◉ No ○ Only in part
○ Urban NPS ◉ Agricultural NPS ○ Other	Crop Practices/Filter Strips (NRCS Code 393)	Modeling: SnapPlus P Trade Report		○ Yes ◉ No ○ Only in part
○ Urban NPS ◉ Agricultural NPS ○ Other				○ Yes ◉ No ○ Only in part
○ Urban NPS ○ Agricultural NPS ○ Other				○ Yes ○ No ○ Only in part
○ Urban NPS ○ Agricultural NPS ○ Other				○ Yes ○ No ○ Only in part
○ Urban NPS ○ Agricultural NPS ○ Other				○ Yes ○ No ○ Only in part
○ Urban NPS ○ Agricultural NPS ○ Other				○ Yes ○ No ○ Only in part
○ Urban NPS ○ Agricultural NPS ○ Other				○ Yes ○ No ○ Only in part

Does plan have a narrative that describes:			Plan Section
a. Description of existing land uses	◉ Yes	○ No	Other Alter.
b. Management practices used to generate credits	◉ Yes	○ No	Other Alter.
c. Amount of credit being generated	◉ Yes	○ No	Other Alter.
d. Description of applicable trade ratio per agreement/management practice	◉ Yes	○ No	Other Alter.
e. Location where credits will be generated	◉ Yes	○ No	Other Alter.
f. Timeline for credits and agreements	◉ Yes	○ No	Other Alter.
g. Method for quantifying credits	◉ Yes	○ No	Other Alter.

APPENDIX G–WATER QUALITY TRADING MANAGEMENT PRACTICE REGISTRATION FORMS (NOT COMPLETED)

Does plan have a narrative that describes:			Plan Section
h. Tracking procedures	◉ Yes	○ No	Other Alter.
i. Conditions under which the management practices may be inspected	◉ Yes	○ No	Other Alter.
j. Reporting requirements should the management practice fail	◉ Yes	○ No	Other Alter.
k. Operation and maintenance plan for each management practice	◉ Yes	○ No	Other Alter.
l. Location of credit generator in proximity to receiving water and credit user	◉ Yes	○ No	Other Alter.
m. Practice registration documents, if available	◉ Yes	○ No	Other Alter.
n. History of project site(s)	◉ Yes	○ No	Other Alter.
o. Other: _____	○ Yes	◉ No	

The preparer certifies all of the following:

- I am familiar with the specifications submitted for this application, and I believe all applicable items in this checklist have been addressed.
- I have completed this document to the best of my knowledge and have not excluded pertinent information.
- I certify that the information in this document is true to the best of my knowledge.

Signature of Preparer	Date Signed

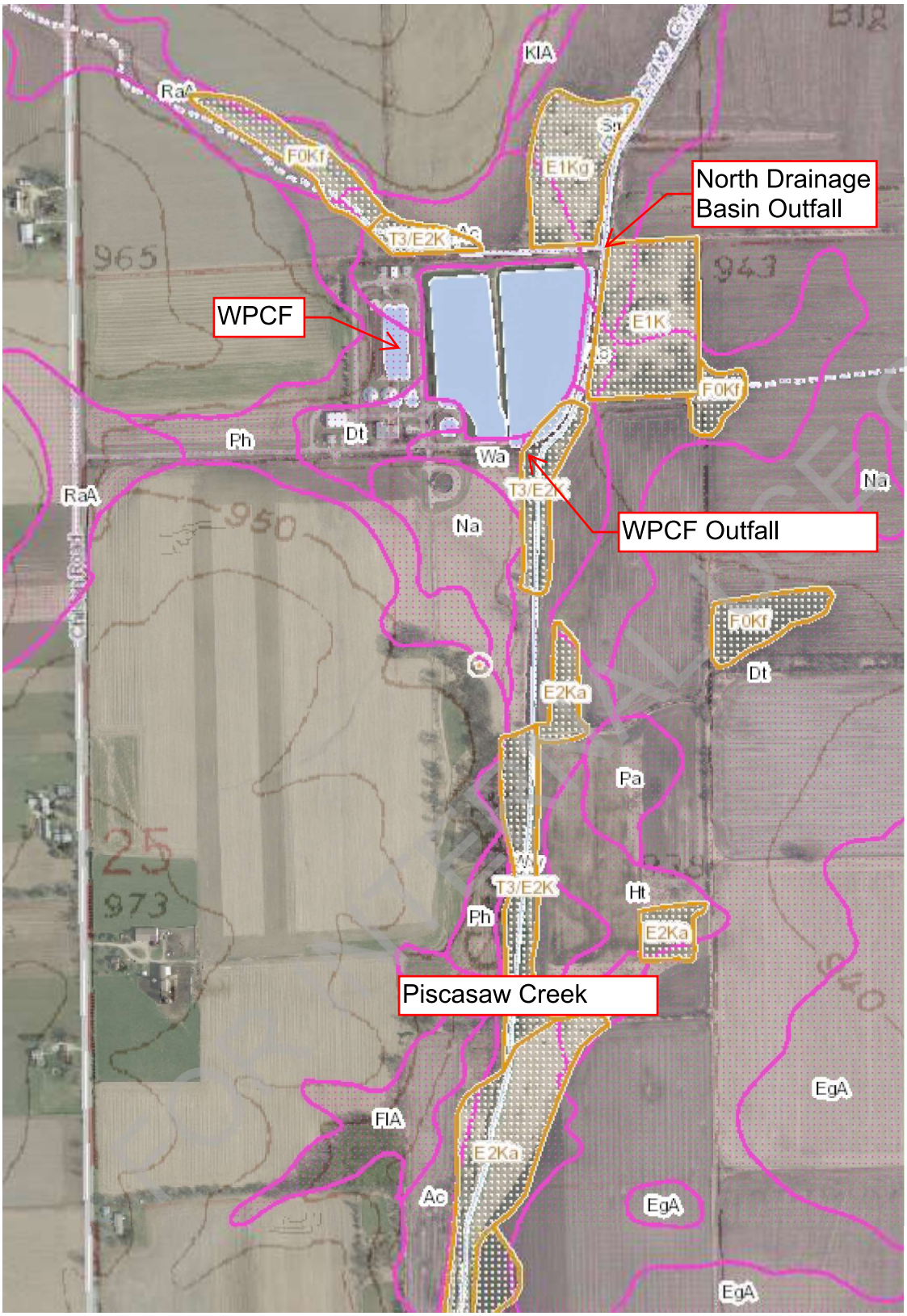
Authorized Representative Signature

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision. Based on my inquiry of those persons directly responsible for gathering and entering the information, the information is, to the best of my knowledge and belief, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Signature of Authorized Representative	Date Signed

APPENDIX H
SURFACE WATER DATA REVIEWER MAP

Surface Water Data Viewer Map



Legend

- Wetland Class Points
  - Dammed pond
  - Excavated pond
  - Filled excavated pond
  - Filled/drained wetland
  - Wetland too small to delineate
- Filled Points
- Wetland Class Areas
  - Wetland
  - Upland
- Filled Areas
- NRCS Wetspots
- Wetland Indicators
- Municipality
- State Boundaries
- County Boundaries
- Major Roads
  - Interstate Highway
  - State Highway
  - US Highway
- County and Local Roads
  - County HWY
  - Local Road
- Railroads
- Tribal Lands
- Rivers and Streams
- Intermittent Streams
- Lakes and Open water
- Index to EN_Image_Basemap_Leaf_Off

0.3 0 0.13 0.3 Miles

1:7,920

NAD_1983_HARN_Wisconsin_TM

Notes

APPENDIX I
P8 MODEL OUTPUT

P8 Urban Catchment Model, Version 3.5				Run Date	02/14/18
Case	North_watershed_proposed_Year1.p8c	FirstDate	10/01/80	Precip(in)	31.0
Title	Proposed Conditions	LastDate	09/30/81	Rain(in)	28.84
PrecFile	Mdsn6095.pcp	Events	79	Snow(in)	2.20
PartFile	NURP50.PAR	TotalHrs	8723	TotalYrs	1.00

Mass Balances by Device and Variable

Device: OVERALL Type: NONE Variable: tp

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
01 watershed inflows	2256.63	3.13	4172.6	4193.2	0.68
06 normal outlet	928.99	1.29	691.3	694.8	0.27
07 spillway outlet	1303.56	1.81	1431.1	1438.2	0.40
08 sedimen + decay	0.00	0.00	1980.2	1989.9	
09 total inflow	2256.63	3.13	4172.6	4193.2	0.68
10 surface outflow	2232.55	3.10	2122.5	2132.9	0.35
12 total outflow	2232.55	3.10	2122.5	2132.9	0.35
13 total trapped	0.00	0.00	1980.2	1989.9	
14 storage increase	24.08	0.03	70.0	70.3	
15 mass balance check	0.00	0.00	0.0	0.0	
Reduction (%)	0.00	0.00	47.5	47.5	

Device: existing outlet Type: SWALE Variable: tp

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
Reduction (%)	0.00	0.00	0.0	0.0	

Device: west pond Type: POND Variable: tp

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
01 watershed inflows	2256.63	3.13	4172.6	4193.2	0.68
06 normal outlet	652.82	0.91	587.6	590.5	0.33
07 spillway outlet	1591.92	2.21	2258.1	2269.2	0.52
08 sedimen + decay	0.00	0.00	1287.2	1293.5	
09 total inflow	2256.63	3.13	4172.6	4193.2	0.68
10 surface outflow	2244.74	3.11	2845.7	2859.8	0.47
12 total outflow	2244.74	3.11	2845.7	2859.8	0.47
13 total trapped	0.00	0.00	1287.2	1293.5	
14 storage increase	11.90	0.02	39.7	39.9	
15 mass balance check	0.00	0.00	0.0	0.0	
Reduction (%)	0.00	0.00	30.8	30.8	

Device: East Pond Type: POND Variable: tp

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
02 upstream device	2244.74	3.11	2845.7	2859.8	0.47
06 normal outlet	928.99	1.29	691.3	694.8	0.27
07 spillway outlet	1303.56	1.81	1431.1	1438.2	0.40
08 sedimen + decay	0.00	0.00	693.0	696.4	
09 total inflow	2244.74	3.11	2845.7	2859.8	0.47
10 surface outflow	2232.55	3.10	2122.5	2132.9	0.35
12 total outflow	2232.55	3.10	2122.5	2132.9	0.35
13 total trapped	0.00	0.00	693.0	696.4	
14 storage increase	12.18	0.02	30.3	30.4	
15 mass balance check	0.00	0.00	0.0	0.0	
Reduction (%)	0.00	0.00	24.4	24.4	

P8 Urban Catchment Model, Version 3.5				Run Date	02/14/18
Case	North_watershed_proposed_Year2.p8c	FirstDate	10/01/80	Precip(in)	31.0
Title	Proposed Conditions	LastDate	09/30/81	Rain(in)	28.84
PrecFile	Mdsn6095.pcp	Events	79	Snow(in)	2.20
PartFile	NURP50.PAR	TotalHrs	8723	TotalYrs	1.00

Mass Balances by Device and Variable

Device: OVERALL Type: NONE Variable: tp

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
01 watershed inflows	2256.63	3.13	5198.8	5224.5	0.85
06 normal outlet	928.99	1.29	861.4	865.6	0.34
07 spillway outlet	1303.56	1.81	1783.1	1791.9	0.50
08 sedimen + decay	0.00	0.00	2467.2	2479.3	
09 total inflow	2256.63	3.13	5198.8	5224.5	0.85
10 surface outflow	2232.55	3.10	2644.5	2657.5	0.44
12 total outflow	2232.55	3.10	2644.5	2657.5	0.44
13 total trapped	0.00	0.00	2467.2	2479.3	
14 storage increase	24.08	0.03	87.2	87.6	
15 mass balance check	0.00	0.00	0.0	0.0	
Reduction (%)	0.00	0.00	47.5	47.5	

Device: existing outlet Type: SWALE Variable: tp

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
Reduction (%)	0.00	0.00	0.0	0.0	

Device: west pond Type: POND Variable: tp

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
01 watershed inflows	2256.63	3.13	5198.8	5224.5	0.85
06 normal outlet	652.82	0.91	732.1	735.7	0.41
07 spillway outlet	1591.92	2.21	2813.5	2827.4	0.65
08 sedimen + decay	0.00	0.00	1603.7	1611.6	
09 total inflow	2256.63	3.13	5198.8	5224.5	0.85
10 surface outflow	2244.74	3.11	3545.6	3563.1	0.58
12 total outflow	2244.74	3.11	3545.6	3563.1	0.58
13 total trapped	0.00	0.00	1603.7	1611.6	
14 storage increase	11.90	0.02	49.5	49.7	
15 mass balance check	0.00	0.00	0.0	0.0	
Reduction (%)	0.00	0.00	30.8	30.8	

Device: East Pond Type: POND Variable: tp

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
02 upstream device	2244.74	3.11	3545.6	3563.1	0.58
06 normal outlet	928.99	1.29	861.4	865.6	0.34
07 spillway outlet	1303.56	1.81	1783.1	1791.9	0.50
08 sedimen + decay	0.00	0.00	863.4	867.7	
09 total inflow	2244.74	3.11	3545.6	3563.1	0.58
10 surface outflow	2232.55	3.10	2644.5	2657.5	0.44
12 total outflow	2232.55	3.10	2644.5	2657.5	0.44
13 total trapped	0.00	0.00	863.4	867.7	
14 storage increase	12.18	0.02	37.7	37.9	
15 mass balance check	0.00	0.00	0.0	0.0	
Reduction (%)	0.00	0.00	24.4	24.4	

P8 Urban Catchment Model, Version 3.5				Run Date	02/16/18
Case	North_watershed_proposed_Year3.p8c	FirstDate	10/01/80	Precip(in)	31.0
Title	Proposed Conditions	LastDate	09/30/81	Rain(in)	28.84
PrecFile	Mdsn6095.pcp	Events	79	Snow(in)	2.20
PartFile	NURP50.PAR	TotalHrs	8723	TotalYrs	1.00

Mass Balances by Device and Variable

Device: OVERALL Type: NONE Variable: tp

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
01 watershed inflows	2256.63	3.13	3840.6	3859.5	0.63
06 normal outlet	928.99	1.29	636.3	639.5	0.25
07 spillway outlet	1303.56	1.81	1317.2	1323.7	0.37
08 sedimen + decay	0.00	0.00	1822.6	1831.6	
09 total inflow	2256.63	3.13	3840.6	3859.5	0.63
10 surface outflow	2232.55	3.10	1953.6	1963.2	0.32
12 total outflow	2232.55	3.10	1953.6	1963.2	0.32
13 total trapped	0.00	0.00	1822.6	1831.6	
14 storage increase	24.08	0.03	64.4	64.7	
15 mass balance check	0.00	0.00	0.0	0.0	
Reduction (%)	0.00	0.00	47.5	47.5	

Device: existing outlet Type: SWALE Variable: tp

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
Reduction (%)	0.00	0.00	0.0	0.0	

Device: west pond Type: POND Variable: tp

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
01 watershed inflows	2256.63	3.13	3840.6	3859.5	0.63
06 normal outlet	652.82	0.91	540.9	543.5	0.30
07 spillway outlet	1591.92	2.21	2078.4	2088.7	0.48
08 sedimen + decay	0.00	0.00	1184.7	1190.6	
09 total inflow	2256.63	3.13	3840.6	3859.5	0.63
10 surface outflow	2244.74	3.11	2619.3	2632.2	0.43
12 total outflow	2244.74	3.11	2619.3	2632.2	0.43
13 total trapped	0.00	0.00	1184.7	1190.6	
14 storage increase	11.90	0.02	36.5	36.7	
15 mass balance check	0.00	0.00	0.0	0.0	
Reduction (%)	0.00	0.00	30.8	30.8	

Device: East Pond Type: POND Variable: tp

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
02 upstream device	2244.74	3.11	2619.3	2632.2	0.43
06 normal outlet	928.99	1.29	636.3	639.5	0.25
07 spillway outlet	1303.56	1.81	1317.2	1323.7	0.37
08 sedimen + decay	0.00	0.00	637.8	641.0	
09 total inflow	2244.74	3.11	2619.3	2632.2	0.43
10 surface outflow	2232.55	3.10	1953.6	1963.2	0.32
12 total outflow	2232.55	3.10	1953.6	1963.2	0.32
13 total trapped	0.00	0.00	637.8	641.0	
14 storage increase	12.18	0.02	27.9	28.0	
15 mass balance check	0.00	0.00	0.0	0.0	
Reduction (%)	0.00	0.00	24.4	24.4	

P8 Urban Catchment Model, Version 3.5				Run Date	02/14/18
Case	North_watershed_proposed_Year4.p8c	FirstDate	10/01/80	Precip(in)	31.0
Title	Proposed Conditions	LastDate	09/30/81	Rain(in)	28.84
PrecFile	Mdsn6095.pcp	Events	79	Snow(in)	2.20
PartFile	NURP50.PAR	TotalHrs	8723	TotalYrs	1.00

Mass Balances by Device and Variable

Device: OVERALL Type: NONE Variable: tp

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
01 watershed inflows	2256.63	3.13	5712.0	5740.1	0.93
06 normal outlet	928.99	1.29	946.4	951.1	0.37
07 spillway outlet	1303.56	1.81	1959.1	1968.8	0.55
08 sedimen + decay	0.00	0.00	2710.7	2724.0	
09 total inflow	2256.63	3.13	5712.0	5740.1	0.93
10 surface outflow	2232.55	3.10	2905.5	2919.8	0.48
12 total outflow	2232.55	3.10	2905.5	2919.8	0.48
13 total trapped	0.00	0.00	2710.7	2724.0	
14 storage increase	24.08	0.03	95.8	96.3	
15 mass balance check	0.00	0.00	0.0	0.0	
Reduction (%)	0.00	0.00	47.5	47.5	

Device: west pond Type: POND Variable: tp

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
01 watershed inflows	2256.63	3.13	5712.0	5740.1	0.93
06 normal outlet	652.82	0.91	804.4	808.4	0.45
07 spillway outlet	1591.92	2.21	3091.2	3106.4	0.71
08 sedimen + decay	0.00	0.00	1762.0	1770.7	
09 total inflow	2256.63	3.13	5712.0	5740.1	0.93
10 surface outflow	2244.74	3.11	3895.6	3914.8	0.64
12 total outflow	2244.74	3.11	3895.6	3914.8	0.64
13 total trapped	0.00	0.00	1762.0	1770.7	
14 storage increase	11.90	0.02	54.4	54.6	
15 mass balance check	0.00	0.00	0.0	0.0	
Reduction (%)	0.00	0.00	30.8	30.8	

Device: East Pond Type: POND Variable: tp

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
02 upstream device	2244.74	3.11	3895.6	3914.8	0.64
06 normal outlet	928.99	1.29	946.4	951.1	0.37
07 spillway outlet	1303.56	1.81	1959.1	1968.8	0.55
08 sedimen + decay	0.00	0.00	948.7	953.3	
09 total inflow	2244.74	3.11	3895.6	3914.8	0.64
10 surface outflow	2232.55	3.10	2905.5	2919.8	0.48
12 total outflow	2232.55	3.10	2905.5	2919.8	0.48
13 total trapped	0.00	0.00	948.7	953.3	
14 storage increase	12.18	0.02	41.4	41.6	
15 mass balance check	0.00	0.00	0.0	0.0	
Reduction (%)	0.00	0.00	24.4	24.4	

P8 Urban Catchment Model, Version 3.5				Run Date	02/14/18
Case	North_watershed_proposed_Year5.p8c	FirstDate	10/01/80	Precip(in)	31.0
Title	Proposed Conditions	LastDate	09/30/81	Rain(in)	28.84
PrecFile	Mdsn6095.pcp	Events	79	Snow(in)	2.20
PartFile	NURP50.PAR	TotalHrs	8723	TotalYrs	1.00

Mass Balances by Device and Variable

Device: OVERALL Type: NONE Variable: tp

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
01 watershed inflows	2256.63	3.13	3649.4	3667.4	0.59
06 normal outlet	928.99	1.29	604.7	607.6	0.24
07 spillway outlet	1303.56	1.81	1251.7	1257.9	0.35
08 sedimen + decay	0.00	0.00	1731.9	1740.4	
09 total inflow	2256.63	3.13	3649.4	3667.4	0.59
10 surface outflow	2232.55	3.10	1856.3	1865.5	0.31
12 total outflow	2232.55	3.10	1856.3	1865.5	0.31
13 total trapped	0.00	0.00	1731.9	1740.4	
14 storage increase	24.08	0.03	61.2	61.5	
15 mass balance check	0.00	0.00	0.0	0.0	
Reduction (%)	0.00	0.00	47.5	47.5	

Device: west pond Type: POND Variable: tp

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
01 watershed inflows	2256.63	3.13	3649.4	3667.4	0.59
06 normal outlet	652.82	0.91	513.9	516.5	0.29
07 spillway outlet	1591.92	2.21	1975.0	1984.7	0.46
08 sedimen + decay	0.00	0.00	1125.8	1131.3	
09 total inflow	2256.63	3.13	3649.4	3667.4	0.59
10 surface outflow	2244.74	3.11	2488.9	2501.2	0.41
12 total outflow	2244.74	3.11	2488.9	2501.2	0.41
13 total trapped	0.00	0.00	1125.8	1131.3	
14 storage increase	11.90	0.02	34.7	34.9	
15 mass balance check	0.00	0.00	0.0	0.0	
Reduction (%)	0.00	0.00	30.8	30.8	

Device: East Pond Type: POND Variable: tp

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
02 upstream device	2244.74	3.11	2488.9	2501.2	0.41
06 normal outlet	928.99	1.29	604.7	607.6	0.24
07 spillway outlet	1303.56	1.81	1251.7	1257.9	0.35
08 sedimen + decay	0.00	0.00	606.1	609.1	
09 total inflow	2244.74	3.11	2488.9	2501.2	0.41
10 surface outflow	2232.55	3.10	1856.3	1865.5	0.31
12 total outflow	2232.55	3.10	1856.3	1865.5	0.31
13 total trapped	0.00	0.00	606.1	609.1	
14 storage increase	12.18	0.02	26.5	26.6	
15 mass balance check	0.00	0.00	0.0	0.0	
Reduction (%)	0.00	0.00	24.4	24.4	

P8 Urban Catchment Model, Version 3.5				Run Date	02/16/18
Case	Nonfarm_Watershed.p8c	FirstDate	10/01/80	Precip(in)	31.0
Title	Proposed Conditions	LastDate	09/30/81	Rain(in)	28.84
PrecFile	Mdsn6095.pcp	Events	79	Snow(in)	2.20
PartFile	NURP50.PAR	TotalHrs	8723	TotalYrs	1.00

Mass Balances by Device and Variable

Device: OVERALL Type: NONE Variable: tp

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
01 watershed inflows	202.53	0.28	198.4	199.4	0.36
06 normal outlet	198.42	0.28	52.8	53.1	0.10
08 sedimen + decay	0.00	0.00	138.0	138.6	
09 total inflow	202.53	0.28	198.4	199.4	0.36
10 surface outflow	198.42	0.28	52.8	53.1	0.10
12 total outflow	198.42	0.28	52.8	53.1	0.10
13 total trapped	0.00	0.00	138.0	138.6	
14 storage increase	4.12	0.01	7.6	7.7	
15 mass balance check	0.00	0.00	0.0	0.0	
Reduction (%)	0.00	0.00	69.5	69.5	

Device: west pond Type: POND Variable: tp

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
01 watershed inflows	202.53	0.28	198.4	199.4	0.36
06 normal outlet	195.16	0.27	66.4	66.8	0.13
07 spillway outlet	4.61	0.01	1.8	1.8	0.14
08 sedimen + decay	0.00	0.00	125.7	126.4	
09 total inflow	202.53	0.28	198.4	199.4	0.36
10 surface outflow	199.77	0.28	68.3	68.6	0.13
12 total outflow	199.77	0.28	68.3	68.6	0.13
13 total trapped	0.00	0.00	125.7	126.4	
14 storage increase	2.76	0.00	4.4	4.4	
15 mass balance check	0.00	0.00	0.0	0.0	
Reduction (%)	0.00	0.00	63.4	63.4	

Device: East Pond Type: POND Variable: tp

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
02 upstream device	199.77	0.28	68.3	68.6	0.13
06 normal outlet	198.42	0.28	52.8	53.1	0.10
08 sedimen + decay	0.00	0.00	12.2	12.3	
09 total inflow	199.77	0.28	68.3	68.6	0.13
10 surface outflow	198.42	0.28	52.8	53.1	0.10
12 total outflow	198.42	0.28	52.8	53.1	0.10
13 total trapped	0.00	0.00	12.2	12.3	
14 storage increase	1.36	0.00	3.2	3.2	
15 mass balance check	0.00	0.00	0.0	0.0	
Reduction (%)	0.00	0.00	17.9	17.9	

APPENDIX J
NUTRIENT MANAGEMENT PLAN FOR FWWPCC-OWNED LAND

ALCIVIA

Tom Kauer

Nutrient Management Plan Crop Year - 2023

ROCK RIVER LABORATORY, INC.
AGRICULTURAL ANALYSIS

6/29/23

ALCIVIA

6/29/2023

Dear Mr. Kauer:

Subject: Nutrient Management Plan for 2023 crop year

Included is your 2023 Nutrient Management Plan needed for compliance with one of the following programs or permits; CSP, EQIP, County Ordinance or WPDES Permit. **Please take time to review Nutrient Application Prohibitions & Restrictions and Recommended Manure & Fertilizer Application Rates.** The Nutrient Management Program works with farmers to ensure proper credit of manure and plant material as sources of nitrogen and phosphorus. Manure and Fertilizer applications should be made based on the current fertility of the soil and the nutrient demand by each crop. Phosphorus and Nitrogen applications in excess of crop demand can result in loss of profit and potential damage to surface and ground water. Insufficient supply of any nutrient results in decreased yields and profit loss.

Please feel free to contact me with any questions or comments regarding your Nutrient Management Plan.

Thank you,

Kerri Helwig, CCA

ROCK RIVER LABORATORY, INC.
AGRICULTURAL ANALYSIS

TABLE OF CONTENTS

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Wisconsin Department of Agriculture, Trade and Consumer Protection
Division of Agricultural Resource Management
Bureau of Land and Water Resources
PO Box 8911, Madison WI 53708-8911, Phone: 608-224-4605

Use this form to check nutrient management (NM) plans for compliance with the WI NRCS 2015-590 Standard.

Nutrient Management Checklist

Wis. Stat. §92.05(3) (k), Wis. Admin. Code §ATCP50.04(3) and Ch. 51

COUNTY Walworth | DATE PLAN SUBMITTED 6/29/2023 | GROWING SEASON YEAR PLAN IS WRITTEN FOR 2023 (from harvest to harvest)

TOWNSHIP: (T. 1 N.) | RANGE: (R. 15 E., W.). | CHECK ONE: ☒ Initial Plan or ☐ Updated Plan

NAME OF FARM OPERATOR RECEIVING NM PLAN	FARM NAME (OPTIONAL)		BUSINESS PHONE	
Tom Kauer			(262) 203 - 2790	
STREET ADDRESS		CITY	STATE	ZIP
N2150 Six Corners Rd.		Walworth	WI	53184

REASON THE PLAN WAS DEVELOPED: DATCP-FP or cost share (cs) (Ordinance, NR 243 WPDES or NOD, DATCP-FP or cost share (cs), DNR-cs, USDA-cs, Other)	CROPLAND ACRES (OWNED & RENTED)
	108.1

RENTED FARM(S) LANDOWNER NAME(S) AND ACREAGE: add sheet(s) if needed
The field is owned by the Fontana Walworth Water Pollution Control Commission.

WAS THE PLAN WRITTEN IN SNAPPLUS? ☒ YES ☐ NO | If yes, which software version, if known? 20.4

CHECK PLANNER'S QUALIFICATION: 2. ASA-CCA
(1. NAICC-CPCC, 2. ASA-CCA, 3. SSSA-Soil Scientist, 4. DATCP approved training course, 5. Other approved by DATCP)

NAME OF QUALIFIED NUTRIENT MANAGEMENT PLANNER			BUSINESS PHONE	
Kerri Helwig			(920) 261 - 0446	
STREET ADDRESS		CITY	STATE	ZIP
710 Commerce Drive		Watertown	WI	53094

Use header sections to add comments. Mark NA in the shaded sections if no manure is applied.

1. Does the plan include the following nutrient application requirements to protect surface and groundwater?
1.e. See Annual Note.

This section applies to fields and pastures. If no manure is applied, check NA for 1.c., 1.h., 1.i., 1.n., 1.o., 1.q., 1.s.	Yes	No	NA
a. Determine field nutrient levels from soil samples analyzed by a DATCP **certified laboratory**.	☒	☐	☐
b. For fields or pastures with mechanical nutrient applications, determine field nutrient levels from **soil samples** collected within the last **4 years** according to 590 Standard (590) and UWEX Pub. A2809, *Nutrient Application Guidelines for Field, Vegetable, and Fruit Crops in Wisconsin* (A2809) typically collecting **1 sample per 5 acres** of 10 cores. Soil tests are not required on **pastures** that do not receive mechanical applications of nutrients if either of the following applies: 1. The pasture average stocking rate is one animal unit per acre or less at all times during the grazing season. 2. The pasture is winter grazed or stocked at an average stocking rate of more than one animal unit per acre during the grazing season, and a nutrient management plan for the pasture complies with 590 using an assumed soil test phosphorus level of 150 PPM and organic matter content of 6%.	☒	☐	☐
c. For **livestock siting permit approval**, collect and analyze soil samples meeting the requirements above in 1. b., excluding pastures, within 12 months of approval and revise the nutrient management plan accordingly. Until then, either option below maybe used: 1. Assume soil test phosphorus levels are greater than 100 ppm soil test P, OR 2. Use preliminary estimates analyzed by a certified DATCP laboratory with soil samples representing > 5 ac/sample.	☐	☐	☒
d. **Identify all fields'** name, boundary, acres, and location.	☒	☐	☐
e. Use the field's previous year's legume credit and/or applications, predominant soil series, and realistic yield goals to determine the crop's nutrient **application rates consistent with A2809 for ALL forms of N, P, and K.**	☒	☐	☐
f. Make no **winter applications of N and P** fertilizer, except on grass pastures and winter grains.	☒	☐	☐
g. Document method used to determine **application rates**. Nutrients shall not runoff during or immediately after application.	☒	☐	☐
h. Identify in the plan that **adequate acreage** is available for manure produced and/or applied.	☐	☐	☒
i. Apply a single phosphorus (P) assessment using either the **P Index** or **soil test P** management strategy to all fields within a tract when fields receive manure or organic by-products during the crop rotation.	☐	☐	☒
j. Use **complete crop rotations** and the field's **critical soil** series to determine that sheet and rill erosion estimates will not exceed **tolerable soil loss** (T) rates on fields that receive nutrients.	☒	☐	☐
k. Use contours; reduce tillage; adjust the crop rotation; or implement other practices to **prevent ephemeral erosion**; and maintain perennial vegetative cover to **prevent reoccurring gullies** in areas of concentrated flow.	☒	☐	☐
l. Make no nutrient applications within 8' of **irrigation** wells or where **vegetation is not removed**.	☒	☐	☐
m. Make no nutrient applications within **50' of all direct conduits to groundwater**, unless directly deposited by gleaning/pasturing animals or applied as starter fertilizer to corn.	☒	☐	☐

	Yes	No	NA
n. Make no **untreated manure applications** to areas within 1000' of a **community potable water well** or within 100' of a **non-community potable water well** (ex. church, school, restaurant) unless manure is treated to substantially eliminate pathogens.	☐	☐	☒
o. Make no manure applications to areas **locally delineated** by the Land Conservation Committee or in a conservation plan as areas contributing runoff to direct conduits to groundwater unless manure is substantially buried within 24 hours of application.	☐	☐	☒
p. Make no applications of **late summer or fall commercial N fertilizer** to the following areas UNLESS needed for establishment of fall seeded crops OR to meet A2809 with a blended commercial fertilizer. Commercial fertilizer N applications shall not exceed 36 lbs. N/acre on: • Sites vulnerable to N leaching **PRW Soils** (P=high permeability, R= bedrock < 20 inches, or W= wet < 12 inches to apparent water table); • Soils with depths of 5 feet or less to bedrock; • Area within 1,000 feet of a community potable water well. On **P soils, when commercial N is applied** for full season crops in **spring and summer**, follow A2809 and apply one of the following: 1. A split or delayed N application to apply a majority of crop N requirement after crop establishment. 2. Use a nitrification inhibitor with ammonium forms of N. 3. Use slow and controlled release fertilizers for a majority of the crop N requirement applied near the time of planting.	☒	☐	☐
q. Limit manure applications in late summer or fall using the lesser of A2809 or the following 590 rates on **PRW Soils.** Use ≤ 120 lbs. available N/acre on: **P and R soils** on *all crops, except annual crops*. Additionally, manure with ≤ 4% dry matter (DM) wait until after soil temp. < 50°F or Oct. 1, and use either a nitrification inhibitor OR surface apply and do not incorporate for at least 3 days. **W soils or combo. W soils** on *all crops.* Additionally, manure with ≤ 4% DM on *all crops* use at least one of the following: **1.** Use a nitrification inhibitor; **2.** Apply on an established cover crop, an overwintering annual, or perennial crop; **3.** Establish a cover crop within 14 days of application; **4.** Surface apply & don't incorporate for at least 3 days; **5.** Wait until after soil temp. < 50°F or Oct. 1. Use ≤ 90 lbs. available N/acre on: **P and R soils** on *annual crops* wait until after soil temp. < 50°F or Oct. 1. Additionally, manure with ≤ 4% DM use either a nitrification inhibitor OR surface apply and do not incorporate for at least 3 days. **W soils or combination W soils** receiving manure with ≤ 4% DM on *all crops*.	☐	☐	☒
r. Use at least one of the following practices on **non-frozen soils for all nutrient applications** within Surface Water Quality Management Area **(SWQMA)** = 1000' of lakes/ponds or 300' of rivers: **1.** Maintain > 30% cover after nutrient application; **2.** Effective incorporation within 72 hours of application; **3.** Establish crops prior to, at, or promptly following application; **4.** Install/maintain vegetative buffers or filter strips; **5.** Have at least 3 consecutive years no-till for applications to fields with < 30% residue (silage) and apply nutrients within 7 days of planting.	☒	☐	☐
s. Limit mechanical applications to **12,000 gals/acre of unincorporated liquid manure or organic by-products** with 11% or less dry matter where **subsurface drainage** is present OR within **SWQMA**. Wait a minimum of 7 days between sequential applications AND use one or more of the practice options on non-frozen soils listed in 1.r.1. through 1.r.5.	☐	☐	☒

2. When frozen or snow-covered soils prevent effective incorporation, does the plan follow these requirements for winter applications of all mechanically applied manure or organic by-products? *This section doesn't apply to winter gleaning/pasturing meeting 590 N and P requirements.*

If no manure is applied, check NA for 2.a. through 2.q..	Yes	No	NA
a. Identify **manure quantities planned to be spread during the winter**, or the amount of manure generated in 14 days, whichever is greater. *For daily haul systems, assume 1/3 of the manure produced annually will need to be winter applied.*	☐	☐	☒
b. Identify **manure storage capacity** for each type applied and stacking capacity for manure ≥ 16% DM if permanent storage does not exist.	☐	☐	☒
c. Show on map and make no applications within the **SWQMA**.	☐	☐	☒
d. Show on map and make no surface applications of liquid manure during **February and March** where **Silurian dolomite** is within 60 inches of the soils surface OR where **DNR Well Compensation** funds provided replacement water supplies for wells contaminated with livestock manure.	☐	☐	☒
e. Show on map and make no applications of manure within **300 feet** of **direct conduits to groundwater**.	☐	☐	☒
f. Do not exceed the P removal of the following growing season's crop when applying manure. Liquid manure applications are limited to **7,000 g/acre**. All winter manure applications are not to exceed **60 lbs. of P2O5/acre**.	☐	☐	☒
g. Make no applications of manure to fields with **concentrated flow channels** unless using two of the following: **1.** Contour buffer strips or contour strip cropping; **2.** Leave all crop residue and no fall tillage; **3.** Apply manure in intermittent strips on no more than 50% of field; **4.** Apply manure on no more than 25% of the field waiting a minimum of 14 days between applications; **5.** Reduce manure app. rate to 3,500 gal. or 30 lbs. P2O5, whichever is less; **6.** No manure application within 200 feet of all concentrated flow channels; **7.** Fall tillage is on the contour and slopes are lower than 6%. Make no applications to **slopes greater than 6%** (soil map units with C, D, E, and F slopes) unless the plan documents that no other accessible fields are available for winter spreading AND two of the options 2.g.1. through 2.g.5. are used.	☐	☐	☒

I certify that the plan represented by the answers on this checklist complies with Wisconsin's NRCS 2015-590 NM Standard or is otherwise noted.

Kerri Helwig CCA# 519887	6/29/2023
Qualified NM planner signature NAICC-*Certified Professional Crop Consultant*, ASA-*Certified Crop Adviser*, or SSSA-*Soil Scientist*	Date

Qualified NM farmer-planner or Authorized farm operator signature receiving and understanding the plan — Date	Signature if reviewed for quality assurance — Date

ROCK RIVER LABORATORY, INC.
AGRICULTURAL ANALYSIS

Tom Kauer
Field

Walworth
Township(s): 1N, 15E
Section(s): 25

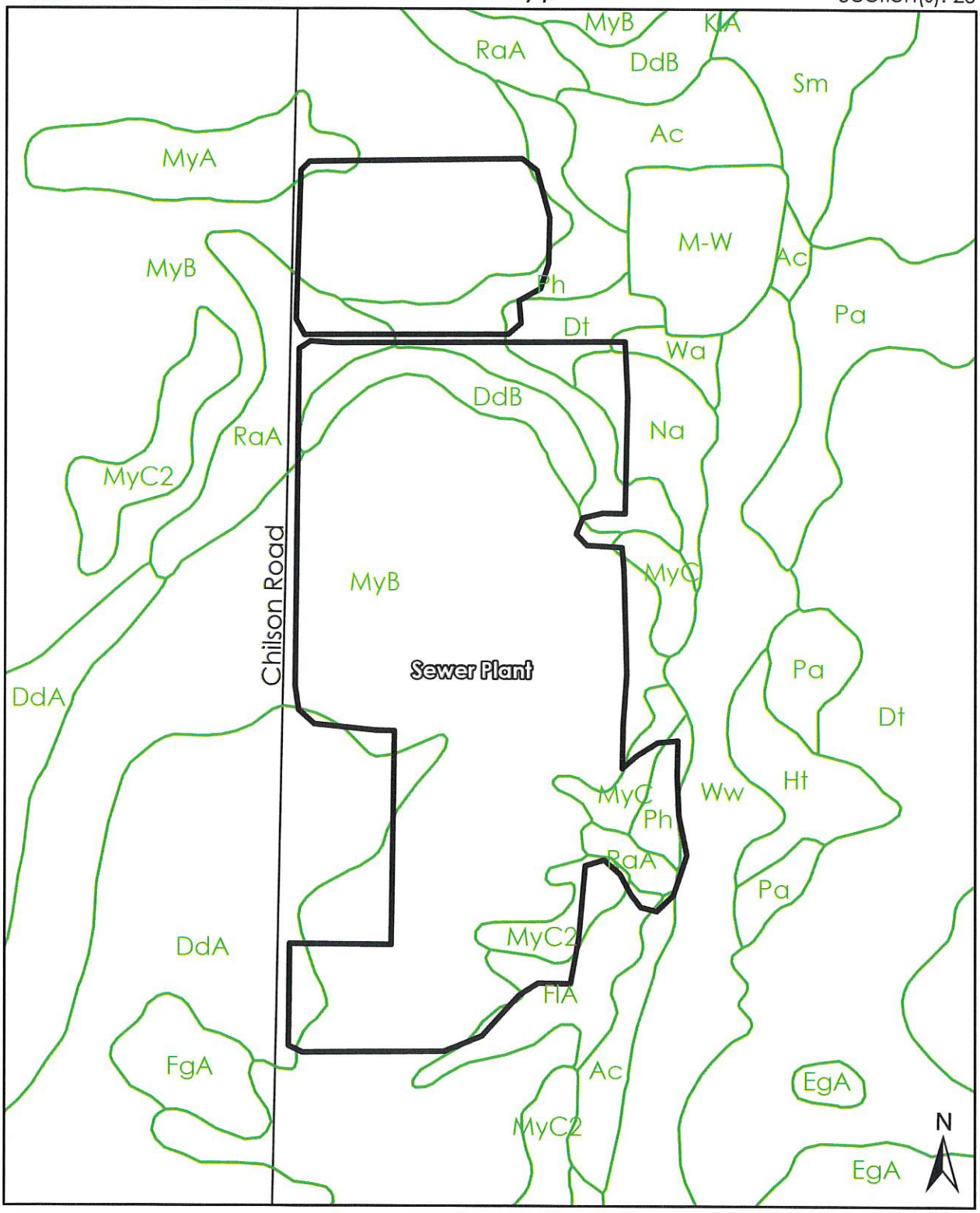
Feet
0 1,000 2,000

6/29/2023
User: Rock River Lab

ROCK RIVER LABORATORY, INC.
AGRICULTURAL ANALYSIS

Tom Kauer
Soil Types

Walworth
Township(s): 1N, 15E
Section(s): 25



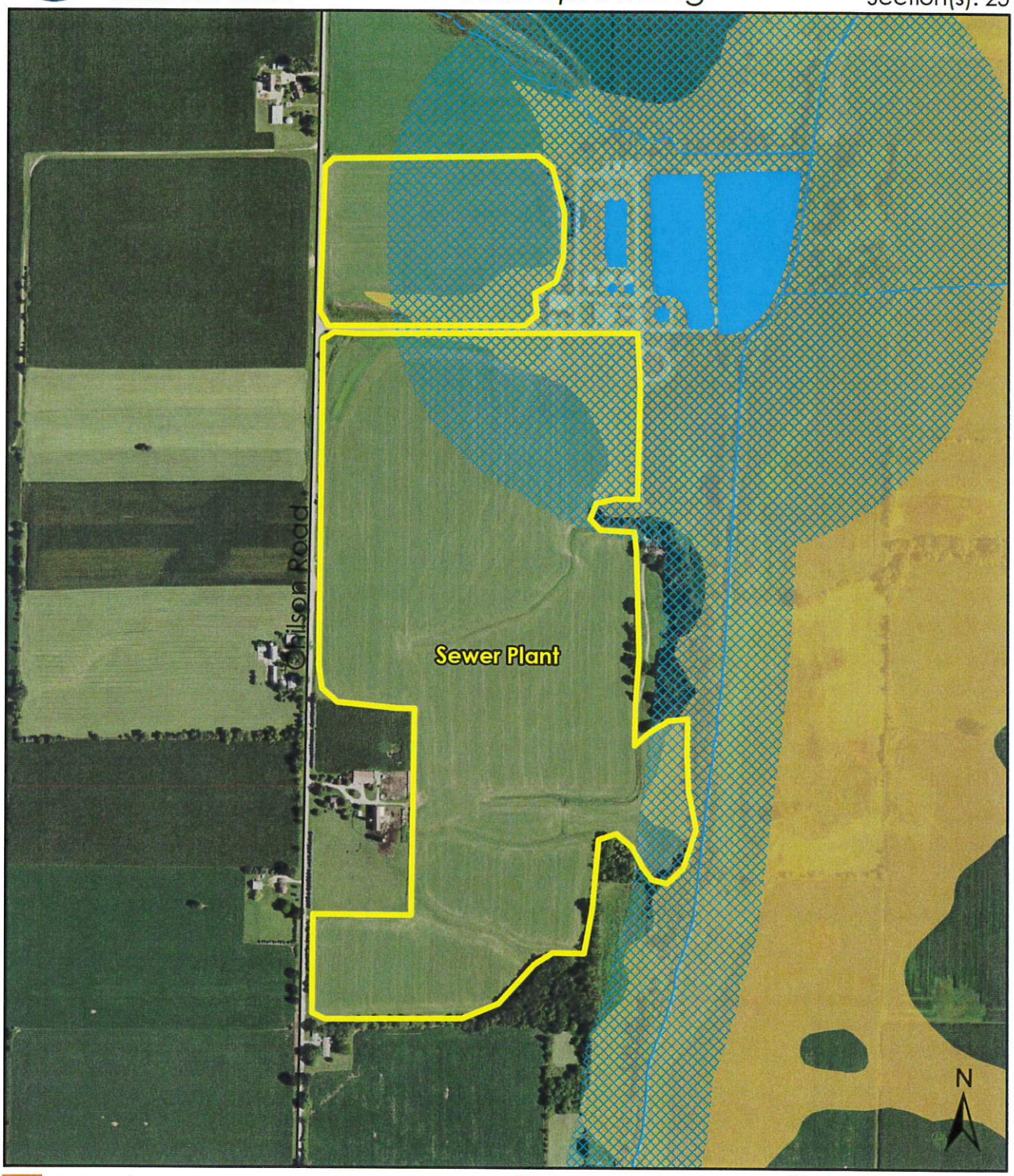
0 1,000 2,000 Feet

6/29/2023
User: Rock River Lab

ROCK RIVER LABORATORY, INC.
AGRICULTURAL ANALYSIS

Tom Kauer
In-Season Spreading

Walworth
Township(s): 1N, 15E
Section(s): 25



No Spreading
Roads
Surface Water
Streams
Intermittent Streams
SWQMA
Shallow Silurian
Fall N Restrictions
No Fall N Fertilizer
Wells

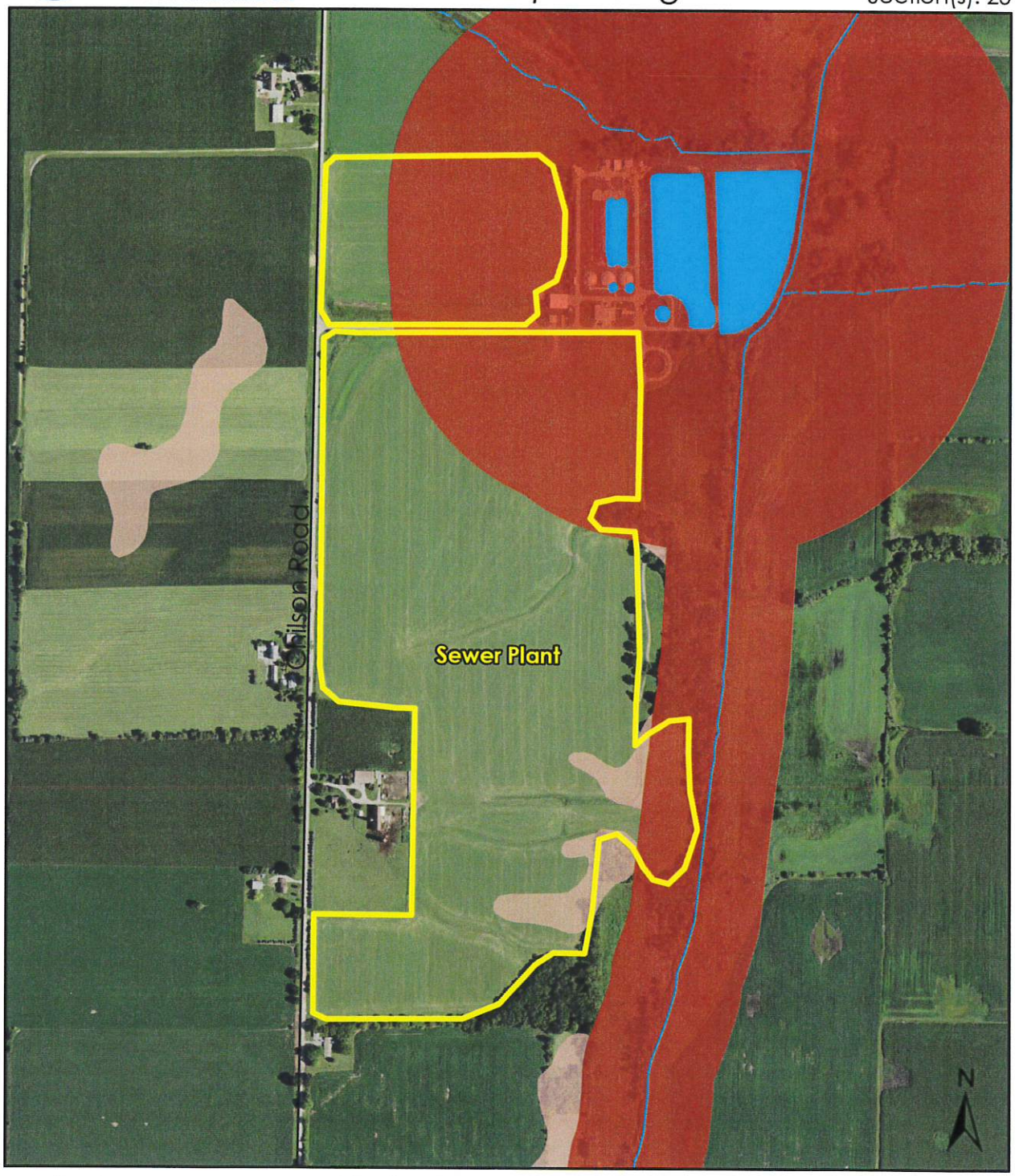
0 1,000 2,000 Feet

6/29/2023
User: Rock River Lab

ROCK RIVER LABORATORY, INC.
AGRICULTURAL ANALYSIS

Tom Kauer
Winter Spreading

Walworth
Township(s): 1N, 15E
Section(s): 25



Roads
Surface Water
Streams
Intermittent Streams
No Spreading
Winter Spreading Practices
Wells

0 1,000 2,000 Feet

6/29/2023
User: Rock River Lab

Nutrient Management and Farm Management Reports

NM1: Narrative & Crops Report

- Narrative and Crops: Gives an overview of the farm operation by including the Farm Narrative, Concentrated Flow Channel Protection Notes, and a table showing the crops, tillage, and yields for every field in the selected year range. This report can be used to show yields over time and that planned yields are consistent with documented yields. This report also includes a table of annual acreage and production for each crop grown on the farm in the selected year range.

NM2: Compliance Check

- Compliance Check: Lists all the fields in the designated year range that have rotational soil loss or phosphorus planning problems and all that have problem manure or fertilizer applications. It identifies each problem and displays any explanations that have been entered in the Nutrient Application Planner dialog box. Soil test problems section of the report also identifies fields with soil sampling that is inadequate or out-of-date. This report set up allows the planner to identify whether the P Index or Soil Test P methods (or both) are being used for phosphorus planning, and the check will only report problems for the planning method chosen. This report also lists fields with excess N applications. For CAFOs, SWQMA spreading strategy selected in the program is listed along with a matrix that identifies whether manure is applied to a SWQMA field in a year.

NM3: Field Data & 590 Assessment

- Field Data and 590 Assessment Plan: Shows soil type and other field information, crops and tillage for the rotation, and rotational soil loss, P2O5 Balance and P Index values. This report can be compared to field and soil maps to determine whether soil types and field characteristics have been identified correctly.

NM4: Manure Tracking

- Manure Tracking: Identifies how much manure was produced on the farm and applied or planned for application in each year of the selected year range. Also reports manure storage information and spreader calibration. This report also includes a matrix that lists acres in plan and acres receiving manure in each year of the selected year range.

NM5: Spreading & NM Sorted by Crop

- Spreading and NM Sorted by Crop: Shows manure and fertilizer nutrient application rates for all fields in the selected year sorted by crop category. Identifies consistency of planned applications with UW-Extension recommendations.

Nutrient Management and Farm Management Reports

NM6: Winter Spreading Plan

- Winter Spreading Plan: Shows the plan of the farm for Winter Spreading.
- Reflects a minimum of 14 days of manure and/or organic by-products generated by the farm or all manure and/or organic by-products anticipated to be spread during frozen or snow-covered soil, whichever is greater
- Documents the storage capacity for each manure type generated
- Documents the capacity for stacking manure that is > 16% dry matter without permanent storage. Refer to NRCS 313 Standard, Waste Storage Facility, to locate potential stacking sites
- Documents that fields with slopes less than 6% are not accessible for winter spreading, if winter spreading on fields with slopes greater than 6%.
- Identifies necessary runoff mitigation practices

NM7: Guidance

- Implementation Guidance: This section will show all the guidance messages that were produced for each field of the currently selected year. This report can be used to see what decisions need to be made at the time of application to keep the farm in compliance.

FM6: Soil Test Summary

- Soil Testing Summary: Shows soil test results for each field on the farm.

NM1: Narrative and Crops Report

Starting Year	**2022**
Reported For	**Kauer.Sewer.Plant_2023NMP_6.28.23**
Printed	**2023-06-29**
Plan Completion/Update Date:	**2023-06-29**
SnapPlus Version 20.4 built on 2021-06-03	
C:\Users\jenbi\OneDrive\Documents\RRL Nutrient Management\ALCIVIA \2023\Kauer.Sewer.Plant_2023NMP_6.28.23\Misc \Kauer.Sewer.Plant_2023NMP_6.28.23.snapDb	

Prepared for:
Kauer.Sewer.Plant_2023NMP_6.28.23
attn:Tom Kauer
N2150 Six Corners Rd.
Walworth, 53184

Farm has 1 fields totalling 108.1 cropped acres.
Farm Narrative: This field is operated by Tom Kauer.
No manure is applied to this field.
Commercial fertilizers used include 32% UAN, potash, and gypsum.
Crops grown include corn and alfalfa. Winter rye is seeded prior to a new stand of alfalfa. Alfalfa is direct seeded into the rye in the spring.
Alfalfa fields are chiseled under in the fall to prepare for corn the following spring.

Annual Farm Notes:

Crop Year	Annual Notes
2023	Nitrogen is overapplied in the current year. Nitrogen rates are reduced in future years to account for N from legume credits.

Spreader Calibration Methods: Custom applications, Amount applied / Acres

Narrative and Crops:

Field Name	Field Acres	2022	2023	2024	2025	2026	2027	2028	2029
Sewer Plant	108.1	Alfalfa None 5.6-6.5 ton/acre	Corn grain Fall Chisel, disked 191-210 bu/acre	Winter Rye (forage) to Late-Direct Seeded Legume Forage Chisel Plow, disked 2.0-3.5 ton/acre/ton/acre	Alfalfa None 5.6-6.5 ton/acre	Alfalfa None 5.6-6.5 ton/acre	Corn grain Fall Chisel, disked 191-210 bu/acre	Winter Rye (forage) to Late-Direct Seeded Legume Forage Chisel Plow, disked 2.0-3.5 ton/acre/ton/acre	Alfalfa None 5.6-6.5 ton/acre

Summary by Crop:
NOTE: Yields calculated using the midpoint of the SnapPlus yield goal range for each crop.

Crops Grouped By Category		2022	2023	2024	2025	2026	2027	2028	2029
Alfalfa	Acres ton	108 653			108 653	108 653			108 653
Corn grain	Acres bu		108 21,654				108 21,654		
Winter Rye (forage) to Late-Direct Seeded Legume Forage	Acres ton/ton			108 297				108 297	

NM2: Application Restriction Compliance Check Report

For Years	**2022 - 2029**
Plan Year	**2023**
Reported For	**Kauer.Sewer.Plant_2023NMP_6.28.23**
Printed	**2023-06-29**
Plan Completion/Update Date	**2023-06-29**
SnapPlus Version 20.4 built on 2021-06-03	
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Prepared for:
Kauer.Sewer.Plant_2023NMP_6.28.23
attn:Tom Kauer
N2150 Six Corners Rd.
Walworth, 53184

This farm uses PI for P2O5 590 Compliance

Rotational Restriction Problems

No Rotational Problems found

Soil Test Problems

No Soil Test Problems

Soil Test Problems Legend	
Too Few Soil Samples	Less than one sample per five acres.
Soil Test Data Too Old	Soil test is greater than 4 years old

Application Restriction Problems

Field Name	Year	Problem	Explanation
Sewer Plant	2023	Overapplication of fertilizer N of 70 lbs N/acre.	

NM3: Field Data and 590 Assessment Plan

Reported For	Kauer.Sewer.Plant_2023NMP_6.28.23
Printed	2023-06-29
Plan Completion/Update Date	2023-06-29
SnapPlus Version 20.4 built on 2021-06-03	
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Prepared for:
Kauer.Sewer.Plant_2023NMP_6.28.23
attn:Tom Kauer
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Walworth, 53184

Field Data: 108 Total Acres Reported.

Field Name	SubFarm	FSA Trct	FSA Fld	Acres	County	Critical Soil Series & Symbol	F. Slp %	F.Slp Len ft	Below Field Slope To Water %	Dist.To Water ft	Contour/ Filters	Irrig	Tiled	Rotation	Tillage	Report Period	Field "T" t/ac	Rot Avg Soil Loss t/ac	SCI	Rot Avg PI	Soil Test P ppm	Rot P2O5 Bal lb/ac	P2O5 Bal Target lb/ac
Sewer Plant				108.1	Walworth	MIAMI MyB	4	200	0 - 2	301 - 1000	No / No	No	No	A-Cg-[Rwf-Fs]-A-A-Cg-[Rwf-Fs]-A	None-FCD-CP-None-None-FCD-CP-None	2022-2029	**5**	**3.4**	**0.1**	**5**	120	-570	-143

Crop Abbreviations

Abbreviation	Crop
[Rwf-Fs]	Winter Rye (forage) to Late-Direct Seeded Legume Forage
A	Alfalfa
Cg	Corn grain

Tillage Abbreviations

Abbreviation	Tillage
CP	Chisel Plow, disked
FCD	Fall Chisel, disked
None	None

NM4: Manure Tracking Report

Starting Year	**2022**
Reported For	**Kauer.Sewer.Plant_2023NMP_6.28.23**
Printed	**2023-06-29**
Plan Completion/Update Date:	**2023-06-29**
SnapPlus Version 20.4 built on 2021-06-03	
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Annual Manure Production And Use By Source

Total Value = $ Value of all nutrients, incorporated including S.

No Rows Found

Estimated Livestock Manure Production For 2023

No Livestock Found

Manure Storage For 2023

No Storages Found

Spreaders For 2023

No Spreaders Found

NM5: Spreading and Nutrient Management Sorted By Crop Report

Crop Year	**2023**
Reported For	**Kauer.Sewer.Plant_2023NMP_6.28.23**
Printed	**2023-06-29**
Plan Completion/Update Date	**2023-06-29**
SnapPlus Version 20.4 built on 2021-06-03	
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Prepared for:
Kauer.Sewer.Plant_2023NMP_6.28.23
attn:Tom Kauer
N2150 Six Corners Rd.
Walworth, 53184

First Year Corn Grain Fields						Crop Removal			Soil Test ppm		Adjusted Recs lb/ac			Planned Applications and Credits lb/ac			Over(+) Under(-) Adj. UW Recs lb/ac			Applications				
Name	Field Ac.	Soil Map Symbol (pred) & N Res	Prior Crop	2023 Crop	Yield Goal	P2O5	K2O	Tillage	Avg P	Avg K	N	P2O5	K2O	N	P2O5	K2O	N	P2O5	K2O	Product Name and Analysis	Rate and Method	N-P2O5-K2O credit	App Acres and Time	Total Amt
Sewer Plant	108.1	MyB W	Alfalfa	Corn grain	191-210	75	60	FCD	120	44	165	0	105	280	0	0	115	0	-105	32% UAN (Liquid 32-0-0)	45 gal Spring Unincorp	160-0-0	108.1 Entire field	4864 gal
																				legume		120-0-0		

108.1 planned First Year Corn Grain acres 4,864 planned gal 32% UAN (Liquid 32-0-0)

108 total planned acres

4,864 planned gal 32% UAN (Liquid 32-0-0)

Total Manure Volume	Manure App Plan	Remaining Manure
0 tons	0	0
0 gals	0	0

Tillage Abbreviations

Abbreviation	Tillage
FCD	Fall Chisel, disked
None	None

NM6 Winter Spreading Plan - 2023
All fields

Manure Production for 2023

Animal Type and Size	No. of head	lb/day per animal	Liquid gal/day per animal	14-day production as tons*	14-day production as gallons*	120-day production as tons*	120-day production as gallons*
Totals							

* These are estimates of the total manure produced by all the animals on a farm for a 14-day and a 120-day period. The intent of this calculation is for comparison to planned winter spreading amounts. Total production is shown both in tons and in gallons to make it easier for planners to compare to whichever units are used on a farm. The 2015 590 standards requires all producers with livestock to plan for winter-spreading for a minimum of 14-days of manure production. The120-day manure production is shown because that is the approximate length of the frozen soil period in southern Wisconsin and is therefore the very minimum amount of days that should be planned for winter application or storage.

Manure Storage for 2023

Storage Name	Storage Source	Storage Type	Solid Storage (tons)	Liquid Storage (gallons)
Totals				

Manure Spreading for 2023

Total planned winter mechanical applications on 0 acres: 0 tons and 0 gallons

Total planned winter grazing applications on 0 acres: 0 tons

All fields with Mechanical Spreading in Winter 2023

Field Name	Winter Acres	Slope %	Other Field Avail. if SI>6%*	Conc. Flow	Winter Application Strategies	Winter Compliance Prob.	Problem Explanation

*Fields with no winter applications and no spreading restrictions in 2023 (0 acres): none found

NM7 Implementation Guidance Report - 2023
All fields

No Guidance Messages found.

FM6: Soil Test Report

Reported For	Kauer.Sewer.Plant_2023NMP_6.28.23
Printed	2023-06-29
Plan Completion/Update Date	2023-06-29
SnapPlus Version 20.4 built on 2021-06-03	
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Prepared for:
Kauer.Sewer.Plant_2023NMP_6.28.23
attn:Tom Kauer
N2150 Six Corners Rd.
Walworth, 53184

			Predominant					Samples				in ppm			
Field Name	Subfarm	Acres	Soil Map Symbol	Soil Name	Soil Test Date	Soil Test Lab	Lab Number	Rec. #	Actual #	pH	OM%	P	K	S	CEC
Sewer Plant		108.1	MyB	MIAMI	2023-06-13	Rock River Laboratory	272722	**22**	**26**	6.4	3.3	120	44	1.9	10

Crop Year Soil Test Needed

Field Name	Soil Test Date	2023	2024	2025	2026	2027	2028	2029
Sewer Plant	2023-06-13						X	

Spreading Log

Application Date	Driver	Field ID	Acres Applied	Manure/Process Wastewater Source	Spreader Volume	# Loads	Soil Conditions* (saturated, dry cracked, non-sat., frozen, snow)	Weather** During Application (temp & precipitation)	Application (Inject, Incorp, or Surface)

Spreading Log

Application Date	Driver	Field ID	Acres Applied	Manure/Process Wastewater Source	Spreader Volume	# Loads	Soil Conditions* (saturated, dry cracked, non-sat., frozen, snow)	Weather** During Application (temp & precipitation)	Application (Inject, Incorp, or Surface)

Spreading Log

Application Date	Driver	Field ID	Acres Applied	Manure/Process Wastewater Source	Spreader Volume	# Loads	Soil Conditions* (saturated, dry cracked, non-sat., frozen, snow)	Weather** During Application (temp & precipitation)	Application (Inject, Incorp, or Surface)

Spreading Log

Application Date	Driver	Field ID	Acres Applied	Manure/Process Wastewater Source	Spreader Volume	# Loads	Soil Conditions* (saturated, dry cracked, non-sat., frozen, snow)	Weather** During Application (temp & precipitation)	Application (Inject, Incorp, or Surface)

Agronomy Facts 68

Manure Spreader Calibration

Manure spreader calibration is an essential and valuable nutrient management tool for maximizing the efficient use of available manure nutrients. Planned manure application rates listed in nutrient management plans must correlate with actual application rates. Calibrating the manure spreader is the only way to know actual manure application rates.

Manure spreader calibration combined with soil test recommendations and manure analysis results enable the determination of nutrient application rates that meet crop nutrient needs. The most critical and challenging aspect of both soil and manure analysis is obtaining a representative sample to submit to the laboratory. It is critical to learn and follow recommended soil and manure sampling procedures in order to obtain a representative sample and test results. The manure nutrient levels and crop nutrient requirements from test results are used to determine manure application rates that will adequately meet crop needs. Manure spreader calibration ensures that manure application rates are realistic, practical, and attainable.

Manure application rates are determined by equipment speeds and settings along with application management, such as overlaps. Manure spreader calibration can be used two ways in nutrient management planning:

- Before planning—Spreaders can be calibrated to determine the rates that can be applied at typical application settings and speed. These rates are then used as the possible planned rates when the nutrient management plan is developed.
- After planning—Spreaders can be calibrated to meet planned application rates by changing speeds, settings, or management. In this case, desired application rates are determined as the nutrient management plan is developed and the spreader is calibrated accordingly.

OVERVIEW OF SPREADER CALIBRATION

An application rate is defined as the amount of manure applied per unit of land area. For manure, it is usually expressed in tons per acre (solid) or gallons per acre (liquid). Generally, application rate equals the amount of manure applied (in tons or gallons) divided by the area covered (in acres).

Manure spreader calibration requires reliable estimates of both the amount applied and area covered. There are two common calibration techniques. The **swath or load-area method** involves measuring both the amount of manure in a typical spreader load and the land area covered by applying one load of manure. While this method can be used for all manures, it is the best method for liquid manure applicators. The **tarp or weight-area method** involves weighing the manure spread over a small surface and computing the amount of manure applied per acre. This method is the best method for solid manure applicators.

CALIBRATION METHODS

Below are descriptions of the two most common calibration methods.

Swath (Load-Area) Method

Liquid manure applicators used in pump-and-haul application systems are best calibrated by the swath or load-area method, which involves land applying a full load of manure and measuring the land area covered. If possible, choose an area that is typical of the land where manure will be spread. If appropriate, a relatively level area long enough for the load to be applied in a single pass makes measurements and calculations simpler. A rectangular field pattern should be used to make measuring easier. The application rate of PTO-driven spreaders depends on ground speed. Therefore, it is important to maintain a uniform ground speed throughout the swath length. Ground-driven spreaders deliver reasonably uniform application rates regardless of ground speed.

For liquid application equipment, application rates and patterns vary depending on ground speed or PTO speed, gear box settings, gate openings, operating pressures, spread widths, and overlaps. To change the application rates, adjustments must be made in tractor/PTO speeds, spreader output settings, or application management. The

calibration process should be followed for each change or combination of changes. Several calibration passes may be necessary to determine the settings required for the desired application rate.

Use the swath (load-area) method procedure and record sheet provided at the end of this publication for this calibration method.

Tarp (Weight-Area) Method

Solid manure applicators are best calibrated by the tarp or weight-area method, which involves measuring the amount of manure (weight) applied over a small measured area (tarp). The application rate is determined by dividing the amount (weight) of manure collected on the tarp by the size of the collection area (tarp).

For solid application equipment, applications rates and patterns vary depending on ground speed or PTO speed, gear box settings, gate openings, operating pressures, spread widths, and overlaps. To change the application rates, adjustments must be made in tractor/PTO speeds, spreader output settings, or application management. The calibration process should be followed for each change or combination of changes. Several calibration passes may be necessary to determine the settings required for the desired application rate.

Use the tarp (weight-area) method procedure and record sheet provided at the end of this publication for this calibration method.

DETERMINING MANURE SPREADER CAPACITY

The load-area method of manure spreader calibration requires knowledge of the manure spreader's capacity. Manure spreader capacity can be determined by one of the following methods.

Manufacturer's Capacity Ratings

The rated capacity for liquid spreaders can be used directly if the spreader is typically filled to capacity. In many cases, the spreader is not fully loaded. Therefore, adjustments must be made for less than full capacity.

The rated capacity of box-type solid or semisolid spreaders must be adjusted according to the fullness of a typical load of manure. Make sure to note whether the rating specifications are for "heaped or piled" or "level" loads.

If there is any uncertainty about the rate capacity, then a more accurate method is needed to measure the actual volume of manure.

Measure Spreader Volume

Spreader volume can be estimated by using the calculations in Figure 1. All dimensions used in the following formulas must be in feet in order to obtain volumes that are in cubic feet. After calculating volume in cubic feet, convert the cubic feet to pounds and then convert pounds to tons or gallons based on manure density using the conversion factors in Table 1.

Figure 1. Calculating estimated manure spreader volumes.

SOLID OR SEMISOLID

[A] Box spreader (level load)*
volume = length x width x depth

[B] Box spreader (piled load)*
volume = length x width x [depth + (stacking height** x 0.8)]

[C] Round-bottom open-top spreader (level load)
volume = length x depth x depth x 1.6

[D] Round-bottom open-top spreader (piled load)
volume = length x depth x 1.6 x (depth + stacking height**)

LIQUID

[A] Box spreader (level load)*
volume = length x width x depth

[C] Round-bottom open-top spreader (level load)
volume = length x depth x depth x 1.6

[E] Tank spreader (round)
volume = length x tank diameter x tank diameter x 0.8

[F] Tank spreader (noncircular)
volume = length x width x depth x 0.8

*For a box spreader with sloping sides, use an average width.
**Stacking height is the height of any mounded manure above level.

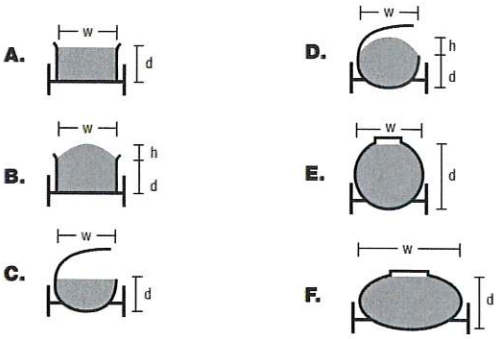

Table 1. Commonly required conversions for manure spreader volumes.

TO CONVERT FROM	TO	MULTIPLY BY
bushels	cubic feet	1.24
gallons	cubic feet	0.134
gallons	pounds	8.3 (liquid)
gallons	tons	0.0041 (liquid)
tons	gallons	240 (liquid)
cubic feet	gallons	7.48
cubic feet	tons	0.031 (liquid) or 0.0275 (solid)
cubic feet	pounds	62 (liquid) or 55 (solid)

See the next page for instructions to determine the actual manure density.

Weigh Manure Load

The most accurate way to determine the capacity of a spreader is to directly weigh the spreader. The spreader should be weighed using drive-on scales or weigh pads.

First, weight the spreader empty and then weight at least three typical loads of manure. Obtain an average weight of the full loads and subtract the weight of the empty load to determine the weight of the manure. Convert this weight to tons or gallons.

DETERMINING MANURE DENSITY

Manure density (weight per cubic foot) varies with moisture content primarily depending on the amount of bedding. To calculate a more accurate estimate of manure density, use the procedure below.

1. Weigh an empty 5-gallon bucket. Record the weight in pounds.
2. Fill the 5-gallon bucket with a typical sample of the manure to be applied and weigh the bucket and manure. Record the weight in pounds.
3. Subtract the weight of the empty bucket (step 1) from the weight of manure and bucket (step 2). Record the weight of manure in pounds.
4. Repeat steps 2 and 3 at least six times and calculate the average manure weight (add the six weights together and divide by six). Record average weight of manure in pounds.
5. Multiply the average manure weight (step 4) by 1.5 to obtain the estimated manure density in pounds per cubic foot. Record the manure density in pounds per cubic foot.

SWATH (LOAD-AREA) METHOD CALIBRATION PROCEDURE

Obtain calibration equipment and supplies.

- Measuring wheel (available from any farm supply catalog, such as NASCO).

1. Determine manure spreader capacity.
   - Use manufacturer's ratings or actual weighing of the spreader, or estimate by using spreader volume calculations described above.
   - Record the capacity in gallons (liquid manure) or tons (solid manure).
   - Load the spreader consistently with the capacity determination above.
2. Spread one full load of manure in a rectangular pattern. Note the details of the operating conditions (e.g., tractor gear, throttle setting, PTO speed, tractor speed, spreader settings).
3. Measure the length and the effective application width of the application coverage area.
   - Record the distances in feet.
   - An alternative method of measuring the application length is to note the ground speed and time required to make the application pass. To calculate length covered, multiply the ground speed (in mph) by the number of seconds by 1.46 feet per second.
4. Calculate the size of the coverage area.
   - Multiply the length by the width and divide by 43,560 square feet per acre.
   - Record the coverage area in acres.
5. Calculate the application rate.
   - Divide the volume of the spreader load of manure (step 1a) by the acres covered (step 4b).
   - Record manure application rate in gallons or tons per acre.
6. Repeat the calibration procedure one or two more times.
   - Repetition is necessary to increase reliability of the application rate. A certain amount of variation is inevitable. However, if there is significant variation among repetitions, check over the equipment and review your calibration procedure to try to determine the cause of the variation.
   - Repeat steps 2 through 5.
   - Calculate the average of each of the measured manure application rates.
   - Record the final calibrated rate in gallons or tons per acre.

MANURE SPREADER CALIBRATION RECORD SHEET—SWATH (LOAD-AREA) METHOD			
SPREADER IDENTIFICATION			
DATE			
1. Determine the capacity of the spreader (use gallons for liquid manure and tons for solid manure).			
a. Spreader capacity			gallons or tons
2. Spread one full load in a rectangular pattern.			
Forward speed, gear, or throttle setting			
PTO speed or setting			
Spreader gate opening setting			
3. Measure the coverage area.			
	Trial 1	Trial 2	Trial 3
a. Spread area width	feet	feet	feet
b. Spread area length	feet	feet	feet
4. Calculate the area covered.			
a. Spread area (3a x 3b)	ft^2	ft^2	ft^2
b. Spread area (4a ÷ 43,560)	acres	acres	acres
5. Calculate the manure application rate.			
a. Application rate (1a ÷ 4b)			gallons or tons/acre
6. Average each of the calibration trials to determine the final application rate.			
Final calibrated application rate (average of trials in 5a)			gallons or tons/acre

Tarp (Weight-Area) Method Calibration Procedure

Obtain calibration equipment and supplies.

- Tarp or plastic (heavy) sheet approximately 100 square feet in size (9 x 12, 10 x 10, 10 x 12, etc.)
- Tent pegs or long nails
- Scales (spring-tension or platform)
- Bucket (optional to assist in weighing)

1. Measure the exact surface area of the trap or plastic sheet (length x width).
   - Record the surface area in square feet.
   - Weigh the "empty" tarp or plastic sheet. If using a bucket, weigh the tarp or plastic sheet with the bucket.
   - Record the weight (empty) in pounds. (3a)
2. Position the tarp in the field where the manure can be spread.
   - Place it far enough into the field to allow enough distance to get the spreader in gear and the tractor up to the desired speed.
   - Avoid placing the tarp where the beginning or end of the load is likely to fall.
   - Secure each corner of the tarp with a tent peg or long nail.
   - Spread the first pass of manure directly over the center of the tarp.
   - Operate the spreader at the speed normally driven when applying manure.
   - Note the details of the operating conditions (e.g., tractor gear, throttle setting, PTO speed, tractor speed, spreader settings).
   - Spread two additional passes on opposite sides of the center of the tarp.
   - Apply these passes at the normal spreader overlap spacing.
3. Remove and fold the tarp.
   - Be careful not to spill any of the collected manure.
   - If using a bucket for weighing, place the manure and tarp in the bucket.
   - Weigh the tarp and manure (and bucket).
   - Record the weight (gross) in pounds (step 3b).
   - Subtract the empty tarp weight (and bucket if using a bucket) (step 3a) from the gross tarp weight (step 3b).
   - Record the weight of collected manure in pounds.
4. Determine the manure application rate.
   - Divide the amount of manure collected (in pounds) (step 3c) by the tarp area (in square feet) (step 1a).
   - Multiply this value by 21.8 (43,560 ft^2/acre ÷ 2,000 lbs/ton) to convert pounds per square foot to tons per acre.
   - Record the manure application rate in tons per acre.
5. Repeat the calibration procedure one or two more times.
   - Repetition is necessary to increase reliability of the application rate.
   - Repeat steps 2 through 4.
   - Calculate the average of each of the measured manure application rates.
   - Record the final calibrated rate in tons per acre.

MANURE SPREADER CALIBRATION RECORD SHEET—TARP (WEIGHT-AREA) METHOD			
SPREADER IDENTIFICATION			
DATE			
1. Measure tarp surface area. Weigh the empty tarp and record under 3a below. Spread and secure the tarp or plastic sheet in the field.			
a. Tarp surface area:	width x	length =	ft^2
2. Spread manure over the center f the tarp an on each side of the tarp at the normal overlap spacing.			
Forward speed, gear, or throttle setting			
PTO speed or setting			
Spreader gate opening setting			
3. Fold and weigh the tarp (and weighing container) with an accurate set of spring-tension or platform scales.			
	Trial 1	Trial 2	Trial 3
a. Empty weight	lbs	lbs	lbs
b. Gross weight with manure	lbs	lbs	lbs
c. Net weight (3b – 3a)	lbs	lbs	lbs
4. Calculate the manure application rate.			
a. Application rate (3c ÷ 1a)	lbs/ft^2	lbs/ft^2	lbs/ft^2
b. Application rate (4a x 21.8)	tons/acres	tons/acres	tons/acres
5. Average each of the calibration trials to determine the final application rate.			
Final calibrated application rate (average of trials in 4b)			tons/acre

Prepared by Gerald Martin, senior extension associate, and Douglas Beegle, professor of agronomy.
Peer-review feedback provided by William Clouser, nutrient management program supervisor, State Conservation Commission; Douglas Goodlander, nutrient management program director, State Conservation Commission; Robert Meinen, senior extension associate, Penn State Extension; and Jennifer Weld, project associate, Penn State.

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D. Table 1. NRCS FOTG Conservation Practice Standard 313, Waste Storage Facility Table 10 Temporary, Unconfined Stacks of Manure and Derivatives Outside the Animal Production Area

1. Waste Consistencies [Note 1]		
	> 32% Solids	16% to 32% Solids [Note 2]
2. Size & Stacking Period		
Stacking Period	8 months	8 months
Maximum Volume/Stack	≤ 40,000 cu ft.	≤ 15,000 cu ft.
Maximum Number of Stacks/40 acres [Note 3]	–	2
Frequency of Stacking Site Use	1 year out of 2	1 year out of 3
3. Hydrologic Soil Groups		
	B or C	B or C
4. Subsurface Separation Distance		
Subsurface Saturation	≥ 3 ft.	≥ 3 ft.
Bedrock	≥ 3 ft.	≥ 5 ft.
5. Surface Separation Distance		
Wells [Note 4]	≥ 250 ft.	≥ 250 ft.
Lakes	≥ 1,000 ft.	≥ 1,000 ft.
Sinkholes, or other Karst Features	≥ 1,000 ft.	≥ 1,000 ft.
Quarries	≥ 1,000 ft.	≥ 1,000 ft.
Streams	≥ 300 ft.	≥ 500 ft.
Wetlands and Surface Inlets	≥ 300 ft.	≥ 500 ft.
Areas of Concentrated Flow	≥ 100 ft.	≥ 300 ft.
Land Slope Down Gradient of Stack	≤ 6%	≤ 3%
Floodplain	≥ 100 ft.	≥ 300 ft.
Tile lines	≥ 40 ft.	≥ 40 ft.

Note 1 Refer to AWMFH, Figure 9-1 for consistency values and Chapter 4 for % solids, for specific livestock types.

Note 2 16% to 32% solids represents waste at near saturation conditions where additions of free water from runoff, rain, or snow-melt can result in liquid flow conditions.

Note 3 The separation distance between stacks shall be at least 100 feet.

Note 4 Community water system wells may require larger separation distances (see NR 812).

Manure Spill Emergency Response Plan

What to do in Case of a Manure Spill

1. **Eliminate the source.**
   - Stop manure application or pumps.
   - Close valves.
   - Separate pipes, creating an air gap and stopping flow.
   - Transfer manure/liquid to another basin or lagoon.

2. **Contain the spill, if possible.**
   - Create a containment dam in the field, ditch or stream.
   - In a field, use tillage equipment to slow the flow
   - Check for tile flows.
   - Construct a temporary holding basin down slope.
   - Ensure that you do not damage the embankment while creating a temporary basis.
   - If possible, place soil over the point of seepage, ensuring that you do not drive over or compact the seepage point.

3. **Assess the extent of the spill and note any obvious damages.**
   - Did the spill reach any surface waters, well casings or other sensitive areas?
   - How much was released?
   - What time?
   - Did any damage occur (employee injury, fish kills, or property damage)?
   - Can the spill reach streams?

4. **Contact the appropriate agencies.**

5. **Clean up the spill and make repairs.**

6. **Prepare and submit summary.**

Farm Information		
Farm Name:		
Address:		
City:	**State:**	**Zip:**
Farm Owner:		
Phone:	**Mobile Phone:**	
Directions to the farm (from crossroad or highway)		

Emergency Phone Numbers	
County Sheriff Dispatch:	**Dial 911**
DNR 24-hour Spill Reporting Hotline	**1-800-943-0003**

County Land & Water Conservation Dept.	
County Conservationist	
Phone Number	
Department of Natural Resources	
Animal Waste Specialist	
Phone Number	
Conservation Warden	
Phone Number	
Refer to listing on back for: Earth Moving, Pumping Equipment, & Manure Hauling Contractors	
Equipment Owners (other neighboring farms)	
Name	**Phone Number**

Manure Spill Emergency Response Plan

Earthmoving Contactors

Company Name	Address	Phone

Pumping Equipment

Company Name	Address	Phone

Custom Manure Applicators

Company Name	Address	Phone

This is a partial listing for informational purposes only. No endorsement is implied or intended.

DEFINITIONS

Adequate Acreage – There is enough land described in the plan to use all the manure generated by the farm annually while maintaining compliance with this standard.

Apparent Water Table - Continuous saturated zone in the soil to a depth of at least 6 feet without an unsaturated zone below it.

Areas Contributing Runoff – Areas located up gradient from an identified feature which generate surface runoff during precipitation and/or melting periods that flows toward and eventually reaches the feature. The contribution area may be identified utilizing digital elevation models, topographic maps or infield measurement and/or observation.

Community Potable Water Well - Found in NR 811.02 (16) means a public water system, regulated under NR 811, which has at least 15 service connections and is used by at least 25 residents for at least 6 months per year.
Any water system serving 7 or more single family homes, 10 or more mobile homes, 10 or more apartment units, 10 or more duplex living units or 10 or more condominium units shall be considered a community water system unless information is provided by the owner indicating that 25 year-round residents will not be served.

Concentrated Flow Channel - A natural channel or constructed channel that has been shaped or graded to required dimensions and established in perennial vegetation for the stable conveyance of runoff. Refer to NRCS FOTG Standard 412, Grassed Waterway, for more information on construction. This definition may include non-vegetated channels caused by ephemeral erosion. These channels include intermittent streams, drainage ditches, and drainage ends identified on the NRCS soil survey. Concentrated flow channels are often identifiable as contiguous up-gradient deflections of contour lines on the USGS 1:24,000 scale topographic map.

Cover Crop – Grasses, legumes, forbs or other herbaceous plants established for seasonal cover and conservation purposes. Cover crops are typically terminated prior to the production of viable seed.

Direct Conduits to Groundwater – Wells, excluding irrigation wells; sinkholes; swallets (a sinkhole or rock hole that intercepts a stream, diverting all or a portion of it to the groundwater); fractured bedrock at the surface, mine shafts; non-metallic mines; tile inlets discharging to groundwater, quarries, or depressional groundwater recharge areas over shallow fractured bedrock. For nutrient management planning, these features will be identified on the Nutrient Application Restriction Maps, NRCS soil survey and/or USGS 1:24,000 scale topographic map, or otherwise determined through on-site evaluation and documented in a conservation plan, nutrient management plan or other local process approved by the Land Conservation Committee.

Effective Incorporation - Mixing with topsoil or residue, or subsurface placement of nutrients by such means as injector, disc, sweep, mold-board plow, chisel plow, or other tillage/infiltration methods. Nutrients will not run off the field or drain to subsurface tiles during application.

Ephemeral Erosion – Erosion which forms by the convergence of overland sheet flow and rill erosion to form shallow channels which reoccur in the same locations even after these channels are filled by tillage. The location of ephemeral erosion channels is typically determined by the macro topography of the field. Ephemeral erosion channels are characterized by a dendritic (branch shaped) pattern vs. the small parallel channel pattern formed by rill erosion (Page 10 Technical Note WI-1).

Gleaning or Pasturing - An area of land where animals graze or otherwise seek feed in a manner that maintains the vegetative cover over all the area and where the vegetative cover is the primary food source for the animals. Livestock shall be managed to avoid the routine concentration of animals within the same area of the field. Manure deposited near a well by grazing of livestock does not require incorporation.

Long term No-till – No tillage has occurred for a minimum of three consecutive previous years.

Major Nutrients - Nitrogen (N), phosphorus (P), and potassium (K).

Nitrification Inhibitor - A compound that temporarily blocks the activity of nitrifying bacteria and limits the conversion of ammonium to nitrate. Use of a nitrification inhibitor with ammonium-based fertilizers or manure has the potential to reduce nitrate loss via leaching or denitrification. Follow product label.

Non-community Potable Water Well – Public water system, regulated under NR 812, which serves at least 25 or more people for 6 months or more per year. Well users may be non-transient (same 25 people) or transient. Non- community potable wells include schools, restaurants, or churches.

N Restricted Soils Are defined below and include the area within 1000 feet draining to community potable water wells or areas identified as having soil depth of 5 feet or less over bedrock (See Technical Note WI-1).

High Permeability Soils (P) – Are equivalent to drained hydrologic group A meeting both of the following criteria:

1. Permeability = 6 inches/hour or more in all parts of the upper 20 inches and
2. Permeability = 0.6 inches/hour or more in all parts of the upper 40 inches.

Use the lowest permeability listed for each layer when evaluating a soil. For a multi-component map unit (complex), evaluate each component separately. If the high permeability components meet the criteria and cannot be separated, the entire map unit should be considered as high permeability.

Wet Soils (W) - Have an Apparent Water Table within 12 inches of the surface at any time of the year. The apparent water table is a continuous saturated zone in the soil to a depth of at least 6 feet without an unsaturated zone below it. A W soil is saturated, flooded, or ponded long enough during the growing season to develop anaerobic conditions. These soils can be non-hydric, saturated, or soggy for short periods in the spring after periods of rain or flooding and usually occur in low areas of the landscape.

Rock Soils (R) - Have less than or equal to 20 inches to bedrock. Bedrock is a general term for the solid rock (lithic) or unconsolidated material (paralithic) that underlies the soil or is exposed at the surface. If R soils are field verified and the depth is more than 20 inches to bedrock, then the soil is not considered restricted for bedrock.

Phosphorus Index (PI) - The Wisconsin Phosphorus Index (PI) is an assessment of the potential for a given field to deliver P to surface water. The PI assessment considers factors that contribute to P losses in runoff from a field and subsequent transport to a water body, including:

- Soil erosion as calculated using the current approved NRCS soil erosion prediction technology located in Section I of the NRCS FOTG.
- Estimated annual field rainfall and snowmelt runoff volume.
- Soil P concentrations as measured by routine soil test P (Bray P-1).
- Rate and management of P applications in the form of fertilizer, manure, or other organic material.
- Characteristics of the runoff flow pathway from the field to surface water.
- The algorithms and software for calculating the Wisconsin PI can be found at *http://wpindex.soils.wisc.edu/*.

Rotation - The sequence of crops to be grown for up to an 8-year period as specified by the conservation plan or as part of the soil erosion assessment calculated with the Wisconsin Phosphorus Index model.

Saturated Soils - Soils where all pore spaces are occupied by water and where any additional inputs of water or liquid wastes cannot infiltrate into the soil.

Slow and Controlled Release Fertilizer – Fertilizer materials that have been coated with a material (e.g. polymers, sulfur) that prevents the nutrients from being immediately available. Instead the nutrients become slowly available over time.

Soil Temperature – The soil temperature can be documented with soil temperature at least 4" depth, or by a 5-day average maximum daily air temperature =55°F, or 5-day average minimum daily air temperature =40°F.

Starter Fertilizer – Fertilizer applied at the time of planting and placed with or in a band near the seed.

Substantially Buried – Mixing the manure or process wastewater with surface soil so that at least 80% of applied manure or process wastewater is covered with soil and the application rate is controlled to ensure that applied material stays in place and does not run off. Incorporation includes standard agricultural practices such as tillage or other practices that are the equivalent to providing 80% soil coverage.

Subsurface Drainage – A conduit installed beneath the soil surface to collect and/or convey excess water. Tile drainage is an example of subsurface drainage. For the purposes of this standard, subsurface drainage does not include structures that divert surface water from ponding or running off a field.

Surface Water Quality Management Areas (SWQMA) - For the purposes of nutrient management planning, Surface Water Quality Management Areas are defined as follows:

1. The area within 1,000 feet from the ordinary high-water mark of navigable waters that consist of a lake, pond or flowage, except that, for a navigable water that is a glacial pothole lake, "surface water quality management area" means the area within 1,000 feet from the high-water mark of the lake.
2. The area within 300 feet from the ordinary high-water mark of navigable waters that consists of a river or stream that is defined as:
    - Perennial streams (continuous flow) identified on the NRCS soil survey and/or USGS 1:24,000 scale topographic map as solid lines,
    - Otherwise determined through an on-site evaluation and documented in an approved conservation plan or nutrient management plan. Areas within the SWQMA that do not drain to the water body are excluded from this definition.

Areas within the SWQMA that do not drain to the water body are excluded from this definition.

Tolerable Soil Loss (T) - For sheet and rill erosion. T-value means the maximum rate of soil erosion established for each soil type that will permit crop productivity to be sustained economically and indefinitely. Erosion calculations shall be based on current approved erosion prediction technology found in NRCS FOTG Section I or the soil loss assessment calculated using the Phosphorous Index Model. Tolerable soil erosion rates shall be determined using the RUSLE2 Related Attributes Report located in Section 2, FOTG, Soil Report.

Treated Manure – Manure and/or manure constituents that HAVE been subjected to treatment or processing that has the documented effect of substantially eliminating pathogens. Treatment or processing examples include thermophilic anaerobic digestion, high temperature composting of manure solids or manipulation of pH.

Urease Inhibitor - A compound that prevents the hydrolysis of urea by blocking the urease enzyme. Use of a urease inhibitor will reduce ammonia volatilization losses from surface applied urea.

Vegetative Buffer - A strip or area of perennial herbaceous vegetation situated between cropland, grazing land, or disturbed land (including forest land) and environmentally sensitive areas (as defined in NRCS Technical Standard 393, Filter Strip).

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Wisconsin Department of Agriculture, Trade and Consumer Protection
Division of Agricultural Resource Management
Bureau of Land and Water Resources
PO Box 8911, Madison WI 53708-8911, Phone: 608-224-4605

Use this form to check nutrient management (NM) plans for compliance with the WI NRCS 2015-590 Standard.

Nutrient Management Checklist

Wis. Stat. §92.05(3) (k), Wis. Admin. Code §ATCP50.04(3) and Ch. 51

COUNTY Walworth | DATE PLAN SUBMITTED 6/29/2023 | GROWING SEASON YEAR PLAN IS WRITTEN FOR 2023 (from harvest to harvest)

TOWNSHIP: (T. 1 N.) | RANGE: (R. 15 E., W). | CHECK ONE: ☒ Initial Plan or ☐ Updated Plan

NAME OF FARM OPERATOR RECEIVING NM PLAN	FARM NAME (OPTIONAL)	BUSINESS PHONE
Tom Kauer		(262) 203 - 2790

STREET ADDRESS	CITY	STATE	ZIP
N2150 Six Corners Rd.	Walworth	WI	53184

REASON THE PLAN WAS DEVELOPED: DATCP-FP or cost share (cs) (Ordinance, NR 243 WPDES or NOD, DATCP-FP or cost share (cs), DNR-cs, USDA-cs, Other)	CROPLAND ACRES (OWNED & RENTED)
	108.1

RENTED FARM(S) LANDOWNER NAME(S) AND ACREAGE: add sheet(s) if needed
The field is owned by the Fontana Walworth Water Pollution Control Commission.

WAS THE PLAN WRITTEN IN SNAPPLUS? ☒ YES ☐ NO | If yes, which software version, if known? 20.4

CHECK PLANNER'S QUALIFICATION: 2. ASA-CCA
(1. NAICC-CPCC, 2. ASA-CCA, 3. SSSA-Soil Scientist, 4. DATCP approved training course, 5. Other approved by DATCP)

NAME OF QUALIFIED NUTRIENT MANAGEMENT PLANNER	BUSINESS PHONE
Kerri Helwig	(920) 261 - 0446

STREET ADDRESS	CITY	STATE	ZIP
710 Commerce Drive	Watertown	WI	53094

Use header sections to add comments. Mark NA in the shaded sections if no manure is applied.

1. Does the plan include the following nutrient application requirements to protect surface and groundwater?
1.e. See Annual Note.

This section applies to fields and pastures. If no manure is applied, check NA for 1.c., 1.h., 1.i., 1.n., 1.o., 1.q., 1.s.	Yes	No	NA
a. Determine field nutrient levels from soil samples analyzed by a DATCP **certified laboratory**.	☒	☐	☐
b. For fields or pastures with mechanical nutrient applications, determine field nutrient levels from **soil samples** collected within the last **4 years** according to 590 Standard (590) and UWEX Pub. A2809, *Nutrient Application Guidelines for Field, Vegetable, and Fruit Crops in Wisconsin* (A2809) typically collecting **1 sample per 5 acres** of 10 cores. Soil tests are not required on **pastures** that do not receive mechanical applications of nutrients if either of the following applies: 1. The pasture average stocking rate is one animal unit per acre or less at all times during the grazing season. 2. The pasture is winter grazed or stocked at an average stocking rate of more than one animal unit per acre during the grazing season, and a nutrient management plan for the pasture complies with 590 using an assumed soil test phosphorus level of 150 PPM and organic matter content of 6%.	☒	☐	☐
c. For **livestock siting permit approval**, collect and analyze soil samples meeting the requirements above in 1. b., excluding pastures, within 12 months of approval and revise the nutrient management plan accordingly. Until then, either option below maybe used: 1. Assume soil test phosphorus levels are greater than 100 ppm soil test P, OR 2. Use preliminary estimates analyzed by a certified DATCP laboratory with soil samples representing > 5 ac/sample.	☐	☐	☒
d. **Identify all fields'** name, boundary, acres, and location.	☒	☐	☐
e. Use the field's previous year's legume credit and/or applications, predominant soil series, and realistic yield goals to determine the crop's nutrient **application rates consistent with A2809 for ALL forms of N, P, and K.**	☒	☐	☐
f. Make no **winter applications of N and P** fertilizer, except on grass pastures and winter grains.	☒	☐	☐
g. Document method used to determine **application rates**. Nutrients shall not runoff during or immediately after application.	☒	☐	☐
h. Identify in the plan that **adequate acreage** is available for manure produced and/or applied.	☐	☐	☒
i. Apply a single phosphorus (P) assessment using either the **P Index** or **soil test P** management strategy to all fields within a tract when fields receive manure or organic by-products during the crop rotation.	☐	☐	☒
j. Use **complete crop rotations** and the field's **critical soil** series to determine that sheet and rill erosion estimates will not exceed **tolerable soil loss** (T) rates on fields that receive nutrients.	☒	☐	☐
k. Use contours; reduce tillage; adjust the crop rotation; or implement other practices to **prevent ephemeral erosion**; and maintain perennial vegetative cover to **prevent reoccurring gullies** in areas of concentrated flow.	☒	☐	☐
l. Make no nutrient applications within 8' of **irrigation** wells or where **vegetation is not removed.**	☒	☐	☐
m. Make no nutrient applications within **50' of all direct conduits to groundwater**, unless directly deposited by gleaning/pasturing animals or applied as starter fertilizer to corn.	☒	☐	☐

	Yes	No	NA
n. Make no **untreated manure applications** to areas within 1000' of a **community potable water well** or within 100' of a **non-community potable water well** (ex. church, school, restaurant) unless manure is treated to substantially eliminate pathogens.	☐	☐	☒
o. Make no manure applications to areas **locally delineated** by the Land Conservation Committee or in a conservation plan as areas contributing runoff to direct conduits to groundwater unless manure is substantially buried within 24 hours of application.	☐	☐	☒
p. Make no applications of **late summer or fall commercial N fertilizer** to the following areas UNLESS needed for establishment of fall seeded crops OR to meet A2809 with a blended commercial fertilizer. Commercial fertilizer N applications shall not exceed 36 lbs. N/acre on: • Sites vulnerable to N leaching **PRW Soils** (P=high permeability, R= bedrock < 20 inches, or W= wet < 12 inches to apparent water table); • Soils with depths of 5 feet or less to bedrock; • Area within 1,000 feet of a community potable water well. On **P soils, when commercial N is applied** for full season crops in **spring and summer**, follow A2809 and apply one of the following: 1. A split or delayed N application to apply a majority of crop N requirement after crop establishment. 2. Use a nitrification inhibitor with ammonium forms of N. 3. Use slow and controlled release fertilizers for a majority of the crop N requirement applied near the time of planting.	☒	☐	☐
q. Limit manure applications in late summer or fall using the lesser of A2809 or the following 590 rates on **PRW Soils.** Use ≤ 120 lbs. available N/acre on: **P and R soils** on *all crops, except annual crops*. Additionally, manure with ≤ 4% dry matter (DM) wait until after soil temp. < 50°F or Oct. 1, and use either a nitrification inhibitor OR surface apply and do not incorporate for at least 3 days. **W soils or combo. W soils** on *all crops.* Additionally, manure with ≤ 4% DM on *all crops* use at least one of the following: **1.** Use a nitrification inhibitor; **2.** Apply on an established cover crop, an overwintering annual, or perennial crop; **3.** Establish a cover crop within 14 days of application; **4.** Surface apply & don't incorporate for at least 3 days; **5.** Wait until after soil temp. < 50°F or Oct. 1. Use ≤ 90 lbs. available N/acre on: **P and R soils** on *annual crops* wait until after soil temp. < 50°F or Oct. 1. Additionally, manure with ≤ 4% DM use either a nitrification inhibitor OR surface apply and do not incorporate for at least 3 days. **W soils or combination W soils** receiving manure with ≤ 4% DM on *all crops*.	☐	☐	☒
r. Use at least one of the following practices on **non-frozen soils for all nutrient applications** within Surface Water Quality Management Area **(SWQMA)** = 1000' of lakes/ponds or 300' of rivers: **1.** Maintain > 30% cover after nutrient application; **2.** Effective incorporation within 72 hours of application; **3.** Establish crops prior to, at, or promptly following application; **4.** Install/maintain vegetative buffers or filter strips; **5.** Have at least 3 consecutive years no-till for applications to fields with < 30% residue (silage) and apply nutrients within 7 days of planting.	☒	☐	☐
s. Limit mechanical applications to **12,000 gals/acre of unincorporated liquid manure or organic by-products** with 11% or less dry matter where **subsurface drainage** is present OR within **SWQMA**. Wait a minimum of 7 days between sequential applications AND use one or more of the practice options on non-frozen soils listed in 1.r.1. through 1.r.5.	☐	☐	☒

2. When frozen or snow-covered soils prevent effective incorporation, does the plan follow these requirements for winter applications of all mechanically applied manure or organic by-products? *This section doesn't apply to winter gleaning/pasturing meeting 590 N and P requirements.*

If no manure is applied, check NA for 2.a. through 2.g..	Yes	No	NA
a. Identify **manure quantities planned to be spread during the winter**, or the amount of manure generated in 14 days, whichever is greater. *For daily haul systems, assume 1/3 of the manure produced annually will need to be winter applied.*	☐	☐	☒
b. Identify **manure storage capacity** for each type applied and stacking capacity for manure ≥ 16% DM if permanent storage does not exist.	☐	☐	☒
c. Show on map and make no applications within the **SWQMA**.	☐	☐	☒
d. Show on map and make no surface applications of liquid manure during **February and March** where **Silurian dolomite** is within 60 inches of the soils surface OR where **DNR Well Compensation** funds provided replacement water supplies for wells contaminated with livestock manure.	☐	☐	☒
e. Show on map and make no applications of manure within **300 feet** of **direct conduits to groundwater**.	☐	☐	☒
f. Do not exceed the P removal of the following growing season's crop when applying manure. Liquid manure applications are limited to **7,000 g/acre**. All winter manure applications are not to exceed **60 lbs. of P2O5/acre**.	☐	☐	☒
g. Make no applications of manure to fields with **concentrated flow channels** unless using two of the following: **1.** Contour buffer strips or contour strip cropping; **2.** Leave all crop residue and no fall tillage; **3.** Apply manure in intermittent strips on no more than 50% of field; **4.** Apply manure on no more than 25% of the field waiting a minimum of 14 days between applications; **5.** Reduce manure app. rate to 3,500 gal. or 30 lbs. P2O5, whichever is less; **6.** No manure application within 200 feet of all concentrated flow channels; **7.** Fall tillage is on the contour and slopes are lower than 6%. Make no applications to **slopes greater than 6%** (soil map units with C, D, E, and F slopes) unless the plan documents that no other accessible fields are available for winter spreading AND two of the options 2.g.1. through 2.g.5. are used.	☐	☐	☒

I certify that the plan represented by the answers on this checklist complies with Wisconsin's NRCS 2015-590 NM Standard or is otherwise noted.

Kerri Helwig CCA# 519887 — 6/29/2023

Qualified NM planner signature — NAICC-*Certified Professional Crop Consultant*, ASA-*Certified Crop Adviser*, or SSSA-*Soil Scientist* — Date

Qualified NM farmer-planner or Authorized farm operator signature receiving and understanding the plan — Date

Signature if reviewed for quality assurance — Date

State of Wisconsin
DEPARTMENT OF NATURAL RESOURCES
Milwaukee Service Center
1027 W Saint Paul Ave
Milwaukee WI, 53233

Tony Evers, Governor

Telephone 608-266-2621
Toll Free 1-888-936-7643
TTY Access via relay - 711

WISCONSIN
DEPT. OF NATURAL RESOURCES

June 6, 2024

Doug York – Superintendent.
Fontana Walworth Water Pollution Control Commission
N840 Chilson Rd
PO Box 850
Walworth, WI 53184-0850

Subject: Fontana Walworth Water Pollution Control Commission - WPDES Permit WI-0036021-11
Water Quality Trading Plan (WQT-2024-0015) - CONDITIONAL APPROVAL

The Department of Natural Resources (department) received an updated water quality trading (WQT) plan for continued compliance with effluent phosphorus limits at the Fontana Walworth Water Pollution Control Commission (commission) on July 29, 2023, January 24, and May 10, 2024. The department has reviewed the updated WQT plan and has no further comments at this time.

Based on the department's review, the WQT plan materials are in general conformance with the Water Quality Trading Guidance and Wis. Stat 283.84. The materials indicate that the commission has established and maintained cover crops, edge of field buffer strips, and grassed waterways on commission owned lands near the wastewater treatment facility and has completed the construction necessary to convert two lagoons that had been idled next to the treatment plant into chemically enhanced stormwater sedimentation basins. A rotational average is now used to calculate the average amount of credit from year to year that result from changes to cropping practices. Available information collected from the input and output of the sedimentation basin so far suggests that phosphorus treatment performance has been better than assumptions of the initial WQT plan. However due to the limited size of the dataset for treatment performance in the sedimentation basins, results from the jar testing completed for the original WQT plan are still used as the basis for removal coefficients/factors in the updated WQT plan. During the review process for this 2024 WQT plan update, it was agreed that the actual treatment performance and modeling for rain events, etc. should be discussed with department staff in the second half of the next permit term and reviewed within the next WQT plan update in 2029. The table below illustrates the total credit availability for total phosphorus resulting from eligible WQT practices for the next five whole calendar years.

Year	Total Available Credits (lbs/year)
2025	2481
2026	2481
2027	2481
2028	2481
2029	2481

The Department conditionally approves the WQT Plan as a basis for water quality trading during the next WPDES permit term. The Department has assigned the WQT plan a tracking number of WQT-2024-0015 and the plan will be referenced as such in the draft WPDES permit. The WQT plan will be included as part of the public notice package for permit reissuance. The draft WPDES permit will include a requirement for an annual trading report and effluent monitoring for total phosphorus.

If you have any questions or comments, please contact me at (414) 897-5723 or at nicholas.lent@wisconsin.gov

Thank you,

Nick Lent

Nick Lent
Wastewater Engineer
Wisconsin Department of Natural Resources

e-CC:

Bradley Lake, Strand Associates
Randy Langer, Strand Associates
Andrew Craig, WDNR
Matt Claucherty, WDNR
Victoria Ziegler, WDNR
Bryan Hartsook, WDNR

		Year 1	Year 2	Year 3	Year 4	Year 5
Source Identification	1. Continue to sample and monitor commercial and industrial customers for high chloride discharges.	X	X	X	X	X
	2. Continue annual chloride sampling at customer wells and track trends/changes.	X	X	X	X	X
	3. Locate manholes for industrial sampling to identify potential high strength chloride contributors. Sample and test annually or as needed for compliance.	X	X	X	X	X
	4. Collect background chloride concentrations and flow volume data from each water supply well for the three customers (Village of Fontana, Village of Walworth, and Kikkoman Foods Inc)					
	a. Request each customer provide background chloride data and volumetric usage from each water-supply well.	X				
	b. Request ongoing chloride data from each well to assess trends at each well.		X		X	
	c. Request ongoing chloride data from each well. Calculate annual baseline chloride mass for each customer water-supply well.			X		
	d. Based on data, evaluate feasibility of centralized/regional lime softening or other feasible alternatives.					X
	5. Obtain pertinent information from the shared village inspector on demand-based water softener use withing the villages.					
	a. Develop survey based on input from softener companies and local building inspector. Distribute draft survey for review by applicable parties.	X				
	b. Send survey out with sewer bills within Villages.		X			
	c. Develop new strategies based on survey results.			X		
	d. Evaluate program success.				X	
	e. Evaluate the potential and feasibility for replacing time-based water softeners.					X

Actions to Minimize Pollutant Sources	6. Manhole inspection for clearwater inflow and infiltration (I&I).					
	a. Create program to inspect all commission manholes.	X				
	b. Commission staff begin manhole inspection/documentation.		X			
	c. Commission staff continue manhole inspection/documentation.			X		
	d. Develop schedule to modify critical Commission manholes.				X	
	e. Begin manhole rehabilitation as necessary.					X
	7. Continue to work directly with KFI and document source reduction measures being considered for implementation.					
	a. Meet with KFI to review chloride sources and effectiveness/feasibility of Implementing: Installing additional chloride monitoring probes where appropriate, collection and disposal of first rinse water sanitation of high viscosity, improving reliability of high chloride wastewater diversion system to minimize discharge to the Commission sewer system. Also discuss potential alternative to haul additional mass of high strength chloride waste for offsite treatment.	X				
	b. Evaluate the effectiveness/feasibility of hauling (either year-round or seasonally) incrementally larger volumes of high strength waste to an offsite facility for treatment and other potential measures.		X			
	c. Implement feasible strategies to further reduce chloride discharge.			X	X	
	d. Implement feasible strategies to further reduce chloride discharge. Asses the chloride concentration/mass discharge from KFI.					X
	8. Incorporate an ordinance revision that imposes installation restrictions so that outside house bibs are on unsoftened water.	X				

	9. Incorporate an ordinance revision that adds a requirement for new and replacement softeners to be metered demand type, with a higher, greater than 3350 grains of hardness exchange per pound of salt, efficiency capability.	X				
	10. Add numeric standards, compliance schedules, and possible enforcement actions for chloride discharges to the collection system to the local sewer use ordinances, if adopted.					
	a. Discuss with villages to add numerical standards to sewer use ordinances and proposed actions to restrict identified excessive discharge of chlorides.	X				
	b. Enact ordinances and develop standards for enforcement		X			
	c. Notify dischargers of new standard including limits, penalties, and compliance timelines, through village water bills, Identify dischargers to be tested and work with dischargers to achieve voluntary reductions.			X		
	d. Collect and analyze samples. Notify any industries of non-compliance with new numerical standards.			X	X	
	e. Meet with industries and discuss compliance options (i.e. transport to acceptable treatment facilities or deicing applications).				X	
	f. Analyze effectiveness of new ordinance and its impact on FWWPCC's effluent chloride concentration. If needed, consider modifications to improve reductions.					X
Maintenance/Education of Source Reduction	11. Distribute educational fliers to villages via water bills and post information on official village websites.					
	a. Develop draft educational flier for review by Commission.	X				
	b. Send educational flier out with village sewer bills and post information on village website.		X			
	c. Resend educational flier with village sewer bills and post information on website.			X	X	
	d. Assess influent chloride mass.					X
	12. Perform annual inspections with industrial representatives with the villages specifically focused on each industry's					

	current method of softening and the mass of salt used annually.					
	a. Perform Inspection of Village of Fontana and Village of Walworth largest water users. Collect information on type of softener, annual salt usage, and other chloride-containing chemicals that may be used.	X				
	b. Document annual type/mass salt used in the softeners for each large water user.		X			
	c. Summarize inspection and salt usage.			X		
	d. Perform annual inspections and document salt usage and any change in the softening processes.				X	X
	13. Distribute updated questionnaire to largest users.					
	a. Develop survey and send (along with educational flier) to largest water users in advance of inspection.	X				
	b. Send survey out annually as a reminder of chloride minimization and documentation of annual salt usage.	X	X	X	X	X
	c. Summarize data collected for each large water user and identify any trends.		X		X	X
	14. Public/Private De-Icing related Activities					
	a. Consider scheduling meetings with City DPW to review collected data, tour facility to review current operations with respect to chloride discharges and identify action items to reduce chloride discharges.	X				
	b. Conduct a follow-up meeting with DPW if BMP's for reducing chloride discharges are identified during initial meetings.		X			
	c. Investigate development of a partnership with a third party environmental public outreach provider to assist with activities such as (DPW training, calibration, and other public education activities).			X		
	d. Consider including letters to commercial and industrial businesses advocating owners work with their private salt/snowplow companies optimize salting practices.				X	

Fontana Walworth SRM Plan
Submitted August 2023; Updated July 2024

Overview:

1. Continue to sample and monitor commercial and industrial customers for high chloride discharges.
2. Continue annual chloride sampling at customer wells and track trends/changes.
3. Locate manholes for industrial sampling to identify potential high strength chloride contributors. Sample and test annually or as needed for compliance.
4. Collect background chloride concentrations and flow volume data from each water supply well for the three customers (Village of Fontana, Village of Walworth, and Kikkoman Foods Inc (KMI)).
5. Obtain pertinent information from the shared village inspector on demand-based water softener use withing the villages.
6. Manhole inspection for clearwater inflow and infiltration (I&I).
7. Continue to work directly with KFI and document source reduction measures being considered for implementation.
8. Incorporate an ordinance revision that imposes installation restrictions so that outside house bibs are on unsoftened water.
9. Incorporate an ordinance revision that adds a requirement for new and replacement softeners to be metered demand type, with a higher, greater than 3350 gains of hardness exchange per pound of salt, efficiency capability.
10. Add numeric standards, compliance schedules, and possible enforcement actions for chloride discharges to the collection system to the local sewer use ordinances, if adopted.
11. Distribute educational fliers to villages via water bills and post information on official village websites.
12. Perform annual inspections with industrial representatives with the villages specifically focused on each industry's current method of softening and the mass of salt used annually.
13. Distribute updated questionnaire to largest users.
14. Public/Private De-Icing related Activities.