Permit Fact Sheet

General Information

Permit Number:	WI-0023485-10-0	
Permittee Name:	VILLAGE OF BROOKLYN	
Address:	210 Commercial Street P.O. Box 189	
City/State/Zip:	Brooklyn WI 53521	
Discharge Location:	North bank of Allen Creek, ¼ mile south of Village limits just west of Hwy 104 bridge. (Lat: 42.84011º N / Lon: 89.36925º W; NE ¼ of NE ¼ of Section 12, T4N, R9E)	
Receiving Water:	Allen Creek (Allen Creek & Middle Sugar River Watershed, SP13 – Sugar-Pecatonica River Basin) in Green County	
StreamFlow ($Q_{7,10}$):	0.27 cfs	
Stream Classification:	Limited Forage Fish (LFF)	
Discharge Type:	Existing, Continuous	
Design Flow(s)	Annual Average	0.20 MGD
Significant Industrial Loading?	O&A Manufacturing	
Operator at Proper Grade?	Facility is Advanced with subclasses A1 – Suspended Growth Processes, B – Solids Separation, C – Biological Solids/Sludges, SS – Sanitary Sewage Collection System and P – Nutrient Removal (Phosphorus). Advanced certification is required. Operator is currently not at proper grade.	
Approved Pretreatment Program?	N/A	

Facility Description

The Village of Brooklyn operates an activated sludge wastewater treatment plant with one categorical industrial contributor. Preliminary treatments consist of a mechanical cylindrical screen. Biological phosphorus removal precedes the oxidation ditch which provides extended and biological treatment of wastewater pollutants, along with removal of ammonia. Ferric chloride is added for phosphorus removal before flow enters the final clarifier where the microorganisms are separated from the treated effluent. Effluent from the clarifiers is metered and discharged to Allen Creek. Waste sludge from the final clarifier is either returned to the head of the plant or stored on-site prior to land application.

The facility completed construction of the new ferric chloride phosphorus removal system, and new biological phosphorus removal system in summer of 2020.

Substantial Compliance Determination

Enforcement During Last Permit:

A Notice of Noncompliance was sent June 14, 2024, for land application without a WPDES permitted outfall. If Brooklyn decides to land apply, they must submit a land application site request form and land application management plan for review and approval prior to land application.

After a desk top review of all discharge monitoring reports, CMARs, land application reports, compliance schedule items, and a site visit on June 7, 2023, this facility has been found to be in substantial compliance with their current permit.

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	0.079 MGD (October 2018 – January 2024 Average)	Influent: 24-hr flow proportional composite samples shall be collected prior to the influent screening station. A magnetic flow meter is located after the influent screening station.
001	0.077 MGD (October 2018 – January 2024 Average)	Effluent: 24-hr flow proportional composite samples shall be collected from the manhole downstream of the final clarifier, prior to discharge to Allen Creek. Effluent DO and pH grab samples shall be taken from the clarifier effluent trough. An ultrasonic flow meter is located downstream of the final clarifier.
003	45 U.S. tons (2023 Permit Application)	Liquid, Class B. Representative sludge samples shall be collected from the sample tap at the biosolids station.

1 Influent – Monitoring Requirements

Sample Point Number: 701- INFLUENT

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Flow Rate		MGD	Daily	Continuous	
BOD5, Total		mg/L	3/Week	24-Hr Flow Prop Comp	
Suspended Solids, Total		mg/L	3/Week	24-Hr Flow Prop Comp	

Changes from Previous Permit:

Flow: Sample frequency has been changed to 'Daily' for eDMR reporting purposes.

Explanation of Limits and Monitoring Requirements

BOD_5 and Total Suspended Solids: Tracking of BOD_5 and 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.

2 Surface Water - Monitoring and Limitations

Sample Point Number: 001- EFFLUENT

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Flow Rate		MGD	Daily	Continuous	
BOD5, Total	Daily Max	30 mg/L	3/Week	24-Hr Flow Prop Comp	
BOD5, Total	Monthly Avg	15 mg/L	3/Week	24-Hr Flow Prop Comp	
Suspended Solids, Total	Daily Max	30 mg/L	3/Week	24-Hr Flow Prop Comp	
Suspended Solids, Total	Monthly Avg	20 mg/L	3/Week	24-Hr Flow Prop Comp	
pH Field	Daily Max	9.0 su	5/Week	Grab	
pH Field	Daily Min	6.0 su	5/Week	Grab	
Dissolved Oxygen	Daily Min	4.0 mg/L	5/Week	Grab	
Nitrogen, Ammonia (NH3-N) Total	Daily Max	19 mg/L	3/Week	24-Hr Flow Prop Comp	May through October
Nitrogen, Ammonia (NH3-N) Total	Daily Max	17 mg/L	3/Week	24-Hr Flow Prop Comp	November through April
Nitrogen, Ammonia (NH3-N) Total	Weekly Avg	6.9 mg/L	3/Week	24-Hr Flow Prop Comp	May through October
Nitrogen, Ammonia (NH3-N) Total	Weekly Avg	12 mg/L	3/Week	24-Hr Flow Prop Comp	November through March
Nitrogen, Ammonia (NH3-N) Total	Weekly Avg	13 mg/L	3/Week	24-Hr Flow Prop Comp	April
Nitrogen, Ammonia (NH3-N) Total	Monthly Avg	3.7 mg/L	3/Week	24-Hr Flow Prop Comp	May through October
Nitrogen, Ammonia (NH3-N) Total	Monthly Avg	6.5 mg/L	3/Week	24-Hr Flow Prop Comp	November through March
Nitrogen, Ammonia (NH3-N) Total	Monthly Avg	6.9 mg/L	3/Week	24-Hr Flow Prop Comp	April
E. coli	Geometric Mean - Monthly	126 #/100 ml	Weekly	Grab	Monitoring and limit effective May through September starting in 2029 per the Effluent Limitations for E. coli Schedule.

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
E. coli	% Exceedance	10 Percent	Monthly	Calculated	Monitoring and limit effective May through September starting in 2029 per the Effluent Limitations for E. coli Schedule. See the E. coli Percent Limit section below. Enter the result in the DMR on the last day of the month.
Phosphorus, Total	Monthly Avg	1.7 mg/L	3/Week	24-Hr Flow Prop Comp	Limit effective throughout the permit term, as it represents a minimum control level. See Water Quality Trading (WQT) sections for more information.
Phosphorus, Total		lbs/day	3/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 2c. 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)	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.
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.
WQT Computed	6-Month Avg	0.13 lbs/day	Monthly	Calculated	Report the WQT TP

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Compliance (TP)					Computed Compliance value using Equation 4b. in the Water Quality Trading (WQT) section. Value entered on the last day of June and Dec. Compliance with the six-month average limit is evaluated at the end of the six-month period.
WQT Credits Used (TP)	Annual Total	224 lbs/yr	Annual	Calculated	The sum of total monthly credits used may not exceed Table 2 values listed below.
Temperature Maximum		deg F	Daily	Continuous	Monitoring year-round in 2028.
Temperature Maximum	Weekly Avg	65 deg F	Daily	Continuous	Monitoring in October effective upon permit reissuance. Limit effective October starting in 2028. See Temperature schedule.
Temperature Maximum	Weekly Avg	57 deg F	Daily	Continuous	Monitoring in November effective upon permit reissuance. Limit effective November starting in 2028. See Temperature schedule.
Chloride		mg/L	Monthly	24-Hr Flow Prop Comp	Monitoring in 2028.
PFOS		ng/L	1/ 2 Months	Grab	Monitoring only. See PFOS/PFOA Minimization Plan Determination of Need schedule.
PFOA		ng/L	1/ 2 Months	Grab	Monitoring only. See PFOS/PFOA Minimization Plan Determination of Need schedule.
Acute WET		TUa	See Listed Qtr(s)	24-Hr Flow Prop Comp	See Whole Effluent Toxicity (WET) Testing section.
Chronic WET	Monthly Avg	1.2 TUc	See Listed Qtr(s)	24-Hr Flow Prop Comp	See Whole Effluent Toxicity (WET) Testing section.
Nitrogen, Total		mg/L	See Listed	24-Hr Flow	Annual in rotating quarters.

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Kjeldahl			Qtr(s)	Prop Comp	See Nitrogen Series Monitoring section.
Nitrogen, Nitrite + Nitrate Total		mg/L	See Listed Qtr(s)	24-Hr Flow Prop Comp	Annual in rotating quarters. See Nitrogen Series Monitoring section.
Nitrogen, Total		mg/L	See Listed Qtr(s)	Calculated	Annual in rotating quarters. See Nitrogen Series Monitoring section. Total Nitrogen shall be calculated as the sum of reported values for Total Kjeldahl Nitrogen and Total Nitrite + Nitrate Nitrogen.

Changes from Previous Permit

Flow: Sample frequency has been changed to 'Daily' for eDMR reporting purposes.

DO & pH: Sample frequency has increased. pH samples need to be grab samples.

Disinfection & E. coli: At the end of the Disinfection and Effluent Limitations for E. coli compliance schedule, disinfection requirements and 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. Monitoring is not required until the limit becomes effective at the end of the compliance schedule.

Phosphorus: The minimum control level has decreased. The annual total WQT credits has increased. The mass limit is a six-month average.

Temperature: Sample frequency has changed to daily. Weekly average limits in October and November will become effective per the compliance schedule. Monitoring in October and November upon permit reissuance. Monitoring year-round in 2028.

Chloride: Sample frequency has changed to monthly, and the monitoring year has been updated.

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.

Acute WET: Two acute WET tests have been included.

Chronic WET: The monthly average limit has decreased.

Total Nitrogen Monitoring (TKN, N02+N03 and Total N): Annual monitoring in rotating quarters throughout the permit term was added to the proposed permit.

Explanation of Limits and Monitoring Requirements

Please refer to the Water Quality Based Effluent Limits Memo for the Brooklyn Wastewater Treatment Facility dated April 4, 2024, prepared by Sarah Luck and used for this reissuance.

BOD_5, Total Suspended Solids (TSS), pH, and DO: No changes are recommended in the categorical permit limitations for BOD_5, TSS, pH, and DO. These limits are based on the Limited Forage Fish community of the receiving water as described in s. NR 104.02(3)(a), Wis. Adm. Code.

Ammonia: 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.

Disinfection & 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.

Section NR 102.04(5)(a), Wis. Adm. Code, states that all surface waters shall be suitable for recreational use and meet the E. coli criteria established to protect this use. Section NR 102.04(5)(b), Wis. Adm. Code, states that exceptions to the disinfection requirement can be made if the department determines, in accordance with the procedures specified in s. NR 210.06(3), Wis. Adm. Code, that disinfection is not required to meet water quality criteria. As part of the reissuance process, the requirements for disinfection were reviewed under s. NR 210.06(3), Wis. Adm. Code.

It was determined that the permittee is required to disinfect, during the following months May – September. See WQBEL for further explanation.

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 Allen Creek is 0.075 mg/L. In this case, the WQBEL is 0.225 mg/L (monthly average), 0.075 mg/L & 0.13 lbs/day (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 phosphorus WQBEL for the permittee as a maximum daily, weekly or monthly value. 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 previous interim limit of 7.9 mg/L is not appropriate since it would well exceed the available credits. A minimum control level of 1.7 mg/L is effective upon permit reissuance. This minimum control level is equal to the peak monthly average of data since the WQBELs went into effect.

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-2023-0006) or approved amendments thereof. The total 'WQT TP Credits' available are designated in the approved WQT Plan. The Village is implementing ongoing whole field management with the installation of filter strips and cover crops. The WQT Plan proposes the generation of 224 lbs/yr phosphorus credits for the next five years.

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

Thermal: Requirements for Temperature are included in NR 102 Subchapter II Water Quality Standards for Temperature and NR 106 Subchapter V Effluent Limitations for Temperature. Thermal discharges must meet the Public Health criterion of 120 degrees F and the Fish & Aquatic Life criteria which are established to protect aquatic communities from lethal and sub-lethal thermal effects. Reasonable potential was shown for a weekly average temperature limit in October and November. A schedule has been included for meeting this limit. See permit for details on submittal of a DC study.

Chloride: 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 VII of ch. NR 106 establishes the procedure for calculating water quality based effluent limitations (WQBELs) for chloride. Chloride monitoring is included during the fourth year of the permit term to ensure that 11 sample results are available at the next permit issuance to meet the data requirements of ch. NR 106, Wis. Adm. Code.

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 municipal dischargers with an average flow rate less than 1 MGD, to be evaluated on a case-by-case basis to determine if monitoring is required pursuant to s. NR 106.98(2)(c), Wis. Adm. Code. The department evaluated the need for PFOS and PFOA monitoring taking into consideration the presence of potential PFOS or PFOA industrial wastes, remediation sites and other potential sources of PFOS or PFOA. Based on information available at the time the proposed permit was drafted, it was identified that the POTW has an indirect discharger(s) that may be a potential source of PFOS/PFOA.

Therefore, monitoring once every two months is included. 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) Two acute and annual chronic WET tests are scheduled during the permit term.

Monitoring Frequencies: The **Monitoring Frequencies for Individual Wastewater Permits** guidance (April 12, 2021) recommends that standard monitoring frequencies be included in individual wastewater permits based on the size and type of the facility, in order to characterize effluent quality and variability, to detect events of noncompliance, and to ensure fairness and consistency in permits issued across the state. Guidance and requirements in administrative code were considered when determining the appropriate monitoring frequencies for pollutants that have final effluent limits in effect during this permit term.

The department has been revisiting the sampling frequencies at every facility to evaluate whether current frequencies are appropriate or if an increase is warranted. The frequencies for DO, pH, and temperature were increased to align Brooklyn with other facilities of similar size to ensure fairness and in consideration of department guidance on sampling frequencies.

Requirements in administrative code (NR 108, 205, 210, and 214 Wis. Adm. Code) and Sections 283.55, Wis. Stats., were considered, where applicable, when determining the appropriate monitoring frequencies for pollutants that have final effluent limits in effect during this permit term. The department has determined at this time that the aforementioned changes in monitoring frequency are warranted based on the size and type of the facility.

Total Nitrogen Monitoring (NO2+NO3, TKN and Total N)- 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.

3 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)**
003	B	Liquid	Fecal Coliform	Injection	Land Application	45 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**

If yes, special monitoring and recycling conditions will be included in the permit to track any potential problems in landapplying sludge from this facility

Is a priority pollutant scan required? **No. Design flow is less than 5 MGD.**

Priority pollutant scans are required once every 10 years at facilities with design flows between 5 MGD and 40 MGD, and once every 5 years if design flow is greater than 40 MGD.

Sample Point Number: 003- SLUDGE

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
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	

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
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	
Solids, Total		Percent	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	Monitoring once in 2025.
PCB Total Dry Wt	High Quality	10 mg/kg	Once	Composite	Monitoring once in 2025.
PFOA + PFOS		ug/kg	Annual	Calculated	Report the sum of PFOA and PFOS. See PFAS 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:

PCBs: Monitoring year for PCBs has been updated to 2025.

PFAS: Annual sludge 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), Wis. Adm. Code. Requirements for pathogens are specified in s. NR 204.07(6) and in s. NR 204.07 (7), Wis. Adm. Code for vector attraction requirements. Limitations for PCBs are addressed in s. NR 204.07(3)(k), Wis. Adm. Code.

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.

4 Schedules

4.1 Disinfection and Effluent Limitations for E. coli

The permittee shall install disinfection treatment and comply with surface water limitations for E. coli as specified. No later than 14 days following each compliance date, the permittee shall notify the Department in writing of its compliance or noncompliance.

Required Action	Due Date
Progress Report: The permittee shall submit a progress report on development and submittal of a facility plan for upgrades to meet disinfection requirements and E. coli limits.	06/30/2025
Submit Facility Plan: The permittee shall submit a Facility Plan per s. NR 110.09, Wis. Adm. Code for meeting disinfection requirements and complying with E. coli surface water limitations. The permittee may submit an abbreviated facility plan if the Department determines that the modifications are minor.	04/30/2026
Final Plans and Specifications: The permittee shall submit final construction plans to the Department for approval pursuant to ch. NR 108, Wis. Adm. Code, specifying treatment plant upgrades that must be constructed to meet disinfection requirements per s. NR 210.06(1), Wis. Adm Code, achieve compliance with final E. coli limitations, and a schedule for completing construction of the upgrades by the complete construction date specified below.	03/31/2027
Treatment Plant Upgrade to Meet Limitations: The permittee shall initiate bidding, procurement, and/or construction of the project. The permittee shall obtain approval of the final construction plans and schedule from the Department pursuant to s. 281.41. Stats., prior to initiating activities defined as construction under ch. NR 108, Wis. Adm. Code. Upon approval of the final construction plans and schedule by the Department pursuant to s. 281.41, Stats., the permittee shall construct the treatment plant upgrades in accordance with the approved plans and specifications.	09/30/2027
Construction Upgrade Progress Report: The permittee shall submit a progress report on construction upgrades.	09/30/2028
Complete Construction: The permittee shall complete construction of wastewater treatment system upgrades.	03/31/2029
Achieve Compliance: The permittee shall achieve compliance with final E. coli limitations.	04/30/2029

Explanation of Schedule

A compliance schedule is included in the permit to provide time for the permittee to submit plans and specs and install disinfection treatment for meeting effluent E. coli water quality-based effluent limits and disinfection requirements pursuant s. NR 210.06, Wis. Adm. Code.

4.2 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 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.	01/31/2025
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 5th annual WQT report. 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.	01/31/2029
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.	

Explanation of 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

4.3 Temperature Limits Compliance and Dissipative Cooling Evaluation

This compliance schedule requires the permittee to achieve compliance by the specified date.

Required Action	Due Date
Preliminary Compliance Report: Submit a preliminary compliance report indicating alternatives to achieve the final temperature limits. Informational Note: Refer to the Surface Water subsection titled 'Dissipative Cooling Demonstration - POTW Weekly Average Limits' regarding requests for Department consideration of dissipative cooling per NR 106.59, Wis. Adm. Code, as well as re-evaluation of the limits pursuant to NR 106 Subchapters V & VI or NR 102.26, Wis. Adm. Code.	01/31/2026

Action Plan: Submit an action plan for complying with all applicable effluent temperature limits.	04/30/2026
Construction Plans: Submit construction plans (if is required for complying with effluent temperature limits) and include plans and specifications with the submittal.	03/31/2027
Initiate Actions: Initiate actions identified in the plan.	09/30/2027
Complete Actions: Complete actions necessary to achieve compliance with effluent temperature limits.	09/30/2028

Explanation of Schedule

A compliance schedule, as allowed by NR 106.62, Wis. Adm. Code, is included in this permit to allow the permittee time to evaluate the facilities thermal discharge, determine whether dissipative cooling as allowed in NR 106.59, Wis. Adm. Code, will preclude the need for temperature limits because the permittee can demonstrate that the heat in the effluent is rapidly dissipated to the environment, and evaluate whether a facility upgrade is needed to meet the temperature limitations.

4.4 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.	09/30/2025
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.	09/30/2026

Explanation of 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.

4.5 Land Application Management Plan

A management plan is required for the land application system.

Required Action	Due Date
Land Application Management Plan Submittal: Submit a management plan to optimize the land application system performance and demonstrate compliance with ch. NR 204, Wis. Adm. Code, by the Due Date. This management plan shall 1) specify information on pretreatment processes (if any); 2) identify land application sites; 3) describe site limitations; 4) address vegetative cover management and removal; 5) specify availability of storage; 6) describe the type of transporting and spreading vehicle(s); 7) specify monitoring procedures; 8) track site loading; 9) address contingency plans for adverse weather and odor/nuisance abatement; and 10) include any other pertinent information. Once approved, all landspreading activities shall be conducted in accordance with the plan. Any changes to the plan must be approved by the Department prior to implementing the changes.	

Explanation of Schedule

A land application management plan shall be submitted to the department for approval.

Special Reporting Requirements

None.

Other Comments:

None.

Attachments:

Water Quality Based Effluent Limits dated April 4, 2024

WQT Plan Conditional Approval Letter dated September 22, 2023

Water Quality Trade Plan dated August 25, 2023

Expiration Date:

September 30, 2029

Justification Of Any Waivers From Permit Application Requirements

No waivers were requested or given from permit application requirements.

Prepared By: BetsyJo Howe, Wastewater Specialist **Date:** 05/30/2024; 06/25/2024; 07/01/2024

Updated (based on fact check comments): Editorial changes for clarity. 7/12/2024

Updated (based on public notice comments):

CORRESPONDENCE/MEMORANDUM

State of Wisconsin

DATE: April 4, 2024

TO: BetsyJo Howe – SCR/Fitchburg

FROM: Sarah Luck – SCR/Fitchburg

SUBJECT: Water Quality-Based Effluent Limitations for the Brooklyn Wastewater Treatment Facility
WPDES Permit No. WI-0023485-10-0

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 the Brooklyn Wastewater Treatment Facility in Green County. This municipal wastewater treatment facility (WWTF) discharges to Allen Creek, located in the Allen Creek and Middle Sugar River Watershed in the Sugar-Pecatonica River Basin. The evaluation of the permit recommendations is discussed in more detail in the attached report.

Based on our review, 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
BOD_5	30 mg/L			15 mg/L		2
TSS	30 mg/L			20 mg/L		2
pH	9.0 s.u.	6.0 s.u.				2
Dissolved Oxygen		4.0 mg/L				2
Bacteria *E. coli*				126 #/100 mL geometric mean		3
Ammonia Nitrogen April May – October November – March	 17 mg/L 19 mg/L 17 mg/L		 13 mg/L 6.9 mg/L 12 mg/L	 6.9 mg/L 3.7 mg/L 6.5 mg/L		2
Phosphorus						4
WQT MCL				1.7 mg/L		
Final				0.225 mg/L	0.075 mg/L 0.13 lbs/day	
Temperature October November			 65°F 57°F			5
PFOS and PFOA						6
Chloride						7
TKN, Nitrate+Nitrite, and Total Nitrogen						8
Acute WET						9,11
Chronic WET				1.2 TU_c		10,11

Footnotes:

1. Monitoring only.
2. No changes from the current permit.

3. 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.
4. Phosphorus limits are in effect. The previous permit had a typo of listing the mass limit as a monthly average when it should have been listed as a six-month average. A minimum control level (MCL) is required for water quality trading (WQT). This value is 1.7 mg/L as a monthly average and should not be exceeded during the permit term.
5. In addition to the limits in October and November, one year of thermal monitoring during the other months is recommended.
6. PFOS and PFOA monitoring is recommended at a frequency of once every two months.
7. Monitoring during the fourth year of the permit term at a frequency to ensure that 11 samples are available at the next permit issuance.
8. As recommended in the Department's October 1, 2019 *Guidance for Total Nitrogen Monitoring in Wastewater Permits*, annual total nitrogen monitoring is recommended for all minor municipal permittees. Total Nitrogen is the sum of nitrate (NO_3), nitrite (NO_2), and total kjeldahl nitrogen (TKN) (all expressed as N).
9. Two acute WET tests are recommended.
10. Annual chronic WET monitoring is recommended. The Instream Waste Concentration (IWC) to assess chronic test results is 82%. 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 Allen Creek.
11. 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).

The recommended limits meet the expression of limits requirements in ss. NR 106.07 and NR 205.065(7), Wis. Adm. Code, and additional limits are not required.

Please consult the attached report for details regarding the above recommendations. If there are any questions or comments, please contact Sarah Luck (Sarah.Luck@wisconsin.gov) or Diane Figiel (Diane.Figiel@wisconsin.gov).

Attachments (4) – Narrative, Site Map, Ammonia Nitrogen Calculations, and Thermal Table

PREPARED BY: Sarah Luck _____ Date: April 4, 2024

Sarah Luck
Water Resources Engineer

E-cc: Kenzie Ostien, Wastewater Engineer – SCR/Fitchburg
Tom Bauman, Regional Wastewater Supervisor – SCR/Fitchburg
Diane Figiel, Water Resources Engineer – WY/3
Kari Fleming, Environmental Toxicologist – WY/3
Nate Willis, Wastewater Engineer – WY/3

Attachment #1

Water Quality-Based Effluent Limitations for
Brooklyn Wastewater Treatment Facility

WPDES Permit No. WI-0023485-10-0

PART 1 – BACKGROUND INFORMATION

Facility Description

The Brooklyn Wastewater Treatment Facility is an activated sludge plant with one categorical industrial user (O&A Manufacturing). Preliminary treatment consists of a mechanical cylindrical screen. Biological phosphorus removal precedes the oxidation ditch which provides extended and biological treatment of wastewater pollutants, along with removal of ammonia. Ferric chloride is added for phosphorus removal before the flow enters the final clarifier where the microorganisms are separated from the treated effluent. Effluent from the clarifier is metered and discharged to Allen Creek.

The facility completed construction of a new chemical phosphorus removal system, a new biological phosphorus removal system, an addition to the Operation Building, and made miscellaneous mechanical and electrical improvements in summer of 2020.

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

Existing Permit Limitations

The current permit, which expired September 30, 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	30 mg/L			15 mg/L		2
TSS	30 mg/L			20 mg/L		2
pH	9.0 s.u.	6.0 s.u.				2
Dissolved Oxygen		4.0 mg/L				2
Ammonia Nitrogen April May – October November – March	 17 mg/L 19 mg/L 17 mg/L		 13 mg/L 6.9 mg/L 12 mg/L	 6.9 mg/L 3.7 mg/L 6.5 mg/L		
Phosphorus Interim Final				 7.9 mg/L 0.225 mg/L 0.13 lbs/day	 0.075 mg/L	3
Chloride						1
Temperature						1
Chronic WET				4.5 TUc		4

Footnotes:

1. Monitoring only.
2. These limits are based on the Limited Forage Fish (LFF) community of the immediate receiving water as described in s. NR 104.02(3)(a), Wis. Adm. Code.
3. A compliance schedule is in the current permit to meet the final WQBELs by April 1, 2022. Water quality trading is approved to demonstrate compliance.
4. Annual chronic WET tests with an IWC of 22%.

Receiving Water Information

- Name: Allen Creek
- Waterbody Identification Code (WBIC): 883700
- Classification used in accordance with chs. NR 102 and 104, Wis. Adm. Code: Limited Forage Fish Community (LFF) upstream from Butts Corner Road. The modeled natural community at the outfall is cool-cold headwater. The classification changes to default Warmwater Sport Fish approximately 2.87 miles downstream from the discharge.
- Low Flow: The following 7-Q_{10} and 7-Q_2 values are from a USGS station located at Highway 104, approximately one mile south of Brooklyn, WI.
  7-Q_{10} = 0.27 cfs (cubic feet per second)
  7-Q_2 = 0.58 cfs
  90-Q_{10} = 0.49 cfs
  Harmonic Mean Flow = 1.71 cfs using a drainage area of 10.8 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).
- Hardness = 339 mg/L as $CaCO_3$. This value represents the geometric mean of data from October 2018 through February 2023 WET testing conducted by the facility.
- % of low flow used to calculate limits in accordance with s. NR 106.06(4)(c)5., Wis. Adm. Code: 25%
- Source of background concentration data: Metals data from Richland Creek in Green County is used for this evaluation because there is no data available for the Allen Creek. Richland Creek 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: Allen Creek is impaired for phosphorus at the point of discharge. There is not currently a TMDL for this waterbody.

Effluent Information

- Flow rate:
  Design annual average = 0.20 MGD (Million Gallons per Day)
  For reference, the actual average flow from October 2018 through January 2024 was 0.077 MGD.
- Hardness = 285 mg/L as $CaCO_3$. This value represents the geometric mean of data (n=4) from February and March 2023 reported on the permit application.
- 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 and commercial wastewater with water supply from wells with industrial

sources from O&A Manufacturing.

- Additives: Ferric chloride for phosphorus removal.
- Effluent characterization: This facility is categorized as a minor municipality, so the permit application required effluent sample analyses for a limited number of common pollutants, as specified in s. NR 200.065, Table 1, Wis. Adm. Code, primarily metal substances plus ammonia, chloride, hardness, and phosphorus.
- 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)
2/28/2023	12	3/13/2023	12	3/27/2023	11
3/3/2023	14	3/16/2023	11	3/30/2023	11
3/6/2023	13	3/20/2023	12	4/3/2023	12
3/9/2023	14	3/23/2023	11		
1-day P_{99} = 15 µg/L					
4-day P_{99} = 13 µg/L					

Chloride Effluent Data

	(mg/L)
1-day P_{99}	417
4-day P_{99}	373
30-day P_{99}	347
Mean	332
Std	33.12
Sample size	30
Range	250 - 415

The following table presents the average concentrations and loadings at Outfall 001 from October 2018 through January 2024 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	5 mg/L*	
TSS	4 mg/L*	
pH field	7.22 s.u.	
Phosphorus	2.64 mg/L	1.78 lbs/day
Ammonia Nitrogen	0.44 mg/L*	
Dissolved oxygen	9.5 mg/L	

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

Attachment #1

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.

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

Daily Maximum Limits based on Acute Toxicity Criteria (ATC)

RECEIVING WATER FLOW = 0.22 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		577.0	115.4	<1.1		
Cadmium	285	34.2		58.1	11.6	<0.19		
Chromium	285	4249		7214.2	1443	<1.1		
Copper	285	41.7		70.7			15	14
Lead	285	294	1.9	497.8	99.6	<4.3		
Nickel	268	1080		1834.3	367	<1.2		
Zinc	285	301	6	506.3	101.3	44		
Chloride (mg/L)		757		1285.4			417	415

* 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.

Weekly Average Limits based on Chronic Toxicity Criteria (CTC)

RECEIVING WATER FLOW = 0.0675 cfs (¼ 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		152.2		185	37.1	<1.1	
Cadmium	175	3.82		4.65	0.9	<0.19	
Chromium	301	325.75		397	79.4	<1.1	
Copper	339	29.45		35.9			13
Lead	339	91.22	1.9	110.7	22.1	<4.3	
Nickel	268	120.18		146	29.3	<1.2	
Zinc	333	344.68	6	419	83.7	44	
Chloride (mg/L)		395		481			373

* 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)

The effluent characterization did not include any effluent sampling results for substances for which Wildlife Criteria exist.

Monthly Average Limits based on Human Threshold Criteria (HTC)

RECEIVING WATER FLOW = 0.43 cfs (¼ 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.
Cadmium	370		880	176.0	<0.19

Attachment #1

SUBSTANCE	HTC	MEAN BACK-GRD.	MO'LY AVE. LIMIT	1/5 OF EFFL. LIMIT	MEAN EFFL. CONC.
Chromium (+3)	3818000		9081615	1816323	<1.1
Lead	140	1.9	330	66.1	<4.3
Nickel	43000		102281	20456	<1.2

Monthly Average Limits based on Human Cancer Criteria (HCC)
RECEIVING WATER FLOW = 0.43 cfs (¼ 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		31.6	6.33	<1.1

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, **no effluent limitations are required.**

Chloride – Considering available effluent data from the current permit term (October 2018 through January 2024), the 1-day P_{99} chloride concentration is 417 mg/L, and the 4-day P_{99} of effluent data is 373 mg/L. These effluent concentrations are below the calculated WQBELs for chloride; therefore, **no effluent limits are needed. Chloride monitoring is recommended to ensure that 11 sample results are available at the next permit issuance** to meet the data requirements of s. NR 106.85, Wis. Adm. Code.

Mercury – The permit application did not require monitoring for mercury because the Brooklyn Wastewater Treatment Facility is categorized as a minor facility as defined in s. NR 200.02(8), Wis. Adm. Code. In accordance with s. NR 106.145(3)(a)3, Wis. Adm. Code, a minor municipal discharger shall monitor, and report results of influent and effluent mercury monitoring once every three months if, "there are two or more exceedances in the last five years of the high-quality sludge mercury concentration of 17 mg/kg specified in s. NR 204.07(5), Wis. Adm. Code." A review of the past five years of sludge characteristics data reveals that all the sample results are within expected analytical ranges and well below the 17 mg/kg level. The average concentration in the sludge from October 2018 through January 2024 was 0.28 mg/kg, with a maximum reported concentration of 0.52 mg/kg. Therefore, **no mercury monitoring is recommended at Outfall 001.**

PFOS and PFOA – The need for PFOS and PFOA monitoring is evaluated in accordance with s. NR 106.98(2), Wis. Adm. Code. Based on the type of indirect discharger contributing to the collection system, **PFOS and PFOA monitoring is recommended at a frequency of once every two months**.

Attachment #1

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.

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 Limited Forage Fishery, and
pH (s.u.) = that characteristic of the effluent.

The effluent pH data was examined as part of this evaluation. A total of 1335 sample results were reported from October 2018 through January 2024. The maximum reported value was 7.80 s.u. (Standard pH Units). The effluent pH was 7.67 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 7.58 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 7.57 s.u. Therefore, a value of 7.80 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 7.80 s.u. into the equation above yields an ATC = 12.14 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 calculated using the 1-Q_{10} receiving water low flow 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	24
1-Q_{10}	21

The 1-Q_{10} method yields the most stringent limits for Brooklyn Wastewater Treatment Facility.

The limit of 21 mg/L is greater than the current daily maximum limits of 17 mg/L and 19 mg/L. If Brooklyn Wastewater Treatment Facility would like to request an increase to the existing permit limits, an assessment of their effluent data consistent with the requirements of ss. NR 207.04(1)(a) and (c), Wis. Adm. Code, must be provided. This evaluation is on a parameter-by-parameter basis and includes

consideration of operations, maintenance and temporary upsets. Without a demonstration of need for a higher limit in accordance with s. NR 207.04, Wis. Adm. Code, the current limits must be continued in the reissued permit.

Presented below is a table of daily maximum limitations corresponding to various effluent pH values. Use of this table is not necessarily recommended in the permit, but it is presented herein for informational purposes.

Daily Maximum Ammonia Nitrogen Limits –LFF

Effluent pH s.u.	Limit mg/L	Effluent pH s.u.	Limit mg/L	Effluent pH s.u.	Limit mg/L
6.0 ≤ pH ≤ 6.1	93	7.0 < pH ≤ 7.1	56	8.0 < pH ≤ 8.1	12
6.1 < pH ≤ 6.2	90	7.1 < pH ≤ 7.2	50	8.1 < pH ≤ 8.2	9.7
6.2 < pH ≤ 6.3	88	7.2 < pH ≤ 7.3	44	8.2 < pH ≤ 8.3	8.0
6.3 < pH ≤ 6.4	86	7.3 < pH ≤ 7.4	39	8.3 < pH ≤ 8.4	6.5
6.4 < pH ≤ 6.5	83	7.4 < pH ≤ 7.5	34	8.4 < pH ≤ 8.5	5.4
6.5 < pH ≤ 6.6	79	7.5 < pH ≤ 7.6	29	8.5 < pH ≤ 8.6	4.5
6.6 < pH ≤ 6.7	76	7.6 < pH ≤ 7.7	24	8.6 < pH ≤ 8.7	3.7
6.7 < pH ≤ 6.8	71	7.7 < pH ≤ 7.8	21	8.7 < pH ≤ 8.8	3.1
6.8 < pH ≤ 6.9	66	7.8 < pH ≤ 7.9	17	8.8 < pH ≤ 8.9	2.6
6.9 < pH ≤ 7.0	61	7.9 < pH ≤ 8.0	14	8.9 < pH ≤ 9.0	2.2

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 #3.

Effluent Data
The following table evaluates the statistics based upon ammonia data reported from October 2018 through January 2024, with those results being compared to the calculated limits to determine the need to include ammonia limits in the Brooklyn Wastewater Treatment Facility permit for the respective month ranges. That need is determined by calculating 99th upper percentile (or P_{99}) values for ammonia during each of the month ranges and comparing the daily maximum values to the daily maximum limit.

Ammonia Nitrogen Effluent Data

Ammonia Nitrogen mg/L	April	May – October	November – March
1-day P_{99}	1.67	1.94	5.52
4-day P_{99}	0.93	1.05	3.12
30-day P_{99}	0.51	0.52	1.36
Mean*	0.34	0.30	0.63
Std	0.35	0.42	1.35
Sample size	64 (7 ND)	405 (20 ND)	347 (49 ND)
Range	<0.08 - 1.74	<0.03 - 3.66	<0.05 - 10.92

*"<" means that the pollutant was not detected at the indicated level of detection. The mean concentration was calculated using zero in place of the non-detected (ND) result.

Based on this comparison, there is no reasonable potential for the discharge to exceed any of the calculated ammonia nitrogen limits. However, since the permit currently has daily maximum, weekly average, and monthly average limits year-round, **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.

Conclusions and Recommendations

In summary, after rounding to two significant figures, the ammonia nitrogen limitations on the next page are recommended. No mass limitations are recommended in accordance with s. NR 106.32(5), Wis. Adm Code.

Final Ammonia Nitrogen Limits

	Daily Maximum mg/L	Weekly Average mg/L	Monthly Average mg/L
April	17	13	6.9
May – October	19	6.9	3.7
November – March	17	12	6.5

PART 4 – WATER QUALITY-BASED EFFLUENT LIMITATIONS FOR BACTERIA

Section NR 102.04(5), Wis. Adm. Code, says that all surface waters shall be suitable for supporting recreational use and shall meet *E. coli* criteria during the recreation season. Section NR 102.04(5)(b), Wis. Adm. Code, allows the Department to make exceptions when it determines, in accordance with s. NR 210.06(3), Wis. Adm. Code, that wastewater disinfection is not required to protect the recreational use. Section NR 210.06(3), Wis. Adm. Code, tasks the Department with determining the need for disinfection using a site-specific analysis based on potential risk to human or animal health. It sets out the factors that must be considered in determining the necessity to disinfect municipal wastewater or to change the length of the disinfection season.

Brooklyn Wastewater Treatment Facility had previously been exempted from disinfection based on the limited forage fish classification of the receiving water at the outfall location. Section NR 210.06(3)(g), Wis. Adm. Code, states that disinfection decisions may be made based on the hydrologic classifications listed in s. NR 104.02(1), Wis. Adm. Code (not on the water quality classifications - i.e., limited forage fish or limited aquatic life - that are defined in s. NR 104.02(3), Wis. Adm. Code). The hydrologic classification of Allen Creek is listed in ch. NR 104, Wis. Adm. Code, as continuous. Continuous streams have a higher likelihood of providing opportunities for full contact recreational activities. Therefore, disinfection should not be exempted based solely on this hydrological classification.

The Department has considered the factors in s.NR 210.06(3), Wis. Adm. Code, and has determined that the discharge cannot meet *E. coli* criteria without disinfection. 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.

These limits are required during May through September. The permit will include a compliance schedule to meet these limits.

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.

Since Brooklyn Wastewater Treatment Facility has phosphorus limits in effect that are more stringent than 1.0 mg/L, the need for a TBEL will not be considered further.
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 Allen 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 Allen Creek
Qs = 100% of the 7-Q_2 of 0.58 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 = 0.20 MGD = 0.31 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 a background concentration of 0.088 mg/L from data collected in 2014 just upstream of the discharge location. Section NR 217.13(2)(d), Wis.

Adm. Code, states that the determination of upstream concentrations shall be evaluated at each permit reissuance. No additional data were available for consideration.

The impaired water listing of Allen Creek at the point of discharge also points towards the notion that effluent phosphorus limits equal to the water quality criterion are needed to prevent the discharge from contributing to further impairment of the receiving water. *The Guidance for Implementing Wisconsin's Phosphorus Water Quality Standards for Point Source Discharges* (2020) suggests setting effluent limits equal to the criterion in the absence of an EPA-approved total maximum daily load for discharges of phosphorus to phosphorus-impaired waters.

Effluent Data
The following table summarizes effluent total phosphorus monitoring data from October 2018 through January 2024 and effluent data since the final phosphorus limits went into effect in April 2022.

Total Phosphorus Effluent Data

	Oct 2018 through Jan 2024		**April 2022 through Jan 2024** (data since final phosphorus limits went into effect)	
	Phosphorus mg/L	**Phosphorus lbs/day**	**Phosphorus mg/L**	**Phosphorus lbs/day**
1-day P_{99}	10.37	7.37	2.69	1.53
4-day P_{99}	5.91	4.15	1.51	0.86
30-day P_{99}	3.64	2.49	0.90	0.51
Mean	2.64	1.78	0.64	0.36
Std	2.06	1.47	0.54	0.31
Sample size	818	816	284	284
Range	0.1 - 9.45	0.06 - 6.85	0.1 - 4.06	0.06 - 2.27

Reasonable Potential Determination
The discharge has reasonable potential to cause or contribute to an exceedance of the water quality criterion because the 30-day P_{99} of reported effluent total phosphorus data is greater than the calculated WQBEL**.** Therefore, **a WQBEL is required.**

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.

Mass Limits
A mass limit is also required, pursuant to s. NR 217.14(1)(a), Wis. Adm. Code, because the discharge is to a surface water that is to a phosphorus-impaired waterbody. **This final mass limit shall be 0.075 mg/L × 8.34 × 0.20 MGD = 0.13 lbs/day expressed as a six-month average.** It should be noted the previous permit erroneously listed the mass limit as a monthly average and it should be corrected in the reissuance.

Water Quality Trading Minimum Control Level

A water quality trading plan has been approved as an alternative compliance option to offset any total phosphorus discharged from Outfall 001 that exceed the WQBELs. The phosphorus WQBELs may be expressed as computed compliance limits, but a Minimum Control Level (MCL) must be set as a limit not to be exceeded at the outfall. Brooklyn has been approved for up to 224 lbs/year of water quality trading credits through 2028. The existing interim limit of 7.9 mg/L is not appropriate since it would well exceed the available credits. Therefore, **the MCL is set equal to the peak monthly average of data since April 2022 when phosphorus limits WQBELs went into effect, rounded to 1.7 mg/L**. Since phosphorus treatment at the facility should be optimized,1.7 mg/L is considered to be the level currently achievable.

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 October 2018 through January 2024.

The table below summarizes the maximum temperatures reported during monitoring from January 2021 through December 2021.

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	44	45	61	94
FEB	43	44	60	91
MAR	48	49	62	91
APR	52	53	69	94
MAY	63	64	74	93
JUN	68	68	82	93
JUL	71	71	86	93
AUG	72	73	84	94
SEP	70	73	78	93
OCT	69	69	**65**	89
NOV	58	61	**57**	91

Attachment #1

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)
DEC	51	52	60	94

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. Based on this analysis, **weekly average temperature maximum limits are necessary for the months of October and November**. In addition to the limits in October and November, one year of thermal monitoring during the other months is recommended. Maximum weekly average effluent flow rates have increased since the current permit issuance which likely contributed to the need for limits. The complete thermal table can be found in Attachment #4.

The following general options are available for a facility to explore potential relief from the temperature limits:

- Effluent monitoring data: Verification or additional effluent monitoring (flow and/or temperature) may be appropriate if there were questions on the representativeness of the current effluent data.
- Monthly low receiving water flows: Contract with USGS to generate monthly low flow estimates for the receiving water to be used in place of the annual low flow.
- Mixing zone studies: A demonstration of rapid and complete mixing may allow for the use of a mixing zone other than the default 25%.
- Dissipative cooling demonstration: Effluent limitations based on sub-lethal criteria may be adjusted based on the potential for heat dissipation from municipal treatment plants as described in s. NR 106.59(4), Wis. Adm. Code.
- Collection of site-specific ambient temperature: default background temperatures for streams in Wisconsin, so actual data from the direct receiving water may provide for relaxed thermal limits

but only if the site-specific temperatures are lower than the small stream defaults used in the above tables.

- A variance to the water quality standard: This is typically considered to be the least preferable and most complex option as it requires the evaluation of the other alternatives.

These options are explained in additional detail in the August 15, 2013 Department *Guidance for Implementation of Wisconsin's Thermal Water Quality Standards* https://dnr.wisconsin.gov/topic/Wastewater/Thermal.html.

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 82%, 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:

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

Where:

Q_e = annual average flow = 0.20 MGD = 0.31 cfs
f = fraction of the Q_e withdrawn from the receiving water = 0
Q_s = ¼ of the 7-Q_{10} = 0.27 cfs ÷ 4 = 0.068 cfs

- The new IWC of 82% is higher than the previous IWC of 22%. The IWC is set based on conditions at the outfall location. The modeled natural community at the outfall is cool-cold headwater, which indicates aquatic organisms could be present at the outfall and not just downstream where the classification changes to warmwater sport fish.

- 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.

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?	
08/14/2007	>100	>100	Pass	Yes	>100	>100	Pass	Yes	
05/06/2014	-	-	-	-	26.8	>100	Fail	Yes	
07/08/2014	-	-	-	-	>100	>100	Pass	Yes	Retest of 5/06/14 failure
10/14/2014	-	-	-	-	>100	>100	Pass	Yes	Retest of 5/06/14 failure
05/17/2016	-	-	-	-	>100	>100	Pass	Yes	
10/30/2018	-	-	-	-	>100	>100	Pass	Yes	
01/08/2019	-	-	-	-	>100	>100	Pass	Yes	
06/09/2020	-	-	-	-	>100	>100	Fail	No	1
08/03/2021	-	-	-	-	>100	>100	Pass	Yes	
10/18/2022	-	-	-	-	>100	>100	Pass	Yes	
02/28/2023	-	-	-	-	>100	>100	Pass	Yes	

Footnotes:

1. *Qualified or Inconclusive Data.* Data quality concerns were noted during testing which calls into question the reliability of the test results.

- 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.**

  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)]

Attachment #1

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
100/26.8 = 3.73	6.2 Based on 1 detect	82%

[(TUc effluent) (B)(IWC)] = 19 > 1.0

Therefore, reasonable potential is shown for a chronic WET limit using the procedures in s. NR 106.08(6) and representative data from 2007-2023.

Expression of WET limits
Chronic WET limit = [100/IWC] TU_c = 100/82 = **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. **0 Points**	IWC = 82% **15 Points**
Historical Data	No data collected since 2007. **5 Points**	10 tests used to calculate RP. One test failed. **0 Points**
Effluent Variability	Little variability, no upsets or significant violations, consistent WWTF operations. **0 Points**	Same as Acute. **0 Points**
Receiving Water Classification	< 4 mi to a non-variance waterbody and cool-cold headwater modeled natural community. **5 Points**	Same as Acute. **5 Points**
Chemical-Specific Data	No reasonable potential for limits based on ATC. Ammonia nitrogen limit carried over from the current permit. Chloride, copper, and zinc detected. Additional Compounds of Concern: None. **3 Points**	No reasonable potential for limits based on CTC. Ammonia nitrogen limit carried over from the current permit. Chloride, copper, and zinc detected. Additional Compounds of Concern: None. **3 Points**
Additives	No biocides and one water quality conditioner (ferric chloride) added. Permittee has proper P chemical SOP in place. **1 Point**	All additives used more than once per 4 days. **1 Point**

Attachment #1

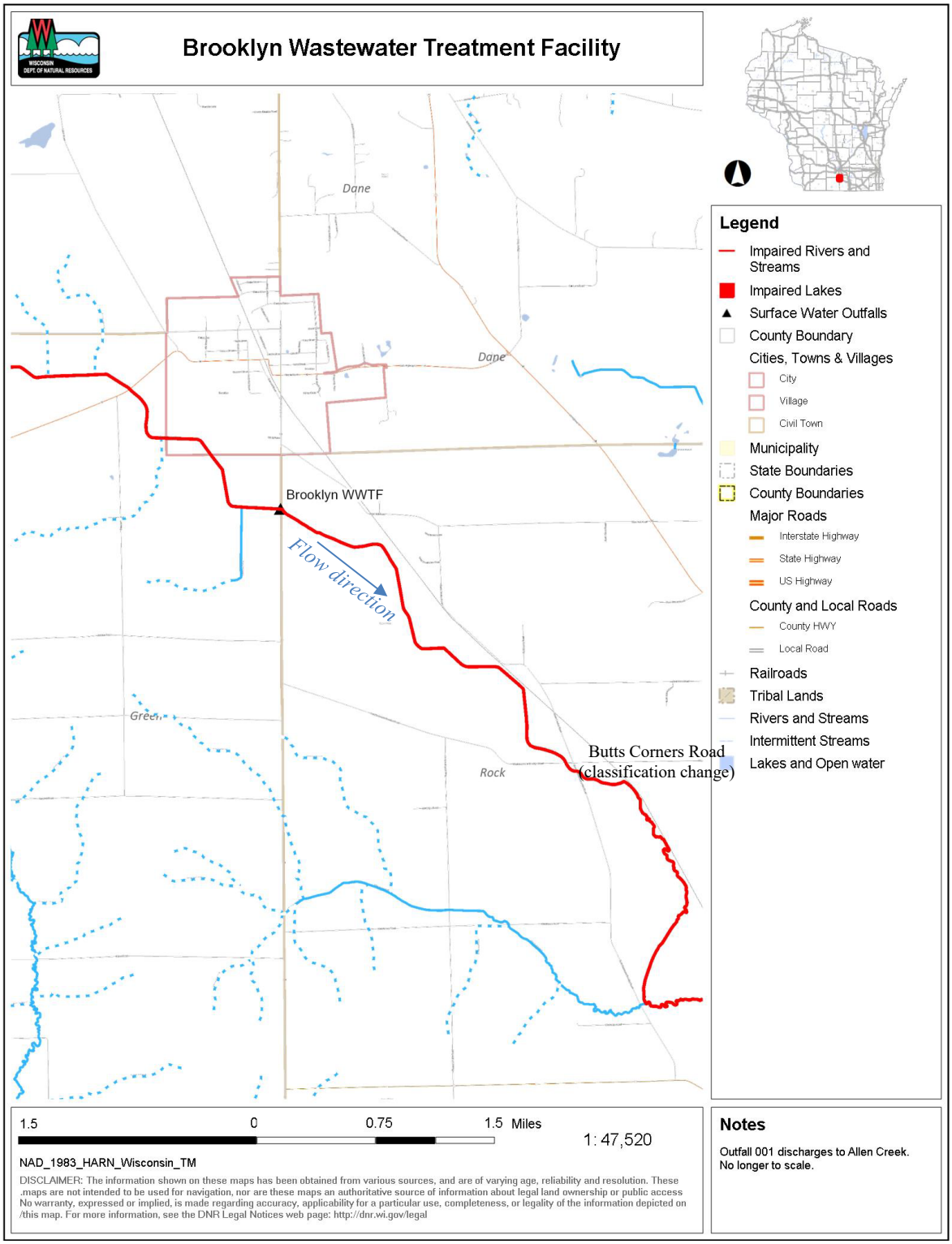
	Acute	Chronic
Discharge Category	One industrial contributor (O&A Manufacturing). **5 Points**	Same as Acute. **5 Points**
Wastewater Treatment	Secondary or better. **0 Points**	Same as Acute. **0 Points**
Downstream Impacts	No impacts known. **0 Points**	Same as Acute. **0 Points**
Total Checklist Points:	**19 Points**	**29 Points**
Recommended Monitoring Frequency (from Checklist):	2 tests during permit term.	3 tests during permit term.
Limit Required?	No	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, **two acute and annual 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 TU_c 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.

Attachment #2

Site Map



Attachment #3

Ammonia Nitrogen Calculations from the WQBEL Memo Dated December 7, 2012

The following tables summarize the effluent limitations for ammonia nitrogen. Effluent limitations were calculated in accordance with revised chs. NR 106.05 (Wis. Adm. Code) for two different stream classifications in order to protect at the point of discharge and downstream uses.

AMMONIA (as N) LIMITS	**Brooklyn**		
CLASSIFICATION:	**LIMITED FORAGE FISH**		
EFFLUENT FLOW (mgd):	0.2		
EFFLUENT FLOW (cfs):	0.309		
MAX. EFFLUENT pH (s.u.):	7.80		
f (withdrawal factor)	0.00		
BACKGROUND INFO.:	***summer***	***winter***	***April***
7Q10 (cfs)	0.27	0.27	0.27
7Q2 (cfs)	0.58	0.58	0.58
Ammonia (mg/L)	0.06	0.19	0.07
Temperature (deg C)	23	3	9
pH (std. units)	8.21	7.97	7.97
% of river flow used:	100	25	25
Reference weekly flow:	0.27	0.0675	0.0675
Reference monthly flow:	0.493	0.12325	0.12325
CRITERIA (in mg/L):			
Acute (@ effl. pH):	12.14	12.14	12.14
4-day Chronic (@ backgrd. pH):			
early life stages present	5.60	8.06	8.06
early life stages absent	7.69	31.06	27.30
30-day Chronic (@ backgrd. pH)			
early life stages present	2.24	3.22	3.22
early life stages absent	3.08	12.42	10.92
EFFLUENT LIMITS (in mg/L):			
Weekly average			
early life stages present	10.44	9.78	9.81
early life stages absent		37.79	33.24
Monthly average			
early life stages present	5.71	4.43	4.48
early life stages absent		17.30	15.24

AMMONIA (as N) LIMITS				
CLASSIFICATION:		**COLD WATER**		
EFFLUENT FLOW (mgd):		0.2		
EFFLUENT FLOW (cfs):		0.309		
MAX. EFFLUENT pH (s.u.):		7.80		
BACKGROUND INFORMATION:		***summer***	***winter***	***spring***
7Q10 (cfs)		0.27	0.27	0.27
7Q2 (cfs)		0.58	0.58	0.58

Ammonia (mg/L)		0.06	0.19	0.07
Temperature (deg C)		20	3	9
pH (std. units)		8.21	7.97	7.97
% of river flow used:		100	100	100
Reference weekly flow:		0.27	0.27	0.27
Reference monthly flow:		0.493	0.493	0.493
CRITERIA (in mg/L):				
Acute (@ effl. pH):		8.11	8.11	8.11
4-day Chronic (@ backgrd. pH):				
early life stages present		3.10	6.35	6.35
30-day Chronic (@ backgrd. pH)				
early life stages present		1.24	2.54	2.54
EFFLUENT LIMITS (in mg/L):				
Weekly average				
early life stages present		5.75	11.73	11.83
Monthly average				
early life stages present		3.12	6.28	6.48

Note: Early life stages present limits apply year round.

Ammonia Decay: The more restrictive calculated limits should be used in order to protect at the point of discharge and downstream uses. Where the calculated limits are more restrictive based on downstream uses, ammonia decay can be considered to determine if these more restrictive limits are needed or if the ammonia will decay before it reaches the point of the classification change.

Ammonia decay rates are dependent on temperature with in-stream nitrification essentially non-existent in the winter. In-stream decay is expected so a first order decay model will be used. Based on the available literature, a decay rate of 0.25 day^{-1} at 20°C has been suggested as a default rate. A temperature correction factor of θ = 1.08 is ($k_{.t} = k_{20}\,\theta^{(T-20)}$).

$$N_{Limit} = \left(\frac{N_{down}}{EXP(-k_t T)} \right)$$

Where: N_{Limit} = Ammonia limit needed to protect downstream use (mg/L)

N_{down} = Ammonia limit calculated based on downstream classification and flow (mg/L)

$-k_t$ = Ammonia decay rate at background stream temperature (day^{-1})

T = Travel time from outfall to downstream use (day)

For Brooklyn, a velocity of the receiving stream is assumed to be 5 miles per day and the distance from the point of discharge to the classification change is approximately 2.87 miles for a travel time of 0.574 days. This equation shows that at the location where the classifications change, 83% of the ammonia is remaining during summer, 96% during winter, and 94% during April. The limits can be adjusted for decay as follows:

Ammonia Limits	At Downstream Point	Adjusted for Decay
April	mg/L	**mg/L**

Attachment #3

Ammonia Limits	At Downstream Point	Adjusted for Decay
Weekly average	11.83	**12.6**
Monthly average	6.48	**6.9**
May – Sept.		
Weekly average	5.75	**6.9**
Monthly average	3.12	**3.7**
Oct - March		
Daily max.	16.21	**16.9**
Weekly average	11.73	**12.2**
Monthly average	6.28	**6.5**

Attachment #4

Temperature limits for receiving waters with unidirectional flow

(calculation using default ambient temperature data)

						Temp Dates	Flow Dates
Facility:	Brooklyn WWTF		**7-Q_{10}:**	0.27	cfs		
Outfall(s):	001		**Dilution:**	25%		**Start:** 01/04/21	10/01/18
Date Prepared:	3/7/2024		**f:**	0		**End:** 12/31/21	01/31/24
Design Flow (Qe):	0.20	MGD	**Stream type:**	Limited forage fish community			
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	37	54	78	0.27	0.103	0.114	0	44	45	61	94
FEB	39	54	79	0.27	0.109	0.140	0	43	44	60	91
MAR	43	57	80	0.27	0.131	0.146	0	48	49	62	91
APR	50	63	81	0.27	0.099	0.108	0	52	53	69	94
MAY	59	70	84	0.27	0.116	0.127	0	63	64	74	93
JUN	64	77	85	0.27	0.112	0.121	0	68	68	82	93
JUL	69	81	86	0.27	0.098	0.112	0	71	71	86	93
AUG	68	79	86	0.27	0.091	0.103	0	72	73	84	94
SEP	63	73	85	0.27	0.087	0.114	0	70	73	78	93
OCT	55	63	83	0.27	0.186	0.209	0	69	69	**65**	89
NOV	46	54	80	0.27	0.126	0.138	0	58	61	**57**	91
DEC	40	54	79	0.27	0.100	0.112	0	51	52	60	94

State of Wisconsin
DEPARTMENT OF NATURAL RESOURCES
3911 Fish Hatchery Road
Fitchburg, WI 53711

Tony Evers, Governor
Adam N. Payne, Secretary
Telephone 608-266-2621
FAX 608-267-3579
TTY Access via relay - 711

September 22, 2023

Linda Kuhlman
PO Box 189
Brooklyn, WI 53521

Subject: Brooklyn Wastewater Treatment Facility - WPDES Permit WI-0023485
Water Quality Trading Plan – CONDITIONAL APPROVAL

Dear Ms Kuhlman:

The Department recently received a water quality trading plan (WQT Plan) for ongoing compliance with phosphorus effluent limits at the Brooklyn Wastewater Treatment Facility. The plan was received in June of 2023 and an updated version was received in August 2023. Based on WDNR review, the final WQT Plan (dated August 2023) is in general conformance with the WDNR Water Quality Trading Guidance and Section 283.84 of the Wisconsin Statutes. The WQT plan proposes ongoing whole field management with the installation of filter strips and cover crop practices on agricultural lands with no till methods. Credits started being generated on January 1, 2022. The filter strips were planted in 2021, cover crops and improved tillage methods began in 2022. The 5-year averaging period for credit generation will be 2024 through 2028. Credits generated from approved practices result in available credit quantities shown in Table 1. These credits will be incorporated into the reissued WPDES permit and will be used to demonstrate compliance with final phosphorus effluent limits beginning October 1, 2023.

Table 1: Total Phosphorus Credits Available per WQT-2023-0006

Year	Available Credits (lbs/yr) – Total
2023	0
2024	224
2025	224
2026	224
2027	224
2028	224

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-2023-0006 and will be referenced as such in the draft WPDES permit. The final 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 608-419-4155 or at betsyjo.howe@wisconsn.gov

Thank You,

BetsyJo Howe

BetsyJo Howe
Wastewater Specialist
Wisconsin Department of Natural Resources

e-CC:

Leif Spilde, Public Works Ditector
Travis J. Anderson, P.E., Strand Associates, Inc.
Matt Claucherty, WDNR
Kenzie Ostien, WDNR

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Strand Associates, Inc.®
910 West Wingra Drive
Madison, WI 53715
(P) 608.251.4843
www.strand.com

August 25, 2023

Ms. Kenzie Ostien
Wisconsin Department of Natural Resources
3911 Fish Hatchery Road
Fitchburg, WI 53711

Re: Water Quality Trading (WQT) Plan Update
Wisconsin Pollutant Discharge Elimination System (WPDES) Permit No. WI-0023485-09
Brooklyn Wastewater Treatment Facility (WWTF)
Village of Brooklyn, Wisconsin (Village)

Dear Ms. Ostien:

The enclosed revised WQT Plan Update is being submitted to the Wisconsin Department of Natural Resources (WDNR) on behalf of the Village. The report addresses comments provided by the WDNR on July 31, 2023.

Please call me with questions at 608-251-4843.

Sincerely,

STRAND ASSOCIATES, INC.®

Travis J. Anderson, P.E.

Enclosure: Report

c/enc: Leif Spilde, Public Works Director, Village of Brooklyn

Report for

Village of Brooklyn, Wisconsin

Wastewater Treatment Facility
Water Quality Trading Plan Update

Prepared by:

STRAND ASSOCIATES, INC.®
910 West Wingra Drive
Madison, WI 53715
www.strand.com

August 2023

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TABLE OF CONTENTS

ABBREVIATIONS

The following list of abbreviations is included as an aid to the reader:

BMP	best management practice
BNR	biological nutrient removal
BOD_5	five-day biochemical oxygen demand
BPR	biological phosphorus removal
CPR	chemical phosphorus removal
Facilities Plan	Wastewater Management Facilities Plan
FCAP	Final Compliance Alternative Plan
Guidance	Guidance for Implementing Water Quality Trading in WPDES Permits
HUC	Hydrologic Unit Code
lb/day	pounds per day
Ib/year	pounds per year
MGD	million gallons per day
mg/L	milligrams per liter
NMP	nutrient management plan
NPS	nonpoint source
NRCS	National Resources Conservation Service
O&M	operation and maintenance
RAS	return activated sludge
SnapPlus	Soil Nutrient Application Planner model
TKN	total Kjeldahl nitrogen
TP	total phosphorus
TSS	total suspended solids
USEPA	United States Environmental Protection Agency
Village	Village of Brooklyn
WAS	waste activated sludge
WDNR	Wisconsin Department of Natural Resources
WPDES	Wisconsin Pollutant Discharge Elimination System
WQBELs	water quality-based effluent limits
WQT	water quality trading
WWTF	Wastewater Treatment Facility

INTRODUCTION

The Village of Brooklyn, Wisconsin (Village), is located in Dane and Green Counties. The Brooklyn Wastewater Treatment Facility (WWTF) serves the Village and discharges to Allen Creek in Green County, near the Green County-Rock County line. A *Wastewater Management Facilities Plan* (Facilities Plan) was completed in March 2006 and approved by Wisconsin Department of Natural Resources (WDNR) in November 2006, which led to major improvements at the WWTF in 2008. The 2008 project included new WWTFs including screening, influent pumping, activated sludge treatment, final clarification, and biosolids storage. In March 2017, the Village submitted its *Final Compliance Alternative Plan* (FCAP) for phosphorus, which concluded with a recommendation to implement water quality trading (WQT) along with WWTF capital improvements in order to meet final phosphorus water quality-based effluent limits (WQBELs).

This report is intended to satisfy the WQT plan update requirement necessary to include WQT in the future reissuance of the Village's Wisconsin Pollutant Discharge Elimination System (WPDES) permit. A Notice of Intent to conduct WQT was submitted to the WDNR in December 2016 and can be found in Appendix A, and the completed WQT checklist can be found in Appendix B. For background information related to the Village collection system, design flows and loadings, and environmental impacts, refer to the 2006 Facilities Plan. For a full explanation regarding the Village's strategy to meet phosphorus WQBELs, refer to the 2017 FCAP. There have been no changes made to the Village's WQT strategy since submittal of the 2020 WQT Plan.

GENERAL AND BACKGROUND INFORMATION

The WWTF is an activated sludge plant. Preliminary treatment consists of a cylindrical mechanical screen. Influent sampling occurs following the mechanical fine screen. Screened influent is pumped to a new biological phosphorus removal (BPR) structure that was completed in summer 2020. The flow then enters an oxidation ditch that provides extended aeration and biological treatment of wastewater organics along with removal of ammonia. Chemical phosphorus removal (CPR) was also completed in summer 2020 with the ability to add phosphorus removal chemical at the effluent of the oxidation ditch. Wastewater then flows to the final clarifier where the microorganisms are separated by gravity from the treated effluent. Effluent from the clarifiers is metered and discharged to Allen Creek. The microorganisms are returned to the oxidation ditch (or to the future BPR structure) as return activated sludge (RAS). Waste activated sludge (WAS) is gravity thickened with optional polymer addition in a biosolids storage tank. The decanted liquid from the storage tank is returned to the oxidation ditch influent. The liquid biosolids are disposed of either by land application or disposal at a larger WWTP. A process flow schematic of the WWTF is provided in Figure 1. BPR and CPR have both proved successful at the WWTF and phosphorus discharges have been consistently less than the required target values when considering the implemented WQT.

The WWTF operates under WPDES Permit No. WI-0023485-09. Design flows and loadings and relevant permit limitations are shown in Table 1. Current WWTF flows average 0.083 million gallons per day (MGD) based on an average of data from 2016 through 2019. Recent flows have been lower due to dryer conditions (for example, the average flow in 2022 was 0.068 MGD). A current average flow of 0.083 MGD will be used for the purposes of the WQT Plan Update to be conservative.

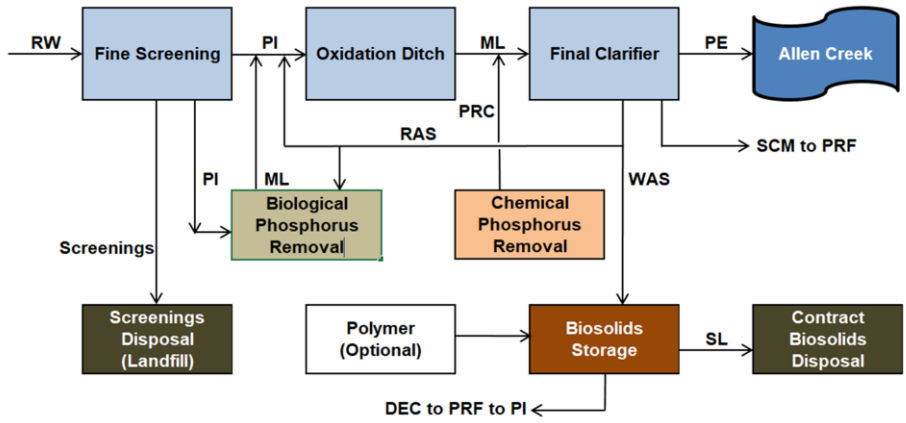


Figure 1 Village WWTF Process Schematic

Design Flows (MGD)	
Average Day	0.20
Peak Hour	0.60
Design Average Influent Loadings (Pounds per Day [lb/day])	
Five-Day Biochemical Oxygen Demand (BOD_5)	428
Total Suspended Solids (TSS)	755
Total Kjeldahl Nitrogen (TKN)	71
Total Phosphorus (TP)	21
Phosphorus Effluent Limits (Milligrams per Liter [mg/L])	
Current Interim Limit–Monthly Average	7.9
Future WQBEL–6-Month Average[1]	0.075
Future WQBEL–Monthly Average	0.225

[1]Averaging periods are May to October and November to April.

Table 1 Design Flows, Loads, and WPDES Permit Phosphorus Limitations

A. WWTF Capital Improvements

Within the FCAP submitted in March 2017, a variety of WWTF Improvement alternatives were explored for phosphorus removal. Alternatives included BPR, CPR, biological nutrient removal (BNR), one- and two-stage reactive sand filters, cloth disk filtration, and an activated algae system.

BPR and CPR jar tests and a CPR pilot test were completed and summarized in the 2015 phosphorus compliance status letter and 2017 FCAP. The results of the tests indicated that CPR, with or without BPR, was capable of producing effluent phosphorus in the range of a 0.5- to 1.0-mg/L monthly average. Neither of the alternatives alone or together would be able to consistently meet the 0.075-mg/L WQBEL.

Reactive sand filtration, cloth disk filtration, and the activated algae system, while potentially capable of meeting the final WQBELs, were not as cost effective as the chosen alternative. The Village began construction of a BPR system with a backup CPR system, to meet less than 1.0-mg/L effluent phosphorus concentrations. Construction was in summer 2020. WQT will be used to achieve the remaining load reduction.

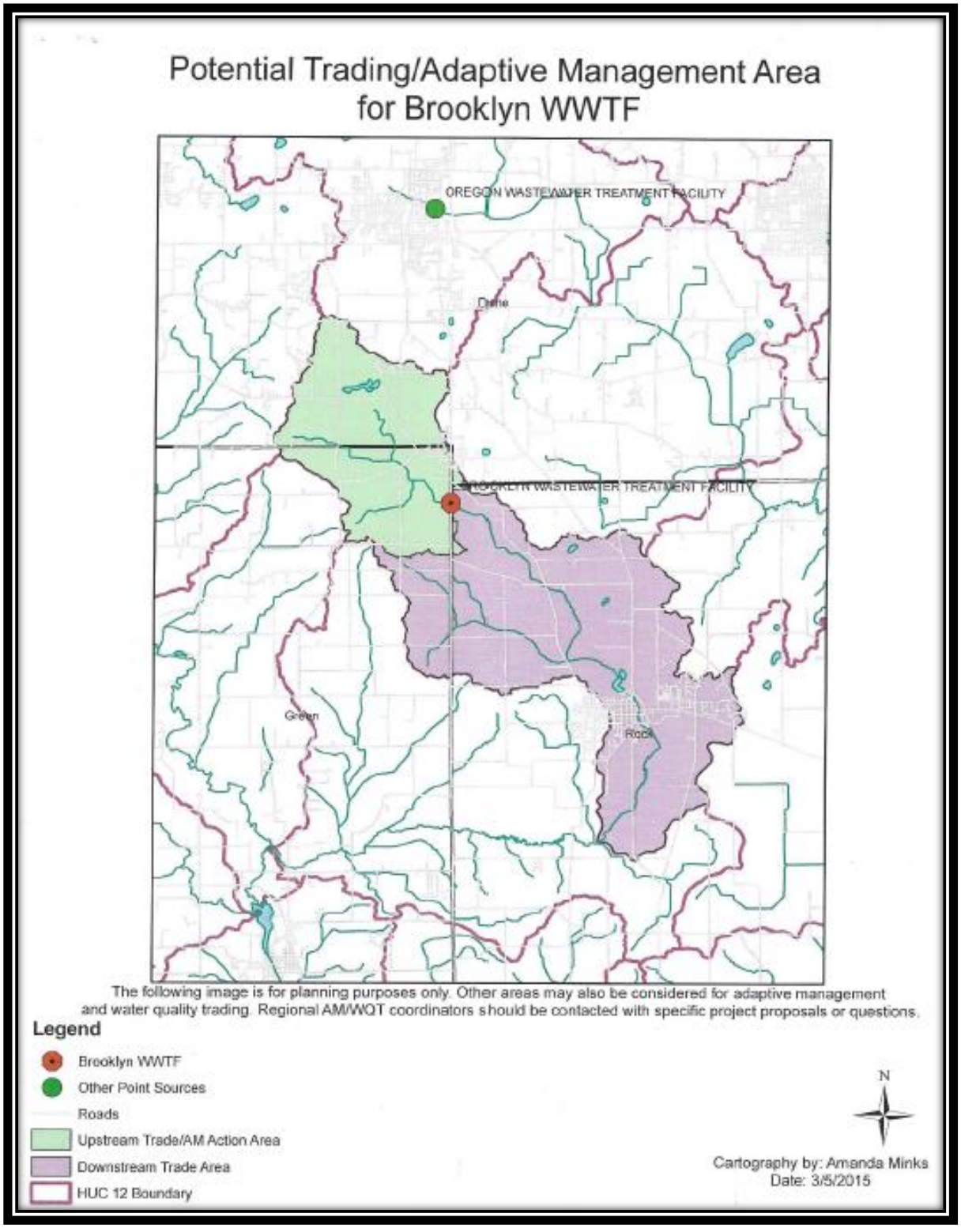
Combining both BPR and CPR allows for less generation of WAS and additional area for grit settling upstream of the oxidation ditches rather than CPR alone. BPR is generally viewed as a more sustainable process compared to CPR alone, as BPR will result in less chemical handling requirements.

WATER QUALITY TRADING

WQT was reviewed in detail in the *2016 Preliminary Compliance Alternatives Plan* and 2017 FCAP. This option was anticipated to employ rural or urban best management practices (BMPs) to reduce nonpoint source (NPS) phosphorus loadings in the watershed. As previously noted, the WWTF discharges to Allen Creek, which is in the Sugar River watershed. According to the WDNR's Surface Water Data Viewer Internet-based tool, the Hydrologic Unit Code (HUC) 12 subwatershed is identified as City of Evansville-Allen Creek, ID No. 070900040301, and it contains 21,660 acres. A map of the HUC 12 and surrounding area, provided by the WDNR at a March 2015 public workshop held in the Village of New Glarus, Wisconsin, is included in Figure 2.

WQT is used to meet effluent limits rather than being used to meet the in-stream water quality criterion. Therefore, stream monitoring is not required. However, field-scale (e.g., SnapPlus P Trade) or similar modeling or monitoring is required to demonstrate that the BMPs will achieve the NPS load reductions. Additionally, a trade ratio is applied to account for uncertainties (because the BMP and stream are not monitored) and other factors. Monitoring may be used to justify a site-specific trade ratio. For WQT, BMPs are generally installed upstream of the outfall; however, the WDNR allows some downstream trading if it is within the HUC 12. Trade ratios for NPS to point source trades within a HUC 12 are typically 1.2 to 2.0. This means that if the WWTF was required to reduce effluent phosphorus by 100 pounds per year (lb/year), for example, it would need to arrange for 120 to 200 lb/year of NPS phosphorus load reductions.

Figure 2 City of Evansville–Allen Creek HUC 12 (ID No. 070900040301)



A. Description of Properties

Two landowners within the Village's HUC 12 watershed and upstream of the WWTF were identified with land parcels (Tax Parcels 2300600840000, 2300600850000, 2300600854000, and 2300600855000) that have historically been used for corn and soybean production. There is an agreement between the landowner and the owner of Tax Parcel 2300600085600 to farm the agricultural land associated with that parcel (a portion of field Amidon D). The two landowners partnered with the Village to provide Whole Field Management as defined in Appendix H of WDNR's *Guidance for Implementing WQT in WPDES Permits* (Guidance). This resulted in phosphorus credit generation beginning in January 2022.

The location of the fields, Allen Creek and its tributaries, and the WWTF and associated outfall (as displayed in the WDNR Surface Water Data Viewer) are shown in the basemap in Figure 3. Each property is split into subfields for the purposes of SnapPlus modeling.

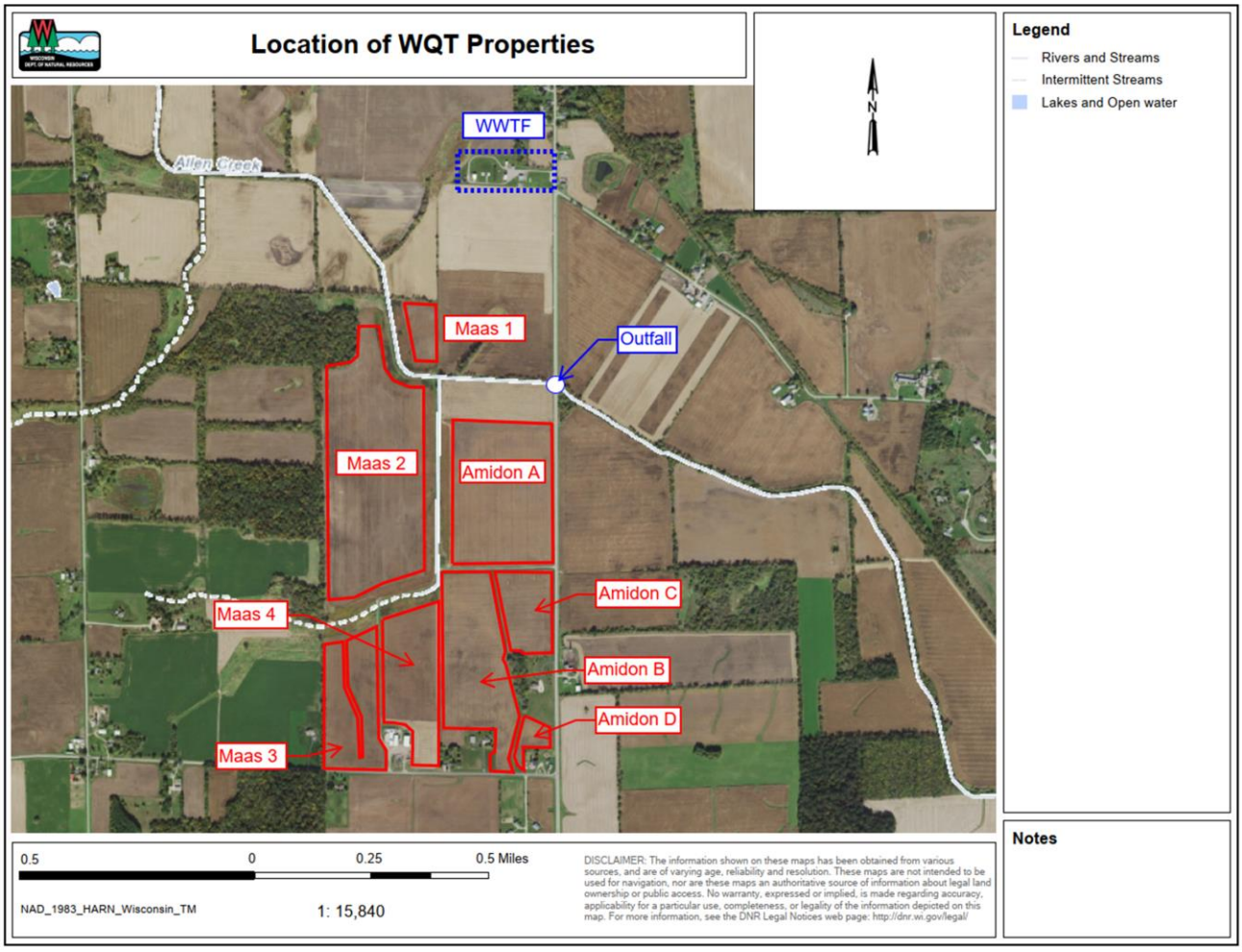


Figure 3 Location of WQT Properties

B. Load Reduction

The required load reductions will be generated upstream from the WWTF discharge location on properties that drain directly to either Allen Creek or tributaries to Allen Creek.

A map of the soil types of both properties can be found in Appendix C. The SnapPlus modeling performed for this trade includes soil phosphorus concentrations from sampling at the two properties to calculate the baseline phosphorus loading and the resulting phosphorus reduction from the proposed filter strips. Soil sampling was performed according to Method A2100 from the University of Wisconsin-Extension and the results are shown in Appendix F. The baseline SnapPlus modeling results are included in Appendix D. Refer to this appendix for details on crop rotation and tillage methods. Tillage methods are different for fields Maas 1 and Maas 2 because the landowner prefers to chisel plow these fields to prevent compaction. These fields are at a relatively low elevation and therefore do not drain as well.

The baseline conditions do not include filters strips or cover crops. Filter strips that were previously installed at the field edges were removed in 2018 and have been planted in corn and beans beginning in 2019. This timeframe meets WDNR's requirements for a minimum of 2 years to establish the baseline condition.

1. Trade Ratio

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 Appendix H of the Guidance. Because the trade occurs within the same HUC 12 watershed and the properties are upstream of the WWTF 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 1 for using Whole Field Management according to Appendix H of the Guidance. As there are no aquatic habitat restoration efforts on either properties, Habitat Adjustment is assigned a value of zero.

Whole Field Management requires an approved nutrient management plan (NMP), filter strips, grassed waterway, conservation or no till methods, and cover crops. All fields shown in Figure 4 will include filter strips, conservation or no till methods, and cover crops. The proposed filter strip locations are shown in Figure 4. All flow from the fields will pass through the filter strips before entering the receiving stream. There are existing grassed waterways on the fields in areas of concentrated flow as shown in Figure 5. The landowners will use small grain cover crops such as rye or wheat. The post-trade tillage methods will be adjusted to meet the Soil Tillage Intensity Rating value of 35 or less as required for Whole Field Management.

Based on the formula previously described, the trade ratio is calculated at 1:1. However, the minimum trade ratio allowable according to Guidance for NPSs is 1.2:1. Therefore, a trade ratio of 1.2:1 is used for all fields involved in this trade

Figure 4 Proposed Filter Strip Locations

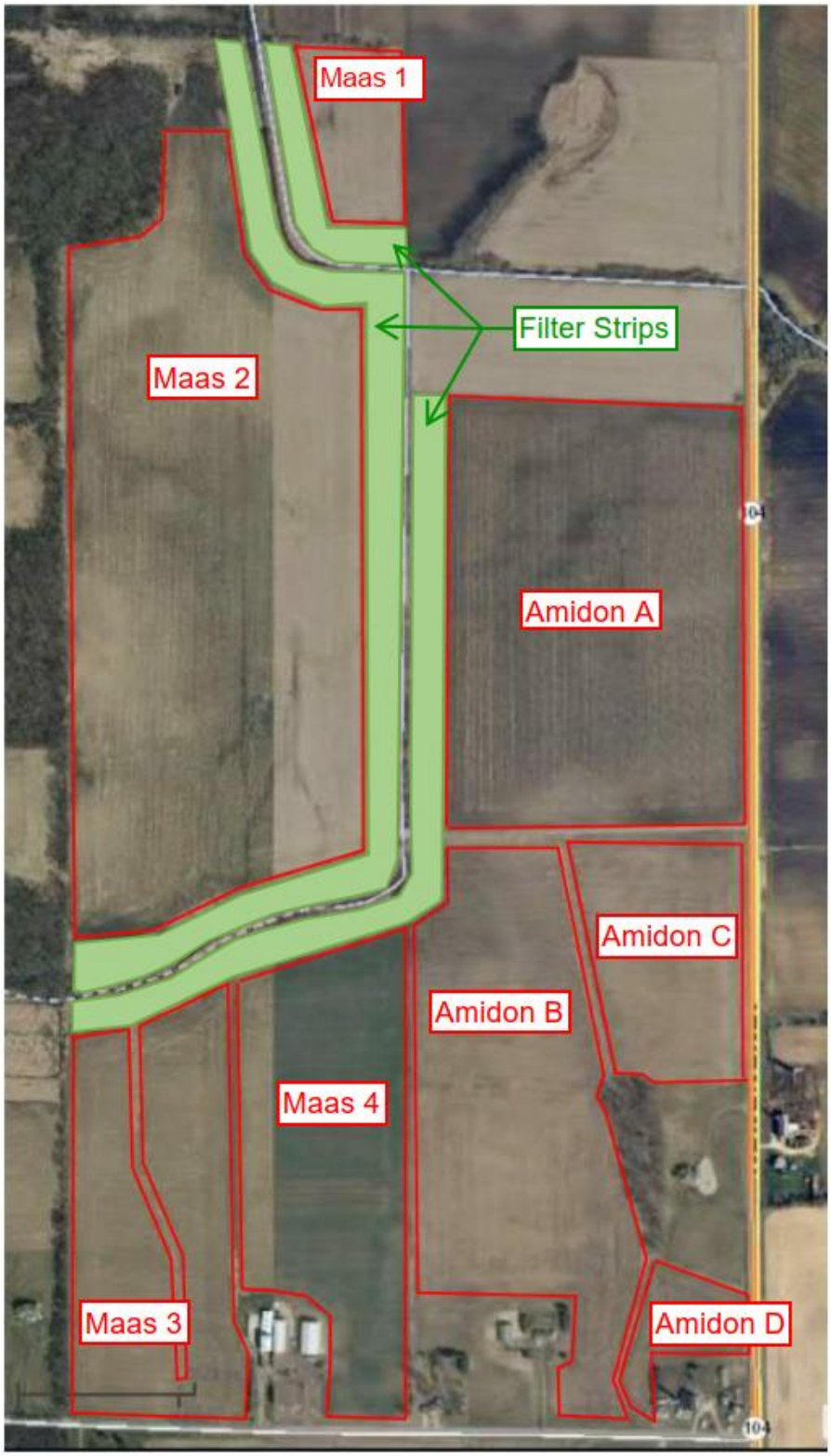
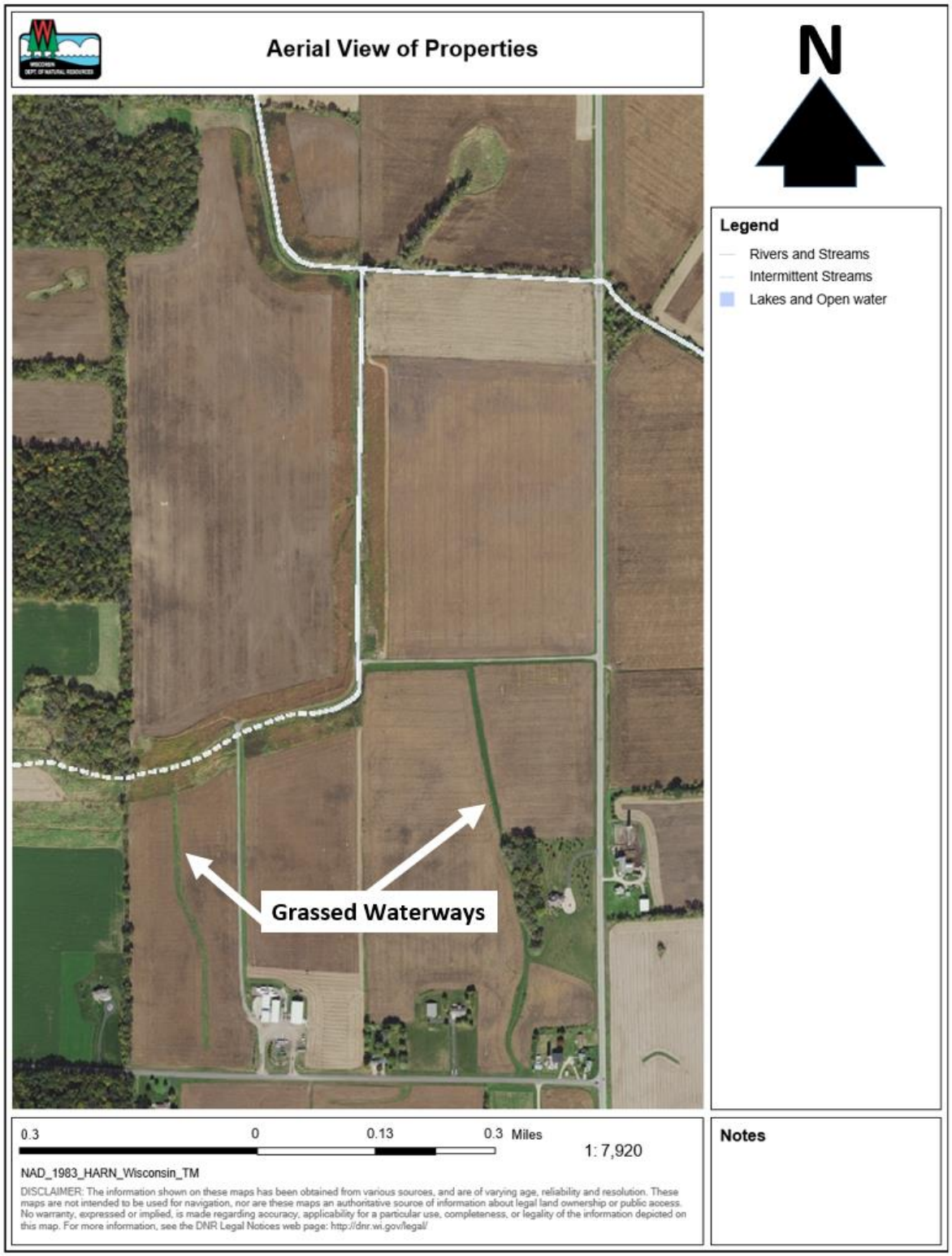


Figure 5 Existing Grassed Waterway Locations



2. Credit Generation Timeline

Credits started being generated on January 1, 2022. This required that the filter strips be planted in 2021 so they were functional in 2022. The other improvements (cover crops and improved tillage methods) began in 2022. The 5-year averaging period for credit generation will be 2024 through 2028.

3. SnapPlus Modeling and NMPs

The post-trade SnapPlus modeling results are included in Appendix E and include all the requirements for Whole Field Management. Refer to this appendix for details on crop rotation and tillage methods. A NMP has been developed for each property as required in Appendix H of the Guidance. All the land owned by the trading partners was included in an NMP by 2021. In addition, the landowners agree to not take any action to cause or permit an overloading of nutrients (i.e., application of more than reasonably determined annual nutrient needs of the crops) or a shifting of nutrients to other properties. Manure is not applied to the fields now and there is no incentive to apply (purchase) more nutrients than necessary for crop growth as dictated by the NMP. The NMPs for the fields are included in Appendix F.

4. Load Reductions, Credits, and Effluent Targets

A summary of the phosphorus load reduction pounds and credits generated from each property and resulting target effluent concentrations are shown in Tables 2 and 3, respectively. An average of 224 pounds phosphorus credits are generated per year from the combined properties using the 5-year average 2024 through 2028. Incorporating the phosphorus credits, the resulting effluent phosphorus target is approximately 0.44 mg/L at the design average flow (DAF) of 0.2 MGD, The current average flow is approximately 0.083 MGD, therefore, allowing for a higher resulting effluent phosphorus target, initially 0.96 mg/L, as shown in Table 3.

The WWTF is expected to be capable of meeting the phosphorus effluent target throughout the 5-year term (2024 through 2028) with the recently installed BPR and CPR systems. The combination of BPR and CPR has been working very well following start-up related optimization efforts demonstrating the ability for the WWTF to meet the targets necessary, additional credits are not anticipated at this time. The need for obtaining additional phosphorus credits will be determined based on actual increases in WWTF flow over time and future performance of the BPR and CPR systems.

Year	2024	2025	2026	2027	2028
Acres Modeled Fields	232	232	232	232	232
Pre-Trade Load Fields (lb/year)	515	251	408	334	320
Post-Trade Load (lb/year)	107	107	93	76	99
Load Reduction (lb/year)	408	144	315	258	221
Trade Ratio	1.2	1.2	1.2	1.2	1.2
Credits Generated	340	120	263	215	184

Table 2 WQT Annual Credits Generated

Credits Generated (5-year average, lb/year)	224
DAF (MGD)	0.2
Current Average Flow (MGD)	0.083
WQBEL (mg/L)	0.075
Resulting Design Effluent Target (mg/L)	0.44
Resulting Current Effluent Target (mg/L)	0.96

Table 3 WQT Annual Credits Generated and Target Effluent Concentrations

C. Operation and Maintenance (O&M)

The landowners will be responsible for installation and maintenance of the whole field management practices in accordance with National Resources Conservation Service (NRCS) standards according to with the trade agreement with the Village. The applicable NRCS standards include Code 393 for filter strips, Code 329/345 for conservation tillage, Code 412 for grassed waterways, Code 340 for cover crops, and Code 590 for NMPs. The filter strips, grassed waterways, and cropping practices will be inspected at least once a year during the month of June by an inspector selected by the Village who 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 filter strips, installation of cover crops, tillage method, and type of crop. 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 landowners will be responsible for correcting any problems, in accordance with NRCS standards and the trade agreement. Inspection reports will be included in the annual WQT report.

D. Inspections and Reporting

A WQT agreement has been completed between the Village and the two property owners with an agreement duration through December 31, 2036. The signature page of the agreement is included in Appendix G. The completed Registration Form 3400-207 for WQT Management Practice Registration is included in Appendix H.

The Village will submit an annual WQT report to the WDNR by January 31 of each year. This report will reference the approved WQT Plan and include the number of TP credits (pounds per month) used each month of the previous year to demonstrate compliance, and O&M inspection reports from the past year of the whole field management practices, and identification of noncompliance or failure to implement any terms or conditions of WPDES permit with respect to WQT that have not been reported in discharge monitoring reports. The most recent annual report is included in Appendix I.

In the event that the phosphorus reduction credits used or intended for use by the Village are not being generated as defined in the approved WQT Plan, the Village will notify the WDNR in writing within 7 days. In accordance with the contracts in place between the Village and the landowners, damage to the filter strips will be corrected to the maximum extent practical within 30 days of discovering the damage.

Any duly authorized officer, employee, or representative of the WDNR shall have the right to access and inspect the fields in accordance with Wisconsin Statutes 283.55(2) as long as the approved WQT Plan remains in effect.

CONCLUSIONS AND RECOMMENDATIONS

Credits have been generated since January 2022 and the Village is in compliance related to their phosphorous limits.

The following steps will be taken for compliance with the phosphorus WQBEL using WQT.

1. Continue operation of the BPR system with supplemental phosphorus removal chemical being added as needed.

2. Continue to evaluate the potential need for additional credits as the WWTF flows increase over time and based on the actual BPR and CPR system performance.

APPENDIX A–NOTICE OF INTENT TO CONDUCT WATER QUALITY TRADING (COMPLETED)

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

Notice of Intent to Conduct Water Quality Trading

Form 3400-206 (1/14)

Notice: Pursuant to s. 283.84, Wis. Stats., and ch. NR 217 Wis. Adm. Code, this form must be completed by any WPDES permittee that is using water quality 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
Village of Brooklyn	WI- 0023485-08-0	6038

Facility Address	City	State	ZIP Code
102 Windy Lane	Brooklyn	WI	53521

Project Contact Name (if applicable)	Address	City	State	ZIP Code
Mark A. Langer	210 Commercial Street P.O. Box 189	Brooklyn	WI	53521

Project Name
Village of Brooklyn Water Quality Trading

Receiving Water Name	Parameter(s) being traded	HUC 12(s)
Allen Creek	Phosphorus	070900040301

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 (select all that apply):
- [ ] Permitted Discharge (non-MS4/CAFO)
- [ ] Permitted MS4
- [ ] Permitted CAFO
- [ ] Urban nonpoint source discharge
- [x] 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; Name: _____
- (●) No
- ( ) Unsure

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

Discharge Type	Permit Number	Name	Contact Address	Is the point source credit generator currently in compliance with their permit requirements?
( ) Traditional ( ) MS4 ( ) CAFO				( ) 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

Point to Nonpoint Trades (Non-permitted Agricultural, Non-Permitted Urban, etc.)

List the practices that will be used to generate credits:

Filter strips (Natural Resources Conservation Service Code 393) will be installed down gradient of agricultural practices to reduce runoff and associated phosphorus from entering the receiving stream. Credit generating practices will be installed on tax parcels 2300600840000 and 2300600850000 in Green County. Assuming a trade ratio f 2:1 for filter strips, the phosphorus credits generated per year are approximately 403 to 517 lb/year. It is intended that water quality trading will be used in conjunction with wastewater treatment plant improvements for compliance with the water quality based effluent limit. Credit generating practices will be installed in the future on tax parcel 2300600897000.

Method for quantifying credits generated:
- ☐ Monitoring
- ☒ Modeling, Names: SNAP Plus
- ☐ Other: _____

Projected date credits will be available: 01/01/2019

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.

Signature of Preparer	Date Signed
Travis J. Gibson	12/22/16

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
Mark A. Langer	12/22/16

APPENDIX B
WATER QUALITY TRADING CHECKLIST (COMPLETED)

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

Water Quality Trading Checklist

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
Village of Brooklyn	WI- 0023485-09-0	

Facility Address	City	State	ZIP Code
102 Windy Lane	Brooklyn	WI	53521

Project Contact Name (if applicable)	Address	City	State	ZIP Code
Leif Spilde	210 Commercial Street P.O. Box 189	Brooklyn	WI	53521

Project Name
Village of Brooklyn Water Quality Trading

Receiving Water Name	Parameter(s) being traded	HUC 12(s)
Allen Creek	Phosphorus	070900040301

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	Whole Field Management	Modeling: SNAP Plus 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
◯ 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	3-A
b. Management practices used to generate credits	◉ Yes	◯ No	3-B
c. Amount of credit being generated	◉ Yes	◯ No	3-B
d. Description of applicable trade ratio per agreement/management practice	◉ Yes	◯ No	3-B
e. Location where credits will be generated	◉ Yes	◯ No	3-A, 3-B
f. Timeline for credits and agreements	◉ Yes	◯ No	3-B
g. Method for quantifying credits	◉ Yes	◯ No	3-B

Does plan have a narrative that describes:			Plan Section
h. Tracking procedures	◉ Yes	○ No	3-D
i. Conditions under which the management practices may be inspected	◉ Yes	○ No	3-D
j. Reporting requirements should the management practice fail	◉ Yes	○ No	3-D
k. Operation and maintenance plan for each management practice	◉ Yes	○ No	3-C
l. Location of credit generator in proximity to receiving water and credit user	◉ Yes	○ No	3-A
m. Practice registration documents, if available	◉ Yes	○ No	App. H
n. History of project site(s)	◉ Yes	○ No	3-A
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.

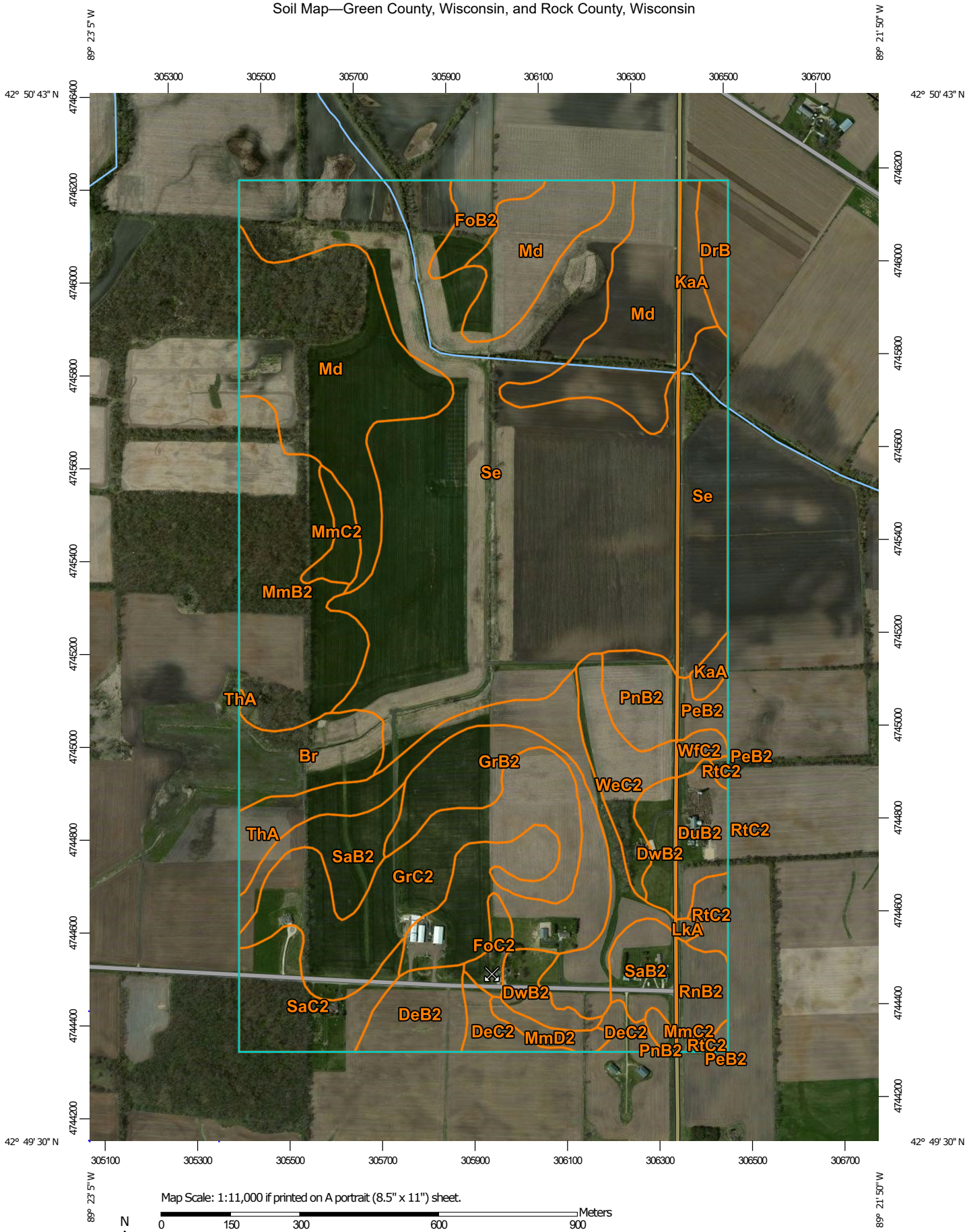
Signature of Preparer	Date Signed
Tan J. Ah	8/24/23

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
Scott Miller	8-24-2023

APPENDIX C
SOIL MAP


89° 23' 5" W
89° 21' 50" W
42° 50' 43" N
42° 49' 30" N
305300
305500
305700
305900
306100
306300
306500
306700
305100
4746400
4746200
4746000
4745800
4745600
4745400
4745200
4745000
4744800
4744600
4744400
4744200
FoB2
Md
DrB
KaA
Md
Md
Se
Se
MmC2
MmB2
KaA
ThA
PnB2
PeB2
Br
GrB2
WfC2
PeB2
RtC2
WeC2
ThA
DuB2
RtC2
DwB2
SaB2
GrC2
RtC2
LkA
FoC2
SaB2
DwB2
RnB2
SaC2
DeB2
DeC2
MmD2
DeC2
MmC2
PnB2
RtC2
PeB2
Map Scale: 1:11,000 if printed on A portrait (8.5" x 11") sheet.
N
Meters
0
150
300
600
900
Feet
0
500
1000
2000
3000
Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 16N WGS84

MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features

- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features

- Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background

- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at scales ranging from 1:12,000 to 1:20,000.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Green County, Wisconsin
Survey Area Data: Version 20, Sep 10, 2019

Soil Survey Area: Rock County, Wisconsin
Survey Area Data: Version 17, Sep 14, 2019

Your area of interest (AOI) includes more than one soil survey area. These survey areas may have been mapped at different scales, with a different land use in mind, at different times, or at different levels of detail. This may result in map unit symbols, soil properties, and interpretations that do not completely agree across soil survey area boundaries.

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Apr 29, 2011—Jun 13, 2011

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
Br	Brookston silt loam, 0 to 2 percent slopes	11.6	2.4%
DeB2	Dodge silt loam, 2 to 6 percent slopes, moderately eroded	8.5	1.7%
DeC2	Dodge silt loam, 6 to 12 percent slopes, moderately eroded	5.7	1.2%
DwB2	Durand silt loam, 2 to 6 percent slopes, moderately eroded	9.3	1.9%
FoB2	Fox loam, 2 to 6 percent slopes, moderately eroded	5.5	1.1%
FoC2	Fox loam, 6 to 12 percent slopes, eroded	2.8	0.6%
GrB2	Griswold silt loam, 2 to 6 percent slopes, moderately eroded	30.9	6.3%
GrC2	Griswold silt loam, 6 to 12 percent slopes, moderately eroded	33.5	6.8%
Md	Matherton silt loam	75.6	15.3%
MmB2	Miami silt loam, 2 to 6 percent slopes, moderately eroded	33.3	6.8%
MmC2	Miami silt loam, 6 to 12 percent slopes, moderately eroded	4.7	0.9%
MmD2	Miami silt loam, 12 to 20 percent slopes, moderately eroded	2.7	0.5%
PnB2	Pecatonica silt loam, 2 to 6 percent slopes, moderately eroded	7.2	1.5%
SaB2	Saybrook silt loam, 2 to 6 percent slopes, moderately eroded	15.9	3.2%
SaC2	Saybrook silt loam, 6 to 12 percent slopes, moderately eroded	13.9	2.8%
Se	Sebewa silt loam, 0 to 2 percent slopes	147.1	29.9%
ThA	Thackery silt loam, 0 to 3 percent slopes	23.4	4.7%
WeC2	Westville silt loam, 6 to 12 percent slopes, moderately eroded	10.1	2.1%
Subtotals for Soil Survey Area		**441.6**	**89.7%**
Totals for Area of Interest		**492.3**	**100.0%**

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
DrB	Dresden silt loam, 2 to 6 percent slopes	4.4	0.9%
DuB2	Durand silt loam, 2 to 6 percent slopes, eroded	7.0	1.4%
KaA	Kane loam, 0 to 3 percent slopes	6.2	1.3%
LkA	Locke loam, 0 to 3 percent slopes	0.5	0.1%
PeB2	Pecatonica silt loam, 2 to 6 percent slopes, eroded	2.8	0.6%
RnB2	Ringwood silt loam, 2 to 6 percent slopes, eroded	5.1	1.0%
RtC2	Rotamer loam, 6 to 12 percent slopes, eroded	4.5	0.9%
Se	Sebewa silt loam, 0 to 2 percent slopes	18.5	3.8%
WfC2	Westville loam, 6 to 12 percent slopes, eroded	1.8	0.4%
Subtotals for Soil Survey Area		**50.8**	**10.3%**
Totals for Area of Interest		**492.3**	**100.0%**

APPENDIX D
PRE-TRADE SNAPPLUS MODELING RESULTS

NM1: Narrative and Crops Report

Starting Year	**2019**
Reported For	**Kevin Klahn**
Printed	**2020-04-23**
Plan Completion/Update Date:	**2020-04-15**
SnapPlus Version 18.1 built on 2019-01-15	
C:\Users\travisa\Desktop\4.23Village of Brooklyn - Pre Trade - Todd only chisel.snapDb	

Prepared for:
Kevin Klahn
attn:Kevin Klahn
N8995 State Highway 104
Brooklyn, 53521

Farm has 8 fields totalling 232.4 acres
Farm Narrative: None

Annual Farm Notes:

Crop Year	Annual Notes
2020	An in row starter mix of 10-34-0, ATS, and 28% is used on all corn acres. VRT maps are available upon request for any applied acres.

Spreader Calibration Methods: Custom applications, Amount applied / Acres

Narrative and Crops:

Field Name	Acres	2019	2020	2021	2022	2023	2024	2025	2026
Amidon A	47.4	Corn grain Strip Till 191-210 bu/acre	Corn grain Spring Chisel, no disk 191-210 bu/acre	Corn grain Strip Till 191-210 bu/acre	Corn grain Strip Till 191-210 bu/acre	Soybeans 15-20 inch row Fall vertical tillage 56-65 bu/acre	Corn grain Strip Till 191-210 bu/acre	Corn grain Strip Till 191-210 bu/acre	Soybeans 15-20 inch row Fall vertical tillage 56-65 bu/acre
Amidon B	31.8	Corn grain Strip Till 191-210 bu/acre	Corn grain Spring Chisel, no disk 191-210 bu/acre	Corn grain Strip Till 191-210 bu/acre	Corn grain Strip Till 191-210 bu/acre	Soybeans 15-20 inch row Fall vertical tillage 56-65 bu/acre	Corn grain Strip Till 191-210 bu/acre	Corn grain Strip Till 191-210 bu/acre	Soybeans 15-20 inch row Fall vertical tillage 56-65 bu/acre

Field Name	Acres	2019	2020	2021	2022	2023	2024	2025	2026
Amidon C	12.9	Corn grain Strip Till 191-210 bu/acre	Corn grain Spring Chisel, no disk 191-210 bu/acre	Corn grain Strip Till 191-210 bu/acre	Corn grain Strip Till 191-210 bu/acre	Soybeans 15-20 inch row Fall vertical tillage 56-65 bu/acre	Corn grain Strip Till 191-210 bu/acre	Corn grain Strip Till 191-210 bu/acre	Soybeans 15-20 inch row Fall vertical tillage 56-65 bu/acre
Amidon D	3.2	Corn grain Strip Till 191-210 bu/acre	Corn grain Spring Chisel, no disk 191-210 bu/acre	Corn grain Strip Till 191-210 bu/acre	Corn grain Strip Till 191-210 bu/acre	Soybeans 15-20 inch row Fall vertical tillage 56-65 bu/acre	Corn grain Strip Till 191-210 bu/acre	Corn grain Strip Till 191-210 bu/acre	Soybeans 15-20 inch row Fall vertical tillage 56-65 bu/acre
Maas 1 - 1	8.2	Corn silage, 18 in rows Spring Chisel, no disk 25.1-30 ton/acre	Corn grain Fall Chisel, no disk 191-210 bu/acre	Soybeans 15-20 inch row Fall vertical tillage 56-65 bu/acre	Corn grain Fall Chisel, no disk 191-210 bu/acre	Soybeans 15-20 inch row Fall vertical tillage 56-65 bu/acre	Corn grain Fall Chisel, no disk 191-210 bu/acre	Soybeans 15-20 inch row Fall vertical tillage 56-65 bu/acre	Corn grain Fall Chisel, no disk 191-210 bu/acre
Maas 1 - 2	81.5	Corn silage, 18 in rows Spring Chisel, no disk 25.1-30 ton/acre	Corn grain Fall Chisel, no disk 171-190 bu/acre	Soybeans 15-20 inch row Fall vertical tillage 56-65 bu/acre	Corn grain Fall Chisel, no disk 191-210 bu/acre	Soybeans 15-20 inch row Fall vertical tillage 56-65 bu/acre	Corn grain Fall Chisel, no disk 191-210 bu/acre	Soybeans 15-20 inch row Fall vertical tillage 56-65 bu/acre	Corn grain Fall Chisel, no disk 191-210 bu/acre
Maas 1 - 3	22.5	Corn grain Spring Chisel, no disk 191-210 bu/acre	Corn grain Fall Chisel, no disk 191-210 bu/acre	Soybeans 15-20 inch row Fall vertical tillage 56-65 bu/acre	Corn grain Strip Till 191-210 bu/acre	Soybeans 15-20 inch row Fall vertical tillage 56-65 bu/acre	Corn grain Strip Till 191-210 bu/acre	Soybeans 15-20 inch row Fall vertical tillage 56-65 bu/acre	Corn grain Strip Till 191-210 bu/acre
Maas 1 - 4	24.9	Corn grain Spring Chisel, no disk 191-210 bu/acre	Corn grain Fall Chisel, no disk 191-210 bu/acre	Soybeans 15-20 inch row Fall vertical tillage 56-65 bu/acre	Corn grain Strip Till 191-210 bu/acre	Soybeans 15-20 inch row Fall vertical tillage 56-65 bu/acre	Corn grain Strip Till 191-210 bu/acre	Soybeans 15-20 inch row Fall vertical tillage 56-65 bu/acre	Corn grain Strip Till 191-210 bu/acre

Summary by Crop:

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

Crops Grouped By Category		2019	2020	2021	2022	2023	2024	2025	2026
Corn grain	Acres bu	143 28,672	232 46,516	95 19,048	232 46,516		232 46,516	95 19,048	137 27,469
Soybeans 15-20 inch row	Acres bu			137 8,289		232 14,036		137 8,289	95 5,748

Crops Grouped By Category		2019	2020	2021	2022	2023	2024	2025	2026
Corn silage, 18 in rows	Acres ton	90 2,480							

WQ1: P Trade Report

Reported For	Kevin Klahn
Printed	2020-04-23
Plan Completion/Update Date	2020-04-15
SnapPlus Version 18.1 built on 2019-01-15	
C:\Users\travisa\Desktop\4.23Village of Brooklyn - Pre Trade - Todd only chisel.snapDb	

Prepared for:
Kevin Klahn
attn:Kevin Klahn
N8995 State Highway 104
Brooklyn, 53521

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	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Amidon A	SEBEWA	Se	47	72	49	44	36	36	57	33	31	50	26	26
Amidon B	GRISWOLD	GrB2	32	89	54	48	39	42	77	40	40	73	37	38
Amidon C	WESTVILLE	WeC2	13	73	42	34	26	32	64	28	31	62	27	30
Amidon D	SAYBROOK	SaB2	3	13	8	7	6	6	11	6	6	11	6	6
Maas 1 - 1	SEBEWA	Se	8	8	17	7	16	6	15	6	14	5	7	5
Maas 1 - 2	SEBEWA	Se	82	66	157	58	139	49	131	46	131	46	70	45
Maas 1 - 3	GRISWOLD	GrC2	23	55	63	58	109	63	108	61	105	59	101	57

P Trade Report				PTP										
Field Name	Soil Series	Soil Symbol	Acres	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Maas 1 - 4	GRISWOLD	GrB2	25	28	31	30	53	32	52	30	49	29	47	27
Total			**232**	**404**	**421**	**287**	**423**	**267**	**515**	**251**	**408**	**334**	**320**	**233**

APPENDIX E
POST-TRADE SNAPPLUS MODELING RESULTS

NM1: Narrative and Crops Report

Starting Year	**2021**
Reported For	**Klahn Brooklyn WQT**
Printed	**2023-06-22**
Plan Completion/Update Date:	**2023-06-21**
SnapPlus Version 20.4 built on 2021-06-03	
C:\Users\amansfield\Documents\NMP\Klondike General Partnership \Brooklyn WQT\Klahn Brooklyn WQT.snapDb	

Prepared for:
Klahn Brooklyn WQT
attn:Klahn Brooklyn WQT
N8995 State Highway 104
Brooklyn, 53521

Prepared by: The DeLong Company
PO Box 552
Clinton,Rock,53525
608-676-2255, amansfield@delongcompany.com

Farm has 8 fields totalling 208.3 cropped acres.
Farm Narrative: The Amidon Farm plans to follow a corn-corn-soybean rotation, with a small grain cover crop planted each fall after harvest.

The Maas Farm plans to follow a corn-soybean rotation, with a small grain cover crop planted each fall after harvest.

An in-row starter mix of 10-34-0, ATS, and 28% is used on all corn acres.

No manure or biosolids are applied at anytime to either of these farms.

Annual Farm Notes:

Crop Year	Annual Notes
2023	Post Trade

Spreader Calibration Methods: Custom applications, Amount applied / Acres

Narrative and Crops:

Field Name	Field Acres	2021	2022	2023	2024	2025	2026	2027	2028
Amidon A	42.6	Corn grain Strip Till 191-210 bu/acre	Corn grain to small grain cover crop Strip Till, cover crop no till 191-210 bu/acre	Corn grain to small grain cover crop Strip Till, cover crop no till 191-210 bu/acre	Soybeans to small grain cover crop Spring vertical tillage, cover crop no till 56-65 bu/acre	Corn grain to small grain cover crop Strip Till, cover crop no till 191-210 bu/acre	Corn grain to small grain cover crop Strip Till, cover crop no till 191-210 bu/acre	Soybeans to small grain cover crop Spring vertical tillage, cover crop no till 56-65 bu/acre	Corn grain to small grain cover crop Strip Till, cover crop no till 191-210 bu/acre

Field Name	Field Acres	2021	2022	2023	2024	2025	2026	2027	2028
Amidon B	31.8	Corn grain Strip Till 191-210 bu/acre	Corn grain to small grain cover crop Strip Till, cover crop no till 191-210 bu/acre	Corn grain to small grain cover crop Strip Till, cover crop no till 191-210 bu/acre	Soybeans to small grain cover crop Spring vertical tillage, cover crop no till 56-65 bu/acre	Corn grain to small grain cover crop Strip Till, cover crop no till 191-210 bu/acre	Corn grain to small grain cover crop Strip Till, cover crop no till 191-210 bu/acre	Soybeans to small grain cover crop Spring vertical tillage, cover crop no till 56-65 bu/acre	Corn grain to small grain cover crop Strip Till, cover crop no till 191-210 bu/acre
Amidon C	12.9	Corn grain Strip Till 191-210 bu/acre	Corn grain to small grain cover crop Strip Till, cover crop no till 191-210 bu/acre	Corn grain to small grain cover crop Strip Till, cover crop no till 191-210 bu/acre	Soybeans to small grain cover crop Spring vertical tillage, cover crop no till 56-65 bu/acre	Corn grain to small grain cover crop Strip Till, cover crop no till 191-210 bu/acre	Corn grain to small grain cover crop Strip Till, cover crop no till 191-210 bu/acre	Soybeans to small grain cover crop Spring vertical tillage, cover crop no till 56-65 bu/acre	Corn grain to small grain cover crop Strip Till, cover crop no till 191-210 bu/acre
Amidon D	3.2	Corn grain Strip Till 191-210 bu/acre	Corn grain to small grain cover crop Strip Till, cover crop no till 191-210 bu/acre	Corn grain to small grain cover crop Strip Till, cover crop no till 191-210 bu/acre	Soybeans to small grain cover crop Spring vertical tillage, cover crop no till 56-65 bu/acre	Corn grain to small grain cover crop Strip Till, cover crop no till 191-210 bu/acre	Corn grain to small grain cover crop Strip Till, cover crop no till 191-210 bu/acre	Soybeans to small grain cover crop Spring vertical tillage, cover crop no till 56-65 bu/acre	Corn grain to small grain cover crop Strip Till, cover crop no till 191-210 bu/acre
Maas 1 - 1	5.5	Soybeans 15-20 inch row Spring vertical tillage 56-65 bu/acre	Corn grain to small grain cover crop Strip Till, cover crop no till 191-210 bu/acre	Soybeans to small grain cover crop Spring vertical tillage, cover crop no till 56-65 bu/acre	Corn grain to small grain cover crop Strip Till, cover crop no till 191-210 bu/acre	Soybeans to small grain cover crop Spring vertical tillage, cover crop no till 56-65 bu/acre	Corn grain to small grain cover crop Strip Till, cover crop no till 191-210 bu/acre	Soybeans to small grain cover crop Spring vertical tillage, cover crop no till 56-65 bu/acre	Corn grain to small grain cover crop Strip Till, cover crop no till 191-210 bu/acre
Maas 1 - 2	67.8	Soybeans 15-20 inch row Spring vertical tillage 56-65 bu/acre	Corn grain to small grain cover crop Strip Till, cover crop no till 191-210 bu/acre	Soybeans to small grain cover crop Spring vertical tillage, cover crop no till 56-65 bu/acre	Corn grain to small grain cover crop Spring vertical tillage, cover crop no till 191-210 bu/acre	Soybeans to small grain cover crop Spring vertical tillage, cover crop no till 56-65 bu/acre	Corn grain to small grain cover crop Strip Till, cover crop no till 191-210 bu/acre	Soybeans to small grain cover crop Spring vertical tillage, cover crop no till 56-65 bu/acre	Corn grain to small grain cover crop Strip Till, cover crop no till 191-210 bu/acre
Maas 1 - 3	21.1	Soybeans 15-20 inch row Spring vertical tillage 56-65 bu/acre	Corn grain to small grain cover crop Strip Till, cover crop no till 191-210 bu/acre	Soybeans to small grain cover crop Spring vertical tillage, cover crop no till 56-65 bu/acre	Corn grain to small grain cover crop Strip Till, cover crop no till 191-210 bu/acre	Soybeans to small grain cover crop Spring vertical tillage, cover crop no till 56-65 bu/acre	Corn grain to small grain cover crop Strip Till, cover crop no till 191-210 bu/acre	Soybeans to small grain cover crop Spring vertical tillage, cover crop no till 56-65 bu/acre	Corn grain to small grain cover crop Strip Till, cover crop no till 191-210 bu/acre

Field Name	Field Acres	2021	2022	2023	2024	2025	2026	2027	2028
Maas 1 - 4	23.4	Soybeans 15-20 inch row Spring vertical tillage 56-65 bu/acre	Corn grain to small grain cover crop Strip Till, cover crop no till 191-210 bu/acre	Soybeans to small grain cover crop Spring vertical tillage, cover crop no till 56-65 bu/acre	Corn grain to small grain cover crop Strip Till, cover crop no till 191-210 bu/acre	Soybeans to small grain cover crop Spring vertical tillage, cover crop no till 56-65 bu/acre	Corn grain to small grain cover crop Strip Till, cover crop no till 191-210 bu/acre	Soybeans to small grain cover crop Spring vertical tillage, cover crop no till 56-65 bu/acre	Corn grain to small grain cover crop Strip Till, cover crop no till 191-210 bu/acre

Summary by Crop:

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

Crops Grouped By Category		2021	2022	2023	2024	2025	2026	2027	2028
Corn grain	Acres bu	91 18,246							
Corn grain to small grain cover crop	Acres bu		208 41,704	91 18,246	118 23,659	91 18,246	208 41,704		208 41,704
Soybeans to small grain cover crop	Acres bu			118 7,139	91 5,506	118 7,139		208 12,584	
Soybeans 15-20 inch row	Acres bu	118 7,139							

WQ1: P Trade Report

Reported For	Klahn Brooklyn WQT
Printed	2023-06-22
Plan Completion/Update Date	2023-06-21
SnapPlus Version 20.4 built on 2021-06-03	
C:\Users\amansfield\Documents\NMP\Klondike General Partnership \Brooklyn WQT\Klahn Brooklyn WQT.snapDb	

Prepared for:
Klahn Brooklyn WQT
attn:Klahn Brooklyn WQT
N8995 State Highway 104
Brooklyn, 53521

Prepared by: The DeLong Company
PO Box 552
Clinton,Rock,53525
608-676-2255, amansfield@delongcompany.com

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	2021	2022	2023	2024	2025	2026	2027	2028	2029
Amidon A	SEBEWA	Se	43	23	19	14	14	17	12	11	12	6
Amidon B	GRISWOLD	GrB2	32	20	17	14	15	20	14	14	18	12
Amidon C	WESTVILLE	WeC2	13	12	10	7	9	14	9	9	14	8
Amidon D	SAYBROOK	SaB2	3	8	6	5	5	10	6	5	10	6
Maas 1 - 1	SEBEWA	Se	6	3	4	3	3	2	2	2	2	1
Maas 1 - 2	SEBEWA	Se	68	29	31	21	23	16	15	10	11	10

P Trade Report				PTP								
Field Name	Soil Series	Soil Symbol	Acres	2021	2022	2023	2024	2025	2026	2027	2028	2029
Maas 1 - 3	GRISWOLD	GrC2	21	21	28	17	23	16	21	15	20	14
Maas 1 - 4	GRISWOLD	GrB2	23	15	18	12	15	11	13	10	12	9
Total			**208**	**131**	**133**	**94**	**107**	**107**	**93**	**76**	**99**	**66**

APPENDIX F
NUTRIENT MANAGEMENT PLAN DOCUMENTATION

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 Green | DATE PLAN SUBMITTED **6/23/2023** | GROWING SEASON YEAR PLAN IS WRITTEN FOR **2023** (from harvest to harvest)

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

NAME OF FARM OPERATOR RECEIVING NM PLAN	FARM NAME (OPTIONAL)	BUSINESS PHONE
Kevin Klahn	**Klondike Farms General Partnership**	**608-455-1096**

STREET ADDRESS	CITY	STATE	ZIP
N8995 State Road 104	**Brooklyn**	**WI**	**53521**

REASON THE PLAN WAS DEVELOPED: DATCP – Farmland Preservation

CROPLAND ACRES (OWNED & RENTED): **91**

RENTED FARM(S) LANDOWNER NAME(S) AND ACREAGE: add sheet(s) if needed
Kevin & Erika Klahn, Lloyd & Ruth Klahn, Dennis Strand

WAS THE PLAN WRITTEN IN SNAPPLUS? **YES** If yes, which software version, if known? **20.4**

CHECK PLANNER'S QUALIFICATION:
(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
Amy Mansfield CCA#354436	**(608) 676-2255**

STREET ADDRESS	CITY	STATE	ZIP
PO Box 552	**Clinton**	**WI**	**53525**

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?

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**.	X		
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%.	X		
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.			X
d. **Identify all fields'** name, boundary, acres, and location.	X		
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**.	X		
f. Make no **winter applications of N and P** fertilizer, except on grass pastures and winter grains.	X		
g. Document method used to determine **application rates**. Nutrients shall not runoff during or immediately after application.	X		
h. Identify in the plan that **adequate acreage** is available for manure produced and/or applied.			X
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.			X
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.	X		
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.	X		
l. Make no nutrient applications within 8' of **irrigation** wells or where **vegetation is not removed**.			X
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.	X		

	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.			X
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.			X
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.	X		
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*.			X
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.	X		
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.**			X

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.*			X
b. Identify **manure storage capacity** for each type applied and stacking capacity for manure ≥ 16% DM if permanent storage does not exist.			X
c. Show on map and make no applications within the **SWQMA**.			X
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.			X
e. Show on map and make no applications of manure within **300 feet** of **direct conduits to groundwater**.			X
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**.			X
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.			X

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.

Qualified NM planner signature NAICC-*Certified Professional Crop Consultant*, ASA-*Certified Crop Adviser*, or SSSA-*Soil Scientist*			Date
Amy Mansfield	6/23/2023		
Qualified NM farmer-planner or Authorized farm operator signature receiving and understanding the plan	Date	Signature if reviewed for quality assurance	Date

NM1: Narrative and Crops Report

Starting Year	**2022**
Reported For	**Klondike Farms General Partnership Subfarm: Amidon**
Printed	**2023-06-23**
Plan Completion/Update Date:	**2023-02-20**
SnapPlus Version 20.4 built on 2021-06-03	
C:\Users\amansfield\Documents\NMP\Klondike General Partnership\Kevin Klahn.snapDb	

Prepared for:
Klondike Farms General Partnership
attn:Kevin Klahn
N8995 State Road 104
Brooklyn, 53521

Prepared by: The Delong Company
PO Box 552
Clinton,Rock,53525
(608) 676-2255,
amansfield@delongcompany.com

SubFarm has 4 fields totalling 90.5 cropped acres.
Farm Narrative: The Amidon farm is part of a WQT with the village of Brooklyn. A specific rotation of strip tilled corn - strip tilled corn - spring vertical till soybeans, with a no till cover crop every year should be followed. Amidon A, B, and C have designed field edge filter strips.

Annual Farm Notes:

No Annual Farm Notes

Spreader Calibration Methods: Amount applied / Acres

Narrative and Crops:

Field Name	Field Acres	2022	2023	2024	2025
Amidon A	42.6	Corn grain to small grain cover crop Strip Till, cover crop no till 191-210 bu/acre	Corn grain to small grain cover crop Strip Till, cover crop no till 191-210 bu/acre	Soybeans to small grain cover crop Spring vertical tillage, cover crop no till 56-65 bu/acre	Corn grain to small grain cover crop Strip Till, cover crop no till 191-210 bu/acre
Amidon B	31.8	Corn grain to small grain cover crop Strip Till, cover crop no till 191-210 bu/acre	Corn grain to small grain cover crop Strip Till, cover crop no till 191-210 bu/acre	Soybeans to small grain cover crop Spring vertical tillage, cover crop no till 56-65 bu/acre	Corn grain to small grain cover crop Strip Till, cover crop no till 191-210 bu/acre

Field Name	Field Acres	2022	2023	2024	2025
Amidon C	12.9	Corn grain to small grain cover crop Strip Till, cover crop no till 191-210 bu/acre	Corn grain to small grain cover crop Strip Till, cover crop no till 191-210 bu/acre	Soybeans to small grain cover crop Spring vertical tillage, cover crop no till 56-65 bu/acre	Corn grain to small grain cover crop Strip Till, cover crop no till 191-210 bu/acre
Amidon D	3.2	Corn grain to small grain cover crop Strip Till, cover crop no till 191-210 bu/acre	Corn grain to small grain cover crop Strip Till, cover crop no till 191-210 bu/acre	Soybeans to small grain cover crop Spring vertical tillage, cover crop no till 56-65 bu/acre	Corn grain to small grain cover crop Strip Till, cover crop no till 191-210 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
Corn grain to small grain cover crop	Acres bu	91 18,246	91 18,246		91 18,246
Soybeans to small grain cover crop	Acres bu			91 5,506	

NM3: Field Data and 590 Assessment Plan

Reported For	Klondike Farms General Partnership Subfarm: Amidon
Printed	2023-06-23
Plan Completion/Update Date	2023-02-20
SnapPlus Version 20.4 built on 2021-06-03	
C:\Users\amansfield\Documents\NMP\Klondike General Partnership\Kevin Klahn.snapDb	

Prepared for:
Klondike Farms General Partnership
attn:Kevin Klahn
N8995 State Road 104
Brooklyn, 53521

Prepared by: The Delong Company
PO Box 552
Clinton,Rock,53525
(608) 676-2255,
amansfield@delongcompany.com

Field Data: 91 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
Amidon A	Amidon	12723	18	42.6	Green	SEBEWA Se	1	250	0 - 2	301 - 1000	No / Edge	No	No	Cg+cv-Cg+cv-Sg+cv-Cg+cv	ST/NTcvr-ST/NTcvr-SVT/NTcvr-ST/NTcvr	2022-2025	**3**	**0.4**	**1.0**	**0**	24	-215	-
Amidon B	Amidon			31.8	Green	GRISWOLD GrC2	9	200	2.1 - 6	301 - 1000	No / Edge	No	No	Cg+cv-Cg+cv-Sg+cv-Cg+cv	ST/NTcvr-ST/NTcvr-SVT/NTcvr-ST/NTcvr	2022-2025	**5**	**2.5**	**0.9**	**1**	52	-215	0
Amidon C	Amidon			12.9	Green	WESTVILLE WeC2	9	200	0 - 2	1001 - 5000	No / Edge	No	No	Cg+cv-Cg+cv-Sg+cv-Cg+cv	ST/NTcvr-ST/NTcvr-SVT/NTcvr-ST/NTcvr	2022-2025	**5**	**2.9**	**0.8**	**1**	52	-215	0
Amidon D	Amidon			3.2	Green	SAYBROOK SaB2	4	200	2.1 - 6	1001 - 5000	No / No	No	No	Cg+cv-Cg+cv-Sg+cv-Cg+cv	ST/NTcvr-ST/NTcvr-SVT/NTcvr-ST/NTcvr	2022-2025	**5**	**1.1**	**0.9**	**2**	104	-215	-69

Crop Abbreviations

Abbreviation	Crop
Cg+cv	Corn grain to small grain cover crop
Sg+cv	Soybeans to small grain cover crop

Tillage Abbreviations

Abbreviation	Tillage
ST/NTcvr	Strip Till, cover crop no till
SVT/NTcvr	Spring vertical tillage, cover crop no till

NM5: Spreading and Nutrient Management Sorted By Crop Report

Crop Year	**2023**
Reported For	**Klondike Farms General Partnership Subfarm: Amidon**
Printed	**2023-06-23**
Plan Completion/Update Date	**2023-02-20**
SnapPlus Version 20.4 built on 2021-06-03	
C:\Users\amansfield\Documents\NMP\Klondike General Partnership\Kevin Klahn.snapDb	

Prepared for:
Klondike Farms General Partnership
attn:Kevin Klahn
N8995 State Road 104
Brooklyn, 53521

Prepared by: The Delong Company
PO Box 552
Clinton,Rock,53525
(608) 676-2255,
amansfield@delongcompany.com

Corn on Corn 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
Amidon A	42.6	Se W	Corn grain to small grain cover crop	Corn grain to small grain cover crop	191-210	75	60	ST/NTcvr	24	132	145	40	0	163	20	122	18	-20	122	Potassium Chloride 0-0-61	200 lb Fall Subsurface	0-0-122	42.6 Entire field Pre Planting	8520 lb
																				28% UAN (Liquid 28-0-0) 28-0-0	8 gal Spring Subsurface	24-0-0	42.6 Entire field At Planting	341 gal
																				32% UAN (Liquid 32-0-0) 32-0-0	9 gal Spring Unincorp	32-0-0	42.6 Entire field Pre Planting	383 gal
																				32% UAN (Liquid 32-0-0) 32-0-0	28 gal Spring Unincorp	99-0-0	42.6 Entire field Post Planting	1193 gal
																				Ammonium thiosulfate (ATS) 12-0-0	2 gal Spring Subsurface	3-0-0	42.6 Entire field At Planting	85 gal

Corn on Corn 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
Amidon A	42.6	SeW	Corn grain to small grain cover crop	Corn grain to small grain cover crop	191-210	75	60	ST/NTcvr	24	132	145	40	0	163	20	122	18	-20	122	Liquid 10-34-0 10-34-0	5 gal Spring Subsurface	6-20-0	42.6 Spreadable At Planting	213 gal
Amidon B	31.8	GrB2W	Corn grain to small grain cover crop	Corn grain to small grain cover crop	191-210	75	60	ST/NTcvr	52	140	190	0	0	202	20	122	12	20	122	Potassium Chloride 0-0-61	200 lb Fall Subsurface	0-0-122	31.8 Entire field Pre Planting	6360 lb
																				28% UAN (Liquid 28-0-0) 28-0-0	8 gal Spring Subsurface	24-0-0	31.8 Entire field At Planting	254 gal
																				32% UAN (Liquid 32-0-0) 32-0-0	20 gal Spring Unincorp	71-0-0	31.8 Entire field Pre Planting	636 gal
																				32% UAN (Liquid 32-0-0) 32-0-0	28 gal Spring Unincorp	99-0-0	31.8 Entire field Post Planting	890 gal
																				Ammonium thiosulfate (ATS) 12-0-0	2 gal Spring Subsurface	3-0-0	31.8 Entire field At Planting	64 gal
																				Liquid 10-34-0 10-34-0	5 gal Spring Subsurface	6-20-0	31.8 Spreadable At Planting	159 gal
Amidon C	12.9	WeC2	Corn grain to small grain cover crop	Corn grain to small grain cover crop	191-210	75	60	ST/NTcvr	52	114	190	0	0	202	20	122	12	20	122	Potassium Chloride 0-0-61	200 lb Fall Subsurface	0-0-122	12.9 Entire field Pre Planting	2580 lb
																				28% UAN (Liquid 28-0-0) 28-0-0	8 gal Spring Subsurface	24-0-0	12.9 Entire field At Planting	103 gal

Corn on Corn 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
Amidon C	12.9	WeC2	Corn grain to small grain cover crop	Corn grain to small grain cover crop	191-210	75	60	ST/NTcvr	52	114	190	0	0	202	20	122	12	20	122	32% UAN (Liquid 32-0-0) 32-0-0	20 gal Spring Unincorp	71-0-0	12.9 Entire field Pre Planting	258 gal
																				32% UAN (Liquid 32-0-0) 32-0-0	28 gal Spring Unincorp	99-0-0	12.9 Entire field Post Planting	361 gal
																				Ammonium thiosulfate (ATS) 12-0-0	2 gal Spring Subsurface	3-0-0	12.9 Entire field At Planting	26 gal
																				Liquid 10-34-0 10-34-0	5 gal Spring Subsurface	6-20-0	12.9 Spreadable At Planting	64 gal
Amidon D	3.2	SaB2	Corn grain to small grain cover crop	Corn grain to small grain cover crop	191-210	75	60	ST/NTcvr	104	203	190	0	0	202	20	122	12	20	122	Potassium Chloride 0-0-61	200 lb Fall Subsurface	0-0-122	3.2 Entire field Pre Planting	640 lb
																				28% UAN (Liquid 28-0-0) 28-0-0	8 gal Spring Subsurface	24-0-0	3.2 Entire field At Planting	26 gal
																				32% UAN (Liquid 32-0-0) 32-0-0	20 gal Spring Unincorp	71-0-0	3.2 Entire field Pre Planting	64 gal
																				32% UAN (Liquid 32-0-0) 32-0-0	28 gal Spring Unincorp	99-0-0	3.2 Entire field Post Planting	90 gal
																				Ammonium thiosulfate (ATS) 12-0-0	2 gal Spring Subsurface	3-0-0	3.2 Entire field At Planting	6 gal

Corn on Corn 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
Amidon D	3.2	SaB2	Corn grain to small grain cover crop	Corn grain to small grain cover crop	191-210	75	60	ST/NTcvr	104	203	190	0	0	202	20	122	12	20	122	Liquid 10-34-0 10-34-0	5 gal Spring Subsurface	6-20-0	3.2 Spreadable At Planting	16 gal

90.5 planned Corn on Corn acres

724 planned gal 28% UAN (Liquid 28-0-0)

3,875 planned gal 32% UAN (Liquid 32-0-0)

181 planned gal Ammonium thiosulfate (ATS)

452 planned gal Liquid 10-34-0

18,100 planned lb Potassium Chloride

91 total planned acres

Total Manure Volume	Manure App Plan	Remaining Manure
0 tons	0	0
1340080 gals	0	1,340,080

724 planned gal 28% UAN (Liquid 28-0-0)

3,875 planned gal 32% UAN (Liquid 32-0-0)

181 planned gal Ammonium thiosulfate (ATS)

452 planned gal Liquid 10-34-0

18,100 planned lb Potassium Chloride

Tillage Abbreviations

Abbreviation	Tillage
ST/NTcvr	Strip Till, cover crop no till

FM6: Soil Test Report

Reported For	Klondike Farms General Partnership Subfarm: Amidon
Printed	2023-06-23
Plan Completion/Update Date	2023-02-20
SnapPlus Version 20.4 built on 2021-06-03	
C:\Users\amansfield\Documents\NMP\Klondike General Partnership \Kevin Klahn.snapDb	

Prepared for:
Klondike Farms General Partnership
attn:Kevin Klahn
N8995 State Road 104
Brooklyn, 53521

Prepared by: The Delong Company
PO Box 552
Clinton,Rock,53525
(608) 676-2255,
amansfield@delongcompany.com

			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
Amidon A	Amidon	42.6	Se	SEBEWA	2020-11-25	A & L Great Lakes Laboratories	F20330-4046	**9**	**12**	6.6	5.3	24	132	0	21
Amidon B	Amidon	31.8	GrB2	GRISWOLD	2020-11-25	A & L Great Lakes Laboratories	F20330-4046	**4**	**8**	6.2	2.6	52	140	0	9
Amidon C	Amidon	12.9	WeC2	WESTVILLE	2020-11-25	A & L Great Lakes Laboratories	F20330-4046	**3**	**4**	6.4	2.8	52	114	0	10
Amidon D	Amidon	3.2	SaB2	SAYBROOK	2020-11-25	A & L Great Lakes Laboratories	F20330-4046	**1**	**2**	5.8	3.0	104	203	0	10

Crop Year Soil Test Needed

Field Name	Soil Test Date	2020	2021	2022	2023	2024	2025	2026
Amidon A	2020-11-25						X	
Amidon B	2020-11-25						X	
Amidon C	2020-11-25						X	
Amidon D	2020-11-25						X	

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 Green | DATE PLAN SUBMITTED **6/23/2023** | GROWING SEASON YEAR PLAN IS WRITTEN FOR **2023** (from harvest to harvest)

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

NAME OF FARM OPERATOR RECEIVING NM PLAN	FARM NAME (OPTIONAL)	BUSINESS PHONE
Kevin Klahn	**Klondike Farms General Partnership**	**608-455-1096**

STREET ADDRESS	CITY	STATE	ZIP
N8995 State Road 104	**Brooklyn**	**WI**	**53521**

REASON THE PLAN WAS DEVELOPED: DATCP – Farmland Preservation

CROPLAND ACRES (OWNED & RENTED): **91**

RENTED FARM(S) LANDOWNER NAME(S) AND ACREAGE: add sheet(s) if needed
Kevin & Erika Klahn, Lloyd & Ruth Klahn, Dennis Strand

WAS THE PLAN WRITTEN IN SNAPPLUS? **YES** If yes, which software version, if known? **20.4**

CHECK PLANNER'S QUALIFICATION:
(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
Amy Mansfield CCA#354436	**(608) 676-2255**

STREET ADDRESS	CITY	STATE	ZIP
PO Box 552	**Clinton**	**WI**	**53525**

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?

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**.	X		
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%.	X		
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.			X
d. **Identify all fields'** name, boundary, acres, and location.	X		
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**.	X		
f. Make no **winter applications of N and P** fertilizer, except on grass pastures and winter grains.	X		
g. Document method used to determine **application rates**. Nutrients shall not runoff during or immediately after application.	X		
h. Identify in the plan that **adequate acreage** is available for manure produced and/or applied.			X
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.			X
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.	X		
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.	X		
l. Make no nutrient applications within 8' of **irrigation** wells or where **vegetation is not removed**.			X
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.	X		

	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.			X
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.			X
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.	X		
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*.			X
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.	X		
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.**			X

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.*			X
b. Identify **manure storage capacity** for each type applied and stacking capacity for manure ≥ 16% DM if permanent storage does not exist.			X
c. Show on map and make no applications within the **SWQMA**.			X
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.			X
e. Show on map and make no applications of manure within **300 feet** of **direct conduits to groundwater**.			X
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**.			X
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.			X

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.

Qualified NM planner signature NAICC-*Certified Professional Crop Consultant*, ASA-*Certified Crop Adviser*, or SSSA-*Soil Scientist*			Date
Amy Mansfield	6/23/2023		
Qualified NM farmer-planner or Authorized farm operator signature receiving and understanding the plan	Date	Signature if reviewed for quality assurance	Date

NM1: Narrative and Crops Report

Starting Year	**2022**
Reported For	**Klondike Farms General Partnership Subfarm: Amidon**
Printed	**2023-06-23**
Plan Completion/Update Date:	**2023-02-20**
SnapPlus Version 20.4 built on 2021-06-03	
C:\Users\amansfield\Documents\NMP\Klondike General Partnership\Kevin Klahn.snapDb	

Prepared for:
Klondike Farms General Partnership
attn:Kevin Klahn
N8995 State Road 104
Brooklyn, 53521

Prepared by: The Delong Company
PO Box 552
Clinton,Rock,53525
(608) 676-2255,
amansfield@delongcompany.com

SubFarm has 4 fields totalling 90.5 cropped acres.
Farm Narrative: The Amidon farm is part of a WQT with the village of Brooklyn. A specific rotation of strip tilled corn - strip tilled corn - spring vertical till soybeans, with a no till cover crop every year should be followed. Amidon A, B, and C have designed field edge filter strips.

Annual Farm Notes:

No Annual Farm Notes

Spreader Calibration Methods: Amount applied / Acres

Narrative and Crops:

Field Name	Field Acres	2022	2023	2024	2025
Amidon A	42.6	Corn grain to small grain cover crop Strip Till, cover crop no till 191-210 bu/acre	Corn grain to small grain cover crop Strip Till, cover crop no till 191-210 bu/acre	Soybeans to small grain cover crop Spring vertical tillage, cover crop no till 56-65 bu/acre	Corn grain to small grain cover crop Strip Till, cover crop no till 191-210 bu/acre
Amidon B	31.8	Corn grain to small grain cover crop Strip Till, cover crop no till 191-210 bu/acre	Corn grain to small grain cover crop Strip Till, cover crop no till 191-210 bu/acre	Soybeans to small grain cover crop Spring vertical tillage, cover crop no till 56-65 bu/acre	Corn grain to small grain cover crop Strip Till, cover crop no till 191-210 bu/acre

Field Name	Field Acres	2022	2023	2024	2025
Amidon C	12.9	Corn grain to small grain cover crop Strip Till, cover crop no till 191-210 bu/acre	Corn grain to small grain cover crop Strip Till, cover crop no till 191-210 bu/acre	Soybeans to small grain cover crop Spring vertical tillage, cover crop no till 56-65 bu/acre	Corn grain to small grain cover crop Strip Till, cover crop no till 191-210 bu/acre
Amidon D	3.2	Corn grain to small grain cover crop Strip Till, cover crop no till 191-210 bu/acre	Corn grain to small grain cover crop Strip Till, cover crop no till 191-210 bu/acre	Soybeans to small grain cover crop Spring vertical tillage, cover crop no till 56-65 bu/acre	Corn grain to small grain cover crop Strip Till, cover crop no till 191-210 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
Corn grain to small grain cover crop	Acres bu	91 18,246	91 18,246		91 18,246
Soybeans to small grain cover crop	Acres bu			91 5,506	

NM3: Field Data and 590 Assessment Plan

Reported For	Klondike Farms General Partnership Subfarm: Amidon
Printed	2023-06-23
Plan Completion/Update Date	2023-02-20
SnapPlus Version 20.4 built on 2021-06-03	
C:\Users\amansfield\Documents\NMP\Klondike General Partnership\Kevin Klahn.snapDb	

Prepared for:
Klondike Farms General Partnership
attn:Kevin Klahn
N8995 State Road 104
Brooklyn, 53521

Prepared by: The Delong Company
PO Box 552
Clinton,Rock,53525
(608) 676-2255,
amansfield@delongcompany.com

Field Data: 91 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
Amidon A	Amidon	12723	18	42.6	Green	SEBEWA Se	1	250	0 - 2	301 - 1000	No / Edge	No	No	Cg+cv-Cg+cv-Sg+cv-Cg+cv	ST/NTcvr-ST/NTcvr-SVT/NTcvr-ST/NTcvr	2022-2025	**3**	**0.4**	**1.0**	**0**	24	-215	-
Amidon B	Amidon			31.8	Green	GRISWOLD GrC2	9	200	2.1 - 6	301 - 1000	No / Edge	No	No	Cg+cv-Cg+cv-Sg+cv-Cg+cv	ST/NTcvr-ST/NTcvr-SVT/NTcvr-ST/NTcvr	2022-2025	**5**	**2.5**	**0.9**	**1**	52	-215	0
Amidon C	Amidon			12.9	Green	WESTVILLE WeC2	9	200	0 - 2	1001 - 5000	No / Edge	No	No	Cg+cv-Cg+cv-Sg+cv-Cg+cv	ST/NTcvr-ST/NTcvr-SVT/NTcvr-ST/NTcvr	2022-2025	**5**	**2.9**	**0.8**	**1**	52	-215	0
Amidon D	Amidon			3.2	Green	SAYBROOK SaB2	4	200	2.1 - 6	1001 - 5000	No / No	No	No	Cg+cv-Cg+cv-Sg+cv-Cg+cv	ST/NTcvr-ST/NTcvr-SVT/NTcvr-ST/NTcvr	2022-2025	**5**	**1.1**	**0.9**	**2**	104	-215	-69

Crop Abbreviations

Abbreviation	Crop
Cg+cv	Corn grain to small grain cover crop
Sg+cv	Soybeans to small grain cover crop

Tillage Abbreviations

Abbreviation	Tillage
ST/NTcvr	Strip Till, cover crop no till
SVT/NTcvr	Spring vertical tillage, cover crop no till

NM5: Spreading and Nutrient Management Sorted By Crop Report

Crop Year	**2023**
Reported For	**Klondike Farms General Partnership Subfarm: Amidon**
Printed	**2023-06-23**
Plan Completion/Update Date	**2023-02-20**
SnapPlus Version 20.4 built on 2021-06-03	
C:\Users\amansfield\Documents\NMP\Klondike General Partnership\Kevin Klahn.snapDb	

Prepared for:
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N8995 State Road 104
Brooklyn, 53521

Prepared by: The Delong Company
PO Box 552
Clinton,Rock,53525
(608) 676-2255,
amansfield@delongcompany.com

Corn on Corn 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
Amidon A	42.6	Se W	Corn grain to small grain cover crop	Corn grain to small grain cover crop	191-210	75	60	ST/NTcvr	24	132	145	40	0	163	20	122	18	-20	122	Potassium Chloride 0-0-61	200 lb Fall Subsurface	0-0-122	42.6 Entire field Pre Planting	8520 lb
																				28% UAN (Liquid 28-0-0) 28-0-0	8 gal Spring Subsurface	24-0-0	42.6 Entire field At Planting	341 gal
																				32% UAN (Liquid 32-0-0) 32-0-0	9 gal Spring Unincorp	32-0-0	42.6 Entire field Pre Planting	383 gal
																				32% UAN (Liquid 32-0-0) 32-0-0	28 gal Spring Unincorp	99-0-0	42.6 Entire field Post Planting	1193 gal
																				Ammonium thiosulfate (ATS) 12-0-0	2 gal Spring Subsurface	3-0-0	42.6 Entire field At Planting	85 gal

Corn on Corn 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
Amidon A	42.6	SeW	Corn grain to small grain cover crop	Corn grain to small grain cover crop	191-210	75	60	ST/NTcvr	24	132	145	40	0	163	20	122	18	-20	122	Liquid 10-34-0 10-34-0	5 gal Spring Subsurface	6-20-0	42.6 Spreadable At Planting	213 gal
Amidon B	31.8	GrB2W	Corn grain to small grain cover crop	Corn grain to small grain cover crop	191-210	75	60	ST/NTcvr	52	140	190	0	0	202	20	122	12	20	122	Potassium Chloride 0-0-61	200 lb Fall Subsurface	0-0-122	31.8 Entire field Pre Planting	6360 lb
																				28% UAN (Liquid 28-0-0) 28-0-0	8 gal Spring Subsurface	24-0-0	31.8 Entire field At Planting	254 gal
																				32% UAN (Liquid 32-0-0) 32-0-0	20 gal Spring Unincorp	71-0-0	31.8 Entire field Pre Planting	636 gal
																				32% UAN (Liquid 32-0-0) 32-0-0	28 gal Spring Unincorp	99-0-0	31.8 Entire field Post Planting	890 gal
																				Ammonium thiosulfate (ATS) 12-0-0	2 gal Spring Subsurface	3-0-0	31.8 Entire field At Planting	64 gal
																				Liquid 10-34-0 10-34-0	5 gal Spring Subsurface	6-20-0	31.8 Spreadable At Planting	159 gal
Amidon C	12.9	WeC2	Corn grain to small grain cover crop	Corn grain to small grain cover crop	191-210	75	60	ST/NTcvr	52	114	190	0	0	202	20	122	12	20	122	Potassium Chloride 0-0-61	200 lb Fall Subsurface	0-0-122	12.9 Entire field Pre Planting	2580 lb
																				28% UAN (Liquid 28-0-0) 28-0-0	8 gal Spring Subsurface	24-0-0	12.9 Entire field At Planting	103 gal

Corn on Corn 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
Amidon C	12.9	WeC2	Corn grain to small grain cover crop	Corn grain to small grain cover crop	191-210	75	60	ST/NTcvr	52	114	190	0	0	202	20	122	12	20	122	32% UAN (Liquid 32-0-0) 32-0-0	20 gal Spring Unincorp	71-0-0	12.9 Entire field Pre Planting	258 gal
																				32% UAN (Liquid 32-0-0) 32-0-0	28 gal Spring Unincorp	99-0-0	12.9 Entire field Post Planting	361 gal
																				Ammonium thiosulfate (ATS) 12-0-0	2 gal Spring Subsurface	3-0-0	12.9 Entire field At Planting	26 gal
																				Liquid 10-34-0 10-34-0	5 gal Spring Subsurface	6-20-0	12.9 Spreadable At Planting	64 gal
Amidon D	3.2	SaB2	Corn grain to small grain cover crop	Corn grain to small grain cover crop	191-210	75	60	ST/NTcvr	104	203	190	0	0	202	20	122	12	20	122	Potassium Chloride 0-0-61	200 lb Fall Subsurface	0-0-122	3.2 Entire field Pre Planting	640 lb
																				28% UAN (Liquid 28-0-0) 28-0-0	8 gal Spring Subsurface	24-0-0	3.2 Entire field At Planting	26 gal
																				32% UAN (Liquid 32-0-0) 32-0-0	20 gal Spring Unincorp	71-0-0	3.2 Entire field Pre Planting	64 gal
																				32% UAN (Liquid 32-0-0) 32-0-0	28 gal Spring Unincorp	99-0-0	3.2 Entire field Post Planting	90 gal
																				Ammonium thiosulfate (ATS) 12-0-0	2 gal Spring Subsurface	3-0-0	3.2 Entire field At Planting	6 gal

Corn on Corn 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
Amidon D	3.2	SaB2	Corn grain to small grain cover crop	Corn grain to small grain cover crop	191-210	75	60	ST/NTcvr	104	203	190	0	0	202	20	122	12	20	122	Liquid 10-34-0 10-34-0	5 gal Spring Subsurface	6-20-0	3.2 Spreadable At Planting	16 gal

90.5 planned Corn on Corn acres

724 planned gal 28% UAN (Liquid 28-0-0)

3,875 planned gal 32% UAN (Liquid 32-0-0)

181 planned gal Ammonium thiosulfate (ATS)

452 planned gal Liquid 10-34-0

18,100 planned lb Potassium Chloride

91 total planned acres

Total Manure Volume	Manure App Plan	Remaining Manure
0 tons	0	0
1340080 gals	0	1,340,080

724 planned gal 28% UAN (Liquid 28-0-0)

3,875 planned gal 32% UAN (Liquid 32-0-0)

181 planned gal Ammonium thiosulfate (ATS)

452 planned gal Liquid 10-34-0

18,100 planned lb Potassium Chloride

Tillage Abbreviations

Abbreviation	Tillage
ST/NTcvr	Strip Till, cover crop no till

FM6: Soil Test Report

Reported For	Klondike Farms General Partnership Subfarm: Amidon
Printed	2023-06-23
Plan Completion/Update Date	2023-02-20
SnapPlus Version 20.4 built on 2021-06-03	
C:\Users\amansfield\Documents\NMP\Klondike General Partnership \Kevin Klahn.snapDb	

Prepared for:
Klondike Farms General Partnership
attn:Kevin Klahn
N8995 State Road 104
Brooklyn, 53521

Prepared by: The Delong Company
PO Box 552
Clinton,Rock,53525
(608) 676-2255,
amansfield@delongcompany.com

			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
Amidon A	Amidon	42.6	Se	SEBEWA	2020-11-25	A & L Great Lakes Laboratories	F20330-4046	**9**	**12**	6.6	5.3	24	132	0	21
Amidon B	Amidon	31.8	GrB2	GRISWOLD	2020-11-25	A & L Great Lakes Laboratories	F20330-4046	**4**	**8**	6.2	2.6	52	140	0	9
Amidon C	Amidon	12.9	WeC2	WESTVILLE	2020-11-25	A & L Great Lakes Laboratories	F20330-4046	**3**	**4**	6.4	2.8	52	114	0	10
Amidon D	Amidon	3.2	SaB2	SAYBROOK	2020-11-25	A & L Great Lakes Laboratories	F20330-4046	**1**	**2**	5.8	3.0	104	203	0	10

Crop Year Soil Test Needed

Field Name	Soil Test Date	2020	2021	2022	2023	2024	2025	2026
Amidon A	2020-11-25						X	
Amidon B	2020-11-25						X	
Amidon C	2020-11-25						X	
Amidon D	2020-11-25						X	

N

One in = 800 feet

0 268 537 805 1074 1342

Farm: Amidon
Grower: Klahn, Kevin

N

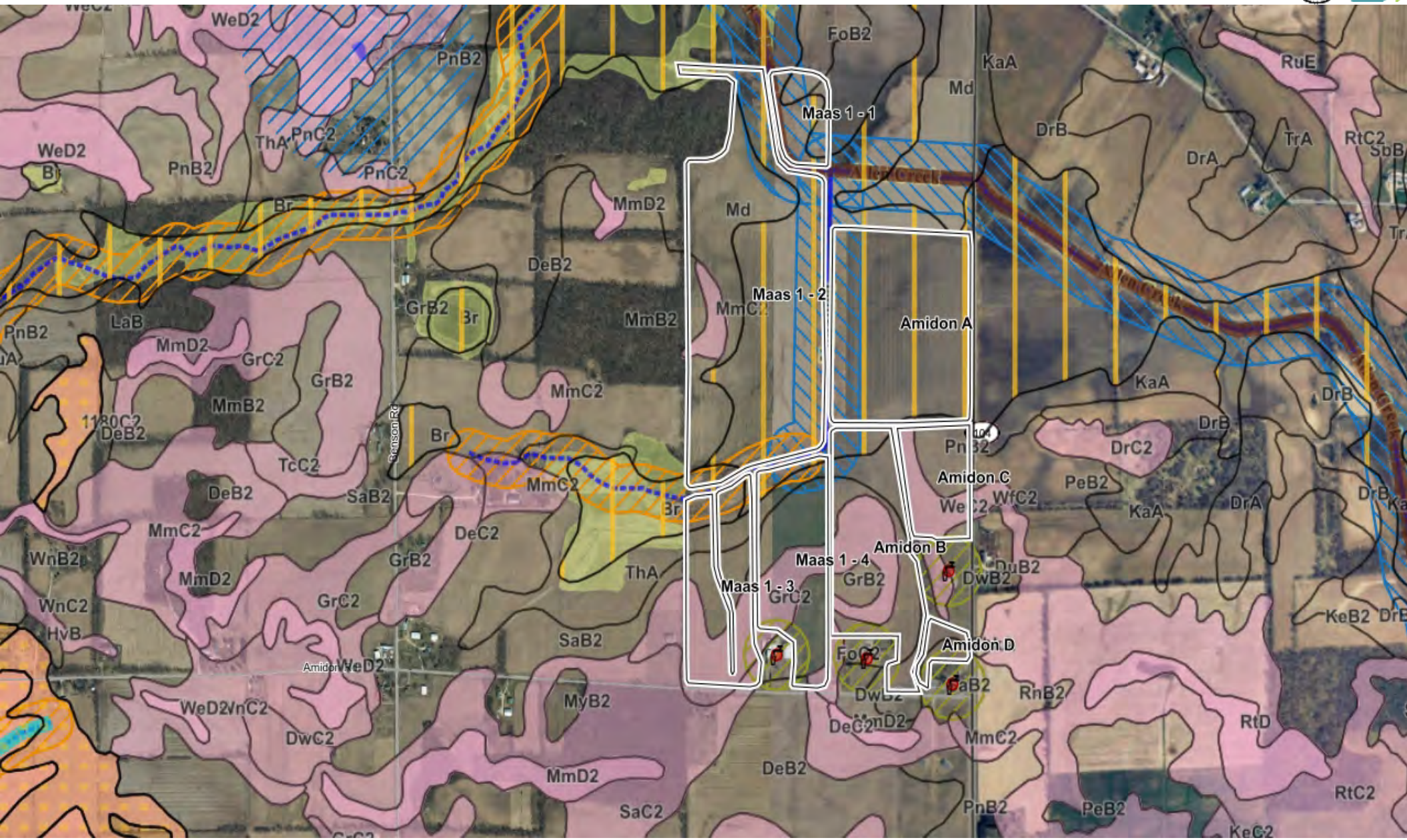
One in = 1063 feet

0 356 713 1069 1426 1782

Farm: Todd Klahn Maas 1

Klahn Amidon/Maas

Farm: Kevin Klahn, V18 Generated:5/1/2020, Crop year: n/a, Township Range Section:4N 9E s12



Klahn Amidon/Maas

Farm: Kevin Klahn, V18 Generated:5/1/2020, Crop year: n/a, Township Range Section:4N 9E s12

- DNR Wetland
- Slopes > 6%
- SWQMA 300FT
- SWQMA 1000FT
- SWQMA 1000FT Dismissed
- Bedrock depth <5ft
- Well compensation
- Shallow Silurian (0-5 ft bedrock)
- Feb/Mar liquid manure prohibited areas
- Local Prohibitions
- Channelized Flow 200ft Buffer
- Direct Conduit to GW 300ft
- Perennial Streams
- Intermittent Streams
- Waterbodies
- HUC 12 Watershed
- HUC 8 Basin
- Impaired Waters (303d)
- Outstanding/Exceptional Waters
- Roads
- Soils
- Areas of contribution to dc's to gw
- P - High Permeability
- R - Bedrock <20"
- W - Wet <12" to Watertable
- Surface lead mining
- Processing site
- Gravel pit
- Abandoned mining railroad
- Borehole
- Mine shaft
- Lower WI River Valley PA
- Atrazine Prohibition Area
- Soil samples
- Silurian 0-2ft
- Silurian 2-5ft
- 5-20 ft to Silurian (16 ft. Door County only)
- 0-2 ft
- Headland stacks
- Tile lines
- Not farmed
- Grass filter area
- Vegetated buffer
- Non-metallic mine
- Water
- Sinkhole/other karst feature
- Other
- Nutrient prohibited buffers
- Nutrient prohibited drawn areas
- Nutrient prohibited winter only
- Winter manure prohibited areas
- Fields
- Grassed waterway
- Non-eroding
- Ephemeral erosion
- Ditch
- Gully
- Drinking well
- Public well
- Irrigation well
- Sinkhole
- Non-metallic mine
- Fractured bedrock
- Other direct conduit
- Tile outlet
- Tile inlet
- County Defined Karst

APPENDIX G
TRADE AGREEMENT SIGNATURE PAGE

In lieu of the entire Contract, a copy of the following section of this Contract can be supplied independently to the Wisconsin DNR to certify that a WQT Contract exists and has been agreed to by the signatories.

13. Signatures, Notarization, and Certification	
Buyer Name (Printed): Brittany Springer Village of Brooklyn Village President - Brit Springer	Seller Name (Printed): Todd Klahn Todd Klahn
Buyer Agent Name (if applicable): Brit Springer	Seller Agent Name (if applicable): NA
HUC12 code: 070900040301 Watershed name: Allen Creek WPDES permit: WI-0023485-09	HUC 12 code: 070900040301 Watershed name: Allen Creek Tax Parcel(s): 2300600840000
Buyer/Buyer Agent Signature: Brittany A Springer	Seller/Seller Agent Signature: Todd Klahn Landowner Signature (if applicable):
Date: 6/10/20	Date: 6-22-2020
Persons listed above personally came before me this 10 day of June 2020. I hereby certify that the above named person Brittany Springer is known to be the person who executed the foregoing Water Quality Trading Contract and acknowledge the same.	Persons listed above personally came before me this 22nd day of June 2020. I hereby certify that the above named person Todd Klahn is known to be the person who executed the foregoing Water Quality Trading Contract and acknowledge the same.
Notary Public Green County, Wisconsin	Notary Public Green County, Wisconsin
Signature of Notary Public: Vicki L. Olson My Commission expires: August 31, 2020	Signature of Notary Public: Linda Kuhlman My commission expires: 7-19-22
Seal of Notary Public	Seal of Notary Public

NOTARY PUBLIC VICKI L. OLSON STATE OF WISCONSIN

In lieu of the entire Contract, a copy of the following section of this Contract can be supplied independently to the Wisconsin DNR to certify that a WQT Contract exists and has been agreed to by the signatories.

13. Signatures, Notarization, and Certification	
Buyer Name (Printed): Brittany Springer Village of Brooklyn Village President - Brit Springer	Seller Name (Printed): Kevin Klahn Kevin Klahn.
Buyer Agent Name (if applicable): Brit Springer	Seller Agent Name (if applicable): NA
HUC12 code: 070900040301 Watershed name: Allen Creek WPDES permit: WI-0023485-09	HUC 12 code: 070900040301 Watershed name: Allen Creek Tax Parcel(s): 2300600850000, 2300600854000, 2300600855000, and 230060085600
Buyer/Buyer Agent Signature: Brittany A Springer	Seller/Seller Agent Signature: Landowner Signature (if applicable):
Date: 6/10/20	Date: 6-22-20
Persons listed above personally came before me this 10 day of June 2020. I hereby certify that the above named person Brittany Springer is known to be the person who executed the foregoing Water Quality Trading Contract and acknowledge the same.	Persons listed above personally came before me this 22nd day of June 2020. I hereby certify that the above named person Kevin Klahn is known to be the person who executed the foregoing Water Quality Trading Contract and acknowledge the same.
Notary Public Green County, Wisconsin	Notary Public Green County, Wisconsin
Signature of Notary Public: Vicki L. Olson My commission expires: August 31, 2020	Signature of Notary Public: Linda Kuhlman My commission expires: 7-19-22
Seal of Notary Public NOTARY PUBLIC VICKI L. OLSON STATE OF WISCONSIN	Seal of Notary Public

APPENDIX H–WATER QUALITY TRADING MANAGEMENT PRACTICE REGISTRATION FORM

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

Water Quality Trading Management Practice Registration

Form 3400-207 (R 1/14)

Notice: Pursuant to s. 283.84, Wis. Stats., this form must be completed by any WPDES permittee that is using water quality 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
Village of Brooklyn	WI- 0023485-09-0	6038

Facility Address	City	State	ZIP Code
102 Windy Lane	Brooklyn	WI	53521

Project Contact Name (if applicable)	Address	City	State	ZIP Code
Leif Spilde	210 Commercial St P.O. Box 189	Brooklyn	WI	53521

Project Name
Village of Brooklyn Water Quality Trading

Broker/Exchange Information (if applicable)

Was a broker/exchange be used to facilitate trade? ○ Yes ◉ No

Broker/Exchange Organization Name	Contact Name	
Address	Phone Number	Email

Trade Registration Information (Use a separate form for each trade agreement)

Type	Trade Agreement Number	Practices Used to Generate Credits	Anticipated Load Reduction	Trade Ratio	Method of Quantification
○ Urban NPS ◉ Agricultural NPS ○ Other		Whole Field Management	265	1.2	SnapPlus

County	Closest Receiving Water Name	Land Parcel ID(s)	Parameter(s) being traded
Green	Allen Creek	2300600840000, 2300608	Phosphorus

The preparer certifies all of the following:

- 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
[signature]	5/11/2022

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
[signature] DPW	5-11-2022

Leave Blank – For Department Use Only

Date Received		Trade Docket Number
Entered in Tracking System ☐ Yes	Date Entered	Name of Department Reviewer

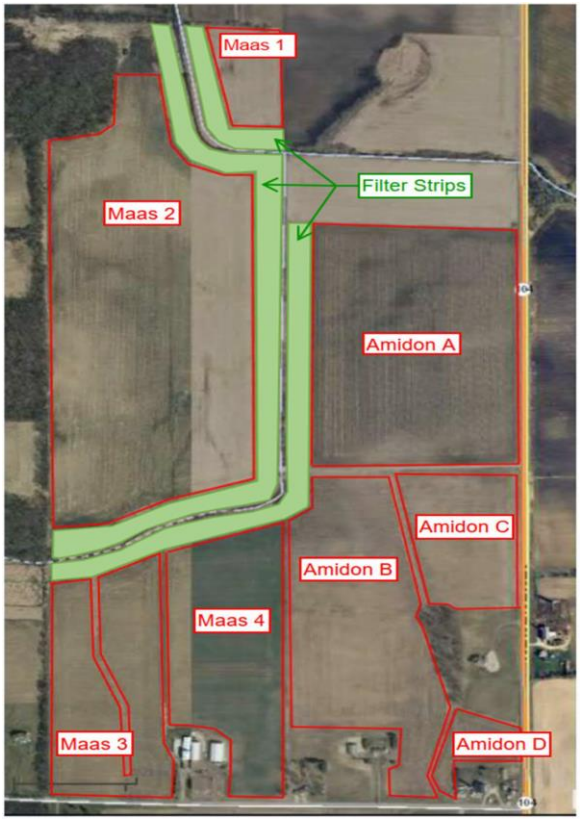
APPENDIX I
WQT ANNUAL REPORT

Todd and Kevin Klahn

Water Quality Trade Inspection Report

By Leif Spilde, Director of Public Works Village of Brooklyn

The site was inspected by Leif Spilde on December 20th, May 24th, June 20th August 22nd and November 4th .All areas were inspected by foot. Close up and distance photographs of site characteristics were taken and are attached and described below.



Seed Establishment for Filter Strips NRCS 393

The site was disked in early November in preparation of seeding. Seed was planted mid-November per plan to have established filter strips in early spring 2022. The photographs taken 12-20-2021 show the filter strips were planted and the 5-24-2022 show that they have started to establish really nicely.

The seed establishment criteria for 2022 are as follow:

- Germination of Filter Strips grass species shall be apparent by mid – July. Areas of erosion where seed has likely been lost will be reseeded and appropriate erosion control measures applied.
- Establishment of Filter Strips should be consistent and widespread by the middle of September 2022. Areas greater than 100 square yards that do not have grasses shall be reseeded as soon as possible.

Crop Rotation and Tillage Practice

5 year schedule NRCS 329/345

2022	2023	2024	2025	2026
Corn grain Strip Till	Soybeans 15-20 inch row Fall vertical tillage	Corn grain Strip Till	Corn grain Strip Till	Soybeans 15-20 inch row Fall vertical tillage

Tillage Practice for 2022 Strip Tillage

- Strip-tillage system used in which residue-free strips of soil are tilled ahead of planting using a knife fertilizer injection shank. The strips are approximately 6 inches wide, or about 1/3 the row width, and 4 to 8 inches deep. These strips are cleared of residue and tilled for warming and drying purposes either before or during the planting operation. Fertilizer was incorporated at this time. The seeds are planted directly into the strip of loosened soil.

Crop Rotation 2022 was corn grain.

- Corn was planted mid May 2022. Documented by photo.
- Corn was removed the last week of October documented by photo.

Seed Establishment for Cover Crops NRCS 340

The site was disked in early November in preparation of seeding. Winter Rye was planted mid-November per plan to have establish a cover crop by December 15th 2022. The photographs taken 11-4-2022 show the cover crop was planted.

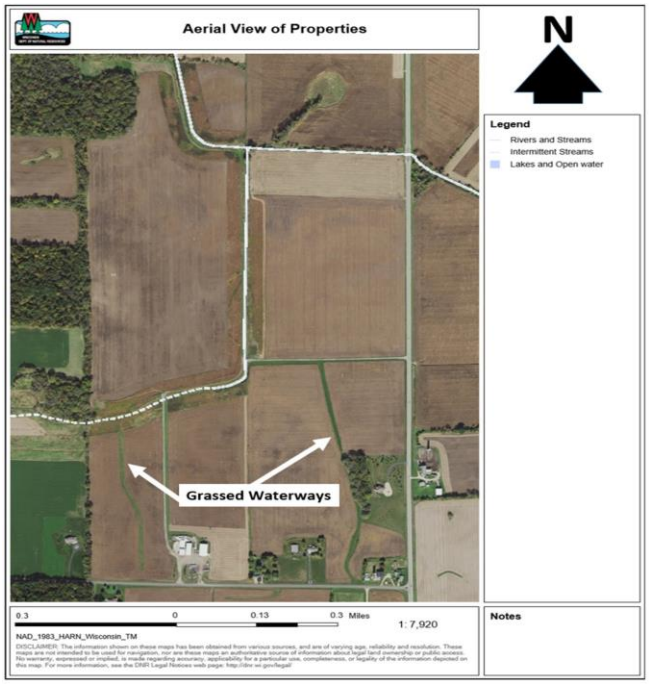
The seed establishment criteria for cover crop as follow.

- Germination of cover crops shall occur within 20 days of installation. Cover crop establishment shall be uniform and consistent. Any more than 1 square yard that is devoid of cover crop shall be reseeded within 3 weeks.
- Establishment of cover crops should be consistent and widespread by December 15th. Areas greater than 100 square yards that do not have grasses shall be reseeded as soon as possible.

Established Grass Waterways

The site already had grass ways established. The photographs taken during the inspections in 2022 show well maintained and established grasses.

- Maintenance of waterways mowing, fertilizing, and sediment removal. Look for damaged caused by machinery, herbicides or erosion. These must be repaired promptly.



Nutrient Management Plan NRCS 590

Manage rate, source, placement, and timing of plant nutrients and soil amendments while reducing environmental impacts. The latest NMP is provided to the village each year and a copy is attached.

- Minimize agricultural nonpoint source pollution of surface and groundwater resources.
- Properly utilize manure, municipal and industrial biosoilds, and other organic byproducts as plant nutrient sources.
- To protect air quality by reducing odors, nitrogen emissions, and the formation of atmospheric particulates.
- To maintain or improve the physical, chemical, and biological condition of soil.

Pollutant Reduction Credits (lbs/month) used each by month

- Total WQT credits available 221lbs per WQT-2020-0012. The permittee may use water quality trading to demonstrate compliance with WQBELs for total phosphorus (TP) of 0.225 mg/L monthly average and 0.075 mg/L 6-month average and 0.13 lbs/day monthly average.
- The table below breaks down Total Phosphorus by month for the year and total credits used. Attachment (Brooklyn 2022 Phos data shows by month Phosphorus data).

Month	Total Credits Needed (TP) (lb/month)	WQT Computed Compliance TP (mg/L)	WQT Computed Compliance TP (lb/day)
Jan-22	6.3	0.075	0.04
Feb-22	18.5	0.075	0.01
Mar-22	15.8	0.075	0.06
Apr-22	7.0	0.075	0.04
May-22	13.6	0.075	0.04
Jun-22	9.3	0.075	0.05
Jul-22	13.9	0.075	0.05
Aug-22	8.5	0.075	0.03
Sep-22	9.8	0.075	0.04
Oct-22	5.6	0.075	0.03
Nov-22	17.2	0.075	0.50
Dec-22	1.8	0.075	0.04
Average	10.6	0.075	0.078

Total 2022 Credits used	127.2

Conclusion

- Erosion No major erosion was found anywhere on the site.
- Weed Competition and Mowing There are many weeds noted on site; although none appear to be in danger of overwhelming the plantings. Mowing was completed in August.
- The entire site met the criteria for 2022 described above.
- The filter strips are installed and functional. Healthy and green throughout the site.
- Strip tillage was used as required.
- Cover crops were used and are healthy.
- Grass waterways are installed and are healthy, maintained and working properly.
- Nutrient Management Plan as provided.