WATER QUALITY TRADING PLAN

City of Viroqua, Wisconsin
Wastewater Treatment Facility

March 2023

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General Overview

In June 2015, the City of Viroqua submitted a Facilities Plan to the DNR to address the WPDES permit requirements for phosphorus compliance. This document served as the Status Report 2, Facilities Plan Phase 1, Preliminary Facilities Plan Phase 2, and Final Facilities Plan Phase 2. In the Facilities Plan Addendum for Phosphorus Compliance submitted to the DNR in July 2016, it was concluded that the lowest cost, feasible alternative for compliance with a future stringent Water Quality-Based Effluent Limit (WQBEL) for phosphorus was Water Quality Trading (WQT). Water Quality Trading involves working within the watershed to reduce phosphorus loading and arrange trades to offset the difference between the Wastewater Treatment Facility (WWTF) discharge of phosphorus and the allowable discharge to comply with a WQBEL. The City of Viroqua had selected WQT as its compliance alternative. Provided in the Appendices of this plan is the City's signed DNR Form 3400-206 (Notice of Intent to Conduct Water Quality Trading) and a signed DNR Form 3400-208 (WQT Checklist) for this plan.

Implementation WQT was not considered feasible within the short timeframe required for the current permit reissuance. In February 2017, the Multi-Discharger Variance (MDV) was approved by the EPA and became an option for phosphorus compliance. Implementation of the MDV requires non-point source phosphorus reductions that may be accomplished through a "payment program" in which the City would pay the County the difference between actual phosphorus discharged and the target value of 0.2 mg/L at a rate of $51.10 per pound of phosphorus. After discussions with the DNR and the City, the City applied for the MDV with the intent to implement trades during the time the MDV was in effect. The City's application was approved in July 2017.

The City's current permit, effective February 2018, has a monthly average phosphorus interim limit of 0.8 mg/L, along with the county payment program. Given the limited resources and timeframe of the permit reissuance, the City utilizes the county payment option for their current first permit term. However, the City has since installed phosphorus reduction projects that could be easily applied for future permit terms as discussed further in this Water Quality Trading Plan.

Point Source and Receiving Waters

After the recent facility upgrades, the Viroqua WWTF has a design capacity of 0.747 MGD. The WWTF provides wastewater treatment through influent flow metering and sampling, fine screening, primary clarification, activated sludge biological treatment, secondary clarification, effluent flow metering and sampling, and UV disinfection.

Effluent is discharged to a tributary of the Springville Branch of the Bad Axe River that is classified as a limited aquatic life stream upstream of the Springville Spring according to NR 104.09(2). Downstream of the Springville Spring, the Springville Branch is classified as a cold (Class I Trout) water sport fish community from the spring down to its mouth (approximately 7.6 miles). The subwatershed for the outfall is the Springville Branch of the Bad Axe River (HUC10 = 0706000103). The point of compliance for the WWTF effluent is at the Spring on the Springville Branch.

Target Phosphorus Water Quality Trading Credits

The future phosphorus WQBEL for the Viroqua WWTF will be 0.18 mg/L. The City has monitored the amount of phosphorus in its effluent over the last ten years. The highest annual total occurred

in 2012 with a total of 452 pounds of phosphorus. The lowest annual total occurred in 2021 with a total of 45 pounds of phosphorus in the effluent. The average of the annual total effluent phosphorus at concentrations above the future WQBEL for the years 2016-2021 was 110 pounds of phosphorus. Given the recent facility upgrades and continual plant optimization resulting in the reduction of effluent phosphorus over the last ten years, the City of Viroqua intends to use 110 pounds of phosphorus as the target annual water quality trading credits during its upcoming permit term beginning on January 1, 2023.

The City intends to obtain a total number of phosphorus WQT credits in excess of the target so as to have a suitable reserve in the event of changed conditions or unforeseen events. In the event that the City is unable to obtain sufficient phosphorus WQT credits, it intends to implement chemical phosphorus removal at the WWTF to ensure compliance with its WPDES permit.

Phosphorus Water Quality Trade

The City of Viroqua is pursuing two water quality trades with all projects located in the same HUC-12 sub-watershed as the Viroqua WWTF. Both projects involve streambank stabilization along an unnamed tributary to the Springville Branch of the Bad Axe River. The 2021 Streambank Stabilization Project was done in partnership with the Vernon County Land and Water Department, the local property owner, and the City of Viroqua. The project involved the installation of rip rap along critical turns in the stream channel and application of seed and mulch on privately-owned land. The Viroqua WWTF Streambank Stabilization Project involved the installation of rip rap along critical turns in the stream channel on the WWTF site parcel.

Table ES-1 summarizes the calculated reduction in phosphorus discharge, trade ratio, and anticipated WQT credit for each project, along with the total phosphorus WQT credits.

Table ES-1 Summary of Proposed Phosphorus Water Quality Trades

Project	Calculated Reduction in Phosphorus Discharge (lbs/year)	Trade Ratio	Phosphorus Water Quality Trading Credits (lbs/year)
Viroqua WWTF Streambank Stabilization	155	3	62
2021 Streambank Stabilization	262.24	3	87.4
Total Phosphorus Water Quality Trading Credits			149.4

Therefore, the City of Viroqua expects its WQTs to generate 149.4 pounds of phosphorus WQT credits per year, greater than its phosphorus WQT credit target of 110 pounds per year and the 126.5 pounds per year phosphorus WQT target when a 15% factor of safety is included.

Implementation

The streambank projects have each been implemented and will receive ongoing operations & maintenance. Appendices D and E of this WQT contain the signed DNR Form 3400-207 (Water Quality Trading Management Practice Registration) for these two WQTs.

Operations and maintenance for the streambank projects consists of a visual inspection of the project location at least annually to ensure that there is not excessive erosion, and the

improvements continue to perform their streambank stabilization functions. This will be done by both City of Viroqua personnel and the Vernon County Land and Water Department.

1. INTRODUCTION

1.1 Selected Phosphorus Compliance Alternative

The current discharge permit for the Viroqua Wastewater Treatment Facility (WWTF) is Wisconsin Permit Discharge Elimination System (WPDES) number WI-0021920-10-0 is in Appendix A. It has an effective date February 1, 2018, and an expiration date of December 31, 2022.

In the previous WPDES permit, the City of Viroqua was required to develop annual reports addressing their plan for phosphorus compliance. Viroqua submitted a Facilities Plan in 2015 that served as the Status Report 2, Facilities Plan Phase 1, Preliminary Facilities Plan Phase 2, and Final Facilities Plan Phase 2. In the Facilities Plan Addendum for Phosphorus Compliance submitted to the DNR in July 2016, it was concluded that the lowest cost, feasible alternative for compliance with a future stringent Water Quality-Based Effluent Limit (WQBEL) for phosphorus was Water Quality Trading (WQT). Water Quality Trading involves working within the watershed to reduce phosphorus loading and arrange trades to offset the difference between the Wastewater Treatment Facility (WWTF) discharge of phosphorus and the allowable discharge to comply with a WQBEL.

Although implementation of WQT was not considered feasible within the short timeframe required for the current permit reissuance, the City submitted a WQT Notice of Intent. The DNR response letter is provided in Appendix A. In February 2017, the Multi-Discharger Variance (MDV) was approved by the EPA and became an option for phosphorus compliance. Implementation of the MDV requires non-point source phosphorus reductions that may be accomplished through a "payment program" in which the City would pay the County the difference between actual phosphorus discharged and the target value of 0.2 mg/L at a rate of $51.10 per pound of phosphorus. After discussions with the DNR and the City, the City applied for the MDV with the intent to implement trades during the time the MDV was in effect. The City's application was approved in July 2017.

The City's current permit has a monthly average phosphorus interim limit of 0.8 mg/L, along with the county payment program. Given the limited resources and timeframe of the permit reissuance, the City utilizes the county payment option for their current first permit term. However, the City has since installed phosphorus reduction projects that could be easily applied for future permit terms as discussed further in this Water Quality Trading Plan.

1.2 Community Background

The City of Viroqua is located in the central region of Vernon County, Wisconsin, roughly 24 miles southeast of La Crosse, WI. The population of the City of Viroqua was found to be 4,504 during the 2020 census and is estimated by the Wisconsin Department of Administration to be 4,487 as of January 1, 2021. The City is expected to grow steadily in the future, reaching a projected population of 4,925 in 2040.

1.3 Existing Wastewater Facilities

The Viroqua WWTF is located at 1315 County Highway B, on the northwest side of the City, west of Highway 14, and north of Highway 56.

Wastewater flows to the Viroqua WWTF from a combination of residential, commercial, and industrial sources from the City. Other hauled waste is accepted on a case-by-case basis.

The Viroqua WWTF was last upgraded in 2016 which included the upgrades to the headworks, anaerobic digester structure, sludge processing building, aeration basins, and final clarifiers. New structures included an electrical building, waste receiving station, administration building, and garage. The relocation of the outfall was completed with a new force main during the 2016 modifications. Wastewater treatment is achieved through preliminary and secondary processes, along with ultraviolet light disinfection. Preliminary treatment processes include influent flow metering and sampling, fine screening, and primary clarification. Secondary treatment is achieved through activated sludge biological treatment, secondary clarification, effluent flow metering and sampling, and UV disinfection. Phosphorus removal is accomplished through a biological treatment process in the aeration basins/final clarifiers and chemical addition to the digester supernatant that is recycled to the head of the plant.

The treatment process achieves biological nutrient removal (BNR) through the arrangement of anaerobic, anoxic, and aerobic zones within the aeration basins/final clarifiers. The anaerobic zone promotes the production of volatile fatty acids (VFAs) and the initial release of phosphorus into the mixed liquor. In addition, the configuration of these different zones promotes the growth of phosphorus accumulating organisms (PAOs) which have been identified as being crucial to the biological nutrient removal mechanism. These PAOs release stored polyphosphates while in the anaerobic environments and in contact with VFAs. These PAOs then take up phosphorus while in the aerobic zone, which includes not only the previously released polyphosphates, but additional phosphorus in the influent wastewater. This is termed luxury uptake of phosphorus and results in a net decrease in the amount of soluble phosphorus in the liquid stream. Phosphorus is removed from the liquid process through wasting of settled bio-mass from the final clarifiers and processing in the solids treatment system.

Biosolids are wasted from the final clarifiers to the anaerobic digester for stabilization prior to thickening. Digested sludge is then pumped to the sludge storage tank, where it is stored temporarily before being land applied. The current design capacity of the Viroqua WWTF is shown in Table 1-1.

Table 1-1 Viroqua Wastewater Treatment Facility

Parameter	Design Rated Capacity
Design Average Flow (MGD)	0.747
Max Day Flow (MGD)	1.929
Peak Flow (MGD)	3.309
BOD (lbs/day)	2,165
Suspended Solids (lbs/day)	2,440
Ammonia (lbs/day)	317
Phosphorus (lbs/day)	59

1.4 Viroqua WWTF Effluent Discharge Summary

Table 1-2 is a summary of the annual average effluent discharges from the Viroqua WWTF from 2015-2021. The Viroqua WWTF started discharging to the relocated outfall on January 23, 2019.

Table 1-2 Summary of Annual Average Effluent Discharges

Parameter	Max Year	Average Year	Min Year	Max Month	Min Month
Flow (MGD)	0.326	0.275	0.216	0.520	0.190
BOD (lbs/day)	29	16	7	59	4
Suspended Solids (lbs/day)	12	9	5	29	4
Ammonia Nitrogen (lbs/day)	16	6	0.4	72	0.05
Phosphorus (mg/L)	0.5	0.3	0.1	1.3	0.1
Phosphorus (lbs/day)	1.4	0.8	0.3	3.3	0.2

1.5 Applicable Effluent Limits

The City of Viroqua's current WPDES permit includes interim phosphorus limit of 0.8 mg/L on a monthly average, and a future WQBEL of 0.18 mg/L six-month seasonal average limit, with averaging periods of May through October and November through April, and a 0.50 mg/L monthly average limit.

1.6 Receiving Water Description and Conditions

The receiving water generally flows southeast to northwest. The Springville Branch is located within the Bad Axe River Watershed (BL02) within the Bad Axe/La Crosse Rivers Basin. (Additional information on the Springville Branch of the Bad Axe River in the Bad Axe River Watershed is available at https://dnr.wi.gov/water/waterDetail.aspx?WBIC=1642200.) The receiving tributary is classified as a limited aquatic life stream upstream of the Springville Spring according to NR 104.09(2). Downstream of the Springville Spring, the Springville Branch is classified as a cold (Class I Trout) water sport fish community from the spring down to its mouth (approximately 7.6 miles). The Springville Spring is considered the point of compliance for the Viroqua WWTF discharge.

Appendix B includes a map and land use data on the HUC-12 subwatershed in which the Viroqua WWTF is located, as well as for the watershed upstream of the WWTF's discharge point.

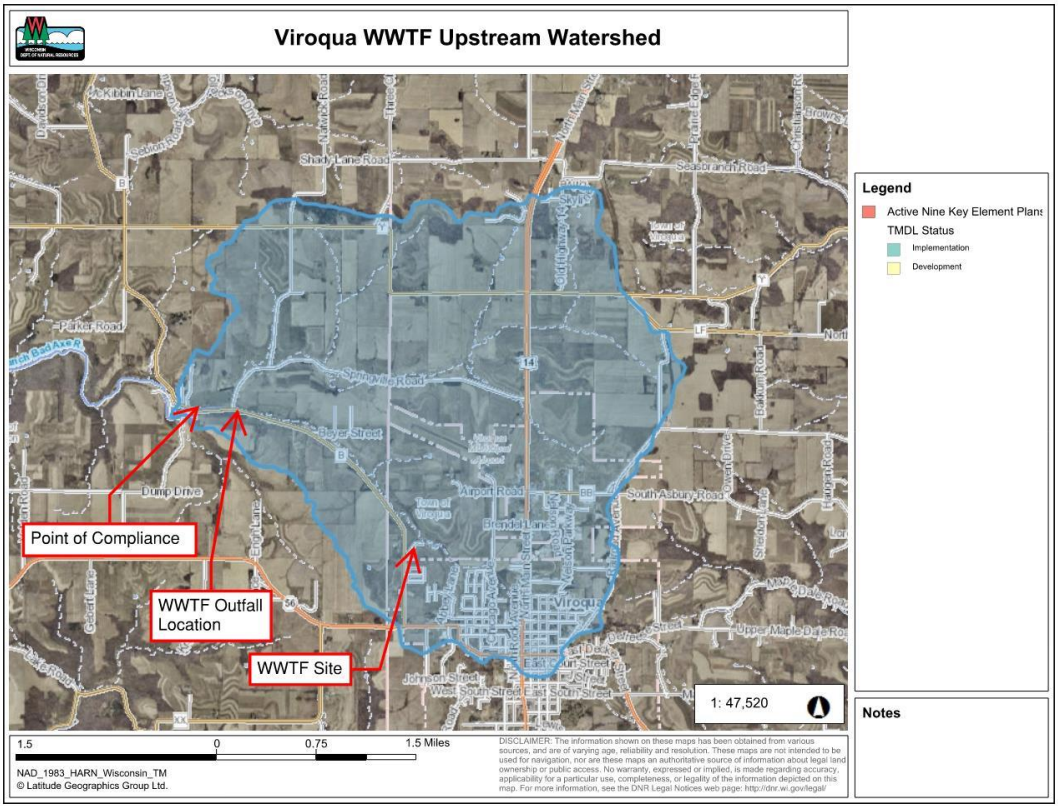
1.7 Watershed Description and Conditions

The DNR's Pollutant Load Ratio Estimation Tool (PRESTO) model states that the watershed area upstream of the Viroqua WWTF's effluent discharge point of compliance in the Springville Branch is 9.06 square miles or 5,798 acres. The PRESTO model states that the upstream watershed is non-point source dominated with a ratio of point source to non-point source phosphorus of 6:94 using a total phosphorus load of 900 pounds per year for the Viroqua WWTF. The PRESTO results are provided in Appendix B.

A map of the watershed upstream of the Viroqua WWTF point of compliance was created using the PRESTO-Lite on-line tool provided by the Wisconsin DNR. This map is shown in Figure 1 1. Appendix B contains a map of the watershed upstream of the Viroqua WWTF's point of compliance and data of land use within the watershed. The watershed upstream of the Viroqua

WWTF point of compliance is 5,798 acres, consisting mainly of agriculture land (81%), urban (17%), and forest (2%).

Figure 1-1 Viroqua WWTF Discharge Location



The USGS has divided watersheds into smaller hydrologic units that are classified by Hydrologic Unit Codes (HUC), with the smallest unit being the HUC-12 subwatershed. Water quality trading is most favorable when trading with upstream sources within the same HUC-12 subwatershed.

The Viroqua WWTF is located in HUC-12 subwatershed 070600010301. Appendix B includes a map and land use data for this subwatershed, which encompasses 14,194 acres, of which the largest land uses are cropland generalized agriculture (46.2%), pasture/hay (28.4%), and deciduous forest (15.5%). The Viroqua WWTF has the only permitted surface water outfall within the HUC-12 subwatershed.

2. WATER QUALITY TRADING BACKGROUND

This chapter provides background on WQT, including calculation of the target number of WQT credits, pollution reduction activities that can result in WQT credits, trade ratios, and a description of additional environmental benefits of WQT. Subsequent chapters will describe the City of Viroqua's phosphorus WQT strategy.

Wisconsin Statutes Section 283.84 and Chapter NR 217 of the Wisconsin Administrative Code allows for alternative compliance through two watershed-based compliance alternatives – WQT and watershed adaptive management (WAM). Both alternatives involve working outside of the service boundaries of the WWTF (and potentially the municipal limits) to reduce phosphorus discharges to the receiving water, allowing for an increase in the mass of phosphorus discharged.

Water quality trading credits must be generated before they can be used to offset a permit limit. In other words, pollution reduction practices must be established and effective before a reduced permit limit takes effect.

2.1 Calculation of Target Water Quality Trading Credits

The target amount of WQT credits can be calculated by comparing the amount of phosphorus discharged by the WWTF to the amount allowed by the WQBEL.

A reduction in WWTF effluent concentrations through additional phosphorus treatment could significantly reduce the amount of WQT credits required. However, the cost of additional phosphorus removal at the WWTF would need to be balanced against the cost of WQT. Once WQT has been selected as the phosphorus compliance alternative, a municipality generally commits itself to achieving the necessary reductions primarily through WQT, but additional phosphorus treatment can be used as necessary if a sufficient number of WQT credits cannot be obtained.

2.2 Pollution Reduction Activities to Generate Trading Credits

Water quality trades can occur on either a point-to-point or nonpoint-to-point basis, as described below.

2.2.1 Point-to-Point Source Water Quality Trading

Point-to-point water quality trading involve trading credits with other point sources within the same watershed as the discharger who has selected WQT as a phosphorus compliance alternative. The point source with whom trading is to occur must have excess water quality credits to trade.

2.2.2 Nonpoint-to-Point Source Water Quality Trading

Nonpoint-to-point water quality trading involves trading credits with nonpoint sources within the same watershed as the discharger who has selected WQT as a phosphorus compliance alternative.

Nonpoint source management practices that can generate trading water quality credits include agricultural practices, urban practices, and lake/reservoir dredging or wetland restoration. Agricultural practices include whole field management / nutrient management planning, planting of companion crops, changes in tilling options, buffers strips and conservation easements, barnyard improvements, and streambank stabilization. Urban practices include stormwater infiltration structures, sedimentation devices, and detention ponds. Dredging is intended to remove in-situ sediment and nutrients to the original or native soil layer and may be done in concert with water quality treatment (e.g., use of alum as a coagulant) and restoration of lake/reservoir aquatic habitat or installation of streambank buffer strips.

The credits generated by the practice are determined by using modeling to predict the difference in phosphorus load between the improved condition and the baseline prior to improvements.

2.3 Trade Ratios

Water quality trading has a higher level of uncertainty associated with it as compared to treatment-based compliance alternatives due to the need for a large number of outside partnerships with trading partners, particularly non-point source contributors. Obtaining the required reductions/credits for WQT generally requires partnering with several landowners in the watershed and a significant effort by municipalities to identify practices, broker agreements, negotiate cost sharing, inspect, and verify implementation, and prepare annual reports to the Wisconsin DNR. A municipality pursuing WQT as a phosphorus compliance alternative would be ultimately responsible for obtaining the required credits and must devote the necessary staff and resources required to support these efforts and to meet the timeline required for permit compliance.

Given inherent uncertainties with WQT, trade ratios must be applied to each WQT project to provide certainty that water quality is actually being improved. A trade ratio is like a multiplier, such that a trade ratio of 3:1 means three pounds of pollution reduction is needed to take one pound of WQT credit.

Trade ratios can vary between 1 and 5 (or higher) depending upon the type of practice installed, location within the watershed, and type of trade being performed. Point-to-point trades generally have the lowest trade ratios (a minimum of 1.1) while nonpoint-to-point trades have higher trade ratios (1.2 to 5). Further, trade ratios are most favorable for phosphorus credits generated upstream of the WWTF discharge and within the same HUC-12 subwatershed, with pollution reduction practices that have a high probability of success.

Trade ratios are calculated for each WQT project, and are based on five factors: delivery, downstream, equivalence, uncertainty, and habitat adjustment. The trade ratio for a particular WQT project is calculated by adding the delivery, downstream, equivalence and uncertainty factors, while subtracting the habitat adjustment factor.

2.3.1 Delivery Factor

A delivery factor is required if trading partners are located in different HUC-12 subwatersheds to account for the fate and transport of the traded pollutant in the surface water. The delivery factor would be zero for trades within the same HUC-12 subwatershed, except if there is a lake or

reservoir between the credit generator and user. If a delivery factor is necessary, it would be calculated during the Total Maximum Daily Load (TMDL) development process or using the computer model known as SPARROW (Spatially Referenced Regressions On Watershed Attributes).

A TMDL is in essence a pollution “budget” for a water body or watershed that establishes reductions needed from each pollutant source to meet water quality goals. Information on Wisconsin’s TMDL development process is available online at https://dnr.wi.gov/topic/TMDLs/.

SPARROW is a USGS model that relates in-stream water quality measurements to spatially referenced characteristics of watersheds, including contaminant sources and factors influencing terrestrial and aquatic transport. SPARROW empirically estimates the origin and fate of contaminants in river networks and quantifies uncertainties in model predictions. Additional information concerning SPARROW is available online at http://water.usgs.gov/nawqa/sparrow/ and the Great Lakes, Ohio, Upper Mississippi, Red River Basins (MRB3) SPARROW Mapper is accessible online at https://wim.usgs.gov/sparrowmrb3/sparrowmrb3mapper.html#. The output from SPARROW is the SPARROW number. A delivery factor can be calculated using the following formula: (Delivery Factor) = [1 / (SPARROW #)] – 1.

2.3.2 Downstream Factor

A downstream factor is necessary if the credit generator is downstream of the credit user. The downstream factor is a function of the difference between the average annual load discharged by the credit user to the overall load at the credit user's point of discharge, and ranges from 0.1 to 0.8. If the credit generator is upstream of the credit user, then the downstream factor is zero.

2.3.3 Equivalence Factor

An equivalence factor is not needed (or zero) for phosphorus water quality trades.

2.3.4 Uncertainty Factor

An uncertainty factor accounts for uncertainties associated with nonpoint source trades that originate from climatic variability, potential inaccuracies in field testing or modeling of the amount of pollutant controlled by a management practice, and the reliability of the management practice to perform. A list of example uncertainty factors is shown in Table 2-1.

The uncertainty factor applicable for each management practice may vary depending on how it is implemented. A more descriptive table of uncertainty factors is provided in DNR’s “Guidance for Implementing Water Quality Trading In WPDES Permits”, available online at https://dnr.wi.gov/topic/wastewater/WaterQualityTrading.html.

Table 2-1 Uncertainty Factors

Pollution Reduction Activities	Uncertainty Factor
Agricultural Management Practices	
Whole Field Management	1
Companion Crops	1
Conservation Easement	1
Nutrient Management	2 – 3
Production Area Diversion or Roof Runoff Structure	2
Vegetated Treatment System or Constructed Wetland	4
Sediment Control Basin	2
Streambank Stabilization & Shoreline Protection	2 – 3
Dredging, Lake Treatment and Wetland Restoration	
Dredging Lakes or Reservoirs	2 – 3
Dredging Rivers or Streams	1 – 3
Wetland Restoration	1
Urban Practices	
Infiltration, Stormwater Sedimentation Devices, Detention Ponds	2

2.3.5 Habitat Adjustment Factor

A habitat adjustment factor is only used for aquatic habitat restoration efforts that meet applicable DNR and NRCS technical standards. If no aquatic habitat restoration is done as part of a trade, this factor is zero.

2.4 Environmental Benefits

Water quality trading offers greater environmental benefit through nonpoint source reductions as compared to additional wastewater treatment. Water quality trading results in greater theoretical reduction of phosphorus loadings within the watershed, and therefore, greater potential environmental benefit. In addition, nonpoint source phosphorus reduction activities have the potential to improve the efficiency of the agricultural practices within the watershed including reducing fertilizer application rates and energy required to create, transport, and apply the fertilizer.

3. TARGET PHOSPHORUS WATER QUALITY TRADING CREDITS

The amount of phosphorus WQT credits required can be calculated by comparing the amount of phosphorus discharged by a WWTF to the amount allowed by the WQBEL. Historical effluent flow and phosphorus loadings are provided in Appendix C.

3.1 Viroqua WWTF's Current Phosphorus Effluent Discharge

Table 3-1 tabulates the monthly average effluent flow rate from the Viroqua WWTF for 2012-2021.

Table 3-1 Monthly Average Effluent Flow Rate (MGD)

Month	Year									
	2012	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**
January	0.290	0.295	0.293	0.288	0.305	0.288	0.289	0.245	0.227	0.201
February	0.297	0.280	0.387	0.271	0.318	0.298	0.286	0.241	0.227	0.213
March	0.300	0.334	0.496	0.301	0.349	0.304	0.238	0.291	0.274	0.232
April	0.321	0.406	0.438	0.323	0.299	0.319	0.235	0.233	0.212	0.240
May	0.323	0.399	0.300	0.301	0.301	0.312	0.339	0.282	0.224	0.222
June	0.300	0.474	0.376	0.292	0.312	0.307	0.250	0.269	0.281	0.220
July	0.302	0.320	0.284	0.285	0.317	0.378	0.243	0.314	0.242	0.222
August	0.298	0.306	0.274	0.279	0.355	0.270	0.321	0.250	0.228	0.261
September	0.308	0.310	0.282	0.287	0.520	0.282	0.380	0.308	0.246	0.214
October	0.306	0.308	0.289	0.278	0.293	0.301	0.344	0.270	0.209	0.201
November	0.284	0.294	0.282	0.284	0.272	0.268	0.274	0.234	0.210	0.194
December	0.274	0.286	0.282	0.427	0.273	0.261	0.238	0.232	0.190	0.197
Annual Avg	**0.300**	**0.334**	**0.332**	**0.301**	**0.326**	**0.299**	**0.286**	**0.264**	**0.231**	**0.218**
Max	0.323	0.474	0.496	0.427	0.520	0.378	0.380	0.314	0.281	0.261
Min	0.274	0.280	0.274	0.271	0.272	0.261	0.235	0.232	0.190	0.194

The Viroqua WWTF had an average effluent flow rate of 0.289 million gallons per day over the period of January 2012 through December 2021.

Table 3-2 tabulates the monthly average phosphorus effluent concentrations from the Viroqua WWTF for 2012-2021.

Table 3-2 Monthly Average Effluent Phosphorus Concentration (mg/L)

Month	Year									
	2012	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**
January	1.151	1.121	0.920	1.076	0.137	0.161	0.582	0.170	0.335	0.138
February	1.311	1.355	0.674	0.176	0.134	0.136	0.948	0.262	0.193	0.136
March	1.524	0.234	0.213	0.192	0.137	0.122	0.825	0.253	0.152	0.161
April	0.475	0.723	0.240	0.224	0.158	0.337	0.838	0.351	0.273	0.187
May	0.744	0.654	0.149	0.594	0.521	0.409	0.385	0.128	0.178	0.154
June	1.271	1.037	0.158	0.489	0.266	0.585	0.170	0.134	0.194	0.161
July	1.160	0.881	0.866	0.517	0.367	0.487	0.148	0.125	0.209	0.170
August	0.989	1.236	0.453	0.562	0.346	0.419	0.223	0.353	0.134	0.095
September	0.896	1.208	0.737	0.194	0.405	0.432	0.165	0.301	0.123	0.109
October	1.102	1.194	0.604	0.564	0.578	1.298	0.131	0.147	0.184	0.172
November	1.135	0.187	0.399	0.665	0.474	0.832	0.202	0.156	0.178	0.155
December	1.498	1.038	0.243	0.901	0.150	0.455	0.172	0.155	0.148	0.151
Annual Ave	**1.105**	**0.906**	**0.471**	**0.513**	**0.306**	**0.473**	**0.399**	**0.211**	**0.192**	**0.149**
Max	1.524	1.355	0.920	1.076	0.578	1.298	0.948	0.353	0.335	0.187
Min	0.475	0.187	0.149	0.176	0.134	0.122	0.131	0.125	0.123	0.095

The Viroqua WWTF discharged an average of 0.47 mg/L of phosphorus over the period of January 2012 through December 2021. After the wastewater treatment facility upgrade in 2016, effluent phosphorus concentrations have gradually decreased, which indicates the plant's biological nutrient removal system is operating efficiently.

Table 3-3 tabulates the monthly average phosphorus loading from the Viroqua WWTF for 2012-2021.

Table 3-3 Monthly Average Effluent Phosphorus Loading (ppd)

Month	Year									
	2012	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**
January	2.780	2.755	2.245	2.585	0.347	0.386	1.402	0.347	0.633	0.231
February	3.251	3.167	2.176	0.397	0.356	0.338	2.257	0.525	0.366	0.241
March	3.816	0.652	0.883	0.483	0.397	0.309	1.635	0.614	0.347	0.313
April	1.272	2.449	0.877	0.602	0.393	0.896	1.639	0.682	0.483	0.374
May	2.005	2.178	0.374	1.489	1.309	1.066	1.090	0.301	0.332	0.285
June	3.179	4.098	0.495	1.192	0.694	1.500	0.354	0.301	0.455	0.295
July	2.923	2.348	2.053	1.228	0.971	1.534	0.299	0.327	0.422	0.315
August	2.462	3.159	1.037	1.305	1.025	0.946	0.597	0.737	0.255	0.207
September	2.299	3.127	1.736	0.465	1.760	1.014	0.522	0.774	0.252	0.194
October	2.813	3.062	1.454	1.309	1.413	3.261	0.375	0.331	0.321	0.287
November	2.691	0.458	0.938	1.577	1.074	1.857	0.461	0.304	0.311	0.250
December	3.425	2.481	0.573	3.210	0.342	0.991	0.341	0.301	0.235	0.248
Annual Ave	**2.743**	**2.494**	**1.237**	**1.320**	**0.840**	**1.175**	**0.914**	**0.462**	**0.368**	**0.270**
Max	3.816	4.098	2.245	3.210	1.760	3.261	2.257	0.774	0.633	0.374
Min	1.272	0.458	0.374	0.397	0.342	0.309	0.299	0.301	0.235	0.194

The Viroqua WWTF discharged an average of 1.182 pounds per day of phosphorus over the period of January 2012 through December 2021.

3.2 Amount of Phosphorus Discharge Allowed by WQBEL

The future WQBEL will be 0.18 mg/L six-month seasonal average limit, with averaging periods of May through October and November through April, and a 0.50 mg/L monthly average limit. Therefore, 0.18 mg/L will be used as the future phosphorus WQBEL for the Viroqua WWTF.

3.3 Calculation of Target Phosphorus Water Quality Trading Credits

In order to calculate the target of phosphorus WQT credits, the monthly average effluent flow rate and phosphorus concentrations for the period of January 2012 through December 2021 were used to calculate the monthly amount of phosphorus above the future WQBEL of 0.18 mg/L discharged by the Viroqua WWTF. Then, each month's totals were summed to provide an annual target of phosphorus WQT credits.

Table 3-4 shows the monthly phosphorus effluent loading above the future WQBEL of 0.18 mg/L from the Viroqua WWTF, along with the annual total. The highest annual total occurred in 2012 when a total of 839 pounds of phosphorus at concentrations above the future WQBEL were discharged. The lowest annual total occurred in 2021 when a total of 0.42 pounds of phosphorus at concentrations above the future WQBEL were discharged. Given the reduction of effluent phosphorus concentrations in recent years, the target for phosphorus WQT credits each year during the Viroqua WWTF's upcoming permit term will be the average of the annual total effluent phosphorus at concentrations above the future WQBEL for the years 2016-2021 (110 pounds of phosphorus).

Table 3-4 Phosphorus Effluent Loading Above Future WQBEL

Month	Year (lbs/month)									
	2012	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**
January	72.70	71.70	55.99	66.73	0	0	30.01	0	9.09	0
February	81.32	76.90	44.65	0	0	0	51.18	4.60	0.73	0
March	104.32	4.68	4.28	0.96	0	0	39.63	5.51	0	0
April	23.69	55.19	6.58	3.52	0.00	12.52	38.60	9.97	4.93	0.42
May	47.12	48.94	0	32.18	26.55	18.51	18.01	0	0	0
June	81.87	101.59	0	22.60	6.75	31.16	0	0	0.97	0
July	76.54	57.92	50.41	24.81	15.32	29.97	0	0	1.83	0
August	62.42	83.66	19.38	27.49	15.27	16.73	3.56	11.20	0	0
September	55.11	79.82	39.35	1.03	29.35	17.73	0	9.32	0	0
October	72.96	80.62	31.64	27.62	30.15	87.07	0	0	0.21	0
November	67.93	0.49	15.44	34.50	19.99	43.66	1.48	0	0	0
December	93.42	63.58	4.62	79.63	0.00	18.58	0	0	0	0
Total (lbs/yr)	**839**	**725**	**272**	**321**	**143**	**276**	**182**	**41**	**18**	**0.42**

3.4 Target Phosphorus WQT Credits with Safety Factor

The City of Viroqua desires to have a safety factor of at least 15% of its phosphorus WQT credit target in the event that the trades do not generate sufficient credits. With a phosphorus WQT credit target of 110 pounds per year, a 15% safety factor would mean the City needs at least 126.5 pounds per year of credits. Given the recent facilities upgrades and the continued plant optimization, effluent phosphorus over the last several years has decreased. With this descending trend, the actual safety factor is much greater. As shown in the table above and in the 6-month breakdown table provided Appendix C, zero credits would have been required for 2021.

4. WATER QUALITY TRADES

The City of Viroqua has pursued two water quality trades for phosphorus, as described below. Both are streambank projects along the upstream tributary to the Springville Branch of the Bad Axe River. One of the streambank projects was a part of the WWTF upgrades and the other project is in partnership with the Gary Stueland, which is the landowner. The completed WQT Checklist for the pursued trades is provided in Appendix A.

4.1 Viroqua WWTF Streambank Stabilization Project

The 2017 facility upgrade to the Viroqua WWTF commenced. This construction project included a streambank stabilization project along a 1,170-foot stretch of the unnamed tributary to the Springville Branch of the Bad Axe River adjacent to the north of the WWTF site.

Appendix D contains plans and documentation of the WWTF streambank stabilization project, including calculations of reduced phosphorus discharge to the tributary.

The WWTF streambank project involved the following work:

- Installation of a total 1,170 linear feet of rip rap along critical turns in the stream channel to armor the streambank from severe erosion

Using the NRCS's Streambank Erosion Estimator, the project is estimated to result in a reduction of streambank soil erosion of 155 tons per year. This estimate was based on lateral recession rates ranging from 0.5 to 1.0 feet per year in the segments before rip rap installation. The lateral recession rate was based upon NRCS guidance documents. In addition, the streambank erosion estimate was based on a varying bank height along the segments receiving rip rap. The project plans detailing the cross-sectional areas along the areas receiving rip rap stabilization are provided in Appendix D.

A composite soil sample taken along the project site resulted in a measurement of 0.06% (or 600 mg/kg) total phosphorus in the streambank soil.

Multiplying the estimated soil erosion reduction rate times the measured soil phosphorus concentration, it is estimated that the project will result in a reduction of 186 pounds of phosphorus discharged to the Springville Branch of the Bad Axe River per year.

Table 4-1 Calculation of Trade Ratio for Viroqua WWTF Streambank Stabilization Project

Delivery Factor	Downstream Trading Factor	Equivalence Factor	Uncertainty Factor	Habitat Adjustment Factor	**Trade Ratio**
0	0	0	3	0	3

The delivery factor is zero because the project location is in the same HUC-12 sub-watershed as the City of Viroqua WWTF.

The downstream trading factor is zero because, the project location is upstream of the WWTF effluent point of compliance.

The equivalence factor is zero because phosphorus is being traded.

The uncertainty factor is three per DNR guidance for streambank stabilization without aquatic habitat restoration.

The trade ratio, determined by summing the delivery, downstream trading, equivalence, and uncertainty factors, and subtracting the habitat adjustment factors, is three. With this trade ratio applied to the phosphorus reduction of 155 pounds per year, the Viroqua WWTF streambank stabilization project results in a phosphorus trading credit of 62.0 pounds per year.

A signed DNR Form 3400-207 (Water Quality Trading Management Practice Registration) for the Viroqua WWTF streambank stabilization project is provided in Appendix D.

Operations and maintenance for this WQT management practice project consists of visually inspecting the streambank at the project locations at least annually to ensure that there is not excessive streambank erosion, and the improvements continue to perform their streambank stabilization functions. This will be done by the City of Viroqua personnel.

4.2 2021 Streambank Stabilization Project

In 2021, the City of Viroqua, working in partnership with the Vernon County Land and Water Department, completed a streambank stabilization project along a 295-foot stretch of the unnamed tributary to the Springville Branch of the Bad Axe River immediately east of Country Road B. The streambank stabilization is located approximately 1 mile upstream of the Viroqua WWTF outfall location.

Appendix E contains documentation of the 2021 streambank project, including calculations of reduced phosphorus discharge to the tributary and the Phosphorus Credit Purchase Agreement.

The 2021 streambank project involved the following work:

- Installation of a total 295 linear feet of rip rap (462 cubic yards of 10-inch D-50 graded rock) at two sites along a critical turn in the stream channel to armor the streambank from severe erosion
- Application of seed and mulch on 0.2 acres of critical areas

Using the NRCS's Streambank Erosion Estimator, the project is estimated to result in a reduction of streambank soil erosion of 163.9 tons per year. This estimate was based on a lateral recession rate of 1.8 feet per year in the segments before rip rap installation. The lateral recession rate was measured by Vernon County Land and Water Department based on historical aerial imagery. In

addition, the streambank erosion estimate was based on a 6.5-foot bank height along the segments receiving rip rap.

A composite soil sample taken along the project site resulted in a measurement of 0.08% (or 800 mg/kg) total phosphorus in the streambank soil.

Multiplying the estimated soil erosion reduction rate times the measured soil phosphorus concentration, it is estimated that the project will result in a reduction of 262.24 pounds of phosphorus discharged to the Springville Branch of the Bad Axe River per year.

Table 4-2 Calculation of Trade Ratio for 2021 Streambank Stabilization Project

Delivery Factor	Downstream Trading Factor	Equivalence Factor	Uncertainty Factor	Habitat Adjustment Factor	**Trade Ratio**
0	0	0	3	0	3

The delivery factor is zero because the project location is in the same HUC-12 sub-watershed as the City of Viroqua WWTF.

The downstream trading factor is zero because, the project location is upstream of the WWTF effluent point of compliance.

The equivalence factor is zero because phosphorus is being traded.

The uncertainty factor is three per DNR guidance for streambank stabilization without aquatic habitat restoration.

The trade ratio, determined by summing the delivery, downstream trading, equivalence, and uncertainty factors, and subtracting the habitat adjustment factors, is three. With this trade ratio applied to the phosphorus reduction of 262.24 pounds per year, the 2021 streambank stabilization project results in a phosphorus trading credit of 87.4 pounds per year.

A signed DNR Form 3400-207 (Water Quality Trading Management Practice Registration) for the 2021 streambank stabilization project is provided in Appendix E. Appendix E also contains a letter from Matt Albright with the Vernon Country Land and Water Department describing the completed project and phosphorus reduction calculation estimates.

Operations and maintenance for this WQT management practice project consists of visually inspecting the streambank at the project locations at least annually to ensure that there is not excessive streambank erosion, and the improvements continue to perform their streambank stabilization functions. This will be done by both City of Viroqua personnel. The Phosphorus Credit Purchase Agreement provided in Appendix E, outlines the terms for maintenance of the streambank stabilization.

4.3 Future Water Quality Trades

The City of Viroqua will pursue additional WQT(s) in the future if needed to meet regulatory requirements.

5. IMPLEMENTATION SCHEDULE AND MILESTONES

5.1 Implementation Timeline

The proposed implementation timeline for this phosphorus WQT plan is as follows:

Implement WQT Management Practices	Completed By 2022
Submit Draft WQT Plan to DNR	June 30, 2022
Submit Management Practice Registration Form to DNR	June 30, 2022
Submit Final WQT Plan to DNR	September 30, 2022
Viroqua WWTF WPDES Permit Expires	December 31, 2022

5.2 Water Quality Trade Practice Installation and Registration

The signed DNR Form 3400-207 (WQT Management Practice Registration) for the proposed water quality trades are provided in Appendix D and Appendix E.

The purpose of the WQT management practice registration is to ratify to DNR that a management practice identified in the plan has been properly installed and is effective. This information is expected to be used by the DNR to track implementation progress, verify compliance, and perform audits, as necessary.

Management practice registration forms will not be submitted for point-to-point source trades. Any point-to-point source water quality trade will be demonstrated via effluent monitoring and will have documentation and effective date requirements specified in the WPDES permits.

5.3 Tracking, Verification, and Inspection

The City of Viroqua staff will verify the performance of the streambank stabilization by performing regular site inspections to ensure the terms of the maintenance plan are being complied with for both the WWTF Streambank Stabilization project and the 2021 Streambank Stabilization project. The City will take necessary action in the event that it is notified of any non-compliance. In addition, the City of Viroqua will make its personnel available to assist the DNR with any inspections it chooses to perform of the streambank stabilization project locations.

5.4 Annual Water Quality Trade Report

The City of Viroqua will submit an annual report to the DNR for each of its water quality trades. The purpose of the annual report is to inform the DNR of the status of management practices, provide the DNR with an update of the trading project overall, and submit any needed changes to the plan to DNR. The annual report will include verification that site inspections occurred, a brief summary of site inspection findings, any applicable notices of termination or practice registration, the amount of credit used each month over the calendar year; and other requirements as stated in the WPDES permit.

5.5 Notification of Termination

If the Water Quality Easement or this WQT Plan needs to be modified or terminated during the permit term, the City of Viroqua will submit DNR Form 3400-209 (Notice of Water Trade Agreement Termination) to the DNR. If the Water Quality Easement is modified or terminated, the phosphorus WQT credits it generates will change accordingly and may result in non-compliance

with the City of Viroqua WPDES permit. The information on the notice of termination form will to be used by the DNR to determine if a permit modification is required due to the termination, the termination will result in non-compliance, or other permit actions are required due to the termination.

An unsigned version of the notice of termination form is provided in Appendix A. If this form is to be used, details concerning the nature of the termination will need to be added and the form signed by the City's authorized representative.

Appendix A

WDNR Documentation

WISCONSIN
DEPT. OF NATURAL RESOURCES

WPDES PERMIT

STATE OF WISCONSIN
DEPARTMENT OF NATURAL RESOURCES

PERMIT TO DISCHARGE UNDER THE WISCONSIN POLLUTANT DISCHARGE ELIMINATION SYSTEM

City of Viroqua

is permitted, under the authority of Chapter 283, Wisconsin Statutes, to discharge from a facility located at
1315 CTH B, Viroqua, WI
to
unnamed tributary to the Springville Branch of the Bad Axe River, in the Bad Axe River Watershed of the Bad Axe / La Crosse Rivers Basin located in Vernon County

in accordance with the effluent limitations, monitoring requirements and other conditions set forth in this permit.

The permittee shall not discharge after the date of expiration. If the permittee wishes to continue to discharge after this expiration date an application shall be filed for reissuance of this permit, according to Chapter NR 200, Wis. Adm. Code, at least 180 days prior to the expiration date given below.

State of Wisconsin Department of Natural Resources
For the Secretary

By _____
Lacey Hillman
Wastewater Field Supervisor

1/30/2018
Date Permit Signed/Issued

PERMIT TERM: EFFECTIVE DATE - February 01, 2018 **EXPIRATION DATE - December 31, 2022**

TABLE OF CONTENTS

1 Influent Requirements

1.1 Sampling Point(s)

Sampling Point Designation	
Sampling Point Number	**Sampling Point Location, WasteType/Sample Contents and Treatment Description (as applicable)**
701	Representative influent samples shall be collected right after the Huber fine screen and prior to the influent partial flume.

1.2 Monitoring Requirements

The permittee shall comply with the following monitoring requirements.

1.2.1 Sampling Point 701 - AFTER SCREEN, PRIOR TO FLUME

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Flow Rate		MGD	Continuous	Continuous	
BOD_5, Total		mg/L	3/Week	24-Hr Flow Prop Comp	
Suspended Solids, Total		mg/L	3/Week	24-Hr Flow Prop Comp	

2 Surface Water Requirements

2.1 Sampling Point(s)

Sampling Point Designation	
Sampling Point Number	**Sampling Point Location, WasteType/Sample Contents and Treatment Description (as applicable)**
001	Emergency Effluent Overflow: Representative effluent samples shall be collected before the UV treatment. Grab samples for fecal coliform should be collected after the UV treatment. After the upgrade of 2017-2018, this outfall will become the diversion for flows that are unable to pass through outfall 005 during periods of extreme flows and will only be utilized on an emergency basis. This diverted flow will consist of the flows from the treated wastewater and possibly the blending line. The flow coming from the blending line will be treated with primary clarification but will bypass the aeration basins and the secondary clarifier prior to being recombined with the treated wastewater for UV treatment. In extremely high flow events, a portion of this combined flow may be bypassed around the UV system and blended with disinfected flow downstream of the UV system to prevent flooding or overtopping of the aeration basins. Sampling for all parameters must occur daily during diversion and blending events. Discharge is to the unnamed tributary immediately adjacent to the wastewater treatment plant. Notification must be made to the Basin Engineer when diversion or blending occurs. See Monitoring Frequency subsection 2.2.1.1 below for information on sampling.
005	Representative effluent samples shall be collected before the UV treatment. Grab samples for fecal coliform should be collected after the UV treatment. The flow coming from the blending line will be treated with primary clarification but will bypass the aeration basins and the secondary clarifier prior to being recombined with the treated wastewater for UV treatment. In extremely high flow events, a portion of this combined flow may be bypassed around the UV system and blended with disinfected flow downstream of the UV system to prevent flooding or overtopping of the aeration basins. Sampling for all parameters must occur daily during diversion and blending events. Discharge is to the unnamed tributary immediately adjacent to the wastewater treatment plant. Notification must be made to the Basin Engineer when diversion or blending occurs. Discharge is upstream of the box culvert at the intersection of CTH B and Springville Rd.

2.2 Monitoring Requirements and Effluent Limitations

The permittee shall comply with the following monitoring requirements and limitations.

2.2.1 Sampling Point (Outfall) 001 - DURING DIVERSION/BLENDING

Monitoring Requirements and Effluent Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Flow Rate		MGD	Continuous	Continuous	
BOD_5, Total	Monthly Avg	20 mg/L	3/Week	24-Hr Flow Prop Comp	
BOD_5, Total	Weekly Avg	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	

Monitoring Requirements and Effluent Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Suspended Solids, Total	Weekly Avg	30 mg/L	3/Week	24-Hr Flow Prop Comp	
Phosphorus, Total	Monthly Avg	1.0 mg/L	3/Week	24-Hr Flow Prop Comp	Interim MDV limit effective through 03/31/2019. See the MDV subsection below and phosphorus compliance schedules.
Phosphorus, Total	Monthly Avg	0.8 mg/L	3/Week	24-Hr Flow Prop Comp	Interim MDV limit starting 04/01/2019. See the MDV subsection below and phosphorus compliance schedules.
Phosphorus, Total		lbs/month	Monthly	Calculated	Report the monthly phosphorus discharged in lbs/month on the last day of the month on the DMR. See Standards Requirements for 'Appropriate Formulas' to calculate the Total Monthly Discharge.
Phosphorus, Total		lbs/yr	Annual	Calculated	Report the sum of the Total Monthly Discharges for the calendar year on the annual DMR.
pH Field	Daily Max	9.0 su	Daily	Grab	
pH Field	Daily Min	6.0 su	Daily	Grab	
Dissolved Oxygen	Daily Min	4.0 mg/L	Daily	Grab	
Nitrogen, Ammonia (NH_3-N) Total		mg/L	Monthly	24-Hr Flow Prop Comp	
Copper, Total Recoverable		µg/L	Quarterly	24-Hr Flow Prop Comp	See Metals subsection below.
Zinc, Total Recoverable		µg/L	Quarterly	24-Hr Flow Prop Comp	See Metals subsection below.
Fecal Coliform	Geometric Mean - Monthly	400 #/100 ml	Weekly	Grab	Limit and monitoring effective year round.
Fecal Coliform	Geometric Mean - Wkly	656 #/100 ml	Weekly	Grab	Limit and monitoring effective year round.

2.2.1.1 Monitoring Frequency for Existing Discharge and Future Emergency Effluent Overflow Events

The Viroqua WWTF is undergoing a facility upgrade that will transition the use of Outfall 001 from being the main effluent discharge outfall to only being used for emergency overflow events. Prior to this transition, the parameters in the above monitoring table for Outfall 001 will be sampled according to the sample frequencies shown. After the

transition to only being used for emergencies, the parameters in the above monitoring table for Outfall 001 will be sampled daily for the duration of the overflow events.

2.2.1.2 Annual Average Design Flow

The annual average design flow of the permittee's wastewater treatment facility is 0.535 MGD.

2.2.1.3 Total Metals Analyses

Measurements of total metals and total recoverable metals shall be considered as equivalent.

2.2.1.1 Multi-Discharger Variance (MDV) Requirements - Optimization and Watershed Provisions

Optimization: The permittee shall continue to optimize performance to control phosphorus discharges in accordance with s. 283.16(6), Wis. Stats. See the Schedules section for optimization requirements.

Watershed Provisions: The permittee is required to implement watershed measures to reduce the amount of phosphorus entering the receiving water. The permittee has selected the following approved watershed measure:

2.2.1.2 Payment to County for Phosphorus Reduction

The permittee shall make payments for phosphorus reduction to the county or counties approved by the Department per s. 283.16(8), Wis. Stats. The permittee shall make a total payment by March 1 of each year in the amount equal to the per pound amount **$51.10** times the number of pounds by which the effluent phosphorus discharged during the previous year exceeded the permittee's target value or $640,000, whichever is less. The target value is 0.2 mg/L per s. 283.16(1)(h), Wis. Stats., and is applicable during the months that the MDV is in effect. The MDV is in effect year around. Refer to the Schedules section for the scheduled annual requirements.

Annual Payment Calculation: The annual payment is equal to the phosphorus load that exceeds the target value multiplied by **$51.10** per pound. Use the steps shown below to calculate the annual payment. In addition, the Department shall send a statement to the permittee specifying the total payment due to the participating counties each year in accordance with the Schedules section.
Annual Payment = [Annual Phosphorus Load – Target Annual Load] × Price Per Pound

First, calculate lbs discharged for each month that the MDV is in effect as follows:
Monthly Phosphorus Load (lbs/month) = Total Monthly flow (MG) × . TP effluent conc. (mg/L) × 8.34

Then calculate the annual phosphorus load:
Annual Phosphorus Load (lbs/year) = $\sum$ [(Total Monthly Flow (MG) × Avg. Monthly TP Concentration × 8.34)]

Finally, calculate the Target Annual Load:
Target Annual Load (lbs/year) = Total Annual Flow (MG) × 0.2 mg/L × 8.34

2.2.2 Sampling Point (Outfall) 005 - RELOCATED OUTFALL TO TRIB

Monitoring Requirements and Effluent Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Flow Rate		MGD	Continuous	Continuous	
BOD_5, Total	Monthly Avg	15 mg/L	3/Week	24-Hr Flow Prop Comp	
BOD_5, Total	Weekly Avg	15 mg/L	3/Week	24-Hr Flow Prop Comp	
BOD_5, Total	Weekly Avg	66 lbs/day	3/Week	Calculated	

Monitoring Requirements and Effluent Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Suspended Solids, Total	Monthly Avg	15 mg/L	3/Week	24-Hr Flow Prop Comp	
Suspended Solids, Total	Weekly Avg	15 mg/L	3/Week	24-Hr Flow Prop Comp	
Phosphorus, Total	Monthly Avg	1.0 mg/L	3/Week	24-Hr Flow Prop Comp	Interim MDV limit effective through 03/31/2019. See the MDV subsection below and phosphorus compliance schedules.
Phosphorus, Total	Monthly Avg	0.8 mg/L	3/Week	24-Hr Flow Prop Comp	Interim MDV limit starting 04/01/2019. See the MDV subsection below and phosphorus compliance schedules.
Phosphorus, Total		lbs/month	Monthly	Calculated	Report the monthly phosphorus discharged in lbs/month on the last day of the month on the DMR. See Standards Requirements for 'Appropriate Formulas' to calculate the Total Monthly Discharge.
Phosphorus, Total		lbs/yr	Annual	Calculated	Report the sum of the Total Monthly Discharges for the calendar year on the annual DMR.
pH Field	Daily Max	9.0 su	Daily	Grab	
pH Field	Daily Min	6.0 su	Daily	Grab	
Dissolved Oxygen	Daily Min	4.0 mg/L	Daily	Grab	
Nitrogen, Ammonia (NH_3-N) Total	Monthly Avg	5.8 mg/L	Monthly	24-Hr Flow Prop Comp	
Nitrogen, Ammonia (NH_3-N) Total	Weekly Avg	14 mg/L	Monthly	24-Hr Flow Prop Comp	
Copper, Total Recoverable		µg/L	Quarterly	24-Hr Flow Prop Comp	See Metals subsection below.
Zinc, Total Recoverable		µg/L	Quarterly	24-Hr Flow Prop Comp	See Metals subsection below.
Temperature		deg F	3/Week	Grab	See Temperature subsection below.
Fecal Coliform	Geometric Mean - Monthly	400 #/100 ml	Weekly	Grab	Limit and monitoring effective May-Sept annually.
Fecal Coliform	Geometric Mean - Wkly	656 #/100 ml	Weekly	Grab	Limit and monitoring effective May-Sept annually.

Monitoring Requirements and Effluent Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Acute WET		TU_a	See Listed Qtr(s)	24-Hr Flow Prop Comp	See WET subsection below.
Chronic WET	Monthly Avg	1.7 TUc	Annual	24-Hr Flow Prop Comp	See WET subsection below.

2.2.2.1 Annual Average Design Flow

The annual average design flow of the permittee's wastewater treatment facility is 0.535 MGD.

2.2.2.2 Multi-Discharger Variance (MDV) Requirements - Optimization and Watershed Provisions

Optimization: The permittee shall continue to optimize performance to control phosphorus discharges in accordance with s. 283.16(6), Wis. Stats. See the Schedules section for optimization requirements.

Watershed Provisions: The permittee is required to implement watershed measures to reduce the amount of phosphorus entering the receiving water. The permittee has selected the following approved watershed measure:

2.2.2.3 Payment to County for Phosphorus Reduction

The permittee shall make payments for phosphorus reduction to the county or counties approved by the Department per s. 283.16(8), Wis. Stats. The permittee shall make a total payment by March 1 of each year in the amount equal to the per pound amount **$51.10** times the number of pounds by which the effluent phosphorus discharged during the previous year exceeded the permittee's target value or $640,000, whichever is less. The target value is 0.2 mg/L per s. 283.16(1)(h), Wis. Stats., and is applicable during the months that the MDV is in effect. The MDV is in effect year around. Refer to the Schedules section for the scheduled annual requirements.

Annual Payment Calculation: The annual payment is equal to the phosphorus load that exceeds the target value multiplied by **$51.10** per pound. Use the steps shown below to calculate the annual payment. In addition, the Department shall send a statement to the permittee specifying the total payment due to the participating counties each year in accordance with the Schedules section.
Annual Payment = [Annual Phosphorus Load – Target Annual Load] × Price Per Pound

First, calculate lbs discharged for each month that the MDV is in effect as follows:
Monthly Phosphorus Load (lbs/month) = Total Monthly flow (MG) × Monthly Avg. TP effluent conc. (mg/L) × 8.34

Then calculate the annual phosphorus load:
Annual Phosphorus Load (lbs/year) = $\sum$ [(Total Monthly Flow (MG) × Avg. Monthly TP Concentration × 8.34)]

Finally, calculate the Target Annual Load:
Target Annual Load (lbs/year) = Total Annual Flow (MG) × 0.2 mg/L × 8.34

2.2.2.4 Total Metals Analyses

Measurements of total metals and total recoverable metals shall be considered as equivalent.

2.2.2.5 Effluent Temperature Monitoring

For manually measuring effluent temperature, grab samples should be collected at 6 evenly spaced intervals during the 24-hour period. Alternative sampling intervals may be approved if the permittee can show that the maximum

effluent temperature is captured during the sampling interval. For monitoring temperature continuously, collect measurements in accordance with s. NR 218.04(13). This means that discrete measurements shall be recorded at intervals of not more than 15 minutes during the 24-hour period. In either case, report the maximum temperature measured during the day on the DMR. For seasonal discharges collect measurements either manually or continuously during the period of operation and report the daily maximum effluent temperature on the DMR.

2.2.2.6 Whole Effluent Toxicity (WET) Testing

Primary Control Water: Springville Branch of the Bad Axe River

Instream Waste Concentration (IWC): 58 %

Dilution series: At least five effluent concentrations and dual controls must be included in each test.

- **Acute:** 100, 50, 25, 12.5, 6.25% and any additional selected by the permittee.
- **Chronic:** 100, 30, 10, 3, 1% (if the IWC $\leq$30%) or 100, 75, 50, 25, 12.5% (if the IWC >30%) and any additional selected by the permittee.

WET Testing Frequency:

Acute tests shall be conducted twice in rotating quarters in order to collect seasonal information about the discharge. Tests are required during the following quarters.

- **Acute:**

1st Test: October – December 2018

2nd Test: April – June 2020

Acute WET testing shall continue after the permit expiration date (until the permit is reissued) in accordance with the WET requirements specified for the last full calendar year of this permit. For example, the next test would be required in April - June 2023.

Chronic tests shall be conducted once each year in rotating quarters in order to collect seasonal information about the discharge. Tests are required during the following quarters.

- **Chronic:**

1st Test: October - December 2018

2nd Test: July - September 2019

3rd Test: October - December 2020

4th Test: January - March 2021

5th Test: April - June 2022

Chronic WET testing shall continue after the permit expiration date (until the permit is reissued) in accordance with the WET requirements specified for the last full calendar year of this permit. For example, the next test would be required in April - June 2023.

Testing: WET testing shall be performed during normal operating conditions. Permittees are not allowed to turn off or otherwise modify treatment systems, production processes, or change other operating or treatment conditions during WET tests.

Reporting: The permittee shall report test results on the Discharge Monitoring Report form, and also complete the "Whole Effluent Toxicity Test Report Form" (Section 6, "*State of Wisconsin Aquatic Life Toxicity Testing Methods Manual, 2nd Edition*"), for each test. The original, complete, signed version of the Whole Effluent Toxicity Test Report Form shall be sent to the Biomonitoring Coordinator, Bureau of Water Quality, 101 S. Webster St., P.O. Box

7921, Madison, WI 53707-7921, within 45 days of test completion. The Discharge Monitoring Report (DMR) form shall be submitted electronically by the required deadline.

Determination of Positive Results: An acute toxicity test shall be considered positive if the Toxic Unit - Acute (TU_a) is greater than 1.0 for either species. The TU_a shall be calculated as follows: $TU_a = 100 \div LC_{50}$. A chronic toxicity test shall be considered positive if the Toxic Unit - Chronic (TU_c) is greater than 1.0 for either species. The TU_c shall be calculated as follows: $TU_c = 100 \div IC_{25}$.

Additional Testing Requirements: Within 90 days of a test which showed positive results, the permittee shall submit the results of at least 2 retests to the Biomonitoring Coordinator on "Whole Effluent Toxicity Test Report Forms". The 90 day reporting period shall begin the day after the test which showed a positive result. The retests shall be completed using the same species and test methods specified for the original test (see the Standard Requirements section herein).

3 Land Application Requirements

3.1 Sampling Point(s)

The discharge(s) shall be limited to land application of the waste type(s) designated for the listed sampling point(s) on Department approved land spreading sites or by hauling to another facility.

Sampling Point Designation	
Sampling Point Number	**Sampling Point Location, WasteType/Sample Contents and Treatment Description (as applicable)**
002	Representative liquid sludge samples shall be collected from the holding tank mixer sample tap prior to hauling.

3.2 Monitoring Requirements and Limitations

The permittee shall comply with the following monitoring requirements and limitations.

3.2.1 Sampling Point (Outfall) 002 - HOLDING TANK LIQUID SLUDGE

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Solids, Total		Percent	Annual	Grab	
Arsenic Dry Wt	Ceiling	75 mg/kg	Annual	Grab	
Arsenic Dry Wt	High Quality	41 mg/kg	Annual	Grab	
Cadmium Dry Wt	Ceiling	85 mg/kg	Annual	Grab	
Cadmium Dry Wt	High Quality	39 mg/kg	Annual	Grab	
Copper Dry Wt	Ceiling	4,300 mg/kg	Annual	Grab	
Copper Dry Wt	High Quality	1,500 mg/kg	Annual	Grab	
Lead Dry Wt	Ceiling	840 mg/kg	Annual	Grab	
Lead Dry Wt	High Quality	300 mg/kg	Annual	Grab	
Mercury Dry Wt	Ceiling	57 mg/kg	Annual	Grab	
Mercury Dry Wt	High Quality	17 mg/kg	Annual	Grab	
Molybdenum Dry Wt	Ceiling	75 mg/kg	Annual	Grab	
Nickel Dry Wt	Ceiling	420 mg/kg	Annual	Grab	
Nickel Dry Wt	High Quality	420 mg/kg	Annual	Grab	
Selenium Dry Wt	Ceiling	100 mg/kg	Annual	Grab	
Selenium Dry Wt	High Quality	100 mg/kg	Annual	Grab	
Zinc Dry Wt	Ceiling	7,500 mg/kg	Annual	Grab	
Zinc Dry Wt	High Quality	2,800 mg/kg	Annual	Grab	
Nitrogen, Total Kjeldahl		Percent	Annual	Grab	
Nitrogen, Ammonium (NH_4-N) Total		Percent	Annual	Grab	
Phosphorus, Total		Percent	Annual	Grab	
Phosphorus, Water Extractable		% of Tot P	Annual	Grab	

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Potassium, Total Recoverable		Percent	Annual	Grab	

Other Sludge Requirements	
Sludge Requirements	**Sample Frequency**
List 3 Requirements – Pathogen Control: The requirements in List 3 shall be met prior to land application of sludge.	**Annual**
List 4 Requirements – Vector Attraction Reduction: The vector attraction reduction shall be satisfied prior to, or at the time of land application as specified in List 4.	**Annual**

3.2.1.1 List 2 Analysis

If the monitoring frequency for List 2 parameters is more frequent than "Annual" then the sludge may be analyzed for the List 2 parameters just prior to each land application season rather than at the more frequent interval specified.

3.2.1.2 Changes in Feed Sludge Characteristics

If a change in feed sludge characteristics, treatment process, or operational procedures occurs which may result in a significant shift in sludge characteristics, the permittee shall reanalyze the sludge for List 1, 2, 3 and 4 parameters each time such change occurs.

3.2.1.3 Multiple Sludge Sample Points (Outfalls)

If there are multiple sludge sample points (outfalls), but the sludges are not subject to different sludge treatment processes, then a separate List 2 analysis shall be conducted for each sludge type which is land applied, just prior to land application, and the application rate shall be calculated for each sludge type. In this case, List 1, 3, and 4 and PCBs need only be analyzed on a single sludge type, at the specified frequency. If there are multiple sludge sample points (outfalls), due to multiple treatment processes, List 1, 2, 3 and 4 and PCBs shall be analyzed for each sludge type at the specified frequency.

3.2.1.4 Sludge Which Exceeds the High Quality Limit

Cumulative pollutant loading records shall be kept for all bulk land application of sludge which does not meet the high quality limit for any parameter. This requirement applies for the entire calendar year in which any exceedance of Table 3 of s. NR 204.07(5)(c), is experienced. Such loading records shall be kept for all List 1 parameters for each site land applied in that calendar year. The formula to be used for calculating cumulative loading is as follows:

[(Pollutant concentration (mg/kg) x dry tons applied/ac) ÷ 500] + previous loading (lbs/acre) = cumulative lbs pollutant per acre

When a site reaches 90% of the allowable cumulative loading for any metal established in Table 2 of s. NR 204.07(5)(b), the Department shall be so notified through letter or in the comment section of the annual land application report (3400-55).

3.2.1.5 Lists 1, 2, 3, and 4

List 1 TOTAL SOLIDS AND METALS See the Monitoring Requirements and Limitations table above for monitoring frequency and limitations for the List 1 parameters
Solids, Total (percent)
Arsenic, mg/kg (dry weight)
Cadmium, mg/kg (dry weight)
Copper, mg/kg (dry weight)
Lead, mg/kg (dry weight)
Mercury, mg/kg (dry weight)
Molybdenum, mg/kg (dry weight)
Nickel, mg/kg (dry weight)
Selenium, mg/kg (dry weight)
Zinc, mg/kg (dry weight)

List 2 NUTRIENTS See the Monitoring Requirements and Limitations table above for monitoring frequency for the List 2 parameters
Solids, Total (percent)
Nitrogen Total Kjeldahl (percent)
Nitrogen Ammonium (NH4-N) Total (percent)
Phosphorus Total as P (percent)
Phosphorus, Water Extractable (as percent of Total P)
Potassium Total Recoverable (percent)

List 3
PATHOGEN CONTROL FOR CLASS B SLUDGE

The permittee shall implement pathogen control as listed in List 3. The Department shall be notified of the pathogen control utilized and shall be notified when the permittee decides to utilize alternative pathogen control.

The following requirements shall be met prior to land application of sludge.

Parameter	Unit	Limit
Fecal Coliform*	MPN/gTS or CFU/gTS	2,000,000
OR, ONE OF THE FOLLOWING PROCESS OPTIONS		
Aerobic Digestion	Air Drying	
Anaerobic Digestion	Composting	
Alkaline Stabilization	PSRP Equivalent Process	

* The Fecal Coliform limit shall be reported as the geometric mean of 7 discrete samples on a dry weight basis.

List 4
VECTOR ATTRACTION REDUCTION

The permittee shall implement any one of the vector attraction reduction options specified in List 4. The Department shall be notified of the option utilized and shall be notified when the permittee decides to utilize an alternative option.

One of the following shall be satisfied prior to, or at the time of land application as specified in List 4.

Option	Limit	Where/When it Shall be Met
Volatile Solids Reduction	≥38%	Across the process
Specific Oxygen Uptake Rate	≤1.5 mg O_2/hr/g TS	On aerobic stabilized sludge
Anaerobic bench-scale test	<17 % VS reduction	On anaerobic digested sludge
Aerobic bench-scale test	<15 % VS reduction	On aerobic digested sludge
Aerobic Process	>14 days, Temp >40°C and Avg. Temp > 45°C	On composted sludge
pH adjustment	>12 S.U. (for 2 hours) and >11.5 (for an additional 22 hours)	During the process
Drying without primary solids	>75 % TS	When applied or bagged
Drying with primary solids	>90 % TS	When applied or bagged
Equivalent Process	Approved by the Department	Varies with process
Injection	-	When applied
Incorporation	-	Within 6 hours of application

3.2.1.6 Daily Land Application Log

Daily Land Application Log

Discharge Monitoring Requirements and Limitations

The permittee shall maintain a daily land application log for biosolids land applied each day when land application occurs. The following minimum records must be kept, in addition to all analytical results for the biosolids land applied. The log book records shall form the basis for the annual land application report requirements.

Parameters	Units	Sample Frequency
DNR Site Number(s)	Number	Daily as used
Outfall number applied	Number	Daily as used
Acres applied	Acres	Daily as used
Amount applied	As appropriate * /day	Daily as used
Application rate per acre	unit */acre	Daily as used
Nitrogen applied per acre	lb/acre	Daily as used
Method of Application	Injection, Incorporation, or surface applied	Daily as used

*gallons, cubic yards, dry US Tons or dry Metric Tons

4 Schedules

4.1 Phosphorus Schedule - Continued Optimization

The permittee is required to optimize performance to control phosphorus discharges per the following schedule.

Required Action	Due Date
Optimization: The permittee shall continue to implement the Optimization Plan as previously approved to optimize performance to control phosphorus discharges. Submit a progress report on optimizing removal of phosphorus by the Due Date.	12/31/2018
Progress Report #2: Submit a progress report on optimizing removal of phosphorus.	12/31/2019
Progress Report #3: Submit a progress report on optimizing removal of phosphorus.	12/31/2020
Progress Report #4: Submit a progress report on optimizing removal of phosphorus.	12/31/2021
Progress Report #5: Submit a progress report on optimizing removal of phosphorus. The monthly averge total phosphorus limit of 0.8 mg/L at outfall 001 and outfall 005 becomes effective on 04/01/2019.	12/31/2022

4.2 Phosphorus Payment per Pound to County

The permittee is required to make annual payments for phosphorus reductions to the participating county or counties in accordance with s. 283.16(8), Wis. Stats, and the following schedule. The price per pound will be set at the time of permit reissuance and will apply for the duration of the permit.

Required Action	Due Date
Annual Verification of Phosphorus Payment to County: The permittee shall make a total payment to the participating county or counties approved by the Department by March 1 of each calendar year on form 3200-151. The amount due is equal to the following: [(lbs of phosphorus discharged minus the permittee's target value) times ($51.10 per pound)] or $640,000, whichever is less. See the payment calculation steps in the 'Surface Water Section'. The first payment is due by the specified Due Date. The applicable Target Value is 0.2 mg/L as defined by s. 283.16(1)(h), Wis. Stats. The "per pound" value of $51.10 is based on $50 adjusted for CPI as defined by s. 283.16(8)(a) Wis. Stats.	03/01/2019
Annual Verification of Payment #2: Submit Form 3200-151 to the Department indicating total amount remitted to the participating counties.	03/01/2020
Annual Verification of Payment #3: Submit Form 3200-151 to the Department indicating total amount remitted to the participating counties.	03/01/2021
Annual Verification of Payment #4: Submit Form 3200-151 to the Department indicating total amount remitted to the participating counties.	03/01/2022
Annual Verification of Payment #5: Submit Form 3200-151 to the Department indicating total amount remitted to the participating counties.	03/01/2023
Annual Verification of Payment After Permit Expiration: If this permit is not reissued prior to the expiration date, the permittee shall continue to submit Form 3200-151 to the Department indicating total amount remitted to the participating counties by March 1 each year.	

4.3 Phosphorus Multi-Discharger Variance Interim Limit (0.8 mg/L)

This compliance schedule requires the permittee to achieve compliance with the specified MDV interim effluent limit in accordance with s. 283.16(6), Wis. Stats., by the due date.for both Outfall 001 and Outfall 005

Required Action	Due Date
Report on Effluent Discharges: Submit a report on effluent discharges of phosphorus with conclusions regarding compliance.	06/30/2018
Action Plan: Submit an action plan for complying with the specified interim effluent limit. If construction is required, include plans and specifications with the submittal.	09/30/2018
Initiate Actions: Initiate actions identified in the plan.	12/31/2018
Complete Actions: Complete actions identified in the plan and achieve compliance with the specified interim effluent limit of 0.8 mg/L monthly average for both outfall 001 and outfall 005.	04/01/2019

5 Standard Requirements

NR 205, Wisconsin Administrative Code: The conditions in ss. NR 205.07(1) and NR 205.07(2), Wis. Adm. Code, are included by reference in this permit. The permittee shall comply with all of these requirements. Some of these requirements are outlined in the Standard Requirements section of this permit. Requirements not specifically outlined in the Standard Requirement section of this permit can be found in ss. NR 205.07(1) and NR 205.07(2).

5.1 Reporting and Monitoring Requirements

5.1.1 Monitoring Results

Monitoring results obtained during the previous month shall be summarized and reported on a Department Wastewater Discharge Monitoring Report. The report may require reporting of any or all of the information specified below under 'Recording of Results'. This report is to be returned to the Department no later than the date indicated on the form. A copy of the Wastewater Discharge Monitoring Report Form or an electronic file of the report shall be retained by the permittee.

Monitoring results shall be reported on an electronic discharge monitoring report (eDMR). The eDMR shall be certified electronically by a responsible executive or municipal officer, manager, partner or proprietor as specified in s. 283.37(3), Wis. Stats., or a duly authorized representative of the officer, manager, partner or proprietor that has been delegated signature authority pursuant to s. NR 205.07(1)(g)2, Wis. Adm. Code. The 'eReport Certify' page certifies that the electronic report form is true, accurate and complete.

If the permittee monitors any pollutant more frequently than required by this permit, the results of such monitoring shall be included on the Wastewater Discharge Monitoring Report.

The permittee shall comply with all limits for each parameter regardless of monitoring frequency. For example, monthly, weekly, and/or daily limits shall be met even with monthly monitoring. The permittee may monitor more frequently than required for any parameter.

5.1.2 Sampling and Testing Procedures

Sampling and laboratory testing procedures shall be performed in accordance with Chapters NR 218 and NR 219, Wis. Adm. Code and shall be performed by a laboratory certified or registered in accordance with the requirements of ch. NR 149, Wis. Adm. Code. Groundwater sample collection and analysis shall be performed in accordance with ch. NR 140, Wis. Adm. Code. The analytical methodologies used shall enable the laboratory to quantitate all substances for which monitoring is required at levels below the effluent limitation. If the required level cannot be met by any of the methods available in NR 219, Wis. Adm. Code, then the method with the lowest limit of detection shall be selected. Additional test procedures may be specified in this permit.

5.1.3 Recording of Results

The permittee shall maintain records which provide the following information for each effluent measurement or sample taken:

- the date, exact place, method and time of sampling or measurements;
- the individual who performed the sampling or measurements;
- the date the analysis was performed;
- the individual who performed the analysis;
- the analytical techniques or methods used; and
- the results of the analysis.

5.1.4 Reporting of Monitoring Results

The permittee shall use the following conventions when reporting effluent monitoring results:

- Pollutant concentrations less than the limit of detection shall be reported as < (less than) the value of the limit of detection. For example, if a substance is not detected at a detection limit of 0.1 mg/L, report the pollutant concentration as < 0.1 mg/L.

- Pollutant concentrations equal to or greater than the limit of detection, but less than the limit of quantitation, shall be reported and the limit of quantitation shall be specified.

- For purposes of calculating NR 101 fees, the 2 mg/l lower reporting limits for BOD_5 and Total Suspended Solids shall be considered to be limits of quantitation

- For the purposes of reporting a calculated result, average or a mass discharge value, the permittee may substitute a 0 (zero) for any pollutant concentration that is less than the limit of detection. However, if the effluent limitation is less than the limit of detection, the department may substitute a value other than zero for results less than the limit of detection, after considering the number of monitoring results that are greater than the limit of detection and if warranted when applying appropriate statistical techniques.

5.1.5 Compliance Maintenance Annual Reports

Compliance Maintenance Annual Reports (CMAR) shall be completed using information obtained over each calendar year regarding the wastewater conveyance and treatment system. The CMAR shall be submitted and certified by the permittee in accordance with ch. NR 208, Wis. Adm. Code, by June 30, each year on an electronic report form provided by the Department.

In the case of a publicly owned treatment works, a resolution shall be passed by the governing body and submitted as part of the CMAR, verifying its review of the report and providing responses as required. Private owners of wastewater treatment works are not required to pass a resolution; but they must provide an Owner Statement and responses as required, as part of the CMAR submittal.

The CMAR shall be certified electronically by a responsible executive or municipal officer, manager, partner or proprietor as specified in s. 283.37(3), Wis. Stats., or a duly authorized representative of the officer, manager, partner or proprietor that has been delegated signature authority pursuant to s. NR 205.07(1)(g)2, Wis. Adm. Code. The certification verifies that the electronic report is true, accurate and complete.

5.1.6 Records Retention

The permittee shall retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings or electronic data records for continuous monitoring instrumentation, copies of all reports required by the permit, and records of all data used to complete the application for the permit for a period of at least 3 years from the date of the sample, measurement, report or application. All pertinent sludge information, including permit application information and other documents specified in this permit or s. NR 204.06(9), Wis. Adm. Code shall be retained for a minimum of 5 years.

5.1.7 Other Information

Where the permittee becomes aware that it failed to submit any relevant facts in a permit application or submitted incorrect information in a permit application or in any report to the Department, it shall promptly submit such facts or correct information to the Department.

5.1.8 Reporting Requirements – Alterations or Additions

The permittee shall give notice to the Department as soon as possible of any planned physical alterations or additions to the permitted facility. Notice is only required when:

- The alteration or addition to the permitted facility may meet one of the criteria for determining whether a facility is a new source.
- The alteration or addition could significantly change the nature or increase the quantity of pollutants discharged. This notification requirement applies to pollutants which are not subject to effluent limitations in the existing permit.
- The alteration or addition results in a significant change in the permittee's sludge use or disposal practices, and such alteration, addition, or change may justify the application of permit conditions that are different from or absent in the existing permit, including notification of additional use of disposal sites not reported during the permit application process nor reported pursuant to an approved land application plan. Additional sites may not be used for the land application of sludge until department approval is received.

5.2 System Operating Requirements

5.2.1 Noncompliance Reporting

Sanitary sewer overflows and sewage treatment facility overflows shall be reported according to the 'Sanitary Sewer Overflows and Sewage Treatment Facility Overflows' section of this permit.

The permittee shall report the following types of noncompliance by a telephone call to the Department's regional office within 24 hours after becoming aware of the noncompliance:

- any noncompliance which may endanger health or the environment;
- any violation of an effluent limitation resulting from a bypass;
- any violation of an effluent limitation resulting from an upset; and
- any violation of a maximum discharge limitation for any of the pollutants listed by the Department in the permit, either for effluent or sludge.

A written report describing the noncompliance shall also be submitted to the Department's regional office within 5 days after the permittee becomes aware of the noncompliance. On a case-by-case basis, the Department may waive the requirement for submittal of a written report within 5 days and instruct the permittee to submit the written report with the next regularly scheduled monitoring report. In either case, the written report shall contain a description of the noncompliance and its cause; the period of noncompliance, including exact dates and times; the steps taken or planned to reduce, eliminate and prevent reoccurrence of the noncompliance; and if the noncompliance has not been corrected, the length of time it is expected to continue.

A scheduled bypass approved by the Department under the 'Scheduled Bypass' section of this permit shall not be subject to the reporting required under this section.

NOTE: Section 292.11(2)(a), Wisconsin Statutes, requires any person who possesses or controls a hazardous substance or who causes the discharge of a hazardous substance to notify the Department of Natural Resources **immediately** of any discharge not authorized by the permit. **The discharge of a hazardous substance that is not authorized by this permit or that violates this permit may be a hazardous substance spill. To report a hazardous substance spill, call DNR's 24-hour HOTLINE at 1-800-943-0003.**

5.2.2 Flow Meters

Flow meters shall be calibrated annually, as per s. NR 218.06, Wis. Adm. Code.

5.2.3 Raw Grit and Screenings

All raw grit and screenings shall be disposed of at a properly licensed solid waste facility or picked up by a licensed waste hauler. If the facility or hauler are located in Wisconsin, then they shall be licensed under chs. NR 500-555, Wis. Adm. Code.

5.2.4 Sludge Management

All sludge management activities shall be conducted in compliance with ch. NR 204 "Domestic Sewage Sludge Management", Wis. Adm. Code.

5.2.5 Prohibited Wastes

Under no circumstances may the introduction of wastes prohibited by s. NR 211.10, Wis. Adm. Code, be allowed into the waste treatment system. Prohibited wastes include those:

- which create a fire or explosion hazard in the treatment work;
- which will cause corrosive structural damage to the treatment work;
- solid or viscous substances in amounts which cause obstructions to the flow in sewers or interference with the proper operation of the treatment work;
- wastewaters at a flow rate or pollutant loading which are excessive over relatively short time periods so as to cause a loss of treatment efficiency; and
- changes in discharge volume or composition from contributing industries which overload the treatment works or cause a loss of treatment efficiency.

5.2.6 Bypass

This condition applies only to bypassing at a sewage treatment facility that is not a scheduled bypass, approved blending as a specific condition of this permit, a sewage treatment facility overflow or a controlled diversion as provided in the sections titled 'Scheduled Bypass', 'Blending' (if approved), 'SSO's and Sewage Treatment Facility Overflows' and 'Controlled Diversions' of this permit. Any other bypass at the sewage treatment facility is prohibited and the Department may take enforcement action against a permittee for such occurrences under s. 283.89, Wis. Stats. The Department may approve a bypass if the permittee demonstrates all the following conditions apply:

- The bypass was unavoidable to prevent loss of life, personal injury, or severe property damage;
- There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities or adequate back-up equipment, retention of untreated wastes, reduction of inflow and infiltration, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass which occurred during normal periods of equipment downtime or preventative maintenance. When evaluating feasibility of alternatives, the department may consider factors such as technical achievability, costs and affordability of implementation and risks to public health, the environment and, where the permittee is a municipality, the welfare of the community served; and
- The bypass was reported in accordance with the Noncompliance Reporting section of this permit.

5.2.7 Scheduled Bypass

Whenever the permittee anticipates the need to bypass for purposes of efficient operations and maintenance and the permittee may not meet the conditions for controlled diversions in the 'Controlled Diversions' section of this permit,

the permittee shall obtain prior written approval from the Department for the scheduled bypass. A permittee's written request for Department approval of a scheduled bypass shall demonstrate that the conditions for bypassing specified in the above section titled 'Bypass' are met and include the proposed date and reason for the bypass, estimated volume and duration of the bypass, alternatives to bypassing and measures to mitigate environmental harm caused by the bypass. The department may require the permittee to provide public notification for a scheduled bypass if it is determined there is significant public interest in the proposed action and may recommend mitigation measures to minimize the impact of such bypass.

5.2.8 Controlled Diversions

Controlled diversions are allowed only when necessary for essential maintenance to assure efficient operation. Sewage treatment facilities that have multiple treatment units to treat variable or seasonal loading conditions may shut down redundant treatment units when necessary for efficient operation. The following requirements shall be met during controlled diversions:

- Effluent from the sewage treatment facility shall meet the effluent limitations established in the permit. Wastewater that is diverted around a treatment unit or treatment process during a controlled diversion shall be recombined with wastewater that is not diverted prior to the effluent sampling location and prior to effluent discharge;
- A controlled diversion does not include blending as defined in s. NR 210.03(2e), Wis. Adm. Code, and as may only be approved under s. NR 210.12. A controlled diversion may not occur during periods of excessive flow or other abnormal wastewater characteristics;
- A controlled diversion may not result in a wastewater treatment facility overflow; and
- All instances of controlled diversions shall be documented in sewage treatment facility records and such records shall be available to the department on request.

5.2.9 Blending

The Department has determined that blending as defined in s. NR 210.03(2e), Wis. Adm. Code, may occur at this sewage treatment facility. The following requirements shall apply whenever blending operations are in effect:

- Blending may occur temporarily only during wet weather or other high flow conditions when peak wastewater flow to the sewage treatment facility exceeds the maximum design and operating capacity of the biological treatment processes and when necessary to avoid severe property damage to the sewage treatment facility as described in NR 210.12 (2) (a), Wis. Adm. Code.;
- Untreated, or partially treated wastewater that is routed around the biological treatment process, or a portion of a biological treatment process, shall be recombined with the biologically treated wastewater and the combined flow shall be disinfected, if required by this permit, prior to discharge;
- Effluent from the sewage treatment facility shall be monitored to include all wastewater that is discharged from the facility, including those wastewaters that are diverted around the biological treatment process and shall meet the effluent limitations for Outfall 001 included in this permit; and
- Blending under this section and the circumstances that lead to blending shall be reported to the Department by telephone, fax or email no later than 24 hours from the time each blending operation ceases at the sewage treatment facility. Permittees shall also report the time, duration and volume of wastewater routed around the biological treatment process on the wastewater Discharge Monitoring Report (DMR) forms.

5.2.10 Proper Operation and Maintenance

The permittee shall at all times properly operate and maintain all facilities and systems of treatment and control which are installed or used by the permittee to achieve compliance with the conditions of this permit. Proper operation and maintenance includes effective performance, adequate funding, adequate operator staffing and training as required in ch. NR 114, Wis. Adm. Code, and adequate laboratory and process controls, including appropriate quality assurance

procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems only when necessary to achieve compliance with the conditions of the permit.

5.2.11 Operator Certification

The wastewater treatment facility shall be under the direct supervision of a state certified operator. In accordance with s. NR 114.53, Wis. Adm. Code, every WPDES permitted treatment plant shall have a designated operator-in-charge holding a current and valid certificate. The designated operator-in-charge shall be certified at the level and in all subclasses of the treatment plant, except laboratory. Treatment plant owners shall notify the department of any changes in the operator-in-charge within 30 days. Note that s. NR 114.52(22), Wis. Adm. Code, lists types of facilities that are excluded from operator certification requirements (i.e. private sewage systems, pretreatment facilities discharging to public sewers, industrial wastewater treatment that consists solely of land disposal, agricultural digesters and concentrated aquatic production facilities with no biological treatment).

5.3 Sewage Collection Systems

5.3.1 Sanitary Sewage Overflows and Sewage Treatment Facility Overflows

5.3.1.1 Overflows Prohibited

Any overflow or discharge of wastewater from the sewage collection system or at the sewage treatment facility, other than from permitted outfalls, is prohibited. The permittee shall provide information on whether any of the following conditions existed when an overflow occurred:

- The sanitary sewer overflow or sewage treatment facility overflow was unavoidable to prevent loss of life, personal injury or severe property damage;
- There were no feasible alternatives to the sanitary sewer overflow or sewage treatment facility overflow such as the use of auxiliary treatment facilities or adequate back-up equipment, retention of untreated wastes, reduction of inflow and infiltration, or preventative maintenance activities;
- The sanitary sewer overflow or the sewage treatment facility overflow was caused by unusual or severe weather related conditions such as large or successive precipitation events, snowmelt, saturated soil conditions, or severe weather occurring in the area served by the sewage collection system or sewage treatment facility; and
- The sanitary sewer overflow or the sewage treatment facility overflow was unintentional, temporary, and caused by an accident or other factors beyond the reasonable control of the permittee.

5.3.1.2 Permittee Response to Overflows

Whenever a sanitary sewer overflow or sewage treatment facility overflow occurs, the permittee shall take all feasible steps to control or limit the volume of untreated or partially treated wastewater discharged, and terminate the discharge as soon as practicable. Remedial actions, including those in NR 210.21 (3), Wis. Adm. Code, shall be implemented consistent with an emergency response plan developed under the CMOM program.

5.3.1.3 Permittee Reporting

Permittees shall report all sanitary sewer overflows and sewage treatment overflows as follows:

- The permittee shall notify the department by telephone, fax or email as soon as practicable, but no later than 24 hours from the time the permittee becomes aware of the overflow;
- The permittee shall, no later than five days from the time the permittee becomes aware of the overflow, provide to the department the information identified in this paragraph using department form number 3400-184. If an overflow lasts for more than five days, an initial report shall be submitted within 5 days as required in this paragraph and an updated report submitted following cessation of the overflow. At a minimum, the following information shall be included in the report:

◦The date and location of the overflow;
◦The surface water to which the discharge occurred, if any;
◦The duration of the overflow and an estimate of the volume of the overflow;
◦A description of the sewer system or treatment facility component from which the discharge occurred such as manhole, lift station, constructed overflow pipe, or crack or other opening in a pipe;
◦The estimated date and time when the overflow began and stopped or will be stopped;
◦The cause or suspected cause of the overflow including, if appropriate, precipitation, runoff conditions, areas of flooding, soil moisture and other relevant information;
◦Steps taken or planned to reduce, eliminate and prevent reoccurrence of the overflow and a schedule of major milestones for those steps;
◦A description of the actual or potential for human exposure and contact with the wastewater from the overflow;
◦Steps taken or planned to mitigate the impacts of the overflow and a schedule of major milestones for those steps;
◦To the extent known at the time of reporting, the number and location of building backups caused by excessive flow or other hydraulic constraints in the sewage collection system that occurred concurrently with the sanitary sewer overflow and that were within the same area of the sewage collection system as the sanitary sewer overflow; and
◦The reason the overflow occurred or explanation of other contributing circumstances that resulted in the overflow event. This includes any information available including whether the overflow was unavoidable to prevent loss of life, personal injury, or severe property damage and whether there were feasible alternatives to the overflow.

NOTE: A copy of form 3400-184 for reporting sanitary sewer overflows and sewage treatment facility overflows may be obtained from the department or accessed on the department's web site at http://dnr.wi.gov/topic/wastewater/SSOreport.html. As indicated on the form, additional information may be submitted to supplement the information required by the form.

- The permittee shall identify each specific location and each day on which a sanitary sewer overflow or sewage treatment facility overflow occurs as a discrete sanitary sewer overflow or sewage treatment facility overflow occurrence. An occurrence may be more than one day if the circumstances causing the sanitary sewer overflow or sewage treatment facility overflow results in a discharge duration of greater than 24 hours. If there is a stop and restart of the overflow at the same location within 24 hours and the overflow is caused by the same circumstance, it may be reported as one occurrence. Sanitary sewer overflow occurrences at a specific location that are separated by more than 24 hours shall be reported as separate occurrences; and
- A permittee that is required to submit wastewater discharge monitoring reports under NR 205.07 (1) (r) shall also report all sanitary sewer overflows and sewage treatment facility overflows on that report.

5.3.1.4 Public Notification

The permittee shall notify the public of any sanitary sewer and sewage treatment facility overflows consistent with its emergency response plan required under the CMOM (Capacity, Management, Operation and Maintenance) section of this permit and s. NR 210.23 (4) (f), Wis. Adm. Code. Such public notification shall occur promptly following any overflow event using the most effective and efficient communications available in the community. At minimum, a daily newspaper of general circulation in the county(s) and municipality whose waters may be affected by the overflow shall be notified by written or electronic communication.

5.3.2 Capacity, Management, Operation and Maintenance (CMOM) Program

- The permittee shall have written documentation of the Capacity, Management, Operation and Maintenance (CMOM) program components in accordance with s. NR 210.23(4), Wis. Adm. Code. Such documentation shall be available for Department review upon request. The Department may request that the permittee provide this documentation or prepare a summary of the permittee's CMOM program at the time of application for reissuance of the WPDES permit.
- The permittee shall implement a CMOM program in accordance with s. NR 210.23, Wis. Adm. Code.
- The permittee shall at least annually conduct a self-audit of activities conducted under the permittee's CMOM program to ensure CMOM components are being implemented as necessary to meet the general standards of s. NR 210.23(3), Wis. Adm. Code.

5.3.3 Sewer Cleaning Debris and Materials

All debris and material removed from cleaning sanitary sewers shall be managed to prevent nuisances, run-off, ground infiltration or prohibited discharges.

- Debris and solid waste shall be dewatered, dried and then disposed of at a licensed solid waste facility.
- Liquid waste from the cleaning and dewatering operations shall be collected and disposed of at a permitted wastewater treatment facility.
- Combination waste including liquid waste along with debris and solid waste may be disposed of at a licensed solid waste facility or wastewater treatment facility willing to accept the waste.

5.4 Surface Water Requirements

5.4.1 Permittee-Determined Limit of Quantitation Incorporated into this Permit

For pollutants with water quality-based effluent limits below the Limit of Quantitation (LOQ) in this permit, the LOQ calculated by the permittee and reported on the Discharge Monitoring Reports (DMRs) is incorporated by reference into this permit. The LOQ shall be reported on the DMRs, shall be the lowest quantifiable level practicable, and shall be no greater than the minimum level (ML) specified in or approved under 40 CFR Part 136 for the pollutant at the time this permit was issued, unless this permit specifies a higher LOQ.

5.4.2 Appropriate Formulas for Effluent Calculations

The permittee shall use the following formulas for calculating effluent results to determine compliance with average concentration limits and mass limits and total load limits:

Weekly/Monthly/Six-Month/Annual Average Concentration = the sum of all daily results for that week/month/six-month/year, divided by the number of results during that time period. [Note: When a six-month average effluent limit is specified for Total Phosphorus the applicable periods are May through October and November through April.]

Weekly Average Mass Discharge (lbs/day): Daily mass = daily concentration (mg/L) x daily flow (MGD) x 8.34, then average the daily mass values for the week.

Monthly Average Mass Discharge (lbs/day): Daily mass = daily concentration (mg/L) x daily flow (MGD) x 8.34, then average the daily mass values for the month.

Six-Month Average Mass Discharge (lbs/day): Daily mass = daily concentration (mg/L) x daily flow (MGD) x 8.34, then average the daily mass values for the six-month period. [Note: When a six-month average effluent limit is specified for Total Phosphorus the applicable periods are May through October and November through April.]

Annual Average Mass Discharge (lbs/day): Daily mass = daily concentration (mg/L) x daily flow (MGD) x 8.34, then average the daily mass values for the entire year.

Total Monthly Discharge: = monthly average concentration (mg/L) x total flow for the month (MG/month) x 8.34.

Total Annual Discharge: = sum of total monthly discharges for the calendar year.

12-Month Rolling Sum of Total Monthly Discharge: = the sum of the most recent 12 consecutive months of Total Monthly Discharges.

5.4.3 Effluent Temperature Requirements

Weekly Average Temperature – The permittee shall use the following formula for calculating effluent results to determine compliance with the weekly average temperature limit (as applicable): Weekly Average Temperature = the sum of all daily maximum results for that week divided by the number of daily maximum results during that time period.

Cold Shock Standard – Water temperatures of the discharge shall be controlled in a manner as to protect fish and aquatic life uses from the deleterious effects of cold shock. 'Cold Shock' means exposure of aquatic organisms to a rapid decrease in temperature and a sustained exposure to low temperature that induces abnormal behavior or physiological performance and may lead to death.

Rate of Temperature Change Standard – Temperature of a water of the state or discharge to a water of the state may not be artificially raised or lowered at such a rate that it causes detrimental health or reproductive effects to fish or aquatic life of the water of the state.

5.4.4 Visible Foam or Floating Solids

There shall be no discharge of floating solids or visible foam in other than trace amounts.

5.4.5 Surface Water Uses and Criteria

In accordance with NR 102.04, Wis. Adm. Code, surface water uses and criteria are established to govern water management decisions. Practices attributable to municipal, industrial, commercial, domestic, agricultural, land development or other activities shall be controlled so that all surface waters including the mixing zone meet the following conditions at all times and under all flow and water level conditions:

a) Substances that will cause objectionable deposits on the shore or in the bed of a body of water, shall not be present in such amounts as to interfere with public rights in waters of the state.

b) Floating or submerged debris, oil, scum or other material shall not be present in such amounts as to interfere with public rights in waters of the state.

c) Materials producing color, odor, taste or unsightliness shall not be present in such amounts as to interfere with public rights in waters of the state.

d) Substances in concentrations or in combinations which are toxic or harmful to humans shall not be present in amounts found to be of public health significance, nor shall substances be present in amounts which are acutely harmful to animal, plant or aquatic life.

5.4.6 Percent Removal

During any 30 consecutive days, the average effluent concentrations of BOD_5 and of total suspended solids shall not exceed 15% of the average influent concentrations, respectively. This requirement does not apply to removal of total suspended solids if the permittee operates a lagoon system and has received a variance for suspended solids granted under NR 210.07(2), Wis. Adm. Code.

5.4.7 Fecal Coliforms

The weekly and monthly limit(s) for fecal coliforms shall be expressed as a geometric mean.

5.4.8 Year Round Disinfection

Disinfection shall be provided year round. Monitoring requirements and the limitation for fecal coliforms apply during the period in which disinfection is required. Whenever chlorine is used for disinfection or other effluent uses, the limitations and monitoring requirements for residual chlorine shall apply. A dechlorination process shall be in operation whenever chlorine is used for disinfection or other effluent uses.

5.4.9 Whole Effluent Toxicity (WET) Monitoring Requirements

In order to determine the potential impact of the discharge on aquatic organisms, static-renewal toxicity tests shall be performed on the effluent in accordance with the procedures specified in the *"State of Wisconsin Aquatic Life Toxicity Testing Methods Manual, 2nd Edition" (PUB-WT-797*, November 2004) as required by NR 219.04, Table A, Wis. Adm. Code). All of the WET tests required in this permit, including any required retests, shall be conducted on the *Ceriodaphnia dubia* and fathead minnow species. Receiving water samples shall not be collected from any point in contact with the permittee's mixing zone and every attempt shall be made to avoid contact with any other discharge's mixing zone.

5.4.10 Whole Effluent Toxicity (WET) Identification and Reduction

Within 60 days of a retest which showed positive results, the permittee shall submit a written report to the Biomonitoring Coordinator, Bureau of Water Quality, 101 S. Webster St., PO Box 7921, Madison, WI 53707-7921, which details the following:

- A description of actions the permittee has taken or will take to remove toxicity and to prevent the recurrence of toxicity;

- A description of toxicity reduction evaluation (TRE) investigations that have been or will be done to identify potential sources of toxicity, including some or all of the following actions:

  (a) Evaluate the performance of the treatment system to identify deficiencies contributing to effluent toxicity (e.g., operational problems, chemical additives, incomplete treatment)
  (b) Identify the compound(s) causing toxicity
  (c) Trace the compound(s) causing toxicity to their sources (e.g., industrial, commercial, domestic)
  (d) Evaluate, select, and implement methods or technologies to control effluent toxicity (e.g., in-plant or pretreatment controls, source reduction or removal)

- Where corrective actions including a TRE have not been completed, an expeditious schedule under which corrective actions will be implemented;

- If no actions have been taken, the reason for not taking action.

The permittee may also request approval from the Department to postpone additional retests in order to investigate the source(s) of toxicity. Postponed retests must be completed after toxicity is believed to have been removed.

5.4.11 Reopener Clause

Pursuant to s. 283.15(11), Wis. Stat. and 40 CFR 131.20, the Department may modify or revoke and reissue this permit if, through the triennial standard review process, the Department determines that the terms and conditions of this permit need to be updated to reflect the highest attainable condition of the receiving water.

5.5 Land Application Requirements

5.5.1 Sludge Management Program Standards And Requirements Based Upon Federally Promulgated Regulations

In the event that new federal sludge standards or regulations are promulgated, the permittee shall comply with the new sludge requirements by the dates established in the regulations, if required by federal law, even if the permit has not yet been modified to incorporate the new federal regulations.

5.5.2 General Sludge Management Information

The General Sludge Management Form 3400-48 shall be completed and submitted prior to any significant sludge management changes.

5.5.3 Sludge Samples

All sludge samples shall be collected at a point and in a manner which will yield sample results which are representative of the sludge being tested, and collected at the time which is appropriate for the specific test.

5.5.4 Land Application Characteristic Report

Each report shall consist of a Characteristic Form 3400-49 and Lab Report. The Characteristic Report Form 3400-49 shall be submitted electronically by January 31 following each year of analysis.

Following submittal of the electronic Characteristic Report Form 3400-49, this form shall be certified electronically via the 'eReport Certify' page by a responsible executive or municipal officer, manager, partner or proprietor as specified in s. 283.37(3), Wis. Stats., or a duly authorized representative of the officer, manager, partner or proprietor that has been delegated signature authority pursuant to s. NR 205.07(1)(g)2, Wis. Adm. Code. The 'eReport Certify' page certifies that the electronic report is true, accurate and complete. The Lab Report must be sent directly to the facility's DNR sludge representative or basin engineer unless approval for not submitting the lab reports has been given.

The permittee shall use the following convention when reporting sludge monitoring results: Pollutant concentrations less than the limit of detection shall be reported as < (less than) the value of the limit of detection. For example, if a substance is not detected at a detection limit of 1.0 mg/kg, report the pollutant concentration as < 1.0 mg/kg .

All results shall be reported on a dry weight basis.

5.5.5 Calculation of Water Extractable Phosphorus

When sludge analysis for Water Extractable Phosphorus is required by this permit, the permittee shall use the following formula to calculate and report Water Extractable Phosphorus:
Water Extractable Phosphorus (% of Total P) =
[Water Extractable Phosphorus (mg/kg, dry wt) ÷ Total Phosphorus (mg/kg, dry wt)] x 100

5.5.6 Monitoring and Calculating PCB Concentrations in Sludge

When sludge analysis for "PCB, Total Dry Wt" is required by this permit, the PCB concentration in the sludge shall be determined as follows.

Either congener-specific analysis or Aroclor analysis shall be used to determine the PCB concentration. The permittee may determine whether Aroclor or congener specific analysis is performed. Analyses shall be performed in accordance with the following provisions and Table EM in s. NR 219.04, Wis. Adm. Code.

- EPA Method 1668 may be used to test for all PCB congeners. If this method is employed, all PCB congeners shall be delineated. Non-detects shall be treated as zero. The values that are between the limit of detection and the limit of quantitation shall be used when calculating the total value of all congeners. All results shall be added together and the total PCB concentration by dry weight reported. **Note**: It is

recognized that a number of the congeners will co-elute with others, so there will not be 209 results to sum.

- EPA Method 8082A shall be used for PCB-Aroclor analysis and may be used for congener specific analysis as well. If congener specific analysis is performed using Method 8082A, the list of congeners tested shall include at least congener numbers 5, 18, 31, 44, 52, 66, 87, 101, 110, 138, 141, 151, 153, 170, 180, 183, 187, and 206 plus any other additional congeners which might be reasonably expected to occur in the particular sample. For either type of analysis, the sample shall be extracted using the Soxhlet extraction (EPA Method 3540C) (or the Soxhlet Dean-Stark modification) or the pressurized fluid extraction (EPA Method 3545A). If Aroclor analysis is performed using Method 8082A, clean up steps of the extract shall be performed as necessary to remove interference and to achieve as close to a limit of detection of 0.11 mg/kg as possible. Reporting protocol, consistent with s. NR 106.07(6)(e), should be as follows: If all Aroclors are less than the LOD, then the Total PCB Dry Wt result should be reported as less than the highest LOD. If a single Aroclor is detected then that is what should be reported for the Total PCB result. If multiple Aroclors are detected, they should be summed and reported as Total PCBs. If congener specific analysis is done using Method 8082A, clean up steps of the extract shall be performed as necessary to remove interference and to achieve as close to a limit of detection of 0.003 mg/kg as possible for each congener. If the aforementioned limits of detection cannot be achieved after using the appropriate clean up techniques, a reporting limit that is achievable for the Aroclors or each congener for the sample shall be determined. This reporting limit shall be reported and qualified indicating the presence of an interference. The lab conducting the analysis shall perform as many of the following methods as necessary to remove interference:

3620C – Florisil	3611B - Alumina
3640A - Gel Permeation	3660B - Sulfur Clean Up (using copper shot instead of powder)
3630C - Silica Gel	3665A - Sulfuric Acid Clean Up

5.5.7 Annual Land Application Report

Land Application Report Form 3400-55 shall be submitted electronically by January 31, each year whether or not non-exceptional quality sludge is land applied. Non-exceptional quality sludge is defined in s. NR 204.07(4), Wis. Adm. Code. Following submittal of the electronic Annual Land Application Report Form 3400-55, this form shall be certified electronically via the 'eReport Certify' page by a responsible executive or municipal officer, manager, partner or proprietor as specified in s. 283.37(3), Wis. Stats., or a duly authorized representative of the officer, manager, partner or proprietor that has been delegated signature authority pursuant to s. NR 205.07(1)(g)2, Wis. Adm. Code. The 'eReport Certify' page certifies that the electronic report form is true, accurate and complete.

5.5.8 Other Methods of Disposal or Distribution Report

The permittee shall submit electronically the Other Methods of Disposal or Distribution Report Form 3400-52 by January 31, each year whether or not sludge is hauled, landfilled, incinerated, or exceptional quality sludge is distributed or land applied. Following submittal of the electronic Report Form 3400-52, this form shall be certified electronically via the 'eReport Certify' page by a responsible executive or municipal officer, manager, partner or proprietor as specified in s. 283.37(3), Wis. Stats., or a duly authorized representative of the officer, manager, partner or proprietor that has been delegated signature authority pursuant to s. NR 205.07(1)(g)2, Wis. Adm. Code. The 'eReport Certify' page certifies that the electronic report form is true, accurate and complete.

5.5.9 Approval to Land Apply

Bulk non-exceptional quality sludge as defined in s. NR 204.07(4), Wis. Adm. Code, may not be applied to land without a written approval letter or Form 3400-122 from the Department unless the Permittee has obtained permission from the Department to self approve sites in accordance with s. NR 204.06 (6), Wis. Adm. Code. Analysis of sludge

characteristics is required prior to land application. Application on frozen or snow covered ground is restricted to the extent specified in s. NR 204.07(3) (l), Wis. Adm. Code.

5.5.10 Soil Analysis Requirements

Each site requested for approval for land application must have the soil tested prior to use. Each approved site used for land application must subsequently be soil tested such that there is at least one valid soil test in the four years prior to land application. All soil sampling and submittal of information to the testing laboratory shall be done in accordance with UW Extension Bulletin A-2100. The testing shall be done by the UW Soils Lab in Madison or Marshfield, WI or at a lab approved by UW. The test results including the crop recommendations shall be submitted to the DNR contact listed for this permit, as they are available. Application rates shall be determined based on the crop nitrogen recommendations and with consideration for other sources of nitrogen applied to the site.

5.5.11 Land Application Site Evaluation

For non-exceptional quality sludge, as defined in s. NR 204.07(4), Wis. Adm. Code, a Land Application Site Request Form 3400-053 shall be submitted to the Department for the proposed land application site. The Department will evaluate the proposed site for acceptability and will either approve or deny use of the proposed site. The permittee may obtain permission to approve their own sites in accordance with s. NR 204.06(6), Wis. Adm. Code.

5.5.12 Class B Sludge: Fecal Coliform Limitation

Compliance with the fecal coliform limitation for Class B sludge shall be demonstrated by calculating the geometric mean of at least 7 separate samples. (Note that a Total Solids analysis must be done on each sample). The geometric mean shall be less than 2,000,000 MPN or CFU/g TS. Calculation of the geometric mean can be done using one of the following 2 methods.

Method 1:

Geometric Mean = $(X_1 \times X_2 \times X_3 \ldots \times X_n)^{1/n}$

Where X = Coliform Density value of the sludge sample, and where n = number of samples (at least 7)

Method 2:

Geometric Mean = $\text{antilog}[(X_1 + X_2 + X_3 \ldots + X_n) \div n]$

Where X = $\log_{10}$ of Coliform Density value of the sludge sample, and where n = number of samples (at least 7)

Example for Method 2

Sample Number	Coliform Density of Sludge Sample	$\log_{10}$
1	6.0×10^5	5.78
2	4.2×10^6	6.62
3	1.6×10^6	6.20
4	9.0×10^5	5.95
5	4.0×10^5	5.60
6	1.0×10^6	6.00
7	5.1×10^5	5.71

The geometric mean for the seven samples is determined by averaging the $\log_{10}$ values of the coliform density and taking the antilog of that value.

$(5.78 + 6.62 + 6.20 + 5.95 + 5.60 + 6.00 + 5.71) \div 7 = 5.98$

The antilog of $5.98 = 9.5 \times 10^5$

5.5.13 Vector Control: Volatile Solids Reduction

The mass of volatile solids in the sludge shall be reduced by a minimum of 38% between the time the sludge enters the digestion process and the time it either exits the digester or a storage facility. For calculation of volatile solids reduction, the permittee shall use the Van Kleeck equation or one of the other methods described in "Determination of

Volatile Solids Reduction in Digestion" by J.B. Farrell, which is Appendix C of EPA's *Control of Pathogens in Municipal Wastewater Sludge* (EPA/625/R-92/013). The Van Kleeck equation is:

$$VSR\% = \frac{VS_{IN} - VS_{OUT}}{VS_{IN} - (VS_{OUT} \times VS_{IN})} \times 100$$

Where: VS_{IN} = Volatile Solids in Feed Sludge (g VS/g TS)

VS_{OUT} = Volatile Solids in Final Sludge (g VS/g TS)

VSR% = Volatile Solids Reduction, (Percent)

6 Summary of Reports Due

FOR INFORMATIONAL PURPOSES ONLY

Description	Date	Page
Phosphorus Schedule - Continued Optimization -Optimization	December 31, 2018	13
Phosphorus Schedule - Continued Optimization -Progress Report #2	December 31, 2019	13
Phosphorus Schedule - Continued Optimization -Progress Report #3	December 31, 2020	13
Phosphorus Schedule - Continued Optimization -Progress Report #4	December 31, 2021	13
Phosphorus Schedule - Continued Optimization -Progress Report #5	December 31, 2022	13
Phosphorus Payment per Pound to County -Annual Verification of Phosphorus Payment to County	March 1, 2019	13
Phosphorus Payment per Pound to County -Annual Verification of Payment #2	March 1, 2020	13
Phosphorus Payment per Pound to County -Annual Verification of Payment #3	March 1, 2021	13
Phosphorus Payment per Pound to County -Annual Verification of Payment #4	March 1, 2022	13
Phosphorus Payment per Pound to County -Annual Verification of Payment #5	March 1, 2023	13
Phosphorus Payment per Pound to County -Annual Verification of Payment After Permit Expiration	See Permit	13
Phosphorus Multi-Discharger Variance Interim Limit (0.8 mg/L) -Report on Effluent Discharges	June 30, 2018	14
Phosphorus Multi-Discharger Variance Interim Limit (0.8 mg/L) -Action Plan	September 30, 2018	14
Phosphorus Multi-Discharger Variance Interim Limit (0.8 mg/L) -Initiate Actions	December 31, 2018	14
Phosphorus Multi-Discharger Variance Interim Limit (0.8 mg/L) -Complete Actions	April 1, 2019	14
Compliance Maintenance Annual Reports (CMAR)	by June 30, each year	16
General Sludge Management Form 3400-48	prior to any significant sludge management changes	25
Characteristic Form 3400-49 and Lab Report	by January 31 following each year of analysis	25
Land Application Report Form 3400-55	by January 31, each year whether or not non-exceptional quality sludge is land	26

	applied	
Other Methods of Disposal or Distribution Report Form 3400-52	by January 31, each year whether or not sludge is hauled, landfilled, incinerated, or exceptional quality sludge is distributed or land applied	26
Wastewater Discharge Monitoring Report	no later than the date indicated on the form	15

Report forms shall be submitted electronically in accordance with the reporting requirements herein. Any facility plans or plans and specifications for municipal, industrial, industrial pretreatment and non industrial wastewater systems shall be submitted to the Bureau of Water Quality, P.O. Box 7921, Madison, WI 53707-7921. All other submittals required by this permit shall be submitted to:
West Central Region - LaCrosse, 3550 Mormon Coulee Road, La Crosse, WI 54601

State of Wisconsin
DEPARTMENT OF NATURAL RESOURCES
La Crosse Service Center
3550 Mormon Coulee Road
La Crosse WI 54601

Scott Walker, Governor
Cathy Stepp, Secretary
Telephone 608-266-2621
Toll Free 1-888-936-7463
TTY Access via relay - 711

February 28, 2017

Sarah Grainger, PE
Director of Public Works/Viroqua City Engineer
202 North Main Street
Viroqua, WI 54665

Subject: Water Quality Trading Notice of Intent Response Letter; WPDES Permit No. WI-0021920-09-1

Dear Ms. Grainger:

The Department received your Notice of Intent to Conduct Water Quality Trading (WQT) dated July 28, 2016. We understand that you propose to use streambank stabilization projects in Vernon County to generate total phosphorus water quality credits for the City of Viroqua. To proceed with WQT, you should submit a WQT plan and a WQT plan checklist. A copy of the checklist that can be completed electronically, and more information on the checklist and plan, can be found at http://dnr.wi.gov/topic/SurfaceWater/WaterQualityTrading.html under "Implementation."

If practices become effective prior to submitting the WQT plan, you should include management practice registrations with the plan. Otherwise practices should be registered as they become effective. A management practice registration form is available at the same website as the WQT plan checklist. It is recommended that the City of Viroqua work with Amanda Minks, WDNR's Statewide Water Quality Trading Coordinator, to ensure that practices are implemented in an appropriate geographic area for the City of Viroqua to utilize in a water quality trading program.

Please send the completed WQT plan and plan checklist to me and copies to Lacey Hillman, Ann Hirekatur and Amanda Minks. Lacey's email address is Lacey.Hillman@wisconsin.gov Ann's email address is Ann.Hirekatur@wisconsin.gov. and Amanda's is Amanda.Minks@wisconsin.gov. We are happy to continue to provide technical feedback as you continue to develop your water quality trading strategy.

If you have any questions or concerns regarding this matter, please call me at (608) 785-9981.

Sincerely,

Julia A. Stephenson
Wastewater Engineer
La Crosse Service Center

cc: System for Wastewater Applications, Monitoring and Permits (SWAMP) – (ecopy)

State of WisconsinDepartment of
Natural Resources101 South Webster
Street
Madison WI 53707-7921dnr.wi.gov

Water Quality Trading Checklist

Form 3400-208 (1/14)

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

Applicant Information

Permittee Name	Permit Number	Facility Site Number
City of Viroqua	WI- 0021920-10-0	

Facility Address	City	State	ZIP Code
1315 County Highway B	Viroqua	WI	54665

Project Contact Name (if applicable)	Address	City	State	ZIP Code

Project Name
Viroqua WWTF Water Quality Trading Plan

Receiving Water Name	Parameter(s) being traded	HUC 12(s)
Trib. to the Springville Branch	Phosphorus	070600010301

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: Streambank Restoration

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	Streambank Restoration	NRCS's Streambank Erosion Estimator	Stueland Water Quality Trade Agreement No. 1	◯ Yes ◯ No ◉ Only in part
◯ Urban NPS ◯ Agricultural NPS ◉ Other	Streambank Restoration	NRCS's Streambank Erosion Estimator	N/A - Stream Bank is adjacent to the WWTF	◯ 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	*4.1 and 4.2*
b. Management practices used to generate credits	◉ Yes	◯ No	*4.1 and 4.2*
c. Amount of credit being generated	◉ Yes	◯ No	*4.1 and 4.2*
d. Description of applicable trade ratio per agreement/management practice	◉ Yes	◯ No	*4.1 and 4.2*
e. Location where credits will be generated	◉ Yes	◯ No	*4.1 and 4.2*
f. Timeline for credits and agreements	◉ Yes	◯ No	*4.1 and 4.2*
g. Method for quantifying credits	◉ Yes	◯ No	*4.1 and 4.2*

Does plan have a narrative that describes:			Plan Section
h. Tracking procedures	◉ Yes	○ No	5.3
i. Conditions under which the management practices may be inspected	◉ Yes	○ No	5.3
j. Reporting requirements should the management practice fail	◉ Yes	○ No	5.4
k. Operation and maintenance plan for each management practice	◉ Yes	○ No	4.1 and 4.2
l. Location of credit generator in proximity to receiving water and credit user	◉ Yes	○ No	4.1 and 4.2
m. Practice registration documents, if available	◉ Yes	○ No	Appendix
n. History of project site(s)	◉ Yes	○ No	4.1 and 4.2
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
Billie C. Kershaw	5/20/22

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]	5/20/22

State of WisconsinDepartment of
Natural Resources101 South Webster
Street
Madison WI 53707-7921dnr.wi.gov

Notification of Water Trade Agreement Termination

Form 3400-209 (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 WI-	Facility Site Number

Facility Address	City	State	ZIP Code

Project Contact Name (if applicable)	Address	City	State	ZIP Code

Project Name

Credit Generator Information

Credit generator type (select all that apply):

- ☐ Permitted Discharge (non-MS4/CAFO)
- ☐ Permitted MS4
- ☐ Permitted CAFO
- ☐ Urban nonpoint source discharge
- ☐ Agricultural nonpoint source discharge
- ☐ Other - Specify:

Trade Agreement number(s) to be terminated including affected land parcel ID(s):

Amount of trading credit being terminated	Effective date of termination

Reason for termination

Is this agreement being updated or replaced?

- ◯ Yes
- ◯ No
- ◯ Unsure

Will this termination result in non-compliance with the effective limit or other permit requirements?

- ◯ Yes; Name: _____
- ◯ No
- ◯ Unsure

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

Authorized Representative Signature

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

Signature of Authorized Representative	Date Signed

Appendix B

Watershed Data

City of Viroqua WWTF HUC 12

Legend

- Surface Water Outfalls
- 12-digit HUCs (Subwatersheds)
- Municipality
- State Boundaries
- County Boundaries
- Major Roads
  - Interstate Highway
  - State Highway
  - US Highway
- County and Local Roads
  - County HWY
  - Local Road
- Railroads
- Tribal Lands
- Rivers and Streams
- Intermittent Streams
- Lakes and Open water

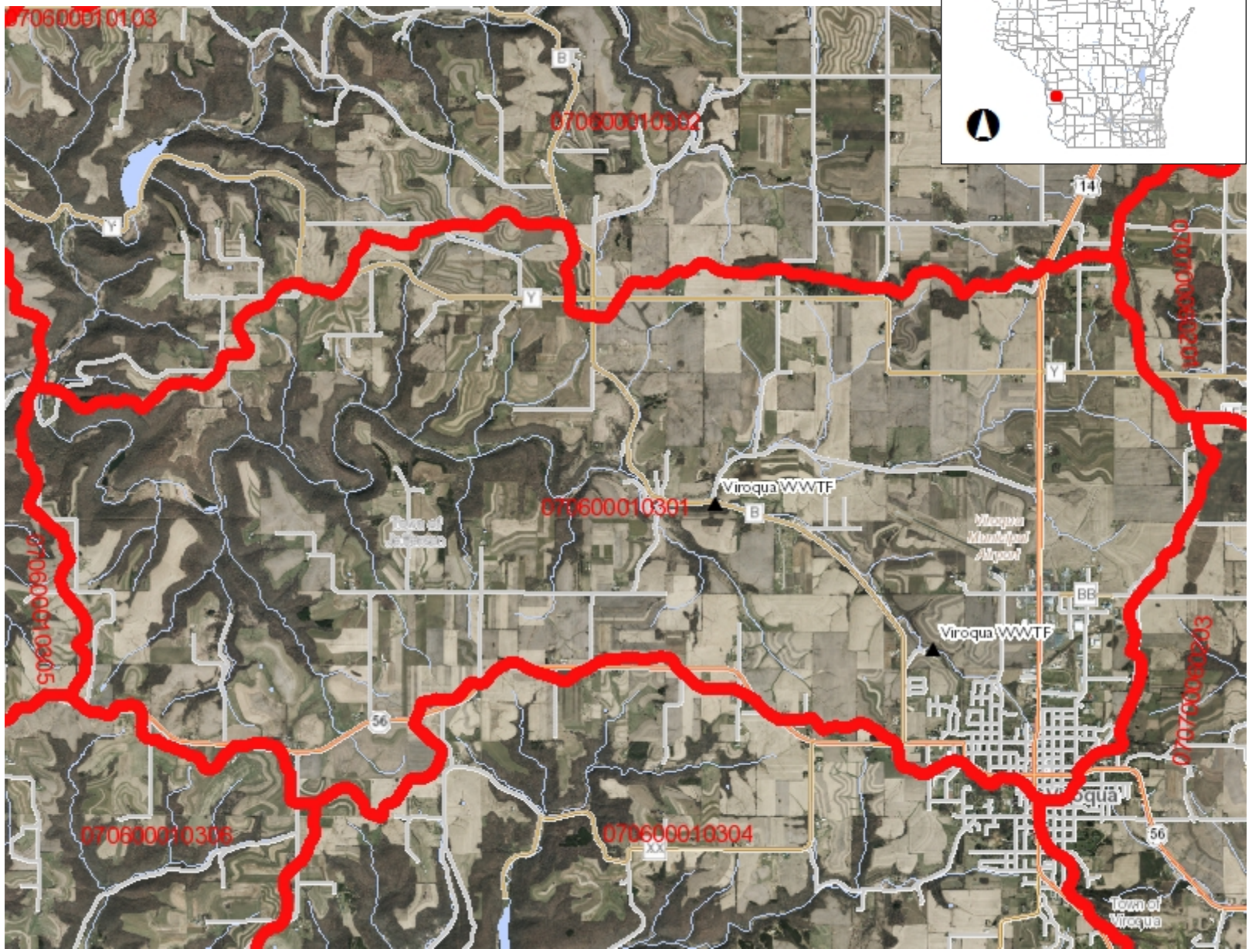
Notes

2.0 0 1.00 2.0 Miles

NAD_1983_HARN_Wisconsin_TM

1: 63,360

City of Viroqua WWTF HUC 12



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- Intermittent Streams
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- Index to EN_Image_Basemap_Leaf_Off

Notes

2.0 0 1.00 2.0 Miles

NAD_1983_HARN_Wisconsin_TM

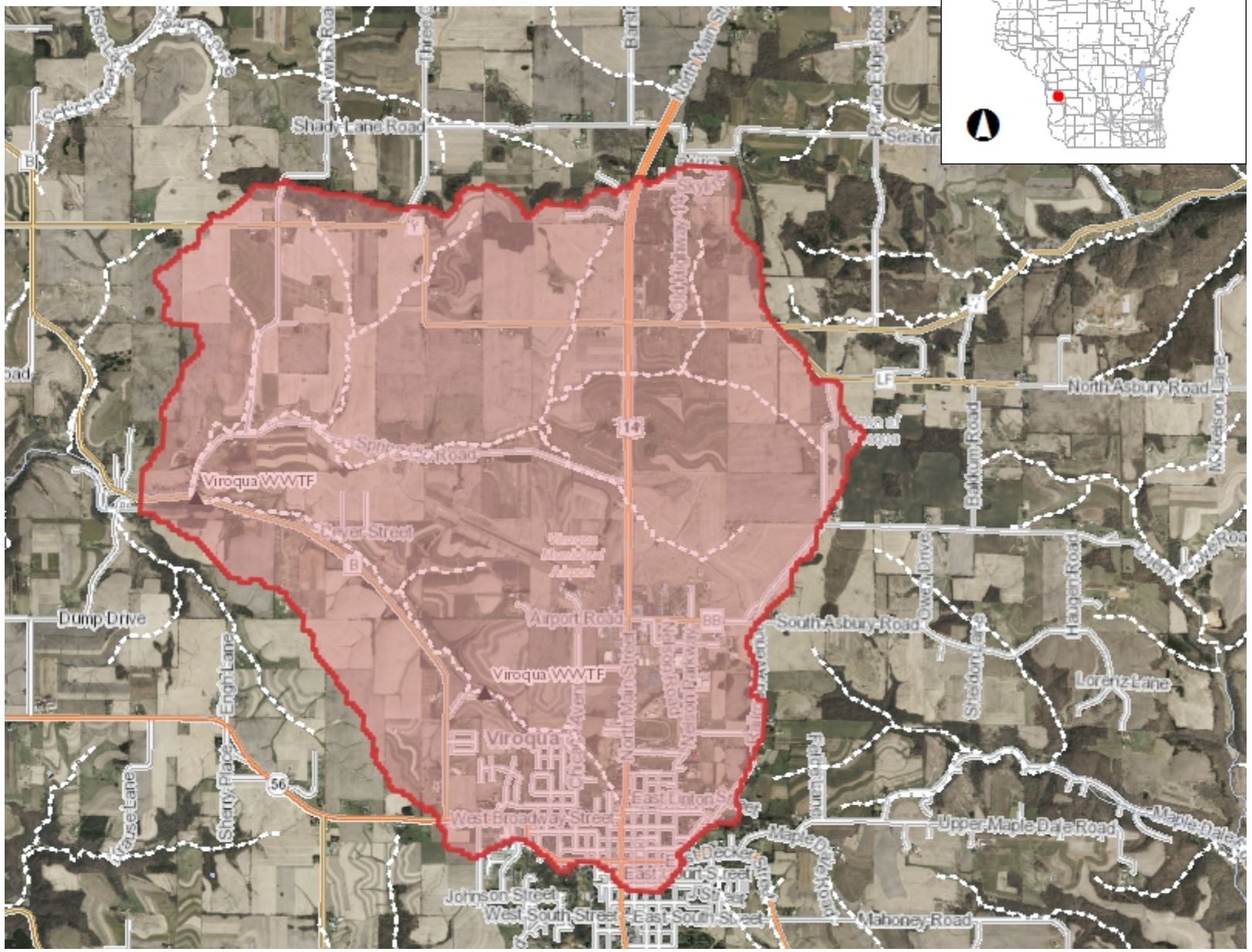
1: 63,360

Table -- Land Use in HUC-12 (070600010301) Watershed with Viroqua WWTF

Land Use	Soil Group	Area [acres]	Sub-Total [acres]	% of Watershed
Open Water	B	5.56	6	0.0%
Open Water	D	0.22		
Open Space/Park	B	497.27	498	3.5%
Open Space/Park	D	1.11		
Low-Density Residential (general 1/3 - 2 ac lots)	B	604.02	606	4.3%
Low-Density Residential (general 1/3 - 2 ac lots)	D	1.56		
High-density Residential (townhomes to 1/4 ac lots)	B	158.79	159	1.1%
Commercial/Industrial/Transportation	B	38.25	38	0.3%
Barren Land	B	1.11	1	0.0%
Deciduous Forest	A	1.33	2,203	15.5%
Deciduous Forest	B	2,134.99		
Deciduous Forest	C	0.22		
Deciduous Forest	D	66.27		
Evergreen Forest	B	20.02	21	0.2%
Evergreen Forest	D	1.33		
Shrub; Scrub	B	36.92	40	0.3%
Shrub; Scrub	D	2.67		
Grassland; Herbaceous	B	33.80	35	0.2%
Grassland; Herbaceous	D	1.56		
Pasture/Hay	A	1.56	4,032	28.4%
Pasture/Hay	B	3,999.77		
Pasture/Hay	C	10.23		
Pasture/Hay	D	20.68		
Cropland generalized agriculture	A	2.22	6,554	46.2%
Cropland generalized agriculture	B	6,540.41		
Cropland generalized agriculture	C	2.45		
Cropland generalized agriculture	D	9.34		
Total		**14,194**	**acres**	

Source: Purdue Univ's Long-Term Hydrologic Impact Analysis (L-THIA) Model -- http://lthia.agriculture.purdue.edu/

Viroqua WWTF Upstream Watershed



Legend

- Surface Water Outfalls
- Municipality
- State Boundaries
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- Major Roads
  - Interstate Highway
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  - County HWY
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Notes

1.5 0 0.75 1.5 Miles

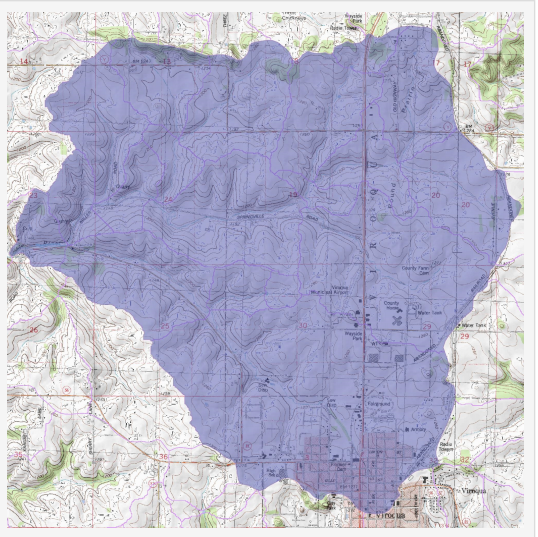
NAD_1983_HARN_Wisconsin_TM

1: 47,520

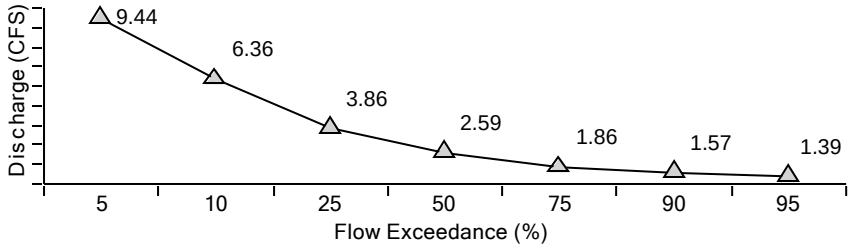
Sample Point ID	Permit No.	Facility Name	Receiving Water	Major Basin	Watershed Area	Nonpoint Load *	2009-2011 Avg. Upstream Point Source Load	2009-2011 Avg. Point Source Load	Total Load *	Point : Nonpoint Source Ratio *	Nonpoint Source Dominated?	Model Flag
					(mi^2)	(lbs)	(lbs)	(lbs)	(lbs)	(%)		**
57836	31224	BANGOR WASTEWATER TREATMENT FACILITY	La Crosse River	Bad Axe - La Crosse	316.5	123486	3261	668	127415	3:97	Yes	
47863	20915	CASHTON WASTEWATER TREATMENT FACILITY	Little LaCrosse River	Bad Axe - La Crosse	0.3	43	0	196	239	82:18	Speak with WDNR Basin Engineer	
48979	25348	CHASEBURG WASTEWATER TREATMENT FAC	Coon Creek	Bad Axe - La Crosse	107.2	96525	1032	756	98313	2:98	Yes	
47883	20958	COON VALLEY WASTEWATER TREATMENT FACILITY	Coon Creek	Bad Axe - La Crosse	79.2	66897	0	1032	67929	2:98	Yes	
54382	29793	DE SOTO WASTEWATER TREATMENT FACILITY	Mississippi River	Bad Axe - La Crosse				176			No Result	
47891	20974	FERRYVILLE WASTEWATER TREATMENT FACILITY	Sugar Creek	Bad Axe - La Crosse	24.6	26557	0	127	26684	0:100	Yes	
51079	47546	FOREMOST FARMS USA COOP SPARTA	La Crosse River	Bad Axe - La Crosse	149.5	49617	667	36	50320	1:99	Yes	
48343	22284	GENOA WASTEWATER TREATMENT FACILITY	Mississippi River	Bad Axe - La Crosse				193			No Result	
49695	29581	LA CROSSE CITY	Mississippi River	Bad Axe - La Crosse				23455			No Result	
50394	36552	MAPLE GROVE ESTATES SANITARY DISTRICT	Unnamed	Bad Axe - La Crosse	5.3	5598	0	111	5709	2:98	Yes	
47580	20257	PRAIRIE DU CHIEN WASTEWATER TREATMENT FAC.	Mississippi River	Bad Axe - La Crosse				2768			No Result	
49564	28967	ROCKLAND WATER SEWER UTILITIES WWTF	Unnamed	Bad Axe - La Crosse	0.1	83	0	595	678	88:12	Speak with WDNR Basin Engineer	EC
47786	20737	SPARTA WASTEWATER TREATMENT FACILITY	La Crosse River	Bad Axe - La Crosse	168.7	57341	703	1767	59811	4:96	Yes	
50005	31186	ST JOSEPH SANITARY DISTRICT	Mormon Creek	Bad Axe - La Crosse	0.7	508	0	322	830	39:61	Yes	
74192	28304	STODDARD WASTEWATER TREATMENT FACILITY	Mississippi River	Bad Axe - La Crosse				913			No Result	
50969	45756	UNITED STATES DEPARTMENT OF INTERIOR USGS	Black River	Bad Axe - La Crosse				394			No Result	
48391	22420	US ARMY HEADQUARTERS, FORT MCCOY WWTP	La Crosse River	Bad Axe - La Crosse	60.4	23293	0	667	23960	3:97	Yes	
50433	36854	VALLEY RIDGE CLEAN WATER COMMISSION WWTF	Mississippi River	Bad Axe - La Crosse				430			No Result	
48231	21920	VIROQUA WASTEWATER TREATMENT FACILITY	Unnamed	Bad Axe - La Crosse	1.7	163	0	772	935	83:17	Speak with WDNR Basin Engineer	
47641	20389	WEST SALEM WASTEWATER TREATMENT FACILITY	La Crosse River	Bad Axe - La Crosse	389.3	168112	3929	892	172933	3:97	Yes	
52229	70645	WESTBY COOP CREAMERY	Unnamed	Bad Axe - La Crosse	0.4	215	0	4075	4290	95:5	Speak with WDNR Basin Engineer	
48193	21792	WESTBY WASTEWATER TREATMENT FACILITY	Unnamed	Bad Axe - La Crosse	1.8	1903	4075	1160	7138	73:27	Speak with WDNR Basin Engineer	
48246	21954	BLACK RIVER FALLS WWTF	Black River	Black River	1595.6	574592	7271	1381	583244	1:99	Yes	
50330	35718	CHELSEA SANITARY DISTRICT	Black River	Black River	4.4	874	0	69	943	7:93	Yes	
49723	29700	CLARK COUNTY HEALTH CARE CENTER WWTF	North Fork of the Popple River	Black River	54.4	11467	634	437	12538	9:91	Yes	
50068	31445	CURTISS WASTEWATER TREATMENT FACILITY	Unnamed	Black River	0.5	37	0	921	958	96:4	Speak with WDNR Basin Engineer	
48119	21571	DORCHESTER WASTEWATER TREATMENT FACILITY	Unnamed	Black River	2.5	157	0	634	791	80:20	Speak with WDNR Basin Engineer	
47746	20621	ETTRICK WASTEWATER TREATMENT FACILITY	North Fork Beaver Creek	Black River	50.7	39785	0	306	40091	1:99	Yes	
48164	21725	GALESVILLE WASTEWATER TREATMENT PLANT	Beaver Creek	Black River	157.1	108399	306	1532	110237	2:98	Yes	
47843	20885	GRANTON WASTEWATER TREATMENT FACILITY	South Branch O'Neill Creek	Black River	16.6	7412	398	62	7872	6:94	Yes	
47164	2984	GRASSLAND DAIRY PRODUCTS, INC.	Black River	Black River	611.0	132239	4795	274	137308	4:96	Yes	
47576	20249	GREENWOOD WASTEWATER TREATMENT FACILITY	Black River	Black River	526.9	103450	4033	762	108245	4:96	Yes	
50397	36641	HATFIELD SANITARY DISTRICT	Black River	Black River	1290.3	458567	6002	675	465244	1:99	Yes	
48789	24261	HOLMEN WASTEWATER TREATMENT FACILITY	Halfway Creek	Black River	31.3	24682	0	691	25373	3:97	Yes	
48311	22179	LOYAL WASTEWATER TREATMENT FACILITY	Black River	Black River	611.0	132239	5069	0	137308	4:96	Yes	
51287	51152	LYNN DAIRY/LYNN PROTEIN, INC.	South Branch O'Neill Creek	Black River	11.1	3910	0	398	4308	9:91	Yes	
47424	3883	MAPLE ISLAND INC	Black River	Black River	47.0	8108	1261	19	9388	14:86	Yes	
50407	36731	MEDFORD CITY OF	Black River	Black River	46.6	8004	69	1192	9265	14:86	Yes	
48862	24678	MELROSE WASTEWATER TREATMENT FACILITY	Black River	Black River	1927.0	681738	8652	367	690757	1:99	Yes	
48884	24732	MERRILLAN WASTEWATER TREATMENT FACILITY	Halls Creek	Black River	47.1	19191	0	199	19390	1:99	Yes	
49599	29106	MINDORO SAN DIST 1 WWTF	Fleming Creek	Black River	24.6	17139	0	228	17367	1:99	Yes	
47984	21202	NEILLSVILLE WASTEWATER TREATMENT FACILITY	Black River	Black River	744.9	176278	5529	473	182280	3:97	Yes	
47876	20940	OWEN WASTEWATER TREATMENT FACILITY	Black River	Black River	330.2	53158	1280	761	55199	4:96	Yes	
50435	36889	WAZEE AREA WASTEWATER COMMISSION	Black River	Black River	1531.3	549686	6876	395	556957	1:99	Yes	
48288	22101	ALMA WASTEWATER TREATMENT FACILITY	Mississippi River	Buffalo-Trempealeau				750			No Result	
47415	3760	AMPI BLAIR CHEESE PLANT	Trempealeau River	Buffalo-Trempealeau	180.8	91106	273	77	91456	0:100	Yes	
48596	23230	ARCADIA WASTEWATER TREATMENT FACILITY	Trempealeau River	Buffalo-Trempealeau	561.0	531598	2932	4935	539465	1:99	Yes	
50607	40223	DAIRYLAND POWER COOP ALMA 1-5 & J.P. MADGETT	Mississippi River	Buffalo-Trempealeau				11			No Result	
52170	61191	DODGE SANITARY DISTRICT NO 1	Trempealeau River	Buffalo-Trempealeau	642.0	571648	7867	110	579625	1:99	Yes	
48722	23892	ELEVA WASTEWATER TREATMENT FACILITY	Buffalo River	Buffalo-Trempealeau	165.2	120352	742	241	121335	1:99	Yes	
51306	51250	FOREMOST FARMS USA COOP ALMA CENTER	South Branch Trempealeau River	Buffalo-Trempealeau	9.6	5365	0	19	5384	0:100	Yes	
49087	26026	FOREMOST FARMS USA COOP WAUMANDEE	Waumandee Creek	Buffalo-Trempealeau	41.3	67612	0	1371	68983	2:98	Yes	
48764	24040	FOUNTAIN CITY WWTF	Mississippi River	Buffalo-Trempealeau				945			No Result	
72647	24287	INDEPENDENCE WASTEWATER TREATMENT PLANT	Trempealeau River	Buffalo-Trempealeau	454.7	394775	1570	1362	397707	1:99	Yes	
47734	20591	MONDOVI WASTEWATER TREATMENT FACILITY	Buffalo River	Buffalo-Trempealeau	237.5	187540	983	390	188913	1:99	Yes	
62440	25046	OSSEO WASTEWATER TREATMENT FACILITY	Buffalo River	Buffalo-Trempealeau	70.7	40950	0	244	41194	1:99	Yes	
62722	62146	SPF NORTH AMERICA, INC.	Buffalo River	Buffalo-Trempealeau	217.8	164921	983	0	165904	1:99	Yes	
49570	28991	STRUM WASTEWATER TREATMENT FACILITY	Buffalo River	Buffalo-Trempealeau	127.8	85815	244	498	86557	1:99	Yes	
48217	21881	TAYLOR WASTEWATER TREATMENT FACILITY	Trempealeau River	Buffalo-Trempealeau	138.8	67248	19	254	67521	0:100	Yes	
47888	20966	TREMPEALEAU WASTEWATER TREATMENT FACILITY	Mississippi River	Buffalo-Trempealeau				1199			No Result	
58403	61646	WAUMANDEE SANITARY DISTRICT #1	Waumandee Creek	Buffalo-Trempealeau	43.2	70912	1371	25	72308	2:98	Yes	
49981	30970	WHITEHALL WASTEWATER TREATMENT FACILITY	Trempealeau River	Buffalo-Trempealeau	224.0	125938	350	1220	127508	1:99	Yes	
48574	23183	ALMENA VILLAGE OF	Hay River	Chippewa River	32.9	19372	1762	944	22078	12:88	Yes	
47338	3476	AMPI JIM FALLS DIVISION	Chippewa River	Chippewa River	4884.7	615729	29191	112	645032	5:95	Yes	
51938	60232	ARKANSAW WASTEWATER TREATMENT FACILITY	Eau Galle River	Chippewa River	224.1	148302	3519	158	151979	2:98	Yes	
48600	23272	AUGUSTA WASTEWATER TREATMENT FACILITY	Bridge Creek	Chippewa River	40.6	39118	0	523	39641	1:99	Yes	
49217	26891	BALDWIN WASTEWATER TREATMENT FACILITY	Baldwin Creek	Chippewa River	3.9	3667	0	3642	7309	50:50	Yes	EC
52174	61255	BAY CITY VILLAGE	Mississippi River	Chippewa River				431			No Result	
80030	42528	BIRCHWOOD MANUFACTURING CO	Red Cedar River	Chippewa River	384.9	63807	0	3	63810	0:100	Yes	
52503	20575	BLOOMER WASTEWATER TREATMENT FACILITY	Duncan Creek	Chippewa River	53.8	10082	0	381	10463	4:96	Yes	
51961	60330	BOYCEVILLE WASTEWATER TREATMENT FACILITY	South Fork Hay River	Chippewa River	92.4	76729	0	363	77092	0:100	Yes	
48653	23515	CADOTT WASTEWATER TREATMENT FACILITY	Yellow River	Chippewa River	364.8	57913	470	278	58661	1:99	Yes	
80337	53597	CADY CHEESE INC	Unnamed	Chippewa River	0.1	4	0	0	4	0:100	Yes	
47195	3077	CASCADES TISSUE GROUP WISCONSIN INC	Chippewa River	Chippewa River	5731.0	772977	35441	1402	809820	5:95	Yes	
61101	61701	CATAWBA KENNAN JOINT SEWAGE COMMISSION	North Fork Jump River	Chippewa River	70.7	6784	0	167	6951	2:98	Yes	
47257	3204	CELLU TISSUE - CITYFOREST LLC	Flambeau River	Chippewa River	1859.9	196639	16543	4456	217638	10:90	Yes	
48126	21598	CHETEK CITY OF	Chetek River	Chippewa River	198.9	29927	0	243	30170	1:99	Yes	

PRESTO-Lite Watershed Delineation Report

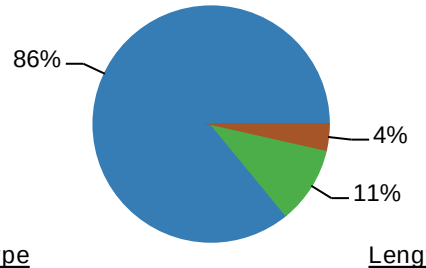
Reach ID: 200048155
Watershed Name: Springville Branch Bad Axe River
Waterbody Name: Springville Br Bad Axe River
HUC08: Coon-Yellow
Watershed Area: 9.06 mi²
Average Annual Precipitation: 32.68in



Stream Flow

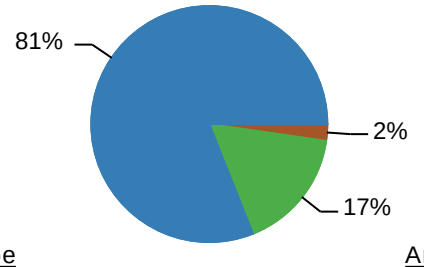


Tributary Stream Type



Type	Length
Cool-Cold Headwater	20276 ft
Coldwater	2484 ft
Macroinvertebrates	831 ft
Cool-Cold Mainstem	0 ft
Cold Headwater	0 ft
Cold Mainstem	0 ft
Large River	0 ft
Warm Headwater	0 ft
Warm Mainstem	0 ft

Landcover



Type	Area
Agriculture	7.31 mi²
Urban	1.51 mi²
Forest	0.2 mi²
Grassland	0.03 mi²
Barren	0.01 mi²

PRESTO Phosphorus Load Estimate

Avg. Annual Nonpoint Phosphorous Load (80% Confidence Interval)	14,934 (4,287 - 52,024) lbs
Number of Facilities (Individual Facility Information below)	1
Avg. Annual Point-source Phosphorous Load (2010 - 2012 total of all facilities)	900lbs
Most Likely Point : Nonpoint Phosphorous Ratio	6% : 94%
Low Estimate Point : Nonpoint Phosphorous Ratio (Adaptive Management)	2% : 98%

Adaptive Management Results

Facilities Discharging to the Springville Branch Bad Axe River Watershed:

Facility Name	Permit #	Outfall #	Waste Type	Receiving Water	Avg. Phosphorus Load (lbs.) (2010 - 2012)
VIROQUA WASTEWATER TREATMENT FACILITY	0021920	001	Municipal	Unnamed	900

Watershed Analysis Limitations

- This analysis relies on pre-defined catchments from the Wisconsin Hydrography Data-Plus and may not delineate from the exact location required. When assessing phosphorus loads for specific facility in support of efforts such as adaptive management, care should be taken to ensure that additional downstream point sources do not exist. For adaptive management information related to specific facilities please reference the PRESTO website http://dnr.wi.gov/topic/surfacewater/presto.html
- Delineation of watersheds is based on a topographic assessment and therefore do not account for modified drainage networks such as stormwater sewer systems and ditched agriculture.
- If a watershed requires delineation from an exact location the user may use the desktop version of PRESTO that requires ESRI ArcGIS. The PRESTO tool and default datasets can be downloaded at http://dnr.wi.gov/topic/surfacewater/presto.html
- Data sources for this report originate from the WDNR's Wisconsin Hydrography Data-Plus value-added dataset and the point and non-point source loading information including in the WDNR's PRESTO model.
- If you have questions about the report generated from the PRESTO-Lite application please contact: DNRWATERQUALITYMODELING@wisconsin.gov

Appendix C

Viroqua WWTF Effluent Data

City of Viroqua
Water Quality Trading
Effluent Phosphorus Concentration

WQBEL	**0.18**	**Ratio**	**3**

Year	*Effl Q (MGD)*	*Effl Conc (mg/L)*	*WQT Req'd (lbs/year)*	*WQT with Ratio (lbs/yr)*
2010	0.347	0.722	572	1,716
2011	0.329	0.928	749	2,247
2012	0.300	1.104	845	2,534
2013	0.334	0.917	750	2,251
2014	0.331	0.477	299	898
2015	0.302	0.514	307	921
2016	0.326	0.306	125	375
2017	0.299	0.475	269	806
2018	0.286	0.395	188	563
2019	0.264	0.208	22	67
2020	0.231	0.193	9	27
2021	0.218	0.149	0	0
Long Term Annual Average	**0.297**	**0.532**	**319**	**957**
2016-2021 Annual Average	**0.271**	**0.288**	**89**	**266**
Design	0.747			

Year	*Period*	*Effl Q (MGD)*	*Effl Conc (mg/L)*	*WQT Req'd (lbs/year)*	*WQT with Ratio (lbs/yr)*	*Annual Lbs Req'd*	*Annual Lbs Req'd w/ Ratio*
2010	Jan - June	0.341	0.594	213	639	555	1,665
	July - Dec	0.352	0.813	342	1,026		
2011	Jan - June	0.352	0.802	331	992	742	2,225
	July - Dec	0.305	1.057	411	1,233		
2012	Jan - June	0.305	1.079	417	1,250	847	2,542
	July - Dec	0.295	1.130	431	1,292		
2013	Jan - June	0.365	0.854	371	1,113	734	2,201
	July - Dec	0.304	0.957	363	1,088		
2014	Jan - June	0.382	0.392	122	367	283	849
	July - Dec	0.282	0.550	160	481		
2015	Jan - June	0.296	0.459	124	373	307	920
	July - Dec	0.307	0.567	182	547		
2016	Jan - June	0.314	0.225	22	65	129	387
	July - Dec	0.339	0.387	107	322		
2017	Jan - June	0.305	0.292	51	154	265	794
	July - Dec	0.293	0.654	213	640		
2018	Jan - June	0.273	0.625	183	549	183	549
	July - Dec	0.300	0.173	0	0		
2019	Jan - June	0.260	0.216	14	43	25	75
	July - Dec	0.268	0.206	11	32		
2020	Jan - June	0.241	0.221	15	45	15	45
	July - Dec	0.221	0.163	0	0		
2021	Jan - June	0.221	0.156	0	0	0	0
	July - Dec	0.215	0.142	0	0		

Appendix D

WWTF Streambank Stabilization

RECORD DRAWING
MARCH 2019

N

NOTES: START AND FINISH RIP RAP LOCATIONS WILL BE DETERMINED BY ENGINEER

UNLESS NOTED, ALL SLOPES ARE 1.5:1 AND HEAVY RIP RAP.
DETAIL 113.C

EX. TREE LINE (TYP.)
EX. WIRE FENCE (TYP.)
EX. STREAM (TYP.)
RIP RAP DITCH (TYP.)
EX. DITCH (TYP.)
EX. PROPERTY CORNER (TYP.)
EX. PROPERTY LINE (TYP.)
STREAMBANK ADDER BIDS LIMITS
(STA. 305+65 TO 311+60)
EXTRA HEAVY RIP RAP AT 2:1
SLOPE BETWEEN LINES
DETAIL 113.A
NEW RIP RAP (TYP.)
NEW 12" PVC
EFFLUENT FORCE MAIN (TYP.)
RIP RAP
OUTFALL STRUCTURE
DETAIL ON SHEET A-30
RIP RAP OUTFALL STRUCTURE.
COORDINATE WITH CONTRACT A
DETAIL ON SHEET A-30
RIP RAP AT 1.5:1 UP TO NEW FENCE.
COORDINATE WITH CONTRACT A ON
NOT INTERFERING WITH NEW FENCE
OR POND
CONTRACT B
CONTRACT A
NEW 8' MANHOLE
TBM 104
SPIKE
ELEV. = 1188.36
EX. PIPE (TYP.)
TBM 100
PK NAIL
ELEV. = 1190.50
EX. LIGHT POLE (TYP.)
EX. FENCE (TYP.)
NEW FENCE (TYP.)
CONSTRUCTED BY
CONTRACT A
SOIL BORING (TYP.)
NEW POND
CONSTRUCTED BY
CONTRACT A
CUT/FILL MATCH LINE
NEW PIPE
CONSTRUCTED BY
CONTRACT A
EX. TREE (TYP.)
EX. BUSH
EX. POLE

180+00 181+00 182+00 183+00 184+00 185+00 186+00 187+00 300+00 301+00 302+00 303+00 304+00 305+00 305+65 306+00 307+00 308+00 309+00 310+00 311+00 311+60 312+00

2912 Marketplace Drive
Suite 103
Madison, WI 53719
(608) 273-3350
www.tcengineers.net
TOWN & COUNTRY ENGINEERING, INC.

PLAN VIEW
STREAM BANK
Rip Rap Stabilization Overview

2017 WASTEWATER FACILITIES
Force Main and Outfall
City of Viroqua, Wisconsin

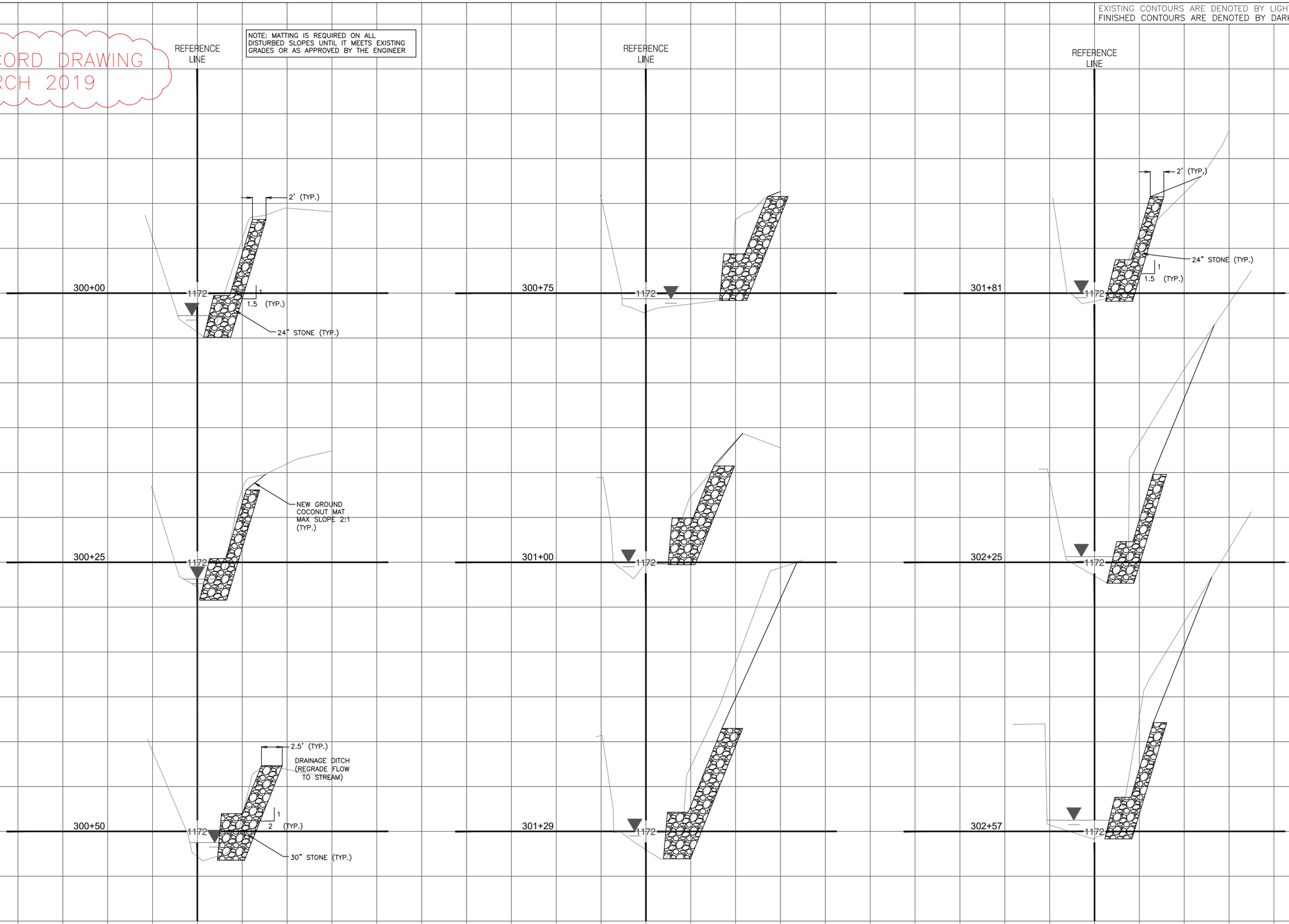
PROJECT NO.: VI 15
DRAWING NAME: FMAIN - RECORD.DWG
DRAWN BY: N.R.B.
CHECKED BY: E.A.L.
DATE: 3-13-17
REVISIONS: 3-8-19
SCALE: 0 10 20 40

SHEET: A-20

RECORD DRAWING
MARCH 2019

NOTE: MATTING IS REQUIRED ON ALL DISTURBED SLOPES UNTIL IT MEETS EXISTING GRADES OR AS APPROVED BY THE ENGINEER

EXISTING CONTOURS ARE DENOTED BY LIGHTER LINES.
FINISHED CONTOURS ARE DENOTED BY DARKER LINES.



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Suite 103
Madison, WI 53719
(608) 273-3350
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TOWN & COUNTRY ENGINEERING, INC.

CROSS SECTIONS
RIP RAP STREAM
Station 300+00 To 302+57

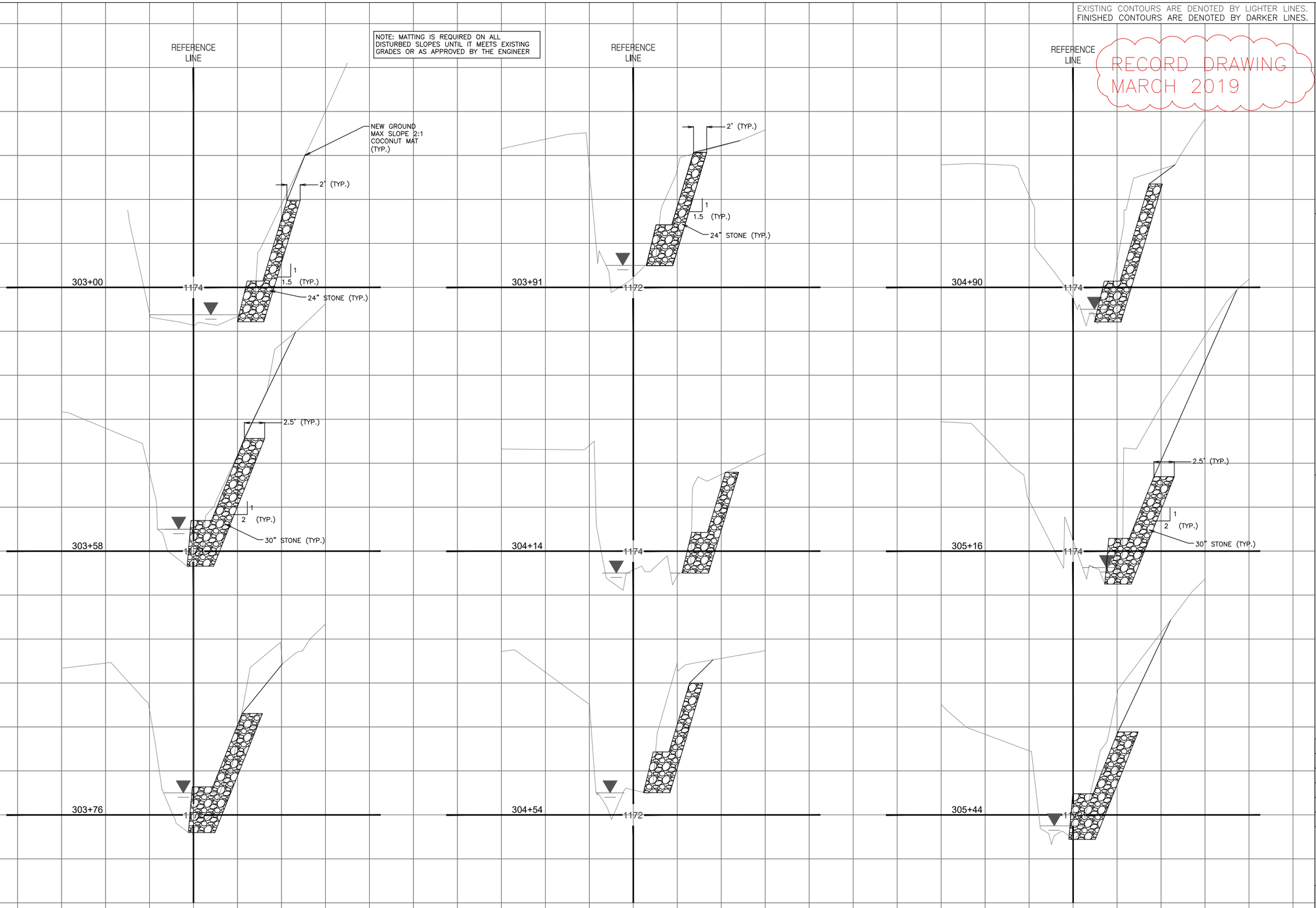
2017 WASTEWATER FACILITIES
Force Main and Outfall
City of Viroqua, Wisconsin

PROJECT NO.: VI 15
DRAWING: FORCE MAIN - RECORD.DWG
DRAWN BY: N.R.B.
CHECKED BY: E.A.L.
DATE: 3-13-17
REVISIONS: 3-8-19
SCALE: HORIZONTAL 0 2.5 5 10, VERTICAL 1 2
SHEET: A-21

EXISTING CONTOURS ARE DENOTED BY LIGHTER LINES.
FINISHED CONTOURS ARE DENOTED BY DARKER LINES.

NOTE: MATTING IS REQUIRED ON ALL DISTURBED SLOPES UNTIL IT MEETS EXISTING GRADES OR AS APPROVED BY THE ENGINEER

RECORD DRAWING
MARCH 2019



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Madison, WI 53719
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www.tcengineers.net

CROSS SECTIONS
STREAM
Station 303+00 To 305+44

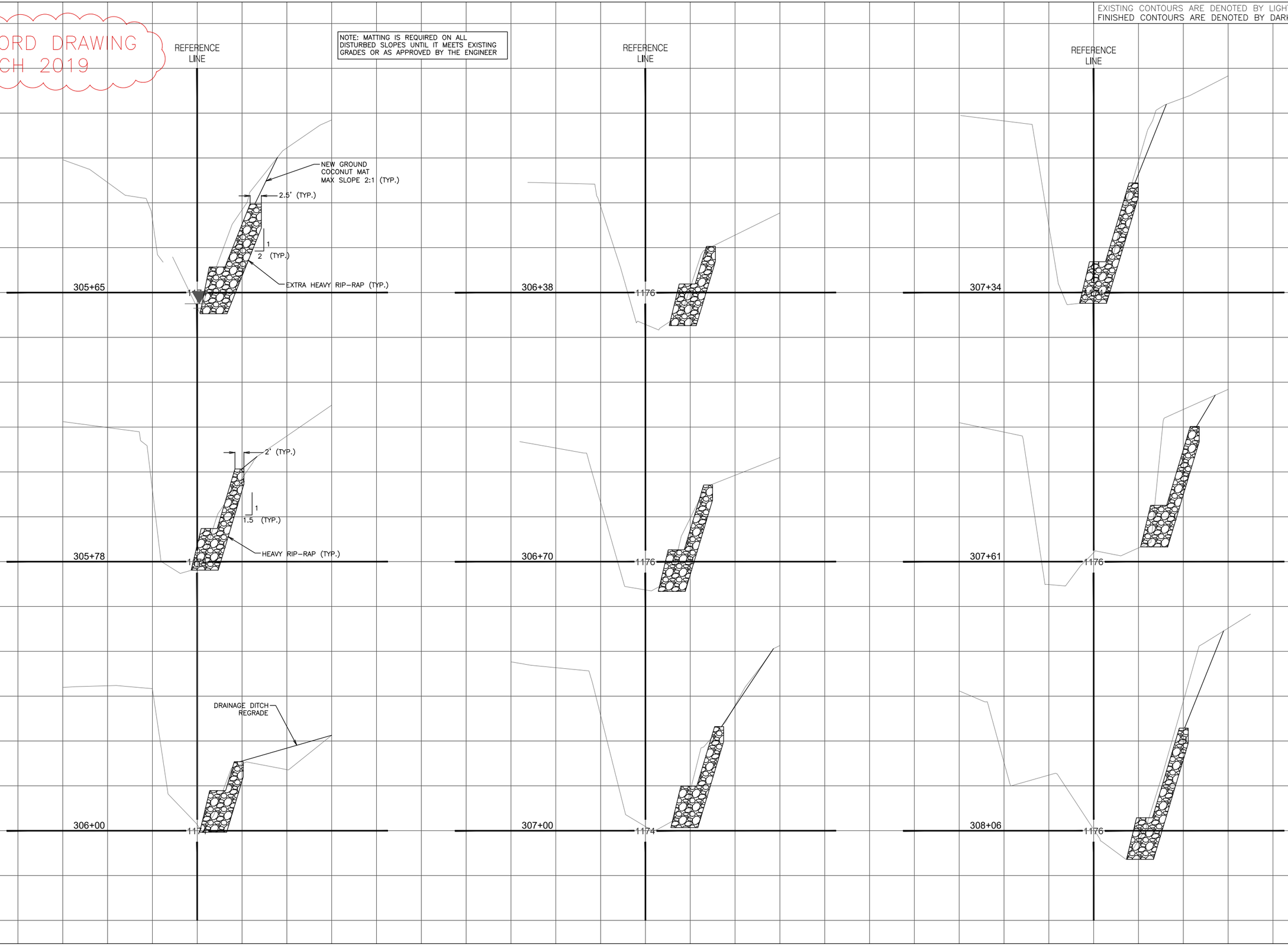
2017 WASTEWATER FACILITIES
Force Main and Outfall
City of Viroqua, Wisconsin

PROJECT NO.: VI 15
DRAWING NAME: FORCE MAIN – RECORD.DWG
DRAWN BY: N.R.B.
CHECKED BY: E.A.L.
DATE: 3-13-17
REVISIONS: 3-8-19
SCALE: HORIZONTAL 0 2.5 5 10
VERTICAL 1 2
SHEET: A-22

RECORD DRAWING
MARCH 2019

NOTE: MATTING IS REQUIRED ON ALL DISTURBED SLOPES UNTIL IT MEETS EXISTING GRADES OR AS APPROVED BY THE ENGINEER

EXISTING CONTOURS ARE DENOTED BY LIGHTER LINES.
FINISHED CONTOURS ARE DENOTED BY DARKER LINES.



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www.tcengineers.net
TOWN & COUNTRY ENGINEERING, INC.

CROSS SECTIONS
STREAM
Station 305+57 To 308+06

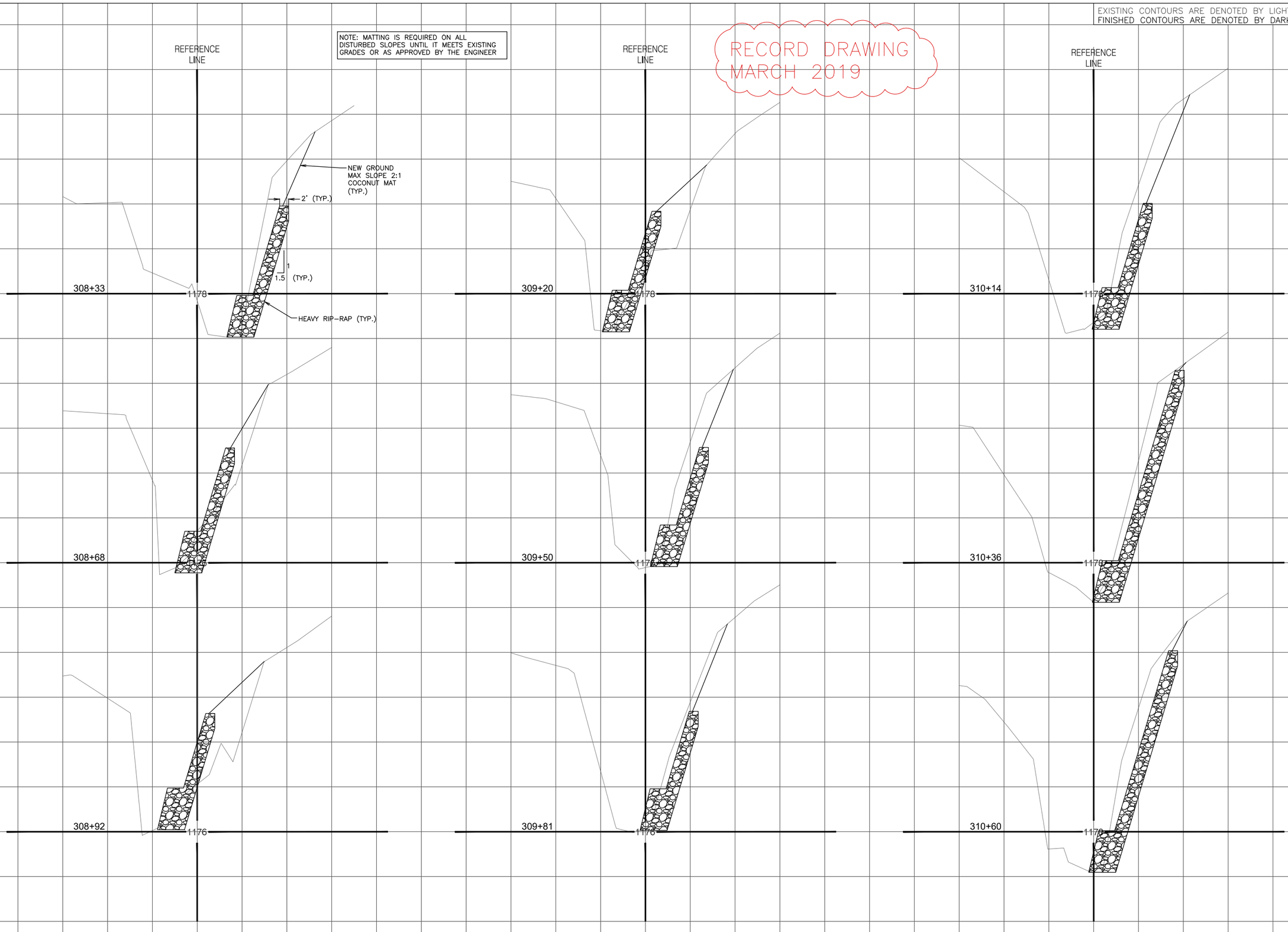
2017 WASTEWATER FACILITIES
Force Main and Outfall
City of Viroqua, Wisconsin

PROJECT NO.:	VI 15
DRAWING:	FORCE MAIN - RECORD.DWG
DRAWN BY:	N.R.B.
CHECKED BY:	E.A.L.
DATE:	3-13-17
REVISIONS:	3-8-19
SCALE: HORIZONTAL	0 2.5 5 10
	1 VERTICAL 2
SHEET:	A-23

NOTE: MATTING IS REQUIRED ON ALL DISTURBED SLOPES UNTIL IT MEETS EXISTING GRADES OR AS APPROVED BY THE ENGINEER

RECORD DRAWING
MARCH 2019

EXISTING CONTOURS ARE DENOTED BY LIGHTER LINES.
FINISHED CONTOURS ARE DENOTED BY DARKER LINES.



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TOWN & COUNTRY ENGINEERING, INC.

CROSS SECTIONS
STREAM
Station 308+33 To 310+60

2017 WASTEWATER FACILITIES
Force Main and Outfall
City of Viroqua, Wisconsin

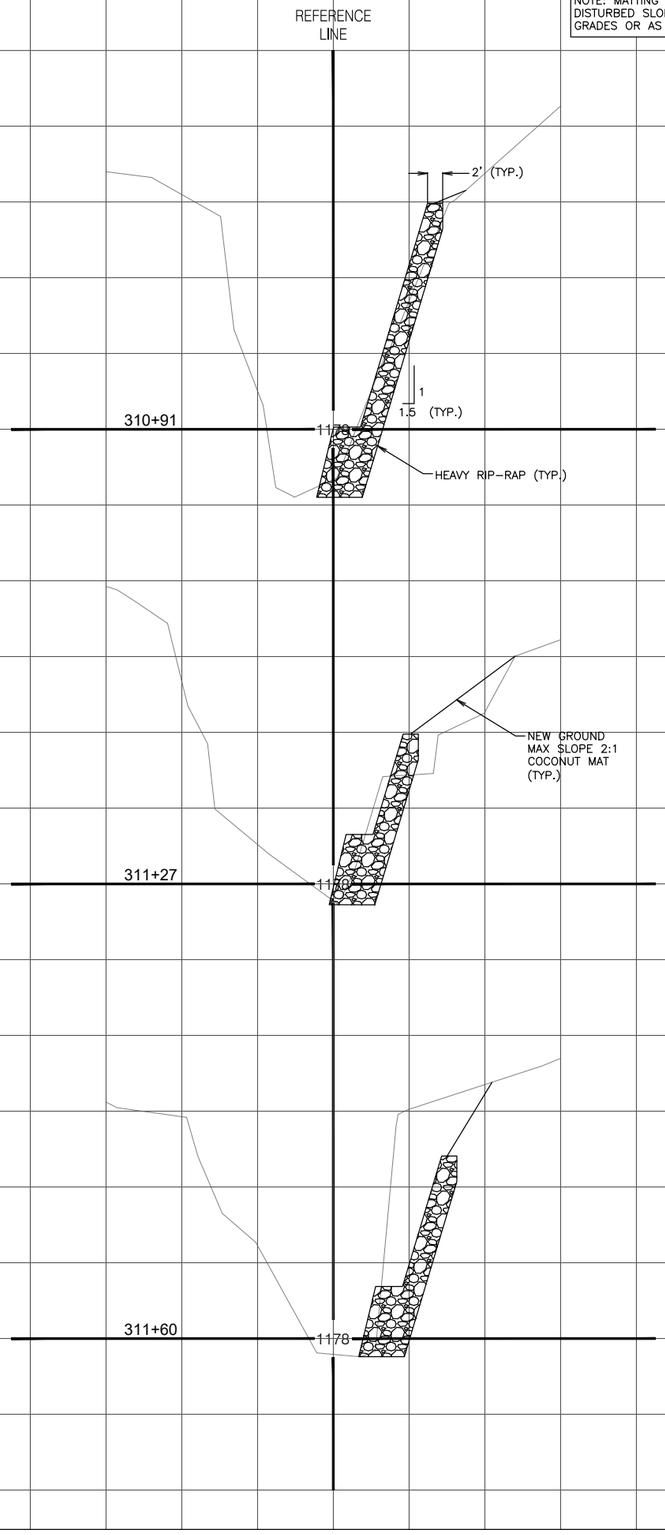
PROJECT NO.: VI 15
DRAWING: FORCE MAIN - RECORD.DWG
DRAWN BY: N.R.B.
CHECKED BY: E.A.L.
DATE: 3-13-17
REVISIONS: 3-8-19
SCALE: HORIZONTAL 0 2.5 5 10
VERTICAL 1 2

SHEET: A-24

EXISTING CONTOURS ARE DENOTED BY LIGHTER LINES.
FINISHED CONTOURS ARE DENOTED BY DARKER LINES.

RECORD DRAWING
MARCH 2019

NOTE: MATTING IS REQUIRED ON ALL DISTURBED SLOPES UNTIL IT MEETS EXISTING GRADES OR AS APPROVED BY THE ENGINEER



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TOWN & COUNTRY ENGINEERING, INC.

CROSS SECTIONS
STREAM
Station 310+91 To 311+60

2017 WASTEWATER FACILITIES
Force Main and Outfall
City of Viroqua, Wisconsin

PROJECT NO.: VI 15
DRAWING NAME: FORCE MAIN - RECORD.DWG
DRAWN BY: N.R.B.
CHECKED BY: E.A.L.
DATE: 3-13-17
REVISIONS: 3-8-19
SCALE: HORIZONTAL 0 2.5 5 10, VERTICAL 1 2
SHEET: A-25

Soil and Forage Analysis Lab
COLLEGE OF AGRICULTURAL & LIFE SCIENCES
UNIVERSITY OF WISCONSIN–MADISON

2611 Yellowstone Drive
Marshfield WI 54449
715-387-2523
http://uwlab.soils.wisc.edu

City of Viroqua
202 N Main St
Viroqua WI 54665

Date 9/1/2020
Account # 557022
Report # 3038

Soil Total Mineral Analysis

Sample ID	*P* %
1	0.06

NRCS Streambank Erosion Estimator (Direct Volume Method)

Viroqua WQT	Evaluated By: BJK
Viroqua WWTF Phosphorus Load Reduction	Evaluation Date: 3/27/2023 Updates

Field Number	*Station*	*Eroding Streambank Reach Number*	*Eroding Bank Length (Feet)*	*Eroding Bank Height * (Feet)*	*Area of Eroding Streambank (FT^2)*	*Lateral Recession Rate (Estimated) (FT / Year)*	*Estimated Volume (FT^3) Eroded Annually*	*Soil Texture*	*Approximate Pounds of Soil per FT^3*	*Estimated Soil Loss (Tons/Year)*
Station 311+60 to 300+00	311+60 to 309+80	1	180.0	5.35	963	0.50	481.5	Silt Loam	85	20.5
	309+80 to 308+55	2	125.0	5.10	638	1.00	637.5	Silt Loam	85	27.1
	308+55 to 308+00	3	65.0	6.40	416	0.60	249.6	Silt Loam	85	10.6
	308+00 to 307+00	4	100.0	5.23	523	1.00	523.0	Silt Loam	85	22.2
	307+00 to 306+00	5	50.0	2.25	113	0.50	56.3	Silt Loam	85	2.4
	306+00 to 305+00	6	100.0	3.68	368	1.00	368.0	Silt Loam	85	15.6
	305+00 to 304+00	7	50.0	5.49	275	0.80	219.6	Silt Loam	85	9.3
	304+00 to 303+00	8	100.0	4.04	404	1.00	404.0	Silt Loam	85	17.2
	303+00 to 302+00	9	100.0	3.15	315	0.50	157.5	Silt Loam	85	6.7
	302+00 to 301+00	10	100.0	3.51	351	0.50	175.5	Silt Loam	85	7.5
	301+00 to 300+00	11	100.0	3.75	375	1.00	375.0	Silt Loam	85	15.9
					Total Estimated Annual Streambank Erosion Soil Loss (Tons):					**155.0**
					Total Estimated Annual Streambank Erosion Soil Loss (lbs):					310033
					Phosphorus Loss at 0.06% Concentration (lbs/year)					186.0
					Trade Ratio 3:1 at facility					**62.0**

* Eroding bank height is measured along the bank, not the vertical height of bank.

Streambank Erosion Calculation Formula:

$$\frac{\text{Eroding Bank } \mathbf{Length} \times \text{Eroding Bank Height} \times \text{Lateral Recession Rate (FT/YR)} \times \text{Soil Weight (lbs/ft}^3\text{)}}{2000} = \mathbf{Estimated} \text{ Soil Loss Per Year (Tons)}$$

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
City of Viroqua	WI- 021920-10-0	

Facility Address	City	State	ZIP Code
1315 County Highway B	Viroqua	WI	54665

Project Contact Name (if applicable)	Address	City	State	ZIP Code

Project Name
Viroqua WWTF Streambank Stabilization Project

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	N/A - Stream bank is adjacent to the WWTF	Streambank restoration	155	3	NRCS's Streambank Erosion Estimator

County	Closest Receiving Water Name	Land Parcel ID(s)	Parameter(s) being traded
Vernon	Tributary of the Bad Axe River	036-00843-0000	Total 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
Billie L. Kershner	3/27/23

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
	3/28/23

Leave Blank – For Department Use Only

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

Appendix E

2021 Streambank Stabilization

Vernon County Land and Water Department
220 Airport Rd.
Viroqua, WI 54665

To Whom It May Concern,

The Water Quality Trade Agreement between the City of Viroqua, Wisconsin and the Gary Stueland for a 2021 streambank stabilization project on an unnamed tributary of the North Fork of the Bad Axe River immediately east of County Rd B. Both sides of entire stretch of the project area is owned by Gary Stueland. The project is contained entirely in the SE ¼ of the NE ¼ of section 25, T-13-N, R-05-W in Vernon County Wisconsin.

The scope of work for the project includes the installation of a total 295 linear feet of rip rap (462 cubic yards of 10-inch D-50 graded rock) in 2 sites along a critical turn in the stream channel. The project will also include the planting of 0.2 acres of critical areas.

The project area (295 linear feet of stream bank 6.5' vertical bank hieght) is estimated to produce a reduction of streambank soil erosion of 163.9 Tons per year. A composite soil sample taken from the streambank of the project site measured 0.08% Phosphorus by volume. Thus, it is estimated that the project will result in a reduction of 262.24 pounds of Total Phosphorus discharged to the creek per year.

If you have any questions please call 608-637-5480 for additional information.

Sincerely,

Matt Albright
Vernon County Land &Water Conservation Specialist

Soil and Forage Analysis Lab
COLLEGE OF AGRICULTURAL & LIFE SCIENCES
UNIVERSITY OF WISCONSIN-MADISON

2611 Yellowstone Drive
Marshfield WI 54449
715-387-2523
http://uwlab.soils.wisc.edu

Matt Albright
Vernon County LWCD
220 Airport Rd
Viroqua WI 54665

Date	4/2/2021
Account #	557914
Report #	1693

Soil Total Mineral Analysis

Sample ID	*P* %
Dan Obert	0.05
Stanek	0.06
Stueland	0.08

% total P

NRCS Streambank Erosion Estimator (Direct Volume Method)

Farmer / Cooperator Name: Gary Stueland
Tract Number:

Evaluated By: MJA
Evaluation Date:

Field Number	Eroding Streambank Reach Number	Eroding Bank Length (Feet)	Eroding Bank Height * (Feet)	Area of Eroding Streambank (FT^2)	Lateral Recession Rate (Estimated) (FT / Year)	Estimated Volume (FT^3) Eroded Annually	Soil Texture	Approximate Pounds of Soil per FT^3	Estimated Soil Loss (Tons/Year)
	1	295.0	6.5	1,918	1.80	3,451.5	Silt Loam	95	163.9
	2	295.0	6.5	1,918	1.80	3,451.5	Silt Loam	95	163.9
	3	295.0	6.5	1,918	1.80	3,451.5	Silt Loam	95	163.9
						Total Estimated Annual Streambank Erosion Soil Loss (Tons):			491.8

Per Year Soil Loss

Field Number	Eroding Streambank Reach Number	Eroding Bank Length (Feet)	Eroding Bank Height * (Feet)	Area of Eroding Streambank (FT^2)	Lateral Recession Rate (Estimated) (FT / Year)	Estimated Volume (FT^3) Eroded Annually	Soil Texture	Approximate Pounds of Soil per FT^3	Estimated Soil Loss (Tons/Year)
	1								
	2								
	3								
						Total Estimated Annual Streambank Erosion Soil Loss (Tons):			

Field Number	Eroding Streambank Reach Number	Eroding Bank Length (Feet)	Eroding Bank Height * (Feet)	Area of Eroding Streambank (FT^2)	Lateral Recession Rate (Estimated) (FT / Year)	Estimated Volume (FT^3) Eroded Annually	Soil Texture	Approximate Pounds of Soil per FT^3	Estimated Soil Loss (Tons/Year)
	1								
	2								
	3								
						Total Estimated Annual Streambank Erosion Soil Loss (Tons):			

Total Estimated Annual Streambank Erosion Soil Loss (Tons):	491.8

* Eroding bank height is measured along the slope of the bank (hypotenuse), not the vertical height of bank.


COUNTY ROAD B
N
W
E
S
1 inch = 50 feet
25 12.5 0 25 50
Feet

PHOSPHORUS CREDIT PURCHASE AGREEMENT

Return to:
Lori Polhamus
202 N. Main Street
Viroqua, WI 54665

024-00944-0000
Parcel Number

THIS AGREEMENT is entered into effective as of May __ , 2021 (the "Effective Date"), by and between the City of Viroqua ("the City"), and Gary Stueland ("Stueland").

RECITALS

WHEREAS, the City operates a sewerage treatment facility located in Viroqua,Wisconsin, pursuant to a Wisconsin Pollutant Discharge Elimination System ("WPDES") permit issued by the Wisconsin Department of Natural Resources ("DNR"), which discharges into the Springville Branch of the Bad Axe River.

WHEREAS, Stueland owns real property located at S4247 County Road B, Viroqua, Wisconsin 54665, through which an unnamed tributary of the Springville Branch of the Bad Axe River flows ("the Property").

WHEREAS, Stueland intends to undertake certain streambank stabilization work ("the Project") on the Property in accordance with an agreement between Stueland and Vernon County ("the County") attached as Exhibit A (the "County Agreement").

WHEREAS, the Vernon County Land & Water Resources Department calculates upon completion of the Project and the DNR approves, the amount of phosphorus entering the unnamed tributary of the Springville Branch of the Bad Axe River to be reduced.

WHEREAS, pursuant to its WPDES permit, the City is subject to certain requirements to reduce phosphorus water quality-based effluent levels.

WHEREAS, the City is willing to reimburse Stueland for certain costs of the Project in order for it to receive credit from the DNR for the phosphorus reduction the Project is calculated to produce.

WHEREAS, Stueland is willing to undertake the Project if the City is willing to contribute to the cost of the Project.

NOW, THEREFORE, in consideration of the mutual covenants contained herein and othergood and valuable consideration, the receipt and sufficiency of which are hereby mutually acknowledged, the parties agree as follows:

1. Project. Stueland and the County have agreed to share the costs of the Project on an equal basis. The Project shall be constructed incompliance with the approved plans and the requirements of the County Agreement. Stueland's share of the Project costs shall be $8,346.25. Upon at least24 hours prior notice to Stueland, except in an emergency for which reasonable notice shall be required, Stueland shall permit City representatives to enter upon the Property at any time toinspect the construction of the Project and verify its completion.

2. Cost Reimbursement. The City shall pay one hundred percent of Stueland's share of the Project cost. The City shall pay Stueland's share of project costs to the contractor within thirty (30) days after receipt of documentation, in a form reasonably acceptable to the City, verifying the amount of, and purpose for, the costs incurred in the construction of the Project.

3. Phosphorus Credit. The City shall receive credit for the phosphorus reduction the Project is calculated to produce. Stueland shall assign all right and interest in said credit to the City for the term of this Agreement and any extensions thereto. The City shall apply to the DNR for approval of the City's phosphorus water quality levels. Stueland shall cooperate with the City in making such application(s) and provide to the City any documents concerning the Project and credit assignment which the City may reasonably require. Upon completion of the Project, Stueland shall allow the City to annually verify the reduction of phosphorus from the Springville Branch of the Bad Axe River watershed as a result of the Project and credit for same toward the City's phosphorus water quality levels. Stueland hereby grants the City representatives, and their agents and contractors, the right to enter upon the Property at any time for purposes of verifying phosphorus levels.

4. Maintenance. Stueland shall maintain the improvements constructed as part of the Project as required by the County agreement and the DNR. Upon at least 24 hours prior notice to Stueland, except in an emergency for which reasonable notice shall be required, Stueland shall permit City representatives to enter upon the Property at any time to inspect the improvements and verify said maintenance obligations are fulfilled. If Stueland fails to fulfill said maintenance obligations, the City shall provide notice to Stueland, and Stueland shall cure all maintenance deficiencies within 30 days of said notice. If Stueland shall fail to so cure, the City may, but shall not be obligated to, cure all maintenance deficiencies. Stueland hereby grants the City representatives, and their agents and contractors, the right to enter upon the Property at any time to cure such deficiencies. In the event it is necessary for the City to cure such deficiencies,the term of this Agreement shall be extended based on the cost incurred by the City in accordance with section 5 below.

5. Term. The term of this Agreement shall commence on the Effective Date and expire 20 years thereafter, unless otherwise extended or terminated as provided herein. The City may terminate this Agreement at any time and for any reason, or no reason, upon notice to Stueland. The term of this Agreement shall automatically extend based on either: (1) the cost of the Project for which the City

reimburses Stueland exceeds $8,346.25; or (2) the City cures maintenance deficiencies pursuant to section 4 above; or (3) the amount of phosphorus entering the unnamed tributary of the Springville Branch of the Bad Axe River is determined to be reduced by less than the amount approved by DNR for purposes of determining the phosphorus credit stated in section 3 above. In the event of either (1) or (2), the term of this Agreement shall be extended one year for each $350.00 the City so expends, without any proration. Upon making such expenditures, the Cityshall provide written notice to Stueland providing documentation as to the amount and purpose of such expenditures and stating the date of the extended expiration date. In the event of (3), the term of this Agreement shall be extended one year for every three pounds less than 262 pounds per year, rounded to the nearest pound, without any proration.

6. Notices. It is hereby agreed that for all purposes hereunder, notices to the parties shall be given to the parties in writing at the following address:

If to Stueland: Gary Stueland
E6448 Miller Road
Viroqua, Wisconsin 54665

If to the Commission: City of Viroqua
Attn: City Administrator
202 N. Main Street
Viroqua, Wisconsin 54665

7. Compliance With Laws and Regulations. Stueland shall maintain the Project and improvements so constructed in compliance with all applicable laws and regulations.

8. Construction/Venue. It is agreed that this Agreement shall be governed by,construed and enforced in accordance with the laws of the State of Wisconsin. Any action arising from this Agreement shall be venued in the circuit court for Vernon County, Wisconsin.

9. Waiver. A waiver by either party of any breach of any covenant or duty of the otherparty under this Agreement is not a waiver of a breach or any other covenant or duty of the other party or any subsequent breach of the same covenant or duty.

10. Validity. The invalidity of any provision of this Agreement shall not be deemed toaffect the validity of any of the other provisions. In the event that any provision of this Agreement is held to be invalid, the parties agree that the remaining provisions shall be deemed to be in full force and effect as if they had been executed by both parties subsequent to the expungement of theinvalid provision.

11. Entire Agreement. This Agreement shall constitute the entire agreement between the parties hereto. Any prior understanding or representation of any kind preceding the date of this Agreement shall be non-binding upon either party, except to the extent incorporated in this Agreement.

12. Amendment. Any amendment of this Agreement shall only be accomplished by awriting to that effect, executed by both parties hereto.

13. Assignment. Stueland may not assign this Agreement without the prior written consent of the City. The City may assign this Agreement freely upon notice to Stueland.

14. Indemnification. Each party agrees to hold the other harmless and keep the other free, during the term of this Agreement and all extensions or renewal thereof, from any and all liability and claims of damages arising out of injury to any person or persons or property whomsoever and whatsoever, arising out of or in any way related to the acts or omissions of the indemnifying party under this Agreement.

15. Binding Effect. The terms, covenants and conditions of this Agreement shall run with the land and be binding upon the successors and assigns of the parties hereto. The City will record a copy of this Agreement, or a memorandum thereof, in the Office of theRegister of Deeds.

16. No Partnership. Nothing in this Agreement shall be construed to create any co-partnership, principal and agent, joint venture or other similar relationship between the parties hereto and neither party may incur debts or liabilities in the name, or on behalf, of the other unless expressly approved by the party to be bound thereby in a written instrument signed by such party.

IN WITNESS WHEREOF, the parties hereto have executed this Agreement of the date stated on the first page.

_____ _____

Gary Stueland Date

STATE OF WISCONSIN)
)ss
COUNTY OF VERNON)

Personally came before me this _____ day of _____, 2021 the above named Gary Stueland, to me known to be the person who executed the foregoing instrument and acknowledged the same.

_____

NOTARY PUBLIC, State of Wisconsin
My Commission expires:_____

CITY OF VIROQUA

By:_____ _____
Karen Mischel, Mayor Date

By:_____ _____
Lori Polhamus, City Clerk Date

STATE OF WISCONSIN)
)ss
COUNTY OF VERNON)

Personally came before me this _____ day of _____, 2021 the above named Mayor and City Clerk, to me known, respectively, of the City of Viroqua, and to be the persons who executed the foregoing instrument and acknowledged the same.

_____
NOTARY PUBLIC, State of Wisconsin
My Commission expires:_____

Drafted by:
Attorney George A. Hopkins
Hopkins & Hopkins, LLP
757 N. Main Street
Viroqua, WI 54665

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
City of Viroqua	WI- 0021920-10-0	

Facility Address	City	State	ZIP Code
1315 County Highway B	Viroqua	WI	54665

Project Contact Name (if applicable)	Address	City	State	ZIP Code
			WI	

Project Name
Viroqua WWTF Streambank Stabilization Project

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	Stueland Water Quality Trade Agreement No. 1	Streambank restoration	262.24	3	NRCS's Streambank Erosion Estimator

County	Closest Receiving Water Name	Land Parcel ID(s)	Parameter(s) being traded
Vernon	Tributary of the Bad Axe River	024-00944-0000	Total 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
Billie C. Kerschner	5/20/22

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
	4/29/22

Leave Blank – For Department Use Only

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