WATERSHED ADAPTIVE MANAGEMENT PLAN

Cambridge-Oakland Wastewater Commission
Wastewater Treatment Facility

February 2019

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1. INTRODUCTION AND BACKGROUND

1.1 Introduction

In 2010 the State of Wisconsin modified NR 102 and NR 217 to include new water quality based effluent limits for phosphorus. As a result, wastewater treatment facilities (WWTF) have begun to receive water quality based phosphorus limits in their new or re-issued Wisconsin Pollutant Discharge Elimination System (WPDES) permits from the Department of Natural Resources (DNR). As a part of the new rule, WPDES permits include a schedule to evaluate compliance with these new effluent limits. The Cambridge-Oakland WWTF received a re-issued permit in January 2015. The current permit includes an interim phosphorus limit of 1.2 mg/L monthly average, a compliance schedule of 7-9 years with annual requirements, and target effluent limits of 0.075 mg/L for a 6-month average and 0.225 mg/L for monthly averages.

The Cambridge-Oakland Wastewater Commission evaluated compliance options in the December 2017 Phosphorus Compliance Alternatives Plan and selected Adaptive Management, due to the uncertainty of the impact that Total Maximum Daily Load (TMDL) allocations for Koshkonong Creek will have on the Commission's discharge limit.

1.2 Existing Facilities

The Cambridge-Oakland Wastewater Commission's WWTF is located on the north side of the Village of Cambridge and discharges to Koshkonong Creek.

The WWTF was constructed in 2005. The liquid treatment train includes: a rotary fine screen, grit removal, influent flow metering and sampling, two sequencing batch reactor (SBR) tanks with biological phosphorus removal, effluent equalization, UV disinfection, effluent flow metering, and effluent sampling. A site plan is provided in Appendix A.

Biosolids are wasted to the aerobic digesters where they are stabilized, then further thickened with a gravity belt thickener. Liquid biosolids are stored in the sludge storage tank and seasonally land applied. A process flow diagram of the Cambridge-Oakland WWTF can be found attached in Appendix A of this report.

The treatment process achieves biological nutrient removal (BNR) through the specific sequencing of anaerobic, anoxic and aerobic conditions in the SBR tanks to promote uptake of phosphorus by the activated sludge microorganisms. Phosphorus is permanently removed from the liquid process through wasting of settled biomass. Waste activated sludge (WAS) is pumped to aerobic digestion then to the gravity belt thickener (GBT). The GBT filtrate is recycled back to the filtrate equalization basin. Decant from the aerobic digesters can also be recycled back to the head of the plant should the operators choose to do so. Stabilized sludge is stored on site prior to land application.

Current operation of the BNR process achieves enhanced biological phosphorus removal for the majority of the year. However, there are periods when the addition of ferric chloride is required to reduce phosphorus to acceptable levels. On days when the GBT is operated, ferric chloride is typically added to the GBT filtrate. This chemical addition has reduced peaks in effluent phosphorus concentrations that used to occur following GBT operation.

Wastewater flowing to the Cambridge-Oakland Wastewater Commission's WWTF comes from a combination of residential and commercial sources. The WWTF has no significant industrial dischargers. The population of the Commission is approximately 3,800 people based upon the Department of Administration (DOA) population estimates for the Village of Cambridge and the Town of Oakland. The DOA census for 2005 is 3,539 and has a population projection of 4,915 by the year 2025.

Current flow and loadings based on data from the past 3 years are summarized in Table 1-1, along with design values for the facility.

Table 1-1
Cambridge-Oakland Wastewater Commission's WWTF Loadings Summary

Parameter	Current	Design	% Design
Average Flow (MGD)	0.411	0.571	72%
BOD (lbs/day)	579	1,000	58%
TSS (lbs/day)	565	1,000	57%

1.3 Phosphorus Compliance Evaluation

Per the requirements of the Phosphorus Compliance Schedule, the Cambridge-Oakland Wastewater Commission conducted a phosphorus compliance evaluation for the treatment facility, which consisted of a series of annual reports.

The year one report consisted of generating an Optimization Plan for the facility. This Optimization Plan identified the following "Action Plans" to improve (reduce) phosphorus discharges from the WWTF:

1. Collection of Recycle Loading Data
    a. Sampling of GBT filtrate
    b. Tracking of ferric chloride quantities added to GBT filtrate
2. Testing and Evaluation of SBR System
    a. Determine the potential for optimizing overall phosphorus removal
    b. Inter-basin testing across selector zones
3. Review and Optimize Aerobic Digestion Decant
    a. Sampling of phosphorus concentrations in the decant

The year two report consisted of a phosphorus planning update, which summarized the progress on the plant optimization, as well as identified the possible compliance options for the facility. The compliance options included:

1. Mechanical upgrade to the existing facility
2. Consolidation with nearby sewerage system
3. Alternative discharge locations
4. Watershed based approaches
   a. Water Quality Trading
   b. Watershed Adaptive Management
5. Water quality variance
6. New multi-discharger phosphorus variance

The year three report consisted of a Phosphorus Compliance Alternatives Plan. In this plan, the alternatives from the year two report were evaluated based on economic and non-economic factors. Economic evaluations considered capital and operational costs through a present worth analysis. Non-economic evaluation considered the feasibility, long term benefit to the Commission, and environmental benefits of each alternative.

The lowest cost, feasible alternative was found to be Watershed Adaptive Management (WAM), followed by Water Quality Trading (WQT). WAM involves working within the watershed to reduce phosphorus loading to offset the difference between the WWTF's discharge of phosphorus and the allowable discharge to comply with WQBEL. WQT is another watershed based approach that is similar to WAM, but works to quantify the overall phosphorus reductions and trade them with other point or non-point sources. The WAM and WQT were similar in cost and the Commission has determined that WAM is the most feasible alternative for the next permit term.

The use of Watershed Adaptive Management for subsequent permit terms will depend on the status of TMDL allocations for Koshkonong Creek and the success of Adaptive Management. The Commission may opt to switch to another compliance option following the first permit term. Additionally, there may be other communities in the Koshkonong Creek Watershed that choose to do Watershed Adaptive Management, which may affect how the program is implemented for the Cambridge-Oakland Wastewater Commission and provide potential opportunities for partnership.

1.4 Adaptive Management Eligibility

A permittee is eligible for Watershed Adaptive Management as long as the following three requirements are met:

- The receiving water is exceeding the applicable water quality criterion (WQC) for phosphorus, which is 0.075 mg/L for Koshkonong Creek.
- An upgrade to the existing facility would be required to comply with the new final effluent limit. It is expected that tertiary filtration (or similar means) in conjunction with chemical coagulation and/or polymer additions will be

required to reach these levels. Tertiary treatment technologies include deep bed continuously backwashing filters, cloth media disc filtration, and tertiary membrane filtration.

- Nonpoint sources contribute at least 50% of the total phosphorus entering the receiving water. The PRESTO-Lite Report estimates the Point to Nonpoint Phosphorus Ratio for Adaptive Management to be 14:86.

Limited recent water quality data is available specifically for total phosphorus, as the available data is 10 data points from a 2000 – 2001 study approximately 1 mile downstream of the outfall. The limited available data indicates that the average phosphorus concentration of the stream is approximately 0.35 mg/L.

The Cambridge-Oakland Wastewater Commission’s staff took in-stream sampling of the Koshkonong Creek from 2012-2014. The results averaged an in-stream phosphorus concentration of 0.22 mg/L, well above the WQC of 0.075 mg/L.

Currently, the average effluent phosphorus concentration of the Cambridge-Oakland WWTF is 0.70 mg/L. Therefore, the Commission feels comfortable that through supplemental chemical addition, and improved efficiency of phosphorus reduction at the plant, compliance with interim limit of 0.6 mg/L will be achieved by midway through the first permit term, as defined in the Implementation Schedule included in Table 5-1.

1.5 Adaptive Management Plan Components

The DNR has created a guideline for a successful Adaptive Management Program, which is outlined below and addressed in the subsequent chapters. The components to develop a successful management plan include:

1. Identify partners
2. Describe the watershed and set load reduction goals
3. Conduct a watershed inventory
4. Identify where reductions will occur
5. Describe management measures
6. Estimate load reductions expected by permit term
7. Measuring success
8. Financial security
9. Implementation schedule with milestones

A schedule of where these components will be addressed is included in Table 1-2.

Table 1-2
DNR Adaptive Management Components

Component	Addressed in
Identify Partners	Section 4.1
Describe the watershed and set load reduction goals	Sections 2 & 3
Conduct a watershed inventory	Section 3
Identify where reductions will occur	Section 4.2
Describe management measures	Section 4.3
Estimate load reductions expected by permit term	Section 3.4
Measuring success	Sections 3.2.2, 5.8 & 5.9
Financial security	Section 6
Implementation schedule with milestones	Section 5.10

2. WATERSHED DESCRIPTION

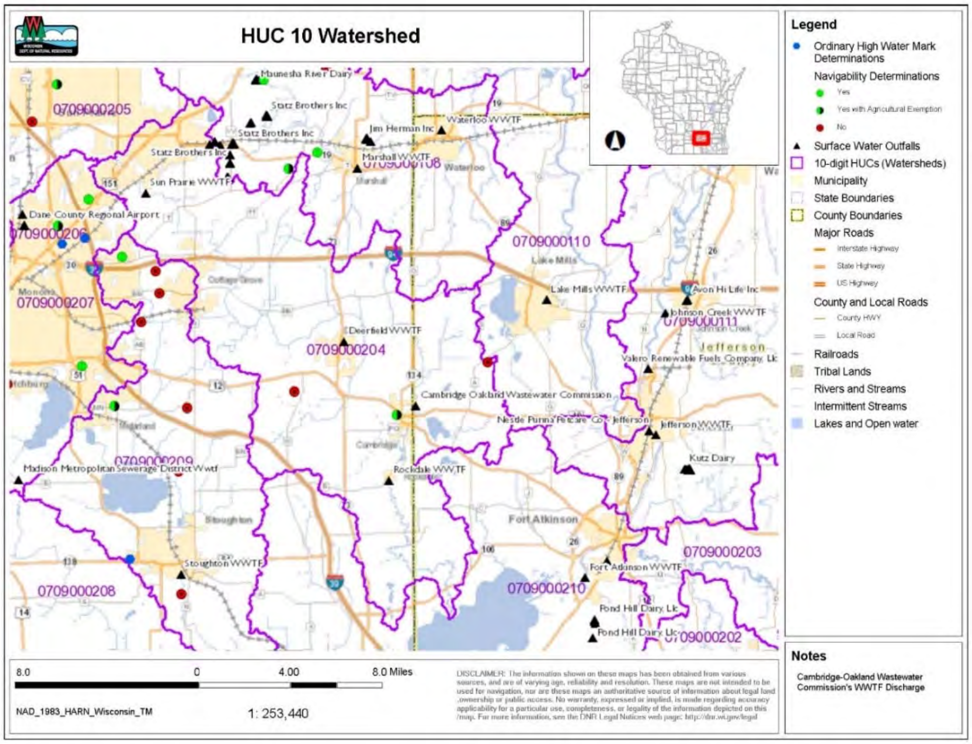
The Cambridge-Oakland Wastewater Commission's WWTF is located in the Lower Koshkonong Creek Watershed of the Lower Rock River Basin in Jefferson County. The WWTF discharges directly to Koshkonong Creek. Throughout this report, the term "Koshkonong Creek Watershed" will be used to refer to the watershed upstream of this discharge point, and will be considered the action area for this adaptive management plan The Commission will initially seek out projects within the HUC 12 upstream of the WWTF discharge, and expand to the HUC 10 if needed.

This section presents general information about the Koshkonong Creek Watershed characteristics, which are important when evaluating phosphorus loading conditions and modeling future phosphorus reduction strategies. Data were collected from on-line tools and geographic information systems (GIS), such as the DNR Surface Water Data Viewer, and the Nations Resources Conservation Service (NRCS) Web Soil Survey. The data included watershed boundaries, soil data, land use, land cover, and temperature and precipitation statistics.

2.1 HUC and Watershed Information

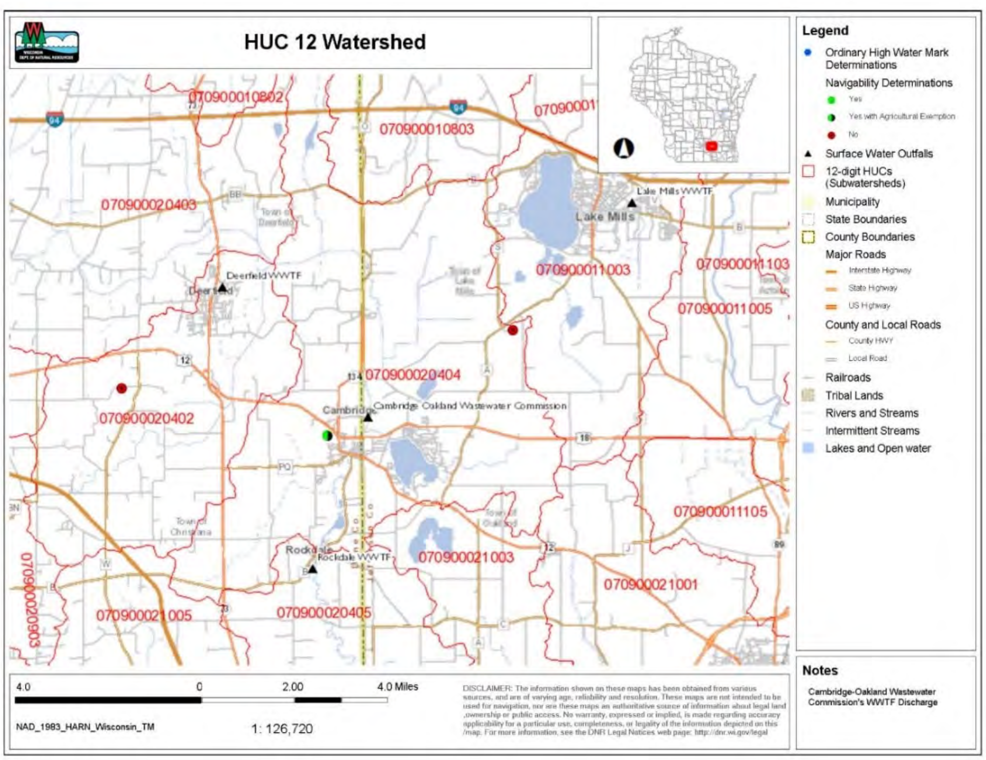
Maps of the HUC 10 (# 0709000204) and HUC 12 (# 070900020404) watersheds for the Commission's WWTF are shown below in Figures 2-1 and Figures 2-2 and are included in Appendix B. Figure 2-3 shows the Koshkonong Creek Watershed.

Figure 2-1: HUC 10 Watershed



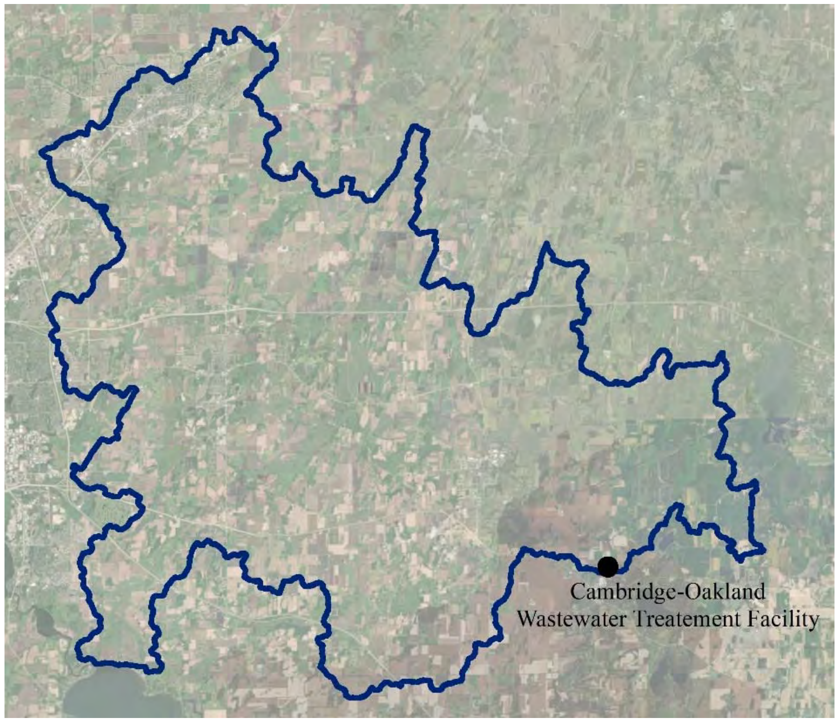
This figure was provided by the DNR's Surface Water Data Viewer Application.

Figure 2-2: HUC 12 Watershed



This figure was provided by the DNR's Surface Water Data Viewer Application.

Figure 2-3: Koshkonong Creek Watershed



2.2 Receiving Water Description

As mentioned previously, the Cambridge-Oakland Wastewater Commission's WWTF discharges to Koshkonong Creek. At the point of discharge, the tributary is classified as a warm water sport fishery. A complete map of the impaired waters in the Koshkonong Creek Watershed is included in Appendix C. Per NR 102.06 Section (3) Paragraph (a), Koshkonong Creek is not listed as having a total phosphorus criterion of 0.1 mg/L, so it shall meet a total phosphorus WQC of 0.075 mg/L.

2.3 Climate and Precipitation

Climatological information can play an important role when modeling phosphorus loads in runoff and calculating phosphorus reductions. Climate and precipitation data for the Koshkonong Creek Watershed from 2004 to 2017 were obtained from the National Oceanic and Atmospheric Administration (NOAA). Data from the Jefferson weather station were selected to represent the Watershed. Average monthly temperatures range from a high of 73°F in July to a low of 20°F in January. Average monthly precipitation (both rainfall and snowfall) ranged from a high of 5.75 inches in June to a low of 1.66 inches in February. The average annual precipitation over the 14 years reported was 34.62 inches. Table 2-1 presents average monthly data for the reporting period.

Table 2-1
NOAA Climate Data

	Temperature			Precipitation		
	Min	Max	Average	Min	Max	Average
Month	(°F)	(°F)	(°F)	(inches)	(inches)	(inches)
Jan	-1	39	20	0.58	3.62	1.70
Feb	0	42	21	0.65	3.44	1.66
Mar	15	60	34	0.64	5.82	2.38
Apr	26	65	47	1.91	7.29	4.29
May	45	75	59	1.55	7.84	4.29
June	56	86	69	0.35	10.59*	5.75
July	58	91	73	2.12	9.00	4.42
Aug	58	85	71	1.17	12.69*	4.15
Sept	49	80	64	0.09	7.49	3.03
Oct	37	67	51	0.54	6.41	3.10
Nov	22	54	38	0.33	4.79	2.38
Dec	7	42	25	0.71	5.18	2.43

(*) The three largest precipitation amounts occurred in August of 2007, June of 2010, and June 2008.

It is important to recognize the impact of extreme weather events on erosion and subsequent transport of sediment, including phosphorus, into surface water. Extreme precipitation can result in excessive loads of phosphorus entering surface water, carried by runoff.

2.4 Soil Types

Data on soil types was available through the NRCS's Web Soil Survey (WSS) and Soil Survey Geographic Database (SSURGO). The predominant soil types in the Watershed were Dodge Silt Loam and Houghton Muck. Soil data was used in conjunction with additional data, such as land cover, in several modeling applications. Soil data can be used in calculating the Phosphorus Index (PI) of the land, selecting locations for phosphorus reducing projects, and modeling future phosphorus reductions. A complete map and table of soil types for the Koshkonong Creek Watershed and the HUC 12 watershed is attached in Appendix D.

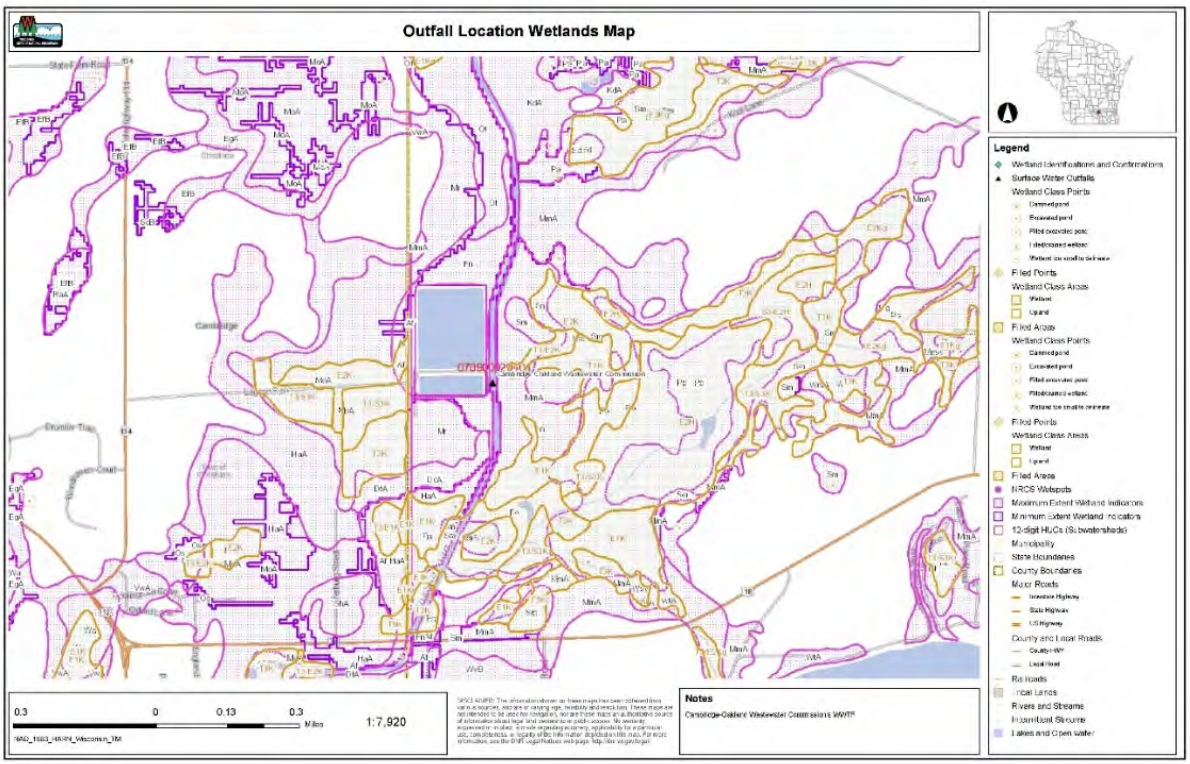
2.5 Land Use

Land use data was obtained through Purdue University's long Term Hydrologic Impact Analysis (L-THIA) model. As with soil type, land use was used in the modeling of phosphorus loads and reduction, as well as to help determine where management measures should take place. The Koshkonong Creek Watershed is primarily made up of agricultural land, pasture/hay land, and deciduous forest. These major land use types make up 55%, 15%, and 7% of the Watershed, respectively. A complete breakdown of land use for the Koshkonong Creek Watershed, as well as the HUC 12 watershed, is included in Appendix E.

2.6 Wetlands

The HUC 12 is spotted with several small emergent and woody wetlands. Respectively, these wetlands make up 6.2% and 3.2% of the Watershed by area. A complete map of the wetland results from the Surface Water Data Viewer is attached in Appendix F. A localized wetland map for the point of compliance is show below in Figure 2-4. It is important to remember that wetland can be both a source of phosphorus or can aid in phosphorus reduction. For these reasons, wetland areas should be evaluated before starting any wetland restoration projects.

Figure 2-4: Cambridge-Oakland Point of Compliance Wetland Map



3. WATERSHED INVENTORY

This watershed inventory for the Koshkonong Creek Watershed expands on the watershed characteristics from the previous section to provide insight into where phosphorus management measures could be implemented.

3.1 Point Sources-Current Phosphorus Loads

The EPA defines point sources as “any single identifiable source of pollution from which pollutants are discharged, such as a pipe, ditch, ship or factory smokestack.” With respect to water pollution, common point sources are municipal WWTFs and industries/factories. In the HUC 12 watershed, there are no other point sources. In the Koshkonong Creek Watershed, there are three other point sources including the Deerfield WWTF, Sun Prairie WWTF, and Landmark Services Cooperative.

3.1.1 Municipal WWTFs

Within the Koshkonong Creek Watershed, there are two municipal WWTFs with an effluent discharge: the City of Sun Prairie and the Cambridge-Oakland WWTF. Town and Country Engineering has contacted the Sun Prairie WWTF about their phosphorus discharge, and the Sun Prairie WWTF plans on installing filters to reduce their effluent concentrations to below 0.075 mg/L by 2022. Currently, the PRESTO report lists Sun Prairie as having an annual point source load of 7,940 pounds of phosphorus. This results in an upstream reduction of an estimated 6,935 pounds/year based on the current flow of 4.4 MGD and a concentration of 0.075mg/L.

Current influent and effluent phosphorus data for the Cambridge-Oakland Wastewater Commission’s WWTF are provided in Appendix G and summarized in Table 3-1. Values for the daily and annual loads were calculated by using annual averages for flow and phosphorus concentration.

Table 3-1
Effluent Phosphorus Summary

Year	Annual Average Flow	Annual Average Phosphorus Concentration	Daily Phosphorus Loading	Annual Phosphorus Loading
	MGD	mg/L	lbs/day	lbs/year
2013	0.369	1.07	3.53	1,288
2014	0.374	0.86	2.55	931
2015	0.373	0.76	2.33	850
2016	0.426	0.73	2.48	905
2017	0.446	0.79	2.84	1,037
2018	0.475	0.70	2.74	1,000

*Excludes October-December 2018 and data error occurring 07/25/2017 - 07/27/2017

3.2 Nonpoint Sources of Phosphorus

According to the EPA, “Nonpoint source pollution generally results from land runoff, precipitation, atmospheric deposition, drainage, seepage or hydrologic modification. Nonpoint source (NPS) pollution, unlike pollution from industrial and sewage treatment plants, comes from many diffuse sources. NPS pollution is caused by rainfall or snowmelt moving over and through the ground. As the runoff moves, it picks up and carries away natural and human-made pollutants, finally depositing them into lakes, rivers, wetlands, coastal waters and ground waters.”

In the Koshkonong Creek Watershed, typical NPS pollution originates from erosion of farmland and streambanks, as well as runoff from barnyards.

3.2.1 Areas of High Erosion

One way to prioritize areas within a watershed that may be vulnerable to water erosion is with the DNR Erosion Vulnerability Assessment for Agricultural Lands (EVAAL) tool, which was used in correlation with soil, land cover and watershed data. This tool allows for the identification of areas that may be most vulnerable to erosion. The EVAAL tool results in a graphic and tabular data set that depicts areas of high vulnerability and can be used to prioritize and focus efforts by identifying fields with high nutrient and sediment transportation.

In order to use the EVAAL tool, the following datasets had to be obtained: LiDAR-based Digital Elevation Model, Area of Interest Boundary, USDA-NRCS Soil Survey Geographic, and Culvert Lines. Using these datasets and the DNR’s EVAAL tool, an EVAAL map for the upstream portion of the HUC 12 watershed was created and is provided in Appendix H.

The results of the EVAAL tool revealed the highest vulnerability areas to be various farm fields throughout the watershed where gully erosion is evident. Although areas that may be vulnerable to erosion should be targeted for management measures, the accessibility of the land ultimately determines which areas can be targeted. Additionally, areas vulnerable to erosion that are located close to surface water will have a higher priority than more distant areas.

3.2.2 CAFOs

CAFOs (Concentrated Animal Feeding Operations) may generate a substantial amount of manure, which naturally contains phosphorus. This manure is typically disposed of by land applying it as fertilizer. This fertilizer can subsequently be washed off after a large storm event and enter surface water. The fact that the fertilizer is land applied played a large part in the U.S. Court of Appeals case that led to the EPA creating its 2008 CAFO rule. This rule states that agricultural stormwater is exempted from being considered a point source, but the EPA may treat the land application of excessive manure as a point source. This result of the rule is that while CAFOs are not considered a point source, they may have to apply for a NPDES permit, or in Wisconsin, a WPDES permit.

Currently in the Koshkonong Creek Watershed, there are no outfalls defined as CAFOs with a WPDES permit.

3.2.3 Barnyards

Outdoor dairy and beef cattle lots can be a significant source of phosphorus entering into surface water. Since Wisconsin has a large beef and dairy industry, it is important that barnyards be examined as a possible target area to reduce phosphorus concentrations.

Barnyards are present in the Koshkonong Creek Watershed, but a barnyard inventory has not yet been performed. These barnyards are considered to be possible Critical Source Areas. An initial inventory using aerial photography was conducted and identified that there a number of barnyards located within the HUC 12 watershed upstream of the WWTF discharge point. A map of the initial inventory is provided in Appendix I.

3.2.4 Streambanks

Streambank erosion can be a source of sediment and nutrients entering into surface water, as well as having a damaging effect on the habitat. Sedimentation can fill pore spaces, reduce oxygen content, and increase turbidity. Excessive phosphorus loading to streams can lead to eutrophication.

Koshkonong Creek and its tributaries were inspected using aerial photography to attempt to identify areas that are in need of streambank repair, such as oxbows and steep banks. Several potential CSAs were identified within the Watershed and can be viewed in Appendix J. Additional inspections of the potential CSAs will need to be conducted to determine their state of erosion.

3.2.5 Phosphorus Nonpoint Source Summary

According to the DNR PRESTO-Lite model results, non-point sources are estimated to contribute approximately 86% of the phosphorus load within the Koshkonong Creek Watershed. The PRESTO-Lite watershed delineation report for the Koshkonong Creek Watershed is provided in Appendix K along with the DNR established PRESTO-Lite Report for each discharge facility. While the quantities of phosphorus contributed from each of the nonpoint sources listed above are not known, it is recognized that erosion of land and streambanks, and runoff from barnyards and feedlots are all potential targets for phosphorus management measures.

3.3 Stream Monitoring Program

3.3.1 Historic Phosphorus Data

Limited recent water quality data is available, specifically for total phosphorus, as the available data is only 10 data points from a 2000 – 2001 study approximately 1 mile downstream of the outfall. The limited available data indicates that the average phosphorus concentration of the stream is approximately 0.35 mg/L as provided in Appendix L.

The Cambridge-Oakland Wastewater Commission Staff collected samples upstream and downstream of the discharge point in the Koshkonong Creek. In May 2012, sample collection began and continued through December 2014. The results of the in-stream sampling are provided in Appendix L. The in-stream phosphorus concentration was 0.22 mg/L downstream of where the WWTF discharges into the Koshkonong Creek and 0.24 mg/L upstream of the discharge location. Table 3-2 details the yearly averages from 2012-2014.

Table 3-2
In-Stream Phosphorus Analysis

Year	Upstream Phosphorus Conc. (mg/L)	Downstream Phosphorus Conc. (mg/L)
2012	0.20	0.21
2013	0.28	0.22
2014	0.29	0.25
Average	**0.24**	**0.22**

3.3.2 In-Stream Sampling Program

For Adaptive Management, the only required monitoring parameters are in-stream phosphorus and flow. The only required sampling area is at the point of compliance.

One sampling point is proposed for monitoring in-stream phosphorus concentrations, downstream of the point where the WWTF outfall discharges to Koshkonong Creek, which has been defined as the Watershed Adaptive Management point of compliance for the Cambridge-Oakland Wastewater Commission, and is located at 43°00’53.48”N and 89°00’34.52”W. No SWIMS ID is currently associated with this point. Appendix M includes a map of the proposed sampling location. As described above, in-stream samples were taken from 2012 through 2014 and additional sampling will be performed during the 2019 growing season to establish a baseline prior to beginning Adaptive Management.

In addition to in-stream phosphorus sampling, the Cambridge-Oakland Wastewater Commission’s WWTF staff will continue to collect composite effluent phosphorus samples at the outfall three times a week, in accordance with the WPDES permit. Samples will be analyzed by the WWTF's lab (#113001570) where the stream samples will be analyzed for phosphorus using EPA method 365.4, and the effluent samples will be analyzed using EPA method 365.1. Stream samples will be collected every other Wednesday by members of the Cambridge-Oakland Wastewater Commission's WWTF staff from May to October. Samples will be collected from the center of the stream (or the portion of the stream with the strongest flow) at a depth of 3 to 6 inches below the surface, and then placed into preserved sample bottles for future analysis by (method SM4500-PE 20 ed.). Phosphorus samples will meet the preservation requirements in ch. NR 219, Wis. Adm. Code, Table F, by having acidified sample bottles and a cooler with ice present for sample collection. Care will be taken while sampling to avoid disturbing the sampling site.

In-stream flow measurements will be taken at the bridge where Koshkonong Creek passes under Highway 18. Town and Country has contacted the USGS in order to establish a stage-flow relationship for this point in the stream. Once established, the Village will measure the stage level of the creek during sampling events to determine the flow.

3.4 Required Phosphorus Load Reduction

Following the guidance for Adaptive Management, phosphorus reductions were calculated for the first permit term. Although the calculation will be for the minimum reduction per permit term, it may be advantageous to offset more than the minimum reduction required to improve the chances of success for Adaptive Management.

Variables for calculations:

- Average flow (2015-2018) of the Cambridge-Oakland Wastewater Commission's treatment plant= **0.427 MGD**
- Permit Term 1 interim limit monthly average effluent phosphorus concentration =**0.60 mg/L**
- Annual mean flow of Koshkonong Creek (from DNR) by Cambridge-Oakland Wastewater Commission's WWTF= **42.1 MGD**
- Mean annual phosphorus concentration of Koshkonong Creek from in-stream sampling results **=0.22 mg/L**

  $42.1\ MGDx\ 0.22\ \frac{mg}{L} x\ 8.34\ x\ 365 \frac{days}{year} = \mathbf{28,228}\ \frac{\boldsymbol{pounds}}{\boldsymbol{year}}$
- 8.34= unit conversion
- Water Quality Criterion for phosphorus= **0.075 mg/L**

Term1:

Step 1: Calculate the current discharge as an annual load.

$$0.427\ MGDx\ 0.60\ \frac{mg}{L} x\ 8.34\ x\ 365 \frac{days}{year} = \mathbf{780}\ \frac{\boldsymbol{pounds}}{\boldsymbol{year}}$$

Step 2: Calculate the current load in the receiving water just downstream from the discharge

$$780\frac{pounds}{year} + 28{,}228\frac{pounds}{year} = \mathbf{29,008}\frac{\boldsymbol{pounds}}{\boldsymbol{year}}$$

Step 3: Calculate the applicant's percent contribution of load.

$$\frac{780\frac{pounds}{year}}{29{,}008\frac{pounds}{year}} * 100 = \mathbf{2.69}\%$$

Step 4: Calculate the allowable load in the receiving water.

$$(0.427\ MGD + \ 42.1\ MGD) * 0.075\frac{mg}{L} * 8.34 * 365\frac{days}{year} = \mathbf{9,709}\frac{\boldsymbol{pounds}}{\boldsymbol{year}}$$

Step 5: Calculate the needed reduction in the receiving water

$$29{,}008\frac{pounds}{year} - 9{,}709\frac{pounds}{year} = \mathbf{19,299}\frac{\boldsymbol{pounds}}{\boldsymbol{year}}$$

Step 6: Calculate the applicant's proportional share of the needed reduction.

$$19{,}299\frac{pounds}{year} * 2.69\% = \mathbf{520}\frac{\boldsymbol{pounds}}{\boldsymbol{year}}$$

For the first permit term of 5 years, the Cambridge-Oakland Wastewater Commission's WWTF needs to reduce at least 520 pounds of phosphorus a year throughout the Adaptive Management program. However, in order to meet water quality goals in Koshkonong Creek, a higher level of reduction should be targeted during the first permit term. Ideally, 30-50% of the overall needed reduction will be targeted within the first 5 years. These reductions will be accomplished by phosphorus removal technology installed at the wastewater treatment plant, as well as a combination of management measures as described in Section 4.3. In order to calculate the expected phosphorus load reductions, modeling tools (such as SnapPlus and BARNY) will be employed. If measures employed during the first permit term of Adaptive Management do not show water quality improvement, the Adaptive Management plan will be modified in subsequent permit terms to offset more of the phosphorus load than required for the first permit term.

To calculate the phosphorus load reduction for the second term, the phosphorus load of the receiving water will be monitored and recorded. Once the new load is determined, the allowable load of the receiving water will be subtracted from the new phosphorus loading, and the remaining phosphorus load will be the reduction needed for Permit Term 2. Currently, the Commission is planning to have a phosphorus reduction of approximately 75% of the overall needed reduction, or 14,475 pounds a year, by the end of the second term.

To calculate the phosphorus load reduction for the third permit term, any remaining phosphorus load above the water quality criterion will be the reduction needed for

Permit Term 3. The ultimate goal of Permit Term 3 will be to lower the receiving water phosphorus concentration to below 0.075 mg/L. Currently, the Commission is planning to have the full quantity of phosphorus reductions required to result in the allowable load of phosphorus in the receiving water, which is 19,299 pounds a year.

3.5 Sensitivity Analysis

In order to estimate the total acreage needed for management measures, a sensitivity analysis was constructed. For each acre of land, varying amounts of phosphorus reduction were assumed in order to calculate total acreage. Table 3-3 shows the total acreage needed to meet the minimum reduction needed for the Cambridge-Oakland Wastewater Commission's WWTF's first permit term of Adaptive Management if only field-based practices are utilized.

Table 3-3
Phosphorus Reduction Sensitivity Analysis

Pounds of P reduction/acre	Acres needed for Permit Term 1
0.5	1,040
1	520
2	260
3	173

For the first permit term, 173 to 1,040 acres would be needed for management measures, assuming between 0.5 and 3 pounds per acre reduction. These numbers are based on previous experience with phosphorus reduction in Wisconsin, but soil testing and additional modeling will be completed by the Commission, Dane County LWRD, and Jefferson County LCD to determine the actual reductions from management measures.

4. PROJECT PLANNING

4.1 Partners

The success of Adaptive Management depends on the joint effort of many partners, and it is important to identify the roles and responsibilities of each partner at the onset of the project. For the Cambridge-Oakland Adaptive Management Plan, the following governmental, professional, and local partners have been identified:

4.1.1 WPDES Permit Holder

The WWTF is operated by the Cambridge-Oakland Wastewater Commission and treats domestic wastewater from the Village of Cambridge and the Town of Oakland with no significant industries and ample capacity for current and future loads. Treatment includes a rotary fine screen, grit removal, influent flow metering and sampling, two sequencing batch reactor (SBR) tanks with biological phosphorus removal, effluent equalization, UV disinfection, effluent flow metering, and effluent sampling.

The Cambridge-Oakland Wastewater Commission will be responsible for financial matters, sampling, stream monitoring, meeting the facility's interim phosphorus limits, generating annual reports, and working with landowners to establish management practices.

4.1.2 Town and Country Engineering

Town and Country Engineering is a consulting firm that was organized in 1981, and works with municipalities in Wisconsin. They have experience in wastewater treatment analysis and design, as well as the design and analysis of water and sewer systems, wells and water treatment facilities, stormwater management, and general municipal engineering.

Town and Country designed the Commission's WWTF upgrade in 2005 and since has assisted with upgrades and operations. Town & Country works with the Commission to ensure that the treatment plant is operating most efficiently, and has assisted the Commission with its phosphorus compliance evaluations.

With respect to Adaptive Management, Town & Country's role will include modeling, mapping, budget review, Adaptive Management Plan development, and evaluation of effluent and stream data.

4.1.3 Jefferson County Land and Water Conservation Department and Dane County Land and Water Resources Department

The Jefferson County Land and Water Conservation Department (LWCD) and Dane County Land and Water Resources Department (LWRD) are governmental agencies committed to ensuring the protection and enhancement of Counties' natural, cultural, and historical resources. The LWCD and LWRD support citizens, communities, and local governments in their resource management and protection activities. The Koshkonong Creek Watershed is spread across both Dane and Jefferson County.

Jefferson County LWCD and Dane County LWRD have each worked with other communities with respect to agricultural conservation practices, and was contacted by the Commission to assist with several aspects of the adaptive management process.

For non-urban practices Dane County LWRD and Jefferson County LWCD will act as the broker between the Commission and landowners in each County to establish cost sharing agreements, and will assist in field-verifying adaptive management practices. Their responsibilities will include modeling with SnapPlus and BARNY (and any other models required), assisting with grants, mapping, estimating load reductions, and conducting site inspections. A service agreement will be developed in the future for any projects requiring Dane County LWRD and Jefferson Country LWCD's assistance. A letter of support from each County is included in Appendix N.

4.1.4 Local Landowners and Agricultural Producers

Farmers in the Koshkonong Creek Watershed are typically dairy farmers, cash croppers, or raise livestock. According to the land use data obtained by L-THIA, agricultural land makes up 55.4% of land in the Koshkonong Creek Watershed.

The Cambridge-Oakland Wastewater Commission, Dane County LWRD and the Jefferson County LWCD will establish contracts with landowners to install or implement management measures. If established in the contract, it will be up to the landowners and farmers to maintain the management measures outlined in their contract, with verification and inspection of the management being conducted by the Dane County LWRD and Jefferson County LWCD.

4.1.5 Other Stakeholders/Partners

There are several other organizations that could have interest or play a role in future Adaptive Management projects, including:

- *Gathering Waters Conservancy*: is an alliance that helps land trusts, landowners and communities by advocating for funding and policies that support land conservation, and fostering a community of practices that promotes land trust excellence and advancement.

- *Natural Resources Conservation Service (NRCS):* is the federal agency that works with landowners on private lands to conserve natural resources. NRCS is part of the U.S. Department of Agriculture. They were formerly called the Soil Conservation Service or "SCS".

- *Farm Service Agency (FSA):* is a federal agency that administers farm commodity, crop insurance, credit, environmental, conservation, and emergency assistance programs for farmers and ranchers.

- *United States Geological Survey (USGS):* is a scientific agency of the United States government. The USGS works in cooperation with more than 2,000 organizations across the country to provide reliable, impartial scientific information to resource managers, planners, and other customers.

Currently, there is no association between these organizations and the projects for the Cambridge-Oakland Adaptive Management Plan.

4.1.6 Summary of Partners

The current partners for the Cambridge-Oakland Wastewater Commission's Adaptive Management plan, along with their roles and responsibilities are summarized in Table 4-1.

Table 4-1
Roles and Responsibilities

Party	Roles/Responsibilities
Cambridge-Oakland Wastewater Commission's Wastewater Treatment Facility	• Financial matters • Stream and Wastewater Sampling • Stream monitoring • Meeting the facility's interim P limits • Verification of implemented urban practices • Annual Reporting
Town & Country Engineering	• Modeling • Mapping • Budget review • Adaptive Management Plan development • Assisting with grants • Data evaluation (effluent and stream)
Dane County Land and Water Resources Department and Jefferson County Land and Water Conservation Department	• Modeling • Assisting with grants • Mapping • Estimating load reductions • Conducting site inspections • Negotiating cost-share agreements • Verification of implemented rural practices
Landowners and Agricultural Producers	• Maintaining management measures

4.2 Areas of Phosphorus Reduction

For the Koshkonong Creek Watershed, both point and nonpoint source phosphorus reductions will occur. Traditional point source reductions will occur at the Cambridge-Oakland Wastewater Commission's WWTF, by maximizing the efficiency of the current biological phosphorus removal, in combination with chemical additions when needed. Currently, the WWTF is averaging 0.70 mg/L to 0.79 mg/L of effluent phosphorus from 2015-2018. The Commission is confident they will be able to meet the interim limits assigned to them for each permit term, which are 0.60 mg/L for the first term and second term, and 0.50 mg/L for the third term. Nonpoint source reductions are described in the following sections.

4.3 Nonpoint Source Management Measures

Nonpoint reductions will be obtained using a combination of Best Management Practices (BMPs) that are described in the following sections. Information about BMPs was obtained from the NRCS website. Most of these BMP's apply only to agricultural land, but some may also be used in urban areas.

4.3.1 Nutrient Management Planning

Nutrient management plans match nutrient inputs to crop demand, in order to maximize the return on nutrients while simultaneously limiting the nutrient loss. Typically, nutrient management plans are devised using analysis from SnapPlus modeling. Currently, many farmers are already utilizing nutrient management plans, so there may not be many opportunities to reduce phosphorus loading further with this method. The Dane County LWRD and Jefferson County LWCD will each help identify target areas for nutrient management planning.

4.3.2 Cover Crops

According to the USDA NRCS factsheet, "A cover crop is grasses, legumes, forbs or other herbaceous plants that are established for seasonal cover and conservation purposes. Cover crops are planted in the late summer or fall around harvest and before spring planting of the following year's crops. Common cover crops used in Wisconsin include winter hardy plants such as barley, rye and wheat."

Cover crops are used after harvesting, when the soil is loose and vulnerable to erosion. Roots from the cover crop increase the stability of the soil, while the additional vegetation can act as a filter to separate out suspended soils from stormwater runoff. Additional benefits of cover crops include increased soil porosity and infiltration, reduction of soil compaction, and improved soil health.

For the Koshkonong Creek Watershed, cover crops may be used at any locations where cover crops are not currently being utilized. Determination of feasibility for this management measure will be made on a case-by-case basis, following initial site inspections.

4.3.3 Conservation Buffers

Referring to the USDA NRCS factsheet, “Conservation buffers are small areas of land in permanent vegetation, designed to intercept pollutants and manage other environmental concerns. Types of buffers include riparian buffers, filter strips, grassed waterways, contour grass strips, field borders, and vegetative barriers. Strategically placed buffer strips in the agricultural landscape can effectively mitigate the movement of sediment, nutrients, and pesticides within farm fields and from farm fields. When coupled with appropriate upland treatments, buffer strips should allow farmers to achieve a measure of environmental sustainability in their operations.

Buffers slow water runoff, trap sediment, and enhance filtration within the buffer. Buffers also trap fertilizers, pesticides, pathogens, and heavy metals, and they help trap snow and cut down on blowing soil in areas with strong winds.”

Several types of conservation buffers may be implemented within the Koshkonong Creek Watershed. These buffers include grassed waterways, contour grass strips, and buffer strips. Details about these buffers and how each of these buffers may be utilized in the Koshkonong Creek Watershed are provided below.

Grassed Waterways
Grassed waterways are broad, shallow channels designed to move surface water across farmland without causing soil erosion. The vegetative cover in waterways slows the water flow and protects the channel surface from rill and gully erosion. Grassed waterways can be used in conjunction with harvestable buffers and cover crops to increase phosphorus reductions. The current use of grassed waterways and their potential use for the future will be assessed during the site visits.

Contour Grass Strips
Contour grass strips are strips of perennial vegetation alternated down the slope with wider cultivated strips that are farmed on the contour. These strips are usually narrower than the cultivated strips. Vegetation in these strips consists of species of grasses or a mixture of grasses and legumes. Contour grass strips established on the contour can significantly reduce sheet and rill erosion, as well as slow runoff and trap sediment. Since the Koshkonong Creek Watershed has some areas of steep slopes, contour grass strips may be a viable option for these parcels. Farm parcels will be evaluated during site visits to determine the effectiveness of contour grass strips.

Buffer Strips

Buffer strips create soil stability between areas that are utilized for crops and streams or water features. They are designed to intercept sediment and other pollutants before they enter the stream. One program that is available in both Dane County and Jefferson County is the FSA Conservation Reserve Enhancement Program (CREP) that allows farmers to establish a perennial grass cover in return for an annual payment. Eligible land must have a crop history (been planted with a commodity crop in 2 out of the last 5 years) or meet the qualifications of marginal pastureland. Potential buffer strip areas will be assessed for eligibility during site visits.

4.3.4 Tillage Changes

Changing the tillage practices on cropland can provide effective control to erosion and can improve soil properties and soil quality. A common option is no till practices, which allows a farmer to plant the crop and control weeds without turning the soil. Traditional plowing reduces the farm's long-term productivity by exposing organic-matter-rich top soil to the surface and breaking up clods that slowly and naturally form in the soil.

High organic matter and good clod formation are both crucial aspects of fertile soil. Organic matter attracts and holds onto water, and its slow breakdown releases vital nutrients into the soil. When soil is turned, the organic matter is exposed to the atmosphere and oxidized into carbon dioxide. Less organic matter in the soil means less water retention, less nutrient release and less clod formation. The broken up clods are exposed to rainfall, which further breaks down the clods and forms a soil crust on the field surface, causing surface runoff and soil erosion.

No-till agriculture uses a disk or chisel plow to prepare the field for seeding. These plows create a narrow furrow, just large enough for the seed to be injected. After the seed and fertilizer is injected, an attachment closes up the furrow. This way the farm field can be seeded with minimal soil disturbance and less potential for runoff and nutrient loss. As with other management measures, the potential for no till practices will be evaluated during the preliminary site visits.

4.3.5 Manure Management

Phosphorus is present naturally in animal manure, and when subsequently applied to agricultural land, can be a primary source of phosphorus to surface and groundwater. This phosphorus reaches surface waters by being carried in runoff if the manure is not properly stored. Runoff control practices can be installed to reduce the amount of manure, and therefore phosphorus, entering surface water. The most common practices for manure management include improved collection and storage, as well as optimizing application rates. The need for and feasibility of manure management will be assessed on a case-by-case basis upon recommendations by the Dane County LWRD or Jefferson County LWCD.

4.3.6 Runoff Control from Barnyards

Barnyards and feedlots can be a substantial source of phosphorus. This is due to the presence of manure and the phosphorus naturally occurring in it, as well as the phosphorus that has accumulated in the soil. If not managed correctly, manure that accumulates in barnyards can be carried via runoff to surface waters from storm events. These storm events can cause erosion and carry a significant amount of soil in the runoff, which is an additional source of phosphorus in the surface water. In order to reduce phosphorus pollution, it is important to manage the runoff coming through barnyards.

Runoff management allows for the direction of rainwater and other runoff water away from manure storage facilities. Additionally, the barnyard should be on a surface that can be cleaned so that manure may be removed, limiting the quantity of manure that can potentially be washed off. Roof gutters, surface water diversions and drip trenches can also keep water clean, and away from the barnyard. The need for and feasibility of barnyard runoff management will be assessed on a case-by-case basis upon recommendations by the Dane County LWRD or Jefferson County LWCD.

4.3.7 Streambank Restoration

Streambank restoration is accomplished by reinforcing the streambank and reestablishing the general structure and function of the stream. Streambank restoration reduces erosion and phosphorus loading from soil loss, but can be a costly management measure. However, restoration can have other benefits such as improvements of fish habitats and aesthetic improvements that may be desirable to landowners and watershed stakeholders. Streambank restoration can be used in both urban and rural areas and may be feasible for parts of the Koshkonong Creek Watershed.

4.3.8 Check Dams and Stormwater Ponds

A check dam is a small, sometimes temporary, dam that is constructed across a swale or a drainage ditch to counter erosion by slowing the velocity of runoff. These check dams can be constructed of rock, gravel bags, sand bags or even logs. Check dams can also improve the water quality of runoff by trapping sediment in the structure, or causing the sediment to settle out in the ponding conditions created behind the check dam.

Runoff can also be collected in stormwater detention or infiltration basins, which are typically installed in urban settings. The most beneficial type of basin for phosphorus reduction is a wet detention basin or pond, which is constructed to collect, detain, treat and release stormwater runoff. A wet detention basin consists of a permanent pool of water with designed dimensions, inlets, outlets and storage capacity.

Potential locations for check dams and ponds will be identified during site visits.

4.4 Prioritization of Management Measures

It is recommended that phosphorus reductions target "critical source areas" or CSAs, which are areas that contribute a disproportional amount of phosphorus to the receiving water. These areas typically store and transport phosphorus, and both factors come into play when locating CSAs. In the process of identifying CSAs, the EVAAL tool and site visits will be used to find areas of high erosion and significant sources of phosphorus.

During the site visits, source factors and transport factors will be identified. Source factors include phosphorus soil tests, application rate of phosphorus fertilizer and manure, and application method of phosphorus fertilizer and manure. Transport factors include erosion potential (identified visually to be used in conjunction with EVAAL data), runoff, and connectivity to receiving water.

A representative from the Commission and Dane County LWRD or Jefferson County LWCD will conduct site visits with each of the land owners to gather data and assess options for each parcel. Following the enrollment of the initial project partners, the process of identifying CSAs and conducting site visits will be repeated as the Adaptive Management program is expanded.

The Commission plans on targeting areas throughout the watershed. These projects could include streambank stabilization, taking land out of production, or buffer strips. Higher priority will be put on projects resulting in long term phosphorus reductions.

4.5 Potential Nonpoint Source Projects

Based on preliminary discussions between the Commission, Dane County LWRD, and Jefferson County LWCD, the following practices have been identified as the most likely types of projects for the initial implementation of Adaptive Management in the Koshkonong Creek Watershed:

- Streambank Stabilization
- Buffer strips or taking agricultural land out of production
- Check dams or stormwater ponds

The Commission intends to begin conducting site visits to identify interested landowners and potential projects in early 2019.

The Commission has been focusing conversations with farmers located within the Watershed and landowners of streambank within the Village of Cambridge and Town of Oakland. The Commission has also met with, and will continue to meet with, Dane County LWRD and Jefferson County LWCD to help locate future projects within the Koshkonong Creek Watershed.

5. PROJECT IMPLEMENTATION

This section presents the steps that will be taken to implement phosphorus reduction projects during the first permit term of Adaptive Management. As the Commission and its partners develop experience with Adaptive Management implementation in the Koshkonong Creek Watershed, these project implementation steps may be refined or revised.

5.1 Preliminary Site Visits

Following the identification of potential project areas, the first step to implementation is conducting site visits to evaluate options and feasibility. Prior to any site visit, a relationship should be established with the land owner by the Commission, Dane County LWRD, or Jefferson County LWCD, so they are informed about Adaptive Management and how they could play a role in the plan. Site visits should occur in the spring or fall, when the land cover will be more easily identifiable. Site visits will be arranged by the Commission, and could include members of the Village of Cambridge, Town of Oakland, WWTF staff, Town & Country Engineering, Dane County LWRD, Jefferson County LWCD, and the land owners themselves.

A typical site visit will usually take approximately 1-2 hours, depending on the size, and consist of a general assessment of areas of concern. These concerns could include streambank erosion, gully erosion, tillage, crop rotations, or nutrient management. General site information and observations will be documented.

5.2 Identification of Reasonable Measures

During the site visits, the most suitable measures for each site will be identified and discussed. Possible management measures are described in Section 4.3. As appropriate, additional management measures may be selected to result in further phosphorus reductions. The reasonable and feasible management measures will depend on the needs of the land owner and the physical properties of the land. These properties include soil type, slope, current land use/cropping practices, and proximity to water bodies/streams. Additional priority may be placed on larger parcels, or parcels with a greater expected phosphorus reduction. This would minimize the initial number of projects in order to gain the same total pounds of phosphorus reduction.

5.3 Data Collection for Modeling

Following the initial site visit, once possible management measures have been identified, there may be a need for additional data. Data collected by the Dane County LWRD and Jefferson County LWCD will be based on the model being utilized and the resource concern that is being assessed. Typical models used include SnapPlus, BARNY, WinSLAMM, P-8 Urban Catchment Model, Phosphorus Index, gully erosion calculator, and streambank erosion calculator. Data could include soil samples, survey data, crop practices and other information.

5.4 Modeling

Modeling will be used to estimate expected phosphorus reductions for various management measures that are being considered. The models that will most commonly be used are described below.

5.4.1 SnapPlus

SnapPlus (Soil Nutrient Application Planner) was designed as a means to streamline the preparation of Comprehensive Nutrient Management Plans (CNMP) for CAFOs. These CNMPs consist of five components: a conservation plan, a nutrient management plan, a record-keeping program, a manure manager, and feed management. Typically, several software programs were needed to generate these components, so SnapPlus was designed to incorporate these programs into one software package. SnapPlus is used to prepare nutrient management plans in accordance with Wisconsin's Nutrient Management Standard Code 590.

SnapPlus can be used to calculate crop nutrient recommendations for all fields on a farm, a rotational Phosphorus Index (PI) value for all fields as required for using the PI for phosphorus management, and a rotational phosphorus balance using soil test P as the criteria for phosphorus management. The PI is calculated by estimating average runoff phosphorus delivery from each field to the nearest surface water in a year given the field's soil conditions, crops, tillage, manure and fertilizer applications, and long-term weather patterns. The higher the PI number, the greater the likelihood that that field is contributing phosphorus to local water bodies.

For this application, SnapPlus will be used to calculate the expected phosphorus reductions for field-based management measures compared to the baseline for current practices. All SnapPlus modeling will be completed by the Dane County LWRD or the Jefferson County LWCD.

5.4.2 BARNY

The Wisconsin Barnyard Runoff Model (BARNY) is used to estimate loads of phosphorus and chemical oxygen demand in stormwater runoff from individual barnyards. It can also evaluate the impacts of buffers on reducing these loads. The main use of the BARNY model is to evaluate phosphorus transportation from barnyards and evaluate phosphorus load reductions due to barnyard management activities.

If it is determined that barnyard improvements could be an efficient source of phosphorus reductions, the Dane County LWRD and the Jefferson County LWCD will run BARNY modeling to estimate the reduction in phosphorus loads.

5.4.3 WinSLAMM

WinSLAMM (Source Loading and Management Model for Windows) was developed to evaluate nonpoint source pollutant loadings in urban areas using small storm hydrology. The model determines the runoff from a series of normal rainfall events and calculates the pollutant loading created by these rainfall events. The user is also able to apply a series of control devices, such as infiltration/biofiltration, street sweeping, wet detention ponds, grass swales, porous pavement, or catchbasins to determine how effectively these devices remove pollutants.

If urban stormwater practices are planned within the Village of Cambridge, WinSLAMM may be used by Town & Country Engineering to estimate phosphorus reductions.

5.4.4 P-8 Urban Catchment Model

P-8 is a model for predicting the generation and transport of storm water runoff pollutants in urban watersheds. The model has been developed for use in designing and evaluating runoff treatment schemes for existing or proposed urban developments. Simulated BMP types include detention ponds (wet, dry, extended), infiltration basins, swales, and buffer strips. The model is used to examine the water quality implications of alternative treatment objectives.

If urban stormwater practices are planned within the Commission, P-8 may be used by Town & Country Engineering to estimate phosphorus reductions.

5.5 Determine Load Reduction

Once the planned management measures have been identified, the load reductions will be determined using the modeling previously discussed. Then the Commission, Dane County LWRD, and Jefferson County LWCD will be able to determine the total load reduction expected for each project area. As stated in Section 3.4, the Commission is required to provide a reduction of at least 520 pounds/year of phosphorus during the first permit term of Adaptive Management. If the calculated reductions for the planned management measures are less than the required amount, the Commission will seek out additional project partners. After the first permit term of Adaptive Management, the Commission may need to install additional management measures if the initial measures do not provide a sufficient reduction in phosphorus loading to Koshkonong Creek.

5.6 Cost-Share Agreements

Cost share agreements or contracts will be established between the landowners and the Commission for the management measures to be installed. Contracts will be drawn up by the Commission, Dane County LWRD, or Jefferson County LWCD and made with landowners for a term 15 years or perpetuity. Once the contract is signed, the landowner will be paid with a lump sum incentive and annual payments for the length of the contract.

It will be up to the Commission to determine the rates for each type of management measure. These rates will be based on typical cost-share models and information provided by the Dane County LWRD and Jefferson County LWCD. Cost-share rates that have not been previously established will be estimated based on demand, local land rental rates, and crop yields.

These cost-share agreements could serve as trade agreements to allow for the ability to transition to Water Quality Trading (WQT). Additionally, practices will be registered upon implementation to further ease the transition from Adaptive Management to WQT. An example cost share contract from the LWRD is included in Appendix O for reference.

5.7 Installation of Management Measures

Once the cost share agreements have been signed between the landowner and the Commission, it will be the responsibility of the landowner to install and maintain the agreed upon management measures. These measures may consist of one or more of the practices previously described in Section 4.3.

5.8 Verification of Installed Management Measures

The Dane County LWRD and the Jefferson County LWCD will verify the status of rural practices installed for management measures. The Commission will be responsible for verifying urban management measures installed within Commission limits. These practices will be verified once per year after initial establishment has been verified. Annual inspections will be conducted by landowners, in which they will report and photograph the condition of the management measure to the Commission. Annual inspection forms will be created by Dane County LWRD, Jefferson County LWCD, and the Commission for use by landowners. In addition, in-stream phosphorus monitoring will be conducted by the WWTF staff to monitor the progress toward meeting the WQC, as described in Section 3.3.2.

Records and data for these practices will be cataloged by Town and County, with practices recorded spatially though GIS software along with LWCD's Conservation Planning System software.

Inspection of the installed management measures will include various steps to ensure that these measures are valid, and that the phosphorus reductions can be claimed for the Adaptive Management program. The steps for these inspections are as follows:

1. *Determine status of management measure*
2. *Issue status determination to landowner*
3. *Take corrective measures as needed*
4. *Document that required corrective measures (if any) are completed*
5. *Update data for modeling, as needed*

5.9 Annual Reporting

In order to ensure the Commission's accountability, the DNR requires annual reporting on Adaptive Management progress. These reports should evaluate the monitoring data that has been collected (including instream phosphorus loadings as well as effluent loadings), describe the management measures that have been installed in the prior year, and describe any outreach and education that has been completed. Annual reporting will be completed by the Commission, with assistance from Town & Country Engineering, Dane County LWRD, and the Jefferson County LWCD, as needed.

These annual reports can also be used to help adjust Adaptive Management actions, such as any changes that would require permit modifications. Changes that would require permit modification would include changes to the action area size, adjustments to the minimum monitoring requirements, and changes to the amount of phosphorus being offset in the current permit term. In summary, these reports will be used as a line of communication between the Commission and the DNR.

5.10 Implementation Schedule

In order to ensure that the Commission meets the minimum required phosphorus loading reduction for the first Adaptive Management permit term, they will follow the implementation schedule in Table 5-1. This schedule will ensure that any management measures will be installed, verified, and inspected during the first permit term. Additionally, annual reporting will be performed to maintain communication between the Commission and the DNR, as well as to reinforce accountability.

Table 5-1
Permit Term 1 Implementation Schedule

Action	Date
Site Inspections	Spring 2019-Fall 2019
Begin Monthly In-stream Sampling	Spring 2019
Data Collection and Modeling	Fall 2019
Cost Share Agreements Signed	Fall 2019
Management Measures Installed	Spring 2020-2024
Annual Adaptive Annual Report	December 31, 2020
Annual Adaptive Annual Report	December 31, 2021
Cambridge-Oakland WWTF meets interim limits for effluent phosphorus	December 31, 2022
Annual Adaptive Annual Report	December 31, 2022
Annual Adaptive Annual Report	December 31, 2023
Total Phosphorus Reduction of a minimum of 528 lbs/year	December 31, 2024
End of Permit Term 1	December 31, 2024

Permit Term 2 Implementation Schedule

Action	Date
Data Collection and Modeling	Spring 2025 – Fall 2029, as needed
Cost Share Agreements Signed	Fall 2024 – Fall 2029, as needed
Management Measures Installed	Spring 2025, 2026, and as needed
Annual Adaptive Annual Report	December 31, 2025
Annual Adaptive Annual Report	December 31, 2026
Annual Adaptive Annual Report	December 31, 2027
Annual Adaptive Annual Report	December 31, 2028
Total Phosphorus Reduction of 14,475 lbs/year	December 31, 2029
End of Permit Term 2	December 31, 2029

Permit Term 3 Implementation Schedule

Action	Date
Data Collection and Modeling	Spring 2030 - Fall 2034, as needed
Cost Share Agreements Signed	Fall 2029 - Fall 2034, as needed
Management Measures Installed	Spring 2030, 2031, and as needed
Annual Adaptive Annual Report	December 31, 2030
Annual Adaptive Annual Report	December 31, 2031
Annual Adaptive Annual Report	December 31, 2032
Annual Adaptive Annual Report	December 31, 2033
Total Phosphorus Reduction of 19,299 lbs/year	December 31, 2034
Koshkonong Creek meets in stream criteria of 0.075 mg/L of phosphorus	December 31, 2034
End of Permit Term 3	December 31, 2034

6. FINANCIAL EVALUATION

The section presents the projected costs for implementation of Adaptive Management for the first permit term as well as certification of the financial security of the Adaptive Management Program.

6.1 Cost Estimate

Table 6-1 presents a breakdown of estimated annual costs associated with Adaptive Management in the Koshkonong Creek Watershed for the next permit term. Costs include the implementation of nonpoint source management measures, outreach and education, modeling, sampling, and other administrative duties. Factors relating to these costs and the responsible parties are listed in Table 6-1.

6.2 Funding Sources

Currently, the Cambridge-Oakland Wastewater Commission's WWTF will assume sole financial responsibility for Adaptive Management in the Koshkonong Creek Watershed and will fund these costs through user fees and cash on hand, but additional sources of funding will be explored. Grants and other funding opportunities will be researched to see if they are applicable to programs for Cambridge-Oakland Wastewater Commission's Adaptive Management program. Possible grant sources include the following:

- NRCS Regional Conservation Partnership Program (RCPP),
- NRCS Environmental Quality Incentives Program (EQIP),
- Department of Agriculture, Trade and Consumer Protection (DATCP), Producer-Led Watershed Protection Grants
- Wisconsin DNR Targeted Runoff Management (TRM) Grants,
- FSA Conservation Reserve Enhancement Program (CREP).

The Dane County LWRD and Jefferson County LWCD will assist the Commission with identifying and applying for applicable grants.

6.3 Financial Security

As required by the DNR, this Adaptive Management Plan contains a written statement from the Commission validating that the financial needs to implement Adaptive Management are feasible. This statement is provided in Appendix P.

Table 6-1
Adaptive Management Cost Estimate

Permit Year	Responsible	0	1	2	3	4	5
Year	Party	2018	2019	2020	2021	2022	2023
Treatment Upgrades Capital Cost	Commission						
Treatment Operating and Maintenance Costs							
Additional Sludge Hauling	Commission						
Additional Chemicals	Commission						
Adaptive Management Planning							
Report Preparation/Revision	T&C	$15,000					
Site Visits and Practice Identification	T&C		$3,000	$3,000	$3,000	$3,000	$5,000
Modeling and Technical Support							
Dane and Jefferson County Modeling Costs	County		$3,000	$2,000	$2,000	$2,000	$2,000
Engineering Support	T&C		$3,000	$2,000	$2,000	$2,000	$2,000
BMP Implementation Costs							
Practice Brokering	County		$3,000	$1,000	$1,000	$1,000	$1,000
Practice Brokering/Implementation Support	T&C		$2,000	$1,000	$1,000	$1,000	$1,000
Cost Share Rates	Commission		$20,000	$20,000	$20,000	$20,000	$20,000
Outreach and Education							
Meetings with Public/Stakeholders	T&C		$1,000	$1,000	$1,000	$1,000	$1,000
Communication about AM in watershed	Commission		$1,000	$1,000	$1,000	$1,000	$1,000
In-Stream and Effluent Sampling							
Sample Collection	Commission		$3,000	$3,000	$3,000	$3,000	$3,000
Sample Analysis	Commission		$3,000	$3,000	$3,000	$3,000	$3,000
Compliance Checking							
Practice Verification	County		$5,000	$5,000	$5,000	$5,000	$5,000
Compliance Notifications	Commission		$1,000	$1,000	$1,000	$1,000	$1,000
Administration							
Annual Reports	Commission		$5,000	$5,000	$5,000	$5,000	$5,000
Meetings/Correspondence with DNR	T&C		$2,000	$2,000	$2,000	$2,000	$2,000
Total		**$15,000**	**$55,000**	**$50,000**	**$50,000**	**$50,000**	**$52,000**

Appendix A

Site Plan and
Process Flow Diagram

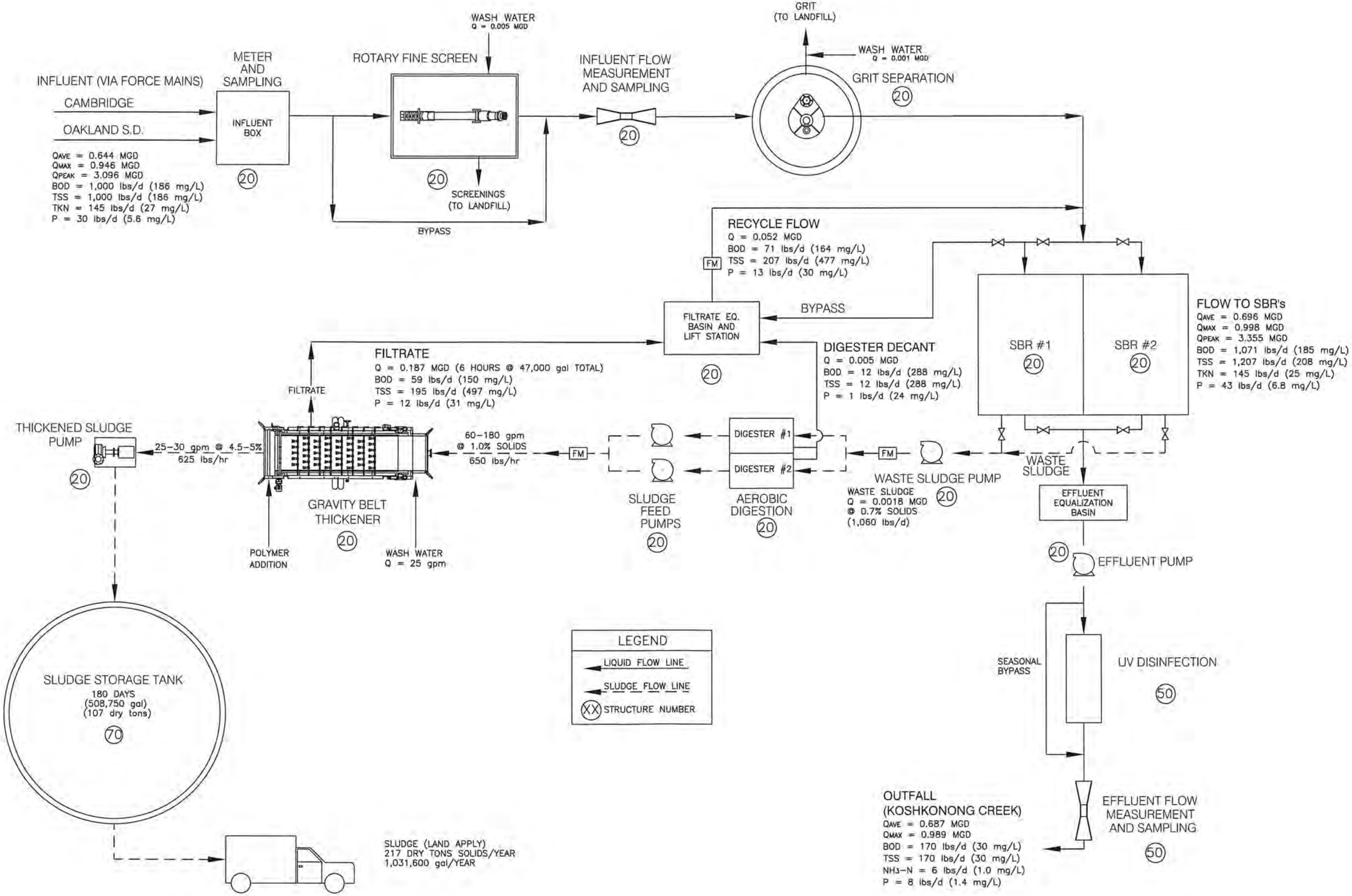
STR. No.	NAME
10	CAMBRIDGE LIFT STATION No. 1
20	PROCESS BUILDING
50	UV DISINFECTION STRUCTURE
70	SLUDGE STORAGE TANK
90	ADMINISTRATION BUILDING

Town & Country Engineering, Inc.
5225 VERONA ROAD, BUILDING NO. 4
MADISON, WISCONSIN 53711
Phone: (608) 273-3350
Fax: (608) 273-3391
E-Mail: tce@tcengineers.net

EXTERIOR PIPING PLAN
WASTEWATER TREATMENT FACILITY SITE

WASTEWATER FACILITIES CONSTRUCTION
Contract A - Wastewater Treatment Plant
Cambridge-Oakland Wastewater Commission

PROJECT NO.: CA 03
DRAWING FILE: 05-C-XX
DRAWN BY: J.R.S.
CHECKED BY: A.L.G.
DATE: 1-10-05
REVISIONS:
SCALE: 0 10 20 30 FEET
SHEET: 13
05-C-05



Town & Country Engineering, Inc.
5225 VERONA ROAD, BUILDING NO. 4
MADISON, WISCONSIN 53711
Phone: (608) 273-3350
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E-Mail: tce@tcengineers.net

PROCESS FLOW DIAGRAM
GENERAL

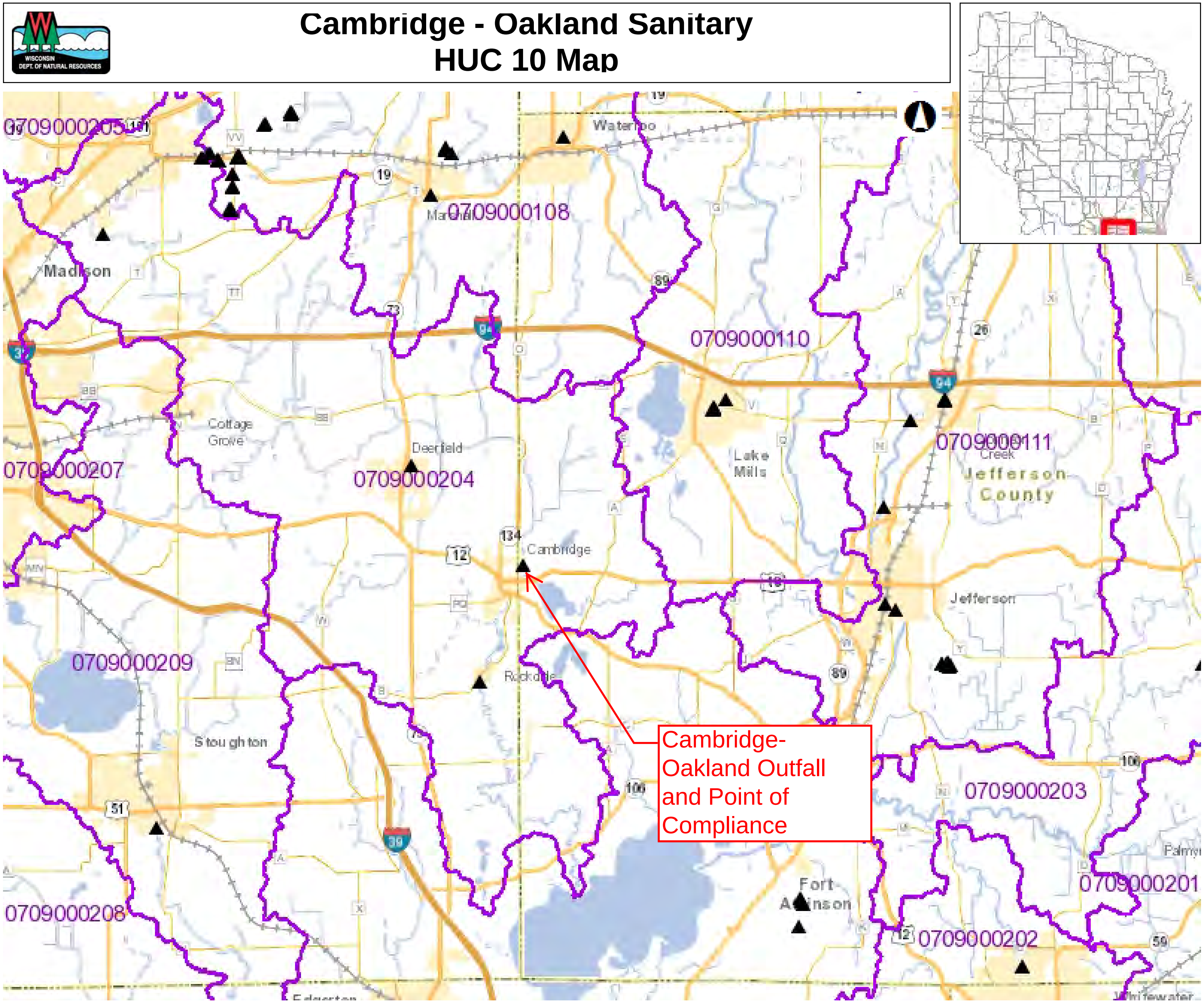
WASTEWATER FACILITIES CONSTRUCTION
Contract A - Wastewater Treatment Plant
Cambridge-Oakland Wastewater Commission

PROJECT NO.:	CA 03
DRAWING FILE:	00-G-06
DRAWN BY:	J.R.S.
CHECKED BY:	A.L.G.
DATE:	1-21-05
REVISIONS:	
SCALE:	NO SCALE
SHEET:	7 00-G-06

Appendix B

Watershed Maps

Cambridge - Oakland Sanitary HUC 10 Map



Legend

- ▲ Surface Water Outfalls
- 10-digit HUCs (Watersheds)
- 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

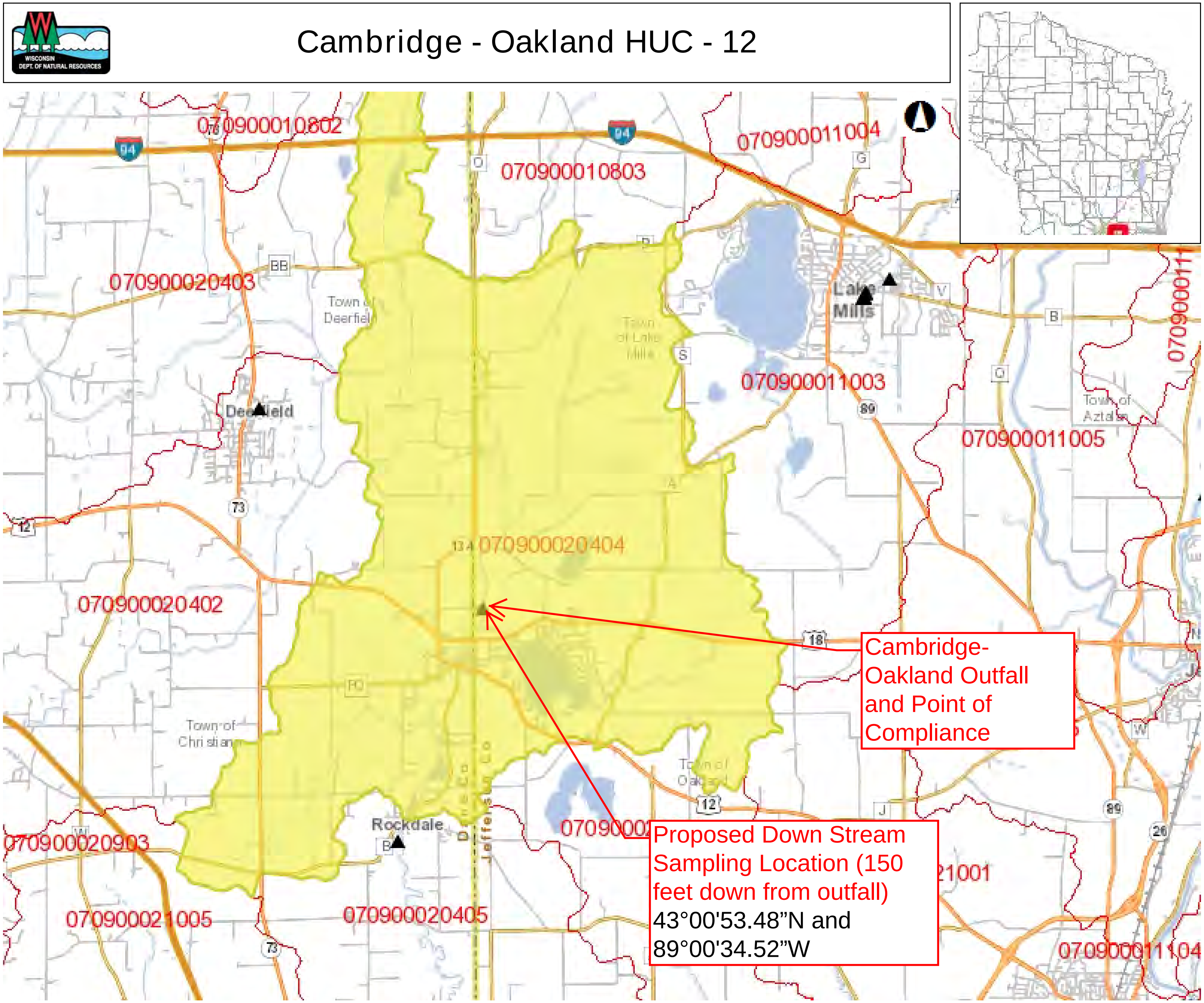
8.0 0 4.00 8.0 Miles

1: 253,440

NAD_1983_HARN_Wisconsin_TM

Notes

Cambridge - Oakland HUC - 12



Legend

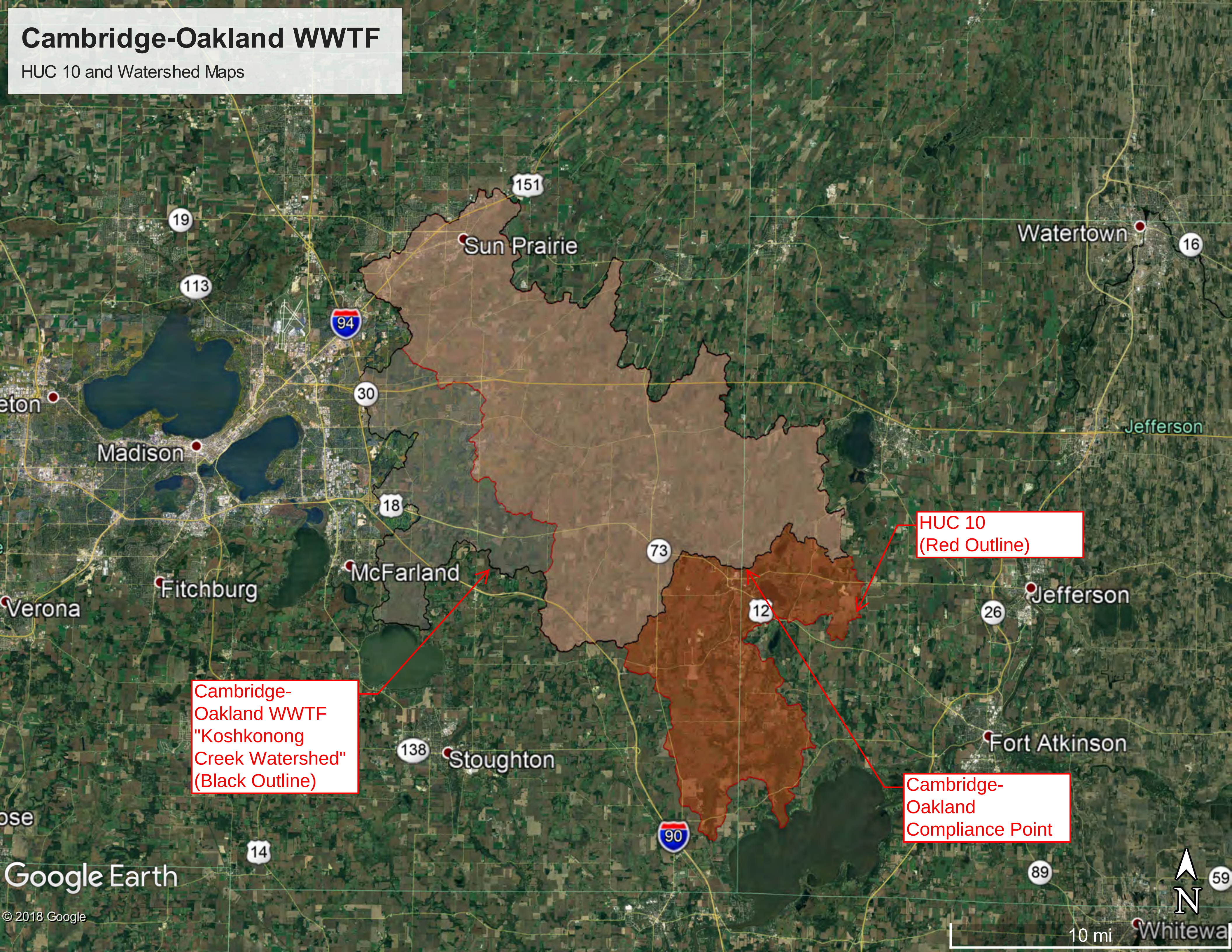
- Surface Water Outfalls
- 12-digit HUCs (Subwatersheds)
- Municipality
- State Boundaries
- County Boundaries
- Major Roads
  - Interstate Highway
  - State Highway
  - US Highway
- County and Local Roads
  - County HWY
  - Local Road
- Railroads
- Tribal Lands
- Rivers and Streams
- Intermittent Streams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

Notes

4.0 | 0 | 2.00 | 4.0 Miles

1: 126,720

NAD_1983_HARN_Wisconsin_TM



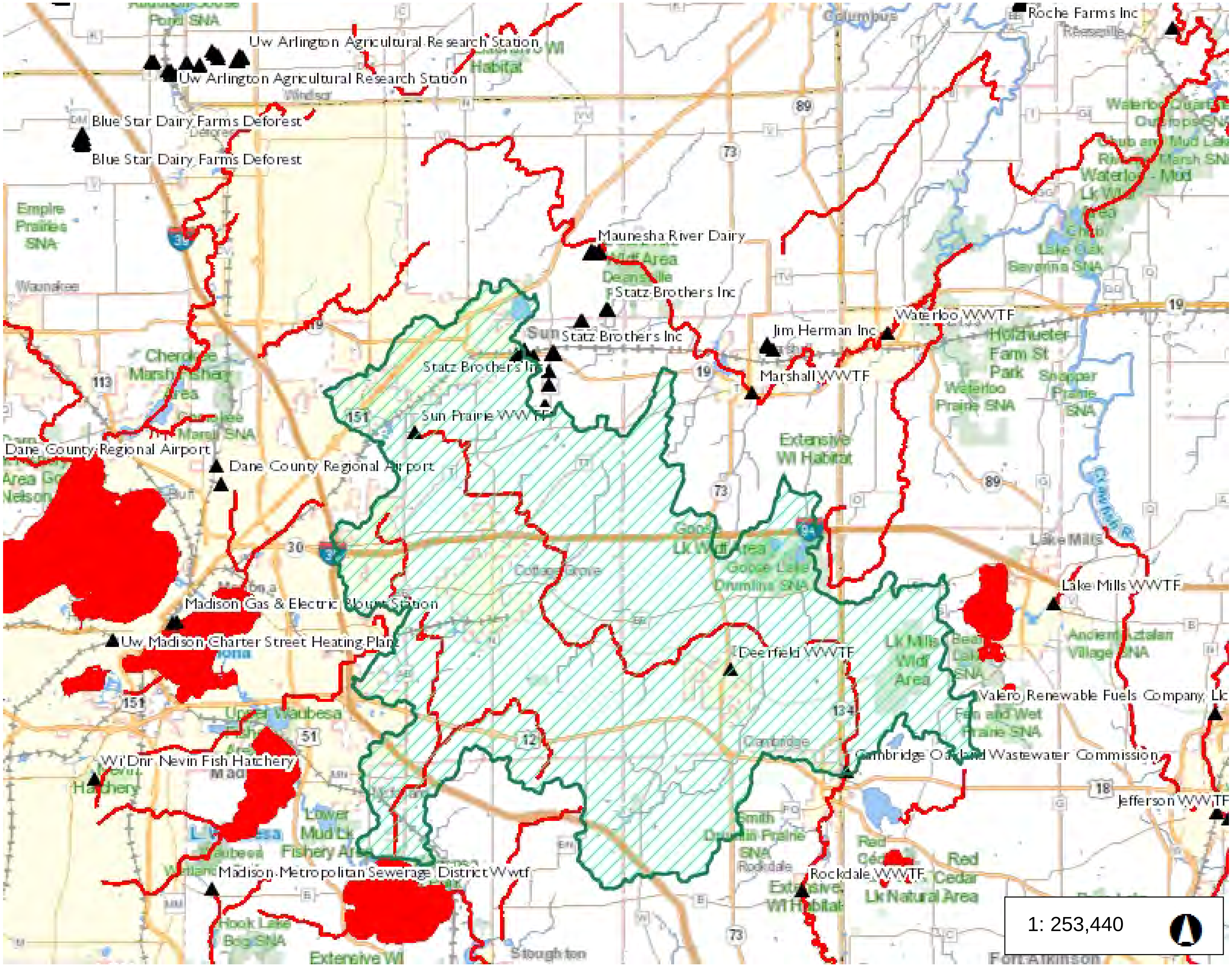
Cambridge-Oakland WWTF
HUC 10 and Watershed Maps
Sun Prairie
Watertown
Madison
McFarland
Fitchburg
Verona
Jefferson
Jefferson
Fort Atkinson
Stoughton
Whitewa
151
19
113
94
30
18
73
12
26
16
138
14
90
89
59
HUC 10
(Red Outline)
Cambridge-
Oakland WWTF
"Koshkonong
Creek Watershed"
(Black Outline)
Cambridge-
Oakland
Compliance Point
Google Earth
© 2018 Google
N
10 mi

Appendix C

Impaired Waters

WISCONSIN DEPT. OF NATURAL RESOURCES

Impaired Waters



Legend

- ▲ Surface Water Outfalls
- Impaired Rivers and Streams
- Impaired Lakes

1: 253,440

8.0 | 0 | 4.00 | 8.0 Miles

NAD_1983_HARN_Wisconsin_TM

Notes

Cambridge-Oakland Wastewater Commission's WWTF Watershed

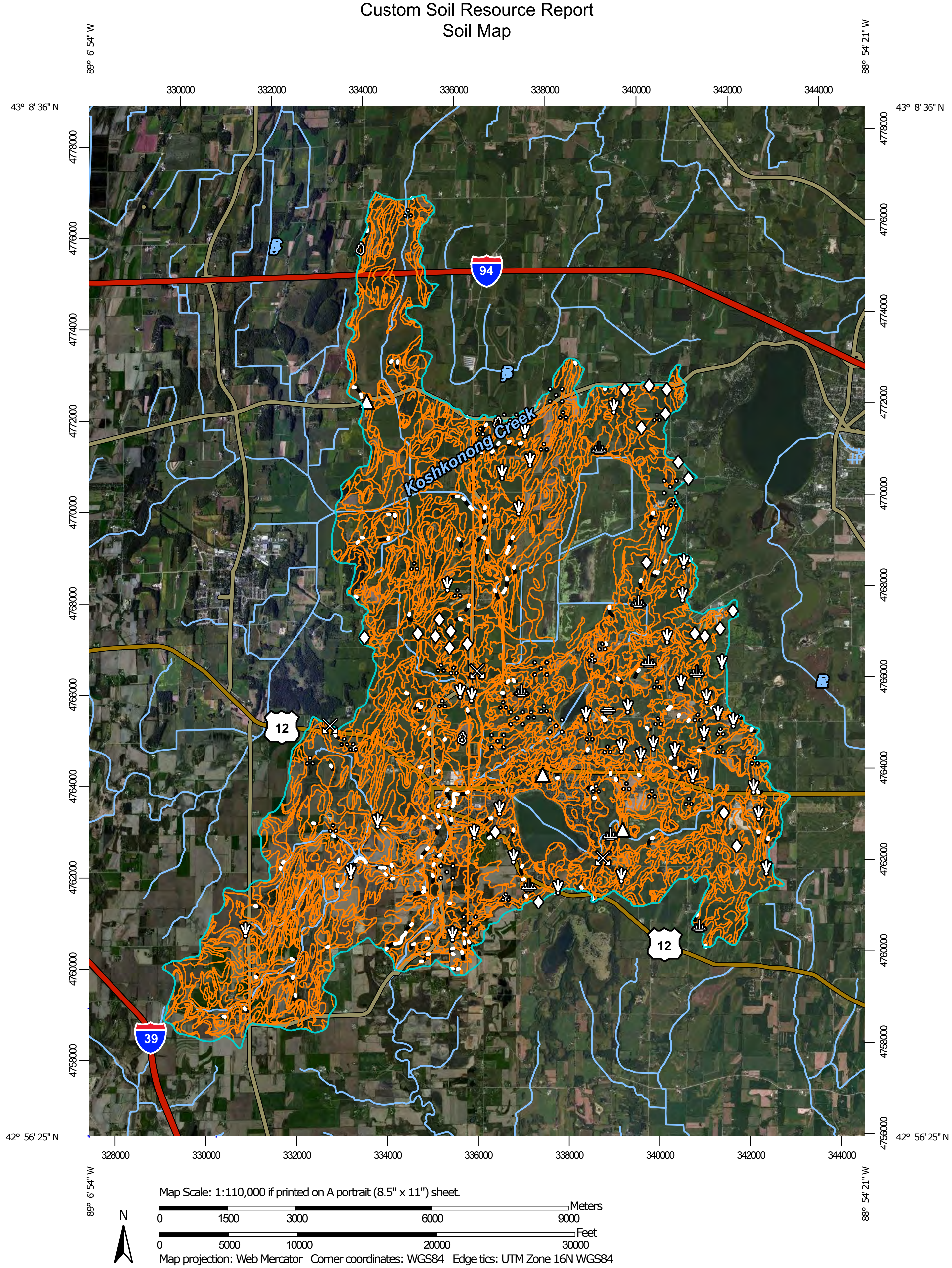
Appendix D

Watershed Soils Report

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report
Soil Map



MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

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

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

Water Features
- Streams and Canals

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

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:15,800.

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

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

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

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

Soil Survey Area: Dane County, Wisconsin
Survey Area Data: Version 17, Sep 11, 2018

Soil Survey Area: Jefferson County, Wisconsin
Survey Area Data: Version 17, Sep 11, 2018

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

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

Date(s) aerial images were photographed: Apr 29, 2011—Mar 28, 2012

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background

MAP LEGEND	MAP INFORMATION
	imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
Ad	Adrian muck, 0 to 2 percent slopes	124.1	0.4%
Af	Alluvial land, wet	145.2	0.5%
BbA	Batavia silt loam, gravelly substratum, 0 to 2 percent slopes	51.1	0.2%
BbB	Batavia silt loam, gravelly substratum, 2 to 6 percent slopes	165.2	0.6%
BbC2	Batavia silt loam, gravelly substratum, 6 to 12 percent slopes, eroded	115.1	0.4%
BoB	Boyer sandy loam, 2 to 6 percent slopes	1.9	0.0%
BoC2	Boyer sandy loam, 6 to 12 percent slopes, eroded	13.8	0.0%
BoD2	Boyer sandy loam, 12 to 20 percent slopes, eroded	4.4	0.0%
Co	Colwood silt loam, 0 to 2 percent slopes	507.7	1.7%
DfA	Del Rey silt loam, 0 to 3 percent slopes	156.3	0.5%
DnB	Dodge silt loam, 2 to 6 percent slopes	734.5	2.5%
DnC2	Dodge silt loam, 6 to 12 percent slopes, eroded	180.8	0.6%
DrD2	Dresden loam, 12 to 20 percent slopes, eroded	25.6	0.1%
DsB	Dresden silt loam, 2 to 6 percent slopes	280.7	1.0%
DsC2	Dresden silt loam, 6 to 12 percent slopes, eroded	287.4	1.0%
EdC2	Edmund silt loam, 6 to 12 percent slopes, eroded	37.1	0.1%
EdD2	Edmund silt loam, 12 to 20 percent slopes, eroded	16.9	0.1%
EfB	Elburn silt loam, 0 to 3 percent slopes	360.2	1.2%
EgA	Elburn silt loam, gravelly substratum, 0 to 3 percent slopes	316.2	1.1%
Ev	Elvers silt loam	18.0	0.1%
Gn	Granby loamy sand	64.8	0.2%
GsA	Grays silt loam, 0 to 2 percent slopes	33.2	0.1%

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
GsB	Grays silt loam, 2 to 6 percent slopes	154.3	0.5%
GsC2	Grays silt loam, 6 to 12 percent slopes, eroded	29.2	0.1%
GwB	Griswold loam, 2 to 6 percent slopes	152.4	0.5%
GwC	Griswold loam, 6 to 12 percent slopes	227.5	0.8%
GwD2	Griswold loam, 12 to 20 percent slopes, eroded	100.8	0.3%
HaA	Hayfield silt loam, 0 to 3 percent slopes	160.0	0.6%
Ho	Houghton muck	882.4	3.0%
HuA	Huntsville silt loam, 0 to 2 percent slopes	8.4	0.0%
HuB	Huntsville silt loam, 2 to 6 percent slopes	12.0	0.0%
KdB	Kidder loam, 2 to 6 percent slopes	60.8	0.2%
KdC2	Kidder loam, 6 to 12 percent slopes, eroded	339.2	1.2%
KdD2	Kidder loam, 12 to 20 percent slopes, eroded	195.0	0.7%
KeA	Kegonsa silt loam, 0 to 2 percent slopes	59.5	0.2%
KeB	Kegonsa silt loam, 2 to 6 percent slopes	397.6	1.4%
KrD2	Kidder soils, 10 to 20 percent slopes, eroded	51.2	0.2%
KrE2	Kidder soils, 20 to 35 percent slopes, eroded	160.1	0.6%
Ma	Made land	5.7	0.0%
Mb	Marsh	35.6	0.1%
Mc	Marshan silt loam	202.2	0.7%
MdB	McHenry silt loam, 2 to 6 percent slopes	126.2	0.4%
MdC2	McHenry silt loam, 6 to 12 percent slopes, eroded	129.6	0.4%
MdD2	McHenry silt loam, 12 to 20 percent slopes, eroded	47.5	0.2%
MoA	Montgomery silty clay loam, 0 to 3 percent slopes	214.0	0.7%
Os	Orion silt loam, wet	57.2	0.2%
Ot	Otter silt loam	67.0	0.2%
Pa	Palms muck, 0 to 2 percent slopes	306.6	1.1%
PnA	Plano silt loam, till substratum, 0 to 2 percent slopes	303.5	1.0%

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
PnB	Plano silt loam, till substratum, 2 to 6 percent slopes	733.0	2.5%
PnC2	Plano silt loam, till substratum, 6 to 12 percent slopes, eroded	29.4	0.1%
PoA	Plano silt loam, gravelly substratum, 0 to 2 percent slopes	79.8	0.3%
PoB	Plano silt loam, gravelly substratum, 2 to 6 percent slopes	57.4	0.2%
QUA	Quarry	37.2	0.1%
RaA	Radford silt loam, 0 to 3 percent slopes	169.8	0.6%
RnB	Ringwood silt loam, 2 to 6 percent slopes	816.7	2.8%
RnC2	Ringwood silt loam, 6 to 12 percent slopes, eroded	141.4	0.5%
RoB	Rockton silt loam, 2 to 6 percent slopes	147.1	0.5%
RoC2	Rockton silt loam, 6 to 12 percent slopes, eroded	37.0	0.1%
RpE	Rodman sandy loam, 12 to 35 percent slopes	8.4	0.0%
SaA	Sable silty clay loam, 0 to 2 percent slopes	755.6	2.6%
ScA	St. Charles silt loam, 0 to 2 percent slopes	58.3	0.2%
ScB	St. Charles silt loam, 2 to 6 percent slopes	204.6	0.7%
ScC2	St. Charles silt loam, 6 to 12 percent slopes, eroded	3.5	0.0%
ScD2	St. Charles silt loam, 12 to 20 percent slopes, eroded	12.2	0.0%
SeB	Salter sandy loam, 2 to 6 percent slopes	14.7	0.1%
SeC2	Salter sandy loam, 6 to 12 percent slopes, eroded	4.5	0.0%
SfB2	Salter silt loam, 2 to 6 percent slopes, eroded	3.2	0.0%
ShA	Salter sandy loam, wet variant, 0 to 3 percent slopes	118.9	0.4%
TrB	Troxel silt loam, 0 to 3 percent slopes	54.2	0.2%
VrB	Virgil silt loam, 1 to 4 percent slopes	280.6	1.0%
VwA	Virgil silt loam, gravelly substratum, 0 to 3 percent slopes	332.1	1.1%
W	Water	131.7	0.5%

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
Wa	Wacousta silty clay loam, 0 to 2 percent slopes	892.0	3.1%
WrB	Warsaw silt loam, 2 to 6 percent slopes	22.6	0.1%
WrC2	Warsaw silt loam, 6 to 12 percent slopes, eroded	13.1	0.0%
WxB	Whalan silt loam, 2 to 6 percent slopes	88.5	0.3%
WxC2	Whalan silt loam, 6 to 12 percent slopes, eroded	2.2	0.0%
WxD2	Whalan silt loam, 12 to 20 percent slopes, eroded	71.1	0.2%
Subtotals for Soil Survey Area		**13,446.2**	**46.3%**
Totals for Area of Interest		**29,044.8**	**100.0%**

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
Ad	Adrian muck, 0 to 2 percent slopes	450.1	1.5%
BoC	Boyer loamy sand, 6 to 12 percent slopes	14.4	0.0%
BpB	Boyer sandy loam, 2 to 6 percent slopes	367.6	1.3%
CaB2	Casco loam, 2 to 6 percent slopes, eroded	27.9	0.1%
CaC2	Casco loam, 6 to 12 percent slopes, eroded	685.8	2.4%
CrD2	Casco-Rodman complex, 12 to 20 percent slopes, eroded	442.8	1.5%
CrE	Casco-Rodman complex, 30 to 45 percent slopes	26.1	0.1%
CtB	Chelsea loamy fine sand, 1 to 6 percent slopes	7.2	0.0%
DcA	Del Rey silt loam, 0 to 3 percent slopes	14.5	0.0%
DdB	Dodge silt loam, 2 to 6 percent slopes	303.2	1.0%
Ed	Edwards muck, 0 to 2 percent slopes	17.2	0.1%
Ev	Elvers silt loam	9.9	0.0%
Fn	Fluvaquents	71.5	0.2%
FoC2	Fox loam, 6 to 12 percent slopes, eroded	532.9	1.8%
FsA	Fox silt loam, 0 to 2 percent slopes	697.4	2.4%
FsB	Fox silt loam, 2 to 6 percent slopes	1,736.2	6.0%
Gd	Gilford sandy loam	122.0	0.4%

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
GsB	Grays silt loam, 2 to 6 percent slopes	66.6	0.2%
HeB	Hebron loam, 1 to 6 percent slopes	6.2	0.0%
Ht	Houghton muck, 0 to 2 percent slopes	2,127.6	7.3%
JuB	Juneau silt loam, 1 to 6 percent slopes	73.8	0.3%
Kb	Keowns silt loam, 0 to 2 percent slopes	235.1	0.8%
KdA	Kibbie fine sandy loam, 0 to 3 percent slopes	38.6	0.1%
KeC2	Kidder sandy loam, 6 to 12 percent slopes, eroded	81.2	0.3%
KfB	Kidder loam, 2 to 6 percent slopes	73.4	0.3%
KfC2	Kidder loam, 6 to 12 percent slopes, eroded	294.5	1.0%
KfD2	Kidder loam, 12 to 20 percent slopes, eroded	180.4	0.6%
KgB	Kidder loam, moderately well-drained, 2 to 6 percent slopes	18.2	0.1%
LaB	Lamartine silt loam, 2 to 6 percent slopes	87.3	0.3%
MmA	Matherton silt loam, 0 to 3 percent slopes	1,027.3	3.5%
MnA	Matherton silt loam, clayey substratum, 0 to 3 percent slopes	1.5	0.0%
MoB	Mayville silt loam, 2 to 6 percent slopes	117.7	0.4%
MpB	McHenry silt loam, 2 to 6 percent slopes	507.4	1.7%
MpC2	McHenry silt loam, 6 to 12 percent slopes, eroded	369.7	1.3%
Mr	Milford silty clay loam	31.8	0.1%
MvB	Moundville loamy sand, 1 to 6 percent slopes	93.4	0.3%
Ot	Otter silt loam	137.7	0.5%
Pa	Palms muck, 0 to 2 percent slopes	306.8	1.1%
Pb	Palms muck, ponded, 0 to 2 percent slopes	47.6	0.2%
Pg	Pits, gravel	41.9	0.1%
RaA	Radford silt loam, 0 to 3 percent slopes	97.7	0.3%
RtC2	Rotamer loam, 6 to 12 percent slopes, eroded	13.5	0.0%

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
RtD2	Rotamer loam, 12 to 20 percent slopes, eroded	66.2	0.2%
RtE2	Rotamer loam, 20 to 30 percent slopes, eroded	15.4	0.1%
SbA	St. Charles silt loam, moderately well drained, 0 to 2 percent slopes	349.2	1.2%
SbB	St. Charles silt loam, moderately well-drained, 2 to 6 percent slopes	185.8	0.6%
SfB	St. Charles silt loam, moderately well-drained, gravelly substratum, 2 to 6 percent slopes	717.6	2.5%
ShB	Salter loamy sand, 2 to 6 percent slopes	2.7	0.0%
Sm	Sebewa silt loam, 0 to 2 percent slopes	656.9	2.3%
Sn	Sebewa silt loam, clayey substratum	9.2	0.0%
SoB	Sisson fine sandy loam, 2 to 6 percent slopes	5.8	0.0%
SoC2	Sisson fine sandy loam, 6 to 12 percent slopes, eroded	7.2	0.0%
TuA	Tuscola silt loam, 0 to 2 percent slopes	7.8	0.0%
TuB	Tuscola silt loam, 2 to 6 percent slopes	18.6	0.1%
Ud	Udorthents	34.4	0.1%
VrB	Virgil silt loam, 2 to 6 percent slopes	104.5	0.4%
VwA	Virgil silt loam, gravelly substratum, 0 to 3 percent slopes	251.0	0.9%
W	Water	598.3	2.1%
Wa	Wacousta silty clay loam, 0 to 2 percent slopes	342.2	1.2%
WmA	Wasepi sandy loam, 0 to 3 percent slopes	119.7	0.4%
WtA	Watseka variant loamy sand, 0 to 3 percent slopes	88.7	0.3%
WvA	Wauconda silt loam, 0 to 2 percent slopes	280.8	1.0%
WvB	Wauconda silt loam, 2 to 6 percent slopes	32.3	0.1%
WxB	Whalan loam, 2 to 6 percent slopes	72.8	0.3%
WxC2	Whalan loam, 6 to 12 percent slopes, eroded	11.5	0.0%

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
WyA	Whalan variant silt loam, 0 to 3 percent slopes	8.1	0.0%
YaA	Yahara fine sandy loam, 0 to 3 percent slopes	8.6	0.0%
Subtotals for Soil Survey Area		**15,598.7**	**53.7%**
Totals for Area of Interest		**29,044.8**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Appendix E

Land Use Data

Cambridge-Oakland Wastewater Commission's WWTF - Koshkonong Creek Land Usage

Land use	Soil group	Area (acres)	Combined Acres	% of Total Acres
Open Water	A	5.56	793	0.8%
Open Water	B	272.21		
Open Water	C	0.89		
Open Water	D	514.62		
Open Space/Park	A	19.57	4,212	4.3%
Open Space/Park	B	3,536.97		
Open Space/Park	C	13.57		
Open Space/Park	D	642.05		
Low-Density Residential (general 1/3 - 2 ac lots)	A	10.67	5,464	5.6%
Low-Density Residential (general 1/3 - 2 ac lots)	B	4,810.62		
Low-Density Residential (general 1/3 - 2 ac lots)	C	11.56		
Low-Density Residential (general 1/3 - 2 ac lots)	D	631.60		
High-density Residential (townhomes to 1/4 ac lots)	A	3.34	1,520	1.6%
High-density Residential (townhomes to 1/4 ac lots)	B	1,325.70		
High-density Residential (townhomes to 1/4 ac lots)	C	2.45		
High-density Residential (townhomes to 1/4 ac lots)	D	188.37		
Commercial/Industrial/Transportation	B	199.49	244	0.3%
Commercial/Industrial/Transportation	D	44.03		
Barren Land	A	9.34	50	0.1%
Barren Land	B	38.70		
Barren Land	C	1.78		
Barren Land	D	0.67		
Deciduous Forest	A	141.22	6,999	7.2%
Deciduous Forest	B	5,639.71		
Deciduous Forest	C	29.80		
Deciduous Forest	D	1,188.26		
Evergreen Forest	A	0.22	85	0.1%
Evergreen Forest	B	60.94		
Evergreen Forest	C	0.44		
Evergreen Forest	D	23.35		
Mixed Forest	A	2.22	132	0.1%
Mixed Forest	B	124.76		
Mixed Forest	D	5.34		
Shrub; Scrub	A	5.12	611	0.6%
Shrub; Scrub	B	558.21		
Shrub; Scrub	C	1.56		
Shrub; Scrub	D	46.04		
Grassland; Herbaceous	A	2.67	390	0.4%
Grassland; Herbaceous	B	260.87		
Grassland; Herbaceous	D	126.10		
Pasture/Hay	A	21.13	14,905	15.3%
Pasture/Hay	B	12,623.58		
Pasture/Hay	C	53.37		
Pasture/Hay	D	2,206.82		
Cropland generalized agriculture	A	243.30	53,793	55.4%
Cropland generalized agriculture	B	37,800.45		
Cropland generalized agriculture	C	342.27		
Cropland generalized agriculture	D	15,406.63		
Woody Wetlands (swamp)	A	8.45	1,385	1.4%
Woody Wetlands (swamp)	B	267.76		
Woody Wetlands (swamp)	C	12.01		
Woody Wetlands (swamp)	D	1,096.85		
Emergent Wetlands (marsh)	A	25.35	6,560	6.8%
Emergent Wetlands (marsh)	B	474.59		
Emergent Wetlands (marsh)	C	15.79		
Emergent Wetlands (marsh)	D	6,044.69		
	Total	97,143.63	97,143.63	100.0%

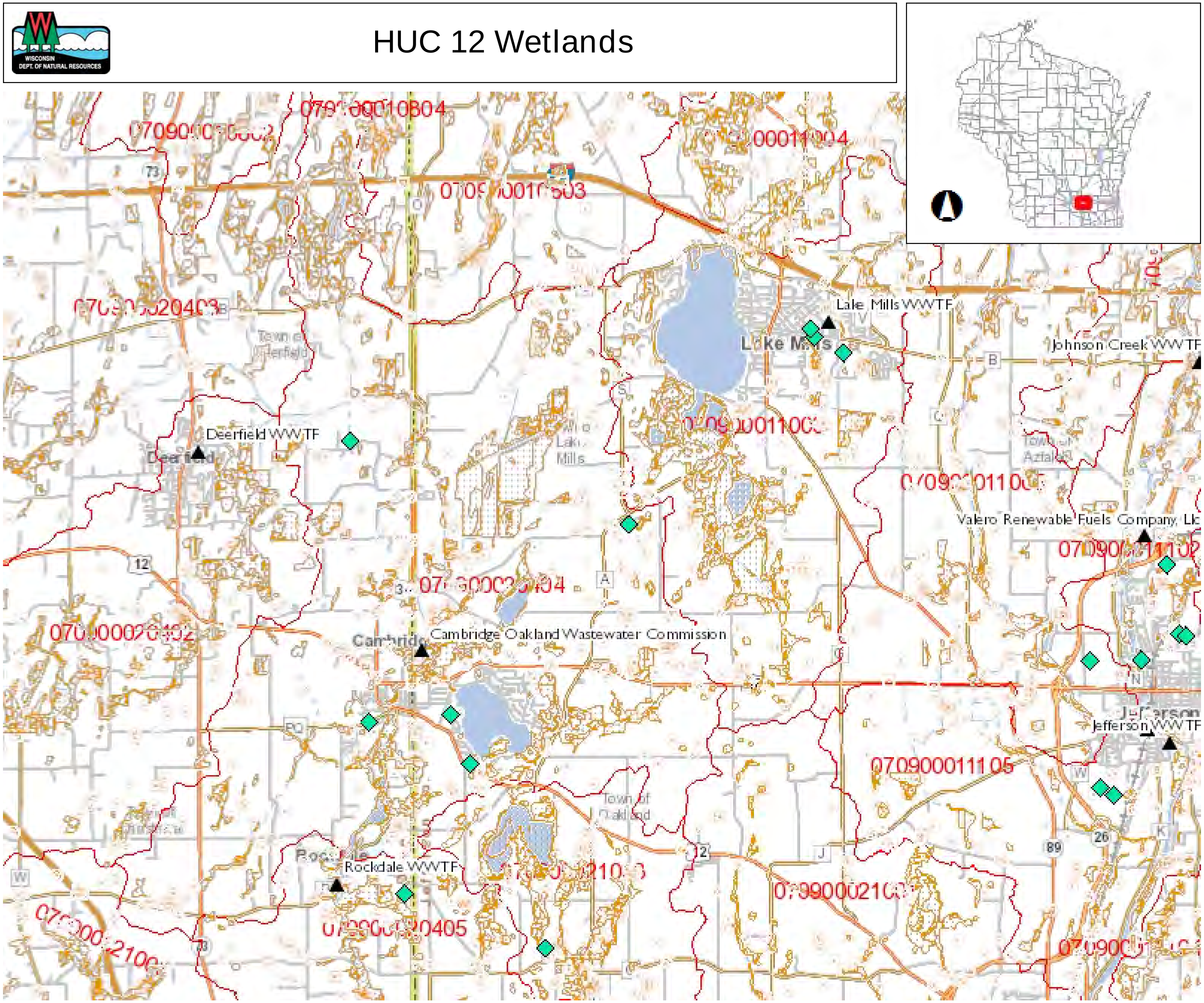
Cambridge-Oakland Wastewater Commission's WWTF - HUC 12 Land Usage

Land use	Soil group	Area (acres)	Combined Acres	% of Total Acres
Open Water	A	1.78	722	2.5%
Open Water	B	583.34		
Open Water	C	0.89		
Open Water	D	135.66		
Open Space/Park	A	4.67	1,110	3.8%
Open Space/Park	B	926.72		
Open Space/Park	C	19.57		
Open Space/Park	D	159.46		
Low-Density Residential (general 1/3 - 2 ac lots)	A	2.00	925	3.2%
Low-Density Residential (general 1/3 - 2 ac lots)	B	821.08		
Low-Density Residential (general 1/3 - 2 ac lots)	C	16.01		
Low-Density Residential (general 1/3 - 2 ac lots)	D	86.07		
High-density Residential (townhomes to 1/4 ac lots)	B	68.05	102	0.4%
High-density Residential (townhomes to 1/4 ac lots)	C	9.12		
High-density Residential (townhomes to 1/4 ac lots)	D	25.13		
Commercial/Industrial/Transportation	B	11.12	31	0.1%
Commercial/Industrial/Transportation	C	2.89		
Commercial/Industrial/Transportation	D	16.90		
Barren Land	B	42.03	43	0.1%
Barren Land	C	1.33		
Deciduous Forest	A	23.80	2,230	7.7%
Deciduous Forest	B	1,683.08		
Deciduous Forest	C	29.58		
Deciduous Forest	D	493.05		
Evergreen Forest	B	62.94	69	0.2%
Evergreen Forest	C	1.11		
Evergreen Forest	D	4.45		
Mixed Forest	B	42.26	44	0.2%
Mixed Forest	D	2.22		
Shrub; Scrub	B	93.85	107	0.4%
Shrub; Scrub	C	2.22		
Shrub; Scrub	D	10.45		
Grassland; Herbaceous	B	63.38	75	0.3%
Grassland; Herbaceous	D	11.12		
Pasture/Hay	A	22.24	3,631	12.5%
Pasture/Hay	B	2,978.53		
Pasture/Hay	C	30.02		
Pasture/Hay	D	599.80		
Cropland generalized agriculture	A	91.18	17,223	59.3%
Cropland generalized agriculture	B	11,760.68		
Cropland generalized agriculture	C	249.75		
Cropland generalized agriculture	D	5,121.09		
Woody Wetlands (swamp)	A	2.67	936	3.2%
Woody Wetlands (swamp)	B	263.76		
Woody Wetlands (swamp)	C	9.12		
Woody Wetlands (swamp)	D	660.51		
Emergent Wetlands (marsh)	A	3.34	1,791	6.2%
Emergent Wetlands (marsh)	B	213.28		
Emergent Wetlands (marsh)	C	13.34		
Emergent Wetlands (marsh)	D	1,561.43		
	Total	29,038.07	29,038.07	100.0%

Appendix F

Wetlands Information

HUC 12 Wetlands



Legend

- Wetland Identifications and Confirmations
- Surface Water Outfalls
- Wetland Class Points
  - Dammed pond
  - Excavated pond
  - Filled excavated pond
  - Filled/drained wetland
  - Wetland too small to delineate
- Filled Points
- Wetland Class Areas
  - Wetland
  - Upland
- Filled Areas
- 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

4.0 0 2.00 4.0 Miles

NAD_1983_HARN_Wisconsin_TM

1: 126,720

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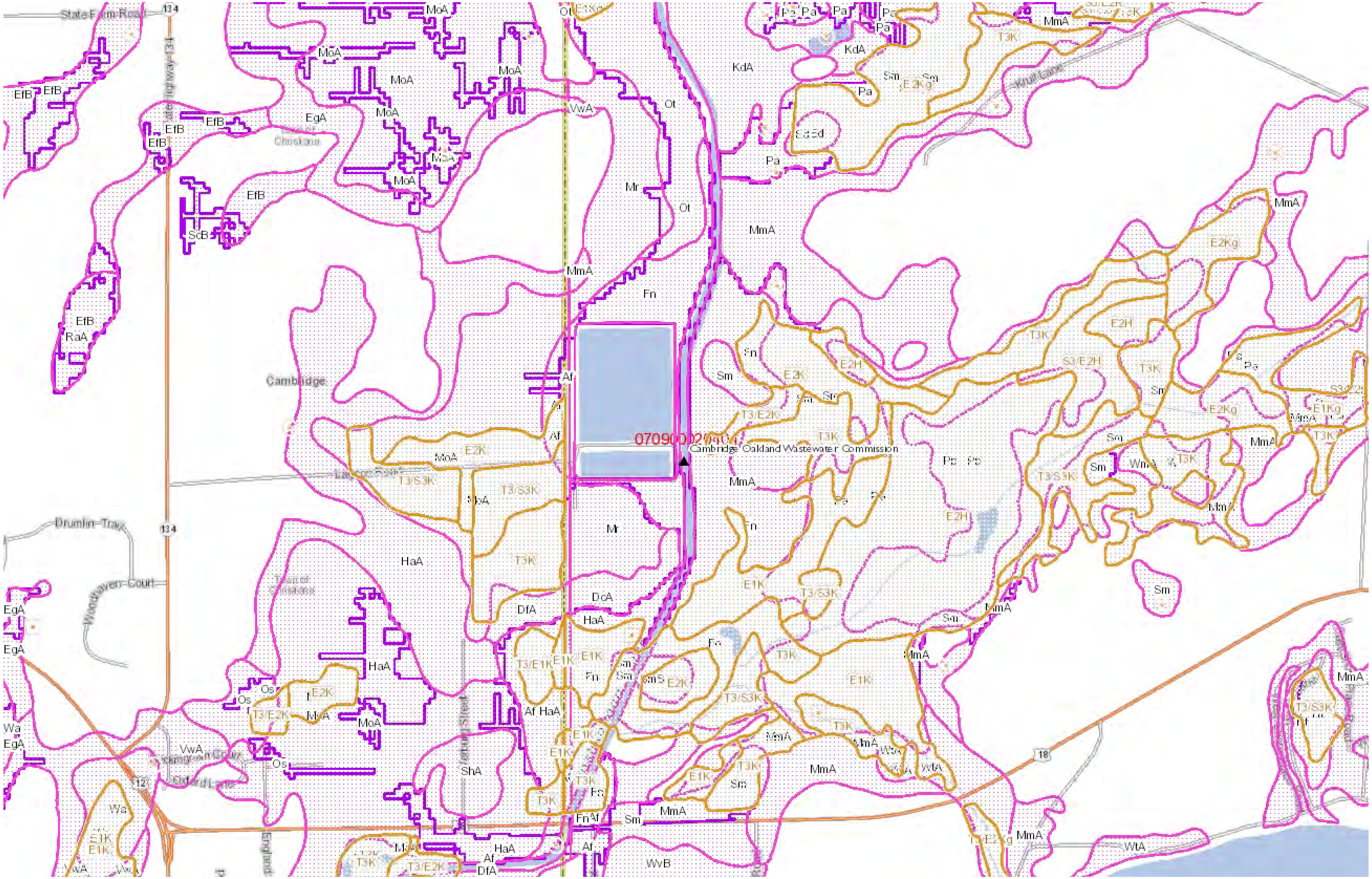
Notes

Cambridge-Oakland Wastewater Commission WWTF Discharge Location

Outfall Location Wetlands Map



Legend

- Wetland Identifications and Confirmations
- Surface Water Outfalls
- Wetland Class Points
  - Dammed pond
  - Excavated pond
  - Filled excavated pond
  - Filled/drained wetland
  - Wetland too small to delineate
- Filled Points
- Wetland Class Areas
  - Wetland
  - Upland
- Filled Areas
- Wetland Class Points
  - Dammed pond
  - Excavated pond
  - Filled excavated pond
  - Filled/drained wetland
  - Wetland too small to delineate
- Filled Points
- Wetland Class Areas
  - Wetland
  - Upland
- Filled Areas
- NRCS Wetspots
- Maximum Extent Wetland Indicators
- Minimum Extent Wetland Indicators
- 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

0.3 0 0.13 0.3 Miles

1:7,920

NAD_1983_HARN_Wisconsin_TM

Notes

Cambridge-Oakland Wastewater Commission's WWTF

Appendix G

WWTF Flow Data

Cambridge-Oakland WWTF
Influent Summary

2013	Influent Flow (MGD)	BOD (lbs/day)	TSS (lbs/day)	Phos (mg/L)	Phos (lbs/day)
January	0.325	540	534	4.38	10.79
February	0.348	586	617	4.23	11.56
March	0.411	505	509	3.65	11.44
April	0.583	605	628	2.11	11.31
May	0.462	645	663	3.58	13.23
June	0.475	591	623	3.26	11.50
July	0.370	578	616	4.11	12.80
August	0.331	578	611	4.53	12.29
September	0.306	595	615	4.93	12.43
October	0.296	644	724	5.42	13.10
November	0.304	581	623	4.85	11.94
December	0.307	762	761	5.40	13.29
Average	**0.377**	**601**	**627**	**4.20**	**12.14**

2014	Influent Flow (MGD)	BOD (lbs/day)	TSS (lbs/day)	Phos (mg/L)	Phos (lbs/day)
January	0.331	693	704	5.25	13.14
February	0.301	520	529	5.94	15.26
March	0.364	577	567	4.19	12.25
April	0.417	608	666	4.49	13.64
May	0.408	562	655	3.78	12.45
June	0.485	662	735	3.36	13.30
July	0.404	567	598	4.34	13.71
August	0.338	601	670	4.87	13.03
September	0.343	552	694	4.79	13.45
October	0.356	556	611	4.61	13.15
November	0.343	557	574	4.32	12.40
December	0.350	569	592	4.38	12.60
Average	**0.370**	**585**	**633**	**4.53**	**13.20**

2015	Influent Flow (MGD)	BOD (lbs/day)	TSS (lbs/day)	Phos (mg/L)	Phos (lbs/day)
January	0.329	501	510	4.32	11.62
February	0.323	484	517	4.52	11.70
March	0.352	478	492	4.16	11.88
April	0.432	532	632	3.57	14.04
May	0.367	532	575	4.37	12.84
June	0.397	582	611	4.54	14.16
July	0.376	583	585	4.40	13.24
August	0.324	555	526	4.90	12.69
September	0.382	565	617	4.61	16.45
October	0.343	497	488	4.46	12.34
November	0.384	556	585	4.20	13.92
December	0.459	535	589	3.53	12.72
Average	**0.372**	**533**	**561**	**4.20**	**13.86**

2016	Influent Flow (MGD)	BOD (lbs/day)	TSS (lbs/day)	Phos (mg/L)	Phos (lbs/day)
January	0.399	483	497	3.96	12.62
February	0.402	553	531	4.10	12.87
March	0.442	525	540	3.05	11.67
April	0.443	535	543	3.72	12.69
May	0.381	565	588	4.32	13.10
June	0.393	587	636	4.25	14.14
July	0.382	586	622	4.35	13.41
August	0.376	595	606	4.40	13.09
September	0.382	565	578	4.24	13.50
October	0.389	538	583	4.28	12.55
November	0.390	523	530	4.20	13.07
December	0.408	520	522	3.81	12.68
Average	**0.399**	**548**	**565**	**3.90**	**12.85**

2017	Influent Flow (MGD)	BOD (lbs/day)	TSS (lbs/day)	Phos (mg/L)	Phos (lbs/day)
January	0.447	525	531	3.49	12.13
February	0.425	501	576	3.69	12.54
March	0.411	495	560	3.44	12.48
April	0.496	527	638	3.09	12.93
May	0.468	570	645	3.64	13.71
June	0.440	722	914	3.80	14.49
July	0.382	606		3.50	13.31
August	0.350	529	559	4.07	13.31
September	0.345	528	544	4.63	12.50
October	0.330	562	619	4.52	12.78
November	0.335	571	561	4.77	13.06
December	0.316	563	605	4.77	12.91
Average	**0.395**	**558**	**614**	**3.53**	**13.05**

2018	Influent Flow (MGD)	BOD (lbs/day)	TSS (lbs/day)	Phos (mg/L)	Phos (lbs/day)
January	0.372	603	591	4.83	13.87
February	0.394	578	559	4.46	12.78
March	0.338	504	522	4.15	11.62
April	0.377	543	548	4.46	13.65
May	0.513	624	652	3.42	13.56
June	0.511	604	604	3.23	13.71
July	0.451	734	686	4.22	14.63
August	0.521	763	809	3.85	15.83
September	0.565	870	1141	3.47	16.53
October					
November					
December					
Average	**0.449**	**647**	**679**	**4.09**	**13.20**

Cambridge-Oakland WWTF
Effluent Summary

2013	Effluent Flow (MGD)	Phos (mg/L)	Phos (lbs/day)
January	0.326	0.57	1.62
February	0.350	1.17	3.25
March	0.408	0.99	3.08
April	0.602	0.95	4.90
May	0.483	1.34	5.16
June	0.497	1.10	4.99
July	0.394	1.36	4.71
August	0.338	1.03	2.71
September	0.330	1.16	3.06
October	0.342	1.29	3.58
November	0.355	0.97	2.79
December	0.321	0.92	2.48
Average	**0.396**	**1.07**	**3.53**

2014	Effluent Flow (MGD)	Phos (mg/L)	Phos (lbs/day)
January	0.309	1.05	2.65
February	0.309	1.12	2.80
March	0.360	0.84	2.43
April	0.423	0.48	1.64
May	0.434	0.56	1.97
June	0.492	1.20	4.64
July	0.415	0.92	2.81
August	0.352	1.33	3.64
September	0.367	0.65	1.91
October	0.352	0.87	2.46
November	0.333	0.91	2.43
December	0.339	0.41	1.18
Average	**0.374**	**0.86**	**2.55**

2015	Effluent Flow (MGD)	Phos (mg/L)	Phos (lbs/day)
January	0.320	0.62	1.62
February	0.308	0.37	0.93
March	0.344	0.42	1.19
April	0.438	1.17	3.99
May	0.362	0.96	2.87
June	0.402	0.99	3.13
July	0.372	0.44	1.32
August	0.320	0.81	2.08
September	0.403	1.17	3.69
October	0.368	0.60	1.79
November	0.378	0.64	1.93
December	0.461	0.92	3.45
Average	**0.373**	**0.76**	**2.33**

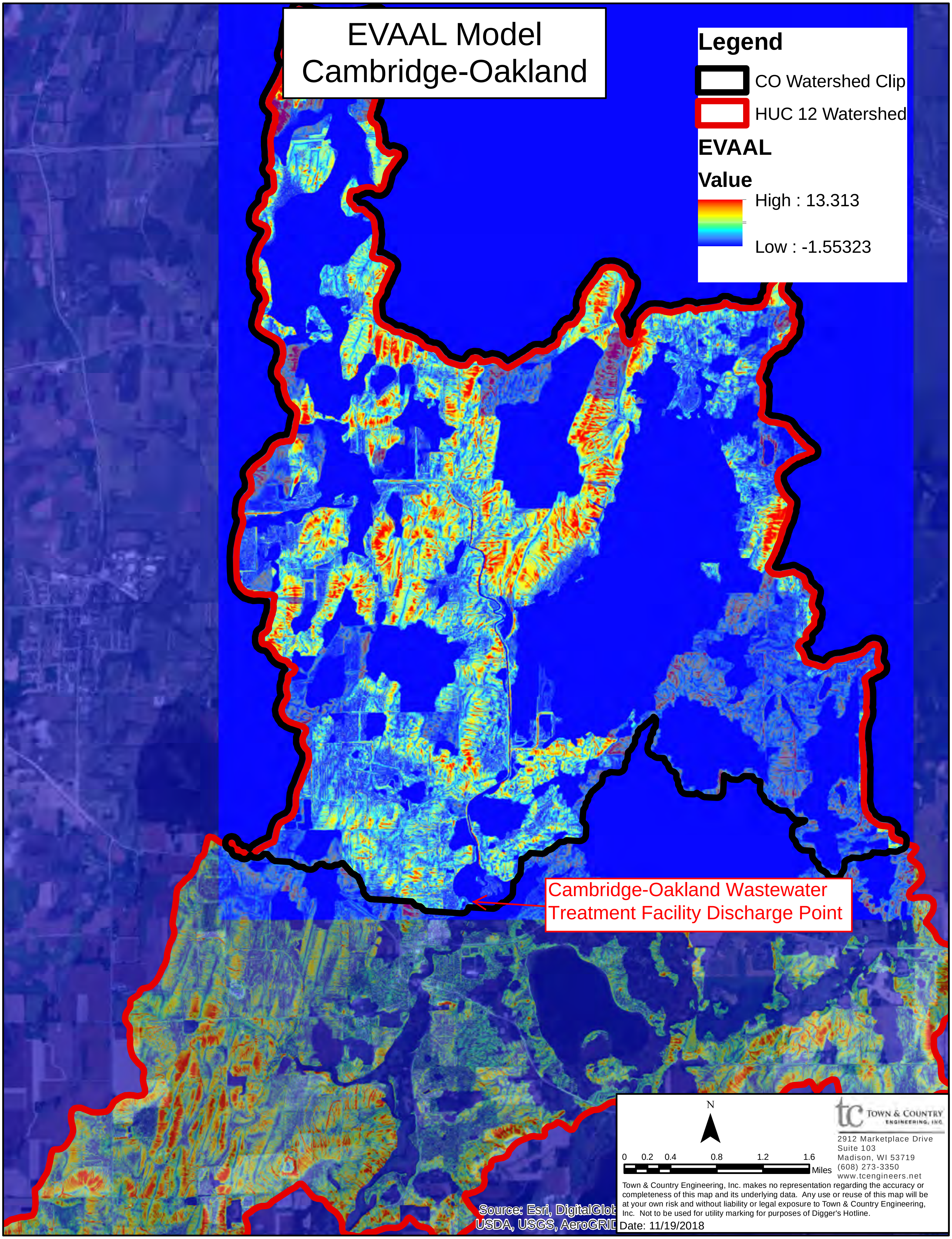
2016	Effluent Flow (MGD)	Phos (mg/L)	Phos (lbs/day)
January	0.412	0.79	2.62
February	0.414	0.64	2.06
March	0.456	0.59	2.24
April	0.487	0.89	3.26
May	0.382	0.94	2.96
June	0.413	0.59	1.91
July	0.454	1.15	4.05
August	0.448	0.80	2.88
September	0.474	0.54	2.18
October	0.389	0.75	2.29
November	0.383	0.40	1.28
December	0.398	0.64	2.10
Average	**0.426**	**0.73**	**2.48**

2017	Effluent Flow (MGD)	Phos (mg/L)	Phos (lbs/day)
January	0.434	0.45	1.67
February	0.446	0.79	2.82
March	0.435	0.84	3.09
April	0.517	0.50	2.14
May	0.490	0.92	3.61
June	0.485	0.80	3.23
July	0.604	1.23	5.18
August	0.440	0.91	3.10
September	0.366	0.92	2.73
October	0.386	0.75	2.34
November	0.403	0.49	1.62
December	0.343	0.85	2.52
Average	**0.446**	**0.79**	**2.84**

2018	Effluent Flow (MGD)	Phos (mg/L)	Phos (lbs/day)
January	0.349	0.53	1.44
February	0.402	0.75	2.26
March	0.352	0.54	1.58
April	0.394	0.61	1.88
May	0.534	0.59	2.49
June	0.541	0.87	4.26
July	0.497	1.10	4.16
August	0.596	0.63	2.87
September	0.609	0.72	3.70
October			
November			
December			
Average	**0.475**	**0.70**	**2.74**

Appendix H

EVAAL Results


EVAAL Model
Cambridge-Oakland
Legend
CO Watershed Clip
HUC 12 Watershed
EVAAL
Value
High : 13.313
Low : -1.55323
Cambridge-Oakland Wastewater Treatment Facility Discharge Point
N
0 0.2 0.4 0.8 1.2 1.6
Miles
TOWN & COUNTRY ENGINEERING, INC
2912 Marketplace Drive
Suite 103
Madison, WI 53719
(608) 273-3350
www.tcengineers.net
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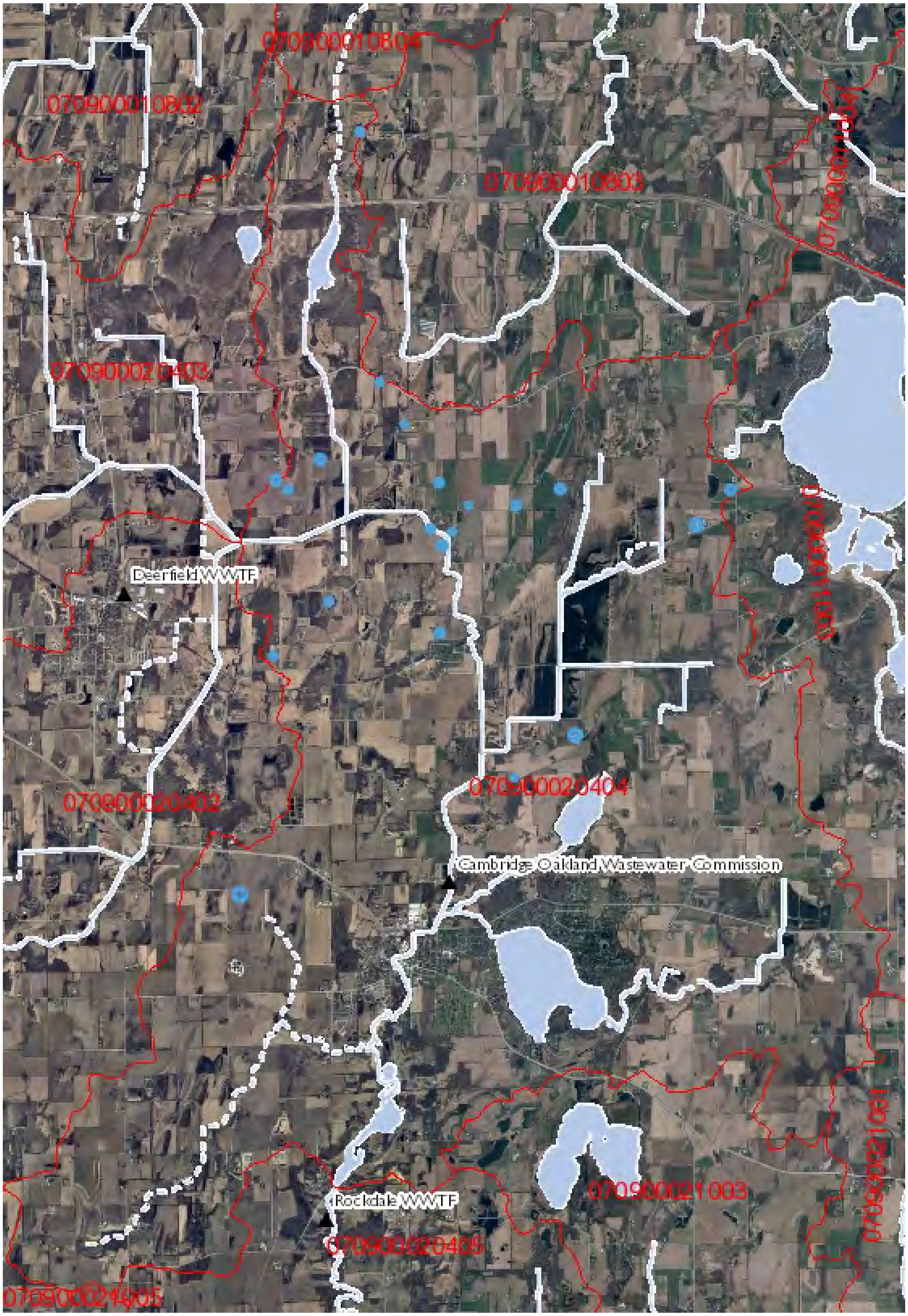
Source: Esri, DigitalGlob
USDA, USGS, AeroGRID
Date: 11/19/2018

Appendix I

Potential Barnyard Inventory

Potential Barnyard Inventory



Legend

- ▲ Surface Water Outfalls
- 12-digit HUCs (Subwatersheds)
- Rivers and Streams
- Intermittent Streams
- Lakes and Open water
- Index to EN_Image_Basemap_Leaf_Off

3.0 0 1.50 3.0 Miles

1: 95,040

NAD_1983_HARN_Wisconsin_TM

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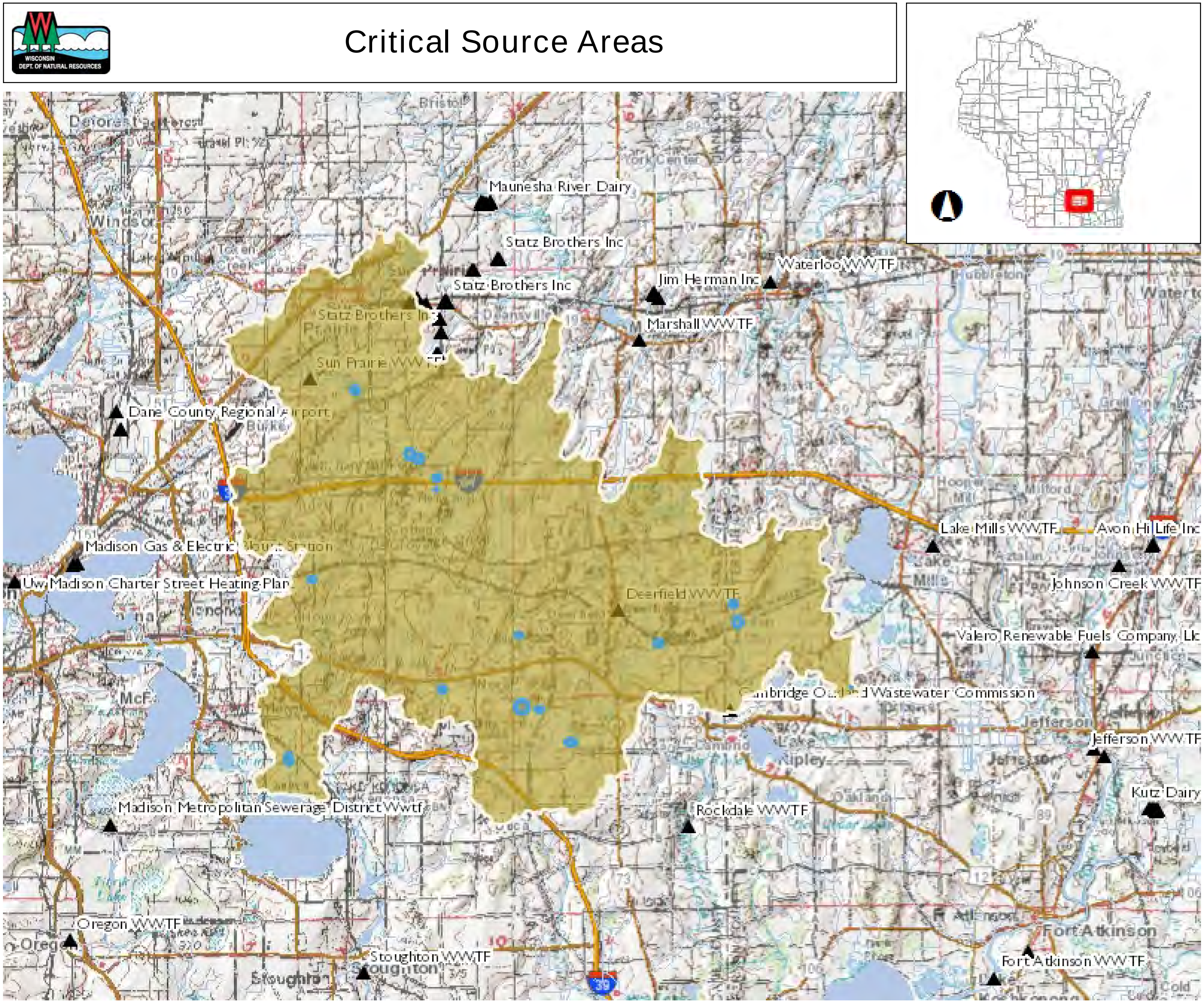
Notes

Cambridge-Oakland Wastewater Treatment Facility

Appendix J

Potential Streambank CSAs

Critical Source Areas



Legend

- ▲ Surface Water Outfalls
- 24K USGS Quad Index - Level 7 - 16

Notes

Oxbows, elbows, and steep banks

8.0 0 4.00 8.0 Miles

NAD_1983_HARN_Wisconsin_TM

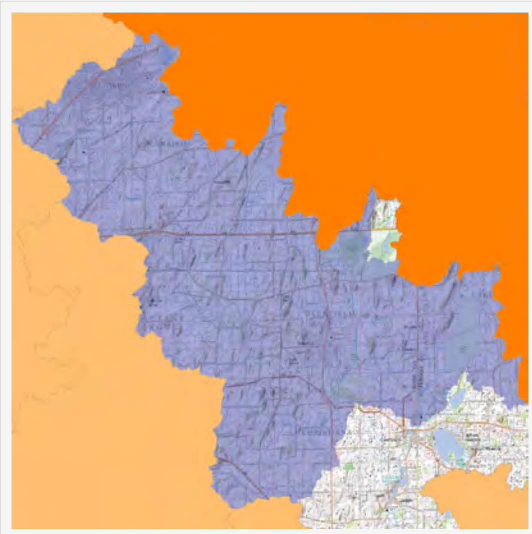
1: 253,440

Appendix K

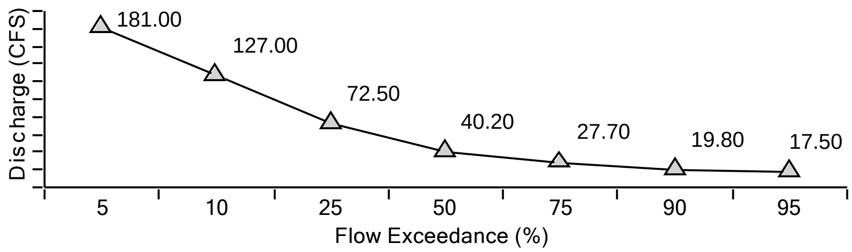
PRESTO-Lite
Watershed Delineation Report

PRESTO-Lite Watershed Delineation Report

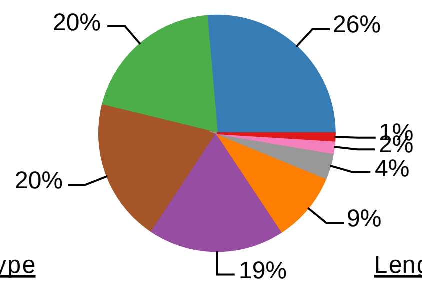
Reach ID: 200023591	
Watershed Name: Lake Ripley-Koshkonong Creek	
Waterbody Name: Koshkonong Creek	
HUC08: Middle Rock	
Watershed Area: 118.53 mi²	
Average Annual Precipitation: 33.74in	



Stream Flow

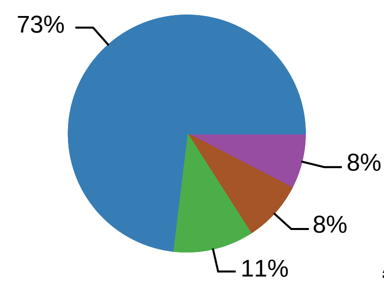


Tributary Stream Type



Type	Length
Cold Headwater	77206 ft
Macroinvertebrates	57874 ft
Cool-Cold Headwater	57050 ft
Warm Headwater	54542 ft
Warm Mainstem	27712 ft
Coldwater	10314 ft
Cold Mainstem	4952 ft
Cool-Cold Mainstem	2839 ft
Large River	0 ft

Landcover



Type	Area
Agriculture	84.88 mi²
Urban	12.77 mi²
Wetland	9.68 mi²
Forest	8.85 mi²
Barren	0.77 mi²
Grassland	0.49 mi²

PRESTO Phosphorus Load Estimate

Avg. Annual Nonpoint Phosphorous Load (80% Confidence Interval)	52,636 (20,305 - 136,445) lbs
Number of Facilities (Individual Facility Information below)	4
Avg. Annual Point-source Phosphorous Load (2010 - 2012 total of all facilities)	8,876lbs
Most Likely Point : Nonpoint Phosphorous Ratio	14% : 86%
Low Estimate Point : Nonpoint Phosphorous Ratio (Adaptive Management)	6% : 94%

Adaptive Management Results

Facilities Discharging to the Lake Ripley-Koshkonong Creek Watershed:

Facility Name	Permit #	Outfall #	Waste Type	Receiving Water	Avg. Phosphorus Load (lbs.) (2010 - 2012)
SUN PRAIRIE WASTEWATER TREATMENT FACILITY	0020478	001	Municipal	Koshkonong Creek	7286
CAMBRIDGE OAKLAND WASTEWATER COMMISSION	0026948	001	Municipal	Koshkonong Creek	1299
DEERFIELD WASTEWATER TREATMENT FACILITY	0023744	001	Municipal	Unnamed	290
LANDMARK SERVICES COOPERATIVE	0049379	001	Industrial	Unnamed	1

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

Sample Point ID	Permit No.	Facility Name	Receiving Water	Major Basin	Watershed Area (mi^2)	Nonpoint Load * (lbs)	2009-2011 Avg. Upstream Point Source Load (lbs)	2009-2011 Avg. Point Source Load (lbs)	Total Load * (lbs)	Point : Nonpoint Source Ratio * (%)	Nonpoint Source Dominated?	Model Flag **
50335	35866	SCHOOL DISTRICT OF SUPERIOR	Unnamed	Lake Superior	0.1	35	0	1	36	3:97	Yes	
49017	25593	SUPERIOR SEWAGE DISPOSAL SYSTEM	Lake Superior	Lake Superior				5205			No Result	
49859	30431	SUPERIOR VILLAGE OF	Pokegama River	Lake Superior	26.1	1737	0	361	2098	17:83	Yes	EC
48432	22675	WASHBURN CITY OF	Lake Superior	Lake Superior				1582			No Result	
50123	31747	WHITECAP MOUNTAINS SANITARY DISTRICT	Alder Creek	Lake Superior	19.2	6325	11	15	6351	0:100	Yes	
47452	4171	WI DNR BRULE RIVER STATE FISH HATCHERY	Little Bois Brule River	Lake Superior	28.8	365	0	369	734	50:50	Speak with WDNR Basin Engineer	
47448	4162	WI DNR LES VOIGT STATE FISH HATCHERY	Pikes Creek	Lake Superior	30.8	8253	0	276	8529	3:97	Yes	
46496	761	BRILLION IRON WORKS	Spring Creek	Manitowoc	6.5	2017	0	268	2285	12:88	Yes	
47663	20443	BRILLION WASTEWATER TREATMENT FACILITY	Unnamed	Manitowoc	6.8	3118	0	529	3647	15:85	Yes	
48489	22799	CHILTON WASTEWATER TREATMENT FACILITY	South Branch Manitowoc River	Manitowoc	74.6	16799	976	1093	18868	11:89	Yes	
50357	36030	CLARKS MILLS SANITARY DISTRICT	Manitowoc River	Manitowoc	392.2	175330	5303	45	180678	3:97	Yes	
49956	30848	CLEVELAND WASTEWATER TREATMENT FACILITY	Lake Michigan	Manitowoc				1052			No Result	
49336	27618	FOREMOST FARMS USA CHILTON	Unnamed	Manitowoc	1.3	16	0	976	992	98:2	Speak with WDNR Basin Engineer	
48016	21270	HILBERT WASTEWATER TREATMENT FACILITY	Unnamed	Manitowoc	3.4	943	0	233	1176	20:80	Yes	
49412	28142	HOLY FAMILY CONVENT WASTEWATER TREATMENT FAC	Silver Lake	Manitowoc	18.9	10786	0	14	10800	0:100	Yes	
46500	795	KOHLER COMPANY GENERATOR	Unnamed	Manitowoc	1.0	572	0	193	765	25:75	Yes	
57841	41475	LAKESIDE FOODS INC MANITOWOC PLANT	Manitowoc River	Manitowoc	526.4	323147	6437	0	329584	2:98	Yes	
51145	49573	LEMBERGER LANDFILL SUPERFUND SITE	Branch River	Manitowoc	79.7	101978	1089	0	103067	1:99	Yes	
48836	24601	MANITOWOC WASTEWATER TREATMENT FACILITY	Lake Michigan	Manitowoc				10640			No Result	
50414	36773	MORRISON SANITARY DISTRICT NO 1	Unnamed	Manitowoc	0.8	1275	0	561	1836	31:69	Yes	
47854	20893	NEW HOLSTEIN WASTEWATER TREATMENT FACILITY	Jordan Creek	Manitowoc	3.4	567	0	547	1114	49:51	Yes	
51120	49239	PARKER HANNIFIN CORPORATION PARFLEX DIV	Unnamed	Manitowoc	0.1	19	0	0	19	0:100	Yes	
49580	29025	POTTER WASTEWATER TREATMENT FACILITY	Unnamed	Manitowoc	1.8	174	0	69	243	28:72	Yes	
48036	21342	REEDSVILLE WASTEWATER TREATMENT FACILITY	Mud Creek	Manitowoc	26.8	19378	0	516	19894	3:97	Yes	
48495	22802	ROCKLAND SD1 WASTEWATER TREATMENT FACILITY	Mud Creek	Manitowoc	53.1	34021	516	60	34597	2:98	Yes	
48317	22195	ST NAZIANZ WASTEWATER TREATMENT FACILITY	Unnamed	Manitowoc	2.1	342	0	373	715	52:48	Speak with WDNR Basin Engineer	
48201	21831	VALDERS WASTEWATER TREATMENT FACILITY	Unnamed	Manitowoc	4.4	3318	0	639	3957	16:84	Yes	
48264	22047	WHITELAW WASTEWATER TREATMENT FACILITY	Unnamed	Manitowoc	0.6	150	0	528	678	78:22	Speak with WDNR Basin Engineer	
50246	33529	BADGER METER INC	Beaver Creek	Milwaukee River				151			No Result	
49159	26514	BRIGGS STRATTON CORP WAUWATOSA	Menomonee River	Milwaukee River				106			No Result	
47820	20818	CAMPBELLSPORT WASTEWATER TREATMENT FACILITY	Milwaukee River	Milwaukee River	53.9	14244	0	1232	15476	8:92	Yes	
50050	31372	CASCADE WASTEWATER TREATMENT FACILITY	North Branch Milwaukee River	Milwaukee River	9.1	927	0	658	1585	42:58	Yes	
47565	20222	CEDARBURG WASTEWATER TREATMENT FACILITY	Cedar Creek	Milwaukee River	125.2	27216	2676	2733	32625	17:83	Yes	
68524	62723	DRS POWER & CONTROL TECHNOLOGIES, INC.	Lincoln Creek	Milwaukee River				155			No Result	
47817	20800	FREDONIA MUNICIPAL SEWER AND WATER UTILITY	Milwaukee River	Milwaukee River	430.3	78652	13038	261	91951	14:86	Yes	
47548	20184	GRAFTON VILLAGE WATER & WASTEWATER UTILITY	Milwaukee River	Milwaukee River	470.7	87854	14852	2988	105694	17:83	Yes	
48198	21806	JACKSON (VILLAGE) WASTEWATER TREATMENT PLANT	Cedar Creek	Milwaukee River	53.6	14078	0	2494	16572	15:85	Yes	
48167	21733	KEWASKUM VILLAGE	Milwaukee River	Milwaukee River	147.2	33880	1232	625	35737	5:95	Yes	
51118	49204	KRIER FOODS INC RANDOM LAKE	Silver Creek	Milwaukee River	9.6	751	0	7	758	1:99	Yes	
85517	728	LADISH FORGING, LLC	Unnamed	Milwaukee River				419			No Result	
64507	62260	MAYFAIR MALL	Menomonee River	Milwaukee River				27			No Result	
44743	272	MAYNARD STEEL CASTING CO	Kinnickinnic River	Milwaukee River	17.7	1736	419	1	2156	19:81	Yes	
46755	1236	MILK SPECIALTIES CO INC - ADELL FACILITY	Unnamed	Milwaukee River	2.8	150	0	1350	1500	90:10	Speak with WDNR Basin Engineer	
46481	744	MILLERCOORS LLC	Menomonee River	Milwaukee River				1021			No Result	
50427	36820	MILWAUKEE METRO SEW DIST COMBINED	Lake Michigan	Milwaukee River				222431			No Result	
48913	24911	NEWBURG VILLAGE	Milwaukee River	Milwaukee River	263.2	50785	9586	630	61001	17:83	Yes	
48976	25321	P & H MINING EQUIPMENT	Menomonee River	Milwaukee River				297			No Result	
50652	41351	PENTAIR RESIDENTIAL FILTRATION, LLC	Milwaukee River	Milwaukee River				9			No Result	
48067	21415	RANDOM LAKE VILLAGE	Silver Creek	Milwaukee River	10.1	833	7	521	1361	39:61	Yes	
48112	21555	SAUKVILLE VILLAGE SEWER UTILITY	Milwaukee River	Milwaukee River	454.8	84461	13299	1553	99313	15:85	Yes	
49199	26751	SCHREIBER FOODS INC - WEST BEND	Cedar Creek	Milwaukee River	85.0	22630	2494	182	25306	11:89	Yes	
51137	49514	WASTE MANAGEMENT OMEGA HILLS LANDFILL	Menomonee River	Milwaukee River	34.5	8481	0	3	8484	0:100	Yes	
46631	931	WE - VALLEY POWER PLANT	Menomonee River	Milwaukee River				18623			No Result	
49051	25763	WEST BEND CITY	Milwaukee River	Milwaukee River	245.7	46496	1857	7729	56082	17:83	Yes	
49135	26255	WI DNR KETTLE MORAINE SPRINGS FISH HATCHERY	Unnamed	Milwaukee River	0.3	32	0	286	318	90:10	Speak with WDNR Basin Engineer	
50701	42218	WISCONSIN THERMOSET MOLDING INC	Milwaukee River	Milwaukee River				2			No Result	
49391	28053	ALLENTON SANITARY DISTRICT WWTP	East Branch rock River	Rock River	28.3	11835	0	317	12152	3:97	Yes	
48098	21512	ARLINGTON WASTEWATER TREATMENT FACILITY	Goose Lake	Rock River	0.2	140	0	1089	1229	89:11	Speak with WDNR Basin Engineer	EC
50054	31381	ASHIPPUN SANITARY DISTRICT WWTF	Rock River	Rock River	691.8	218662	23529	1654	243845	10:90	Yes	
48603	23345	BEAVER DAM WASTEWATER TREATMENT FACILITY	Beaver Dam River	Rock River	157.0	21371	2376	7561	31308	32:68	Yes	0
49228	26930	BELOIT TOWN WASTEWATER TREATMENT FACILITY	Rock River	Rock River	3441.3	809981	169428	1304	980713	17:83	Yes	
48619	23370	BELOIT WASTEWATER TREATMENT FACILITY	Rock River	Rock River	3467.0	817572	170732	8117	996421	18:82	Yes	
48640	23442	BRANDON WASTEWATER TREATMENT FACILITY	Unnamed	Rock River	0.0	14	0	1058	1072	99:1	Speak with WDNR Basin Engineer	
48129	21601	BROWNSVILLE WASTEWATER TREATMENT FACILITY	Kummel Creek	Rock River	11.4	2049	612	881	3542	42:58	Yes	
50089	31551	BURNETT SANITARY DISTRICT #1 WWTF	Spring Brook	Rock River	205.7	30411	8994	317	39722	23:77	Yes	
49231	26948	CAMBRIDGE OAKLAND WASTEWATER COMMISSION	Koshkonong Creek	Rock River	120.2	40814	8245	1430	50489	19:81	Yes	
48259	22039	CLINTON WASTEWATER TREATMENT FACILITY	Unnamed	Rock River	0.5	92	0	477	569	84:16	Speak with WDNR Basin Engineer	
47775	20702	CLYMAN WASTEWATER TREATMENT FACILITY	Unnamed	Rock River	0.9	153	0	216	369	58:42	Speak with WDNR Basin Engineer	
47909	21008	COLUMBUS WASTEWATER TREATMENT FACILITY	Crawfish River	Rock River	165.5	32425	324	1282	34031	5:95	Yes	
47932	21059	CONSOLIDATED KOSHKONONG SANITARY DIST WWTF	Rock River	Rock River	2564.2	662703	84384	3632	750719	12:88	Yes	
48694	23744	DEERFIELD WASTEWATER TREATMENT FACILITY	Unnamed	Rock River	0.6	9	0	299	308	97:3	Speak with WDNR Basin Engineer	
50175	32026	DELAFIELD HARTLAND POLLUTION CONTROL COMM	Bark River	Rock River	59.5	4444	0	4684	9128	51:49	Speak with WDNR Basin Engineer	
48040	21351	DOUSMAN WASTEWATER TREATMENT FACILITY	Bark River	Rock River	62.1	4713	4684	462	9859	52:48	Speak with WDNR Basin Engineer	
47616	20346	EDGERTON WASTEWATER TREATMENT FACILITY	Rock River	Rock River	2635.5	669175	89626	563	759364	12:88	Yes	
48751	23973	FALL RIVER WASTEWATER TREATMENT FACILITY	Crawfish River	Rock River	135.7	23467	110	214	23791	1:99	Yes	
50354	36021	FONTANA WALWORTH WATER POLLUTION CONT. COMM	Piscasaw Creek	Rock River	10.8	1113	0	2804	3917	72:28	Speak with WDNR Basin Engineer	
48761	24023	FOOTVILLE WASTEWATER TREATMENT FACILITY	Bass Creek	Rock River	13.9	11250	0	1835	13085	14:86	Yes	
48411	22489	FORT ATKINSON WASTEWATER TREATMENT FACILITY	Rock River	Rock River	2268.6	607538	70165	4406	682109	11:89	Yes	
51155	50016	GRANDE CHEESE CO BROWNSVILLE	Kummel Creek	Rock River	11.4	2049	881	612	3542	42:58	Yes	

Appendix L

In-steam Sampling Results

Monitoring Station

Station ID 133437
Station Name Koshkonong Creek - Cambridge

Show specific parameter: PHOSPHORUS TOTAL

Sample Results

Previous 1-10 of 10 Next

Project	Date/Time	DNR Parameter	Species	Result	Units	Present/Absent	Lab Comments
TMDL 2000-2001	11/01/2000 12:00 AM	PHOSPHORUS TOTAL		0.259	MG/L		
TMDL 2000-2001	10/04/2000 12:00 AM	PHOSPHORUS TOTAL		0.188	MG/L		
TMDL 2000-2001	09/19/2000 12:00 AM	PHOSPHORUS TOTAL		0.291	MG/L		
TMDL 2000-2001	09/05/2000 12:00 AM	PHOSPHORUS TOTAL		0.336	MG/L		
TMDL 2000-2001	08/22/2000 12:00 AM	PHOSPHORUS TOTAL		0.329	MG/L		
TMDL 2000-2001	08/08/2000 12:00 AM	PHOSPHORUS TOTAL		0.379	MG/L		
TMDL 2000-2001	07/25/2000 12:00 AM	PHOSPHORUS TOTAL		0.292	MG/L		
TMDL 2000-2001	07/10/2000 12:00 AM	PHOSPHORUS TOTAL		0.404	MG/L		
TMDL 2000-2001	06/27/2000 12:00 AM	PHOSPHORUS TOTAL		0.411	MG/L		
TMDL 2000-2001	06/12/2000 12:00 AM	PHOSPHORUS TOTAL		*0.609	MG/L		

Average = 0.35 mg/L

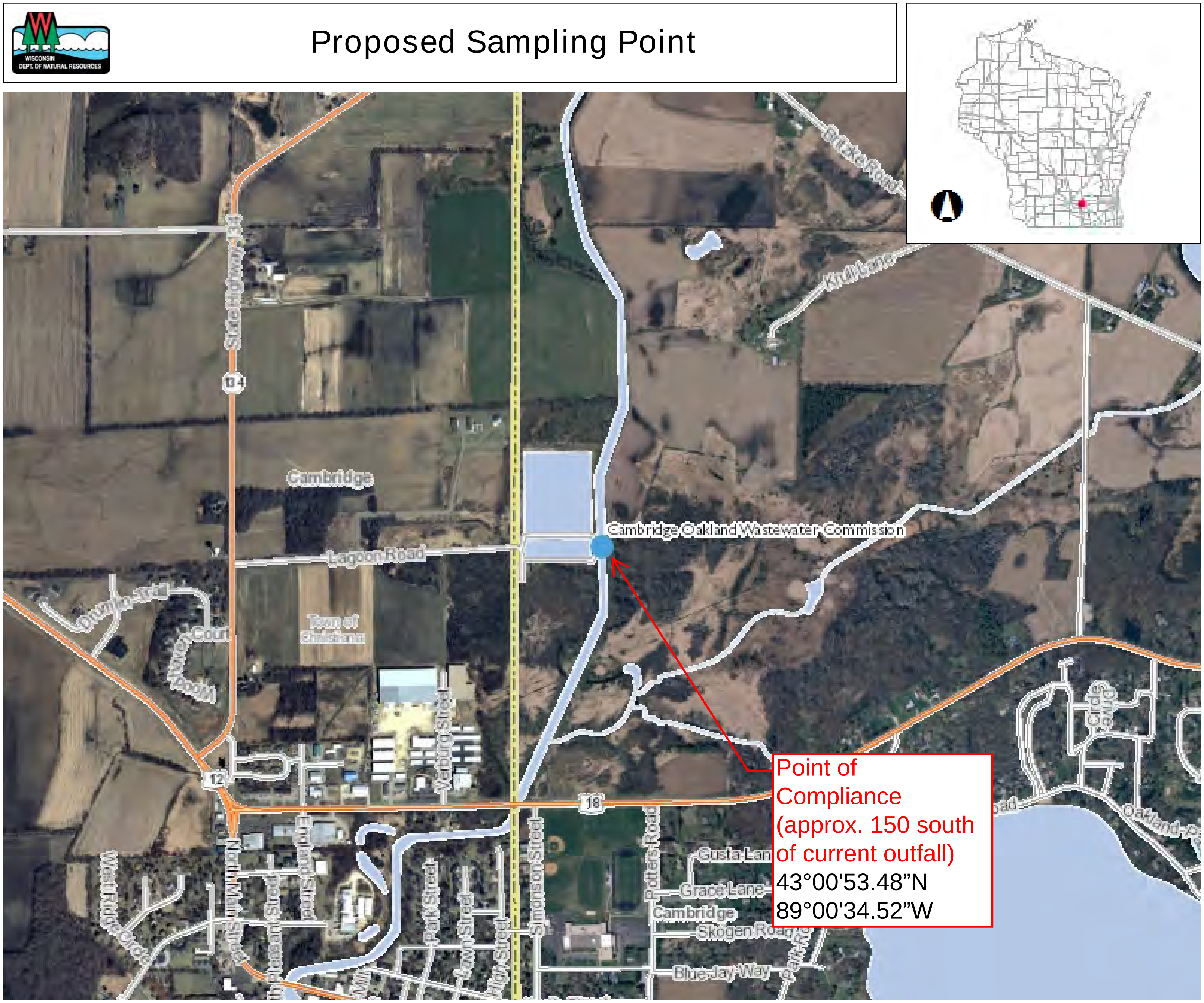
Cambridge-Oakland Wastewater Commission's WWTF
Koshkonong Creek In-Stream Sampling Data
2012-2014

Date	Upstream (mg/L)	WWTF Effluent (mg/L)	WWTF Flow (MGD)	Downstream (mg/L)
5/24/2012	NA	1.32	0.372	Non Detect
6/8/2012	NA	0.99	0.343	0.17
6/12/2012	NA	0.56	0.304	0.19
6/21/2012	0.27	1.19	0.297	0.27
7/5/2012	0.29	1.23	0.305	0.29
7/11/2012	0.46	1.66	0.287	0.49
7/19/2012	0.31	0.42	0.312	0.36
7/27/2012	0.27	0.18	0.301	0.29
8/3/2012	0.20	0.15	0.295	0.24
9/11/2012	0.16	1.44	0.306	0.19
9/18/2012	0.13	1.52	0.268	0.20
10/31/2012	0.11	2.33	0.280	0.08
11/7/2012	0.09	2.90	0.279	0.08
12/18/2012	0.07	0.27	0.297	0.05
12/26/2012	0.08	0.31	0.490	0.07
2/18/2013	0.17	1.10	0.368	0.14
2/28/2013	0.12	1.15	0.329	0.10
3/28/2013	0.54	0.85	0.425	0.56
6/19/2013	0.39	0.38		0.18
9/16/2013	0.16			0.12
4/15/2014	0.41			0.22
5/21/2014	0.24	0.88		0.25
6/18/2014	0.20			0.24
7/11/2014	0.69			0.55
8/29/2014	0.33			0.31
9/17/2014	0.16	0.57		0.15
10/17/2014	0.18			0.20
12/4/2014	0.09	0.32		0.07
Average	**0.24**	**0.99**	**0.325**	**0.22**
2012 Ave.	0.20	1.10	0.316	0.21
2013 Ave.	0.28	0.87	0.374	0.22
2014 Ave.	0.29	0.59		0.25

Appendix M

Proposed In-stream Sampling Location

Proposed Sampling Point



Legend

- Surface Water Outfalls
- Municipality
- State Boundaries
- County Boundaries
- Major Roads
  - Interstate Highway
  - State Highway
  - US Highway
- County and Local Roads
  - County HWY
  - Local Road
- Railroads
- Tribal Lands
- Rivers and Streams
- Intermittent Streams
- Lakes and Open water
- Index to EN_Image_Basemap_Leaf_Off

0.5 0 0.25 0.5 Miles

NAD_1983_HARN_Wisconsin_TM

1: 15,840

Notes

Cambridge-Oakland Wastewater Commission

Appendix N

Dane County LWRD and Jefferson County LWCD Letter of Intent

Jefferson County
Land & Water Conservation Department
Courthouse - 311S Center Ave, Rm 113
Jefferson, WI 53549-1701
(920) 674-7110

December 17, 2018

Mr. Gregory Droessler
Town & Country Engineering, Inc.
10505 Corporate Dr., Suite 105A
Pleasant Prairie, WI 53158

Subject: Adaptive Management Plan

Dear Mr. Droessler,

Jefferson County Land & Water Conservation Department (LWCD) intends to assist the Cambridge-Oakland Wastewater Commission with implementation of their proposed adaptive management plan within the scope of the services typically provided by Jefferson Cambridge-Oakland Wastewater Commission County LWCD to landowners. A service agreement is proposed to be developed between and Jefferson County. Contingent on approved by the appropriate boards and commissions identifying services to be provided by Jefferson County LWCD.

If you have additional questions, please contact me at (920) 674-7111, or markw@jeffersoncountywi.gov

Sincerely,

Mark Watkins
Jefferson County LWCD Director

Cc: Matthew Claucherty, Wisconsin Department of Natural Resources

December 18, 2018

Ms. Cassie Elmer
Town & Country Engineering, Inc.
2912 Marketplace Drive, Suite 103
Madison, Wisconsin 53719

SUBJECT: Cambridge Oakland Adaptive Management Plan

Dear Ms. Elmer:

Dane County Land & Water Resources Department (LWRD) intends to assist the Cambridge Oakland Treatment Plant and Commission with implementation of their proposed adaptive management plan within the scope of the services typically provided by LWRD to landowners. A service agreement is proposed be developed between Cambridge Oakland and Dane County and approved by the appropriate boards and commissions identifying services to be provided by LWRD as a broker for the Cambridge Oakland adaptive management plan.

If you have additional questions, please contact me at (608) 224-3740 or piaget.amy@countyofdane.com.

Sincerely,

Amy S. Piaget, County Conservationist
Land Conservation Division
Dane County Land & Water Resources Department

Appendix O

Dane County LWRD and Jefferson County LWCD Cost Share Contract Template

COST-SHARE CONTRACT NO.:

SOIL AND WATER RESOURCE MANAGEMENT GRANT PROGRAM

Sec. 92.14, Wis. Stats

COST-SHARE CONTRACT

(DATCP approval required for cost-share amounts over $50,000)

This contract is made and entered into by and between **Dane** County Land Conservation Committee, and landowner(s) ______________and grant recipient(s)**N/A**. **This contract is complete and valid as of the date signed by the county representative.**

In consideration of the terms and conditions herein, the parties agree to this contract as set forth in the following Sections 1, 2, and 3, and any addenda that are annexed and made a part hereof.

NOTE 1: It is **not** necessary to notarize the spouse's signature unless this contract will be recorded. However, the spouse must sign his or her own name. If there are additional landowners or any grant recipients, check here ☐ and attach Exhibit A1. **NOTE 2:** Only properly authorized person(s) can sign in a representative capacity and must sign in such capacity if the landowner is a corporation, trust, estate, partnership, limited partnership, or limited liability company.

Recording Area

Agency Name & Return Address
Dane County Land & Water Resources
5201 Fen Oak Drive, Room 208
Madison, WI 53718

Parcel Identification Number

LANDOWNER/REPRESENTATIVE **DATE**	**LANDOWNER/REPRESENTATIVE** **DATE**
PRINT OR TYPE NAME: JAMES M. LUNDE	**PRINT OR TYPE NAME: SHARON LUNDE**
State of Wisconsin)) ss. _____County)	**State of Wisconsin)) ss. _____County)**
This instrument was acknowledged before me on _____ (date)	**This instrument was acknowledged before me on _____ (date)**
by_____ (name of landowner or representative)	**by _____ (name of landowner or representative)**
as _____ (representative's position or type of authority, if applicable)	**as _____ (representative's position or type of authority, if applicable)**
for _____ (name of entity on behalf of whom instrument was executed, if applicable)	**for_____ (name of entity on behalf of whom instrument was executed, if applicable)**
SIGNATURE _____ **PRINT NAME** **Notary Public, State of Wisconsin** **My commission expires _____ (is permanent).**	**SIGNATURE** _____ **PRINT NAME** **Notary Public, State of Wisconsin** **My commission expires _____ (is permanent).**

SIGNATURE OF COUNTY REPRESENTATIVE **DATE**

PRINT OR TYPE NAME: _____

State of Wisconsin)
) ss.
_____County)
This instrument was acknowledged before me on _____
(date)

by _____
(name of county representative)

as_____of _____

SIGNATURE _____ **PRINT NAME**
Notary Public, State of Wisconsin
My commission expires _____ (is permanent)

This document was drafted by the Wisconsin Department of Agriculture, Trade and Consumer Protection.

COST-SHARE CONTRACT NO.:

SECTION 1A. COUNTY INFORMATION	PAGE 2 of 5
NAME OF COUNTY AGENCY **Dane County Land & Water Resources**	TELEPHONE NUMBER 608-224-3730
ADDRESS **5201 Fen Oak Drive, Room 208**	CITY, STATE, ZIP CODE Madison WI 53718
NAME OF AUTHORIZED REPRESENTATIVE **Amy Callis – County Conservationist**	

SECTION 1B. LANDOWNER and GRANT RECIPIENT INFORMATION

TOTAL DATCP COST-SHARE AMOUNT (refer to page 5)	NON-DATCP FUNDING BY SOURCE (refer to page 5) ☐ County $ ☐ Other State Agency $ ☐ Federal $ ☐ Non-Profit or Other $

NAME OF LANDOWNER (Check the description that best applies: ☒ Individual (Note: Spouse must be included) ☐ Corporation ☐ Limited Liability Company ☐ Trust, Estate or Partnership ☐ Local Unit of Government)

ADDRESS

CITY, STATE, ZIP CODE WI	TELEPHONE NUMBER

LOCATION OF COST-SHARED PRACTICE(S) (Locate by providing parcel numbers(s) or coordinates below or attach required information as Exhibit B)

Parcel Identification Number(s):

Latitude and longitude (degrees and minutes):
° . ' N ° ' W

Note: If this document will be recorded, attach a legal description of the location of the cost-shared practice(s) that meets the requirements of ss. 706.05(2m)(a) and 66.0217(1)(c), Wis. Stats.

NAME OF GRANT RECIPIENT, if different than above. NOTE: SPOUSE MUST BE INCLUDED
N/A

ADDRESS

CITY, STATE, ZIP CODE	TELEPHONE NUMBER

INSTALLATION PERIOD

Each practice must be installed, and all costs associated with the practice must be incurred, by December 31st of the cost-share contract year, or December 31st of the year of an approved extension. This contract may provide cost-sharing for more than one year for the following items as long as the parties record the number of years of cost-sharing in the appropriate column in Section 3:

a. **To install and maintain contour farming, cover and green manure crop, nutrient management, pest management, residue management, and strip-cropping (up to 4 years).**
b. **For land taken out of production for 10 years or other period specified in Section 3.**
c. **For riparian land taken out of production for 15 years or in perpetuity as specified in Section 3.**

Disclosure of non-DATCP funding: By signing this contract, the landowner or grant recipient agrees to disclose all information related to any non-DATCP funding that has been or will be obtained to pay for practices described in this contract, and to authorize the county and DATCP to access files related to this funding, including release of county and federal files in accordance with the provisions of 16 U.S.C. 3844(b) (2) (D) (i).

Appeal Rights: The landowner or grant recipient may appeal to the county, in writing, any decision of the county land conservation department regarding this grant. The county will determine if the grantee is eligible for a hearing under Chapter 68, Wis. Stats.

Landowner Initials	Date	Spouse Initials	Date	Grant Recipient Initials	Date	Spouse Initials	Date	County Reps. Initials	Date

ADDENDA MAY BE ATTACHED TO THIS DOCUMENT TO RECORD SPECIAL CONDITIONS

COST-SHARE CONTRACT NO.:

A. The landowner/grant recipient agrees:

1. To install and maintain cost-shared practice(s) listed in Section 3, consistent with the plans and specifications referenced in Section 3, during periods identified in Section 3.
2. To make all payments for which the landowner/grant recipient (hereinafter referred to as "landowner") is obligated under this contract, as specified in Section 3. Landowners are responsible for all payments for state or local administrative permit fees.
3. To provide the county with evidence of payment, as applicable, for services, supplies, and practices performed or installed pursuant to this contract. Proof of payment may be in the form of a statement or invoice, or receipts or cancelled checks with the related vendor contract. For services provided by the landowner, the landowner shall submit a detailed invoice or cost-estimate for those services.
4. To maintain the cost-shared practice for at least 10 years from the date of installation, except for these "soft" practices: contour farming, cover and green manure crop, nutrient management, pest management, residue management, and strip-cropping. Soft practices must be maintained for each year cost-share funds are provided, as specified in Section 3. Extended maintenance periods apply if land is taken out of production for more than 10 years, as specified in Section 3.
5. To operate and maintain each cost-shared practice for the required maintenance period following the certification of installation or replace it with an equally effective practice. To refrain, during the maintenance period, from actions that may reduce a practice's effectiveness, or result in water quality problems. The landowner agrees to follow an operation and maintenance (O&M) plan or other maintenance requirements including those in ATCP 50.62, Wis. Admin. Code. All nutrient management plans must comply with s. ATCP 50.04(3), Wis. Admin. Code.
6. To repay cost-share funds immediately, upon demand by the county, if the landowner fails to operate and maintain the cost-shared practice according to the contract. Repayment of grant funds shall not be required if a practice(s) is rendered ineffective during the required maintenance period due to circumstances beyond the control of the landowner.
7. To the recording of this contract, including the legal description of the subject property, with the deed to the subject property, if cost-sharing exceeds $14,000 unless this contract cost-shares only practices listed in s. ATCP 50.08 (5) (b). This contract shall be recorded before the county makes any cost-share payment to the landowner. Upon recording, this contract constitutes a covenant running with the land described in Section 1B, and is binding on subsequent owners, heirs, executors, administrators, successors, trustees, and assigns, and users of the land for the period set forth in Section 3.
8. To comply with (i) the performance standards, prohibitions, conservation practices and technical standards under s. 281.16, Stats., (ii) plans approved under ss. 92.14, 92.15 (1985 Stats.), 92.10 and 281.65, Stats., and (iii) the practices necessary to meet the requirements of this contract, and to continue such compliance after the term of this contract, without further cost-sharing, if the landowner has received cost-sharing for compliance at least equal to the cost-sharing required under s. ATCP 50.08, Wis. Admin. Code. There is no requirement for continuing compliance for land that is taken out of production unless cost-sharing is provided.
9. To acknowledge receipt of a notice provided by the county explaining continuing compliance requirements arising out of the installation of specific cost-shared practices. (Initial here _____, ______, _____, ______.)
10. Not to discriminate against contractors because of age, race, religion, color, handicap, gender, physical condition, developmental disability, or national origin, in the performance of responsibilities under this contract.
11. To make any changes to this contract, including changes in project components and costs, according to the procedures set forth in Section 2.C.3.
12. To the county's right to stop work, or withhold cost-share grant funds, if it is found that the landowner, grant recipient, or construction contractor in their employ has violated ch. 92, Wis. Stats., ch. ATCP 50, Wis. Admin. Code, or has breached this contract.

Landowner Initials	Date	Spouse Initials	Date	Grant Recipient Initials	Date	Spouse Initials	Date	County Reps. Initials	Date

COST-SHARE CONTRACT NO.:

B. The county agency agrees:

1. To enter this cost-share contract only after the Land Conservation Committee has authorized the cost-sharing of this project.
2. To provide technical assistance for the design, construction, and installation of cost-shared practice(s) according to applicable standards in ch. ATCP 50, Wis. Admin. Code. The county agrees to provide written notice, when applicable, to inform each landowner and grant recipient of the full ramifications of a cost-share contract, including future compliance obligations. The county further agrees to ensure that cost-shared practices are maintained as required in II. A. 4 by securing O&M plans and performing site checks as needed.
3. To use the most cost-effective methods to address the water quality concerns of this project, and apply cost containment procedures, consistent with ch. ATCP 50, Wis. Admin. Code, when estimating and paying for cost-shared practice(s).
4. To provide cost-share funds to the landowner, in the amounts specified in Section 3 and any amendments, upon proof that (i) the landowner has made all payments for which the landowner is responsible under the contract, (ii) the practice(s) are designed and installed according to standards in ch. ATCP 50, Wis. Admin. Code and this contract, including compliance with applicable construction site erosion control standards, and (iii) nutrient management plans comply with s. ATCP 50.04(3) Wis. Admin. Code. The county may make payments to third parties as provided in s. ATCP 50.40(13), Wis. Admin. Code.
5. To collect and retain all contract-related documents regarding operation and maintenance, proof of certification of design and installation, change orders, receipts and payments, and other referenced materials for a minimum of three years after making the last cost-share payment to the landowner, or for the duration of the maintenance period of this contract, whichever is longer. Records may be retained longer to demonstrate that a landowner meets the cost-sharing exemption under s. ATCP 50.08(5), Wis. Admin Code. Payment records from the landowner and county must provide proof of payment in full for all cost-shared practices installed. Copies of records shall be made available to DATCP upon request.
6. To record this contract, including the legal description of the subject property, with the deed to the subject property, as required under Section 2.A.7. Contracts may be recorded if not required under Section 2.A.7.
7. To coordinate eligibility for DATCP cost-share funding, and to follow required reimbursement procedures to facilitate timely cost-share payment(s) to the landowner, including the submission of certification forms to DATCP documenting that cost-shared practice(s) have been properly installed in accordance with this contract and paid for.

C. General conditions of the contract

1. State cost-share reimbursement amounts in Section 3 are contingent on receiving DATCP funding. The county may cancel this contract, in whole or in part, due to non-availability of DATCP funds. A county is responsible for contract grant amounts when the county makes cost-share commitments beyond the amount of its DATCP annual allocation or the county fails to obtain DATCP approval required under 2.C.2.
2. Written approval from DATCP shall be obtained before this contract is executed or amended if the DATCP cost-share amount exceeds $50,000, and such approval shall be attached to, and made part of, this contract.
3. This contract may be amended, by mutual written agreement of the parties, during the installation or maintenance periods, if the proposed changes will provide equal or greater control of water pollution. For any changes in practice components or costs, the county will determine eligibility and whether to approve such changes. Counties must use a "Cost-Share Contract Change Order" form (ARM-LR-166) for changes prior to or during the installation and maintenance periods. Except as otherwise provided in the "Change Order" form, any completed "Change Order" form must be attached to, and made part of, this contract. Changes to this contract that increase the DATCP cost-share amount over $14,000 or $50,000 are subject to requirements in Sections 2.A.7., regarding recording and 2.C.2., regarding DATCP approval, respectively.
4. This contract is void if, prior to installation, the county determines that due to a material change in circumstances the proposed practices will not provide cost-effective water quality benefits.

Landowner Initials	Date	Spouse Initials	Date	Grant Recipient Initials	Date	Spouse Initials	Date	County Reps. Initials	Date

COST-SHARE CONTRACT NO.: LWRM #2 (2017)

SECTION 3. PRACTICES, COST, COST-SHARE AMOUNTS, AND INSTALLATION SCHEDULE

The parties agree to the following related to the conservation practices, technical design and specifications, eligible costs, cost-share rates and amounts, and rate set forth below.

Name of Person Preparing Technical Design: **Representing:** (COUNTY OR PRIVATE ENGINEERING FIRM) **Dane County Land & Water Resources**	**Technical Standards Used in the Design:** (LIST NAME AND DATE OF NRCS, DNR OR OTHER STANDARDS EMPLOYED IN THE DESIGN)	**USE OF THE 3 BOXES BELOW IS OPTIONAL** **REPRESENTING:** / **DATE OF APPROVAL:** **AMOUNT OF COST-SHARE CONTRACT APPROVED: $**

*	**Cost-Shared Item Description** ss. ATCP 50.62 to 50.98, 50.40 (15) & (18), & 50.08 (3) and (4)	**Yrs of CS****	**Quantity (Use Standard Units)**	**Unit Cost or Flat Rate $**	**Estimated Total Cost $**	**COST-SHARE RATE** State %***	Grantee %	County/ other %	**ESTIMATED COST-SHARE AMOUNTS** DATCP $	Grantee $	County/other $
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			TOTALS								

* Must check if the 50% maximum rate applies based on the installation of a practice after January 1, 2014 under one of these two conditions:
a. The practice is installed on land owned by a local governments
b. Cost-sharing is provided for access roads (ATCP 50.65) , roof runoff system (ATCP 50.85), stream bank or shoreline protection (ATCP 50.88), stream crossing (s. ATCP 50.885), or wetland development or restoration (ATCP 50.98) and the practice does not implement a farm performance standard.
** Enter the number of years the practice is cost-shared only if the contract provides for (a) more than one year of cost-sharing for soft practices (contour farming, cover and green manure crop, nutrient management, pest management, residue management, and strip-cropping), (b) land taken out of production for more than one year, or (c) CREP equivalent payments for riparian land taken out of production. For "soft practice" payments, the landowner receives the full contract amount after the practice is certified, and has a contractual obligation to maintain the practice for the number of years cost-shared. For "land out of production" payments under ATCP 50.08(3) (d), the landowner receives the sum of the landowner's annual cost for the period specified in the contract. A landowner's annual cost equals the number of affected acres multiplied by the per-acre weighted average soil rental rate in the county on the date of the cost-share contract. For CREP equivalent payments authorized under ATCP 50.08(4), the landowner receives an amount equal to the amount that would be offered under the CREP program if the affected lands were enrolled in that program. To receive a CREP- equivalent payment, a landowner must keep riparian land out of production for 15 years, or in perpetuity, and must agree to contract terms similar to those imposed by the CREP program. Insert "P" if the land is taken out of production in perpetuity. Cost-share practices must be operated and maintained in accordance with O&M plans and other requirements that may apply
*** May exceed 70 percent only if the farm landowner qualifies for economic hardship.

Landowner Initials	Date	Spouse Initials	Date	Grant Recipient Initials	Date	Spouse Initials	Date	County Rep. Initials	Date

Appendix P

Financial Security Statement

CAMBRIDGE-OAKLAND WASTEWATER COMMISSION
STATEMENT OF FINANCIAL SERCURITY

WHEREAS, the Cambridge-Oakland Wastewater Commission, Dane and Jefferson County, Wisconsin (the "Commission") owns and operates a municipal wastewater treatment system; and

WHEREAS, the Commission intends to implement an Adaptive Management Program (the "Project"); to comply with the water quality based effluent limits for phosphorus established by NR 102 and NR 217 and its Wisconsin Pollutant Discharge Elimination System (WPDES) permit; and

WHEREAS, the Commission expects to finance the Project with existing funds and user charges;

NOW, THEREFORE, Cambridge-Oakland Wastewater Commission, Dane and Jefferson County, Wisconsin confirms that the Commission has the financial means to implement the project during the next WPDES permit term, beginning in January 2020.

Signed this 19TH day of DECEMBER, 2018.

Cambridge-Oakland Commission President