

Heart of the Valley

METROPOLITAN SEWERAGE DISTRICT

Water Quality Trading Plan

Prepared by:



In partnership with:



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ATTACHMENTS

- 1) Notice of Intent to Conduct Water Quality Trading Submitted by Heart of the Valley (HOV) Metropolitan Sewerage District to WDNR 8/10/16
- 2) HOV's Technology and Historical Discharge
- 3) HOV owned parcels
- 4) NR 151 Agricultural Performance Standards Compliance Letter
- 5) NRCS Technical Standard 350 (Sediment Basin)
- 6) Sediment Basin enhanced with Wetland Vegetation Design, Construction Plan and Justifications
- 7) Sediment Basin Operation and Maintenance Plan
- 8) NRCS Technical Standard 327 (Conservation Cover)
- 9) Conservation Cover Establishment and Operation and Maintenance Plan
- 10) SnapPlus report that shows TSS loss from fields for years 2014-2021 assuming current cropping rotation continues and justifications including crop verification map
- 11) SnapPlus report that shows TSS loss from fields for years 2022-2029 assuming current cropping rotation continues
- 12) SNAP Map showing fields that drain into Sediment Basin enhanced with Wetland Vegetation
- 13) Contour map
- 14) Agreement with upstream landowners
- 15) SnapPlus report that show soil loss with established Conservation Cover
- 16) Credit Generation Calculation Spreadsheet based on SnapPlus model
- 17) WDNR issued permit for Sediment Basin

1. Executive Summary

This Water Quality Trading Plan summarizes Heart of the Valley Metropolitan Sewerage District's ("HOV") plan to use water quality trading to comply with its total suspended solids water quality-based effluent limits in its Wisconsin Discharge Elimination System ("WPDES") permit. To assist in complying with HOV's total suspended solids limits, HOV will install and will maintain Conservation Cover on a 3.6 acre field as well as a Sediment Basin enhanced with Wetland Vegetation that is capture sediment from an additional 12.8 acre field within the Plum Creek Sub-watershed. The Plum Creek Sub watershed falls within the same Point of Standard for the Lower Fox River Total Maximum Daily Load as HOV's outfall. To determine the number of credits generated by establishing conservation cover, HOV has used SnapPlus modeling to quantify the amount of TSS loss that would have occurred from the field that will have permanent cover installed assuming current farming practices continued and the amount after establishment of the permanent cover. HOV then applied a ten percent loading factor as directed by WDNR. Using a trade ratio of 1.2:1, HOV calculated the Total Suspended Solids credits available per year based on the change in management practice from farming to permanent vegetative cover on 3.6 acres. To determine the number of credits generated by the Sediment Basin enhanced with Wetland Vegetation, HOV used SnapPlus to determine the TSS loss from the fields that drain to the Sediment Basin, applied a ten percent loading factor to the SnapPlus report and then applied an eighty percent capture rate based on the design of the Sediment Basin. Using a trade ratio of 2:1, HOV calculated the total suspended solids credits available per year based on the addition of the Sediment Basin enhanced with Wetland Vegetation. HOV will use these credits to demonstrate compliance with its total suspended solids limit in its WPDES permit.

2. General Information

2.1. APPLICANT INFORMATION

Heart of the Valley Metropolitan Sewerage District (HOV)
801 Thilmany Road
Kaukauna, WI 54130

Contact: Brian Helminger, District Director
801 Thilmany Road
Kaukauna, WI 54140
(920)766-5731
brian.helminger@hvmsd.org

2.2. DISCHARGE INFORMATION

WPDES Permit: WI-0031232-09-0

HOV discharges directly to the main stem of the Lower Fox River in the Garner's Creek subwatershed (HUC 12: 040302040205) at approximately: latitude 44°17' 12.8" N, longitude 88° 14' 45.4" W. Located within US Canal Parcel A, Private Claim 33, Kaukauna, Outagamie, Wisconsin (HOVMSD) or, south shore of a side channel of the Fox River, downstream from the

Kaukauna Lock # 5. SE ¼ of the SW ¼ of Sec. 18, T21N – R19E, in the City of Kaukauna, Outagamie County (WDNR).

2.3. CREDIT GENERATOR GENERAL INFORMATION

HOV owns the land on which the credit generating practice will be built and therefore is also the credit generator. The Parcel ID on which the practices will be located is #030014300, which is located in the NW ¼ of the NE ¼ of Section 28, in Outagamie County.

2.4. CREDIT FACILITATOR INFORMATION

HOV has contacted the Fox-Wolf Watershed Alliance to aide in Water Quality Trading facilitation.

Fox-Wolf Watershed Alliance
1000 N. Ballard Road
P.O. Box 1861
Appleton, WI 54911

Contact: Jessica Schultz, Executive Director
(920)858-4246
jessica@fwwa.org

2.5. PARAMETER BEING TRADED

This water quality trading plan has been developed to trade for Total Suspended Solids (TSS) credits. HOV may submit a water quality trading plan in the future for P credits from these practices. The sediment basin with enhanced with wetland vegetation will be monitored for Phosphorus (P) reduction effectiveness.

3. Water Quality Trade Background

3.1. PURPOSE OF WATER QUALITY TRADE

The purpose of this Water Quality Trading Plan (“Plan”) is to describe HOV’s use of water quality trading to comply with the total suspended solids limits of WPDES permit WI-0031232-09-0. HOV will install a Sediment Basin enhanced with Wetland Vegetation to capture sediment from a field upstream as well as establish Conservation Cover on a field owned by the District within the Plum Creek Sub watershed, a watershed which lies within the same Point of Standards Application as HOV’s discharge for the Lower Fox River Total Maximum Daily Load in order to generate TSS credits. HOV will use the TSS credits generated from these management practices to comply with its total suspended solids limits in WPDES permit WI-0031232-09-0. Because HOV is both the credit generator and credit user, HOV is entering into a trade agreement with the Wisconsin Department of Natural Resources (“WDNR”) for this trade. This Water Quality Trading Plan was developed following the Notice of Intent to Conduct Water Quality Trade¹ which was originally dated August 10, 2016.

The Heart of the Valley Metropolitan Sewerage District Wastewater Treatment Facility serves the domestic, commercial and industrial wastewater needs of customers from the communities

¹ The Notice of Intent is attached.

of; Kaukauna, Kimberly, Little Chute, Combined Locks, and Darboy. Treatment² consists of raw wastewater screening and grit removal, Actiflo ballasted sedimentation utilizing chemicals and ballast sand to settle out solids and remove phosphorus, Biostyr up-flow biological aerated filter for BOD removal and nitrification, and chlorine disinfection. Solids are processed in aerobic digesters which produce class “A” bio-solids which are stored on site until being injected in farm land as fertilizer and soil conditioner.

HOV is located in the City of Kaukauna, Outagamie County, Wisconsin. HOV discharges to the main stem of the Lower Fox River in the Garners Creek Sub watershed. The impact of the Lower Fox River Total Maximum Daily Load³ on HOV’s permit was more stringent TSS and P limits. Given the new stringent permit requirements, HOV cannot consistently and reliably achieve compliance with the water quality based effluent limits (WQBELs) proposed in the new permit when there are wet weather events, or when the WPS/Fox Energy peaking plant is not drawing water from the HOV effluent.⁴ The permit compliance timelines are different for TSS and P. At this time, HOV is pursuing water quality trading to comply with TSS requirements.

To determine credit need HOV District Director analyzed flow and loading data from 2008 through 2016. HOV currently sends a portion of their effluent every month to Fox Energy, because the agreement between HOV and Fox Energy is a monthly agreement, weekly and monthly effluent numbers calculated with and without Fox-Energy Withdrawal were examined against new TMDL goals.

HOV estimates its monthly discharge will be between 102 lbs/tss/day and 1198 lbs/tss/day (based on 2013-2015 discharge numbers shown in attachment 2). The discrepancy is due to wet weather events and the amount of effluent that is directed to Fox Energy.

Based on new monthly average limits of 801 lbs/day, HOV determined they would like to acquire a minimum of 800 water quality trading credits to serve as insurance in the event that Fox Energy discontinues taking effluent. The credit generating practice this water quality trading plan is based upon generates between 1,517 credits/year and 3,157 credits/year over the 5 year permit cycle.

HOV reserves the right to sell excess TSS credits to another point source.

² A detailed explanation of HOV’s technology can be found in attachment 2

³ A TMDL is the amount of a pollutant a waterbody can receive and still meet water quality goals. The Lower Fox River TMDL can be found online:

<http://dnr.wi.gov/topic/TMDLs/documents/lowerfox/LowerFoxRiverTMDLReport2012.pdf>

⁴ Tables showing historical discharges can be found in attachment 2

4. Description and Location of Sites where Credits will be Generated

4.1. LOCATION WHERE CREDITS WILL BE GENERATED

HOV discharges directly to the main stem of the Lower Fox River in Kaukauna, between the mid-Appleton Dam and the DePere Dam.

HOV will implement the conservation management practice to generate total suspended solid credits on a field it owns in the Plum Creek Sub-watershed. The field is parcel number 030014300 located in the Town of Buchanan in Outagamie County. The field that will have the Sediment Basin enhanced with Wetland Vegetation installed to generate credits acres and is 39.32 GIS acres and is labeled number 14 in Attachment 3. The location of the credit generating practice and the credit user can be seen in figure 1 below.

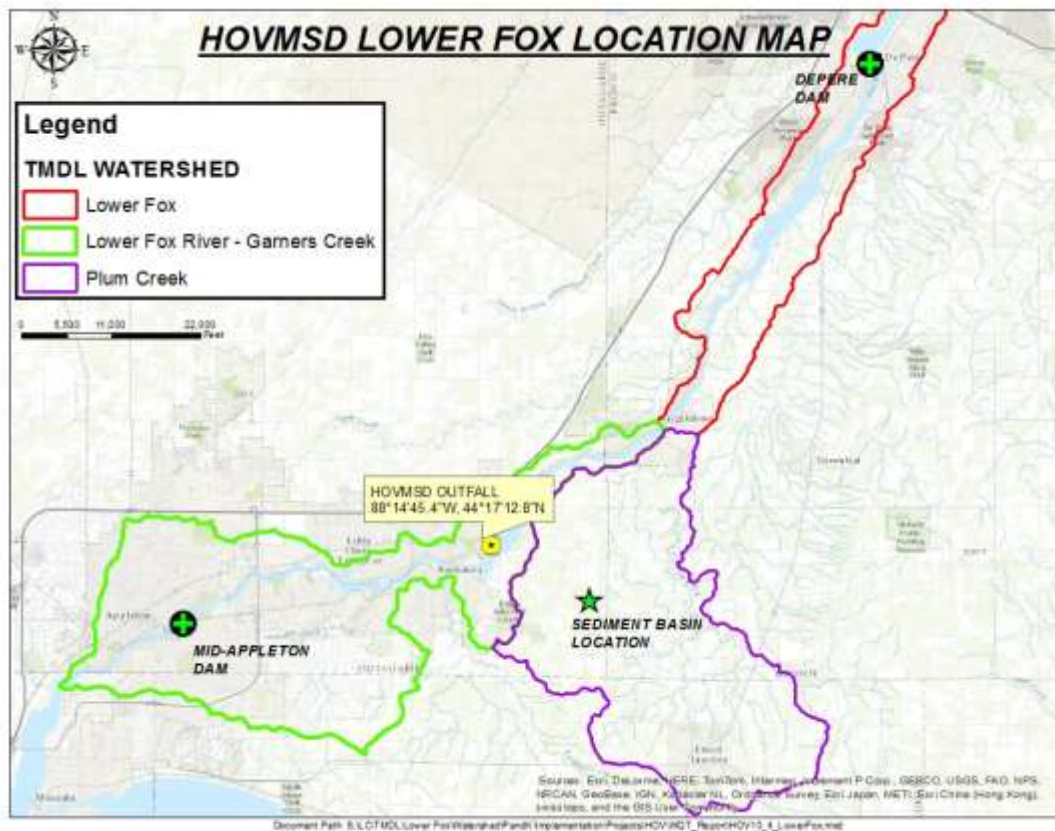


Figure 1:
Location of
Credit
Generating
Practice
compared to
Credit
User and
the
relevant
Lower Fox
River
TMDL
Reach.

The Plum Creek sub-watershed, where the credit generating practice is located is in the Lower Fox River Watershed. It empties into the main stem of the Lower Fox River between the mid-Appleton dam and the DePere dam.

HOV and the sub-watershed of the credit generating practice both discharge to the main stem of the Lower Fox River between the mid-Appleton dam and the DePere dam. Because the Lower Fox River is a Total Maximum Daily Load watershed, HOV has the flexibility to trade within this TMDL reach. See figure 2 for further explanation.

Flexibility in TMDL Watersheds

A “TMDL reach” is a waterbody segment used to calculate pollutant allocations for point and nonpoint sources in a TMDL. Typically, TMDL reaches are either impaired themselves or located upstream of an impaired water. Because of how TMDL reaches are delineated TMDL reaches may overlap with HUC 12 watershed boundaries allowing TMDL reaches to be used in lieu of or in addition to the HUC 12 boundary. When trading to meet allocations from a TMDL the trade locations must be hydraulically connected and located upstream of the impaired segment.

Figure 2: Explanation of TMDL reach from WDNR, A Water Quality Trading How to Manual 09/09/13

5. Methods for Reducing Nonpoint Source Loading

5.1. METHODS USED TO GENERATE LOAD REDUCTIONS

HOV will install and maintain a Sediment Basin consistent with the requirements of NRCS Technical Standard 350 (attachment 5). In particular, HOV will install and maintain the Sediment Basin enhanced with Wetland Vegetation in accordance with the Design Plan included in Attachment 6 and the Operation and Maintenance Plan in Attachment 7. HOV contracted with Jeremy Freund, PE, Project Coordinator for Outagamie County Land Conservation Department⁵ to design the Basin and prepare these plans.

As stated in the NRCS technical standard “the Sediment Basin will capture and detain sediment, manure-laden runoff, or other debris for a sufficient length of time to allow it to settle in the basin.”

The Sediment Basin enhanced with Wetland Vegetation is designed to capture 80%. The Design Plan in Attachment 6 shows/describes in detail how the Sediment Basin enhanced with Wetland Vegetation will be built on the Field consistent with NRCS Technical Standard 350.

HOV will also install and maintain Permanent Vegetative Cover on a 3.6 acre field consistent with the requirements of the NRCS Technical Standard 327 (attachment 8). In particular, HOV will install and maintain permanent vegetative cover on the field in accordance with the establishment plan included in Attachment 9 and the Operation and Maintenance Plan in Attachment 9.

⁵ Jeremy Freund, PE Project Coordinator, Outagamie County Land Conservation Department (920)832-5076, jeremy.freund@outagamie.org

5.2. HISTORY OF PROJECT SITE

The Sediment Basin site as well as the fields draining into the site, which include the field that will have conservation cover established have been in agricultural production. The past three years (2015-2017) of agricultural activity have been modeled in SnapPlus to determine historical soil loss and are available in Attachment 10.

HOV owns approximately 250 acres of agricultural land in the Town of Buchanan within the Plum Creek Watershed. All of the 250 acres including the acres generating credits for this trade are in compliance with NR 151 agricultural performance standards and applicable regulations. A letter of compliance issued by Outagamie County Land Conservation Department can be found is presented as Attachment 4. The upstream field that is not owned by HOV but drains to the sediment basin is also in compliance with NR151 agricultural performance standards.

5.3. MODEL USED TO DERIVE LOAD REDUCTIONS

SnapPlus was used to determine soil loss from the agricultural fields that the conservation cover is being established and the field that drains to the proposed sediment basin enhanced with wetland vegetation. SnapPlus runs for years 2014-2022 can be found in Attachment 10. SnapPlus runs for years 2023-2029 can be found in Attachment 11.

There are two fields that drain into the proposed Sediment Basin enhanced with Wetland Vegetation. The 3.6 acre field that will be generating credits from going from conventional farming to Permanent Vegetative Cover consistent with NRCS Standard 327 is owned by HOV. The second 12.8 acre field is owned by an independent producer. HOV has an agreement (attachment 15) with the landowner upstream of the sediment basin to ensure the land is managed according to the SnapPlus model. Field verification of crops and conservation practices installed will occur annually in May each year, and if there are changes from the SNAP Plus and/or WQT Plan. If there are changes to the Plan, HOV will revise the SNAP Plus calculations and number of credits and submit to WDNR in June of each year.

Not all soil loss from the field is delivered to the stream. WDNR has determined that for this plan we shall assume that 10% of the soil loss is delivered and can be counted as potentially tradable TSS.

The design of the Sediment Basin enhanced with Wetland Vegetation (attachment 6) meets NRCS's technical standard (attachment 5), and is anticipated to capture 80% of the potentially tradable TSS. Because the NRCS technical standard no longer indicates percent removal, justification for the 80% reduction is based upon the settling equation for the soil texture which was in a previous version of the 350 standard (also included as attachment 5) as well as in standard 1001 for wet detention ponds. The settling is based on micron size and the smallest diameter is 3 micron which is a silty clay. The settling equation indicates we would need a 7,330 square feet open water area for treating our drainage area size. The design of the credit generating sediment basin provides 11,670 square feet, not including the additional area for wetland vegetation. Additional justification for the 80% reduction can be found with the design plan in attachment 6.

A second SnapPlus run was done on the field that will be established with conservation cover. The difference between the first and second run was used to determine load reduction for that

practice. The second SnapPlus run showing the impact of the conservation cover is provided as Attachment 15.

5.4. CREDIT THRESHOLD AND METHOD FOR DERIVATION

The WDNR developed a TMDL Baseline for TSS and a TMDL Threshold for TSS in Plum Creek sub-basin 2 based upon the Lower Fox River TMDL. The TMDL Baseline Sediment loss is 0.94788 T/ac/yr or 1,895.76 lbs/ac/yr and the TMDL TSS Threshold with a 10% delivery factor is 0.0245 T/ac/yr or 48.15 lbs/ac/yr.

HOV will claim interim⁶ credits for all credits generated that reduce the load from the field to the TMDL TSS threshold and beyond for the duration of this plan (5 years). HOV reserves the right to utilize long term⁷ credits generated for those bring the TSS reduction beyond the credit generating threshold in future plans.

5.5. OPERATION AND MAINTENANCE

The Operation and Maintenance Plans in Attachment 7 and Attachment 9 describe in detail how the Sediment Basin and Conservation Cover will be inspected and maintained in accordance with NRCS Technical Standards 350 and 327, respectively, particularly to meet the needs of this water quality trading plan.

The Operation and Maintenance Plan for the Sediment Basin recommends monthly inspections for removal of litter and debris from the Basin, embankments and outlet structure as well as inspection and maintenance to address weed and invasive vegetation growth.

The Sediment Basin Operation and Maintenance Plan specifically identifies the need for an annual inspection of the permanent pool depth. This inspection shall be certified by a licensed Professional Engineer to ensure that the Basin is functioning as intended in order to meet the requirements of this WQT Plan.

The Operation and Maintenance Plan for the Conservation Cover requires inspections one time each during the spring, summer and fall of the first and second growing seasons to ensure compliance with seed establishment standards and identify any erosion issues. Inspections at least once per year between mid-August to mid-September will be required thereafter to observe the permanent vegetative cover, confirm seed establishment standards are met and identify an erosion concerns. The annual inspections shall be complete by an independent agronomist familiar with NRCS technical standard 327.

The operation and maintenance plans also address how HOV shall respond In the event of a disastrous weather event, including tornadoes or flooding, as well as vandalism.

⁶ WDNR: Guidance for Implementing Water Quality Trading in WPDES Permits (8/21/2013) Section 2.8 “Interim credits are generated by load reductions that achieve the credit threshold and, therefore, can be generated only when the current pollutant load exceeds the applicable LA.”

⁷ WDNR: Guidance for Implementing Water Quality Trading in WPDES Permits (8/21/2013) Section 2.8 “Long-term credits are generated by load reductions obtained below the LA credit threshold.”

6. Derivation of Water Quality Trading Credits

6.1. INDIVIDUAL TRADE RATIO FACTORS

In order to determine the Total Suspended Solids that would have been delivered to the water from the Soil Loss determined by the SnapPlus model a 10% factor is applied (this factor was provided by WDNR for this trade). The resulting number is the Potential Tradable TSS.

For the Sediment Basin, 80% of the potentially tradable TSS will be captured in the Credit Generating Practice. The applicable trade ratio is then applied to this number to determine the number of credits the credit user can receive for the management practice.

For the Conservation Cover, a second SnapPlus model was run and the 10% delivery factor is applied, the applicable trade ratio is then applied to the difference in Potential Tradable TSS from the first run and the second run to determine the number of credits the credit user can receive for the management practice.

The WDNR “Guidance for Implementing Water Quality Trading in WPDES Permits” which became effective August 21, 2013 identifies individual components of the trade ratio as seen in figure 3.

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

Figure 3: Trade Ratio WDNR “Guidance for Implementing Water Quality Trading in WPDES Permits”

Delivery Factor

According to the WDNR Water Quality Trading Guidance “2.11.1 Delivery Factor – When TMDLs do not include fate and transport, pollutant loads are assumed to move through the system in a conservative fashion with no losses due to settling of other processes. This results in downstream allocations being lower with an implicit margin of safety because there are no pollutant losses assumed to have occurred in the system.” The Lower Fox River/ Lower Green Bay TMDL does not have fate and transport factors. Therefore, there is no delivery factor that needs to be accounted for in the trade ratio calculation.

Downstream Factor

The Fields where the credits are being generated are located in the Plum Creek Sub-Watershed. The Plum Creek Sub Watershed discharges to the main stem of the Lower Fox River above the Point of Water Quality Standard below the HOV discharge which is the DePere Dam, eliminating the Delivery Factor.

Equivalency Factor

WDNR Water Quality Trading Guidance states “An equivalency factor is not necessary for trading TSS credits at this time.” See WQT Guidance 2.11.3.

Uncertainty Factor

The practice generating the Water Quality Trading Total Suspended Solids Credits is a Sediment Basin enhanced with Wetland Vegetation, NRCS Technical Standard 350. According to Table 4 of the Water Quality Trading Guidance, utilizing the Sediment Basin enhanced with Wetland Vegetation as a conservation practice results in an uncertainty factor of 2.

Habitat Adjustment Factor

HOV is not claiming any beneficial habitat, resulting in an adjustment factor of 0.

TRADE RATIO CALCULATION

Based on the above factors, the trade ratio for the HOV TSS trade utilizing a Sediment Basin is a trade ratio of 2:1.

Sediment Basin

Trade Ratio = Delivery + Downstream + Equivalency + Uncertainty – Habitat Adjustment

$$2:1 = 0 + 0 + 0 + 2 - 0$$

Applying the same logic as above, the trade ratio for the HOV TSS trade utilizing Conservation Cover would be 1:1. The WQT guidance, Section 2.11.6 states there is a minimum trade ratio of 1.2:1. Therefore, trade ratio for the conservation cover will be 1.2:1.

Conservation Cover

Trade Ratio = Delivery + Downstream + Equivalency + Uncertainty – Habitat Adjustment

$$1.2:1 = 0 + 0 + 0 + 1 - 0$$

6.2. INTERIM AND LONG TERM CREDIT

According to WDNR WQT guidance Section 2.8 “NPS (nonpoint source) credit generators... that are located in a watershed with an approved TMDL may generate two types of credits; interim credits and long-term credits. Interim credits are generated by load reduction that achieve the credit threshold and therefore, can be generated only when the current pollutant load excess the applicable LA (load allocation). Long-term credits are generated by load reductions obtained below the LA credit threshold.

The durations of interim credits equals the lifespan of the management practice employed to reduce pollutant loads, or 5 year, whichever is shorter.”

HOV is trading within a TMDL watershed and qualifies to utilize interim credits. The tables below show how interim credits were calculated for this plan.

Heart of the Valley Metropolitan Sewerage District
Water Quality Trading Plan – August 25, 2017

Year 2018

Field 1 (W hoelzel)		
12.8 Acre Field		
Credits being generated from Conventional Farming with drainage entering a Sediment Basin enhanced with Wetland Vegetation		
Trade Ratio:	2:1	Sediment Control Basin (further justification in plan)
Annual Soil Loss		
Conventional Farming	0.581 tns/ac/yr	1162 lbs/ac/yr
10% Delivery Factor	0.0581 tns/ac/yr	116.2 lbs/ac/yr
80% Reduction		
(captured in Sediment Basin)	0.04648 tns/ac/yr	92.96 lbs/ac/yr
Sediment loss after practice	0.01162 tns/ac/yr	23.24 lbs/ac/yr
Plum Creek TMDL Threshold	0.024 tns/ac/yr	48 lbs/ac/yr
Does loss after practice meet TMDL Threshold		
Yes		
Total sediment delivery reduced from practice = (annual soil loss conventional farming with 10% delivery factor - Sediment loss after practice)		
	0.04648 tns/ac/yr	92.96 lbs/ac/yr
Total Reductions (*12.8 acres)	0.594944 tns/yr	1189.888 lbs/yr
All reductions qualify as interim credits.		
Trade Ratio 2:1 594.944 credits		
HOV can utilize interim credits for five years (from 2018 - 2022)		
Field 1 - 2018 TSS Credits 594.9 credits		

Field 2 (W HOV - 7 oaks)		
3.6 Acre Field		
Credits generated from going from Conventional Farming to Permanent Vegetative Cover consistent with NRCS Standard 327		
Trade Ratio:	1.2:1	Minimum Nonpoint Trade Ratio (further justification in plan)
Annual Soil Loss		
Conventional Farming	1.541 tns/ac/yr	3082 lbs/ac/yr
10% Delivery Factor	0.1541 tns/ac/yr	308.2 lbs/ac/yr
Annual Soil Loss grasslands	0.004 tns/ac/yr	8 lbs/ac/yr
10% Delivery Factor	0.0004 tns/ac/yr	0.8 lbs/ac/yr
Plum Creek TMDL Threshold	0.024 tns/ac/yr	48 lbs/ac/yr
Does loss after practice meet TMDL Threshold	Yes	
Sediment delivery reduced from practice = (annual soil loss conventional farming with 10% delivery factor - annual soil loss grasslands with 10% delivery factor)		
	0.1537 tns/ac/yr	307.4 lbs/ac/yr
Total Reductions (*3.6 acres)	0.55332 tns/yr	1106.64 lbs/yr
All reductions qualify as interim credits.		
Trade Ratio 1.2:1		922.2 credits
HOV can utilize interim credits for five years (from 2018 - 2022)		
Field 2 - 2018 TSS Credits		922.2 credits

Total 2018 TSS Credits available: 1517

Year 2019

Field 1 (W hoelzel)		
12.8 Acre Field		
Credits being generated from Conventional Farming with drainage entering a Sediment Basin enhanced with Wetland Vegetation		
Trade Ratio:	2:1	Sediment Control Basin (further justification in plan)
Annual Soil Loss		
Conventional Farming	0.327 tns/ac/yr	654 lbs/ac/yr
10% Delivery Factor	0.0327 tns/ac/yr	65.4 lbs/ac/yr
80% Reduction (captured in Sediment Basin)	0.02616 tns/ac/yr	52.32 lbs/ac/yr
Sediment loss after practice	0.00654 tns/ac/yr	13.08 lbs/ac/yr
Plum Creek TMDL Threshold	0.024 tns/ac/yr	48 lbs/ac/yr
Does loss after practice meet TMDL Threshold	Yes	
All reductions qualify as interim credits.		
Total sediment delivery reduced from practice = (annual soil loss conventional farming with 10% delivery factor - Sediment loss after practice)		
	0.02616 tns/ac/yr	52.32 lbs/ac/yr
Total Reductions (*12.8 acres)	0.334848 tns/yr	669.696 lbs/yr
Trade Ratio 2:1		334.848 credits
HOV can utilize interim credits for five years (from 2018 - 2022)		
Field 1 - 2019 TSS Credits		334.8 credits

Field 2 (W HOV - 7 oaks)		
3.6 Acre Field		
Credits generated from going from Conventional Farming to Permanent Vegetative Cover consistent with NRCS Standard 327		
Trade Ratio:	1.2:1	Minimum Point to Nonpoint Trade Ratio (further justification in plan)
Annual Soil Loss		
Conventional Farming	4.708 tns/ac/yr	9416 lbs/ac/yr
10% Delivery Factor	0.4708 tns/ac/yr	941.6 lbs/ac/yr
Annual Soil Loss grasslands	0.004 tns/ac/yr	8 lbs/ac/yr
10% Delivery Factor	0.0004 tns/ac/yr	0.8 lbs/ac/yr
Plum Creek TMDL Threshold	0.024 tns/ac/yr	48 lbs/ac/yr
Does loss after practice meet TMDL Threshold	Yes	
All reductions qualify as interim credits.		
Sediment delivery reduced from practice = (annual soil loss conventional farming with 10% delivery factor - annual soil loss grasslands with 10% delivery factor)		
	0.4704 tns/ac/yr	940.8 lbs/ac/yr
Total Reductions (*3.6 acres)	1.69344 tns/yr	3386.88 lbs/yr
Trade Ratio 1.2:1		2822.4 credits
HOV can utilize interim credits for five years (from 2018 - 2022)		
Field 2 - 2019 TSS Credits		2822.4 credits

Total 2019 TSS Credits available: 3157

Heart of the Valley Metropolitan Sewerage District
Water Quality Trading Plan – August 25, 2017

Year 2020

Field 1 (W hoelzel)			
12.8 Acre Field			
Credits being generated from Conventional Farming with drainage entering a Sediment Basin enhanced with Wetland Vegetation			
	Trade Ratio:	2:1	Sediment Control Basin (further justification in plan)
Annual Soil Loss			
Conventional Farming	0.239 tns/ac/yr		478 lbs/ac/yr
10% Delivery Factor	0.0239 tns/ac/yr		47.8 lbs/ac/yr
80% Reduction			
(captured in Sediment Basin)	0.01912 tns/ac/yr		38.24 lbs/ac/yr
Sediment loss after practice	0.00478 tns/ac/yr		9.56 lbs/ac/yr
Plum Creek TMDL Threshold	0.024 tns/ac/yr		48 lbs/ac/yr
Does loss after practice meet TMDL Threshold	Yes		
All reductions qualify as interim credits.			
Total sediment delivery reduced from practice =			
(annual soil loss conventional farming with 10% delivery factor			
- Sediment loss after practice)			
	0.01912 tns/ac/yr		38.24 lbs/ac/yr
Total Reductions (*12.8 acres)	0.244736 tns/yr		489.472 lbs/yr
Trade Ratio 2:1		244.736 credits	
HOV can utilize interim credits for five years (from 2018 - 2022)			
Field 1 - 2020 TSS Credits 244.736 credits			

Field 2 (W HOV - 7 oaks)			
3.6 Acre Field			
Credits generated from going from Conventional Farming to Permanent Vegetative Cover consistent with NRCS Standard 327			
	Trade Ratio:	1.2:1	Minimum Point to Nonpoint Trade Ratio (further justification in plan)
Annual Soil Loss			
Conventional Farming	4.19 tns/ac/yr		8380 lbs/ac/yr
10% Delivery Factor	0.419 tns/ac/yr		838 lbs/ac/yr
Annual Soil Loss grasslands	0.004 tns/ac/yr		8 lbs/ac/yr
10% Delivery Factor	0.0004 tns/ac/yr		0.8 lbs/ac/yr
Plum Creek TMDL Threshold	0.024 tns/ac/yr		48 lbs/ac/yr
Does loss after practice meet TMDL Threshold	Yes		
All reductions qualify as interim credits.			
Sediment delivery reduced from practice = (annual soil loss conventional farming with 10% delivery factor - annual soil loss grasslands with 10% delivery factor)			
	0.4186 tns/ac/yr		837.2 lbs/ac/yr
Total Reductions (*3.6 acres)	1.50696 tns/yr		3013.92 lbs/yr
		Trade Ratio 1.2:1	2511.6 credits
HOV can utilize interim credits for five years (from 2018 - 2022)			
Field 2 - 2020 TSS Credits		2511.6 credits	

Total 2020 TSS Credits available: 2756

Year 2021

Field 1 (W hoelzel)		
12.8 Acre Field		
Credits being generated from Conventional Farming with drainage entering a Sediment Basin enhanced with Wetland Vegetation		
	Trade Ratio:	2:1 Sediment Control Basin (further justification in plan)
Annual Soil Loss		
Conventional Farming	4.86 tns/ac/yr	9720 lbs/ac/yr
10% Delivery Factor	0.486 tns/ac/yr	972 lbs/ac/yr
80% Reduction		
(captured in Sediment Basin)	0.3888 tns/ac/yr	777.6 lbs/ac/yr
Sediment loss after practice	0.0972 tns/ac/yr	194.4 lbs/ac/yr
Plum Creek TMDL Threshold	0.024 tns/ac/yr	48 lbs/ac/yr
Does loss after practice meet TMDL Threshold		
No		
Reductions do not qualify to generate credits because TMDL threshold is not met (per guidance		
Total sediment delivery reduced from practice = (annual soil loss conventional farming with 10% delivery factor - Sediment loss after practice)		
	0.3888 tns/ac/yr	777.6 lbs/ac/yr
Total Reductions (*12.8 acres)	4.97664 tns/yr	9953.28 lbs/yr
Trade Ratio 2:1		0 credits
HOV can utilize interim credits for five years (from 2018 - 2022)		
Field 1 - 2021 TSS Credits		0 credits

Field 2 (W HOV - 7 oaks)		
3.6 Acre Field		
Credits generated from going from Conventional Farming to Permanent Vegetative Cover consistent with NRCS Standard 327		
	Trade Ratio:	1.2:1
	Minimum Point to Nonpoint Trade Ratio (further justification in plan)	
Annual Soil Loss		
Conventional Farming	4.128 tns/ac/yr	8256 lbs/ac/yr
10% Delivery Factor	0.4128 tns/ac/yr	825.6 lbs/ac/yr
Annual Soil Loss grasslands	0.004 tns/ac/yr	8 lbs/ac/yr
10% Delivery Factor	0.0004 tns/ac/yr	0.8 lbs/ac/yr
Plum Creek TMDL Threshold	0.024 tns/ac/yr	48 lbs/ac/yr
Does loss after practice meet TMDL Threshold	Yes	
All reductions qualify as interim credits.		
Sediment delivery reduced from practice = (annual soil loss conventional farming with 10% delivery factor - annual soil loss grasslands with 10% delivery factor)		
	0.4124 tns/ac/yr	824.8 lbs/ac/yr
Total Reductions (*3.6 acres)	1.48464 tns/yr	2969.28 lbs/yr
	Trade Ratio 1.2:1	2474.4 credits
HOV can utilize interim credits for five years (from 2018 - 2022)		
Field 2 - 2021 TSS Credits 2474.4 credits		

Total 2021 TSS Credits available: 2474

Heart of the Valley Metropolitan Sewerage District
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Year 2022

Field 1 (W hoelzel)		
12.8 Acre Field		
Credits being generated from Conventional Farming with drainage entering a Sediment Basin enhanced with Wetland Vegetation		
Trade Ratio:	2:1	Sediment Control Basin (further justification in plan)
Annual Soil Loss		
Conventional Farming	7.048 tns/ac/yr	14096 lbs/ac/yr
10% Delivery Factor	0.7048 tns/ac/yr	1409.6 lbs/ac/yr
80% Reduction (captured in Sediment Basin)	0.56384 tns/ac/yr	1127.68 lbs/ac/yr
Sediment loss after practice	0.14096 tns/ac/yr	281.92 lbs/ac/yr
Plum Creek TMDL Threshold	0.024 tns/ac/yr	48 lbs/ac/yr
Does loss after practice meet TMDL Threshold	No	
Reductions do not qualify to generate credits because TMDL threshold is not met (per guidance)		
Total sediment delivery reduced from practice = (annual soil loss conventional farming with 10% delivery factor - Sediment loss after practice)		
	0.56384 tns/ac/yr	1127.68 lbs/ac/yr
Total Reductions (*12.8 acres)	7.217152 tns/yr	14434.3 lbs/yr
Trade Ratio 2:1		0 credits
HOV can utilize interim credits for five years (from 2018 - 2022)		
Field 1 - 2022 TSS Credits		0 credits

Field 2 (W HOV - 7 oaks)		
3.6 Acre Field		
Credits generated from going from Conventional Farming to Permanent Vegetative Cover consistent with NRCS Standard 327		
Trade Ratio:	1.2:1	Minimum Point to Nonpoint Trade Ratio (further justification in plan)
Annual Soil Loss		
Conventional Farming	3.834 tns/ac/yr	7668 lbs/ac/yr
10% Delivery Factor	0.3834 tns/ac/yr	766.8 lbs/ac/yr
Annual Soil Loss grasslands	0.004 tns/ac/yr	8 lbs/ac/yr
10% Delivery Factor	0.0004 tns/ac/yr	0.8 lbs/ac/yr
Plum Creek TMDL Threshold	0.024 tns/ac/yr	48 lbs/ac/yr
Does loss after practice meet TMDL Threshold	Yes	
All reductions qualify as interim credits.		
Sediment delivery reduced from practice = (annual soil loss conventional farming with 10% delivery factor - annual soil loss grasslands with 10% delivery factor)		
	0.383 tns/ac/yr	766 lbs/ac/yr
Total Reductions (*3.6 acres)	1.3788 tns/yr	2757.6 lbs/yr
Trade Ratio 1.2:1		2298 credits
HOV can utilize interim credits for five years (from 2018 - 2022)		
Field 2 - 2022 TSS Credits		2298 credits

Total 2022 TSS Credits available: 2298

These practices generate long term credits that extend beyond the timeframe covered by this plan. Attachment 16 contains tables summarizing the credit generated for each year through 2029. Long term credits may be generated beyond 2029 and will be included in future trading plans.

HOV may utilize the credits generated each year as shown in the tables above to comply with the total suspended solids water quality based effluent limits in its WPDES Permit WI 0031232-09-0.

HOV also reserves the right to sell credits generated in excess of their anticipated demand.

7. Trade Timeline

7.1. TIMING OF TRADE AGREEMENT, MANAGEMENT PRACTICE INSTALLATION AND CREDIT GENERATION

Schedule for Installation of Sediment Basin enhanced with Wetland Vegetation for Total Suspended Solids Credit Generation for TSS compliance can be seen in figure 4 below.

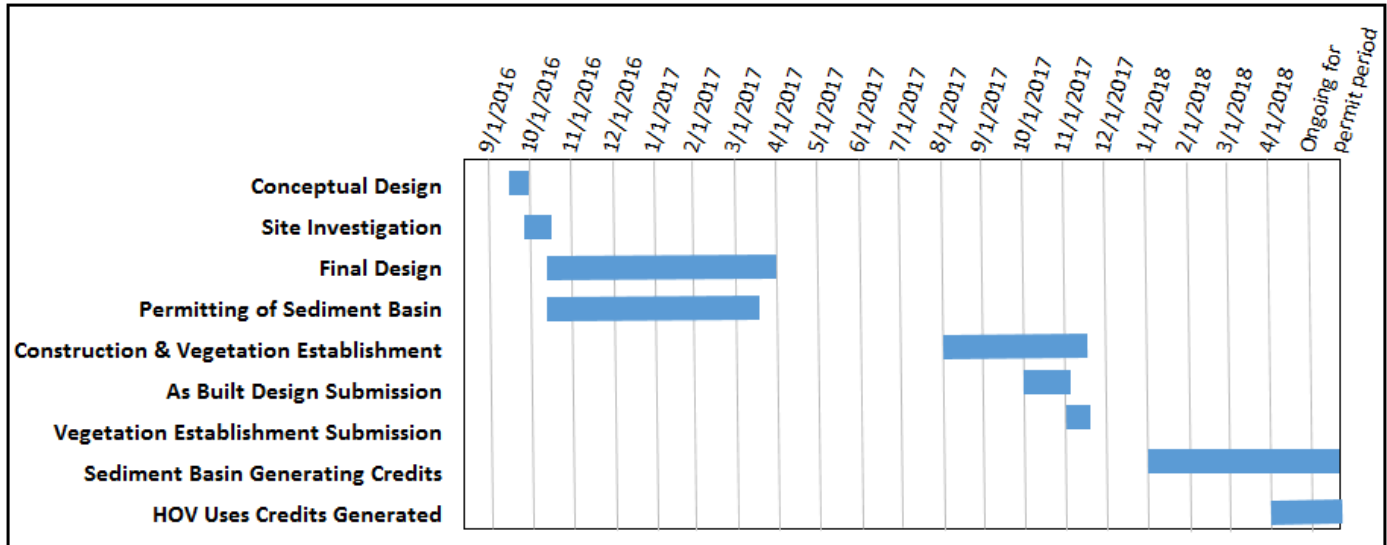


Figure 4: Schedule for Installation of Sediment Basin enhanced with Wetland Vegetation

Credits will be used by HOV beginning 4/1/2018. Interim credits will expire 3/28/2022. Long term credits continue pending operation and maintenance of practice is followed as outlined in this WQT Plan and practices is still generating credits based on upland land use.

8. Inspections and Reporting

8.1. TRACKING PROCEDURES

HOV will track credits used monthly on a spreadsheet. HOV will report to WDNR credit usage on a monthly basis in the Discharge Monitoring Reports (DMR - see section 8.4). The annual report will summarize the 12 months of credit usage and credit generation. HOV will report to DNR any concern that they have that may result in a need to modify the trade agreement and/or this trade plan. For example, a need to purchase additional credits based on discharge.

8.2. INSPECTION

Inspections of the established conservation cover and of the sediment basin enhanced with wetland vegetation shall occur to ensure HOV remains in compliance.

Inspections of the Basin shall occur (1) routinely, (2) after a large precipitation event and (3) an annual certification by a licensed professional engineer.

The Sediment Basin Operation and Maintenance Plan (attachment 7) recommends routine monthly inspections and inspections after a rain event of 2" or more to identify issues as they begin to occur and for the removal of litter and debris from the Basin, embankments and outlet structure as well as inspection and maintenance to address weed and invasive vegetation growth.

The inspector will inspect the Sediment Basin generating the water quality trading credits to ensure it is performing as intended.

The inspection reports will include:

- Name and contact information of the inspector
- Inspection Date
- Relevant standards set forth in the Design Plan or Operation and Maintenance Plan
- Issues identified
- When and how any issues identified were addressed
- When and how any issues identified will be addressed in the future

Inspection reports generated during each routine or after rain event inspection will be included with the Annual Water Quality Trading Report submitted by HOV to WDNR.

The Sediment Basin Operation and Maintenance Plan specifically identifies the need for an annual inspection of the permanent pool depth. Annual inspections are used to assess structural integrity of the Basin, inspect sediment depths, assess the overall performance of the Basin and certify that it meets the intent of the original construction plan. This inspection shall be certified by a licensed Professional Engineer to ensure that the Basin is functioning as intended in order to meet the requirements of this WQT Plan. The licensed professional engineer shall be qualified and knowledgeable of sediment basins.

Annual inspections by a professional engineer will typically occur in mid- to late-May. This time of year is ideal so the effects of a Wisconsin winter can be evaluated and enough growing season exists to re-establish any vegetation prior to the following summer and fall when large rain events have a higher likelihood of occurring.

The Conservation Cover Operation and Maintenance Plan (Attachment 9) identifies the need for verification of establishment 6 weeks after planting and quarterly inspections for the first two years after establishment to ensure compliance with seed establishment standards and identify any erosion issues. Annual inspections will be required in May to observe the permanent vegetative cover, confirm continued compliance with seed establishment standards and identify erosion concerns. The Operation and Maintenance Plan describes how erosion control concerns, like bare spots or gullies shall be addressed if they are observed.

Annual photo verification of both crop and tillage practices of the cropland upstream of the sediment basin and the land in conservation cover shall be collected in May of each year. This verification documentation and any revisions to SNAP Plus calculations as a result of field verification will be submitted to WDNR by June of each year.

8.3. MANAGEMENT PRACTICE REGISTRATION FORM

HOV will file a completed registration form 3400-207 for Water Quality Trading Management Practice Registration separately from this Plan.

8.4. ANNUAL WATER QUALITY TRADING REPORT SUBMITTAL

The following shall be submitted to WDNR by January 31 of each year:

- The number of pollutant reduction credits (lbs/month) used each month of the previous year to demonstrate compliance;

- A summary of the annual inspection of the practice that generated any of the pollutant reduction credits used during the previous year, this inspection shall be completed by a licensed Professional Engineer;
- All monthly inspection reports;
- Identification of noncompliance or failure to implement any terms or conditions of this permit with respect to water quality trading that have not been reported in discharge monitoring reports;
- A list of all noncompliance and the correction measures and timing to address the issues throughout the year (all noncompliance or failure to implement any terms or conditions of this plan should have also followed procedures outlined in Section 8.6); and
- An updated WQT plan if management practices or fields have or will change.

8.5. MONTHLY CERTIFICATION OF MANAGEMENT PRACTICES

Each month, HOV will certify that the Sediment Basin enhanced with Wetland Vegetation is operated and maintained in a manner consistent with this Water Quality Trading Plan or provide a statement noting noncompliance with this Plan. The monthly Discharge Monitoring Report (DMR) will include the following statement as a certification of compliance when the Credit Generating Practice is operating in a manner consistent with the Plan:

I certify that to the best of my knowledge that the management practices identified in the approved water quality trading plan as the source of total suspended solids credits is installed, established and properly maintained.

8.6. NOTIFICATION OF FAILURE TO GENERATE CREDITS

HOV will notify WDNR by telephone call to WDNR's regional wastewater compliance engineer within 24 hours or next business day of becoming aware that total suspended solid credits used or intended for use by HOV are not being generated as outlined in this Water Quality Trading Plan.

HOV will submit a written notification within five days after HOV becomes aware that the total suspended solids credits are not being generated as outlined in the Trading Plan. WDNR may waive the requirement for submittal for a written notice within five days and instruct HOV to submit the written notice with the next regularly scheduled monitoring report required by HOV's WPDES Permit.

The written notice will contain a description of how and why the TSS credits are not being generated as outlined in the Water Quality Trading Plan, the steps taken or planned to prevent reoccurrence of the identified problems and the length of time anticipated it will take to address the issue.

HOV will work to rectify the problem as laid out in the Design and Operation and Maintenance Plans.

8.7. CONDITIONS UNDER WHICH MANAGEMENT PRACTICES MAY BE INSPECTED

Any WDNR authorized officer, employee, or representative has the right to access and inspect the credit generating practice so long as HOV's trade agreement with WDNR and this Water Quality Trading Plan remain in effect.

9. Certification

9.1. VERIFICATION OF TRADE AGREEMENT

The undersigned hereby certifies that this Water Quality Trading Plan is accurate and correct to the best of his knowledge.

Heart of the Valley Metropolitan Sewerage District

By: _____

Brian Helminger
District Director
Heart of the Valley Metropolitan Sewerage District
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Kaukauna, WI 54130
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