SENECA FOODS – MAYVILLE, WI

WATER QUALITY TRADING PLAN

TMDL Derived WQBELs for Total P &

TSS-North Drain Tile (Outfall 013)

WPDES Permit WI-0050822-08

January 2021

Prepared For:

Seneca Foods Corporation
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TMDL Derived WQBELs for Total P and TSS-North Drain Tile (Outfall 013)

Seneca Foods – Mayville, WI

1 BACKGROUND

The Seneca Foods Mayville (Figures 1 & 2) WPDES permit requires that measures be taken to satisfy TMDL derived solids discharge limits for total phosphorus (TP) and total suspended solids (TSS) at Outfall 013 (Figure 3). Discharge from Outfall 013 consists of subsurface tile drainage from Sprayfield G. Operational Evaluation Reports were previously prepared and submitted to the Department (April 2017). These evaluations concluded that source control measures were unlikely to influence amounts of TP and TSS discharged. However, further evaluations (particularly for TP) of the sprayfield/tile system for operational modifications/improvements and other options, such as P trading, were made that would allow Outfall 013 discharge limits to be met. As part of this evaluation, additional monitoring was performed during 2017 and 2018 in order to support an assessment of alternatives for meeting discharge limits. In particular, dissolved P was added to the laboratory analytical parameters from Outfall 013 discharges so that the impact of solids removal on TP content could be evaluated.

Due to the lack of source control measures and relatively low mass exceedance of TP and TSS limits, Seneca chose to pursue water quality trading to achieve compliance with permit limits as noted in the Final Compliance Alternatives Plan (April 2020). This plan describes trading planned to generated credits needed for permit compliance and described means of implementing and maintaining land use changes on the adjacent agricultural fields noted in Figure 3, that are the basis of credit generation.

2 TRADE CREDIT REQUIREMENTS

Based on monitoring results over a 5-year period, TP exceeded the monthly average mass limit by an annual average of 9.9 lb/year with annual exceedances ranging from 1.6 to 20.1 lb/year. Similarly, TSS exceeded the monthly average mass limit and daily maximum limit by an annual average of 90 lbs/year with annual exceedances ranging from 0 to 240 lb/year.

3 SOURCE OF TRADE CREDIT

Trade credit will be generated by improving cropping management of agricultural fields (Figure 3) resulting in reduced nonpoint source loadings of TP and TSS.

3.1 TRADE CREDIT SITE LOCATION

Agricultural fields utilized for credit generation are located in NE¼NE¼ Section 34, NW¼NW¼ Section 35 and SW¼SW¼ Section 26, T12N R16E, Town of Williamstown, Dodge County, Wisconsin. Fields utilized are immediately north of Sprayfield G and shown on Figure 3 along with the location of Outfall 013.

3.2 SITE HISTORY

The trading site is owned by Veolia ES Glacier Ridge Landfill LLC (Veolia). The land was previously considered for use as expanded sprayfield treatment system and is currently part of a multi-year lease by Seneca from Veolia. As part of the intended sprayfield development, cropping was converted from row cropping (i.e. field corn and soybeans) to permanent grass cover. The site has remained as permanent grass cover since this conversion. Both the area generating credit and the sprayfield containing Outfall 013 are included in the same lease. While the current lease (Appendix D) does not cover the entire upcoming permit period, both the outfall and need for trading credit would be eliminated should the lease not be renewed.

4 CREDIT GENERATION

Trade credit will be generated by a change in cropping, resulting in reduced nonpoint source loadings to surface water that offset TP and TSS discharged from Outfall 013.

4.1 MANAGEMENT PRACTICES USED TO GENERATE CREDIT

Cropping during 2009 and 2010 was a corn/soybean rotation which, based on site observations, utilized reduced tillage methods. During 2011, while the site was being investigated for potential for use as sprayfield, the site was uncropped (fallow) during much of the growing season. During summer, the site was seeded to a mixture of grasses in anticipation of use as sprayfield. Since the 2011 seeding, site cropping has been managed similar to that for the adjacent spray irrigation fields including regular harvest of forage produced. Management practice registration is included as Appendix B.

4.2 QUANTIFICATION OF CREDITS

Trading credits were quantified using SnapPlusV2 (build 19.3). Baseline conditions were determined by carrying the corn/soybean rotation staring in 2009 forward through the end of the renewed permit period (2025). Recommended fertilizer addition rates were used for crops grown, which included a starter fertilizer phosphorus addition for corn cropping. Reductions associated with cropping changes were calculated by revising the baseline cropping over the same period to include fallow during 2011 followed by perennial grass cover thereafter. No fertilizer was applied during the period fields were cropped to mixed grasses. For baseline and reduction scenarios, P Trade and Sediment Trade reports were generated for use in calculating trade credits.

4.3 TRADE RATIO

Trade ratio has been set at 2:1 by the Department.

4.4 AMOUNT OF CREDIT GENERATED

Detailed calculation of trade credits for each field for the permit renewal period are provided in Table 1 for TP, and Table 2 for TSS. Both long term and interim calculations of credit are presented and averaged to provide a rotation average value. A summary of rotation average credits for combined fields is provided below.

	Interim Credit[1]	Long Term Credit[2]	Years 1-10 Total Credit[1]
TP (lbs/yr)	33.1	53.2	86.3
TSS (lb/yr)	8,800	17,000	25,800

[1] Only available years 1-10.

[2] Long term credit is the total annual credit year 11 and after.

5 TIMELINE FOR CREDITS AND AGREEMENTS

Management changes generating credits were initiated during crop year 2012 and have produced reduced TP and TSS loadings to surface water compared to baseline cropping since that time. However, trade credits are only being requested for the upcoming permit renewal period (2021-2025) at this time. Seneca may choose to renew the trade agreement as part of subsequent permit renewals.

6 OPERATION AND MAINTENANCE

Operation and maintenance will be performed consistent with NRCS Wisconsin Agronomy Technical Note 6 (Appendix E) as it relates for forage and biomass production except as noted below.

6.1 INITIAL SEEDING

Fields were seeded in 2011 with a continuous grass cover and has remained since that time. The seed mix utilized includes Kentucky fescue, Switch grass, Orchard grass, Alsike clover and Annual Rye at a seeding rate of 20 lbs/acre. Subsequent seeding for maintenance purposes will be performed using the above seed mix in the following proportions: 35% Kentucky Fescue, 25% Switch Grass, 15% Orchard grass, 15% Alsike clover and 10% annual Rye

6.2 SOIL SAMPLING AND NUTRIENT/AMMENDMENT RECOMMENDATIONS

Soil sampling will be performed fall 2020 consistent with procedures described in UW Extension Publication A2809 (Nutrient application guidelines for field, vegetable, and fruit crops in

Wisconsin). Specifically, soils will be analyzed for pH, available phosphorus, available potassium and nitrate-N. Subsequent soil sampling will be performed at minimum 4-year intervals. Any fertilizer or lime additions made will be consistent with recommendations derived from soil test results. No surface application of phosphorus fertilizer will be made.

6.3 HARVESTING

Forage crops will be harvested at least twice annually. Crop yield will be estimated from number of bales generated during harvest (i.e., tons/acre).

6.4 RESEEDING

Reseeding will be performed consistent with procedures described in NRCS Technical Note 6 (Appendix E). The preferred method is no-till interseeding following a harvest event.

7 INSPECTION AND REPORTING

7.1 SITE INSPECTION

Site inspection will be performed by Seneca in the spring following snowmelt and after each harvest. Each of the fields will be evaluated to identify areas where erosion or other factors may have reduced stand. A site inspection checklist (Table 3) will be used to document inspection date, performing personnel, and observations made. At least one photograph of each of the four field areas (Figure 3) will be taken to document site conditions. Areas identified as having reduced stands will be reseeded. Notification of inspection and any response taken as a result will be documented in the comments section of the monthly DMR for Outfall 013. Should results of inspection indicate fields are not compliant with this plan, the Department will be notified within 1 week of the inspection and informed of corrective measures to be taken will be provided to the Department by letter or email. In the event of extreme rainfall/runoff events, inspection of fields will be performed and documented as described above.

7.2 ANNUAL WATER QUALITY TRADING REPORT

An annual report will be provided to the Department by January 31 of the year following the reporting year. The report will contain the number of pounds of TP and TSS discharged from Outfall 013 during the prior calendar year which will be compared with credits to demonstrate compliance. The report will also summarize results of site inspections previously reported on monthly DMRs.

7.3 SITE INSPECTION BY WDNR

The field may be inspected by WDNR after providing notice of intent to inspect to the Seneca Foods Mayville plant manager.

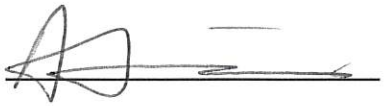
8 WATER QUALITY PLAN TRADING CHECKLIST

A water Quality Trading Plan Checklist is provided in Appendix C which includes plan locations of specific checklist plan requirements for point to nonpoint trades.

9 PLAN CERTIFICATION

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

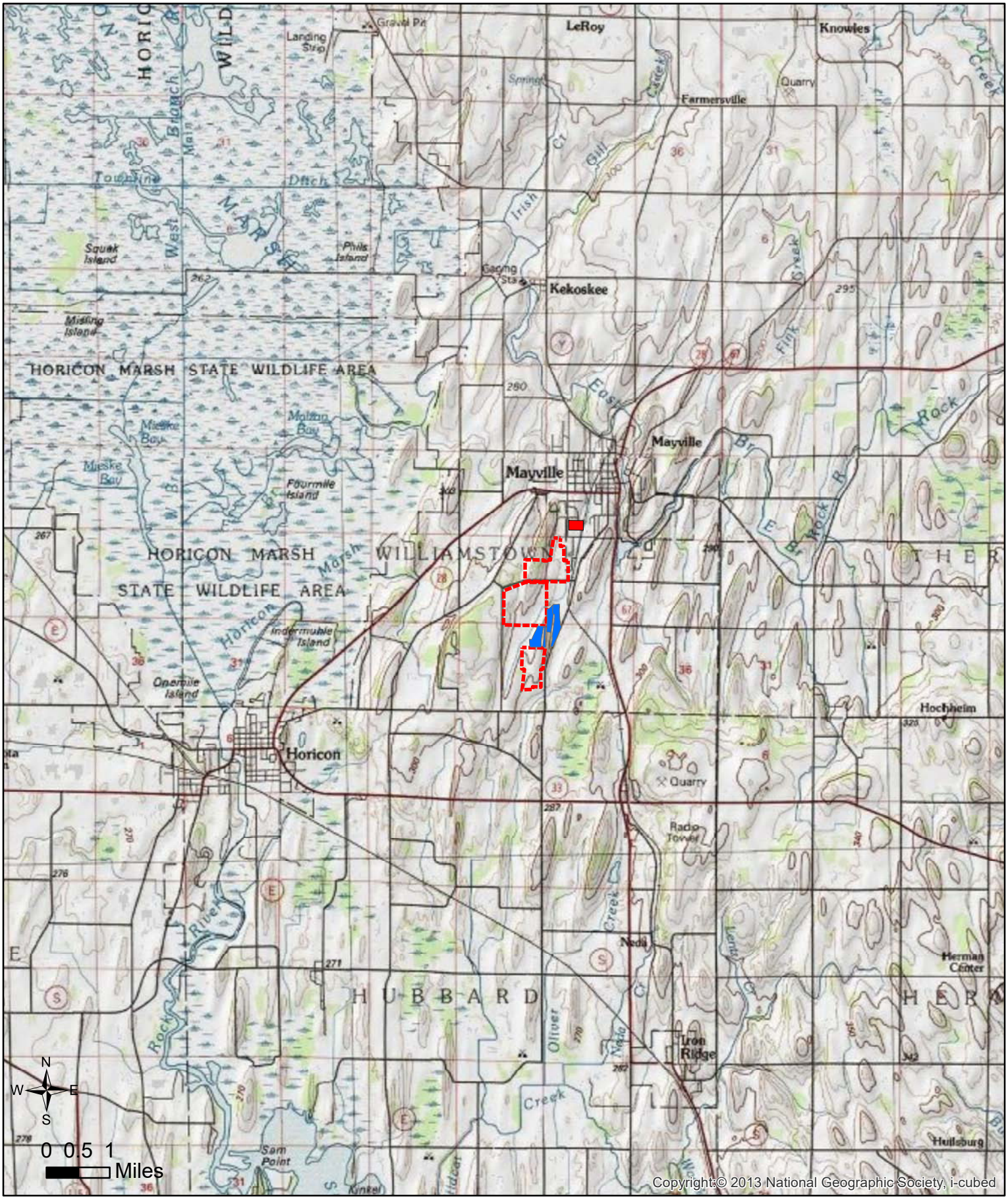
SENECA FOODS-MAYVILLE



Aaron Hendrickson, Plant Manger

Seneca Foods-Mayville
5000 S Clark St
Mayville, WI 53050

FIGURES



Fields Utilized for Trade Credit

Plant

Sprayfields

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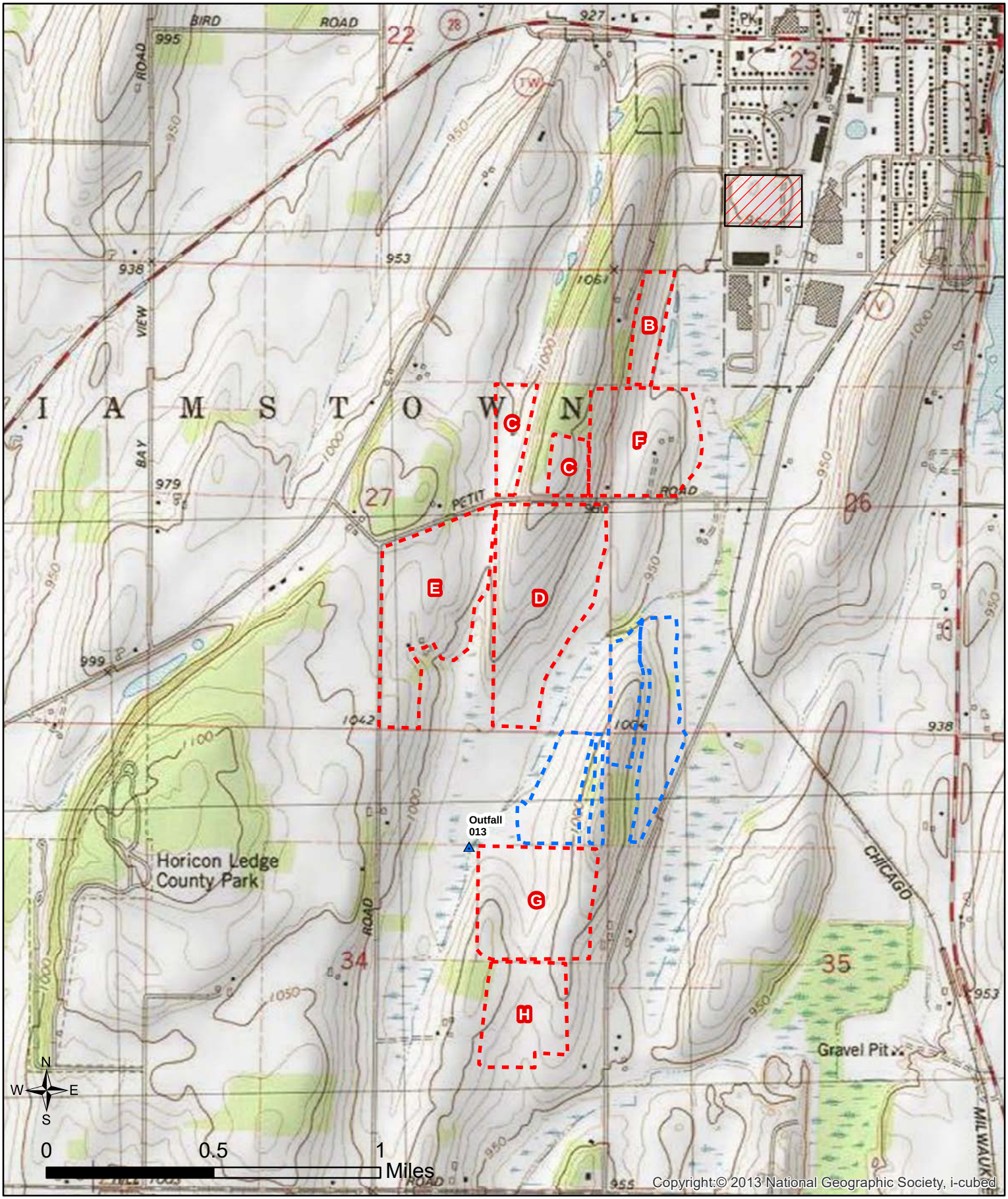
SITE LOCATION MAP

SENECA FOODS CORPORATION
MAYVILLE, WISCONSIN

FIGURE NO. 1

DRAWN	CHECKED	APPROVED	REVISED	PROJECT NO.	FILE
RCW	NPH	NPH	06/06/19	C12901	2020Fig1



Fields Used to Generate Credit
Sprayfields
Plant

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AREA LOCATION MAP

SENECA FOODS CORPORATION
MAYVILLE, WISCONSIN

FIGURE NO. 2

DRAWN	CHECKED	APPROVED	REVISED	PROJECT NO.	FILE
RCW	NPH	NPH	06/09/2020	C12901	2020Fig2

TileOutfall
Field Boundaries
Streams
Soil Type
HUC12

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DRAWN	CHECKED	APPROVED
RCW	NPH	RCW

Fields Generating Trade Credit

SENECA FOODS CORPORATION
MAYVILLE, WISCONSIN

REVISED	PROJECT NO.	FILE
9/16/2020	C12901	2020WQTRD

FIGURE NO.
3

TABLES

Table 1
WASTEWATER MANAGEMENT - SENECA MAYVILLE
Total P Trade Calculation

Farm	Field		Acres	PTP 2020	PTP 2021	PTP 2022	PTP 2023	PTP 2024	PTP 2025	Average lbs/yr
Seneca-Mayville	**Field 1**	Baseline (lbs)	16.2	22	69	22	68	21	66	
Seneca-Mayville	**Field 1**	Reduction (lbs)	16.2	0	1	1	1	0	0	
		Savings (lbs)		22	68	21	67	21	66	**44**
	TMDL Credit Threshold [1]	lb/acre		2.6	2.6	2.6	2.6	2.6	2.6	
	Baseline	lb/acre		1.3	4.3	1.3	4.2	1.3	4.1	
	Reduction	lb/acre		0.0	0.1	0.1	0.1	0.0	0.0	
Intermim Credits [3]	Difference	lb/acre		1.3	4.2	1.3	4.1	1.3	4.1	
	Difference * Acres	lbs		21.6	68.0	20.7	67.2	20.9	65.9	
	Trade Ratio [2]			2:1	2:1	2:1	2:1	2:1	2:1	
	Final Credit	lbs		10.8	34.0	10.3	33.6	10.5	33.0	**22.0**
Long Term Credit	Difference	lb/acre		1.3	2.5	1.3	2.5	1.3	2.6	
	Difference * Acres	lbs		21.6	41.1	20.7	41.1	20.9	42.0	
	Trade Ratio [2]			2:1	2:1	2:1	2:1	2:1	2:1	
	Final Credit	lbs		10.8	20.6	10.3	20.6	10.5	21.0	**15.6**
Seneca-Mayville	**Field 2**	Baseline (lbs)	3.2	10	34	10	33	10	33	
Seneca-Mayville	**Field 2**	Reduction (lbs)	3.2	0	0	0	0	0	0	
		Savings (lbs)		10	34	10	33	10	33	**22**
	TMDL Credit Threshold [1]	lb/acre		2.6	2.6	2.6	2.6	2.6	2.6	
	Baseline	lb/acre		3.1	10.6	3.1	10.3	3.1	10.3	
	Reduction	lb/acre		0	0	0	0	0	0	
Intermim Credits [3]	Difference	lb/acre		3.1	10.6	3.1	10.3	3.1	10.3	
	Difference * Acres	lbs		10.0	34.0	10.0	32.9	10.0	33.0	
	Trade Ratio [2]			2:1	2:1	2:1	2:1	2:1	2:1	
	Final Credit	lbs		5.0	17.0	5.0	16.5	5.0	16.5	**10.8**
Long Term Credit	Difference	lb/acre		2.6	2.6	2.6	2.6	2.6	2.6	
	Difference * Acres	lbs		8.3	8.3	8.3	8.3	8.3	8.3	
	Trade Ratio [2]			2:1	2:1	2:1	2:1	2:1	2:1	
	Final Credit	lbs		4.2	4.2	4.2	4.2	4.2	4.2	**4.2**

Table 1
WASTEWATER MANAGEMENT - SENECA MAYVILLE
Total P Trade Calculation

Farm	Field		Acres	PTP 2020	PTP 2021	PTP 2022	PTP 2023	PTP 2024	PTP 2025	Average lbs/yr
Seneca-Mayville	**Field 3**	Baseline (lbs)	11.1	20	62	21	61	21	60	
Seneca-Mayville	**Field 3**	Reduction (lbs)	11.1	0	1	1	1	1	1	
		Savings (lbs)		20	61	20	60	20	59	**40**
	TMDL Credit Threshold [1]	lb/acre		2.6	2.6	2.6	2.6	2.6	2.6	
	Baseline	lb/acre		1.8	5.6	1.9	5.5	1.9	5.4	
	Reduction	lb/acre		0	0	0	0	0	0	
Intermim Credits [3]	Difference	lb/acre		1.8	5.5	1.8	5.4	1.8	5.3	
	Difference * Acres	lbs		20.4	61.0	20.0	60.0	20.0	59.2	
	Trade Ratio [2]			2:1	2:1	2:1	2:1	2:1	2:1	
	Final Credit	lbs		10.2	30.5	10.0	30.0	10.0	29.6	**20.0**
Long Term Credit	Difference	lb/acre		1.8	2.6	1.8	2.6	1.8	2.6	
	Difference * Acres	lbs		20.4	28.9	20.0	28.9	20.0	28.9	
	Trade Ratio [2]			2:1	2:1	2:1	2:1	2:1	2:1	
	Final Credit	lbs		10.2	14.4	10.0	14.4	10.0	14.4	**12.2**
Seneca-Mayville	**Field 4**	Baseline (lbs)	20.4	34	106	34	104	33	102	
Seneca-Mayville	**Field 4**	Reduction (lbs)	20.4	2	2	2	2	2	2	
		Savings (lbs)		32	104	32	102	31	100	**67**
	TMDL Credit Threshold [1]	lb/acre		2.6	2.6	2.6	2.6	2.6	2.6	
	Baseline	lb/acre		1.7	5.2	1.7	5.1	1.6	5.0	
	Reduction	lb/acre		0.1	0.1	0.1	0.1	0.1	0.1	
Intermim Credits [3]	Difference	lb/acre		1.6	5.1	1.6	5.0	1.5	4.9	
	Difference * Acres	lbs		31.8	104.1	32.3	102.5	31.0	100.0	
	Trade Ratio [2]			2:1	2:1	2:1	2:1	2:1	2:1	
	Final Credit	lbs		15.9	52.1	16.2	51.2	15.5	50.0	**33.5**
Long Term Credit	Difference	lb/acre		1.6	2.6	1.6	2.6	1.5	2.6	
	Difference * Acres	lbs		31.8	53.0	32.3	53.0	31.0	53.0	
	Trade Ratio [2]			2:1	2:1	2:1	2:1	2:1	2:1	
	Final Credit	lbs		15.9	26.5	16.2	26.5	15.5	26.5	**21.2**

[1] Rock River TMDL Reach 14, 56% reduction from baseline load of 6 lb/acre

[2] Specified by the Department

[3] Available during the first 10 years

Table 2
WASTEWATER MANAGEMENT - SENECA MAYVILLE
TSS Trade Calculation

Farm	Field		Acres	2020	2021	2022	2023	2024	2025	Average (Ton/yr)
Seneca-Mayville	**Field 1**	Baseline (Tons)	16.2	2.85	8.97	2.85	8.97	2.85	8.97	**5.91**
Seneca-Mayville	**Field 1**	Reduction (Tons)	16.2	0.01	0.01	0.01	0.01	0.01	0.01	
		Savings (Tons)		2.84	8.96	2.84	8.96	2.84	8.96	
		TMDL Credit Threshold [1]		1.88	5.92	1.88	5.92	1.88	5.92	
Interim Credits [3]		Difference (Tons)		2.84	8.96	2.84	8.96	2.84	8.96	
		Trade Ratio [2]		2:1	2:1	2:1	2:1	2:1	2:1	
		Final Credit (Tons)		1.42	4.48	1.42	4.48	1.42	4.48	**2.95**
Long Term Credit		Difference (Tons)		1.87	5.91	1.87	5.91	1.87	5.91	
		Trade Ratio [2]		2:1	2:1	2:1	2:1	2:1	2:1	
		Final Credit (Tons)		0.93	2.95	0.93	2.95	0.93	2.95	**1.94**
Seneca-Mayville	**Field 2**	Baseline (Tons)	3.2	1.72	5.64	1.72	5.64	1.72	5.64	**3.68**
Seneca-Mayville	**Field 2**	Reduction (Tons)	3.2	0.01	0.01	0.01	0.01	0.01	0.01	
		Savings (Tons)		1.71	5.63	1.71	5.63	1.72	5.63	
		TMDL Credit Threshold [1]		1.14	3.72	1.14	3.72	1.14	3.72	
Interim Credits [3]		Difference (Tons)		1.71	5.63	1.71	5.63	1.72	5.63	
		Trade Ratio [2]		2:1	2:1	2:1	2:1	2:1	2:1	
		Final Credit (Tons)		0.86	2.81	0.86	2.82	0.86	2.82	**1.84**
Long Term Credit		Difference (Tons)		1.13	3.71	1.13	3.71	1.13	3.71	
		Trade Ratio [2]		2:1	2:1	2:1	2:1	2:1	2:1	
		Final Credit (Tons)		0.56	1.86	0.56	1.86	0.56	1.86	**1.21**

Table 2
WASTEWATER MANAGEMENT - SENECA MAYVILLE
TSS Trade Calculation

Farm	Field		Acres	2020	2021	2022	2023	2024	2025	Average (Ton/yr)
Seneca-Mayville	**Field 3**	Baseline (Tons)	11.1	2.30	6.76	2.30	6.76	2.30	6.76	**4.53**
Seneca-Mayville	**Field 3**	Reduction (Tons)	11.1	0.01	0.01	0.01	0.01	0.01	0.01	
		Savings (Tons)		2.29	6.75	2.29	6.75	2.29	6.75	
		TMDL Credit Threshold [1]		1.52	4.46	1.52	4.46	1.52	4.46	
Interim Credits [3]		Difference (Tons)		2.29	6.75	2.29	6.75	2.29	6.75	
		Trade Ratio [2]		2:1	2:1	2:1	2:1	2:1	2:1	
		Final Credit (Tons)		1.14	3.38	1.15	3.38	1.15	3.38	**2.26**
Long Term Credit		Difference (Tons)		1.51	4.45	1.51	4.45	1.51	4.45	
		Trade Ratio [2]		2:1	2:1	2:1	2:1	2:1	2:1	
		Final Credit (Tons)		0.75	2.23	0.75	2.23	0.75	2.23	**1.49**
Seneca-Mayville	**Field 4**	Baseline (Tons)	20.4	5.70	17.96	5.70	17.96	5.70	17.96	
Seneca-Mayville	**Field 4**	Reduction (Tons)	20.4	0.02	0.02	0.02	0.02	0.02	0.02	
		Savings (Tons)		5.68	17.94	5.68	17.94	5.69	17.94	**11.81**
		TMDL Credit Threshold [1]		3.76	11.85	3.76	11.85	3.76	11.85	
Interim Credits [3]		Difference (Tons)		5.68	17.94	5.68	17.94	5.69	17.94	
		Trade Ratio [2]		2:1	2:1	2:1	2:1	2:1	2:1	
		Final Credit (Tons)		2.84	8.97	2.84	8.97	2.84	8.97	**5.91**
Long Term Credit		Difference (Tons)		3.74	11.83	3.75	11.83	3.75	11.83	
		Trade Ratio [2]		2:1	2:1	2:1	2:1	2:1	2:1	
		Final Credit (Tons)		1.87	5.92	1.87	5.92	1.87	5.92	**3.89**

[1] Rock River TMDL Reach 14, 33% reduction from baseline load
[2] Specified by the Department
[3] Available during the first 10 years

APPENDIX A

Notice of Intent to Conduct Water Quality Trading

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

Notice of Intent to Conduct Water Quality Trading

Form 3400-206 (1/14)

Notice: Pursuant to s. 283.84, Wis. Stats., and ch. NR 217 Wis. Adm. Code, this form must be completed by any WPDES permittee that is using water quality trading as a method of complying with a permit limitation. Failure to complete this form would not result in penalties. Personal information collected will be used for administrative purposes and may be provided to requesters to the extent required by Wisconsin's Open Records Law (ss. 19.31 - 19.39, Wis. Stats.).

Applicant Information

Permittee Name	Permit Number	Facility Site Number
Seneca Foods Mayville	WI- 0050822-08	114007520

Facility Address	City	State	ZIP Code
500 S Clark St.	Mayville	WI	53050

Project Contact Name (if applicable)	Address	City	State	ZIP Code
Robert Wendt	2902 Perry St	Madison	WI	53713

Project Name: Seneca Foods Mayville TP/TSS

Receiving Water Name	Parameter(s) being traded	HUC 12(s)
East Branch of Rock River	Total P & TSS	070900010107

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

- ○ Point source dominated
- ◉ Nonpoint source dominated

Credit Generator Information

Credit generator type (select all that apply):

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

Are any of the credit generators in a different HUC 12 than the applicant?

- ○ Yes; HUC 12: _____
- ◉ No
- ○ Unsure

Are any of the credit generators downstream of the applicant?

- ◉ Yes
- ○ No
- ○ Unsure

Will a broker/exchange be used to facilitate trade?

- ○ Yes; Name: _____
- ◉ No
- ○ Unsure

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

Discharge Type	Permit Number	Name	Contact Address	Is the point source credit generator currently in compliance with their permit requirements?
○ Traditional ○ MS4 ○ CAFO				○ Yes ○ No ○ Unsure
○ Traditional ○ MS4 ○ CAFO				○ Yes ○ No ○ Unsure
○ Traditional ○ MS4 ○ CAFO				○ Yes ○ No ○ Unsure
○ Traditional ○ MS4 ○ CAFO				○ Yes ○ No ○ Unsure
○ Traditional ○ MS4 ○ CAFO				○ Yes ○ No ○ Unsure

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

List the practices that will be used to generate credits:

Credits will be generated by conversion of previously row cropped farm land to permanent grass cover. Reduced erosion associated with the management change will be used to offset total phosphorus and total suspended solids generated from tile line discharge.

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

Projected date credits will be available: 09/01/2020

The preparer certifies all of the following:

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

Signature of Preparer	Date Signed
Robert C. Wardt	10-20-2020

Authorized Representative Signature

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

Signature of Authorized Representative	Date Signed
Matt Rusch	10/22/20

APPENDIX B

Water Quality Trading Management Practice Registration

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

Water Quality Trading Management Practice Registration

Form 3400-207 (R 1/14)

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

Applicant Information

Permittee Name	Permit Number	Facility Site Number
Seneca Foods.Mayville	WI- 0050822-08	114007520

Facility Address	City	State	ZIP Code
500 S Clark St.	Mayville	WI	53050

Project Contact Name (if applicable)	Address	City	State	ZIP Code
Robert Wendt	2901 Perry St	Madison	WI	53713

Project Name
Seneca Foods Mayville TP/TSS

Broker/Exchange Information (if applicable)

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

Broker/Exchange Organization Name	Contact Name	
Address	Phone Number	Email

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

Type	Trade Agreement Number	Practices Used to Generate Credits	Anticipated Load Reduction	Trade Ratio	Method of Quantification
○ Urban NPS ◉ Agricultural NPS ○ Other					

County	Closest Receiving Water Name	Land Parcel ID(s)	Parameter(s) being traded
Dodge	East Branch of Rock River		TP & TSS

The preparer certifies all of the following:

- I have completed this document to the best of my knowledge and have not excluded pertinent information.
- I certify that the information in this document is true to the best of my knowledge.

Signature of Preparer	Date Signed
Robert C. Wendt	10-20-2020

Authorized Representative Signature

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

Signature of Authorized Representative	Date Signed
Mike Kendall	10/22/20

Leave Blank – For Department Use Only

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

APPENDIX C

Water Quality Trading Checklist

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

Water Quality Trading Checklist

Form 3400-208 (1/14)

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

Applicant Information

Permittee Name	Permit Number	Facility Site Number
Seneca Foods Mayville	WI- 0050822-08	114007520

Facility Address	City	State	ZIP Code
500S Clark St	Mayville	WI	53050

Project Contact Name (if applicable)	Address	City	State	ZIP Code
Robert Wendt	2902 Perry St	Madison	WI	53713

Project Name
Seneca Foods Mayville TP/TSS

Receiving Water Name	Parameter(s) being traded	HUC 12(s)
East Branch of Rock River	Total P & TSS	070900010107

Credit Generator Information

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

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

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

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

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

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

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

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

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

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

Discharge Type	Practices Used to Generate Credits	Method of Quantification	Trade Agreement Number	Have the practice(s) been formally registered?
○ Urban NPS ◉ Agricultural NPS ○ Other				○ Yes ○ No ○ Only in part
○ Urban NPS ○ Agricultural NPS ○ Other				○ Yes ○ No ○ Only in part
○ Urban NPS ○ Agricultural NPS ○ Other				○ Yes ○ No ○ Only in part
○ Urban NPS ○ Agricultural NPS ○ Other				○ Yes ○ No ○ Only in part
○ Urban NPS ○ Agricultural NPS ○ Other				○ Yes ○ No ○ Only in part
○ Urban NPS ○ Agricultural NPS ○ Other				○ Yes ○ No ○ Only in part
○ Urban NPS ○ Agricultural NPS ○ Other				○ Yes ○ No ○ Only in part
○ Urban NPS ○ Agricultural NPS ○ Other				○ Yes ○ No ○ Only in part

Does plan have a narrative that describes:			Plan Section
a. Description of existing land uses	◉ Yes	○ No	3.2
b. Management practices used to generate credits	◉ Yes	○ No	4.1
c. Amount of credit being generated	◉ Yes	○ No	4.2
d. Description of applicable trade ratio per agreement/management practice	◉ Yes	○ No	4.3
e. Location where credits will be generated	◉ Yes	○ No	3.1
f. Timeline for credits and agreements	◉ Yes	○ No	5
g. Method for quantifying credits	◉ Yes	○ No	4.2

Does plan have a narrative that describes:			Plan Section
h. Tracking procedures	◉ Yes	○ No	7.1/7.2
i. Conditions under which the management practices may be inspected	◉ Yes	○ No	7.3
j. Reporting requirements should the management practice fail	◉ Yes	○ No	7.1
k. Operation and maintenance plan for each management practice	◉ Yes	○ No	6
l. Location of credit generator in proximity to receiving water and credit user	○ Yes	○ No	3.1
m. Practice registration documents, if available	◉ Yes	○ No	Appendix B
n. History of project site(s)	◉ Yes	○ No	3.2
o. Other: _____	○ Yes	○ No	

The preparer certifies all of the following:

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

Signature of Preparer	Date Signed
Kyle L. Wyatt	10-20-2020

Authorized Representative Signature

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

Signature of Authorized Representative	Date Signed
Matt Lovell	10/22/20

APPENDIX D

Lease Agreement

LEASE AGREEMENT

THIS LEASE, effective as of the 27th day of September 2012, by and between Veolia ES Glacier Ridge Landfill, LLC (hereinafter called "LESSOR"), and Seneca Foods Corporation (hereinafter called "LESSEE"):

WITNESSETH:

In consideration of the respective covenants of the parties and other valuable consideration, the receipt and sufficiency of which are hereby acknowledged, the undersigned do hereby mutually agree as follows:

1. **Leased Premises.** That LESSOR, for and in consideration of the rents, covenants and agreements hereinafter set forth and hereby agreed to be paid, kept and performed by LESSEE and subject to the terms and conditions herein contained, does hereby lease to LESSEE, and LESSEE hereby leases from LESSOR, parts of the following parcels: Tax Parcel 048-1216-3414-000 totaling 39.03 acres; Tax Parcel 048-1216-3441-000 totaling *44.53* acres; Tax Parcel *048-1216-3523-001* totaling 6.1 acres; Tax Parcel 048-3411-000 totaling 40.00 acres; Tax Parcel 048-3522-000 totaling 36.37 acres. Property leased under this agreement totals 111 acres and is located in the Town of Williamstown, Section 34, Wisconsin, as more particularly denoted on Exhibit A and subject to the terms and conditions herein set out.

2. **Term.** The term of this Lease shall be for a period of ten (10) years commencing on the 1st day of July, 2013, and extending through the 30th day of June, 2023, unless terminated early as provided in this Lease. The Lease will automatically renew for two five (5) year renewal terms thereafter unless either party provides the other party with written notice of its intent to terminate the Lease at least one year prior to the next termination date.

3. **Rent.** LESSEE shall pay to LESSOR as rent on the Leased Premises for each year of the Lease the sum of One Hundred Seventy-Five Dollars ($175.00) per acre to be paid on the first day of July of each year. A 10% increase per acre shall be applied to the Rent on July 1, 2018 and on each five (5) year automatic renewal, which means that: (i) on July 1, 2018, and thereafter until the end of the initial term of this Lease, the per acre rent shall be One Hundred Ninety Two and 50/100's Dollars ($192.50), (ii) on July 1, 2023, and thereafter until the next renewal, the per acre rent would be Two Hundred Eleven and 75/100's Dollars ($211.75), and (ii) on July 1, 2028, and thereafter until the end of the second renewal term, the per acre rent would be Two Hundred Thirty Two and 92/100's Dollars ($232.92).

4. **Additional Payments.** LESSEE agrees to pay, in addition to the rent set forth above, all additional charges, including but not limited to the following charges:

   a. all utility charges, including water, electricity, gas, sewer, trash pick-up, and

other utilities furnished to the Leased Premises for the benefit of the LESSEE during the term of this Lease.

b. all costs, fees and charges related to or arising out of, LESSEE's operations;

c. all costs, fees and charges related to the upkeep and repair of the Leased Premises.

5. **Use of Premises.** LESSEE shall use the premises during the original term and any renewal term only for planting, growing and harvesting hay and spraying the hay with vegetable processing wastewater in strict compliance with its Permit to Discharge Under the Wisconsin Pollutant Discharge Elimination System (as set forth in Exhibit B, attached hereto and incorporated herein)(hereinafter "Permit") and activities directly incident thereto. LESSEE shall also be permitted to operate four-wheel vehicles on the Leased Premises and along the Easement (set forth in Section 17 below) solely of the purpose of maintaining and inspecting the Leased Premises and the force main. LESSEE may not at any time use the Leased Premises for any other purpose other than that defined without consent of LESSOR, and LESSEE shall not have the right to use the Leased Premises for any mining or hunting. Further, LESSEE will not occupy, or use, said premises or permit the same to be occupied or used for any purpose or business which is unlawful. LESSEE shall comply with all lawful and applicable requirements of all valid laws, ordinances, rules and regulations of all governmental authorities having jurisdiction over the premises, pertaining to the use and occupancy of the Leased Premises. LESSEE shall not operate on the Leased Premises in any manner that interferes with or potentially interferes with any of the business operations of LESSOR or that creates a public or private nuisance or that is a threat to the health, safety, or welfare of the LESSOR or any third party or their employees, invitees, agents, or otherwise. LESSEE shall no cause, allow or permit any interference with or damage or loss to any property or equipment of LESSOR.

6. **Possession.** LES SEE shall have the right to possession of the Leased Premises for the term of this Lease beginning on the commencement date of this Lease, and, on paying the rents and performing the covenants herein contained, LESSEE may peaceably hold said possession for the term of this Lease, except that LESSEE understands and agrees that LESSOR shall retain the right to allow hunting by its employees, guests, or invitees on the Leased Premises, and except as set forth in Section 16 of this Lease. Furthermore, the parties agree that LESSOR shall have the right to enter the Leased Premises at any time to conduct borings and/or small excavation pits on the Leased Premises to observe subsurface soils and groundwater. In the event that any plantings are disturbed by such work, LESSOR shall reimburse LESSEE for any damaged plantings at a mutually agreed upon rate, not to exceed $175 per acre damaged.

7. **Real Estate Taxes.** LESSOR shall pay all real estate taxes levied on or assessed against the Leased Premises during the term of this Lease, except that if LESSEE makes any improvements to the Leased Premises or real estate taxes are increased due to LESSEE's use of the Leased Premises, then LESSEE shall be responsible for the additional real estate taxes. In the event LESSOR fails to pay taxes when due, LESSEE may pay the taxes due and deduct such

amount from the rent due LESSOR under section 3 above.

8. **Insurance.** LESSEE hereby covenants and agrees at all times during the original term of this Lease and any renewal terms to maintain and keep in full force and effect the following insurance coverage at its own expense:

a. workers compensation insurance providing statutory benefits.
b. automobile insurance with policy limits of not less than $1,000,000 each person, $2,000,000 each occurrence for bodily injury and $2,000,000 each occurrence for property damage liability.
c. general liability insurance with policy limits of not less than $1 ,000.000 each person, $2,000,000 each occurrence for bodily injury and $2,000,000 each occurrence for property damage liability.
d. personal property insurance in amounts and types of coverage as is customarily maintained by LESSEE at facilities it leases.

The insurance shall be with a reputable insurance company qualified to do business in the State of Wisconsin, with LESSOR named as an additional insured.

LESSEE shall, on or before the commencement date of this Lease, furnish to LESSOR a certificate from the insurance company showing that said insurance coverage is in full force and effect. LESSEE shall at all times during the term of this Lease keep said policy in full force and effect, and LESSEE shall at all times keep LESSOR furnished with a current copy of said policy and a certificate from the insurance company certifying that the same are in full force and effect. Each certificate shall contain a statement of the insurer's obligation to endeavor to notify the LESSOR at least thirty (30) days prior to cancellation or any change of any policy covered thereunder. Upon the failure of LESSEE to obtain any insurance as set forth in this paragraph, LESSOR may, at its option, obtain the same and the premiums shall be immediately due and payable as additional rent.

9. **Indemnification.** Notwithstanding the fact that LESSEE is required to furnish and maintain liability insurance as provided herein, LESSEE expressly agrees to indemnify and hold LESSOR harmless from any loss or damage, including reasonable attorney fees, arising out of or resulting from any claim, demand, action or cause of action brought or instituted against LESSOR solely as a result of or to the extent arising out of any act or omission of LESSEE, its agents, servants, employees or invitees in regard to the Leased Premises or to the extent arising out of LESSEE'S use, occupancy and control of the Leased Premises during the term of the Lease, including but not limited to damages due to any personal injury or death, any damage to property, any environmental impairment, including but not limited to, contamination of or other adverse effect on land, water, or air, or human or animal life, (including federal and state superfund investigations and/or remedial actions), or any fines, penalties, fees or other monetary payments required to be paid to a governmental authority .LESSEE is not obligated to indemnify or hold harmless LESSOR for any of the foregoing damages, injuries or environmental impairment to the extent said damages, injuries or impairment are caused by LESSOR'S negligence or wrongful conduct or by any acts of LESSOR'S agents, employees, servants or invitees. The indemnification obligations of the LESSEE

shall survive the term of this lease and any renewals thereof for a period of six years after termination of this Lease.

10. **No Representations.** Excepting the clear and marketable title, LESSOR makes no representations with respect to the Leased Premises. LESSEE assumes the full and sole responsibility for the condition, safety, operation and management of the Leased Premises.

11. **Maintenance and Repairs.** LESSEE understands that it is leasing the Leased Premises "As Is." LESSEE agrees to maintain in good repair all of the Leased Premises, and all damage caused by fault of LESSEE or any of its employees, licensees, invitees or other representatives. LESSEE further acknowledges and agrees that LESSOR does not owe any person who enters the Leased Premises a duty to keep the Leased Premises safe, a duty to inspect the Leased Premises, or a duty to give warning of an unsafe condition, use or activity on the Leased Premises. LESSEE shall be responsible for any property damage, the death of, or any injury to, or any death or injury caused by, a person engaging in any activity on the Leased Premises during the term of this Lease and LESSEE further acknowledges and agrees that LESSOR shall not be liable for property damage, the death of, or any injury to, or any death or injury caused by, a person engaging in any activity on the Leased Premises during the term of this Lease. LESSEE shall not, however, be responsible for property damage caused by LESSOR' S employees, guests, or invitees hunting on the Leased Premises or for Section 16 Activities (as defined in Section 16), or for the death of, or any injury to LESSOR'S employees, guests, or invitees for hunting on the Leased Premises, except to the extent such damage, death or injury is caused by LESSEE' S gross negligence or willful misconduct.

12. **Alterations.** LESSEE will not make any structural alterations, additions or improvements to the Leased Premises without the prior written consent of LESSOR, except that LESSEE shall have the right to install, solely at its own expense, groundwater monitoring wells, and such other equipment as is required by the Permit. All such groundwater monitoring wells and other equipment shall be removed from the Leased Premises at the expiration of this Lease in accordance with all federal, state, and/or local laws and regulations. LESSEE shall restore the Leased Premises to its condition existing prior to the installation of said groundwater monitoring wells and other equipment.

13. Property **Care.** LESSEE agrees to fairly treat, preserve and care for the Leased Premises, at its sole expense, including but not limited to the following:

a. to keep in good repair, to refrain from committing or permitting to be committed waste on the Leased Premises;
b. to maintain a cover crop on the Leased Premises and manage same in a manner to insure against impoverishment;
c. to conform to Federal, State, County and Township Laws and regulations regarding noxious weeds on the Leased Premises;
d. to maintain the Leased Premises so as to prevent the development and/or expansion of brushy areas, wood lots, and wetlands;
e. to use due care and diligence in guarding the Leased Premises from fire; and

f. to monitor the groundwater in accordance with all Federal, State, County, and Township laws and regulations and also in accordance with any more stringent monitoring as mutually agreed upon between the parties and to take immediate action for any changes to the groundwater. LESSEE shall provide copies of all groundwater monitoring data and related reports to the LESSOR in the manner that it has previously provided to LESSOR.

14. **Assignment and Subletting.** LESSEE will not assign this Lease nor any interest herein other than to an affiliated entity, and LESSEE shall not sublet the Leased Premises or any party thereof nor shall LESSEE permit any person other than employees or agents of LESSEE or an affiliated entity to come in, with, through, or under it on the Leased Premises, without obtaining the prior written consent of LESSOR, which consent shall not be unreasonably withheld.

15. **Laws and Regulations.** LESSEE agrees that during the term of this Lease LESSEE will strictly comply with the Permit, will comply with all laws, regulations, rules and ordinances of the City, County, State and the United States of America pertaining to the Leased Premises, and comply with all rules and regulations of all public boards, commissions, authorities and officers relating to the Leased Premises and the use of the same and will not permit the Leased Premises to be used for any illegal purpose. LESSEE agrees to provide immediate written notice to LESSOR of any notices of non-compliance, violation or enforcement action relating to LESSEE's activities on the Leased Premises.

16. **Inspection.** LESSEE will permit LESSOR or their representatives to enter the Leased Premises at any reasonable time upon reasonable prior notice from LESSOR for the purpose of inspecting, for the purpose of repairing, for the purpose of showing for sale or rent or for the purpose of viewing the same for any reasonable purpose (collectively, "Section 16 Activities").

17. **Easement.** LESSOR shall grant LESSEE a 15 foot wide easement on LESSOR'S property located to the north of the Leased Premises, as set forth in Exhibit A (attached hereto and incorporated herein) to allow LESSEE, solely at its own expense, to run a force main on said property. At the termination of this Lease, LESSEE shall remove or disconnect and cap such force main and remove all associated hydrants and will return the property included in the Easement to the same condition it was in prior to the force main being run, and at the termination of this Lease the Easement shall expire.

18. **Environmental Matters.** LESSEE represents to LESSOR that during the term of the Lease and any renewals thereof, LESSEE will not store, deposit, treat, recycle or dispose of on, under, in or about the Leased Premises any Hazardous Materials as hereinafter defined. LESSEE agrees that it will at all times during the term of this Lease conduct its business on the Leased Premises in compliance with all Environmental Requirements (hereinafter defined) applicable to the Leased Premises including but not limited to said laws, rules and regulations applicable to Hazardous Materials (hereinafter defined) located on the Leased Premises. LESSEE agrees that it shall not allow any Hazardous Materials onto the Leased Premises. LESSEE hereby agrees to indemnify and

forever hold LESSOR harmless from any loss or damage, including attorney fees, arising out of or resulting from any act or omission of LESSEE on the Leased Premises during the term of this Lease which is in violation of any applicable Environmental Requirements.

LESSOR hereby agrees to indemnify and forever hold LESSEE harmless from any loss or damage, including attorney fees, arising out of or resulting from any act or omission of LESSOR on the Leased Premises prior to the term of this Lease which is in violation of any applicable Environmental Requirements or during the term for anything present on the Leased Premises and not placed on Leased Premises by LESSEE.

For the Purpose of this numbered paragraph, the following terms shall have the meanings set forth below:

a) "Hazardous Materials" shall mean any substance which is or contains (1) any "hazardous substance" as defined in Section 101(14) of the Comprehensive Environmental Response, Compensation and Liability Act of 1980, as amended (42 U.S.C. Section 9601 et seq.) ("CERCLA") or any regulations promulgated under CERCLA, (2) any "hazardous waste" as defined in the Resource Conservation and Recovery Act (42 U.S.C. Section 6901, et. seq.) ("RCRA") or regulations promulgated under RCRA, (3) any substance regulated under the Toxic Substances Control Act *(15* U.S.C. Section 2601, et seq.), (4) gasoline, diesel fuel or other petroleum hydrocarbons, *(5)* asbestos and asbestos containing materials, in any form, whether friable or non-friable, (6) polychiorinated byphenyls, (7) radon gas and (8) any additional substances or materials that are classified or considered to be hazardous or toxic under Environmental Requirements (hereinafter defined) or the common law, or any other applicable law, statute, ordinance, rule or regulation.

b) "Environmental Requirements" shall mean all laws, statutes, ordinances, rules, regulations, agreements, judgments, orders and decrees now or hereafter enacted, promulgated or amended, of the United States, the states, the counties, the cities or any other political subdivisions in which the Leased Premises is located and any other political subdivision, agency or instrumentality exercising jurisdiction over the Leased Premises or the use of the Leased Premises relating to pollution, the protection from pollution, or regulation of human health, natural resources or the environment, or the emission, discharge, release or threatened release of pollutants, contaminants, chemicals or industrial, toxic or hazardous substances or waste or Hazardous Materials into the environment, including, without limitation, ambient air, surface water, ground water or land or soil.

19. **Condition at End.** LES SEE will surrender possession of the Leased Premises at the expiration or termination of this Lease without further notice to quit in as good a condition as received, except for normal wear.

20. **Lessee's Property. LESSOR** shall not be responsible or liable at any time for any loss or damage to LESSEE'S equipment, trade fixtures or other personal property on the Leased Premises except to the extent caused by LESSOR's negligence or wrongful conduct.

21. **Default.** The following events shall be deemed to be events of default by LESSEE under this Lease:

a) Should LESSEE fail to comply with any term, provision or covenant of this Lease, including the payment of rent;

b) Should LESSEE make a transfer in fraud of creditors, or should LESSEE make an assignment for the benefit of creditors.

c) Should LESSEE file a petition under any section or chapter of the Federal Bankruptcy Act, as amended, or under any similar law or statute of the United States or any state thereof; or should LESSEE be adjudicated a bankrupt or insolvent in proceedings filed against LESSEE thereunder.

d) Should a receiver or trustee be appointed for all or substantially all of the assets of LES SEE;

e) Should LESSEE receive any notice of non-compliance, violation or enforcement action relating to LESSEE'S activities on the Leased Premises, unless LESSEE is diligently opposing such notice or action in good faith and on the grounds that it is erroneous or not in compliance with applicable law;

Should LESSEE bring any lawsuits or actions against LESSOR or is a named party in, or provide funding for support of, any lawsuits or actions against LESSOR except that, as used herein, "lawsuits and actions" shall exclude lawsuits and actions to enforce the terms of this Lease.

Upon the occurrence of any such events of default and unless LESSEE shall cure the event of default within 30 days after the notice described in this sentence, LESSOR shall have the option to pursue any one or more of the following remedies upon thirty (30) days notice after an event of default (as defined in this paragraph) has occurred without any notice or demand:

(i) To terminate this Lease and all provisions herein, in which event LESSEE shall immediately surrender the Leased Premises to LESSOR. If LESSEE fails so to do, LESSOR may, without prejudice to any other remedy which they may have for possession or arrearages in rent, enter upon and take possession of the Leased Premises and expel or remove LESSEE and any other person who may be occupying said Leased Premises or any party thereof without being liable for prosecution or any claim of damage therefor.

(ii) LESSOR may relet the Leased Premises and receive the rent therefor. LESSEE agrees to pay to LESSOR on demand any deficiency in rentals that may arise by reason of such reletting.

(iii) To enter upon the Leased Premises without being liable for prosecution of any claim for damages therefor and do whatever LESSEE is obligated to do under the terms of this Lease. LESSEE agrees to reimburse LESSOR on demand for any reasonable expenses which LESSOR may incur in thus effecting compliance with LESSEE'S obligations under this Lease. LESSEE further agrees that LESSOR shall not be liable for any damages resulting to the LESSEE for any such action unless caused by the negligence or willful misconduct of LESSOR.

(iv) To recover all amounts due from LESSEE under the terms of this Lease.

Pursuit of any of the foregoing remedies shall not preclude pursuit of any of the other remedies herein provided or any other remedies provided by law, nor shall pursuit of any remedy herein provided constitute a forfeiture or waiver of any rent due to LESSOR hereunder or of any damages occurring to LESSOR by reason of the violation of any of the terms, provisions and covenants herein contained. Failure by either party to enforce one or more of the remedies herein provided upon any event of default shall not be deemed or construed to constitute a waiver of such default, or of any other violation or breach of any of the terms, provisions and covenants contained herein. If LESSOR shall incur any expenses, including court costs and attorney fees, as the result of a default by LESSEE under the terms of this Lease, then LESSOR shall have the right to recover from LESSEE all of said expenses incurred by LESSOR as a result of the default by LESSEE which shall be considered as additional rent hereunder, incurred by LESSOR as a result of the default by LESSEE.

22. **Termination.** LESSOR shall have the right to terminate this Lease upon thirty (30) days written notice in the event of a default to the extent set forth in Section 21 above. If, during the initial ten year term of this Lease, LESSOR sells the Leased Premises to another party besides LESSEE, the terms and conditions of this Lease shall remain in place and binding on any subsequent owners of the Leased Premises. If, during any 5 year renewal term, LESSOR sells the Leased Premises to another party besides LESSEE, LESSOR shall provide LESSEE with written notice one year prior to terminating the Lease.

23. **Eminent Domain.** In the event a part of the Leased Premises is taken by eminent domain and the part remaining is still suitable for the use contemplated by LESSEE herein, this Lease as to the part taken shall terminate as of the date title shall be taken by the condemnor and all monies paid or to be paid by the condemnor shall be paid to LESSOR, and LESSEE shall have no right to participate in said condemnation, proceedings. In the event said taking has any detrimental effect upon LESSEE'S use of the Leased Premises, the rent shall be reduced according to the extent that LESSEE'S use of the Leased Premises has been affected by said condemnation proceedings.

In the event all of the Leased Premises is taken, or so much thereof as to render the Leased Premises unsuitable to LESSEE for the use being made of the Leased Premises at the time of

condemnation, this Lease shall terminate as of the date that the condemning authority has the right to possession of the Leased Premises, and the condemnation proceeds shall be paid to LESSOR. The parties acknowledge that the provisions of this paragraph shall not preclude LESSEE from pursuing a separate claim against the condemning authority for any damage sustained by LESSEE as a result of said condemnation proceedings.

24. **Holdover.** In the event that the LESSEE retains possession of the Leased Premises beyond the term of this Lease, or after termination of LESSEE's right to possession under this Lease, LESSEE shall pay 200% of the applicable Rent and the Additional Payments plus any damages, including damages incurred by subsequent tenant(s), arising out of holding possession after termination. LESSOR may elect, by giving written notice, to treat holding over as a renewal of this Lease for a period from month to month, or for one year, solely at the LESSOR's discretion.

25. Notices. Any notice provided for herein may be personally served or shall be sent by certified U.S. mail, return receipt requested, in which case it shall be deemed served on the second business day subsequent to the date of mailing.

Notices to LESSEE shall be addressed to LESSEE as follows: Seneca Foods Corporation, Attn: Judd Rux, at 500 South Clark Street, Mayville, Wisconsin *53050* or at such other address as LESSEE may direct in writing to LESSOR.

Notices to LESSOR shall be addressed to LESSOR as follows: Veolia ES Glacier Ridge Landfill, LLC, Attn: Jay Warzinski, at N7296 Highway V, Horicon, WI *53032,* or at such other place as LESSOR may direct in writing to LESSEE.

26. **Waiver.** No waiver of any forfeiture by acceptance of rent or otherwise shall waive any subsequent cause of forfeiture or breach of any condition of this Lease.

27. **Governing law and venue.** This Lease shall be interpreted and enforced according to the laws of the State of Wisconsin. The parties hereby stipulate that venue of any action brought in respect of the interpretation hereof, or the right of the parties hereunder shall be placed in any state court of general jurisdiction in Wisconsin.

28. **Time** is **of the essence.** Time is of the essence under this Lease and all provisions herein relating thereto shall be strictly construed.

29. **Right of First Refusal to Purchase the Leased Premises.** If the LESSOR at any time during the term of this Lease, or any renewal or extension thereof, receives a bona fide offer to purchase the Leased Premises, which offer the LESSOR desires to accept, LESSOR agrees to give LESSEE 30 days' notice in writing of such bona fide offer, setting forth the name and address of the proposed purchaser who has made the offer, the amount of the proposed purchase price, and the terms of payment thereof. The LESSEE shall have the first option to purchase the Leased Premises within the above mentioned 30 day period at the same price and on the same terms of any such proposal. In the event that the LESSEE does not exercise its option to purchase the Leased Premises within the aforesaid period and the Leased Premises, for any reason, is not sold pursuant

to the bona fide offer set forth in the notice, then LESSEE shall have, upon the same conditions of notice, the continuing first option to purchase the Leased Premises upon the terms of any subsequent bona fide offer or offers to purchase received by LESSOR. Should LESSOR, in the absence of the exercise by LESSEE of its option to purchase hereunder, consummate a sale to any such bona fide offeror, such sale shall not, in any manner, affect the right, title, interest and estate of LESSEE under this Lease.

30. Termination of Existing Lease. The existing Lease between the LESSOR, or its predecessor, and LESSEE, effective as of July 1, 2009, shall expire and be of no force and effect as of July 1, 2013, and this Lease shall be controlling. It is agreed by the parties that the additional promises, terms and conditions of this Lease are sufficient additional consideration for entering into this Lease. Additionally, while LESSEE has paid LESSOR the amount of rent due July 1, 2012, under the existing lease, LESSEE agrees to pay LESSOR additional rent for 2012 in the amount of $50 per acre, for a total of amount of Five Thousand Five Hundred Fifty Dollars ($5,550.00) (i.e., 111 acres x $50 = $5,500.00) for additional consideration ("Additional Rent"). Payment of the Additional Rent shall be made by LESSEE to LESSOR within thirty days after receiving a copy of this Lease fully executed.

TN WITNESS WHEREOF, the parties have hereunto executed this Lease the day and yeai first above written.

LESSOR:

Veolia ES Glacier Ridge Landfill, LLC

By: _____

Jay Warzinski, Senior Regional Engineer

LESSEE:

Seneca Foods Corporation

_____

Paul Palmby, COO

to the bona fide offer set forth in the notice, then LESSEE shall have, upon the same conditions of notice, the continuing first option to purchase the Leased Premises upon the terms of any subsequent bona fide offer or offers to purchase received by LESSOR. Should LESSOR, in the absence of the exercise by LESSEE of its option to purchase hereunder, consummate a sale to any such bona fide offeror, such sale shall not, in any manner, affect the right, title, interest and estate of LESSEE under this Lease.

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LESSOR:

Veolia ES Glacier Ridge Landfill, LLC

By: _____

Jay Warzinski, Senior Regional Engineer

LESSEE:

Seneca Foods Corporation

_____

Paul Palmby, COO

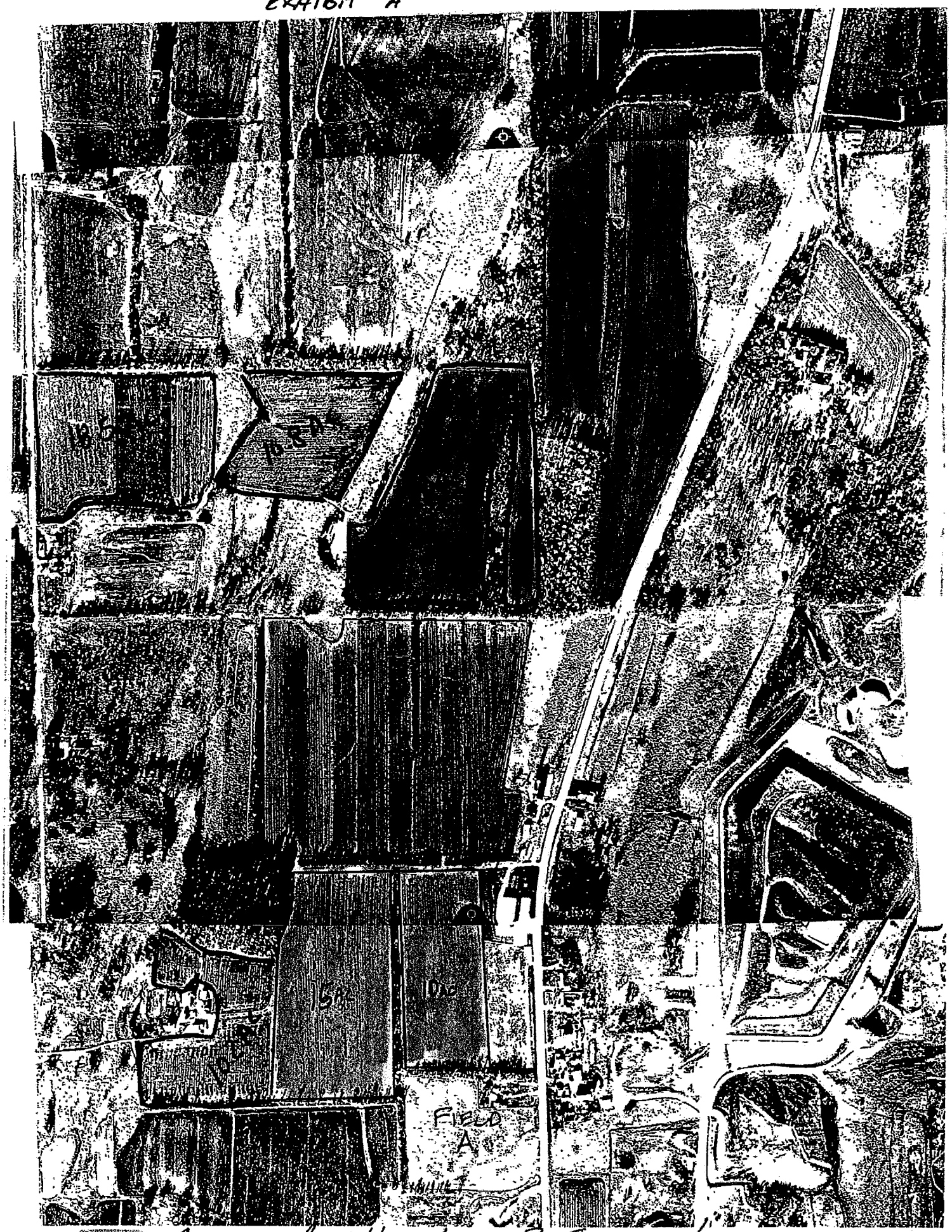
THIS LEASE WAS DRAFTED BY:

Jay R. Warzinski Senior Regional Engineer Veolia ES Glacier Ridge Landfill, LLC

Exhibit A

Map of Leased Premises

EXHIBIT "A"

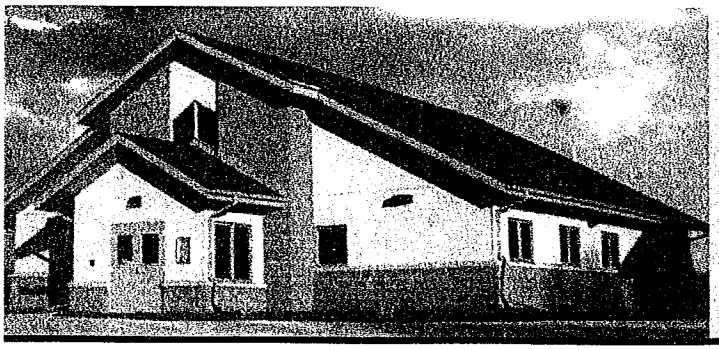


Approximate Area Video Taken By Camera 11/2013

Exhibit B

Seneca Foods Corporation

License for the Dumping of Sludge or Waste Materials in the Town of Williamstown



Town of
WILLIAMSTOWN

W3275 Hwy. TW
Mayville, WI 53050

Mailing Address: N9260 Hwy. V
Mayville, WI 53050

TOWN OF WILLIAMSTOWN

LICENSE FOR DUMPING SLUDGE OR WASTE MATERIALS

29 July 2012

Amount $25.00

The Town of Williamstown does hereby grant a license to deposit **vegetable processing waste water** on the property owned by **Seneca Foods Corporation** in sections **26 and 27** and in Section **34** of **Glacier Ridge Landfill, LLC**, in the Town of Williamstown. The legal description of the property where dumping will take place is: Parcel numbers **2622, 2623, 2714, 2742, 2743, 2744, 3414, 3441, and 2741.**

This license is in effect for the period beginning **1 July 2012** ending on **30 June 2013**.

Donald Roll
Clerk, Town of Williamstown

APPENDIX E

NRCS Wisconsin Agronomy Technical Note 6

USDA NRCS
United States Department of Agriculture
Natural Resources Conservation Service

Wisconsin Agronomy Technical Note 6

Establishing and Maintaining Introduced Grasses and Legumes

INTRODUCTION

This technical note will provide guidance for the establishment of introduced (non-native) plantings of perennial herbaceous vegetation for the purpose of meeting the criteria in Wisconsin Natural Resources Conservation Service (NRCS), Field Office Technical Guide (FOTG), Section IV, Practice Standards 327, Conservation Cover; 645, Wildlife Upland Habitat Establishment; 342, Critical Area Planting; and 512, Forage and Biomass Planting. Additional ecological and engineering standards will reference this technical note. Refer to those standards for specific practice purposes and requirements.

BACKGROUND

Introduced stands of perennial herbaceous vegetation have the potential to control soil erosion and sedimentation, improve water quality, and create or enhance wildlife habitat if properly established and maintained.

Introduced species are typically easier and less expensive to establish than native grasses and forbs. Seed sources are readily available, relatively inexpensive, and establishment methods are widely understood using common agricultural equipment.

Introduced plantings can provide high quality wildlife habitat with some degree of routine maintenance and cover management. These species will require some reoccurring interseeding to maintain a diverse plant community. Legumes adapted to wet and wet-mesic sites are typically short lived and will require routine reseeding to maintain plant diversity.

Introduced plantings are better adapted to the typical growing conditions in the Northern Planting Zone and tend to strive in areas where sunlight intensity is moderate, temperature is moderate, and water is readily available. These plants produce most of their growth during the spring, late summer, and early fall when the soil and air temperatures are cooler. For this group of plants, the minimum air temperature for active shoot growth is 40-42 degrees F. Growth is maximized at 65-75 degrees F.

For erosion control, on critical areas, introduced species are the preferred vegetation.

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SITE ASSESSMENT

Introduced plants are generally adapted to one or more soil moisture regimes: wet, wet-mesic, mesic, dry-mesic, and dry. These moisture regimes correlate to some degree with both drainage classes and forage suitability groups.

Drainage classes refer to the frequency and duration of wet periods under conditions similar to those under which the soil formed naturally. Alterations of the water regime by human activities are not considered in this case. These soil moisture regimes fall into one or more of the seven natural soil drainage classes.

Forage suitability groupings are an additional tool to provide guidance to planners. Forage Suitability Groups (FSG) are pasture and hay land soil interpretation reports that provide users with forage production guidance for the soils and climatic conditions present in their area of interest. The vast majority of forage plants utilized in Wisconsin are introduced grasses and legumes. For the purpose of this technical note, FSGs will focus on available water capacity, water table, and runoff potential. FSGs are divided into ten categories.

There is often no sharp division between moisture regimes, drainage classes and forage suitability groups, and oftentimes they blend or overlap into multiple categories. Understanding soil conditions plays an important role when planning a successful introduced herbaceous planting.

Refer to Table 1 correlating the five moisture regimes, seven drainage classes, and ten forage suitability groups.

SPECIE SELECTION AND SEED QUALITY

Evaluate the winter hardiness of species selected for planting. To ensure stand longevity, species listed as Hardy (H) or Very Hardy (VH) in Tables 2-8 of Wisconsin Circular A-1525, Forage Crop Variety Yield Trials for Wisconsin, are preferred. Varieties listed as Moderately Hardy-Plus (MH+) are acceptable.

Select species based on the site conditions looking closely at soil type and moisture regime. Tables 1, 2 and 3 will provide additional guidance for selecting species appropriate for the site conditions.

The recommended introduced species, listed in Table 2, are not identified as prohibited or restrictive for planting statewide in accordance with Natural Resource Law 40, Invasive Specie Control. However, Kentucky Bluegrass, Smooth Bromegrass, Redtop, Birdsfoot Trefoil, Red and White Cover are species that can propagate and spread with little difficulty due to their growth characteristics and should be evaluated carefully when plantings are planned in the vicinity of native remnants or natural areas.

- It is suggested that seed purchased be harvested within a 250 mile radius of the area where the planting will occur. This suggestion is less critical for introduced versus native species.
- For pollinator habitat, the recommended introduced bunch grasses are Orchardgrass, Tall Fescue, Perennial Ryegrass, and Timothy. Refer to Table 9 for introduced pollinator habitat mixtures.
- Kentucky Bluegrass, Bromegrass, and Redtop are examples of sod-forming plants. Refer to Table 8 for additional examples.

Introduced mixtures for wildlife habitat must contain at least 50 percent grass seed per square foot. The exception to this criteria is the establishment of pollinator habitat.

Introduced mixtures for areas with shrub and tree plantings are not required to contain 25 percent sod forming grass seed per square foot. These seed mixtures must still contain at least 50 percent grass seed per square foot. Sod-forming grasses are not recommended in shrub and tree plantings.

Below are species with multiple scientific names. The underlined specie is the most recognized genus and specie in Wisconsin and is referenced as such in vegetative Standards 327, Conservation Cover; 342, Critical Area Planting; and 512, Forage and Biomass Planting.

- **Tall Fescue:** Schedonorus arundinaceus, Lolium arundinacea, Festuca arundinacea
- **Meadow Fescue:** Schedonorus pratense, Lolium pratense

Pure Live Seed

Pure Live Seed (PLS) is a means of expressing seed quality.

PLS is the percentage of seed in a seed lot that is both pure seed and viable seed. Pure seed is the percentage by weight of the seed (kind, cultivar,

variety) that is under consideration. Inert matter, weed seed, and other crop seed is excluded from pure seed. Total Viable Seed (TVS) is the percentage estimate of the potential for germination, which includes percent hard seed and/or dormant seed.

Example: Pure Live Alfalfa Seed

(1) XYZ Seed Company, 1000 Crop Seed Lane, Ft. Collins, CO	
(2) Alfalfa, VNS	(6) Germination: 92%
(3) Lot number: 1234	Hard seed: 5%
(4) Pure Seed: 99.00%	Dormant seed: --
Other Crop: 0.25%	T.V.S.: 97%
Weed Seed: 0.10%	(7) Date Tested: 10/2000
Inert material: 0.65%	(8) Origin: CO
(5) Noxious weed seed: dodder 1 per lb.	(9) Seed Treatment: none

Pure seed x TVS = PLS
99% x 97% = 96.03%

The PLS for Lot number 1234 is 96.03%.

Nearly all species recommended for conservation plantings by NRCS uses PLS expressed in pounds or ounces per acre which is calibrated to seeds per square foot.

Seeding rates in this technical note are shown in pounds or ounces and seeds per square foot per acre.

Inoculation

Legumes are unique plants which have the ability to work with certain strains of bacteria (Rhizobia) to gather atmospheric nitrogen from the soil atmosphere and convert it to useable ammonia nitrogen. Nitrogen produced by this symbiotic relationship is virtually free and results not only in improved soil fertility, but increased protein and forage production in the legume host plant for the benefit of domesticated and wildlife heterotrophs.

Inoculate legume seed with the appropriate inoculant. Inoculants must not be exposed to sunlight or allowed to dry out prior to planting legumes.

CRITERIA FOR SEED MIXTURE DEVELOPMENT

Seed mixtures can consist of a grass component only or a grass and legume component, depending on the standard criteria and the purpose of the planting. Custom seeding mixtures can be developed from selected species listed in Table 2.

For other ecological Wisconsin standards such as Field Border (386), the planner will need to review the standard to determine the specific seeding requirements for the intended purpose. The Field Border standard will direct the planner to use Standard 342, Critical Area Planting, for erosion concerns and Standard 327, Conservation Cover, when the purpose or concern is for establishing pollinator habitat. This also includes Wisconsin engineering standards such as Standard 635, Waste Treatment Strips.

It is important to reference program rules when determining seed mixtures. Some programs have preapproved required mixtures to meet program and cost requirements.

Conservation Cover (327)

Introduced Species

1. Wildlife Habitat Planting

   A minimum of two grasses seeded at a minimum rate of 70 grass seeds per square foot, and at least one legume seeded at a minimum of 30 seeds per square foot.

   Fifty percent of the seeds per square foot will comprise of grasses.

   Refer to Table 7 for example mixtures.

   For dormant and frost seedings, increase seeds per square foot by 15 percent.

2. Herbaceous Pollinator Habitat

   At least one and a maximum of two bunch grasses seeded at a maximum rate of 30 seeds per square foot and a minimum of two legumes seeded at a minimum rate of 40 seeds per square foot.

Fifty percent of the seeds per square foot comprising of grasses is not a seed requirement for pollinator habitat planting mixtures.

For dormant and frost seedings, increase the seeds per square foot by 15 percent.

Critical Area Planting (342)

Introduced Species

- A minimum of 160 seeds per square foot for a solid grass planting or in combination with legumes.
- Fifty percent of the seeds per square foot will comprise of grasses and 25 percent of the seed

per square foot will consist of sod-forming grasses.
- For dormant seedings, increase the seeds per square foot by 15 percent.

Dormant seeding can be used when planting introduced species on concentrated and non-concentrated flow areas. When using dormant seedings on concentrated flow areas, the site must be mulched according to Standard 484, Mulching. Frost seeding is not an approved seeding method when using this standard.

Refer to Table 8 for example mixtures.

Forage and Biomass Planting (512)

Introduced Species

1. Pasture and Hayland Planting

    - For pasture plantings, mixtures will have at least 1 grass and 1 legume. The mixture will have at least 50 percent grass seeds per square foot, and the total mix will have at least 60 seeds per square foot.
    - For hayland establishment, mixtures and single specie plantings may be used as long as the total seeding rate is at least 60 seeds per square foot.

2. Interseeding of Grasses/Legumes Into Existing Pastures and Haylands

    - Seeding rate is half of the pure stand seeding rate as specified in Table 2. Seeds per square foot for legumes will vary according to specie.
    - Frost seeding is approved only for legumes into existing pastures at a seeding rate of two-thirds the recommended pure stand seeding rate.

    Refer to Table 10 for pasture and hayland planting seed mixtures.

Table 1
Relationship Between Moisture Regimes, Drainage Classes, and Forage Suitability Groups

Moisture Regimes	Drainage Class	Forage Suitability Group
Wet Wet mineral or organic soils are typified by very poorly drained soil types.	**Very poorly drained** Water is removed from the soil so slowly that free water remains at or very near the ground surface during much of the growing season and mesophytic crops cannot be grown. The soils are commonly level or depressed and frequently ponded.	**FSG 7** High water holding capacity, seasonal high water table, excessively wet, subject to ponding and flooding. **FSG 10** High water holding capacity, seasonal high water table, organic surface layers, subject to ponding and flooding.
Wet-Mesic Wet-mesic sites are transitional between wet and mesic. Most wet-mesic sites occur on somewhat poorly drained mineral soils.	**Very poorly drained**	**FSG 7, FSG 10**
	Somewhat poorly drained Water is removed slowly so that the soil is wet at a shallow depth for significant periods during the growing season. Wetness markedly restricts the growth of mesophytic crops.	**FSG 4** Moderate water holding capacity, generally sandy, seasonal high water table, excessively wet for half of growing season. **FSG 7, FSG 10**
Mesic Mesic sites will be found on most moderately well and well drained mineral soils which have moderate to very high Available Water Capacity. Mesic sites may occur on some somewhat poorly drained soils with low or very low Available Water Capacity.	**Somewhat poorly drained**	**FSG 4, FSG 7, FSG 10**
	Moderately well drained Water is removed from the soil somewhat slowly during some periods of the year. The soils are wet for only a short time within the rooting depth during the growing season.	**FSG 1** Low water holding capacity, generally sandy, seasonal high water table. **FSG 4** **FSG 5** Moderate water holding capacity, no seasonal high water table, at times seasonal droughtiness, less than 12% slope. **FSG 6** Moderate water holding capacity, no seasonal high water table, seasonal droughtiness, greater than 12% slope, runoff concerns. **FSG 8** High water holding capacity, no seasonal high water table, less than 12% slopes.
	Well drained Water is removed from the soil readily but not rapidly. Water is available to plants throughout most of the growing season. Wetness does not inhibit growth of roots.	**FSG 1, FSG 5, FSG 6, FSG 8** **FSG 9** High water capacity, no seasonal high water table, runoff concern.
Dry-Mesic Dry-mesic sites are transitional between dry and mesic. They occur on some somewhat excessively drained and some well drained soils.	**Moderately well drained**	**FSG 1, FSG 4, FSG 5, FSG 6, FSG 8**
	Well drained	**FSG 1** **FSG 2** Low water holding capacity, generally sandy, no seasonal high water table, 0 to 12% slopes. **FSG 3** Low water holding capacity, generally sandy, no seasonal high water table, greater than 12% slopes, seasonal droughtiness. **FSG 5, FSG 6**
	Somewhat excessively drained Water is removed from the soil rapidly. The soils are commonly coarse-textured.	**FSG 1, FSG 2, FSG 3, FSG 5, FSG 6**
Dry Dry sites occur mostly on well to excessively drained soils.	**Well drained**	**FSG 1, FSG 2, FSG 3, FSG 5, FSG 6**
	Somewhat excessively drained	**FSG 2, FSG 3, FSG 6**
	Excessively drained	**FSG 2, FSG 3**

Table 2
Common Species and Recommended Pure Stand Seeding Rates

Name	Genus and species	Plant Type	Moisture Regime	Single Species Seeding Rate (PLS) Lbs./Acre	Seeds/Lb.	Seeds/Ft^2/ Lb./Ac.
Chewings Red Fescue	Festuca rubra L. ssp fallax	Grass	D, DM, M	5	350,000	8
Creeping Red Fescue	Festuca rubra	Grass	DM, M, WM	5	350,000	8
Festulolium	Festuca X Lolium	Grass	DM, M, WM	12	227,000	5.2
Italian or Annual Ryegrass	Lolium perenne L. ssp. multiflorum	Grass	DM, M, WM	20	227,000	5.2
Kentucky Bluegrass	Poa pratensis	Grass	D, DM, M, WM, W	8	2,177,000	50
Meadow Fescue	Schedonorus pratensis	Grass	DM, M, WM	12	227,000	5.2
Orchardgrass	Dactylis glomerata L.	Grass	D, DM, M, WM	10	653,000	15
Perennial Ryegrass	Lolium perenne	Grass	DM, M, WM	20	227,000	5.2
Redtop	Agrostis gigantea	Grass	M, WM, W	4	4,990,000	114.5
Smooth Bromegrass	Bromus inermis	Grass	D, DM, M, WM	20	136,000	3.1
Tall Fescue	Schedonorus arundinaceus	Grass	D, DM, M, WM	12	227,000	5.2
Timothy	Phleum pratense	Grass	DM, M, WM, W	8	1,230,000	28.2
Alfalfa	Medicago sativa	Legume	D, DM, M	12	219,000	5.0
Alsike Clover	Trifolium hybridum	Legume	M, WM, W	3	680,000	15.6
Birdsfoot Trefoil	Lotus corniculatus	Legume	DM, M, WM, W	7	375,000	8.6
Red Clover	Trifolium pratense	Legume	DM, M, WM	10	275,000	6.3
White Ladino Clover	Trifolium repens	Legume	DM, M, WM	3	871,650	20

Table 3
Plant Morphology and Physiology Characteristics

Common Name *Scientific Name*	Plant Type	Growth Habit	Practice Recom-mendation	Pure Stand Rate	Seeds per Ft^2/Lb/ Ac.	Wildlife Value	Retardance	Pollinator Habitat	Deep Rooted	Moisture Regime	Forage Suitability Group	pH	Flood Tolerance	Average Height at Maturity	Drought
Grasses															
Chewings Red Fescue *Festuca rubra L. ssp. fallax*	grass	perennial, cool season sod-forming	342, 512	5 lbs/ac	8	poor	D	no	no	D-M	2, 3, 5, 6, 8, 9	5.0 - 7.5	poor	1.5’	yes
Creeping Red Fescue *Festuca rubra*	grass	perennial, cool season sod-forming	342, 512	5 lbs/ac	8	poor	D	no	no	DM-WM	1, 4 to 9	5 - 7.5	poor	2'	yes
Festulolium *Festuca x Lolium*	grass	short-lived annual bunchgrass	342, 512	12 lbs/ac	5.2	fair	C	yes	no	DM-WM	1 to 9	5.0 - 7.5	moderate	1.5 - 2.0'	moderate
Italian (Annual) Ryegrass *Lolium perenne L. ssp. multiflorum*	grass	short-lived annual bunchgrass	327, 342, 512	12 lbs/ac	5.2	fair	C	yes	no	DM-WM	1, 4 to 9	5.0 - 7.5	moderate	1.5 - 2.0'	moderate
Kentucky Bluegrass *Poa pratensis*	grass	long-lived perennial cool season plant, sod-forming by rhizomes	327, 342, 512	8 lbs/ac	50	poor	D	no	no < 8"	D-W	1 to 9	5 - 7	fair	2.0'	yes
Meadow Fescue *Lolium pratense*	grass	perennial, cool season aggressive bunchgrass, with age produces thick sod	342, 512	12 lbs/ac	5.2	fair	D	no	no	DM-WM	1, 4 to 9	5 - 7.2	moderate	2 - 3'	yes
Orchard Grass *Dactylis glomerata*	grass	long-lived perennial bunchgrass, reproduces from seed	327, 342, 512	10 lbs/ac	15	fair	B	yes	no < 8"	D-WM	1 to 9	5.8 - 7.0	moderate	2.5'	yes
Perennial Ryegrass *Lolium perenne*	grass	short-lived perennial bunchgrass	327, 342, 512	20 lbs/ac	5.2	fair	C	yes	no	DM-WM	1, 4, 5, 6 to 9	5 - 7.5	moderate	1.5 - 2.0'	yes

Common Name *Scientific Name*	Plant Type	Growth Habit	Practice Recom-mendation	Pure Stand Rate	Seeds per Ft^2/Lb/ Ac.	Wildlife Value	Retardance	Pollinator Habitat	Deep Rooted	Moisture Regime	Forage Suitability Group	pH	Flood Tolerance	Average Height at Maturity	Drought
Redtop *Agrostis gigantea*	grass	long-lived perennial cool season plant, sod-forming by stolons	327, 342, 512	4 lbs/ac	114.5	fair	C	no	yes < 2"	M-W	1, 4, 7	4.5 - 8.0	good	3'	no
Smooth Bromegrass *Bromus inermis*	grass	tall long-lived perennial cool season plant, sod-forming by rhizomes	327, 342, 512	20 lb/ac	3.1	fair	B	no	no < 12"	D-WM	1 to 9	6 - 7.5	brief fair	3 - 4'	yes
Tall Fescue *Schedonorus arundinaceus*	grass	perennial, cool season aggressive bunchgrass, with age produces thick sod	327, 342, 512	12 lbs/ac	5.2	fair	B	yes	yes > 14"	D-WM	1 to 9	5 - 9	moderate	2.5 - 3.0'	yes
Timothy *Phleum pretense*	grass	cool season short-lived perennial bunch grass, reproduces by seed	327, 342, 512	8 lbs/ac	28.2	fair	B	no	no < 8"	DM-W	1, 4 to 9	5.5 - 7.0	moderate	3.0'	no
Legumes															
Alfalfa *Medicago sativa*	legume	single crown, warm season perennial legume, has a deep tap root	327, 342, 512	12 lbs/ac	5	good	C	yes	yes > 14"	D-M	2-3, 5, 6, 8, 9	> 6.5	poor	2.5'	yes
Alsike Clover *Trifolium hybridum*	legume	perennial, single crown, upright short-lived legume	327, 342, 512	3 lbs/ac	15.6	good	D	yes	no < 8"	M-W	1, 4, 5, 7, 8, 9	> 6.2	moderate	1'	no
Birdsfoot trefoil *Lotus corniculatus*	legume	warm season perennial legume	327, 342, 512	7 lbs/ac	8.6	good	D	yes	no < 10"	DM-W	1, 4 to 9	> 5.5	moderate-good	.5 - 1'	moderate
Red Clover *Trifolium pretense*	legume	upright short-lived perennial legume, produces runners, deep taproot	327, 342, 512	10 lbs/ac	6.3	good	C	yes	yes > 14"	DM-WM	1 to 9	> 6.0	poor	2.0'	no
White Ladino Clover *Trifolium repens*	legume	shallow-rooted perennial legume, prostrate, spreads by stolons	327, 342, 512	3 lbs/ac	20	fair	D	yes	no	DM-WM	1, 4, 5, 7 to 9	> 5.5	fair to poor	1.0'	no

Table 4
Summary of Seeding Requirements for Standards 327, 342, 512 (Introduced Species)

327 - Conservation Cover									
Mix Type	Grasses		Legumes[a]		Seeding Periods				Notes
	No.	seeds/ft^2	No.	seeds/ft^2	Spring	Late Summer	Dormant[b]	Frost[b]	
Wildlife Habitat	≥2	≥70	≥1	≥30	X	X	X	X	Grasses must be at least 50% of mix.
Pollinator Habitat	1-2	≤30	≥2	≥40	X	X	X	X	Grasses must be bunch-type.

(a) If more than 20% of legumes are hard seed, increase rate by % of hard seed.
(b) Increase rate 15% for frost and dormant seedings.

342 - Critical Area Planting									
Mix Type	Grasses		Legumes[a]		Seeding Periods				Notes
	No.	seeds/ft^2	No.	seeds/ft^2	Spring	Late Summer	Dormant[b]	Frost	
Grasses Only	≥1	160			X	X	X	NR	At least 25% of the total seeds must be sod-forming grasses.
Mixtures	≥1	≥80	≥1	See Notes	X	X	X	NR	Grasses must be at least 50% of the mix. Mix must be at least 160 seeds/ft^2 total. At least 25% of the seeds in the mix must be sod-forming grasses.

(a) If more than 20% of legumes are hard seed, increase rate by % of hard seed.
(b) Increase rate 15% for dormant seedings. Seedings in concentrated areas must be mulched.

512 - Forage & Biomass Planting									
Mix Type	Grasses		Legumes[a]		Seeding Periods				Notes
	No.	seeds/ft^2	No.	seeds/ft^2	Spring	Late Summer	Dormant	Frost	
Pasture	≥1	See Notes	≥1	See Notes	X	X	NR	NR	Mix must be at least 60 seeds/ft^2 total. Grasses must be at least 50% of the mix.
Hayland	Single species or mixture with ≥60 seeds/ft$^{2.}$				X	X	NR	NR	
Interseeding		See Notes		See Notes	X	X	NR	Legumes Only	Use 1/2 the pure stand rate for spring or late summer seeding. Use 2/3 pure stand rate for frost seeding.

(a) If more than 20% of legumes are hard seed, increase rate by % of hard seed.

SEEDING DATES

Date of seeding is a critical factor in determining whether a seeding will succeed or fail. The specific date that provides the best chance for success will vary from south to north and from year to year with prevailing moisture and temperature conditions. Late summer seeding is generally riskier than spring seeding. Planting at either end of the allowable range is riskier than the middle of the range. Refer to Table 5 for the recommended seeding dates.

Seeding outside of the established dates must be approved by the NRCS State Agronomist or Area Resource Conservationist prior to seeding. All variance requests shall provide documentation of the current soil moisture conditions and proposed timeframes for seeding to be completed.

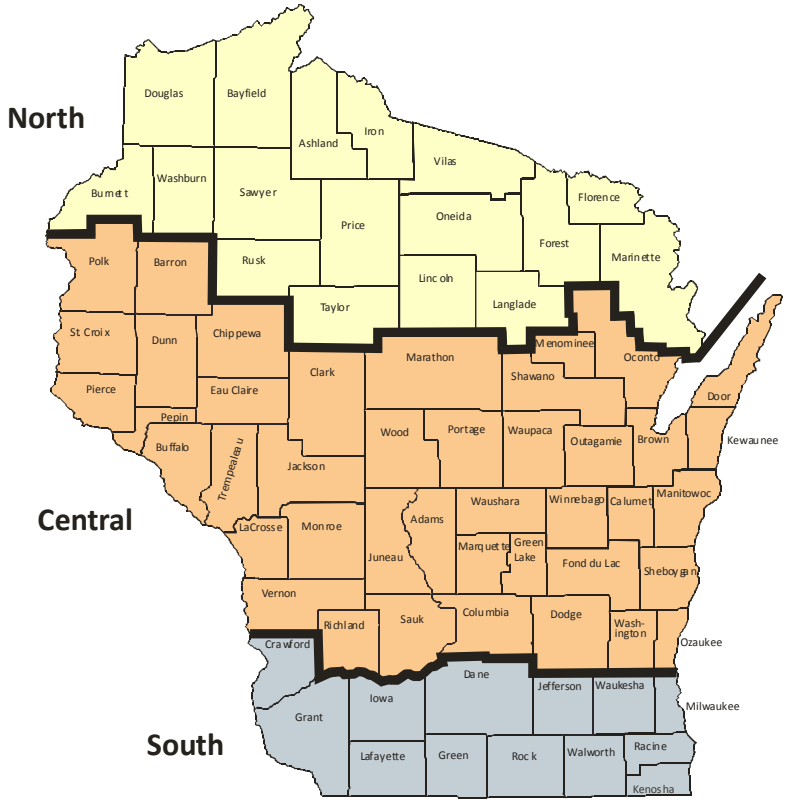
The frost seeding period in Wisconsin ranges from mid February to early March and will vary from year to year depending on the weather. Frost seeding is only allowed during active freezing and thawing cycles.

Table 5
Recommended Seeding Dates by Planting Zone

Planting Zone*	Spring	Late Summer	Dormant
North	5/1 – 6/15	7/15 – 8/10	11/1 – Freeze up
Central	4/15 – 6/1	8/1 – 8/21	11/1 – Freeze up
South	4/1 – 5/15	8/7 – 8/29	11/1 – Freeze up

*See Figure 1

Figure 1
Planting Zone Map



TEMPORARY COVER AND COMPANION CROPS

Temporary Cover Crop

All land will be established to permanent vegetative cover during the first year of the land use conversion, when possible. Temporary cover, during the first year, may be used if:

- the required seeds or plant stock are not available,
- the normal planting period for the species has passed, or
- where herbicide carryover will not allow establishment of permanent cover immediately.

If temporary cover is used, the permanent vegetative cover must be established by the end of the normal planting period of the following year.

Temporary Seeding Recommendations

1. Fields where planting is delayed due to lack of suitable seed or late planting, select one of the following species:

    - Forage sorghum – ½ bushel per acre (5/15 to 7/15)
    - Sorghum - Sudangrass hybrid – 1 bushel per acre (5/15 to 7/15)
    - Sudangrass – 1 bushel per acre (5/15 to 7/15)
    - Winter wheat - 2 bushels per acre (8/1 to 10/1)
    - Winter cereal rye - 2 bushels per acre (8/1 to 10/15)
    - Oats - 2 bushels per acre (4/1 to 9/1)
    - Annual ryegrass - 20 pounds per acre (4/1 to 9/1)

2. For fields with triazine herbicide carryover, select one of the following species:

    - Forage sorghum – ½ bushel per acre (5/15 to 7/15)
    - Sorghum - Sudangrass hybrid – 1 bushel per acre (5/15 to 7/15)
    - Sudangrass – 1 bushel per acre (5/15 to 7/15)

    A bioassay test may be used to better determine chemical carryover.

A temporary cover will typically not be necessary on those areas where at least 50 percent of the ground is covered with either crop residue or vegetative cover.

Temporary cover crops must be clipped or destroyed before the plant produces viable seed, preventing excessive competition to the scheduled permanent seeding. Winter wheat and rye must be terminated by tillage, crimping, herbicides, or a combination before planting the permanent seeding.

Companion Crops

Companion crops can be used to reduce the amount of erosion on critical sites, suppress weeds, and provide added protection for permanent perennial vegetation seeded during first year plantings.

Companion crop recommendations:

- Oats - 2 bushels per acre (4/1 to 9/1)
- Winter wheat - 1 bushel per acre (8/1 to 10/1)
- Annual ryegrass - 6 pounds per acre (4/1 to 9/1)
- Spring wheat - 1 bushel per acre (4/1 to 6/1)

Companion crops shall be clipped after jointing or boot stage. Second and subsequent clippings are necessary when re-growth provides competition to the new planting. Clipping height should be above the developing seedlings. Where excessive growth has accumulated, the vegetation should be mowed and vegetation distributed uniformly. Companion crops seeded with late summer introduced grasses and legumes in most cases will not require clippings prior to the first killing frost. When the growing season is prolonged, clipping may be required for late summer plantings.

Winter cereal rye is not recommended as a companion crop with introduced season grasses. Biotoxin compounds secreted by cereal rye may inhibit germination or suppress introduced grass seedlings.

SPECIAL EROSION CONTROL MEASURES

Evaluate the need for additional soil erosion controls prior to and during the establishment period. Where erosion is determined to be a concern, alternatives shall be developed to divert water from the site or stabilize the soil surface.

When soil erosion control is an identified resource concern, increase grass composition above 50 percent of the mixture and increase the percentage of sod-forming grasses above 25 percent of the mixture.

Introduced mixtures for areas with shrub and tree plantings are not required to contain 25 percent sod forming grass seed per square foot. These seed mixtures must still contain at least 50 percent grass seed per square foot. Sod-forming grasses are not recommended in shrub and tree plantings.

Mulching

Wisconsin NRCS Standard 484, Mulching, shall be followed if program or practice design requires mulching.

Mulch shall consist of either natural and/or artificial materials such as plant residue (including cereal grain straw, grass hay, wood chips, bark and wood fiber), plastic, fabric, or other equivalent materials of sufficient dimension (depth or thickness) and durability to achieve the intended effect for the required time period. Mulch material shall be relatively free of disease, pesticides, chemicals, noxious weed seeds, and other pests and pathogens.

The type of mulching material selected should be based on cost, time of year, soils, percent slope, anticipated runoff velocities, and landscape position.

Mulching will be applied as soon as possible after seeding. Prepare the seedbed, apply the fertilizer and seed, then apply and anchor the mulch material.

When construction is completed and a permanent seeding delay is anticipated, plant temporary cover or apply a temporary mulch to the site to control erosion, or seed permanent vegetation and evaluate the status of the seeding, especially when seeding outside of the recommended dates. Reseeding may be required. All dormant plantings planned on concentrated flow areas will be mulched.

Hydroseeding

Hydroseeding typically consists of applying a mixture of cellulose fiber, seed, fertilizer, and stabilizing emulsion with hydromulching equipment to provide permanent or temporary protection to disturbed areas that are susceptible to erosion by water and wind. Hydroseeding may be used as the primary mulching method only when there is sufficient time remaining in the season to ensure adequate vegetation establishment and will provide adequate erosion control. Hydroseeding can be used in conjunction with other mulching techniques. Hydroseeding advantages include:

- the protection of seeds from heat and birds during the germination process,
- a stabilized soil temperature,
- more even application of seeds than broadcast seeding,
- effective in keeping seeds from being washed away on slopes,
- provide added organic components to enrich the soil after the critical area is established,
- retention of moisture as seeds sprout, and
- allows for a better root formation as opposed to sodding.

Follow seeding dates outlined in Table 5 of this technical note.

Sodding

Specifications for site preparation, topsoiling, seedbed preparation and fertilizing are the same as conventional seeding. Sod shall consist of a dense, well rooted growth of a perennial desirable specie. All sod used shall be free of noxious weeds, diseases and insects. Only moist, fresh sod shall be used. The sod shall be sufficiently moist to withstand exposure during transport and transplanting operations. Sod should be placed on site within 24 hours after cutting and sod strips shall not have dry or dead edges.

Wet soil to a depth of two inches or more prior to laying the sod. Lay the sod from the lower end of the slope and work up slope. On steep slopes, stake the sod or peg with at least 6 inches or longer anchoring staplers. Tamp or roll the laid sod to insure uniform contact between the roots and soil surface. Outside edges of sodded areas shall be rolled in or banked flush with soil. On sites where surface drainage may try to follow sodded edges, extend sod strips 1 foot beyond the edges of the area sodded.

After laying sod, water thoroughly to wet the sod pad and the soil to a depth of 4 inches. In the absence of adequate rainfall, water during the first 30 days to keep underlying soil moist and allow the sod to become established. After the initial 30 day period, water as necessary to maintain adequate moisture in the root zone.

NUTRIENT AND SOIL AMENDMENT RECOMMENDATIONS

Fertilizer

Fertilizer will be applied according to a current soil test and will be consistent with University of Wisconsin recommendations found in Publication A-2809, Nutrient Application Guidelines for Field, Vegetable and Fruit Crops. A current soil test is defined as test results no older than four years from the time last tested to the date of the planned seeding. Guidelines for soil testing in Wisconsin can be found in Publication A-2100, Sampling Soils For Testing. In lieu of soil testing, apply 150 pounds of 20-10-10 fertilizer per acre, applicable only to Practice Standards 327, Conservation Cover; and 342, Critical Area Planting.

Lime

When alfalfa is part of the seeding mixture, the soil pH must be corrected to a minimum of 6.5. When birdsfoot trefoil, red clover or white ladino clover is a component of the seeding mixture, pH must be corrected to a minimum of 6.2. Liming material will be applied according to soil test recommendations. In lieu of soil testing, apply 2 tons of 80-89 lime or equivalent per acre, applicable only to Practice Standards 327, Conservation Cover; and 342, Critical Area Planting..

SEEDBED PREPARATION AND SEEDING RECOMMENDATIONS

Conventional Seeding

The seed is broadcasted or drilled into a partial or clean seedbed.

For conventional seeding, prepare a fine, firm seedbed to a minimum of 3 inches. All tillage operations shall be performed across the general slope of the landscape.

The seedbed should contain enough fine soil particles to provide uniform shallow coverage of the seed as well as contact with moisture and nutrients. It is important to have a firm seedbed. As a minimum, cultipack or roll before and after seeding. When walking on a properly prepared seedbed, the depth of your footprints should not exceed ¼ inch. Do not use heavy, no-till type drills to seed on conventionally prepared seedbeds. Heavy drills tend to sink into the soil and seeding depth will be difficult to control. Do not plant seed deeper than ¼ inch. The use of a drag or similar equipment after seeding is not advised when small seeds are included in the mixture.

Advantages:
- May incorporate nutrients and soil amendments such as lime.
- Provides the opportunity to destroy perennial weeds.

Disadvantages:
- Soil erosion risk increases greatly.
- Erosion can wash away new seedlings or cover and smother the seedling with sediment.
- Higher field preparation cost.
- Annual weed competition can be greater.
- A nurse crop is often needed for erosion control and to suppress weed competition.
- Requires more trips across the field resulting in higher fuel cost.

No-Till Planting

No-till is the seeding of grasses and/or legumes in the absence of tillage using planting tools capable of drilling into an undisturbed soil surface and interseeding into existing herbaceous cover or prior-year crop residue.

No-Till Planting Into the Prior-Year Crop Residue

On cropland, leave the existing crop residue on the field without tillage. Soybean stubble is the preferred residue of choice. No-tilling into large amounts of non-fragile residue such as corn and small grain will reduce germination and seedling vigor. For spring weed control, when no-tilling introduced grasses and legumes, use a burndown chemical prior to or within four days after planting to kill weeds. Keep in mind that quackgrass and many broadleaf weeds are more consistently controlled when herbicides are applied early fall and a follow-up application in the spring.

Site Preparation for No-Till Interseeding Into Existing Grass Cover

Interseeding is a good way to improve existing stands of single species on fields utilized for pasture, wildlife, or idle land. Interseeding yields a mixture of grasses and legumes that gives the greatest benefit for wildlife or forage for livestock.

Land that has been in grass for many years usually has a thick layer of residue on the soil surface. In order to prepare a good seedbed for no-till interseeding and improve herbicide effectiveness, the litter or residue must be removed or altered. Existing vegetation shall be evaluated prior to seeding and a

management strategy developed to limit competition with new seedings. Reducing competition of the existing stand is important for a successful interseeding. Options to prepare existing cover for no-till interseeding include herbicide application, grazing, mowing, haying, or burning the site.

- Mowing: Mow the site using a rotary mower or flail chopper to a height of 3 inches. The timing and type of mowing equipment selected shall be planned to uniformly distribute the mowed plant material over the field surface. Mowing should be planned before any known weeds produce mature seeds.

- Burning: Carry out a Prescribed Burn according to the requirements outlined in the plan. The burn plan must address safety concerns and document the appropriate timing for the burn to provide the maximum control of weeds and protect any existing desirable plants on the site.

- Haying: Harvest a hay crop from the site the year before the planned interseeding. The timing of the hay harvest should be planned to minimize the amount of re-growth that will occur prior to interseeding.

- Grazing: Graze the site immediately prior to herbicide application, if herbiciding is planned. The timing and duration of the grazing must be managed to prevent erosion or damage to sensitive environmental areas, but must be intensive enough to significantly reduce the existing vegetative cover. If possible, begin the grazing at a time of the year when the standing vegetation is green and growing to increase the palatability and feed value of the forage, resulting in a more uniform removal of the vegetation by grazing animals.

- Herbicide Application: Apply approved herbicides to kill or suppress existing vegetation and control weeds. The effectiveness of herbicides improves when combined with haying, grazing, or mowing.

A drill equipped for no-till planting shall be used to allow consistent penetration of disk openers.

Advantages:
- Soil erosion is minimized.
- Reduced energy usage.
- No nurse crop is required.
- Greater moisture availability due to lack of tillage.
- Drilling can occur under adverse conditions.
- Carbon sequestration improves.
- Seed placement is ensured.

Disadvantages:
- Increased herbicide use.
- No-till drill required.
- Nutrients and soil amendments cannot be incorporated.

To ensure success of the interseeding, regardless of the options selected above, the field will need constant maintenance by mowing and removal of the existing vegetation until the interseeded planting becomes well-established and can survive the competition of the existing vegetation.

Dormant Seeding

Seed is broadcasted and incorporated, no-tilled, or drilled into a partial or clean seedbed after the growing season and before freeze-up. The seed remains dormant until the following spring.

Seedbed preparation and conditions are similar to conventional seeding. A firm seedbed is strongly recommended for broadcast dormant seedings. Seed broadcasted without incorporation is more risky, and relies on snow, freezing, and thawing to embed seed. The approved dormant seeding date for introduced species statewide is November 1.

Advantages:
- Occurs at a time of year when labor is more available.
- Seedlings take advantage of early spring moisture.
- Soil erosion is minimized.

Disadvantages:
- Seeding rates should be increased.

Refer to the section, “Criteria for Seed Mixture Development,” to determine when dormant seeding is allowed.

Frost Seeding

Broadcast seed on top of existing stands of introduced grass species or on seedbeds prepared the previous fall. Frost seed in February to mid March when the freezing and thawing cycle is active to help incorporate the seed into the soil.

The soil surface is usually “honeycombed” with small cracks at this time during the year. Frost seeding SHALL NOT occur on fields covered with

solid ice or a snow cover depths greater than 2 inches. Frost seeding must be completed before the freeze and thaw cycle ends. Do not frost seed into winter wheat or winter rye cover crops. All commonly grown legumes can be frost seeded because of their greater seedling vigor, such as red clover, alsike clover, and white ladino clover. Alfalfa and birdsfoot trefoil are approved for frost seeding; however, these species at times are less successful and slower to establish.

Advantages:
- No special drill is required.
- Labor is more available in late winter.

Disadvantages:
- Stand establishment is normally less successful, particularly in dry years.
- The seeding rate must be increased.

Frost seeding is only recommended under the following conditions:

- legumes seeded into established pastures,
- seedbeds prepared in fall, and
- undisturbed sites that consist of fragile residue such as soybean stubble.

Frost seeding is not recommended in undisturbed non-fragile residue such as corn and small grain.

Refer to the section, "Criteria for Seed Mixture Development," to determine when frost seeding is allowed.

STAND EVALUATION

To determine the overall success of the planting, a monitoring program should consider the number of seedlings across a field, seeding vigor, height, and growth stage and overall diversity of plants. Preliminary evaluation of spring and fall plantings should be completed four to six weeks after germination. This inspection of seeding density and distribution can be combined with an inspection for post planting weed control recommendations.

Several methods can be used to evaluate stand adequacy. Density measurements are taken by counting the number of individual plants and species within a standard one foot quadrant. As a general rule, there should be at least two sample sites per acre.

Table 6
Plant Density and Stand Evaluation One Year After Planting

Average Seedlings/Ft^2	Action/Condition
<1	Reseed.
1-3	Wait and re-evaluate next year.
4-5	Successful planting.
>6	Very good.

COVER MAINTENANCE

Weed Control - Establishment Year

Weed control during the establishment year is required to ensure survival of the new permanent seeding. Weed control during the seeding year will have precedent over nesting season concerns and is allowed until stand is established. Activities should be minimized when possible during the nesting season.

Mow early before weeds have a chance to smother out the new seeding. Mow before the companion crop or undesirable vegetation reach boot stage. Mow introduced plantings to a height of no less than 4 inches. Depending on the weather, mowing every 2 or 3 weeks throughout the growing season may be required to increase the probability of a successful stand. In addition, approved herbicides may be used on introduced plantings for additional weed control.

Weed Control - Established Cover

Any planned maintenance after establishment, should be done before May 15 or after August 1 to protect nesting species and reduce disruption of nesting activities. The impact of any disturbance to existing cover on wildlife and threatened or endangered species must be assessed and mitigated to the extent practicable or as required by law. In the majority of situations, established plantings will only require spot treatment without disturbing the entire unit.

To control undesirable plants during the primary nesting season, utilize one or more of the following spot treatment options:

- Spot mowing can be used to control annual weeds and to suppress perennial weeds. Spot mowing must be done before the target plant produces viable seed and must continue throughout the growing season as needed. Spot mowing is not the most effective treatment

option for biennial and perennial weeds but can be used to contain these plants until other control treatments can be implemented.

- Spot treatment of herbicides is often necessary for controlling invasive plants in introduced plantings. Spot treatment should be timed to treat weeds during active growth periods. Effective herbicide spot treatment can prevent the target plants from setting seed and spreading and dominating introduced stands. NRCS staff is prohibited from making herbicide recommendations.

- Spot Treatment by hand pulling or digging can be an effective control if the entire root is removed from the soil. Hand pulling/digging is most effective in the spring when the soil is moist and loose from the winter freeze/thaw cycle.

REFERENCES

Curtis, J. T., 1959. The Vegetation of Wisconsin: an Ordination of Plant Communities. University of Wisconsin Press, Madison.

USDA NRCS, Wisconsin Field Office Technical Guide, Section IV, Conservation Practice Standards and Specifications.

USDA, NRCS Wisconsin Field Office Technical Guide (FOTG), Section III, Conservation Management Systems.

University of Wisconsin Extension Publication A1525, Perennial Forage Crop Variety Update for Wisconsin.

University of Wisconsin Extension Publication A2809, Nutrient Application Guidelines for Field, Vegetable and Fruit Crops.

University of Wisconsin Extension Publication A2100, Sampling Soils For Testing.

Wisconsin Administrative Code, Department of Agriculture, Trade and Consumer Protection, Chapter ATCP 20, Seed Labeling and Sale.

Wisconsin State Statutes, Chapter 94, Plant Industry, ss. 94.38 to 94.46.

Table 7
Wildlife Habitat Mixes

Seed Calculator Code*	Mixtures	Pounds PLS per Acre	Seeds per Square Foot	Moisture Regime
327-16A	Timothy	2.5	71	DM, M
	Smooth Bromegrass	3.0	9	
	Alfalfa	6.0	30	
327-16B	Timothy	2.0	56	M, WM, W
	Orchardgrass	2.0	30	
	Red Clover	5.0	32	
327-16C	Timothy	2.0	56	DM, M
	Orchardgrass	2.0	30	
	Alfalfa	6.0	30	
327-16D	Timothy	2.5	71	M, WM
	Smooth Bromegrass	3.0	9	
	Red Clover	5.0	32	
327-16E	Timothy	2.0	56	M, WM
	Smooth Bromegrass	2.0	6	
	Orchardgrass	1.0	15	
	Red Clover	5.0	32	
	White Ladino Clover	0.5	10	
324-16F	Timothy	2.0	56	M, WM
	Orchardgrass	2.0	30	
	Red Clover	5.0	32	
	White Ladino Clover	0.5	10	
327-16G	Timothy	2.0	56	DM, M, WM
	Orchardgrass	2.0	30	
	Birdsfoot Trefoil	4.0	34	
327-16H	Tall Fescue	3.0	15	M, WM
	Red Clover	4.0	25	
	White Ladino Clover	1.0	20	
	Timothy	2.0	56	

*These codes represent the mixtures used in the Wisconsin Seed Calculator.

Table 8
Seeding Mixtures Suitable for Critical Area Plantings

Seed Calculator Code*	Moisture Regimes	Common Name	Scientific Name	Seeding Rate in lb/ac PLS	Seeding Rate in Seeds/Ft^2 PLS	Capacity Retardance	Type of Site**
342-1	*Dry-Mesic* and *Mesic* Sites	Smooth Bromegrass	Bromus inermis	10	31	B	EB, WW, CSB
		Creeping Red Fescue	Festuca rubra	3	24		
		Alfalfa	Medicago sativa	3	15		
		Red Clover	Trifolium pratense	3	19		
		Kentucky bluegrass	Poa pratensis	1.5	75		
342-2	Dry-Mesic and Mesic Sites***	Smooth Bromegrass	Bromus inermis	15	47	B	EB, WW
		Alfalfa	Medicago sativa	7	35		
		Timothy	Phleum pratense	3	85		
342-3	Dry-Mesic and Mesic Sites	Kentucky bluegrass	Poa pratensis	1	50	B	CSB, EB, WW
		Smooth Bromegrass	Bromus inermis	10	31		
		Timothy	Phleum pratense	2	56		
		Tall Fescue	Schedonorus arundinaceus	2	10		
		Perennial Ryegrass	Lolium perenne	5	26		
342-4	Dry-Mesic and Mesic Sites	Smooth Bromegrass	Bromus inermis	20	62	B	EB, WW, CSB
		Creeping Red Fescue	Festuca rubra	5	40		
		Alfalfa	Medicago sativa	8	40		
		Red Clover	Trifolium pratense	4	25		
342-5	Dry-Mesic and Mesic Sites	Smooth Bromegrass	Bromus inermis	30	93	B	EB, WW, CSB
		Alfalfa	Medicago sativa	14	70		
342-6	Dry-Mesic, Mesic, and Wet Mesic Sites	Smooth Bromegrass	Bromus inermis	7	22	B	CSB, EB, WW
		Timothy	Phleum pratense	2	56		
		Creeping Red Fescue	Festuca rubra	1	8		
		Kentucky Bluegrass	Poa pratensis	1	50		
		Perennial Ryegrass	Lolium perenne	3	16		
		Red Clover	Trifolium pratense	3	19		
342-7	Mesic Sites***	Smooth Bromegrass	Bromus inermis	7	22	B	EB, WW
		Creeping Red Fescue	Festuca rubra	2	16		
		Kentucky bluegrass	Poa pratensis	3	150		
		Birdsfoot trefoil	Lotus corniculatus	2	17		
342-8	Mesic Sites***	Smooth Bromegrass	Bromus inermis	15	47	B	WW, EB
		Creeping Red Fescue	Festuca rubra	2	16		
		Kentucky Bluegrass	Poa pratensis	2	100		
342-9	Mesic Sites***	Kentucky Bluegrass	Poa pratensis	3	150	C	WW, EB
		Creeping Red Fescue	Festuca rubra	4	32		
		Perennial Ryegrass	Lolium perenne	10	52		
342-10	Mesic Sites	Smooth Bromegrass	Bromus inermis	14	43	B	EB, WW, CSB
		Timothy	Phleum pratense	3	85		
		Red Clover	Trifolium pratense	3	19		
		Perennial Ryegrass	Lolium perenne	4	21		
342-11	Mesic Sites	Smooth Bromegrass	Bromus inermis	32	99	B	EB, WW
		Creeping Red Fescue	Festuca rubra	8	64		

Seed Calculator Code*	Moisture Regimes	Common Name	Scientific Name	Seeding Rate in lb/ac PLS	Seeding Rate in Seeds/Ft^2 PLS	Capacity Retardance	Type of Site**
342-12	Mesic Sites	Kentucky bluegrass	Poa pratensis	4	200	C	EB, WW
		Creeping Red Fescue	Festuca rubra	3	24		
342-13	Mesic Sites	Smooth Bromegrass	Bromus inermis	14	43	B	EB, WW, CSB
		Timothy	Phleum pratense	4	113		
		Red Clover	Trifolium pratense	3	19		
342-14	Mesic Sites	Smooth Bromegrass	Bromus inermis	15	43	B	EB, WW, CSB
		Timothy	Phleum pratense	3.5	99		
		Alsike Clover	Trifolium hybridum	2	32		
342-15	Mesic Sites	Smooth Bromegrass	Bromus inermis	15	47	B	EB, WW
		Timothy	Phleum pratense	3.5	99		
		Birdsfoot trefoil	Lotus corniculatus	3	26		
342-16	Wet Mesic Sites	Tall Fescue	Schedonorus arundinaceus	5	26	B	CSB, EB, WW
		Timothy	Phleum pratense	3	85		
		Perennial Ryegrass	Lolium perenne	3	16		
		Red Clover	Trifolium pratense	3	19		
		Smooth Bromegrass	Bromus inermis	6	19		
		Kentucky Bluegrass	Poa pratensis	2	100		
342-17	Wet Mesic Sites	Redtop	Agrostis gigantea	1	115	C	WW, CSB, EB
		Timothy	Phleum pratense	3	85		
		Red Clover	Trifolium pratense	5	32		
342-18	Wet Mesic Sites	Timothy	Phleum pratense	3	85	B	WW, CSB, EB
		Perennial Ryegrass	Lolium perenne	3	16		
		Red Clover	Trifolium pratense	3	19		
		Smooth Bromegrass	Bromus inermis	6	19		
		Kentucky Bluegrass	Poa pratensis	2	100		
342-19	*Wet Mesic* Sites	Redtop	Agrostis gigantea	1	115	C	WW, CSB, EB
		Timothy	Phleum pratense	1	28		
		Red Clover	Trifolium pratense	4	25		
		Kentucky Bluegrass	Poa pratensis	2	100		
342-20	*Wet* Sites***	Redtop	Agrostis gigantea	2	229	C	WW
		Alsike Clover	Trifolium hybridum	2	31		
		Kentucky Bluegrass	Poa pratensis	2	100		
342-21	Wet Mesic Sites	Redtop	Agrostis gigantea	3	344	C	WW
		Alsike Clover	Trifolium hybridum	3	47		

*These codes represent the mixtures used in the Wisconsin Seed Calculator.
**EB = Embankments; WW = Waterways; CSB = Channel and Streambanks
***Mixtures can be used on other site descriptions when not listed.

Table 9
Introduced Pollinator Habitat Mixes

Seed Calculator Code*	Mixtures	Pounds PLS per Acre	Seeds per Square Foot	Moisture Regime
327-17A	Timothy	0.5	14	DM, M
	Orchardgrass	1.0	15	
	Alfalfa	4.0	20	
	White Ladino Clover	1.5	30	
327-17B	Tall Fescue	3.0	16	WM, W
	Perennial Ryegrass	3.0	16	
	Red Clover	4.0	25	
	Alsike Clover	1.5	23	

*These codes represent the mixtures used in the Wisconsin Seed Calculator.

Table 10
Forage and Hayland Planting Recommendations

Forage Suitability Group	Seed Calculator Code[1]	Species	Lbs. PLS per Acre	Seeds per Square Foot
Hay Crop				
Group 1: Low water holding capacity, seasonal high water table.	512-H1	Red Clover Tall Fescue Timothy	6 6 1	38 31 28
Group 2: Low water holding capacity, 0 to 12 percent slopes.	512-H2	Alfalfa	12	60
	512-H3	Alfalfa Smooth Bromegrass	10 4	50 12
Group 3: Low water holding capacity, greater than 12 percent slopes.	512-H3	Alfalfa Smooth Bromegrass	10 4	50 12
Group 4: Moderate water holding capacity, seasonal high water table.	512-H4	Alsike Clover Tall Fescue Timothy	3 6 1	47 31 28
Group 5: Moderate water holding capacity, less than 12 percent slopes.	512-H3	Alfalfa Smooth Bromegrass	10 4	50 12
Group 6: Moderate water holding capacity, greater than 12 percent slopes.	512-H3	Alfalfa Smooth Bromegrass	10 4	50 12
Group 7: High water holding capacity, seasonal high water table.	512-H4	Alsike Clover Tall Fescue Timothy	3 6 1	48 31 28
Group 8: High water holding capacity, less than 12 percent slopes.	512-H5	Alfalfa Timothy	8 2	40 56
Group 9: High water holding capacity, greater than 12 percent slopes.	512-H6	Alfalfa Smooth Bromegrass Timothy	8 4 1	40 12 28

Forage Suitability Group	Seed Calculator Code[1]	Species	Lbs. PLS per Acre	Seeds per Square Foot
Group 10: Organic soils, wetlands, ledge outcrop.	---	Planting not feasible.	---	---
Rotation and Permanent Pastures				
Group 1: Low water holding capacity, seasonal high water table.	512-PP1	Alsike Clover Meadow Fescue	2 6	31 31
	512-PP1A	Alsike Clover Orchardgrass	2 3	31 45
	512-PP1B	Alsike Clover Timothy	2 1.5	31 42
Groups 2: Low water holding capacity, 0 to 12 percent slopes.	512-PP2	Alfalfa Smooth Bromegrass Orchardgrass	6 4 4	30 12 60
Group 3: Low water holding capacity, greater than 12 percent slopes.	512-PP2	Alfalfa Smooth Bromegrass Orchardgrass	6 4 4	30 12 60
Group 4: Moderate water holding capacity, seasonal high water table.	512-PP4	Alsike Clover Meadow Fescue Timothy	2 6 1	31 31 28
	512-PP4B	Birdsfoot Trefoil Meadow Fescue Timothy	3 6 1	26 31 28
Group 5: Moderate water holding capacity, less than 12 percent slopes.	512-PP5	Red Clover White Ladino Clover Orchardgrass Meadow Fescue	5 1 3 6	32 20 45 31
	512-PP5B	Red Clover White Ladino Clover Festulolium Meadow Fescue	5 1 7 6	32 20 36 31
Group 6: Moderate water holding capacity, greater than 12 percent slopes.	512-PP6	Red Clover Orchardgrass Smooth Bromegrass	5 4 4	32 60 12
Group 7: High water holding capacity, seasonal high water table.	512-PP7	Alsike Clover Meadow Fescue Timothy Redtop	2 6 1 1	31 31 28 115
	512-PP7B	Birdsfoot Trefoil Meadow Fescue Timothy Redtop	3 6 1 1	26 31 28 115
Group 8: High water holding capacity, less than 12 percent slopes.	512-PP8	White Ladino Clover Orchardgrass Meadow Fescue	1 3 6	20 45 31
	512-PP8B	White Ladino Clover Festulolium Meadow Fescue	1 7 6	20 36 31
Group 9: High water holding capacity, greater than 12 percent slopes.	512-PP9	Red Clover Orchardgrass Meadow Fescue	5 3 6	32 45 31

Forage Suitability Group	Seed Calculator Code[1]	Species	Lbs. PLS per Acre	Seeds per Square Foot
Group 10: Organic soils, wetlands, ledge outcrop.	---	Planting not feasible.	---	---
Pasture for Horses/Sheep				
Groups 1, 4, 7: Seasonal high water table.	512-PHS1	Kentucky Bluegrass Meadow Fescue White Ladino Clover	4 4 1	200 21 20
	512-PSH1A	Kentucky Bluegrass Meadow Fescue Birdsfoot Trefoil	4 4 3	200 21 26
Groups 5, 6, 7, & 8: Moderate to high water holding capacity.	512-PHS2	Kentucky Bluegrass Festulolium White Ladino Clover	2 7 1	100 36 20
	512-PHS2A	Kentucky Bluegrass Perennial Ryegrass White Ladino Clover	2 7 1	100 36 20
Groups 2 & 3: Low water holding capacity.	512-PHS3	Alfalfa Orchardgrass	6 3	30 45
Pasture for Hogs				
		Alfalfa OR Red clover Forage Rape OR Oats OR Sudangrass OR Hybrid Pearl Millet	12 10 25 35 2 bu/ac	60 63 --- --- ---
Summer Annuals for Supplemental Forage				
		Hybrid Pearl Millet Winter rye (fall planted) Forage Rape Forage Turnips and Swedes Rape and Kale	25 1½ - 2 bu/ac 4 bu/ac 1½-2 lbs./ac 4 lbs./ac	--- --- --- --- ---

[1]These codes represent the mixtures used in the Wisconsin Seed Calculator.