

Permit Fact Sheet

General

Permittee Name and Address:	Seneca Foods Mayville 500 S CLARK ST MAYVILLE WI 53050	
Permit Number:	WI-0050822-07-0	
Proposed Permit Term:	June 1, 2016 through March 31, 2021	
Discharge Location:	Outfall 013 North drain tile is located in the SW ¼ of NE ¼ Section 34 T12N, R16E, Dodge County. Outfall 014 South drain tile is located in the NE ¼ of the SE ¼ of Section 34 T12N, R16E, Dodge County. Both Outfalls are located on approved Spray Irrigation fields located North of Raachs Hill Rd, and West of Hwy V. Approved Spray Irrigation fields are located in Sections 23, 26, 27, and 34, T12N, R16E, Dodge County. See Attachment 1 for map.	
Receiving Water:	Unnamed tributary to the East Branch of the Rock River and unnamed wetlands in the Rock River basin. Groundwaters of the Rock River Drainage Basin via Spray Irrigation.	
StreamFlow (Q _{7,10}):	Low flow 7Q10 of the unnamed ditch to the East Branch of the Rock River at the discharge is 0 cfs.	
Stream Classification:	Warmwater sport fish community (Outfall 013), Limited Aquatic Life (Outfall 014)	
Design Flow(s)	Average Annual Flow	Outfall 013: 0.02 mgd (2013) Outfall 014: 0.095 mgd (2014)

Facility and Discharge Description

Seneca Foods Mayville (Seneca) is an existing discharger. Seneca cans peas, corn, and mixed vegetables. Production – pack season – at this facility is June through October. During this time period the facility operates 24-hours a day, 7 days a week. Process wastewater and can cooling water are spray irrigated via three force mains. Wells are located around separate zones of the spray irrigation fields to monitor the groundwater. Byproduct solids are hauled off site. Process wastewater, byproduct solids, and silage leachate can be land applied under this permit.

Outfall 013 – also known as North Drain Tile – is located in Spray Field G. This drain tile is closed after the pack season and reopened in the spring prior to the start of the pack season to allow the field to dry out. No samples are taken when the drain tile is closed. Samples are taken at a reduced frequency (monthly) when the drain tile is open but spray fields are not active. Sampling data at this outfall has indicated that BOD exceedances are likely and therefore Seneca has implemented a process of recirculating the water discharged from the drain tile back to the spray field therefore, there is typically no discharge to the unnamed tributary. This permit authorizes discharge to the unnamed tributary when Seneca is able to meet effluent limitations and therefore includes required monitoring and limitations. Samples are taken from the pump line prior to discharge to the waterway after a sump. Discharge from this outfall includes rainwater, groundwater, and treated wastewater or any combination of these waters.

Outfall 014 – also known as South Drain Tile – is located in Spray Field H. This drain tile is also closed after the pack season and reopened in the spring prior to the pack season. This drain tile drains to an agricultural ditch that becomes a grassed swale prior to discharge to a wetland complex that eventually discharges to a surface water. The Department

completed an assessment of the discharge from Outfall 014 and determined that this outfall discharges to a wetland. Discharge from this outfall includes rainwater, groundwater, and treated wastewater or any combination of these waters. Flow is monitored by hand using the bucket method currently. Samples are taken from the outfall pipe after a sump prior to discharge to the waterway. The permittee reports zero when there is no flow and is not required to monitor and report when the tile is closed.

There are no planned changes to the treatment train or increases in flow to the facility during the proposed permit term.

Seneca submitted a permit application on December 7, 2006 and an updated application in 2015 that has been accepted by the Department.

Sampling Point Designations

Sample Point Designation		
Sample Point Number	Discharge Flow, Units, and Averaging Period	Sample Point Location, WasteType/sample Contents and Treatment Description (as applicable)
013	0.02 mgd (2013)	Surface water discharge to an Unnamed Tributary of the East Branch of the Rock River: North drain tile discharge located in Spray Field G. Sample taken from the pump valve prior to discharge to the waterway
014	0.095 mgd (2014)	Surface water discharge to a Wetland: South drain tile discharge located in Spray Field H. Sample taken at outfall pipe immediately prior to discharge to waterway.
001	0.150 mgd (2014)	Land Treatment: Discharge from outfall 001 shall be limited to process wastewater. Samples shall be collected prior to discharging to the 179 acre spray irrigation system located at the SW 1/4 , SW 1/4 of Section 23, and the NW 1/4, NW1/4 of section 26 and the SW1/4 or the NE1/4 of section 27 and the SE1/4 of section 27 and the SW1/4,NW1/4 of section 26 and the SE1/4,NE1/4 of section 34 and the NE1/4, SE1/4 of section 34 all in T12N,R16E, Dodge County.
003	3.47 million gallons (2015)	Land Spreading of Liquid Wastes (silage leachate and process waste water)
004	57,860 tons (2015)	Landspreading of Byproduct Solids

Sample Point Designation For Groundwater Monitoring Systems			
System	Sample Pt Number	Well Name	Comments
the central spray fields C, D, and E	806	W-106	
	808	W-108	
	811	W-111	

Sample Point Designation For Groundwater Monitoring Systems

System	Sample Pt Number	Well Name	Comments
	813	W-113 BACKGRD	Background well for Central Spray Fields C, D, and E; and North Spray Fields B and F.
the north spray fields B and F	816	W-103	
	817	W-104	
	818	W-105	
	819	W-115	
the south spray fields G and H	886	W-116	Background Well for South Spray Fields G and H.
	887	W-117	
	888	W-118	
	889	W-119	
	890	W-120	
	891	W-121	

1 Surface Water - Proposed Monitoring and Limitations

1.1 Rock River Total Maximum Daily Load

A total maximum daily load (TMDL) was developed for the Rock River Basin to determine the maximum amounts of phosphorus and sediment that can be discharged to protect and improve water quality. The Rock River Basin's TMDL was approved by the Environmental Protection Agency (EPA) in September 2011. These final effluent limits were derived from and comply with the applicable water quality criterion and are consistent with the assumptions and requirements of the EPA-approved WLA for the Rock River. The entire report can be found at: http://dnr.wi.gov/topic/TMDLs/RockRiver/Final_Rock_River_TMDL_Report_with_Tables.pdf. The proposed permit includes limitations and requirements necessary to implement the recommendations of the TMDL. For specific limits see below for Outfalls 013 and Outfall 014.

1.2 Sample Point Number: 013- North Drain Tile

Monitoring Requirements and Limitations

Parameter	Limit Type	Limit and Units	Sample Frequency	Sample Type	Notes
Flow Rate		gpd	Weekly	Estimated	Monitoring monthly when not spraying.
BOD5, Total	Daily Max	10 mg/L	Weekly	Grab	Monitoring monthly when

Monitoring Requirements and Limitations					
Parameter	Limit Type	Limit and Units	Sample Frequency	Sample Type	Notes
					not spraying.
BOD5, Total	Monthly Avg	10 mg/L	Weekly	Grab	Monitoring monthly when not spraying.
Suspended Solids, Total	Daily Max	40 mg/L	Weekly	Grab	Monitoring monthly when not spraying.
Suspended Solids, Total	Monthly Avg	40 mg/L	Weekly	Grab	Monitoring monthly when not spraying.
Suspended Solids, Total	Daily Max	5.67 lbs/day	Weekly	Calculated	Monitoring monthly when not spraying. See TSS Limitations in Subsection below.
Suspended Solids, Total	Monthly Avg	3.46 lbs/day	Weekly	Calculated	Monitoring monthly when not spraying. See TSS Limitations in Subsection below.
Phosphorus, Total	Monthly Avg	0.7 mg/L	Weekly	Grab	Monitoring Monthly when not spraying. Note that this is an interim limit. See the Phosphorus Limitation subsection in the permit for the final water quality based phosphorus limit effective at the end of the compliance schedule.
Phosphorus, Total		lbs/day	Weekly	Calculated	See phosphorus subsections in the permit for final limits. Calculate the daily mass discharge of phosphorus in lbs/day on the same day phosphorus sampling occurs. Daily mass (lbs/day) = daily concentration (mg/L) x daily flow (MGD) x 8.34.
pH Field	Daily Min	6.0 su	Weekly	Grab	Monitoring monthly when not spraying.
pH Field	Daily Max	9.0 su	Weekly	Grab	Monitoring monthly when not spraying.
Dissolved Oxygen	Daily Min	7.0 mg/L	Weekly	Grab	Monitoring monthly when not spraying.

Monitoring Requirements and Limitations					
Parameter	Limit Type	Limit and Units	Sample Frequency	Sample Type	Notes
Chloride		mg/L	Weekly	Grab	Monitoring monthly when not spraying.
Acute WET		TUa	See Permit Note	24-Hr Flow Prop Comp	See WET testing Subsection
Chronic WET		rTUc	See Permit Note	24-Hr Flow Prop Comp	See WET testing Subsection

1.2.1 Changes from Previous Permit

Outfall 013 was evaluated based on the data submitted on the DMRs. The facility has been recirculating the flow from outfall 013 back onto the spray irrigation fields prior to discharge to the surface water. The permittee reports monthly samples when the spray fields are active but there is no discharge because of recirculation. These monthly samples during recirculation are taken from the pump line prior to recirculation. Monthly average limits were added for BOD and TSS. Daily minimum DO limits were added. Mass limits were added for TSS and TP. TKN monitoring and ammonia limits were removed, acute and chronic WET tests were increased, and pH limits were added.

1.2.2 Explanation of Limits and Monitoring Requirements

Water Quality Based Limits and WET Requirements were included per the WQBEL memo dated February 29, 2016 by Nasrin Mohajerani.

Flow Rate: Flow rate is monitored at Outfall 013 by documenting pump run time. The permittee recirculates flow to the spray fields from the sump prior to discharge to the stream therefore no discharge occurs during the majority of the year. When the wastewater is recirculated and the spray irrigation fields are active monthly monitoring is required for all parameters.

BOD: BOD limitations are expressed as daily maximum and monthly average for industrial permittees. The BOD limits are carried over from the previous permit and were set based on the receiving water classification of Warm Water Sport Fish with consideration of flow in the receiving water per 40 CFR 122.45(d).

Total Suspended Solids: TSS limitations are expressed as daily maximum and monthly average for industrial permittees were required to comply with the Rock River TMDL, and were derived consistent with the assumptions and requirements of the EPA-approved WLA for the Rock River. Since the facility can easily meet these new mass limits of 5.67 lbs/day as a daily max and 3.46 lbs/day as a monthly average, no compliance schedule is included. These limits are in addition to the concentration limits for suspended solids of 40 mg/L monthly average and 40 mg/L daily maximum.

Total Phosphorus: Revisions to the administrative rules for phosphorus discharges took effect on December 1, 2010. Details may be found at: <http://dnr.wi.gov/topic/surfacewater/phosphorus.html>. Mass limits were calculated to comply with the Rock River TMDL, and were derived consistent with the assumptions and requirements of the EPA-approved WLA for the Rock River. Limits for the permit were determined using the code changes and the provision of the TMDL percent reduction required for the reach of waterway Seneca Foods Mayville discharges to. The final effluent limits for phosphorus are expressed as monthly averages. The facility currently treats for phosphorus via land treatment but cannot meet the final TP limits year round.

Since Seneca is unable to immediately achieve the proposed WQBELs based on existing operation, a schedule of compliance is appropriate and necessary pursuant to s. NR 217.17, Wis. Adm. Code. A lengthy compliance schedule has been included because the permittee will need a significant amount of time to meet the stringent phosphorus water quality based effluent limits (WQBEL) contained in the permit. The overall compliance schedule takes place over a 9 year time

period. Please see compliance schedule specifics in the Schedules section. Because a phosphorus compliance schedule was granted, an interim phosphorus limit was also calculated based on current effluent quality to prevent backsliding during the term of the permit. The highest reported value of 0.7 mg/L is included as the interim limit. The approved total phosphorus TMDL mass limits for this permittee was calculated to be 0.03 lbs/day. The calculation methods are provided in the February 29, 2016 WQBEL memo.

pH: Standard pH limitations were included per ch. NR 102, Wis. Adm. Code.

Dissolved Oxygen: The DO limit of 7 mg/L daily minimum is included because this value was used in the calculation of the BOD limit to ensure attainment of the water quality criteria in ch. NR 102, Wis. Adm. Code, for fish and aquatic life.

Acute and Chronic WET: Acute and Chronic WET testing is required based on historic WET data and chapter 1.3 of the WET guidance. The WET testing frequency is increased from the previous permit term.

1.3 Sample Point Number: 014- South Drain Tile

Monitoring Requirements and Limitations					
Parameter	Limit Type	Limit and Units	Sample Frequency	Sample Type	Notes
Flow Rate		gpd	Weekly	Grab	Monitoring monthly when not spraying.
BOD5, Total	Daily Max	40 mg/L	Weekly	Grab	Monitoring monthly when not spraying.
BOD5, Total	Monthly Avg	20 mg/L	Weekly	Grab	Monitoring monthly when not spraying.
Suspended Solids, Total	Daily Max	40 mg/L	Weekly	Grab	Monitoring monthly when not spraying.
Suspended Solids, Total	Monthly Avg	20 mg/L	Weekly	Grab	Monitoring monthly when not spraying.
Suspended Solids, Total		lbs/day	Weekly	Calculated	Calculate the daily mass discharge of TSS in lbs/day on the same day phosphorus sampling occurs. Daily mass (lbs/day) = daily concentration (mg/L) x daily flow (MGD) x 8.34.
Phosphorus, Total		mg/L	Weekly	Grab	Monitoring monthly when not spraying.
Phosphorus, Total		lbs/day	Weekly	Calculated	Calculate the daily mass discharge of phosphorus in lbs/day on the same day phosphorus sampling occurs. Daily mass (lbs/day) = daily

Monitoring Requirements and Limitations					
Parameter	Limit Type	Limit and Units	Sample Frequency	Sample Type	Notes
					concentration (mg/L) x daily flow (MGD) x 8.34.
pH Field	Daily Max	9.0 su	Weekly	Grab	Monitoring monthly when not spraying.
pH Field	Daily Min	6.0 su	Weekly	Grab	Monitoring monthly when not spraying.
Dissolved Oxygen	Daily Min	4.0 mg/L	Weekly	Grab	Monitoring monthly when not spraying.
Nitrogen, Ammonia (NH3-N) Total		mg/L	Weekly	Grab	Monitoring calendar year 2019 only. Monitoring monthly when not spraying.
Chloride		mg/L	Weekly	Grab	Monitoring calendar year 2019 only. Monitoring monthly when not spraying.

1.3.1 Changes from Previous Permit

Outfall 014 was not included in the previous permit. The facility routinely discharges from Outfall 014 during the pack season. This outfall discharges to a wetland and therefore water quality based effluent limitations (WQBELs) were calculated based on the waterway classification of Limited Aquatic Life as a default. This is standard default for wetland surface water discharges.

1.3.2 Explanation of Limits and Monitoring Requirements

Water Quality Based Limits and WET Requirements were included per the WQBEL memo dated February 29, 2016 by Nasrin Mohajerani.

Flow Rate: Flow rate is monitored at Outfall 014 by hand. The permittee should report zero on the DMR when the discharge is zero. During the winter the drain tile is closed and therefore no flow monitoring is completed. The permittee should leave the DMR blank when the drain tile is closed.

BOD: BOD limitations are expressed as daily maximum and monthly average for industrial permittees. The BOD limits were set based on the receiving water classification of Limited Aquatic Life which is a default for discharges to wetlands.

Total Suspended Solids: TSS limitations are expressed as daily maximum and monthly average for industrial permittees were required to comply with the Rock River TMDL, and were derived consistent with the assumptions and requirements of the EPA-approved WLA for the Rock River. Given the small effluent flow volume at this time, and the wetland complex, the Department also finds that there is no potential for effluent to enter into the stream adjacent to the wetland complex. Therefore, current discharge at outfall 014 has no potential to cause or contribute to an impairment in the adjacent stream, or further downstream waters including the Rock River. For these reasons, TSS mass limitations are not included at this time. This evaluation would need to be reconsidered if the effluent flows at outfall 014 increase. These mass limit considerations are in addition to the concentration limits for suspended solids of 20 mg/L monthly average and 40 mg/L daily maximum.

Total Phosphorus: Revisions to the administrative rules for phosphorus discharges took effect on December 1, 2010. Details may be found at: <http://dnr.wi.gov/topic/surfacewater/phosphorus.html>. Mass limits were calculated to comply with the Rock River TMDL, and were derived consistent with the assumptions and requirements of the EPA-approved

WLA for the Rock River. Given the small effluent flow volume at this time, and the wetland complex, the Department also finds that there is no potential for effluent to enter into the stream adjacent to the wetland complex. Therefore, current discharge at outfall 014 has no potential to cause or contribute to an impairment in the adjacent stream, or further downstream waters including the Rock River. For these reasons, phosphorus mass limitations are not included at this time. This evaluation would need to be reconsidered if the effluent flows at outfall 014 increase.

pH: Standard pH limitations were included in compliance with ch. NR 104, Wis. Adm. Code.

Dissolved Oxygen: A dissolved oxygen daily minimum was included based on the receiving water classification of Limited Aquatic Life which is a default for discharges to wetlands per ch. NR 104, Wis. Adm. Code.

2 Land Treatment – Proposed Monitoring and Limitations

2.1 Sample Point Number: 001- SPRAY IRRIGATION

Monitoring Requirements and Limitations					
Parameter	Limit Type	Limit and Units	Sample Frequency	Sample Type	Notes
Flow Rate		MGD	Daily	Total Daily	Enter zeros for Flow Rate on the DMR for the days that no discharge occurs.
Hydraulic Application Rate	Monthly Avg	3,500 gal/ac/day	Monthly	Calculated	
BOD5, Total		mg/L	Weekly	Composite	
Chloride		mg/L	Weekly	Composite	
Nitrogen, Total Kjeldahl		mg/L	Weekly	Composite	
Nitrogen, Max Applied On Any Zone	Annual Total	300 lbs/ac/yr	Annual	Total Annual	Report the annual 'Nitrogen, Max Applied on Any Zone' on the December DMR each year. See the Nitrogen Loading Limitations Subsection.

2.1.1 Changes from Previous Permit:

The flow rate limitation was removed. A total annual maximum nitrogen applied per zone was added. The daily log and annual reporting requirements were changed to reflect current typical land treatment log and report requirements.

2.1.2 Explanation of Limits and Monitoring Requirements

Requirements for land treatment of industrial wastewater are determined in accordance with ch. NR 214, Wis. Adm. Code.

The permit proposes to continue a maximum irrigation volume limit of 1.0 inch/load cycle based on the past practice on the irrigation fields and field soil type. The monthly average hydraulic application rate is continued from the previous permit (3,500 gallons/acre/day). The proposed permit authorizes spray irrigation from May 1 to October 31. In the spring,

the soils have limited ability to absorb wastewater, and in the fall, there is little evapo-transpiration due to colder weather. The applied wastewater is meant to be stored in the top several feet of soil so that plants can absorb nutrients in the wastewater.

Process wastewater from vegetable cleaning, cutting, washing, blanching, canning and equipment sanitation is spray irrigated on grass covered fields near the processing plant. The wastewater discharge varies depending on the vegetable product being processed.

The proposed permit requires Seneca to monitor and report total annual nitrogen loadings to the spray irrigation fields. The permit contains new subsections that allow increased wastewater loading amounts if groundwater results demonstrate nitrogen losses in the treatment system. The maximum nitrogen loading limit for any calendar year shall be 600 lb/acre/year when the previous year’s monitoring results for all down-gradient monitoring wells demonstrate compliance with all nitrogen groundwater preventative action limits at the point of standards application.

The maximum nitrogen loading is reduced to 400 lbs/acre/year when the previous calendar year’s monitoring results for any down-gradient well shows two or more sampling events exceed any nitrogen groundwater preventative action limits at the point of standards application.

The maximum nitrogen loading limit for any calendar year shall be 300 lb/acre/year when the previous calendar year’s monitoring results for any down-gradient well shows two or more sampling events exceed any nitrogen Enforcement Standard at the point of standards application. The 300 lbs/acre/year loading value was chosen based on reed canary cover crops on the fields. If the field is planted in corn the maximum nitrogen loading is 165 lbs/ac/yr and mixed grass is 240 lbs/ac/yr. The Department may require further actions to comply with groundwater standard exceedances as specified in s. NR 140.24 and 140.26, Wis. Adm. Code.

3 Groundwater – Proposed Monitoring and Limitations

3.1.1 Groundwater Monitoring System for the north spray fields B and F

Location of Monitoring system: perimeter of the north spray fields

Wells to be Monitored: W-103, W-104, W-115, and W-113 BACKGRD

Well Used To Calculate PALs: W-113 BACKGRD

Enforcement Standard Wells: W-103, W-104, W-115

Parameter	Units	Preventative Action Limit	Enforcement Standard	Frequency
Depth To Groundwater	feet	*****	N/A	Quarterly
Groundwater Elevation	feet MSL	*****	N/A	Quarterly
Chloride Dissolved	mg/L	250	250	Quarterly
COD	mg/L	37	N/A	Quarterly
Nitrogen, Ammonia Dissolved	mg/L	0.97	9.7	Quarterly
Nitrogen, Nitrite + Nitrate (as N) Dissolved	mg/L	3.2	10	Quarterly
Nitrogen, Organic Dissolved	mg/L	2.3	N/A	Quarterly
pH Field	su	8.4	N/A	Quarterly
Solids, Total Dissolved	mg/L	940	N/A	Quarterly

Sulfate, Total	mg/L	150	250	Quarterly
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3.1.2 Groundwater Monitoring System for the central spray fields C, D, and E

Location of Monitoring system: perimeter of the central spray fields

Wells to be Monitored: W- 105, W-106, W-108, W-111, and W-113 BACKGRD

Well Used To Calculate PALs: W-113 BACKGRD

Enforcement Standard Wells: W-106, W-108, W-111

Parameter	Units	Preventative Action Limit	Enforcement Standard	Frequency
Depth To Groundwater	feet	*****	N/A	Quarterly
Groundwater Elevation	feet MSL	*****	N/A	Quarterly
Chloride Dissolved	mg/L	250	250	Quarterly
COD	mg/L	37	N/A	Quarterly
Nitrogen, Ammonia Dissolved	mg/L	0.97	9.7	Quarterly
Nitrogen, Nitrite + Nitrate (as N) Dissolved	mg/L	3.2	10	Quarterly
Nitrogen, Organic Dissolved	mg/L	2.3	N/A	Quarterly
pH Field	su	8.4	N/A	Quarterly
Solids, Total Dissolved	mg/L	940	N/A	Quarterly
Sulfate, Total	mg/L	150	250	Quarterly

3.1.3 Groundwater Monitoring System for the south spray fields G and H

Location of Monitoring system: perimeter of the south spray fields

Wells to be Monitored: W-116, W-117, W-118, W-119, W-120, W-121

Well Used To Calculate PALs: W-116 BACKGRD

Enforcement Standard Wells: W-117, W-118, W-119, W-120, W-121

Parameter	Units	Preventative Action Limit	Enforcement Standard	Frequency
Depth To Groundwater	feet	*****	N/A	Quarterly
Groundwater Elevation	feet MSL	*****	N/A	Quarterly
Chloride Dissolved	mg/L	140	250	Quarterly
COD	mg/L	32	N/A	Quarterly
Nitrogen, Ammonia Dissolved	mg/L	0.97	9.7	Quarterly

Nitrogen, Nitrite + Nitrate (as N) Dissolved	mg/L	3.9	10	Quarterly
Nitrogen, Organic Dissolved	mg/L	2.2	N/A	Quarterly
pH Field	su	8.4	N/A	Quarterly
Solids, Total Dissolved	mg/L	620	N/A	Quarterly
Sulfate, Total	mg/L	170	250	Quarterly

3.2 Changes from Previous Permit:

Submitted groundwater monitoring data recommended an Alternated Concentration Limit for Fields B and F for Chloride and Nitrogen, Nitrite+Nitrate and Sulfate. Also the PAL was recalculated for all the groundwater parameters for Fields B and F. For fields C, D, and E the Preventative Action Limits and Enforcement Standards were updated. Alternative Concentration Limit for Chloride and Nitrogen, Nitrite+Nitrate and Sulfate were also calculated. Fields G and H were similar with updated Preventative Action Limits and Enforcement Standards and Alternative Concentration limitations for Chloride and Nitrogen, Nitrite+Nitrate. Based on revisions to ch. NR 140, Wis. Adm. Code, the new ammonia Nitrogen PAL and Enforcement Standard was added to the permit. Sulfate PAL (ACL) and ES limitations were also added for all the fields. The background well for the North Spray Field has been re-evaluated and changed from W-105 (818) to W-113 (813). Well W-105 was changed to only monitor groundwater elevation and depth to groundwater quarterly.

3.3 Explanation of Limits and Monitoring Requirements

Groundwater limits and requirements are determined in accordance with ch. NR 140, Wis. Adm. Code. Indicator parameter Preventive Action Limit (PAL) values are established per s. NR 140.20 Wis. Adm. Code. Alternative Concentration Limits as allowed under s. NR 140.28 Wis. Adm. Code, are established on a case by case basis. The groundwater evaluation was reviewed and recently finalized on April 7, 2016 for this permit reissuance.

4 Land Application - Sludge/By-Product Solids (industrial only)

4.1 Sample Point Number: 003- Land Spreading of Liquid Waste

Monitoring Requirements and Limitations					
Parameter	Limit Type	Limit and Units	Sample Frequency	Sample Type	Notes
Flow Rate		gal/month	Monthly	Total Monthly	
BOD5, Total		mg/L	Monthly	Grab	
Nitrogen, Total Kjeldahl		mg/L	Monthly	Grab	
Chloride		mg/L	Monthly	Grab	
Phosphorus, Total		mg/L	Monthly	Grab	

Monitoring Requirements and Limitations					
Parameter	Limit Type	Limit and Units	Sample Frequency	Sample Type	Notes
Potassium, Total Recoverable		mg/L	Monthly	Grab	

4.1.1 Changes from Previous Permit:

The daily logs and annual reports were updated to the standard reports for industrial food processors. Monthly monitoring has been added for Flow Rate, Chloride, Phosphorus, and Potassium.

4.1.2 Explanation of Limits and Monitoring Requirements

The monitoring requirements are standard requirements for industrial food processors per ch. NR 214, Wis. Adm. Code. The permittee treats liquid wastewater with land treatment system but under this permit retains the option to direct land apply. The permittee currently uses Buske Trucking to haul liquid wastes to approved land application sites as reported in the 2015 permit application.

4.1 Sample Point Number: 004- Spreading of Byproduct Solids

Monitoring Requirements and Limitations					
Parameter	Limit Type	Limit and Units	Sample Frequency	Sample Type	Notes
Volume		tons/month	Monthly	Total Monthly	
Solids, Total		Percent	Annual	Grab	
Nitrogen, Total Kjeldahl		Percent	Annual	Grab	
Chloride		Percent	Annual	Grab	
Phosphorus, Total		Percent	Annual	Grab	

4.1.1 Changes from Previous Permit:

The daily logs and annual reports were updated to the standard reports for industrial food processors. Monthly volume monitoring has been added and annual chloride and phosphorus monitoring has been added.

4.1.2 Explanation of Limits and Monitoring Requirements

The monitoring requirements are standard requirements for industrial food processors. The permittee hauls treats byproduct solids off site but under this permit retains the option to direct land apply. The permittee currently sells all byproduct solids for animal feed per the 2015 permit application.

5 Compliance Schedules

5.1 Land Application Management Plan

Submit an updated land application management plan.

Required Action	Due Date
<p>Operating Requirements & Land Application Management Plan: All land application sites used for treatment of liquid waste, by-product solids, and/or industrial sludge shall be operated in accordance with a Department Approved Land Application Management Plan. The management plan shall be consistent with the requirements of this permit and ch. NR 214, Wis. Adm. Code.</p> <p>The plan shall specify information on pretreatment processes, site identification on plat and soil maps, aerial photographs, if available, description of all site limitations, vegetative cover management and removal, availability of storage, type of transporting and spreading vehicle, load and rest schedules, monitoring procedures, contingency plans for periods of adverse weather or odor or nuisance abatement and any other pertinent information.</p> <p>If operational changes are needed, the land application management plan shall be amended by submitting a written request to the Department for approval of such amendments.</p>	01/01/2017

5.1.1 Explanation of Compliance Schedules

An updated Land Application Management plan is a standard requirement in reissued permits. This plan includes the details for how Seneca will comply with the required standards.

5.2 Land Treatment Management Plan

Submit an updated land treatment management plan for the wastewater irrigation treatment system.

Required Action	Due Date
<p>Management Plan: Management Plan: Submit a management plan to optimize the land treatment system performance and demonstrate compliance with Wisconsin Administrative Code NR 214.</p> <p>The management plan shall be consistent with the requirements of this permit and ch. NR 214.14(5)(d), Wis. Adm. Code. The plan shall specify information on pretreatment processes, load and rest schedules, schedules maintenance, vegetation cover management and removal, scheduling of annual soil nutrient testing, operational strategies for periods of adverse weather, monitoring procedures, and any other pertinent information.</p>	01/01/2017

5.2.1 Explanation of Compliance Schedules

An updated Land Treatment Management Plan is a standard requirement in reissued permits with land treatment system. This plan includes the details for how Seneca will comply with the required standards. This is especially important for this permittee because of Outfalls 013 and 014, drain tiles in the spray irrigation fields. The plan should include the sampling protocol and reporting standards for sampling data for Outfall 013 and 014 as these data can be confusing.

5.3 COD Source Investigation for Groundwater Discharges

Submit a COD reduction Investigation and annual COD reduction updates for Wells 118 and 120.

Required Action	Due Date
<p>COD Source Investigation: The permittee shall complete and submit for Department review and approval a COD Source Investigation report for Wells 118 and 120. This report shall include at a minimum the potential sources of COD, a plan for identifying sources of COD, step toward controlling COD and attain the COD PAL. The report shall include a COD Reduction Plan (CRP) to evaluate new applicable source reduction measures (SRMs), evaluate SRMs previously implemented, and establish appropriate implementation activities for the SRMs. The report shall include a schedule</p>	01/31/2017

for implementing the selected SRMs and reevaluation of implemented SRMs.	
Annual Progress Report: Once the COD investigation and COD reduction plan (CRP) is approved by the Department, the permittee shall submit an annual progress report, under the authority of s. NR 205.07(1)(h), Wis. Adm. Code. If a SRM implementation date of an approved CRP is not met, this may constitute a violation of the permit. Submittal of the first annual progress report is required by the Date Due.	01/31/2018
Second Annual Progress Report: Submit progress report in implementing the COD reduction plan (CRP).	01/31/2019
Third Annual Progress Report: Submit progress report in implementing the COD reduction plan (CRP).	01/31/2020
Annual COD Reduction Reports Required After Permit Expiration: In the event that this permit is not reissued on time for an April 1, 2020 effective date, the permittee shall continue to submit annual COD reduction reports by January 31 of each year covering source reduction measures implemented and COD concentration and mass discharge trends for the previous calendar year (i.e., the annual report covering year 2020 shall be due January 31, 2021; the annual report covering calendar year 2021 shall be due January 31, 2022; etc.).	

5.3.1 Explanation of Compliance Schedules

The Groundwater evaluation recommended a COD reduction plan because of unexpected elevated COD reported data for Wells 118 and 120.

5.1 Chloride Source Reduction Measures (SRMs) for Groundwater Discharges

Submit a Chloride SRM plan and annual Chloride reduction updates.

Required Action	Due Date
Chloride Reduction Plan: The permittee shall complete and submit for Department review and approval a chloride reduction plan (CRP). The CRP is an initial step toward controlling chloride and ensuring compliance with chloride limits based on applicable groundwater standards. The CRP shall evaluate all applicable source reduction measures (SRMs) and establish appropriate implementation activities for the SRMs. The CRP shall include a schedule for implementing the selected SRMs.	01/31/2017
Annual Progress Report: Once the chloride reduction plan (CRP) is approved by the Department, the permittee shall submit an annual progress report, under the authority of s. NR 205.07(1)(h), Wis. Adm. Code. If a SRM implementation date of an approved CRP is not met, this may constitute a violation of the permit. Submittal of the first annual progress report is required by the Date Due.	01/31/2018
Second Annual Progress Report: Submit progress report in implementing the chloride reduction plan (CRP).	01/31/2019
Third Annual Progress Report: Submit progress report in implementing the chloride reduction plan (CRP).	01/31/2020
Fourth Annual Progress Report: Submit progress report in implementing the chloride reduction plan (CRP).	01/31/2021
Final Annual Progress Report: Submit progress report in implementing the chloride reduction plan (CRP).	

5.1.1 Explanation of Compliance Schedules

The groundwater evaluation recommended a chloride reduction plan.

5.2 Byproduct Solid Storage Pad and Leachate Containment Operation Plan

Report on by-product storage pads and leachate containments.

Required Action	Due Date
Storage Stack and Leachate Containment Standard Operations Plan: The permittee shall submit a report to the Department documenting compliance with the requirements of chs. NR 213 and 214, Wis. Adm. Code. This report shall include, at a minimum, review and inspection procedures completed by the permittee, timing of inspections, a sample inspection log, record retention procedures, and process used for facilities not in compliance with chs. NR 213 and 214, Wis. Adm. Code. It shall also include a list of all byproduct solid storage pads and leachate containment systems.	04/30/2017
Updated Operation Plan: The permittee shall submit an updated byproduct solid storage stack and leachate containment structures management plan for approval prior to implementing changes to the plan.	

5.2.1 Explanation of Compliance Schedules

Seneca Foods Mayville uses a large number of off-site silage storage stacks and leachate containment systems operated by third parties. Seneca maintains records and completes inspections in accordance with the standards in ch. NR 213 and 214, Wis. Adm. Code. This compliance schedule requires an updated plan which is a standard requirement and requires updates to this plan whenever a change is made. During the compliance inspection the Department determined that the methods Seneca was using to ensure compliance are adequate but an updated plan documenting these procedures was needed.

5.3 Water Quality Based Effluent Limits (WQBELs) for Total Phosphorus

The permittee shall comply with the WQBELs for Phosphorus as specified. No later than 30 days following each compliance date, the permittee shall notify the Department in writing of its compliance or noncompliance. If a submittal is required, a timely submittal fulfills the notification requirement.

Required Action	Due Date
Operational Evaluation Report: The permittee shall prepare and submit to the Department for approval an operational evaluation report. The report shall include an evaluation of collected effluent data, possible source reduction measures, operational improvements or other minor facility modifications that will optimize reductions in phosphorus discharges from the treatment system during the period prior to complying with final phosphorus WQBELs and, where possible, enable compliance with final phosphorus WQBELs by April 30, 2019. The report shall provide a plan and schedule for implementation of the measures, improvements, and modifications as soon as possible, but not later than April 30, 2019 and state whether the measures, improvements, and modifications will enable compliance with final phosphorus WQBELs. Regardless of whether they are expected to result in compliance, the permittee shall implement the measures, improvements, and modifications in accordance with the plan and schedule specified in the operational evaluation report. If the operational evaluation report concludes that the facility can achieve final phosphorus WQBELs using the existing treatment system with only source reduction measures, operational improvements,	04/30/2017

<p>and minor facility modifications, the permittee shall comply with the final phosphorus WQBEL by April 30, 2019 and is not required to comply with the milestones identified below for years 3 through 9 of this compliance schedule ('Preliminary Compliance Alternatives Plan', 'Final Compliance Alternatives Plan', 'Final Plans and Specifications', 'Treatment Plant Upgrade to Meet WQBELs', 'Complete Construction', 'Achieve Compliance').</p> <p>STUDY OF FEASIBLE ALTERNATIVES - If the Operational Evaluation Report concludes that the permittee cannot achieve final phosphorus WQBELs with source reduction measures, operational improvements and other minor facility modifications, the permittee shall initiate a study of feasible alternatives for meeting final phosphorus WQBELs and comply with the remaining required actions of this schedule of compliance. If the Department disagrees with the conclusion of the report, and determines that the permittee can achieve final phosphorus WQBELs using the existing treatment system with only source reduction measures, operational improvements, and minor facility modifications, the Department may reopen and modify the permit to include an implementation schedule for achieving the final phosphorus WQBELs sooner than April 30, 2025.</p>	
<p>Compliance Alternatives, Source Reduction, Improvements and Modifications Status: The permittee shall submit a 'Compliance Alternatives, Source Reduction, Operational Improvements and Minor Facility Modification' status report to the Department. The report shall provide an update on the permittee's: (1) progress implementing source reduction measures, operational improvements, and minor facility modifications to optimize reductions in phosphorus discharges and, to the extent that such measures, improvements, and modifications will not enable compliance with the WQBELs, (2) status evaluating feasible alternatives for meeting phosphorus WQBELs.</p>	04/30/2018
<p>Preliminary Compliance Alternatives Plan: The permittee shall submit a preliminary compliance alternatives plan to the Department.</p> <p>If the plan concludes upgrading of the permittee's wastewater treatment facility is necessary to achieve final phosphorus WQBELs, the submittal shall include a preliminary engineering design report.</p> <p>If the plan concludes Adaptive Management will be used, the submittal shall include a completed Watershed Adaptive Management Request Form 3200-139 without the Adaptive Management Plan.</p> <p>If water quality trading will be undertaken, the plan must state that trading will be pursued.</p>	04/30/2019
<p>Final Compliance Alternatives Plan: The permittee shall submit a final compliance alternatives plan to the Department.</p> <p>If the plan concludes upgrading of the permittee's wastewater treatment is necessary to meet final phosphorus WQBELs, the submittal shall include a final engineering design report addressing the treatment plant upgrades, and a facility plan if required pursuant to ch. NR 110, Wis. Adm. Code.</p> <p>If the plan concludes Adaptive Management will be implemented, the submittal shall include a completed Watershed Adaptive Management Request Form 3200-139 and an engineering report addressing any treatment system upgrades necessary to meet interim limits pursuant to s. NR 217.18, Wis. Adm. Code.</p> <p>If the plan concludes water quality trading will be used, the submittal shall identify potential trading partners.</p> <p>Note: See 'Alternative Approaches to Phosphorus WQBEL Compliance' in the Surface Water section of this permit.</p>	04/30/2020
<p>Progress Report on Plans & Specifications: Submit progress report regarding the progress of preparing final plans and specifications. Note: See 'Alternative Approaches to Phosphorus WQBEL</p>	04/30/2021

Compliance' in the Surface Water section of this permit.	
Final Plans and Specifications: Unless the permit has been modified, revoked and reissued, or reissued to include Adaptive Management or Water Quality Trading measures or to include a revised schedule based on factors in s. NR 217.17, Wis. Adm. Code, the permittee shall submit final construction plans to the Department for approval pursuant to s. 281.41, Stats., specifying treatment plant upgrades that must be constructed to achieve compliance with final phosphorus WQBELs, and a schedule for completing construction of the upgrades by the complete construction date specified below. (Note: Permit modification, revocation and reissuance, and reissuance are subject to s. 283.53(2), Stats.) Note: See 'Alternative Approaches to Phosphorus WQBEL Compliance' in the Surface Water section of this permit.	04/30/2022
Treatment Plant Upgrade to Meet WQBELs: The permittee shall initiate construction of the upgrades. The permittee shall obtain approval of the final construction plans and schedule from the Department pursuant to s. 281.41, Stats. Upon approval of the final construction plans and schedule by the Department pursuant to s. 281.41, Stats., the permittee shall construct the treatment plant upgrades in accordance with the approved plans and specifications. Note: See 'Alternative Approaches to Phosphorus WQBEL Compliance' in the Surface Water section of this permit.	07/31/2022
Construction Upgrade Progress Report #1: The permittee shall submit a progress report on construction upgrades. Note: See 'Alternative Approaches to Phosphorus WQBEL Compliance' in the Surface Water section of this permit.	07/31/2023
Construction Upgrade Progress Report #2: The permittee shall submit a progress report on construction upgrades. Note: See 'Alternative Approaches to Phosphorus WQBEL Compliance' in the Surface Water section of this permit.	07/31/2024
Complete Construction: The permittee shall complete construction of wastewater treatment system upgrades. Note: See 'Alternative Approaches to Phosphorus WQBEL Compliance' in the Surface Water section of this permit.	01/31/2025
Achieve Compliance: The permittee shall achieve compliance with final phosphorus WQBELs. Note: See 'Alternative Approaches to Phosphorus WQBEL Compliance' in the Surface Water section of this permit.	03/31/2025

5.3.1 Explanation of Compliance Schedules

While Seneca Foods Mayville currently recirculates the discharge from the draintile Outfall 013 back on to the spray fields, this permit authorizes discharge to the surface water and includes all limitations as though they are discharging to a surface water. Seneca Foods Mayville did not receive a waste load allocation. The permit includes a mass allocation that is representative of the total reduction specified for reach 14 of the East Branch River from Gill Creek to Mile 11. A lengthy compliance schedule was included to allow Seneca time to determine ways to comply with the mass allocation. Note one alternative for compliance with the mass allocation would be reduced or eliminated discharge to the surface water.

These alternatives, among others, will be assessed as part of the compliance alternatives evaluation. While the permittee has not been discharging from Outfall 013 routinely in the recent past, the permittee requested the option to discharge to surface waters and therefore the Phosphorus limits apply. Given the infrequent discharge in recent years the permittee may work with the Department on alternative methods to document how the total phosphorus mass limitations would be met should discharge to the surface water take place. This may significantly reduce or alter this compliance schedule during the permit term under the discretion of the Department compliance staff. A permit modification is needed if the compliance schedule is altered.

Other Comments:

Post Public Notice Revisions: See Notice of Determination for a description of any post public notice revisions. If no comments were received, see the Notice of No Comments Received for any typographical corrections the Department made after the public notice period.

Attachments:

Water Quality Based Effluent Limits with discharge location map– Dated February 29, 2016

Groundwater Evaluation – Dated April 7, 2016

Substantial Compliance Inspection Form – September 23, 2015

Flow Diagram

Prepared By: Jennifer Jerich – WDNR, Wastewater Permits Specialist

Public Notice Fact Sheet Date: 04/11/2016

Amended Post Public Notice Fact Sheet Date:

DATE: February 29, 2016

FILE REF: 3200

TO: Jennifer Jerich - SCR/Horicon

FROM: Nasrin Mohajerani – SCR *N. Mohajerani*

SUBJECT: Water Quality-Based Effluent Limitations for the Seneca Foods Corporation – Mayville Plant (WI-00050822) in Dodge County.

This is in response to your request for an evaluation of the need for water quality-based effluent limitations using chs. NR 102, 105, 106, 207, 210 and 217 of the Wisconsin Administrative Code (where applicable). This facility is located in the Sinissippi Lake Watershed (UR08) T11R16E and discharges through two drain tiles via outfall 013 to a unnamed tributary of the East Branch of the Rock River and to a wetland via outfall 014 in the East Branch Rock River Watershed (UR13) in the Upper Rock River Basin .

This discharge is in the Rock River Basin and is subject to the requirements of the TMDL as approved by EPA. The evaluation of the permit recommendations is discussed in more detail in the attached report.

No changes are recommended to the existing permit limitations for BOD₅, TSS, pH, and dissolved oxygen for outfall 013. Based on our review, the following limitations are recommended for permit reissuance.

OUTFALL 013 –NORTH DRAINTILE DISCHARGE RECOMENDED EFFLUENT LIMITATIONS					
Substance	Daily	Weekly Average	Monthly Average	Six-Month Average	Monitoring
BOD₅	10 mg/L – max.		10 mg/L		
TSS	40 mg/L – max. 5.67 lbs/day		5.67 lbs/day		
Phosphorus: TMDL Interim ¹			(0.03 lbs./d) 0.7 mg/L		
pH (s.u.)	6.0 – min. 9.0 – max.				
Dissolved Oxygen					X
Ammonia					X
Chloride					X
WET: Acute Chronic	Two tests (1 test every other year e.g. year 2, year 4, etc.) Three tests (1 test every other year e.g. year 1, year 3, year 5, etc.)				

1. An interim limit for phosphorus is only necessary if a compliance schedule is included in the permit that extends beyond this permit term.

OUTFALL 014 – SOUTH DRAINTILE DISCHARGE RECOMENDED EFFLUENT LIMITATIONS				
Substance	Daily	Weekly Average	Monthly Average	Monitoring
BOD ₅	40* mg/L – max.		20 mg/L	
TSS	40* mg/L – max.		20 mg/L	
Dissolved Oxygen	4 mg/L - min			
pH (s.u.)	6.0 – min., 9.0 – max.			
Ammonia				X
Chloride				X

*- Since this is an industrial discharge, daily maximum limits are recommended instead of weekly limits in NR 104

Along with the chemical-specific recommendations mentioned above, the need for acute and chronic whole effluent toxicity testing is also evaluated for the discharge from Seneca Foods Mayville. Following the guidance provided in the Department's January 27, 2014 *Whole Effluent Toxicity Program Guidance Document - Revision #10*, as well as previous permitting data and decisions, two acute (1 test every other year e.g. year 2, year 4, etc.) and three chronic (1 test every other year e.g. year 1, year 3, year 5, etc.) whole effluent toxicity test batteries are recommended throughout the permit term for **outfall 013**. Sampling concurrently with any chemical-specific toxic substances is also recommended.

No WET testing is recommended at outfall 014 due to the fact that this is a wetland discharge and based on a field assessment the discharge from this outfall is not believed to reach the downstream water.

Please consult the attached report for details regarding the above recommendations. If you have any questions or comments regarding the above recommendations, please contact Nasrin Mohajerani at (608) 275-3239 or by email at Nasrindokht.Mohajerani@wisconsin.gov

Attachment #1 is a USGS topographic map of the area showing the approximate location of Outfall 013 and Outfall 014.

PREPARED BY:

N. Mohajerani

Nasrin Mohajerani
Water Resources Engineer, P.E.

CC: Diane Figiel – WY/3

**Water Quality-Based Effluent Limitations for
Seneca Foods Corporation
Mayville, Wisconsin – Dodge County
WPDES Permit No. WI-0050822**

PART 1 – BACKGROUND INFORMATION

Facility Description:

Seneca Foods cans various vegetables throughout the growing season and is all but closed down in the winter months. This facility operates 24 hours a day, seven days a week. Operation usually starts mid -May and continues into November each year. Process wastewater is discharged to the groundwater of the Rock River Drainage Basin via a spray irrigation system and a land spreading system. This memo addresses the surface water discharge that results from the spray irrigation system through the drain tiles. Updating the management plans is required in this permit for the irrigation fields and the land application program.

Existing WPDES Permit Limitations at Outfall 013

OUTFALL 013 – NORTH DRAINTILE DISCHARGE EXISTING EFFLUENT LIMITATIONS				
Substance	Daily	Weekly Average	Monthly Average	Monitoring
BOD₅	10 mg/L - max		10 mg/L	
TSS	40 mg/L - max			
pH (s.u.)				X
Dissolved Oxygen				X
Ammonia:				
Summer	3.0 mg/L - max			
Winter	6.0 mg/L - max			
Chloride				X
Phosphorus				X

Receiving Water Information For Outfall 013

- Name: Unnamed Tributary to East Branch of the Rock River
- Classification: Warm Water Sport Fish (unnamed tributary to East Branch of the Rock River at the point of discharge is not listed in ch. NR 104 and currently carries the default classification of Full Fish and Aquatic Life stream).
- Low Flow: $7-Q_{10} = 0$ cfs (cubic feet per second)
- % of Flow used to calculate limits : $7-Q_{10} = 0$
- Hardness = 450 mg/L as CaCO₃ same as effluent because $7-Q_{10} = 0$

Effluent Information

- Effluent Flows reported in permit application
- Outfall 013 – North Drain tile
- Maximum Annual average design flow = 0.02 MGD, this is the actual average flow during 2013
- Effluent characterization: This facility is categorized as a secondary industrial discharge
- Hardness = 450 ppm as CaCO₃ from application

- Monitoring data: Data submitted by the facility to the department was used in this evaluation. Chloride was monitored during current permit: available data (5/19/10-10/21/15) was evaluated and are summarized in the following table.

	Chloride (mg/L)
1-day P ₉₉	59.49
4-day P ₉₉	39.88
30-day P ₉₉	29.81
Mean*	24.95
Std	10.65
Sample size	43
Range	11.6 - 82

**PART 2 – WATER QUALITY-BASED EFFLUENT LIMITATIONS
FOR TOXIC SUBSTANCES – EXCEPT AMMONIA NITROGEN
OUTFALL - 013**

Evaluation of Chemical Specific Toxicants: The following tables list the water quality-based effluent limitations for this discharge along with the results of testing effluent samples. All concentrations are expressed in term of micrograms per Liter (µg/L) except for Hardness and Chloride. Following the tables, permit recommendations are made where appropriate, based on a comparison between the effluent concentrations and the calculated limits pursuant to ss. NR 106.04 and 106.05.

EFFLUENT LIMIT CALCULATIONS FOR:		Outfall 013			
RECEIVING WATER:	Trib to E.B. of Rock River				
RECEIVING WATER INFO.:					
CLASSIFICATION: Warmwater Sport Fish, Warm Water Forage,					
FLOWS (cfs):		7Q10	7Q2	90Q10	Harmonic Mean
	=	0	0	0	0
HARDNESS (mg/L)	=	450		WET data	
EFFLUENT INFORMATION:		DAILY FLOW			
OUTFALL NUMBER	f	(mgd)	(cfs)		
013	0	0.020	0.031		
EFFLUENT HARDNESS (mg/L)	=	450		WET data	

CALCULATION OF EFFLUENT LIMITATIONS BASED ON ATC (ug/L)							
	REF.		MAX.	1/5 OF	MEAN		1-day
	HARD		EFFL.	EFFL.	EFFL.	1-day	MAX.
SUBSTANCE	or pH	ATC	LIMIT	LIMIT	CONC.	P99	CONC.
Arsenic		339.80	679.60	135.92	6.03		
Cadmium	450	57.86	115.72	23.14	0.0345		
Chromium (+3)	301	4445.84	8891.68	1778.34	0.373		
Copper	427	58.28	116.56	23.31	10.12		
Lead	356	364.66	729.32	145.86	2.86		
Nickel	157	2219.01	4438.02	887.60	6.23		
Zinc	333	344.68	689.36	137.87	12.33		
Chloride (mg/L)		757.00	1514.00			59.49	

CALCULATION OF EFFLUENT LIMITATIONS BASED ON CTC (ug/L)							
RECEIVING WATER FLOW (cfs)		0					
	REF.		MEAN	WEEKLY	1/5 OF	MEAN	4-day
	HARD.		BACK-	AVE.	EFFL.	EFFL.	4-day
SUBSTANCE	or pH	CTC	GRD.	LIMIT	LIMIT	CONC.	P99
Arsenic		152.20		152.20	30.44	6.03	
Cadmium	175	3.82	0.0165	3.82	0.76	0.0345	
Chromium (+3)	301	325.75		325.75	65.15	0.373	
Copper	427	41.29		41.29	8.26	10.12	
Lead	356	95.51	0.372	95.51	19.10	2.86	
Nickel	157	246.88		246.88	49.38	6.23	
Zinc	333	344.68	1.9	344.68	68.94	12.33	
Chloride (mg/L)		395.00		395.00			39.88

Monthly Average Limits based on Wildlife Criteria (WC):

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

CALCULATION OF EFFLUENT LIMITATIONS BASED ON HTC (ug/L)							
RECEIVING WATER FLOW		0 cfs					
			MEAN	MO'LY	1/5 OF	MEAN	
			BACK-	AVE.	EFFL.	EFFL.	30-day
SUBSTANCE		HTC	GRD.	LIMIT	LIMIT	CONC.	P99
Cadmium		1200		1.20E+03	2.40E+02	0.0345	
Chromium (+3)		2.50E+06		2.50E+06	5.00E+05	0.373	
Lead		140		1.40E+02	2.80E+01	2.86	
Nickel		43000		4.30E+04	8.60E+03	6.23	

CALCULATION OF EFFLUENT LIMITATIONS BASED ON HCC (ug/L)							
RECEIVING WATER FLOW		0 (cfs)					
			MEAN	MO'LY	1/5 OF	MEAN	
			BACK-	AVE.	EFFL.	EFFL.	30-day
SUBSTANCE		HCC	GRD.	LIMIT	LIMIT	CONC.	P99
Arsenic		50		50	10.00	6.03	

In addition to evaluating the need for limits for each individual substance for which HCC exist, s. NR 106.06(8) requires the evaluation of the cumulative cancer risk. Because effluent data is available for only one substance for which Human Cancer Criteria exists, and it was not detected in the effluent in excessive amounts, determination of the cumulative cancer risk is not needed.

Permit Recommendations:

Permit limits for toxic substances are recommended whenever any of the following occur:

1. Maximum effluent concentration exceeds the limit (only applies to daily maximum unless there are at least 4 consecutive days with data, which isn't the case here).
2. If 11 or more detected results are available in the effluent, the 99th upper percentile (or P99) value exceeds the comparable calculated limit.
3. If fewer than 11 detected results are available, the mean effluent concentration exceeds 1/5 of the calculated limit.

Conclusions and Recommendations: Based on a comparison of the effluent data and calculated effluent limitations, no effluent limitations are recommended for toxic at outfall 013.

**PART 3 – WATER QUALITY-BASED EFFLUENT LIMITATIONS
FOR AMMONIA NITROGEN
Outfall - 013**

Ammonia Nitrogen: Water quality-based effluent limitations are evaluated in this report for Ammonia Nitrogen based upon water quality criteria in ch. NR 105 (as revised in March, 2004), including acute toxicity criteria (ATC) and chronic toxicity criteria (CTC). Effluent limitations for ammonia are calculated using the procedures in s. NR 106.32. The acute criteria relate to the pH of the effluent; the chronic criteria relate to both the pH and temperature of the receiving water body. This approach will establish criteria that are necessary to assure attainment of the designated use for the water body receiving the discharge.

A 99th percentile or a reasonable maximum value may be used for effluent pH to calculate the ammonia limit depending on the number of results available, the variability of those results, and the potential for outlier values. An effluent variability analysis was conducted according to the procedures of s. NR 106.05(5) and resulted in one-day p99 of 8.8 s.u. for effluent pH. The maximum value reported was 8.4, reported once; a value of 8.3 was also reported once. A value of 8.0 - 8.3 was reported 11 times. Based on these results, the value of 8.4 su is believed to represent the maximum reasonably expected pH, and therefore most appropriate for determining daily maximum limitations for ammonia nitrogen.

The following tables summarize the effluent limitations for ammonia nitrogen. Effluent limitations were calculated in accordance with revised chs. NR 106.05 (Wis. Adm. Code) for a warm water sport fish community.

AMMONIA (as N) LIMITS	Seneca Outfall 013	
CLASSIFICATION:	WARMWATER SPORTFISH	
EFFLUENT FLOW (mgd):	0.02	
EFFLUENT FLOW (cfs):	0.031	
MAX. EFFLUENT pH (s.u.):	8.4	
BACKGROUND INFO.:	<i>May – Oct.</i>	<i>Nov. - April</i>
7Q10 (cfs)	0	0
7Q2 (cfs)	0	0
Ammonia (mg/L)	0.07	0.17
Temperature (deg C)	23	3
pH (std. units)	8.4	8.4
% of river flow used:	100	25
Reference weekly flow:	0	0
Reference monthly flow:	0	0
CRITERIA (in mg/L):		
Acute (@ effl. pH):	3.88	3.88
4-day Chronic (@ backgrd. pH):		
early life stages present	1.87	3.22
early life stages absent	1.87	5.24
30-day Chronic (@ backgrd. pH)		
early life stages present	0.75	1.29
early life stages absent	0.75	2.09
EFFLUENT LIMITS (in mg/L):		

Daily maximum (also see below)	7.77	7.77
Weekly average		
early life stages present	1.87	3.22
early life stages absent		5.24
Monthly average		
early life stages present	0.75	1.29
early life stages absent		2.09

Early life stages present limits apply during the months of April through September and the early life stages absent limits apply to October through March because burbot are not expected to be present in the receiving water.

AMMONIA LIMITATIONS:

Using the available information summarized earlier and pursuant to s. NR 106.33(2), the calculated ammonia limitations would be as follows.

Ammonia Nitrogen	Daily maximum	Weekly average	Monthly average
<i>May – Oct.</i>	7.8 mg/L	1.9 mg/L	0.75 mg/L
<i>Nov. - April</i>	7.8 mg/L	5.2 mg/L	2.1 mg/L

	Ammonia (mg/L)
Date	5/25/11-10/21/15
1-day P ₉₉	0.81
4-day P ₉₉	0.48
30-day P ₉₉	0.26
Mean*	0.162
Std	0.178
Sample size	33(12=ND)
Range	0.066-0.75

Ammonia Recommendation:

The above ammonia limitations are for informational purposes and no effluent limitations for ammonia were necessary at this time. The effluent ammonia data for past four years was evaluated as shown in the above table. Given the fact that the 1-day p99 (0.81 mg/L) is less than the calculated daily maximum limit of 7.8 mg/L acute limit is not needed at this time. In addition comparing the 4-day p99 and 30-day p99 with calculated weekly and monthly averages as shown in the above table chronic limit are not necessary either.

Note: there are daily maximum ammonia limits of 3 mg/L for summer and 6 mg/L for winter in Seneca current permit. Based on our evaluations of effluent data there is no need for daily maximum ammonia limits at this time. Given the fact that these are daily limits based on previous criteria, the ammonia limits can be dropped from the reissued permit. **Continued monitoring for ammonia nitrogen is recommended.**

PART 4–PHOSPHORUS Outfall 013

Technology Based Limit (TBL) – Phosphorus

The effluent Phosphorus data collected from November 2011 through July 2015 is evaluated below to determine the need for a technology based phosphorus limit. The mass is calculated by summing the reported daily flows for each month and averaging the total phosphorus concentrations reported each month.

The data demonstrates that the annual monthly average phosphorus loading is less than 60 lbs/month, which is the threshold for industries in accordance to s. NR 217.04(1)(a), and therefore no technology based limit is recommended.

Month	Average Phosphorus Concentration (mg/L)	Total Effluent Flow (Million Gallons)	Calculated Mass (lbs/month)
June 2015	0.057	0.09	0.04
July 2015	0.086	0.18	0.13
August 2015	0.067	0.34	0.19
Average			0.12

Water Quality Based Limit – Phosphorus

Revisions to the administrative rules for phosphorus discharges took effect on December 1, 2010. These rule revisions include additions to ch. NR 102 (s. NR 102.05), which establish phosphorus standards for surface waters. Revisions to ch. NR 217 (s. NR 217, Subchapter III) establish procedures for determining water quality based effluent limits for phosphorus, based on the applicable standards in ch. NR 102.

The Department has developed a TMDL for the Upper and Lower Rock River Basins. The US EPA approved the Rock River TMDL on September 28, 2011. The document, along with the referenced appendices can be found at: http://dnr.wi.gov/topic/TMDLs/RockRiver/Final_Rock_River_TMDL_Report_with_Tables.pdf

Section NR 217.16, Wis. Adm. Code, states that the Department may include a TMDL-derived water quality based effluent limit (WQBEL) for phosphorus in addition to, or in lieu of, a s. NR 217.13 WQBEL in a WPDES permit. Because the Rock River Basin TMDL was developed to protect and improve the water quality of phosphorus impaired waters within the basin and the discharge from Seneca Foods at Mayville flows directly into the East Branch of the Rock River, which is listed as phosphorus impaired, the TMDL-based limit can be included in the WPDES permit absent the s. NR 217.13 WQBEL. This limit should be expressed in a manner consistent with the wasteload allocation and assumptions of the TMDL. If after two permit terms, the Department determines the nonpoint source load allocation has not been substantially reduced, the Department may include the s. NR 217.13 WQBEL unless these reductions are likely to occur.

TMDL Limits – Phosphorus

Seneca Foods at Mayville is located in Reach 14 of the East Branch River from Gill Creek to Mile 11. The phosphorus load reduction target for treatment facilities in this reach is 78%. Although it is noted that a substantial portion of the total reduction specified for reach 14 will be coming from the Mayville WWTF (WI-0024643), it is recommended that Seneca Foods at Mayville also comply with the 78% reduction target in order to be consistent with the TMDL reduction requirements within this reach. The effluent data for Seneca Foods at Mayville from May 2011 through July 2015 is summarized in the table below.

	Phosphorus (mg/L)
1-day P ₉₉	0.70
4-day P ₉₉	0.39
30-day P ₉₉	0.19
Mean*	0.157
Std	0.14
Sample size	29
Number of No Detects	13
Range	0.022 - 0.7

Seneca Foods at Mayville is a seasonal, irregular, and infrequent discharge to the East Branch of the Rock River. For these reasons, the 1-day P₉₉ was used to establish TMDL limits for Seneca Foods at Mayville at this time. In the Rock River TMDL, TMDL-derived limits are monthly average limitations expressed in terms of mass. **Therefore, a phosphorus limitation of 0.03 lbs/day, expressed as a monthly average, is recommended for the proposed permit** (0.7 mg/L – (0.7 mg/L x 78%) x 0.02MGD x 8.34). For reference, this limit is equivalent to a concentration limit of 0.18 mg/L. This determination may be revisited upon permit reissuance if the effluent flow conditions at Seneca Foods at Mayville change.

Interim Limit - Phosphorus

The table above shows data from effluent monitoring at the facility, reported from May 2011 through July 2015. The data suggests that a compliance schedule may be necessary in order for the facility to meet the given phosphorus limits.

An interim limit is needed when a compliance schedule is included in the permit. This limit should reflect a value which the facility is able to currently meet; however, it should also consider the receiving water quality, keeping the water from further impairment. After review it is recommended that the maximum reported value, **0.7 mg/L, may be considered for use as an interim limit** and should be expressed as a monthly average concentration. Again, an interim limitation is only necessary if a compliance schedule that extends beyond the first permit term is determined to be necessary for phosphorus.

PART 5 –TOTAL SUSPENDED SOLIDS (TSS) TMDL – Outfall 013

TMDL Limits – TSS

The Rock River TMDL also has wasteload allocations (WLA) for total suspended solids (TSS). For an industrial discharge, the limits for TSS must be expressed as daily maximums and monthly averages. The current permit includes a TSS limit of 40 mg/L expressed as a daily maximum.

The TSS load reduction target for wastewater treatment facilities in Reach 14 is 15%. Seneca Foods at Mayville should comply with the 15% TSS reduction goal to conform to the expectations set forth in the Rock River TMDL for Reach 14. It is recommended that this reduction be applied to the currently applicable effluent limitation. **Therefore, a TSS limitation of 5.67 lbs/day, expressed as a daily maximum limitation, is recommended for the proposed permit** (40 mg/L – (40 mg/L x 15%) x 0.02MGD x 8.34). EPA’s statistical method for deriving water quality-based effluent limits as presented in 5.4 and 5.5 of the *Technical Support Document for Water Quality-based Toxics Control* (EPA/505/2-90-001) can be used to convert this limitation to monthly average permit limits. In this guidance, USEPA’s statistical method for converting from daily maximum to monthly average limits is summarized in Table 5-3. Given the infrequency of discharge a default CV of 0.6 was used to derive this monthly average limitation. It was also assumed that weekly effluent monitoring would continue to be the appropriate monitoring frequency for TSS in the proposed permit. Based on the results of this

analyses, a TSS limitation of 3.46 lbs/day, expressed as a monthly average limitation, is also recommended for the proposed permit. This determination would need to be revisited if the effluent variability or TSS monitoring frequency changed significantly. For reference, these limits are equivalent to concentration limits of 34 mg/L, expressed as a daily maximum, and 20.7 mg/L, expressed as a monthly average, based on the current effluent flow rates.

PART 6 – THERMAL – Outfall 013

Evaluation of Thermal Limitations:

Chapter NR 102, Subchapter II of the Wisconsin Administrative Code establishes water quality standards for temperature, in order to protect fish and other aquatic life from lethal and sub lethal effects. Chapter NR 106, Subchapter V, specifies procedures for calculating water quality based effluent limitations for temperature. These rule changes became effective on October 1st, 2010.

Evaluation of thermal limitations is required for discharges to streams to determine if there are a potential impacts from the thermal discharge. No representative temperature data for this discharge is available. However, since this is a drain tile discharge following spray irrigation of the effluent and it is fairly small amount this discharge is not expected to have any potential impacts on the downstream reach therefore limits or monitoring are not required.

Part 7 - WHOLE EFFLUENT TOXICITY (WET) EVALUATION –Outfall 013

WET testing is used to measure, predict, and control the discharge of toxic materials that may be harmful to aquatic life. In WET tests, organisms are exposed to a series of effluent concentrations for a given time and effects are recorded.

- Acute tests predict the concentration that causes lethality of aquatic organisms during a 48 to 96-hour exposure. In order to assure that a discharge is not acutely toxic to organisms in the receiving water, WET tests must produce a statistically valid LC₅₀ (Lethal Concentration to 50% of the test organisms) greater than 100% effluent.
- Chronic tests predict the concentration that interferes with the growth or reproduction of test organisms during a seven-day exposure. In order to assure that a discharge is not chronically toxic to organisms in the receiving water, WET tests must produce a statistically valid IC₂₅ (25% Inhibition Concentration) greater than the instream waste concentration (IWC). Chronic testing is not recommended where the ratio of the 7-Q₁₀ to the effluent flow exceeds 100:1. For this facility that ratio is 0:1.
- The IWC is an estimate of the proportion of effluent to total volume of water (receiving water + effluent). The IWC of 100% shown in the WET Checklist summary below was calculated according to the following equation, as specified in s. NR 106.03(6):

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

Where:

Q_e = annual average flow = 0.02 MGD (0.031 cfs)

f = fraction of the Q_e withdrawn from the receiving water = 0

Q_s = ¼ of the 7-Q₁₀ = 0 cfs

Based on the effluent and receiving stream flow conditions summarized above, the dilution-based instream waste concentration (IWC) is estimated as 100%.

Dilution Series:

According to the *State of Wisconsin Aquatic Life Toxicity Testing Methods Manual* (s. NR 219.04, Wis. Adm. Code), the default acute dilution series is: 6.25, 12.5, 25, 50, 100%, and the default chronic dilution series is 1, 3, 10, 30, 100%. Other dilution series may be chosen by the permittee or Department staff, but alternate dilution series must be specified in the WPDES permit. For guidance on selecting an alternate dilution series, see Chapter 2.11 of the WET Guidance Document.

- Also according to the *State of Wisconsin Aquatic Life Toxicity Testing Methods Manual*, receiving water must be used as the dilution water and primary control in WET tests, unless the use of different dilution water is approved by the Department prior to use. The dilution water used in WET tests conducted on Outfall 001 shall be laboratory water.
- Below is a tabulation of all available WET data for Outfall 001. Efforts are made to insure that decisions about WET monitoring and limits are made based on representative data. Data which is no longer believed to be representative of the discharge is not included in Reasonable Potential Factor (RPF) calculations. The table below differentiates between tests used and not used in RPF calculations.

Historical WET Data: The following available data are old and is not used in this evaluation.

Date Initiated	Acute Results				Chronic Results				Footnotes
	LC ₅₀ % (% survival in 100% effluent)				IC ₂₅ %				
	<i>C. dubia</i>	Fathead minnow	Pass or Fail?	Use in RPF?	<i>C. dubia</i>	Fathead Minnow	Pass or Fail?	Use in RPF?	
06/19/2003	>100		Pass	Y	>100		Pass	Y	Old data
08/23/2007	>100		Pass	Y	>100		Pass	Y	Old data

- **WET Checklist:** The WET Checklist has been developed to assist DNR staff when deciding whether WET limits and monitoring are needed. The Checklist recommends acute and chronic WET limits (as needed) based on the Reasonable Potential Factor (RPF), as required by s. NR 106.08, Wis. Adm. Code. Monitoring frequencies are based on points accumulated during the Checklist analysis. As toxicity potential increases, more points accumulate and more monitoring is needed to insure that toxicity is not occurring. The completed WET Checklist and monitoring recommendations are summarized in the table below. (For more on the RPF and WET Checklist, see Chapter 1.3 of the WET Guidance Document, at: <http://dnr.wi.gov/topic/wastewater/WETguidance.html> .)

WHOLE EFFLUENT TOXICITY (WET) CHECKLIST SUMMARY

	A C U T E	C H R O N I C
1. INSTREAM WASTE CONCENTRATION	1A. Not Applicable TOTAL POINTS = 0	1B. IWC = 100% TOTAL POINTS = 15
2. HISTORICAL DATA	2A. No recent test has been done TOTAL POINTS = 5	2B. No recent test has been done TOTAL POINTS = 5
3. EFFLUENT VARIABILITY	3A. No violations or upsets, consistent WWTF operations TOTAL POINTS = 0	3B. Same as Acute TOTAL POINTS = 0
4. STREAM CLASSIFICATION	4A. FFAL TOTAL POINTS = 5	4B. Same as Acute TOTAL POINTS = 5
5. CHEMICAL SPECIFIC DATA	5A. No limit 8 substances detected TOTAL POINTS = 3	5B. No limit 8 substances detected TOTAL POINTS = 3
6. ADDITIVES	6A. None TOTAL POINTS = 0	6B. Same as Acute TOTAL POINTS = 0
7. DISCHARGE CATEGORY	7A. Drain tiles under the spray irrigation fields TOTAL POINTS = 5	7B. Same as Acute TOTAL POINTS = 5
8. WASTEWATER TREATMENT	8A. Secondary Treatment TOTAL POINTS = 0	8B. Same as Acute TOTAL POINTS = 0
9. DOWNSTREAM IMPACTS	9A. None attributable to discharge TOTAL POINTS = 0	9B. Same as Acute TOTAL POINTS = 0
TOTAL POINTS	18	33

WET Monitoring and Limit Recommendations:

Based on the calculated Reasonable Potential Factor using representative historical WET data and chapter 1.3 of the WET Guidance, **two acute tests (1 test every other year e.g. year 2, year 4, etc.)**

and three chronic tests (1 test every other year e.g. year 1, year 3, year 5, etc.) are recommended during the permit term. Tests should be done in rotating quarters, in order to collect seasonal information about this discharge.

PART 8- EVALUATION FOR OUTFALL 014

Receiving Water Information

- Name: Wetland
- Classification: Limited Aquatic Life stream by default.
- Low Flow: 7-Q₁₀ = 0 cfs (cubic feet per second)
- % of Flow used to calculate limits: 7-Q₁₀ = 0 cfs

Effluent Information

- Effluent Flow =
- Outfall 014 – South drain tile
- Maximum Annual average design flow = 0.095 MGD, this is the actual average flow during 2014
- Effluent characterization: This facility is categorized as a secondary industrial discharge
- Monitoring data: results are shown below

Chloride was monitored during current permit: available data (4/30/10-10/21/15) was evaluated and are summarized in the following table.

	Chloride (mg/L)
1-day P ₉₉	49.39
4-day P ₉₉	38.62
30-day P ₉₉	32.72
Mean*	29.65
Std	6.93
Sample size	80
Range	16.3-50

The following tables list the water quality-based effluent limitations for this discharge along with the results of testing effluent samples. Following the tables, permit recommendations are made where appropriate, based on a comparison between the effluent concentrations and the calculated limits pursuant to ss. NR 106.04 and 106.05.

CALCULATION OF EFFLUENT LIMITATIONS BASED ON ATC (ug/L)							
	REF.			MAX.	1/5 OF	MEAN	
	HARD.			EFFL.	EFFL.	EFFL.	1-day
SUBSTANCE	or pH	ATC		LIMIT	LIMIT	CONC.	P99
Arsenic		339.80		679.60	135.92	1.52	
Cadmium	443	155.37		310.74	62.15	0.021	
Chromium (+3)	301	4445.84		8891.68	1778.34	0.45	
Copper	443	63.20		126.40	25.28	3.28	
Lead	356	364.66		729.32	145.86	0.082	
Nickel	268	1048.88		2097.76	419.55	5.45	
Zinc	333	344.68		689.36	137.87	1.3	
Chloride (mg/L)		757.00		1514.00			49.39

CALCULATION OF EFFLUENT LIMITATIONS BASED ON CTC (ug/L)							
RECEIVING WATER FLOW			0 (cfs)				
	REF.		MEAN	WEEKLY	1/5 OF	MEAN	
	HARD.		BACK-	AVE.	EFFL.	EFFL.	4-day
SUBSTANCE	or pH	CTC	GRD.	LIMIT	LIMIT	CONC.	P99
Arsenic		152.20		152.20	30.44	1.52	
Cadmium	175	3.82		3.82	0.76	0.021	
Chromium (+3)	301	325.75		325.75	65.15	0.45	
Copper	443	36.99		36.99	7.40	3.28	
Lead	356	95.51		95.51	19.10	0.082	
Nickel	268	169.08		169.08	33.82	5.45	
Zinc	333	344.68		344.68	68.94	1.3	
Chloride (mg/L)		395.00		395.00			38.17

CALCULATION OF EFFLUENT LIMITATIONS BASED ON HTC (ug/L)							
RECEIVING WATER FLOW (cfs) =			0 cfs				
			MEAN	MO'LY	1/5 OF	MEAN	
			BACK-	AVE.	EFFL.	EFFL.	30-day
SUBSTANCE		HTC	GRD.	LIMIT	LIMIT	CONC.	P99
Cadmium		8.80E+02		8.80E+02	1.76E+02	0.021	
Chromium (+3)		8.40E+06		8.40E+06	1.68E+06	0.45	
Lead		2.24E+03		2.24E+03	4.48E+02	0.082	
Nickel		1.10E+05		1.10E+05	2.20E+04	5.45	

CALCULATION OF EFFLUENT LIMITATIONS BASED ON HCC (ug/L)							
RECEIVING WATER FLOW (cfs)			0 cfs				
			MEAN	MO'LY	1/5 OF	MEAN	
			BACK-	AVE.	EFFL.	EFFL.	30-day
SUBSTANCE		HCC	GRD.	LIMIT	LIMIT	CONC.	P99
Arsenic		40		40.00	8.00	1.52	

Conclusions and Recommendations: Based on a comparison of the effluent data and calculated effluent limitations, effluent limitations, no effluent limitations are recommended for toxic at outfall 014 at this time.

PART 9 – WATER QUALITY-BASED EFFLUENT LIMITATIONS FOR AMMONIA NITROGEN OUTFALL - 014

Daily Maximum Limits based on Acute Toxicity Criteria (ATC):

Daily maximum limitations are based on acute toxicity criteria, which are a function of the effluent pH and the receiving water classification. The acute toxicity criterion (ATC) for ammonia is calculated using the following equation.

$$ATC \text{ in mg/L} = [A \div (1 + 10^{(7.204 - pH)})] + [B \div (1 + 10^{(pH - 7.204)})]$$

Where:

A = 0.633 and B = 90.0 for Limited Aquatic Life, and

pH (su) = that characteristic of the effluent.

The effluent pH data for the past four years was examined as part of this evaluation. A total of 60 sample results were reported from April 2011 through September 2015. The maximum reported value was 8.57 su (Standard pH Units), and a pH of greater than 8.5 was reported once. More than 99% of the time the pH was 8.5 or less. The one-day P₉₉, calculated in accordance with s. NR 106.05(5), is 8.75 su. And the mean plus the standard deviation multiplied by a factor of 2.33, an estimate of the upper ninety ninth percentile for a normally distributed dataset, is 8.6 su. A value of 8.5 is believed to represent the maximum reasonably expected pH, and therefore most appropriate for determining daily maximum limitations for ammonia nitrogen. Substituting a value of 8.5 into the equation above yields an ATC = 4.94 and a computed daily maximum limit of 9.87 mg/L (rounded to 9.9 mg/L).

Weekly Average & Monthly Average Limits based on Chronic Toxicity Criteria (CTC):

Weekly average and monthly average limits for Ammonia Nitrogen are based on chronic toxicity criteria.

The 30-day chronic toxicity criterion (CTC) for ammonia in waters classified for Limited Aquatic Life is calculated by the following equation.

$$CTC = E \times \{ [0.0676 \div (1 + 10^{(7.688 - pH)})] + [2.912 \div (1 + 10^{(pH - 7.688)})] \} \times C$$

Where:

- pH = the pH (su) of the receiving water,
- E = 1.0,
- C = $8.09 \times 10^{(0.028 \times (25 - T))}$
- T = the temperature of the receiving (°C)

The 4-Day criterion is simply equal to the 30-Day criterion multiplied by 2.5. The 4-day criteria are used in a mass-balance equation with the 7-Q₁₀ (4-Q₃, if available) to derive weekly average limitations. And the 30-day criteria are used with the 30-Q₅ (estimated as 85% of the 7-Q₂ if the 30-Q₅ is not available) to derive monthly average limitations. The stream flow value is further adjusted to temperature. 100% of the flow is used if the Temperature ≥ 16 °C. Only 25% of the flow is used if the Temperature < 11 °C. And 50% of the flow is used if the Temperature ≥ 11 °C but < 16 °C.

The following tables summarize the effluent limitations for ammonia nitrogen. Effluent limitations were calculated in accordance with revised chs. NR 106.05 (Wis. Adm. Code) for a Limited aquatic Life community.

AMMONIA (as N) LIMITS		
CLASSIFICATION:	LIMITED AQUATIC LIFE	
EFFLUENT FLOW (mgd):	0.095	
EFFLUENT FLOW (cfs):	0.147	
MAX. EFFLUENT pH (s.u.):	8.50	
BACKGROUND INFO.:	May - Oct.	Nov. - April
7Q10 (cfs)	0	0
7Q2 (cfs)	0	0
Ammonia (mg/L)	0.1	0.1
Temperature (deg C)	23	3
pH (std. units)	8.5	8.5
% of river flow used:	100	25
Reference weekly flow:	0	0
Reference monthly flow:	0	0
CRITERIA (in mg/L):		
Acute (@ effl. pH):	4.94	4.94
4-day Chronic (@ backgrd. pH):	10.30	37.39

30-day Chronic (@ backgrd. pH)		4.12	14.95
EFFLUENT LIMITS (in mg/L):			
Daily maximum (also see below)		9.87	9.87
Weekly average		10.30	37.39
Monthly average		4.12	14.95

AMMONIA LIMITATIONS:

Using the available information summarized earlier and pursuant to s. NR 106.33(2), the calculated ammonia limitations would be as follows.

Ammonia Nitrogen	Daily maximum	Weekly average	Monthly average
<i>May – Oct.</i>	9.9 mg/L	No limit*	4.1 mg/L
<i>Nov. - April</i>	9.9 mg/L	No limit*	No limit*

*- Calculated limits are greater than daily limits

Statistics	Ammonia (mg/L)
Date	04/28/11 - 09/28/15
1-day P ₉₉	1.83
4-day P ₉₉	0.99
30-day P ₉₉	0.517
Mean	0.32
Std	0.38
Sample Size	68
Range	0.057-2.9

Note: There was a sample result for ammonia reported at 9.7 mg/L on 8/12/15 it wasn't used in the calculation of p99 because it was considered not to be representative of the discharge compare to the rest of the data.

Conclusions and Recommendations:

The above ammonia limitations are for informational purposes and no effluent limitations for ammonia are necessary at this time. The effluent ammonia data for past four years was evaluated as shown in the above table. Given the fact that the 1-day p99 (1.83 mg/L) is less than the calculated limit of 9.9 mg/L acute limit is not needed at this time. In addition comparing the 4-day p99 and 30-day p99 with calculated weekly and monthly averages as shown in the above table chronic limit are not necessary either.

PART 10-PHOSPHORUS

Because Seneca Foods at Mayville discharges to a limited aquatic life system that flows to an internally drained wetland complex, this discharge does not have the potential to cause or contribute to a downstream impairment. Also at the time of this evaluation, there is no applicable phosphorus standards for the wetland complex. Therefore, **phosphorus water quality based effluent limitations are not recommended** at this time.

TMDL Phosphorus and TSS for Outfall 014

A field assessment was completed by DNR water quality biologist, Michael Sorge, on May 27th, 2015 at outfall 014. This determination is summarized in a memo dated November 11, 2015 and concluded that the effluent from this outfall location enters a ditch and eventually to a wetland. At the time of this evaluation, there is no applicable phosphorus or total suspended solids (TSS) standards for the wetland complex. Given the small effluent flow volume at this time, and the wetland complex, the Department also finds that there is no potential for effluent to enter into the stream adjacent to the wetland complex. Therefore, current discharge at outfall 014 has no potential to cause or contribute to an impairment in the adjacent stream, or further downstream waters including the Rock River. **For these reasons, phosphorus and TSS limitations are not recommended at this time.** This evaluation would need to be reconsidered if the effluent flows at outfall 014 increase.

PART 11 – THERMAL

Evaluation of Thermal Limitations:

New surface water quality standards for temperature took effect on October 1, 2010. These new regulations are detailed in Chapter NR 102 (Subchapter II – Water Quality Standards for Temperature) and NR 106 (Subchapter V – Effluent Limitations for Temperature) of the Wisconsin Administrative Code. The daily maximum effluent temperature limitation shall be 86 °F for discharges to surface waters classified as Limited Aquatic Life according to s. NR 104.02(3)(b)1, except for those classified as wastewater effluent channels and wetlands regulated under ch. NR 103 [s. NR 106.55(2)].

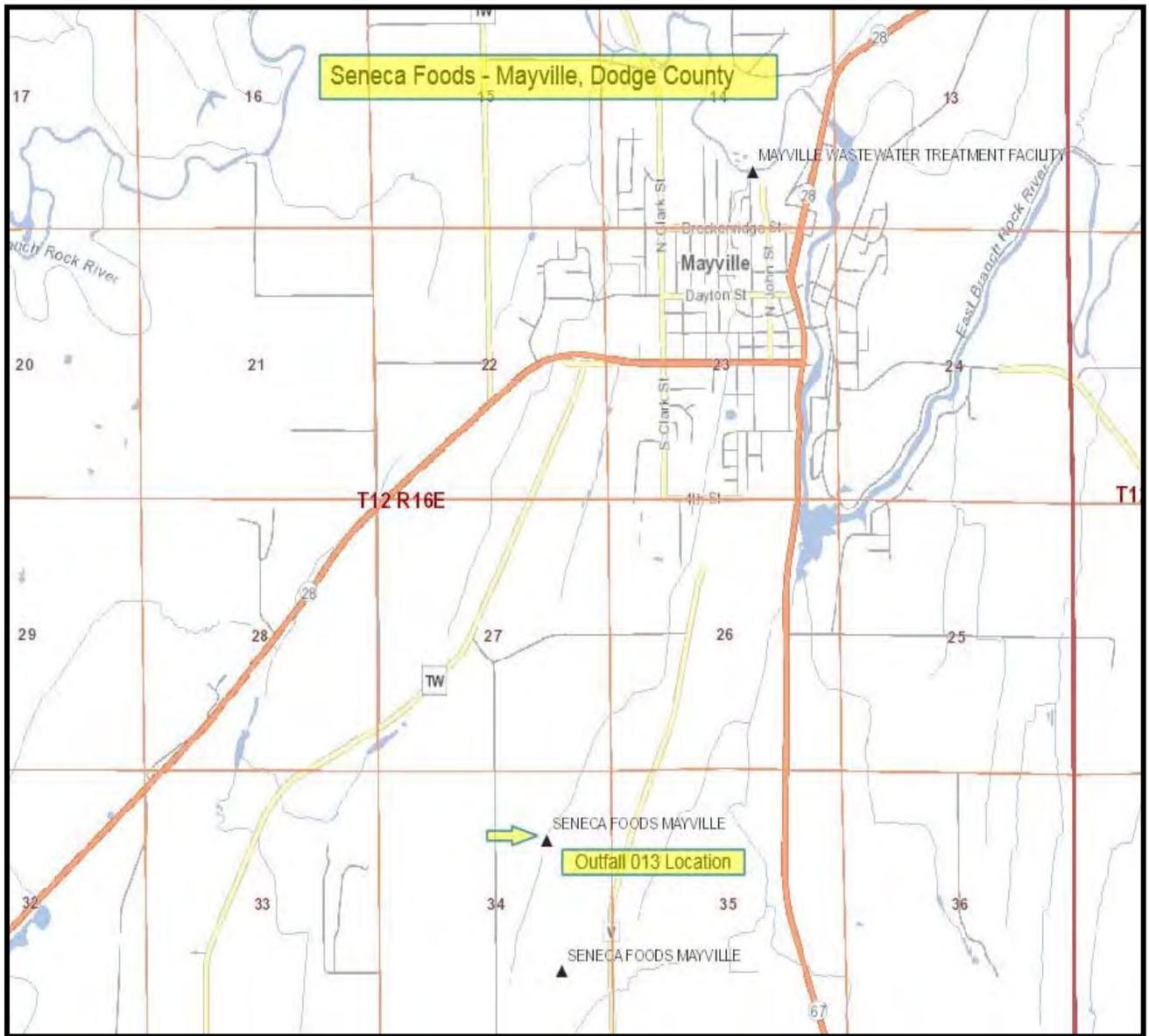
Evaluation of thermal limitations is required for discharges to streams to determine if there are a potential impacts from the thermal discharge. No representative temperature data for this discharge is available. However, since this is a drain tile discharge following spray irrigation and it is fairly small amount based on best professional judgment this discharge is not expected to have any potential impacts on the downstream reach therefore, **no limits or monitoring are recommended.**

Part 12 - WHOLE EFFLUENT TOXICITY (WET) EVALUATION

WET Monitoring Recommendations:

Based on Chapter 1.3 of the WET Guidance Document, **no acute and no chronic test are recommended.**

Attachment # 1



DATE: March 4, 2016

FILE REF: 3400

TO: File

FROM: Jim Boettcher – WCR, Alan Hopfensperger - SCR

SUBJECT: Groundwater Evaluation and Exceedence Report for Seneca Foods, Mayville
WPDES Permit # 0050822

The groundwater evaluation was originally drafted in 2011. The evaluation was reviewed and finalized on March 4, 2016, for the purpose of ensuring the background groundwater quality limits for the facilities Land Treatment Systems are appropriate prior to public noticing permit #0050822-07. Furthermore, a review of the recent sampling data from November 2010-December 2015 was conducted to confirm the substantial compliance determination and recommendations remain unchanged.

The Seneca Foods Mayville Spray Irrigation fields are divided into the following groups:

North Fields B and F

Fields B and F are monitored by wells W-103 (816), W-104 (817), W-113 (813) and W-115 (819). W-113 (813) is considered the background well based on the groundwater flow gradient of the current groundwater monitoring system. W-103 (816), W-104 (817) and W-115 (819) are enforcement standard wells for fields B and F.

Central Fields C, D and E

Fields C, D and E are monitored by wells MW-105 (818), W-106 (806), W-108 (808), W-111 (811) and W-113 (813). W-113 (813) is considered the background well based on the groundwater flow gradient of the current groundwater monitoring system. MW-105 (818), W-106 (806), W-108 (808) and W-111 (811) are enforcement standard wells for fields C, D and E.

South Fields G and H

South Spray Fields G and H are monitored by wells W-116 (886), W-117 (887), W-118 (888), W-119 (889), W-120 (890) and W-121 (891). W-116 (886) is considered the background well based on the groundwater flow gradient of the current groundwater monitoring system. W-117 (887), W-118 (888), W-119 (889), W-120 (890) and W-121 (891) are enforcement standard wells for fields G and H.

Spray Field A

Spray Field A located west of the Seneca Foods Mayville plant and north of Field B is no longer used.

North Fields B and F

The following groundwater limits for North Fields B and F are contained in the latest Seneca Foods Mayville WPDES permit which expired June 30, 2007:

Parameter	PAL or ACL	ES	Source
Chloride	152 mg/L (ACL)	250 mg/L	Calculated, Table 2, NR 140
COD	29 mg/L	N/A	Calculated
Ammonia Nitrogen	2.1mg/L	N/A	Calculated
NO ₂ -NO ₃ ,N	28 mg/L (ACL)	28 mg/L (ACL)	Calculated
Organic Nitrogen	2.2 mg/L	N/A	Calculated
pH, Field	6.2-8.2 su	N/A	Calculated
TDS	705 mg/L	N/A	Calculated
Sulfate 140	211 mg/L(ACL)	250 mg/L	Calculated, Table 2, NR 140

The following groundwater limits are recommended for the upcoming permit. Calculated values are based on groundwater data from background well W-113 (813):

Parameter	PAL or ACL	ES	Source
Chloride	250 mg/L (ACL)	250 mg/L	Calculated, Table 2, NR 140
COD	31 mg/L	N/A	Calculated
Ammonia Nitrogen	0.97 mg/L	9.7 mg/L	Table 1, NR 140 *
NO ₂ -NO ₃ ,N	3.0 mg/L (ACL)	10 mg/L (ACL)	Calculated
Organic Nitrogen	2.3 mg/L	N/A	Calculated
pH, Field	6.4-8.4 su	N/A	Calculated
TDS	1,100 mg/L	N/A	Calculated
Sulfate	180 mg/L (ACL)	250 mg/L	Calculated, Table 2, NR 140

* Health related standards for ammonia nitrogen were established in January 2011.

Exceedence Report Fields B and F

This exceedence report is based on PALs, ACL and ESs contained in the permit that expired in June 2007. The sample date range was from March 2001-November 2010.

W-103 (816)

A sample result of 14.66 for pH is an obvious error on Sept 27, 2001.

W-104 (817)

One of 34 sample results exceeded the PAL of 730 mg/L for TDS.

W-113 (813) Background

11 of 40 samples exceeded the ACL and ES of 250 mg/L for chlorides. The mean chloride concentration of all samples from this well was 230.5 mg/L.

1 of 40 samples exceeded the PAL of 6.0-8.0 su for field pH.

2 of 40 sample results exceeded the PAL of 954 mg/L for TDS.

Central Fields C, D and E

The following groundwater limits for Central Fields C, D and E are contained in the latest Seneca Foods Mayville WPDES permit which expired June 30, 2007:

Parameter	PAL or ACL	ES	Source
Chloride	250 mg/L (ACL)	250 mg/L	Calculated, Table 2, NR 140
COD	31 mg/L	N/A	Calculated
Ammonia Nitrogen	2.1mg/L	N/A	Calculated
NO ₂ -NO ₃ ,N	2 mg/L	10 mg/L	Calculated, Table 1, NR 140
Organic Nitrogen	2.5 mg/L	N/A	Calculated
pH, Field	6.0-8.0 su	N/A	Calculated
TDS	954 mg/L	N/A	Calculated
Sulfate	125 mg/L	250 mg/L	Table 2, NR 140

The following groundwater limits are recommended for the upcoming permit. Calculated values are based on groundwater data from background well W-113 (813):

Parameter	PAL or ACL	ES	Source
Chloride	250 mg/L (ACL)	250 mg/L	Calculated, Table 2, NR 140
COD	31 mg/L	N/A	Calculated
Ammonia Nitrogen	0.97 mg/L	9.7 mg/L	Table 1, NR 140 *
NO ₂ -NO ₃ ,N	3.0 mg/L (ACL)	10 mg/L	Calculated, Table 1, NR 140

Organic Nitrogen	2.3 mg/L	N/A	Calculated
pH, Field	6.4-8.4 su	N/A	Calculated
TDS	1,100 mg/L	N/A	Calculated
Sulfate	180 mg/L (ACL)	250 mg/L	Calculated, Table 2, NR 140

* Health related standards for ammonia nitrogen were established in January 2011.

Exceedence Report Central Fields C, D and E

This exceedence report is based on PALs, ACL and ESs contained in the permit that expired in June 2007. The sample date range was from March 2001-November 2010.

W-105 (818)

35 of 35 sample results exceeded the ES of 10 mg/L for NO₂-NO₃,N.

1 of 35 sample results exceeded the PAL of 6.0-8.0 su for field pH.

W-106 (806)

38 of 40 samples exceeded the ACL and ES of 250 mg/L for chlorides. The mean chloride concentration of all samples from this well was 316.3 mg/L.

2 of 40 sample results exceeded the PAL of 6.0-8.0 su for field pH.

2 of 40 sample results exceeded the PAL of 954 mg/L for TDS.

1 of 40 sample results exceeded the PAL of 125 mg/L for sulfates.

W-108 (808)

1 of 39 sample results exceeded the PAL of 6.0-8.0 su for field pH.

1 of 35 sample results exceeded the PAL of 954 mg/L for TDS.

5 of 34 sample results exceeded the PAL of 125 mg/L for sulfates.

W-111 (811)

2 of 40 sample results exceeded the PAL of 954 mg/L for TDS.

28 of 37 sample results exceeded the PAL of 125 mg/L for sulfates. 13 results exceeded 250 mg/L

W-113 (813) Background

11 of 40 samples exceeded the ACL and ES of 250 mg/L for chlorides. The mean chloride concentration of all samples from this well was 230.5 mg/L.

1 of 40 samples exceeded the PAL of 6.0-8.0 su for field pH.

2 of 40 sample results exceeded the PAL of 954 mg/L for TDS.

South Fields G and H

The following groundwater limits for Central Fields G and H are contained in the latest Seneca Foods Mayville WPDES permit which expired June 30, 2007:

Parameter	PAL or ACL	ES	Source
Chloride	125 mg/L	250 mg/L	Table 2, NR 140
COD	****	N/A	Calculated
Ammonia Nitrogen	****	N/A	Calculated
NO ₂ -NO ₃ ,N	2 mg/L	10 mg/L	Calculated, Table 1, NR 140
Organic Nitrogen	****	N/A	Calculated
pH, Field	****	N/A	Calculated
TDS	****	N/A	Calculated
Sulfate	125 mg/L	250 mg/L	Table 2, NR 140

**** The minimum of eight sample results needed to calculate a PAL or ACL for these parameters was not available at the time the permit was issued in June 2002.

The following groundwater limits are recommended for the upcoming permit. Calculated values are based on groundwater data from background well W-116 (887):

Parameter	PAL or ACL	ES	Source
Chloride	150 mg/L (ACL)	250 mg/L	Calculated, Table 2, NR 140
COD	30 mg/L	N/A	Calculated
Ammonia Nitrogen	0.97 mg/L	9.7 mg/L	Table 1, NR 140 *
NO ₂ -NO ₃ ,N	3.9 mg/L (ACL)	10 mg/L	Calculated, Table 1, NR 140
Organic Nitrogen	2.3 mg/L	N/A	Calculated
pH, Field	6.7-8.7 su	N/A	Calculated

TDS	640 mg/L	N/A	Calculated
Sulfate	190 mg/L (ACL)	250 mg/L	Calculated, Table 2, NR 140

* Health related standards for ammonia nitrogen were established in January 2011.

Exceedence Report South Fields G and H

The exceedence report for the south fields is based on the PALs and ACL calculated for the upcoming permit because there were insufficient sample results to calculate groundwater limits for parameters that did not have limits listed in Table 1 or Table 2, NR 140. The sample date range was from March 2001-November 2010.

W-116 (887) Background

5 of 34 sample results exceeded the PAL of 2.0 mg/L for NO₂-NO₃,N. There is a decreasing trend for NO₂-NO₃,N. No sample result has exceeded 1 mg/L since September 2005 in W-116.

1 of 34 sample results exceeded the PAL of 2.3 mg/L for organic nitrogen.

W-117 (887)

1 of 34 sample results exceeded the ACL of 190 mg/L for sulfates.

W-118 (888)

5 of 34 sample results exceed the PAL of 30 mg/L for COD.

1 of 34 sample results exceeded the PAL of 2.3 mg/L for organic nitrogen.

1 of 34 sample results exceeded the PAL of 6.7-8.7 su for field pH.

4 of 34 sample results exceeded the PAL of 640 mg/L for TDS.

W-119 (889)

13 of 34 sample results exceeded the ACL of 2.6 mg/L for NO₂-NO₃,N. There is a decreasing trend for NO₂-NO₃,N. No sample result has exceeded 1 mg/L since September 2007 in W-119.

1 of 34 sample results exceeded the PAL of 2.3 mg/L for organic nitrogen.

W-120 (890)

2 of 34 sample results exceeded the PAL of 30 mg/L for COD.

16 of 33 sample results exceeded the PAL of 640 mg/L for TDS. There is a downward trend in the TDS concentration with no PAL exceedences since March 2008.

7 of 33 sample results exceeded the ACL of 190 mg/L for sulfates. 4 samples exceeded 250 mg/L. There is a decreasing trend in sulfates in W-120 with no sample results exceeding the ACL since September 2006 and none over the Table 2 NR 140 PAL of 125 mg/L since June 2007.

W-121 (891)

1 of 34 sample results exceeded the PAL of 30 mg/L for COD.

1 of 34 sample results exceeded the PAL of 640 mg/L for TDS.

Discussion

Fields B and F

Background well W-113 has relatively high chloride concentrations.

The mean chloride concentration in W-113 was 230.5 mg/L with a range of 160-350 mg/L for the March 2001-November 2010 time frame.

The mean effluent chloride concentration for 1999-2004 was 222.98 mg/l if all data was included. If three data points over 800 mg/L are excluded the mean effluent chloride concentration drops to 168.5 mg/L. The mean effluent chloride concentration for 2005 through 2010 was 160.7 mg/L.

The mean chloride effluent concentrations referenced above appear to suggest that there may be other sources of chloride that affect W-113. The means above are not flow proportional.

The background well W-113 has had low NO₂-NO₃,N concentrations with a range of .01 - 1.8 resulting in an alternate concentration limit of 3.0 mg/L.

The wells near Fields B and F had low NO₂-NO₃,N results in samples collected from monitoring wells W-103, W-104 and W-115. The highest NO₂-NO₃,N result from W-103 was 4.8 mg/L in November 2001 with declining concentrations since that time with no sample results above 2.4 mg/L since June 2003. The highest NO₂-NO₃,N result in W-104 was 5.9 mg/L in March 2004 with the second highest result being 1.4 mg/L for the March 2001-November 2010 time frame. The highest NO₂-NO₃,N sample result in W-115 was 1.1 mg/L during the same time frame.

There was essentially no ammonia nitrogen detected and little organic nitrogen detected in the monitoring wells. The highest organic nitrogen detects in were in W-105 where 8 of 36 samples ranged between 1.1 and 1.9 mg/L.

Chlorides were single digits in W-103 and W-104 with the exception of three results between 10 and 15 mg/L in W-103. Chlorides in W-115 were between 32 and 84 mg/L.

Central Fields C, D and E

W-106 and background well W-113 have relatively high chloride concentrations.

The mean chloride concentration in W-106 for the March 2001-November 2010 time frame was 316.3 mg/L with a range of 21-690 mg/L with all but on sample in the 170-690 mg/L range.

The mean chloride concentration in W-113 was 230.5 mg/L with a range of 160-350 mg/L for the same time frame.

Both W-106 and W-113 are located near public roads that may receive deicer in winter months.

The mean effluent chloride concentration for 1999-2004 was 222.98 mg/l if all data was included. If three data points over 800 mg/L are excluded the mean effluent chloride concentration drops to 168.5 mg/L.

The mean effluent chloride concentration for 2005 through 2010 was 160.7 mg/L.

The mean chloride concentrations referenced above appear to suggest that there may be other sources of chloride that affect W-106 and W-113. The means above are not flow proportional.

The background well W-113 has had low NO₂-NO₃,N concentrations with a range of .01 - 1.8 resulting in an alternate concentration limit of 3.0 mg/L.

W-105 (818) is located in the northwest corner of Field C near the drainage way from Field C and a nearby agricultural field. W-105 (818) has had high NO₂-NO₃, N concentrations with a range of 11-33 mg/l. Based on the facilities low Nitrogen effluent data to Field C, the agricultural field located to the West (sidegradient) of W-105 is the likely source of the NO₂-NO₃, N groundwater concentrations above NR 140 ES detected in this monitoring well. Chlorides in W-105 are in the 18-38 mg/L range with a mean of 23.9. The mean effluent chloride concentration for the June 2005- September 2010 time frame was 161.5 mg/L.

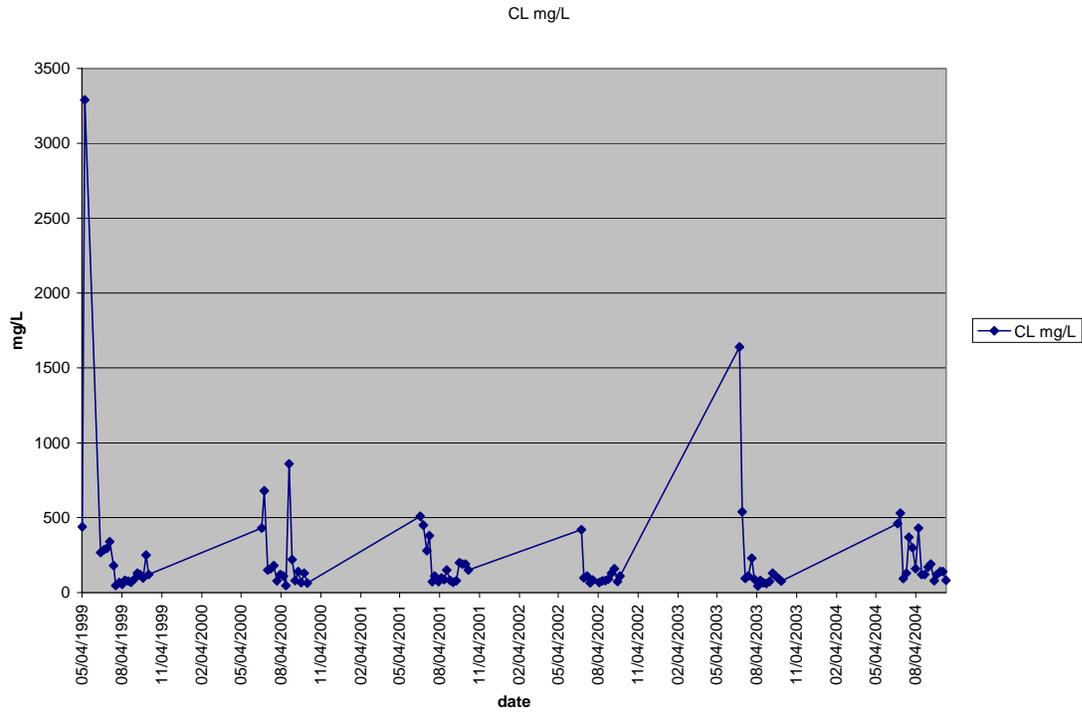
South Fields G and H

The only area of concern for south fields G and H is the sudden increase in COD in wells W-118 and W-120. The COD sample results exceeded 100 mg/L in December 2009, August 2010 and November 2010 in W-118 and in March and November 2010 in W-120. Other monitored parameters did not mirror the COD data.

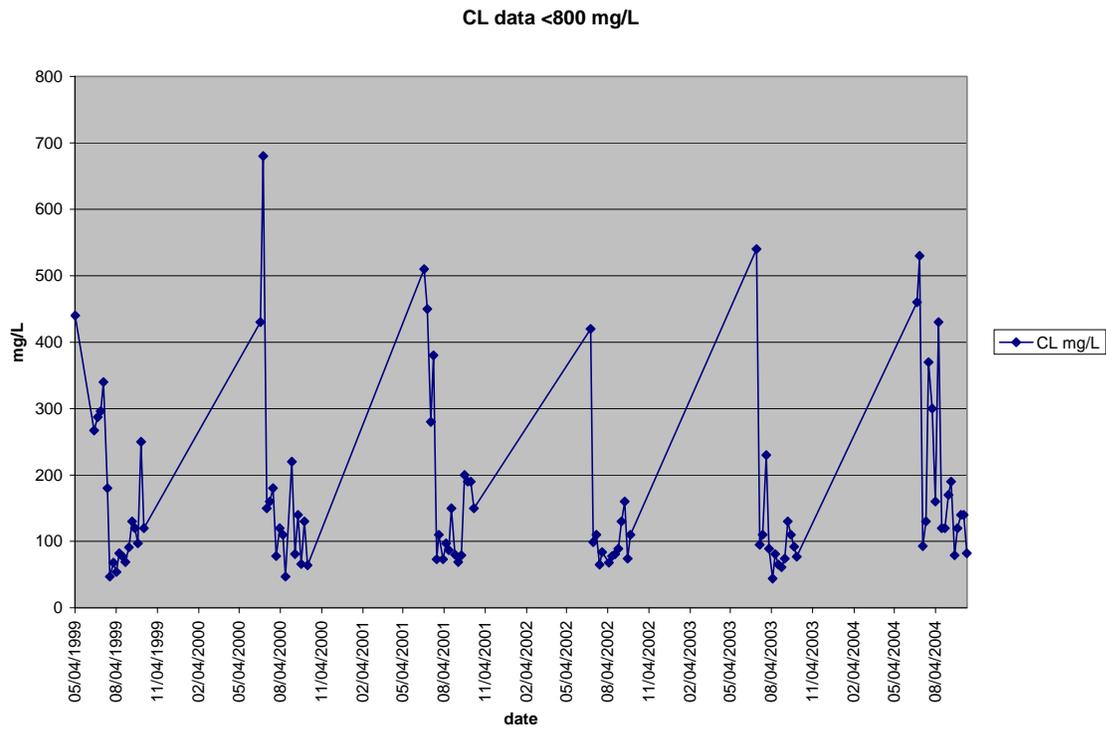
Recommendations

- That the Seneca Foods Mayville facility be considered in substantial compliance.
- Insert a compliance schedule in the permit requiring creation of or continued implementation of a chloride reduction/management plan.
- Insert a compliance schedule in the permit to require investigation of the cause(s) and remedies for the elevated COD in monitoring wells W-118 and W-120.
- Continue groundwater monitoring at the same frequency and for the same parameters as in the current permit.

Appendix A Effluent Chloride Data 1999-2004



Effluent chloride data < 800 mg/L 1999-2004



Substantial Compliance Determination

Permittee Name: Seneca Foods Mayville		Permit Number: 0050822-06-0
	Compliance?	Comments
Discharge Limits	Yes	The permittee is discharging from Outfall 014, this needs to be added to the permit.
Sampling/testing requirements	Yes	
Groundwater standards	Yes	see GW eval
Reporting requirements	Yes	
Compliance schedules	Yes	
Management plan	Yes	Update needed
Other:	Yes	
Enforcement Considerations		
In substantial compliance?	Yes Comments: See inspection checklist Signature: Jennifer Jerich Date: September 23, 2015 Concurrence: _____ Date: _____	