Nasco
Phosphorus Water Quality Trading Plan

City of Fort Atkinson
Jefferson County, WI

Prepared for:
NASCO Education LLC

March 30, 2018
Revised June 29, 2018

Montgomery Associates
Resource Solutions, LLC • ma-rs.org

MARS Project #1806

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1 Introduction

1.1 Background and Purpose

Montgomery Associates: Resource Solutions LLC (MARS), on behalf of Nasco Education LLC (Nasco) in Fort Atkinson Wisconsin has developed a phosphorus trading plan. This plan is intended to describe Nasco's approach to meet the Rock River Total Maximum Daily Load (TMDL) Total Phosphorus (TP) limits described in its Wisconsin Pollutant Discharge Elimination System (WPDES) permit. Nasco will purchase TP credits from the City of Columbus to demonstrate compliance with future permitted TP limits.

Nasco's Biological Division operates a Xenopus Frog (African clawed frog) breeding program, with frogs being distributed for education and research purposes. The frog colony has been maintained for over 35 years, with colony numbers between 90,000-150,000 individuals in the last 5 years. The operation water is supplied by a private well on Nasco's property and water is discharged directly to the City of Fort Atkinson storm sewer system. The primary discharge from the operation is overflow from aquariums as fresh water is supplied to the tanks and cleaning water discharged as tanks are scrubbed five times per week. The facility averages approximately 40,000 gallons of discharge water per day. The primary sources of TP in the discharge water are animal wastes.

Nasco has limited, cost-effective, options for compliance by modifying operations or upgrading facilities. Re-configuring the plant to discharge to the sanitary sewer would require costly plumbing upgrades as-well as annual payments to the City of Fort Atkinson to handle and treat waste water. Filtering or settling systems would only provide marginal treatment as most of the phosphorus in the discharge water is in the dissolved form. Finally, changes made to the feed formulation or cleaning operations may impact animal growth or health, thereby negatively impacting ongoing research projects.

In evaluating the current operation and potential compliance options Nasco determined that TP credit trading was the preferred alternative. Nasco will have an agreement in place with the City of Columbus, which operates the Columbus Wastewater Treatment Plant (WWTP), to purchase TP credits to be applied toward future limits.

This report was revised and submitted June 29, 2018 to address DNR reviewer comments. A summary of the comments and responses is provided in *Appendix D*.

1.2 Nasco Location

Nasco's operation is located at 901 Janesville Avenue, in Fort Atkinson Wisconsin; the NW ¼ of the NW ¼ of Section 9, Township 5 North Range 14 East. The outfall is located in HUC 12 watershed 070900021001, The Fort Atkinson- Rock River Basin. The frog facility discharges directly to the City of Fort Atkinson storm sewer. The storm sewer outfall discharges to the Rock River, located at 42.925°N 88.850°W. The location of Nasco and the outfall shown on *Figure C1*.

1.3 Nasco Current Permit

Nasco currently operates pursuant to WPDES Permit No. WI-005822, facility site Number 10141. The only outfall for the operation is directly to the City of Fort Atkinson storm sewer and, eventually, the Rock River. The current permit describes the Water Quality Based Effluent Limits (WQBELs) for TP concentrations of 4.3 mg/L, on a monthly average. Nasco has not experience past compliance issues meeting these limits. As part of the implementation of the Rock River Total Maximum Daily Load (TMDL), Nasco was provided with revised TP discharge limits. These limits are expressed as an average in lb/day and are described in more detail Section 2.1.

1.4 City of Columbus Wastewater Treatment Plant

The City of Columbus operates a waste water treatment plant through the City's Department of Public Works. The plant treats municipal sewage wastes and discharges treated effluent to the Crawfish River, just south of the City of Columbus in Dodge County WI. The plant is located at 537 River Rd, Columbus, WI 53925. The WWTP is located in HUC 12 Watershed 070900011001, the Nolan Creek-Crawfish River Watershed, upstream of the Nasco outfall. The location of Nasco and the outfall shown on *Figure C2*.

1.5 City of Columbus Treatment Plant Permit

The City of Columbus WWTP currently operates under WPDES Permit No. WI-0021-008-09-0. The current WQBELs for TP discharge from the plant are a monthly average of 1.0 mg/L.

1.6 TMDL Reaches

The Nasco outfall is located on the Rock River TMDL Reach 60 (Main Branch of the Rock River). The permittable Waste Load Allocation (WLA) for Nasco was derived to be protective of the water quality at the downstream end of this reach. The City of Columbus WWTP falls within the Rock River TMDL Reach 51 (Maunesha River). The WLA developed for the City of Columbus was derived to protect water quality at the confluence of the Crawfish and Maunesha Rivers, upstream of the Nasco outfall location. The location of Nasco and the City of Columbus WWTP in relation to the TMDL reaches is shown in *Figure C3*.

2 Credit Need

2.1 Nasco Future TP Limits

Beginning in January 2021, Nasco will be subject to daily TMDL TP allocations. These limits are show in *Table 1* and are expressed as total discharge in lbs TP/day. The limits vary by month ranging from 0.29 lb/day to 0.67 lb/day.

Table 1 – Jan 2021 Permitted Monthly TP Limits (lb/day)

Month	TP limit (lb/day)		Month	TP limit (lb/day)
Jan	0.39		Jul	0.46
Feb	0.55		Aug	0.39
Mar	0.59		Sep	0.32
Apr	0.67		Oct	0.29
May	0.64		Nov	0.30
Jun	0.59		Dec	0.33

2.2 Evaluation of Current and Projected Discharge

To provide a conservative estimate of the TP mass discharge from the existing operation, Nasco collects samples from the outfall location on days when the frog tanks are scrubbed. This is typically completed bi-weekly on Tuesdays. To demonstrate compliance with the current permit WQBELs, Nasco collects a composite sample during cleaning periods when the TP concentration is highest. Flow data is continuously collected with a Parshall Flume and level sensor in a manhole within the warehouse.

To project the estimated TP discharge Nasco utilized sample and flow data from January 2015 through February 2018 (*Figure 1*). Prior to October 2017, only one composite sample was collected per day during the tank cleaning operations. That concentration was then applied to the full day's flow data. This resulted in a significant over estimate of the total daily TP load. TP loads calculated using this approach were between 0.4 and 1.9 lb/day, well above the future permitted limits as is shown in *Figure 1*.

Beginning in October 2017, the more detailed sampling protocol was developed, and the cleaning procedures were modified to estimate the TP discharge from the operation more accurately. Nasco has begun collecting a pseudo flow-proportional sample. The system is not currently configured to collect flow proportional samples and so sub-samples are collected every 15 minutes during cleaning. Flow rates are maintained at constant level, during these cleanings. Outside of the cleaning period the only discharge from the operation is overflow from the tanks as fresh water is supplied. The TP concentration in the discharge water does not change rapidly and the outflow rates are relatively steady. During these “non-cleaning periods” outfall samples are collected every 15 minutes. This

allows for a cleaning period load to be calculated as well as a non-cleaning period load. These two estimates are combined to provide the total daily estimated load from the operation.

In the five months after the modified procedures were initiated the average calculated daily TP load has been much more consistent and much lower than previous estimates. This is not necessarily reflective of a change in the actual load discharged from the facility, more likely it demonstrates the improvements in estimating the discharge loads from the facility. A subset of the data collected by Nasco between October 2017 and March 2018 is provided in *Appendix A*.

With a better estimate of the existing discharge from the facility, Nasco's projected TP discharge was compared to the future permitted limits to determine the anticipated Permit Compliance. The 2021 permitted TP limits are shown as compared to the estimated discharge from Nasco in *Figure 1*. From October 2017-February 2018 the calculated averaged daily TP load was 0.43 lb/day. To provide a factor of safety and allow for some modifications to the operation over time this value was increased by 20%. Therefore, the assumed average daily TP load from Nasco was assumed to be 0.51 lb/day.

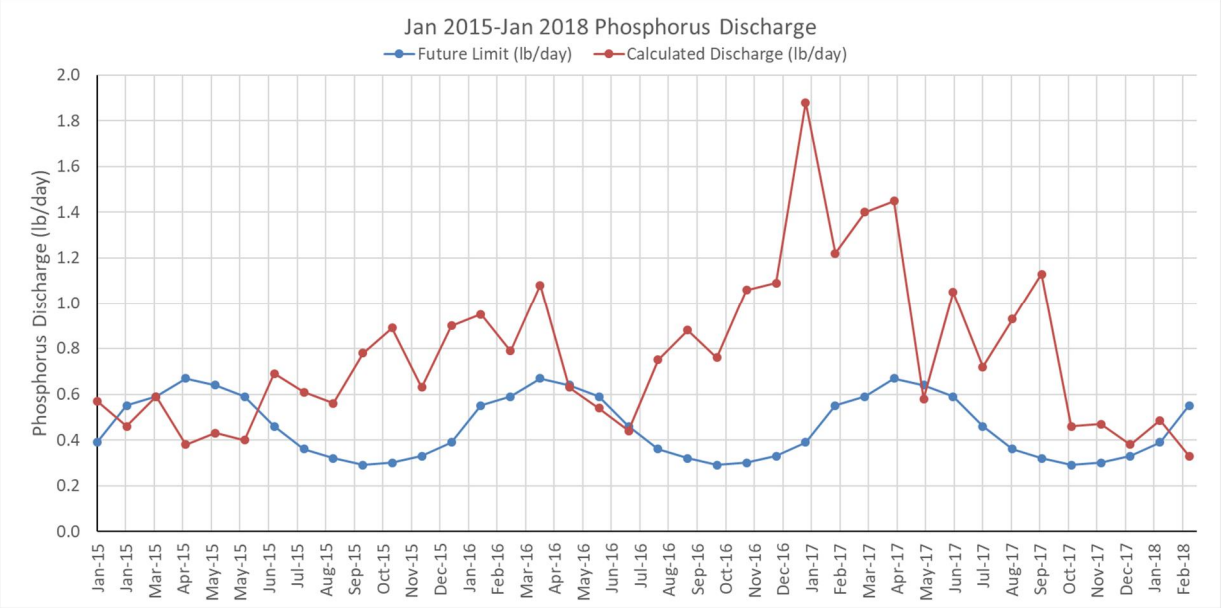


Figure 1 – Nasco Estimated TP Discharge Jan 2015 – Feb 2018

2.3 Credit Need

To meet the future permit limits based on the estimated TP loads from the facility Nasco requires P discharge credits. Nasco's projected discharge is lower than the permitted limits five months out of the year and above the permitted limits the remainder of the time. The lowest permitted discharge limits will be between September and December, ranging from 0.29-0.33 lb TP/day, or 0.22 lb/day lower than projected average daily load from the operation. Nasco will acquire 0.25 lb TP/day in credits to meet the limits during this more restrictive period.

3 Credit Availability

3.1 Columbus Waste Water Treatment Plant Future TP Limits

Revised WQBELs will be applied to the City of Columbus WWTP WPDES permit. These limits include TP concentration limits of 0.075 mg/L on a six-month average, and 0.225 mg/L single month average. TMDL TP allocations (prior to application of the trade) will be applied as described in *Table 2*.

Table 2 – City of Columbus WWTP Future TMDL TP Limits

Month	TP limit (lb/day)		Month	TP limit (lb/day)
Jan	16.39		Jul	14.17
Feb	20.88		Aug	15.58
Mar	18.83		Sep	16.11
Apr	15.65		Oct	15.58
May	14.43		Nov	15.93
Jun	14.16		Dec	14.61

3.2 Columbus WWTP Projected Discharge and Credit Availability

Data on the Columbus WWTP operation and discharge was used to calculate excess TP in the WWTP WLA available for trading. This data was provided by the City's municipal engineer (Dave Arnott, Ruekert Mielke). Currently the WWTP discharges about 4.5 lb TP/day and the City projects that with plant optimization the TP flow may be reduced to about 1.5 lb/day. The WWTP design flow is 1.26 MGD and the required future treatment level is 0.075 mg/L. Therefore, the permittable TP discharge is approximately 0.8 lb TP/day. The current excess TP availability by month conservatively assuming a plant daily TP discharge of 4.5 lb/day is provided in *Table 3*. If the plant can achieve a discharge concentration of 0.075 mg/L the amount of excess P (and therefore the amount available to trade) will increase as shown in *Table 4*. The Columbus WWTP is pursuing measures to ensure compliance with future WQBEL's and TMDL limits.

Table 3 – Columbus WWTP Current TP Availability

Month	TMDL Allocation (lb TP/day)	Allocation (lb TP/month)	lb TP at Design Flow	Excess (lb TP)
Jan	16.39	508.09	139.50	369
Feb	20.80	582.40	126.00	456
Mar	18.83	583.73	139.50	444
Apr	15.65	469.50	135.00	334
May	14.43	447.33	139.50	308
Jun	14.16	424.80	135.00	290
Jul	14.17	439.27	139.50	300
Aug	15.58	482.98	139.50	343
Sep	16.11	483.30	135.00	348
Oct	15.58	482.98	139.50	343
Nov	15.98	479.40	135.00	344
Dec	14.61	452.91	139.50	313
Total				4194

Table 4 – Columbus WWTP Future TP Availability

Month	TMDL Allocation (lb TP/day)	Allocation (lb TP/month)	Actual lb TP at Design Flow	Excess (lb TP)
Jan	16.39	508.09	24.43	484
Feb	20.80	582.40	22.07	560
Mar	18.83	583.73	24.43	559
Apr	15.65	469.50	23.64	446
May	14.43	447.33	24.43	423
Jun	14.16	424.80	23.64	401
Jul	14.17	439.27	24.43	415
Aug	15.58	482.98	24.43	459
Sep	16.11	483.30	23.64	460
Oct	15.58	482.98	24.43	459
Nov	15.98	479.40	23.64	456
Dec	14.61	452.91	24.43	428
Total				5549

3.3 Notice of Intent

A notice of intent was provided to WDNR in March 31, 2017 demonstrating the interest in establishing a water quality trade for TP between Nasco and the City of Columbus.

4 Trade Agreement

Nasco and the City of Columbus have the principal structure of an agreement in place to trade water quality TP credits. The trade agreement outlines the number of credits to be purchased by Nasco, the cost per credit, payment structure, duration of the agreement, as well as other clauses to trigger contract review. This agreement requires approval by the City Council of Columbus and therefore is not finalized as of the issuance of this report. A final signed trade agreement will be provided to the DNR once it has been approved by all parties involved.

4.1 Trade Ratios

A trade ratio for the proposed trade was calculated for each field based on DNR guidance documents. Each factor of the trade ratio is summed to calculate the overall trade ratio, i.e. *Trade Ratio = (sum of factors):1*. A brief discussion of the evaluation for each of the factors is provided below.

Delivery – The delivery factor has been incorporated into the WLA's generated from the Rock River TMDL. Therefore, a delivery factor does not apply to the trade ratio in this case.

Downstream – In this case the credit user is downstream from the credit generator and so the downstream factor does not apply.

Equivalency – The proposed traded nutrients are the same form (TP to TP); the factor does not apply.

Uncertainty – According to DNR trading guidance, a value of one is used for the uncertainty factor for a point source credit generator "when the credit generator performs effluent monitoring in accordance with the terms of its WPDES discharge permit".

Habitat –The factor does not apply in a trade between point sources.

Only the uncertainty factor applies to the P trade between the City of Columbus and Nasco, resulting in a trade ratio of 1:1. However, to ensure that the trade results in a water quality improvement a minimum trader ratio of 1.1:1 is mandated for trades between point sources. Therefore, a trade ratio of 1.1:1 will apply to the point to point trade between Nasco and the City of Columbus.

4.2 Credit Purchase

Despite only needing credits for a portion of the year, Nasco has agreed to purchase credits to be applied to all months of the year. This will allow for the City of Columbus to maintain consistency in operations. Based on the applicable trade ratios, Nasco will purchase credits of 0.28 lb/day to be able to apply 0.25 lb/day to their monthly permit limits. For the period of one year the total number of credits purchase will be 102.2 lb.

4.3 Timeline of Credit Availability

Nasco's TMDL TP limits will be applied effective January 2021. Nasco intends to make quarterly payments to the City of Columbus to obtain the TP credits. Therefore, Nasco will initiate payments to the City prior to December 31, 2020, with credits becoming available beginning in January 2021.

4.4 Proposed Permit Limits

The permitted TP limits prior to implementation of the trade for Nasco and the City of Columbus WWTP were provided in *Tables 1* and *2*. Consistent with the trading plan described above the proposed TP limits after implementation of the plan are shown in *Tables 5* and *6*.

Table 5 – Nasco TMDL-derived TP limit Post Trade (Effective Jan 2021)

Month	TP limit (lb/day)		Month	TP limit (lb/day)
Jan	0.64		Jul	0.71
Feb	0.80		Aug	0.64
Mar	0.84		Sep	0.57
Apr	0.92		Oct	0.54
May	0.89		Nov	0.55
Jun	0.84		Dec	0.58

Table 6 – Columbus WWTP TMDL-derived TP limit Post Trade (Effective Jan 2021)

Month	TP limit (lb/day)		Month	TP limit (lb/day)
Jan	16.11		Jul	13.89
Feb	20.60		Aug	15.30
Mar	18.55		Sep	15.83
Apr	15.37		Oct	15.30
May	14.15		Nov	15.65
Jun	13.88		Dec	14.33

5 Reporting

Nasco and The City of Columbus Waste Water Treatment Plant will continue to report monthly to the DNR, the daily calculated TP discharge from operations in accordance with the WPDES permit requirements. If for any reason this trade is modified or terminated Nasco and the City of Columbus will notify the DNR and request permit modification, if necessary.

Appendix A – Nasco Monitoring Data

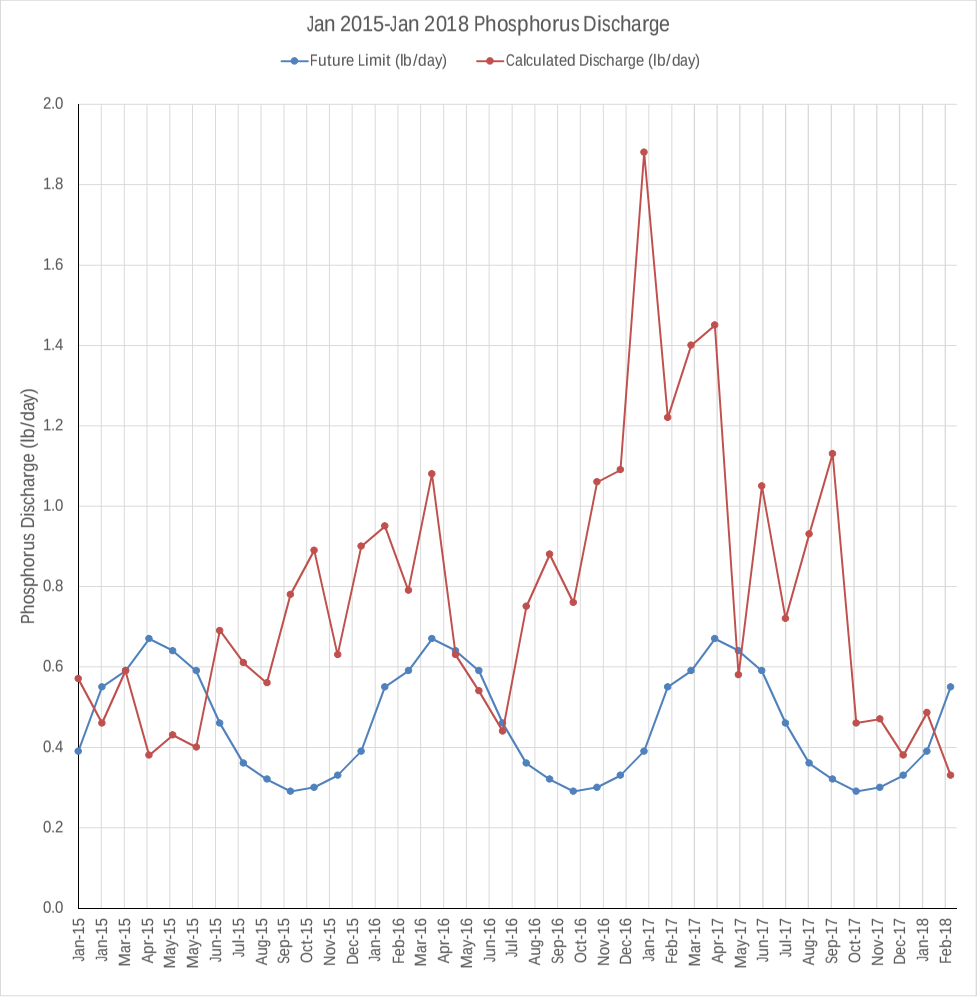
Montgomery Associates
Resource Solutions, LLC

Jan2015 - Jan 2018 Measured Phosphorus Discharge and Calculated Credit Need

Month	Future Limit (lb/day)	Calculated Discharge (lb/day)	Monthly Limit (lb)	Actual Monthly Discharge (lb)	Total Credit Need (lb)	Credit Need in lb/day
Jan-15	0.39	0.57	12.1	17.7	5.6	0.18
Feb-15	0.55	0.46	17.1	14.3	0.0	0.00
Mar-15	0.59	0.59	18.3	18.3	0.0	0.00
Apr-15	0.67	0.38	20.8	11.8	0.0	0.00
May-15	0.64	0.43	19.8	13.3	0.0	0.00
Jun-15	0.59	0.4	18.3	12.4	0.0	0.00
Jul-15	0.46	0.69	14.3	21.4	7.1	0.23
Aug-15	0.36	0.61	11.2	18.9	7.8	0.25
Sep-15	0.32	0.56	9.9	17.4	7.4	0.25
Oct-15	0.29	0.78	9.0	24.2	15.2	0.49
Nov-15	0.3	0.89	9.3	27.6	18.3	0.59
Dec-15	0.33	0.63	10.2	19.5	9.3	0.30
Jan-16	0.39	0.9	12.1	27.9	15.8	0.51
Feb-16	0.55	0.95	17.1	29.5	12.4	0.44
Mar-16	0.59	0.79	18.3	24.5	6.2	0.20
Apr-16	0.67	1.08	20.8	33.5	12.7	0.42
May-16	0.64	0.63	19.8	19.5	0.0	0.00
Jun-16	0.59	0.54	18.3	16.7	0.0	0.00
Jul-16	0.46	0.44	14.3	13.6	0.0	0.00
Aug-16	0.36	0.75	11.2	23.3	12.1	0.39
Sep-16	0.32	0.88	9.9	27.3	17.4	0.58
Oct-16	0.29	0.76	9.0	23.6	14.6	0.47
Nov-16	0.3	1.06	9.3	32.9	23.6	0.76
Dec-16	0.33	1.09	10.2	33.8	23.6	0.76
Jan-17	0.39	1.88	12.1	58.3	46.2	1.49
Feb-17	0.55	1.22	17.1	37.8	20.8	0.74
Mar-17	0.59	1.4	18.3	43.4	25.1	0.81
Apr-17	0.67	1.45	20.8	45.0	24.2	0.81
May-17	0.64	0.58	19.8	18.0	0.0	0.00
Jun-17	0.59	1.05	18.3	32.6	14.3	0.48
Jul-17	0.46	0.72	14.3	22.3	8.1	0.26
Aug-17	0.36	0.93	11.2	28.8	17.7	0.57
Sep-17	0.32	1.13	9.9	35.0	25.1	0.84
Oct-17	0.29	0.46	9.0	14.3	5.3	0.17
Nov-17	0.3	0.47	9.3	14.6	5.3	0.17
Dec-17	0.33	0.38	10.2	11.8	1.6	0.05
Jan-18	0.39	0.49	12.1	15.1	3.0	0.10
Feb-18	0.55	0.33	15.4	9.2	0.0	0.00

Year	Future Limit (lb/day)	Average Discharge (lb/day)	Monthly Limit (lb)	Avg Monthly Discharge (lb)	Total Credit Need (lb)
2015	0.29-0.67	0.58	8.99-20.77	18.1	71
2016		0.82		25.5	138
2017		0.97		30.1	193
Annual Projected*		0.51		13.0	35

* (based on Oct 2017-Feb 2018, 20% increase from the 4 month avg)



...lient Sample ID: WPDES
Date Collected: 12/05/17 09:30
Date Received: 12/06/17 11:15

Lab Sample ID: 500-138194-1
Matrix: Wastewater

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	17		5.0	1.9	mg/L			12/06/17 13:08	1
Phosphorus as P	1.2		0.25	0.12	mg/L		12/08/17 13:05	12/11/17 12:58	5
Biochemical Oxygen Demand	13		2.0	2.0	mg/L			12/06/17 14:11	1

Client Sample ID: WPDES
Date Collected: 12/05/17 13:30
Date Received: 12/06/17 11:15

Lab Sample ID: 500-138194-2
Matrix: Wastewater

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Phosphorus as P	0.22		0.050	0.024	mg/L		12/08/17 13:05	12/11/17 12:59	1

$55,000 \div 1,000,000 = .055 \times 8.34 = .458$

Tss # day $= 17 \times .458 = 7.78$

P # day $= 1.2 \times .458 = .54$

Cleaning Time $35,000 \div 1,000,000 = .035 \times 8.34 = .29$

P # $= 1.2 \times .29 = .348$

$.348 + .036 = 0.384$ Total

Noncleaning Time $20,000 \div 1,000,000 = .020 \times 8.34 = .166$

P # $= .22 \times .166 = .036$

Client Sample Results

nt: Nasco - Biology Division
roject/Site: WPDES WW Comp.

TestAmerica Job ID: 500-138547-1

Client Sample ID: WPDES
Date Collected: 12/12/17 09:30
Date Received: 12/13/17 10:40

Lab Sample ID: 500-138547-1
Matrix: Wastewater

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	14		5.0	1.9	mg/L			12/14/17 10:01	1
Phosphorus as P	1.1	B	0.10	0.048	mg/L		12/14/17 10:13	12/15/17 11:38	2
Biochemical Oxygen Demand	13		2.0	2.0	mg/L			12/13/17 17:23	1

Client Sample ID: WPDES
Date Collected: 12/12/17 13:30
Date Received: 12/13/17 10:40

Lab Sample ID: 500-138547-2
Matrix: Wastewater

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Phosphorus as P	0.26	B	0.050	0.024	mg/L		12/14/17 10:13	12/15/17 11:38	1

58,400 ÷ 1,000,000 = 0.0584 X 8.34 = .487

Tss # day = 14 X .487 = 6.82

P # day = 1.1 X .487 = 1.54

Cleaning time 36,000 ÷ 1,000,000 = 0.036 X 8.34 = .300

P # day = 1.1 X .30 = .33

.33
+ .048
.378
Total

Non Cleaning time 22,400 ÷ 1,000,000 = 0.0224 X 8.34 = .186

P # day = .26 X .186 = .048

Client Sample Results

Client: Nasco - Biology Division
Project/Site: WPDES WW Comp.

TestAmerica Job ID: 500-139470-1

Client Sample ID: WPDES
Date Collected: 01/09/18 09:30
Date Received: 01/10/18 10:55

Lab Sample ID: 500-139470-1
Matrix: Wastewater

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	16		5.0	1.9	mg/L			01/11/18 09:15	1
Ammonia	5.1		0.40	0.20	mg/L		01/15/18 20:05	01/16/18 01:01	2
Phosphorus as P	1.5		0.25	0.12	mg/L		01/12/18 10:02	01/15/18 12:46	5
Biochemical Oxygen Demand	25		2.0	2.0	mg/L			01/10/18 15:05	1

Client Sample ID: WPDES
Date Collected: 01/09/18 13:30
Date Received: 01/10/18 10:55

Lab Sample ID: 500-139470-2
Matrix: Wastewater

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Phosphorus as P	0.31		0.050	0.024	mg/L		01/12/18 10:02	01/15/18 12:46	1

$51,500 \div 1,000,000 = 0.0515 \times 8.34 = .429$

Tss # day $= 16 \times .429 = 6.86$

P # day $= 1.5 \times .429 = .643$

Clean system $34,200 \div 1,000,000 = .0342 \times 8.34 =$

P # day $= 1.5 \times .285 = .427$

Non clean system $22,400 \div 1,000,000 = .0224 \times 8.34 = .186$

P # day $= .31 \times .186 = .057$

.427
+ .057
.484
Total

Water output Every 5 Min for 24hrs for January 9, 2018

Date	Time	Pulses (gal)	
1/9/2018	12:04:13 AM	0	
1/9/2018	12:09:13 AM	100	
1/9/2018	12:14:13 AM	100	
1/9/2018	12:19:13 AM	0	
1/9/2018	12:24:13 AM	100	
1/9/2018	12:29:13 AM	100	
1/9/2018	12:34:13 AM	0	
1/9/2018	12:39:13 AM	100	
1/9/2018	12:44:13 AM	100	
1/9/2018	12:49:13 AM	0	
1/9/2018	12:54:13 AM	100	
1/9/2018	12:59:13 AM	100	
Total from 1204am thru 0709am = 5900 Non Cleaning Time			
1/9/2018	6:04:13 AM	0	
1/9/2018	6:09:13 AM	100	
1/9/2018	6:14:13 AM	100	
1/9/2018	6:19:13 AM	100	
1/9/2018	6:24:13 AM	0	
1/9/2018	6:29:13 AM	100	
1/9/2018	6:34:13 AM	100	
1/9/2018	6:39:13 AM	0	
1/9/2018	6:44:13 AM	100	**Non cleaning time Total**
1/9/2018	6:49:13 AM	100	**5900 + 11400 = 17,300**
1/9/2018	6:54:13 AM	100	
1/9/2018	6:59:13 AM	0	
1/9/2018	7:04:13 AM	100	
1/9/2018	7:09:13 AM	100	
1/9/2018	7:14:13 AM	400	
1/9/2018	7:19:13 AM	700	
1/9/2018	7:24:13 AM	1200	
1/9/2018	7:29:13 AM	1400	
1/9/2018	7:34:13 AM	1600	
1/9/2018	7:39:13 AM	2200	
1/9/2018	7:44:13 AM	2300	
1/9/2018	7:49:13 AM	1900	
1/9/2018	7:54:13 AM	1800	
1/9/2018	7:59:13 AM	1000	**Cleaning Time**
1/9/2018	8:04:13 AM	900	**Total from 0714am thru 0929am = 34,200**
1/9/2018	8:09:13 AM	700	
1/9/2018	8:14:13 AM	1200	
1/9/2018	8:19:13 AM	1600	
1/9/2018	8:24:13 AM	1400	
1/9/2018	8:29:13 AM	1500	
1/9/2018	8:34:13 AM	1500	
1/9/2018	8:39:13 AM	1300	
1/9/2018	8:44:13 AM	1000	
1/9/2018	8:49:13 AM	1000	
1/9/2018	8:54:13 AM	1100	
1/9/2018	8:59:13 AM	1200	
1/9/2018	9:04:13 AM	1000	
1/9/2018	9:09:13 AM	1200	
1/9/2018	9:14:13 AM	1200	
1/9/2018	9:19:13 AM	700	
1/9/2018	9:24:13 AM	700	
1/9/2018	9:29:13 AM	500	
1/9/2018	9:34:13 AM	700	
1/9/2018	9:39:13 AM	100	
1/9/2018	9:44:13 AM	0	
1/9/2018	9:49:13 AM	100	
1/9/2018	9:54:13 AM	0	
1/9/2018	9:59:13 AM	100	
1/9/2018	10:04:13 AM	0	
1/9/2018	10:09:13 AM	0	
1/9/2018	10:14:13 AM	100	
1/9/2018	10:19:13 AM	0	
1/9/2018	10:24:13 AM	0	
1/9/2018	10:29:13 AM	100	
1/9/2018	10:34:13 AM	200	
1/9/2018	10:39:13 AM	300	
1/9/2018	10:44:13 AM	100	
1/9/2018	10:49:13 AM	0	
1/9/2018	10:54:13 AM	100	
1/9/2018	10:59:13 AM	0	
Total from 1059am thru 1104pm = 11400 Non Cleaning Time			
1/9/2018	11:04:13 PM	100	
1/9/2018	11:09:13 PM	0	
1/9/2018	11:14:13 PM	100	
1/9/2018	11:19:13 PM	100	
1/9/2018	11:24:13 PM	100	
1/9/2018	11:29:13 PM	100	
1/9/2018	11:34:13 PM	0	
1/9/2018	11:39:13 PM	100	
1/9/2018	11:44:13 PM	100	
1/9/2018	11:49:13 PM	100	
1/9/2018	11:54:13 PM	0	

Client Sample Results

Client: Nasco - Biology Division
Project/Site: WPDES WW Comp.

TestAmerica Job ID: 500-139791-1

Client Sample ID: WPDES
Date Collected: 01/16/18 09:30
Date Received: 01/17/18 11:45

Lab Sample ID: 500-139791-1
Matrix: Wastewater

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	21		7.1	2.8	mg/L			01/18/18 10:22	1
Phosphorus as P	1.5		0.25	0.12	mg/L		01/19/18 09:47	01/22/18 14:56	5
Biochemical Oxygen Demand	19		2.0	2.0	mg/L			01/17/18 16:09	1

Client Sample ID: WPDES
Date Collected: 01/16/18 13:30
Date Received: 01/17/18 11:45

Lab Sample ID: 500-139791-2
Matrix: Wastewater

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Phosphorus as P	0.24		0.050	0.024	mg/L		01/19/18 09:47	01/22/18 14:57	1

$54,800 \div 1,000,000 = .0548 \times 8.34 = .457$

TSS #/day $= 21 \times .457 = 9.59$

P #/day $= 1.5 \times .457 = .685$

Cleaning time $36,100 \div 1,000,000 = 0.0361 \times 8.34 = .301$

P# day $= 1.5 \times .301 = .451$

$18,700 \div 1,000,000 = .0187 \times 8.34 = .155$

P# day $= .24 \times .155 = .037$

$.451 + .037 = .488$ Total

Water output Every 5 Min for 24hrs for January 16, 2018

Date	Time	Pulses (gal)	
1/16/2018	12:04:15 AM	100	
1/16/2018	12:09:15 AM	0	
1/16/2018	12:14:15 AM	100	
1/16/2018	12:19:15 AM	100	
1/16/2018	12:24:15 AM	100	
1/16/2018	12:29:15 AM	100	
1/16/2018	12:34:15 AM	0	
1/16/2018	12:39:15 AM	100	
1/16/2018	12:44:15 AM	100	
1/16/2018	12:49:15 AM	100	
1/16/2018	12:54:15 AM	0	
1/16/2018	12:59:15 AM	100	
Total from 1204am thru 0709am = 7100 Non Cleaning time			
1/16/2018	6:04:15 AM	100	
1/16/2018	6:09:15 AM	100	
1/16/2018	6:14:15 AM	100	
1/16/2018	6:19:15 AM	0	
1/16/2018	6:24:15 AM	100	
1/16/2018	6:29:15 AM	100	
1/16/2018	6:34:15 AM	100	
1/16/2018	6:39:15 AM	0	
1/16/2018	6:44:15 AM	100	**Non Cleaning time Total**
1/16/2018	6:49:15 AM	100	**7100 + 11600 = 18,700**
1/16/2018	6:54:15 AM	100	
1/16/2018	6:59:15 AM	0	
1/16/2018	7:04:15 AM	100	
1/16/2018	7:09:15 AM	700	
1/16/2018	7:14:15 AM	1000	
1/16/2018	7:19:15 AM	1600	
1/16/2018	7:24:15 AM	1600	
1/16/2018	7:29:15 AM	1500	
1/16/2018	7:34:15 AM	700	
1/16/2018	7:39:15 AM	1600	
1/16/2018	7:44:15 AM	1700	
1/16/2018	7:49:15 AM	2100	
1/16/2018	7:54:15 AM	1400	
1/16/2018	7:59:15 AM	2200	**Cleaning Time**
1/16/2018	8:04:15 AM	2000	**Total from 0714am thru 0929am = 36,100**
1/16/2018	8:09:15 AM	1500	
1/16/2018	8:14:15 AM	2300	
1/16/2018	8:19:15 AM	1500	
1/16/2018	8:24:15 AM	2000	
1/16/2018	8:29:15 AM	1800	
1/16/2018	8:34:15 AM	1400	
1/16/2018	8:39:15 AM	1000	
1/16/2018	8:44:15 AM	900	
1/16/2018	8:49:15 AM	900	
1/16/2018	8:54:15 AM	1300	
1/16/2018	8:59:15 AM	700	
1/16/2018	9:04:15 AM	1300	
1/16/2018	9:09:15 AM	700	
1/16/2018	9:14:15 AM	600	
1/16/2018	9:19:15 AM	400	
1/16/2018	9:24:15 AM	200	
1/16/2018	9:29:15 AM	200	
1/16/2018	9:34:15 AM	300	
1/16/2018	9:39:15 AM	100	
1/16/2018	9:44:15 AM	0	
1/16/2018	9:49:15 AM	0	
1/16/2018	9:54:15 AM	100	
1/16/2018	9:59:15 AM	0	
1/16/2018	10:04:15 AM	100	
1/16/2018	10:09:15 AM	0	
1/16/2018	10:14:15 AM	0	
1/16/2018	10:19:15 AM	100	
1/16/2018	10:24:15 AM	0	
1/16/2018	10:29:15 AM	100	
1/16/2018	10:34:15 AM	0	
1/16/2018	10:39:15 AM	100	
1/16/2018	10:44:15 AM	100	
1/16/2018	10:49:15 AM	0	
1/16/2018	10:54:15 AM	100	
1/16/2018	10:59:15 AM	0	
Total from 1059am thru 1104pm = 11600 Non Cleaning			
1/16/2018	11:04:15 PM	100	
1/16/2018	11:09:15 PM	100	
1/16/2018	11:14:15 PM	100	
1/16/2018	11:19:15 PM	0	
1/16/2018	11:24:15 PM	100	
1/16/2018	11:29:15 PM	100	
1/16/2018	11:34:15 PM	100	
1/16/2018	11:39:15 PM	100	
1/16/2018	11:44:15 PM	100	
1/16/2018	11:49:15 PM	0	
1/16/2018	11:54:15 PM	100	

Client Sample Results

Client: Nasco - Biology Division
Project/Site: WPDES WW Comp.

TestAmerica Job ID: 500-140606-1

Client Sample ID: WPDES
Date Collected: 02/06/18 09:30
Date Received: 02/07/18 11:30

Lab Sample ID: 500-140606-1
Matrix: Wastewater

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	16		5.0	1.9	mg/L			02/07/18 12:58	1
Ammonia	3.4		0.20	0.10	mg/L		02/11/18 18:15	02/11/18 22:20	1
Phosphorus as P	0.88		0.10	0.048	mg/L		02/09/18 08:48	02/12/18 12:04	2
Biochemical Oxygen Demand	12		2.0	2.0	mg/L			02/07/18 16:08	1

Client Sample ID: WPDES
Date Collected: 02/06/18 13:30
Date Received: 02/07/18 11:30

Lab Sample ID: 500-140606-2
Matrix: Wastewater

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Phosphorus as P	0.20		0.050	0.024	mg/L		02/09/18 08:48	02/12/18 12:04	1

54,800 ÷ 1,000,000 = .0548 X 8.34 = .457

Tss # day = 16 X .457 = 7.31

P # day = .88 X .457 = .402

Cleaning Time 37,100 ÷ 1,000,000 = .0371 X 8.34 = .309

P # day = .88 X .309 = .271

.271
.029
+
.300
Total

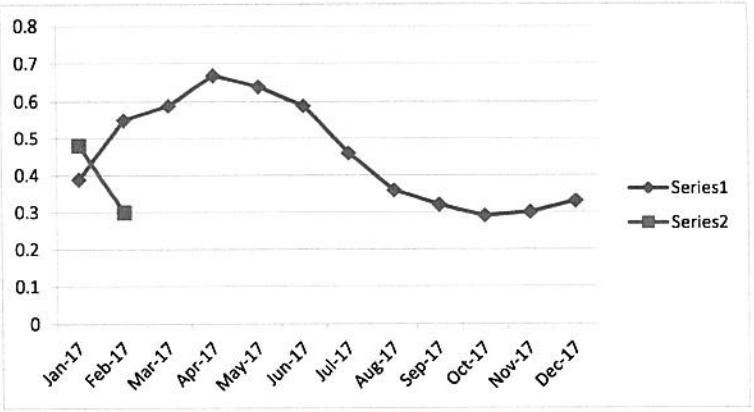
Non cleaning Time 17,700 ÷ 1,000,000 = .0177 X 8.34 = .147

P # = .20 X .147 = .029

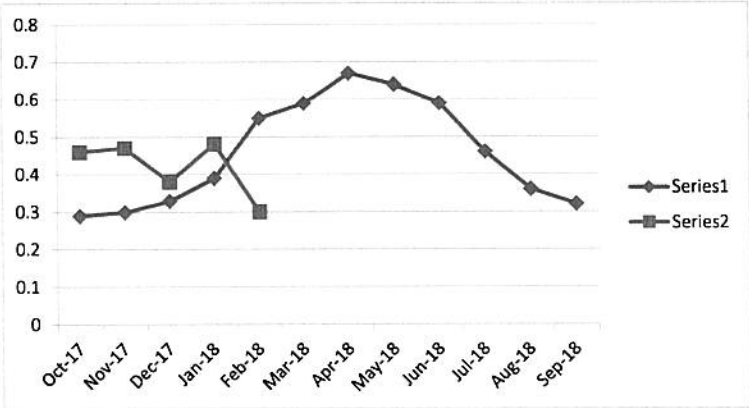
Water output Every 5 Min for 24hrs for February 06, 2018

Date	Time	Pulses (gal)	
2/6/2018	12:04:12 AM	100	
2/6/2018	12:09:12 AM	100	
2/6/2018	12:14:12 AM	100	
2/6/2018	12:19:12 AM	100	
2/6/2018	12:24:12 AM	100	
2/6/2018	12:29:12 AM	0	
2/6/2018	12:34:12 AM	100	
2/6/2018	12:39:12 AM	100	
2/6/2018	12:44:12 AM	100	
2/6/2018	12:49:12 AM	100	
2/6/2018	12:54:12 AM	0	
2/6/2018	12:59:12 AM	100	
Total from 1204am thru 0709am = 7500 Non Cleaning time			
2/6/2018	6:09:12 AM	100	
2/6/2018	6:14:12 AM	100	**Non Cleaning time Total**
2/6/2018	6:19:12 AM	0	**7500 + 10200 = 17,700**
2/6/2018	6:24:12 AM	100	
2/6/2018	6:29:12 AM	100	
2/6/2018	6:34:12 AM	100	
2/6/2018	6:39:12 AM	100	
2/6/2018	6:44:12 AM	0	
2/6/2018	6:49:12 AM	100	
2/6/2018	6:54:12 AM	100	
2/6/2018	6:59:12 AM	100	
2/6/2018	7:04:12 AM	100	
2/6/2018	7:09:12 AM	500	
2/6/2018	7:14:12 AM	500	
2/6/2018	7:19:12 AM	1700	
2/6/2018	7:24:12 AM	1600	
2/6/2018	7:29:12 AM	1700	
2/6/2018	7:34:12 AM	1500	
2/6/2018	7:39:12 AM	1700	
2/6/2018	7:44:12 AM	1800	
2/6/2018	7:49:12 AM	1800	
2/6/2018	7:54:12 AM	1600	
2/6/2018	7:59:12 AM	1800	**Cleaning Time**
2/6/2018	8:04:12 AM	1700	**Total from 0714am thru 0929am = 37,100**
2/6/2018	8:09:12 AM	1400	
2/6/2018	8:14:12 AM	1200	
2/6/2018	8:19:12 AM	1200	
2/6/2018	8:24:12 AM	1100	
2/6/2018	8:29:12 AM	1500	
2/6/2018	8:34:12 AM	1300	
2/6/2018	8:39:12 AM	1200	
2/6/2018	8:44:12 AM	1200	
2/6/2018	8:49:12 AM	1200	
2/6/2018	8:54:12 AM	1300	
2/6/2018	8:59:12 AM	1000	
2/6/2018	9:04:12 AM	1200	
2/6/2018	9:09:12 AM	700	
2/6/2018	9:14:12 AM	1400	
2/6/2018	9:19:12 AM	1200	
2/6/2018	9:24:12 AM	800	
2/6/2018	9:29:12 AM	800	
2/6/2018	9:34:12 AM	200	
2/6/2018	9:39:12 AM	0	
2/6/2018	9:44:12 AM	0	
2/6/2018	9:49:12 AM	100	
2/6/2018	9:54:12 AM	0	
2/6/2018	9:59:12 AM	100	
2/6/2018	10:04:12 AM	0	
2/6/2018	10:09:12 AM	0	
2/6/2018	10:14:12 AM	100	
2/6/2018	10:19:12 AM	0	
2/6/2018	10:24:12 AM	0	
2/6/2018	10:29:12 AM	100	
2/6/2018	10:34:12 AM	0	
2/6/2018	10:39:12 AM	0	
2/6/2018	10:44:12 AM	100	
2/6/2018	10:49:12 AM	0	
2/6/2018	10:54:12 AM	0	
2/6/2018	10:59:12 AM	100	
Total from 1059am thru 1104pm = 10200 Non Cleaning			
2/6/2018	11:04:12 PM	100	
2/6/2018	11:09:12 PM	100	
2/6/2018	11:14:12 PM	100	
2/6/2018	11:19:12 PM	0	
2/6/2018	11:24:12 PM	100	
2/6/2018	11:29:12 PM	100	
2/6/2018	11:34:12 PM	100	
2/6/2018	11:39:12 PM	100	
2/6/2018	11:44:12 PM	0	
2/6/2018	11:49:12 PM	100	
2/6/2018	11:54:12 PM	100	

Month	Limit	2018
Jan-17	0.39	0.48
Feb-17	0.55	0.3
Mar-17	0.59	
Apr-17	0.67	
May-17	0.64	
Jun-17	0.59	
Jul-17	0.46	
Aug-17	0.36	
Sep-17	0.32	
Oct-17	0.29	
Nov-17	0.3	
Dec-17	0.33	



Month	Limit	Since New Way of Testing
Oct-17	0.29	0.46
Nov-17	0.3	0.47
Dec-17	0.33	0.38
Jan-18	0.39	0.48
Feb-18	0.55	0.3
Mar-18	0.59	
Apr-18	0.67	
May-18	0.64	
Jun-18	0.59	
Jul-18	0.46	
Aug-18	0.36	
Sep-18	0.32	



Client Sample Results

Client: Nasco - Biology Division
Project/Site: WPDES WW Comp.

TestAmerica Job ID: 500-140899-1

Client Sample ID: WPDES
Date Collected: 02/13/18 09:30
Date Received: 02/14/18 13:50

Lab Sample ID: 500-140899-1
Matrix: Wastewater

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	13		5.0	1.9	mg/L			02/16/18 13:00	1
Ammonia	3.7		0.20	0.10	mg/L		02/15/18 20:35	02/15/18 23:18	1
Phosphorus as P	1.1		0.10	0.048	mg/L		02/15/18 08:17	02/19/18 13:10	1
Biochemical Oxygen Demand	14		2.0	2.0	mg/L			02/14/18 15:22	1

Client Sample ID: WPDES
Date Collected: 02/13/18 13:30
Date Received: 02/14/18 13:50

Lab Sample ID: 500-140899-2
Matrix: Wastewater

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Phosphorus as P	0.27		0.10	0.048	mg/L		02/15/18 08:17	02/19/18 13:10	1

$53,900 \div 1,000,000 = .0539 \times 8.34 = .449$

TSS #day $= 13 \times .449 =$ 5.83 TSS

P #day $= 1.1 \times .449 = .49$

Cleaning Time $35,800 \div 1,000,000 = .0358 \times 8.34 = .298$

P #day $= 1.1 \times .298 = .327$

$.327 + .040 = .367$ Total P

Non-cleaning Time $18,100 \div 1,000,000 = .0181 \times 8.34 = .150$

P #day $= .27 \times .150 = .040$

2-6-18 P .300
2-13-18 P .367
.667 AVG for month is = .333 Total P

Water output Every 5 Min for 24hrs for February 13, 2018

Date	Time	Pulses (gal)	
2/13/2018	12:04:12 AM	100	
2/13/2018	12:09:12 AM	0	
2/13/2018	12:14:12 AM	100	
2/13/2018	12:19:12 AM	100	
2/13/2018	12:24:12 AM	100	
2/13/2018	12:29:12 AM	0	
2/13/2018	12:34:12 AM	100	
2/13/2018	12:39:12 AM	100	
2/13/2018	12:44:12 AM	100	
2/13/2018	12:49:12 AM	0	
2/13/2018	12:54:12 AM	100	
2/13/2018	12:59:12 AM	100	
Total from 1204am thru 0709am = 7000 Non cleaning time			
2/13/2018	6:09:12 AM	100	
2/13/2018	6:14:12 AM	0	
2/13/2018	6:19:12 AM	100	**Non Cleaning Time Total**
2/13/2018	6:24:12 AM	100	**7000 + 11100 = 18,100**
2/13/2018	6:29:12 AM	100	
2/13/2018	6:34:12 AM	100	
2/13/2018	6:39:12 AM	0	
2/13/2018	6:44:12 AM	100	
2/13/2018	6:49:12 AM	100	
2/13/2018	6:54:12 AM	100	
2/13/2018	6:59:12 AM	0	
2/13/2018	7:04:12 AM	100	
2/13/2018	7:09:12 AM	400	
2/13/2018	7:14:12 AM	700	
2/13/2018	7:19:12 AM	1300	
2/13/2018	7:24:12 AM	1700	
2/13/2018	7:29:12 AM	2000	
2/13/2018	7:34:12 AM	1800	
2/13/2018	7:39:12 AM	2300	
2/13/2018	7:44:12 AM	1800	
2/13/2018	7:49:12 AM	2200	
2/13/2018	7:54:12 AM	1700	
2/13/2018	7:59:12 AM	1800	**Cleaning Time**
2/13/2018	8:04:12 AM	1800	**Total from 0714am thru 0929am = 35,800**
2/13/2018	8:09:12 AM	1600	
2/13/2018	8:14:12 AM	1800	
2/13/2018	8:19:12 AM	1500	
2/13/2018	8:24:12 AM	2000	
2/13/2018	8:29:12 AM	1700	
2/13/2018	8:34:12 AM	1000	
2/13/2018	8:39:12 AM	1300	
2/13/2018	8:44:12 AM	800	
2/13/2018	8:49:12 AM	700	
2/13/2018	8:54:12 AM	1100	
2/13/2018	8:59:12 AM	400	
2/13/2018	9:04:12 AM	300	
2/13/2018	9:09:12 AM	1000	
2/13/2018	9:14:12 AM	500	
2/13/2018	9:19:12 AM	400	
2/13/2018	9:24:12 AM	500	
2/13/2018	9:29:12 AM	100	
2/13/2018	9:34:12 AM	0	
2/13/2018	9:39:12 AM	100	
2/13/2018	9:44:12 AM	0	
2/13/2018	9:49:12 AM	100	
2/13/2018	9:54:12 AM	0	
2/13/2018	9:59:12 AM	0	
2/13/2018	10:04:12 AM	100	
2/13/2018	10:09:12 AM	0	
2/13/2018	10:14:12 AM	0	
2/13/2018	10:19:12 AM	100	
2/13/2018	10:24:12 AM	0	
2/13/2018	10:29:12 AM	0	
2/13/2018	10:34:12 AM	100	
2/13/2018	10:39:12 AM	0	
2/13/2018	10:44:12 AM	0	
2/13/2018	10:49:12 AM	200	
2/13/2018	10:54:12 AM	100	
2/13/2018	10:59:12 AM	0	
Total from 1059am thru 1104pm = 11100 Non Cleaning time			
2/13/2018	11:04:12 PM	0	
2/13/2018	11:09:12 PM	100	
2/13/2018	11:14:12 PM	100	
2/13/2018	11:19:12 PM	100	
2/13/2018	11:24:12 PM	100	
2/13/2018	11:29:12 PM	100	
2/13/2018	11:34:12 PM	0	
2/13/2018	11:39:12 PM	100	
2/13/2018	11:44:12 PM	100	
2/13/2018	11:49:12 PM	100	
2/13/2018	11:54:12 PM	100	

Appendix B – Forms

WQT Checklist

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

Water Quality Trading Checklist

Form 3400-208 (1/14)

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

Applicant Information

Permittee Name	Permit Number	Facility Site Number
Nasco Education LLC	WI- 005822	10141

Facility Address	City	State	ZIP Code
901 Janesville Avenue	Fort Atkinson	WI	53538

Project Contact Name (if applicable)	Address	City	State	ZIP Code
Ryan Stenjem	119 S Main Street	Cottage Grove	WI	53527

Project Name: Nasco P Water Quality Trading Plan

Receiving Water Name	Parameter(s) being traded	HUC 12(s)
Rock River	TP	070900021001

Credit Generator Information

Credit generator type (select all that apply):

- ☒ Permitted Discharge (non-MS4CAFO)
- ☐ Permitted MS4
- ☐ Permitted CAFO
- ☐ Urban nonpoint source discharge
- ☐ Agricultural nonpoint source discharge
- ☐ Other - Specify:

Are any of the credit generators in a different HUC 12 than the applicant?
- ◉ Yes; HUC 12: 070900011001
- ○ No

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

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

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

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

Discharge Type	Permit Number	Name	Contact Information	Trade Agreement Number
◉ Traditional ○ MS4 ○ CAFO	WI-0021-008-09-0	City of Columbus Waste Water Treatment Plan	Dave Arnott darnott@ruekert-mielke.com	TBD
○ Traditional ○ MS4 ○ CAFO				
○ Traditional ○ MS4 ○ CAFO				
○ Traditional ○ MS4 ○ CAFO				
○ Traditional ○ MS4 ○ CAFO				

Point to Point Trades (Traditional Municipal / Industrial, MS4, CAFO) *cont.*		
Does plan have a narrative that describes:		Plan Section
a. Summary of discharge and existing treatment including optimization	◉ Yes ◯ No	Section 2.2
b. Amount of credit being generated	◉ Yes ◯ No	Section 3
c. Timeline for credits and agreements	◉ Yes ◯ No	Section 4
d. Method for quantifying credits	◉ Yes ◯ No	Section 2
e. Tracking and verification procedures	◉ Yes ◯ No	Section 5
f. Location of credit generator in proximity to receiving water and credit user	◉ Yes ◯ No	Section 1
g. Other: ____________________	◯ Yes ◯ No	

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

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

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

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

The preparer certifies all of the following:

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

Signature of Preparer	Date Signed
Ryan Thye	3/30/18

Authorized Representative Signature

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

Signature of Authorized Representative	Date Signed
Thomas S. Smith	3.27.2018

Nasco and City of Columbus Water Quality Trading NOI

Wastewater Discharge Monitoring Long Report

For DNR Use Only

Facility Name: NASCO DIVISION OF ARISTOTLE
Contact Address: P O Box 901
Fort Atkinson, WI 53538-0901
Facility Contact: Debra Tipton, Director of Ops-Nasco Prod Fac
Phone Number: (920) 568-5518
Reporting Period: 07/01/2017 - 07/31/2017
Form Due Date: 08/21/2017
Permit Number: 0058220

Date Received:	
DOC:	385806
FIN:	10141
FID:	128082790
Region:	South Central Region
Permit Drafter:	Jennifer K Jerich
Reviewer:	Amy M Garbe
Office:	Fitchburg

	Sample Point	001	001	001	001	001
	Description	SURFACE WATER DISCHARGE	SURFACE WATER DISCHARGE	SURFACE WATER DISCHARGE	SURFACE WATER DISCHARGE	SURFACE WATER DISCHARGE
	Parameter	211	66	457	457	388
	Description	Flow Rate	BOD5, Total	Suspended Solids, Total	Suspended Solids, Total	Phosphorus, Total
	Units	gpd	mg/L	mg/L	lbs/day	mg/L
	Sample Type	CONTINUOUS	FLOW PROP COMP	FLOW PROP COMP	CALCULATED	FLOW PROP COMP
	Frequency	DAILY	2/MONTH	2/MONTH	2/MONTH	2/MONTH
Sample Results	Day 1	23500				
	2	55000				
	3	64000				
	4	29700				
	5	70600				
	6	56700				
	7	55400				
	8	25700				
	9	26600				
	10	82800				
	11	63700	16	14	7.42	1.3
	12	54200				
	13	54200				
	14	61800				
	15	27100				
	16	26400				
	17	59200				
	18	61000	15	13	6.61	1.5
	19	53300				
	20	54900				
	21	73800				
	22	24300				
	23	21800				
	24	58400				
	25	56700				
	26	51700				
	27	55400				
	28	61900				
	29	31800				
	30	33600				
	31	64400				

	Sample Point	001		001		001		001		001	
	Description	SURFACE WATER DISCHARGE		SURFACE WATER DISCHARGE		SURFACE WATER DISCHARGE		SURFACE WATER DISCHARGE		SURFACE WATER DISCHARGE	
	Parameter	211		66		457		457		388	
	Description	Flow Rate		BOD5, Total		Suspended Solids, Total		Suspended Solids, Total		Phosphorus, Total	
	Units	gpd		mg/L		mg/L		lbs/day		mg/L	
Summary Values	**Monthly Avg**	49664.516129032		15.5		13.5		7.015		1.4	
	Daily Max	82800		16		14		7.42		1.5	
	Daily Min	21800		15		13		6.61		1.3	
Limit(s) in Effect	**Monthly Avg**			30	0	30	0	19	0	4.30	0
	Daily Max							40	0		
	Daily Min										
QA/QC Information	**LOD**			0.0251						0.0251	
	LOQ			0.05						0.05	
	QC Exceedance	N		N		N		N		N	
	Lab Certification			999580010		999580010				999580010	

	Sample Point	001	001
	Description	SURFACE WATER DISCHARGE	SURFACE WATER DISCHARGE
	Parameter	388	377
	Description	Phosphorus, Total	pH Field
	Units	lbs/day	su
	Sample Type	CALCULATED	GRAB
	Frequency	2/MONTH	MONTHLY
Sample Results	Day 1		
	2		
	3		
	4		
	5		
	6		
	7		
	8		
	9		
	10		
	11	.68	6.8
	12		
	13		
	14		
	15		
	16		
	17		
	18	.76	7.6
	19		
	20		
	21		
	22		
	23		
	24		
	25		
	26		
	27		
	28		
	29		
	30		
	31		

	Sample Point	001		001	
	Description	SURFACE WATER DISCHARGE		SURFACE WATER DISCHARGE	
	Parameter	388		377	
	Description	Phosphorus, Total		pH Field	
	Units	lbs/day		su	
Summary Values	Monthly Avg	0.72		7.2	
	Daily Max	0.76		7.6	
	Daily Min	0.68		6.8	
Limit(s) in Effect	Monthly Avg				
	Daily Max			9	0
	Daily Min			6	0
QA/QC Information	LOD				
	LOQ				
	QC Exceedance	N		N	
	Lab Certification				

Footnotes (DNR Use Only; Instructions for completing this form that are unique for your facility may be displayed here.)

General Remarks

Laboratory Quality Control Comments

Submitted by Debra Tipton(tipsey22) on 8/7/2017 9:59:26 AM

State of Wisconsin
DEPARTMENT OF NATURAL RESOURCES
Waukesha Service Center
141 NW Barstow St, Room 180
Waukesha WI 53188

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

December 14, 2016

Deb Tipton
NASCO - Division of Aristotle
PO Box 901
901 Janesville Ave
Fort Atkinson WI 53538

Subject: NASCO – Division of Aristotle Phosphorus Planning Status Report
APPROVAL
WPDES Permit: WI-0058220-05

Dear Ms. Tipton:

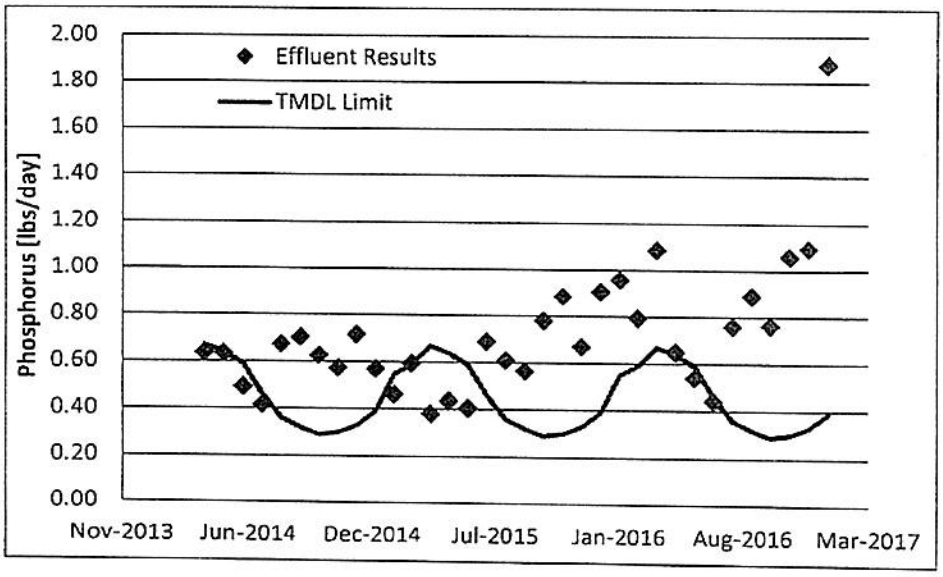
Thank you for submitting the Facilities Planning Status Report on behalf of NASCO that was required as part of their "Water Quality Based Effluent Limits (WQBELs) for Total Phosphorus" compliance schedule (Section 2.1 of the WPDES permit). The report was received on March 31, 2016. The Department has reviewed the report and is granting approval of the status report.

Due to being an industry with no treatment of the discharge water, it is very difficult to optimize the system. NASCO did evaluate the phosphorus in the feed, the feasibility of space for a filter, and connecting to the City's sanitary sewer. The results have been that there are potential trading partners in both the City of Fort Atkinson and the City of Columbus.

After evaluating the data submitted by NASCO from April 2014 through November 2016, the total pounds needed by month is listed in the following table:

	Actual Discharge [lbs/day]	TMDL Limit [lbs/day]	Lbs/day Needed	Total lbs/month
January	0.74	0.39	0.35	10.8
February	0.79	0.55	0.24	6.8
March	0.69	0.59	0.10	3.2
April	0.66	0.67	0	0
May	0.57	0.64	0	0
June	0.49	0.59	0	0
July	0.45	0.46	0	0
August	0.68	0.39	0.29	8.9
September	0.71	0.32	0.39	11.7
October	0.66	0.29	0.37	11.5
November	0.69	0.3	0.39	11.6
December	0.71	0.33	0.38	11.8

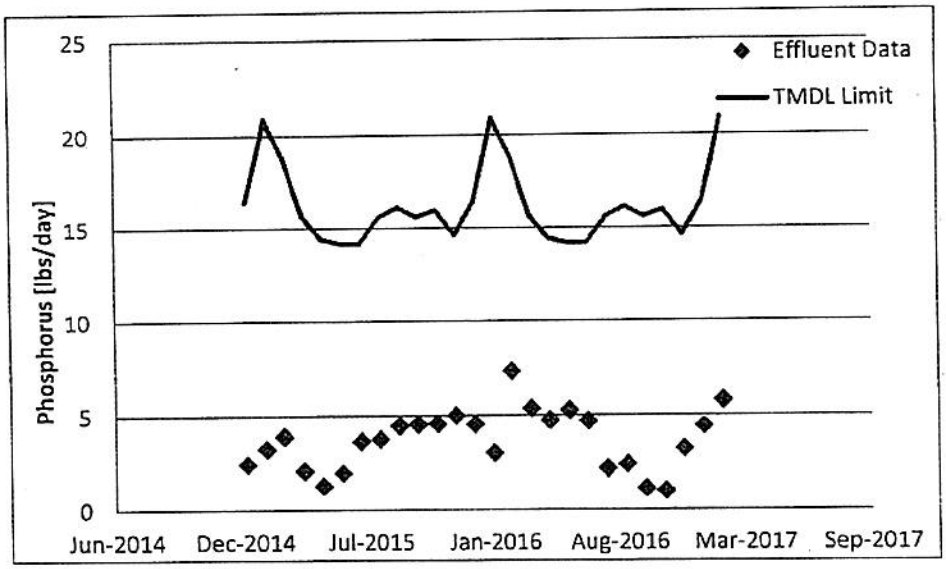
NASCO



Date	Monthly Average [lbs/day]	Limit [lbs/day]	Excess Allocation [lbs/day]
Apr-2014	0.64	0.67	0.032
May-2014	0.64	0.64	0.005
Jun-2014	0.49	0.59	0.100
Jul-2014	0.42	0.46	0.045
Aug-2014	0.67	0.36	-0.314
Sep-2014	0.70	0.32	-0.384
Oct-2014	0.63	0.29	-0.338
Nov-2014	0.57	0.3	-0.274
Dec-2014	0.72	0.33	-0.388
Jan-2015	0.57	0.39	-0.180
Feb-2015	0.46	0.55	0.090
Mar-2015	0.60	0.59	-0.005
Apr-2015	0.38	0.67	0.290
May-2015	0.44	0.64	0.205
Jun-2015	0.41	0.59	0.185
Jul-2015	0.69	0.46	-0.230
Aug-2015	0.61	0.36	-0.250
Sep-2015	0.57	0.32	-0.245
Oct-2015	0.78	0.29	-0.490
Nov-2015	0.89	0.3	-0.585
Dec-2015	0.67	0.33	-0.341

Date	Monthly Average [lbs/day]	Limit [lbs/day]	Excess Allocation [lbs/day]
Jan-2016	0.91	0.39	-0.515
Feb-2016	0.96	0.55	-0.408
Mar-2016	0.79	0.59	-0.203
Apr-2016	1.09	0.67	-0.415
May-2016	0.65	0.64	-0.010
Jun-2016	0.54	0.59	0.050
Jul-2016	0.44	0.46	0.019
Aug-2016	0.76	0.36	-0.399
Sep-2016	0.89	0.32	-0.570
Oct-2016	0.76	0.29	-0.474
Nov-2016	1.06	0.3	-0.760
Dec-2016	1.10	0.33	-0.765
Jan-2017	1.88	0.39	-1.487

Columbus



Date	Monthly Average [lbs/day]	Limit [lbs/day]	Excess Allocation [lbs/day]
Jan-2015	2.46	**16.39**	13.93
Feb-2015	3.27	**20.88**	17.61
Mar-2015	3.92	**18.83**	14.91
Apr-2015	2.10	**15.65**	13.55
May-2015	1.30	**14.43**	13.13
Jun-2015	1.99	**14.16**	12.17
Jul-2015	3.66	**14.17**	10.51
Aug-2015	3.77	**15.58**	11.81
Sep-2015	4.46	**16.11**	11.65
Oct-2015	4.54	**15.58**	11.04
Nov-2015	4.57	**15.93**	11.36
Dec-2015	4.99	**14.61**	9.62

Date	Monthly Average [lbs/day]	Limit [lbs/day]	Excess Allocation [lbs/day]
Jan-2016	4.54	**16.39**	11.85
Feb-2016	3.05	**20.88**	17.83
Mar-2016	7.29	**18.83**	11.54
Apr-2016	5.34	**15.65**	10.31
May-2016	4.73	**14.43**	9.70
Jun-2016	5.25	**14.16**	8.91
Jul-2016	4.69	**14.17**	9.48
Aug-2016	2.21	**15.58**	13.37
Sep-2016	2.43	**16.11**	13.68
Oct-2016	1.15	**15.58**	14.43
Nov-2016	1.01	**15.93**	14.92
Dec-2016	3.26	**14.61**	11.35
Jan-2017	4.43	**16.39**	11.96
Feb-2017	5.76	**20.88**	15.12

How would this look in my permit?

For example, if trade with Columbus for 2 lbs/day

Current

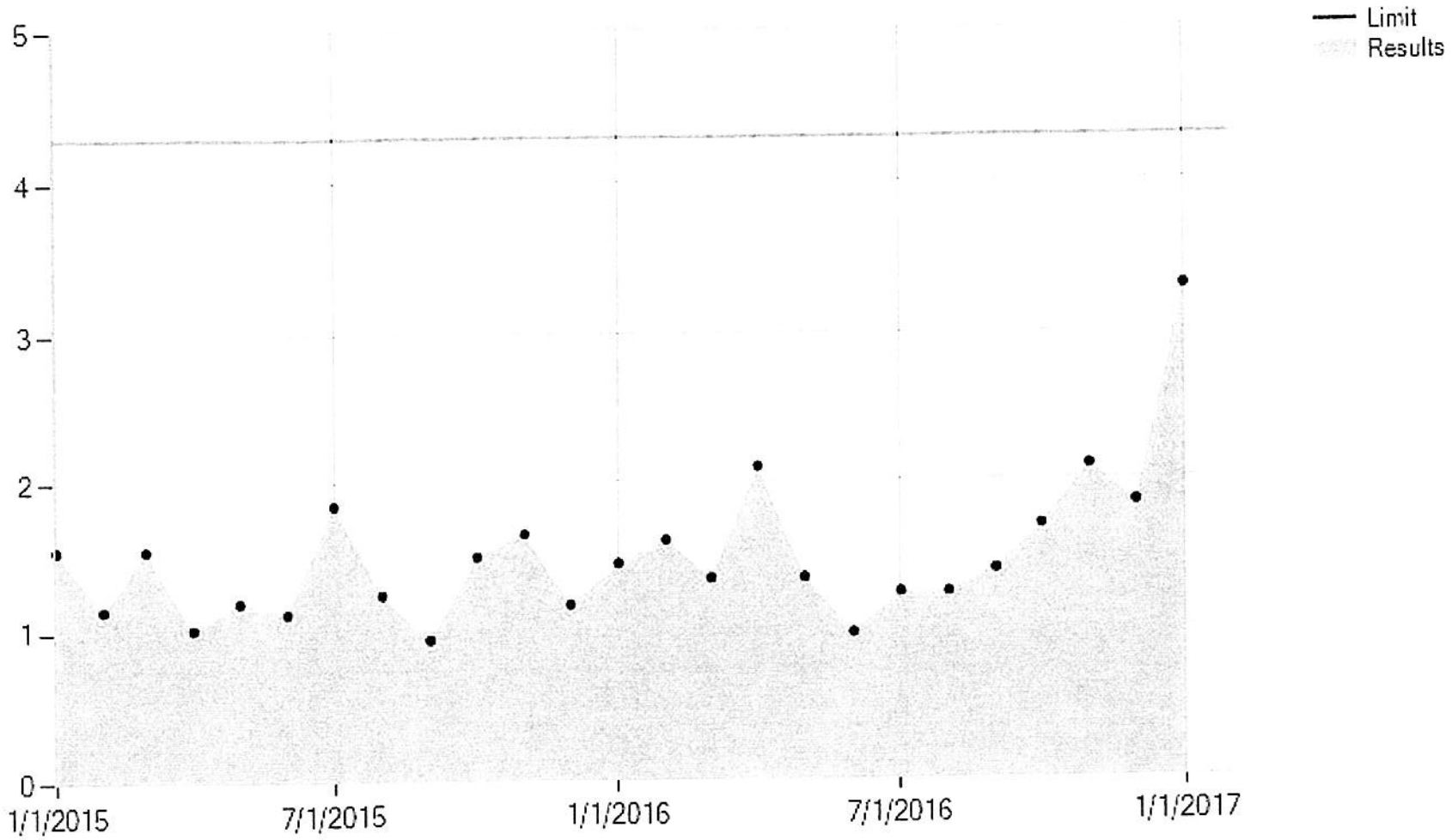
Month	Monthly Total P WLA[1] (lbs/month)	Days Per Month	Monthly Ave Total P Effluent Limit[2] (lbs/day)
Jan	12.07	31	**0.39**
Feb	15.47	28	**0.55**
March	18.18	31	**0.59**
April	19.98	30	**0.67**
May	19.71	31	**0.64**
June	17.72	30	**0.59**
July	14.22	31	**0.46**
Aug	11.23	31	**0.36**
Sept	9.51	30	**0.32**
Oct	9.09	31	**0.29**
Nov	9.01	30	**0.3**
Dec	10.08	31	**0.33**

Adjusted

Month	Monthly Total P WLA[1] (lbs/month)	Days Per Month	Monthly Ave Total P Effluent Limit[2] (lbs/day)
Jan	74.1	31	**2.39**
Feb	71.4	28	**2.55**
March	80.3	31	**2.59**
April	80.1	30	**2.67**
May	81.8	31	**2.64**
June	77.7	30	**2.59**
July	76.3	31	**2.46**
Aug	73.2	31	**2.36**
Sept	69.6	30	**2.32**
Oct	71.0	31	**2.29**
Nov	69.0	30	**2.30**
Dec	72.2	31	**2.33**

NASCO DIVISION OF ARISTOTLE - 0058220-05-0

001 - Phosphorus, Total (mg/L) - Jan/2015 - Jan/2017 - Monthly Average



WPDES PERMIT

STATE OF WISCONSIN
DEPARTMENT OF NATURAL RESOURCES

PERMIT TO DISCHARGE UNDER THE WISCONSIN POLLUTANT DISCHARGE ELIMINATION SYSTEM

Nasco Division of Aristotle

is permitted, under the authority of Chapter 283, Wisconsin Statutes, to discharge from a facility located at
901 Janesville Avenue Fort Atkinson, WI
NW ¼ of the NW ¼ of Section 9, Township 5 North, Range 14 East City of Fort Atkinson
to
the Rock River (Lower Koshkonong Creek Watershed , LR 11 – Lower Rock River Basin) in Jefferson County

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

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

State of Wisconsin Department of Natural Resources
For the Secretary

By _____
Tim Ryan
Wastewater Field Supervisor

_____
Date Permit Signed/Issued

PERMIT TERM: EFFECTIVE DATE - April 01, 2014 **EXPIRATION DATE - March 31, 2019**

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

Notice of Intent to Conduct Water Quality Trading

Form 3400-206 (1/14)

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

Applicant Information

Permittee Name	Permit Number	Facility Site Number
NASCO	WI- 0005822	10141

Facility Address	City	State	ZIP Code
901 Janesville Ave	Fort Atkinson	WI	53538

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

Project Name

Receiving Water Name	Parameter(s) being traded	HUC 12(s)
Rock River	Phosphorous	070900021001

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

Credit Generator Information

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

Are any of the credit generators in a different HUC 12 than the applicant?
- ☒ Yes; HUC 12: 070900011001
- ○ No
- ○ Unsure

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

Will a broker/exchange be used to facilitate trade?
- ○ Yes; Name:
- ☒ No
- ○ Unsure

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

Discharge Type	Permit Number	Name	Contact Address	Is the point source credit generator currently in compliance with their permit requirements?
☒ Traditional ○ MS4 ○ CAFO	WI- 0021008	Columbus Wastewater Treatment facility	537 River Road Columbus, WI 53925	☒ Yes ○ No ○ Unsure
☒ Traditional ○ MS4 ○ CAFO	WI- 0022489	Fort Atkinson Wastewater Treatment facility	101 N. Main st Atkinson, WI 53538	☒ Yes ○ No ○ Unsure
○ Traditional ○ MS4 ○ CAFO				○ Yes ○ No ○ Unsure
○ Traditional ○ MS4 ○ CAFO				○ Yes ○ No ○ Unsure
○ Traditional ○ MS4 ○ CAFO				○ Yes ○ No ○ Unsure

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

List the practices that will be used to generate credits:

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

Projected date credits will be available:

The preparer certifies all of the following:

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

Signature of Preparer	Date Signed
Debra S. Lyst	3.28.2017

Authorized Representative Signature

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

Signature of Authorized Representative	Date Signed
Debra S. Lyst	3.28.2017

Appendix C – Figures

Nasco Phosphorus Trading Plan
City of Fort Atkinson, Jefferson County, WI
Nasco Education LLC

Montgomery Associates: Resource Solutions, LLC
119 South Main St., Suite A
Cottage Grove, WI 53527

Figure C1 - Nasco Location

Legend

- Nasco Location
- Outfall Location (City of Fort Atkinson Storm Sewer)

DNR Hydrography

- Perennial Flow Lines
- Water Bodies

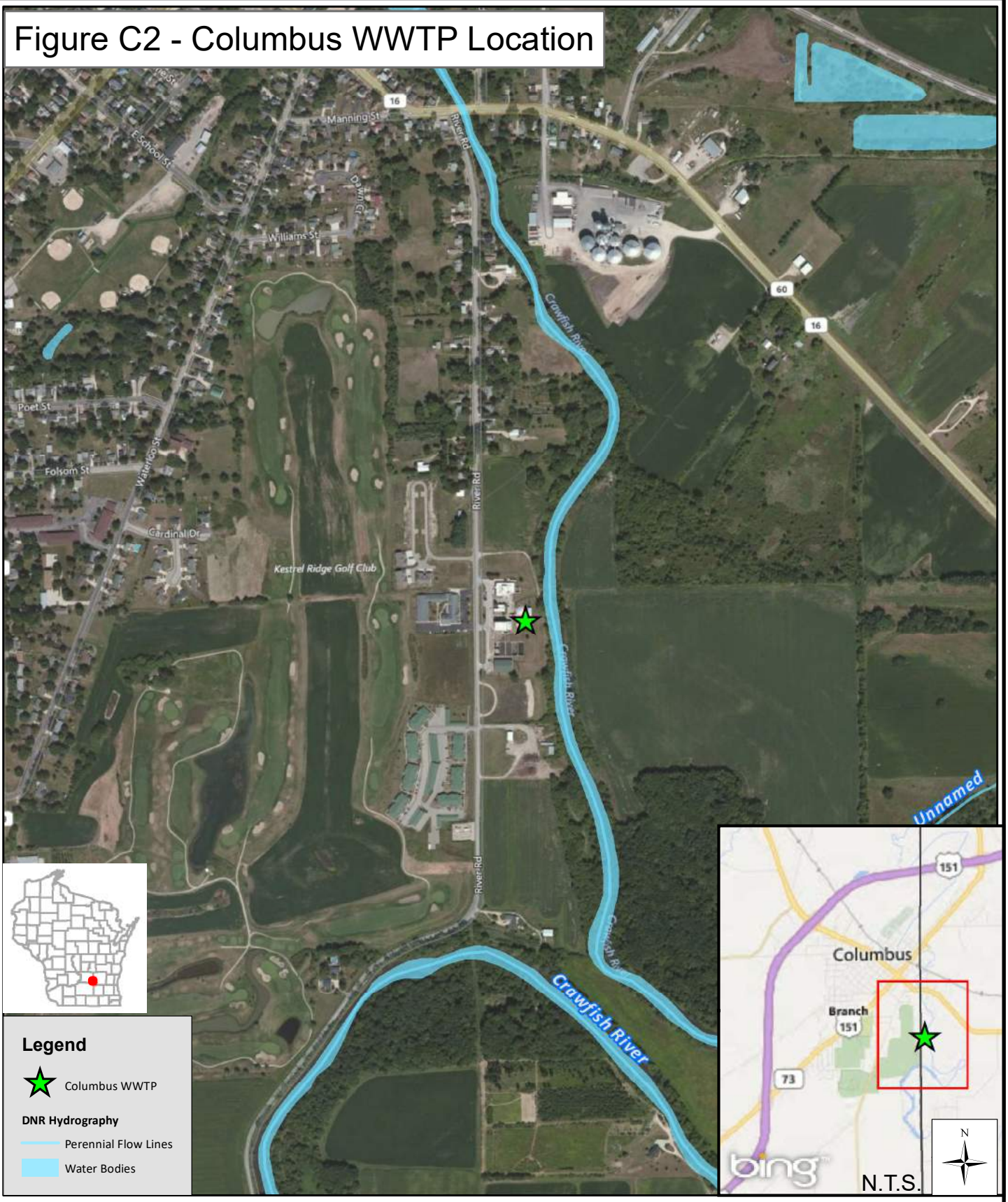
June 2018

0 250 500 1,000 Feet

Nasco Phosphorus Trading Plan
City of Fort Atkinson, Jefferson County, WI
Nasco Education LLC

Montgomery Associates:
Resource Solutions, LLC
119 South Main St., Suite A
Cottage Grove, WI 53527

Figure C2 - Columbus WWTP Location

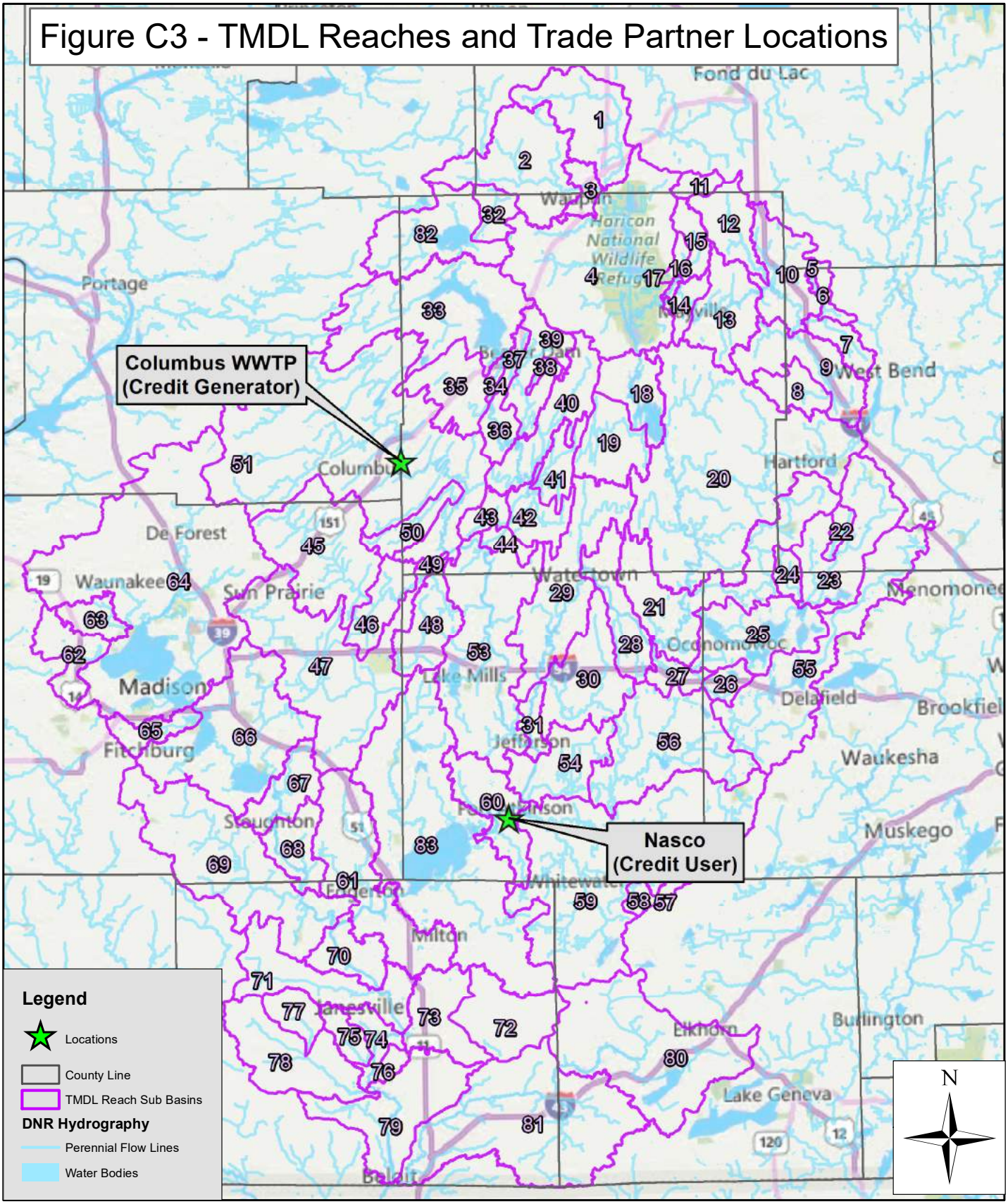


June 2018

Nasco Phosphorus Trading Plan
City of Fort Atkinson, Jefferson County, WI
Nasco Education LLC

Montgomery Associates:
Resource Solutions, LLC
119 South Main St.
Cottage Grove, WI 53527

Figure C3 - TMDL Reaches and Trade Partner Locations



June 2018

Appendix D – WDNR Reviewer Comments and Responses

Appendix D – WDNR Reviewer Comments and Responses
(Responses to DNR Review comments provided in Red)

NASCO Water Quality Trading Plan

Plan Comments and Suggested Revisions

5/21/2018, Amy Garbe

Location of Credit User and Credit Generator

Please include which TMDL Reach both the City of Columbus and NASCO discharge to. It should be made clear that the City's TMDL WLA was derived to be protective of the confluence of the Crawfish and the Maunesha River (Reach 51), while NASCO's TMDL WLA was derived to be protective of the Rock River (Reach 60). Also include a map that lists the location of both outfalls.

Language has been added to Section 1.6 to describe the TMDL reaches that the WWTP and Nasco discharge to. Additionally, Figures C1, C2, and C3 have been created to show the locations of the Nasco Facility, Columbus WWTP, and their locations within the Rock River TMDL Reaches.

Columbus WWTP Projected Discharge and Credit Availability

Table 3 lists the credits that the Columbus WWTP has available; however, it appears that the excess pounds are calculated using the future limit of 0.075 mg/L. The City is not currently meeting the 0.075 mg/L limit and are currently discharging around 4.5 lbs/day. Table 3 should be relabeled as 'Future Credit Availability" and a new table created that shows the currently available credits.

Former Table 3 (now Table 4) has been renamed and a new table has been added to show current credit availability.

Trade Ratios

Include a discussion regarding the delivery factor of the trade ratio. Due to the Rock River TMDL, the delivery factor was incorporated into the WLAs; therefore, a delivery factor does not need to be applied to the trade ratio.

Additional discussion has been added to section 4.1 to describe the trade ratio calculation with information on each factor provided for the sake of completeness.

Clarify that the 1.1:1 trade ratio is the minimum trade ratio for a point to point source trade.

This information has been added to section 1.4.

Trade Agreement

Pursuant s. 283.84(1), Wis. Stats, a trade agreement is required to be in place prior to using trading to help demonstrate compliance with the final phosphorus limits. In this case, NASCO is working with the City of Columbus to generate credits and s. 283.84(1)(a), Wis. Stats applies, meaning that NASCO must enter into an agreement with the City of Columbus. This agreement shall be in place prior to conditional approval of the WQT plan. Please provide certification that these trade agreements are in place.

Appendix D – WDNR Reviewer Comments and Responses
(Responses to DNR Review comments provided in Red)

Nasco and The City of Columbus are in the process of finalizing a trade agreement. This agreement has been drafted by legal representatives from Nasco and is currently under City review. The agreement will require City Council approval before officially being executed. The agreement will be provided to the DNR once finalized and executed by both parties.