WATER QUALITY TRADING FRAMEWORK AND PROCESSES

Ruekert · Mielke

Agenda

- Cooperative Approaches to Water Quality Improvements
- Types of Water Quality Trading
- Point Source to Nonpoint Source Trading
- Point Source to Point Source Trading
- Questions

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COOPERATIVE APPROACHES TO WATER QUALITY IMPROVEMENTS

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Cooperative Approaches to Water Quality Improvements

- Adaptive management (AM)
- Water Quality Trading (WQT)

Adaptive Management	Water Quality Trading
•Permittee improves water quality in a watershed by reducing in-stream phosphorus concentrations •Permit compliance is demonstrated by reducing in-stream phosphorus concentrations and eventually acheiving the phosphorus water quality criteria	•Permittee purchases "credits" in the watershed to acheive permit compliance •Permit compliance is demonstrated by comparing permittee discharge data and "credits" available to the applicable WQBEL

Quick Terms & Acronyms

PS = Point Source

NPS = Nonpoint Source

Reachshed = Small drainage area /subwatershed in TMDL

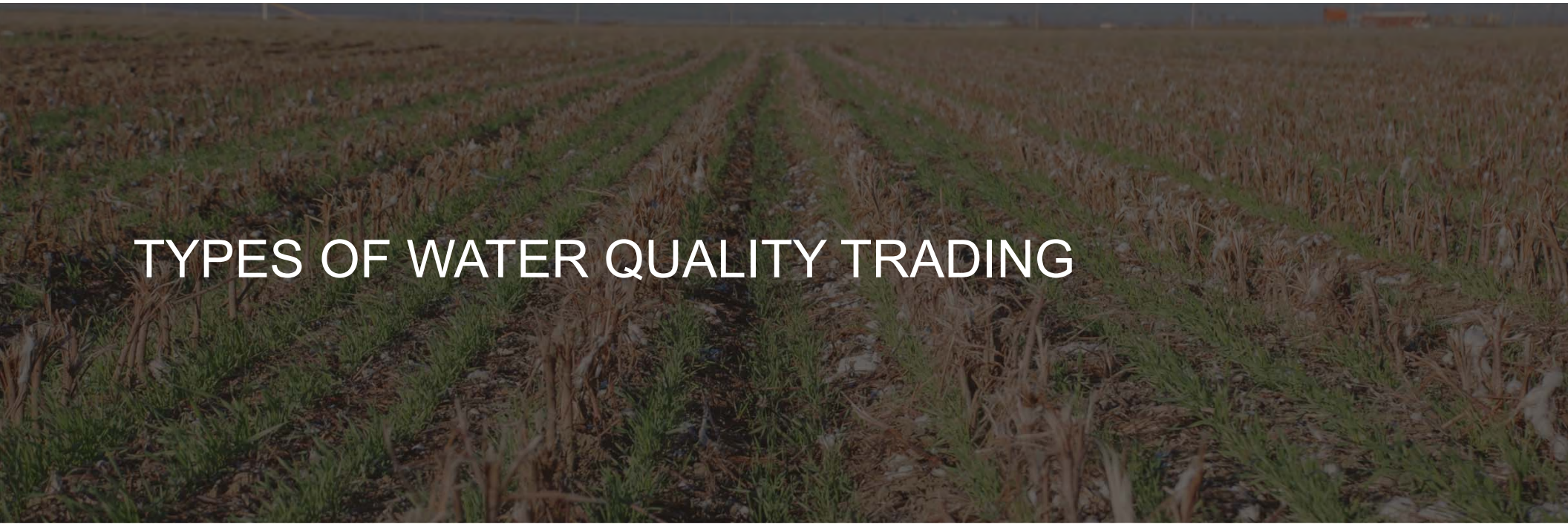
TMDL = Study to determine the amount of pollution that a waterway can receive & still meet water quality standards

MS4 = Municipal *Separate* Storm Sewer System

WWTF = Wastewater Treatment Facility

TSS = Total Suspended Solids

TP = Total Phosphorus (as opposed to Dissolved or Particulate Phosphorus)



TYPES OF WATER QUALITY TRADING

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Types of Water Quality Trading

- Point to Point Trades (Traditional Municipal/Industrial Discharge, MS4, CAFO)
- Point to Nonpoint Trades (Non-permitted Agricultural, Non-permitted Urban, etc.)

POINT SOURCE TO NONPOINT SOURCE TRADING

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Agricultural Coordination

BMPs

1. Filter strips
2. Buffers
3. Improved Tillage

Agricultural Coordination

4. Cover crops
5. Grassed waterways
6. Retention ponds
7. Wetland restoration
8. Barnyard improvement
9. Nutrient management plans

City of Columbus

- Not Permitted MS4 Community
- Rock River TMDL Requirements Less Stringent for TSS and TP than WWTF permit
- WWTF TP Future Permit
  - 0.075 mg/L
  - Optimized to 0.15 mg/L


YOU'RE INVITED

Columbus Agricultural Conservation Team Seminar

AGRICULTURAL CONSERVATION PRACTICES:
- Cover Crops
- Conservation Cover
- Crop Rotation
- Contour Strips
- Grassed Waterways
- Harvestable Buffers
- Low/No Till Practices
- Nutrient Management Plans

BENEFITS TO YOU:
- Improved Soil Health
- Increased Crop Yield
- 100% Funding & Rent Offset
- Cost Savings from Efficient Nutrient Management

BENEFITS TO WATERSHED:
- Decreased Erosion
- Decreased Nutrient Runoff to Waterways
- Improved Water Quality
- Return to Fishable, Swimmable Waters
- Enhance Local Wildlife Habitat & Ecology
- Reduction in Algal Blooms & Other Aquatic Plants

ColumbusACTS

Join us for casual conversation about how you can influence positive change that benefits the watershed and you!

September 12, 2018

5:00 - 8:00p.m.

Savanna Oaks Community Center

100 Savanna Road, Fall River, WI

Subs and soda will be provided by the City of Columbus Conservation Collective.

COLUMBUS

RSVP

EMAIL:

CALL: (920) 623-5900

Or fill-out and MAIL form back to:

105 N. Dickason Blvd

Columbus, WI 53925

NAME:

ADDRESS:

PHONE:

EMAIL:

Compliance Options

- Treatment plant upgrades: estimated $3,203,000 - $5,850,000
- OR cooperative approach: estimated $1,779,790

Watershed Trading Unit Cost		
	Watershed 20 Year Cost	**Pounds Phosphorus**
Initial cost per acre (seeding, etc), $/acre	500	
Lost production, $/acre/yr	300	
O&M Cost $/ac/yr	100	
20 Year Cost, $/acre	8500	
Annual Cost, $/acre	425	
Filter Strip P Reduction, lbs P/acre/yr		8
20 Year P Reduction, lbs P/acre		160
Unit Cost, $ / lbs P		**53**

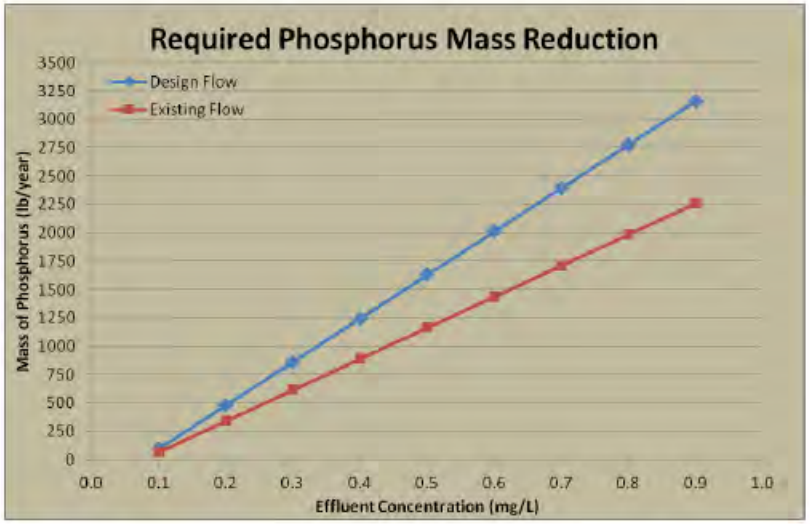
WQT Program Development Process

1. Calculate approximate pounds of P per year needed to determine feasibility

2. Research watershed
   - Critical Source Areas
   - Nutrient Management Plans
   - Proximity to waterway/location in reachshed
   - Upstream/downstream of WWTF

Phosphorus Reduction Calculation

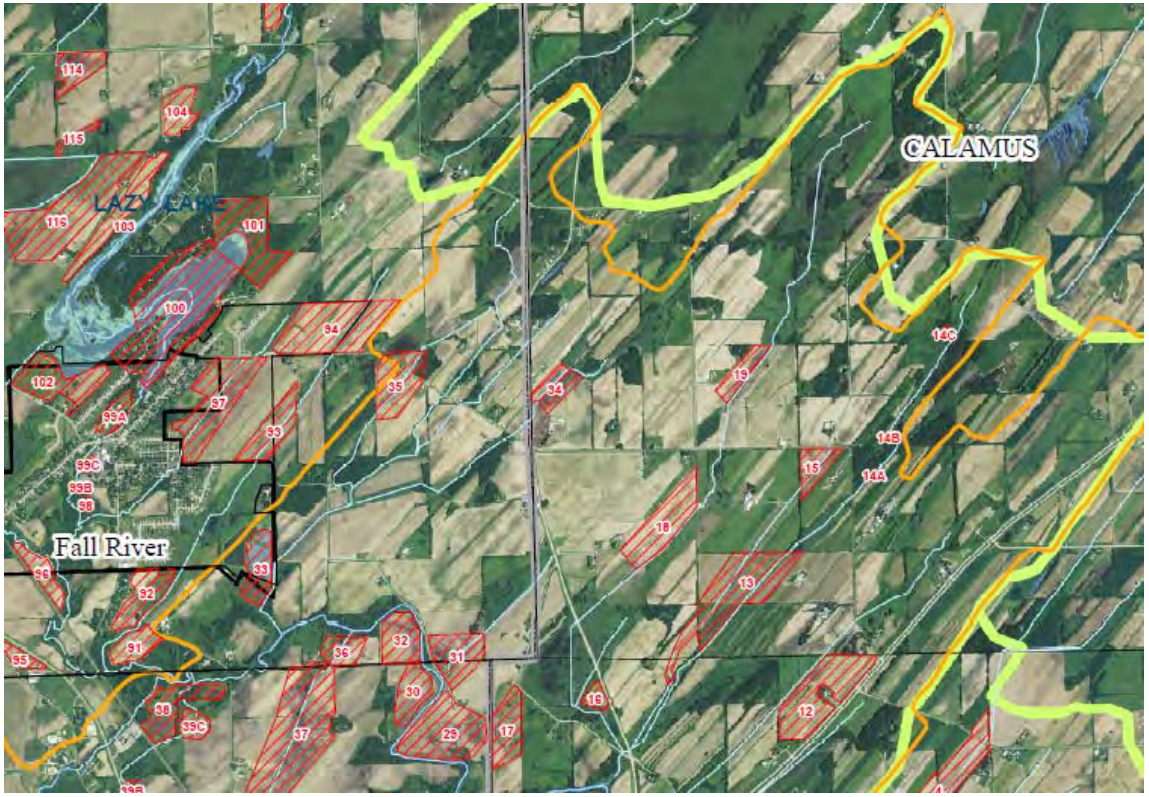
$$\text{Phosphorus Load Reduction } \left(\frac{pounds}{year}\right) = \left(\text{Effluent Concentration} - \text{WQBEL } \left(\frac{mg}{L}\right)\right) * \text{Effluent Flow (MGD)} * 8.34 * 365 \left(\frac{days}{year}\right)$$



- Reduction from existing 0.9 MGD at 0.7 mg/L
- Optimization at the WWTF to 0.15 mg/L
- Remaining reduction from 0.15 to 0.075 equates to ~270 pounds of phosphorus per year

City of Columbus

- Watershed research
- 230 Sites Identified



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WQT Program Development Process

3. Reach out to DNR to discuss WQT program

4. Reach out to farmers in watershed and/or other organizations that own farmed land in the watershed

5. Secure enough projects to meet needed pounds P, plus a 10-15% buffer

City of Columbus

- ColumbusACTS meeting

- 2 interested parties
  - One private entity
    - Later restructured into two projects
  - One producer

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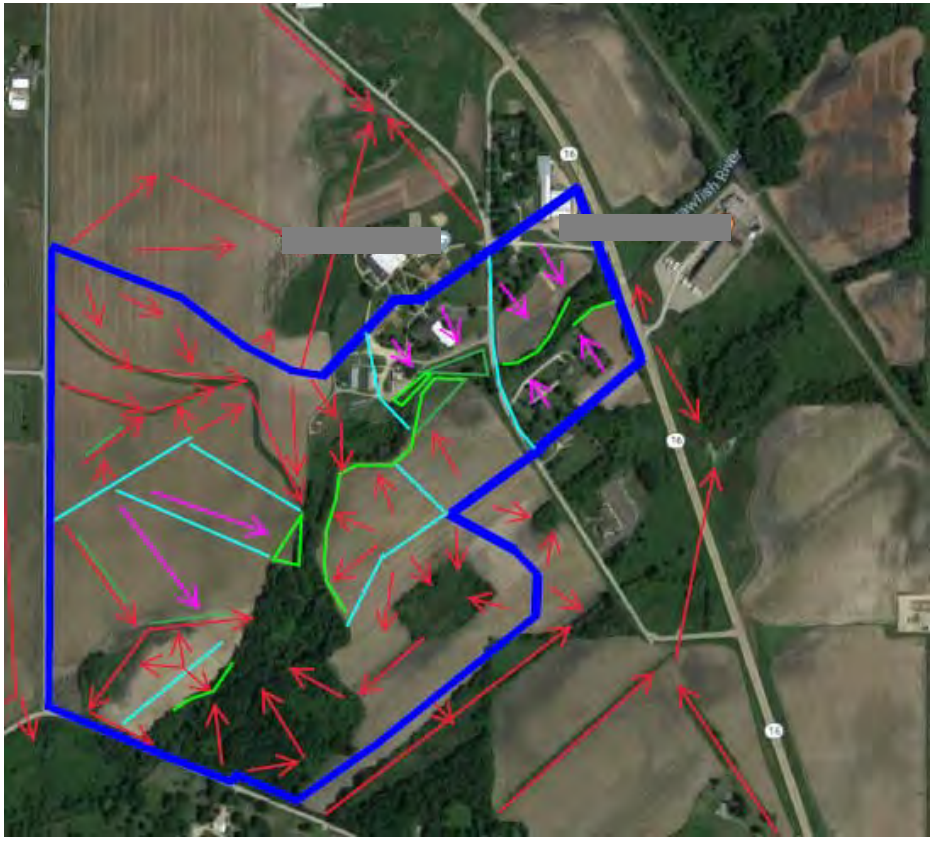

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Calculation for Pounds Phosphorus from practices

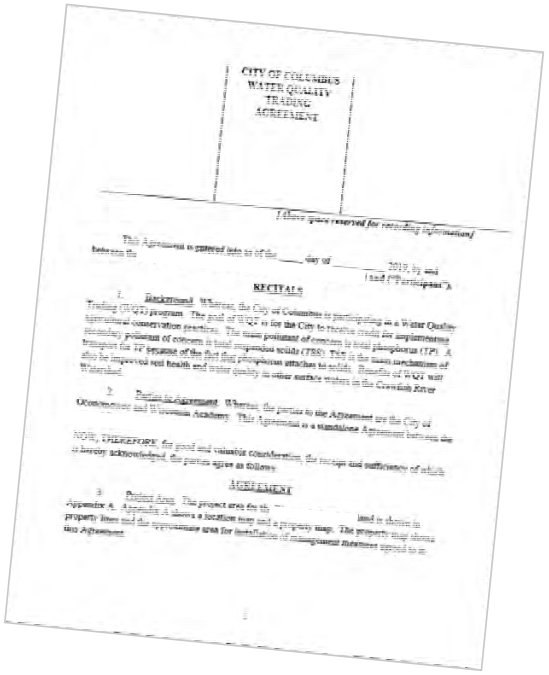
- Acreage taken out of production, controlled acreage
- Phosphorus index based on soil sampling
- TMDL non point source load allocation
- Long-term credits vs. interim credits
- Trade Ratio
  - **Trade Ratio** = (Delivery + Downstream + Equivalency + Uncertainty - Habitat Adjustment):1

WQT Program Development Process

6. Draft preliminary WQT Plan and submit to DNR
7. Receive comments and requests for further information from DNR
8. Update trading plan and resubmit to DNR

WQT Program Development Process

9. Develop land owner agreements and contracts
   - Address any land owner concerns
10. Submit final paperwork to WDNR


CITY OF COLUMBUS
WATER QUALITY
TRADING
AGREEMENT

RECITALS

AGREEMENT

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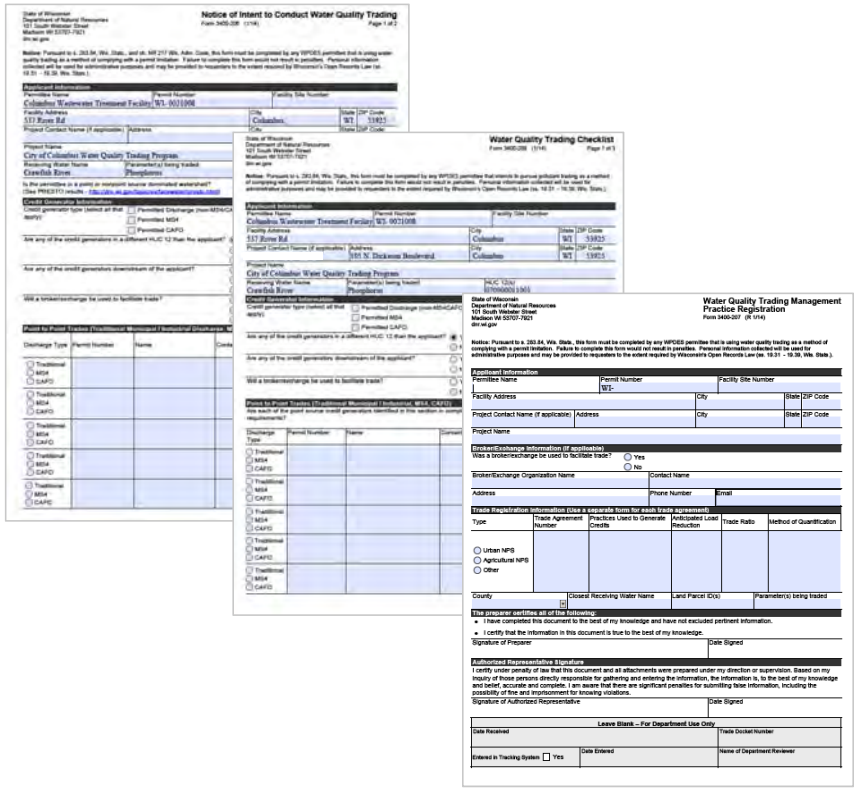
Typical Landowner Concerns

- Contract length
- Crop rotations with regard to cover crops
- Rental rate
- Who is the point of contact
- What happens if practice fails or is unable to be constructed
- Weather issues

WQT Trading Plan Requirements

- Notice of Intent to Conduct Water Quality Trading
  - Permit renewal application
- WQT Plan
  - Site analyses
  - Quantification of credits
  - Preliminary design and maintenance considerations
  - Snap Plus modeling
  - Soil Sample Information
  - Implementation and timeline information
  - O&M documents
- WQT Checklist
- Management Practice Registration



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WQT Trading Plan Requirements

Trading Document	Purpose	Parties Involved	Additional Guidance (click to follow)
Notice of Intent	• Permittee/credit user submits to WDNR • Allows permittee to confirm trading eligibility prior to plan development • Typically submitted no later than the preliminary facility plan step of a compliance schedule for TP WQBELs or at least 12 months prior to permit expiration.*	• Permittee/credit user • WDNR local wastewater engineer/local trading coordinator	Notice of Intent
Trade Agreement	• Document required of permittee/credit user by s. 283.84, Wis. Stats. to formalize the trade • Typically completed prior to submittal of the WQT plan or at least 9 months prior to permit expiration.*	• Permittee/credit user • Credit generator • WDNR or local governmental unit (if applicable)	Trade Agreement
WQT Plan &Checklist	• Permittee/credit user submits to WDNR • Documents will be public noticed • Outlines the content of the WQT strategy • Typically submitted with the final facility plan step of the compliance schedule for TP WQBELs or with the permit application for reissuance at least 6 months prior to permit expiration.*	• Permittee/credit user • WDNR wastewater engineer/local trading coordinator • Statewide trading coordinator, if necessary	WQT Plan & Checklist
Management Practice Registration (only with NPS credit generators)	• Permittee/credit user submits to WDNR to confirm the management practice has been properly installed in accordance with the WQT plan • WDNR reviews and tracks registration using docket numbering system • Information can be reviewed later for trade verification and auditing	• Permittee/credit user • WDNR wastewater engineer/local trading coordinator • Statewide trading coordinator	Registration

http://dnr.wi.gov/topic/SurfaceWater/waterqualitytrading.html

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WQT Program Development Process

11. Implement WQT plan practices
12. Annual inspections
13. Annual O&M
14. Continue to look for new opportunities in the watershed

POINT SOURCE TO POINT SOURCE TRADING

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Nasco and City of Columbus

- Rock River Basin TMDL
- Nasco
  - Life Sciences Company, frogs
  - Fort Atkinson
  - Direction discharge to Rock River
    - Frog tanks
    - TMDL requirements

Nasco and City of Columbus

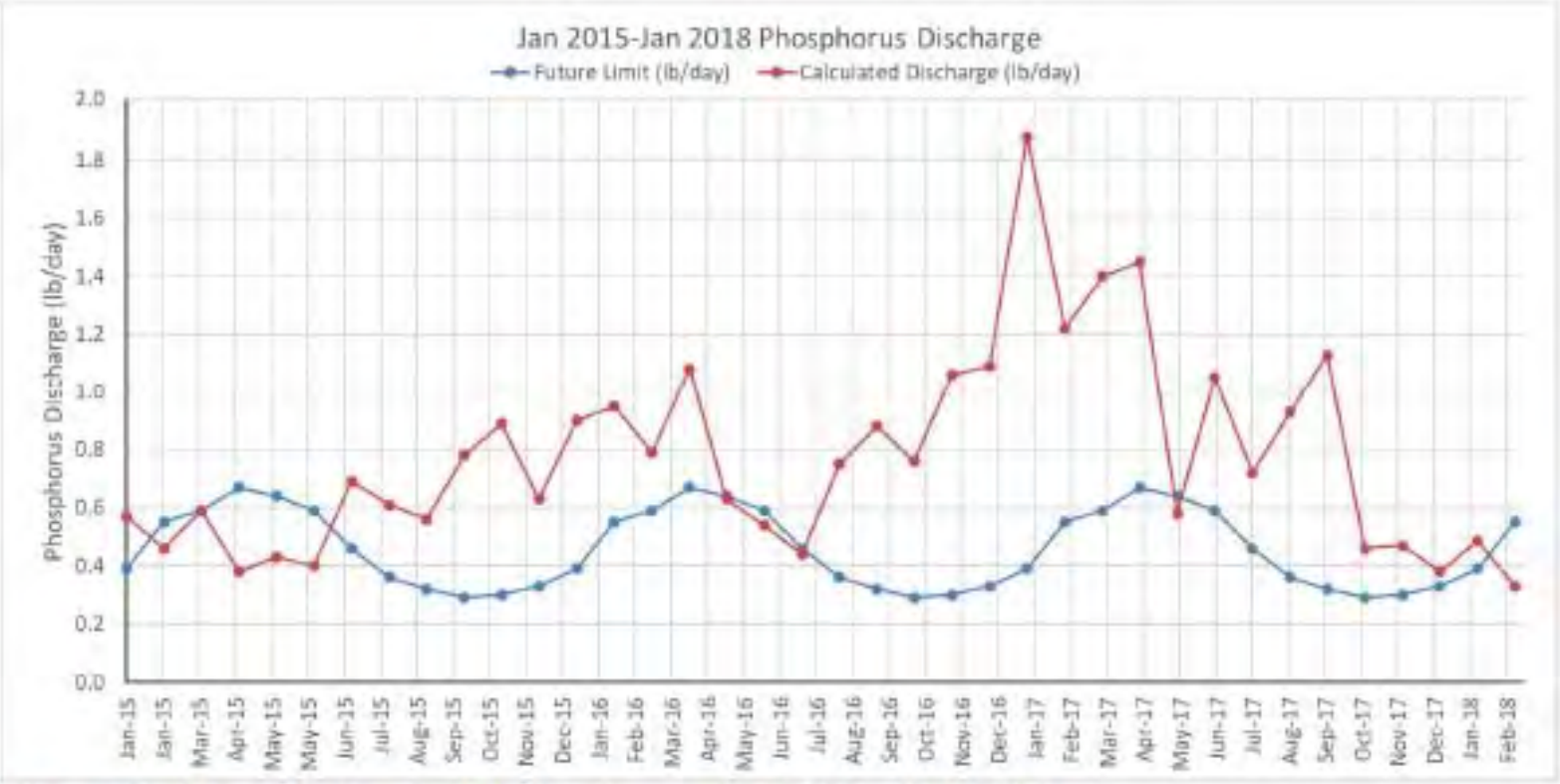

Figure 1 – Nasco Estimated TP Discharge Jan 2015 – Feb 2018

- Courtesy of Montgomery and Associates Resources Solutions, LLC.

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Nasco and City of Columbus

- City of Columbus
- TP TMDL

City of Columbus WWTF				
Design Flow (MGD)		1.26		
Treatment Level (mg/L)		0.075		
Month	TMDL Allocation (pounds per day)	Allocation (pounds per month)	Actual Pounds at Design Flow	Excess Pounds
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

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Nasco and City of Columbus

- Agreement Finalized
  - 8/30/2018
  - 10 yr.
  - 5 yr. “Off Ramp”


QUESTIONS?