Information Item: Municipal Wastewater Charge Data Analysis

METROPOLITAN COUNCIL

Environment Committee: August 26, 2025

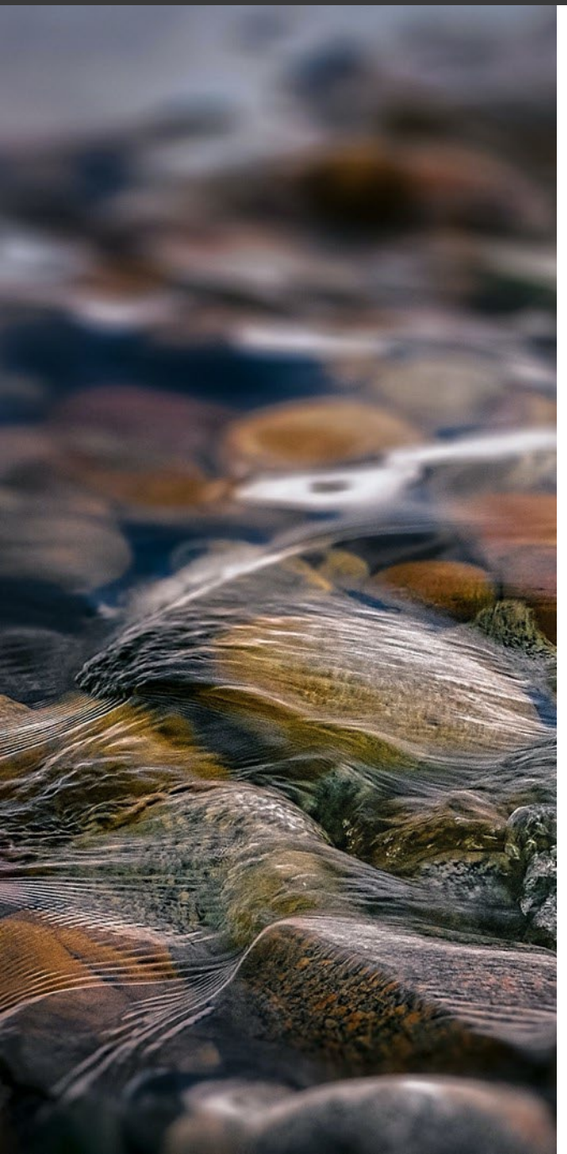
Alison Wayman

Introduction

Alison Wayman

- University of St. Thomas
- Junior
- Major: Civil Engineering
- Enjoys skiing, dogs, swimming and traveling
- Municipal Wastewater Charge (MWC) Data Analysis

Overall Concept and Method



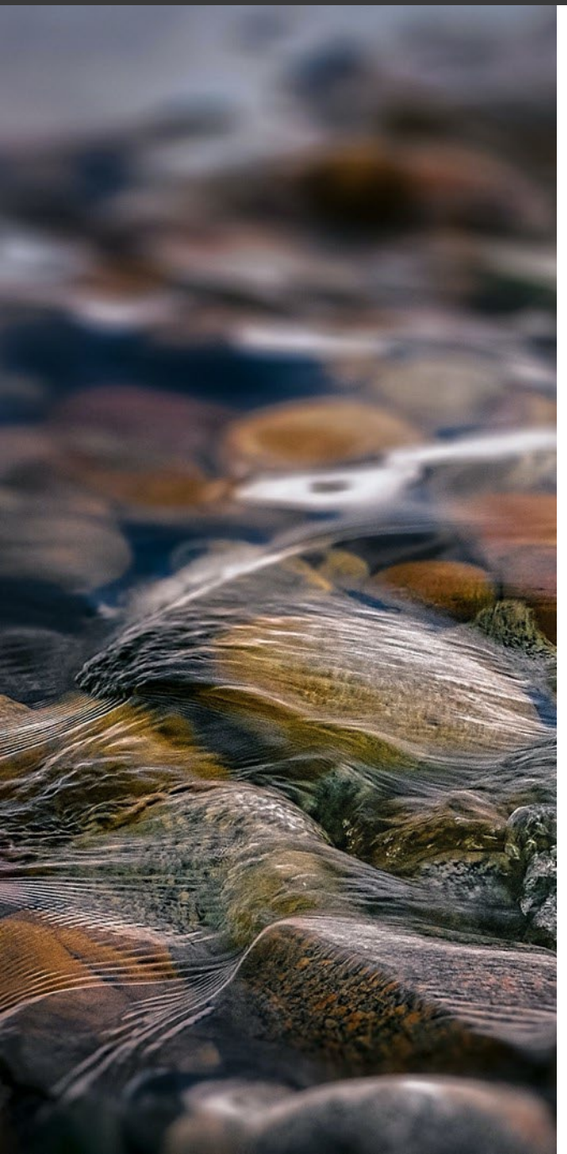
Current Method

- Percent of regional flow from a community determines cost
  - As outlined in the 1972 Clean Water Act

New Method – Two Possible Methods

- Municipal Wastewater Charge (MWC) Letter for data
- Flow of Communities – example below
  - Average of (2018, 2019, and 2020) is the value for 2020
- Regional Flow three-year average value
- Percent of regional flow from a community determines cost

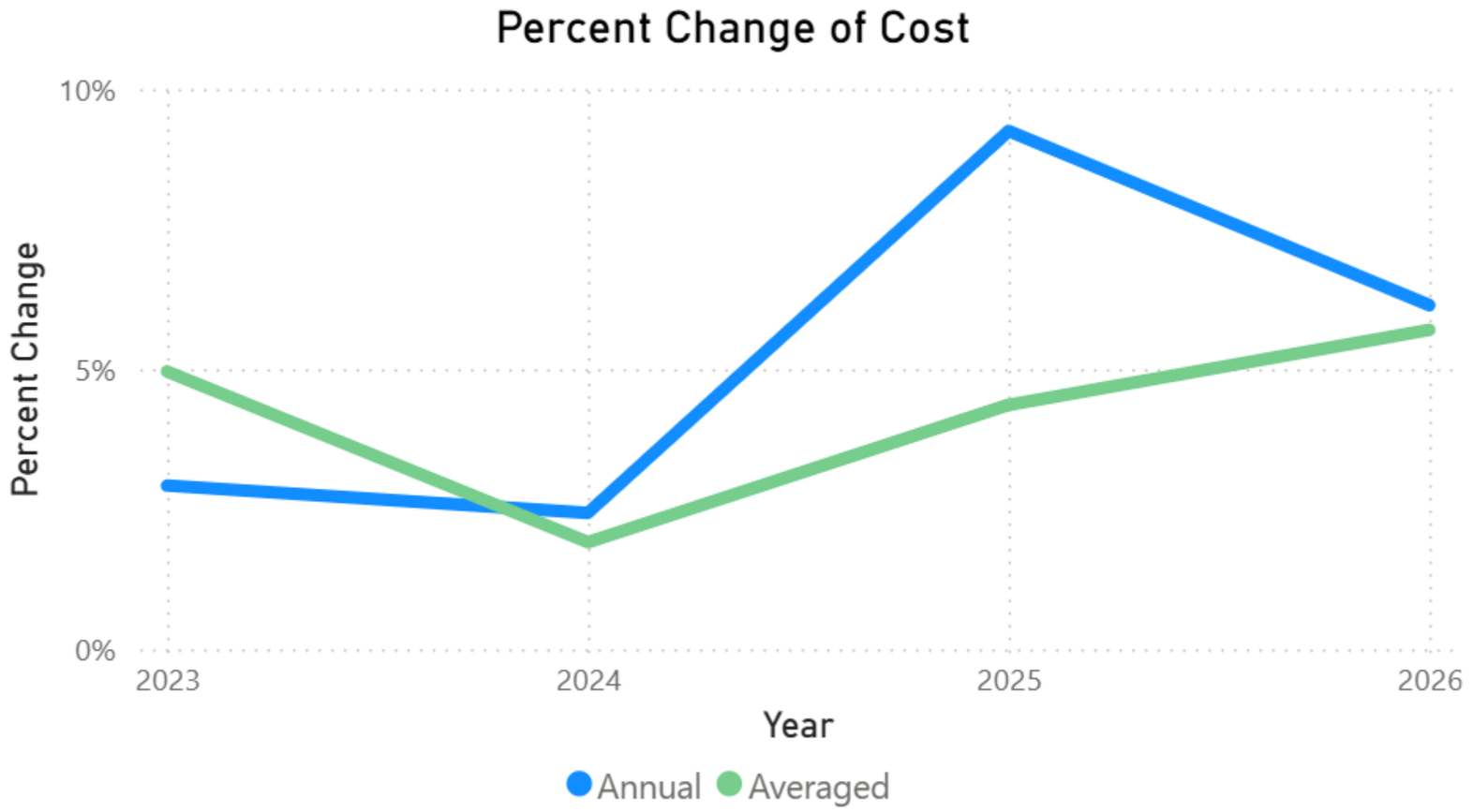
1972 Clean Water Act



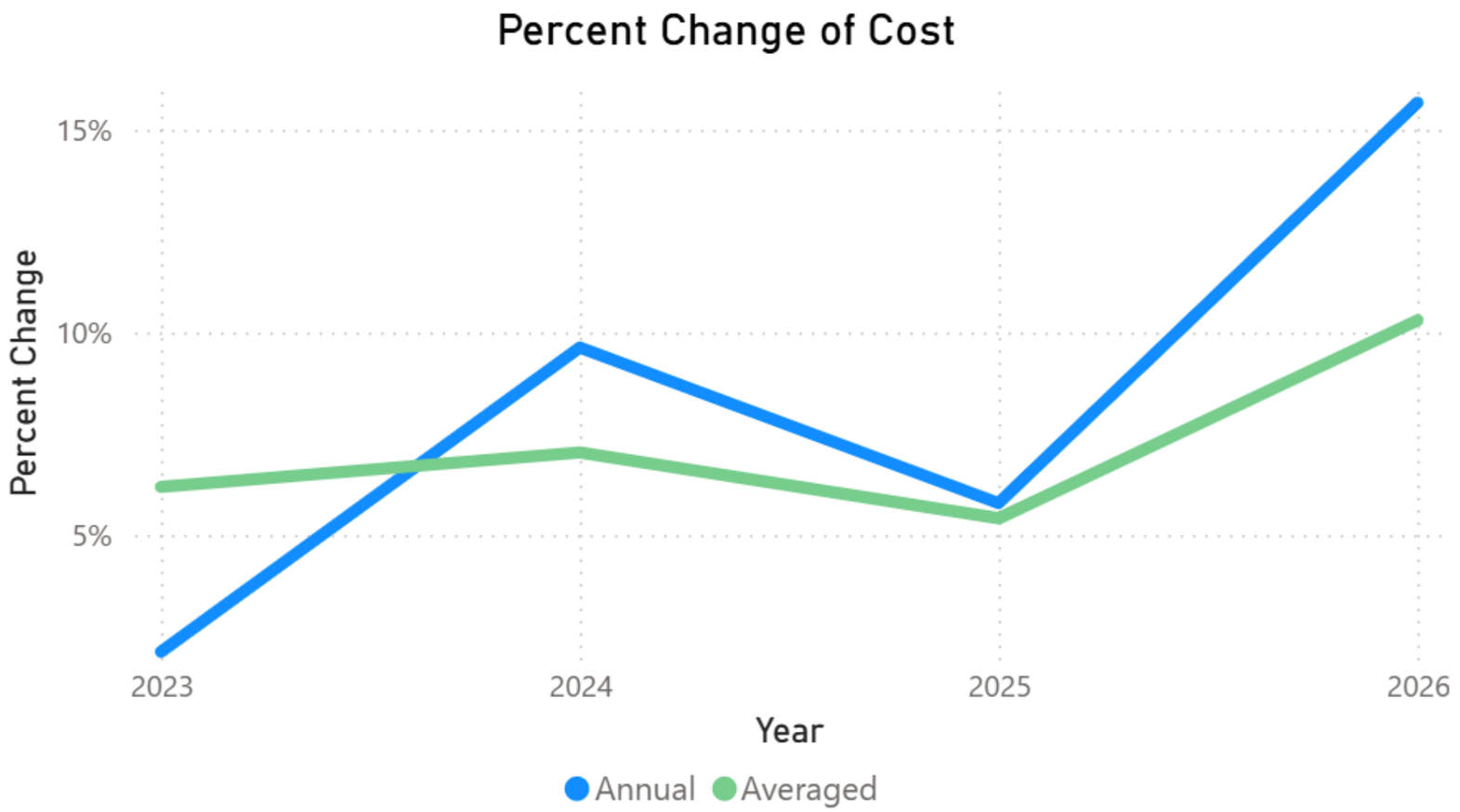
Public Law No. 92-500 (Federal Water Pollution Control Act Amendments of 1972), Section 204, (b) (1), requires that a utility;

- “has adopted or will adopt a system of charges to assure that each recipient of waste treatment services within the applicant’s jurisdiction, as determined by the administrator, will pay its proportionate share (except as otherwise provided in this paragraph) of the costs of operation and maintenance”

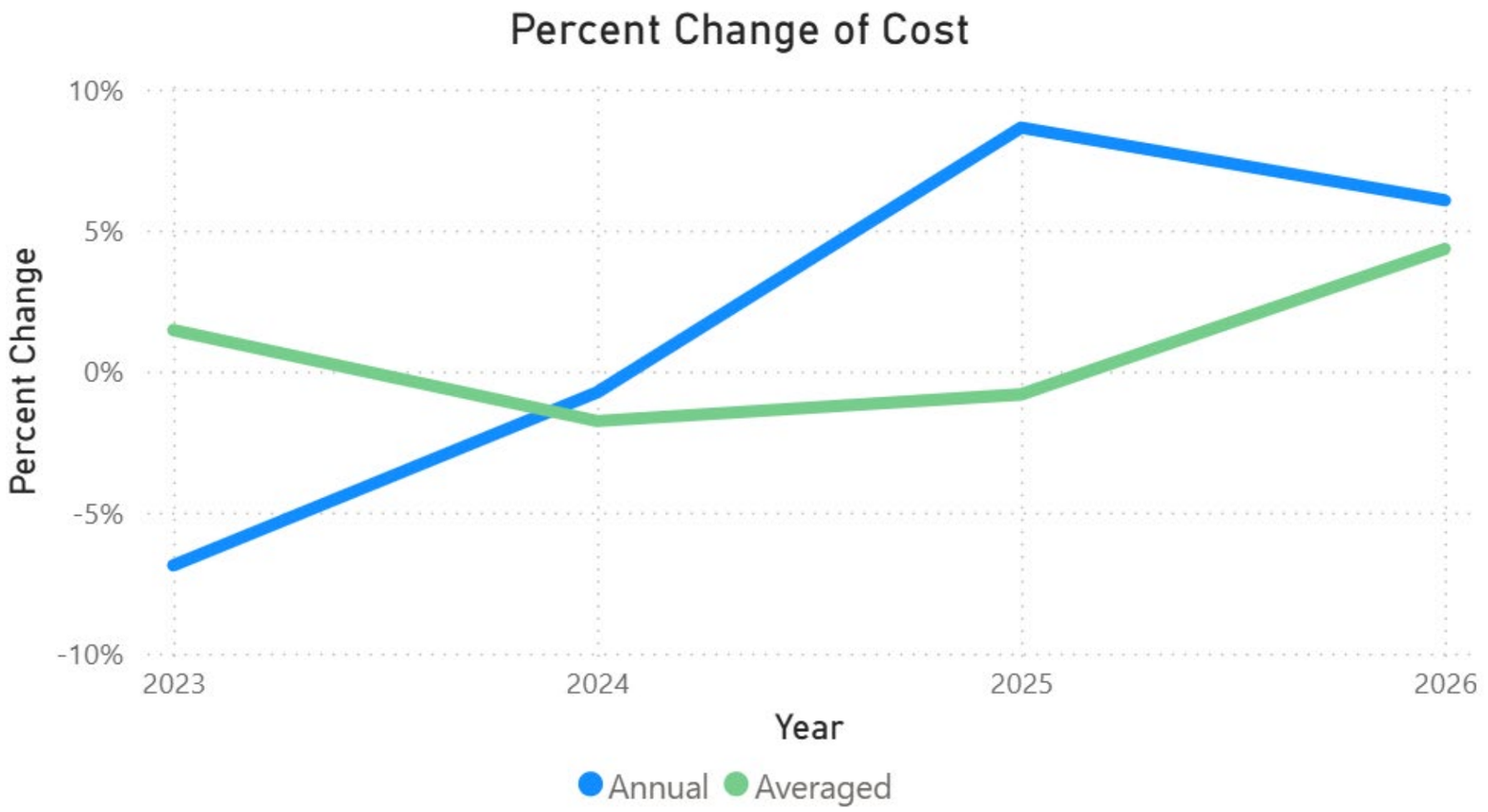
Minneapolis



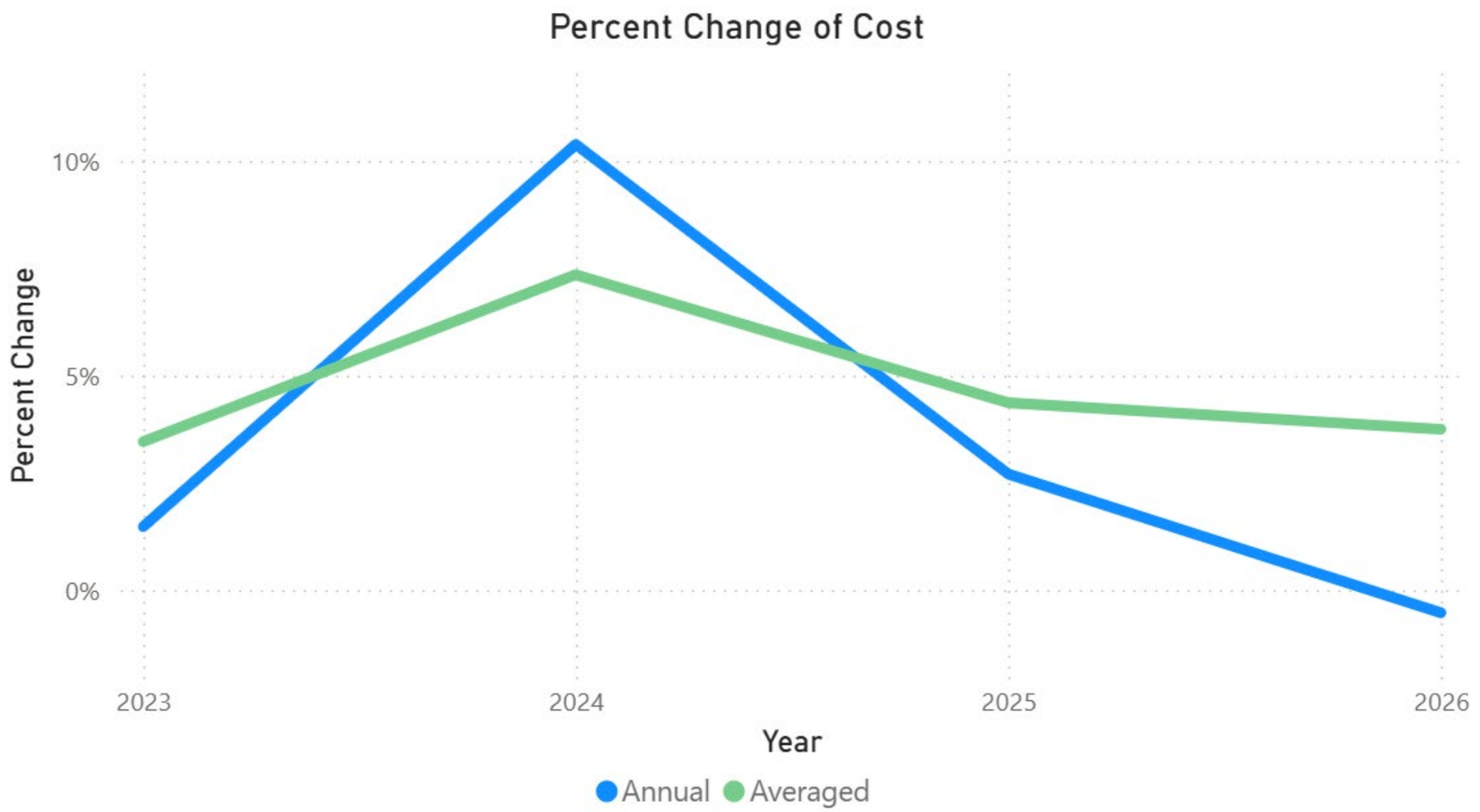
St. Paul


Percent Change of Cost
15%
10%
5%
Percent Change
2023
2024
2025
2026
Year
Annual
Averaged

Golden Valley



Champlin


Percent Change of Cost
10%
5%
0%
Percent Change
2023
2024
2025
2026
Year
Annual
Averaged

Conclusion and Next Steps

- Average method does smooth out percent change of cost
  - Current point in analysis
- Further analysis for all communities of all methods
  - Flow volume
  - Percent change in cost
  - Percent of regional flow
  - Total cost per year
- Complete Analysis to determine
  - Possible Advantages
    - Reduces sticker shock for community's bill
    - Helps with local budgeting
  - Communicate with communities and determining possible disadvantages

Flow Year	Precipitation (in./yr)
2024	36.55
2023	29.69
2022	22.97
2021	25.96
2020	29.83
2019	43.17
2018	33.57
2017	32.36
2016	40.31
2015	36.14
2014	35.40
2013	32.77

Questions

Alison Wayman

Wastewater Planning and Community Programs Intern

Alison.Wayman@metc.state.mn.us

METROPOLITAN COUNCIL

Information Item: Sludge Dewatering Optimization

METROPOLITAN COUNCIL

Environment Committee: August 26, 2025

Evan Leeser

Introduction

Evan Leeser

- St. Cloud State University
- Senior
- Major: Environmental Engineering, Minor: Hydrology
- Hobbies: hiking, rock climbing, painting, esports
- Sludge Dewatering Optimization
- Seneca Inhibition

Project Overview

Sludge Dewatering

Polymer

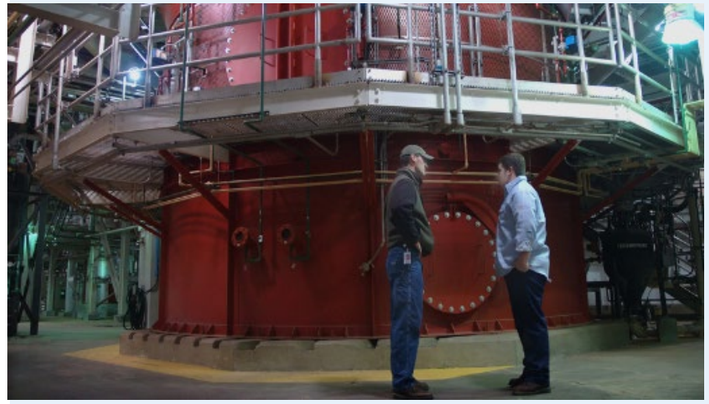
- Binds solids in sludge
- Crucial for dewatering
- $4.5-5.4 million annually

Centrifuge

- Dosed sludge enters
- Separates solids from water
- Creates cake

Incineration

- Burns cake
- Dry cake burns better

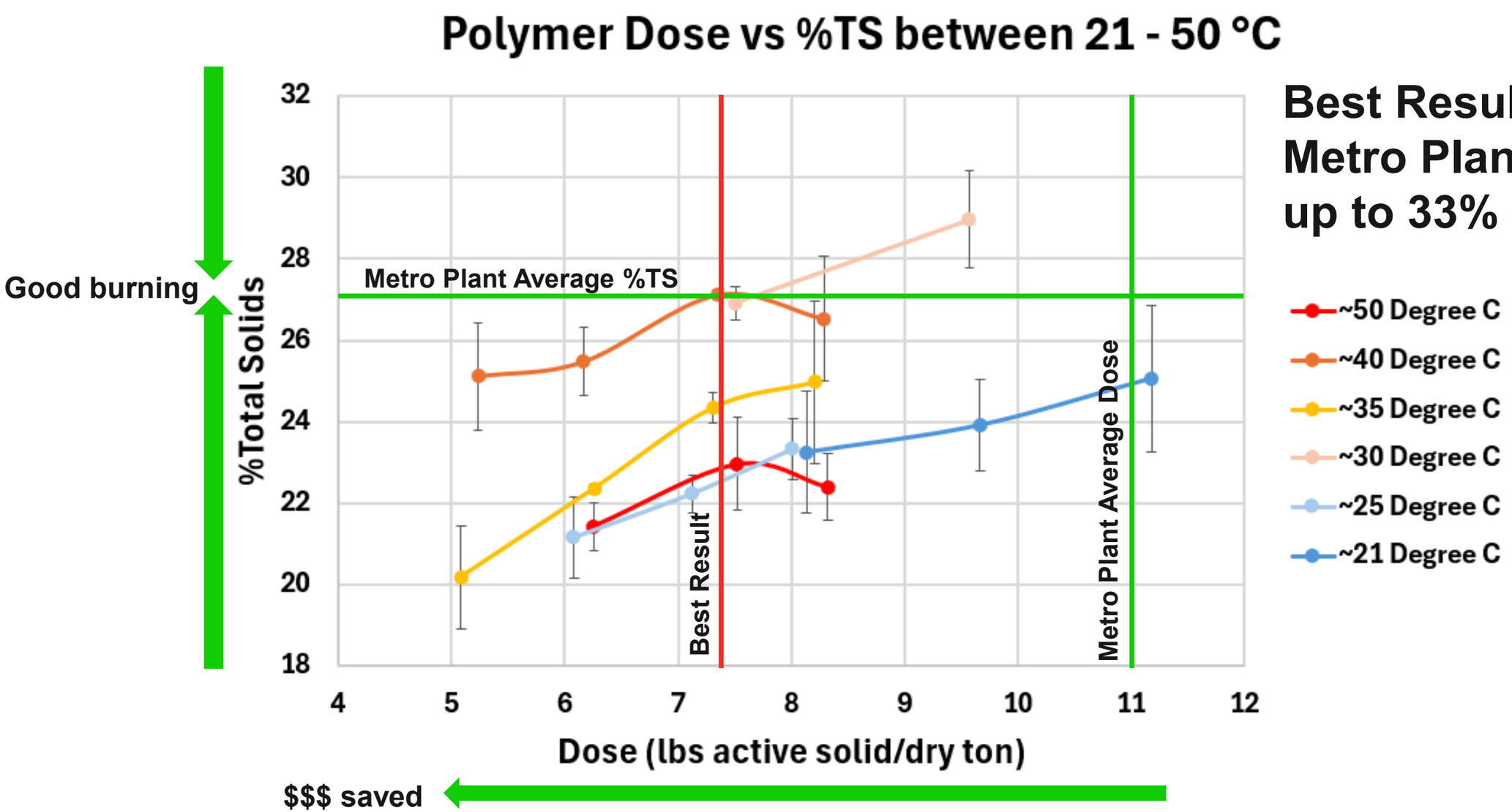


Polymer Optimization

Reducing Polymer Usage

- Optimal temperature
- Less polymer used = savings
- Need to maintain good dewatering

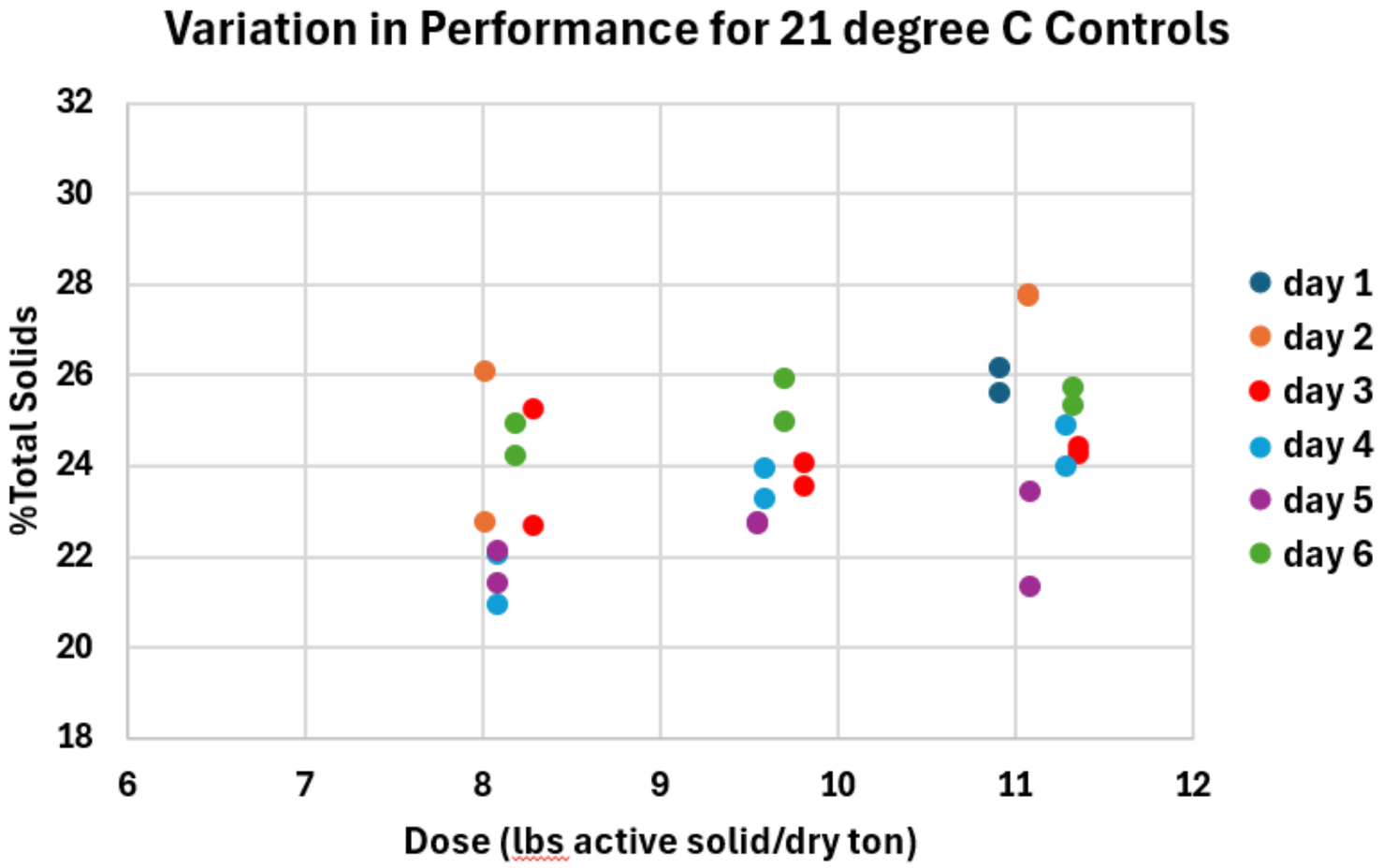
Polymer Dose vs %Total Solids



Best Result compared to Metro Plant Average was up to 33% dose reduction.

Metropolitan Council

Variations in 21 Degree C Control



Each day, sludges are different, and results can vary.

Different days affects how well heating treatments performed.

Method precision or real-world variance in what the plant receives?

Seneca Plant Opportunity

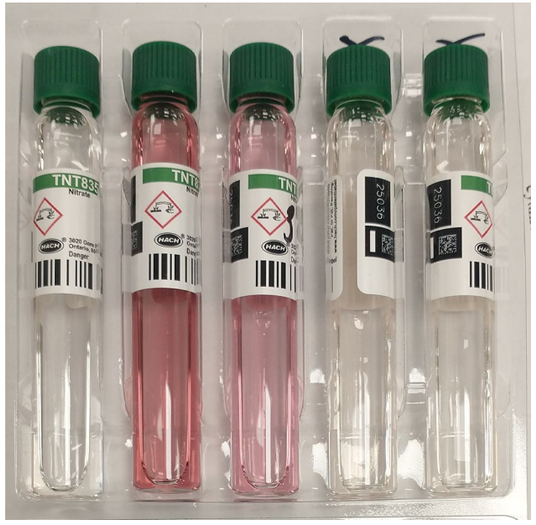
Cyanide Inhibition on Nitrifiers

- Nitrite not converting to nitrate
- Batch tests – recreate the issue
- Sampling
- Treatment exploration for cyanide

Seneca Plant Opportunity

Problem Solving

- My favorite part of internship
- Work closely with team of engineers
- Collaboration with other sections of ES



Metropolitan Council

Impacts on Met Council

Real Implications

Seneca

- Inform plant operations
- Problem prevention

Dewatering

- Sets up research for heating sludge instead of polymer
- Implementation of heating?
- Possible cost savings

Impacts on Me

Value of Internship

- Teamwork and collaboration
- Engineering problem solving
- Confirmed interest in wastewater
- Continue to serve communities

Questions

Evan Leeser

Intern, ES-OSS-PERDAQ

METROPOLITAN COUNCIL

Information Item: Watering the Plans: Streamlining Water Resource Considerations in Local Long-Range Planning

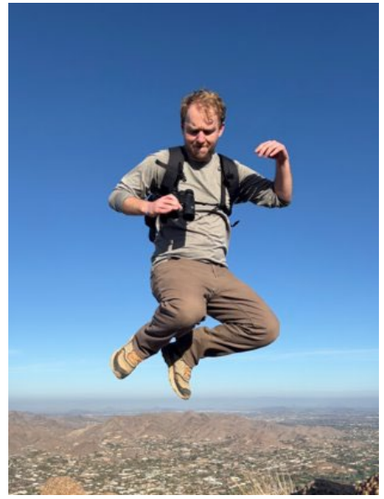
METROPOLITAN COUNCIL

Environment Committee: August 26 2025

Peter Miller

Introducing Peter

- **University of Minnesota, Humphrey School of Public Affairs**
  - Science, Technology, and Environmental Policy
  - Graduating May 2026
  - Hobbies include hiking, cooking, birding, weather-watching, camping
  - Passionate about planning for a sustainable future, understanding how we can create systems that reimagine and best deliver benefits for the human-ecological interaction
  - Previous experience in Department of Interior
- **Have not worked in any planning capacity, this is my introduction to local and regional government**



2050 Comprehensive Plan Update

Importance of long-range water planning

- Objectives of long-range regional water planning
- Local Planning Handbook (LPH)
- How to enhance communications between the needs of long-range water planning and the capacity, needs, and ideas of constituent communities?
- How can water considerations be more directly involved in long-term planning considerations?
    - **Water Chapter Template facilitating comprehensive, standardized planning**

MAWSAC and the community of communities

Incorporating municipal planner feedback

- Metropolitan Area Water Supply Advisory Committee

- To assist local water planners, which materials, context, and assistance should be included in the Local Planning Handbook (LPH)?

  - *Sufficient resources and cross-collaboration with source water protection in communities*

  - *Examples of contingency planning*

  - *Access to other communities' plans, data*

  - *Prioritization of confliction requirements from watershed, state*

2050 Comprehensive Plan and community involvement

Clarifying planning considerations

- Reasoning for streamlining the process
- Previous comprehensive plan updates (CPUs) have varied by community in content, structure, and narrative of localities' water needs and expectations.

- **How-to Guide**
  - Establish commonalities
  - Recognize differences in approach
  - Allow for distinctions of planning needs
- Example of requirement for Water Supply:

Requirement 2 – Goals and policies (SWP)

2.Include water resource management goals and policies to protect the quality of water supply sources, especially in any highly vulnerable DWSMAs.

SUBURBAN community

Stillwater 2040 Comprehensive Plan Update

"The purposes of the water management programs are to: Protect, preserve, and use natural surface and groundwater storage and retention systems; Minimize public capital expenditures needed to correct flooding and water quality problems; Identify and plan for means to effectively protect and improve surface and groundwater quality; Establish more uniform local policies and official controls for surface and groundwater management; Prevent erosion of soil into surface water systems; Promote groundwater recharge, where beneficial; Protect and enhance fish and wildlife habitat and water recreational facilities; and Secure the other benefits associated with the proper management of surface and groundwater."

URBAN EDGE community

Maplewood 2040 Comprehensive Plan Update

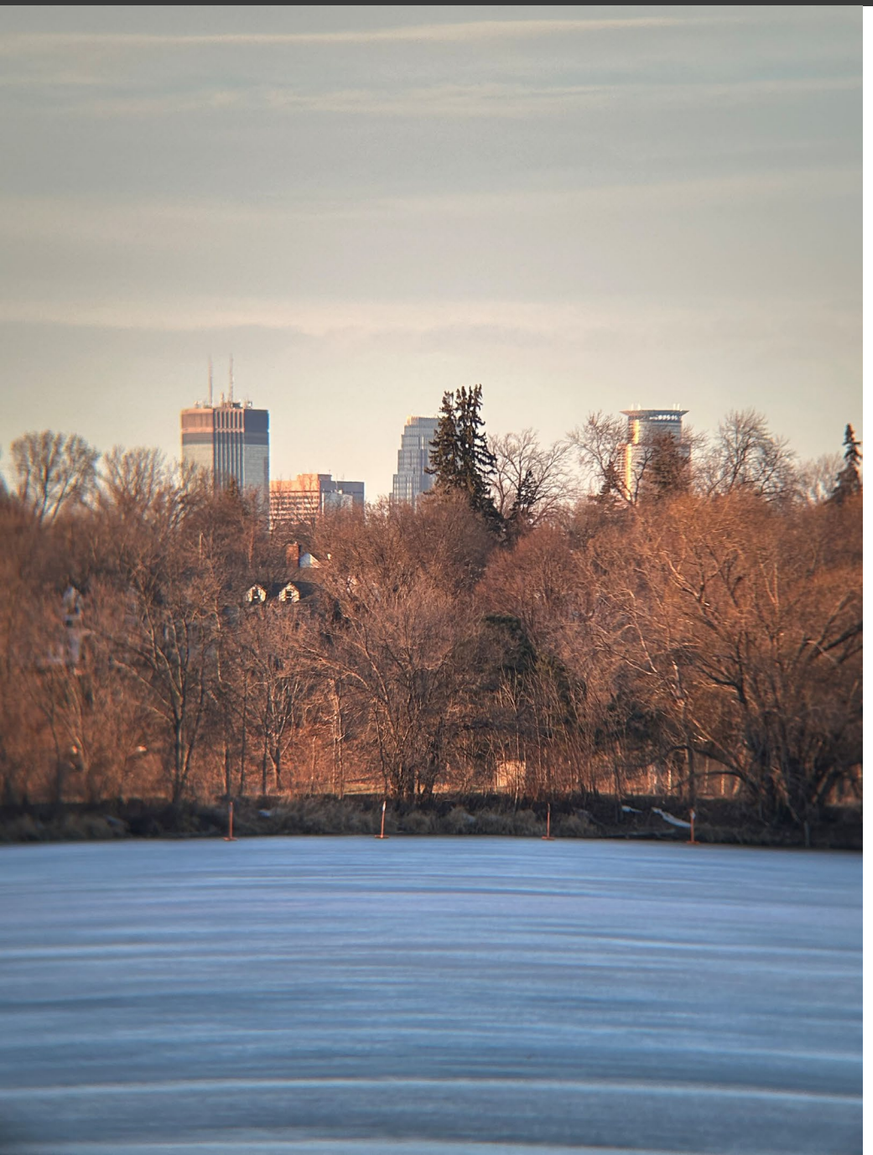
"Related to protection of groundwater resources, Maplewood and the local watershed management organizations have placed prohibitions on using infiltration practices for stormwater treatment where high-levels of contamination in groundwater will be mobilized by the infiltration practice. In addition, City standards restrict the use of infiltration practices within Drinking Water Supply Management Areas (DWSMAs) and vulnerable Wellhead Protection Areas. The City's 2018-2028 Surface Water Management Plan includes information on these protective standards as well as mapping of DWSMAs and Wellhead Protection Areas throughout the City."

Connecting water to other subject areas

Centering water planning considerations

- Finding overlaps with other plan elements of Local Planning Handbook (LPH)
- Connections between **Water Supply** and **Surface Water**
  - *Ex. Describing best-management practices for success at mitigating risk to water resources*
- Connections with **Natural Systems**
  - *Ex. Describing sensitive "terrestrial and water areas," and goals of community to improve or protect systems*
- Connections with **Transportation**
  - *Ex. Development of resilient infrastructure, consistent with protections for source water and stormwater storage*

Connecting water to other subject areas



- Connections with **Parks and Trails**
  - *Ex. Protection of surface water congruent with local and regional parks centered around such features*
- Connections with **Land Use**
  - *Ex. Forecasted density of community designations proportional to water supply projections*
- Connections with **Housing**
  - *Ex. Analysis of affordable housing availability factored alongside access to water resources*
  - *Ex. Development of housing need concurrent with expected water demand*
- Empirical and narrative description of requirements

Long-range outcomes for long-range plans

- Synthesizing the specific *and* shared water resources management needs to build a resilient, prosperous, and prepared regional community

- Purpose is to ensure that, by 2050, communities can reflect on plans as thorough, impactful, and purposeful

- This well-established process reflects the collective interest of stakeholders at all levels in the metro, demonstrating the value of collaborative regional government

Where from here

Thank you, water resources!

This experience has deepened my knowledge of local and regional planning, and provided me an incomparable perspective on the nuance of water management

Find me on west bank the next two semesters, I'll be working with Dr. Elise Harrington and hoping my capstone project can be water-related

Questions

Peter Miller

Water Policy and Planning Intern

PeterC.Miller@metc.state.mn.us

METROPOLITAN COUNCIL

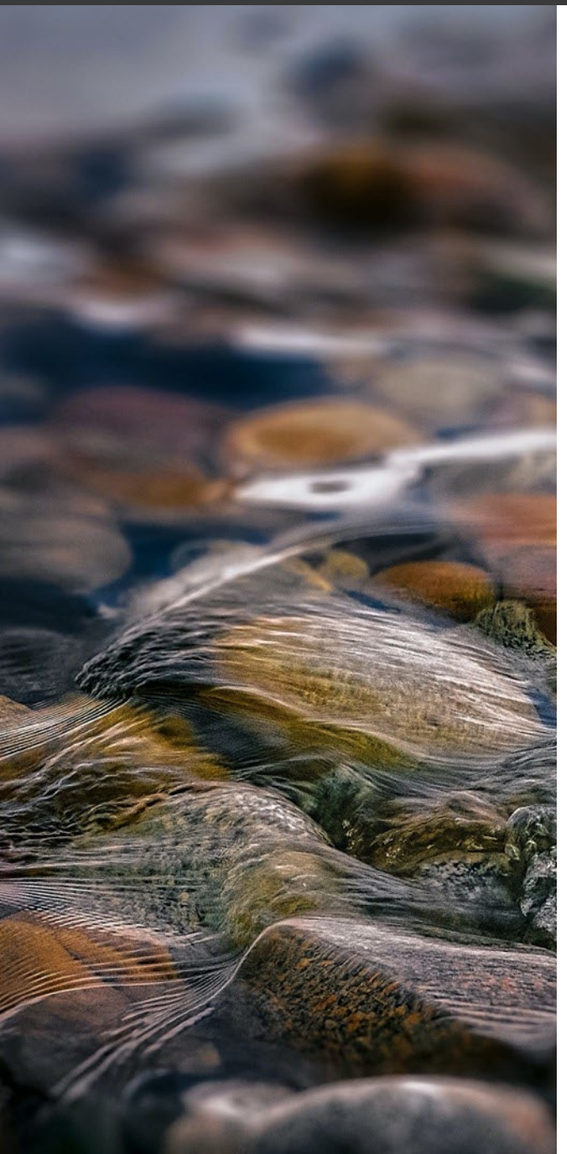
Information Item: Bridging SCADA & WAM Data For Proactive Asset Management

METROPOLITAN COUNCIL

Environment Committee: August 26, 2025

Faizan Bhutto

Introduction



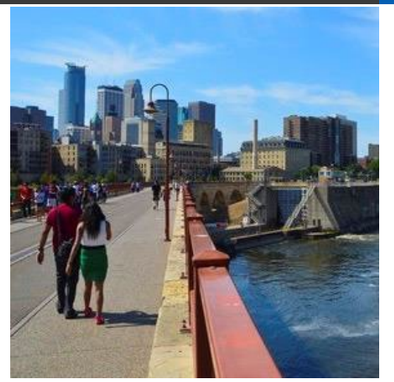
Faizan Bhutto

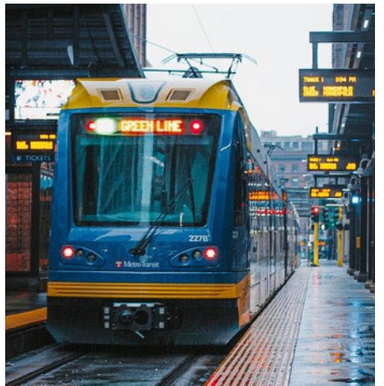
- DePaul University
- Graduated May 2025
- **Major**: MS Data Science
- **Business Analyst Intern** - Asset Management
- **Project**: SCADA + WAM Integration
- Hobbies: Business, Soccer, Hiking, Traveling

Bridging SCADA & WAM Data For Proactive Asset Management

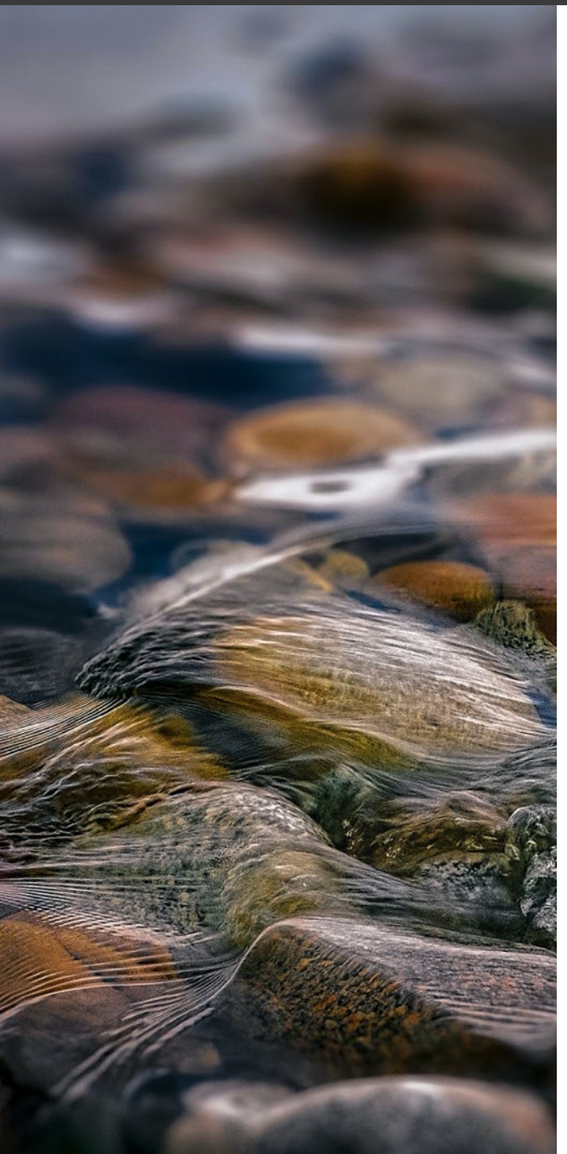
KEY HIGHLIGHTS:

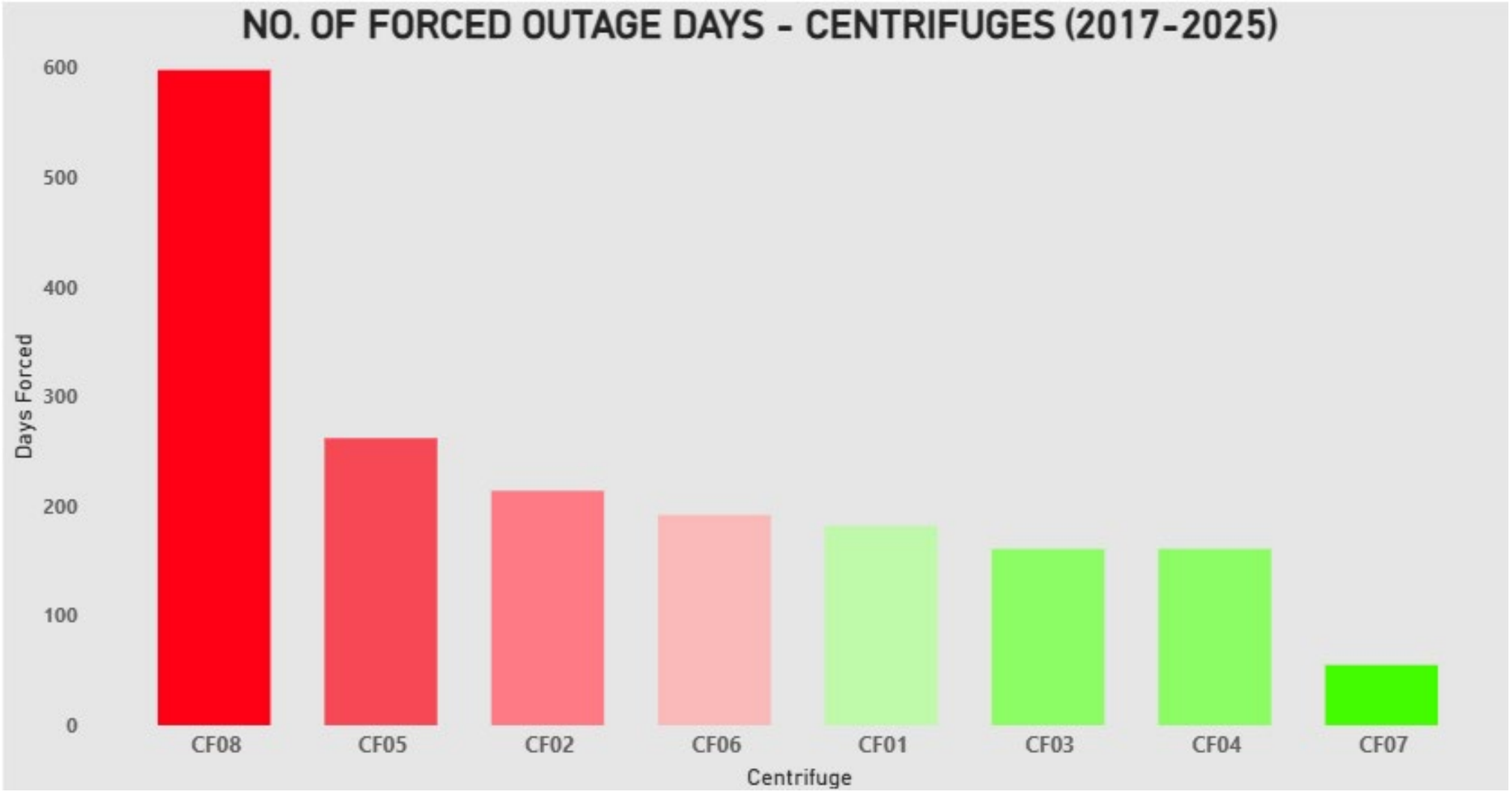
- Connected **operations data (SCADA)** with **maintenance data (WAM)**.
- Focused on **centrifuges**.
- Built dashboards that showed:
  - Which centrifuges had the **most downtime**.
  - What **type of work** was done (**Proactive vs. Reactive**).
  - **Costs** tied to outages and repairs.
- Found big gaps — e.g., one centrifuge (CF08) had **600+ forced outage days**.
- Showed how shared data helps **plan ahead, cut costs, and work better together**.



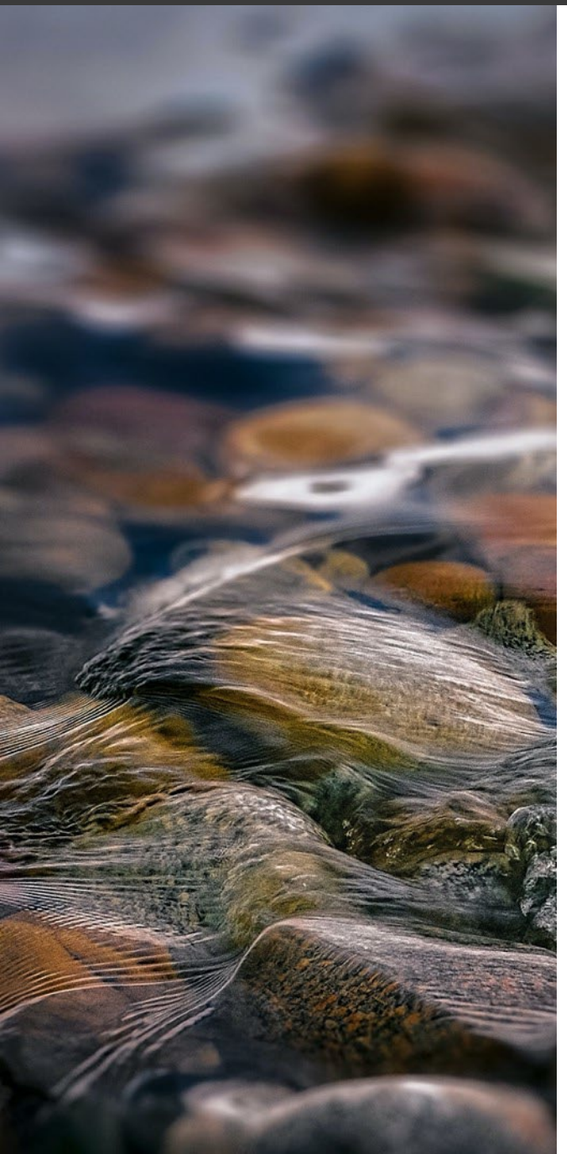


Bridging SCADA & WAM Data For Proactive Asset Management





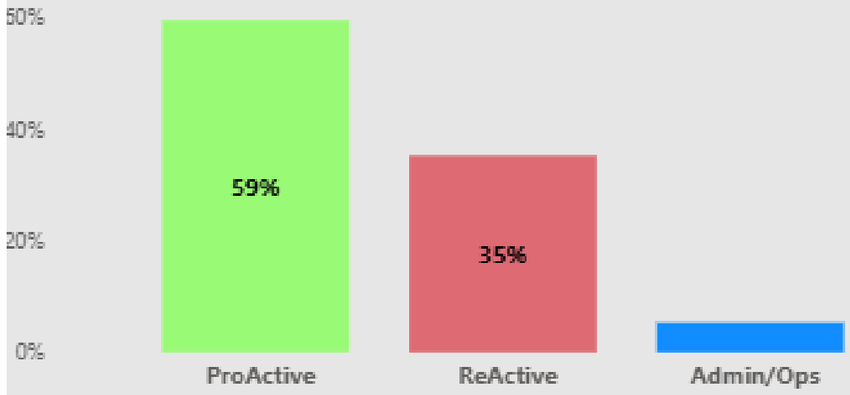
Bridging SCADA & WAM Data For Proactive Asset Management



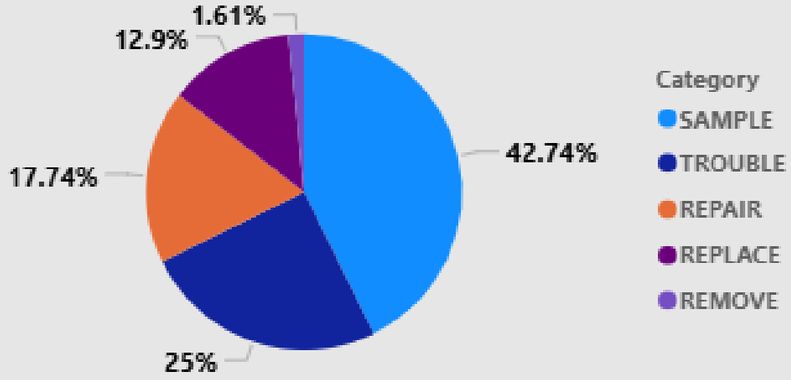
TOP 10 MOST COSTLY WORK TASKS

Centrifuge	Work Task	Type	Classification	Cost	Year	Category	Description
CF05	2139942-01	[R] Regular	ProActive	201,878	2021	Repair	Rebuild bowl #3012 and scroll #6459. Came out
CF05	1624709-01	[U] Urgent	ReActive	144,372	2017	Replace	Please replace the Accelerator on Centrifuge 5
CF05	2222426-01	[R] Regular	ProActive	61,436	2023	Replace	Need to pull out CF05 rotating assembly and rep and found glitter in the oil
CF05	1720155-01	[R] Regular	ReActive	29,185	2017	Repair	Pull centrifuge and take apart pillowblock bearin suspect o-ring.
CF05	2215547-01	[R] Regular	ReActive	22,674	2022	Troubleshoot	Centerfuge 5 has no power. Operator stated hea voltage breaker room 4th floor. I checked and n
Total				527,467			

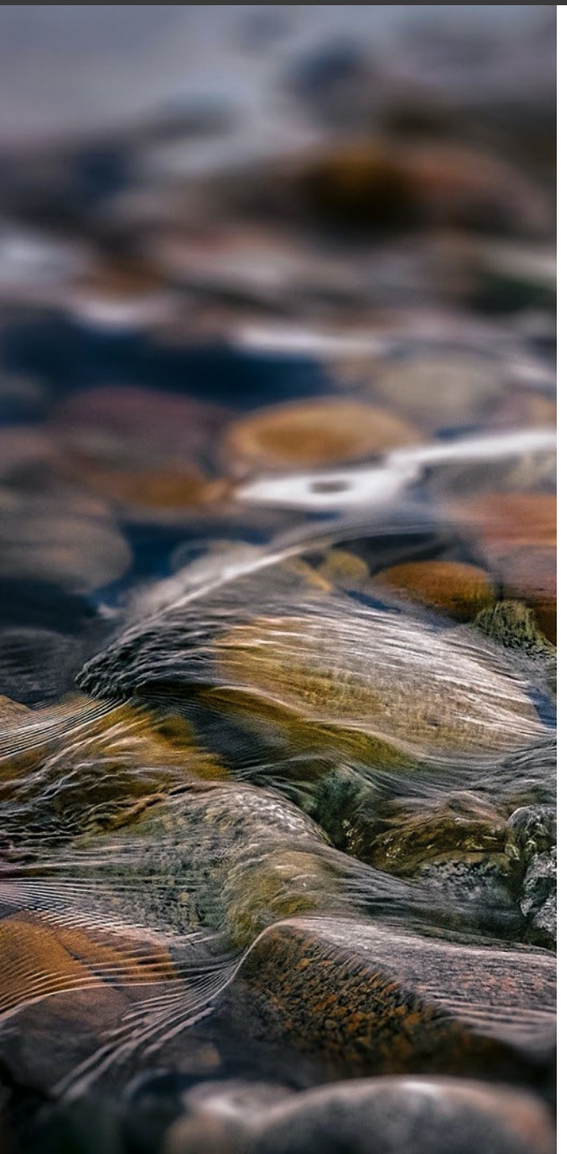
WHAT'S THE OVERALL WORK CLASSIFICATION FOR THIS CENTRIFUGE?



TOP 5 TASK CATEGORIES FOR THIS CENTRIFUGE

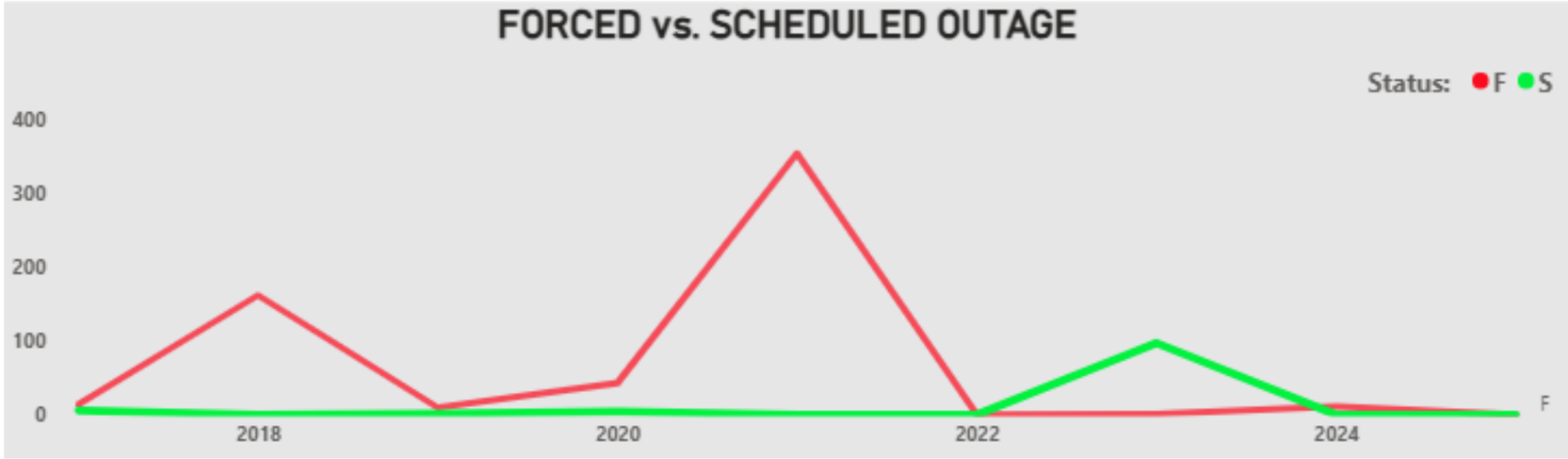


Bridging SCADA & WAM Data For Proactive Asset Management



Centrifuge ReActive Work Tasks with WAM Links (2017-2025)

Centrifuge	Work Task	Status	Task Classification	Department	Cost	Task Class	Task Description
CF08	1802935-01	CLOSED	ReActive	SMBU	251,980.79	[CM] Other Maintenance work (not found by looking for it)	Accelerator failed. Centrifu needs to be pulled out an rebuilt.
CF08	1213988-01	CLOSED	ReActive	SMBU	126,329.31	[CM] Other Maintenance work (not found by looking for it)	Gearbox is Bad needs Alfa Laval rebuild
CF08	1114920-01	CLOSED	ReActive	SMBU	97,511.49	[CM] Other	CF08 something bad has
Total					**1,323,964.38**		

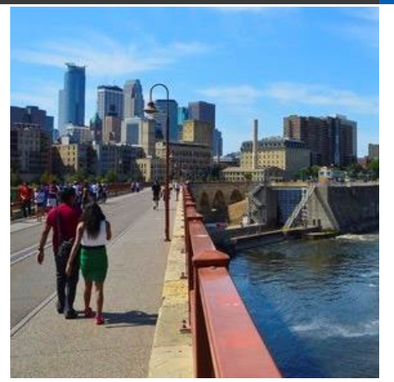


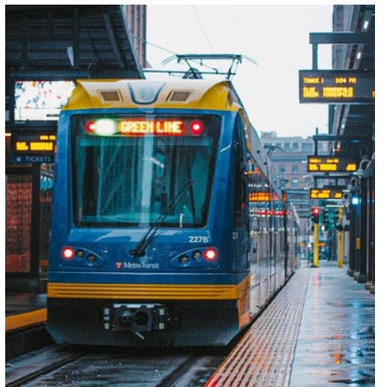
Bridging SCADA & WAM Data For Proactive Asset Management

Impact & Future Potential:

- **Today:**
  - Smarter planning & budgeting.
  - Spot problem equipment early.
  - Stronger teamwork across departments.

- **Tomorrow:**
  - Expand integration to all equipment.
  - Predict failures before they happen.
  - Enable smarter, region-wide decisions.

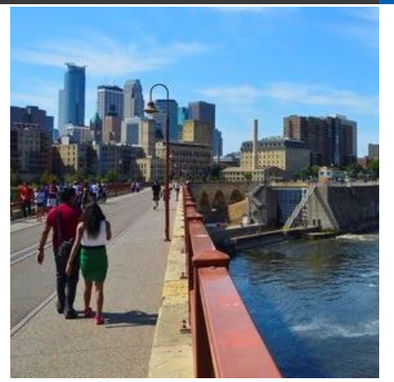


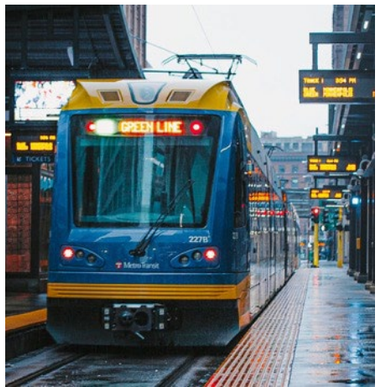


Bridging SCADA & WAM Data For Proactive Asset Management

My Experience Here:

- Gained a deeper understanding of how wastewater treatment plants operate and the critical role they play for the Twin Cities.
- Learned real-world lessons (for example: many “flushable” paper towels aren’t actually flushable!).
- Had the opportunity to work alongside knowledgeable, supportive, and welcoming colleagues.





Bridging SCADA & WAM Data For Proactive Asset Management

"Data is only as valuable as the decisions it drives."

Questions

Faizan Bhutto

Business Analyst Intern – Asset Management

METROPOLITAN COUNCIL

Information Item: Blue Lake Phosphorus Removal and Seneca Chlorine Demand

METROPOLITAN COUNCIL

Environmental Committee: August 26, 2025

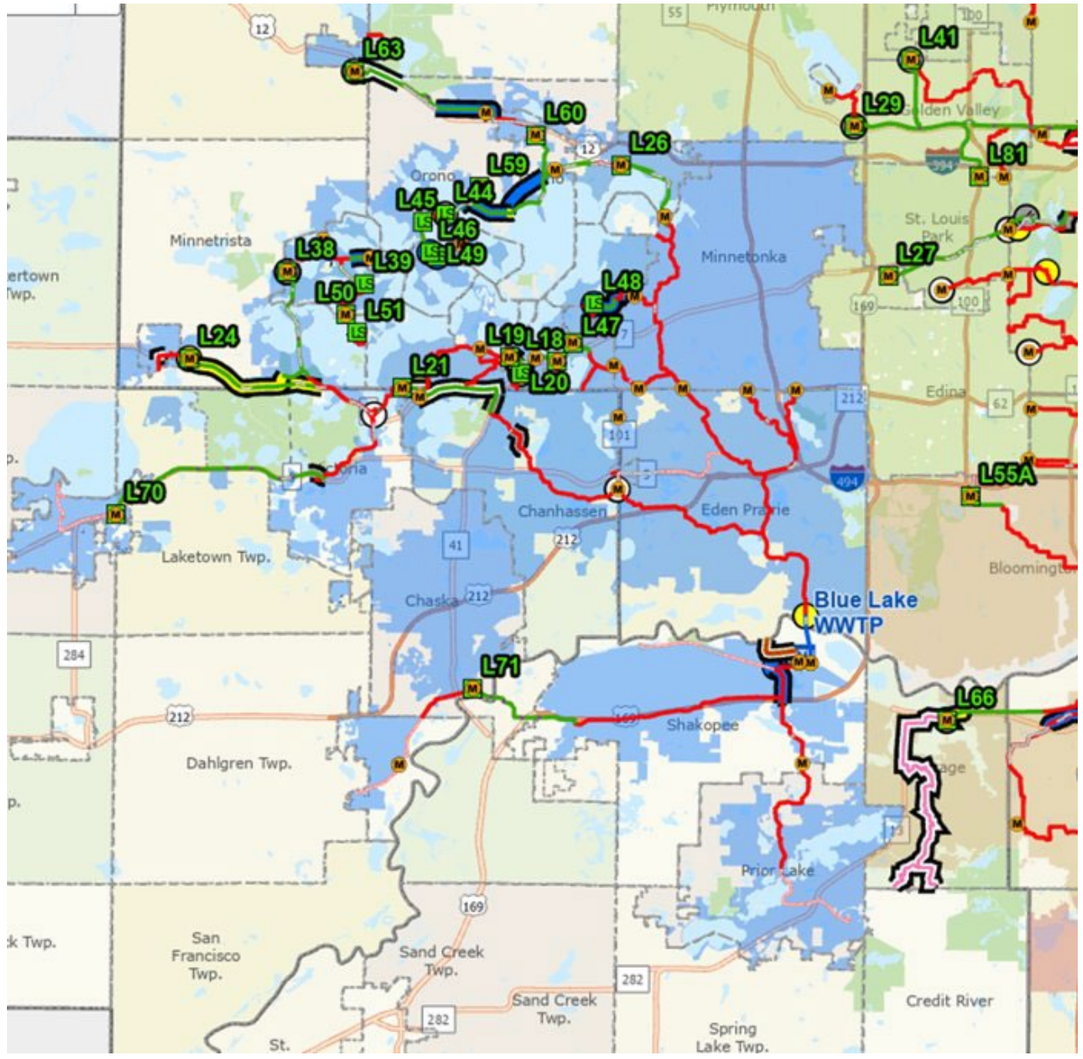
Lucy Jones

Introduction

Lucy Jones

- University of Wisconsin-Madison
- Junior
- Major: Environmental Engineering, Minor: Environmental Studies
- R&D: Blue Lake Phosphorus Removal Optimization
- Additional Project: Seneca Chlorine Demand
- Fun fact: I’ve swam with whale sharks

Blue Lake



- ~ 300,000 residents
- ~29 Million Gallons per day
- Discharges to the Minnesota River

Phosphorus Removal

- Phosphorus (P) accumulating bacteria eat the phosphate to use as energy storage.
- Bacteria need carbon as food to effectively remove phosphorus.

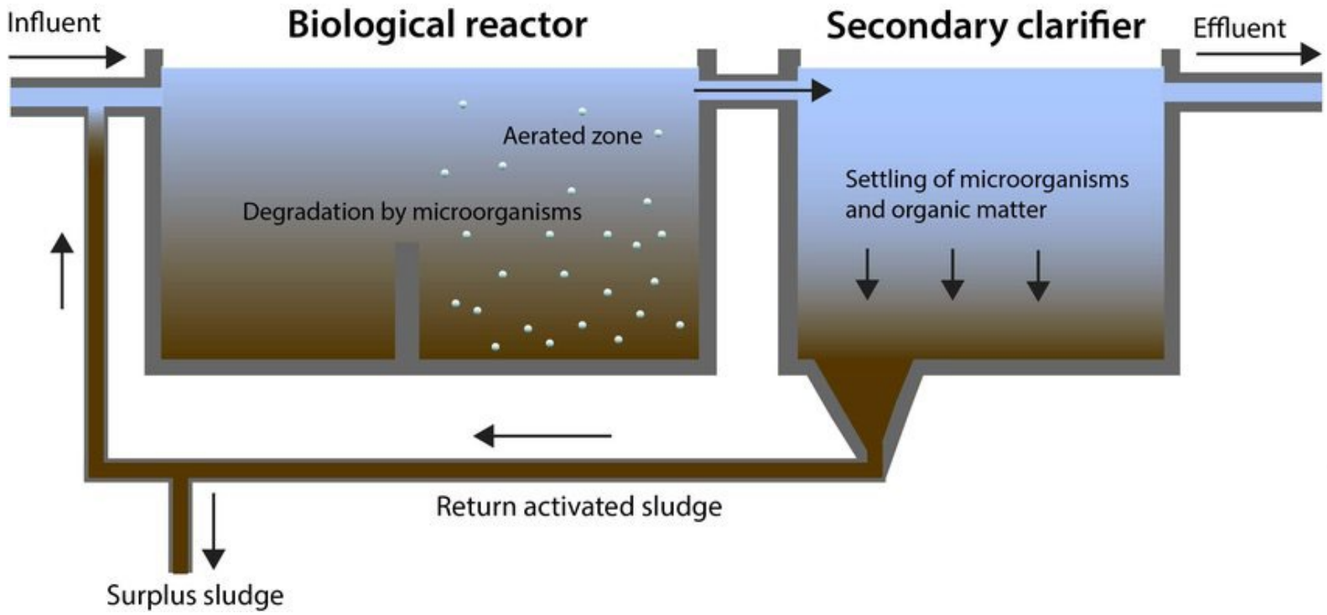
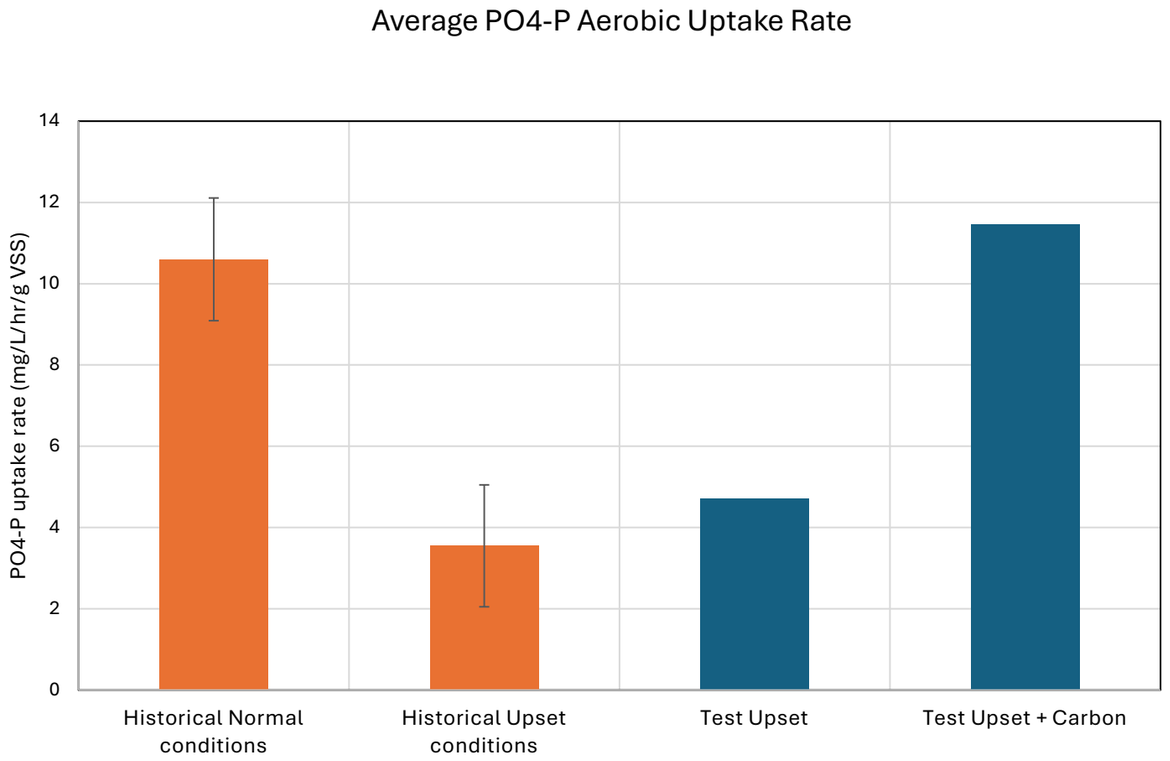


Figure 5. Östman, Marcus. (2018). Antimicrobials in sewage treatment plants. 10.13140/RG.2.2.30958.87367.

Phosphate Uptake Rate test during Upset

- A low uptake rate indicates upset conditions.
- Supplementing 80 mg/L rbCOD was sufficient to recover a normal uptake rate.
- To treat with MicroC:
- For spikes above 0.5 P mg/L
  - 18000 $/day
  - 1,730,000 $/year



Blue Lake Anaerobic Samples 7/28/25

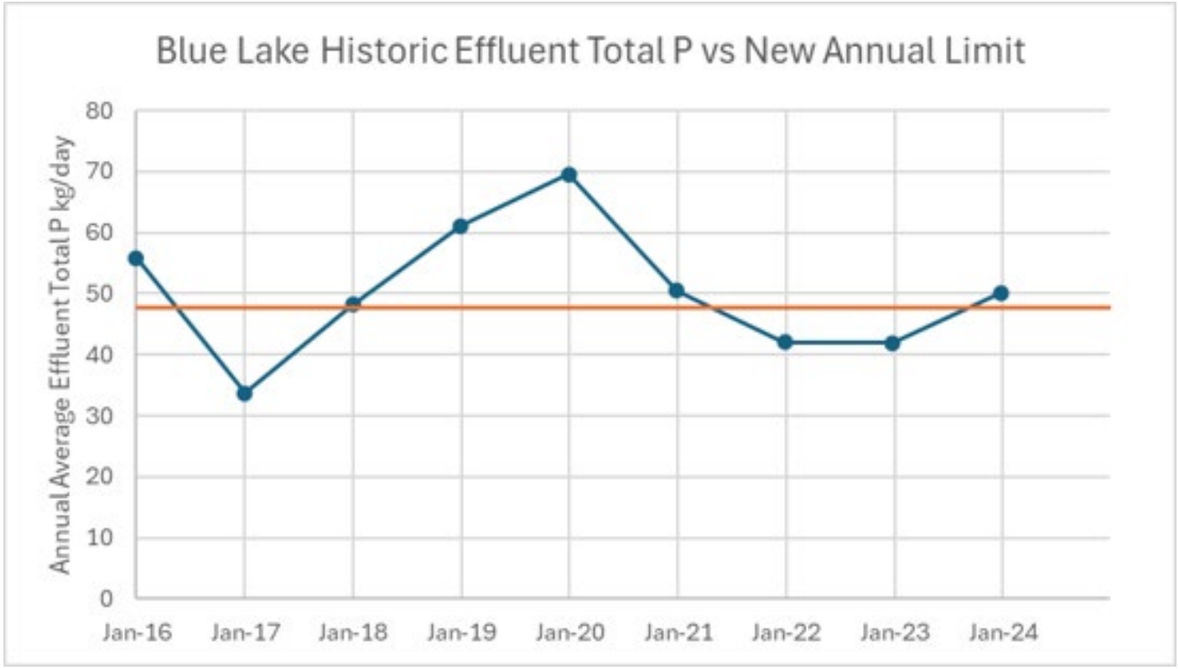
Blue Lake Phosphorus Removal Introduction

The Problem

Current Permit limit: 1 mg/L total P (110 kg/day)

New Permit limit: 47.7 kg/day total P

An industry that contributes a significant amount of carbon to the wastewater has periodic shutdowns that result in phosphorus spikes (upsets).



Phosphorus Removal Project Introduction

Project Focus

Predicting Phosphorus Spikes:

- Aerobic Phosphorus Uptake Test

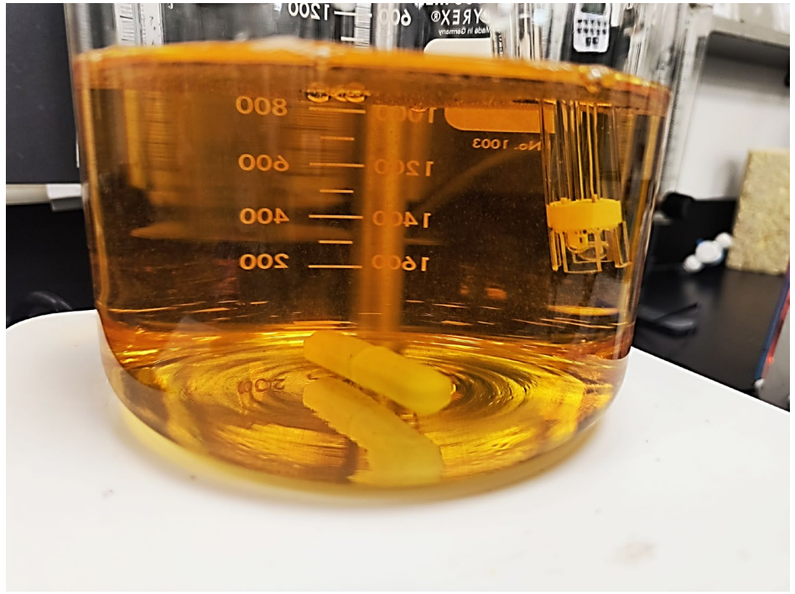
Removing Phosphorus:

- Ferric chemical treatment: adding carrier water improves mixing but can precipitate with ferric.

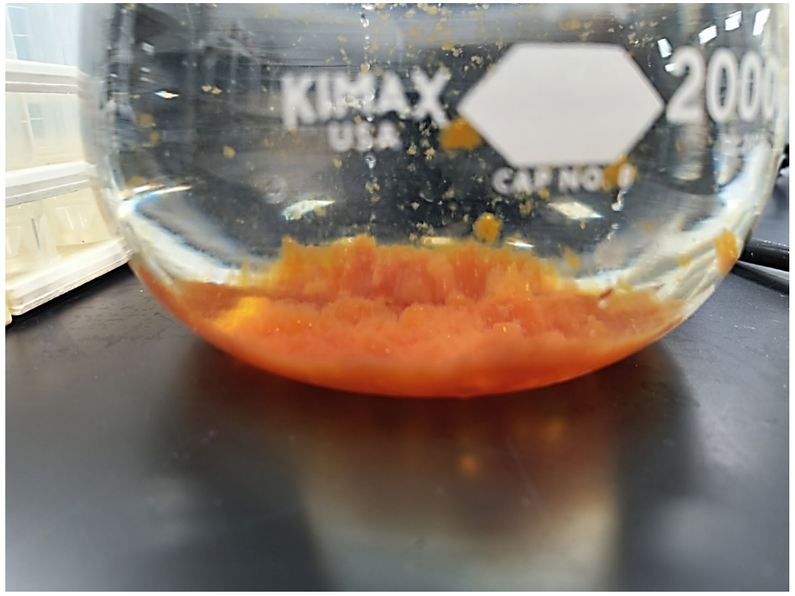
- Carbon supplementation to improve biological treatment

Dilution of Ferric with Carrier water

- Precipitation occurs at a ratio of >1250 ml of carrier water per 1 ml of ferric

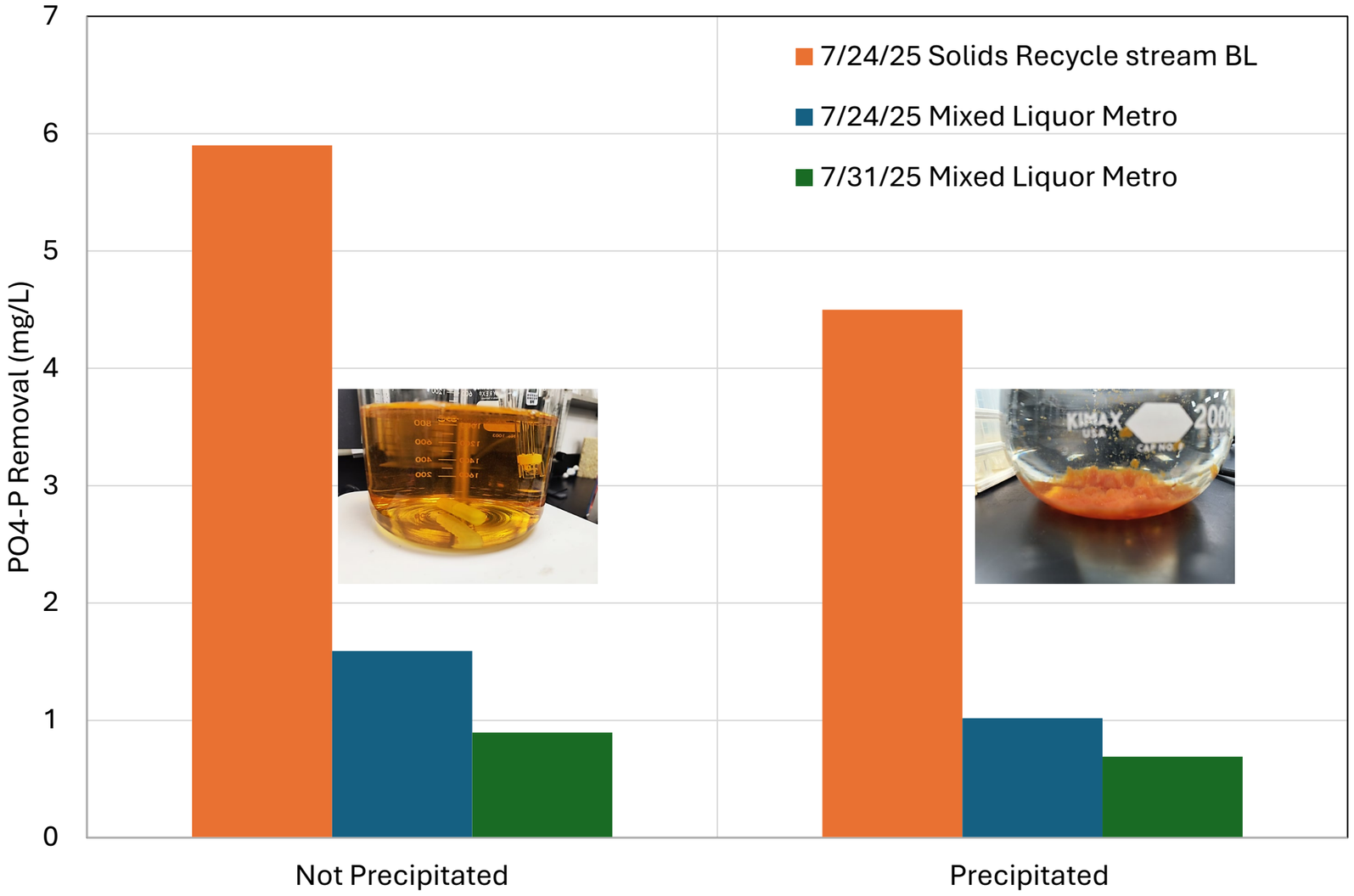


Dilution ratio of 200 ml of carrier water to 1 ml of ferric
Not precipitated



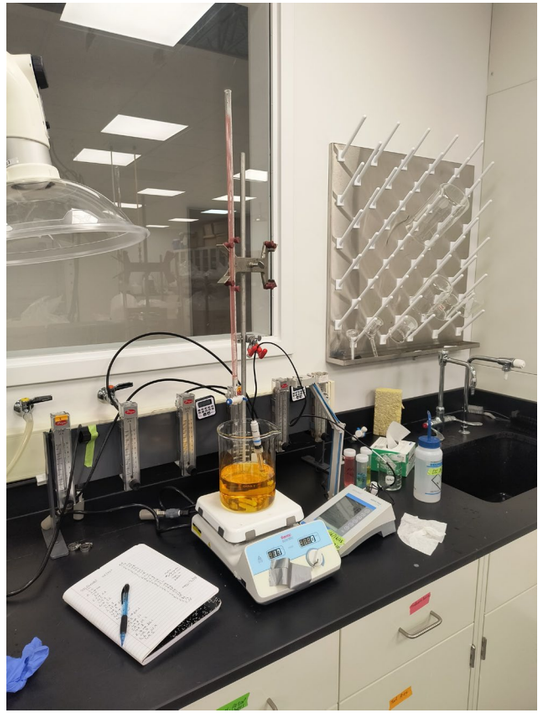
Dilution ratio of 2000 ml of carrier water to 1 ml of ferric
Precipitated

Phosphate Removal using Ferric



Career impact

- Gained experience planning, preparing, and conducting experiments
- Obtained in-depth information on a variety of wastewater topics.
- Explored future career opportunities
- Practiced relationship building and communication.



Questions

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