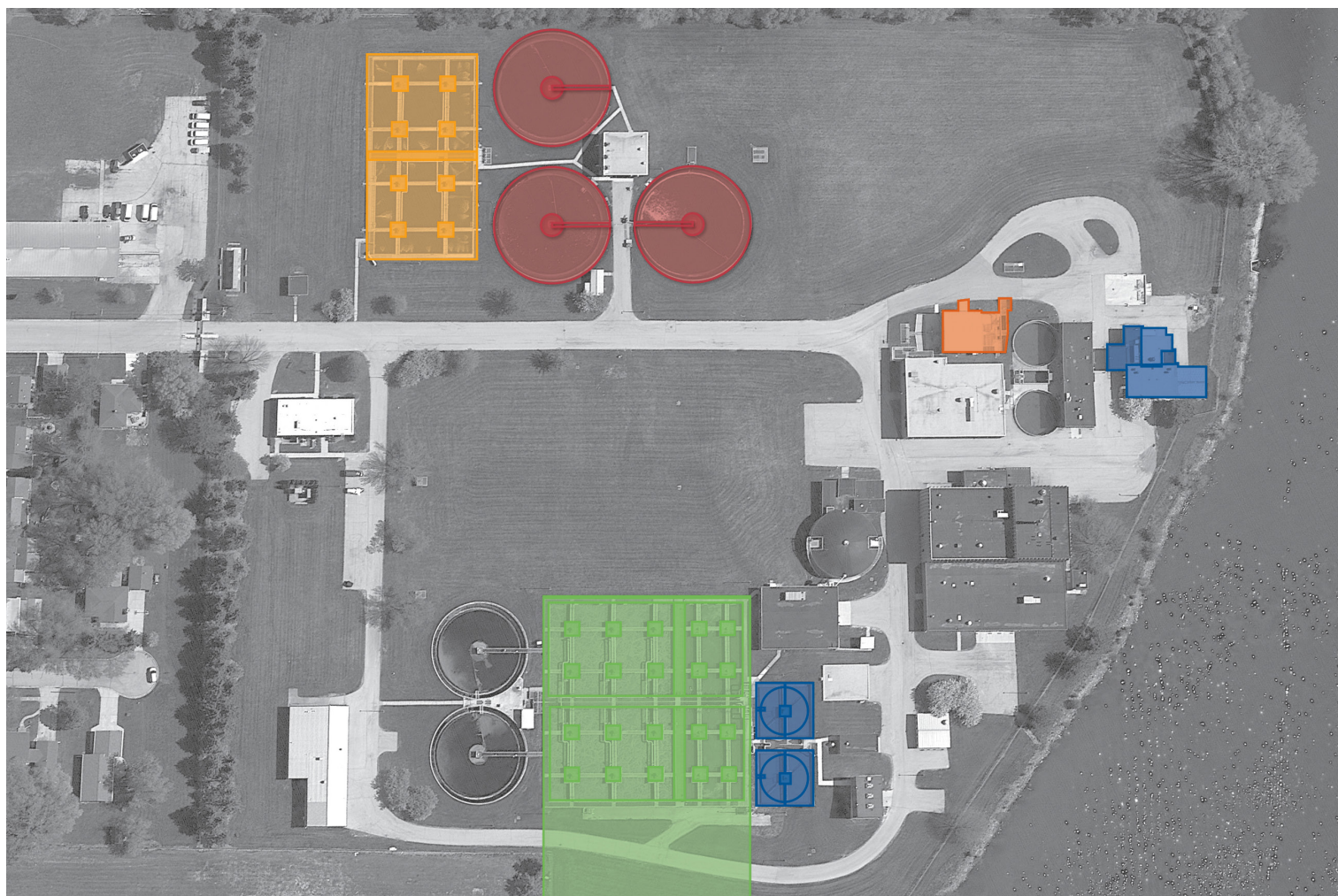


# FACILITY PLAN NEAR-TERM IMPROVEMENTS SUMMARY

AT THE DE PERE FACILITY

**NEW Water**  
The brand of the Green Bay  
Metropolitan Sewerage District



PROJECT	DRIVERS	CAPITAL COST RANGE (2021\$)	TARGET COMPLETION YEAR
■ DPF Pumping and Headworks	Capacity, O&M, Asset Renewal	\$21-31M	2024
■ DPF Final Clarifier and RAS	Capacity, Asset Renewal, O&M	\$8-11M	2025
■ DPF Aeration Basin Improvements	Capacity, O&M, Regulatory, Energy	\$24-34M	2026
■ DPF Equalization	Capacity, O&M	\$8-12M	2027
■ DPF UV Disinfection	Capacity, O&M	\$3-4M	2027

# FACILITY PLAN

## DPF Pumping and Headworks

### COMPONENT DESCRIPTION

Pumping, screening, and grit removal at the DPF are undersized and have reached the end of their useful life. The age and capacity of the facilities impacts the reliability and operability of the DPF, and drive investment for improved facilities. The poor performance of the DPF facilities also impacts ragging at the GBF in the solids thickening and R2E2 facilities. To address these facilities, replacement pumps and screens are recommended. In addition, conversion of the existing Preliminary Treatment Units (PTUs) with vortex grit systems for grit management is recommended.

### PHASED IMPLEMENTATION CONSIDERATIONS

Improvements to the DPF headworks should precede improvements to the GBF headworks and sludge screening improvements.



Potential Cost Range	\$21-32M
Target Year of Completion	2024
Operating Cost Impact	Decreased maintenance costs



### PROJECT DRIVERS

#### CAPACITY

- Peak flow capacity limitation for pumping and screening

#### ASSET RENEWAL

- Equipment has reached the end of its useful life

#### O&M

- Maintenance impacts of limited screening capacity throughout GBF



### PROJECT TRIGGER

- Prior to GBF headworks investment



### PROJECT BENEFITS

- Improved performance of thickening unit processes
- Decreased ragging issues in GBF
- Achieve full pumping and screening of future peak hour flow



### IMPROVEMENTS SUMMARY

- New, expanded capacity influent screens
- New, expanded capacity influent pumps
- New vortex grit system in existing PTU tanks
- Miscellaneous renewal improvements





# FACILITY PLAN

## DPF Final Clarifier and RAS

### COMPONENT DESCRIPTION

Final clarifiers are critical for permit compliance. The solids generated in the activated sludge process, where the majority of treatment occurs, are settled in the final clarifiers. Reliable, high functioning final clarifiers are a necessary part of wastewater treatment. A previous project identified final clarifier rehabilitation as a need for the DPF, and these projects need to be incorporated into the overall CIP. The Final Clarifier project will replace aging infrastructure and improve facilities for increased capacity and permit compliance.

### PHASED IMPLEMENTATION CONSIDERATIONS

Improvements should be completed prior to the aeration basin improvements, and include RAS piping and pumping modifications.



Potential Cost Range	\$8-11M
Target Year of Completion	2025
Operating Cost Impact	Increased reliability



### PROJECT DRIVERS

#### CAPACITY

- Peak flow capacity limitation

#### ASSET RENEWAL

- The mechanical equipment of mechanisms and pumps have reached the end of their useful life



### PROJECT TRIGGERS

- Required for current peak flow capacity
- Critical process bottleneck



### PROJECT BENEFITS

- Increased peak flow capacity
- Enables modifications to the aeration basins to eliminate intermediate clarifiers



### IMPROVEMENTS SUMMARY

- Final clarifier improvements
- RAS modifications to enable elimination of the intermediate clarifiers

# FACILITY PLAN

## DPF Aeration Basin Improvements

### COMPONENT DESCRIPTION

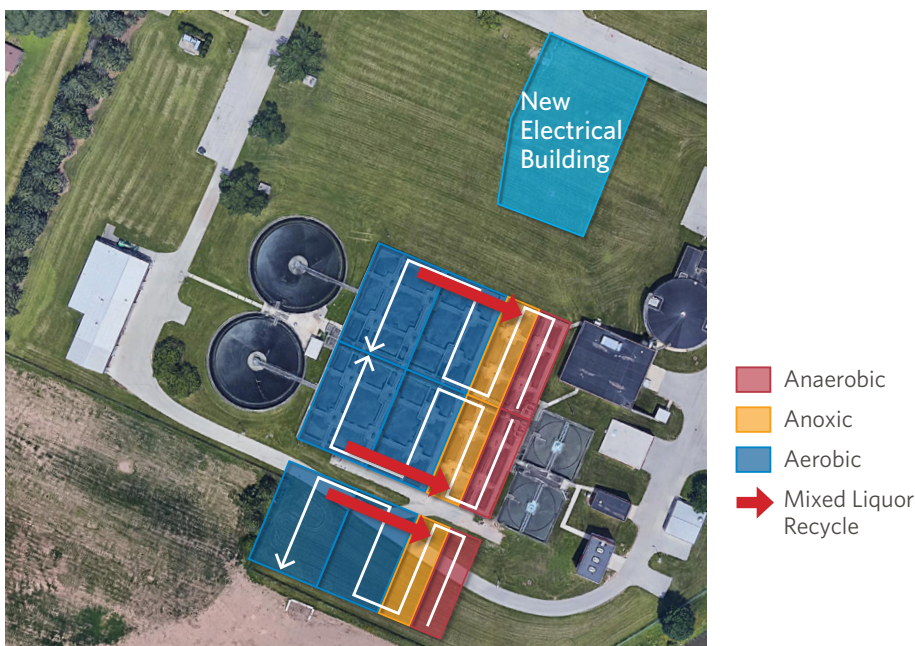
The DPF has several major needs in the aeration basins: increased volume for capacity, elimination of the intermediate clarifiers, improved settling for capacity improvements, and configuration modifications for total nitrogen removal. To address these needs, a third aeration basin will be constructed and the intermediate clarifiers will be decommissioned. The new aeration basin, along with the two existing basins, will be converted to the A2O process.

### PHASED IMPLEMENTATION CONSIDERATIONS

**Phase I:** Applied research at the GBF can inform final design of the A2O configuration and aeration system

**Phase II:** Construction the new aeration basin

**Phase III:** Modify existing aeration basins



Potential Cost Range	\$24-34M
Target Year of Completion	2026
Operating Cost Impact	Decreased energy use



### PROJECT DRIVERS

#### CAPACITY

- Organic loading limitation in 2030

#### REGULATORY

- Future nitrogen limits

#### O&M

- Eliminates intermediate clarifiers



### PROJECT TRIGGERS

- Inefficient aeration energy
- Total nitrogen removal
- Total suspended solids removal improvements



### PROJECT BENEFITS

- Positive energy balance impacts
  - Decreased energy consumption in activated sludge
- Improved nitrogen and phosphorus removal
- Increased total suspended solids removal stability



### IMPROVEMENTS SUMMARY

- Addition of one aeration basin
- Conversion of the existing aeration basins to A2O
- Aeration basin influent splitter modifications
- Decommission intermediate clarifiers





# FACILITY PLAN

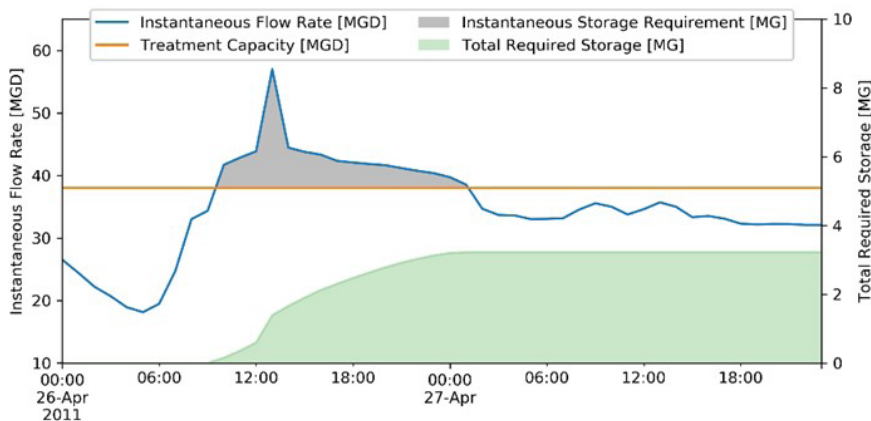
## DPF Equalization

### COMPONENT DESCRIPTION

Peak flows are a major contributor to process capacity limitations at the DPF. Given the peaking factor of the facility, and the need for additional final clarifier capacity, it was proposed the peak flow equalization be included for the DPF. This equalization would provide peak flow storage from screened, degrittied wastewater at flows greater than 38 mgd. This represents a peak day condition. After the high flow event occurs, the flow would be returned to the headworks for treatment. The preliminary sizing of the equalization basin is a 3 million gallon basin.

### PHASED IMPLEMENTATION CONSIDERATIONS

Construction of the peak flow basin should be considered before the final clarifier rehabilitation project to provide redundancy and operational flexibility.



### PROJECT DRIVERS

#### CAPACITY

- Cost-effectively addresses peak flows more than 38 mgd

#### O&M

- Reduces difficult operations during times of very high flows



### PROJECT TRIGGERS

- Complete prior to the DPF clarifier rehabilitation project



### PROJECT BENEFITS

- Peak flow treatment stability
- Simplified peak flow operation
- Additional asset that provides construction phasing flexibility



### IMPROVEMENTS SUMMARY

- New equalization volume
- Assumed new tanks, but could be a re-purposing of the existing secondary aeration basins

Potential Cost Range	\$8-\$12M
Target Year of Completion	2027
Operating Cost Impact	Peak flow operational stability

# FACILITY PLAN

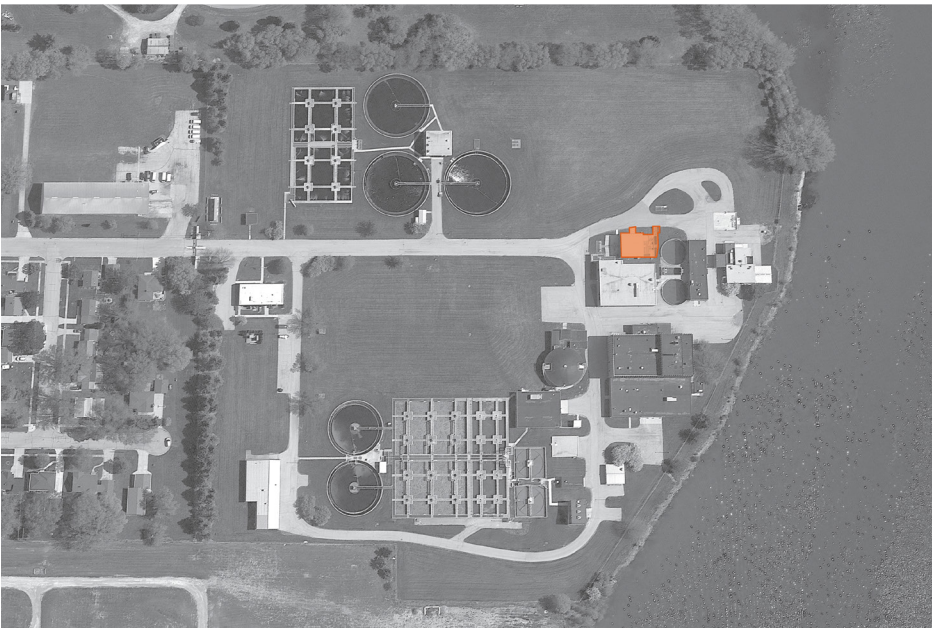
## DPF UV Disinfection

### COMPONENT DESCRIPTION

Disinfection is the final treatment step before discharge to the Fox River. The existing UV disinfection facilities have been identified as having capacity limitations as well as aging infrastructure concerns. Recent wet-weather events have resulted in diverting some flow around disinfection to protect critical equipment. These improvements will be incorporated into the Facility Plan CIP.

### PHASED IMPLEMENTATION CONSIDERATIONS

UV disinfection improvements should be completed after tertiary filtration improvements.



### PROJECT DRIVERS

#### CAPACITY

- Required to address peak flows

#### REGULATORY

- Required to maintain permit compliance

#### O&M

- Will result in easier O&M especially during peak flows



### PROJECT TRIGGER

- After tertiary filtration improvements are completed



### PROJECT BENEFITS

- More reliable operations
- Increased treatment capacity



### IMPROVEMENTS SUMMARY

- Expand existing UV facilities

Potential Cost Range	\$3-4M
Target Year of Completion	2027