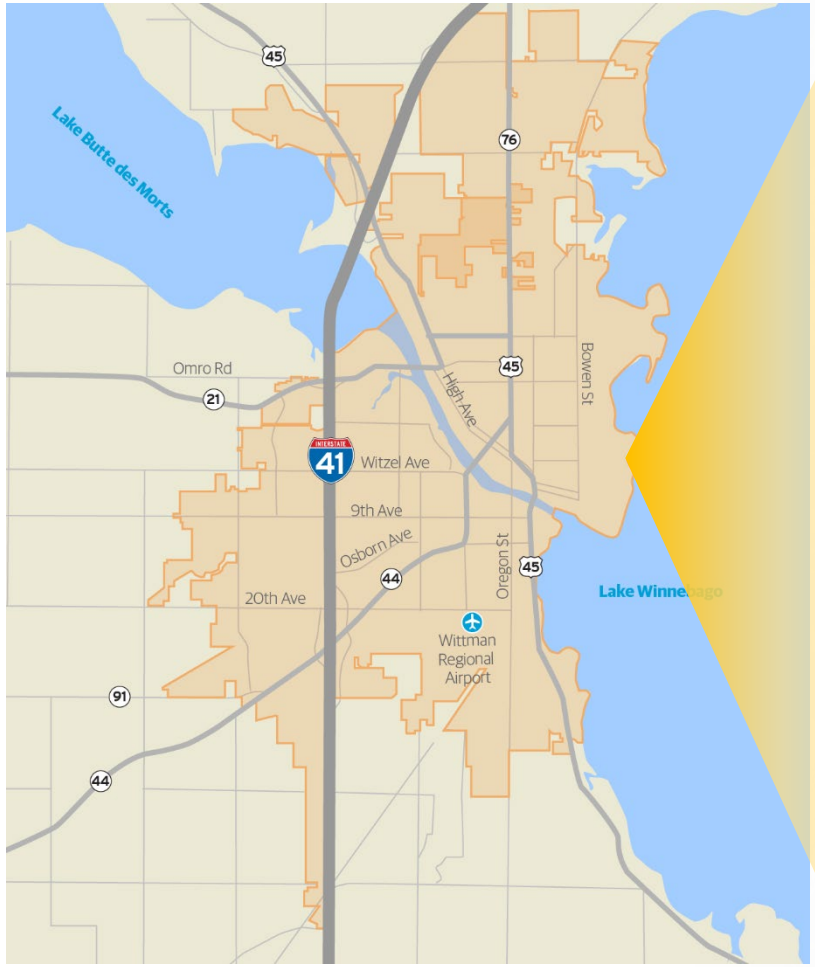
Water Filtration Plant Clearwells Replacement Project

October 13, 2021

Agenda

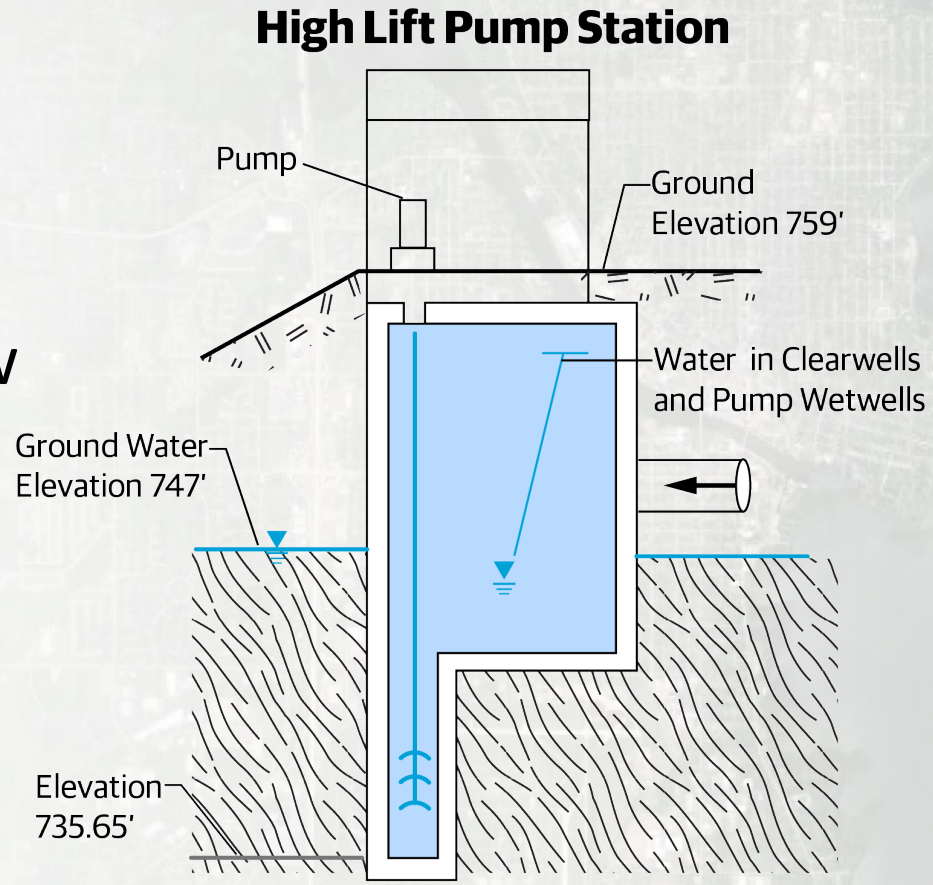
- Project Overview
- Estimated Project Cost
- Schedule
- Questions and Comments

Project Overview – Water Filtration Plant Site



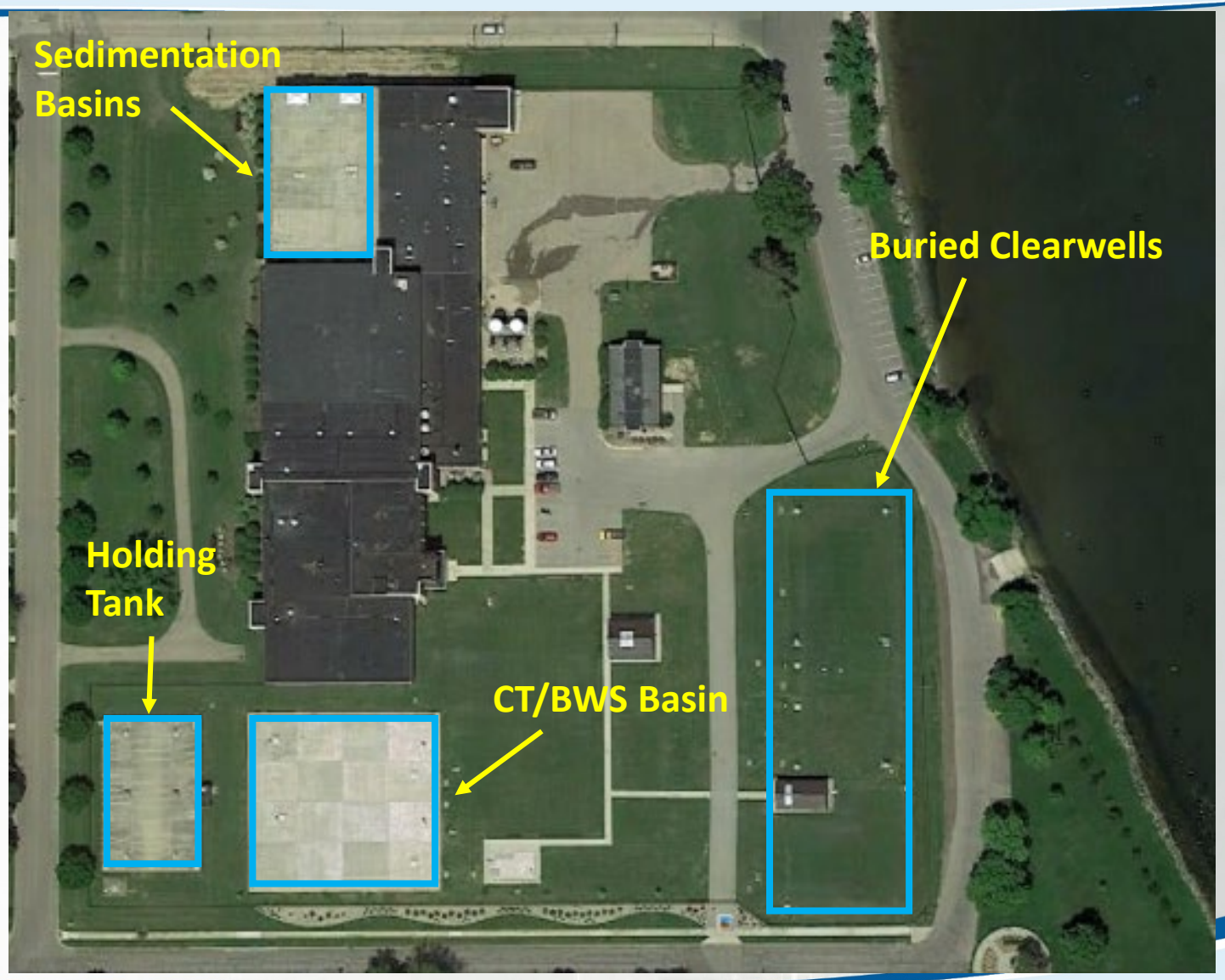
Need for Clearwells Replacement

- Wisconsin Department of Natural Resources (WDNR) notified the City the Clearwells do not comply with current state administrative code
  - Drinking water storage is located below groundwater & below the 100-year flood plain
  - High Lift Pump Stations' wetwells are similarly deficient



Need for Clearwells Replacement

- Two Clearwells are over 100 years old; one is over 60 years old



CT/BWS = Chlorine Contact Time/Backwash Supply

Why Store Water at Water Filtration Plant?

- Total system storage = 6.25 million gallons ≈ average day demand
- Water Filtration Plant (WFP) storage is used for backwashing (cleaning) 4 filters and 4 granular activated carbon contactors
  - Typical backwash volume = 300,000 gallons
  - As many as 4 backwashes/day needed during summer
- WFP storage allows City to fill water towers at night when energy costs are lower
- WFP storage supports rapids response for fire protection and maintaining system pressures in event of large water main breaks
- Redundancy needed to accommodate inspections and repairs

Clearwells Replacement Project Development

- 2007 Clearwells deficiency notice from WDNR
- 2008-2010 Major WFP Project (construct CT/BWS Basin, demolish old plant)
- 2012-2016 Water Distribution System Studies, Clearwells Replacement Preliminary Design (alternatives evaluation), WFP Electrical System Study
- 2017 Clearwells Replacement Design & Permitting *<Public Service Commission requires justification for pump station capacity, given historic water use>*
- 2018-2019 Water System Capacity Planning Study (new demand forecasts)
- 2020 Revise Project Scope
- 2021-2022 Project Redesign and Permitting

Alternatives Considered to Meet Project Requirements

Requirements

- Replace Clearwells
- Replace High Lift Pumping System

Alternatives Evaluated

1. Construct new double-walled, buried storage tanks and new High Lift Pump Station with double-walled wetwell
2. Construct at-grade Reservoirs, new Intermediate and High Lift Pump Station

Alternative 1 Advantages and Disadvantages

Advantages

- Maintains similar visual impacts
- Does not require an additional new Intermediate Pump Station

Disadvantages

- Buried tanks require a variance from state administrative code – this type of variance has not been granted before by WDNR
- Construction involves extensive, costly excavation support and dewatering
- Double-wall concrete tanks with leak monitoring systems require unique construction methods
- Containment systems need to be monitored and repaired, when needed, during service life which pose challenges with buried structures

Alternative 2 Advantages and Disadvantages

Advantages

- Drinking water protected from potential groundwater and flood water contamination
- Complies with regulations and aligns with drinking water industry best practices
- Involves conventional construction methods
- Results in accessible facilities that are easier to maintain and repair when needed

Disadvantages

- Requires construction, operation, and maintenance of new Intermediate Pump Station
- Highly visible structures block Lake views

Alternative Selected

- Alternative 1 – estimated construction cost $24,000,000 (2017 dollars)
- Alternative 2 – estimated construction cost $12,200,000 (2017 dollars)

Alternative 2 was selected because it is more protective of public health, involves less risk during construction and over the service life of the new assets, and has lower estimated cost.

Clearwells Replacement Project Scope

2017

- Replace 2.4 million gallons (MG) water storage with 2.0 MG
- Add 16 million gallons per day (mgd) Intermediate Pump Station
- Replace 17.3 mgd high lift pumping capacity with 16 mgd
- Replace two 750 kilowatt (kW) generators with two 1,000 kW generators

2021

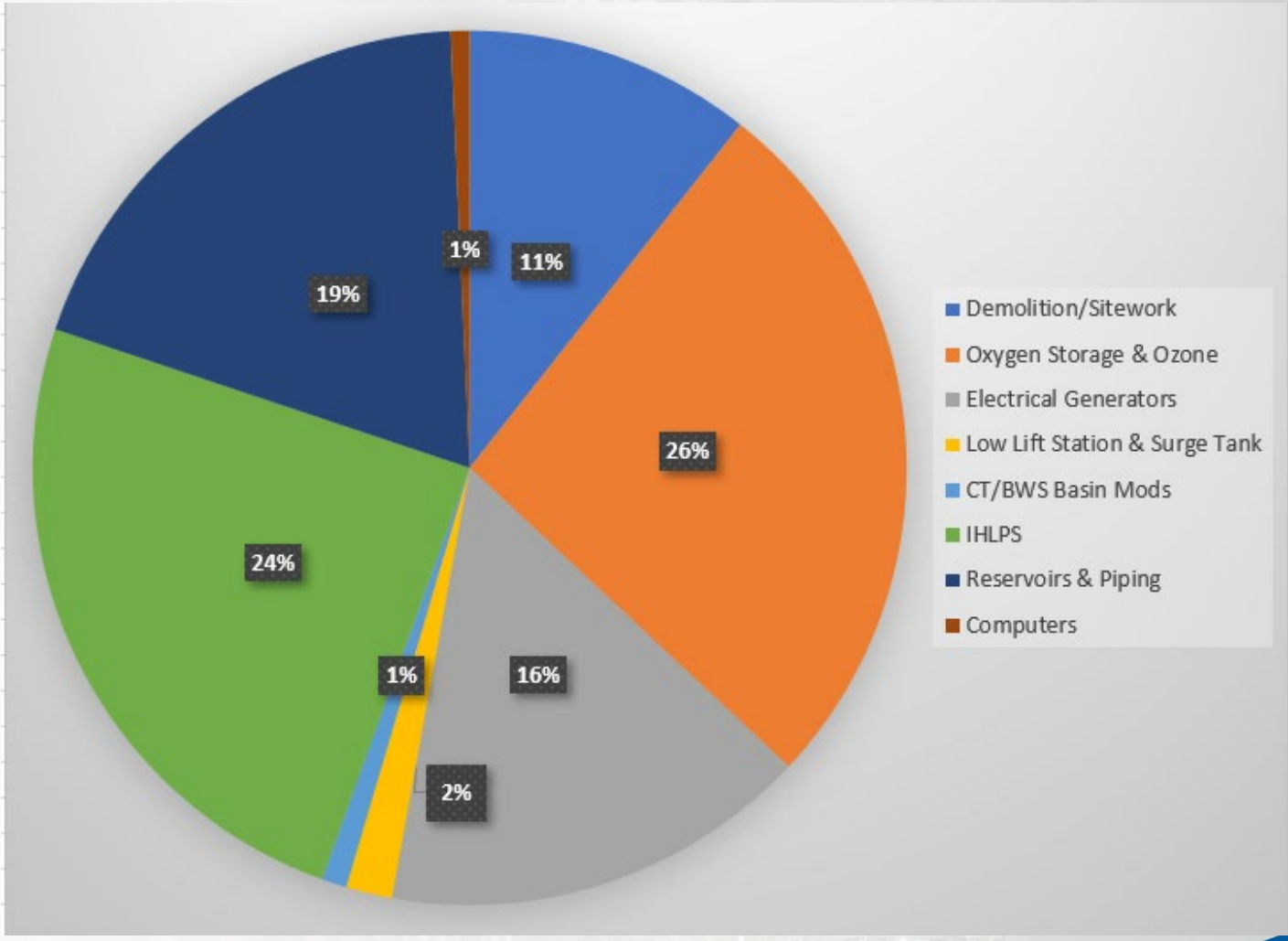
- Replace 2.4 MG water storage with 2.0 MG
- Replace 17.3 mgd High Lift Pumping capacity with 13.7 mgd
- Add 13.7 mgd Intermediate Pump Station
- Replace two 750 kW generators with two 1,000 kW generators
- Update 1998 WFP control system computers, servers, and operator interfaces
- Replace liquid oxygen storage and ozone generation systems

Why Replace Oxygen Storage and Ozone System?

1. Rebuilt equipment has diminished performance
2. Aspects of system are unreliable; component obsolescence issues due to changes in technology
3. Scheduled replacement in City Capital Improvement Program coincides with Clearwells Replacement Project construction

2021 Estimated Project Cost

- Total Project Cost: $34,384,000
- Construction Cost: $29,780,000
  - Fall 2021 equipment, materials, labor costs
  - Contractor's markups, 22%
  - Contingency, 10 – 15%
- Non-Construction Cost: $4,604,000
  - Design and permitting
  - Construction management, inspection, loan administration, engineering, software development



Cost Comparison, Example Project Components

- **High Lift Pumping Equipment 2017**
  - Pumps, valves, electrical, $571,300
- **Emergency Generators 2017**
  - Generators & switchgear $1,676,400
- **Concrete Reservoirs 2017**
  - Tank and associated piping $1,067,700
  - Exterior architectural finish $160,000
  - Each Tank = $1,237,700

- **High Lift Pumping Equipment 2021**
  - Pumps, valves, electrical, $729,300
  - 28% increase
- **Emergency Generators 2021**
  - Generators & switchgear $2,226,800
  - 33% increase
- **Concrete Reservoirs 2021**
  - Tank and associated piping $1,199,200
  - Exterior architectural finish $326,000
  - Each Tank = $1,525,200
  - 23% increase

Anticipated Project Funding and Schedule

- Project funding source: Wisconsin Safe Drinking Water Loan
- Loan repayment source: Water user rates
- Complete design and permitting (2021 thru mid 2022)
- Construction (mid 2022 thru mid 2025)

New Facilities Concept (also see handout and displays)

LEGEND

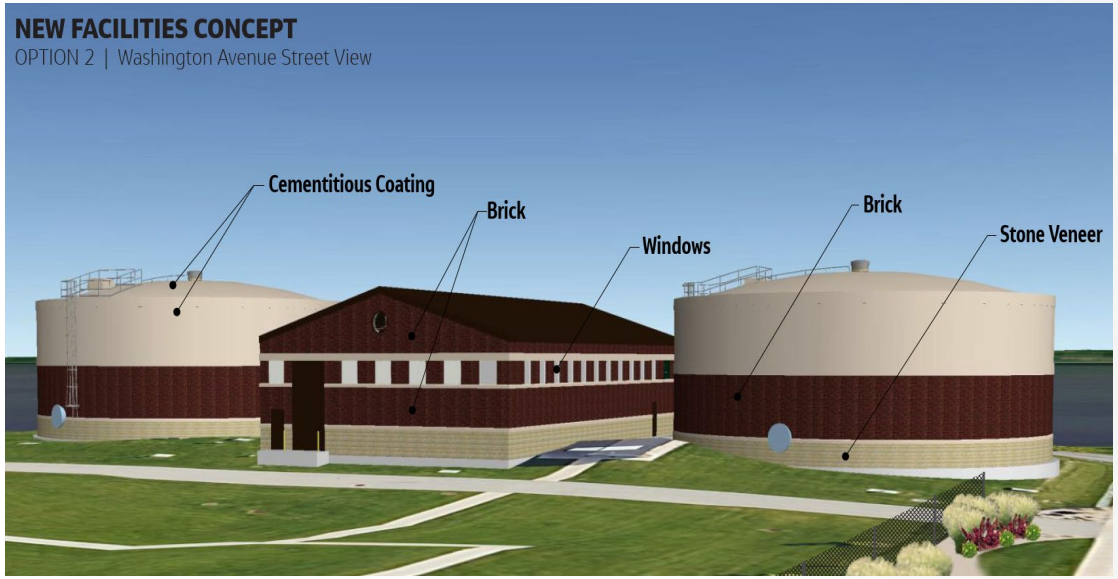
Cementitious Coating

Brick

Windows

Stone Veneer

New Facilities Concept (also see handout and displays)



2017 New Facilities Concept (see handout)

Questions and Comments