



King County

Asset Management South Treatment Plant

Presented to the Metropolitan Water
Pollution Abatement Advisory Committee

October 1, 2020

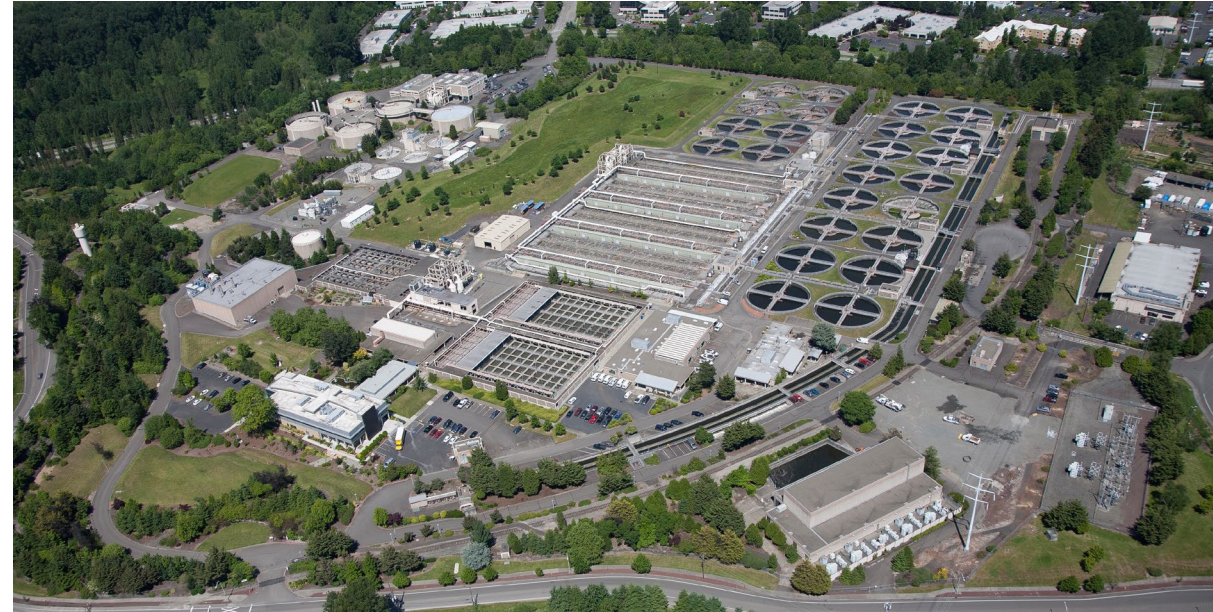


King County

Department of Natural Resources and Parks
Wastewater Treatment Division

Today's Presentation

- South Plant's history
- Operational Issues
- Recent major asset replacements
- Upcoming asset replacements
- Recent capacity analysis



South Plant History – Major Expansions

1965

- Original Construction
- Capacity: 125MGD Primary Treatment, 44 MGD Secondary Treatment

1971

- Added Additional Raw Sewage Pump (RSP) and Increased Primary and Secondary Treatment Capacity

1985

- Added Solids Treatment and increased Secondary Treatment Capacity
- Built new effluent discharge pipeline and outfall to Puget Sound

1995

- Added RSP, Upgraded Preliminary and Primary Treatment, Increased Primary and Secondary Treatment Capacity, Added Odor Control, Upgraded Solids Handling and Expanded Gas Scrubbing Capacity

1997

- North Primary Tanks 1-4 go on-line, increasing Primary Treatment Capacity

2001

- Increased Secondary Treatment Capacity to 144 MGD

2006

- Co-Generation Facility
- 7.5 MW Energy Generated per year



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South Plant History – Recent Major Asset Replacements

2005	• Solids Dewatering – Replaced Belt Filter Presses with Centrifuges
2009	• Administration Building
2010	• Permanent Disinfection System (Conversion from Chlorine Gas to Sodium Hypochlorite)
2013	• Controls System
2017	• Raw Sewage Pumps 1, 4, and 6 and 4160 V Switchgear
2018	• Effluent Transfer System Pump Variable Frequency Drives
2019	• 13kV Switchgear and Transformers in Pump Building



Equipment Service Life

Over 10,000 current assets

Some conditions that reduce service life:

- Wear on equipment from rags and grit
- Chemical attack
 - Hydrogen sulfide
 - Process chemicals
- Obsolescence



Operational Issues

- Chemical tank leaks / Chemical distribution piping leaks
 - Implemented localized Sodium Hypochlorite storage to minimize issue
- Odor control equipment
 - Equipment is not optimized and is showing age
- Screenings Equipment
 - Plant receives a tremendous amount of grit and rags
- Piping Age
 - Starting to see corrosion in process piping



Upcoming Major Asset Replacements

- Heat System Improvements
 - Boiler provides heat for process using sludge gas recovered from digestion process
 - Project will replace existing boiler with new equipment and add redundancy
 - Construction anticipated to begin in 2021
 - Designed to meet future digester heating needs



Future Major Asset Replacements



Barscreens

- Used in preliminary treatment to remove debris, installed in 1990's
- Parts are not available, requires custom fabrication to make repairs



Screening Dewatering Equipment

- Used to dewater debris prior to disposal, installed between 1987-1997
- WTD annually expends up to half the cost of a new machine to maintain the existing units.



Electrical Equipment

- Transformers, switchgear, and motor control centers that provide power to plant equipment
- Past expected life, replacement units have long lead times



Sludge Gas Scrubbing Improvements

- Conditions methane gas created by the digestion process so that it can be sold
- Some system components and control software have no vendor or spare part support



Future Major Asset Replacements



Odor Control Equipment

- Current equipment has deficiencies that cause downstream corrosion
- Projects will correct deficiencies and replace corroded odor control equipment



Raw Sewage Pump #3

- Installed in 1971, replacement will include motor and drive
- Added benefit of increased efficiency

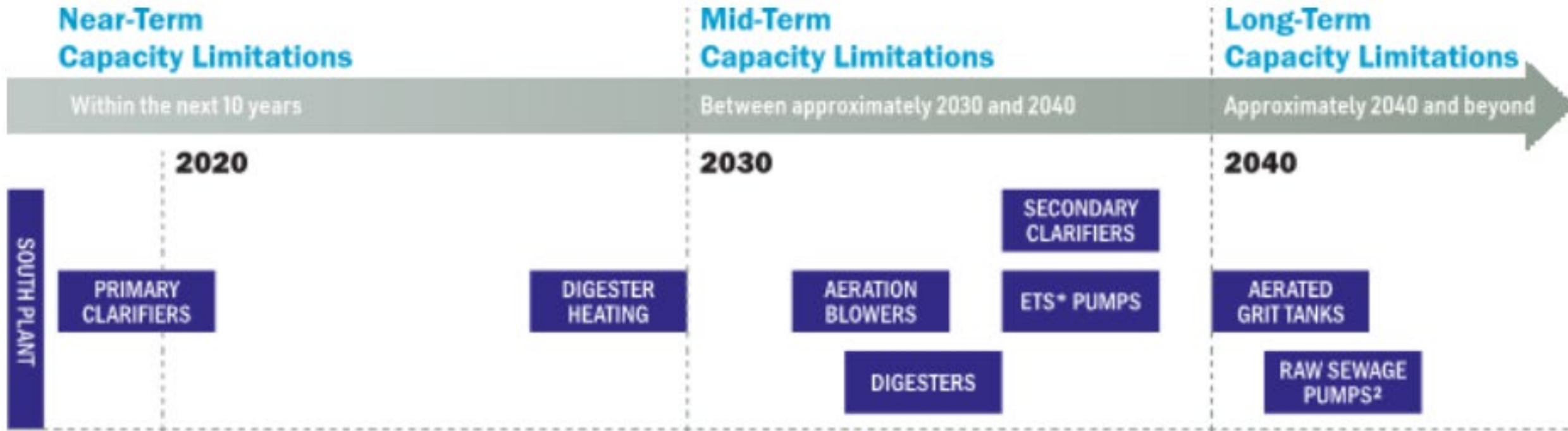


Secondary Effluent Flow Control Equipment

- Provides level control for secondary aeration process, installed prior to 1985
- Increased equipment failure rate, piping has had leaks due to corrosion



Flows and Loadings Study - South Plant Process Capacity Limitations



Next Steps

- Upcoming presentations on:
 - West Point
 - Conveyance System
 - Further information for all plants on condition assessment, analysis, and approach



Questions?

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