

CITY COUNCIL MEETING

STAFF REPORT

Meeting Date: August 1, 2022		Subject: Wastewater Treatment Plant Master Plan			
		Staff Member: Mike Nacrelli, Senior Civil Engineer			
		Department: Community Development			
Action Required		Advisory Board/Commission Recommendation			
□ Motion		Approval			
	Public Hearing Date:			Denial	
	Ordinance 1 st Reading Date:		□ None Forwarded		
] Ordinance 2 nd Reading Date:		☑ Not Applicable		
	□ Resolution		Comments: N/A		
\boxtimes	Information or Direction				
	Information Only				
	Council Direction				
	Consent Agenda				
Staff Recommendation: Provide input on components of the Wastewater Treatment Plant					
(WWTP) Master Plan.					
Recommended Language for Motion: N/A					
Project / Issue Relates To:					
$\boxtimes C$	⊠Council Goals/Priorities: □Ado		pted	Master Plan(s):	□Not Applicable
Align infrastructure plans					
with sustainable financing					
resources.					

ISSUE BEFORE COUNCIL:

Provide feedback and input on components of the Wastewater Treatment Plant (WWTP) Master Plan.

EXECUTIVE SUMMARY:

This new City of Wilsonville (City) Wastewater Treatment Plant (WWTP) Master Plan (the Plan) has been developed to satisfy requirements associated with the State of Oregon Department of Environmental Quality (DEQ) guidance document entitled "Preparing Wastewater Planning Documents and Environmental Reports for Public Utilities." To accommodate future flows and loads, projections were developed based on population projections and referencing WWTP historical data and DEQ wet weather project methodologies. Similarly, to accommodate future water quality regulations, the Plan is adaptive and considers potential future regulatory changes.

The City prepared the Plan with the goal of developing a capital plan that identifies improvements required through the planning period (today through 2045) to comply with requirements of the WWTP National Pollutant Discharge Elimination System (NPDES) permit and potential future regulatory requirements, while accommodating growth identified in the City of Wilsonville Comprehensive Plan (October 2018, updated June 2020). These improvements are designed to provide the best value to the City's ratepayers by maximizing the use of existing infrastructure and improving system operation while continuing to protect water quality and human health and supporting economic development, consistent with goals and policies contained in the Comprehensive Plan and 2021-2023 City Council Goals.

The City's WWTP was originally built in 1971 and discharges treated effluent to the Willamette River. The WWTP underwent major upgrades in 2014 to expand the average dry weather capacity to four million gallons per day (mgd) to accommodate the City's continued growth. The WWTP processes include headworks screening and grit removal facilities, aeration basins, stabilization basins, secondary clarifiers, biosolids processing, cloth filtration, and disinfection processes. Additionally, the City contracts with Jacobs for operation of the wastewater treatment plant, located at 9275 Southwest Tauchman Road.

This Plan identifies improvements taking into consideration:

- The age and condition of existing process equipment and structures,
- Growth in demand for sewer service due to increased population and economic development over the planning period,
- Potential changes to water quality regulations impacting process needs in order to meet effluent limitations and discharge prohibitions imposed by the Oregon Department of Environmental Quality (DEQ), and
- Consistency with the 2018 Comprehensive Plan and City Council 2021-2023 Goals 5, 6 and 7.

WWTP Condition Assessment

Carollo reviewed prior condition assessments performed by others, conducted geotechnical investigations and performed seismic assessments at the WWTP in the course of Plan development.

In 2019, Jacobs Engineering Group Inc. (Jacobs) and Brown and Caldwell both completed condition assessments at the City's WWTP. A total of 322 major assets (per Jacobs' report), including process and mechanical equipment, motors and drives, control panels, generators, instrumentation, and structures, were examined for a variety of conditions that may signify their need for maintenance or replacement.

Seismic Analysis

In 2021, Carollo performed a seismic evaluation and analysis of the City's WWTP as part of the overall plant condition assessment. Because the WWTP was substantially upgraded and expanded in 2014, most of its infrastructure is designed in accordance with the 2010 Oregon Structural Specialty Code (OSSC) and follows modern seismic design and detailing. During Tier 1 evaluations, Carollo identified potential deficiencies and areas for additional investigation. A Tier 1 seismic analysis is an initial evaluation performed to identify any potential deficiencies, whether structural or non-structural, in a building based on the performance of other similar buildings in past earthquakes. Subsequent to the Tier 1 analysis, a more detailed seismic evaluation of five older and potentially seismically vulnerable structures on the WWTP site was conducted. Those structures receiving a more detailed evaluation included the following:

- Operations Building
- Process Gallery
- Workshop
- Aeration Basins and Stabilization Basins
- Sludge Storage Basins and Biofilter

The five potentially vulnerable structures were for an M9.0 Cascadia Seismic Zone (CSZ) earthquake. The M9.0 CSZ is reflective of a catastrophic natural disaster event that has an estimated 35 percent likelihood of occurring within the next 50 years. Following the Tier 1 evaluation, Carollo began Tier 2 evaluations for a select number of identified deficiencies. Although none of the structures showed significant irregularities, the team did identify seismic deficiencies. The recommended seismic retrofits are included in the CIP for the Plan.

Prior to the 2021 seismic evaluation, Carollo's subconsultant, Northwest Geotech, Inc. (NGI), completed a seismic response and geologic hazards assessment of the City's WWTP. Through past and present site investigations and engineering analyses, NGI determined that the native soils beneath the site's granular pit backfill have low risk of liquefaction and its slopes do not pose undue risk. NGI concluded that the WWTP's primary site hazard is the differential settlement that may be caused by soil piping (development of subsurface air-filled voids), which raises the risk of sinkholes forming beneath structures and pipelines. Soil piping usually develops in unsaturated soils when a water source percolates into the ground. While the site is mostly paved and stormwater is being collected, there may be areas where infiltration is occurring next to structures or below pipelines. Recommended actions from NGI to mitigate the risk of soil piping are presented in the Plan.

Wastewater Flow and Load Projections

The Plan evaluates the historical and projected wastewater flows and loads generated in the City of Wilsonville's service area. The load projections include total suspended solids (TSS), biochemical oxygen demand (BOD5), ammonia (NH3), and total phosphorous (TP) loads.

Service area, residential population, industrial contribution, and rainfall records were all considered in the flow and load projection analyses.

Capacity Analysis

Summaries of plant process area capacity assessments and conclusions are presented in the Plan. These assessments focus on the need for improvements or upgrades to existing facilities to address capacity deficiencies identified in the course of Master Plan evaluations.

Regulatory Considerations and Strategy

Several possible regulatory actions by the Oregon DEQ could drive investments in future improvements at the City's WWTP. The plant discharges to the Willamette River and existing and future effluent limitations contained in the NPDES permit dictate, in large part, the necessary treatment processes and configuration at the WWTP necessary to maintain compliance. The existing permit limits for the Wilsonville WWTP are effective September 1, 2020 through July 30, 2025.

Alternative Development and Evaluation

The Plan presents the methodology and findings of a process improvements alternatives evaluation. The plant's treatment process needs were defined by comparing the plant's existing condition, capacity and reliability, with the projected flows, loads, and regulatory constraints for the recommended alternatives. Where capacity deficiencies were predicted, at least two alternatives were analyzed for each corresponding unit process.

EXPECTED RESULTS:

The Plan includes a list of recommended capital improvements, along with an anticipated schedule for completion and preliminary cost estimates. The total estimated amount of capital investment over the planning period is approximately \$31 million, of which \$4.5 million is anticipated in the next 5 years. The recommended capital improvements will provide the basis for an analysis of sewer rates and system development charges (SDCs) that will be necessary to ensure adequate funding to implement to required upgrades.

TIMELINE:

This is the second in a series of presentations to the Planning Commission and City Council. Completed and subsequent planned meetings are as follows:

- Planning Commission Work Session July 13 (completed)
- City Council Work Session August 1 (current)
- Planning Commission Public Hearing September 14
- City Council Public Hearing 1st Reading October 3
- City Council 2nd Reading October 17

Wastewater Treatment Plant Master Plan Staff Report

CURRENT YEAR BUDGET IMPACTS:

The remaining contract balance for finalizing the Plan will carry over into FY 22/23. An additional \$92,450 has been budgeted in FY 22/23 for the Sewer System Rate Study and System Development Charge (SDC) Update, using a combination of Sewer Operating funds and SDCs.

COMMUNITY INVOLVEMENT PROCESS:

A virtual town hall meeting to present the findings of the Plan and solicit public input will be scheduled in August and posted on the City's online calendar. The public hearings listed above will provide additional opportunity for public input. The forthcoming Sewer System Rate Study and SDC Update will also include a robust public engagement process.

POTENTIAL IMPACTS OR BENEFIT TO THE COMMUNITY:

A technically and financially sound plan for providing reliable wastewater treatment, capacity to accommodate future development, and compliance with environmental regulations.

ALTERNATIVES:

The Plan includes alternatives for several of the recommended improvements. The selected alternatives were determined to be the most economically viable. Some of the more capital intensive alternatives can be revisited if necessary due to changing regulatory requirements.

CITY MANAGER COMMENT:

N/A

ATTACHMENT:

1. Draft Wastewater Treatment Plant Executive Summary (dated July 2022)