Sammamish Plateau Water and Sewer District

2018 Water Comprehensive Plan

December 2018
Revised October 2019
Final Approval May 2020
SAMMAMISH PLATEAU
WATER AND SEWER DISTRICT

2018 Water Comprehensive Plan

December 2018
Revised October 2019
Final Adoption May 2020

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SAMMAMISH PLATEAU WATER & SEWER DISTRICT
KING COUNTY, WASHINGTON

RESOLUTION NO. 4959

RESOLUTION OF THE BOARD OF COMMISSIONERS OF SAMMAMISH PLATEAU WATER AND SEWER DISTRICT, KING COUNTY, WASHINGTON, ADOPTING THE FINAL 2018 WATER COMPREHENSIVE PLAN WITH FINAL REVISIONS IN ACCORDANCE WITH RCW 57.16.010(7) AND WAC 246-290-100.

WHEREAS, the Sammamish Plateau Water and Sewer District ("District") is a municipal corporation providing water and sewer utility services pursuant to Title 57 of the Revised Code of Washington ("RCW"); and

WHEREAS, RCW 57.16.010(1) authorizes the District to adopt a general comprehensive water system plan, and the District has previously done so by the adoption of the 2018 Comprehensive Water System Plan on October 7, 2019 by Resolution No. 4901, (referred to as "the Final 2018 Plan"); and

WHEREAS, state law and administrative regulation, including WAC 246-290-100, require that the District's comprehensive water system plan be updated periodically; and

WHEREAS, the Water Comprehensive Plan has been amended at various times, and the District Board of Commissioners ("Board of Commissioners") adopted an updated and revised Draft Water Comprehensive Plan and Appendices dated December 2018 by Resolution No. 4851 for public distribution and comment on February 25, 2019 (the "2018 Plan"); and Board of Commissioners thereafter adopted a proposed Final 2018 Water Comprehensive Plan October 7, 2019 by Resolution No. 4901 ("Final 2018 Plan"); and

WHEREAS, in accordance with Resolution No. 4901, the Final 2018 Plan was submitted to the legislative authorities of King County, City of Sammamish and City of Issaquah and to appropriate state agencies, including the Washington State Department of Health, for review and comment by those jurisdictions and agencies as provided and required by law; and

WHEREAS, pursuant to RCW 57.16.010, the Washington State Department of Health has by letter dated April 23, 2020 approved the Final 2018 Plan identified as Submittal #19-0208, King County has approved the Final 2018 Plan by Ordinance #19069 dated March 24, 2020 signed March 28, 2020, City of Sammamish has approved the 2018 Plan by adoption of Resolution R2020-864 dated January 7, 2020, and the City of Issaquah has approved the 2018 Plan by provision of Local Government Consistency Review Checklist response dated June 11, 2019; and

WHEREAS, the 2018 Final Plan as approved by the appropriate state and local agencies are collectively referred to herein as the "Final 2018 Water Comprehensive Plan"; and
WHEREAS, based on a SEPA checklist prepared regarding the proposed adoption of the 2018 Plan as a non-project action, a SEPA Determination of Non-Significance ("DNS") was issued by John Krauss, District Manager and District Responsible SEPA Official, on February 19, 2019, and a SEPA Notice of Action was issued on April 1, 2019, in conformance with the District’s SEPA Resolution No. 3209; now, therefore,

BE IT RESOLVED, by the Board of Commissioners of Sammamish Plateau Water & Sewer District, King County, Washington, as follows:

1. The Board of Commissioners hereby adopts as findings the recitals to this Resolution set forth above.

2. The Final 2018 Water Comprehensive Plan with final revisions is approved and adopted as the District’s comprehensive water system plan effective the date set forth below.

ADOPTED by the Board of Commissioners of Sammamish Plateau Water and Sewer District, King County, Washington, at a regular open public meeting held on the 11th day of May 2020.

Individual Commissioner’s Vote on this Resolution:

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Ryika Hooshangi, President and Commissioner

Lloyd Warren, Vice President and Commissioner

Mary Shustov, Secretary and Commissioner

Tom Harman, Commissioner

Mahbubul Islam, Commissioner

Resolution No. 4959
# Acknowledgements


# Acronyms and Abbreviations


# Certificate of Engineers


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T Financial Summary Appendix
U SEPA Checklist
V Agency Approvals & Draft Plan Comments and Responses
Acknowledgements

The Sammamish Plateau Water and Sewer District Board of Commissioners, staff, and their consultants have played an integral part in preparing this document. Their invaluable assistance and contributions to all elements presented herein have shaped this document to reflect the values of the community and the role of the region as the District prepares to meet the upcoming needs of the water service area. Thanks and appreciation are extended to the following commissioners, staff, and consultants.

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Mahbubul Islam, Vice President
Mary Shustov, Secretary
Tom Harman, Commissioner
Ryika Hooshangi, Commissioner

Staff
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Jay Regenstreif
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Chris Gonzales

Inslee, Best, Doezie & Ryder, P.S.
John Milne
# ACRONYMS AND ABBREVIATIONS

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<td>2010 Water Comprehensive Plan</td>
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<td>AC</td>
<td>asbestos concrete</td>
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<td>ac-ft</td>
<td>acre-feet</td>
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<td>ADD</td>
<td>average day demand</td>
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<tr>
<td>af/yr</td>
<td>acre-foot per year</td>
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<td>AMCL</td>
<td>alternative maximum contaminant levels</td>
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<td>APWA</td>
<td>American Public Works Association</td>
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<td>ASR</td>
<td>aquifer storage and recovery</td>
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<td>ASTM</td>
<td>American Society for Testing and Materials</td>
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<td>AWWA</td>
<td>American Water Works Association</td>
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<td>BIP</td>
<td>Cascade Bellevue-Issaquah Pipeline</td>
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<td>CARA</td>
<td>Critical Aquifer Recharge Area</td>
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<td>Cascade Water Alliance</td>
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<td>CCCP</td>
<td>Cross-Connection Control Program</td>
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<td>ccf</td>
<td>100 cubic feet</td>
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<td>Consumer Confidence Report</td>
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<td>cubic feet</td>
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<td>CIP</td>
<td>Capital Improvement Project</td>
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<td>Capital Plan</td>
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<td>copper</td>
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<td>Stage 1 Disinfectants/Disinfection By-Products</td>
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<td>ductile iron</td>
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<td>District</td>
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<td>Equivalent Residential Unit</td>
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<td>F/SID</td>
<td>Washington State Department of Ecology’s Facility/Site Identification System</td>
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<td>FAC</td>
<td>Federal Advisory Committee</td>
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<tr>
<td>fps</td>
<td>feet per second</td>
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ft  feet
FTE  full time equivalents
FWSA Future Water Service Area
GFC  general facility charge
GIS  Geographical Information Services
gpd gallons per day
gpf gallons per flush
gpm gallons per minute
GWR  Groundwater Rule
HAA  haloacetic acid

HDPE high-density polyethylene
HGL hydraulic grade line
HPC heterotrophic plate count
ICI Institutional, Commercial and Industrial
IDSE Initial Distribution System Evaluation
IBC International Building Code
IFC International Fire Code
IOC inorganic compound
ISO Insurance Services Office
IT Information Technology

KCFD King County Fire District
KCWD King County Water District
LCR Lead and Copper Rule
LIDs Local Improvement Districts
LIVA Lower Issaquah Valley Aquifer
LRAA location-specific running annual average
LRIG Issaquah Highlands Lower Reid Infiltration Gallery
MCL maximum contaminant levels
MDD maximum day demand
MF Multi-Family

MG million gallons
mg/L milligrams per liter
μg/L micrograms per liter
mgd million gallons per day
MMM multimedia mitigation
MPD Master Planned Development
MRDLs Residual Disinfectant Levels
NESSWD Northeast Sammamish Sewer & Water District
NIMS National Incident Management System
NOM natural organic matter

O&M Operations and Maintenance
<table>
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<td>OIT</td>
<td>Operators-In-Training</td>
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<tr>
<td>OSHA</td>
<td>Occupational Health and Safety Administration</td>
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<td>PAA</td>
<td>Potential Annexation Areas</td>
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<tr>
<td>ppm</td>
<td>parts per million</td>
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<td>PAS</td>
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<td>pCi/L</td>
<td>picocuries per liter</td>
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<td>Per- and Polyfluoroalkyl Substances</td>
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<td>PFOA</td>
<td>perfluorooctanoic acid</td>
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<td>persons per household</td>
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<td>pressure reducing valve</td>
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<td>Puget Sound Regional Council</td>
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<td>PVC</td>
<td>polyvinyl-chloride</td>
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<td>Public Works Trust Fund</td>
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<td>Qa</td>
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<tr>
<td>Qi</td>
<td>instantaneous quantity</td>
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<td>Standard Monitoring Program</td>
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<td>Time of Travel</td>
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<td>Description</td>
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<td>Urban Growth Area</td>
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<td>Union Hill Water Association</td>
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<tr>
<td>UIC</td>
<td>Underground Injection Control</td>
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<td>ULIDs</td>
<td>Utility Local Improvement Districts</td>
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<td>UPC</td>
<td>Uniform Plumbing Code</td>
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<td>USEPA</td>
<td>United States Environmental Protection Agency</td>
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<td>VAS</td>
<td>Valley Aquifer System</td>
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<td>VOCs</td>
<td>volatile organic compounds</td>
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<td>Washington Administrative Code</td>
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<td>Washington Association of Sewer and Water Districts</td>
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2018 WATER COMPREHENSIVE PLAN

SAMMAMISH PLATEAU
WATER AND SEWER DISTRICT

December 2018
Revised October 2019

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Rodney Langer, P.E.
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WATER AND SEWER DISTRICT

December 2018
Revised October 2019

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Water Comprehensive Plan

Executive Summary

The Sammamish Plateau Water and Sewer District (District) has prepared this Water Comprehensive Plan (Plan) as a road map to guide the District into the future and ensure that it continues to provide high-quality water service to the customers in its water service area. The Plan has been prepared in accordance with the Washington State Department of Health regulations as presented in WAC 246-290-100.

The District, governed by a five-person Board of Commissioners, has been supplying drinking water to its customers on the Sammamish Plateau since 1948. The District’s water service area is composed of two distinct areas, designated as the Plateau Zone and the Cascade View Zone. The system includes a total of 12 wells, two connections to the Cascade Water Alliance’s regional supply, eight storage tanks, and more than 295 miles of transmission and distribution pipelines, and currently serves more than 60,000 people. The District’s service area boundary has evolved as a function of growth and reflects hydraulic and topographical constraints. It is not coincident with political boundaries.

There have been several changes from the federal to the local level regulations since the District’s last Water Comprehensive Plan was prepared in 2010 (with an amendment in 2012) that impact the comprehensive planning process. The District has completed several programmatic initiatives in support of actively improving its management, planning, customer service and operations missions. Notable changes and new programs and achievements are highlighted in the following sections and detailed in the following chapters.

Two particularly notable advances include the implementation of Advanced Metering Infrastructure, discussed further under Water Use Efficiency, and development and adoption of an Asset Management Plan, discussed further under Capital Plan.
Policies

In accordance with the guidance provided in the Growth Management Act, this Plan is designed to be consistent with other applicable City and County plans. The District has policies that outline its approach to provision of service within its Retail Service Area, consistent with “duty-to-serve” requirements established by the State. The District’s service area boundary is independent of political boundaries.

Since adoption of the last Plan, the District has modified its policies for meter requirements for certain public-institutional developments. In addition policies were changed to allow new Group B systems in areas of the District’s future service area where direct District service is not readily available. This would be particularly applicable outside of the Retail Service Area.

The Board also adopted a formal Drinking Water Quality Policy statement addressing drinking water standards and groundwater and aquifer protection.

Demand Forecast

A primary element of developing an effective water system plan is the ability to forecast future demands on the system. The District is not a land use agency, and therefore must plan to meet the water demands that will result from land use and zoning designations established by King County and the Cities of Issaquah and Sammamish. Long-term (20-year and buildout) forecasts were prepared using District data, zoning designations, current development activity, population and housing unit growth projections developed by the PSRC and estimated future water conservation savings.

Recent updates used in this Plan include the 2015 update of the Puget Sound Regional Council (PSRC) long-range population and housing growth forecast for the region, the 2015 update to the City of Sammamish Comprehensive Plan, and the 2017 City of Issaquah update to its Comprehensive Plan. The updated growth forecasts have been prepared following a significant recession and reset the long-range growth forecast.
Average day water demands in the District’s service area are projected to reach 5.99 million gallons per day (mgd) by 2027, and 6.1 mgd by 2037. Maximum day demand is forecast to reach 12.7 mgd by 2027 and 13.0 mgd by 2037.

As evident in the growth trend line, PSRC growth forecasts anticipate a period of very slow population and housing growth beginning in about 10 years, with increasing growth rates late in the 20-year planning period. However, since several variables influence growth and water use, the population and water demand forecasts will be periodically reassessed by the District.

Transmission, Distribution, and Storage Analyses

Transmission, distribution, and storage analyses were conducted through the development of an extensive hydraulic model and supporting calculations of capacity versus forecast demand. In 2016 the District completed a project to comprehensively update and calibrate the distribution system hydraulic model. The update included inputs from the District’s geographic information system (GIS) asset inventory, updated pump curves, well production data and customer consumption from billing records. Preliminary model results were compared to data collected during field tests conducted in June, July and October 2016. Forty-five locations were used for field data collection. Field testing focused on measurement of static pressure, time and date at a hydrant followed by opening a nearby hydrant for testing under demand conditions. The model was then calibrated to achieve a high level of accuracy for nearly all conditions.

The hydraulic model evaluated current and future water requirements, analyzed present facilities, and anticipated the impact of future demand increases. The analysis indicated that existing source and storage facilities are sufficient to meet needs through the 20-year planning period (i.e. to 2037).

While most of the District’s transmission and distribution systems are adequate, projects were identified for some areas, including increases in size or enhancement with looping to meet fire flow requirements and for provision of service to all portions of the District’s service area.

In addition to system requirements for normal operations, the District also completed a redundancy analysis to identify the criticality of system facilities, and identified solutions to improve the overall redundancy of the system. Additionally, a Seismic Vulnerability
Assessment Report, completed in 2014, and a follow-up 2017 Seismic Pipeline Study recommended an additional project to enhance the District’s system resiliency.

**Water Use Efficiency**

The District understands how important it is to conserve water and to make the best use of water resources. In 2013 the Cascade Water Alliance (CWA) adopted a Water Use Efficiency (WUE) program for the period 2014-2019 on behalf of its members. This included an aggregated goal for its seven members of a “…cumulative drinking water savings of 0.6 million gallons per day on an annual basis, and 1.0 million gallons per day on a peak season (June-September) basis by 2020.” Conservation within the District’s system will be achieved by implementation of activities provided by CWA and additional measures administered directly by the District. Presently planned efforts are forecast to reduce District water use forecast for year 2037 by 0.26 mgd or 4.3 percent for the average day and 0.5 mgd or 3.8 percent for the maximum day.

Service meters are an essential component of conservation programs as they provide feedback to customers on their water use, and provide the basis for financial incentives for individual customers. Starting in 2016 the District significantly improved the potential for customers to monitor and manage their water consumption with implementation of an Advanced Metering Infrastructure (AMI) system. The District continues to identify ways to utilize the additional information available for the District and for each customer. The additional detail available, rather than water use readings bimonthly, will support future planning efforts, water use efficiency evaluations and programs, hydraulic modeling, and timelier leak detection for customers.

**Water Resources**

The District’s intends to continue using its existing groundwater wells as the primary source of supply into the future. These sources are supplemented by water obtained from two connections to the CWA regional supply.

The District has a long-term interest to develop aquifer storage and recovery (ASR) as an element of its water supply strategy, The District’s efforts to secure permits to implement ASR have stalled due to reluctance by the State Department of Ecology (DOE) to issue the necessary approvals and recovery rights, in context of comments by third-parties and the very complex analysis desired to address all stakeholders’ concerns and interests.

Water quality in the aquifer continues to be an area where the District must be vigilant. The District successfully worked with the City of Issaquah to avoid risk of contamination of District groundwater supply in the Issaquah Valley aquifer near the District’s Well 9. The District provided funding to allow the City to abandon the Lower Reid Infiltration Gallery in 2014 and manage the stormwater discharge in an area outside a wellhead protection area. More recently, detection of minute amounts of per- and polyfluorinated
substances (PFASs), well below the US EPA Health Advisory Limits, in two wells and uncertainty over changes in level of contamination and further development of the understanding of health impacts and potential regulations has prompted more specific review of use of those wells for supply. To assist in the understanding of this situation, the District updated its Issaquah Valley groundwater model in 2016. The District then developed a monitoring and response plan. Alternatives to address this new constraint include addition of treatment, if necessary, and/or increased reliance on the regional water supply system.

**Water Operations Regulatory Requirements**

The District’s water supply and monitoring programs comply with current drinking water regulations. The District has complied with new regulations since the last Plan, and continually looks to the future to anticipate upcoming regulations and how they might affect the utility and its operations, and most importantly, the quality of water provided to its customers. New and updated District programs include the following.

- The Revised Total Coliform Rule/Distribution System Rule took effect in 2016. The revised rule placed increased emphasis on evaluation of water samples for presence of total coliform, fecal coliform and *E. coli*, and consideration of how to respond following detection of the presence of each. In 2017 the District updated its Coliform Monitoring Plan and developed the associated Triggered Groundwater Monitoring Plan. The Coliform Monitoring Plan includes two tiers of assessment in response to potential unsatisfactory quality results, and an *E. coli* response plan.

- The District collected the required Unregulated Contaminant Monitoring Rule 3 (UCMR3) data from 2013 to 2015. As part of the UCMR 3 monitoring program the District detected PFASs in the supply from District Wells 7 and 8 in 2015. Minute quantities of the contaminants were detected below the survey’s minimum reporting level and well below the health advisory level. The City of Issaquah detected these compounds at levels above the health advisory levels in their wells about 1,600 feet away from District wells 7 and 8. The presence of this class of contaminants in the District’s water supply has prompted more detailed evaluation and consideration of measures to assure delivery of a safe water supply. Emergence of PFASs as contaminants of concern, including refinement of the health advisory impacts indicates there is potential for associated future water quality regulations.

- In 2017 the fourth Unregulated Contaminants Monitoring Rule (UCMR 4) identified 30 additional chemical and biological contaminant parameters to be included in the District’s water quality monitoring program. The District will conduct that monitoring beginning in 2019. There is anticipated continued participation in the UCMR monitoring program including phases anticipated beyond UCMR 4.

- The City of Flint changed its source of water supply and, with insufficient treatment, lead leached from lead water pipes into the local drinking water supply. This exposed
customers to lead contamination. EPA is considering long-term revisions to the federal Lead and Copper Rule, with a final rule anticipated in 2020. The District also anticipates designation of a national primary drinking water regulation for Perchlorate in the near future.

Capital Plan

Starting in 2016, the District established the practice of preparing a biennial Capital Plan, as a programmatic approach for near-term implementation of capital improvement projects, in the context of operational needs, the most recent Water Comprehensive Plan and Wastewater Comprehensive Plan, collaboration opportunities with local governments, development and system extension activity and the Asset Management (AM) Plan.

Also in 2016, through an intensive effort by all District staff and management, with support of the Commissioners, the District developed an AM Plan for its water and sewer system assets. The AM Plan addresses:

- The current state or condition of the District’s assets.
- Asset performance needed to deliver our desired level of service.
- Which assets are critical to sustained performance and service delivery.
- The minimum life-cycle costs for the assets relied on to provide service.
- The best long-term funding strategy to operate and renew assets.

The AM Plan identified 45,000 water system assets with a then-current replacement value estimated to be $584 million. Eighty-nine percent of the water system assets were determined to be in “good” to “very good” condition. This is due to the District’s historic and ongoing efforts to maintain the system and due to the relatively young age of many of the assets. The findings of the AM Plan support long-range financial planning for maintenance and eventual replacement of assets as they reach the end of their life cycle. Prudent planning for future needs will avoid the need for significant unforeseen increases in rates and connection charges.

The current biennial District Capital Plan was completed for 2018-2019, with consideration of projects through 2023. That plan was a significant resource for identification of projects for the early years of the 10-year capital plan presented in this Plan. The Plan contains the District’s Capital Plan (CP) that has been developed to guide the growth of the utility’s water system through the year 2037 and beyond. Included in the ten-year CP are:

- Water system share of combined water and sewer system general projects (e.g. office and administration facilities and programs, shared equipment, etc.)
- General water system projects or programs (e.g. completion of AMI project, Smart Water programs, vehicles and equipment, studies, etc.)
- Water supply and treatment improvement projects
- Booster pump station upgrade projects
• Storage safety and coating improvements, and a booster pump station project to utilize more existing capacity
• Transmission main upgrades or extensions
• Fire flow improvements in the transmission and distribution system
• Redundancy piping and pressure reducing valve projects

The CP also includes identification of several projects in progress.

Capital Plan Summary (Ten-Year)

<table>
<thead>
<tr>
<th>Description</th>
<th>2018 to 2027</th>
</tr>
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<tbody>
<tr>
<td>Water Share of Combined Projects</td>
<td>$3,146,905</td>
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<td>General Water System</td>
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<td>Supply</td>
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<td>Booster Pumping</td>
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<td>Storage</td>
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<td>Mains – Transmission and General</td>
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<td>Mains – Fire Flow Deficiency</td>
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<td>Mains - Redundancy</td>
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<td>Mains – Projects in Progress</td>
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<tr>
<td><strong>Total</strong></td>
<td><strong>$56,807,560</strong></td>
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Financial Evaluation

The District is in excellent financial health, and the financial plan presented herein verifies that the District can continue meeting all financial requirements. Revenue adjustments will be necessary to fund capital improvement projects outlined in the CP. Through this planning process the District has determined that the District’s Water General Facility Charges (GFCs) are adequate to recover an equitable share of system costs from growth. The financial plan review is based on assumptions that may change over time. The District reviews financial needs as part of an annual budget process, with annual rate analyses that provide the basis for actual revenue adjustments.
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