Dublin San Ramon Services District

Water, wastewater, recycled water

Building for the Future

FISCAL YEAR 2018 ANNUAL REPORT

July 1, 2017 - June 30, 2018

Dublin San Ramon Services District
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Engineering Services Manager Judy Zavadil conducts a tour for elected officials during the inaugural Water Professionals Appreciation Week celebration.

Cover:
These photos chronicle the various stages of building the fourth and final digester at the Regional Wastewater Treatment Facility: (main photo) Workers drive sheet piles 30 feet into the earth to create shoring so they can dig the 27-foot-deep hole for the digester; (large circle) Workers construct the curved walls of the 70-foot diameter digester; and (small circle) Workers weld the 40-ton steel dome, the digester's lid. See page 8 for a photo of the massive dome being lifted into place atop the digester.

A message from the General Manager

This past fiscal year, the Dublin San Ramon Services District has been busy building for the future, whether it's physical structures, pipes in the ground, or the people behind the pipes.

Expand - We expanded our water recycling plant (page 7) and added a fourth digester (page 8). The former increases our ability to process wastewater into irrigation water, and the latter increases our ability to process wastewater solids.

Repair - As DSRSD celebrated its 65th birthday, it became clear some older assets needed repairs. We relined the 58-year-old sewer main (page 9), a large pipe that runs down Village Parkway collecting sewage from homes and businesses and transporting it to our wastewater treatment plant. With its new lining, this pipe can be used for another 50 years.

Replace - The District's most valuable asset is our labor force, and like many other businesses and organizations, we've been experiencing a "Silver Tsunami" of baby boomers retiring. DSRSD has been busy recruiting and hiring about 20 percent of our staff (21 out of 121 positions, plus facilitating 5 promotions). Our relatively new senior management team has done a great job managing this fluid workforce during the transition.

Educate - The District was instrumental in inspiring California legislators to declare the first full week of October as Water Professionals Appreciation Week. To celebrate, DSRSD invited local elected officials to tour our water, wastewater, and recycled water facilities.

In March, April, and May of 2018, the District held its first Citizens Water Academy. Consisting of three evening sessions, 22 participants from our service area toured facilities and discussed presentations on our water system, water supply challenges, the wastewater master plan, asset management, and preparing for a water emergency. Watch your mail early in the year for a postcard announcing our second Citizens Water Academy.

Serve - Strategically, the District continues working on its eight goals, including the goal to develop a fully integrated asset management program (page 3). With the replacement value of assets at more than $1 billion (back cover), it's vital we achieve maximum use of our assets with minimum disruption of service. To that end, we are integrating our capital planning (big ticket items) with our operations and maintenance activities to optimize life-cycle costs. We are developing 10-year financial models to guide future operating budgets and rate studies, and we are continuously matching District staffing to business needs, reallocating resources as necessary to address new challenges and opportunities.

Keep reading for stories that illustrate how the District is protecting public health and the environment, increasing efficiencies, reducing costs, and investing in and planning for the future.

Daniel McIntyre
General Manager

Accelerating today's maintenance to meet tomorrow's demands

DSRSD's Operations Department regularly ensures all of the District's working parts are in good condition. Staff regularly inspect, repair, and replace mechanical and electrical equipment as part of DSRSD's asset management program. Essentially, their goal is to achieve maximum use of District assets (pipes, pumps, motors) with minimum or no disruption of service. And remember, District services are provided 24/7/365, so there's never a good time for an asset to be out of commission.

The District uses asset management databases to track the history and current condition of machines and equipment. It is a guide for preventative maintenance and helps staff anticipate life cycles of various assets. Having access to each asset's history, including information on actual number of hours used, allows the District to plan for a more efficient system that ultimately saves time and money.

Staff is embracing technology, linking the geographic information system (mapping software) with the maintenance management system. This enables users to access work orders directly from an electronic map. As part of a $53,000 field wireless project, Wi-Fi is now enabled at nearly all DSRSD sites in the field such as pump stations, turnouts, and reservoirs. Operators can use smartphones or computer tablets to automatically link into the database and quickly access inspection data and work orders for maintenance. Also, field staff are safer with access to the District's phone system and instant messaging services, as many remote sites have unreliable cellular service.

By managing District assets more efficiently, staff is also better able to plan for the future. Determining the life cycle of equipment helps staff minimize unexpected maintenance and failures, as well as more accurately budget for replacements. The maintenance management software allows staff to track where most repairs have been needed and can then more accurately plan for replacements before a system fails.

Some of the replacements made during this fiscal year included the three pumps at the Regional Wastewater Treatment Facility used to recirculate treated wastewater for washing process tanks before maintenance and for cooling the cogeneration power system that provides almost 90 percent of the plant's electricity. Staff also replaced the four pumps that move solid material to be thickened before the digestion process where bacteria decompose the solids.

The above examples illustrate how the District's asset management program makes it possible to get the maximum life out of our assets while avoiding disruption of service.

Protecting Public Health and the Environment

Respecting Dublin's golden eagle habitat

Safeguarding the environment is something the District undertakes every day when treating wastewater and providing recycled water for irrigation. Occasionally, environmental protection for DSRSD takes on additional forms. The District works with a raptor biologist with the Center for Natural Lands Management who has been monitoring the golden eagles in east Dublin for three decades. By coordinating with the raptor biologist, DSRSD is able to help protect a golden eagle habitat near water and recycled water reservoirs.

Each year from January to July, staff receive updates on the golden eagles nesting in this area. This time span encompasses the eagles' courtship, breeding, egg laying, hatching, and fledging (when young birds develop wing feathers large enough for them to fly).

The neighboring Livermore Valley has a dense population of golden eagles, offering a habitat with rolling grasslands, trees for nesting, and food such as ground squirrels and jackrabbits. The golden eagle has been federally protected since 1962 under the Bald and Golden Eagle Protection Act. DSRSD coordinates with the raptor biologist to schedule maintenance on the water system so it does not disrupt critical breeding and nesting of the golden eagles in the District's service area.

DSRSD improves water quality in storage and distribution system

The District's water wholesaler, Zone 7 Water Agency, adds chloramine, a disinfectant, to the water. Chloramine, a mixture of chlorine and ammonia, protects against disease-causing organisms and pathogens.

The chloramine can break down over time, so the longer the water remains in the system, the lower the protection against microbial contamination. This breakdown occurs more rapidly in warmer summer months and low water use in the winter.

To solve this problem, the District added a chloramination system to a two-million-gallon reservoir in west Dublin in 2015. The system includes a water quality station, water quality controller, and chloramine dosing system along with a reservoir mixer.

The mixer, only eight inches tall, can circulate millions of gallons of water using very little energy—the equivalent of three 100-watt light bulbs. This powerful mixer mimics natural flow patterns observed in nature, such as ocean whirlpools, and creates a vortex flow pattern to mix the water.

After the first chloramination system proved effective at maintaining desired levels of chlorine residuals, the District installed a second system in a smaller reservoir, which holds 340,000 gallons of water and is also located on the west side of Dublin. This reservoir serves customers higher up the hill and farther from the source water. The project cost $675,000 to install the mixer into the 25-foot-tall, 50-foot diameter reservoir.

© Pax Water Technologies

The mixer is a rotating spiral impeller, which acts like a propeller, to mix chloramine into the water as a secondary disinfectant to improve water quality.

The stainless steel impeller is fastened on to a 4-foot-tall tripod with rubber feet resting on the bottom of the tank reservoir.

Water/Wastewater Systems Lead Operator Danny Leonardo opens the hydrant used to flush a drinking water main.

Flushing water pipes is one of the best ways to improve water quality

In 2015, two events coincided to change the way the District flushes its water system: regulations tightened to encourage "only rain down the storm drains," and the extreme statewide drought heightened public sensitivity to the long-standing industry practice of flushing water mains onto the street.

Water operators were inspired to rethink how they flush the District's 321 miles of water pipes. Most of this pipeline is part of a looped system where water can be provided from two directions. However some pipelines are spurs off these loops and these are called dead ends. Dead ends are challenging for water operators because these are where water can stand still, and it is best to keep water moving. Over the years, biofilm and sediments build up in the pipes. Hence, the need to flush them regularly.

The flushed water is diverted into the sewer, so it returns to the treatment plant where it is available to be treated and made into recycled irrigation water. This procedure not only reuses the resource, but it also helps to clean the sewer pipes at the same time.

To flush, operators send high velocity water through the water pipes. They need the water to move at five feet per second in order to scour the pipes' walls clean. Operators determine the desired velocity for effectively flushing out scale and sediments based on the size of each pipe. For an 8-inch diameter pipe, operators need to flow 750 gallons of water per minute, while a 12-inch-diameter pipe requires 1,800 gallons of water per minute.

While field crews are in neighborhoods flushing the water pipes, they also exercise water valves, opening and closing them to ensure they are in good working condition to ensure critical valves don't get stuck in an emergency. When all the valves in the water system are working well, District crews only need to shut off valves closest to where they are working, impacting fewer customers.

Increasing Efficiency and Savings

Photo by John Hawke

Fiber optics faster, more reliable way to connect DSRSD facilities

A new fiber optic connection to DSRSD's Field Operations Facility (FOF) enhances the District's readiness for disaster recovery, increases productivity, and adds redundancy to the District's communications system.

When the FOF opened in fall 2016, its initial connection to other District facilities was via slower, wireless radio communications. The $248,000 fiber optic project to upgrade the network connected a new line to DSRSD's existing fiber that runs between the Regional Wastewater Treatment Facility in Pleasanton and the District Office in Dublin. The new line was operational in June 2018.

A fiber optic system is the fastest technology used to connect remote facilities. The new line increased the FOF connection from 25 megabits per second (a million bits per second) to 10 gigabits per second (a billion bits per second)—400 times faster. The higher network speed also allows staff to be ready for disaster recovery so they can restore systems more swiftly than they could with a radio communications connection.

An additional benefit of the fiber optic connection is increased productivity. Staff can now access information instantly and use radio communications as a backup, which increases the high availability of the District network. With fiber's ability to send a high volume of data at a high speed, the District's security network can transmit large video feeds with ease. Furthermore, with DSRSD owning the fiber line, it increases savings in the long term by not having to lease fiber from an outside service provider. The Information Technology Services Division and Engineering Department worked together to upgrade the District's network connectivity for more reliable communications.

Refinancing saves $9.8 million

With a new AA+ credit rating, DSRSD refinanced its outstanding 2011 Water Revenue bonds. This will save the District an estimated $9.84 million over the next 24 years. The District refinanced a $33.5 million debt that was originally issued to fund a few potable water facilities and to build its share of the San Ramon Valley Recycled Water Program, including the Jeffrey G. Hansen Water Recycling Plant, pump stations, reservoirs, and pipes. The original plant opened in 2006.

Similar to refinancing a home loan, DSRSD refunded its debt to get a lower interest rate. The new bonds have a true interest cost to the District of 3.17 percent, which includes interest on the bonds and $192,895 of refunding costs. Compared to the original 5.7 percent interest rate on the former bonds, the new rate provides significant savings.

Aerial view of DSRSD facilities

Pictured left are 1) the DSRSD District Office (blue-roofed building, left center) on Dublin Boulevard; 2) the Facultative Sludge Lagoons (six ponds just south of Interstate 580) where digested solids are pumped for storage and further treatment; 3) the Livermore-Amador Valley Water Management Agency (smaller basins to the southwest of the Facultative Sludge Lagoons), which manages the regional sewer pipeline that transports treated wastewater from the Tri-Valley to a deep water outfall in the San Francisco Bay; 4) the new DSRSD Field Operations Facility (dark-roofed building just north of LAVWMA basins) on Commerce Circle; and 5) the Regional Wastewater Treatment Facility (bottom).

Photo courtesy of Covello Group

Investing in the Future

Photo courtesy of Covello Group

Increasing recycled water reliability

Clockwise, from top:

(Top) *General contractor C. Overaa and Company installs shoring next to the secondary effluent holding basin to allow the recycled water plant to remain fully operational throughout expansion of the plant.*

(Right) *Construction workers coat the new discharge pipeline leading from the pretreatment system to the sand filtration process.*

(Bottom) *Workers construct a new ramp into the holding basin, where the secondary effluent will flow before continuing through the pretreatment system.*

(Left) *Protected by shoring, workers place rebar for the pretreatment structure in preparation to pour the concrete walls.*

Plant expansion recycles water more quickly

The growing demand for recycled water spurred the 2017-2018 expansion of the Jeffrey G. Hansen Water Recycling Plant. In 2006, DSRSD and the East Bay Municipal Utility District partnered to build the plant and the recycled water transmission system of 68.2 miles of pipe, four reservoirs, and six pump stations. Since its inception, the plant has supplied recycled water to Dublin, the Dougherty Valley, and parts of San Ramon. The City of Pleasanton joined the program in 2014.

For a 10-day period, the facility managed to recycle every drop of wastewater coming in to the wastewater treatment plant.

Demand for recycled water continues to grow. In 2017, customers in Dublin, San Ramon, and Pleasanton used a total of 1.454 billion gallons of recycled water for irrigation, saving enough drinking water to supply 15,683 homes for a year. Peak summer demand for the plant's recycled water hit a record 9.9 million gallons per day in June 2017. For a 10-day period, the facility managed to recycle every drop of wastewater coming in to the wastewater treatment plant. Demand for recycled water is expected to keep growing, from a peak 9.9 million gallons a day in 2017 to a maximum demand of 16 million gallons a day by 2020. DSRSD recycled 79.1 percent of the wastewater from May through September, and more than 90 percent from June to August 2017.

Construction started on the water recycling plant expansion in January 2017, to boost water recycling capacity by 70 percent, from 9.7 million to 16 million gallons maximum daily use. The project involved adding a pretreatment step before entering the water recycling plant. The pretreatment system works like a clarifier, settling particles out of the water to improve turbidity before it continues on to sand filtration and ultraviolet disinfection. In addition, the recent construction increased pumping and ultraviolet disinfection capacity. The ultraviolet disinfection system destroys any bacteria or viruses that might remain in the water before it is used for irrigation.

Project completion allows the water recycling plant to efficiently treat all of the secondary effluent produced at DSRSD's wastewater treatment facility whenever demand for irrigation is high (hot summer days). Additionally, with more wastewater being recycled, less treated wastewater is discharged to the San Francisco Bay.

The three agencies shared costs for the $18.8 million expansion: DSRSD 46 percent and EBMUD and Pleasanton 27 percent each. The shared cost proportions mirror how the agencies will share the increased recycled water production. DSRSD managed the construction and operates the facility on behalf of the regional partnership.

Additionally, the partnership received a $150,000 Bureau of Reclamation WaterSmart grant for a feasibility study and was awarded a $2.5 million principal forgiveness loan through the California State Water Resources Control Board Clean Water State Revolving Fund and the Environmental Protection Agency's Green Project Reserve. Through the Green Project Reserve, the principal will not have to be repaid and the loan will be forgiven.

(L to R) *Stephan Kozanda, Senior Wastewater Treatment Plant Operator III, and Virgil Sevilla, Process Lead Wastewater Treatment Plant Operator V, inspect ultraviolet lamps of one of the new UV modules installed during the plant expansion. In total, there are ten UV banks with seven UV modules each, totaling 1,400 UV lamps that operators inspect monthly.*

Treatment facility operations smooth during construction

Amid two major construction projects and training seven new employees on systems and equipment, staff successfully operated both the Regional Wastewater Treatment Facility and the Jeffrey G. Hansen Water Recycling Plant. The two projects involved building the fourth and final digester at the wastewater treatment plant and expanding the water recycling plant.

Wastewater and recycled water treatment plants operate 24/7, which is challenging when large construction projects at the plant require certain processes to go offline for a brief time. DSRSD Operations and Engineering staff worked together to determine the best way to take any equipment offline in order to minimize the risk of affecting the treatment process.

Completion of final digester increases solids processing by 50 percent

In May 2018, DSRSD's contractor topped off the $13 million fourth and final digester under construction at the Regional Wastewater Treatment Facility. Construction on the District's newest digester began in August 2017 on both the concrete silo and its 40-ton steel lid. Both measure 70 feet in diameter. The new digester holds one million gallons of biosolids, making DSRSD's combined total capacity three million gallons.

The anaerobic digesters work like mechanical stomachs, providing a warm environment, free of oxygen, where bacteria decompose organic solids and destroy pathogens. The process produces biogas, a renewable fuel DSRSD captures and combines with natural gas to generate electricity to power the plant and heat the digesters and buildings. With the lid in place, the digester became operational in September 2018.

The new digester allows DSRSD to stay ahead of the region's growth while protecting public health and the environment 24 hours a day, 365 days a year.

Relining a major sewer main ensures 50 more years of reliable service

Camera footage from a robotic device relays images back to the video truck for inspection.

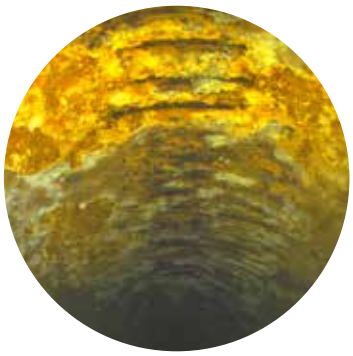
To maintain 207 miles of sewer pipes, field crews can inspect them three different ways: closed-circuit television, sonar, and infrared laser. Sometimes, when the pipes are especially large, old, and play a critical role, like the 33-inch to 42-inch sewer main that brings millions of gallons of wastewater to the plant daily, the crews use all three methods of inspection.

Such was the case regarding the 58-year-old sewer trunk main that runs under Village Parkway carrying wastewater from south San Ramon and central Dublin to the Regional Wastewater Treatment Facility in Pleasanton. The inspections revealed that the large sewer pipeline needed to be repaired: rebar was showing through the reinforced concrete; its walls were thinning; bits of concrete were flaking off (spalling); and sediment was occupying the bottom of the pipe.

Repairing such a large pipe running down the middle of a major roadway can be disruptive to the community, but not if cured-in-place pipe technology is used. Working through manholes, the contractor inserted a flexible liner into 8,000 feet of the trunk sewer line. Once inside the pipeline, the liner hardens and bonds with the pipe's interior, restoring it to near-new condition and adding structural integrity.

The $6.7 million pipe rehabilitation project was significantly faster (a quarter of the time it would have taken to dig a trench and replace the pipe), less disruptive (only one lane of traffic was blocked), and less expensive.

Originally installed in 1960, the reinforced concrete pipe deteriorates over time from sulfides in wastewater. The District assesses the condition of all pipes in the sewage collection system to proactively plan for the long term and to establish priorities to rehabilitate or replace pipes. Rehabilitating the Dublin trunk sewer was completed in October 2017, extending the life of this major pipeline another 50 years.



After nearly 60 years, the reinforced concrete pipe deteriorated from sulfides in the wastewater. Erosion exposed the ribs of the rebar (dark lines at the top of the photo).

The liner is temperature sensitive and shouldn't be exposed to high heat. A shade canopy shields it from premature fusing before installation.

A worker positions the forced air heating duct, which assists in curing the pipe liner.

Partnering and planning for a more reliable water supply

A study jointly funded by Tri-Valley cities and water agencies found that purifying wastewater to drinking water standards is technically feasible in the Tri-Valley. The study found that it could make the Tri-Valley water supply more reliable by providing more water for the groundwater basin, or supplementing the water supply.

The study identified six alternatives for detailed evaluation, which could provide an additional 5,500 to 10,000 acre-feet of water per year, or an additional 7 to 15 percent to the Tri-Valley water supply annually. Capital costs for the alternatives range from $103 million to $222 million.

Environmental Chemist I David Bonn samples recycled water for total coliform analysis, dissolved oxygen, and conductivity.

Budget in Brief

The District provides water, wastewater, and recycled water services to 186,000 people. In fiscal year ending 2019, the District expects to collect $110 million in revenue and spend $79.2 million on daily operations.

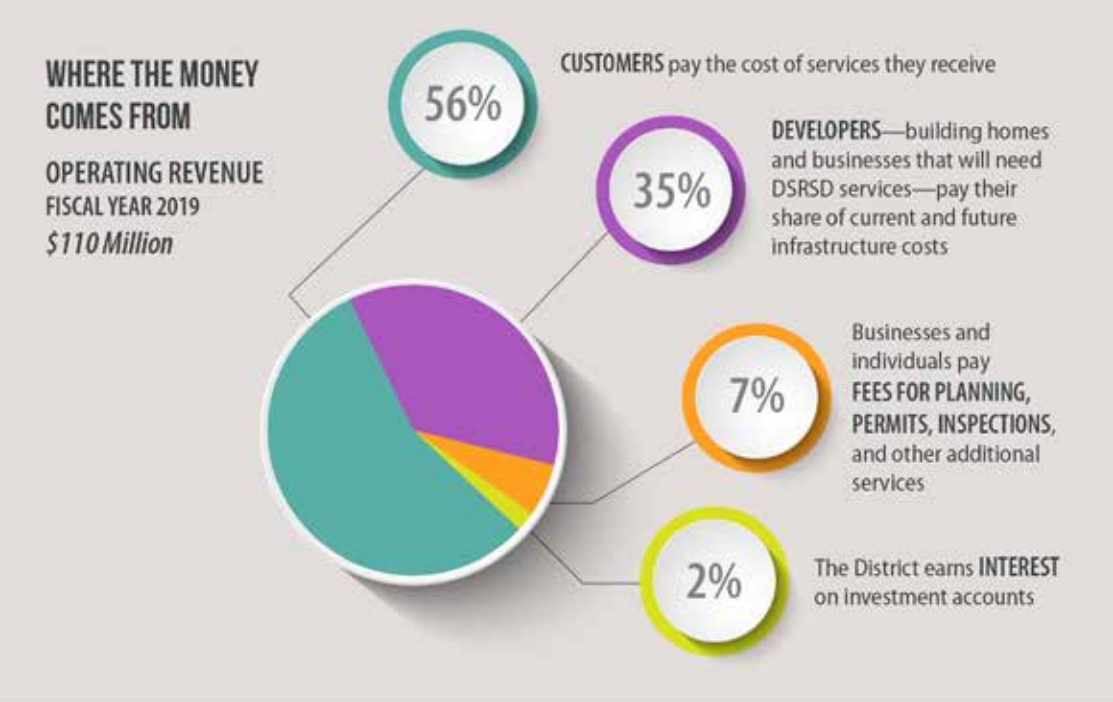
Operations

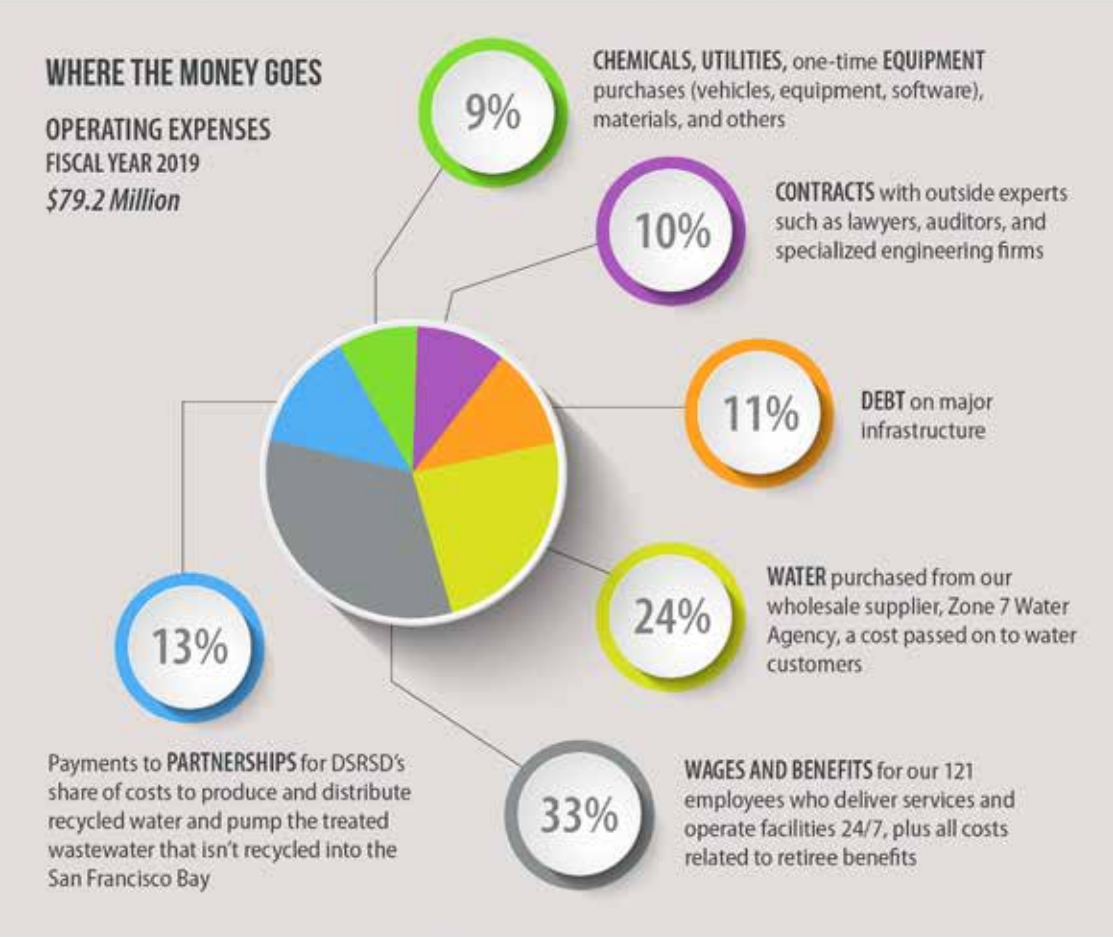
The annual Operating Budget forecasts revenue and spending for daily operations.

Want to know more?

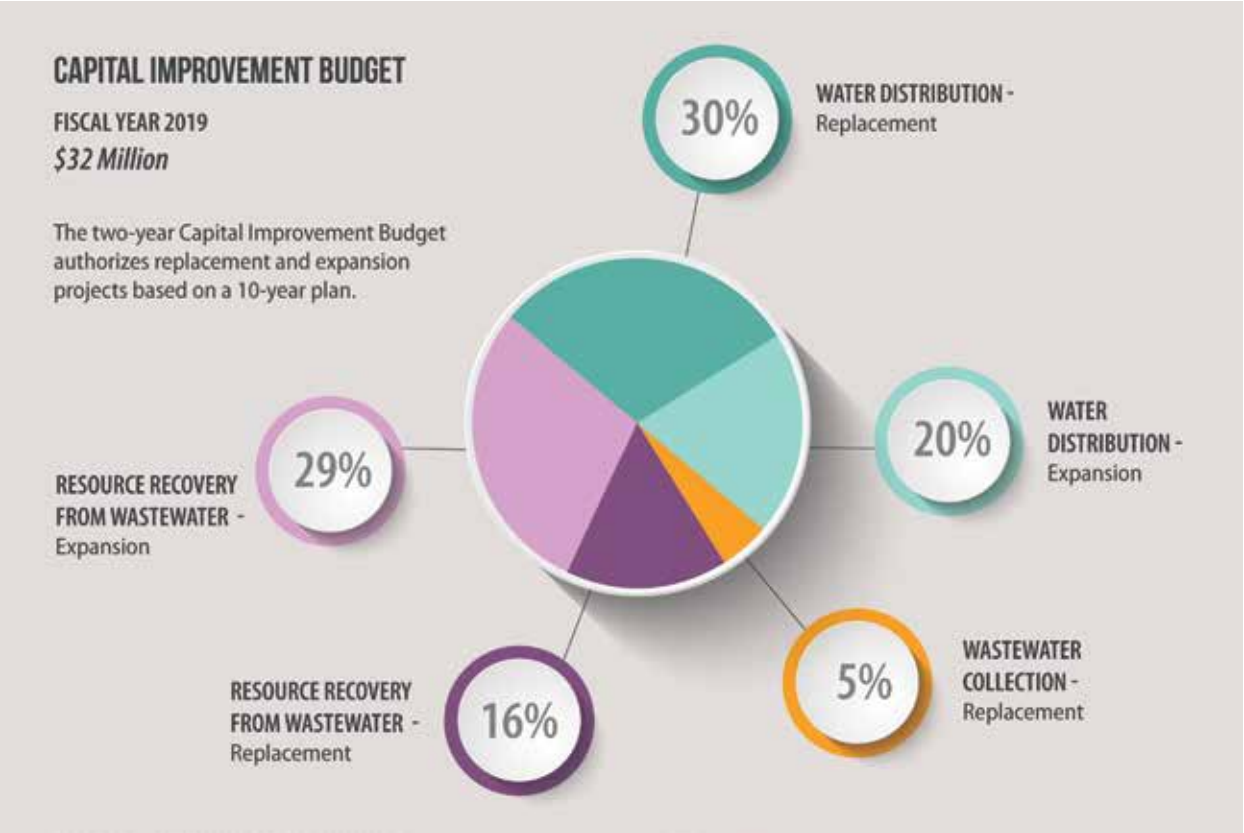
For in-depth information, find these documents in the Library at www.dsrsd.com.

- Operating Budget – forecasts revenues and day-to-day operating expenses over the next two fiscal years
- Capital Improvement Program (CIP) Ten-Year Plan and Two-Year Budget – identifies, prioritizes, and schedules capital improvement projects for the next 10 years, outlines a plan for generating the financial resources needed to complete them, and authorizes projects for the next two years





In the fiscal year 2019 budget, DSRSD plans to invest $32 million in infrastructure.



Projects started, under construction, or completed, 2017-2019 budget

- $6.9 million to upgrade the Supervisory Control and Data Acquisition System (controls the District's instrumentation, pumps, and valves), improving emergency communications
- $7.5 million to purchase and renovate the old Clorox research building into the Field Operations Facility
- $675,000 to install a chloramination and water mixing system at a reservoir in western Dublin

Expand

- $18.8 million to expand the Jeffrey G. Hansen Water Recycling Plant, increasing water recycling capacity by 70 percent, adding a pretreatment step between secondary and tertiary treatment
- $13 million to build the fourth and final digester that will process one million gallons of biosolids
- $850,000 to design the primary sedimentation expansion to ease the load on treatment, improve the secondary process, and reduce energy use (total estimated cost of this project is about $10 million)

Repair

- $6.7 million to reline the 58-year-old sewer main that transports wastewater from Dublin homes and businesses to the wastewater treatment plant, enabling this pipe (which varies in diameter from 33 to 42 inches) to remain in service for another 50 years
- $744,000 to reline 550 feet of 24-inch steel pipe that returns activated sludge to the beginning of the aeration process, maintaining the biological organisms needed to treat wastewater

Replace

- $142,400 to replace seven pumps: three that recirculate treated wastewater to wash and perform various processes at the wastewater treatment plant and four pumps that move solid material to the Dissolved Air Flotation Thickener, which removes more water from the solids before they go to the digester and are decomposed by bacteria
- $1.95 million to replace and relocate the underground sewer lift station (which elevates sewage by 17 feet so it can continue to flow by gravity to the treatment facility) along with several water meters and five hydrants to accommodate the City of Dublin's project to widen Dublin Boulevard

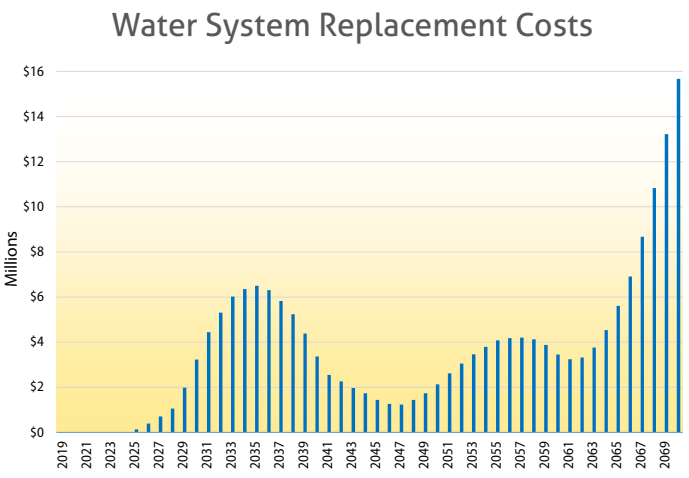
Your Water and Wastewater Systems are an Invaluable Investment

Did you know you are part owner of a $1 billion enterprise? That's right! You and the other 186,000 people who receive water, wastewater, and/or recycled water service from DSRSD are owners of the District and all its assets —and $1 billion is what it would cost if the entire operation had to be replaced.

Formed in 1953, this local government agency provides potable and recycled water service to Dublin and the Dougherty Valley area of San Ramon, wastewater collection and treatment to Dublin and south San Ramon, and wastewater treatment to Pleasanton (by contract).

Owning an enterprise is like owning an automobile. With ownership comes responsibility to operate it safely and to maintain it properly. When something needs to be repaired or replaced, you take it to the professionals. That's us. The District has a team of skilled staff, including eight experienced engineers who plan and manage projects necessary to provide these services; 16 licensed operators who deliver the water, collect and treat the wastewater, and make recycled water; seven laboratory personnel who monitor the processes to maintain public health and safety; and five financial experts who ensure there's funding available to do what needs to be done, when it needs to be done.

The District operates three business enterprises, each with its own funds, separate and distinct from the others: 1) water enterprise wherein staff distributes potable and recycled water; 2) local wastewater enterprise wherein staff collects local sewage; and 3) the regional wastewater enterprise wherein staff treats and disposes of the treated wastewater at the Regional Wastewater Treatment Facility.



This graph illustrates estimated replacement costs of the water system during the next 50 years. Many of the District's water pipelines were installed in the 1960s. Asset management models identify significant surges in replacement need and indicate an increase in the cost approximately 75 years after they were installed. Water pipes tend to last 75 to 100 years. (This graph was generated in early 2017.)

Photo credits: *Cover photos, L-R: Roger Li, Steve Delight, Joyce Chang. All other photos by Joyce Chang unless otherwise noted.*

An emergency crew repairs a 20-foot-long split along a water main under Tuscany Drive in September 2017. DSRSD staff members were on site to provide drinking water and information to the 25 affected households during the 27-hour repair job.

The average automobile purchase often involves debt (thousands of dollars), constant care (refueling, cleaning, and lubing), regular maintenance (oil and filter changes), replacement of worn parts (cracked hoses, tires, brakes), and improvements (GPS navigation, enhanced sound system, fancy wheel rims).

To build the DSRSD enterprise—596 miles of pipe, 16 reservoirs, 20 pump stations, a laboratory, maintenance building, wastewater and recycled water treatment plants, administrative office, and Field Operations Facility—involved millions of dollars of debt. Whether DSRSD is providing water, wastewater or recycled water infrastructure, the District often has to go into debt to build it all before the first customer can use any of the services. As customers move into the community, they "buy in" to the system and pay their share of the cost to operate, repair, and maintain the infrastructure. Expansion of the District facilities is usually covered by developer fees to purchase "capacity" in the system and those fees then repay the debt.

As time goes by, various parts of the system need to be maintained: pumps and motors need to be serviced; reservoirs need to be cleaned; and water pipes need to be flushed. Also, as the system ages, parts need to be repaired—rags, wipes, and syringes need to be removed from stopped pumps—and replaced—valves and gaskets need to be changed.

To be most efficient in this endeavor, District staff can track assets in a database—things such as pumps, pipes, and reservoirs. They note the life expectancy of the asset, its current condition, and other preventative maintenance details. This information enables staff to plan and prepare for major repairs and replacements.