

OPTIMIZATIONS PROGRAM ANNUAL REPORT

Fiscal Year 2021-22





A NEW ERA OF OPTIMIZATION AND INNOVATION

A MESSAGE FROM THE GENERAL MANAGER

Central San has always been proactive, especially when it comes to our customers' needs. Each of the optimizations in this report has helped us become an innovative industry leader with a focus on continuous improvement, to constantly push ourselves to be of better service to our stakeholders. Our employees continue to dream up creative cost savings to pass along to our customers, which is crucial to upholding our service levels during challenging times in our economy.

This year, we will go a step further and embark on a new era of optimization at Central San. With the creation of an Optimizations Division, we will be increasing efficiencies and effectiveness in all dimensions of performance. We will develop programs, projects, and training activities that significantly improve all aspects of our operations - from our advanced wastewater treatment plant, to our water reuse distribution system, our engineering projects, our administrative processes, and everywhere in between.

Our optimizations this fiscal year culminated with our first in-person Innovations Fair, which celebrated and shared stories of innovation at Central San over the last two years. It was exciting to see the passion with which our staff showcased their projects, and the enthusiasm with which those projects were received. I want to say thank you to the many individuals and workgroups who embrace futuristic thinking and innovations, and to our leadership team and Board for their support in these efforts.

A handwritten signature in black ink, appearing to read "Roger S. Bailey".

GENERAL MANAGER

Roger S. Bailey



This report provides the status of optimizations completed and in progress between July 1, 2021 and June 30, 2022. Optimizations can create efficiency, save time, be cost effective, improve safety, innovate new ways of doing things, or all the above.

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23 OPTIMIZATIONS
COMPLETED

25 PROJECTS
IN PROGRESS

A UTILITY OF THE FUTURE TODAY

Central San was recently recognized with the **Utility of the Future Today** (UotFT) distinction for the second time (our first time being in 2019, pictured). The UotFT is a joint recognition program established by the National Association of Clean Water Agencies (NACWA), the Water Environment Foundation (WEF), the Water Research Foundation (WRF), and WaterReuse, with input from the Environmental Protection Agency (EPA).



ABOUT CENTRAL SAN

Established in 1946, Central San is a special district responsible for the collection and treatment of wastewater for nearly 500,000 residents and more than 3,000 businesses. It is headquartered in Martinez, California, approximately 30 miles east of San Francisco.

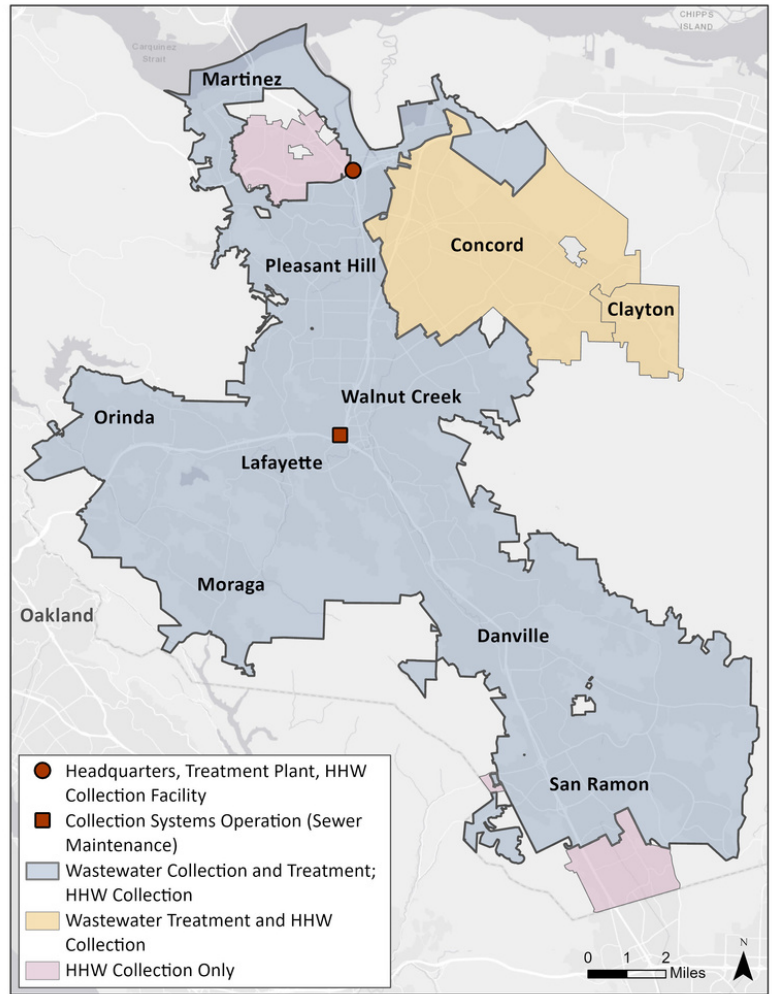
Central San serves the communities pictured in the service area map on the right. Central San operates and maintains about 1,540 miles of sewer pipelines and cleans more than 13 billion gallons of wastewater each year.

Central San has 294 budgeted full-time employees led by a General Manager, a Deputy General Manager, two Department Directors, and 13 Division Managers.

ENVIRONMENTAL STEWARDSHIP

Since 1997, Central San has operated a Household Hazardous Waste Collection Facility (HHWCF) that serves approximately 24,000 residential and small business customers, keeping more than 2.1 million (M) pounds of hazardous waste per year out of landfills and waterways.

Central San also operates a Residential Recycled Water Fill Station to provide customers with recycled water at no additional charge. Through the fill station and the Recycled Water Program, Central San distributes about 250M gallons of recycled water each year to help augment the potable water supply in the service area.



GUIDED BY A STRATEGIC PLAN



Every two years, Central San adopts a Strategic Plan as a roadmap to accomplish the goals set by the Board of Directors, reflecting the priorities and practices for the following two years. The FY 2020-22 Strategic Plan included Goal 6 - INNOVATION AND OPTIMIZATION: Explore new technologies for continuous improvement, setting forth the strategies, initiatives, and key success measures to drive optimizations and innovations to manage costs and embrace technology.

The FY 2022-24 Strategic Plan includes *Goal 7 - INNOVATION AND AGILITY*. In tandem with the annual Optimizations Program Annual Reports, the Strategic Plan Goal 7 Key Success Measures and Key Metrics help track progress in innovations and optimizations across Central San.

MISSION

To protect public health and the environment



VISION

To be an industry-leading organization known for environmental stewardship, innovation, and delivering exceptional customer service at responsible rates



VALUES

PEOPLE

- Respect customers and employees
- Work efficiently and effectively as a team
- Celebrate our successes and learn from our challenges

COMMUNITY

- Collaborate with water sector partners
- Foster community relationships
- Be open, transparent, and accessible
- Understand service level expectations

PRINCIPLES

- Be truthful and honest
- Be fair, kind, and friendly
- Take ownership and responsibility

LEADERSHIP AND COMMITMENT

- Promote a passionate and empowered workforce
- Encourage continuous growth and development
- Inspire dedication and top-quality results
- Provide a safe and healthful environment

STRATEGIC GOALS



INNOVATIONS FAIR

CELEBRATING EMPLOYEE INGENUITY AND CREATIVITY
BY SHOWCASING INNOVATIVE PROJECTS

At the September 21, 2022 Employee Appreciation Picnic, Central San hosted its first in-person Innovations Fair to celebrate employees' creativity by showcasing innovative projects currently in progress or completed in the last two years. Featured projects were selected from nominations submitted by staff, and display booths were created by the innovators. Fair attendees voted for Innovation of the Year.



INNOVATION OF THE YEAR:

DEBRIS-CATCHING DEVICE FOR MAINTENANCE ACCESS HOLES

Innovators: Tifton Gantt and Loren Reimer (Collection System Operations (CSO))

Adjusting maintenance access hole castings and covers creates concrete debris that falls into a makeshift device or into the channel, requiring a confined space entry or a vac truck to retrieve the debris. CSO made a **device that catches the debris at an easily-reachable level**, just below the frame and cover; is adjustable for access holes with different depths; and is easy to carry. Best of all, everything to make the device was found at CSO, with the only additional cost being a signpost.



INNOVATIONS FAIR

CELEBRATING EMPLOYEE INGENUITY AND CREATIVITY
BY SHOWCASING INNOVATIVE PROJECTS

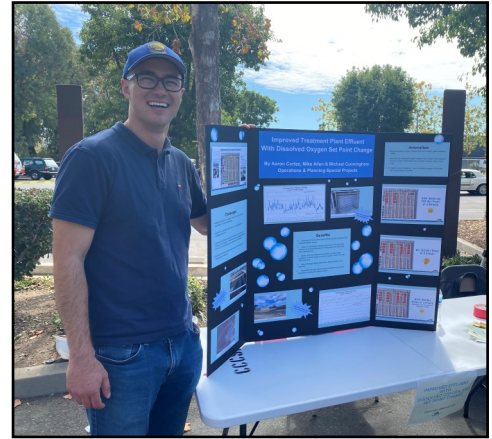
RUNNER-UP:

IMPROVED EFFLUENT WITH DISSOLVED OXYGEN (DO) SET POINT CHANGE

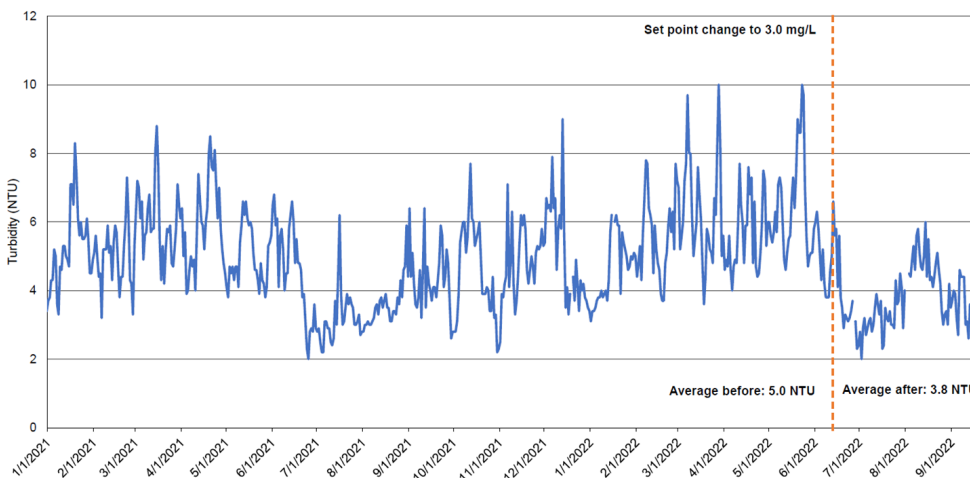
Innovators: Mike Allen (Plant Operations), Aaron Cortez (Plant Operations), and Michael Cunningham (Special Projects / Planning & Development Services)

Central San's aeration equipment is aging, making air distribution control a challenge. As high turbidity (low clarity) events increased in frequency and duration, Operations and Special Projects came up with a low-cost experiment to mitigate the issues. They methodically and gradually **increased the DO target** from the industry norm of 2 mg/L to a higher level of 3 mg/L to the first half of the tanks over three weeks. During the following months, they were surprised to see stabilized and improved effluent quality (reduced nitrogen and increased clarity), which have huge benefits for Central San.

The observed reductions in effluent nitrogen concentrations could help towards future potential permit limits. The improved effluent turbidity can reduce operations and maintenance (O&M) costs for downstream processes by requiring fewer ultraviolet (UV) disinfection lamps to be in service, reducing maintenance and electricity demand, and potentially reducing chemical usage in recycled water treatment. Improved secondary process performance will hopefully assist with maintaining stable effluent quality during upcoming capital projects around the treatment plant. Staff plans to continue fine tuning the DO target changes and quantifying benefits once the second aeration blower is back in service.



Treatment Plant Effluent Turbidity (lower turbidity indicates better clarity)



Lower turbidity levels indicate better clarity, which can reduce O&M costs and stabilize effluent quality during future shutdowns due to capital projects.

INNOVATIONS FAIR

CELEBRATING EMPLOYEE INGENUITY AND CREATIVITY
BY SHOWCASING INNOVATIVE PROJECTS

FEATURED INNOVATION: 75TH ANNIVERSARY EXPERIENCE

Innovators: Emily Barnett, Zoie Campbell (former intern), Chris Carpenter, Kelsey Lansang, Ben Lavender, Ann Valleé, Charles Waltmire (retiree), and Joe Zumbo

This 360-degree interactive website (75th.centrialsan.org) was created completely in-house by the Communications Team, to host a virtual public open house 75th anniversary event during the pandemic. The site is outfitted with a guided facilities tour; a learning hub with hands-on science activities for kids; videos; photo galleries; historical facts and images; and customer information on how to protect their pipes, safely dispose of household hazardous waste, and get free recycled water for their gardens. It enhances accessibility for tours, facilitates customer engagement, and has been used to recruit and educate future wastewater workers. Additionally, over 20 virtual tours for over 900 participants of all ages have been hosted using the site.

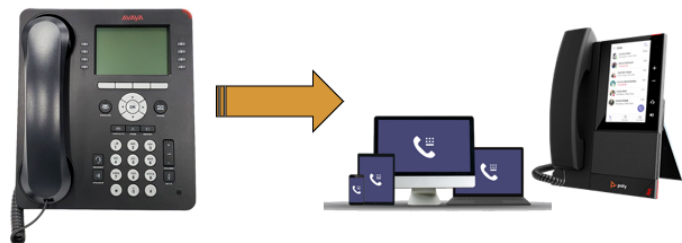


Since its launch a year ago, there have been **more than 11,000 page views** and **13,500 hotspot clicks** across the site.

FEATURED INNOVATION: TEAMS PHONE REPLACEMENT

Innovators: Dmitry Abramov, Damon Dun, Matt Hart, Tim Hiteshow, John Huie (retiree), Charles Mallory, Joseph Smith, George Solivar, and Jose Vega

Central San's former, dated Avaya phone system lacked modern communications and productivity features. To ensure a proper replacement, the Information Technology (IT) team spent three years considering different options, until they finally found a winner: **a phone system based on and integrated with Teams** - a program staff was already using extensively during the pandemic. Now, with the new system, staff can be more responsive while working off-site, maintaining high customer service levels, by making and receiving telephone calls from within Teams. In addition to having a "single pane of glass" for telephone, chat, and video meetings, Teams calling is cloud-based, so employees can access it from anywhere on a wide range of devices. This gives added flexibility to employees working remotely and provides a way to access the corporate phone system during an emergency or disaster when employees may be dispersed in various locations. Enhanced 911 service will automatically transmit detailed location information such as building and floor number to 911 dispatch. To make or receive telephone calls, staff now uses the Teams software client or a physical Teams phone.



INNOVATIONS FAIR

CELEBRATING EMPLOYEE INGENUITY AND CREATIVITY
BY SHOWCASING INNOVATIVE PROJECTS

FEATURED INNOVATION: TERTIARY MEMBRANE FILTRATION PILOT

Innovators: Amanda Cauble and Dan Frost (Planning & Applied Research)

To determine the suitability of membranes to meet Title 22 regulations, Planning & Applied Research operated and completed a **pilot project** to 1) refine operating parameters using three tertiary membrane manufacturers, and 2) operate a reverse osmosis skid to gather water quality information for potential refinery uses. The pilot required 24/7 operation during its six months, including performing operator checklists, water quality tests, and membrane chemical cleans; observing performance trends; and completing maintenance and repairs.



The pilot ran concurrently with Phase 1A of the Filter Plant Improvements Project, where staff changed the media in one of the four filter cells. Staff will compare the performance and operating costs of that media with the membranes in the pilot project. The pilot was completed and decommissioned in July 2022, and data is now being analyzed to help make informed decisions on the future of recycled water treatment at Central San.



FEATURED INNOVATION: UV RESOURCE PLANNING DASHBOARD

Innovators: Khae Bohan (Asset Management), Mike Matthews (Asset Management), Neil Meyer (Plant Maintenance), Ian Morales (Asset Management), Jon Nicolaus (Plant Maintenance), and Carl Von Stetten (Asset Management)

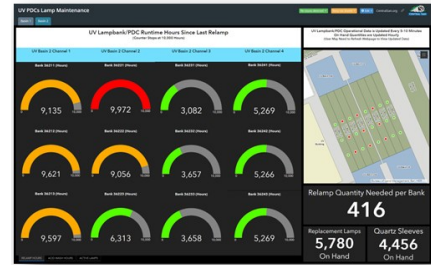
The objective of this project was to improve the way staff plans resources (e.g., staff availability and UV stock availability) needed to perform relamp tasks for the 9,984 UV lamps in the plant. The previous workflow (pictured) was reliant on binders, penned notes, and tedious parts audits to manually cross-reference Warehouse stock availability. This paper process can be hindered by supply chain issues, which can complicate the effort to organize staff and determine the equipment needed to perform the relamp tasks.



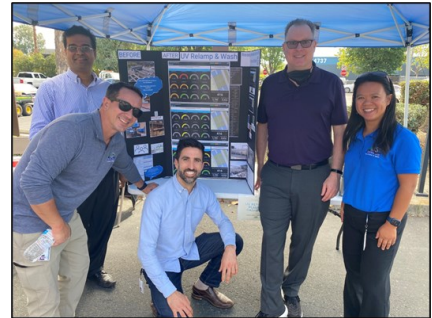
INNOVATIONS FAIR

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To improve this process, a new **dashboard** was developed to break down data silos by pulling in data from Oracle and the Supervisory Control and Data Acquisition (SCADA) system, to digitize the manual checking of runtime hours from SCADA. Staff now knows when to pre-plan maintenance activity based on a digital gauge reader, and when to tell the Warehouse the lamp sleeves and count of availability. The gauge reader will also show which assets are coming up for relamp, so Maintenance supervisors can plan well in advance and order supplies.



With this dashboard, staff can now utilize near real-time data to inform decision making and maintenance activities. The digitized monitoring process is a quickly interpreted dashboard, making the intersection of SCADA, Warehouse, and maintenance data immediately actionable, allowing staff to be proactive and save significant time.



INNOVATIONS IN MECHANICAL MAINTENANCE: HEAT EXCHANGER FLUSHING CART

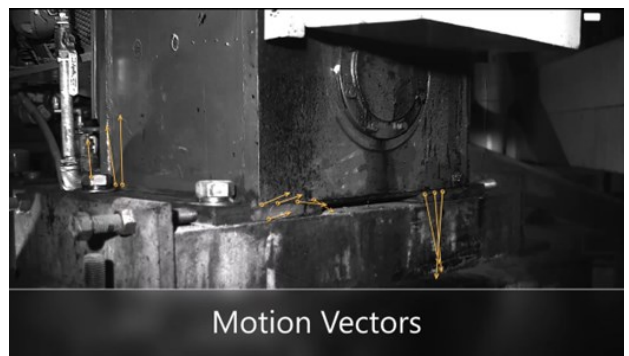
Innovator: Anthony Smith (Mechanical Shop)

Throughout the plant, heat exchangers run process water through tubes to keep critical equipment from overheating. Over time, the water leaves residue inside the walls of the tubes, reducing efficiency or eventually requiring replacement of the exchanger. This **flushing cart** – made in house – expels the material, allowing the exchangers to cool the equipment they serve for many more years.

INNOVATIONS IN MECHANICAL MAINTENANCE: DIAGNOSING, REPLACING, AND REPAIRING THE FURNACE NO. 2 GEARBOX USING MOTION AMPLIFICATION TECHNOLOGY

Innovators: Shaun Mockel, Anthony Smith, and Brian Walters (Mechanical Shop)

When Operations noticed an oil leak and a crack when bringing Furnace No. 2 online, Plant Maintenance diagnosed the issue by filming the furnace's gearbox in slow motion using **motion amplification technology**. In the video, technicians could see what was invisible to the naked eye: the gearbox was rocking side to side and cracking its case (pictured). The gearbox and pinion gear was changed, but, then, technicians noticed a potential "soft foot" (a void between mounting surfaces which can cause stress and deformation) on the rebuilt gearbox. Staff step shimmed each foot to minimize any soft foot issue, and they confirmed the fix was complete by taking follow-up motion amplification videos, which did not show the same rocking motion that caused the initial damage, letting them know the job was a success.



INNOVATIONS FAIR

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INNOVATIONS IN MECHANICAL MAINTENANCE: RETURN ACTIVATED SLUDGE (RAS) PUMP IMPROVEMENTS

Innovators: Kenny Rosenstiel and Brian Walters (Mechanical Shop)

RAS pumps help maintain a healthy population of microorganisms in the wastewater by returning activated sludge back to the treatment process. Staff made the following **improvements** to a RAS pump in the plant to enhance its performance and make future maintenance easier:

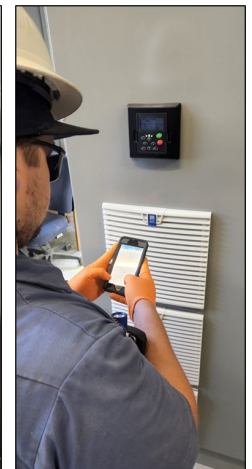
- Replaced v-belt with a cog belt (improving power transmission)
- Greased the bearings instead of using oil (increasing reliability)
- Converted mechanical seal from split to cartridge style (reducing leakage and making impeller adjustment easier)
- Chromed pump shaft surface (preventing corrosion)
- Split the 60 lb. guard in half for easier access (pictured below) (making maintenance a one-person job)



INCUBATOR BOOTH (PROJECTS IN PROGRESS): DIGITAL OPERATOR ROUNDS SHEETS

Innovators: Ashley Freeman (CSO), Nick Hansen (Plant Operations), Neil Meyer (Plant Maintenance), and Ian Morales (Asset Management)

Plant Operators perform "rounds" every day to gather data to monitor plant performance. On any given day, they can collect up to 3,300 data points on 18 sheets of paper, which they copy by hand for the Control Room. However, less than 8% of the data that is written or collected is currently stored electronically. In a multi-divisional effort, staff from CSO, Plant Ops, Plant Maintenance, and Asset Management have **digitized rounds sheets** by transferred them into Cityworks, and the Operators are currently beta testing the digitized process on mobile devices. If successful, the project will import and export data easily in a central system, and doing rounds will be a more efficient and paperless process. Additionally, if more data is needed to be tracked in the future, the templates can be easily edited to add new fields.



INNOVATIONS FAIR

CELEBRATING EMPLOYEE INGENUITY AND CREATIVITY
BY SHOWCASING INNOVATIVE PROJECTS



INCUBATOR BOOTH (PROJECTS IN PROGRESS): HANDHELD DEVICE TO COLLECT VISITOR DATA

Innovators: Dmitry Abramov (IT), Dennis Chebotarev (IT), Winston Ingram (HHWCF), and Dave Wyatt (HHWCF)

Technicians at the Household Hazardous Waste Collection Facility (HHWCF) and Recycled Water Fill Station process over 74,000 drivers licenses (DL) per year to confirm that the customers live in the service area. Technicians take the DLs, go to a computer station or use a tablet, and enter data into an aging system by hand.

To streamline this process, HHW and IT staff collaborated to identify and pilot a **new, compact device** that can scan a DL and collect data for improved record-keeping and reporting. The size of a smart-phone, the device can fit in a pocket for efficiency and mobility. The devices can also be used interchangeably at either facility. As an added safety bonus, the new scanners can scan a DL through a car window, not requiring the technicians to physically touch the DLs anymore.

The devices are also technologically advanced; they can perform speech-to-text entry, hide not-commonly-used fields, attach pictures, and add new functionalities as time goes on. Technicians can also select from “canned responses” (samples pictured below) to quickly make notes in the customer’s file. The system can automatically detect when the zip code on a DL is out of the service area.

Staff is now using the new devices full time. The second phase of the project - reporting and data visualization - is currently in development.

“It’s a great system that has really improved the way we register our customers for both HHW and recycled water. It has **streamlined** the entire process by increasing the range of our scanning and recordkeeping capability and offers the **flexibility** of using any of the devices for HHW or water customers.”
- Dave Wyatt,
HHW Program Administrator

A screenshot of the handheld device's software interface. It features a 'Zip Code' input field, a 'Been Here:' section with a 'Yes' toggle switch, an 'Extra: (Overload, Thermometers)' section with a plus icon, and a 'Notes/Pictures:' section with a minus icon. Below these are several buttons for 'Per DW', 'No Mask', 'E-Waste', 'Rude Customer', and 'Suspected business waste'. At the bottom, there is an 'Attach picture:' section with a 'Choose File' button and the text 'No file chosen', and an 'Accept or Reject:' label.

Thank you to all the nominators, innovators, and visitors
who made the fair a success!

OPTIMIZATIONS

NEW WAYS OF WORKING TO STREAMLINE AND MODERNIZE OPERATIONS,
MANAGE COSTS, AND PROVIDE EXCEPTIONAL CUSTOMER SERVICE

INTERAGENCY OUTREACH COORDINATION

Central San performed **strategic outreach coordination** with two sister agencies to increase customer engagement through new communication opportunities. Central San partnered with Contra Costa Water District (CCWD) on student education programming outreach and with East Bay Municipal Utility District (EBMUD) on virtual plant tours and the 75th Anniversary Customer Experience. CCWD and Central San partnered on a one water student education program which served over 13,000 students. EBMUD sent 14 emails that promoted Central San's plant tour along with EBMUD's tours to the District's customers. Over 75,000 customers received outreach on Central San's plant tours via emails from EBMUD.

ONLINE ACCESS TO INTERNAL DETAIL-LEVEL BUDGET-TO-ACTUAL REPORTS

To optimize staff productivity and reduce manual effort involved in preparing, reviewing, and distributing detail-level budget-reports for each cost center to staff, Finance has implemented **online access to budget-to-actual results** for managers and budgeteers. All managers and budgeteers have a unique login and can easily lookup specific cost center budgets at a summary or detail-level, at their discretion.

MONTHLY TO QUARTERLY FINANCIAL REPORTING TO FINANCE COMMITTEE

To provide transparency to the public and facilitate Board oversight of financial operations, financial reports have been presented on a monthly basis to the Board Finance Committee. These monthly reports are labor intensive to put together, yet, through the new ERP system, **quarterly reports** can be produced which are very robust, rendering monthly reports as providing little additional value. With Finance Committee concurrence, staff can transition to presenting detailed financial reports on a quarterly basis, in addition to monthly O&M and Capital budgets-to-actual summary reports, which will save staff time while preserving transparency and oversight.

PERMIT COUNTER CUSTOMER SERVICE

Development Services has seen a significant increase in activity, with more residents building accessory dwelling units (ADUs) and completing home projects that require Central San review. The Permit Counter has made **operational improvements** to optimize and maintain Central San's high level of customer service. To assist with the high volume of plans received, a temporary Administrative Assistant performs precursory reviews before going to a reviewer to assist with initial checks to catch general items the applicant may need. A dedicated email address acknowledges electronic receipt of plans and advises customers when their plans are ready for pickup. An ADU frequently asked questions sheet is in development to clarify the process and requirements for contractors and homeowners, to answer customers' questions before they arise.

STANDARDIZED DAILY CONSTRUCTION INSPECTION REPORTS

Staff has standardized the **daily construction inspection reports** used by outside consultants and internal engineers and inspectors. Initially, a beta team was testing sending these reports through e-Builder, but ultimately staff determined that sending the reports through Outlook makes the process efficient, mobile, more effective with improved timing of receiving the reports, and consistency in reporting.

OPTIMIZATIONS

NEW WAYS OF WORKING TO STREAMLINE AND MODERNIZE OPERATIONS,
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REMOTE RECYCLED WATER METER READING PILOT

Staff recently completed a two-year pilot to test new technology to [remotely read Zone 1 recycled water meters](#). Two generations of Water Pigeons were installed inside meter boxes at 10 piloted sites, sending water consumption data and analytics to a web portal. This could facilitate remote meter readings and be used to assist in identifying usage trends and potential customer leaks. CSO staff currently conduct these readings manually, which can take up to eight hours to read all 47 meters in the recycled water distribution system.

Unfortunately, due to battery and device failures, site condition limitations, reading inaccuracies and inefficiencies, and a high staff cost despite the low cost of the technology, full-scale implementation was not recommended, but the pilot served its purpose in allowing Central San to test this new technology for potential savings. Staff is currently researching alternative meters.



RECYCLED WATER INSPECTION MOBILE APPLICATION

Staff developed a [Recycled Water Inspection mobile application](#) to conduct inventory of meter, valve, hydrant, and sampling station locations with photos.

DAM FOR OVERFLOW RESPONSE CLEANUP

CSO purchased an [dam](#) that can be inflated with water to use for Category 1 sanitary sewer overflow emergency response. In the past, CSO has used plastic and sandbags to create a pool in a creek that can be used for pumping operations. This was very labor intensive and had a high potential for slips, trips, and falls. The new dam can be carried down to the creek with just two people - only requiring them one trip, and allowing crews to stop the flow in a creek in minutes. Staff found the product online as marketed for building protection from flooding, and re-imagined it to put it to work for Central San's needs.

EASEMENT VEHICLE

Staff re-purposed an existing field truck to accommodate rodder hoses for easement maintenance by adding a new utility bed. This created an [Easement Vehicle](#) specifically outfitted for easement maintenance.

PRE-CONSTRUCTION UTILITY LOCATING

Central San has unofficially adopted a practice to thoroughly evaluate project sites with [pre-construction utility locating](#). This practice aids with design, helps contractors with their bidding, provides some relief from high dollar change orders, and prevents damaging other utilities. The useful exercise has expanded beyond the typical collection system projects to treatment plant projects, and is now an overall Capital Improvement Program practice in the agreement scope.

OPTIMIZATIONS

NEW WAYS OF WORKING TO STREAMLINE AND MODERNIZE OPERATIONS,
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DON'T JUST FIX IT; IMPROVE IT

Plant Maintenance staff is constantly rehabilitating assets to optimize their performance. They make it a regular practice to not just perform the preventive maintenance (PM) or repair, but also to ask what more can be done. Work orders that are categorized as "Don't Just Fix It; Improve It" (DJFI) typically are an optimization idea to respond to a failure before an asset's useful life, repeat failures showing on the Bad Actors list, multiple reactive or corrective work orders on a high-criticality asset, or more than one reactive work order with a priority of one or two on a specific asset between PM tasks.

In total, **14 DJFIs** were completed in FY 2021-22 that resulted in energy cost savings, staff time savings, added redundancies, improved resiliency, simplified operations, and/or made adjustments needed for regulatory requirements.

QUALITY ASSURANCE / QUALITY CONTROL PLANNER UPDATES

When Plant Maintenance technicians are fulfilling a work order, they sometimes identify a need to update the work order to reflect a better way of performing the task than prescribed. Within Cityworks, Maintenance staff can check a box that sends an email to a Maintenance Planner to request a quality assurance / quality control (QA/QC) check or improvement to the work order, standard operating procedure, or asset. The Planners then review and update the work order accordingly. This practice ensures that the work orders which form the basis of all maintenance tasks are kept updated both by staff doing the work and by staff scheduling the tasks, leading to increased PM program effectiveness and efficiency. Staff is constantly QA/QCing and improving the work orders in Cityworks. Staff completed **106 QA/QC Planner updates** in FY 2021-22.

ARC RATED, QUICK ELECTRICAL DISCONNECTS ON MOTORS IN HEADWORKS

Washer compactor motors in the Headworks are frequently disconnected so Mechanical Maintenance technicians can perform preventative maintenance on the motors. Previously, the Electrical Shop would have extensive involvement in the process, to facilitate the electrical disconnect and isolation of the hardwired motors. By **installing arc rated, quick electrical disconnects** on washer compactor motors, the electrical isolation can be performed relatively quickly by either Mechanical Maintenance or Operations staff (with some training on the process). This may potentially eliminate some call outs for electrical support on this equipment. The installation was performed consistently with the highest standards of electrical safe work practices and national code requirements.



OPTIMIZATIONS

NEW WAYS OF WORKING TO STREAMLINE AND MODERNIZE OPERATIONS, MANAGE COSTS, AND PROVIDE EXCEPTIONAL CUSTOMER SERVICE

ONE-WEEK LOOK-AHEAD SCHEDULE FOR WORK ORDERS

Reliability Engineering produces a one-week look-ahead schedule for upcoming work orders. The schedule forecast utilizes the Doc Palmer methodology, which is renowned in the maintenance world for the way it systematically prioritizes and groups hundreds of work orders for the same equipment and/or equipment in close physical proximity to gain efficiency. The custom schedule saves time by sorting and coordinating hundreds of work orders, reducing equipment shutdowns, and ensuring that regular PM activities are not missed. The work descriptions indicate what kind of maintenance it is (e.g., preventive, predictive, etc.) and at what frequency the work is scheduled to be performed. Reliability Engineering works closely with the Maintenance Shops to continue to refine the look-ahead schedules (sample pictured) to show the most relevant information and eliminate redundancies.

Plant Operations Department							
CENTRAL SAN CENTRAL CONTRA COSTA SANITARY DISTRICT							
MAINTENANCE DIVISION Schedule Forecast							
For Period: 10/24/22 to 10/28/22							
#	WO #	Work Description	Equipment	Status	Priority	Type	Total Estimated Hours
1	554528	PM Fogger Pump 1 Month	22119 FOGGER - HWKS FENCE, 22120 FOGGER - PRI HI PRES OCU, 22200 FOGGER - PRI SED TANK AR, 32500 Fogger, Hi-Pres OCU Sys	INITIATED	3	PREVENTIVE	3
1.1	556655	PM Fogger Pump 1 Week	22119 FOGGER - HWKS FENCE, 22120 FOGGER - PRI HI PRES OCU, 32500 Fogger, Hi-Pres OCU Sys	INITIATED	3	PREVENTIVE	3
2	556656	PM Vulcan Screens 1 Week	24110 Wet Well 1, 24120 Screen 1, 24210 Wet Well 2, 24220 Screen 2, 24320 Screen 3, 24420 Screen 4	INITIATED	3	PREVENTIVE	1
2.1	541288	PM Vulcan Barscreen 6 Month	24120 Screen 1, 24220 Screen 2	INITIATED	3	PREVENTIVE	21
2.2	539624	PM Vulcan Barscreen 6 Month	24320 Screen 3, 24420 Screen 4	INITIATED	3	PREVENTIVE	21
3	554027	PDM Steam Aeration Units 1 Month	51231 Aer Unit 1 Lube Oil Reservoir, 51232 Aer Unit 2 Lube Oil Reservoir	INITIATED	3	PREDICTIVE	2
4	554025	PDM Lube Room Inspection 1 Month	200000 Treatment Plant	IN PROGRESS	3	PREDICTIVE	10
5	506867	PM Final effluent valve replacement annual	34510 Bioassay Trailer (Lab)	INITIATED	3	PREVENTIVE	1
6	554031	PM PE Pump Gearbox 1 1 Month	52103 Pri Eff Pump 1 Gear	INITIATED	3	PREVENTIVE	2
7	554030	PM PE Pump Gearbox 2 1 Month	52104 Pri Eff Pump 2 Gear	INITIATED	3	PREVENTIVE	2
8	377963	PM Service Air Heat XC 4 Year	52260 Heat Exchanger 1, Service Air	INITIATED	3	PREVENTIVE	20
9	554538	PM Waste Oil Pump 1 Month	55212 WASTE OIL PUMP	INITIATED	3	PREVENTIVE	1
10	541196	Install	69000 Material SB and Mech Maint Bldg	IN PROGRESS	3	NON-MAINTENANCE CORRECTIVE	32
11	551162	Manufacture	69000 Material SB and Mech Maint Bldg	IN PROGRESS	3	NON-MAINTENANCE CORRECTIVE	30
12	554564	PM Mechanical Shop Slings 1 Month	69000 Material SB and Mech Maint Bldg	INITIATED	3	PREVENTIVE	4
13	556421	PDM Furnace Blowers 1 Week	71102 Furn 2 Shaft Cooling Blower, 71126 Furn 2 Comb Air Blower, 74102 Furn 2 ID Blower	ASSIGNED	3	PREDICTIVE	3
14	551775	PDM Pugmill 2 Month	71115 Pugmill (Ash Screw Conveyor)	INITIATED	3	PREDICTIVE	3

CONDITION ASSESSMENT TECHNOLOGIES

Central San uses advanced, non-invasive **condition assessment technologies** to minimize disruption to plant operations. Examples include remote field testing (used with Auxiliary Boilers, pictured at left) and guided wave inspections (used with steam piping, pictured at right).

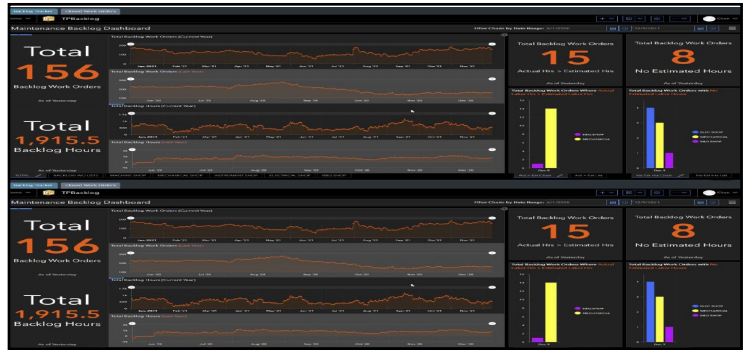
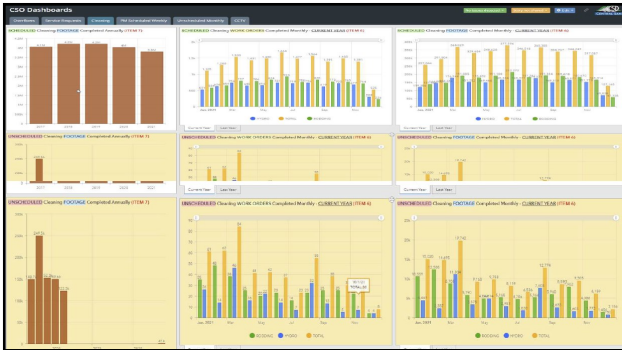


OPTIMIZATIONS

NEW WAYS OF WORKING TO STREAMLINE AND MODERNIZE OPERATIONS, MANAGE COSTS, AND PROVIDE EXCEPTIONAL CUSTOMER SERVICE

DASHBOARDS

Dashboards help staff monitor, report, and adjust operations by implementing automatic monitoring and reporting of key maintenance and crew parameters. They provide easy access to information without having to log in or navigate specialized systems. Search functions display information specific to the treatment plant asset, including as-built drawings, project drawings, manuals, etc. As part of the Asset Management Program, staff is constantly rolling out new dashboards. Currently, one is in the works to display trending information from bearing temperature and sound inspections.



FINDING INSPIRATION FOR OPTIMIZATION

Central San is always open to learning about new technologies, and **being inspired** to innovate by seeing what private companies and other agencies are doing. By touring the Anaergia Rialto Plant in Southern California, staff researched the latest and best practices on biosolids and solids waste management, biogas production, and energy recovery. The Anaergia Rialto Plant facility diverts organic waste from landfills and biosolids from municipal wastewater treatment plants to produce high-quality methane gas. The renewable gas is then sold to SoCal Gas, reducing greenhouse gas emissions by up to 220,000 metric tons per year. Designed to process up to 1,000 tons of food waste and biosolids per day, the plant is one of the largest organic waste diversion and energy recovery facilities in North America. This was a timely visit as Central San is undertaking its own biosolids management studies.



IN PROGRESS

OPTIMIZATION PROJECTS CURRENTLY UNDERWAY OR IN THE WORKS

HAZARDOUS MATERIALS DATABASE

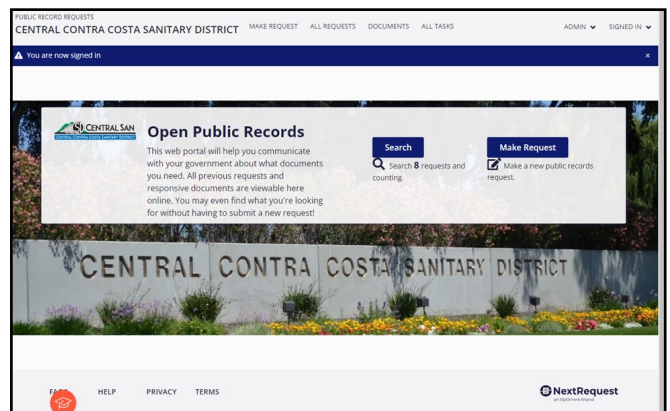
Hazardous materials tracking is currently handled in a Microsoft Access database that is not easily searchable or accessible from multiple locations. A more sophisticated hazardous materials tracking database will automate the tracking of hazardous materials and locations throughout Central San's facilities. When launched, the new database will be linked from the San Central intranet to make it easy to find and use.

PUBLIC RECORDS REQUEST MANAGEMENT THROUGH NEXTREQUEST

The Secretary of the District office has contracted with online, cloud-based platform **NextRequest** for the management of Public Records Requests. To optimize Central San's response to requests, this application offers some great features, such as the following:

- A single repository with unlimited file size and comprehensive tracking capabilities for all communications and documents related to requests. This means no more emails, attachments, Share-Point folders, Excel spreadsheets, etc.
- In-app redaction capability that ensures confidentiality and safety of personally identifiable information
- Simplified and improved accessibility for all requesters via an online portal, with enhanced ability to connect them with self-service information
- Robust reporting capabilities that define what is being requested, by whom, and how CentralSan responds.

Once launched, the landing page for NextRequest will be at <https://centralsanca.nextrequest.com/>.



PIPELINE TOOL AND MAINTENANCE ACCESS HOLE INSTALLATION DEMONSTRATORS

CSO completed an award-winning Overflow Simulator in past years, and now, they plan to further expand their in-house training tools to include a **demonstrator of pipeline cleaning tools**, and a **demonstrator on how to install a maintenance access hole** - specifically, the proper methods of turning cleaning tools within the maintenance access holes. When completed, these projects will efficiently train staff and potentially also educate customers on the work done to maintain sewer pipelines.

PROCORE CONSTRUCTION MANAGEMENT SOFTWARE

Capital Projects staff has begun using a new construction management software called **ProCore**. They are currently using it through consultants but could acquire it for full-time use if the pilot is successful.

IN PROGRESS

OPTIMIZATION PROJECTS CURRENTLY UNDERWAY OR IN THE WORKS

OPTIMIZING CLEANING SCHEDULES

Cleaning and performing maintenance on sewer lines effectively and on schedule prevents overflows and uses staff resources efficiently. Using the Pipeline Cleaning Schedules Web Application, CSO staff is **constantly reviewing and improving pipeline cleaning schedules** based on schedule frequency intervals and by location. Staff can see information on each pipe, project out seven years, and schedule mains or groups of mains to manage distribution of schedules by month. Pipelines can be on one-, two-, three-, or six-month schedules, or on one-, two-, three-, five-, and seven-year schedules. Using the web application software, staff continues the ongoing effort to optimize these schedules with the goal of reducing overflows, helping to meet Central San's ambitious Strategic Plan target of completing $\geq 98\%$ pipeline cleaning schedules on time, increasing productivity, and reducing vehicle wear-and-tear.

ONLINE ENVIRONMENTAL COMPLIANCE PERMITTING

Staff is currently evaluating whether it is feasible to move some of the **Environmental Compliance permitting** to an online system. Part of the feasibility depends on regulatory requirements.

PURCHASING CONTRACT DOCUMENTS IN LASERFICHE

To alleviate the limitations that have been experienced affecting the naming structure, accessibility, and the security of Purchasing contract documents, these files will be **moved into a central repository, Laserfiche**, to provide a secure storage location while also giving staff across the organization the ability to search and access the contract documentation they are looking for in a system with which they are already familiar. Staff has moved the documents into a shared network drive and will continue to work on uploading them into Laserfiche.

MAINTENANCE ACCESS HOLE REMOTE MONITORS

Staff recently tested two **remote manhole monitoring** vendors over 12 months. The technology applications of these units include real-time level monitoring, hydraulic surcharge evaluation, cleaning frequency validation, and smart systems.

Following the pilot, after weighing the pros and cons of each unit, staff selected the one that provides real-time understanding of levels, level and machine learning alerts, and easy-to-access data. Staff is moving forward with developing a scale-up phasing strategy to employ monitors in the collection system as part of the Collection System Master Plan update.



LEARNING MANAGEMENT SYSTEM

Having a **centralized learning management system** will fill an existing need to track District-wide training consistently and in a centralized place for reporting purposes such as benchmarking and strategic planning. Staff had previously identified NeoGov to fulfill this purpose, as the system can not only track spending and hours, but also course content.

IN PROGRESS

OPTIMIZATION PROJECTS CURRENTLY UNDERWAY OR IN THE WORKS

GRIT TRAP DESIGNED BY STAFF

Solids and grit tend to build up in pipelines when flow is low. For larger pipes designed to handle wet weather conditions, seasonal changes and weather can contribute to the challenges of low flows, as they require higher flows to flush grit and solids settlement. Thus, larger pipelines can retain more sediment during long periods of low flow. This is especially the case for siphons that can trap settlement until higher flows are present. In response to recurring challenges encountered in cleaning and flushing one particular 42-inch interceptor and siphon, staff designed a **grit trap** that can be installed before sewage even enters the siphon. The new structure will help CSO significantly. Installation will be completed by a contractor as part of the Danville Sewer Renovations, Phase 4, District Project 8466. This project is ongoing and scheduled for completion in FY 2022-23.

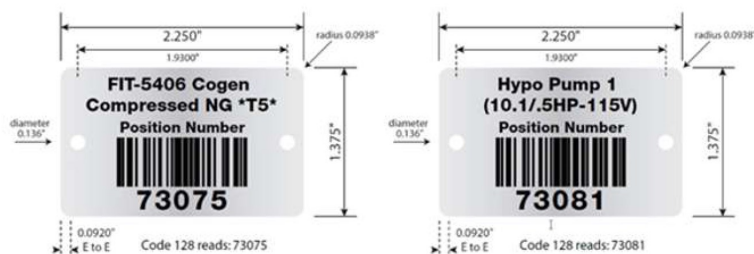
ASSET CONDITION MANAGEMENT PROGRAM DEVELOPMENT

Plant Maintenance is constantly developing its **condition monitoring program** which incorporates new technologies and expands on condition-based maintenance and predictive maintenance activities. Asset condition monitoring technologies include ultrasound testing, motor analysis, visual inspection, infrared thermography, vibration analysis/motion amplification, lubrication and fluid analysis, laser alignment, cathodic protection surveys, and closed-circuit television (CCTV).



ASSET BARCODING

Staff has begun putting **barcodes on assets** to streamline work order creation and asset lookup. For this pilot project, Central San put about 100 barcodes on assets and tested a new user interface using mobile tablets. Currently, staff is standardizing asset names and they plan on ordering more barcodes.



36243 UV Lamp Bank/PDC 36243



37010 Hypo Pump 1 (40/2HP)

IN PROGRESS

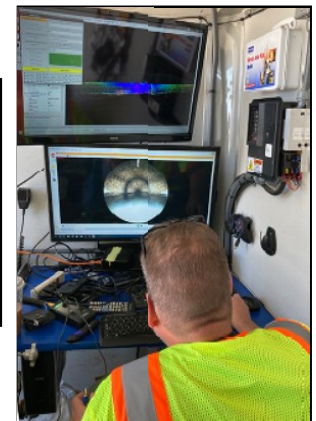
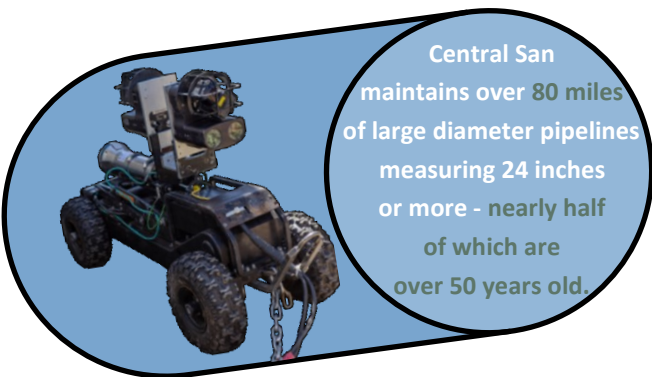
OPTIMIZATION PROJECTS CURRENTLY UNDERWAY OR IN THE WORKS

LARGE-DIAMETER PIPELINE INSPECTION PROGRAM

Central San has launched a pilot project using **multi-sensor technology to assess the condition of its largest sewers** and better plan for needed repairs and replacements. The 39-inch reinforced concrete pipe located near the treatment plant, for example, dates to the late 1940s. Staff has begun working with contractors to inspect about 630 feet of one of Central San's interceptors using the state-of-the-art technology like lidar, which emits laser pulses and measures the time it takes them to bounce back to the receiver. From this, staff can determine the inside diameter of the pipe in different locations and spot deviations: a sign that the pipe may have corroded or thinned in that area.

To assess the pipe, contractors are using a four-wheel-drive buggy that can be equipped with a variety of sensors. The vehicle is lowered into the maintenance access hole and operated remotely from a control van (similar to the CCTV system used for inspecting smaller pipes).

The Executive Summary for phase 1 has been completed. If the results from phase 1 of the pilot prove valuable, the team plans to continue assessing other interceptors in the system. Next on the list is 29,000 feet of 30- to 36-inch pipe along Danville Boulevard. In phase 2, staff will evaluate options to improve safety and reliability, enhance ease of operation, extend the useful life of equipment, and reduce operating costs.



STEAM AND AERATION BLOWER SYSTEM IMPROVEMENTS

Central San's steam system is complex and aging, requires significant maintenance, and has the potential to perform more energy recovery. The Steam and Aeration Blower Improvements (**Steam Project**), a multi-year effort to optimize one of the main power sources at the treatment plant, continues to progress. After a two-year condition assessment effort to estimate the remaining useful life of the existing boiler feedwater, steam, and aeration systems, as well as associated structural, electrical, and instrumentation and control systems, workshops were held with consultants and staff to discuss the results of the condition assessments, including remaining useful life and improvement options for current equipment.

Now in Phase 2, staff is evaluating options to improve safety and reliability, enhance ease of operation, extend useful life of equipment, and reduce operating costs. The overall Steam Project will be completed as four separate projects: 1) Blower Project, 2) Aeration Basin Diffusers, 3) Secondary Process Improvements, and 4) Steam Process Improvements. The Executive Summary was recently completed.



IN PROGRESS

OPTIMIZATION PROJECTS CURRENTLY UNDERWAY OR IN THE WORKS

SODIUM HYPOCHLORITE USAGE FOR #3 WATER

This Mentorship Project from the 2018 cycle of mentees identified the ability to **reduce or eliminate the use of bleach** to disinfect #3 (tertiary-treated) water as a potential cost savings. Staff sought input from multiple divisions, tested samples, and gathered data to confirm that there is no chlorine residual requirement for in-plant water use within Central San's National Pollutant Discharge Elimination System Permit, and the #3 water for on-site use is a Title 22 exemption Central San provides for itself. Thus, Central San could either eliminate sodium hypochlorite feed to the high and low pressure #3 water or significantly reduce the current amount used by as much as 50%. While there is not a capital cost associated with elimination, there is a capital cost with reduction that has a payback of approximately eight months. A chlorine analyzer is on site and mounted and will be installed in the Piping Renovations, Phase 10 Project. This analyzer will provide the necessary hardware to establish this feature, so staff can perform program modifications to adjust the pump speed to maintain a desired chlorine dose.

ENTERPRISE RESOURCE PLANNING SOFTWARE REPLACEMENT

A multi-year optimization project to replace Central San's outdated CentralSquare / SunGard HTE enterprise resource planning (ERP) system with Oracle Fusion Cloud is now mostly complete. Staff is now using the new ERP software to manage business data and processes for Human Resources, Procurement, Accounting, Billing and related subsystems. Every area of Central San's operations depends upon the ERP as a foundational technology. Replacing the ERP was a highly complex and time-consuming effort involving conference room pilots, user acceptance testing, closing of configuration gaps, data conversion system documentation, and training staff. While it was a challenge, the new ERP system improves internal operations with employees by eliminating onerous and time-consuming paper-based procedures, re-engineering business processes to employ controls and best practices for efficiency and security, facilitating productive work from home, and producing reports that assist staff and our leadership in making smart data-based decisions. It also opens the door to future new modules which are in the process of being developed:

GOALS AND PERFORMANCE MODULE

This module will facilitate the rollout of the enhanced performance appraisal process, which - among other improvements - includes an employee self-assessment, clearer rating scales and competencies, and is based on supervisory or non-supervisory roles instead of bargaining unit. The new process will bring a career coaching and personal development focus to the appraisal process, and it will be done electronically through Oracle. Staff worked with Oracle to develop and test the module and drafted

IN PROGRESS

OPTIMIZATION PROJECTS CURRENTLY UNDERWAY OR IN THE WORKS

procedures. The new module and performance appraisal process will be launched after the module goes live and the procedures are tested.

COMMUNITY DEVELOPMENT PERMITTING MODULE

This module will migrate the permitting system from the legacy SunGard system, to improve business processes, add tools for public access and mobile inspection, save staff time, and improve customer service. It can potentially integrate with Environmental Compliance permits and the future billing module. Go-live is scheduled for fall 2023 upon the release and implementation of a software update by Oracle that will provide necessary functionality for use of the module by Central San.

SAFETY MODULE

This is currently on hold, pending improvements from Oracle.

MOBILE DEVICES FOR INSPECTORS / DIGITAL PROJECT PLAN REVIEW

Development Services inspectors currently carry paper with them on their jobs, but having the plans available digitally will save time and money in running hard copies. When the Oracle permitting software is completed, Inspectors may transition to full use of mobile devices to use the permitting software and GeoPortal in the field.

IT STRATEGIC PLAN

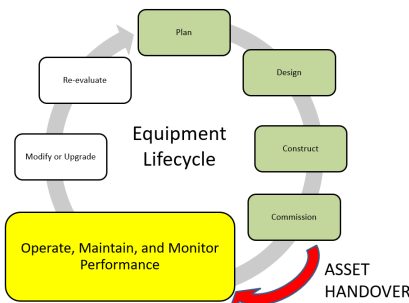
To develop the updated IT Strategic Plan, Central San engaged a firm that specializes in master planning, which has partnered with an engineering consultant to help guide Central San through the process, with the benefit of their experience in implementing universal technology plans at other utilities. The goal of this project is to keep Central San at the forefront of innovation and ensure that Central San uses IT effectively to reduce risks and improve efficiency; plan for both business and O&M needs; establish a framework for bringing in new technology in smart ways; transform data into actionable information; stage projects for success with proper resources and foundations in place; and provide for proper security, business continuity, and disaster response. The IT Strategic Plan will include roadmaps for various systems that will be considered both on their own as well as in the context over the overall effort. This will ensure that needs of each business unit will be addressed and provide a path forward that will take into consideration cost and resource requirements for each functional area. Specific roadmaps will include Enterprise Asset Management, Geographic Information System, SCADA, Document Management, Information Security Roadmap, and Business Intelligence & Analytics Planning. These will be incorporated into an overall plan that will also include methodologies to ensure that future projects will properly integrate and interoperate with existing systems and business processes prior to project initiation. In addition, Central San will be using this opportunity to explore ways to improve standardization and implement a platform to help support all systems in a cohesive manner. When information from each system can be accessed in a uniform way, providing needed data to staff will be simplified. This will enable the creation of more useful agency dashboards, which will put information in the hands of the end-users, where it belongs. The consultant has completed their interviews with staff, and results are expected in mid-2023. Projects included in the IT Strategic Plan include the following:

IN PROGRESS

OPTIMIZATION PROJECTS CURRENTLY UNDERWAY OR IN THE WORKS

DOCUMENT MANAGEMENT

Most agencies struggle with maintaining documents, files, email, and other information in a way that staff can find current information quickly. Central San is no exception. Documents are stored in a variety of places that are impossible to search in any practical way. Documents are stored on network drives, in email folders, SharePoint, LaserFiche, and many other places. When staff retire or change positions, their records are sometimes hard to find and important information can be lost. In addition, Central San still has many paper documents stored in file cabinets and off-site storage. These documents are difficult to find and are at constant risk since they are susceptible to loss by fire or water, or simply by being misplaced. The IT Strategic Plan will inventory and prioritize the major documents stored across the organization. Items will be scanned, procedures will be created to make sure staff is working with the latest information, and indexing and nomenclature standards will be created. This will help ensure that the document retention schedules are being followed and the needs of the organization are met in terms of workflow, security, and system backups.



TREATMENT PLANT ASSET HANDOVER PROCESS

The Treatment Plant Asset Handover Process is a complicated series of steps, requiring coordination among all multiple divisions to ensure the continuity of O&M of new assets delivered from the Engineers to the Plant staff as capital projects. Various departments and programs are involved in the planning and design, construction, and project closeout of acquiring, replacing, or disposing of capital assets. Often, documentation and information are in silos and are not properly passed off to the

O&M staff, who need this information to properly service the equipment. Some of the equipment is also decades old, and records are no longer available. Without the historical information on the equipment, staff must come up with creative, sometimes costly, ways to fix the asset. Some of the asset handover processes include properly recording as-builts, as-is drawings, hazard energy control procedures, manuals, spare parts, and asset registries. Flowcharts depicting each process have been generated and reviewed by stakeholders. Software is being evaluated to automate these processes, to hand over asset information to the appropriate staff, and to house it in a centralized document management system using supportable processes and methodologies.

ASSET HEALTH INDICATOR TOOL

This is a tool to use data and analytics to optimize maintenance schedules to supplement Central San's condition-based maintenance program. Plant Maintenance has various asset condition monitoring sensors which monitor and measure the health of assets and identify opportunities for optimization. These tools can sense vibration, thermography, ultrasound, motor windings temperature, flow, laser alignment, and motion amplification. The objective of using these sensors, coupled with analytics tools, is to perform analysis on the assets and determine when a failure may occur, when to perform maintenance, how to reduce overall cost of maintenance, and ways to improve reliability. Part of the IT Strategic Plan will be to develop [Asset Health Indicator Requirements](#) and an [Asset Tool Framework](#) and workflows, evaluate various software products, and begin rolling this program out in a systematic way that will more efficiently utilize maintenance staff and resources while improving the reliability of these systems.



OPTIMIZATION STRATEGIC INITIATIVE

A MULTI-DEPARTMENT EFFORT TO IMPROVE PERFORMANCE IN ALL DIMENSIONS

VISION

The District is implementing a multi-department strategic initiative to improve performance through organizational development and enhancements in training, workflow efficiencies, and physical facilities by adopting the latest in data management and analytics. This effort will be particularly focused on integrated and system-wide improvements to collection, treatment, and reuse/disposal facilities.

ADOPTING A DATA-DRIVEN DECISION PROCESS

This initiative will reduce O&M costs and optimize the need and timing of projects through the Capital Improvement Plan (CIP) by implementing real-time data-driven decision-making and by leveraging the latest technologies in real-time monitoring and advanced process controls. The overall goal of this project is to identify and prioritize the monitoring, metrics, and controls for improving efficiencies of those treatment processes that consume the greatest amount of power, chemicals, and supplies - and to develop real-time (RT) monitoring and reporting systems that track the performance and progress of the top-ranked efficiency projects towards the objectives.

OVERALL APPROACH TO IMPLEMENTATION

This initiative will be implemented as a phased program, with the major phases including the following:

- Phase 1 – Organizational Structure and Communications
- Phase 2 – Data Management, Performance Metrics/Analytics
- Phase 3 – Discovery and Innovation
- Phase 4 – Collection, Treatment, and Reuse/Disposal Optimizations
- Phase 5 – Training and Continuous Improvement Reporting/Feedback

Phase 1 - Organizational Structure and Communications: This phase will focus on improved communications across Central San's departments and divisions to leverage existing capabilities and to better coordinate data-gathering activities and methods. Progress to date is the recent formation of a new Optimization Division in the Operations Department. The new Optimizations Manager is anticipated to be selected and in place by the close of December 2022.

Phase 2 – Data Management, Performance Metrics/Analytics: The goal of this phase is to improve data-driven decision-making processes through improved data collection, analytics, and Operations Technology (OT). Progress to date includes contracting with Aquasight, a company that is on the cutting edge of real-time monitoring and analytics. Aquasight will assist O&M staff in optimizing operations and achieving savings in power and chemical costs, determine proactive maintenance needs and document knowledge, train new staff, and aid in decision making. The use of real-time monitoring alongside SCADA will leverage operations' capabilities to assess and respond to help with optimization and contribute to knowledge retention. This phase will engage deep collaboration among all the departments and divisions, especially IT. At the completion of phase 2, the vision is to have 7 to 10 TV screens in hallways with high foot traffic in the Martinez offices to show real-time operating performance at a glance.

Phase 3 – Discovery and Innovation: This phase is the heart of idea generation for tracking, assessing, and adopting the latest optimization strategies and assets, including extending awareness of industry

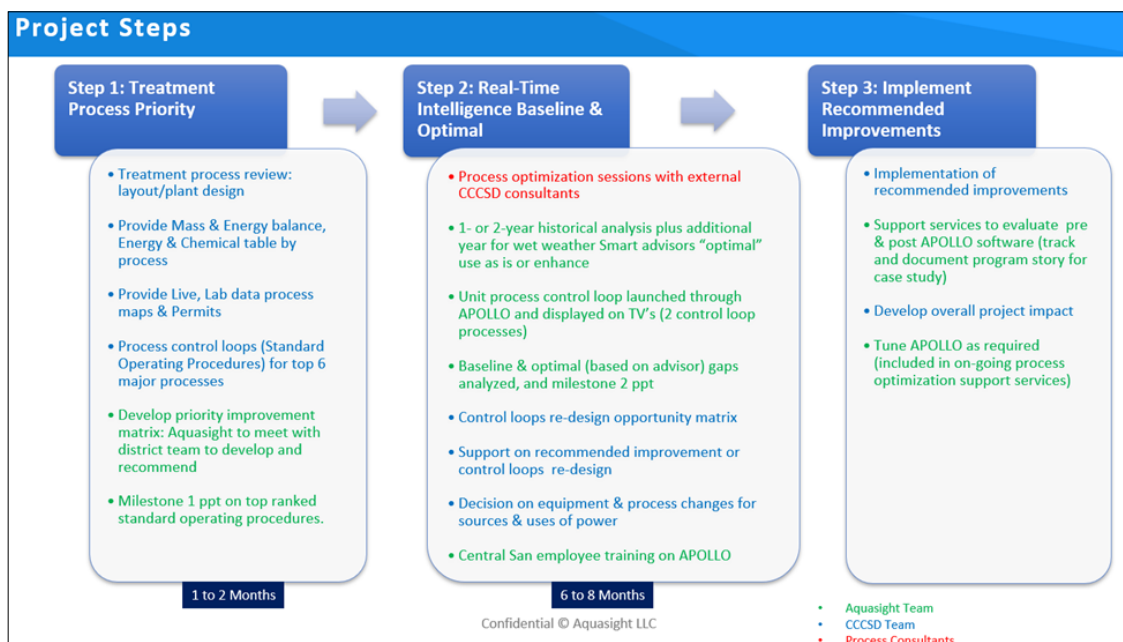
OPTIMIZATION STRATEGIC INITIATIVE

A MULTI-DEPARTMENT EFFORT TO IMPROVE PERFORMANCE IN ALL DIMENSIONS

trends and opportunities. Progress to date is the formation of a Blue-Ribbon Treatment Process Committee composed of the top process engineering experts and innovators in the industry from four different consulting firms. The Blue-Ribbon Committee will help to lead overall discovery and brainstorming efforts through facilitated workshops conducted every quarter. The Blue-Ribbon Committee and Central San team will work together to develop the fundamental information and data requirements for successful completion of the objectives for optimization. The team will work through a series of tasks and analytical evaluations to identify the top-ranked unit operations and process control loops as candidates with the greatest opportunities for sustained cost savings. Also, this effort is being closely coordinated with the development of the IT/OT Strategic Plan currently in progress.

Phase 4 – Collection, Treatment, and Reuse/Disposal Optimizations: The purpose of Phase 4 is to develop a final assessment and recommendations for implementation of optimization projects and programs. The conceptual ideas and improvements that are generated in Phase 3 will be assessed and short-listed for implementation in Phase 4 through a 3-step process. Step 1 is to develop the Basis of Design. This includes the comparative costs and benefits of not only individual asset options, but also overall systems for improved reliability and efficiencies. Step 2 is to finalize the conceptual design to confirm earlier expectations. Step 3 is the final design/construction for capital assets, or the development of new operating standards and program initiatives, as determined. More specifically, this effort will be key to achieving the institutional and policy objectives outlined in the Strategic Plan, including water reuse and net zero greenhouse gas emissions.

Phase 5 – Training and Continuous Improvement Reporting/Feedback: This phased program and project implementation approach will build on the collaboration among the Central San Team, the Aquasight Team, and the Blue-Ribbon Committee Process Experts. It will also require ongoing communication and development of training support and performance feedback reports that are comprehensive, concise, and complete the circle of continuous improvement. Progress toward this effort is work that Central San has done to collaborate with the developers of Jarvis, an Operator training and knowledge retention software support system.



ACRONYMS



ADU	Accessory Dwelling Unit	HHWCF	Household Hazardous Waste Collection Facility
CCTV	Closed-circuit Television	IT	Information Technology
CCWD	Contra Costa Water District	O&M	Operations and Maintenance
CSO	Collection System Operations	PM	Preventive Maintenance
DJFI	Don't Just Fix It; Improve It	QA/QC	Quality Assurance / Quality Control
DO	Dissolved Oxygen	SCADA	Supervisory Control and Data Acquisition
EBMUD	East Bay Municipal Utility District	UotFT	Utility of the Future Today
ERP	Enterprise Resource Planning	UV	Ultraviolet
FY	Fiscal Year		

