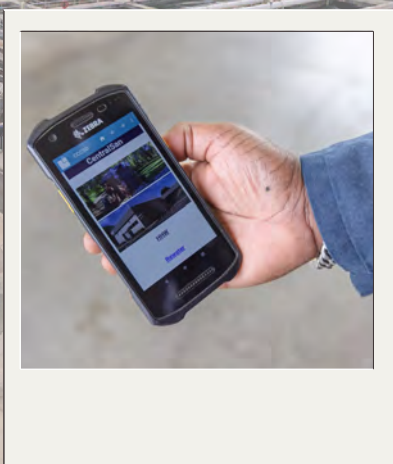


# OPTIMIZATIONS PROGRAM ANNUAL REPORT

## Fiscal Years 22-24







# STAYING AHEAD OF THE GAME

## A MESSAGE FROM THE GENERAL MANAGER

This past summer, the San Francisco Bay Regional Water Quality Control Board introduced new regulations requiring all Bay Area wastewater agencies to reduce nitrogen discharges by 40% from 2022 levels within a decade. Meeting this goal will be no small feat; it will require the largest combined public investment in treatment upgrades across our region since the passage of the Clean Water Act in 1972.

Luckily, Central San has been focusing on optimizing our operations toward cost efficiency for many years, and we've set a standard for employees across the organization to devise creative cost savings to pass along to our customers.

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 think of new ways to be of better service to our stakeholders.

Our report begins with the winners and featured projects at our two most recent Innovations Fairs. At these annual events, we continue to celebrate and share stories of innovation at Central San. These projects, as well as the others in this report, are just a representation of the ingenuity, collaboration, and hard work that our highly skilled staff exhibit every day.

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, which appears to read "Roger S. Bailey".

**GENERAL MANAGER**

Roger S. Bailey

# ABOUT CENTRAL SAN

Established in 1946, Central San is a special district which collects and cleans more than 13 billion gallons of wastewater per year for nearly 500,000 residents and more than 15,000 businesses on over 3,000 parcels in central Contra Costa County. It is headquartered in Martinez, California, approximately 30 miles east of San Francisco.

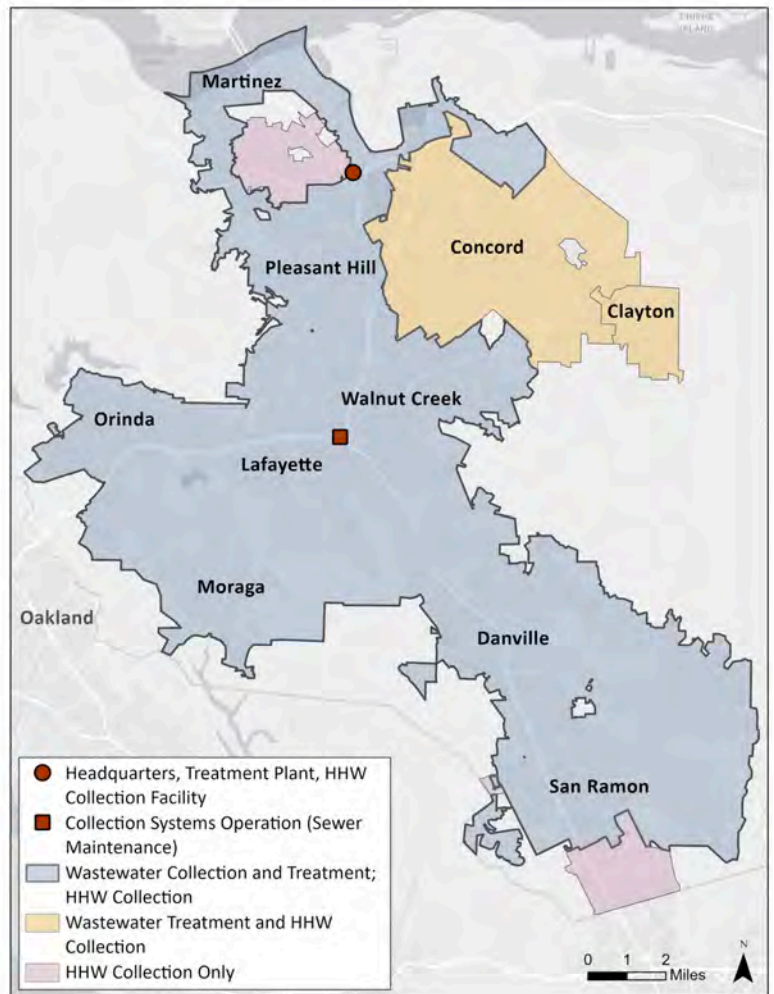
Central San serves the communities pictured in the service area map on the right. Central San operates and maintains about 1,540 miles of sewer pipelines and cleans more than 13 billion gallons of wastewater each year.

Central San has 303 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 1.8 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 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 innovative industry leader in environmental stewardship and sustainability, while delivering exceptional service at responsible rates.

.....

## VALUES

Our core values guide our daily decisions and how we fulfill our mission, vision, and goals.

## **CUSTOMER SERVICE**

We are responsive to our customers, and we deliver on our commitment to provide safe, reliable, and cost-efficient services.

## **EMPLOYEES**

We empower our employees to do their best work.

## **INTEGRITY**

We hold ourselves accountable to a high standard of honesty, reliability, and transparency.

## **INNOVATION**

We continuously improve and optimize our operations.

## STRATEGIC GOALS



## **ENVIRONMENTAL SUSTAINABILITY**

We conduct our business to safeguard and improve our planet.

## **DIVERSITY, EQUITY, AND INCLUSION**

We value people of all backgrounds, cultures, and perspectives, and we are committed to the principles of equity and inclusion.



# OUR COMMITMENT TO OPTIMIZATION AND INNOVATION IN NUMBERS

APPROXIMATELY  
**40** OPTIMIZATIONS  
COMPLETED

APPROXIMATELY  
**30** OPTIMIZATIONS  
IN PROGRESS

**34** DON'T JUST FIX IT;  
IMPROVE IT  
WORK ORDERS  
COMPLETED

**286** PLANNER UPDATES  
COMPLETED





This report provides the status of optimizations completed and in progress between July 1, 2022 and June 30, 2024.

Optimizations can increase efficiency and effectiveness, improve customer service, save time and/or money, add redundancies, improve safety, leverage data for smart decision making, and innovate new ways of doing business.

The optimizations in this report are categorized by type, as shown below.

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## INNOVATIONS FAIRS

At our yearly Employee Appreciation Event, Central San holds an Innovations Fair to recognize and reward our staff's creativity and hard work. The following are the 2023 and 2024 featured innovations and winners of Innovation of the Year – as crowned by popular vote.

### 2023 INNOVATIONS FAIR



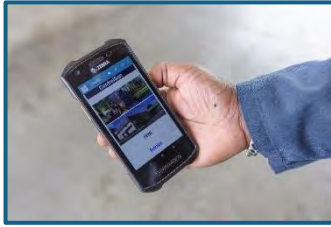
**INNOVATION OF THE YEAR: Permanently Mounted GPS Base Station (completed)**

*Project Team: Greg St. John (Survey), Kelly Weir (Survey), Chris Pentes (Survey), Nate Hill (Electrical Shop), Mark Turner (Electrical Shop), Josh Powell (Machine Shop), Jason DeGroot (Collection System Operations (CSO)), and Jose Vega (Information Technology (IT))*

The Collection Systems Renovation program requires a lot of detailed land surveying to derive elevations, identify potential conflicting utilities, and map data that serves as a base for engineering design. The new permanently mounted GPS base station allows staff to work more effectively near large buildings and under tree canopies that can block GPS signals.

These signal upgrades, the hardware, and the software will shift our program away from conventional, tedious total station surveying.

For example, staff used to use 90% total station and 10% GPS to complete their surveying; they can now use 90% GPS and 10% total station. This will allow Central San to survey more linear footage and will also be accessible to our consultants. The results have had the added advantage of getting all the projects on an identical coordinate system, avoiding time-consuming project-specific "control" surveys. The survey measurements will both be more consistent and more accurate than yesterday's GPS surveying, allowing staff to work in places that weren't previously possible with this equipment.



**FEATURED INNOVATION: Household Hazardous Waste Collection Facility and Residential Recycled Water Fill Station Visitor Electronic Scanning**  
(completed)

*Project Team: Dmitry Abramov (IT), Dennis Chebotarev (IT), Winston Ingram (HHW), and Dave Wyatt (HHW)*

In FY 23-24, Household Hazardous Waste staff oversaw approximately 56,000 visitors to the Household Hazardous Waste Collection Facility (HHWCF) and Residential Recycled Water Fill Station. To help serve this high volume of customers more efficiently, staff researched and implemented a handheld device to use in processing customers and collecting visitor information electronically. With the device, staff can scan the driver's license of a customer through a car window – improving comfort and safety – and can process customers quicker, without having to go back and forth with a tablet as they had in the past. The device also allows for speech-to-text entry and picture attachments, and automatically detects out of service area zip codes, thereby helping new staff members know when customer is not from service area.



*It's a great system that has really improved the way we register our customers. 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 recycled water customers.*

*Since the device is the size of a smartphone, it can fit in a pocket, which increases our efficiency since we no longer must return to a computer station or drop off a heavy rugged tablet. This also allows us to have backup devices for either service, which is a bonus.*





### FEATURED INNOVATION: **Oracle Cloud Enterprise Performance Management (EPM) for Capital Reporting** *(completed)*

*Project Team: Heather Ramamurthy (IT), Amal Lyon (Finance), Olivia Ruiz (Finance), and Kevin Mizuno (Finance)*

Oracle EPM cloud planning was implemented to prepare the annual Operations & Maintenance (O&M) Budget, and staff needed something comparable for capital reporting, to revamp their reliance on spreadsheets and time-consuming manual processes in preparing the annual Capital Improvement Budget (CIB) and 10-year Capital Improvement Plan (CIP). EPM for Capital improved interdivisional collaboration with simplified monthly reporting, reduced administrative burdens, and produced more transparent data on capital projects. It helped Capital Projects, Planning, and Finance track fiscal year-end accruals to help us foresee and manage cash flow impacts, ensuring optimal rates for our customers.



### FEATURED INNOVATION: **Go With the Flow Bike Tours** *(completed)*

*Project Team: Ben Lavender (Communications), Khae Bohan (Geographic Information Systems (GIS)/Asset Management), Rebecca Polcyn (Communications), and Ian Morales (GIS/Asset Management)*



For 21 miles, the Iron Horse Trail pedestrian and bicycling path follows one of Central San's sewer lines - nearly the entirety of the flow from the southeastern-most corner of our service area in San Ramon all the way to our treatment plant in Martinez. Staff began holding periodic public guided tours to bike, skate, rollerblade, etc. along the path.

In addition, to help our customers see (and sometimes hear) the flow of wastewater along this path, we built a Story Map that follows the

Iron Horse Trail and the wastewater infrastructure along the way. Using the interactive map, customers can view prominent access covers, convenient entry points to the trail, and information about what's happening just below ground. By following the map, our customers can walk, bike, or run the path of wastewater on their own from their home, school, office, all the way to our treatment plant.

## **2024 INNOVATIONS FAIR**



### **INNOVATION OF THE YEAR: Membrane Aerated Biofilm Reactor (MABR) Pilot Phase 1 (completed)**

*Project Team: Michael Cunningham (Optimization), Mike Zubrzycki (Capital Projects), William Grant (Capital Projects), Joey Gois (Mechanical Shop), Mike Matthews (GIS/Asset Management), Nitin Goel (Optimization), Blake Brown (Lab), Brent Harvey (Lab), Jesse McDermott (Lab), Tristan Kimball (Optimization), Denys Chaus (Optimization), Brianna Bansraj (Optimization)*



The groundbreaking MABR pilot project tested nitrogen removal using Central San's existing secondary treatment process and a novel treatment process intensification technology, MABR. The existing secondary process has a short solids retention time (SRT). Increasing the SRT (i.e., age and concentration of bacteria in the tank) would traditionally require new tankage to be constructed. Theoretically, the MABR process could intensify the existing secondary process by

providing a place for nitrogen removing bacteria to live without having to increase the SRT.

Initial results have shown it is possible to remove nitrogen through the MABR intensification technology with mixed liquor from the existing secondary treatment process. This could potentially help avoid hundreds of millions of dollars in the construction of new tanks. Instead, we could retrofit existing tankage to include this energy efficient technology. Phase 2 and 3 in progress are testing different pilot feed locations within the existing secondary treatment process, and initial results are promising.

Many existing staff members have been involved in the day-to-day operation and maintenance of the pilot project. By leveraging existing staff resources, we avoided the significant costs of full-time contractor operators and external laboratory services.



**FEATURED INNOVATION: In/Out Board  
for Capital Projects (completed)**

*Project Team: Dmitry Abramov (IT), Lela Joya  
(Capital Projects)*

The Interactive In/Out Board is a modern system designed to streamline employee status tracking. It features a user-friendly interface for easy updates, real-time synchronization, and remote accessibility

via multiple devices (e.g., a television screen, Teams Client Integration, and/or web interface). The board supports detailed status options and offers various features, like status schedules, and Outlook calendar synchronization. It is cloud-based for seamless updates. This innovative tool makes it easier to manage and communicate employee availability, location (e.g., office, field, teleworking, out of the office), and ultimately enhances organizational productivity.

**FEATURED INNOVATION: CSO Training Vault  
(completed)**

*Project Team: Alex Benavidez (CSO), Shane McElley  
(CSO), Russell Salva (CSO), Jason DeGroot (CSO)*

CSO now has an in-house training tool to demonstrate how pipeline cleaning tools work. The CSO Training Vault – designed and constructed by staff – provides hands-on training using tools in the Rodding, Hydro, CCTV, and Locating sections and helps staff learn, repeat, and master sewer maintenance best practices in a controlled environment. With this interactive training module, staff learns everything from safety protocols to advanced cleaning techniques without the risk of real-world accidents. The vault contributes to delivering first-class sewer

maintenance, continuing our exceptional reputation and client satisfaction, all while operating safely and efficiently.

**FEATURED INNOVATION: Steam and Aeration Blower Renovations**  
(completed)

*Project Team: Nancy Molina (Capital Projects), Nate Hodges (Capital Projects), Parker Ewing (Capital Projects)*

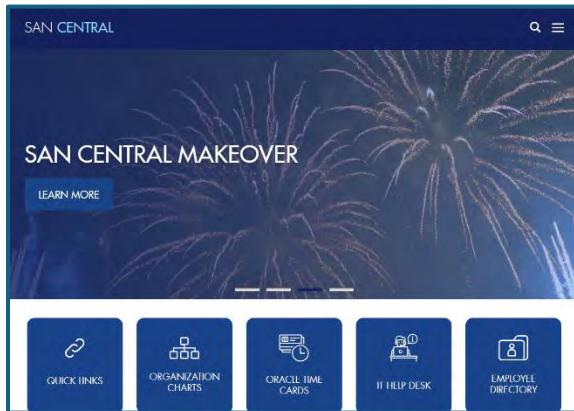
This year, Central San renovated the steam and aeration blower operational process to increase reliability in the event the steam driven aeration turbines are unavailable. Central San installed three high speed (13,000 rpm) 1MW magnetic bearing electric blowers, providing firm aeration capacity, and demonstrating that a steam-driven blower and electric blower could operate in tandem.





## ADMINISTRATIVE

The optimizations in this section make administrative processes more efficient and effective, improving the way we conduct business.



### **Intranet Redesign** *(completed)*

Our San Central intranet site was given a fresh new look to make it more user-friendly and engaging for all employees. The new design incorporates a rotating banner and a scrolling text feed, allowing us to highlight current news and events more effectively. Users can add items directly to the text scroll, and Communication Services can update the banner items to reflect the latest news. In addition, the new homepage has a cleaner and more streamlined design, making it

easier to find what employees need. To ensure that the most frequently searched information is readily accessible, staff reviewed the top search terms and page visits from the past year and a half. These links are now prominently featured, so employees can quickly navigate to the information they need most.

### **Digitizing District Archive Photos** *(in progress)*

Central San has several thousand print and slide photos that cannot be used as they are not in a digital format. This optimization sorts through and digitizes all the appropriate photos for District use and removes the need for hard copy archives. Staff is systematically evaluating and digitizing photos using a new high-resolution scanner, so that photos kept can be of the quality needed to be utilized in future communications.

### **Contract Documents in Laserfiche** *(in progress)*

Since the beginning of the pandemic, all Purchasing contract documents have been saved to a shared network drive. Limitations with that system affect the naming structure, accessibility, and the security of these files. These files will be moved into Laserfiche, providing a secure storage location while also giving District staff the ability to search and access the contract documentation they are looking for.

### **Oracle Procurement Specialist** *(in progress)*

Central San has retained a consultant specializing in Oracle procurement and procurement best practices to perform a review of status quo procurement business processes and provide recommendations to staff on ways to better utilize the system to employ functionalities and best practices, particularly as it relates to a potential transition to encumbrance tracking/reporting in the future. The draft report was received from the consultant, and staff provided feedback in May/June 2024. Using the revised report, the goal is to complete the report and provide the Executive Team with an overview for direction on potential system/process changes by the close of the first quarter of FY 24-25.

### **Risk Management Functional Assessment** *(in progress)*

Central San has retained a consultant for a Risk Management functional assessment to assess the scope of the function and how the responsibilities can best be executed.

### **Hazardous Materials Database** *(completed)*

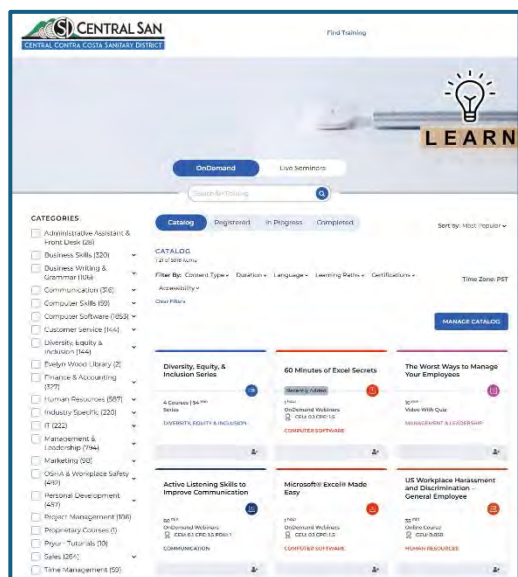
Staff created a new database to automate the tracking of hazardous materials and locations throughout District facilities. This process was previously handled in a Microsoft Access database that was not easily searchable or accessible from multiple locations. The new database is linked from the San Central intranet to make it easy to find and use, reducing staff time and increasing the accuracy of information.

### **Asset Barcoding** *(in progress)*

This optimization puts a barcode on assets to streamline work order creations and asset lookup. For the 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 plans on ordering more barcodes.

### **Recycled Water Inspection Mobile Application** *(completed)*

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



### **Pryor+ Learning Management System** *(in progress)*

For years, there has been a need to track District-wide training consistently and in a centralized place for reporting purposes. In FY 23-24, it was brought to staff's attention that several workgroups were individually using an online learning platform, Pryor+, to conduct training. After hearing positive feedback from those users, staff negotiated with Pryor Learning to offer District-wide licenses to the over 5,000 online courses on Pryor+ as well as unlimited, free attendance at select in-person seminars. In addition to this variety of learning opportunities, Pryor Learning offers the ability to track and report on usage. This year-long pilot partnership launched with District-

wide training at the end of October 2024. Staff will collect feedback and assess usage to determine the path forward at the close of the trial period.

### **Online Permit Reporting** *(in progress)*

Staff continues to explore the feasibility of moving some of the Environmental Compliance permit reporting to an online system that complies with the Environmental Protection Agency (EPA)'s Cross-Media Electronic Reporting Rule (CROMERR). Staff is working through regulatory requirements and the EPA CROMERR application process. The application packet will be sent to the EPA in the first quarter of FY 24-25.



**Oracle Permitting and Licensing (OPAL) *(in progress)***

Staff is working on modernizing the permitting system and migrating it from the legacy SunGard system, which was dated and inefficient. OPAL, a beta tested software, was selected to interface with the Oracle enterprise resource planning (ERP) software. Central San is testing it and helping Oracle improve its software for marketability and usability. The Permit Counter went live with OPAL on February 1, 2024. Staff is entering permit data, with the online permitting portal not anticipated to go live until 2025. Oracle has assigned a larger team to work out the bugs and performance issues that have developed after going live. Staff is continuing to hold weekly meetings with Oracle and testing patches while also working in the environment.

**Using Oracle to Develop CIB/CIP Section of Budget Book *(in progress)***

Central San is optimizing Oracle-integrated Enterprise Performance Management (EPM) technology to improve the transparency, collaboration, effectiveness of the CIB/CIP administration and reporting process, particularly as it relates to managing growing capital spend carryforward. Assessing optimal use of Oracle EPM versus Project Portfolio Management (PPM) is also a key goal of the project to maximize usefulness of project budgeting for different stakeholders' (e.g., project managers versus division managers) varying needs. Capital Projects, Finance, and Planning staff have worked together to develop a draft IT charter. The goal is for the EPM implementation to be final by the close of FY 24-25 to develop the FY 25-26 CIB and necessary updates to CIP.

**Lab Cityworks Implementation *(in progress)***

Staff is in the process of adding Lab tasks and data into our computerized maintenance management system, Cityworks. Once integrated, staff will be able to place records of maintenance and repair for lab equipment, schedule routine maintenance and calibration and receive notification when something is due, automatically run an annual maintenance report for each piece of equipment/instrument, and link equipment manuals from Laserfiche.

**ProCore Construction Management Software *(in progress)***

Capital Projects project managers are pilot testing ProCore construction management software through outside partners for potential purchase and implementation in our internal systems.

**Performance Appraisal Process *(in progress)* /****Oracle Goals and Performance Module *(in progress)***

The Goals and Performance module in Central San's Oracle ERP can allow staff to conduct performance appraisals electronically. The module has been configured and draft standard operating procedures (SOPs) are being piloted by staff. Using the feedback, staff will continue to assess whether the system works and whether using it would represent an efficiency gain versus the current manual process. In the meantime,

staff rolled out updated appraisal forms in paper hard copy format in November 2024 – with increased employee engagement through self-assessments, improved rating scales, clearer competencies, and more focus on career coaching.

**Records Retention Schedule** *(in progress)*

With the help of legal counsel, staff is working on optimizing and simplifying Central San's Records Retention Schedule. This will reduce the number of paper copies and boxes stored in facilities off-site.

**Agenda Management System** *(in progress)*

An upgrade to a new agenda management system will help with the process of creating Board and Committee agendas. Staff is working on rolling it out.

**IT Disaster Recovery Plan** *(completed)*

Central San completed the following innovations related to the IT Disaster Recovery Plan:

- Implemented ExaGrid to protect backups from ransomware
- Migrated pump stations to a new AT&T fiber network
- Enhanced cybersecurity with PhishER, Arctic Wolf, Darktrace, and CrowdStrike.

**New IT Business Workflow Procedures** *(completed and in progress)*

Central San created the following new workflows:

- Introduced a 90-Day Retention Policy for Teams Messaging
- Developed a Backup Retention policy
- Implemented Administrative Assets Tracking system
- Began phase 2 improvements to the Permitting system.

**Formation of Northern California Sanitation Agencies Financing Authority** *(in progress)*

There is a need for about \$200 million of additional external financing for Central San's ten-year Capital Improvement Program. External financing may come in the form of State Revolving Fund (SRF) loans, or debt issued to the public in the form of Certificates of Participation (COPs), or revenue bonds. Staff is looking for the most cost-effective form of financing, which could include revenue bonds. Revenue bonds are a very standard form of municipal financing, especially for utilities. However, revenue bonds for special districts in California can only be used for new money (as opposed to refinancing existing debt) through a public vote. Being part of a joint powers authority (JPA) allows for the issuance of revenue bonds as a form of financing. Revenue bonds issued through a JPA, on behalf of a participant already in the JPA, do not require a public vote. Accordingly, that arrangement achieves the same outcome as a COP structure, but through a "more standard" structure.

Establishing a JPA requires at least one other government entity to join in the effort. The costs of forming a JPA are minimal and include legal costs to specify formation and governance documents, and then filing fees with the State. Ongoing costs are minimal, and comparable to those involved in maintaining an entity like Central San's existing facilities financing authority used for COPs.



**In-house Treasury Function** (*in progress*)

The District has been transitioning to an in-house treasury function, which is targeted for finalization in early FY 24-25. An internal audit conducted on Accounts Payable processes found operational inefficiencies associated with Central San's long-standing treasury structure. In addition, the non-industry standard treasury arrangement does not allow implementation of modern ERP and banking technology solutions offered by Central San's new Oracle Fusion Cloud ERP system. Due to the County's strict deadlines, policies, and procedures to ensure the security of funds held in the pool and the accuracy of the underlying financial records, daily treasury related tasks come with administrative challenges. Over the years, County staff have made several process and policy accommodations and have been helpful and responsive to Central San staff. To consider alternate options, staff conducted an interagency survey which found evidence that it is not typical for an agency of Central San's size that operates autonomously to bank and invest with their county. Staff also weighed the pros and cons associated with alternative investment management options, as well as Treasurer appointment options. Staff has concluded that implementing a more traditional banking arrangement will return more control back to Central San, allowing staff to more quickly respond to a dynamic environment, implement ERP process optimizations, and ultimately improve the speed and accuracy of record keeping and reporting, all the while maintaining simpler and effective internal controls.

During FY 22-23, staff provided an initial assessment of status quo treasury structure challenges and received Board direction to investigate the matter further and return with the following: a specific recommendation for the preferred treasury structure (i.e., who to be appointed as Treasurer, investment management approach, etc.), a risk assessment of the to-be treasury internal control environment, and draft policies and procedures. Additionally, a consultant was contracted to help manage the project through completion.

During FY 23-24, key milestones completed included the following: Board appointment of an in-house Treasurer and approval of a Cash Management & Banking policy; issuance of a banking Request for Proposal (RFP) and Board approval of a contract with US Bank banking services in March 2024; issuance of an investment management services RFP; and Finance Committee support to execute a contract with PFMAM in June 2024. Ongoing key work will involve the following: Enterprise Resource Planning (ERP)/banking system testing and implementation, contract negotiation and execution for US Bank custodial services, US Bank merchant card services (Elavon), and PFMAM investment management services. The transition will be followed by post-implementation monitoring, troubleshooting and enhancements expected over the ensuing three to six months.

## CUSTOMER SERVICE

The optimizations in this section help us serve our customers better by providing information and resources.



### **Central San Home Guide (completed)**

The Home Guide includes a variety of important information for our customers on private sewer laterals, overflow protection devices, hiring a sewer contractor, easements, and accessory dwelling units, as well as HHW and other services we provide. Our customers often have questions on these topics, so, by bringing this information together in one place, the Home Guide will serve as a positive reminder and helpful reference for them. The guide was mailed to homeowners and is posted online and at the Permit Counter.

### **Development Services Website Update and Development of New Permit FAQ's (completed)**

Central San's website was upgraded more than six years ago and most of the content was transferred. However, new content is needed to clarify permit and recycled water requirements, update reports and fee studies, and describe the new financing programs for Septic 2 Sewer, contractual assessment districts, and lateral replacement. These changes provide necessary information for customers to participate in the programs and saves staff time in answering calls. In FY 23-24, the Permits, Fees, and Recycled Water web pages were all overhauled and new content was uploaded, including FAQs for permitting.



### **Electronic Posting Board (in progress)**

Staff is working on obtaining an electronic posting board for agendas and notices which will work concurrently with the agenda management system. Once live, staff will be able to post to the board from anywhere. Staff is currently researching companies.



### **NextRequest for Management of Public Records Requests (completed)**

Central San now uses an online, cloud-based platform called NextRequest for the management of Public Records Requests. To optimize Central San's response to requests, this application offers the following features: a single



repository with unlimited file size and comprehensive tracking capabilities for all communications and documents related to requests (meaning no more emails, attachments, SharePoint 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; and robust reporting capabilities that define what is being requested, by whom, and how Central San responds.

## OPERATIONAL

The optimizations in this section improve our plant operations by increasing redundancy, optimizing performance, saving money, and more.

### **Optimized Secondary Process Performance during Aeration Basin Diffuser Replacement Project Construction *(in progress)***

Through a joint effort among Operations, Optimization, and Capital Projects staff, Central San has achieved stable and high-quality secondary process effluent while significant amounts of equipment are out of service for the diffuser replacement. Initiatives included a data dashboard to help review key process performance indicators and temporary flow meters to help distribute flow to each set of clarifiers. The existing secondary process optimization is complete, and the system is performing well during the construction of Tank 1A/1B. Further improvements will occur after completion of the diffuser replacement capital project.

### **Secondary Clarifier Optimization *(in progress)***

Staff is identifying and evaluating improvements to the secondary clarifier hydraulic capacity and process performance, as well as equipment optimizations to improve operations and maintainability, through the Secondary Clarifier and Channel Improvements design. In FY 23-24, staff completed clarifier performance testing and is in the process of evaluating various optimization alternatives in parallel with final design.

### **Odor Control Optimization *(in progress)***

Staff is developing an Odor Control Facility Plan to evaluate options for improving equipment reliability and performance while identifying long-term operations and maintenance cost savings opportunities. Staff completed the condition assessments in FY 23-24, with performance testing scheduled for late 2024.

### **New Electrical Substation *(in progress)***

A multi-divisional effort is ongoing to further develop a new electrical substation (referred to as substation #55) for providing a new feeder from PG&E. The new substation will address redundancy, reliability, and safety concerns, and it offers a phased approach to replacing electrical assets in need of replacement for the entire treatment plant. Capital Projects expects to begin final design in early 2025 after the RFP process is completed in later half of 2024.

### **Steam Turbine Generator Feasibility Evaluation *(in progress)***

Staff is evaluating the feasibility of the steam turbine generator which would provide a means to convert steam surplus to electricity and is predicated on having the new electric blowers serving as the lead blowers. Staff from multiple divisions completed a site visit to see similarly sized equipment at the University of California, San Diego in December 2023. Evaluations will continue as part of Energy Management Planning and Pre-design Project.



**Retrofit of Aeration Basins for Nutrient Removal** (*in progress*)

A multi-divisional effort is ongoing to evaluate technologies that can be used to retrofit the existing aeration basins to address nutrient mitigation in a timely fashion before 2034. Work in progress includes the MABR pilot (detailed earlier in this report), split treatment evaluation (secondary clarifier final design), and scum/foam control evaluation. The MABR pilot phase was completed in November 2024. Nutrient Management Planning will begin in FY 24-25.

**Grit Trap Designed by Staff** (*completed*)

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 a 42-inch interceptor and siphon, staff designed a grit trap that could be installed before sewage enters the siphon. The new structure will help CSO significantly in removing settlement before reaching the siphon. Installation was completed as part of the Danville Sewer Renovations, Phase 4, District Project 8466.

CSO recently removed approximately five cubic yards of grit from the trip. In the past, this grit would have flowed through a siphon and would have remained there until the flows were great enough to flush the siphon. There is now a recurring preventative maintenance work order to clean the grit trap every 12 months to prevent grit accumulation in the downstream siphon.

**Piloting Addition of Baffles to Secondary Clarifiers** *(in progress)*

In 2022, there was a study which utilized a proprietary flo-clip baffle system that was piloted, validated, and installed in our primary tanks in 2014-15. Staff is now evaluating adding baffles to our secondary clarifiers, using a model which predicts that this proprietary baffle system will increase process capacity of the clarifiers from 100 MGD to 127 MGD. Extreme weather events are concerning for the plant, and the potential increase in capacity allows the clarifiers to handle more flow. Unit costs for potential future baffles would be less than an initial pilot, and in-depth modeling will continue to be invaluable for evaluating alternatives and making recommendations. This baffle pilot will collect real data and ultimately provide Central San with more potential options. Central San is looking into installing a baffle pilot in North Clarifier 1 to allow for data gathering.

**Instrument Work Order Report** *(completed)*

Central San developed a Cityworks Title V Instrument Work Order Report, which is being used by the Regulatory Compliance group to ensure all instruments used to demonstrate compliance with Title V requirements are being routinely calibrated. Prior to implementation, staff would need to look up 20 different work orders individually two to three times/year, but the data can now be retrieved in under a minute and presented in a concise, presentable way. Staff can now fill in a starting date and ending date field to extract relevant Title V work order data into a spreadsheet and HTML document.

**Sodium Hypochlorite Usage for #3 Water** *(completed)*

This optimization is the culmination of a years-long project to identify the ability to reduce or eliminate the use of bleach as a potential efficiency and cost savings. Staff sought input from multiple divisions, tested samples, and gathered data, and confirmed that there is not a chlorine residual requirement for in-plant water use within our National Pollutant Discharge Elimination System Permit, and the #3 water for on-site use is a Title 22 exemption we provide for ourselves. 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. Chlorine Cl<sub>2</sub> analyzers have been installed and are operational on both 3WH and 3WL systems. As we are now able to continually measure the residual, we can keep the level between 2-3 mg/L. With the soon to be completed modifications to Hypo Site 1, staff should be able to control the hypo pumps off the measured analyzer reading.

**Optimization of Extraction Procedure for Semi-Volatile Organic Compounds by EPA 625.1** *(in progress)*

The Lab Group is exploring alternative extraction procedures for method EPA 625.1. The existing procedure limits laboratory capacity to 15 samples per 3 days. The new Solid Phase Extraction (SPE) procedure has the potential for 75 samples per day. This will greatly increase laboratory capacity. A requisition is in progress for a 60-day trial of a Fluid Management Systems (FMS) SPE apparatus. Staff has visited a sister agency in San Jose to see their FMS set up and ask questions.



**Capital and Operational Improvements** *(completed and in progress)*

Central San completed the following innovations in Capital and Operational improvements:

- Completed the Information Technology / Operational Technology (IT/OT) Strategic Plan with roadmaps for network security, SMART Utilities, GIS, Enterprise Asset Management, Business Intelligence, and Supervisory Control and Data Acquisition (SCADA) systems, prioritizing 81 projects
- Established IT and OT Steering Committees for plan governance
- Digitized 35 boxes of plant documents for Laserfiche, reducing paper processes
- Integrated RF Smart Barcode with Oracle to automate cycle count and receiving processes in Materials Services
- Enabled plant virtualization with hyperconverged servers for SCADA
- Configured ERP system
- Implemented Permitting and Community Development
- Implemented Journeys for administrative asset tracking of badges, keys, and other items issued to employees
- Developed agreement terms and conditions with Contracts
- Formulated 18+ reports for Finance, Human Resources, and Purchasing.

## DATA ANALYTICS AND VISUALIZATION

The optimizations in this section gather, display, and use data to inform staff decisions, whether in responding to issues in real time or in thoughtful planning for the future.

### **Digital Real-Time Monitoring Program (Aquasight Apollo) *(in progress)***

Staff in multiple Operations divisions are working together to pilot Aquasight's Apollo intelligent process advisor tool on two treatment plant processes: solids dewatering and treatment plant influent pumping. The tool will use real-time data to evaluate process performance, suggest changes to improve energy efficiency and chemical usage, and identify opportunities for preventative maintenance to try to avoid more expensive emergency fixes. A real-time data connection is complete between Aquasight and Central San's data historians for the treatment plant. Dashboards are operational, and after conducting training sessions, Operations is pilot testing the tool through December 2024 to determine if long-term adoption is beneficial.

### **Mechanical Maintenance Dashboards *(completed)***

Staff created a dashboard to develop trending information for the Treatment Plant Mechanical Maintenance Shop, showing various readings from bearing temperature and sound inspections for furnace blowers.

### **Smart Motor Controls *(completed)***

Staff implemented smart motor control centers (MCCs) at variable frequency drives (VFDs) at the Headworks facility. Performance metrics such as power and pump efficiency are available, so real-time data driven decisions are being made by Operators.



### **Digital Recording of Rounds Data *(in progress)***

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 sought a way to optimize this process by digitizing rounds sheets by transferring them into Cityworks. After the Operators beta tested the digitized process on mobile devices, it was found that entering rounds data into Cityworks was time consuming and not justified by the gained benefit. Digitally recording rounds data in Dynac provides more operational benefit, and staff is now exploring ways to expand this effort.

### **Migration to Utility Network for Sewer and Recycled Water *(completed)***

Central San's current geographic information system (GIS) database follows the Local Government Information Model (LGIM) database schema, which used the Geometric Network for Sewer and Recycled Water datasets. Staff used ArcGIS Desktop (ArcMap)

for editing the datasets on the Geometric Network. Esri is phasing out their support for the ArcGIS Desktop in the next five years, with support ending March 1, 2026, which will limit staff's ability to continue editing these datasets. This project migrated the sewer and recycled water to Esri's newer Utility Network Model, which accurately models real-world assets with greater detail, providing us the tools to enable Central San to showcase our assets towards a digital twin.

**Asset Health Indicator Tool *(in progress)***

A tool is being developed to use data and analytics to optimize maintenance schedules to supplement Central San's condition-based maintenance program. The Plant Maintenance Division has various asset condition monitoring sensors which monitor and measure the health of assets and identify opportunities for optimization. These tools can sense vibration of rotating equipment such as pumps and motors, 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 Master 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 enable us to more efficiently utilize our maintenance staff and resources while improving the reliability of these systems.

**Large Diameter Inspection Program *(in progress)***

Central San has 88 miles of large-diameter pipes (greater than 18 inches), which include approximately 3,800 feet with a siphon configuration and 1,200 maintenance access holes. These assets have a replacement cost of over \$2 billion. Approximately 50 percent of these are over 50 years old, so a comprehensive condition assessment at this point in their lifecycle is appropriate to proactively identify early failure that can be addressed through spot repairs, provide an estimate of the assets' remaining life to better inform future replacement in the Capital Improvement Program, and develop a reasonable reinspection program based on the deterioration rates identified. A five-year inspection contract was awarded in June 2024 to inspect large diameter pipes, siphons and force mains. In FY 24-25 (the first year of the contract), approximately 80,000 linear feet (LF) of large diameter pipe, 1,900 LF of siphons, and 360 maintenance access covers are planned for inspection. The findings of these inspections will help us plan for the future.

**Visualizing HHW/Recycled Water Customer User Data on Map *(in progress)***

Staff is working on a way to visualize visitor data collected for the HHWCF and Residential Recycled Water Fill Station for location-based analytics. Currently, staff is



working to create maps and automate the process of cleaning up data.

**Map Layer and Map for Environmental Compliance** *(in progress)*

Staff developed a map layer and associated web map for the Environmental Compliance group using data derived from their Structured Query Language (SQL) Server database. Staff developed processes to automatically find new businesses entered into the SQL Server database and create corresponding locations in the map layer. Environmental Compliance can use the web map to perform QA/QC on the business location points and adjust locations as needed. The map layer can be added to Central Portal to make it easier to identify businesses that are inspected by Environmental Compliance.

**Data Screens at Pumping Stations** *(completed)*

Staff implemented high performance graphics at three pumping stations, with screens tailored for intuitive, information-driven interfaces.

## PLANT MAINTENANCE

*(co-authored by Staff Engineer Alejandro Lanza in the Plant Maintenance Division)*

The optimizations in this section were completed by the Plant Maintenance Division to effectively maintain our assets and improve processes in the plant.

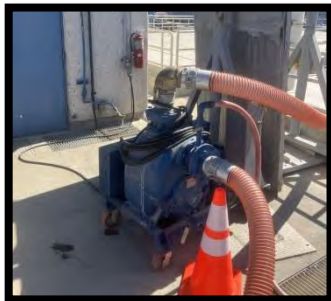
### **Street Sweeper Truck (completed)**

Buildings and Grounds (B&G) staff spend a significant amount of their time working to keep the treatment plant and roads clean. Their new street sweeper lowers the cost for monthly sweeping services and provides for safer and cleaner sites at CSO, the pumping stations, the treatment plant, and the Martinez campus. B&G staff also plans to do weekly sweeping in the fall, and during projects inside the treatment plant (in the purple-colored areas below) as needed.



### **Hot Well VFD Retrofit (completed)**

In February 2024, Maintenance staff completed a retrofit of the Hot Well 2 VFD. Work consisted of replacing the existing, obsolete Allen Bradley model with a new, readily available, Eaton Power XL DG1 drive. In addition, the Controls group assisted with replacing the existing hardwired controls with network control that utilizes a single ethernet cable connection between the programmable logic controller (PLC) and drive, significantly cleaning up the control system design and minimizing failure points. This VFD configuration will be used on all projects moving forward.



### **Electric Utility Pumps for Wet Weather Basins (completed)**

During the wet weather season of 2023, B&G staff set up to pump and fill the wet weather basins using diesel utility pumps. This required frequent diesel fuel refills that added time and labor to the job. Staff noticed there was 480V power supply at the basins and realized they could use an electric utility pump instead of the diesel pump. This allows B&G staff to let the pump run continuously, which significantly reduces pump monitoring and makes time to address other high priority wet weather work. This strategy will be implemented for future basin pumping.

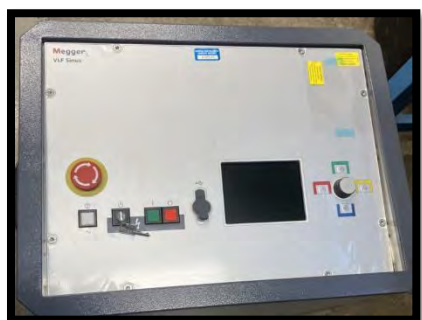


### **On-Site Vacuum Truck** *(completed)*

B&G now has a vacuum truck for as-needed on-site use. Having this robust equipment on standby at the treatment plant allows maintenance to optimize its strategy towards activities like wet weather work and catch basin and sump maintenance. The vacuum truck can also be of use to help set up for performing camera inspections of underground piping systems.

### **Punch-Lok Hose Clamping Machine** *(completed)*

Custom hoses with diameters ranging from 3/4" up to 4" can now be made in-house, using a punch-lok hose clamping machine. Staff can maximize the useful life of hose material and save on costs of buying new hoses when fittings break. Previously, an entire hose would be disposed of if a fitting broke. Now, with the Punch-Lok machine, broken fittings can be removed, and a new fitting can be attached.



### **VLF Tan Delta Testing** *(completed)*

The Electrical Shop has recently begun using a new and improved method of cable testing called Very Low Frequency (VLF) Tan Delta testing. Data acquired from VLF testing has been shown to be much more precise and conclusive compared to Central San's former practice of megger testing. VLF testing is also advantageous, as it requires 600x less power and current to conduct the testing, making this method non-destructive to the equipment as well. With the new VLF

Sinus testing unit, the Electrical Shop's trained technicians can now get better cable condition data with decreased risk of damage.

### **Beaker Filling Manifold** *(completed)*

The Machine Shop fabricated an upgraded beaker filling manifold for the Lab. The preceding manifold shared a common 4-inch header, fed by one inlet, for six nozzles. As a result, the Lab experienced issues with uneven flow distribution and a few failures at different nozzles. With the new manifold design, an inlet feed from both sides and an internally split chamber allows the Lab to have greater flow control at each nozzle. The footprint has also been reduced by using 2-inch CPVC, freeing up table space to mount the manifold.





**Hypo Pump Maintenance** (*in progress*)

There are multiple hypochlorite pumps used around the plant for keeping odor production levels controlled. It was noticed that these hypo pumps get frequent work orders written to address leaking inlet/discharge end check valves. Following a Root Cause Analysis study on these valve failures, it was discovered that the combined factors of high ambient temperatures, PVC fitting degeneration, hypochlorite off-gassing, and the use of threaded connections were causing the hypo pump check valves to over-pressurize and fail. The Machine Shop is rebuilding these pumps to have an internal check valve design, where threaded connections have been completely removed and more weather resistant CPVC is used. This work minimizes the frequency of hypo pump valve failures and further optimizes our maintenance program.

**Lubrication Program Enhancements** (*completed*)

Mechanical Technicians worked together with Reliability Engineering staff to update the list of currently used and stored oils. By updating this lubrication list and analyzing necessary quantities, storage space was maximized in the Lube Room and further lubrication program enhancement efforts were kickstarted. The updated list of lubrications is now a living document dedicated to listing what oils are used for specific equipment, monitored by Mechanical Maintenance and Reliability.

Additionally, a new oil storage Conex was purchased to consolidate and centralize bulk oil storage. The Conex was received and stationed across from the current Lube Room. This additional enclosure helps keep bulk oil barrels out of the elements and uncontaminated.

**Centrate Line Flange Modification for CSO** (*completed*)

Every year, CSO visits the treatment plant to clean out the centrate line in the Solids Conditioning Building (SCB). Typically, they must remove a blind flange that caps the line and install an adaptor plate to install their hose equipment. To make the process smoother and more efficient, the Mechanical Maintenance Shop fabricated a permanent flange with preinstalled hose connections so CSO can simply arrive and connect to the line and perform their maintenance.



*(Left – old adaptor plate, Right – New permanent flange)*



#### **Service Air Rental Compressor Filter Skid (completed)**


The rental air compressor filter skid was designed and developed because of the increasing difficulty and cost of finding oil-free rental compressors for Central San's service air maintenance needs. Instead of trying to find a cost-effective oil-free rental compressor, Reliability staff purchased a set of compressed air filters and mounted the assembly onto a portable skid for transportation. Staff purchased three filter elements and associated housings

for removal of oil & water droplets, dry particulates, and oil vapors generated from an oil-flooded compressor. The Machine Shop was then able to assemble the filters in series and fabricate a wheeled skid that allows easy access to the filter elements for future replacements. After some testing and troubleshooting, the filter skid is fully operational and able to be used for future compressor rentals.

#### **SQE (Safety Quality Effectiveness) Reliability Strategy Pilot (completed)**

Reliability Engineering is trying out a new maintenance optimization strategy called SQE. SQE is an internal audit that can be requested by maintenance staff to address any concerns regarding safety, quality of work, or job effectiveness. The first SQE audit was on B&G's monthly Outfall PM, and it resulted in the development of a more complete and comprehensive Outfall Line map created by the GIS Group for utility workers to reference. The goal of the SQE strategy is to give maintenance staff another method of voicing their ideas of maximizing safety, quality and effectiveness to keep our maintenance program continuously improving. Another recent SQE effort was held for

our Washer Compactor 6-month PM and resulted in a new and improved SOP with photos for each step and details provided by the technicians for smoother removal and installation.

  
Central Contra Costa Sanitary District  
Standard Operating Procedures

Updated: **March 29, 2024**  
Author: **Emon Kandahari**  
ID #: **MNT-RE-#**

**PM Washer/ Compactor 6 Month**

**Purpose**      The purpose of this procedure is to maintain the Washer/Compactor.

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**Materials & Supplies**


Quantity	
3	Locks
1	Empty Wash
1	Rebuilt Rotat
2	Desiccant Br
1	Anti-seize

**Equipment & Tools**

- 30mm Wrench/Socket (Thrust
- 19mm Wrench/Socket (Motor)
- 5/16" Wrench/Socket (Rotary C
- 7/16" Wrench/Socket (Motor H
- 500lb com-a-long
- (2) 4ft slings
- 6ft sling
- ½" Shackle
- Ice Removal Tool
- Forklift

**Information**



- DO NOT drive forklift ove weight
- W/C #1 is furthest south
- W/C #2 is furthest north

  
Central Contra Costa Sanitary District  
Standard Operating Procedures

Updated: **March 29, 2024**  
Author: **Emon Kandahari**  
ID #: **MNT-RE-#**

**Procedure**      Follow these steps to complete the PM.

Step	Action
<b>PART 1: SETUP</b>	
1	Perform LOTO using the HECF.
2	Close flushing header valve
3	LOTO Sluice Gate Control Unit for the washer/compactor you will be working on
4	LOTO Manual Valve on the platform above the washer/compactor housing you will be working on

### Instrument Shop Optimizations *(completed and in progress)*

- Replaced old float assembly in the brine tank with a standalone controller to monitor brine tank level and control the 2 pumps in SCB Basement.
- Installed centrifuge sludge feed high pressure isolation rings on pumps 1-4, which saved costs on an expensive diaphragm rebuild.
- Changed the configuration of the primary sampler in a way that saves money on material, as well as resolves plugging issues.
- Upgrade to 3 water high and low transmitter.
- SCB Gas Train – upgraded all transmitters to smart transmitters (Furnace 2). This is in process on Furnace 1.
- Cogen Transmitter Replacement – upgraded level and temperature transmitters to smart transmitters.



- Waste Steam Exchanger Controls – built PLC panel and assisted with new controls.
- Installed SCB steam header transmitter and upgraded pneumatic control to new transmitter.
- Final effluent bubbler – replaced old equipment with new bubble and controls in Pump and Blower Basement.
- Working with Reliability on calibration and other gas bottle redundancy identification effort to minimize wasted instrumentation gas.
- Upgrading SCB gas monitoring system (sensors and panel) to newer system with better programming capability for alarming and communications.



Our Plant Maintenance staff is constantly rehabilitating our assets to extend their useful life and optimize their performance. They make it a regular practice not to just perform the preventative 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 meet one or more of the following criteria:

- Proposal of an optimization idea
- 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
- More than one reactive work order with a priority of one or two on a specific asset between PM tasks.

***DJFI Work Orders completed in FY 2022-23: 11***

***DJFI Work Orders completed in FY 2023-24: 23***

In total, these 34 DJFIs resulted in energy cost savings, staff time savings, added redundancies, improved resiliency, simplified operations, and/or made adjustments needed for regulatory requirements.

#### DJFI Highlights:

- Replaced old underground feeder wires with cross-linked polyethylene high heat-resistant water-resistant (XHHW) wire.
- Finalized electrical quick disconnect installation effort on washer compactor 1 and 2.
- Cut all UV channel support bracing at a 45-degree angle to prevent any catching of the UV bank.
- Upgraded Deaerator Supply Pump #2.
- Installed lifting eye to the Primary Effluent Pump #2 coupling guard.
- Installed new grease plumbing on Primary Effluent Pump #2 Motor for safe access while running.
- Hard face welded the compaction zone of the conveyor shaft, adding time to the life expectancy of the washer compactor.
- Replaced flusher fixture with a recycled water rated flusher to mitigate wear and tear failures.
- Added isolation valve to 3WHP system piping to simplify operations.
- Primary effluent pump conduit brace adjusted for better accessibility.

- Replaced old style desiccant breathers on ash equipment for longer run time and staff time savings.
- Installed new lifting cables on sump pumps that allows Maintenance to access the lifting devices in a safer manner than previously (no longer requiring a confined space permit to recover the lifting devices from their previous positions).



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 QA/QC or improvement to the work order, SOP, or asset.

The Planners then review and update the work orders accordingly – executing a “Planner Update”. 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 staff scheduling the tasks, leading to increased PM program effectiveness and efficiency.

***Planner Updates completed in FY 2022-23: 141***

***Planner Updates completed in FY 2023-24: 145***

**Planner Update Highlights:**

- Added inspections to critical furnace blower preventative maintenance work orders (PMs)
- Received and uploaded maintenance manuals per requests by technicians
- Greasing schedule updates on influent pump PM
- Cancelling of redundant work orders on Cake Pump PMs
- Revised use of scaffolding for various PMs
- Added new Nueros blowers VFD filters to plant filters PM
- Obsolete Nax plant eyewash stations removed from inspection PM
- Updated and added multiple equipment stock items per requests by shops



## ACRONYMS

B&G	Buildings and Grounds
CIB	Capital Improvement Budget
CIP	Capital Improvement Plan
COPs	Certificates of Participation
CROMERR	Cross-Media Electronic Reporting Rule
CSO	Collection System Operations
DJFI	Don't Just Fix It; Improve It
EPA	Environmental Protection Agency
EPM	Enterprise Performance Management
ERP	Enterprise Resource Planning
FMS	Fluid Management Systems
GIS	Geographic Information Systems
HHW	Household Hazardous Waste
HHWCF	Household Hazardous Waste Collection Facility
IT	Information Technology
IT/OT	Information Technology / Operational Technology
JPA	Joint Powers Authority
LF	Linear Feet
MABR	Membrane Aerated Biofilm Reactor
MCC	Motor Control Centers
O&M	Operations & Maintenance
OPAL	Oracle Permitting and Licensing
PLC	Programmable Logic Controller
PM	Preventative Maintenance
RFP	Request for Proposal
SCADA	Supervisory Control and Data Acquisition
SCB	Solids Conditioning Building
SOP	Standard Operating Procedure
SPE	Solid Phase Extraction
SQE	Safety Quality Effectiveness
SQL	Structured Query Language
UV	Ultraviolet
VFD	Variable Frequency Drives
VLF	Very Low Frequency

