2018 YEAR END REPORT

Accomplishments and View of the Horizon

PCWA

water • energy • stewardship

2018
YEAR END REPORT

Accomplishments and View of the Horizon

PCWA
water + energy + stewardship

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Administrative Services Department

Administrative Services is comprised of three divisions: Human Resources, Risk and Safety Services, and Information Systems Services. In addition to the work of these three functional programs, the Department also supports the Board of Directors and General Manager on Agency-wide issues, provides administrative assistance and consultation to Agency departments, ensures a consistent organizational identity and public image, facilitates organizational effectiveness and employee recognition, and serves as the steward of the organization's workplace culture.

Human Resources is responsible for recruitment and talent acquisition; employee orientation, training and development; compensation and benefits administration; performance management; organizational design; payroll; workforce planning; employee and labor relations; labor negotiations; policy development and documentation; and the administration of human resources rules, policies, and Memoranda of Understanding.

Risk and Safety Services is responsible for managing and mitigating the Agency's exposure to risk. This is achieved by purchasing property and liability insurance to protect Agency assets, actively managing liability and Workers' Compensation claims, and implementing safety and loss control programs. This division also has responsibility for records retention and records archives.

Information Systems Services is responsible for maintaining the Agency-wide business network and related hardware and software, as well as website design and maintenance. In addition, this division is responsible for Agency telecommunications including landline telephones, communication lines, and cellular telephones. As a result, Information Systems Services serves as the technological backbone and nerve center for all Agency operations.

SIGNIFICANT ACCOMPLISHMENTS FOR 2018

Human Resources

Payroll and Benefits

- Identified and implemented operational and system changes to achieve Internal Revenue Service (IRS) compliance with the distribution and filing requirements of the 2017 Affordable Care Act reports.
- Conducted the annual Health Benefits Fair for Agency employees and their families.

- Revised the Agency's Employee Benefits Overview booklet, which provides information for employees on Agency-provided health and wellness benefit programs.
- Planned and strategized several workflow changes to support automated workflows and features of the new enterprise resource planning (ERP) system, including Employee Self-Service and Manager Self-Service functions.

Training

- Conducted the 7th annual "Administrative Services World Tour" with Agency departments to share benefits-related information, provided policy updates and highlighted available resources.
- Completed the 2nd full year of *The Training Wave*, a monthly lunch-hour training program for employees which offers sessions on a variety of topics such as leadership/supervision, safety, financial planning, and personal growth.
- Refined and fully implemented the Agency's Virtual Leadership Academy (VLA), a self-paced leadership academy for employees designed to develop current and future leaders of the organization. Conducted three VLA workshops entitled *Employee Engagement*, *Eliminating Toxicity in the Workplace*, and *Succession Planning*. Also introduced *Leader Readers*, a book-of-the-quarter club focusing on leadership books.
- Completely revamped and enhanced the "Organizational Effectiveness" training program which is provided to all new hires at the Agency. A form of this training program has been used at the Agency for decades to properly orient new employees to the culture of PCWA.
- Developed and presented a series of Change Management sessions intended to prepare employees for business process reengineering efforts which will accompany the implementation of the Agency's new enterprise resource planning (ERP) solution. Also created a Change Management resource page on *The Splash.*
- Designed and implemented a new training and development forum for Agency supervisors called the Supervisors Roundtable. This quarterly discussion group was created to address supervisory questions, challenges and training needs.

Staffing

- Conducted recruitment and selection processes for 36 regular, 19 temporary, and 3 student intern positions.

- Custom-developed and successfully implemented a new written selection examination for the Treatment Plant Operator Trainee II job classification.
- Participated in two local high school career fairs to promote Agency employment and provide an overview of career opportunities in the water and power industries.
- Provided retirement counseling and processed the retirements of 13 Agency employees, representing 5.80 percent of the Agency's workforce with a combined 264 years of Agency service.

Information Systems Services

- Deployed a new disaster recovery and file backup solution for the Agency's server environment to allow business operations to continue in the event of a disaster.
- Planned and began migrating all Agency workstations to the Windows 10 operating system.
- Assisted the Customer Services Department with the implementation of systems and practices that are compliant with Payment Card Industry (PCI) standards.
- Initiated a 3-year cybersecurity infrastructure build-out and deployment project designed to protect the Agency from cyber threats.

CASCADE Project

CASCADE (**C**omprehensive **A**ssessment of **S**oftware **C**ompatibility for **A**gency **D**eployment and **E**ngagement) is a multi-year project to replace the Agency's aging Superion Enterprise Resource Planning (ERP) system. An ERP system is a suite of integrated software applications used to collect, store, manage and interpret data from many business activities including financial management, human resources, payroll, utility billing, work order management and inventory control.

- Purchased and installed new virtual server hardware and software to improve and expand the Agency's server infrastructure and meet the needs of the Agency's new enterprise resource planning (ERP) system.
- Established the **CASCADE** Command Center (CCC) for testing and configuration of new ERP system software.
- Provided technical support and assistance associated with the implementation of a new ERP system.
- Provided project management and coordination for the Agency during the ERP implementation.

PLANNED PROJECTS AND ANTICIPATED CHALLENGES FOR 2019

Human Resources

Training

- Through the Virtual Leadership Academy, provide an in-house three-day symposium for current and future leaders entitled Leadership Learning, and a one-day workshop for supervisors entitled Stepping Up to Supervision.
- Continue to offer monthly lunch-hour training sessions through *The Training Wave* on a variety of topics intended to enhance employee work life and personal life.
- Offer refresher training to departmental ambassadors on the new hire on-boarding process to enhance the experience of new employees as they receive their introduction and orientation to the Agency.
- Conduct the training class "Prevention of Sexual Harassment, Discrimination, Retaliation and Abusive Conduct" for all managers and supervisors, as required every two years by the State of California, pursuant to AB 1825, AB 2053 and SB 1343.
- Conduct the training class "Local Government Ethics" for all managers and Board members, as required every two years by the State of California, pursuant to AB 1234.
- Conduct the training class "Harassment Prevention/ Maintaining a Respectful Work Environment" for all non-supervisory and non-managerial employees, as required by the State of California, pursuant to SB 1343.

Human Resources

- Plan and orchestrate an activity in the Business Center lobby in acknowledgment of Public Service Recognition Week which is held annually each May.
- As a component of workforce and succession planning, design and conduct an internal job fair for interested employees highlighting Agency career developmental opportunities.
- Update the Agency's on-boarding program for new hires to enhance the orientation experience for new employees, as well as the hiring departments.
- Explore potential modifications to the Agency's performance management system to integrate professional best practices and to provide meaningful tools, processes and outcomes for managers, supervisors and employees.

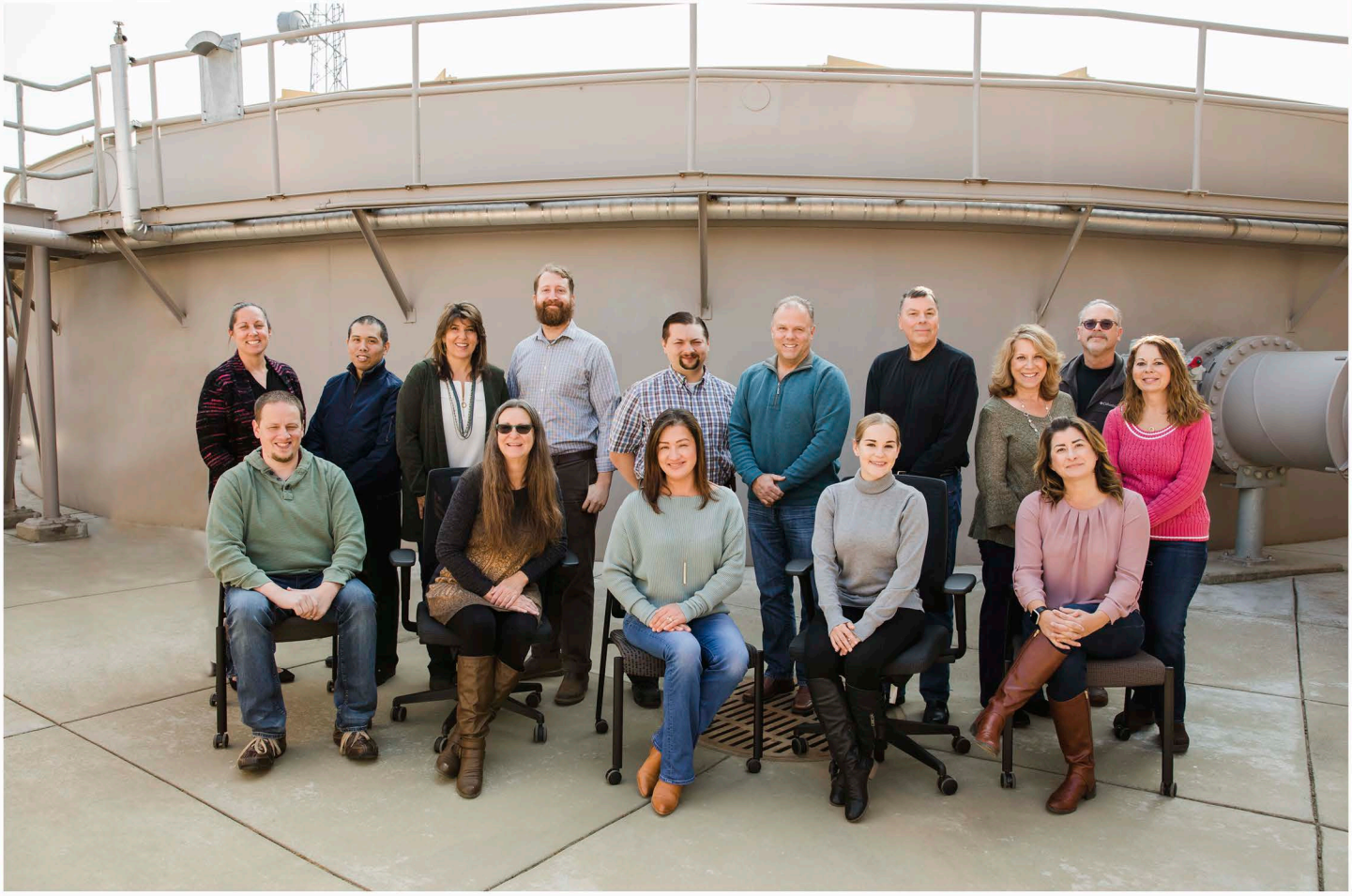
Risk & Safety Services

Records Retention and Records Archives

- Update the Agency's Records Retention Schedule and Policy to ensure that physical and electronic documents are maintained as long as legally and operationally required.
- Provide training to departments on the Agency's revised Records Retention Schedule and Policy.

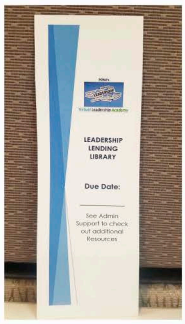
Information Systems Services

- Complete the implementation of the new Agency-wide telephone system which will place the Foresthill, Maidu, and Ferguson campuses all on the same system.
- Move Questys, the Agency's document management system, to a new server and upgrade the software to the most current version.
- Initiate a cybersecurity policy update and management project to establish Agency-wide standards for cybersecurity safeguards.
- Continue to provide project management and technical support for the **CASCADE** Project.



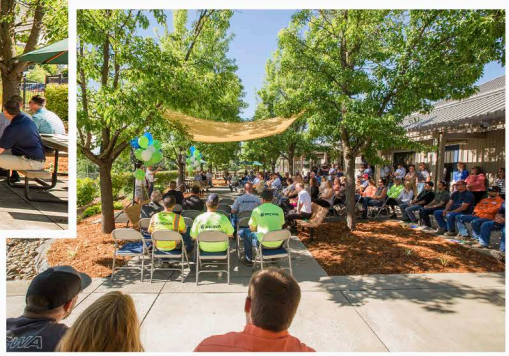
Administrative Services Department

Celebrating Public Service Recognition Week



Virtual Leadership Academy

Benefits Fair 2018



Exemplary Performance Award Ceremony 2018

Driving Safely

Safety on Fire!

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Customer Services Department

The Customer Services Department is comprised of Contact Center and Utility Billing, Water Efficiency, Facilities Maintenance, and Public Affairs. Contact Center and Utility Billing is responsible for customer contact, account billing and collections, new accounts, and mail distribution. Water Efficiency is responsible for meter reading, testing, repair, replacement, and water use efficiency programs. Facilities Maintenance is responsible for the ongoing maintenance of facilities, building access, and security systems. Public Affairs is responsible for customer communications including the customer newsletter, social media, multimedia, press releases, government affairs, and legislative tracking.

SIGNIFICANT ACCOMPLISHMENTS FOR 2018

Contact Center and Utility Billing

- Increased average number of payments processed through our website payment portal to 3,700 per month in 2018 from 2,400 per month in 2017.
- Total front counter transactions (bill payments) decreased to 4,300 in 2018 from 4,600 in 2017.
- Responded to approximately 40,000 customer calls in 2018, holding steady from 2017 call volume.
- Assisted developers and customers to complete multiple facility agreements, 21 infill projects, 16 restore projects and 9 Lot Size Variances.
- Successfully implemented and administered the first year of the Sustainable Irrigation Pilot Program (SIPP) grant for Western Placer agriculture. Customer Services handled all calls as they are no longer handled through South Sutter Water District.
- Launched Phase I of the customer payment portal known as Paymentus.
- Promoted internal staff to fill the vacant position of Deputy Director; also filled two new Customer Service Representative vacancies.
- Worked with Technical Services to create a Payment Card Industry compliant office.

Water Efficiency

- Performed over 284 Water Wise House Calls and Water Wise Business Calls.
- Provided over $139,000 in Water Efficiency rebates to customers, including 100 high-efficiency toilet rebates, 35 high-efficiency washing machine rebates, 94 turf rebates, and 174 irrigation system rebates.

- Promoted internal staff to Lead Water Efficiency Specialist.
- Completed the Prop 84 grant with Placer County Resource Conservation District.
- Continued participation in public outreach events including the Master Gardener's Garden Faire, Mulch Mayhem, the Forgotten Soldier Program and the Auburn Hip Hop Congress' Earth Day Festival, the Mandarin Festival, and the Colfax Chambers Winter Fest.
- Placed digital advertising for rebates and events on Facebook and Google Display Network to target geographic service areas.
- Successfully read meters and billed 1,500 customers using newly deployed AMI (cellular), applied Beacon Analytics and an Application Programming Interface (API) to the Naviline Customer Information System.
- Continued exploration and propagation for a small AMI fixed network pilot. Installed 213 – 100W Itron endpoints and a collector on the Midas Water Tank.
- Participated in an AMI study with seven other utilities nationwide to discuss hardware interoperability and software integration guidelines, an AMI Request for Proposal template, and AMI manual of practice.
- Improved hydrant meter testing program by creating Standard Operating Procedures for testing and repair. Updated 58 of the 124 hydrant meters.
- Optimized large meter testing program by collecting data to customize a testing schedule based on test results of each size.
- Tested 271 large and intermediate meters and rebuilt 77 large and intermediate meters.
- Analyzed the 35,516 deployed endpoints in the field to understand warranty end dates to develop a plan for multiyear replacement.

Facilities Maintenance

- Worked with Technical Services to assist in developing specifications for replacement of the Liebert HVAC unit.
- Repaired and cleaned AC units at the Stoneridge Tank Site in preparation to add two additional units to meet goals in the Preventative Maintenance Plan.
- Replaced Lincoln Metering Station AC unit and coordinated with Drinking Water Operations to fabricate mounting supports.
- Coordinated upgrade of main control board, touch pad, sensors and refortified posts at the Tinker Road Tank main entrance gate.
- Created fire maps including door sensors, smoke detectors, pull stations and motion detectors for the Business Center.
- Created a preventive maintenance plan to ensure fencing to maintain Agency facilities.

- Successfully cataloged maintenance assets at the Bowman Treatment Plant buildings, Ophir Pump Station, Applegate Treatment Plant, and at the Ferguson campus.
- Participated in the Agency's Confined Space Rescue Team.
- Worked with CalFire to oversee California Conservation Crews to perform hand vegetation treatment on 10 acres at Lake Theodore.

Public Affairs and Multimedia Services

- Developed Strategic Communications Plan to better align internal and external communications related to advocacy efforts, Agency operations, and stakeholder engagement.
- Assumed responsibility for Agency sponsorship opportunities.
- Acquired Federal Aviation Administration certification for aerial drone.
- Collaborated with regional and statewide partners on legislative and regulatory matters, improving water conservation legislation (AB 1668/ SB 606) and defeating the statewide water tax (SB 845).
- Increased social media activity with more than 200 posts on Facebook and Twitter, a 165 percent increase from 2017. Presence on both platforms grew to more than 600 "Followers," adding 80 new followers on Twitter and 171 new followers on Facebook.
- Assisted other Agency departments with promotional materials, videos, and communication materials. Highlights include, but are not limited to, the following:
    - T-Shirt design for the Mentorship Program/Career Day, hosted by Technical Services.
    - Banner display designs for Human Resources' promotional activities
    - Educational videos related to:
        - Annual Consumer Confidence Report announcement
        - Construction milestones of Agency infrastructure (e.g. Long Ravine Pipeline Project, Foothill Water Treatment Plant upgrades, Middle Fork Project communications upgrades, etc.)
        - Participation in National Recognition Days (e.g. Public Service Appreciation Week, Water Professionals Appreciation Week, etc.)
        - The Speed Key invention (for entry into American Water Works Association's Gimmicks and Gadgets contest)
        - A "day-in-the-life" series of a canal operator, exploring the Agency's canal system and services

- Prepared the 2018 *Fire and Water* publication which is distributed annually by Gold Country Media
- Created a tip sheet of protocols for employees to reference when approached by the media on the job site.
- Created a standardized consent and release form for Agency photo and video production.

PLANNED PROJECTS AND ANTICIPATED CHALLENGES FOR 2019

Contact Center and Utility Billing

- Complete PCI compliance facility changes, implement internal process changes and educate customers on new policies and procedures related to PCI.
- Partner with ISSD to implement new and advanced phone system for the contact center.
- Partner with Technical Services and ISSD to email outage notifications to our canal water customers
- Plan and begin implementation of "Pay Bill by Text" and "E-Bill."
- Begin planning to expand monthly billing.
- Research cloud-based IVR option for outbound notifications.

Water Efficiency

- Update and streamline the Lawn Replacement and Irrigation Efficiencies Rebate application and website to improve customer accessibility.
- Partner with Regional Water Authority to host a Qualified Water Efficient Landscaper training in Placer County.
- Reach out to local land use authorities with dedicated landscape meters to promote the Irrigation Efficiencies Rebate and find a partner to host an irrigation installation training for the local community.
- Develop a Meter and Endpoint Asset Management Plan to assist the Department in planning for ongoing meter replacement, forming meter testing plans, applying for grants, tracking Agency metering technology lifespan, and maximizing budget dollars for reading meters and analyzing data.
- Continue working with an interagency team to develop implementation goals for AMI.
- Work with Technical Services to create a plan to upgrade large meters based on highest priority.

- Develop relationships with up to five schools to offer educational materials, including a Water Wise School Call, and other water efficiency ideas for the landscape and buildings.
- Raise awareness about the WaterSense brand, and PCWA rebates available for WaterSense products, as a foundation for 2020 application for an award.
- Increase PCWA participation in the Regional Water Authority's WaterSpots video contest by 10 percent.
- Complete implementation of an AMI Fixed Network pilot in Rocklin.

Facilities Maintenance

- Develop and begin implementing a roofing preventative maintenance and inspection plan.
- Create system zone maps to assist police and fire when responding to PCWA facilities. This includes door sensors, smoke detectors, pull stations, and motion detectors for the Ferguson campus.
- Continue working with CalFire on long-term Vegetation Management Plan for Lake Arthur and Lake Theodore properties.
- Identify, inventory, and develop a maintenance plan for Agency automatic gate operators.

Public Affairs and Multimedia

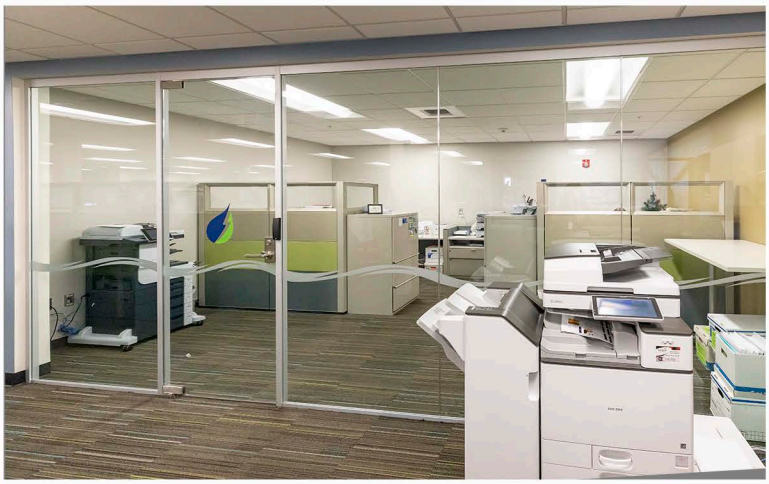
- Develop a more formal sponsorship program to maximize promotional opportunities.
- Work with staff to identify and develop educational materials/activities for school outreach within Placer County.
- Create an internal employee newsletter.
- Develop a "Profiles in Water" campaign to highlight customers' beneficial uses of water in customer newsletter, social media and other publications.
- Redesign customer newsletter.

Customer Services Department

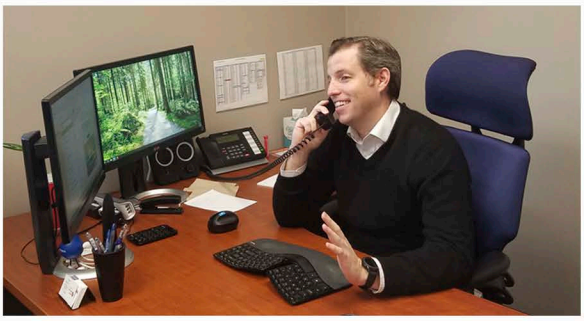
Kathryn H. answers questions about a customer's billing statement at the front counter.

Ann R. leads a training session for Customer Service Representatives.

Michelle M. and Rebecca B. (left and right), new Customer Services Representatives and Jill Howes, promoted to Deputy Director of Customer Services.

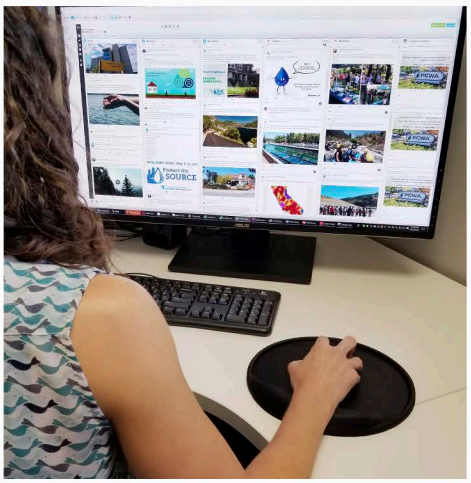


Customer Services collaborated with Technical Services to create a PCI Compliant billing office

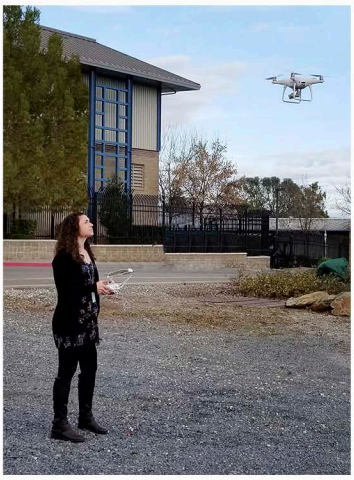


Ross B. handles press inquiry.

Brie C. takes photos to document progress on the South Canal Intake Phase I Project at Ophir Pump Station.



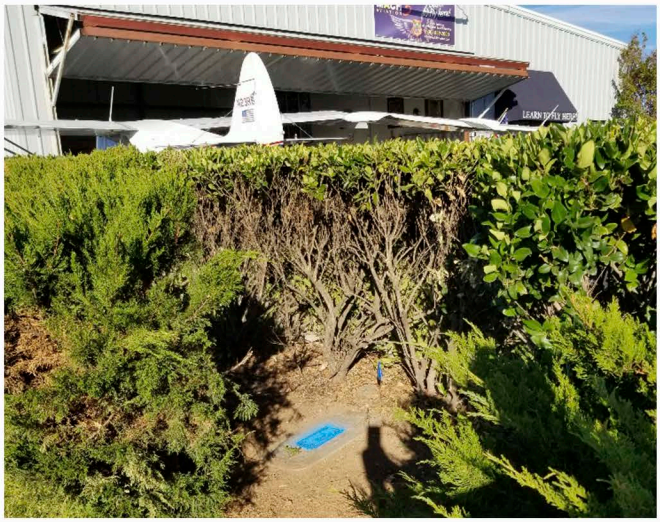
Social media communications increased 165% from 2017 to 2018.



Multimedia Services acquired Federal Aviation Administration certification for aerial drone use.

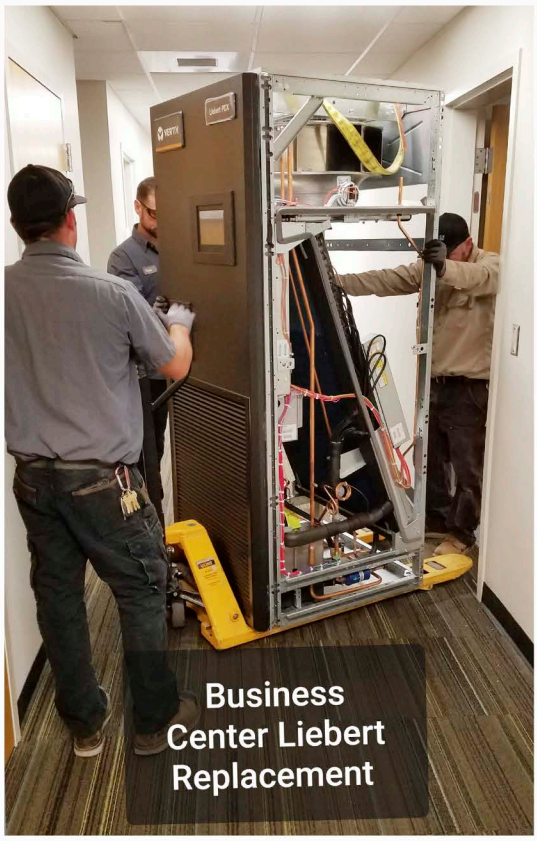
Annual large water meter testing in Rocklin.

Facilities Maintenance staff unblocks supply duct at Maidu.



Water Efficiency launches the "Keep the Meter Clear" campaign.

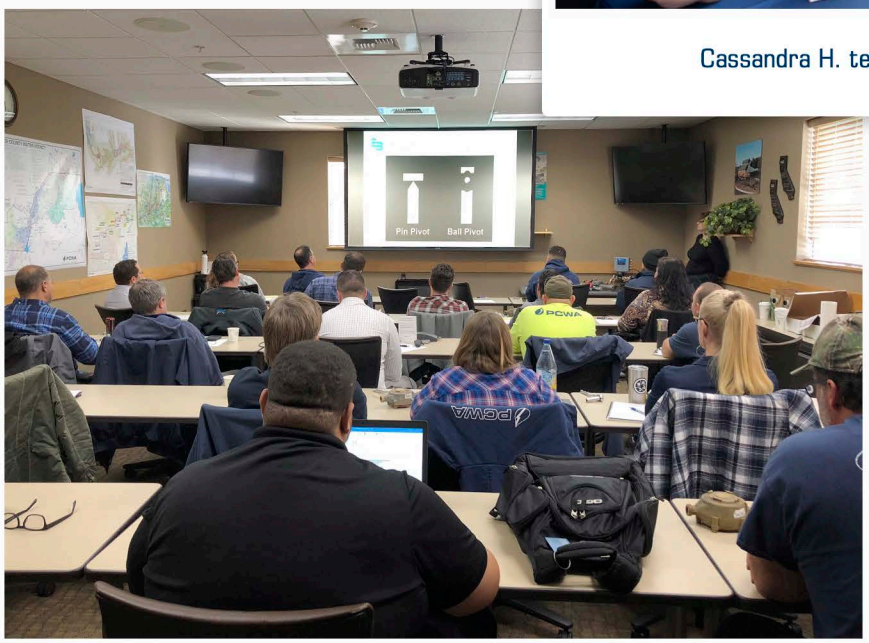
Facilities Maintenance teams up with Techinical Services on the upgrade of the Liebert HVAC units at the Business Center. Here a crane instals a rooftop unit.



Crews move the new Liebert air conditioning unit into the server room at the Business Center.

A crowd gathers at the PCWA booth at the Auburn Earth Day Festival.

Cassandra H. teaches students how water meters work.



Water Efficiency partnered with multiple departments for a Meter Training with Badger Meter.

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Energy Marketing Department

The Energy Marketing Department is responsible for the management of all energy products and sales from the Agency's Middle Fork American River Project (MFP). This includes planning, analysis, and optimization of water supplies and energy market trends; management of water storage, flows, and generation based on operating plans, forecasts, contract provisions and limitations, and hydrologic conditions; and marketing and sales of energy products in the California Independent System Operator (CAISO) and bilateral energy markets.

As the certified Scheduling Coordinator for the MFP, the Department is also responsible for scheduling MFP power sales, monitoring compliance with Federal Energy Regulatory Commission (FERC) resource management license requirements, and ensuring that MFP operations continue to remain in compliance with North American Electric Reliability Corporation (NERC) safety and reliability requirements.

SIGNIFICANT ACCOMPLISHMENTS FOR 2018

Hydrology and Operations Planning

Water supply planning is a critical component of the Energy Marketing Department. Extreme precipitation and snowpack variability makes forecasting and planning for water availability in Agency watersheds a challenging task. Meteorological and runoff conditions are constantly monitored, along with energy price trends to optimize MFP generation schedules with water release commitments. In addition to existing in-house hydrologic expertise, the Department filled the remaining staff vacancy in 2018 with a candidate who provides expertise in meteorological and hydrologic processes and forecasting.

Preliminary forecasts for this past Water Year 2018 (October 2017 through September 2018) called for near-normal precipitation, but with extreme variability from month-to-month. Early in the season this seemed to hold true with Lake Spaulding reporting 219 percent of average precipitation in November before drying out dramatically. With only 17 percent of average precipitation observed in December, and a combined December through February average total of only 39 percent, staff adjusted the MFP generation hours to account for the drier conditions, while still maintaining the possibility for much more precipitation to return toward the end of the winter.

These planning strategies ultimately proved to be effective, as the dry weather pattern flipped in March, which pushed a series of powerful late-season storms into the state. These storms brought record breaking precipitation to several locations across the Sierra with Lake Spaulding reporting 22.7 inches of precipitation, or 210 percent of average conditions in March. The

combination of heavy rain and high snow levels resulted in a surge of runoff across the MFP basin, and the planning strategies developed in early winter provided enough flexibility in the system to account for the increased flows. By late May, MFP combined storage was at a healthy level of 107 percent of normal conditions.

In addition to the hydrologic variability and energy market trends, other factors need to be considered in reservoir and power generation planning. Occasionally, projects such as the Hell Hole Dam Core Raise Project limit the reservoir levels to allow for construction to be completed. In 2018, the Energy Marketing Department managed to fill Hell Hole Reservoir to just below the project limited capacity. This allowed for explorations within the dam to be completed. Unfortunately, unexpected results from the explorations will require extensive improvements to the top section of the dam which will limit the available storage within the reservoir for potentially the next couple of years.

Energy Markets

Energy market prices in 2018 were primarily driven by weather events and natural gas prices. Energy markets experienced low prices in the spring, and record-breaking high prices during the summer months.

Although an ever increasing prevalence of solar generation in the state has an impact on energy prices year round, the greatest influence of solar on market prices occur during the spring months when power demand is at its lowest. Solar generation pushes prices lower during the middle part of the day when the sun is shining the brightest. Unfortunately, the peak demand for power does not occur until the sun sets and the grid must rely on more expensive resources to meet power demand over the evening peak. This causes energy prices to swing dramatically from one hour to the next.

Hydro generation can also play a significant role in energy price formation in the springtime. During wet years, such as 2017, hydro generators may run at maximum capacity around the clock to limit spill conditions. Hydro generation, coupled with solar generation can lead to extremely low prices in wet years. 2018 was an average water year and many hydro generators had enough storage capacity to limit generator run hours during the middle of the day. Energy prices during the spring months where 20 percent higher in 2018 compared to 2017, with an average price of $25.24 per megawatt hour (MWhr).

Since the beginning of 2015, natural gas prices have been relatively low ranging from $2.00 to $3.50 per million British Thermal Units (MMBtu), varying seasonally. At the same time there has been growing concern regarding the health of the natural gas delivery system in the state. Aging infrastructure has been neglected for decades, leaving it susceptible to equipment

failures and pipeline limitations. By the summer of 2018, such failures were realized in Southern California, which limited pipeline delivery capability to roughly 60 percent of capacity. During peak power demand days this past summer, the limited supply of natural gas reached scarcity pricing levels, and the normal price of $3.00 jumped up to $38.84 per MMBtu. This dramatic price increase caused power prices to surge to record levels in July and August of 2018.

The demand for natural gas generation was primarily driven by west wide heat waves in the summer. Although California peak power demand did not reach all-time levels, when hot weather did show up in the state, the Pacific Northwest and Desert Southwest experienced high temperatures as well. When this weather pattern occurs, power imports to California are limited and prices soar. Such was the case on July 24 when power prices reached record levels of over $900 per MWhr. For the first time ever, MFP revenues exceeded $1 million in a single day. On average, summer power prices where 10 percent higher in 2018 compared to 2017, averaging $45.42 per MWhr.

Natural gas prices continue on an upward trajectory heading into 2019. Natural gas storage levels are well below five-year averages as the winter heating season approaches. Storage concerns, coupled with an early October pipeline explosion in British Columbia have sent average gas prices upwards in excess of $4.00 per MMBtu, to levels not experienced since 2014. Power prices are expected to be 5 to 10 percent higher in 2019 as compared to 2018 due primarily to an increase in natural gas prices.

Energy Contracting

From 2013 to 2017, PCWA worked under one Power Purchase Agreement with Pacific Gas & Electric (PG&E) for the sale of all MFP energy products such as Resource Adequacy (RA) capacity, renewable energy credits (RECs), and carbon-free attributes. For delivery period 2018, this single contract was replaced with fifteen individual contracts. Combined, 99.5 percent of all MFP energy products were contracted for sale in 2018. It should be noted that the carbon-free attributes produced by the MFP were sold under a five-year contract running from 2018-2023 and RA and RECs were sold under one-year contracts for 2018.

Once again, this year, Energy Marketing staff have solicited buyers and marketed MFP RA and RECs to be delivered in 2019. Due to the hard work of building positive business relationships over the past several years, Energy Marketing staff was able to contract 100 percent of the available RA capacity and RECs for delivery period 2019.

Prices for both RA and RECs have increased for 2019. Both markets have been oversupplied for the past several years leading to muted prices. The supply stack has gradually eroded on the RA front, and RECs are increasing in value due to higher market demand. Combined, revenue for

these two energy products will be 35 percent higher in 2019 compared to 2018. This upward price trend will likely continue over the next several years.

Scheduling Coordinator

On January 1, 2018, PCWA took over the Scheduling Coordinator (SC) responsibilities of the MFP in the California Independent System Operator (CAISO) market. This allows PCWA to interact directly with the CAISO on day-to-day activities that were either previously managed by PG&E or where PG&E was an intermediary used to access the CAISO and energy markets. PCWA now has a direct financial relationship with the CAISO and is paid generation revenues weekly. Energy Marketing staff directly enter bids, upload monthly and annual supply plans, enter and manage outages, respond to data requests and regulatory filings, and manage the unit characteristics with the CAISO. Finally, PCWA participates in the CAISO stakeholder initiative process for market design changes, ensuring a proper defense to the value of the MFP and associated energy products, and provides a voice in the CAISO rule making process.

Remote Dispatch Transferred from PG&E to NCPA

After much preparation in 2017, on January 1, 2018, PCWA seamlessly transitioned the remote dispatch operations of the MFP from the PG&E Drum Powerhouse, to Northern California Power Agency (NCPA) in Roseville. The Drum Powerhouse historically provided the remote dispatch responsibilities of the MFP since it began operations in 1967. PCWA found a robust, economical, local partner in NCPA when it comes to control room and dispatch services, and have been a good fit given NCPA's hydro experience and availability of existing facilities. NCPA provides software for Energy Marketing staff to easily access the CAISO API systems. This software also provides reporting functionality for settlements that have proven helpful in monitoring CAISO metering and settlement data as it acts as a "shadow" settlement system. NCPA and PCWA have also negotiated a Coordinated Functional Registration Agreement that was filed with NERC for designation of compliance responsibilities.

Senate Bill (SB) 100

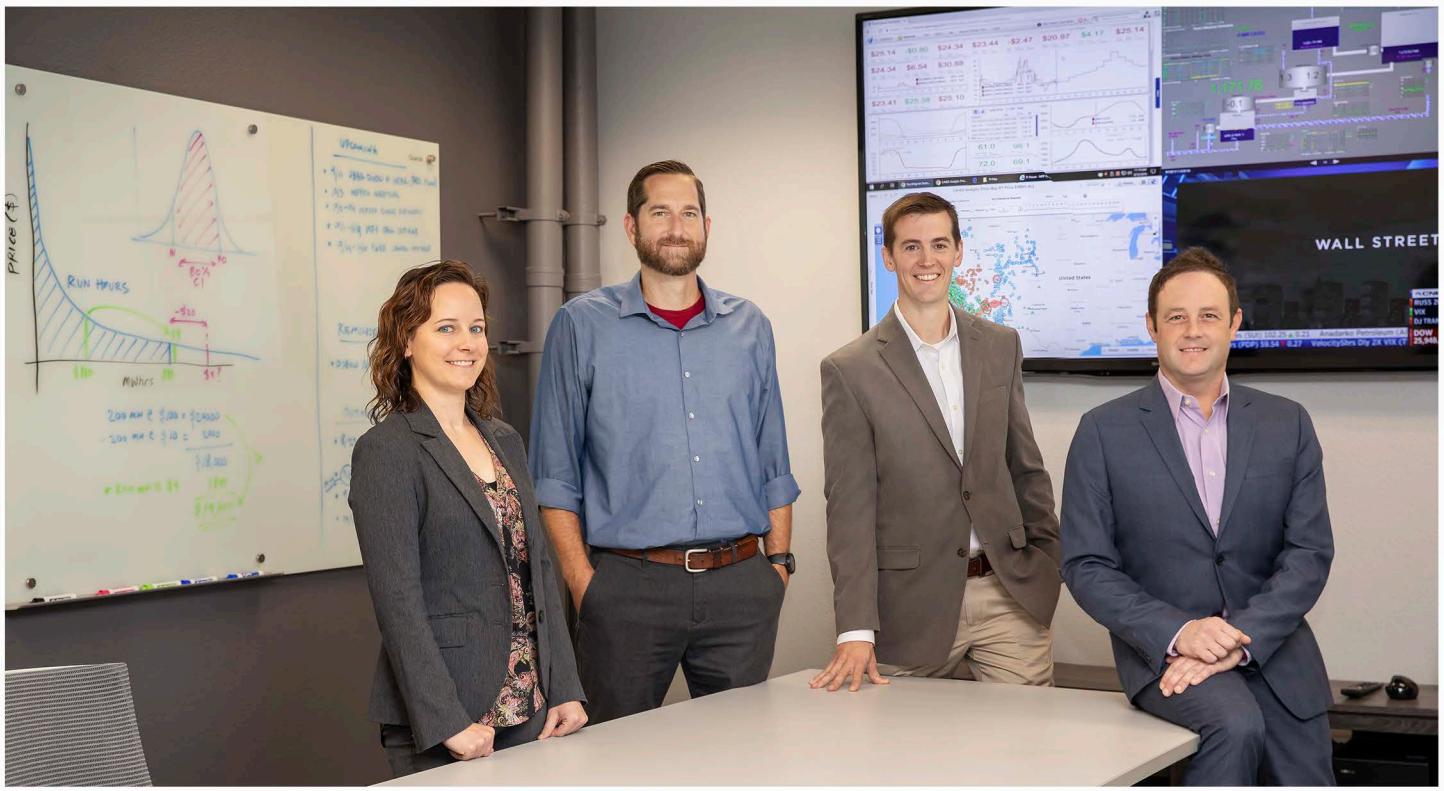
For the past 15 years, California lawmakers have passed legislation to decrease carbon emissions in the state's wholesale power sector. A Renewable Portfolio Standard (RPS) was first established in 2002, requiring that 20 percent of electricity retail sales be served by renewable energy resources by 2010. In 2008, the RPS target was increased to 33 percent by 2020. SB 350 was signed into law in 2015, further increasing the RPS to 50 percent by the year 2030. The march toward a lower carbon emissions future has been inevitable, and in September of 2018, landmark legislation known as the California 100% Clean Energy Act or SB 100, was signed into law.

SB 100 is the most ambitious energy legislation to date. It mandates that the state will supply 100 percent of its electricity needs with "Carbon Free" resources by the year 2045. The RPS target is once again increased to 60 percent by 2030. SB 100 had been under consideration by the legislature for the past two years before final approval. During this time, Energy Marketing staff have been closely monitoring draft language of the bill, and working with lawmakers to ensure "Carbon Free resources" include large hydro projects. We are confident this goal has been accomplished and the MFP will continue to be a viable resource in California's 100% Clean Energy future.

ANTICIPATED CHALLENGES FOR 2019

2018 was a busy and productive year for the Energy Marketing Department with new challenges on the horizon for 2019. There are several CAISO market initiatives Energy Marketing staff will participate in, such as changes to the Day Ahead market that will step granularity down from one hour to fifteen minutes, and changes to Flexible Resource Adequacy bidding obligations. Another very important CAISO issue that the Energy Marketing staff will be focused on resolving in 2019, will be updating how the CAISO calculates the MFP's Default Energy Bid when CAISO considers the MFP to have market power and dictates price mitigation for MFP delivery points. As new market participants have entered into the CAISO Energy Imbalance Market, we have experienced a dramatic uptick in the amount of market intervals that the CAISO has found the MFP to have market power. We believe this is a modeling issue for the CAISO and staff will push for this to be resolved quickly.

For the past five years, the Energy Marketing Department has only been able to sell power in the CAISO spot market. There are advantages and disadvantages to being subject to spot market prices only, but as the expertise of the new Energy Marketing staff grows, so does our ability to venture into other markets. For the past two years staff has been exploring entry into the forward energy markets. Entry into forward market transactions requires an update to the Energy Risk Management Policy outlining roles and responsibilities for multiple PCWA departments, as well as defined checks and balances as it pertains to energy risk management. We are hopeful new policies and procedures will be adopted in 2019 that allow for opportunities to participate in forward markets.



Energy Marketing Department

Field Services Department

The Field Services Department consists of three operational divisions: Field Administration, Raw Water Operations and Maintenance, and Treated Water Maintenance.

Field Administration oversees and provides departmental wide support in coordinating, monitoring, compiling and distributing a variety of operational data and schedules; synchronizing crew operations with outside entities and utilities; interfacing with other Agency departments; attending meetings and communicating updated information, safety trainings and policies to support the Department in staying abreast of current Agency issues and goals.

Raw Water Operations and Maintenance is responsible for in-house raw water renewal and replacement projects, service installations, system maintenance and repairs throughout the Agency on canals and raw water pipelines. Raw Water Operations and Maintenance also provides construction support to all other Agency departments. Raw Water Operations and Maintenance includes the following functions:

Canal Operations controls all canal water flows and adjustments to the raw water system throughout the County while working closely with other utilities, entities and stakeholders including, but not limited to PG&E, Nevada Irrigation District (NID) and South Sutter Irrigation District. This crew also handles after-hours customer calls and emergencies as they apply to the raw water system.

Canal Cleaning is comprised of seasonal employees, in addition to permanent employees, who have the responsibility for annual cleaning of debris out of the Agency's 165-mile canal system in only 90 days.

Brush and Weed Control is vital to the control of algae and aquatic weeds. This crew has the responsibility of treating canals for the removal and control of aquatic vegetation to assure capacity and deliveries in the raw water system. These practices ensure an adequate and reliable water supply to all Agency water treatment plants, several private treatment plants, and over 4,000 raw water customers. Additionally, Brush and Weed Control maintains various Agency owned properties, earthen dams and 165 miles of canal berms. Brush and Weed Control also works to control invasive weeds and rodents and helps promote the growth of native grasses and plants.

Treated Water Maintenance is responsible for all treated water service installations, various main replacement projects, and repairs throughout the County. Treated Water Maintenance handles treated water duties including emergency leak repairs and 24-hour, stand-by personnel to respond to emergencies and customer concerns. This crew also provides support for all other Agency departments related to construction. Treated Water Maintenance includes the following functions:

Fleet Maintenance is responsible to repair and maintain a variety of vehicles and equipment while staying abreast of current and new rules, regulations and laws; maintain and update the vehicle and equipment replacement plan; and write and review vehicle and equipment specifications to stay current with changes both inside and outside the Agency. Currently, this group is responsible to maintain 109 vehicles and 95 pieces of equipment.

Warehouse is responsible for the timely acquisition, tracking, dispensing and financial reporting of material support services. Values of current inventoried products are nearly $700,000, excluding fuel. These products, along with support services, are provided to the personnel of the following operational areas: Treated Water Maintenance, Raw Water Operations and Maintenance, Canal Operations, Brush and Weed Control, Fleet Maintenance, Water Efficiency, and Drinking Water Operations. Additionally, the Warehouse personnel provide support services to the entire Agency in the form of uniform rentals, acquisition of safety gear, forklift certification, and fuel supply services.

SIGNIFICANT ACCOMPLISHMENTS FOR 2018

Field Administration

- Provided Department with three new standard operating procedures and updated seven safety compliance programs, which resulted in a new record for the number of days without a lost time injury.
- On-boarded and trained six new permanent employees, including one Deputy Director and 14 temporary employees.
- Expanded the use of electronic dispatching, saving staff time.
- Implemented new computer tablets into each Field Services vehicle for remote access and better in-the-field information sharing.
- Converted nearly 40 years of daily Canal Operator paper reports to electronic files in Questys.

Raw Water Operations and Maintenance

Raw Water Operations and Maintenance

- Replaced 350 feet of old, leaking steel spill pipe with 10-inch ductile iron pipe (DIP) on the Turner Canal.
- Replaced 100 feet of old steel pipe with 8-inch C-900 pipe on the Newcastle Irrigation line.
- Made multiple improvements in western Placer County, which include new 24-inch and 12-inch lines and head gates for Burt Lefty's services and new flash board services on the Pleasant Grove Canal. Also secured the outlet of the culvert for the Home Ranch Canal with rip-rap bags and replaced five old wooden walkways with new, safer metal walkways with handrails.
- Eliminated a restriction on the Boardman Canal and Mt. Howell Road in Colfax; and worked with our customers to replace an old wooden bridge in poor condition with a new bridge constructed of gunite and 1.5-inch steel plates.
- Installed manhole on Boardman Canal in front of Auburn Iron Works to provide needed access for inspections and future cleanings.
- Lined 14,065 linear feet of canal using 2,267 yards of gunite as part of PCWA's Capital Gunite Project, improving the overall canal system.
- Worked with Engineering to install slip-line through leaking section of lower Boardman at YB-78 (under PG&E's South Canal). Helped complete the project in the needed time frame at total cost of about $40,000, compared to the estimate of $50,000 for contractors to complete the work.

Canal Operations

- Scheduled and coordinated outages for Raw Water Operations and Maintenance crews to conduct maintenance programs (e.g., gunite, flume repair, leak repairs, etc.).
- Scheduled and coordinated outages to accommodate capital projects such as the Long Ravine Pipeline and the Clover Valley Pipeline Projects.
- Scheduled, coordinated, and re-routed flows for the four-week annual PG&E Lower and Upper Drum Canal outages.
- Operated and maintained the reliable flow of water through the Agency's 165-miles of canal and raw water pipelines.
- Successfully completed both summer and winter water orifice changing on-time.
- Successfully operated the newly acquired western Placer canal system providing crucial water to rice farmers and cattle ranchers in Lincoln, receiving positive feedback from our customers.

- Managed water throughout the hottest summer months without the American River Pump Station, saving the Agency pumping costs.
- Helped with the fine-tuning of the new Upper Greely Pressure Control Valve/System.
- Coordinated and scheduled the lowering of Lake Theodore on two occasions to accommodate requested outlet valve testing with State Division of Safety of Dams (DSOD).

Brush and Weed Control

- Coordinated with Raw Water Operations and Maintenance to prepare canals and berms for gunite work.
- Skillfully handled dynamic labor requirements of dense vegetation removal and algae control treatments due to record rainfall in the winter of 2017 and hot summer temperatures.
- Managed a new contract to facilitate the use of goats for control of vegetation on various Agency properties.
- Worked with Agency Right-of-Way Technician to gain access and do necessary vegetation maintenance on Cook Spill, improving performance of the spill and limiting Agency liability.
- Modified spray program and rodent baiting to include Agency dams and right-of-ways to ensure positive DSOD inspections.

Treated Water Maintenance

Treated Water Maintenance

- Replaced 543 feet of 6-inch steel main under College Way in Auburn due to leak history and water quality. This project completed a three-year multi-phased effort that replaced a total of 960 feet of 1940s-era steel pipe with DIP.
- Replaced 300 feet of 4-inch steel main with 4-inch DIP on Davis Lane, Auburn, due to water quality and leak history. Phase II of this project extended the main 265 feet to Chamberlain Avenue and abandoned 507 feet of 1930's-era cast iron pipe. This two-phase project enhanced water quality and abandoned the water main that was in backyards causing accessibility issues.
- Replaced 120 feet of 6-inch steel main with 6-inch DIP on Cherry Lane, Newcastle, and 80 feet of 6-inch steel with 6-inch DIP, on Cherry Lane, Newcastle, due to leak history and water quality.
- Replaced 65 feet of 6-inch DIP with new 8-inch DIP and a 16-inch steel casing that houses the new 8-inch mainline, under the railroad tracks. The new pipe and casing

replaces a ductile main that was damaged due to settling of the railroad tracks and concrete casing in Alta. This project was estimated at over $500,000, but Field Services was able to react quickly and take advantage of an already excavated trench to install the new line at a cost of under $20,000.

- Lowered two fire hydrants and two 2-inch water services on Sunset Boulevard to assist the City of Rocklin for the future installation of a storm drain.
- Repaired 304 water leaks in the system and performed 10,876 "USA Locate" requests.
- Leak detected 9.40 miles of water main as part of our annual leak detection efforts.
- Worked with Cathodic protection consulting contractor Corrpro to identify test stations throughout the Agency's service area, and areas of concern around Midas Avenue, Rocklin.
- Staff received Award from American Water Works Association (AWWA) for designing and creating the "Speed Key".

Fleet Maintenance

- Placed 16 new vehicles and six new pieces of equipment into service. Prepared 15 vehicles and six pieces of equipment for surplus auction.
- Smog-tested 31 vehicles and smoke-tested 18 trucks.
- Performed 36 inspections as required by California's Basic Inspection of Terminal program, managed by the California Highway Patrol.
- Responded to 63 roadside service calls.

Warehouse

- Reorganized and updated the shelving storage systems, as well as the item barcodes to alleviate errors in the issuing of parts and supplies.
- Implemented a practice of banding the lumber stored outside to limit the amount of warping of the materials from the sun.
- Maintained an inventory valued at $671,965, with only $202.71 in variances during the year. That equates to a 0.03 percent variance to this point; the industry standard is one percent.

PLANNED PROJECTS AND ANTICIPATED CHALLENGES FOR 2019

Field Administration

- Continue identifying and improving efficiencies within the Department and practicing "Safety First" in everything we do.

- Continue converting paper archive documents to electronic files in Questys.

Raw Water Operations and Maintenance

Raw Water Operations and Maintenance

- Increase system reliability by guniting both lined and unlined canals. Potentially lining over 14,000 linear feet of canal with gunite.
- Replace Penryn Flume #1 with underground pipe-currently under negotiations with property owners.
- Replace understructure of Nary Red Flume #1 and #2.
- Replace tin on Rock Springs Flume and Tailrace Flume.

Canal Operations

- Continue to explore ways to maximize and improve the operation of the canal system.
- Refine operational methods and efficiency in western Placer County seasonal water deliveries.
- Increase cross-training and operational awareness across the different areas of responsibility.

Brush & Weed Control

- Operate equipment and lead temporary employees to remove debris from canals in advance of the 2019 summer irrigation season.
- Continue with algae and vegetation control efforts system-wide.
- Create additional fire breaks near key infrastructure.

Treated Water Operations and Maintenance

Treated Water Maintenance

- Replace 400 feet of 6-inch steel main with 6-inch DIP on E. Towle Road and Alta Bonnynook Road in Alta, due to water quality and leak history.
- Replace 400 feet of 4-inch steel on Channing Way, Auburn, with 6-inch DIP, due to leak history, water quality and fire protection.
- Install 680 feet of 24-inch C-905 PVC and 60-feet of 16-inch blow off line during Phase I of the Penryn Flume abandonment and Raw Water Syphon installation.
- Perform roadway maintenance on Maidu Drive, Auburn, installing a micro-pave overlay.

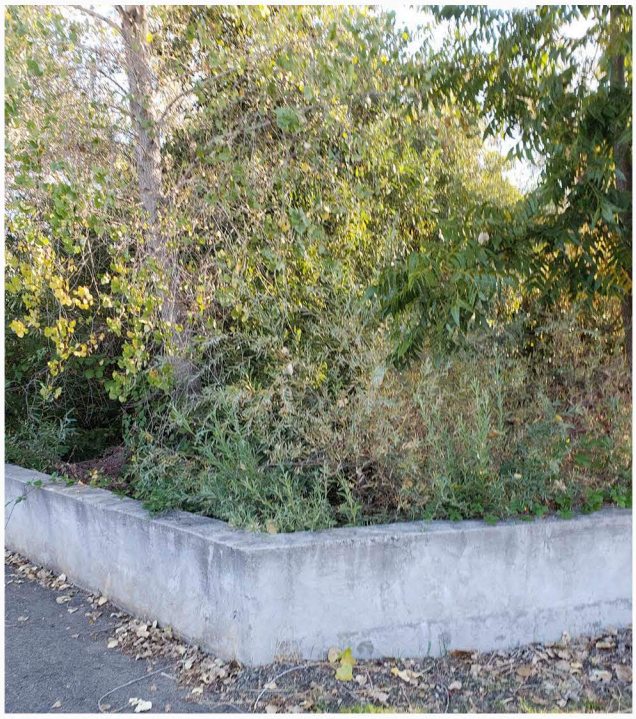
Fleet Maintenance

- Maintain 204 Agency vehicles and equipment, according to set service intervals.
- Replace 16 vehicles and one piece of equipment in Fiscal Year 2019.

Warehouse

- Utilize available yard storage space to purchase bulk materials at cost savings.
- Complete scheduled bi-annual inventory of entire warehouse.
- Complete Agency wide forklift safety training.

Field Services Department



Cook Spill off of Boardman Canal
before cleaning by Brush and Weed Crew.

Cook Spill after cleaning by Brush and Weed Crew.

Newly fabricated metal walkways and handrailings
for Canal Operator safety, Moore Canal.

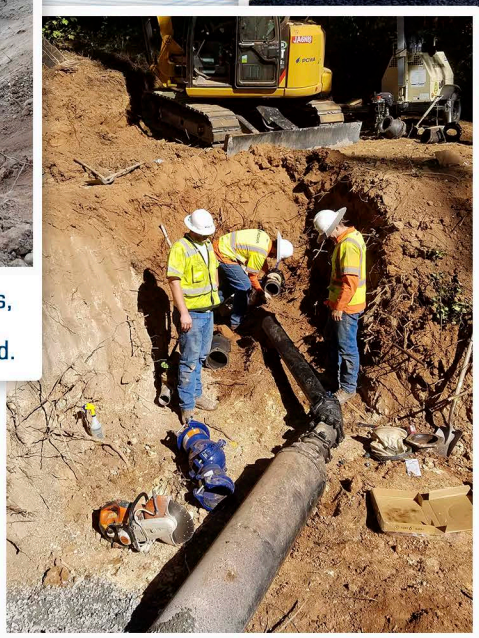
Original bridge over Boardman Canal in Colfax was failing and restricting water at higher flows.

Replacement bridge over Boardman Canal in Colfax now allows full canal capacity.

Two typical Pleasant Grove canal services before replacement.

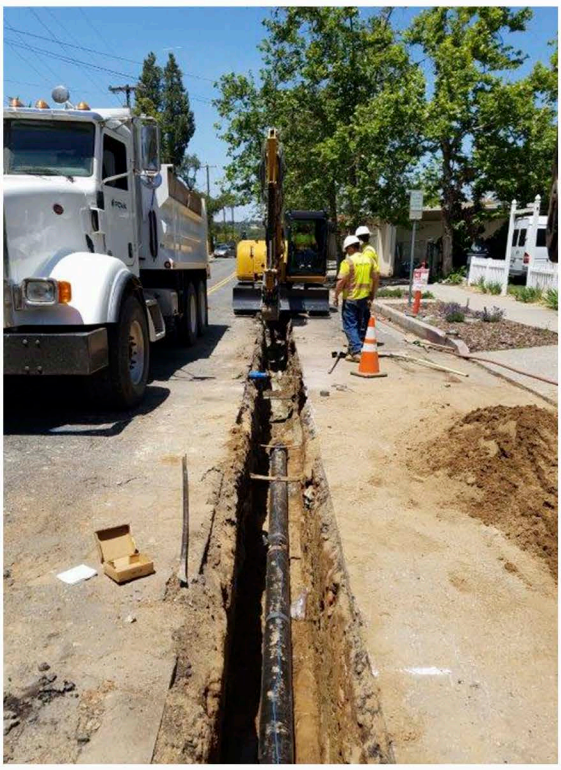
Pleasant Grove services after replacement by Raw Water Operations and Maintenance crew.

Open excavation under railroad tracks, in Alta. PCWA crews working in conjunction with Union Pacific Railroad.



PCWA crews setting preassembled casing sleeve and water main, in Alta; working in conjunction with Union Pacific Railroad.

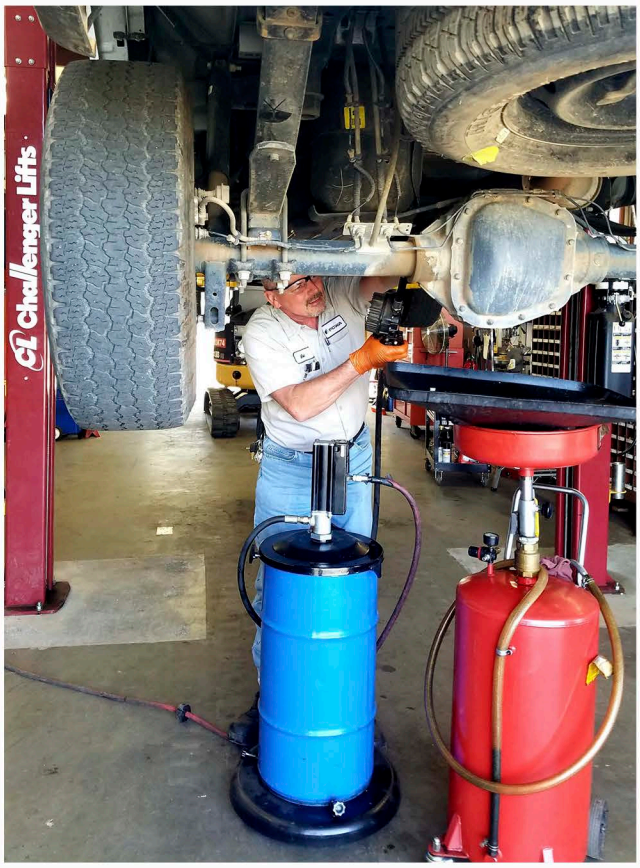
Crews using our newly purchased 308 Caterpillar Excavator and a Backhoe mounted ripper tooth to break up and excavate rock, College Way, Auburn.



Newly installed 8-inch DIP prior to backfilling, College Way Auburn.

Crews assemble and prep 6-inch valve cluster prior to installation, Davis Lane, Auburn

Newly installed valve cluster and tie-in points, Davis Lane, Auburn



Mechanic Eric H. performs routine maintenance on an agency vehicle.

Storekeeper Jon Lipsmeyer stocks and organizes parts in the Field Services Warehouse.

Financial Services Department

The Financial Services Department is comprised of four functional areas: Financial Services, Analysis, Procurement, and Energy Risk Management. The Department performs a variety of financial activities for the Agency including accounting, analysis, purchasing, reconciling and reporting. The Department also provides these services for the Middle Fork Project Finance Authority (MFPFA), and on a more limited basis, for the American River Authority, which is in the process of dissolving.

The Financial Services Department's primary customers are the Agency departments and the General Manager, in which we serve by providing sound financial management and a system of internal controls over Agency resources. The Department is ultimately accountable to the Agency's Board of Directors, Agency customers and the community.

Financial Services is responsible for all accounting, cash and investment management, debt management and administration, budget monitoring and analysis, financial reporting and disclosure, accounts payable processing, non-utility invoicing, capital assets, grant and project accounting, internal audit, and coordination with various external auditors.

Analysis performs a variety of analysis and financial projections, including power settlements, budget and emerging technology. This area is also responsible for the development, implementation and review of financial plans.

Procurement performs a variety of functions to assist departments in acquiring products and services needed by the Agency in a timely and cost-effective manner, including checks and balances, competitive pricing, and appropriate approvals. To fulfill this responsibility, the Procurement team consults with and assists departmental staff with purchasing needs, procedures and regulations, contract negotiation, contract development and management, generation of purchase orders, and soliciting formal bids and request for proposals.

Energy Risk Management institutes, supervises, and reviews all energy risk management activities. Energy Risk Management is comprised of the middle and back office functions that provide risk oversight and support with a wide range of activities necessary to execute and settle transactions and risk control efforts (e.g. billing, data collection, transaction entry, bookkeeping and accounting, contract administration, etc.), in addition to ensuring state and federal annual compliance with the Energy Information Administration (EIA), Department of Energy (DOE), and the CA Energy Commission (CEC).

SIGNIFICANT ACCOMPLISHMENTS FOR 2018

Financial Services

- Received the Agency's 12th consecutive Comprehensive Annual Financial Report (CAFR) Award from the Government Finance Officers Association (GFOA).
- Successfully established a new relationship with U.S. Bank.
- Completed the application for the Western Area Power Administration (WAPA) 2025 Marketing Plan for additional power allocation over the next 30 years, starting in 2025, as our current base resource allocation is .03822 percent.
- Administered the 2018 Financial Assistance Program grant awards totaling $106,612 to eligible districts to fund six projects that support the Agency's County-Wide Master Plan.
- Enhanced the Financial Assistance Program funding request process by allowing eligible districts to submit applications electronically through the County-Wide Master Plan Project Database.
- Supported Customer Services in administering the Sustainable Irrigation Pilot Program grant.
- Successfully transitioned all PCWA electric meter billing (except three WAPA and three solar meters) from PG&E to the local Community Choice Aggregate (CCA) Pioneer, which will be a cost reduction for the Agency.
- Worked closely with WAPA to understand the financial implications of starting up the ARPS following the destruction of several WAPA transmission lines from the Carr fire, which forced WAPA to cease base resource deliveries to customers, including PCWA. Finance communicated the financial implications to Technical Services who was able to supplement flows from Lake Theodore and postpone starting up the ARPS, which resulted in avoiding high energy costs.
- Enhanced the Unclaimed Property procedure by providing quarterly updates to the PCWA website on unclaimed checks and an annual publication in the Auburn Journal.
- Successfully completed all needed compliance requirements for the arbitrage rebate calculation for the 2008 and 2013 Refunded Certificates of Participation (COPs).
- Participated in the kick-off of the Agency Grant Team with a goal of centralizing resources and information.
- Administered the dissolution process of the American River Authority in accordance with the Board of Director's action, which has been in place since 1982.
- Increased fiscal transparency by including all CAFRs and three years of Budget documents on the PCWA website.
- Key participant in the Cayenta implementation and assessment training and configuration.

- Updated the Investment Policy and implemented enhanced investment practices.

Analysis

- Presented to rating agencies Standard & Poor's (S&P) and Moody's Investors Service (Moody's), in conjunction with the 2018 COPs refunding, and received updated credit ratings. S&P reaffirmed their highest rating of AAA and Moody's reaffirmed their Aa2 rating on the Agency's COPs.
- Successfully refunded the 2008 Water Revenue COPs to the Water Division's debt service cost, resulting in a reduction in debt service by an average of $773,000 annually.
- Settled approximately $49 million in Power Sales Revenue from Energy Product Services as follows:
    - $43.0 million Energy Sales
    - $0.9 million Carbon Free
    - $1.1 million Renewable Energy Credits
    - $4.0 million Resource Adequacy (capacity)
- Kicked off the Long Range Financial Plan.
- Analyzed the 2018 water rate structure and reviewed water sales revenue at the commodity level.
- Reviewed and assessed Agriculture Grant invoices of both PCWA and Placer County Resource Conservation District for supporting documentation and overall reconciliation prior to submission to the granting agency.
- Performed a solar analysis and engaged Montague DeRose and Associates to review solar program benefits and evaluate buy-out options.

Budget

- Developed the annual Agency and MFPFA Budgets.
- Improved the Budget Policy and obtained Board approval.
- Performed an extensive review of the Agency's Cost Allocation Plan (CAP) and made revisions to the CAP Model; this allocation plan is used to share Agency Wide operating costs with Power Division, Water Division and capital projects through service level support (SLS).
- Established category level groupings for the Water Division Capital Improvement Program (CIP) based on the nature of the project, allowing for flexibility in funding projects.

Procurement

- Performed a follow-up Procurement Assessment Review that leverages the July 2015 analysis to gauge the success of implemented programs, enhanced processes, and to obtain feedback from departments for further improvement opportunities.
- Reviewed and improved the Procurement Policy and obtained Board approval.
- Generated $177,000 in surplus property sale proceeds. This includes $82,000 in surplus vehicle sales that were deposited in Reserves for the Vehicle Replacement Program, in accordance with the Surplus Policy.
- Implemented a vehicle rental program through a State of California contract with Enterprise Rent-A-Car that provides further liability protections for the Agency at discounted rental rates.
- Implemented the Amazon Business Program to improve ordering efficiency. This program provides more transparency and control over ordering and approvals, and includes special pricing, terms and conditions that are favorable to government agencies.

Energy Risk Management

- Hired an experienced employee to perform the needed energy risk management functions for the forward market program and other functions.
- Key participant in drafting a revised Energy Risk Management Policy.
- Commenced expanding the middle office and back office functions for the forward market program, in addition to establishing procedures for both the middle and back office.
- Established Energy Counterparty Credit Limits and Controls as required for the forward market program.
- Fulfilled the final true-up invoice between PG&E and PCWA from the Power Purchase Agreement that commenced in 2013.
- Performed testing in Decipher software that captures energy transactions and produces risk reporting.

PLANNED PROJECTS AND ANTICIPATED CHALLENGES FOR 2019

Financial Services

- Revise the General Financial Policy and Capital Asset Policy.
- Continue to work with WAPA and PG&E on converting the three Dual Supply delivery points from Dual Supply Service to Full Load Service. The exit fee will be based on

energy usage from 2016 through 2018, which will be determined when the usage is known for 2018.

- Continue providing excellent reporting to achieve the GFOA's CAFR Award.
- Commence an initiative to review the Agency's capital asset data.
- Analyze the financial implications of transitioning the three solar accounts from PG&E to Pioneer Community Energy, which will occur in the first quarter of 2019.

Analysis

- Analyze new PG&E Time of Use (TOU) and financial implications.
- Collaborate with Technical Services and outside consultants to expand the Long-Range Financial Plan.
- Continue monitoring and reporting water sales revenue during the budget process.

Procurement

- Find a suitable location to hold the Business Center surplus items until disposal.
- Improve the surplus process to better meet customer needs.
- Analyze the effect of the additional tariffs on $200 billion worth of Chinese imports. Beginning on January 1, 2019, these additional tariffs are set to increase to 25 percent. Though the full extent to which these tariffs will affect the Agency is not fully known, we do know that there will be a direct impact to the cost of chemicals, equipment, vehicles, tools, and parts.

Energy Risk Management

- Transition from test phase to go live phase for the forward market program at a pace established by Energy Marketing.
- Continue to explore and understand the reporting requirements for derivative accounting.
- Develop and evaluate various reports to provide to senior management on forward market results.
- Continue to strive for effective communications between the front, middle and back office.
- Evaluate the credit of counterparties for use by Energy Marketing on energy transactions.
- Monitor Value at Risk of the forward energy market portfolio.

- Team up with Energy Marketing to contract and/or renew data subscriptions and enter into the most economic terms and conditions with the best interest for the Agency.
- Perform various time sensitive analyses to support Energy Marketing on potential forward market transactions for energy pricing, hedging and contract negotiation.
- Continue to maintain and ensure energy risk management methods and processes are consistent with industry standards.

Financial Services Department

From left to right: David Jarman, Jon Turner, Gina Lambeth, Lance Chang, Carrie Parks, Melissa Cope, Joe Parker, Jenniffer Foster, Tracey Fortner, Chris Bonnenfant, Todd Deacon, Jannet Hendrix, Neil Bartlett

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Legal Department

The Legal Department is responsible for assisting all of the Agency's various departments on diverse legal matters, and provides specific in-depth assistance on longer-term matters as needed.

SIGNIFICANT ACCOMPLISHMENTS FOR 2018

Bay-Delta Water Quality Control Plan Update

- Assisted PCWA staff with efforts to protect PCWA water supplies and interests in the American River watershed, including the development of voluntary agreements for flow and non-flow actions in the American River as an alternative to the State Water Resources Control Board's (SWRCB) unimpaired flow approach to water management.
- Continued coordination with northern California water interests as part of a collaborative effort to protect northern California water supplies as part of the SWRCB's Bay-Delta Water Quality Control Plan Update.
- Monitored and coordinated efforts to participate in Phase 1 of the Bay-Delta Water Quality Control Plan Update.

WaterFix

- Continued participation in the administrative proceedings before the SWRCB regarding the petitions filed by the California Department of Water Resources (DWR) and United States Bureau of Reclamation (USBR) to add new north Delta diversions to the state and federal water projects.
- Began preparing, along with other northern California interests, for final briefing and possible SWRCB decision on the WaterFix change petition.
- Oversaw CEQA litigation over the adequacy of the WaterFix Environmental Impact Report.

Legislation

- Participated on the ACWA State Legislative Committee, providing input/feedback on diverse pieces of legislation affecting PCWA customers and resources, including conservation legislation, the water tax, and the "water shutoff" bill, among others.

PLANNED PROJECTS AND ANTICIPATED CHALLENGES FOR 2019

Bay-Delta Water Quality Control Plan Update

In December 2018, the SWRCB adopted the Bay-Delta Plan Amendments for the Lower San Joaquin River and South Delta. The amendments include, among other things, an unimpaired flow range for each of the major tributaries to the lower San Joaquin River. An effort to reach voluntary settlements on these tributaries failed, as agreements were not reached on the Stanislaus or Merced Rivers, which resulted in the SWRCB adopting the Plan Amendments as proposed by staff.

In the Sacramento River watershed, there are proposed voluntary agreements on the Sacramento River and all its major tributaries. As part of its approval of the Plan Amendments, the SWRCB acknowledged the effort to reach agreement and directed staff to include those agreements in its analysis as an alternative to the unimpaired flow approach. There will be a significant effort in 2019 to ensure the agreements are included as an alternative to the unimpaired flow approach. In the event the SWRCB does not accept the voluntary agreements, PCWA will need to be prepared to protect PCWA's interests and investments in the American River watershed. PCWA expects to continue to work closely with its northern Californian partners in the Plan Amendment process.

WaterFix

The evidentiary portion of the WaterFix proceeding concluded in late 2018. To date, the SWRCB has not requested briefing on issues raised by protestants. We expect the SWRCB to either provide a briefing schedule or issue a draft decision on the WaterFix petition in early 2019 and will respond consistent with Board direction and consistent with PCWA's continued effort to protect water supplies and meet its environmental commitments in the American River watershed.

Legislation

PCWA continues to actively monitor and participate in legislative processes to advance and protect PCWA's interests. In 2018, we saw continued attempts to pass a "water tax" and other mandates affecting how PCWA operates. Moreover, given the significant recent wildfires, PCWA expects legislative activity related to wildfire prevention and responsibility. The Legal Department will continue to assist PCWA's other departments in protecting PCWA's interests on these various and diverse issues.

Legal Department

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Power System Department

The Power System Department consists of four functional areas: operations, maintenance, engineering, and administration. The Department operates and maintains the Middle Fork American River Project (MFP), which is made up of five hydroelectric power plants, two large reservoirs, seven dams, twenty-one miles of tunnel, and numerous associated facilities. The Department works with regulatory and resource agencies such as the Federal Energy Regulatory Commission (FERC), the State Division of Safety of Dams (DSOD), the Western Electricity Coordinating Council (WECC), the North American Electric Reliability Corporation (NERC), and the United States Forest Service to ensure the safety of Project facilities, protection of water supply and the environment, reliable production of electrical energy, and the availability of recreation facilities. It also plans and carries out many rehabilitation and improvement projects in order to keep the MFP in good operating condition for water storage and reliable electricity production, as well as improving response to safety, security and environmental needs.

Operations Division consists of Hydro Station and Roving Operators. The 24/7 control room remote operation functions of the MFP continue to be provided under contract by the Northern California Power Agency (NCPA) at their Dispatch Center in Roseville. Hydro Roving Operators are responsible for the entire MFP while on day shift, and provide standby coverage at night. Hydro Station Operators cover the upper end of the MFP. Hydro Operators perform inspections, local operation of the MFP as needed, and operational preventive maintenance.

Maintenance Division consists of a civil, mechanical, and electrical maintenance sections. The skilled trades of this Division such as Hydro Plant Mechanics, Hydro Electrical Machinists, Hydro Plant Electricians, and Hydro Electrical Technicians, perform preventive and corrective maintenance, as well as equipment modifications and capital improvement projects for MFP facilities.

Engineering Division provides maintenance engineering and technical support to the Operations and Maintenance Divisions, project managers for capital improvement projects, and compliance support for the MFP's FERC License, WECC/NERC Reliability Standards, and OSHA Safety Standards requirements.

Administration Division provides support to the Operations, Maintenance, and Engineering Divisions. Administrative support by this staff includes budget management, contracts and procurement for routine operations and capital improvement projects, spare parts inventory, and support for maintenance of MFP documentation and drawings.

SIGNIFICANT ACCOMPLISHMENTS FOR 2018

- Deferred from 2017, the Hell Hole Dam Core Raise Project started in June. Excavation started at the left abutment, and the contactor found material conditions were different than those shown on the original design drawings. As-found conditions showed that both the clay core and the downstream fine filter zone were below the required original height. Based on discussion with the Agency Engineer of Record, and with state and federal regulators, a new project is being developed to rebuild the top twenty feet of the 410-foot tall dam. This greatly expanded scope will likely require two construction seasons.
- NCPA took over remote operation of the MFP from PG&E on January 1, 2018. As expected, there were a few challenges after cutover, but overall NCPA Dispatchers have done an excellent job this year.
- Completed all civil work construction for the MFP Communications System upgrade project. Electrical/electronic installations are on-going; completion is expected by January 2019.
- Upgraded the turbine governor at French Meadows Powerhouse from analog to digital controls during the spring 2018 annual maintenance outage.
- During the fall annual maintenance outage, upgraded the plant cooling water intake and straining system equipment and controls at Middle Fork Powerhouse.
- The Forest Service finally cleared the slide on Blacksmith Flat Road (FR23) near Ralston Powerhouse. The Agency will continue to monitor the slope, particularly after the winter season's first rains. In addition, multiple slides on 11 Pines Road (FR2) were cleared and the road opened for public use.
- During a scheduled outage, replaced high voltage bushings on the French Meadows Main Transformer by an Agency contractor to extend the life of the transformer. In addition, the transformer insulating oil was processed to remove moisture and contaminants.
- Upgraded plant controls at Hell Hole Powerhouse, and automated a number of control features.
- A rockslide occurred on January 9, 2018 on Interbay Road, next to Interbay Dam. The slide was cleared and subsequently the slope was evaluated by Sage Engineers and a slope stabilization design was completed. A contractor completed the slope stabilization work which included scaling the slope, rock bolting, and netting.
- Removed and rebuilt the spillway gate hoist gearboxes for Gates 1 to 4 at Interbay Dam in the mechanical shop at the Foresthill Facility Center (FFC). The

gearboxes were thoroughly cleaned, gearing inspected, seals replaced, and fresh lube oil added. In addition, gate hoist electric motors were rewound and reinsulated.

- Replaced back-up generator at the Church Street Communications Site in Foresthill with an industrial grade back-up generator and automatic transfer switch. This site is a key microwave communications site for the MFP.
- Under contract, rebuilt and repaved access road to French Meadows Powerhouse.
- Selected an engineering firm to start an alternatives analysis, leading to design and specifications development for Middle Fork Powerhouse main transformer and generator circuit breaker replacements, and switchyard upgrades.
- Completed engineering design and specifications for replacement of the French Meadows generating unit excitation system in spring 2019. The new generator excitation system was ordered from Balser Electric Company.
- Completed a sediment removal project at the intake of Ralston Afterbay's low level outlet. The sediment consisted mostly of sand, so the contractor used suction dredging as the method for removal. Water pulled from the reservoir along with the sand had to be filtered to return clear water back to the river.
- Hired a contractor to help with planning, preparation, and facilitation for a FERC required functional exercise in 2019 of the MFP's Emergency Action Plan (for dam failure).
- Modification of the low level outlet works at L.L. Anderson Dam had been planned for this year. FERC's environmental department held up construction at the last minute and required an additional environmental study. The project includes installation of a micro hydroelectric unit on the outlet to provide continuous power to the new communications site to be constructed there.
- Completed another sediment removal project at North and South Fork Long Canyon Diversion Dams. Approximately 6,700 cubic yards was excavated. The removed sediment was used to fill the hole created by excavating clay for the Hell Hole Core Raise project on property belonging to Sierra Pacific Industries.
- The Agency hired HDR Engineers to conduct a FERC required 10-year spillway gate inspection at Interbay and Ralston Afterbay Dams. No significant issues were noted.
- Started modifications to the FFC in November. Modifications include construction of a new training/meeting room space, a new designated central files location, and improved office storage facilities. The project is expected to be completed in April 2019.

PLANNED PROJECTS AND ANTICIPATED CHALLENGES FOR 2019

- The Hell Hole Dam Core Raise Project will be re-started in early summer as reservoir elevation allows. A number of alternatives were considered as a path forward, with the remove and replace option selected as a permanent solution. Project start will be dependent on completion of design and specifications, and approval by both the FERC and the California DSOD. At this time, it is anticipated the work will require two construction seasons.
- Final construction and commissioning of the MFP Communications System upgrade is expected to be completed during the first quarter of 2019. The system will bring much needed expanded digital bandwidth and system redundancy.
- Once specifications are completed, bids will be sought to purchase a main transformer and generator circuit breakers for the Middle Fork Switchyard upgrades. Power transformers typically require a lead time of 12 to 18 months for construction and delivery. Construction at the powerhouse switchyard is planned for 2020.
- Modification of the low level outlet works at L.L. Anderson Dam is planned for 2019. The project includes installation of a micro hydroelectric unit on the outlet to provide continuous power to the new communications site that was constructed near the spillway in 2018. The modifications will meet the release requirements of the new FERC license.
- The generator excitation system on the French Meadows generating unit will be replaced. The original 55 year old system will be replaced with a modern fully digital electronic system.
- HVAC systems will be upgraded at the following powerhouses: Middle Fork, Ralston, and Oxbow.
- The turbine governor at Oxbow Powerhouse will be upgraded from analog to digital controls during the Fall 2019 annual maintenance outage.
- A 5-year FERC required table top and functional exercise of the MFP Emergency Action Plan (EAP) will be conducted. The Agency will invite emergency responders and resource agency personnel to use a real life scenario to test the effectiveness of the MFP's EAP, so that if an emergency ever occurred at a MFP dam, we know we have a valid EAP.
- The MFP's FERC License expired in 2013. The license has been renewed annually by FERC since then with the same terms and conditions. It is possible the new license will be issued in 2019. With the new license will come all new terms and

conditions, and will start the clock on required infrastructure and recreation improvements, each with an implementation timeline.

- In anticipation of the new FERC license, modifications will be made to the Interbay Dam Low Level Outlet to accommodate increased minimum flows required under the new license.

Power System Department

The main transformer high voltage bushings were leaking at the flange and had to be replace.

The insulating oil was reprocessed to remove containments and moisture.

Interior of original turbine governor, before upgrades.

Interior of turbine governor, after modifications and upgrades.

New digital controls for upgraded turbine governor.

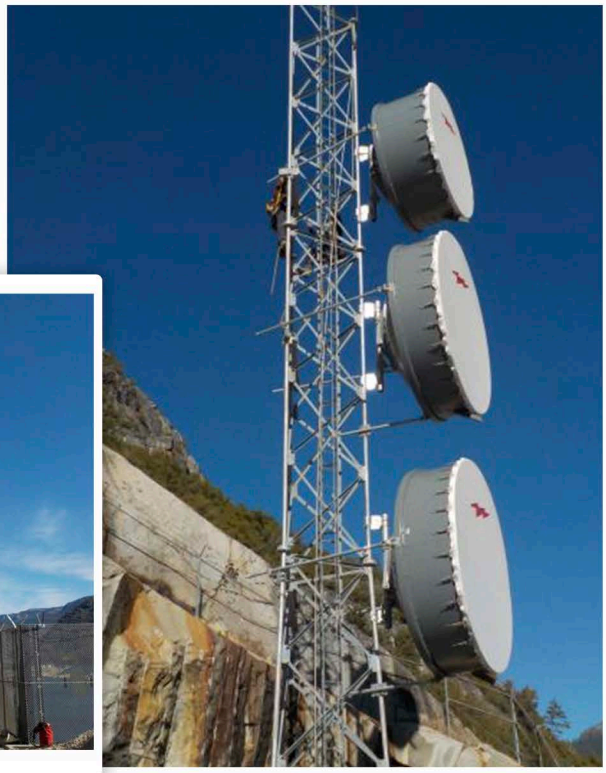
Exterior of original turbine governor cabinet, before upgrades.

Exterior of turbine governor cabinet after modifications and upgrades.

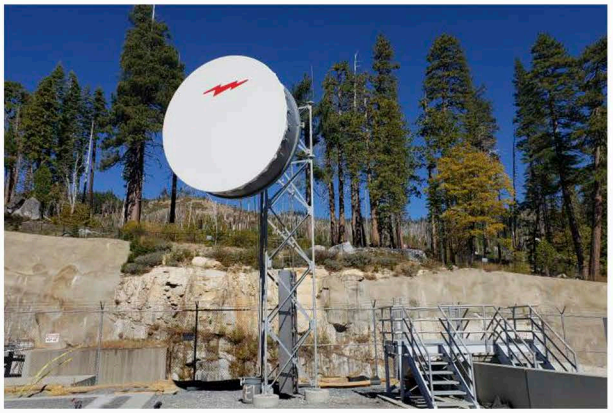
Middle Fork Project Communications Upgrade Project

Concrete mixer trucks could not use the dirt road to the Bunker Hill Passive Reflector Site. A helicopter was necessary to fly the concrete to the site for the reflector foundation.

Red Star Ridge Passive Reflector Site: Construction complete.



French Meadows Powerhouse
microwave tower dish installation



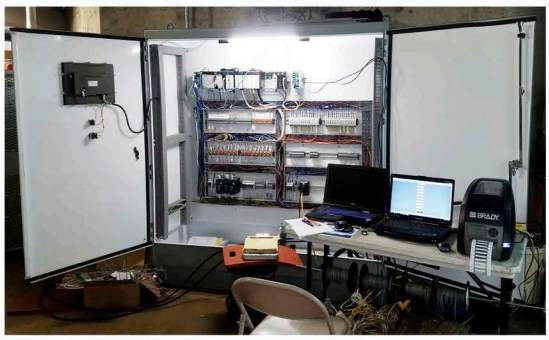
LL Anderson Dam communications
tower and microwave dishes

Middle Fork Surge Shaft communications site

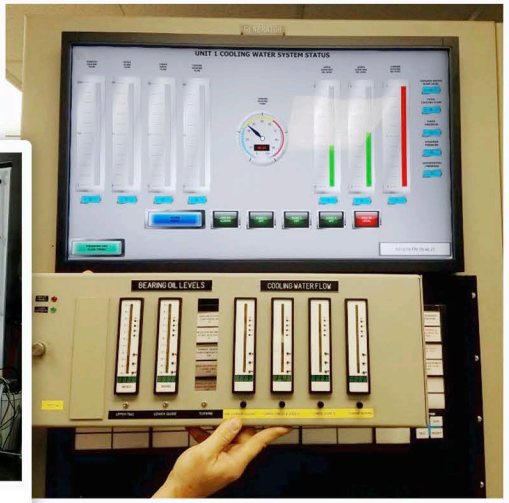
Ralston Surge Shaft communications site - setting
prefabricated communication shelter

Middle Fork Powerhouse - Cooling Water Upgrade Project

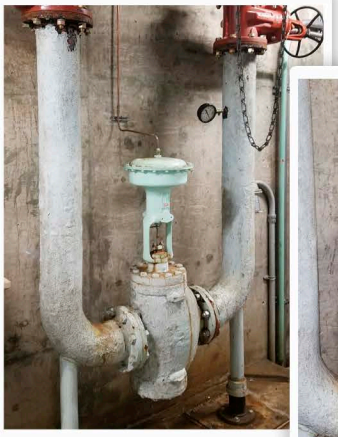
Old control panel



New control panel



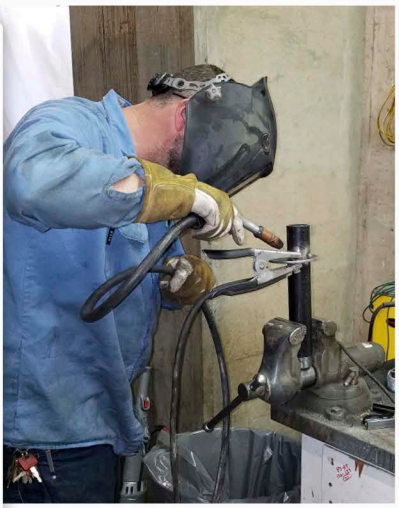
Swithboard display panel



Old Taylor valve

New Fisher valve

New auto backflush strainer



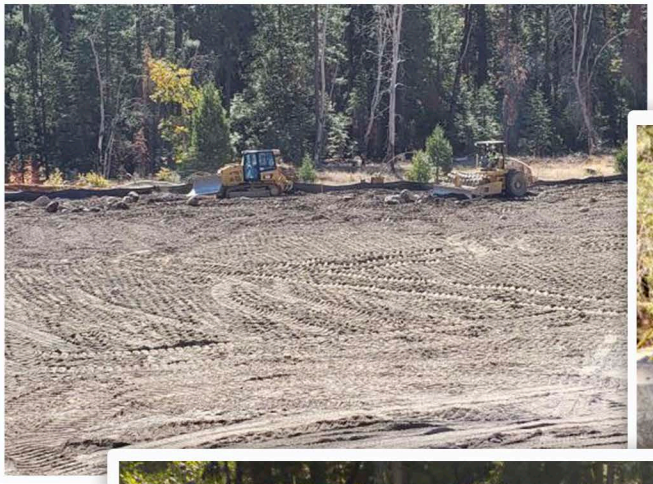
A lot of welding was needed during the upgrade project.

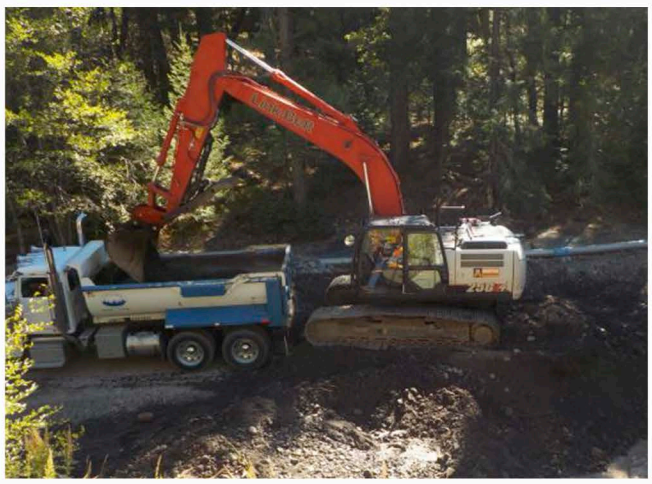
New auto strainer

Upgrade completed!

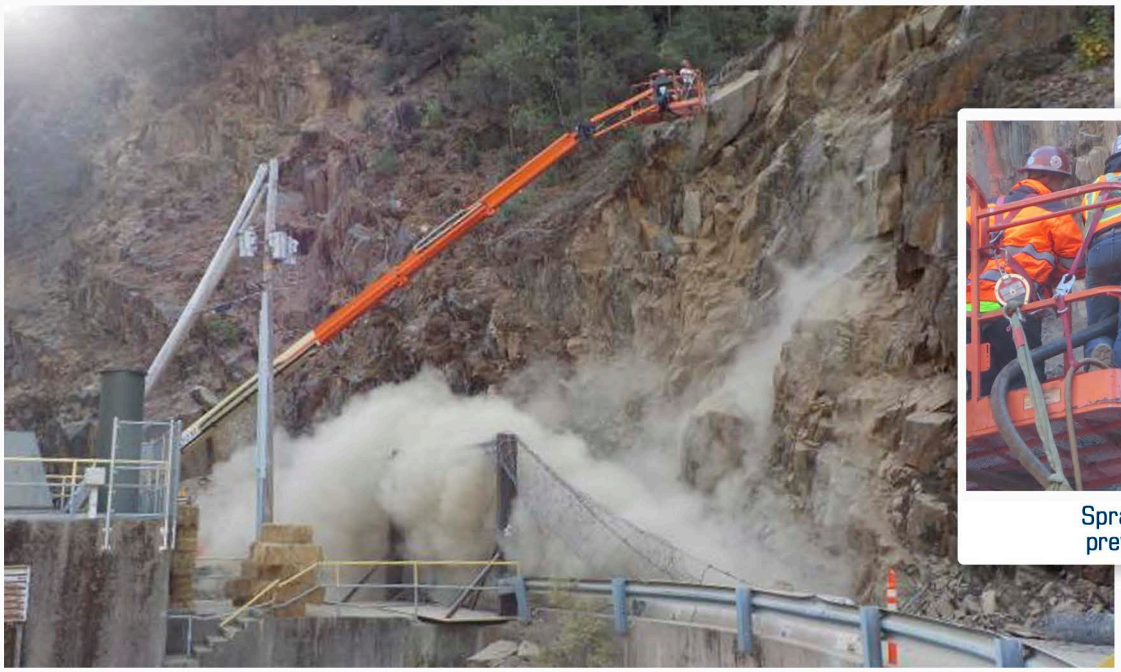
Sediment Removal Projects

Dredging at Ralston Afterbay Dam
Low Level Outlet



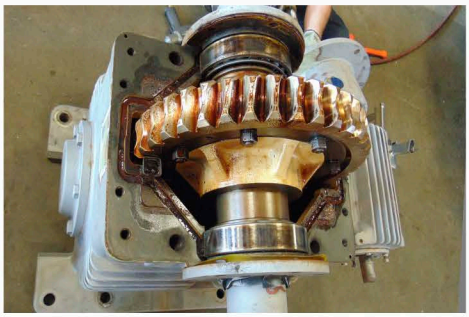


Dredging at North Fork
and South Fork Long Canyon

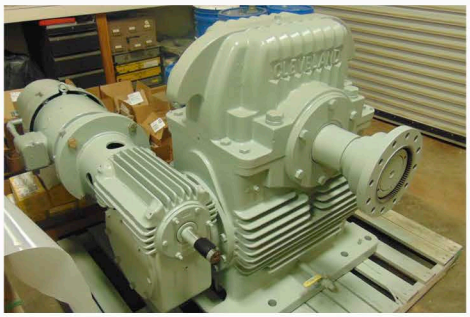


Interbay Road Slide

Spraying gunite on rock to prevent further corrosion



Ralston Afterbay Gate 5 gearbox disassembly



Ralston Afterbay Gate 5 gearbox and electric motor reassembled and painted

Ralston Afterbay Gate 5 hoist gearbox overhaul in progress

Middle Fork Powerhouse runners were replaced on Units No. 1 and No. 2 in 2010.

Before weld repair on buckets of Unit No. 2 runner

After weld repair on buckets of Unit No. 2 runner

Strategic Affairs Department

Strategic Affairs is responsible for assisting the General Manager and the Board of Directors with strategic partnerships and contracts, long-term planning, and legislative, legal and regulatory defense of the Agency's assets and water rights. These efforts include collaboration with federal and state agencies, local governments, citizens, and nonprofit organizations to meet the Agency's goals. It also includes support to the Middle Fork Project Finance Authority.

The Department participates in various cross-departmental team projects, such as land development projections, and water system infrastructure planning and financing.

SIGNIFICANT ISSUES in 2018

Statewide Water Issues

State Water Resource Control Board – Bay Delta Plan Update

The State Water Resources Control Board recently noticed a process to review the Water Quality Control Plan (WQCP) for the Sacramento San Joaquin Bay Delta (Delta). This process will redefine the minimum water quality parameters that must be maintained by responsible parties to maintain Delta health. In past proceedings, the latest of which culminated with SWRCB Decision 1641, northern California had reached settlement agreements regarding its portion of the share of water necessary for Delta health. Staff continues to believe that voluntary settlement agreements are the most effective and efficient way of providing water for the Delta while transferring water to parties south of the Delta for other beneficial uses. The outcomes of voluntary agreements are generally more durable and more beneficial to the environment and water users than a strictly regulatory approach that is favored by some in the state government.

The WQCP update will be an intense technical and legal effort involving PCWA in-house science and legal resources, as well as a technical consulting team. The American River Water Supplies Joint Defense and Cost Sharing agreement will be a useful vehicle for continuing to share costs and resources across the seven local participating water agencies. It is likely that costs to participate in the WQCP process will amount to approximately $200,000 annually for each participating agency, and may continue for three to five years. If litigation is required to resolve the Agency's issues, costs will likely increase substantially.

The current SWRCB staff proposal to improve the health of the Bay Delta ecosystem relies on a pattern of reservoir releases from major tributaries to the Delta of between 40 and 65 percent of natural flow in the January through June period of every year. This proposal by SWRCB staff

is devastating to water management in the state, leaving reservoirs consistently lower and unable to sustain significant parts of the state's economy during dry periods. In addition, because reservoirs are key to maintaining water temperatures for salmon and steelhead in streams like the American River, lower reservoirs mean warmer temperatures and increased likelihood of decimating local salmon runs. The SWRCB adopted the staff proposal on the San Joaquin River, leading to litigation that will take years to sort out. The staff proposal for the Sacramento River has been released, but no formal action has been taken by the SWRCB.

In an effort to reduce the damage of the SWRCB staff proposals, the Governor's Office invited key stakeholders from river systems throughout the state to work on a compromise solution that would balance the needs of local salmon runs, water supplies for homes and farms, and the Delta ecosystem. Strategic Affairs staff continues to participate in these discussions representing the interests of the Agency and its customers, using the Agency's FERC settlement and the Water Forum Agreement as baselines for discussion. For PCWA's customers and the residents of Placer County in general, the SWRCB proposal could lead to permanent water use restrictions that could have dramatic impacts on property values and the quality of life associated with living in suburban and rural settings.

The Water Forum Agreement (Agreement), signed in the year 2000 by a broad coalition of environmental, business, government and water utility organizations, has been thoroughly tested as a result of the drought. For the most part, for the portions of the Agreement under local control, the Agreement has been a resounding success. All water agency signatories have abided by their "Purveyor Specific Agreements" to either limit their withdrawals from the American River, including Folsom Reservoir, switch sources to groundwater, or, in PCWA's case, release additional water from storage to aid the aquatic species in the lower American River. Habitat enhancement projects implemented by the staffs of the Water Forum, U.S. Fish and Wildlife Service, and the Bureau of Reclamation (USBR) have continued to be successful in providing additional habitat for all species.

The obvious weakness in the Agreement has been the management of Folsom Reservoir storage levels. In times of drought, Delta water quality requirements and Sacramento River endangered species take priority and water needed to flush the Delta and provide for minimal levels of exports for basic public use and safety has predominantly been withdrawn from Folsom Reservoir, as water is saved in Shasta Reservoir for purposes of maintaining a cold-water pool to protect endangered Sacramento River winter-run Chinook salmon. The effects on Folsom Reservoir have been dramatic, with lake levels reaching historic lows two years in a row during the 2013-2015 drought, and threatening the water supplies of half a million people including those in the cities of Roseville and Folsom, and the service area of the San Juan Water

District. Because of low water levels, and the resulting lack of cool water, it is likely that the entire year's class of threatened American River juvenile steelhead perished in 2015.

The Water Forum collaborative has set about to fix the problem of dangerously low Folsom Reservoir levels by revising the American River Flow Management Standard. Chief among the modifications is an end-of-year reservoir storage target of between 230,000 and 300,000 acre-feet (AF). This is sufficient storage to guarantee local water supplies should the subsequent year be dry, as well as provide habitat and water temperature benefits to the lower American River. A joint group of environmental and water purveyor stakeholders is working with the USBR to finalize the new Flow Management Standard. This initiative is intended to form the backbone of a voluntary settlement agreement that will provide an alternative to the SWRCB proposal.

The RiverArc Project

One important element of the Water Forum Agreement is the general philosophy of reducing surface water diversions from the American River in dry years. For some purveyors, this paradigm results in a shift to groundwater in dry years, but for those purveyors with limited access to groundwater, a new source of surface water was contemplated as part of the aforementioned Water Forum Agreement. To that end, the cities of Roseville and Sacramento and PCWA commenced work in the early 2000s on a plan to build a new diversion structure on the Sacramento River, near the international airport, and the related infrastructure necessary to bring that water to our respective service areas.

Throughout the 1990s and into the 2000s, Placer County experienced rapid growth in the western portion of the county, and the need for water supply infrastructure to serve the area was increasing rapidly. At about the time a draft environmental document for the new diversion facility was completed, the Great Recession began and the bottom fell out of the California housing market. Understandably, the need for the Sacramento River facility and its associated infrastructure diminished dramatically, as did the available financing to accomplish its construction.

As a result of the drought, additional water utilities in the region, many of which previously relied entirely on the American River supplies, have become interested in diversifying their portfolios to include additional sources of water. A dozen local water agencies are now moving forward with the planning phases of the new RiverArc project, which is a reimagining of the original Sacramento River Water Supply Reliability Study. The new project utilizes existing diversion structures and state-of-the-art fish screen facilities owned by Natomas Mutual Water Company to convey water from the Sacramento River to a treatment facility near Rio Linda.

From that location water utilities can deliver water to their service areas through new or existing transmission infrastructure.

This new design is modular in nature and staff believes that the ability to phase construction is key to successful implementation. The pace of the region's economic recovery and the related growth in new urban and suburban development has been moderate at best. Large infrastructure projects of this nature have become increasingly difficult for local agencies to finance and therefore projects that can be built in phases as water demands grow enjoy significant advantages. For RiverArc, the initial construction of the raw water pipeline, a smaller modular water treatment facility and a treated water pipeline that connects to the regional cooperative pipeline will provide important backbone infrastructure for regional water supply reliability and emergency back-up purposes. As demands grow, treatment plant capacity and transmission infrastructure can be added.

The next three years of planning effort will focus on environmental documentation and site planning. There are currently six funding partners for this phase of work, operating under a Memorandum of Understanding.

Regional Water Bank

The construction of the RiverArc project backbone infrastructure provides a significant opportunity to leverage the region's unused groundwater potential to create a regional conjunctive use project and water bank. PCWA and Sacramento Suburban Water District's (SSWD) partnership to provide SSWD MFP water in wetter years has been an unqualified success in terms of recovering groundwater levels. As successful as this program has been, it is a small part of a regional effort that could yield tens of thousands of acre-feet of additional water supplies for local agencies and the lower American River.

The expansion of the region's conjunctive use program is dependent on the continued availability of surface water in wetter years, and region wide shifts to groundwater in the driest years. With the RiverArc backbone infrastructure in place, participating agencies north of the American River will have access to American River water from Folsom Reservoir, Sacramento River water from the new facilities, and a robust reserve of groundwater for use during times of drought or emergency. For PCWA, in particular, the RiverArc infrastructure and water banking program will create a redundant supply for the planned development in western Placer County that is not easily served from our treatment plants and surface water sources farther to the east.

The regional water bank technical effort is currently being funded by a combination of federal grants and technical assistance (USBR) and local matching funds and in-kind contributions. The

water banking program is intended to proceed in conjunction with the RiverArc project, in a phased manner that provides benefits in proportion to investments.

Water Rights Extension

PCWA's extension of its MFP water rights continues to be a significant work effort. Through an agreement with the USBR, PCWA has agreed to limit its withdrawal of its MFP supplies for consumptive use to 120,000 AF per year. To date, the Agency has used a maximum of approximately 50,000 AF, predominantly from our Folsom point of diversion, to service our wholesale water supply contracts to San Juan Water District, the City of Roseville and SSWD. The Agency, based on growth projections for Placer County, believes it will slowly build up its use of MFP water rights over the next three decades until full consumptive use is reached in 2043. We have requested an extension of time to put these rights to beneficial use until this date from the SWRCB.

Staff is currently preparing a draft California Environmental Quality Act (CEQA) document that will document the environmental impacts of withdrawing an additional 70,000 AF of MFP water from the American River and propose mitigation strategies if needed. We anticipate that the document will be ready for circulation in early 2019.

Long-term Central Valley Project (CVP) Contract Renewal

As a result of a settlement agreement between the USBR and PCWA regarding the construction and operation of Auburn Dam in the 1960s, the Agency agreed to limit its withdrawal of MFP water for consumptive uses to 120,000 AF a year, provided that the USBR met the rest of Placer County's ultimate water needs by providing 117,000 AF a year from the CVP. PCWA and USBR executed a CVP water supply contract in 1970 that memorialized this settlement agreement.

In the ensuing years, water supply deliveries from the CVP have continued to decline. As a result, in the driest years, the CVP is only able to deliver 25 percent of average contract deliveries to their municipal contractors. This situation is unacceptable to Placer, El Dorado and Sacramento County water purveyors that have built entire communities on the assurances that were made in order to settle water rights disputes that led to the construction of the CVP.

PCWA and other local purveyors are in the midst of renegotiating their CVP contracts in order to provide a firm supply of water to our citizens in all years. Firm supply contracts will reflect the commitments made by the federal government when Folsom Reservoir was first constructed and local citizens were promised full deliveries before any water left the region.

The process of negotiating a new, firm contract, including securing the necessary environmental and regulatory approvals will likely take years of staff and technical effort to

complete. PCWA, Sacramento County, the City of Roseville and the Sacramento Municipal Utility District are cooperating in the effort in order to lower individual costs and present unified positions on important legal and technical matters.

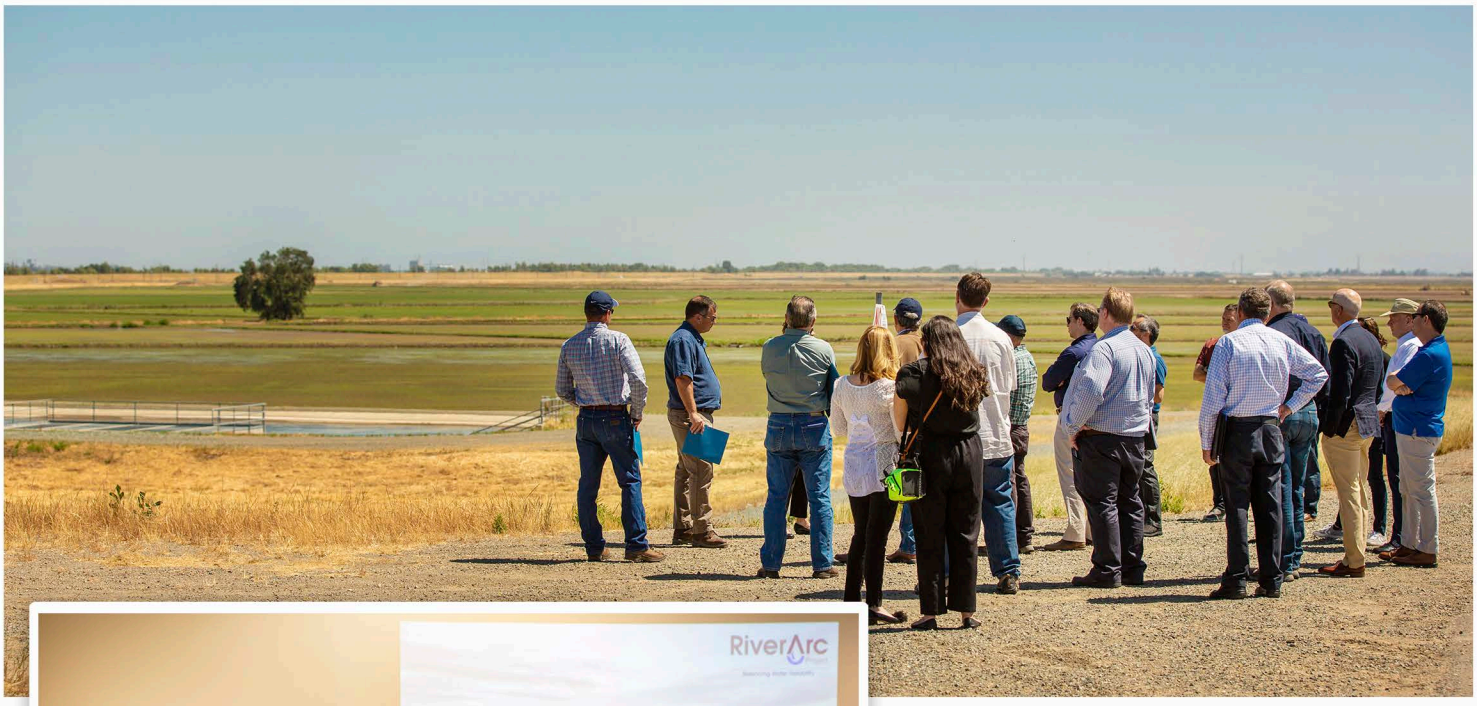
French Meadows Forest Restoration Project

A diverse partnership is advancing the 28,000 acre French Meadows Forest Restoration Project (Project), a collaborative, all-lands approach to restore forest health and resilience to reduce the risk of high-severity wildfire around French Meadows Reservoir, a critical municipal watershed. The Project involves clearing underbrush, thinning smaller trees, removing biomass to energy facilities, reforestation, restoring meadows and prescribed fire. Key to success of the Project is a strategic partnership and innovative funding. Partners include PCWA, the United States Forest Service (USFS), The Nature Conservancy, Placer County, American River Conservancy, the Sierra Nevada Conservancy, and the Sierra Nevada Research Institute at the University of California, Merced. With limited USFS resources already engaged on other projects in the American River watershed, the partnership rolled up their sleeves to design, manage, and fund the Project. After two years of work, the USFS has given its final approval of the Project and work is to begin in May or June 2019.

Conclusion

The Agency is moving forward with a host of water supply reliability projects and programs in an extremely challenging regulatory environment. At the Board's direction, staff continues to work collaboratively with our regional partners in developing strategies to secure this area's water rights and entitlements, while also investing in conservation and alternative supplies. We are now better positioned as a region to effectively and efficiently serve our current and future customers while successfully stewarding our local environmental resources.

Strategic Affairs



Tour of anticipated RiverArc Project site.

Presentation on RiverArc Project to interested stakeholders.

Tour of French Meadows Forest Restoration Project.

Technical Services Department

The Technical Services Department consists of two divisions: the Drinking Water Operations Division and the Engineering Division.

Drinking Water Operations is responsible for treatment, storage, pumping and distribution of water to PCWA customers and for maintenance of the facilities used in providing this service. This division is responsible for computer technology, communications, instrumentation, and electrical systems comprising the water system Supervisory Control and Data Acquisition system. A critical function of this division is to ensure compliance with water quality regulations, which is accomplished by collecting and analyzing thousands of water samples per year throughout the distribution system.

Engineering is responsible for project management, long-term planning, coordination and processing of land development activities, property and right-of-way acquisition, environmental compliance, design, construction management and inspection of the Agency's water and power system projects, Geographic Information Systems, and providing general technical support across the Agency.

YEAR END SUMMARIES OF THE DEPARTMENT

Water Production & Operations

Drinking Water Operations (DWO) produced more than 10.6 billion gallons of high quality potable water; estimated to be 12 billion gallons by the end of 2018. This estimate is approximately the same as produced in 2017 (11.9 billion), but 1.5 billion gallons less, or 11 percent, than produced in 2013. The peak month in 2018 was July, where the treatment plants produced 1.67 billion gallons.

In addition to treated water production, DWO tested and inspected 303 backflow prevention devices, surveyed 70 properties, inspected 26 storage tanks, responded to 103 customer calls, and conducted 54 fire flow tests.

The metrics behind 12 billion gallons of drinking water:

- *Over $400,000 of electricity at treated water facilities*
- *Over 500,000 gallons of liquid chemicals for treatment processes*
- *Over 75,000 pounds of dry chemicals for treatment processes*
- *Over 2,000 turbidity samples sent to the State's Division of Drinking Water*
- *3,110 assets entered into computerized system, and growing*
- *17 operators, 4 operational-technology staff, and 7 maintenance personnel*

Capital Infrastructure Program (CIP)

Throughout 2018, the Engineering Division continued to manage or support over 70 CIP projects in the Water and power systems. The Engineering Division inspected 40 construction projects, which included pipelines for new development. Nine construction contracts worth approximately $10 million were completed by the Engineering Division. Four additional CIP projects worth approximately $250,000 were completed by DWO staff.

The largest construction contract completed in 2018 was the Long Ravine Pipeline Replacement project valued at just over $6.6 million. The pipe, approximately one mile long and located above the City of Colfax, was originally installed circa 1910 and is a section of the Boardman Canal. The 22-inch riveted steel pipeline originated on the east side of Interstate 80, traversed down a steep grade to the freeway, crossed under the freeway, and then proceeded uphill to the Colfax Header Box near Rollins Lake Road.

The pipeline was replaced with a 30-inch ductile iron pipe (DIP) and included an improved inlet structure and a pressure sustaining station to reduce air entrainment and regulate pressure within the pipeline.

Land Development

As of October 2018, the Agency committed 338 equivalent dwellings units (EDUs) to new residential and commercial connections. This equals approximately $6.3 million dollars of revenue at the 2018 Water Connection Charge (WCC) rate; however, the actual amount of revenue as of this time is approximately $5.6 million. There is typically a difference in the amount committed versus the amount of revenue because payment is not required until completion of PCWA pipelines by the developer. A year-to-year summary of EDU commitments is as follows:

- 2013 – 1,032 EDUs
- 2014 – 1,651 EDUs
- 2015 – 1,243 EDUs
- 2016 – 669 EDUs
- 2017 – 665 EDUs
- 2018 – 338 EDUs (through October)

Note that 1 percent growth in the communities served by PCWA water treatments plants equates to approximately 600 EDUs.

There are approximately 250 EDUs of commitments anticipated to be made prior to year-end. The water mains serving the EDUs approved through October will come from 16 facility agreements, resulting in over four and a half miles of new pipelines being added to the water system. These new pipelines will serve 442 new treated water service connections, both

residential and non-residential. These development projects are located in the following land use jurisdictions:

- Rocklin - 9 projects
- Loomis - 1 project
- Auburn - 2 projects
- Colfax - 1 project
- Unincorporated Placer County - 3 projects

SIGNIFICANT ACCOMPLISHMENTS FOR 2018 AND ANTICIPATED CHALLENGES AHEAD

Because projects and efforts of Technical Services span multiple years and cover a range of functions, year-end accomplishments and challenges ahead are discussed together under each topic.

Maintaining Drinking Water Quality

The fourth unregulated contaminant monitoring rule (UCMR4) was launched by the Environmental Protection Agency (EPA). Started in 1996, the Safe Drinking Water Act amendments require that the EPA issue a new list of no more than 30 unregulated contaminants once every five years to be monitored by public water systems. DWO began its obligation to begin monitoring 10 different cyanotoxins and 20 other contaminants that range from specific metals, pesticides, pesticide manufacturing by-products, brominated haloacetic acids (disinfection by-products), and alcohols and semi-volatile chemicals. This rule takes time to organize and implement for each contaminant, with the likely outcome that some of these contaminants will be adopted into law after the monitoring period. The end result will be increased lab costs, increased responsibilities and awareness on operations, and possible treatment plant process improvements.

One contaminate that we are watching closely stems from harmful algae blooms that may result in cyanotoxins. Potential for this contaminant exists due to algae in our water supply, as demonstrated by minor taste and odor observations in the Auburn Water System. Taste and odor is primarily caused by the presence of geosmin in the raw water source. As micro-organisms die, they release the geosmin. If the population of micro-organisms are cyanobacteria based, we may need to add processes for removal of cyanotoxin when this contaminant is adopted into law. It would be ideal to remove this contaminate in the raw water source with regular and aggressive system cleaning and maintenance. If removed at the

treatment plants, chemical feed systems like ozone and potassium permanganate, and/or ultra violet light will be needed.

Customer perception and confidence have a great impact in the drinking water industry. We all appreciate the value of water, and it is easy to take for granted the reliability and safety that our industry has achieved. In 2018 we had customer inquiries about taste and odor in two areas of our water system. DWO was able to respond with satisfactory results in both instances, one requiring modified operations and the other simply requiring monitoring, and then informing the customers of clear results. In both cases, the water was 100 percent safe to drink, where keeping the customers informed and responding to their inquiries was the most important step towards consumer confidence. PCWA must continue to operate in a manner that is responsive to customer inquiries, keep pace with regulatory requirements, take advantage of technology when appropriate, and remain fully transparent with our customers.

Effective operational strategies depend on the coordination of multiple work groups, namely canal water operations, treatment plant operations and water quality in the distribution system. Understanding the source water and canal system, organic loading rates and potential contamination sources falls to the canal operators, concerns of cyanobacteria that dominate an algae bloom and properties of the toxins come from water quality staff, and the response of appropriate treatment techniques falls to treatment plant operators. These work groups are most efficient and arrive at the best results when they coordinate in lock-step with their respective systems. Staff has made great progress towards symbiotic relationships between these work groups over the last several years.

Keeping Pace with Technology

Areas where Technical Services staff is currently having to adapt and keep up with technology include instrumentation and Supervisory Control and Data Acquisition (SCADA) network security. In some cases, these adaptations are wrought by regulatory changes, requiring heightened water quality monitoring, and in other cases by the need to constantly evade cybersecurity breaches. Another area of evolving technology that staff is responding to is mobile computing, where we can take advantage of advancements for greater operational efficiency in both DWO and Field Services.

DWO completed a comprehensive control system upgrade at the Sunset Water Treatment Plant (WTP). This upgrade establishes the standards of the control system upgrades now planned at the Agency's seven remaining water treatment plants. In the past, such upgrades were typically completed by consultants and contractors. In the last year, the Agency has made strides in developing staff to complete this work in-house, yielding substantial cost savings. We are finalizing back-bone communication upgrades using radio and fiber-optic that runs between

the Sunset WTP, Auburn WTP and Foothill WTP. This "ringed" communication link has been the backbone of the network for more than a decade, and keeping it up to date and secure will ensure operational reliability and quick access to data. Provisions have been designed for the planned Ophir WTP to be incorporated into this communication ring.

Our SCADA network is generally isolated from the public facing World Wide Web; however, there are a few access points for sharing of selected data and for standby operators to connect remotely. The firewalls protecting these access points were receiving tens of thousands of "knocks at the door" per day, many from international addresses. Needing to maintain these functionalities but discourage the barrage of potential threats, staff implemented changes, some physical and some digital. Since the security enhancements were configured early in 2018, the SCADA system has successfully refused 740 thousand inquiries into the network from suspicious or unknown sources.

There have been significant gains in the use of mobile computing within the Geographic Information System (GIS) industry over the last decade. The Agency's GIS is used by most departments on a routine basis, but it is notably useful for field-based operations staff for quick and visual access to our horizontal asset information. These staff include canal operators, treated water maintenance, distribution operators, water quality technicians, and water efficiency. The GIS group has made significant advancements in use of cloud computing, mobile applications, and dashboards for use by these operations staff.

Renewal and Replacement of Aging Infrastructure

Approximately 12 miles of treated water mains in the system are older than 80 years. Over 15 miles of mains installed circa 1960s in the Sunset/Whitney area of Rocklin have experienced numerous destructive leaks (e.g. the recent Midas Avenue service connection failure). From 2015-2018 just over three miles of treated water mains were replaced at a cost of $11.7 million, averaging less than one mile per year and $4 million per mile. At this rate, it will take over 600 years to replace all pipes in the treated water system.

Completion of the Long Ravine Pipeline project replaced approximately one third of the remaining riveted steel pipes in our untreated water system. Approximately two miles still remain, along with over 11 miles of unlined steel main in need of replacement.

Recently completed upgrades at the Foothill WTP No. 2 and current upgrades at the Alta WTP will greatly increase the reliability and remaining life of those plants. The next plants to be rehabilitated include the Bowman WTP and the Colfax WTP, PCWA's oldest plant originally constructed in 1958. A major overhaul of the mechanical equipment is anticipated in the next 5 to 10 years at PCWA's largest plant, Foothill WTP No. 1.

While rate-based funding has made strides in improving water system reliability, only 33 percent of the $10.72 million available to the 2019 CIP addresses the replacement of old infrastructure. Renewal and replacement needs continue to compete for rate funded dollars against a variety of other projects. These projects include non-Agency driven utility relocation or improvement projects that require PCWA to replace facilities sooner than necessary, projects seeking to leverage grant funding, reliability and operational enhancement projects, and projects required to address ever changing regulations.

Breakdown of 2019 Rate Funding for Projects:

Funding	*$10.72 million*
Projects:	
Foothill Supply Pipeline	*$6.75 million*
Mandated/Grant Projects	*$0.40 million*
Renewal & Replacement	*$3.57 million*
Renewal & Replacement	*33%*

Staff continues to seek ways to more efficiently address the replacement of old infrastructure. In 2018, several projects that normally would have been designed, bid, and built by outside contractors were completed internally by staff. These projects included pipeline replacements, altitude valve station and pressure regulating station upgrades, and various SCADA improvements across the system. In terms of 2019 dollars, $2.32 million is budgeted for Field Services to perform work in-house while $1.25 million is budgeted for conventional design-bid-build implementation, totaling $3.57 million for Renewal and replacement. While completion of CIP projects with in-house staff has proven to "stretch the dollar," completing day to day tasks and operating the water system take priority and limit the amount of work that can be accomplished in this manner.

In 2019, as part of our growing asset management program, staff intends to complete a 25-year look ahead into PCWA's renewal and replacement needs.

Ophir Capacity Funding Partnerships

A critical objective noted in the year-end report last year was to negotiate terms and execute funding agreements with partners in the future planned Ophir WTP. The objective was to execute these agreements by mid-year 2018. The terms have been negotiated and proposed agreements have been vetted and sent to the Cities of Roseville and Lincoln and to the NID, all who have indicated they wish to be funding partners. Roseville has indicated a desired capacity of 3 million gallons per day (MGD), Lincoln desires 2.5 MGD, and NID desires 1 MGD, leaving 3.5 MGD of the proposed 10 MGD first phase of plant capacity for PCWA. Our original objective was at least 50 percent partner subscription in the first phase. Positive feedback on the agreements has been received, but for a variety of reasons each party has not been able to take

the agreements to their elected bodies for consideration. It is anticipated that these agreements will be executed with partners in 2019.

American River Water Rights Extension

The Agency's extension of its American River water rights continues to be a significant work effort. Through an agreement with the US Bureau of Reclamation (USBR), PCWA had agreed to limit diversion of its American River supplies for consumptive use to 120,000 acre-feet (AF) per year. To date, the Agency has used a maximum of approximately 50,000 AF, predominantly from our Folsom Dam point of diversion to service our wholesale water supply contracts to San Juan Water District, the City of Roseville, and Sacramento Suburban Water District. The Agency, based on growth projections for Placer County, believes it will slowly build up its use of American River water rights over the next several decades until full consumptive use is reached in 2043. We have requested an extension of time from the State Water Resources Control Board to put these rights to beneficial use until this date.

A time extension for full use of water rights requires an extensive environmental analysis, in which the impacts of diverting amounts greater than the historic peak must be mitigated under current regulations, leading to an Environmental Impact Report (EIR) and public review. Significant progress was made on this effort in 2018. Staff has identified and modeled an operational regime that will allow for full consumptive use of the American River supplies without negative environmental impacts. The Agency has also entered into a Letter of Agreement with the USBR that will facilitate the negotiation of the contracts required to deliver water downstream of Folsom Reservoir. Staff is proceeding aggressively towards circulating environmental documents for public review in 2019. These documents include an EIR for the California Environmental Quality Act and an Environmental Assessment for the National Environmental Protection Act. Staff is also initiating Endangered Species Act Consultation with the National Marine Fisheries Service and U.S. Fish and Wildlife Service regarding potential impacts to the Lower American River, Sacramento River, and the Delta.

Acquisition of Grants

In 2017 and 2018 staff made significant efforts to obtain Proposition 1 funding for eligible projects, with specific focus on small water systems struggling to produce safe and reliable drinking water for their customers. Staff submitted four project applications seeking $4.6 million in funding. Two of the projects were denied funding. PCWA received a grant for $480,000 for the Dutch Flat Mutual Water Company consolidation and staff anticipates that one additional project will be funded in the amount of approximately $1.7 million for the Castle City Mobile Home Park consolidation.

Typically staff seeks to leverage CIP funds to obtain grants, but sometimes it is difficult to align PCWA infrastructure and operational priorities with the state's priorities. With the exception of canal lining, grants awarded have not addressed aging infrastructure. Some grants fund the majority of the project with little or no PCWA funds required. However, other grants might only fund 25 percent of the overall project, or less. The remaining portion is typically funded from rate projects, which are competing against renewal and replacement funding needs.

The effort and resources to apply for and manage grants can be quite substantial. This effort includes, but is not limited to, a substantial application process, maintaining and updating Integrated Water Management Plans in order to qualify to apply for state grants, quarterly reporting and invoicing for reimbursement, and post monitoring requirements which can extend significantly beyond the completion of the project. In 2019, we anticipate establishing an interdepartmental G*rant Acquisition and Management Committee* to set general guidelines to use resources efficiently and determine what types of grants PCWA should target.

Left: Drinking Water Operations Division
Below: Engineering Division

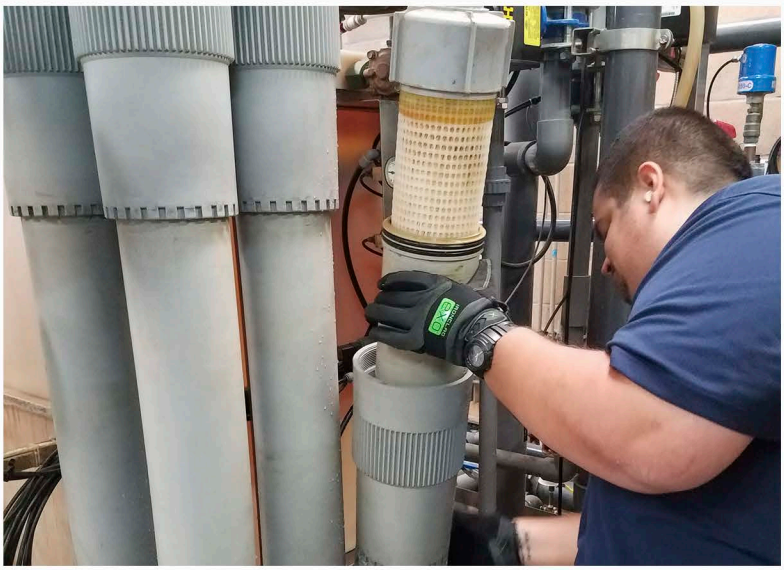
Technical Services Department

Lincoln Metering Station Meter Replacement

Greeley Canal Automation

Penryn Altitude Valve Station Upgrade

Confined Space Training



Applegate Water Treatment Plant Membrane Replacement

Water Quality Sampling

Long Ravine Pipeline Replacement Project

Steep terrain causes pressure changes in the pipeline, requiring careful grading.

Final piece of pipe installation

The new intake structure is equipped with fine wedge wire screens to minimize debris going through the pipe.

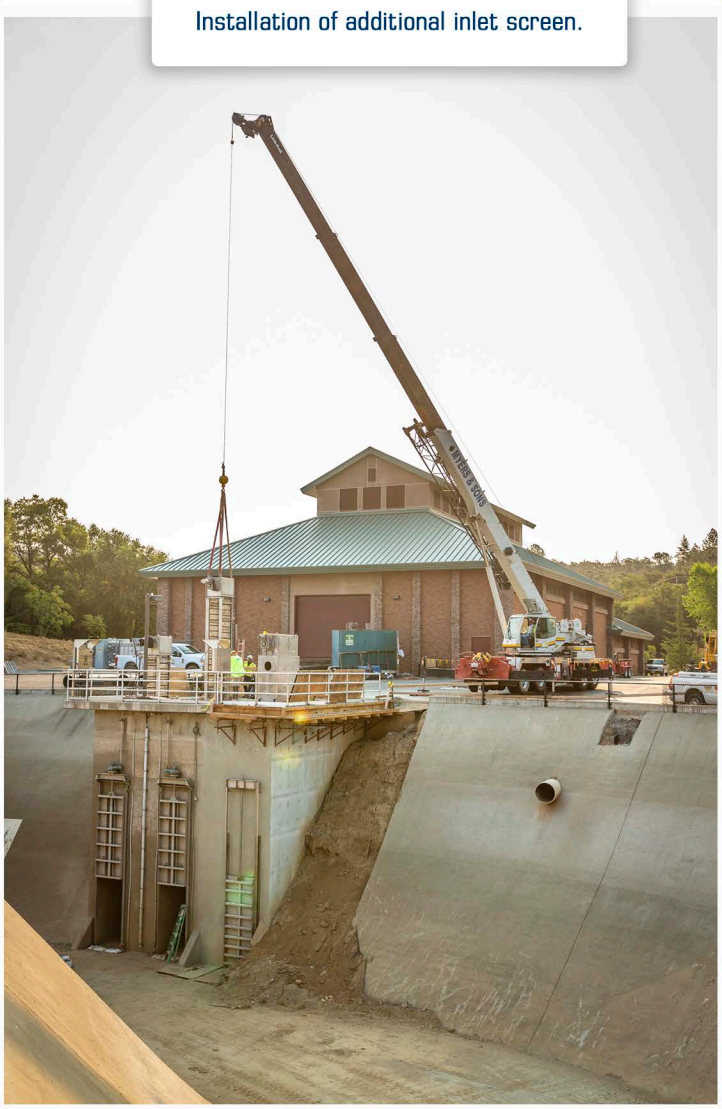
New pressure sustaining station

Interior of new pressure sustaining station

Installation of additional intake structure.

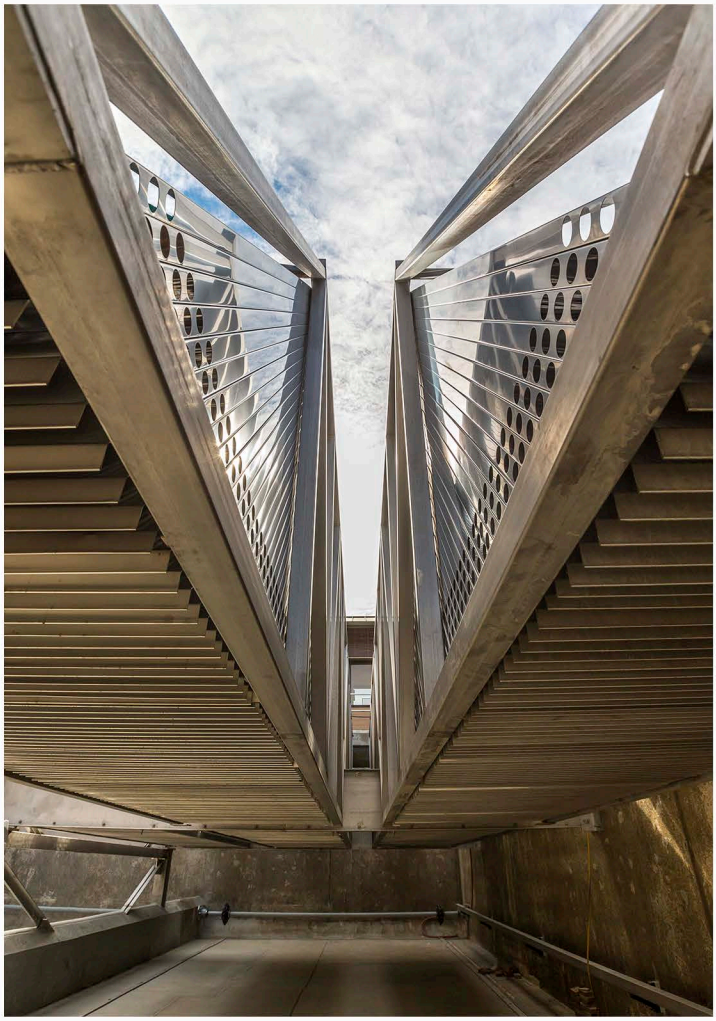
Installation of additional inlet screen.

Ophir Pump Station
South Canal Intake Phase I Project

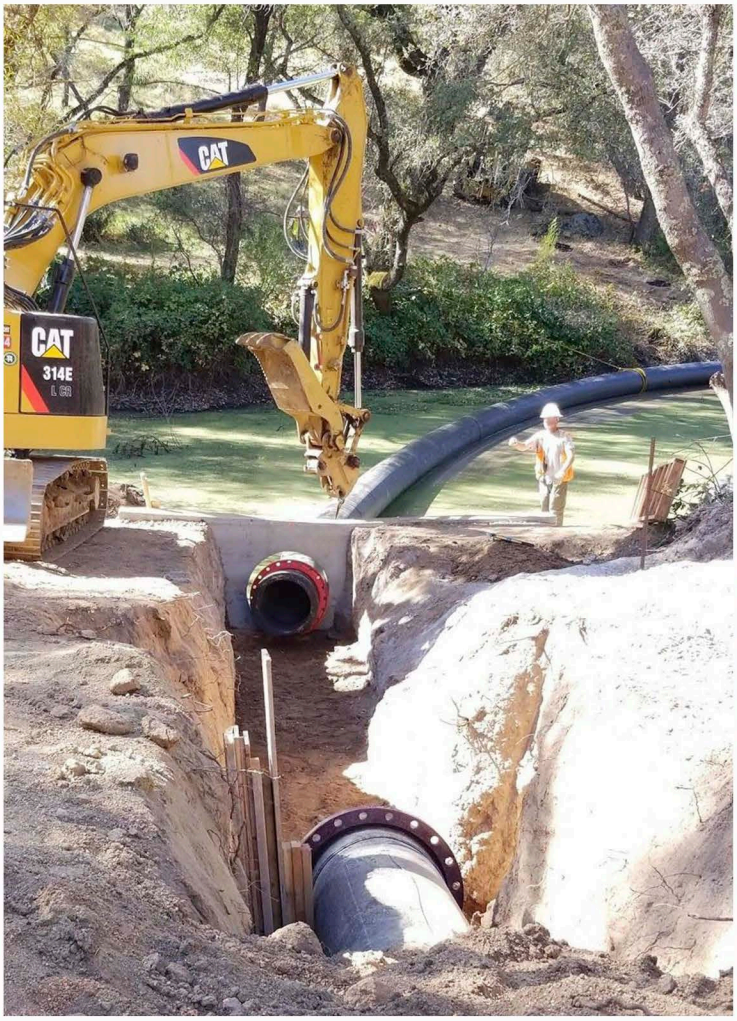


Completed intake structure during installation of the additional inlet screen.

New plate settlers being installed at Foothill Water Treatment Plant No. 2.



Foothill Water Treatment Plant No. 2; new plate settlers



Clover Valey Reservoir inlet piping