



# Making Water a Career of Choice

A Compendium of Water Workforce Case Studies from  
Across the Country

January 2021



# Foreword

Ensuring that all Americans have access to clean water is a top priority for EPA. Each day, communities and businesses depend on clean and safe water for daily activities that can range from drinking a glass of water to irrigating the crops that support our food supply. Behind each drop of clean water are the hundreds of thousands of skilled workers, or water protection specialists, and many others that comprise America's water sector. These "water protection specialists" are critical to the safety and well-being of our communities and serve as the foundation for virtually all aspects of our society. They are on the front line of environmental protection in this country.

Jobs in the water sector provide stable employment, meaningful careers, technical training, and important technical skills (including using innovative technologies), and a chance to make a real difference in our communities across the nation.

An occupation in the water sector is a meaningful career in public service with a clear and impactful mission to deliver clean and safe water. Water protection specialists have positive and profound impacts on the health and wellbeing of everyday Americans and our environment. They have an opportunity to contribute to the vitality of their community and be a part of something bigger than themselves.

As part of the agency's commitment to work with partners and make joining the water workforce a career of choice, EPA has recently issued [America's Water Workforce Initiative](#)<sup>1</sup>, which serves as a call of action for many partners across the water sector to address the pressing workforce challenges facing the sector. As part of its water workforce initiative, EPA developed this compendium of case studies to illustrate approaches that utility leaders are using to help ensure that their current workers have the skills to meet both current and future challenges as they continue to provide reliable and affordable water services. These case studies also highlight the policies and programs utilities are designing to ensure greater equity, diversity, and inclusion at their utility. Many utilities are engaging in innovative work to build community connections to attract new, talented people to the water sector. These community partnerships amplify and support both utility workforce and public engagement efforts.

Each case study is different, but they all share a dedication to the health and safety of our communities. The dedicated water workforce professionals at the utilities highlighted in this compendium demonstrate that a career in water means making a difference in people's lives every day.

EPA believes these case studies will provide valuable and useful information to help utilities across the water sector support and sustain their most precious resource—their workers.

Finally, EPA wishes to express our sincere appreciation to the following individuals who contributed the information used to develop these case studies.

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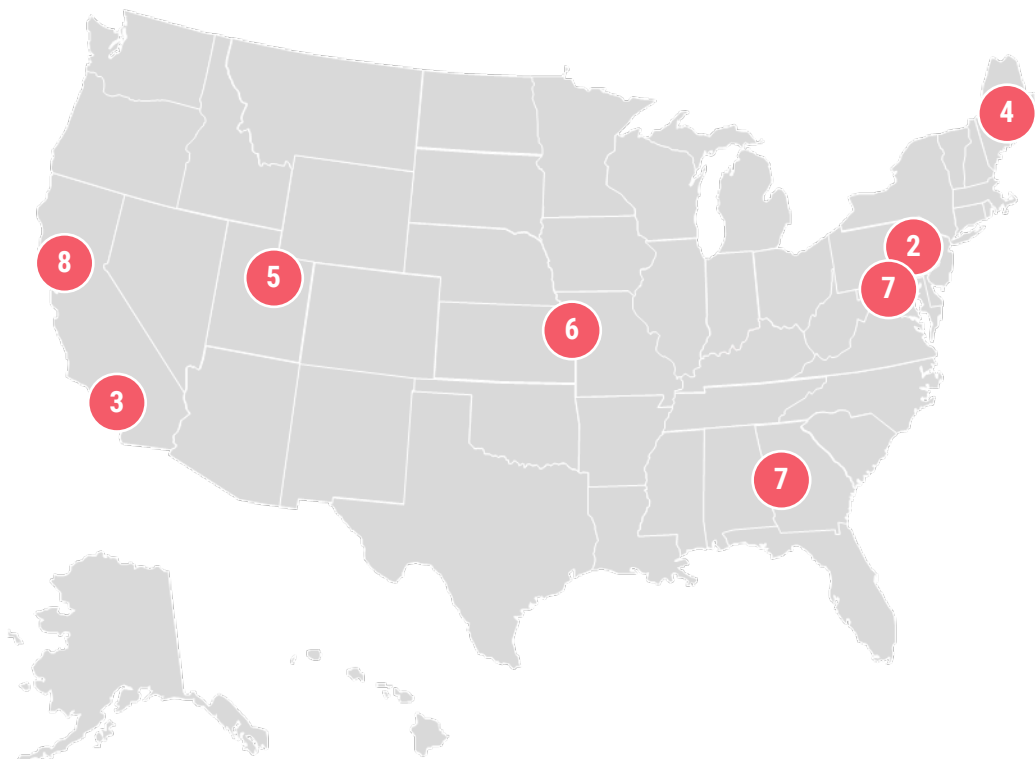


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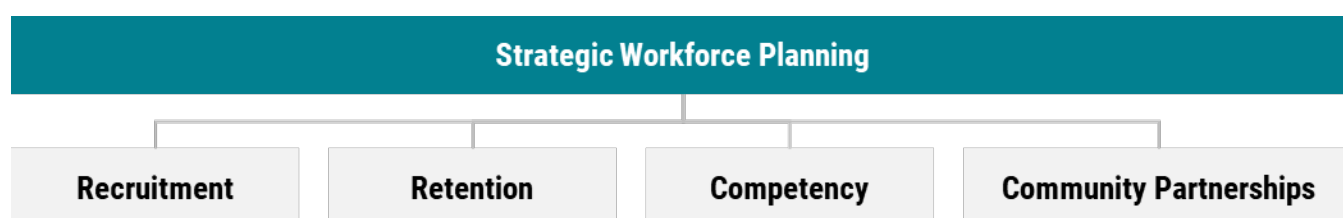
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# Introduction

The water sector faces significant challenges in recruiting and maintaining an adequate and well-prepared workforce to deliver the critical services that protect public health and support the vitality of our communities, natural environment, and economy. To address these challenges, many utilities have dedicated themselves to advancing practice in four key elements of an effective water utility workforce program: recruitment; retention; competency; and community partnerships. The following provides an overview of each of these four key elements as well as a quick reference to case study profiles that highlight each key element. Although each case study is organized under one key element of an effective water utility workforce program, many case studies encompass other elements as well.



**Recruitment:** Utilities with strong recruitment programs maintain a stable, robust, and qualified pool of applicants. Also, they can compete effectively for needed skills and talent. To learn about utilities that are focused on bolstering their recruitment efforts, see:

- [Louisville Metropolitan Sewer District, page 2](#)
- [Philadelphia Water Department, page 8](#)

**Retention:** Utilities with effective retention programs achieve desired workforce retention levels with qualified, motivated, and resilient staff. Within the utility, human resources and organizational culture can motivate staff and support retention. To learn about utilities with a strong focus on retention, see:

- [Moulton Niguel Water District, page 13](#)
- [Saco Water Resource Recovery Department, page 20](#)

**Competency:** Utilities with robust competency programs have well characterized core competencies and emergent skill needs for distinct positions within the utility. Programs provide sufficient training and certifications to support staff and ongoing development opportunities as skills and business requirements evolve. To learn about utilities with strong programs to support workforce competency, see:

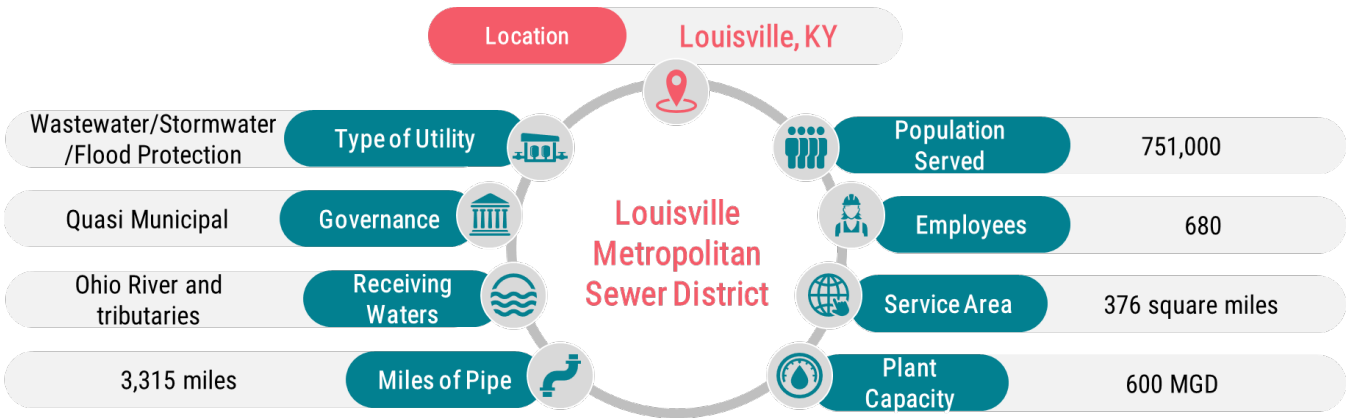
- [Central Utah Water Conservancy District, page 25](#)
- [WaterOne, page 32](#)

**Community Partnerships:** Meaningful community partnerships create value to both the utility and their partners. To achieve this “co-value,” utilities often align their workforce strategy and hiring practices to support the broader economic development and social impact goals of their communities. To learn more about utilities with strong community partnerships, see:

- [AlexRenew/City of Atlanta Department of Watershed Management, page 38](#)
- [San Francisco Public Utilities Commission, page 46](#)



# Community Resiliency Through Youth Engagement and Recruitment



## Introduction

The [Louisville Metropolitan Sewer District](#)<sup>2</sup> (MSD) helps provide clean waterways to their region through wastewater treatment, stormwater/drainage management, and Ohio River flood protection. Each aspect of MSD’s operations provides an opportunity to enhance the local workforce, offer educational opportunities, and spur economic development within their community. These actions are part of a larger resiliency effort by the city to create a culture of equity, compassion, and trust within its communities. In 2016, the City of Louisville was chosen to

participate in the Rockefeller Foundation's 100 Resilient Cities initiative and developed a comprehensive Resilience Strategy. The vision, goals, and actions in this strategy reflected the equation that resilience is the summation of equity, compassion, and trust. These three qualities are incorporated into Louisville MSD's work each day.

$$R = E + C + T$$

*To be a **Resilient** city, Louisville creates a culture of **Equity, Compassion, and Trust**.*

MSD embraces its role as an anchor institution and, in 2018, developed a [Community Benefits Program](#)<sup>3</sup> to provide a wide variety of programs that leverage partnerships to build a water workforce pipeline, support MSD core services, and ensure all local communities within the MSD service area experience public benefits. This case study will focus on two aspects of MSD's community commitment: their formal contracting process, which encourages contractors to submit bids that demonstrate a commitment to provide financial contributions, volunteer hours, or in-kind services to the community, as well as MSD's youth development programs, which seek to prepare high school students for successful careers in water infrastructure.

## Community Benefits Program

In the summer of 2018, Louisville MSD completed a [Disparity Study](#)<sup>4</sup>, which found disparities in contractor procurement processes for minority-owned businesses and underutilization of women-owned businesses. These findings meant that only a portion of the potential benefits that result from MSD contracts was being experienced within their community. The disparity study recommendations included the need for MSD to embed the provision of community benefits into all aspects of MSD's capital investments, from construction and construction-related projects to professional and engineering services.

Having seen the success and the impact of a Community Benefits Program (CBP) at other utilities, such as San Francisco Public Utilities Commission, MSD adopted and launched its own CBP. MSD's CBP was formally approved in 2019. The CBP's mission is to be a good neighbor within the community and invite contracting firms to use their resources for positive impact.

The CBP's goals are to foster partnerships within the local communities, build a water workforce pipeline, and ensure all local communities within the MSD service area experience public benefits, especially during times of construction. The CBP is supported by two full-time staff who oversee and monitor the program.

A main component of the CBP is the procurement process, which provides a community benefit score to contracting firms that submit a formal community benefit commitment with their proposal. This procurement process applies to all construction and construction-related contracts valued at \$2 million or more and professional service contracts valued at \$200,000 or greater. These voluntary commitments can range from a financial contribution to community improvements in the form of volunteer hours, or in-kind services. The firm that submits this commitment must demonstrate that their community benefits will go directly to



*"Thanks to MSD and your Community Benefits Program for helping us make a connection with YouthBuild, such a great organization that we look forward to continue investing in!"*

**-John Allen (L), President, RA Consultants  
and Tony Marconi (R), former Regional  
Director of Engineering, RA Consultants, LLC**

schools and nonprofits directly impacted by MSD's operations. Upon award of the contract, the contractor is required to submit a summary of their anticipated activities, which must then be updated and submitted by the contractor at regular intervals to demonstrate the progress and completion of their commitment.

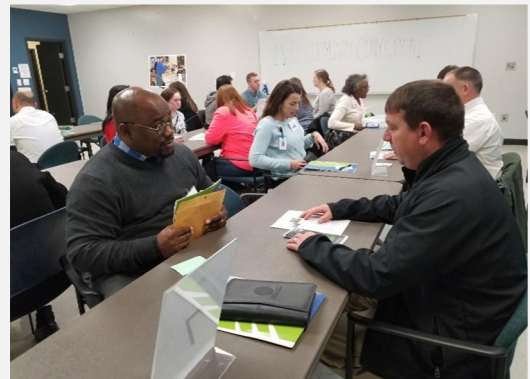
## Community Connections

To connect contracting firms with community partners and schools, MSD created a speed-networking event called *Community Connections*. *Community Connections* is a monthly networking event in which community partners and local contracting firms come together to discuss the community partners' programs. During this event, firms learn about community programs and ask questions to gain a better understanding of the community's needs. After four minutes of discussion, participants switch and are paired with a new firm or community partner/school. Pairs switch until all pairs have met and firms have gained an overarching view of the wide range of community partners and schools. These connections are crucial to create external buy-in from community members, educate firms on the important work being done in the community and by educators, and convey the impact a firm may have if they participate in CBP. For more information, check out this [video](#)<sup>5</sup> from a Community Connections event.

### Partnerships from Community Connections

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After one of the *Community Connections* events, a local firm decided the work being done by community partners was so important, they wanted to contribute even outside of the CBP process. The firm committed a financial contribution to a local 501(c)(3) organization whose focus is on education, job training, and leadership development for low income youth between the ages of 16 to 24. To-date firms who have committed to the program have contributed by voluntarily planting trees in communities with low tree canopy, providing financial support to educating youth in STEM related activities, and assisting with emergency housing, job placement, and tutoring services.



*Contractors and community organizations came together for the November 2019 Community Connections*

## Youth Programs

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MSD has been an active partner with community programs focused on increasing youth awareness of the critical role of clean water in their communities and the availability and attractiveness of water infrastructure careers. MSD's engagement starts early with the River to River program that provides an outdoor classroom experience for elementary, middle, and high school students to explore the surrounding water bodies. In addition to programs targeted at the youngest members of their community, MSD provides high school students with valuable hands-on experiences in the water sector, along with career and personal mentorship through three robust programs.

## River to River

The [River to River: Louisville's Human Water Cycle](#)<sup>6</sup> program is a joint effort between Louisville MSD and Louisville Water Company to reach and educate elementary and middle school students. This free, hands-on, hour-long lesson for 4<sup>th</sup> to 8<sup>th</sup> graders explores water's journey from the Ohio River to people's homes and back again, allowing students to make larger connections between the classroom lessons and the outside world. The classroom experience is capped with a tour of Louisville Water Tower Park and Louisville MSD Floyds Fork Water Quality Treatment Center. The guided tours provide an opportunity for the students to bring what they learned in the classroom to life.

In addition, River to River: Urban Water Cycle High School Learning Experience is offered to freshman and sophomore year students. Students gain an appreciation of how clean and safe water is reclaimed in streams after serving Louisville's drinking water and wastewater needs, as well as the stormwater management, stream monitoring, and flood protection operations that MSD manages along the Ohio River. Many sophomores at Holy Cross High School help with the River to River program and its specific projects.

## Fairdale Student Program

Louisville MSD has partnered with Fairdale High School for almost 20 years through the [Fairdale Student Program](#)<sup>7</sup>. Fairdale is designed to prepare students for post-secondary education and career success through the [Academies of Louisville](#)<sup>8</sup>. At Fairdale, there are three academies: Civil Service, Public Service, and Global Service. Each academy has two to four specific pathways – such as Heavy Equipment Sciences and Fire Science within the Public Service Academy, and Cyber Engineering and Law Enforcement Services within the Civil Service Academy.

During their freshman year, students take career exploration classes and job site field trips to gain an overview of the different academies. Students then choose an academy and pathway to pursue for the next three years. Students in the Heavy Equipment Sciences pathway work with MSD to gain direct exposure to heavy equipment and construction tools, safety training, and lessons on current MSD environmental projects. Due to the hands-on nature of the Heavy Equipment Sciences pathway, students not only learn how to operate machinery and gain foundational knowledge in the water sector but can earn industry certifications before graduating. From this partnership, MSD has hired 40 students as employees over the past 20 years and continues to look for opportunities to expand similar outreach efforts at other schools.



*Students in the Heavy Equipment Sciences pathway at Fairdale High School receive hands-on machinery and safety training.*

## SummerWorks Program

Stemming from Mayor Greg Fischer's initiative in 2011, [SummerWorks](#)<sup>9</sup> connects Louisville's youth, ages 16 to 21, to summer jobs, career opportunities, and supportive networks. In total, SummerWorks has placed over 23,000 youth into summer jobs with over 6,900 youth participating during the summer of 2019. Participants are paired with an employer that aligns with each participant's interests and receive an employee mentor for their eight-week hands-on experience. Louisville MSD has been a partner with SummerWorks for the last five years.

Typically, MSD hosts 14 students each summer. Participants are placed in a department that matches their career interests such as Legal, Finance, Operations, Facility Management, Engineering, and IT. Throughout the summer, interns receive meaningful, challenging, and substantial tasks, and work activities can include administrative support, network support, and preparing and reading drawings. Additionally, MSD provides professional development sessions to prepare participants for their entrance into the workforce on topics such as dressing for success, punctuality at work, and increasing job performance. Over the last five years, one participant has been hired as a full-time MSD employee, but MSD is looking for additional ways to provide a pathway towards full-time employment for SummerWorks participants. Check out this [video](#)<sup>10</sup> that showcases several SummerWorks participants and their highlights.

## Pipeline Academy

Though the two high school programs outlined above are important and successful aspects of MSD's outreach, after the publication of the [2018 Brookings Report](#)<sup>11</sup> on workforce needs, MSD believed they could do more to engage youth in their community to increase their awareness and interest in water utility careers. To do this, MSD created the Pipeline Academy to provide a year-long internship for junior and senior high school students.

The Pipeline Academy is a partnership between MSD and Holy Cross High School, that allows upper level high school students to explore STEM fields in the water sector and gain hands-on experience through a year-long unpaid internship. Each student receives a primary MSD mentor that supports them throughout the work experience and a secondary MSD staff member for additional support. This two-tiered mentorship structure provides each student with valuable support that can be a critical element of student success.

In the pilot program, four students participated during the 2019-2020 school year. Weekly during the fall, two juniors and two seniors shadowed different departments with a STEM focus. Students also rotated through different departments every few weeks to allow them to gain an understanding of each department. Additionally, students received advice on necessary academic coursework and certifications to succeed in those respective areas. At the beginning of the new year, the students choose one department to shadow for the remainder of the school term, allowing them to gain a deeper insight and hands-on opportunities.

The Pipeline Academy not only provides a two-tiered mentorship and hands-on experience within MSD's departments, but also provides students with the opportunity to develop important soft skills. MSD hosts a monthly "Real Talk" session to help students delve deeper into questions such as, "What is your career path? How do we help you get there? How do I write a resume? How do I deal with workplace conflict?" These sessions provide a safe space for the students. MSD prides itself on these "Real Talk" sessions because it allows students and MSD employees to take a step back from the day-to-day operations and help students progress on the right path to success.

Although the Pipeline Academy is a new program, MSD plans to expand to a larger cohort and partner with local public high schools. MSD is committed to supporting and mentoring the youth water workforce pipeline and annually provides 10-15 employee mentors that participate and support the youth mentorship programs.



*"I had an incredible experience with MSD and have learned how much MSD does in keeping our waterways safe and clean. The staff are welcoming, helpful, and assisted in my learning about the different departments. I really enjoyed my time in the IT department, and it encouraged me to consider pursuing a career in the tech industry."*

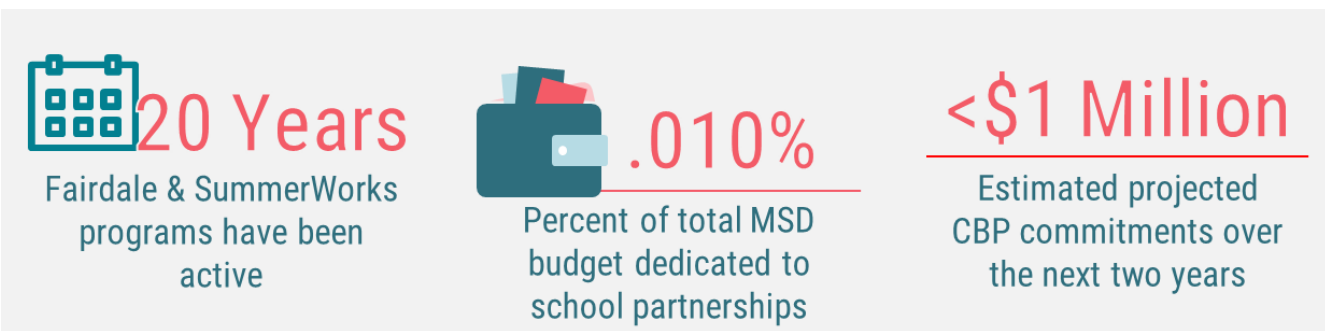
**-Brian M., Pipeline Academy Intern, High School Junior**

## Lessons Learned

Louisville MSD created community ties that enabled them to develop a robust Community Benefits Program and host a variety of student programs. These lessons learned will assist utilities in developing and maintaining community partnerships and engaging with youth:

- **Engage with the Community:** Create neutral spaces for the community to engage with the utility and learn of collaborative opportunities such as the Community Connections event.
- **Find Champion(s):** Identify and engage experienced and dedicated staff to support the various programs.
- **Build Relationships with Schools:** Use every opportunity to build relationships with the students, teachers, and school systems. MSD found it was easier to create school programs/partnerships and gain school support because they actively participated on school boards and at community events. The creation of the Pipeline Academy was not difficult because MSD had an existing relationship with the school.
- **Create Internal Buy In:** Provide staff with internal, open-door training sessions to learn about the utility's initiatives. Educate and empower staff to be advocates for utility initiatives.

### Louisville MSD's Programs by The Numbers



## Conclusion

Through the kinds of relatively low-cost investments summarized above, and with the City's resilience initiative in mind, Louisville MSD embraces its role as an anchor institution with a robust portfolio of programs that help recruitment and create a culture of equity, compassion, and trust in its communities. These programs create positive impacts within the region, strengthen community partners, and encourage contractors to do the same. With the CBP, MSD leveraged its capital investments to embed good neighbor principles with contractors. The Community Connection events create a roadmap for those contractors, and this effort received overwhelmingly positive reviews from participants. MSD's youth engagement created clear recruitment opportunities and employment pathways and the space to learn and engage with the water sector. All these efforts emphasize and bolster MSD's mission to be a strategic partner and good neighbor and provide pathways for community connections and recruitment leading to employment in the water workforce.

*"I like working with my hands," Megan said, noting that she learns more from hands-on experiences than from reading or listening to lectures. "Academies of Louisville students 'should be excited' about the on-the-job experience they will gain as teens."*  
-Megan M., current MSD employee and former Fairdale student



# Ensuring a Greener Future by Empowering Young People



## Introduction

After the 2008 recession, the City of Philadelphia was facing high poverty rates and high levels of unemployment. The City was making plans to meet federal regulations mandating drastic reductions in pollution from sewer overflows, as well as setting its own goal of becoming the greenest city in the country. To achieve these objectives, the City developed the [Green City, Clean Waters](#)<sup>13</sup> Plan. A critical component of the Plan was the construction of an extensive network of green infrastructure projects through the [Philadelphia Water Department](#)<sup>14</sup> (PWD). Once constructed, the green infrastructure sites required maintenance, and PWD was faced with a shortage of workers, to maintain them. [PowerCorpsPHL](#)<sup>15</sup>, a workforce development program, was launched to cultivate a talented workforce among Philadelphia’s underemployed young adults. Over the last seven years, this partnership between PowerCorpsPHL and PWD has given the necessary tools and support for 670 of Philadelphia’s unemployed and underemployed young people to succeed and thrive in the workforce. This case study will examine

PowerCorpsPHL's model, partnership between PWD and PowerCorpsPHL, and lessons learned to create water workforce opportunities for its unemployed and underemployed young people.

## PowerCorpsPHL

Launched in 2013, PowerCorpsPHL is a cross-sector collaborative model that engages disconnected young adults and returning citizens to enter and succeed in career pathways by using service as the strategy. They focus on developing local talent and honing existing skills to create a sustainable career pathway while addressing systemic barriers to employment.

PowerCorpsPHL supports members, ages 18 to 28, through trainings on teamwork, task management, and other soft skills necessary for the workforce, while also providing technical skills, mentorship, a living stipend, and expungement services. The program aims to address the City's gun violence, youth unemployment, and sustainability challenges, and was launched through the Mayor's Office.

Leveraging an AmeriCorps grant, City departments, such as the Philadelphia Water Department, Philadelphia Parks & Recreation, Department of Human Services, and the Office of Workforce Development, collaborated to design the initiative and matched funding through investments from their departmental budgets. PowerCorpsPHL uses social service agencies, such as alternative high schools, foster care, probation officers, and other organizations with clients in need of employment training to recruit new members into the program. Half of the program's participants come from social service agencies; the other half come from alumni referrals and community word of mouth through neighbors, friends, and family.

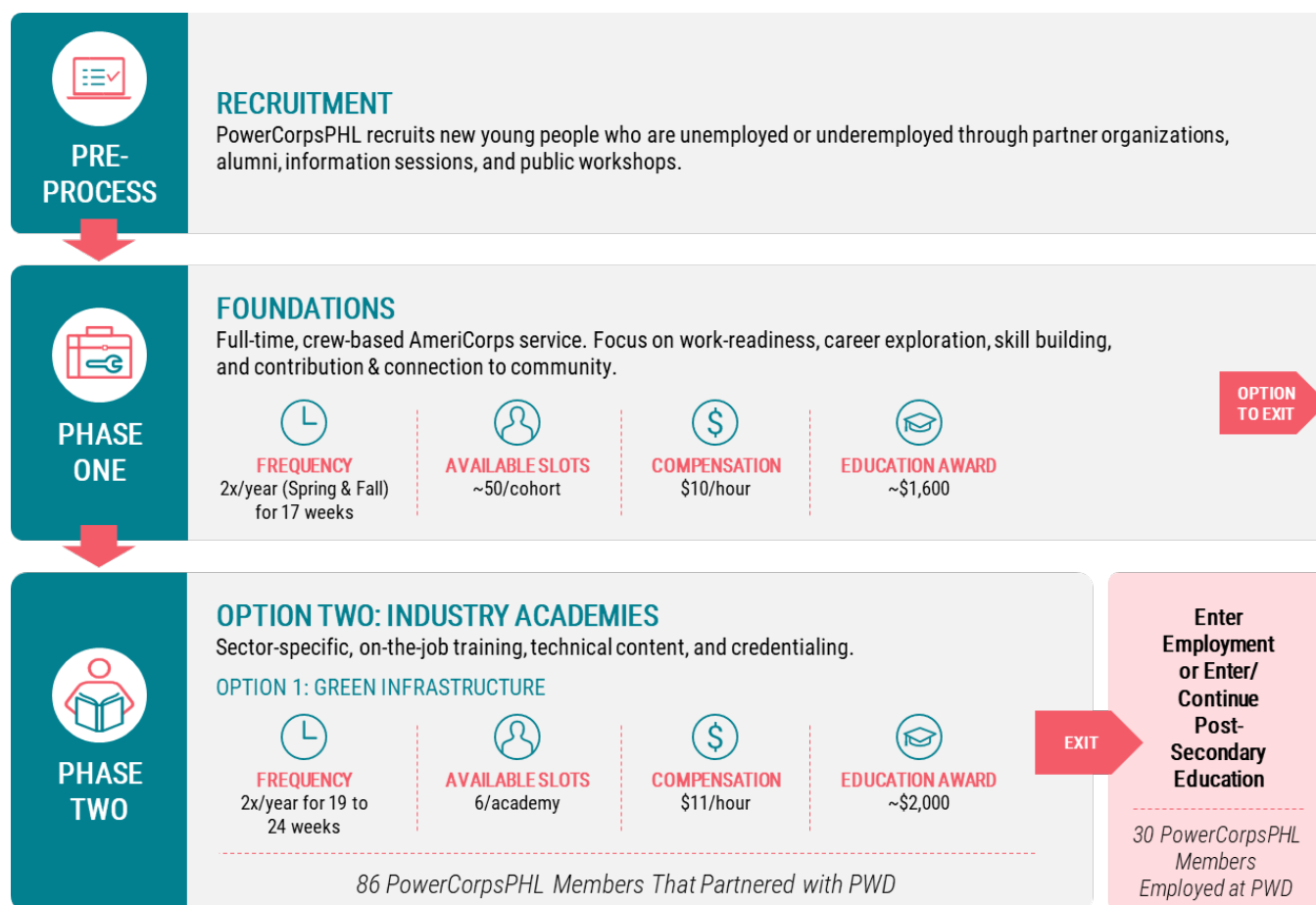
All members complete [Phase One](#)<sup>16</sup>, a four-month, full-time, crew-based AmeriCorps service program that builds a foundation of job-readiness skills. Additionally, Phase One focuses on contribution and connection to the community through the enhancement of public lands and stewardship of community spaces. After completing the foundation, members continue to Phase Two and have the opportunity to partner with PWD. They are able to work with PWD for 19 to 24 weeks, and upon completion can receive an education award of up to a \$2,000. Members are able to enter or continue their post-secondary education or they can enter employment at PWD.

PowerCorpsPHL staff work with local private industry to align training and cultivate employment opportunities. Through this collaborative co-designing process between PowerCorpsPHL staff and private industries, members benefit from industry-aligned career pathways that connect to existing, in-demand jobs. Through engagement with potential employers, coupled with individual member career counseling, members can either exit the program for full-time employment or are supported in the process of entering/continuing post-secondary education through academic support classes and one-on-one counseling. As PowerCorpsPHL has grown, it has refined its model structure to ensure that all members are supported along the process.



*PowerCorpsPHL members maintain over 100 GSI sites around Philadelphia.*

## The Three Phases of the PowerCorps PHL Model



## Philadelphia Water Department and PowerCorpsPHL

To achieve the goal of becoming the greenest city in the country and supporting the community's young people, PWD and PowerCorpsPHL developed a pathway for young people to gain on-the-job training and transition into full-time positions at PWD. In Phase One, members are introduced to green infrastructure concepts and related careers through preliminary "on-the-job" training overseen by experienced PWD staff. In Phase Two, members in the green infrastructure Maintenance Industry Academy receive higher-level technical training and apply those skills at more than 270 annually serviced green infrastructure systems at 125 different locations across the City. Since 2013, PowerCorpsPHL team members working with PWD have been tasked to complete green infrastructure site maintenance throughout the City of Philadelphia. PowerCorpsPHL members receive work orders from PWD and work together to clear debris and litter, remove sediment, prune trees, pull weeds, plant vegetation, and apply mulch to green infrastructure systems to ensure they function properly.

After PowerCorpsPHL members complete Phases One and Two of the program, they are eligible to interview with PWD for an apprenticeship position. Given the experience gained during their time working on PWD's GSI and being exposed to the City's water infrastructure systems, PowerCorpsPHL alumni are well-trained and competitive applicants. Since the partnership launched in 2013, PWD has employed 30 PowerCorpsPHL alumni. Due to their on the job training, alumni are prepared to work in positions ranging from Maintenance Workers and Engineering Aides

to Electricians and Electronic Technicians, and they play an important role as members of the PWD community. Check out this [video](#)<sup>17</sup> that highlights alumnus Aaron Kirkland.

## Continuing Education and Growth

Education and professional development do not stop when PowerCorpsPHL graduates transition to employment at PWD. PWD has partnerships with the Orleans Technical College and the Community College of Philadelphia to offer general education courses, as well as customized and specialized courses in skilled trades. These partnerships have been crucial in supporting PowerCorpsPHL alumni to broaden out of green infrastructure-focused maintenance work to advance into other positions, including electrical, HVAC maintenance, and building mechanics. Alumni receive specialized training that allows them to have strong, long-term careers with the utility. The partnership has also provided the unexpected benefit of filling a variety of positions at PWD beyond the green infrastructure maintenance role originally envisioned.

*"I love the fact that there's a sense of purpose in what I'm doing. We all have the same passion for cleaning Philadelphia up. I really take pride in investing in the people that's coming behind me, because I know what it's like when somebody showed me the right things to do."*

**- Aaron Kirkland, Crew Chief GSI  
Operations Unit**

## Create Champions for Your Effort

One of the key program successes has been the tangible and intangible benefits to the city, utility, and PowerCorpsPHL, as tracked through metrics. These metrics demonstrate the successful partnership and have been crucial to showcasing successes and highlighting champions within the program.

## Lessons Learned

As PWD and PowerCorpsPHL have developed their partnership, they have experienced challenges and continue to improve this program through support and communication. These lessons learned will assist utilities undertaking similar efforts:

- **Create Internal Buy-In:** Communicate with employees the benefits of workforce partnerships through metrics to gain a higher rate of acceptance and approval among PWD employees for workforce partnerships.
- **Provide Clear Expectations:** Provide clear guidance and a tangible workorder tasking process that enables members to learn and successfully complete each work order.
- **Support Members:** Provide training to both members and utility employees to set them up for success. PWD recognized the need to provide an on-site PWD employee to support PowerCorpsPHL Members and help direct the successful completion of work orders.
- **Track Metrics:** Gather metrics to demonstrate and widely publicize tangible outcomes of a community partnership. People rely on numbers to convey a program's success, and metrics provide insight to tangible benefits.

## Philadelphia Water Department's Program by the Numbers



30

PowerCorpsPHL  
members employed at PWD



8 PWD skilled trade  
pathways supported

6,245



Work Orders  
Completed



86

PowerCorpsPHL members  
that have partnered with PWD

### Conclusion

As utilities seek to diversify their workforce beyond their traditional sources of employees, programs like the partnership between PowerCorpsPHL and PWD are essential. This partnership took fine-tuning over the years. Both entities relied on strong communication and relationship building to refine their program partnership and ensure both PowerCorpsPHL members and PWD employees were supported. The partnership demonstrated to both organizations the value of collaboration between job readiness organizations and public utilities to provide employment and training opportunities for those within the community, while filling a critical workforce gap faced by many utilities. PWD's partnership with PowerCorpsPHL empowered and employed once underemployed and unemployed young people who can now positively contribute to the greener future of Philadelphia.

*"Our crucial and important partnership with PowerCorps showcases what PWD is and continues to be about as a utility leader."*

**- Alex Warwood, Former Apprenticeship and Workforce Development Director at PWD**



# Creating a Healthy and Inspiring Workplace Culture



## Introduction

[Moulton Niguel Water District](#)<sup>18</sup> (Moulton Niguel or the District), located in Orange County, provides high-quality drinking water, recycled water, and wastewater services to more than 170,000 customers in the Cities of Laguna Niguel, Aliso Viejo, Mission Viejo, Laguna Hills, Dana Point, and San Juan Capistrano. Moulton Niguel is devoted to cultivating a healthy and inspiring workplace for its 163 employees. Since joining the team in 2012, Moulton Niguel General Manager Joone Lopez has instilled the District's HERO Principles – Honesty, Effort, Respect, and One Team – at every level of the organization. The goal is to support the District's foundation of Performance, Impact, and Resiliency. Moulton Niguel ensures that employees are performing at the highest levels, going above and beyond in the community, and are prepared for unforeseeable events.

Over the last eight years, Moulton Niguel launched a wide variety of efforts, such as the Moulton Leadership Academy, the Future Leaders of Water (FLOW) Initiative, and partnerships with academic institutions, to imbed these

principles into the operational DNA at Moulton Niguel. This case study will examine the academies, programs, and partnerships that support and help achieve the District's mission to create a healthy, respectful, and inspiring workplace culture.

## HERO Principles

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At the heart of Moulton Niguel's workforce program is a commitment to creating a workplace where employees feel respected and taken care of by each other and the management team. In 2012, General Manager Joone Lopez brought her vision of the HERO Principles to Moulton Niguel. Through her leadership and workforce initiatives, the HERO Principles became the foundation for a respectful and supportive workplace:

**Honesty:** The fundamental principle, honesty, is the "H" in HERO. To develop a strong workforce culture, trust and accountability must be established and reinforced first. The management team encourages feedback from all employees regardless of title. The team fosters communication and creates neutral spaces and an open forum for idea sharing during daily staff meetings and monthly all-hands team meetings to hear feedback and integrate these ideas into District operations. Honesty is part of individual professional growth as well. Employees are also expected to share their weaknesses or mistakes with their supervisors to gain constructive feedback to continuously improve.

**Effort:** The management team encourages and reinforces individual and team effort. Employees are consistently encouraged to come to work every day and give their best effort to the job at hand. Effort is valued and rewarded through public acknowledgment, praise, and recognition.

**Respect:** The management team treats employees – and requires employees to treat each other – with respect and courtesy. Coordination and collaboration are based on mutual respect and regard for each other's strengths, expertise, and knowledge. Demonstrating respect demands a level of professional civility towards one another that ultimately leads to growth in personal connection, understanding, and appreciation amongst the organization.

**One Team:** During all-hands meetings, the management team promotes engagement and connections at all staff levels. These meetings allow employees to understand how their roles fit into the District's big picture.

These actions create a sense of excitement and pride, which promotes comradery within, leading to cross collaborations between various departments. The HERO acronym was created to make it easy for staff to remember Moulton Niguel's core values. During new hire orientations, new employees are introduced to these core values and are reminded that technical expertise is important but upholding Moulton Niguel's core values is required. All employees know they can and will be called upon at any time to remind each other of these values. The values are even woven into an interview question asked of all prospective candidates. Staff make job applicants aware of Moulton Niguel's workplace culture prior to hire.

## Cross Collaboration

Moulton Niguel has a leadership mandate, or rather expectation for all staff, that states departments must work together on issues that cross multiple departments such as finance, operations, etc. This interdepartmental collaboration brings a wide variety of senior staff and their respective department teams together to discuss issues with a cross-disciplinary lens. Examples include monthly engineering and operations “huddles,” annual budget workshops, and communications teams that may involve more than 25 participants. During these meetings, hierarchy and titles are of little importance, leading to greater feedback and generation of ideas and solutions. Employees are encouraged to be honest and freely share their ideas. During these meetings, ideas from entry-level employees are incorporated into future work plans. These contributions are recognized at all-hands meetings during a regular “kudos” section, where Moulton Niguel collectively celebrates staff achievements, reinforcing the One Team principle.



*Moulton Niguel employees have an annual District Day and reinforce the HERO principles through group activities.*

## Internal Leadership Academy

Moulton Niguel recognized that to effectively instill HERO Principles across the organization, they needed to provide managers with the tools and support necessary to lead by example. However, the District found a lack of available and appropriate external leadership training and though they considered hiring an external group to facilitate a leadership academy, there were many logistical hurdles and many of the external curriculums did not fit into Moulton Niguel’s logistical and organizational needs.

After deliberation, the management team decided it would be most cost-effective and beneficial if Moulton Niguel conducted the leadership academy internally. This tailor-made program would fit all of Moulton Niguel’s logistical constraints and organizational needs; reinforce the mission, values, and sense of team; and take advantage of inherent institutional knowledge by using Moulton Niguel’s subject matter experts. One of the first steps to create the leadership academy was to form an interdepartmental innovation team to identify the necessary qualities and skills of a Moulton Niguel leader.

### Forming an Interdepartmental Innovation Team

Moulton Niguel formed an interdepartmental innovation team made up of well-rounded individuals from different departments such as engineering, operations, customer service, and finance. The team served as an initial think-tank and identified the qualities of a successful leader at the District. Some examples of these qualities were:

- Perpetually seeks further understanding of the bigger picture
- Serves as a steward of Moulton Niguel’s vision and mission
- Holds themselves to a great sense of accountability
- Creates an inclusive environment and facilitates a team-win group mindset

Once the necessary qualities were identified, the innovation team created a curriculum that would effectively teach and reinforce these qualities.

## Curriculum

The innovation team brainstormed curriculum components and incorporated past experiences and observations, and the necessary qualities of a leader. The team designed a curriculum that reflected these qualities and provided tools and knowledge for a successful leader at Moulton Niguel. The team crafted these ten focus areas:

- Operational Overview
- Administrative Policies
- Interagency Relations
- Occupational Safety
- Customer Service
- Communication
- Time Management
- Technology
- Employee Development
- Employee Discipline

Each focus area had a set of subtopics with a functional tie to actual job performance at Moulton Niguel. The innovation team recruited internal subject matter experts to teach specific subtopics and split the workload. This approach allowed Moulton Niguel to support internal knowledge transfer and experience without the cost of an external service.

Participants attended five, on-site half-day sessions over five months. They were scheduled on strategic days and times to reduce the impact on operations and customers. During these sessions, speakers were encouraged to use various teaching techniques such as PowerPoint presentations, Q&A sessions, competitive group activities, theatrical skits, and technology demonstrations. These sessions were interactive and pushed managers outside of their comfort zones. Throughout the process, each manager was able to be the student as well as the teacher to incorporate their own experiences into the curriculum through the motto of “Learn, Share, Grow.” This empowering leadership academy gave managers the tools to continue to succeed and progress in their career paths, and effectively engage and empower the staff at Moulton Niguel.

## Academy Expansion

The first Moulton Niguel Internal Leadership Academy in 2017 proved to be a success for managers. Due to this success, the District expanded it to an organization-wide training during the Annual District Day. Moulton Niguel’s employees participated in activities that focused on the District’s core values through the motto of “Learn, Share, Grow” and provided ample teambuilding opportunities. This new academy included staff members from all levels and focused on employee core values, promotion of grassroots leadership, and emphasis on HERO Principles through a combination of skits and group activities.

The success of the two internal leadership academies has strengthened employee engagement and development. Moulton Niguel plans to make these academies reoccurring to continuously empower its employees and maintain a supportive work environment. The internal academies and support of the HERO Principles earned Moulton Niguel the award of Top Workplace in Orange County for three years running. Check out this [video](#)<sup>19</sup> that showcases Moulton Niguel’s Third Year as a Top Workplace.

## Future Leaders of Water Initiative

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[The Future Leaders of Water](#)<sup>20</sup> (FLOW) Initiative seeks to inspire a new generation of water champions through education and recruitment. FLOW was an effort to integrate all of Moulton Niguel's workforce initiatives and build on them through sharing and great collaboration. This initiative, created in 2019, engages with community groups, professional associations, and academic institutions and aims to educate the public to actively seek career opportunities in the water sector.

FLOW reaches a broad audience and creates excitement about the water sector. Moulton Niguel engages with participants through facility tours, internships, and community events. During these connections, participants are asked about their interests, career, and education goals with the hopes to attract and recruit the best and brightest candidates. These engagements emphasize the many career opportunities available in the water sector such as information technology and human resources to the frequently advertised construction and water chemistry positions. Additionally, it is emphasized that every position plays an important role in Moulton Niguel and each position is part of the One Team mindset.

The water sector is evolving and adopting new technologies that are crucial for the sustainability of the District and region. To adapt to these changes and tackle upcoming challenges, Moulton Niguel recognizes that their water workforce needs to be innovative and creative. Moulton Niguel continues to concentrate on recruiting innovative skillsets such as data science, which has provided value to not only Moulton Niguel but also to the customers and communities it serves. FLOW allows Moulton Niguel to engage, educate, and empower, and recruit bright individuals for available opportunities at Moulton Niguel and in the water sector.

Check out this [video](#)<sup>21</sup> that highlights the FLOW Initiative at Moulton Niguel.



*A group of emerging professionals from the Coro Fellows program, visit Moulton Niguel to learn about the water sector as part of the FLOW Initiative.*

## Partnerships with Academic Institutions

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With changing technologies and the influx of new information, it is crucial that utilities engage with different sectors to gain new perspectives. For this reason, Moulton Niguel engages with various schools, community colleges, and universities in their region to discuss the attractiveness and availability of job opportunities in the water sector. At local high schools and community colleges, the District meets with students in career and technical education programs to discuss the full range of water sector careers to expand their understanding beyond the prominently advertised engineer and construction positions. Students are frequently surprised to hear the range of stable jobs and the many avenues for involvement.

Additionally, Moulton Niguel is surrounded by some of the nation's top universities and strives to connect with these universities through partnerships. Moulton Niguel has created partnerships with the following academic institutions, to name a few:

**Santiago Canyon College:** Moulton Niguel visits students and provides advice to students on career opportunities in the classroom and during the college's career fair. Moulton Niguel informs students of opportunities in the water sector beyond the traditional construction and engineering positions. Moulton Niguel has hired several employees who attended Santiago Canyon College, and many employees continue their education at the College.

**University of California, Davis:** Moulton Niguel is partnering with UC Davis in a multi-year, multi-million-dollar pilot program to better understand how water utilities can reduce energy usage. This pilot program idea was the result of the state's goal to reduce greenhouse gas emissions. This project is designed to reduce the District's energy consumption and will combine water system hydraulic modeling with energy intensity models to create a demand management system. The pilot will help utilities nationwide reduce energy consumption, saving money for utilities and ratepayers, and reduce greenhouse gas emissions. This pilot will be coming to an end in 2021.

**University of California, Irvine:** With the FLOW Initiative and Moulton Niguel's expanded efforts in educating the public, Moulton Niguel connected with a dedicated water center at its neighboring research institution, University of California, Irvine (UCI). Water UCI is a globally recognized leader in water research and has built several educational offerings, from a middle school program to internships to symposia. Moulton Niguel has partnered in their educational offerings and determined there were opportunities to broaden the FLOW Initiative through a collaboration with Water UCI. Additionally, Moulton Niguel staff are participating in developing a National Science Foundation Industry University Research Center at UCI.

*"I attended a Water Science Career Fair on campus. At this event, I sat in a presentation on job interview preparation led by Todd Novacek, Director of Operations for Moulton Niguel. One key moment that stood out to me in the presentation was when Todd explained that he began his career as a meter reader and how rewarding a career in the water industry can be. I applied for a position with MNWD following the career fair."*

**– Matt Keith, Temp Customer Service Field Tech**

**California Data Collaborative:** Moulton Niguel is a founding member of the California Data Collaborative, which provides a network for water professionals to design and build the data infrastructure and analytic tools that strengthen water planning. The collaboration empowers agencies to make informed, data-driven decisions responsive to tomorrow's water needs. The unique inter-agency database of cleaned and standardized data accelerates research to generate insights for the water industry. World-renowned research institutions, including the University of Southern California, University of California, Los Angeles, and Stanford University, and industry professionals facilitate intellectual partnerships to fill gaps in knowledge and transform the state of the art.

## Lessons Learned

Moulton Niguel is committed to creating a workplace culture that supports and empowers its most valuable resources: its employees. The following lessons learned will assist utilities as they create programs for a healthy and inspiring workplace culture:

- **Care for your employees:** Show employees that management cares about their wellbeing in addition to their job performance. Make an effort to engage and connect with all employees.

- **Encourage employees:** Create spaces that encourage employees to use their imagination to address and tackle problems. Encourage creativity and support employees in their efforts.
- **Learn from staff:** Engage with staff and subject matter experts on unfamiliar topics and provide neutral spaces for knowledge transfer.
- **Prioritize others:** Identify the needs of the utility and coworkers, and create time and space to address those needs.

## Moulton Niguel's Program by the Numbers



3 Years Academy has been active



60 School engagements



20 FLOW engagements



45 Managers that have attended the Academy



65 Promotions following attendance at the Academy

## Conclusion

Moulton Niguel creates safe and supportive spaces for its employees to thrive and succeed through their foundation of Performance, Impact, and Resiliency and upholding the HERO Principles. The District's efforts began with a commitment to treating employees with respect and the development of programs to achieve that goal has resulted in the District winning the Top Workplace in Orange County for three years in a row. Moulton Niguel focuses on internal employee development through the two internal leadership academies and an environment that focuses on and reinforces the HERO Principles. Employees can provide honest feedback to continuously enhance the District and improve methods to support the community.

To keep pace with the changing technologies and information, the District recruits some of the nation's best and brightest through the Future Leaders of Water program and academic partnerships. These initiatives and programs allow employees to use technology and science to think creatively and advance the District towards a sustainable future. Moulton Niguel not only provides safe, high-quality water to its customers but also provides a healthy and inspiring workforce for its employees.

*"Knowing the names of your employees means a lot. This is one part of a larger effort to show employees that you care, that they are seen, and that they are respected and taken care of."*

**- Joone Lopez, General Manager**



# Internal Support for Emerging Leaders



## Introduction

[Saco Water Resource Recovery Department](#)<sup>22</sup> (WRRD) is committed to providing customers with the highest level of quality service through the responsible, sustainable, and creative stewardship of resources and assets. To achieve this level of service, Saco WRRD made a commitment to hire and retain a productive and talented workforce and to support employees through networking and professional development opportunities.

Though a smaller utility, Saco WRRD is a regional and national leader in professional development for staff and outstanding service to the community. Saco WRRD is an active member of regional and national associations and leadership encourages employees to attend conferences and join team challenges that help employees gain new skills and network with other utility professionals. Employees take classes at the Wastewater and Drinking

*"You have to plan for the future of your utility. If you don't train your workforce, where are they going to be in the future?"*

**- Stacy Thompson, Deputy Director**

Water Operator Training School and Maine Management Candidate School to train and stay up to date in clean water treatment, maintenance, asset management, and all other facets to running a treatment facility. This case study describes how Saco WRRD supports its employees through teambuilding, networking, and professional development opportunities.

## Teambuilding Experiences

With a full-time staff of ten, Saco WRRD employees work together to provide service to its almost 12,000 customers. Saco WRRD supports these teambuilding activities by setting aside 2–3% of its annual budget for teambuilding, training, and travel opportunities. This consistent line item creates a culture of professional development and ensures that employees are able to consistently engage with professional networks.

### Operations Challenge

Since 1998, Saco WRRD employees have joined the Maine state team and competed in the Operations (Ops) Challenge at the annual Water Environment Federation’s Technical Exhibition and Conference (WEFTEC). At this event, teams compete in various challenges and scenarios and are scored on accuracy and time. This event, funded by state and regional associations, is a cost-effective opportunity to test Operators on their knowledge and skills to network with the thousands of other conference attendees. The annual participation at WEFTEC also ensures employees are regularly exposed to innovative ideas from across the nation and able to maintain connections to other water professionals. Many Saco WRRD employees have participated for three or four years and developed lasting relationships with their teammates.

Participation in the Ops Challenge is also important once employees return home. Historically, this experience is often a steppingstone to upper management positions. Saco WRRD Director, Howard Carter, notes that most of the Saco WRRD employees who have participated in the Ops Challenge have moved onto higher positions both within Saco WRRD and other utilities in the region.

### Regular, Internal Team Meetings

Saco WRRD has an all-team meeting every morning to discuss outstanding items, items for the day, and a plan for the upcoming day. These daily meetings follow an open discussion format and allow all employees to participate and share their ideas and thoughts. This format emphasizes teamwork and the Director and Deputy Director look forward to hearing feedback from their employees.

## Networking Through Professional Development

Saco WRRD leadership encourages and provides funding for its employees to participate in water professional development courses through regional programs. Since 1985, all employees have participated in Joint Environmental Training Coordinating Committee (JETCC) courses.



*The Maine Ops Team competes in a set of challenges testing their knowledge and communication skills.*

*Photo Credit: City of Saco/A. Dickinson*

## The Joint Environmental Training Coordinating Committee

The JETCC coordinates training for Maine's environmental professionals. In addition to JETCC's regular ongoing certification and continuing education classes for Wastewater and Drinking Water operators, JETCC offers Management Candidate School (MCS) and an intensive Wastewater Operator School (WOS). As part of the New England Interstate Water Pollution Control Commission's (NEIWPCC) state network, JETCC, the Maine-based program partner, develops, coordinates, and conducts training courses that serve water quality professionals. Training credits fulfill requirements of the Maine Department of Environmental Protection's Wastewater Treatment Plant Operator Certification Program and are approved by the Maine Board of Licensure of Water Systems Operators for Drinking Water Operator Training. Participation in JETCC classes helps employees expand their engagement with other water professionals as they gain knowledge and experience in their respective fields.

**Wastewater and Drinking Water Operator Training**<sup>23</sup>: A regular, ongoing Operator Training schedule with a variety of entry level and advanced courses each fall and spring. As the foundation of JETCC training, Maine operators rely on this innovative program to remain current on water quality issues and to obtain state required continuing education.

**Wastewater Operator School (WOS)**<sup>24</sup>: A 6-month, 12-session training program with in-depth training to entry level Operators, technicians, and others who want to deepen their understanding of biological wastewater treatment concepts. WOS prepares personnel for Maine's Wastewater Operator exams. Two Saco WRRD employees have completed this program.

**Maine Management Candidate School (MCS)**<sup>25</sup>: An 11-month training program that provides intensive skills-development training and networking that is crucial for the next generation of water professional leaders. The curriculum, designed for mid-level Operators, includes technical courses on topics like construction planning and engineering basics, communication, and specialized skill training in budget preparation and personnel management. Four Saco WRRD employees have graduated from this program.

## Water Leadership Institute

Through the Water Environment Federation, the Water Leadership Institute program aims to educate, train, and connect emerging leaders within the water industry. This intensive program allows participants to take management training and leadership development courses that combine the challenges facing water and wastewater industries. Participants attend an in-person workshop, complete assignments, and produce a final project. Saco WRRD encourages its employees to apply to this program to further their professional development.

## Creating Opportunities for Employees Beyond Saco

Saco WRRD is considered a "training ground" for Operators and leadership promotes professional development opportunities to gain experience in teambuilding and management skills. Director Howard Carter supports staff that gain these important experiences and seek managerial opportunities at other utilities. He believes it is important for water professionals to share their knowledge and skills to help advance the clean water sector as a whole.

## From Intern to Operator: Riley's Journey at Saco WRRD

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*Operator and Lab Technician, Riley C., participates in regular team meetings.*

*Photo Credit: City of Saco/A. Dickinson*

Riley started at Saco WRRD eight years ago as an intern and is currently an Operator and Lab Technician. He started with an Associate Degree in Environmental Science and while working at Saco WRRD took classes in Wastewater 101 through the JETCC. As he progressed, he realized that, “having joined a team that has been together for many years and each teach member having significantly more experience in the field than I, it was clear that I had some learning to do.” Riley pursued a bachelor’s degree and felt, “Saco was an extremely useful resource for me, from notifying me of open scholarship opportunities and allowing me to use work computers after hours to complete homework, to even offering tuition reimbursement for some courses.”

Saco WRRD’s school assistance helped Riley complete his bachelor’s degree and continue to gain more skills at the utility through training and external opportunities. Riley participated in the Ops Challenge and pushed himself to learn new materials and network with other professionals. After his first Ops Challenge, Riley continued to study and passed his Grade 5 Wastewater Certification and then participated in the Management Candidate School. Riley notes, “These programs have all been a great reminder to keep learning. It inspired me to take on new challenges and meet others in the field.” Riley exemplifies the benefits of teambuilding and professional development opportunities.

Check out this [video](#)<sup>26</sup> that highlights Riley’s journey at Saco WRRD.

## Lessons Learned

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Saco WRRD supports its employees by creating a culture of professional improvement. Employees that engage in networking opportunities are celebrated and promoted. These lessons learned will help assist utilities create a supportive culture for their employees:

- **Support and Empower Your Employees:** Help employees accomplish their career goals by providing resources or on-site training. Let your employees grow and be supportive of their goals.
- **Encourage Professional Development:** Create a supportive environment where employees feel comfortable sharing professional ambitions and approaching management with opportunities.
- **Think Beyond Your Utility:** Support and train employees to succeed in your utility and at other utilities. Saco WRRD feels that if their employees receive training, succeed, and move to another utility, it benefits the clean water industry as a whole.
- **Include Training and Travel in the Budget:** Set aside money to support employee professional development training and traveling. Communicate with employees about utility resources when they are exploring continuing education classes and out-of-state conferences.

## Saco Water Resource Recovery Department Program by the Numbers



## Conclusion

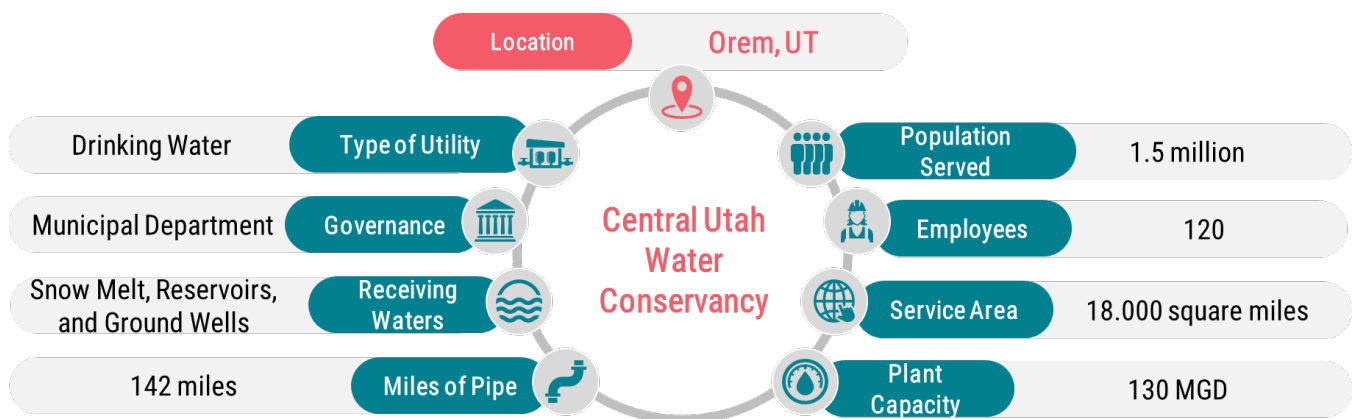
Saco Water Resource Recovery Department is the training ground for Operators and supports its employees through numerous external professional development opportunities. Employees further their knowledge and network with industry peers through the Ops Challenge at WEFTEC, take Wastewater and Drinking Water Operator Training courses, and gain leadership skills at the Maine Management Candidate School. Through these important engagements, Saco WRRD employees develop necessary technical and leadership skills to progress in their careers. Many individuals have progressed from Operators to Directors, either at Saco WRRD or at other utilities. Saco WRRD genuinely wants its employees to succeed and provides ample opportunities to support its employees and the clean water sector.

*"For people thinking of entering the clean water industry, know that we care and support one another and that's why many of us stay and make our careers out of it."*

**- Howard Carter, Director**



# Ensuring the Future: Every Plant Operator is a Potential Plant Manager



## Introduction

[Central Utah Water Conservancy District](#)<sup>27</sup> (CUWCD) has delivered clean water for the growing population of Central Utah's eight counties for over 50 years. With 62% of Utah's population currently living within its boundaries, CUWCD recognizes that achieving customer expectations and utility sustainability depends on developing and supporting its workforce.

**The Problem:** Twenty years ago, CUWCD's hiring and training workforce strategies did not result in a prepared, engaged workforce. The treatment plants had high turnover rates and a small candidate pool for new hires, which resulted in a staff unprepared to react to change. When positions were filled, the hiring process focused on present needs but did not anticipate management positions that would likely be vacant in the future. Additionally, plant operations at the utility rarely provided formal training opportunities. The turnover rates, recruitment challenges,

short-term hiring views, and lack of employee training led to low morale, lack of knowledge transfer, and ultimately a decline in employee trust, which left the various plants at risk.

**The Path Forward:** In 1997, CUWCD initiated changes to their recruitment strategies and employee development programs to address these issues. First, CUWCD started to hire differently, by recruiting and hiring treatment plant staff with STEM backgrounds and leadership experience. Next, CUWCD developed a training program for employees differently to advance their technical and leadership skills, leading to upward mobility within the utility. This case study will examine CUWCD's journey and lessons learned in their efforts to hire and train differently.

## Hire Differently

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Prior to 1997, CUWCD's hiring practices focused only on present workforce demands. CUWCD utilized its network from the Utah Water Quality Alliance to share information, cross-train with other treatment plant staff, and communicate staffing opportunities, but it did not have a specific community outreach initiative. As the years went on, senior treatment plant positions and management roles became vacant due to retirement and turnover without well-qualified internal replacement. This disconnect between current and future needs led CUWCD to hire externally for senior staff positions, leading to low employee morale. To address this gap in personnel, CUWCD recruited the best and brightest candidates with STEM backgrounds, interviewed candidates with a long-term growth mindset, and provided competitive entry-level salary and benefits. These "Hire Differently" changes brought in candidates that would not only succeed in their current role but demonstrated traits of a great future Plant Manager.

### Advertise to Attract the Best and Brightest

First, CUWCD changed its hiring announcement to attract those with STEM backgrounds and advertised employment opportunities at academic institutions. To do this, CUWCD changed the job description title from "Operator" to "Water Systems Technician." This change attracted candidates with STEM technical skills, as opposed to those with only heavy machinery experience. CUWCD also developed partnerships with local university professors to increase student awareness of the attractive, well-paying jobs at CUWCD. Professors within science departments advertised and encouraged qualified students to apply to these positions. Interested students were invited to tour the facility to see the real-world applications of their STEM skills and to learn of career pathways within the water sector. Currently, CUWCD is invited to college classes to teach water topics and college career fairs to discuss employment opportunities. CUWCD typically recruits 4–5 interns each year from local colleges.

### Interview with a Growth Mindset

To effectively identify interviewees with long-term growth potential, CUWCD needed to articulate critical knowledge categories for successful plant operations. Leadership met with facility managers and developed five knowledge areas needed for success, from Water Systems Technician to Plant Manager:

- Education and Water Experience
- Computers and SCADA
- Electrical Skills
- Mechanical
- Personal Character

Once these critical knowledge categories were identified, CUWCD scored each candidate's application based on their demonstrated knowledge within each area. Top applicants were then invited, as a group, for a facility tour, which served as an initial screening or "informal interview" to assess interest and ability. A refined group of candidates were selected for formal interviews. Interview questions touched on the variety of potential situations

and functions anticipated for each role, ranging from instrumentation and electronics to leadership experience. Top candidates were then given an exam to assess computer skills and problem-solving abilities.

This multi-tiered approach allowed CUWCD to interview and hire the right candidates with the necessary technical background and growth potential. Each candidate filled the present position vacancy but was also hired for their potential to grow into the role of Plant Manager.

### Shift Pay Differential

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CUWCD has around the clock employee coverage with plant roles that require consistent shifts as well as roles that require rotating shift schedules. Rotating shift schedules vary each month and consist of afternoon (swing) and evening (grave) shifts. CUWCD noticed that highly trained rotating shift employees were transferring internally to other CUWCD departments that offered consistent day shift schedules. These transfers occurred when no consistent non-rotating day shift positions were available and left the treatment plants short on experienced employees, thus creating risk for CUWCD.

To prevent the loss of staffing in critical rotating shift positions, CUWCD increased the shift differential resulting in higher hourly wages for swing and grave shifts. Employees with swing shifts received \$2.75 more per hour, originally \$0.25 per hour, and grave shift workers received \$5.50 more per hour, originally \$0.50 per hour. This increased shift differential incentivized employees to stay in their rotating swing and grave shifts, which resulted in fewer vacancies and less overtime pay. The increased differential pay annually per employee was approximately \$6,000, but the net increase per employee after the first year was approximately \$1,500. This “savings” from what was budgeted, appeared to be the result of employees choosing not to call in sick during higher-paid shifts, which previously resulted in covering the shift with an employee who received unexpected, overtime pay. It appears that employees tend to utilize sick leave during the day, regular pay, when there is typically an “extra” operator (technician) available to cover the shift. The most important improvement was the long-term retention of highly skilled employees to operate the treatment plant.

### Ensure Pay Is Competitive

As younger workers and recent college graduates enter the workforce, many gravitate toward jobs with high salaries and comprehensive benefits. CUWCD knew it needed to be more competitive with a higher salary for entry-level positions to attract younger workers and recent graduates. CUWCD’s entry-level salaries increased and are competitive on the national water utility scale; within the first five years, Water Systems Technicians are aggressively compensated for completing certification programs and gaining on the job experience. This accelerated increase in salary is meant to be commensurate with what a candidate may experience in a private sector position. Candidates are motivated to apply to CUWCD because of the competitive salaries for entry-level positions and stay long term because of internal training and advancement opportunities that allow for financial growth and stability.

### Train Differently

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In conjunction with an overhaul of hiring practices, CUWCD created a training program to ensure each employee is supported and encouraged to develop professionally throughout their time at CUWCD. The Lead Operator Training Program is a multi-year, comprehensive training that provides employees with the skills, knowledge, and practice necessary to become a successful Plant Manager. Although the program is voluntary, participants become eligible

for promotions, reductions in rotating shiftwork, and salary increases. These additional benefits contributed to an increase in job satisfaction and confidence.

Employees are eligible to participate in the program after completing three years as an Operator (technician). Employees in the program participate in weekly, peer-to-peer trainings and are tested across 120 skills. The training program takes approximately two years to complete and CUWCD encourages employees to take their time to master the necessary skills. Operators who successfully complete the program receive a one-time \$2,500 bonus and are eligible for a promotion to Lead Operator with a supervisor's recommendation and company approval. This section focuses on the two components of the Lead Operator Training Program: the peer-to-peer learning to support skills development and the demonstration of competency across 120 skills through testing.

## Peer-to-Peer Training

Peer-to-peer training is an important component of the Lead Operator Training Program. In peer-to-peer training, Operators identify a skill topic of choice, learn about that skill through self-study, and educate their peers with a one-hour presentation and training session. These weekly training sessions enable employees to become resident experts across a variety of topics and foster confidence and teamwork within the utility.

Operators choose a topic from the 120 required skills and lead sessions on those topics, ranging from standard operating procedures to water chemistry. Each operator is typically given three months to research their topic and to create a presentation with information gathered from the utility's subject matter experts. CUWCD prioritizes these trainings by creating dedicated weekly sessions that bring the Operators together. Training sessions are either presented through a PowerPoint presentation or video clips recorded on company smartphones. Both presentation formats allow remote site employees to participate in the training sessions. Most sessions are taught by Operators enrolled in the training program, but other departments such as human resources, are encouraged to participate and teach on topics such as time management and performance coaching.

These cost-effective peer-to-peer training sessions ensure procedures and protocols are consistent among employees, resulting in a safer work environment and safer water for the public. CUWCD's peer-to-peer training challenges employees to continuously learn and gain new skills from colleagues resulting in greater confidence and workplace morale.

## Demonstration of Competencies Through Testing

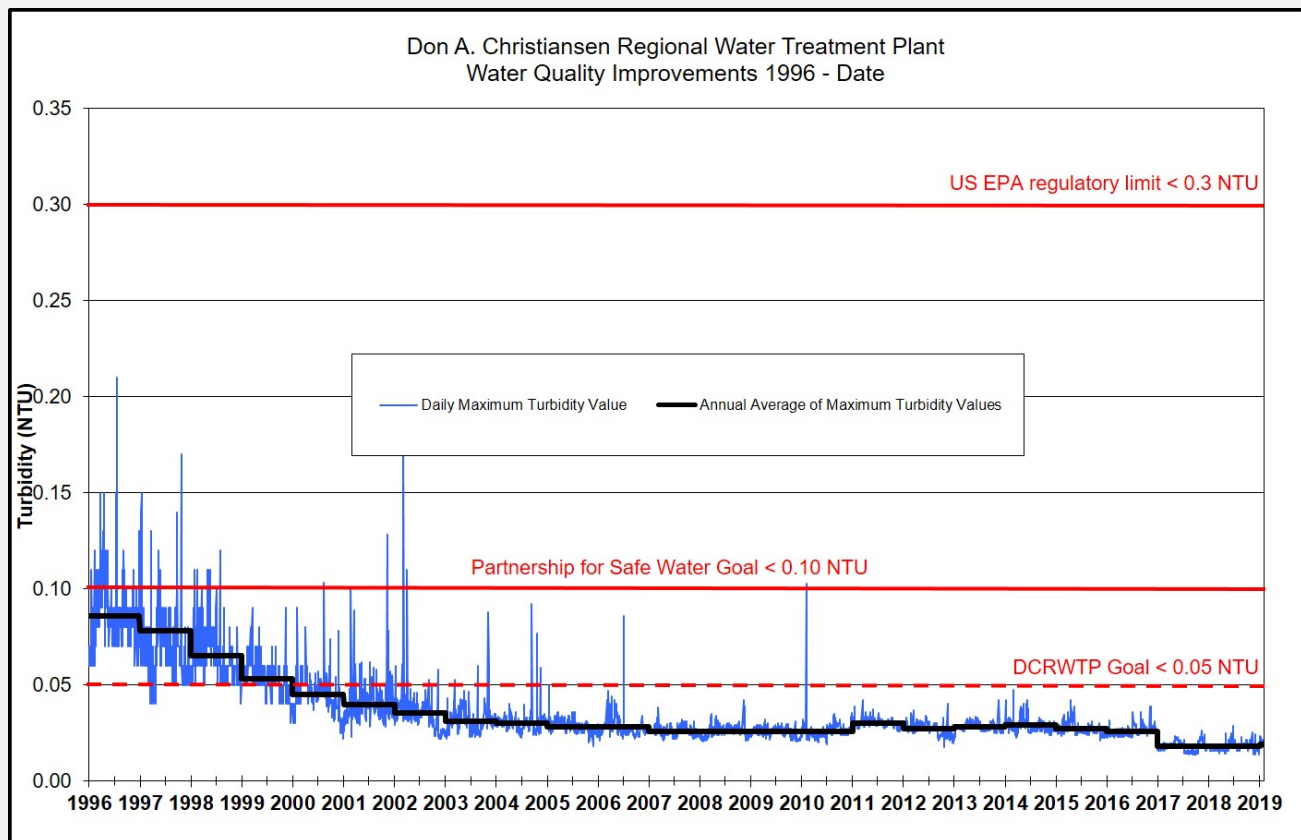
At the completion of each training session, the trainer is charged with measuring the Operator's knowledge, skills, and ability (KSA) through a demonstration of skills, verbal communication, or through a written test at the end of the training. If the Operator is successful, the trainer or supervisor, signs-off on a document of completion/ demonstration of competency. This document is then reviewed by the Operator and the plant manager during scheduled performance planning meetings. While some skills can be learned and signed off in a single training session, most require independent effort and additional studying to reach the required level of competence.



*CUWCD team members must be able to step out of their comfort zone and complete trainings such as confined space trainings.*

The peer-to-peer training program has resulted in several positive outcomes for CUWCD. As the Operators prepare, share knowledge, and assist co-workers, unity and friendship develops among the cohort of Operators that lasts well beyond the training. Additionally, Operators in the program become more confident in their ability to make critical operational decisions when it matters most, and those that successfully complete the program move on to become Lead Operators and often continue their development to become plant managers, facility supervisors, or managers within the organization.

Finally, the investment in these trainings has directly led to an improvement in water quality. The turbidity graph below shows the relationship between implementation of advanced training and enhanced finished water quality over time. The treatment plants consistently meet all the established water quality goals and finished water quality has improved dramatically.



*The graph shows the decrease in Annual Average of Maximum Turbidity Values and turbidity spikes due to advanced training.*

## Lead Operator Training Program Evolution

Over the last 20 years, the Lead Operator Training Program has evolved to keep pace with the changing technology and industry. CUWCD has kept pace with these external changes by evolving its program. The program has added new plant processes such as ozone, mechanical dewatering, and reclamation processes, which led to the creation of new training skill sets. The original training program had 12 categories and 72 skill sets; today there are 18 categories with 120 skill sets. Additionally, as employees maneuvered their way through the Lead Operator Training

Program, CUWCD saw the need to continuously support employee growth and development and created a new position, Operations Supervisor. This supervisory role allows employees to continue to grow in their career.

## Lessons Learned

Over the last 20 years, CUWCD has created a comprehensive training program that ensures their workforce has the necessary skills and knowledge to adapt and advance in the water sector. In developing and implementing this program, CUWCD has learned the following lessons along the way:

- **Adapt Training for Employee Needs:** Change training formats to meet different learning styles. CUWCD originally completed trainings through paper documents and PowerPoint presentations but has since adapted to generational learning and moved towards “YouTube-like” video training. These videos have not only benefitted the younger workforce, but also allow for the engagement of employees at remote sites.
- **Be Patient:** Emphasize the importance of slowing down and fully mastering the program skill bases. Employees that proceed to the next step without comprehensive preparation, create risk for utilities. CUWCD recognized this shortfall and adjusted the completion time for the Lead Operator Training Program.
- **Dedicate Time for Employee Development:** Commit to weekly training sessions to allow for knowledge transfer and teambuilding between employees. CUWCD designates one hour on Thursday mornings for training and includes both technical and scheduled support staff, such as engineering and human resources.
- **Make it Voluntary:** Provide the pathway for employees who want to develop but recognize that not everyone wants to be a Plant Manager. All Operators participate in the peer-to-peer training program, but completion of CUWCD’s Lead Operator Training Program is voluntary. This does not force employees to complete the program but creates incentives for employees to do so.
- **Incentivize Participation:** Provide avenues for employees without a four-year college degree to meet educational requirements for supervisory positions. The position of plant manager has a four-year college degree education requirement that can be satisfied either with a four-year degree or successful completion of the Lead Operator Training Program.



*A group of Operators engage in peer-to-peer training and learn about pH probe calibration.*

## Central Utah Water Conservancy District Program by the Numbers



23

Years since  
program  
launched



3%

Percent of CUWCD labor  
budget dedicated to  
training



75%

Percent  
reduction in  
turnover

80%



Percent completion rate  
for Lead Operator  
Program



\$6,000

Increase in differential pay  
(annual, per employee)

### Conclusion

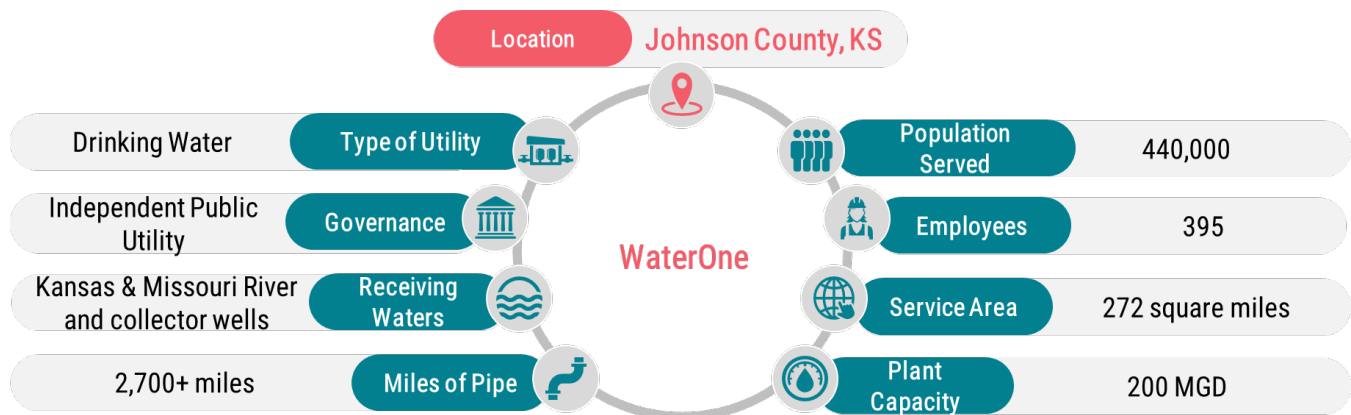
CUWCD has curated and sustained a training program and hiring process that ensures the utility is prepared to continuously provide safe and secure water for its residents. The “Hire Differently” and “Train Differently” initiatives are aimed to create a sustainable and supportive workforce environment that provides opportunities for employee growth and development. These initiatives have increased employee morale, reduced staff turnover, encouraged knowledge transfer, provided generational training, and created successful a learning community among CUWCD employees. Over the last 20 years, Central Utah Water Conservancy District has committed to hiring and training the right people because they see every employee as a future Plant Manager.

*“When you are hiring for a Plant Operator, you are always hiring for a future Plant Manager.”*

**- Gerard Yates, Water Quality & Treatment  
Department Manager**



# From Career Pathways to Career Empowerment



## Introduction

[WaterOne](#)<sup>28</sup> is committed to providing Johnson County, Kansas, a safe and reliable water supply with exceptional service and value. Every day, WaterOne relies on its employees to provide those high-quality services. To ensure their employees are supported and engaged, WaterOne developed a workforce program that trains and empowers staff to advance in their careers and not just their current job.

For WaterOne, developing a robust workforce program has been a journey that started in 2015. At that time, a lack of vacant upper-level positions and non-competitive salaries led many WaterOne Field employees to look for career development opportunities elsewhere. Facing turnover rates as high as 25% annually, WaterOne began to restructure its workforce program to develop a voluntary career pathway for Distribution Technicians. The Distribution

Technician Program establishes a set of milestones that result in career advancement, provides the support needed to achieve those milestones, and empowers employees to control their own career trajectory. This case study will examine the development of the Distribution Technician Program career pathway and the development of a workforce program that has made WaterOne an employer of choice in the region.

## Distribution Technician Program

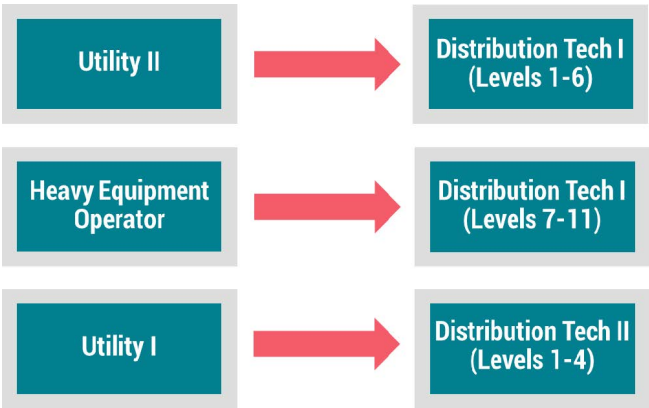
In 2015, WaterOne’s high turnover rates resulted in a rapid loss of institutional knowledge, a constant stream of new hires, and many frustrated front-line supervisors who were continuously pulled away from their regular work to train new employees. The Field workforce was suffering from low morale and reduced productivity. Leadership saw there was an overwhelming need to retain employees, support training, and facilitate knowledge transfer throughout the utility.

In October 2016, WaterOne established the Distribution Technician Program to train and provide advancement opportunities for its workforce. The voluntary program offered participants a comprehensive set of trainings that would provide them with the competencies needed to be successful as a distribution technician. The program also set the stage for participants to advance in their careers at WaterOne through promotions and higher compensation.

### Internal Restructuring for Upward Mobility

The Distribution Technician program is curated for employees within the Construction, Maintenance, Valving, and Services (CMVS) branch housed in the larger Distribution Division Structure. WaterOne’s first step for creating a new pathway was to restructure the existing job titles within the CMVS branch to reflect the progression of skills and responsibilities. The entry-level position, Utility II, changed to Distribution Tech I (Levels 1-6), the mid-level position, Heavy Equipment Operator, changed to Distribution Tech I (Levels 7-11), and the higher-level position, Utility I, changed to Distribution Tech II (Levels 1-4). Employees in the CMVS branch with these titles were invited to voluntarily participate in the program.

### Job Title Transitions Within the CMVS Branch



### Skill-Based Competencies

In conjunction with the position restructuring, WaterOne created a list of six competencies that reflected the skills needed for a Distribution Technician to succeed at the utility. At the beginning of their Distribution Technician program, employees are evaluated by their Foreman to assess their current abilities and competencies. Human Resources partners with CMVS to review the evaluations, discuss whether the employee is at the appropriate level, and develop next steps with the employee. Employees receive a booklet that further details the Distribution Technician program and the specific competencies within each of the six major categories. WaterOne is currently developing a digitized version of the booklet and tracking within the Learning Management System (LMS).

Each Distribution Technician level has a set of competencies that must be completed before advancing to the next level. Within the new structure, the Distribution Technician I is composed of 11 levels and the Distribution Technician II is composed of 4 levels. Once an employee has successfully demonstrated proficiency in a level’s respective competencies, they are eligible for a pay increase. This skill-based pay structure incentivizes employees

to continuously learn and advance through the competencies. On average, it takes six months for a Distribution Technician to successfully complete one level. However, this self-paced structure allows employees to dictate their study schedules and complete each level at a slower pace.

## Training

When the Distribution Technician program started, participants met with a University of Kansas professor to learn study habits to prepare for their national license and certification exams. As part of the curriculum, participants utilize the online [Water Distribution Operator Training Courses](#)<sup>29</sup>, which are offered at California State University in Sacramento. These self-paced courses correspond with study materials and cover a range of topics. Within the Water Distribution System course, students learn safety, distribution facilities, disinfection, operation and maintenance, and management. Employees take the courses at their own pace and WaterOne covers the cost of study materials, training, and the exams. WaterOne's Safety team provides training and guidance on safety requirements. Distribution Technician IIs attend a three-day supervisory workshop presented by the University of Kansas.



## Testing

Testing is an important aspect of the WaterOne Distribution Technician program. Employees not only commit to learning the six competency categories but demonstrate their knowledge in the form of in-utility exams, on the job demonstrations, and national certification exams. In the Licenses & Certifications category, Distribution Technicians are required to take the Water Distribution Operator course and certification exams that are regularly scheduled through the Kansas Water Environment Association. In addition, Commercial Driver's License training and certification on heavy equipment are also included in the program.

In the other competency categories, Distribution Technicians must demonstrate proficiency through utility-specific equipment operation, safety, and WaterOne specific curriculum. To assess their skills in specific competencies, employees complete written and practical exams that are scheduled twice a year. In the practical components, employees must physically demonstrate capabilities to their Foreman. After all competencies within the level have been successfully completed, the Foreman and Assistant Manager convene and identify the employees that will progress to the next level.

## Salary Progression

Distribution Technicians are eligible to receive a pay increase when they progress to the next level. This increase typically ranges between 4–7% and is dependent on factors such as where the employee started in the program, how fast they progressed, and their performance. Employees who quickly progress through the program may have two opportunities within the year to move to the next competency and pay level.

Initially, WaterOne's salary progression did not cause an increase in their overall budget. The decrease in turnover and vacancies increased productivity, quality, and engagement.

## Empowered Engagement

Over the last four years, the Distribution Technician program has created a pathway for career advancement and reduced the bottleneck that many employees faced before reaching upper-level positions. The program has seen a high level of engagement from staff and when first launched; 75 of the eligible 95 employees enrolled in the program. However, the transition was not without challenges. Some existing employees felt the program created an undue burden and that adequate time and experience would lead to career progression. However, newer employees reported that the clear process enabled and empowered them to succeed at their own pace.

Overall, WaterOne leadership is pleased with how quickly employees have embraced and progressed through the program. Currently, 58 employees are enrolled, and 16 have successfully completed the Distribution Technician program.

## Succession Planning

The Distribution Technician program creates skills overlap that allows for additional coverage across positions leading to many participants emerging as future leaders. Within the major competencies, Distribution Technician II employees receive training in necessary Foreman skills, such as timekeeping and completing work orders. WaterOne is currently expanding training efforts to ensure they have adequate coverage during emergency callouts, especially for Foreman positions. These trainings facilitate knowledge transfer and allow Distribution Technician II employees to gain hands-on experience and become leaders within the utility. Leaders gain more responsibilities and are promoted to higher positions, thus securing the future workforce and internal knowledge.

*"The Distribution Technician program has been a great success. It has improved employee retention and has helped us with recruiting. Distribution Technicians know precisely what they need to do to progress and they are able to determine their own rate of advancement. A side benefit of the program is that it has caused us to do a better job of providing training to our employees on a regularly scheduled basis."*

**- Greg Johnson, Manager CMVS**



*WaterOne employees work and learn together to solve water sector problems.*

## Higher Caliber Applicants

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A positive outcome of the Distribution Technician Program was the influx of higher caliber applicants. Previously, WaterOne often received applications from individuals with only distantly related experiences, which meant leadership was often engaging in the time intensive process of actively recruiting qualified candidates for positions. Since the start of the Distribution Technician Program in 2016, WaterOne has seen an increase in qualified applicants. This increase is due to two motivating factors: the opportunity to develop a career path and an increase in compensation. Applicants are motivated to apply and work for a utility that invests in their employees through development of a career path, allowing them to control their trajectory.

The Human Resources (HR) team connected with the Engineering Career Centers at the University of Kansas and Kansas State University through the biannual career fairs. The WaterOne HR team attends the career fairs with a WaterOne engineer, preferably one that graduated from the university. The engineer acts as an ambassador and subject matter expert while talking with students about WaterOne opportunities. These career fairs have increased HR's awareness and knowledge about the engineering profession, as well as provided an opportunity to network with students/potential candidates.

In addition to career fair recruitment opportunities, WaterOne has a robust summer intern program. Interns are placed within most of the Divisions, including Engineering. During the program, interns receive tours and engage in organizational awareness activities that provide interns the opportunity to learn about other positions and functions at WaterOne. Students often return for multiple years and are valuable mentors for incoming interns.

## Lessons Learned

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WaterOne created an empowering career path that allows employees to manage their career trajectory and enhance workforce morale. This restructuring process was not without challenges and learning experiences. These lessons learned will help assist utilities to create their own internal career paths:

- **Encourage Open Communication:** Provide neutral spaces that allow employees to engage and provide feedback for management. Support all-inclusive staff meetings that allow everyone to engage.
- **Provide Resources:** Help employees succeed with on-site training and resources. WaterOne partnered with the University of Kansas to provide employees with study skills and resources
- **Clearly Convey Competencies:** Emphasize that employee advancement is based on successfully demonstrating competencies. Highlight that successful demonstration of competencies equates to an increase in skills, pay, and promotions.
- **Create Internal Buy-In:** Create a workgroup to formally involve staff that will be impacted at the beginning of program development to help articulate current challenges and create buy-in for proposed solutions. Ensure there is consensus with Human Resources, managers, and other internal business partners to support the process.

## WaterOne's Program by the Numbers



4 Years since program launched



16 Employees graduated from the program



18% Percent reduction in turnover 2015 to 2018



24%

Percent change in cost per employee from pre-program to present



4-7%

Percent increase in salary per raise

## Conclusion

WaterOne's Distribution Technician Program empowers employees to control their own career trajectory. This self-paced program allows staff in the Distribution Division to gain skills and advance their careers. Prior to this program, WaterOne was experiencing turnover rates of 25%, as employees were leaving in search of other opportunities. Since the implementation of the Distribution Technician Program, WaterOne's turnover rate has reduced to 7%. WaterOne hopes to expand its workforce program to create a career pathway for advancement to the Foreman position and to develop on-site training sessions. By supporting employees, WaterOne has increased morale and attracted a higher caliber of job applicants. The Distribution Technician Program has improved retention at the utility and enabled employees to set their career paths to control their own trajectory, making WaterOne an employer of choice in the region.

*"The Distribution Technician program gives new staff a way to control their own destiny. As part of this program, a technician can see that they set their own career path through what they learn and achieve."*

**- Michael Armstrong, General Manager at WaterOne**



# Building Bridges to Meaningful Employment for Vulnerable Communities

## Introduction

Both Alexandria Renew Enterprises (AlexRenew) and the City of Atlanta Department of Watershed Management (DWM) are leaders in their communities. They not only provide safe and reliable water to their communities, but they also employ residents in meaningful, wage-competitive careers. In recent years, both utilities have looked to reach further into their community to build relationships with organizations that prepare vulnerable populations for career success. These relationships have resulted in the development of programs that provide clear pathways to train and hire new employees from diverse backgrounds. These programs range from high school internships for economically disadvantaged youth to adult programs that enable victims of sex trafficking and individuals who are currently incarcerated—on non-violent/non-sex offending charges—to transition to meaningful and family-sustaining careers. These partnerships have required communication and active engagement from both utility and community partners to create supportive learning and work environments for their participants.

This case study will examine how partnerships help build the utility workforce of the future and bolster the community by providing participants with the education, life skills, and career readiness needed to secure full-time employment and financial independence in their communities.

## Alexandria Renew Enterprises



### Overview

[Alexandria Renew Enterprises](#)<sup>30</sup> (AlexRenew) is one of the most advanced water resource recovery facilities in the country, and the innovation doesn't stop when it comes to growing and developing the workforce that ensures the safety and wellness of their Northern Virginia community. Over the years, AlexRenew developed a robust portfolio of workforce programs to recruit, retain, train, and empower their workforce. More recently, AlexRenew established and grew community partnerships to cultivate the workforce of the future. This case study focuses on the partnerships AlexRenew established with the [Urban Alliance Internship Program](#)<sup>31</sup> and the [Arlington Career Center](#)<sup>32</sup>. These partnerships were developed to increase youth awareness of the attractiveness of water sector careers and to provide hands-on job training, internship opportunities, and mentorship to under-resourced young people in the community.

*"Community partnerships are a cornerstone of our working programs. These partnerships not only allow us to train and recruit outstanding young people for careers in water, but they also help us continue to educate our community on the importance of clean water and our critical role as a public service anchor in them."*

**- Karen Pallansch, AlexRenew Chief Executive Officer**

### Urban Alliance High School Internship Program

[Urban Alliance](#)<sup>33</sup> is a national youth development nonprofit that provides economically disadvantaged young people with access to the exposure, opportunity, support, and training needed to prepare them for lifelong economic self-sufficiency. A core component of their work is the High School Internship Program, which provides students an intensive, year-long experience through paid internships, job training, and mentoring. Every year, more than 80 seniors in Northern Virginia sign-up for the year-long internship program, which offers the opportunity to work with [24 local businesses and organizations](#)<sup>34</sup>. Urban Alliance hosts three "mixer" style activities, providing a space where students can meet and ask questions of the organizations/mentors. After the mixers, students list the businesses and mentors they are interested in interning with and mentors create a list of students as well. Participants in the Urban Alliance Internship Program have reported increases in confidence working in professional environments and higher high school graduation and college acceptance rates.

Starting in 2013, AlexRenew began a partnership with the Urban Alliance High School Internship Program to mentor seniors from T.C. Williams High School, the only public high school in Alexandria City. T.C. Williams serves approximately 4,000 students, 70% of whom come from diverse backgrounds. This unique year-long paid program

introduces motivated T.C. Williams students to a variety of water jobs and exposures the students to a professional workplace. Critically, the partnership provides each student with two engaged adults: an Urban Alliance Coordinator who provides professional or “soft” skills training and a one-on-one AlexRenew mentor to support the student through direct work experience and education. The AlexRenew mentor supports the students as they rotate through the different departments and ensures that department projects given to students are viable and challenging. This complimentary coordination between the two organizations provides each student with the wraparound support that is essential to success.

During the school year, interns work part-time at AlexRenew and rotate departments regularly to ensure they are exposed to the full suite of possible careers in resource recovery, including engineers, scientists, and professionals in finance, communications, and IT departments. During the departmental rotation, interns assist with ongoing projects and report to their project supervisor and coordinator. Students are mentored through the process of learning about technical complexities, career opportunities, and sustainable practices within the water utility sector. Urban Alliance and AlexRenew host workshops on professional development, professional writing, and assistance on college and career planning. To date, AlexRenew has hosted 10 Urban Alliance interns.

### Arlington Career Center Internships

The [Arlington Career Center](#)<sup>35</sup> (ACC) offers students project-based learning for their high school education, which allows students to succeed in higher education and the workplace. ACC offers 24 unique Career and Technical Education programs and provides students with opportunities to earn college credits through a dual enrollment program. ACC students reflect the diversity of the Arlington/Northern Virginia community. Many students come from diverse backgrounds and are often English as a Second Language students. ACC supports the diverse student body by providing over two dozen career and technical education programs, counselor support, and allowing students the ability to curate their Capstone Experience.

ACC students start to curate their own [Capstone Experience](#)<sup>36</sup> in 9<sup>th</sup> grade by building a foundation, then exploring Capstone opportunities in 10<sup>th</sup> grade, preparing their Capstone in 11<sup>th</sup> grade, and conducting their Capstone Experience during their senior year. This experience is unique to each individual and their internship aligns with their interests and academic/career goals. Students gain experience writing a resume and cover letter, developing a research question, and presenting their final thesis at the end of their experience.

In 2018, AlexRenew began conversations with the ACC to develop an internship program for ACC students to complete their required Capstone Experience project. This partnership allows students to obtain hands-on experience in STEM-related fields and increase their awareness of the availability and attractiveness of water sector jobs. Students who are interested in working with AlexRenew for their Capstone Experience are given tours of the



*Kayla Yingst, AlexRenew's Communications Programming Specialist, with two interns, Isaac (left) and Hiwot (right) at an Urban Alliance event.*

municipal water facility and meet with AlexRenew staff to ask questions and determine if AlexRenew is the right fit for their Capstone project.

Though the relationship between the two organizations is relatively new, AlexRenew already hosted two students from the ACC. The first student, upon completion of the internship, was hired as a part-time data analyst at AlexRenew. The second student, Aidan, completed their internship and is working full-time as a General Laborer at AlexRenew. Visit the text box below to learn more about Aidan's experience. This partnership has given ACC students real-world experiences and a direct pipeline for employment with AlexRenew. The utility sees the importance of interacting and curating workforce experiences with Northern Virginia's youth to recruit these bright students to AlexRenew.

### Intern Spotlight



*Aidan, 2020 Senior at  
Arlington Career Center*

**Interests:** Maintenance, Operations, and working on cars.

**What the internship has meant to Aidan:**

"I am learning loads of information every day while working at AlexRenew. Whether it be simple small tricks about every little tool, or how the entire system of a water treatment plant works. I never go a day without learning something new. What I love about the Capstone Experience is the reality of actually working in the field. In my high school, I am given the opportunity and knowledge of working over 200 hours at a real job. The fact that I leave high school with the knowledge puts me much higher than the average student. Giving high school students this opportunity to give the workforce a try is, in my opinion, one of the greatest things we can do."

This past summer, Aidan started as a full-time General Laborer at AlexRenew.

### AlexRenew's Program by the Numbers



**2** Years ACC Program  
has been active



**0.12%**

Percent of total AlexRenew  
operating budget dedicated to  
student internships



**2**  
ACC students that have  
interned at AlexRenew



**7** Years UA program  
has been active

# City of Atlanta Department of Watershed Management



## Overview

The [City of Atlanta's Department of Watershed Management](#)<sup>37</sup> (DWM) provides safe drinking water and clean water services to over 1.2 million residents. In 2017, DWM experienced stagnant recruitment and challenges with knowledge transfer from experienced staff members to newer staff members. To address this, DWM developed a strategic workforce plan to ensure a sufficient and prepared workforce. This planning effort included a review and revision of job position requirements and qualifications to solicit broader applicants, the development of career pathways to demonstrate the growth available to DWM staff, and an increased focus on employee development and support.

External partnerships are a key aspect of DWM's strategic workforce plan and they have developed strong relationships with local educational institutions, such as Atlanta Technical College and Georgia Tech, to provide curriculum for water professionals, increase student awareness of the water sector employment opportunities, and provide water operator certification programs. As these programs grew, so did DWM's ability to recruit post-secondary candidates and existing water professionals, but DWM and the City of Atlanta wanted to reach deeper and build capacity among Atlanta's more vulnerable residents.

In 2018, Mayor Keisha Lance Bottoms created the Office of Equity, Diversity, and Inclusion (known as One Atlanta) and developed legislation that provided support to Atlanta's often forgotten communities. This case study focuses on the new partnerships that the City of Atlanta and the DWM cultivated with the [Wellspring Living Women's Academy Program](#)<sup>38</sup> and the Atlanta Department of Corrections.

## Wellspring Living Women's Academy Program

Wellspring Living's mission is to transform the lives of women who are at-risk or victims of sexual exploitation by providing specialized recovery services. The Women's Academy at Wellspring Living offers General Educational Development (GED) completion support, career readiness training, and apprenticeship opportunities to help ensure participants obtain living-wage jobs upon completion of the program. Full-time employment is often a critical step

towards independence. In 2019, DWM developed a partnership with Wellspring Living to launch an apprenticeship opportunity to provide workforce soft-skills and full-time employment with DWM.

Participants receive 12 weeks of paid apprentice training in job readiness skills and are then employed by the DWM for 12 weeks. Wellspring Living staff conduct trainings with DWM staff to ensure that the work environment is supportive for both staff and participants. After this period, participants may be hired full time to support the DWM in their customer service or billing operations. Since the inception of the initiative, the DWM has trained three individuals and has hired two full time. Looking forward, the DWM hopes to continue and expand its partnership with Wellspring Living and increase the number of apprenticeship participants to support their transition into full-time employment.

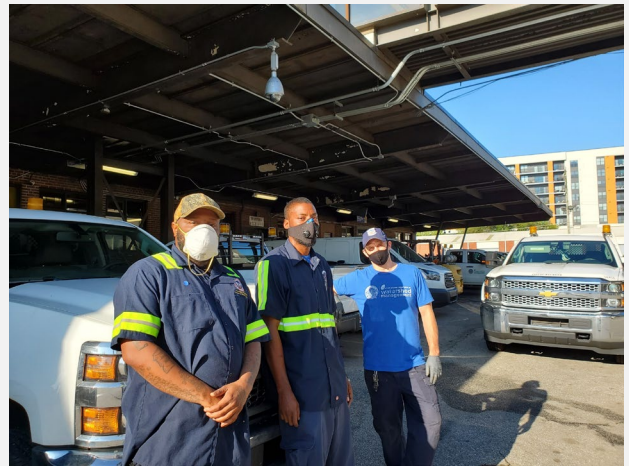
*"I am so grateful for this opportunity and just blessed that the City of Atlanta is willing to partner with programs like Wellspring. With this type of partnership, not only does it help give women like me a chance at a different way of life, it gives us hope."*

**- J., Wellspring Apprentice and now a current Atlanta DWM Employee**

### Preparing Adult Offenders to Transition through Training and Therapy (PAT<sup>3</sup>)

In 2018, the DWM partnered with the City of Atlanta Department of Corrections (ADOC), the Georgia Department of Corrections (GDC), and the Urban League of Greater Atlanta (ULGA) to develop the Preparing Adult Offenders to Transition through Training and Therapy (PAT<sup>3</sup>). PAT<sup>3</sup> is a pre-release reentry program for male offenders who are held in medium- or minimum-security facilities with 12 to 18 months remaining in their sentences for non-violent/non-sex offending charges. This program aims to reduce the recidivism rate and reintegrate individuals into the community by providing substance abuse training, education, life skills, family planning resources, on-the-job training, anger and stress management, and certification and employment assistance. Check out this [video](#)<sup>39</sup> that highlights several PAT<sup>3</sup> participants.

PAT<sup>3</sup> is a three-tiered process consisting of state-mandated vocational training, workforce development, and employment. The whole process can take 12–18 months and has the end goal of full-time employment with the DWM.



*PAT<sup>3</sup> graduates maintain DWM's operations during the COVID-19 pandemic and provide clean water to their community.*

- **State Mandated Vocational Training:** The first tier is the New Beginnings Transitional Training, Career and Employment program, a 12-week curriculum, administered by the ULGA. The curriculum is designed for the individual's workforce development needs and addresses the barriers to becoming employed. Participants work to establish employment/career and personal goals with qualified training facilitators, a case manager, and a job/career coach.
- **Workforce Development:** The remaining weeks are supported by the DWM and are dedicated to industry-sector competency training and gaining the certification needed for a water service professional. The tier includes five modules that take participants through topics such as career opportunities, water system introductions, major

components of a distribution system, safety, and 16 weeks of preparation to become a licensed Water Distribution System Operator for the State of Georgia.

- **Employment:** Graduates of the program become full-time employees at DWM. Participants maintain regular contact with their career and employment coach to ensure employee retention and consistency for 90 days.

PAT<sup>3</sup> provides career training and life-skills to reduce recidivism and provides a sustainable career path while supporting workforce initiatives by DWM. Since 2018, DWM has permanently hired 13 of 15 program participants from the PAT<sup>3</sup> program.

### Resource Allocation for DWM Programs

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As relatively new programs, DWM did not have to dedicate any additional resources for either program. The department had over 300 vacant positions and the available budget to hire new employees. They felt these were great programs and were dedicated to their success.

## Lessons Learned

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AlexRenew and the City of Atlanta's DWM robust programming unite their communities through the engagement with underrepresented persons and populations. While developing these programs, both utilities experienced challenges and breakthroughs and provided the following insights and lessons learned for other utilities interested in undertaking similar efforts.

- **Align Goals:** Find community partners that have focused objectives that are aligned with your needs to ensure both entities benefit from the partnership.
- **Build on Strong Foundations:** Look for organizations with an already established program that has available resources to support participants and other aspects of participant support that are not managed by the utility.
- **Celebrate the Wins:** Celebrate the program's wins and successes. By keeping metrics, utilities can showcase the successes through their community partnerships for outreach and development of new community partners.
- **Communicate:** Identify and prioritize the needs and expectations of the utility and the community partner through an active discussion and development of a plan to address those needs and expectations.
- **Prepare Employees for Success:** Provide staff with the information and training necessary to support participants. In these instances, AlexRenew provided training and education for working with high school age students and Atlanta DWM worked with staff to ensure sensitivity and appropriate engagement with at-risk individuals.
- **Find Champion(s):** Identify and engage dedicated and experienced staff to support the effort. Having internal buy-in and support beyond leadership is a critical step in program success.

## City of Atlanta DWM's Program by the Numbers



Years of partnership with  
Wellspring Living



Years of Partnership  
with PAT<sup>3</sup>



Wellspring Living graduates that  
have transitioned to full-time  
employees



PAT<sup>3</sup> graduates that have  
transitioned to full-time  
employees

### Conclusion

Through these new initiatives, both AlexRenew and the City of Atlanta's DWM have developed meaningful partnerships to build a future workforce from among underserved populations in our communities. These partnerships have created numerous touchpoints and opportunities to create a diverse and passionate workforce. Participants have benefited from the support given by utility staff champions and the communication between utilities and community partners to secure full-time employment and financial independence.

*"We must continue to focus on recruiting, training and maintaining our most valued resource: our workforce. It is the employees who make our vision and mission a reality."*

**-Andrada Butler-Cunning, Chief of Staff, City of Atlanta DWM**



## Connecting with Students from Kindergarten-to-Career



### Introduction

The [San Francisco Public Utilities Commission](#)<sup>42</sup> (SFPUC) is a national leader in developing and growing a utility workforce program with initiatives focused on recruitment, retention, competency, and community partnerships. The foundation of these efforts is their Kindergarten-to-Career strategy, which is focused on engaging with kindergarten through high school students to raise early awareness of the Bay Area's watersheds, develop the next generation of

environmental stewards, and provide opportunities for San Francisco's youth to learn about STEM careers within the utility sector.

SFPUC developed youth engagement touchpoints at each stage of a student's educational experience, from Kindergarten-to-Career. These engagements build upon one another to match a student's academic progression, beginning with initial elementary classroom presentations and field trips and culminating in job shadowing and paid internships for high school and college students considering their future careers.

Since 2012, these efforts have engaged more than 77,000 youth in San Francisco. While these programs may not directly result in immediate recruitment, SFPUC's long-term Kindergarten-to-Career approach provides many lasting tangible and intangible benefits that build strong communities and a strengthened workforce pipeline. This case study will provide an overview of SFPUC's youth community programs with a spotlight on the John O'Connell High School program.

### SFPUC's Community Benefits Program

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Youth engagement and education are key components of SFPUC's [Community Benefits Policy](#)<sup>43</sup>. This policy outlines the agency's commitment and approach to ensuring that communities are positively impacted by SFPUC services. The Community Benefits Program focuses on workforce development, small business opportunities, neighborhood partnerships, environmental justice and land use, education, and art. SFPUC has shared its good neighbor approach with other communities, government agencies, and utilities around the country.

## Supporting Elementary School Students

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SFPUC introduces elementary school students to water services, environmental stewardship principles, and watershed concepts through curricula content, classroom presentations, and visits to demonstration gardens. Below is an overview of the various programs and materials that SFPUC produced in partnership with local educational organizations to build and deepen ecological awareness.

- **[The Story of Poo](#)**<sup>44</sup>: Produced in partnership with the California Academy of Sciences, this [short animated video](#)<sup>45</sup> teaches young audiences about San Francisco's sewer system, from flushing the toilet all the way to the treatment plant.
- **[Our Water Curriculum](#)**<sup>46</sup>: SFPUC has developed water curricula aimed at students in 4<sup>th</sup> through 6<sup>th</sup> grades and includes teacher guides, fact sheets, activity sheets, and lesson plans that discuss the history of water in San Francisco, recycled water, and plastic pollution. SFPUC has also designed a [Watershed Stewardship Curriculum](#)<sup>47</sup> that teaches watershed and pollution awareness, green stormwater management, and water conservation. Additionally, SFPUC provides free classroom presentations on the Our Water curriculum.
- **[College Hill Learning Garden](#)**<sup>48</sup>: The College Hill Learning Garden is an education and demonstration garden that teaches over 2,000 local students each year how they can support ecologically friendly water, food, energy, and waste systems. Students of all ages participate in hands-on stewardship focused activities, often building upon

other SFPUC experiences and concepts, to adopt sustainable practices and understand career opportunities in related green industries. Students can also visit the [Garden for the Environment](#)<sup>49</sup> to learn about small-scale urban food production and organic gardening space.

- **Big Ideas Educational Framework**<sup>50</sup>: In partnership with the Center for Ecoliteracy, SFPUC created the *Big Ideas* educational framework to serve as a resource for curriculum developers, teachers, and schools. Through the publication of this framework, the SFPUC seeks to foster the next generation of environmental stewards and provide a water, power, and sewer framework for Grades K-12. Teachers can also engage in a one-year professional learning opportunity through the [Bayview Science Institute](#)<sup>51</sup>, in partnership with the California Academy of Sciences.



*Elementary students visit SFPUC's College Hill Learning Garden to learn and explore the relationship between food, water, and energy.*

## Supporting Middle School Students

As students advance in their educational journey, SFPUC helps middle school students explore a variety of water resource environments. Students have the opportunity to take field trips to wastewater treatment plants and parks, to explore physical environments and ask questions, and to explore real career opportunities. Middle school students build upon knowledge gained in elementary school by emphasizing the relationships and connectivity of water to the San Francisco Bay Area.

- **Wastewater Treatment Plant Tours**<sup>52</sup>: SFPUC provides free tours of the Westside Recycled Water Facility and the Southeast Treatment Plant to provide students with exposure and the knowledge of how SFPUC protects human health and the environment.
- **Sunol AgPark**<sup>53</sup>: Located in beautiful Sunol Valley, within the Alameda Creek Watershed, the Sunol AgPark is owned by SFPUC and is managed through a partnership agreement with the [Alameda County Resource Conservation District](#)<sup>54</sup> (ACRCD). Within the AgPark, eight small-scale organic farms grow fresh fruit, vegetables, and flowers for Bay Area communities. The SFPUC and ACRCD partnership provides land and technical assistance to the farmers and hands-on environmental education programs for Bay Area schoolchildren.

## Supporting High School Students

SFPUC's high school programs enrich students' lives and provide exposure to environmental stewardship and water, power, and sewer concepts. High school students are presented opportunities to explore employment opportunities at SFPUC through after-school and summer internship programs. These programs provide valuable mentorship to students and open the door to possibilities in the water service sector and STEM fields.

- **SSIP CityWorks**<sup>55</sup>: Entering its ninth summer, SSIP CityWorks is an eight-week paid summer internship program for high school students and college students from San Francisco's southeast neighborhoods. Starting after their junior year in high school, students are provided with internship opportunities every summer either at the

SFPUC or with one of the private engineering firms participating in the Sewer System Internship Program. Since 2012, nearly 100 students have participated in the CityWorks internship.

- **[Project Learning Partnership Grant Program](#)**<sup>56</sup>: Through the Project Learning Partnership Grant Program, SFPUC supports existing summer and academic-year youth programs to integrate project-based learning on water, power, and sewer concepts and to learn about utility careers. More than 3,000 youth have engaged in meaningful and enriching projects related to the SFPUC since 2012. In the most recent grant cycle, participating organizations have implemented activities designed by the California Academy of Sciences on Clean Power, Flooding, and Groundwater; brought youth on tours of the SFPUC headquarters and the College Hill Learning Garden; and participated in the annual Futures Fair, a youth summit focused on utility job opportunities and career readiness programming.
- **[YouthWorks](#)**<sup>57</sup>: For about 20 years, YouthWorks—a paid after-school and summer internship program—has provided San Francisco high school students interested in public service with job opportunities at SFPUC and more than 30 other City departments, such as the Department of Health and District Attorney’s Office.
- **[Project Pull](#)**<sup>58</sup>: For more than 25 years, Project Pull has provided more than 1,500 San Francisco high school and college students with paid summer internships at SFPUC and other City departments. During their eight-week program, interns at the SFPUC learn about careers in architecture, business, engineering, and science.

## Virtual Engagement During COVID-19

Due to the COVID-19 pandemic, SFPUC launched its ninth annual CityWorks Summer Internship Program in late June 2020 as a virtual internship for the first time. This paid internship opportunity allowed 20 students from the Bayview-Hunters Point community to gain important mentorship opportunities and exposure to available career opportunities in the utility sector. SFPUC worked with its private contracting partners, [Young Community Developers](#)<sup>59</sup> and [Ignited](#)<sup>60</sup>, to ensure interns have a unique and impactful virtual summer internship program.

## John O’Connell High School Career Awareness Pilot

The John O’Connell High School in San Francisco’s Mission District neighborhood provides an equity-centered learning community for students to develop academic mastery and interpersonal skills that will help them succeed in both college and in their careers. Since 2017, the SFPUC has partnered with the teachers at John O’Connell High School to develop a unique project-based curriculum with a deep nexus to the water, power, and sewer operations of the SFPUC. Furthermore, students gain exposure to careers in the water, wastewater, and utility field during their studies through the SFPUC partnership. This program has become the cornerstone of the SFPUC’s Kindergarten-to-Career strategy.

The John O’Connell Career Awareness Pilot has four main goals:

1. Foster student awareness of career opportunities in the utility industry through the creation of regular and progressive education and engagement.
2. Provide all students with real-world connections to SFPUC staff and work-based learning experiences related to the agency.

3. Provide teachers with the opportunity, time, and resources to build connections, knowledge, and excitement around work-based learning and career skills.
4. Clearly connect graduating students to internship, trainee, pre-apprentice, apprenticeship, and entry-level job opportunities.

These goals are met through the support of the school's administration, SFPUC staff engagement with teachers and students, tours of SFPUC sites, and SFPUC-integrated lesson plans.

## Supporting the School Administration

For the SFPUC, making a meaningful impact on the students at John O'Connell High School requires a comprehensive approach that includes teachers' needs and the administrative context within which they operate. As a school operating in a lower-income community with 60% of students on the subsidized lunch program, SFPUC has created a funding structure that allows their grant to also be used in support of meeting administrative needs and providing teacher teams additional time and supplies. The majority of grant funds support teacher planning time for SFPUC-related project-based learning curricula, which ensures that teachers are resourced to integrate learning creatively and effectively on utility concepts and careers into their lesson plans. Funds also support 8<sup>th</sup>-grade recruitment efforts, which showcase the partnership with the SFPUC, and busses for SFPUC-related tours and trips.

## Engaging with Teachers

Teachers are uniquely positioned to make a meaningful impact in the lives of their students, and SFPUC designed a program that places teachers at the center of this effort. SFPUC partners with [Ignited](#)<sup>61</sup>, a Bay Area-based nonprofit that connects teachers with business leaders and scientists to help transform the classroom experience by providing teachers with real-world applications to their curriculums. With Ignited, teachers participate in a week-long paid externship to learn about SFPUC operations, from collection systems to treatment processes. This learning opportunity helps teachers understand things like the biology behind wastewater treatment processes, the history behind San Francisco's water system, and math involved in SFPUC hydrology.

The externship also provides teachers with working time to develop their curriculum and ensures subject matter experts are available during that time to act as a resource in developing lesson plans. In advance of the 2018–2019 academic year, a third of John O'Connell teachers attended the SFPUC Teacher Externship and developed SFPUC-aligned curricula on water, power, and sewer concepts for their students. Teachers leave the externship with a breadth of water, power, and sewer knowledge; connections to SFPUC staff; and a clearer sense of how students can benefit from the agency partnership.

## Engaging with Students

SFPUC wanted to create a sustained, sequential set of interactions with students that introduced age-appropriate educational content and experiences and laid the foundation for older students to consider SFPUC as an attractive potential employer. For this reason, the pilot includes engagements at freshman, junior, and senior years with plans for touchpoints at the sophomore level anticipated in future iterations of the program.



*Teachers take a SFPUC facility tour during their week-long externship.*

- **Freshmen:** Freshmen have an opportunity to go on an overnight trip to Camp Mather and visit the Hetch Hetchy Reservoir. For many students, this rewarding outdoor experience visiting Yosemite National Park and the surrounding public lands is deeply impactful. During this trip, students learn about the environment and see first-hand the source of 85% of San Francisco’s drinking water.
- **Juniors:** Juniors receive work-based learning in their curriculum and visit various employers across the region once a week. This allows students to see different industries and develop a better understanding of how their classroom content applies to the real world. As part of this program, students visit one of the SFPUC plants or facilities to better understand the types of jobs that are available and the skills and education needed to work in those facilities.
- **Seniors:** Seniors are poised to enter the workforce and, for that reason, SFPUC has targeted its most in-depth engagement at this grade level. At John O’Connell, seniors are eligible to receive weekly hands-on training at one of the SFPUC’s plants or facilities. Students shadow different departments and gain an all-encompassing knowledge of the public water sector. As a result of this program, one John O’Connell student became interested in the engineer and maintenance technician positions, completed an electronic technician program, and is currently an intern at SFPUC.

*“It has been a positive experience being able to learn about San Francisco’s environment and natural resources, research and work collaboratively with my classmates, and have hands-on projects related to the SFPUC.”*

**- John O’Connell High School student**

## Lessons Learned

For SFPUC, the decision to develop and launch a robust and varied youth engagement program came after an internal workforce assessment identified a significant future gap in mission-critical positions. SFPUC also saw this challenge as an important opportunity to help its local community access family-sustaining employment opportunities—specifically, job seekers from environmental justice communities. With that goal in mind, SFPUC developed programs aimed at creating capacity and awareness at an early age within the community. For utilities interested in launching educational programs for students, SFPUC noted the following lessons learned:

- **Invest in Teachers:** Resources for teacher planning time are vital to the John O’Connell pilot’s success. The grants help to ensure that teachers are supported and incentivized to put time and effort into the integration of SFPUC concepts in their lesson plans.
- **Offer Tours to Allow Students to See “Behind the Scenes”:** Tours can help to ensure that students see the concepts in action and meet a range of utility staff to learn about their careers. Staff are encouraged to share with students about their jobs, key responsibilities, highlights, challenges, and how they got to the SFPUC.
- **Create Utility Liaisons:** For many SFPUC staff serving as subject-matter experts (SMEs), working with students and teachers can be an exciting opportunity that makes their work more meaningful and fun. Nevertheless, busy schedules and new partnerships can foster unclear expectations and miscommunications. SFPUC pilot program staff have found success in serving as liaisons between teachers and SFPUC SMEs. SFPUC liaisons help to clarify the time expected of an SME’s schedule, coordinate dates for guest speaking and tour opportunities, coach SFPUC SMEs on useful and relevant content for high school youth and ensure responsiveness from all parties.

- **Consult and Communicate with School Career Counselors:** It is helpful to ensure that students can access career counselors with knowledge about utility job training so that counselors can support students to advance towards work in the water, power, and sewer sectors. Consultation between career counselors and utility human resources staff can aid in this effort.

## San Francisco Public Utilities Commission's Program by the Numbers



Engaged students from John O'Connell High School annually (average)



Years of partnership with John O'Connell High School



Annual Project Pull internship participants (average)



\$150,000

Annual Grant for John O'Connell High School Program

## Conclusion

Utilities must make an investment in their young people, just as we invest in our natural resources. The San Francisco Public Utilities Commission has curated an array of programs that engage students from kindergarten to career to build important fundamental environmental stewardship ideals and support students as future leaders and utility workers. While these programs do not necessarily result in immediate recruitment, they have touched over 77,000 youth and more than 100 of their educators as they build towards the future together.

The SFPUC's Kindergarten-to-Career strategy and engagements enable students to think about their connection to the natural environment through hands-on field trips, in-classroom curricula, and workforce exposure programs. Through this holistic approach, SFPUC is active in promoting water as a career of choice in their communities by supporting education and opportunity for youth – particularly youth who live in environmental justice communities. The John O'Connell High School Awareness Pilot Program is a catalytic program ensuring that students acquire the opportunity to connect their studies to real-life SFPUC concepts and projects and learn about utility careers in the process.

*"We understand that our mission entails more than simply delivering water, power, and sewer services to the public. We want to support our youth through education initiatives, enliven our communities with public arts and green spaces, and bolster the local economy through apprenticeship training and economic assistance programs. We see it as our duty to partner with our residents and businesses to build strong, sustainable and vibrant communities for generations to come."*

**- Juliet Ellis, Chief Strategy Officer and Assistant General Manager for External Affairs**

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- <sup>1</sup> <https://www.epa.gov/sustainable-water-infrastructure/americas-water-sector-workforce-initiative>
- <sup>2</sup> <https://louisvillemsd.org/>
- <sup>3</sup> <https://louisvillemsd.org/doing-business-us/community-benefits>
- <sup>4</sup> [https://louisvillemsd.org/sites/default/files/file\\_repository/Supplier%20Diversity/MSD%20Disparity%20Study%20Executive%20Summary%207-23-18.pdf](https://louisvillemsd.org/sites/default/files/file_repository/Supplier%20Diversity/MSD%20Disparity%20Study%20Executive%20Summary%207-23-18.pdf)
- <sup>5</sup> <https://www.youtube.com/watch?v=NrJzDqxhOcw&feature=youtu.be>
- <sup>6</sup> [https://louisvillemsd.org/sites/default/files/file\\_repository/6843LWC-Joint%20Partnership%20Flyer%20DIGITAL.pdf](https://louisvillemsd.org/sites/default/files/file_repository/6843LWC-Joint%20Partnership%20Flyer%20DIGITAL.pdf)
- <sup>7</sup> <https://www.jefferson.kyschools.us/schools/profiles/fairdale-high>
- <sup>8</sup> <https://www.jefferson.kyschools.us/file/fairdale-pathway-chart.jpg>
- <sup>9</sup> <https://www.summerworks.org/>
- <sup>10</sup> <https://www.youtube.com/watch?v=wlnlpWBjQe8>
- <sup>11</sup> <https://www.brookings.edu/research/water-workforce/>
- <sup>12</sup> W represents drinking water; WW represents wastewater
- <sup>13</sup> <https://www.phila.gov/water/sustainability/greencitycleanwaters/Pages/default.aspx>
- <sup>14</sup> <https://www.phila.gov/water/pages/default.aspx>
- <sup>15</sup> <http://powercorpsphl.org/>
- <sup>16</sup> <http://powercorpsphl.org/model/>
- <sup>17</sup> <https://vimeo.com/382437196>
- <sup>18</sup> <https://www.mnwd.com/>
- <sup>19</sup> <https://www.youtube.com/watch?v=EPigX2PYK8Q&feature=youtu.be>
- <sup>20</sup> <https://www.mnwd.com/future-leaders-of-water/>
- <sup>21</sup> <https://youtu.be/ttsMS5R02Ds>
- <sup>22</sup> [https://www.sacomaine.org/departments/water\\_resource\\_recovery\\_division/index.php](https://www.sacomaine.org/departments/water_resource_recovery_division/index.php)
- <sup>23</sup> <http://jetcc.org/wastewater-training.php>
- <sup>24</sup> <http://jetcc.org/wastewater-training.php>
- <sup>25</sup> <http://jetcc.org/mcs.php>
- <sup>26</sup> <https://www.youtube.com/watch?v=rUjGtAu9yXI&feature=youtu.be>
- <sup>27</sup> <https://www.cuwcd.com/>
- <sup>28</sup> <https://www.waterone.org/>
- <sup>29</sup> <https://www.owp.csus.edu/courses/catalog.php>
- <sup>30</sup> <https://alexrenew.com/>
- <sup>31</sup> <https://theurbanalliance.org/locations/northern-virginia/>
- <sup>32</sup> <https://careercenter.apsva.us/>
- <sup>33</sup> <https://theurbanalliance.org/about-us/>
- <sup>34</sup> <https://theurbanalliance.org/locations/northern-virginia/partners/>
- <sup>35</sup> <https://careercenter.apsva.us/>
- <sup>36</sup> <https://careercenter.apsva.us/capstone/>
- <sup>37</sup> <https://www.atlantawatershed.org/>
- <sup>38</sup> <https://wellspringliving.org/academy/>
- <sup>39</sup> <https://vimeo.com/269732421>
- <sup>40</sup> SFPUC offers water, power, and sewer services.
- <sup>41</sup> The range of 80-575 MGD depends on wet weather events. SFPUC has multiple wastewater plants.
- <sup>42</sup> <https://www.sfwater.org/>
- <sup>43</sup> <https://sfwater.org/index.aspx?page=656>
- <sup>44</sup> <https://www.calacademy.org/educators/the-story-of-poo>
- <sup>45</sup> <https://www.youtube.com/watch?v=hBuWCKAx8Is>
- <sup>46</sup> <http://sfwater.org/index.aspx?page=490>

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- 47 <https://sfwater.org/index.aspx?page=491>
- 48 <https://sfwater.org/index.aspx?page=987>
- 49 <https://www.sfwater.org/index.aspx?page=160>
- 50 <https://sfwater.org/index.aspx?page=1077>
- 51 <https://www.calacademy.org/bsi>
- 52 <https://www.sfwater.org/index.aspx?page=95>
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- 59 <http://www.ycdjobs.org/>
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