



Smart Management for  
Small Water Systems

# ***Workforce Development***

*[www.efcnetwork.org](http://www.efcnetwork.org)*



Environmental  
Finance  
Center  
*Syracuse University*




American Water Works  
Association



WICHITA STATE  
UNIVERSITY  
HUGO WALL SCHOOL  
OF PUBLIC AFFAIRS  
*Environmental Finance Center*

This program is made possible under a cooperative agreement with the U.S. EPA.



As the U.S. economy continues to grow, many communities are struggling to translate economic growth into more equitable and inclusive employment opportunities.

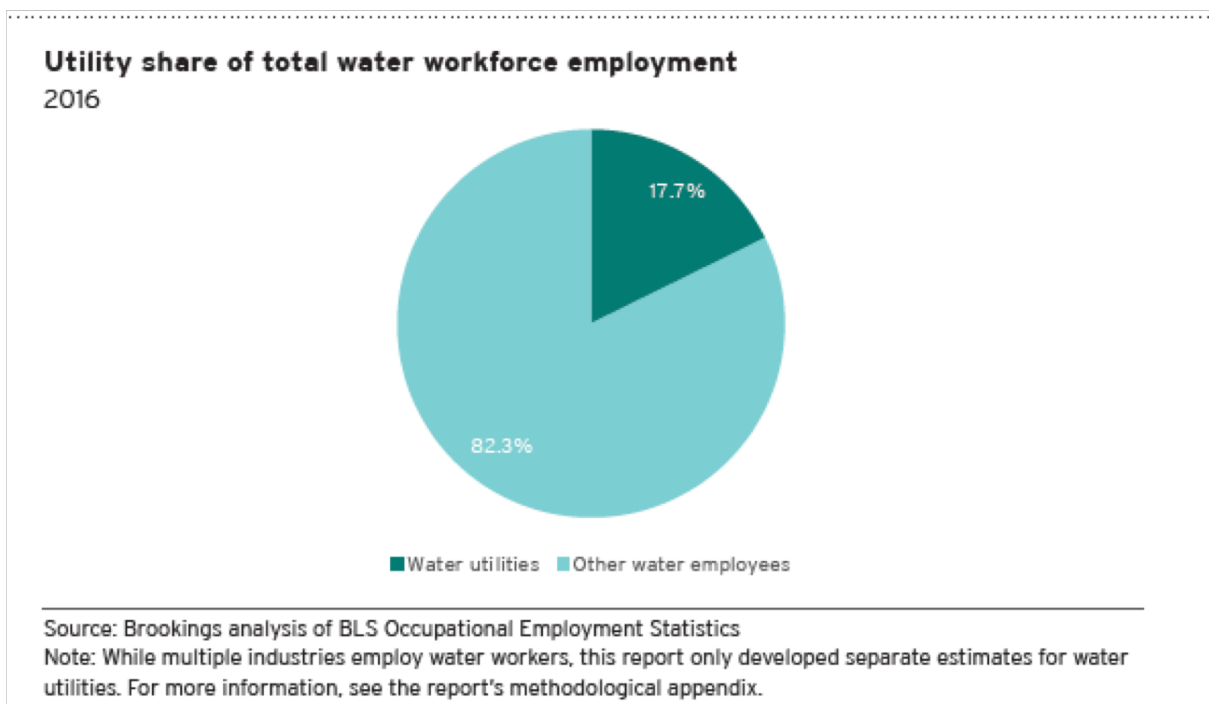
Simultaneously, many of the nation's water infrastructure assets are in urgent need of repair, maintenance, and restoration.

Yet the workers capable of carrying out these efforts are in short supply due to an aging workforce eligible for retirement and the lack of a pipeline for new talent.





**In 2016, nearly 1.7 million workers were directly involved in designing, constructing, operating, and governing U.S. water infrastructure, spanning a variety of industries and regions.**



## 15 largest occupations, across the entire water workforce and across utilities 2016

Water occupations	Employment	Share of employment
Plumbers, Pipefitters, and Steamfitters	324,500	19.3%
Construction Laborers	149,513	8.9%
Water and Wastewater Treatment Plant and System Operators	115,840	6.9%
Operating Engineers and Other Construction Equipment Operators	79,900	4.8%
Heating, Air Conditioning, and Refrigeration Mechanics and Installers	70,811	4.2%
First-Line Supervisors of Construction Trades and Extraction Workers	56,021	3.3%
Office Clerks, General	47,602	2.8%
Helpers--Pipelayers, Plumbers, Pipefitters, and Steamfitters	46,510	2.8%
Heavy and Tractor-Trailer Truck Drivers	38,548	2.3%
Secretaries and Administrative Assistants, Except Legal, Medical, and Executive	35,141	2.1%
Electricians	34,800	2.1%
Pipelayers	33,810	2.0%
General and Operations Managers	33,788	2.0%
Hazardous Materials Removal Workers	26,850	1.6%
Septic Tank Servicers and Sewer Pipe Cleaners	26,320	1.6%
<b>Water Workforce Total</b>	<b>1,679,971</b>	



Water utility occupations	Utility employment	Share of utility employment
Water and Wastewater Treatment Plant and System Operators	102,520	34.4%
Meter Readers, Utilities	17,500	5.9%
Electricians	14,900	5.0%
Plumbers, Pipefitters, and Steamfitters	12,850	4.3%
Pipelayers	9,880	3.3%
Industrial Machinery Mechanics	9,870	3.3%
Office Clerks, General	9,654	3.2%
Maintenance and Repair Workers, General	7,820	2.6%
Septic Tank Servicers and Sewer Pipe Cleaners	7,510	2.5%
Secretaries and Administrative Assistants, Except Legal, Medical, and Executive	7,080	2.4%
General and Operations Managers	4,441	1.5%
Bookkeeping, Accounting, and Auditing Clerks	4,124	1.4%
First-Line Supervisors of Office and Administrative Support Workers	3,570	1.2%
Landscaping and Groundskeeping Workers	3,537	1.2%
Customer Service Representatives	3,415	1.1%
<b>Water Utility Total</b>	<b>297,787</b>	

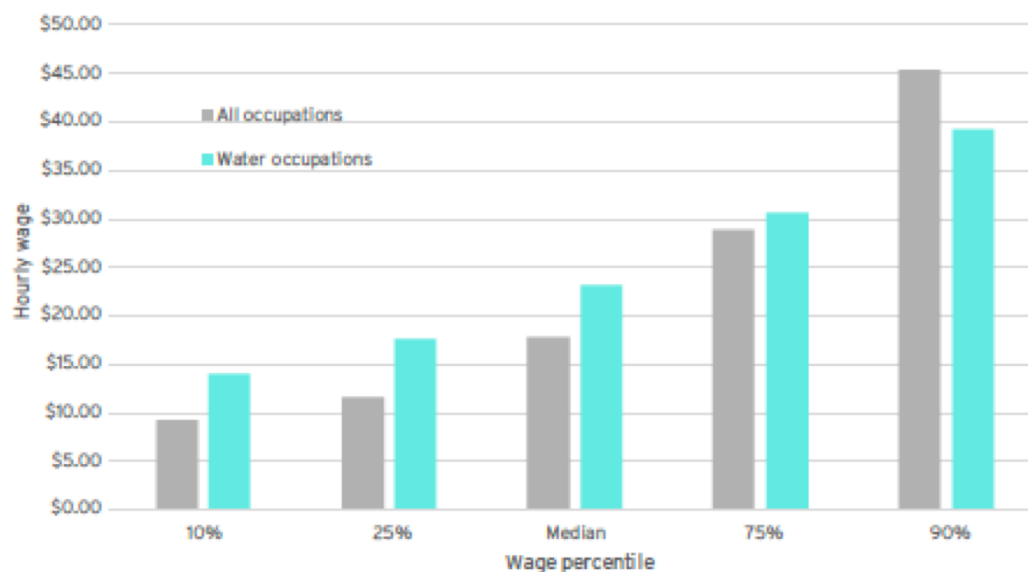
Source: Brookings analysis of BLS Occupational Employment Statistics

Note: Workers employed in water utility occupations represent a subset of all workers employed in the water sector. For example, 102,520 of the 115,840 water operators nationally are employed in water utilities.



**Water occupations not only tend to pay more on average compared to all occupations nationally, but also pay up to 50 percent more to workers at lower ends of the income scale.**

**U.S. hourly wage comparison: water occupations vs. all occupations  
2016**



Source: Brookings analysis of BLS Occupational Employment Statistics



**Water workers at lower ends of the income spectrum earn more competitive wages compared to all workers nationally.**

**Water workers earn hourly wages of \$14.01 and \$17.67 at the 10th and 25th percentiles, respectively, compared to \$9.27 and \$11.60 earned by all workers at these percentiles nationally.**

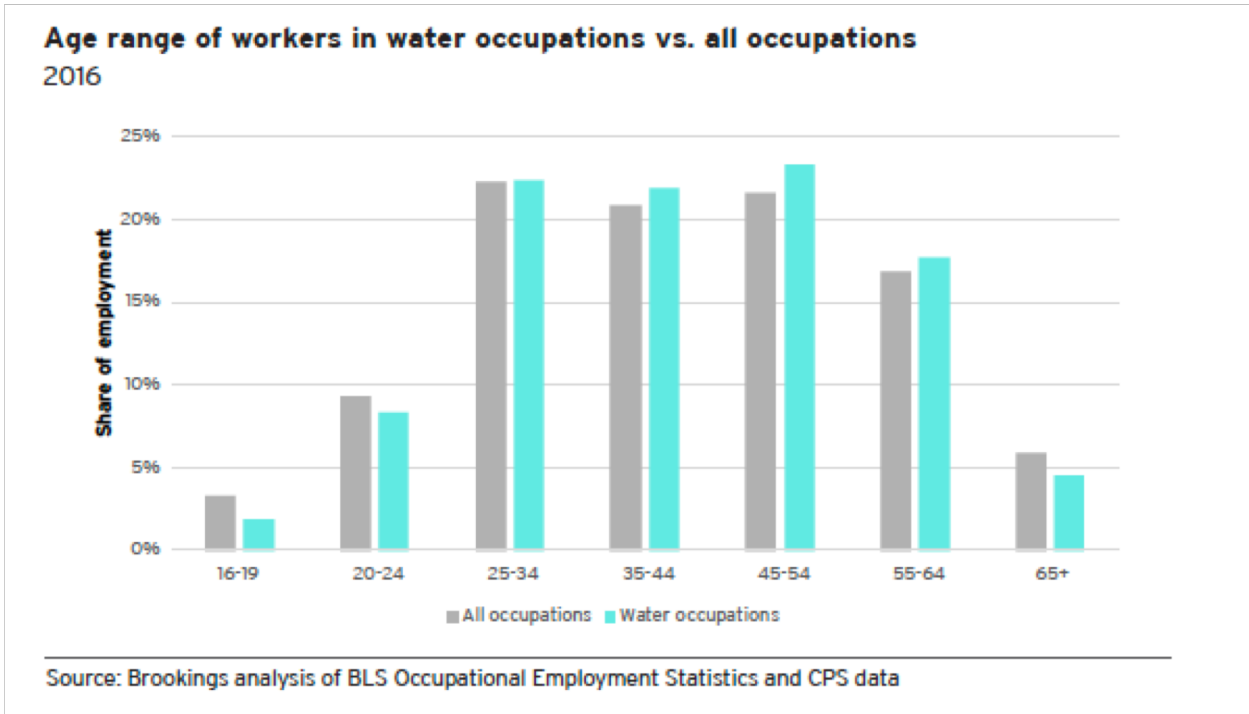
**Selected water occupations with higher wages at the 10th and 25th percentile**  
By educational attainment, 2016

Water occupation	Water employment	Percent with a high school diploma or less	10th percentile wage	25th percentile wage
Operating Engineers and Other Construction Equipment Operators	79,900	71.2%	\$14.29	\$17.19
Carpenters	19,449	68.5%	\$13.02	\$16.24
Pipelayers	33,810	63.0%	\$12.66	\$14.79
Sheet Metal Workers	22,084	62.8%	\$12.81	\$16.50
Septic Tank Servicers and Sewer Pipe Cleaners	26,320	61.4%	\$11.13	\$13.87
Industrial Machinery Mechanics	13,100	52.2%	\$15.52	\$19.10
Control and Valve Installers and Repairers, Except Mechanical Door	2,481	51.1%	\$14.99	\$19.01
Electricians	34,800	45.0%	\$15.29	\$19.02
Water and Wastewater Treatment Plant and System Operators	115,840	43.6%	\$13.25	\$16.96
Meter Readers, Utilities	17,780	42.9%	\$11.03	\$13.77
First-Line Supervisors of Mechanics, Installers, and Repairers	11,651	42.0%	\$18.49	\$23.74
<b>All U.S. Occupations</b>		<b>32.5%</b>	<b>\$9.27</b>	<b>\$11.60</b>

Source: Brookings analysis of BLS Occupational Employment Statistics and Employment Projections data



Water workers tend to be older and lack gender and racial diversity in certain occupations; in 2016, nearly 85 percent of them were male and two-thirds were white, pointing to a need for younger, more diverse talent.





**1. Utilities and other water employers need to empower staff, adjust existing procedures, and pilot new efforts in support of the water workforce**

**EMPLOYER-DRIVEN ACTIONS**

- ✓ Hire and train dedicated staff to meet with younger students, connect with more diverse prospective workers, and explore alternative recruitment strategies
- ✓ Create a new branding strategy to more effectively market the utility or organization to younger students and a broader pool of prospective workers
- ✓ Account for workforce needs as part of the budget and capital planning process, while creating more detailed and consistent labor metrics
- ✓ Update or create new job categories to provide greater flexibility for potential applicants
- ✓ Develop competency models—or customize existing models—to promote continued learning and skills development among staff
- ✓ Design and launch new bridge programs, including “water boot camps,” to provide ways for younger workers and other nontraditional workers to explore water careers and gain needed experience
- ✓ Implement a formalized mentorship program to provide interns and younger workers a clear point of contact and better monitor their career progression



## 2. A broad range of employers and community partners need to hold consistent dialogues, pool resources, and develop platforms focused on water workers

### REGIONAL ACTIONS

- ✓ Identify a common regional point person—or organization—to schedule and steward consistent meetings among a broad range of community partners
- ✓ Hold an annual water summit/meet-and-greet where prospective workers, employers, and community partners can connect with one another regionally
- ✓ Out of these dialogues, develop a comprehensive water workforce plan, highlighting regional training needs and avenues for additional collaboration
- ✓ Develop a more predictable, durable channel of funding to support these efforts, driven by public fees and private sector support
- ✓ Strengthen local hiring preferences in support of more minority and women business enterprises
- ✓ Create a new web platform to connect water workers and employers, serving as a simple, consolidated site for regional job postings
- ✓ Launch a new regional academy—designed and run by employers and community partners—in support of more portable infrastructure education, training, and credentials



### 3. National and state leaders need to provide clearer technical guidance, more robust programmatic support, and targeted investments in water workforce development

#### NATIONAL AND STATE ACTIONS

- ✓ Hire or assign specific program staff to serve as common points of contact across relevant federal agencies, with a focus on water workforce development
- ✓ Supported by federal agencies or other national organizations, conduct a series of dialogues and learning sessions in a broad range of markets to assess water workforce needs and priorities
- ✓ Develop a common landing page, or repository, that highlights regional best practices and other innovative water workforce development strategies
- ✓ At a national level, form a “water workforce council” among leading groups to serve as an advisory body, with an eye toward future priorities
- ✓ With guidance from employers, industry associations, and other stakeholders, establish more versatile and streamlined water certifications nationally
- ✓ Expand federal and state funding via existing workforce development programs and educational initiatives, including apprenticeships
- ✓ Expand federal and state funding via newly targeted and competitive grant programs, in support of alternative bridge programs and other innovative training programs

# Succession Planning





Employees  
are a Water  
Utility's  
Greatest  
Asset

# Human Capital Management



**Employees Leave.**

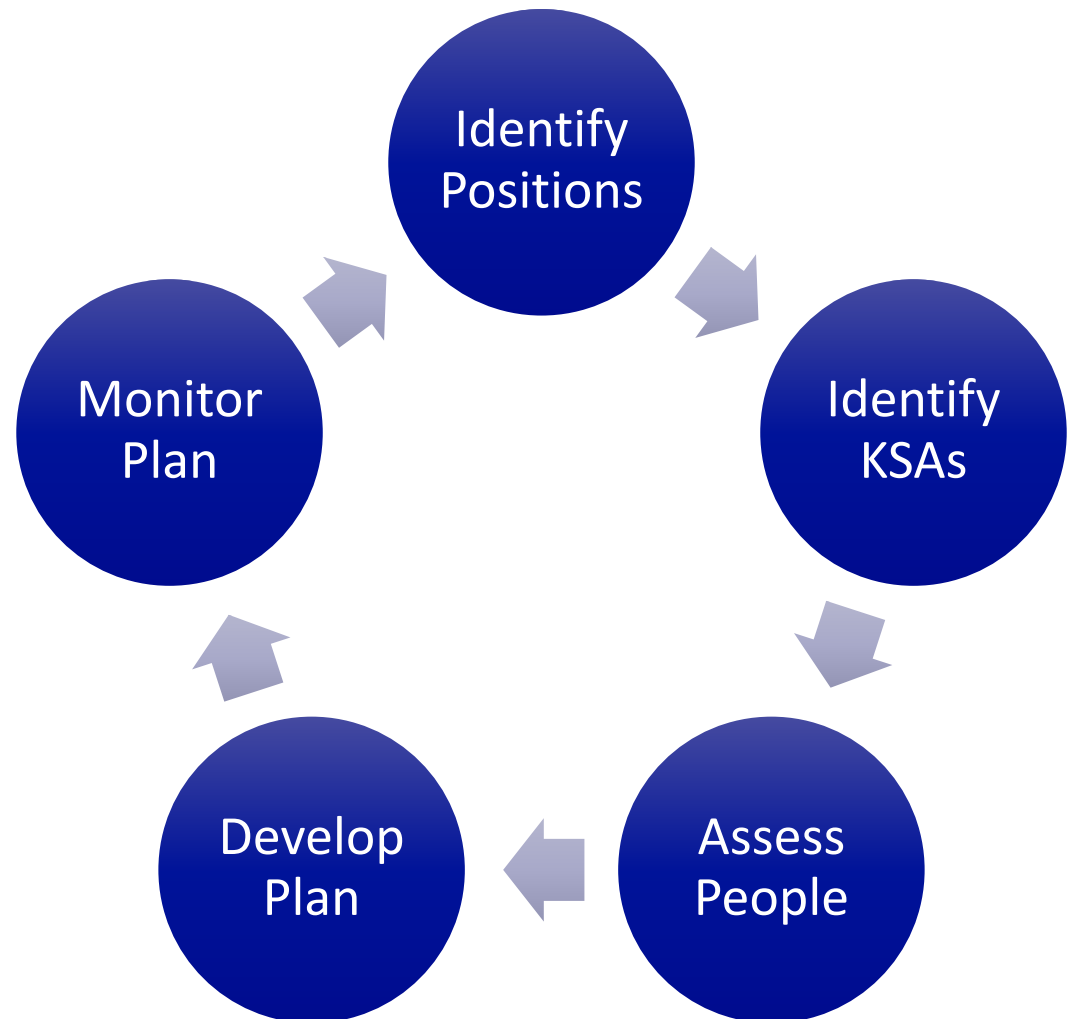
**They always do.**

Preparation for that day  
is Succession Planning



# Succession Plan

Systematic approach to **building replacement workers to ensure continuity**, by identifying potential successors in ***critical*** work processes





# Knowledge, Skills and Abilities Needed

## Technical Background

- Science, engineering, technology, and math (STEM)
- Ability to use computers and software programs as a tool

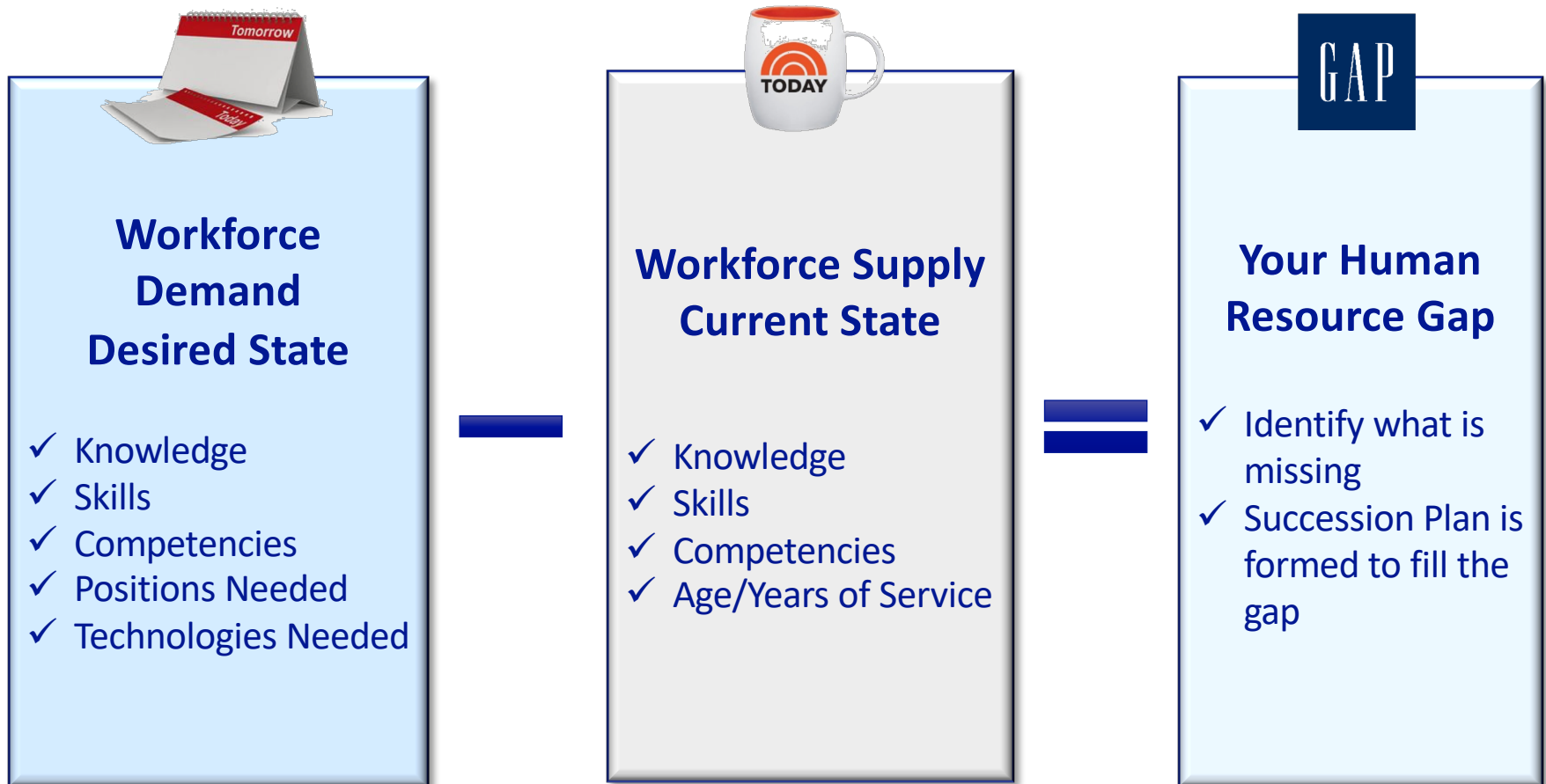
## Personal Characteristics

- Dedication and reliability
- Drive, ambition and initiative

## Soft Skills

- Critical thinking, problem solving and decision making
- Planning, organizing, directing and controlling

# Analyze Workforce Gaps

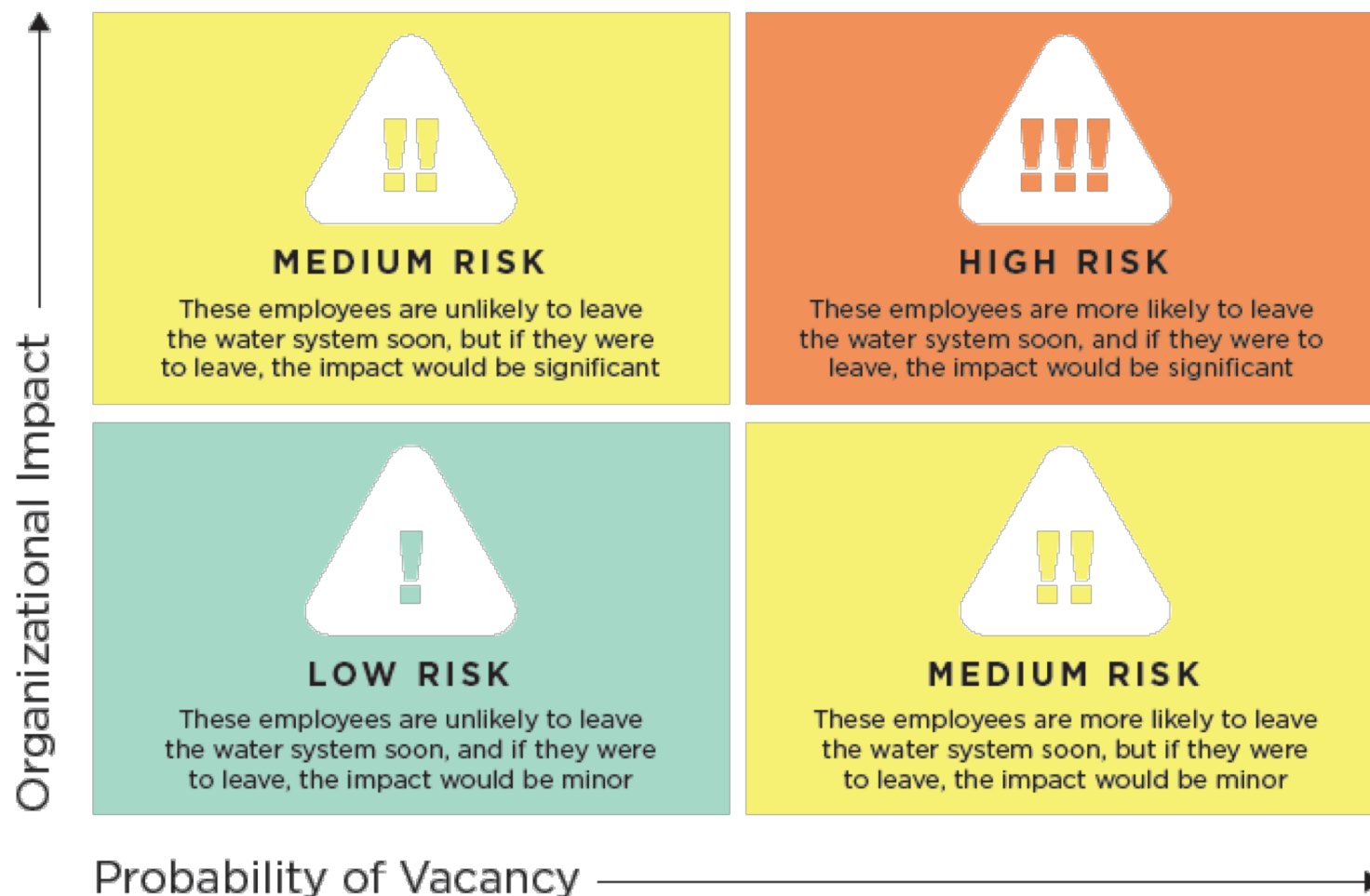


# Common Pitfalls

- Keeping it a secret
- Underestimating talent within
- Focusing exclusively on hard skills (value soft skills)
- Not offering training/development opportunities
- Expecting employees to self-identify; help them see what they can be
- Not holding managers accountable for succession planning
- Making promises
- Considering only upward succession. Lateral?
- One size fits all program
- Producing too many candidates for too few spots



# Human Capital Criticality



# Retooling & Reinvention

Are there alternative ways to get the work done?



# Knowledge Transfer

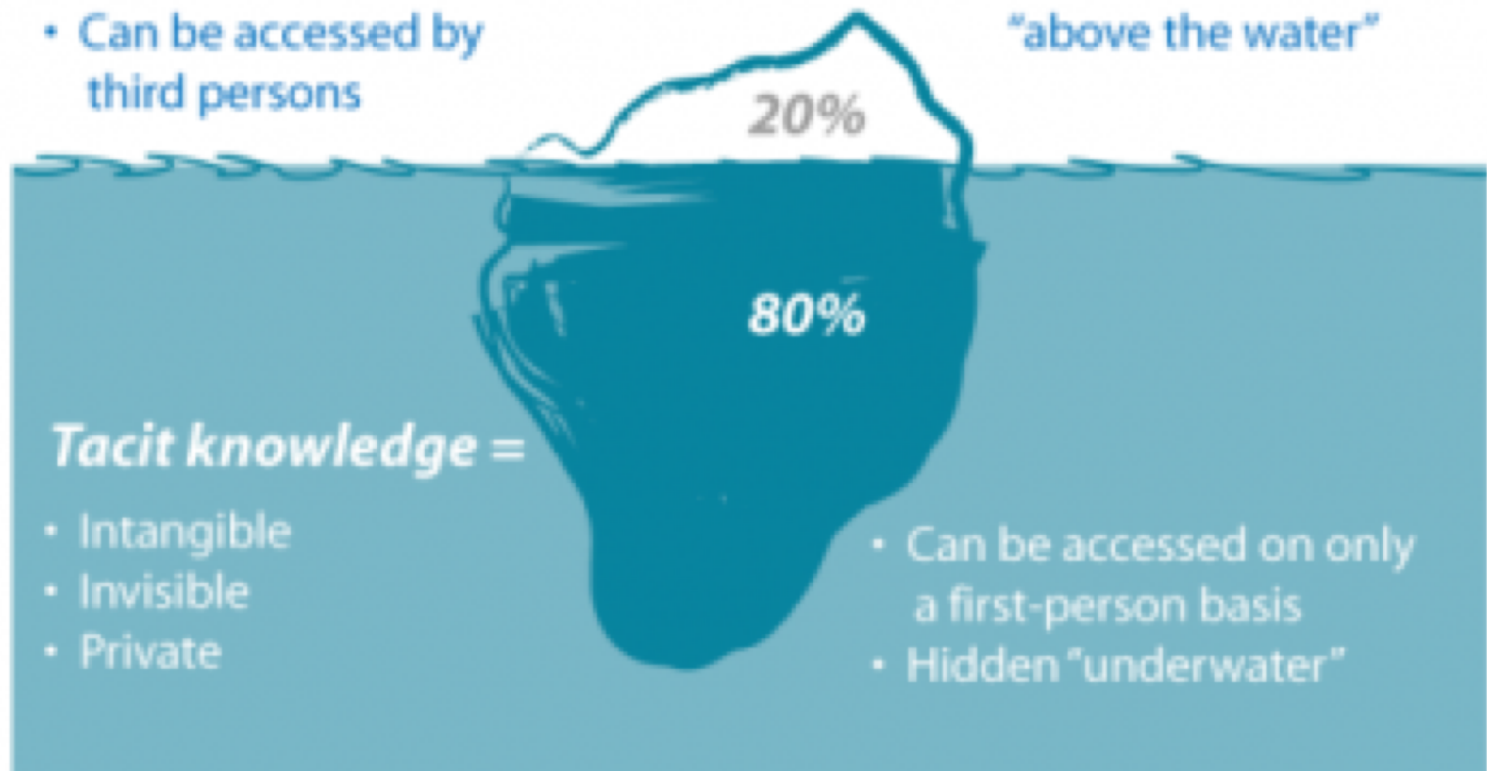


Keeping the “know-how” when you lose employees

# Types of Knowledge

## ***Explicit knowledge =***

- Tangible
- Visible
- Public
- Can be accessed by third persons
- Once shared, it belongs to everyone
- Can be seen "above the water"



## ***Tacit knowledge =***

- Intangible
- Invisible
- Private
- Can be accessed on only a first-person basis
- Hidden "underwater"

# Methods for Transferring

Overlapping positions

Desk manuals

Databases

Work teams

Project partners

Job shadowing

Mentoring

Outside resources



# Recruitment





# Messaging

*Tell the Working in Water Story*

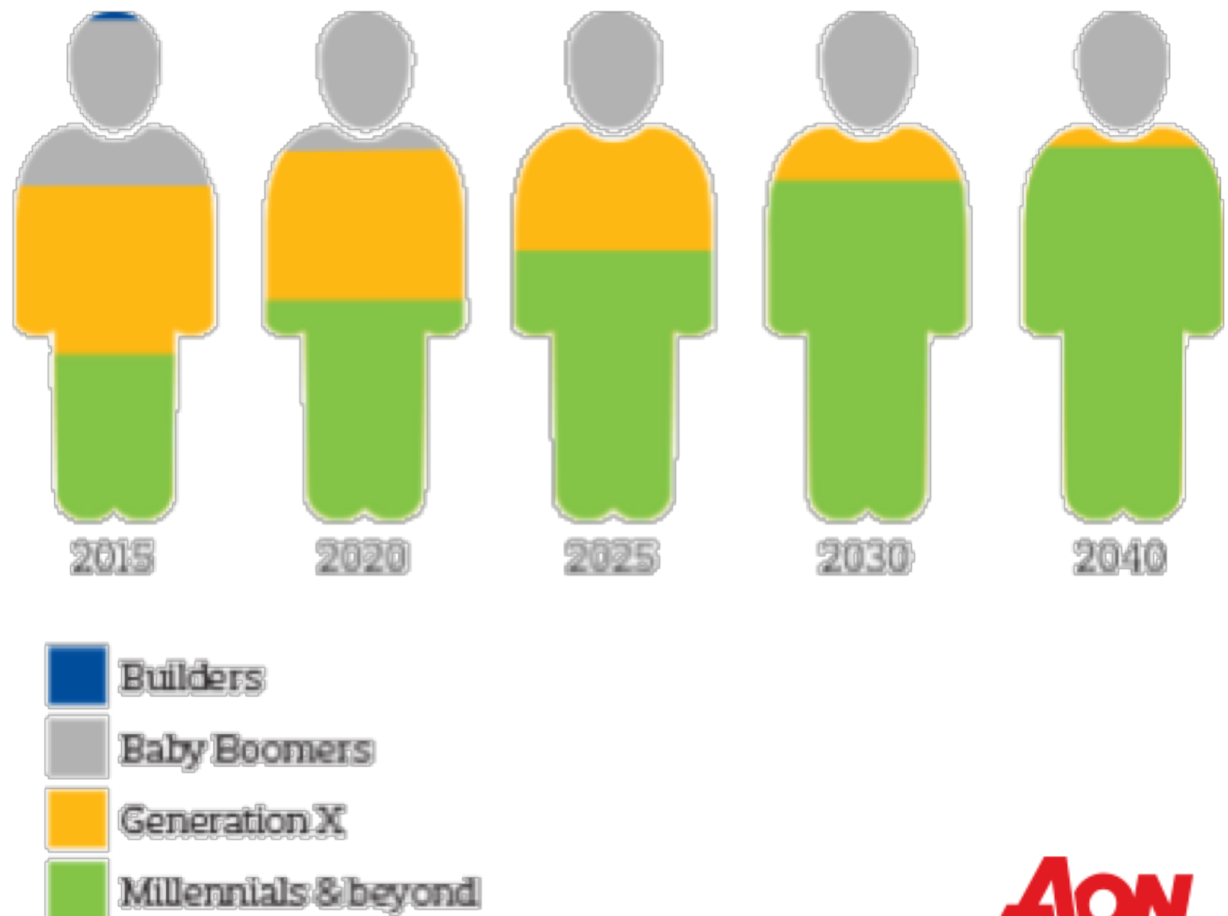


# Wastewater Treatment = Resource Recovery



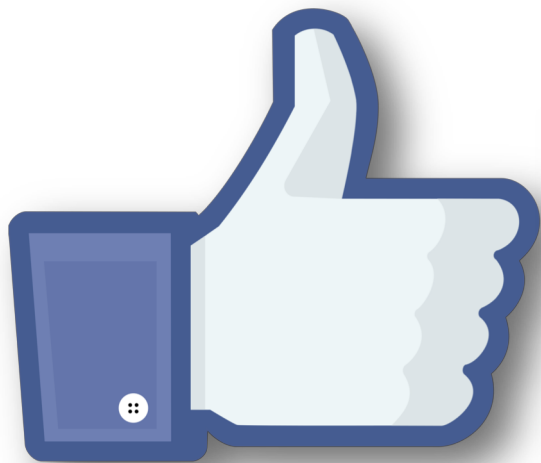
# Who is Working with Us?

Millennials and beyond will make up to 75% of the global workforce by 2025





# Attract Millennials with ...



Positive  
Feedback



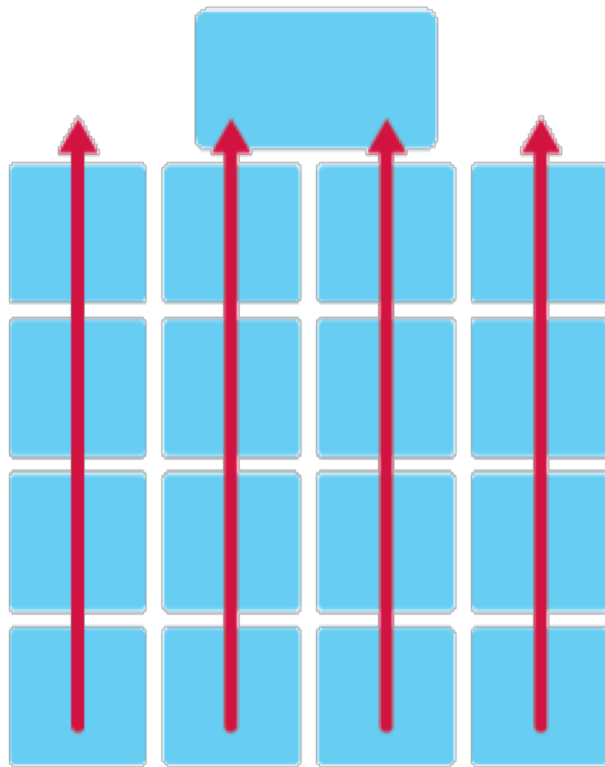
Work-Life  
Integration



Dedicated to  
Larger Purpose

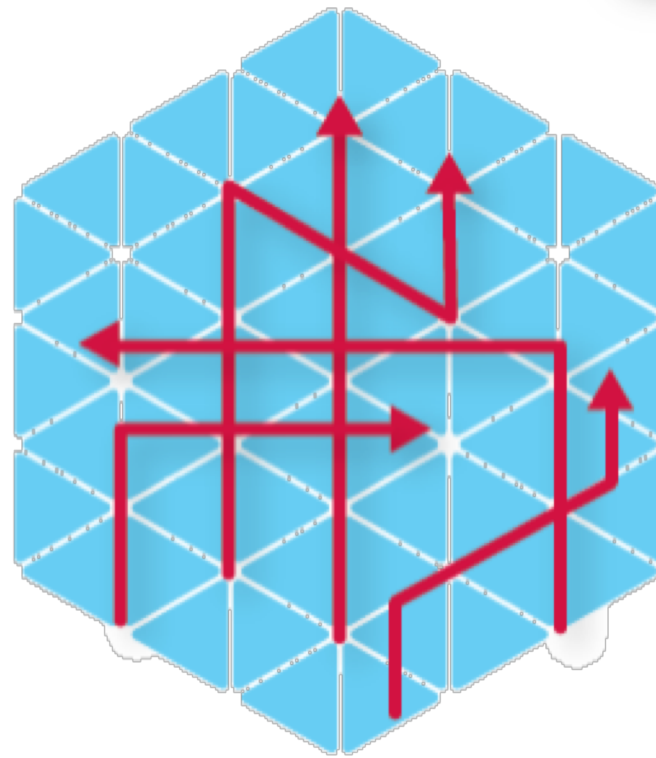
# Career Pathways

Ladder progression



Examples of linear career paths

Lattice pathways



Examples of more varied paths for growth and development

**BIG  
PICTURE**





84% of Millennials believe *helping to make a positive difference* in the world is more important than professional recognition.

We want to *believe in the mission*, believe our efforts are *going towards something bigger* than just our paycheck.

Financial reward is somewhat of a commodity, an *undervalued* one at that.



# Creating Interest in Water Careers

*Share the Benefits of Working in the Water Industry*



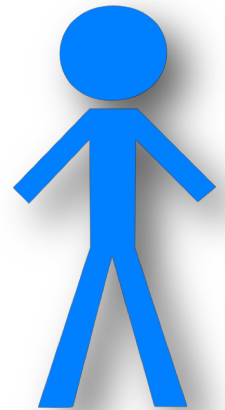
Environmental  
Stewardship



High-Tech Nature



Public Service



Personal Benefits



# Benefits of Working in Water Industry

## Environmental Stewardship



### We Are Committed to Sustainable Business Practices

The Middlesex Water family of companies is committed to the support of sustainable business practices that reflect responsible water and wastewater management. As a provider of water and wastewater services, we look to continuously improve our environmental performance through economically sound, ecologically sensitive, and technologically practical processes.



***70% of the Earth is water. From seas to lakes, to rivers and creeks, water is everywhere. Valuing water means valuing our future.***

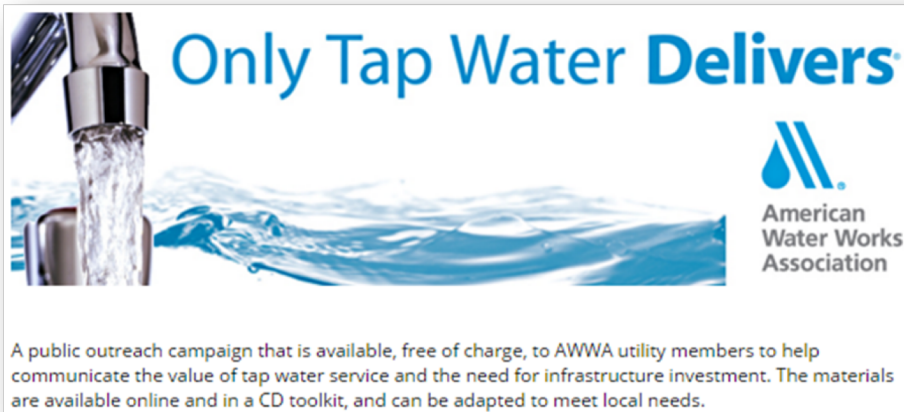
**– Value of Water Coalition**

# Benefits of Working in Water Industry


## Public Service



- ✓ **22,284** the number of gallons of water used per day by schools based on an evaluation done of schools in the Tampa Bay region
- ✓ **2,000,000** the number of gallons of water user per day the San Antonio Zoo uses to care for animals
- ✓ **300,000,000** the number of gallons the National Hockey League Uses per season – it takes 12,500 gallons to make ice for each rink
- ✓ **61%** of Americans rely on lakes, rivers and streams as their source of drinking water. The other 39% rely on groundwater located underground in aquifers and wells



**Only Tap Water Delivers**



American Water Works Association

A public outreach campaign that is available, free of charge, to AWWA utility members to help communicate the value of tap water service and the need for infrastructure investment. The materials are available online and in a CD toolkit, and can be adapted to meet local needs.

***Water connects us. Water is a ride on a boat. Water is a sprinkler, making children laugh with joy. Water brings families and friends together in countless ways.***  
***– Value of Water Coalition***

# Benefits of Working in Water Industry

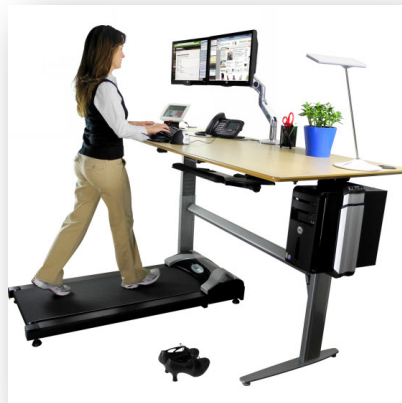
## High Tech



Up-to-Date Tools



Advance Systems



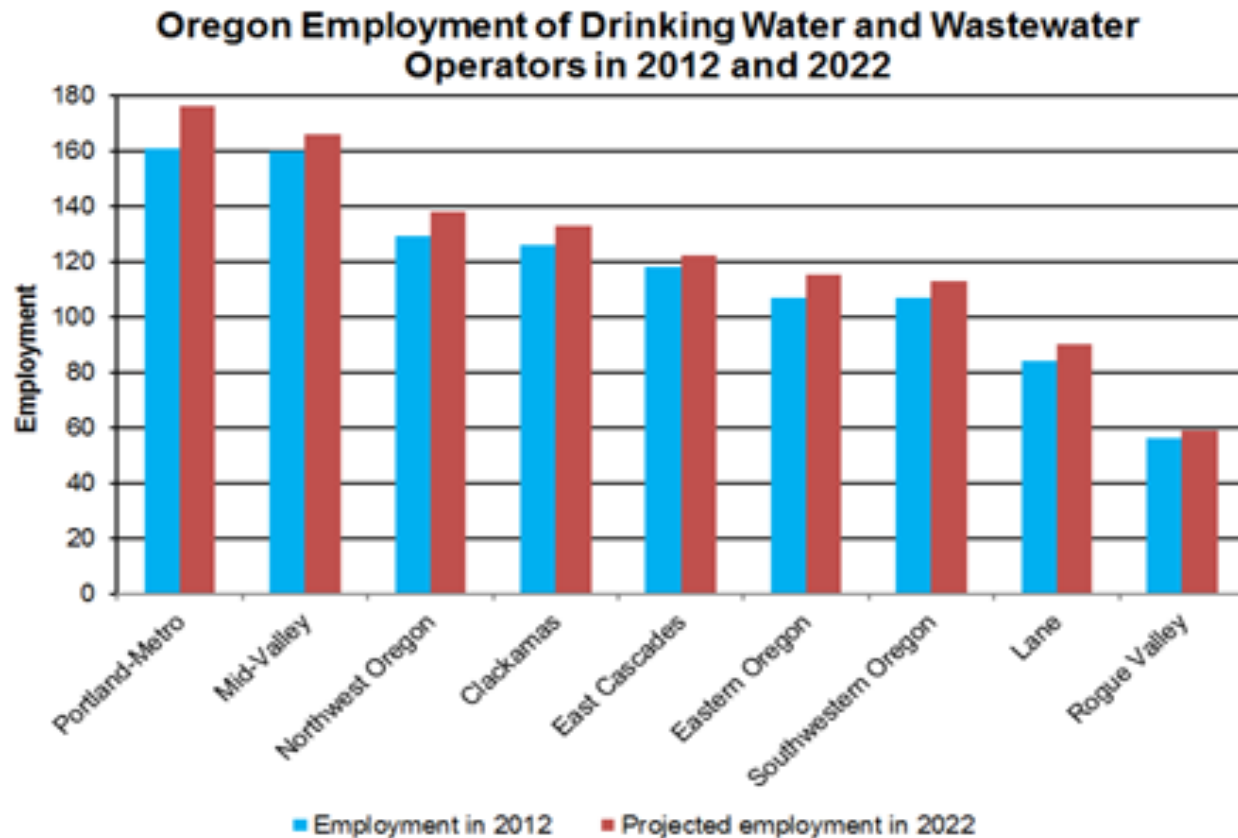
Up-to-Date Workspaces



Cutting Edge / Unique

# Benefits of Working in Water Industry

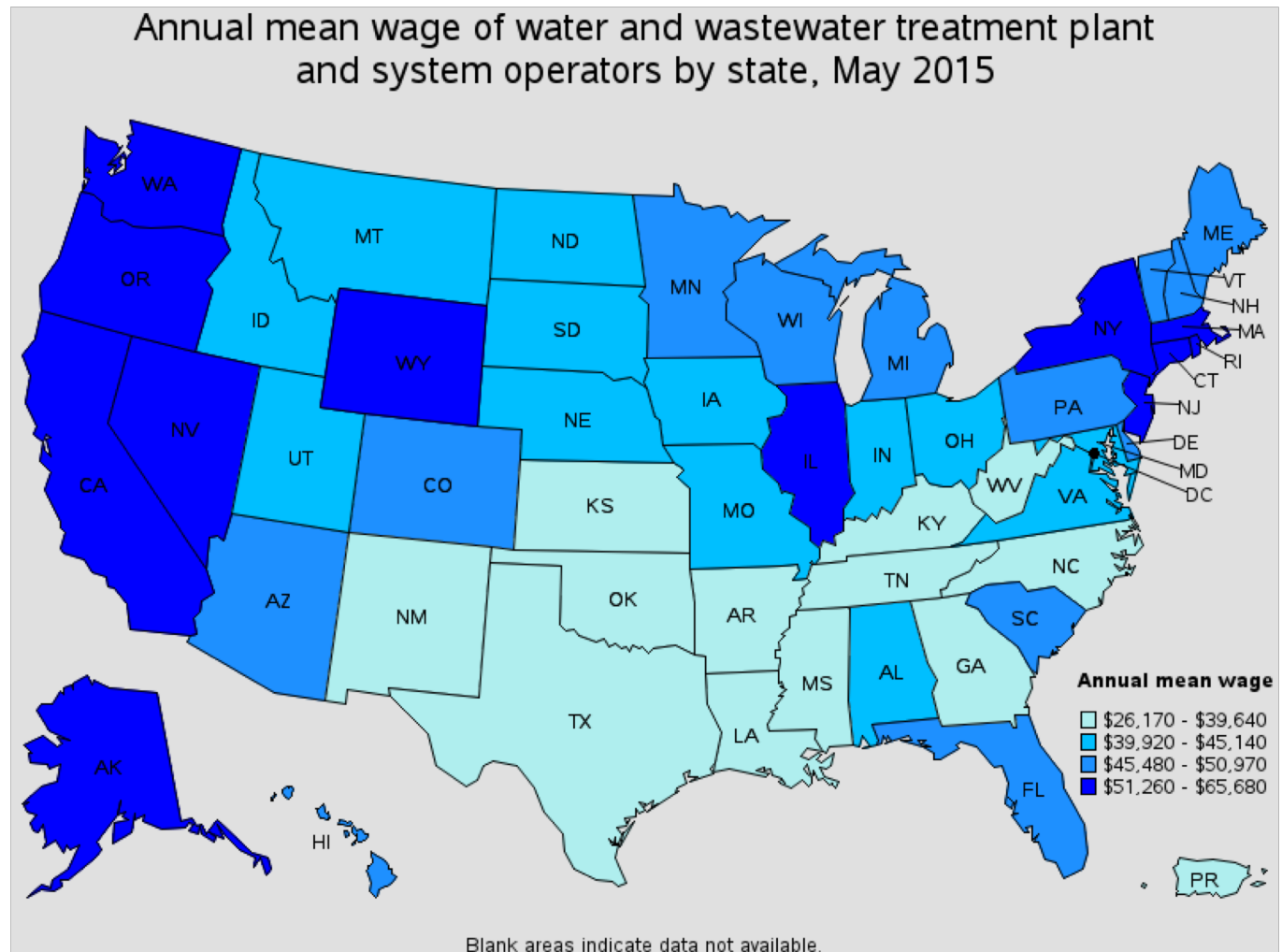
Stable  
Employment



State of Oregon Employment Department

# Benefits of Working in Water Industry

Good  
Salary



# Benefits of Working in Water Industry

## Professional Development & Paid Training



### ELEARNING PROGRAM

Welcome to AWWA's eLearning program, offering **self-paced** and **in** industry professionals. We offer quality training and **professional development education units (CEUs)** with the ability to learn on your own time and

Explore a variety of subjects, methods, and strategies with an **eLearning Bundle**. Available for individuals and organizations!

**AWWA members receive discounted pricing on Distance Learning about [membership](#).**

### FEATURED COURSES

NEW! Total Water Solutions Courses

- EL206 - Why Are Water Service Lines Important
- EL207 - Residential Meters
- EL208 - Fire Hydrant Basics for Pressurized Water Systems

### Earn CE Credits!

Spring Water Treatment Operator Courses:

Level 3 | April 25 - May 27

Spring High -Tech Operator Courses:

Level 2 | April 18 - May 7  
Level 1

2016-2017  
**ASSET MANAGEMENT  
WORKSHOP  
FOR UTILITIES**

**A.M. KAN WORK!**





# Benefits of Working in Water Industry

Professional  
Organizations





# Benefits of Working in Water Industry

## Advancement Opportunities





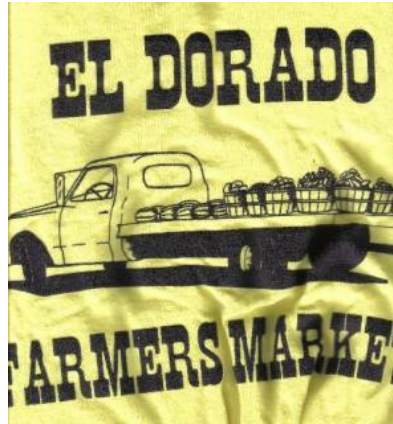
# Benefits of Working in Water Industry

## Union Representation



# Benefits of Working in Water Industry

## Local Connections



# Recruitment

- How effective are your current practices?
- What changes will you have to make to recruit the talent you need?
- What can you do in the short-term?
- Long-term?



# Recruiting the Next Generation

You might need

- Technology
- Flexibility
- Marketing
- Compensation
- Rethinking retention





# Outreach Opportunities

*Where to Look for Current & Future Talent*



# K-12 Outreach

- In-school educational programming
- Field trips
- Camps
- Internship/employment program for high school students
- Career fairs/days
- Industry career pathways



High school internship  
(King County, WA)



Kid's Camp  
(City of Fresno Water  
Division)



In school programming  
(Jacksonville Electric  
Authority)



# Post-Secondary Outreach

- Post-secondary internship programs (technical schools, community colleges, universities)
- Visit classrooms or give tours
- Career fairs/days



*Inland Empire Utilities Agency*

A MUNICIPAL WATER DISTRICT

## INTERN PROGRAM

Inland Empire Utilities Agency provides college students (undergraduate or graduate level) or an individual who has graduated from an accredited college or university the opportunity to explore a wide range of career paths within a regional wastewater treatment agency. Interns are assigned to an Agency department for a specific period of time to learn the administration and operation of the Agency. Assignments may include general administrative duties as well as working on special projects.

# Professional/Mid-Career Outreach

- Employee referral program
- Open house
- 'Citizens Academy' – showcase potential municipal careers



Every individual has a network.  
Every network has a sea of prospects.



**CITY OF RICHMOND**

DEPARTMENT OF PUBLIC UTILITIES



## **What Is The Citizens' Academy?**

The City of Richmond Department of Public Utilities (DPU) Citizens' Academy is a four-week program that provides Richmond citizens an inside look at the operations of DPU. Participants will be introduced to the five utilities DPU operates: natural gas, water, wastewater, stormwater, and electric streetlighting. Tours of various DPU facilities and demonstrations of equipment will be conducted. This program will provide citizens an opportunity to ask questions about the department's operations.

# Veteran Outreach



- Federal and State funding & career placement services
- Partner with Veterans Upward Bound at local universities (if applicable)



# Employing Veterans: Programs & Funding



U.S. Department  
of Veterans Affairs

## On-The-Job Training & Apprenticeship Program

### *Recruiting Tool*

Employers can combine MHA from Post-9/11 GI Bill plus wages to attract Veteran candidates.

Training Period	Stipend Received
First 6 months of training	110% of the applicable Monthly Housing Allowance (MHA)
Second 6 months of training	80% of the applicable MHA
Every 6 months after year 1	Reduced by 20%

# Employing Veterans: Programs & Funding



U.S. Department  
of Veterans Affairs

Vocational Rehabilitation & Employment  
On-The-Job Training & Apprenticeships

## Employers who hire using this program receive:

Reimburse  
ment of up  
to 50% of  
the  
Veteran's  
salary

VA  
provided  
tools,  
equipment,  
uniforms  
and other  
supplies

Supplies  
and  
equipment  
necessary  
to complete  
training

Appropriate  
accommod  
ations  
based on  
individual  
needs of  
the Veteran

VA support  
during  
training and  
placement



# Develop & Update Job Descriptions

*Communicate knowledge, skills and abilities that align with industry re-branding*



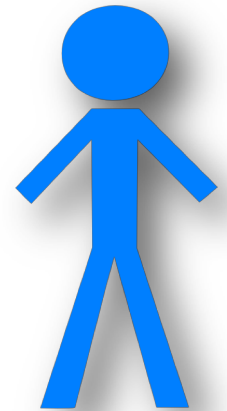
Environmental  
Stewardship



High-Tech Nature



Public Service



Personal Benefits

# Job Description with a Message

## **PURPOSE OF THE POSITION**

(The main reason for the position, in what context and what is the overall end result)

The Water Treatment Plant Operator is responsible for of the water plant in order to ensure that residents have safe and clean water in accordance with federal, territorial and municipal legislation, policies and standards.

## **SCOPE**

(The way that the position contributes to and impacts on the organization)

Reporting to the Public Works Foreman, the Water Treatment Plant Operator maintains the water plant. This includes maintaining the water and sewer treatment plant and facilities.

The delivery of safe and clean water is vital to the safety and health of the community. Failure to provide adequate services will jeopardize the health of the community. Failure to meet federal, territorial and municipal legislation and water quality standards will significantly jeopardize the health and well-being of residents and may result in liability for the municipality. Failure to deal with residents and the public in a courteous and respectful manner will lead to complaints concerning municipal services.

## **RESPONSIBILITIES**

(Major responsibilities and target accomplishments expected of the position including the typical problems encountered in carrying out the responsibilities.)

1. Maintain the water treatment plant systems in order to ensure the availability of a clean community water supply

### Main Activities

- Maintain the treatment plant systems
- Maintain and operate the filtering and chemical treatment processes
- Inspect, service and repair components of the water treatment plant including water

Job Description for  
a Water Treatment  
Plant Operator

Northwest  
Territories –  
Municipal and  
Community Affairs

# Evaluate to Retain



# Evaluation Basics

- Review performance continually
- Consult others on performance
- Inform employees of assessment process
- Set goals in advance
- Set challenging & SMART goals
- Let employee help set goals
- Align goals with organizational objectives
- Keep an open mind about employee's future goals





# Evaluation

Set the bar appropriately and retain the best workers.

**When evaluating new hires, municipalities should consider the following:**

- Transparency; so new employees know what is expected of them
- Providing standard rubrics for common titles to help evaluators
- Assessing each new hire's future potential (not just that they meet the minimum for their current position)

**Evaluation Process At-a-Glance:**

- Staff self-evaluation
- Supervisor reviews, does own evaluation
- Meet to discuss and set goals for future. Agree, sign, file
- 360 review
- Peer-to-peer reviews (best to be informal)



# Sample Evaluation Questions

## **Use as many open-ended questions as possible**

- What accomplishment(s) are you most proud of?
- In which area(s) would you like to improve?
- What have I done to help you do your job better?  
What have I done to hinder your job performance?
- Do you have the resources and tools you need to perform your job?
- What are your goals for the next six months/year?
- What do you want your next position at this utility?
- Are there any other concerns you have going forward?

# Use the Evaluation Form and Meeting to Set Goals for Future

- Pass my 3A certification within 1 year
- Learn more about plant management
  - *SMART Goal*– spend 3 afternoons each month shadowing the plant manager for 1 yr
- Attend trainings and/or webinars to increase my knowledge base
- Increase my communications with peers and management



"I like you, Thompson. You're smart, a hard worker, and you're full of potassium."

Learning Objective	Methods and Strategies to meet the Objective	Resources Needed to Achieve Objective – Information, Money, Training, Equipment and/or Time	Deadline or Benchmark Dates	How will success of each learning objective be measured?	Verified? Yes ( ) No ( )
I want to learn more about interacting with elected officials and how decisions are made.	I will attend meetings with Department Head and BOS members including individual meetings, work sessions and BOS meetings. I will meet with the Department Head afterward to assess, evaluate and discuss the meetings.	Time to attend meetings.  Time with Department Head for review and discussion.	4 months. Goal is to attend 4 individual meetings with BOS members.	Department Head will discuss content, answer questions and evaluate each meeting with me.  I will conduct one individual meeting with a BOS member that the Department Head will observe.	
I want to learn more about the budget process including preparation, presentation and justification.	I will work with an experienced Budget Analyst.  I will attend budget training workshops	Time to attend budget class  Time to attend budget meetings	6 months to go through entire budget cycle including department preparation, budget review and BOS approval	I will meet with Department Head after budget cycle to discuss and evaluate.  Next year, I will make department budget presentation at department staff meeting.	
I want to learn to conduct public meetings and make effective presentations.	I will take over public meeting facilitator role from Department Head. I will need to take a PowerPoint class.	<ul style="list-style-type: none"><li>• PowerPoint class</li><li>• Time to take classes</li><li>• Money for classes if not offered by HR</li><li>• Time to meet with Department Head to do run-through of PowerPoint presentation</li></ul>	Three (3) months to complete classes. Six (6) months to complete objective.	Department Head will observe me conducting the meeting and will assess how well I prepared for the meeting by seeing how I handle questions from the audience, and by getting feedback from audience members.	

# Compensation

## Going beyond the \$\$\$

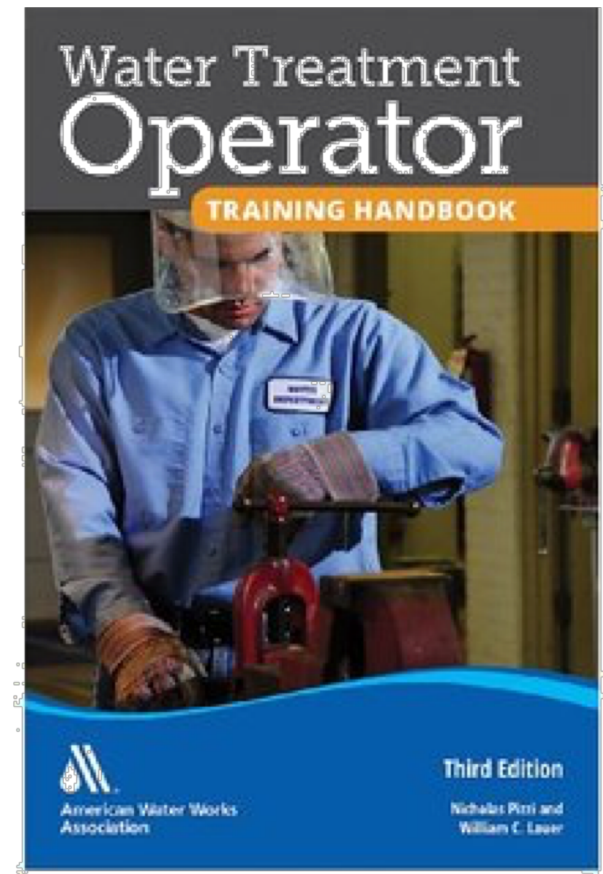
- Flexible schedule
- Compressed work week
- Telecommute
- Time off for volunteering
- Reimbursement for tuition or training
- Provide support for gym membership, clothing allowance, child care, etc
- Bonus time off



# Training

Employees require tremendous investment and reinvestment

- In-house training – site specific knowledge
- Funding recertification training
- Incentivize training
- Offer training modules for non-operator positions
- Send to conferences to network



“People worry about paying to train staff who then leave...

...But what happens if we don't pay to train them and they stay?”

# Mentoring and Coaching

**DILBERT**

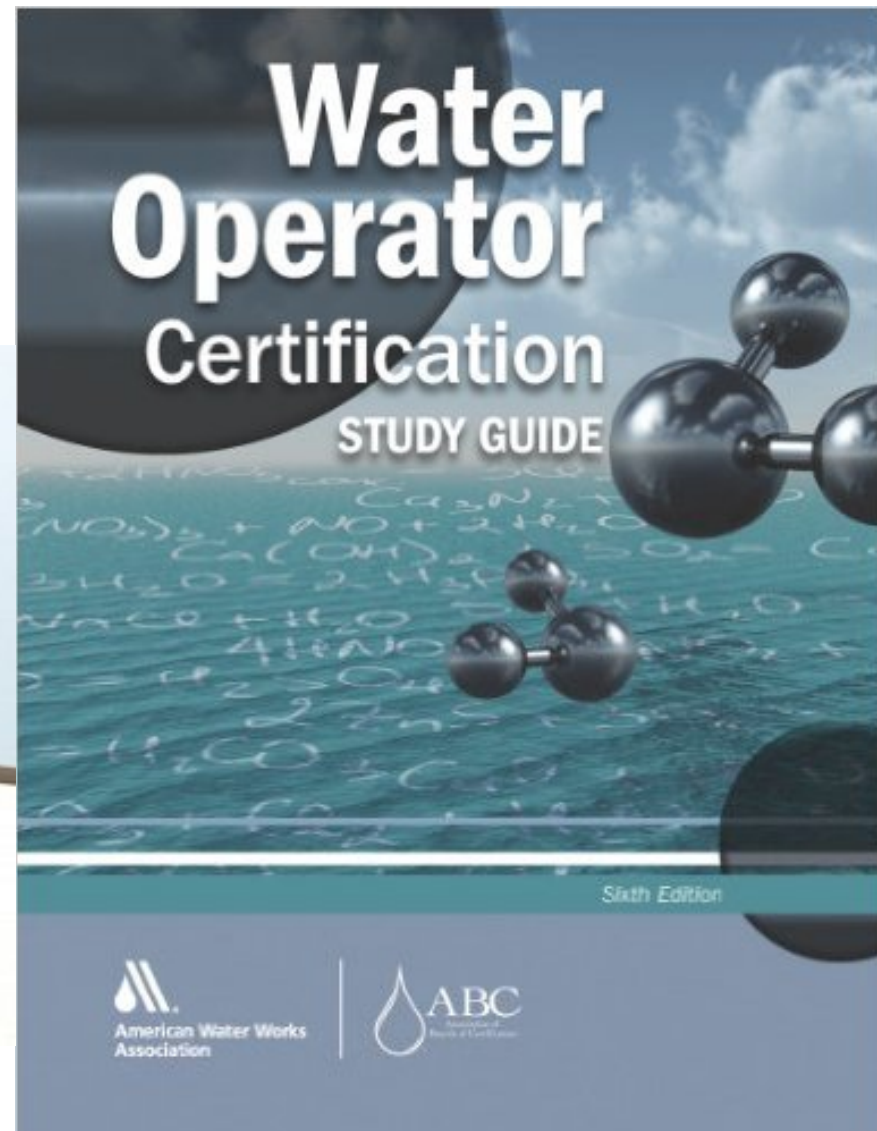
**BY SCOTT ADAMS**



# Leadership Training



# Licensing & Recertification



# Retention

Recruitment

Compensation and Salary

Evaluation

Training

**Continual Employee Focus**



Assess your work environment



# Recognition

“Recognition is proven as among the best method of improving work motivation and employee engagement.”



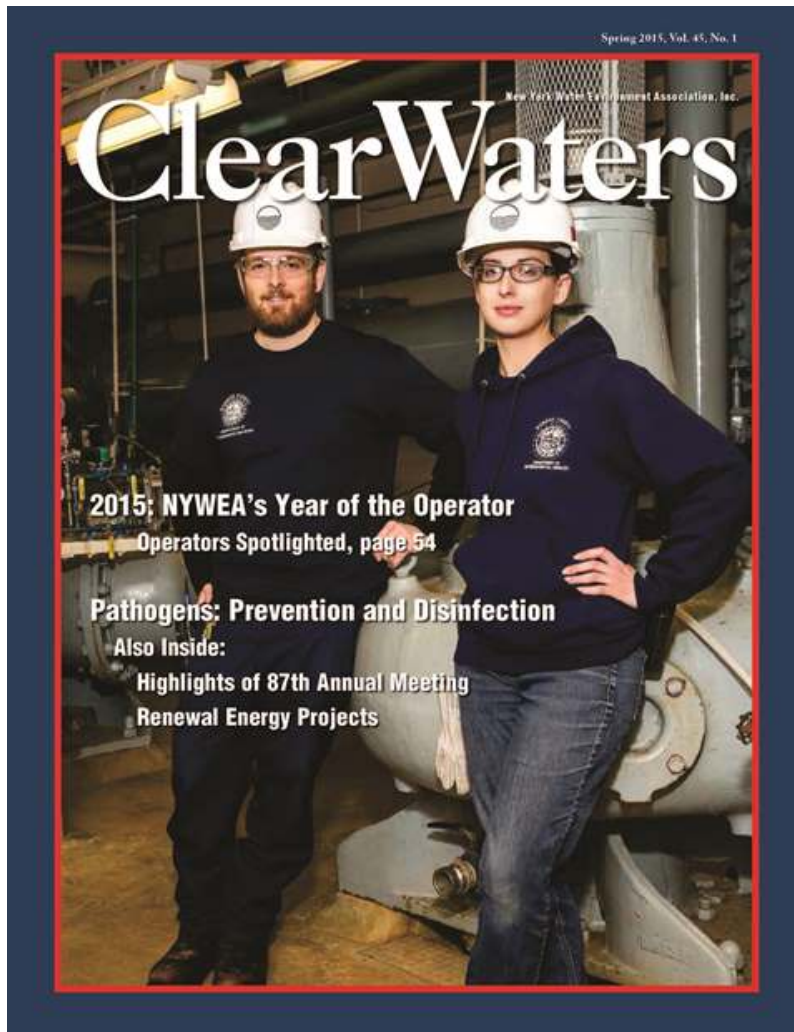
1 minute spent on recognising behaviour  
= 100 minutes of initiative in return.



Yet 2 out of 3 people receive no workplace recognition in a given year.



# Recognition



# Recognize and reward employees...and those pursuing certifications





**Ops Challenges:**  
Networking, skill-  
building, training and  
recognition

# Positive Workplace Relationships

- Birthday recognition...
- Occasional “Happy Hour”
- Evening/weekend family BBQs
- Christmas Party



If you are lucky enough  
to be someone's employer,  
then you have a moral  
obligation to make sure  
people do look forward to  
coming to work in the  
morning.

John Mackey  
Whole Foods CEO

*WSU EFC Office Christmas Party 2016*



Smart Management for  
Small Water Systems

**Thank you for participating today, and we  
hope to see you at a future workshop!**

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American Water Works  
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