

Training as Infrastructure

The Workforce ROI Case for Water and Wastewater

How structured operator training, certification, and professional development convert workforce risk into competitive advantage — across utilities, contractors, and the communities they serve.

Slater Infrastructure Group, LLC

Infrastructure services for the water sector

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Moving training from a cost to an investment lifts compliance, reduces unplanned downtime, protects public health, lowers injuries, expands the labor pool — and ultimately, raises the floor for the entire water sector.

Water and wastewater utilities and the contractors who serve them face a unique confluence of pressures. The workforce is older than the U.S. average, regulations are tightening on multiple fronts at once, and physical assets are aging faster than they can be replaced. At the same time, the public expectation has never been higher: clean water out of every tap, treated effluent that meets permit, every day, with no excuses.

That collision is happening now. According to the U.S. Environmental Protection Agency, roughly one-third of the U.S. drinking water and wastewater workforce is eligible to retire within the next decade.¹ The Bureau of Labor Statistics reports 132,400 water and wastewater treatment plant operators in 2024, with about 10,700 annual openings driven almost entirely by replacement need.² Meanwhile, ASCE's 2025 Infrastructure Report Card gave U.S. drinking water a C- and wastewater a D+, citing workforce loss alongside aging pipes as the dominant constraints.³

In that environment, every utility and contractor faces the same question: do you treat workforce training as a discretionary cost to be deferred when budgets tighten, or as a strategic investment in operational resilience, regulatory standing, and growth?

“Our work moves water. People move our work. When we invest in operator and other water professional training, we are not just developing employees — we are protecting the public health mission of every utility we serve and reducing risk for every client who trusts us on a job site.”

—Jeanne Simkins Hollis, CEO, Slater Infrastructure Group

This paper lays out six measurable ways structured training delivers return on investment in the water and wastewater sector — and what it takes to move from informal, on-the-job learning to a system that compounds value year over year.

The pressure water and wastewater operators face right now

Today's water sector contractors and utilities operate under intensifying pressure from a stack of simultaneous forces:

- **A “Silver Tsunami” workforce** — roughly one-third of the U.S. water workforce is eligible to retire in the next decade, with a median worker age of 48 and only 10% of the workforce under age 24.¹
- **New and evolving regulation** — the Lead and Copper Rule Improvements (LCRI), PFAS National Primary Drinking Water Regulation (NPDWR), and AWIA Risk and Resilience Assessment requirements all carry hard deadlines and material penalty exposure.^{4–6}
- **Aging infrastructure** — nearly 20% of U.S. water mains have exceeded useful life, and the average pipe age has climbed to roughly 78 years.³
- **A widening investment gap** — ASCE estimates a \$99 billion combined annual water/wastewater/stormwater infrastructure gap in 2024, growing rapidly.⁷
- **Rising public-health and accountability stakes** — a single compliance failure can trigger boil-water advisories, consent decrees, and political consequences that reach far beyond the plant fence line.

Despite this, many organizations still rely on informal, on-the-job training — a tap on the shoulder, a quick walk-through with whoever happens to be on shift, a binder no one has opened in years. Decisions about who trains, on what, and to what standard get deferred until something breaks. The result is a system that produces just enough capability to get through this week's work but never compounds into real organizational capacity.

Structured training is the opposite. It defines clear competencies, ties learning to certification, builds in assessment, and aligns to business KPIs — compliance, productivity, safety, retention, and customer satisfaction. It is the difference between a workforce that survives the next retirement wave and one that is ready for it.

“Securing the future water workforce is job number one. We can't deliver safe, reliable water and protect the environment without a trained and committed water workforce.”

— David LaFrance, CEO, American Water Works Association⁸

6 Ways Formal Training Delivers ROI

Six measurable ways standardized water and wastewater workforce training delivers return on investment — and how leaders can move from a mentality of training as a cost to training as a competitive advantage.

1. Expanded labor pool.

Structured training expands the available labor pool by accelerating onboarding and shortening the path from new hire to fully certified operator. That matters more in the water sector than almost anywhere else, because the licensing structure is non-negotiable: nearly every state requires operators of community water and wastewater systems to hold a graded license (typically Grade I through IV), with experience requirements that range from about a year for entry-level grades to four or more years for the highest grades.

The BLS classifies water and wastewater treatment plant operators as requiring “long-term on-the-job training,” meaning more than 12 months of combined experience and instruction.² Without a structured program, that 12-month clock starts over every time a new hire walks in. With one, candidates progress on a defined timeline, with measurable milestones, against a curriculum mapped to state licensing exams and current technologies.

“A new hire with a structured certification pathway in front of them is a fundamentally different proposition than a new hire we hope will pick it up. The first one is a future Grade III operator. The second one is a turnover statistic.”

—Jeanne Simkins Hollis, CEO, Slater Infrastructure Group

Formal training also expands the labor pool by widening the front door. Texas, for example, passed legislation in 2023 allowing qualifying high school students to earn provisional water or wastewater operator licenses while still in school — a model designed specifically to give utilities and contractors access to candidates who would otherwise never enter the pipeline.⁹ Programs like EPA’s Innovative Water Infrastructure Workforce Development Program (\$20 million awarded across 13 organizations in 2024) exist for exactly this reason: the sector cannot recruit its way out of the silver tsunami without rebuilding the on-ramp.¹⁰

For employers, the practical consequence is straightforward. A contractor or utility known for its training reputation gets first look at the candidates the rest of the market is fighting over. That reputation is built slowly, with structure, and it pays dividends every recruiting cycle that follows.

2. Reduced compliance failures and regulatory exposure.

In construction, the analog metric is rework. In water, it is the compliance failure — the boil-water advisory, the permit exceedance, the missed monitoring deadline, the consent decree. The financial and reputational consequences of these events have grown sharply, and they are almost always traceable back to gaps in operator knowledge, procedural consistency, or both.

The scale of the exposure is substantial. EPA data shows that approximately 4% of U.S. public water systems reported health-based Safe Drinking Water Act violations in 2022.¹¹ More striking, more than 70% of water systems inspected by EPA since September 2023 were found to be in violation of the America's Water Infrastructure Act (AWIA) Risk and Resilience Assessment requirements — a compliance category that demands documented operator engagement.¹² Federal civil penalties under SDWA and CWA are adjusted annually for inflation; the maximum per-day, per-violation civil penalty under the Clean Water Act is currently in the tens of thousands of dollars per day, and SDWA penalties adjust similarly.¹³

“The most effective way of providing high quality drinking water and protecting public health is to have public water systems operated by certified operators.”

— U.S. Environmental Protection Agency, Drinking Water System Operator Training and Certification¹⁴

Structured training reduces this exposure in three concrete ways. First, it ensures that operators across every shift, location, and seniority level perform the same procedures the same way — so a sampling protocol, chlorine residual check, or DMR submission does not change depending on who is on duty. Second, it builds documentation discipline into the work itself; assessments and signoffs produce the paper trail that regulators expect to see. Third, it reinforces the connection between front-line decisions and downstream consequences, so the operator running a backwash cycle understands what an out-of-spec turbidity reading means for the consumer two miles downstream.

For contractors working in and around active water systems, the same logic applies in the construction sequence: a structured craft training program reduces the probability of cross-connections, contamination events, and permit-impacting incidents that can put a project behind schedule and a client in front of regulators.

3. Improved productivity and asset performance.

The productivity case for training in water and wastewater is hidden in two numbers that almost every U.S. utility is quietly tracking: non-revenue water and unplanned downtime.

S&P Global Ratings estimated in 2023 that roughly 33.3 trillion gallons of water are lost annually in the United States, representing more than \$187 billion in lost revenue across the sector.¹⁵ A separate Utah State University Water Research Laboratory study put the U.S. and Canada at approximately 240,000 water main breaks per year, with direct repair costs near \$2.6 billion annually.¹⁶ Both numbers are heavily influenced by operator decisions: which mains get inspected and when, how leaks are detected and prioritized, how repair crews execute, and how pressure-management programs are run.

“Every gallon we treat that does not reach a customer is a triple loss — we paid for the chemicals, we paid for the power, and we still have to answer for the water we cannot account for. A well-trained operator can move that needle every quarter.”

—Jeanne Simkins Hollis, CEO, Slater Infrastructure Group

Inside the plant, the productivity calculus is similar. Treatment performance depends on operator decisions made dozens of times a shift — coagulant dose, filter run length, sludge wasting rate, aeration setpoints. Trained operators run plants closer to optimum: lower chemical use per million gallons treated, lower energy intensity, fewer unplanned process upsets. That difference compounds. Across a year, single-digit percentage gains in chemical efficiency or power consumption translate to six-figure savings at a mid-sized plant, with no capital outlay required.

Equally important, structured training extends asset life. Operators who understand the equipment they run — not just how to push the buttons, but why a pump curve matters, what cavitation sounds like, when a bearing is telling you it is about to fail — catch problems early. That is the difference between a scheduled maintenance window and a 3 a.m. emergency call-out.

Across the sector, the through-line is simple: trained crews complete more work to a higher standard with the same headcount. In a workforce shortage, that productivity multiplier is the single most actionable lever an operator has.

4. Strengthened retention and a deeper bench.

The retention math in the water sector is brutal. With about one-third of the workforce eligible to retire in the next decade and a median worker age of 48, every voluntary departure of a younger operator is doubly costly — you lose the employee you have, and you give up time you cannot get back on developing the bench that has to replace your retirees.¹

Training is among the strongest retention levers available. LinkedIn's 2024 Workplace Learning Report found that 94% of employees say they would stay longer at a company that invests in their career development.¹⁷ In water specifically, the effect is amplified by the structure of the licensing system: each new grade earned is a tangible, portable credential, a raise, and a step on a clearly visible career ladder. That visibility is the antidote to the most common reason new operators leave — the perception that the work is a dead end.

“The first 90 days are where you keep them or lose them. If a new operator can see the ladder on day one — the grade levels, the timeline, what the company will pay to get them there — churn drops dramatically. That is not soft. That is a hard number on the P&L.”

—Jeanne Simkins Hollis, CEO, Slater Infrastructure Group

The cost of getting it wrong is real even if it is rarely measured well. The Society for Human Resource Management's long-standing benchmark for replacing a skilled or technical employee is 50% to 200% of annual salary once recruiting, ramp time, lost productivity, and downstream effects are tallied.¹⁸ Applied to the BLS median water and wastewater operator wage of \$58,260, that range — roughly \$29,000 to \$116,000 per replacement — puts a meaningful dollar value on every operator who stays.²

Beyond economics, retention is what allows institutional knowledge to survive. The 25-year operator who knows that the third lift station downstream of the rail yard always struggles after a storm event is carrying knowledge that no manual captures. Structured training programs, when they include mentorship and intentional knowledge transfer, are how that knowledge gets handed off rather than walked out the door.

5. Lowered injuries and stronger safety culture.

Water and wastewater work is more dangerous than the U.S. private-sector average. BLS data on the Water, Sewage and Other Systems industry (NAICS 2213) consistently shows nonfatal injury and illness incidence rates above the all-private-industry benchmark of 2.4 cases per 100 full-time workers.¹⁹ The hazard profile is unusually broad: permit-required confined spaces, hydrogen sulfide and chlorine gas exposure, trench collapses on distribution and collection work, electrical and arc-flash hazards in pump stations and headworks, and biological exposure throughout the wastewater system.

OSHA enforces this hazard profile through specific standards — 29 CFR 1910.146 for permit-required confined spaces, 29 CFR 1926 Subpart P for trenching, and the standards governing hazardous chemical exposure — each of which carries documentation and training requirements that an informal safety program almost never satisfies under scrutiny.²⁰

“On a water main job, on a pump station rebuild, on any wastewater confined-space entry — our crews are not just protecting themselves. They are protecting the public, our client, and the work itself. Safety is the deliverable. Training is how we deliver it.”

—Jeanne Simkins Hollis, CEO, Slater Infrastructure Group

Structured safety training works because it shifts the safety conversation upstream of the incident. In an unstructured environment, training tends to happen after something has gone wrong — a near-miss debrief, a post-incident standdown, an OSHA citation. By that point, the cost is already on the books. Structured programs proactively reinforce the procedures that prevent the next event: pre-entry atmospheric testing, lockout/tagout discipline, the daily safety review that catches the missing detail before the trench gets entered.

Equally important, structured training builds peer safety culture. When every crew member has the same baseline knowledge, they watch out for each other. The newest hire knows what a Grade IV operator considers unacceptable, and feels empowered to say so when they see it on a job site.

The downstream financial signal is workers' compensation. Carriers price risk by experience modification rate (EMR), and the water/sewer construction class codes carry materially higher base rates than general building construction. An EMR below 1.0 is not an accident — it is the cumulative result of a safety program that works, and a workforce that has been trained to operate within it. Over a multi-year horizon, that EMR differential is one of the largest line-item returns on training a contractor will ever see.

6. Increased quality and customer trust.

Quality in the water sector is not a marketing claim — it is a public health outcome. The customer expects water that meets every primary drinking water standard and effluent that meets every NPDES permit limit, every day. There is no “mostly compliant.”

The regulatory environment is making the quality standard harder, not easier. The Lead and Copper Rule Improvements (LCRI), finalized in October 2024, require utilities to replace all lead service lines within a decade — EPA estimates 9.2 million lead lines remain in service nationally, at an aggregate cost near \$45 billion.^{4 21} The PFAS National Primary Drinking Water Regulation, finalized in April 2024, set enforceable maximum contaminant levels at 4.0 parts per trillion for PFOA and PFOS and additional limits for several other compounds, with monitoring and compliance deadlines that will require capital investment for thousands of systems — although the rule itself is subject to ongoing reconsideration, leaving utilities to plan in an environment of regulatory uncertainty.^{5 22} ASCE’s 2025 Infrastructure Report Card grades drinking water at a C- and wastewater at a D+, reinforcing that the sector’s quality challenge is structural, not episodic.³

“Quality is the only thing we get paid to deliver. Everything else — schedule, budget, communications — supports that. When we invest in our people, we are protecting the one promise that actually matters to the community at the other end of the pipe.”

—Jeanne Simkins Hollis, CEO, Slater Infrastructure Group

Standardized training is the prerequisite for consistent quality at scale. It ensures that every crew member knows what “right” looks like, can recognize when something is off, and understands the chain of escalation when it is. On a multi-year capital program — a lead service line replacement, a treatment plant upgrade, a PFAS retrofit — that consistency is the difference between a project that delivers its stated water quality outcome and one that delivers an asset which still does not solve the underlying problem.

For utilities and the contractors who serve them, the strategic prize is trust. The municipalities, regulators, and ratepayers who choose your services do so because they believe you will deliver the quality you promised. A workforce trained to deliver that quality, consistently, across geographies and over time, is the most durable competitive moat the sector has.

The Slater Certified® difference

The six returns above describe what structured training does for any organization in the water sector. What sets Slater Infrastructure Group apart is how it delivers them. Through Slater Certified®, the company has built workforce development as a service — integrating three functions the industry has long kept separate: training and certification, a pipeline of license-ready operators, and operations, maintenance and compliance support. Where the traditional model is classroom-only, geographically limited, and measured in years, Slater treats training as infrastructure: competency-based, EPA- and state-aligned, and engineered to produce verified, auditable capability rather than self-reported attendance.

The pathway is built around the graded licensing system the sector already runs on. Slater Certified® delivers a mobile-first route that carries a candidate from little or no experience to Grade 1–4 licensure, with more than 50 state-approved courses, a curriculum mapped to state licensing examinations, and portable digital credentials that travel with the worker. An AI-powered tutor, G.A.I.L., adapts licensure preparation to each learner, reducing dependence on scarce field instructors and reaching candidates a classroom-only model never could. Real-time compliance and performance dashboards give utilities and municipal partners verified competency they can audit — not a binder no one has opened.

The early results bear the model out. Across initial pilots, Slater Certified® participants posted a 62% improvement in licensing-exam pass rates, with 85% satisfaction among beta users — evidence that a structured, technology-enabled pathway does not just widen the front door to the profession, it produces better-prepared operators on the other side.

“We don’t bolt training onto the work. We engineer it into the work — the same way we engineer everything else we deliver. That is what it means to treat training as infrastructure.”

—Jeanne Simkins Hollis, CEO, Slater Infrastructure Group

This is workforce development built the way Slater builds everything — through people, technology, and performance. As the retirement wave accelerates, Slater continues to expand the platform across states and to pair adaptive digital learning with experienced-operator mentorship, so that capability compounds rather than walks out the door.

Structured training lifts the entire water sector

Workforce training in water and wastewater is not an operational expense. It is a strategic investment that strengthens regulatory standing, reduces unplanned events, protects public health, and builds the workforce capable of executing the largest sustained capital program the sector has ever seen.

EPA's 2023 Drinking Water Infrastructure Needs Survey identified \$625 billion in drinking water investment needs over 20 years — a 30% increase over the prior assessment.²³ The Infrastructure Investment and Jobs Act allocated roughly \$50 billion to EPA water programs, including \$15 billion specifically for lead service line replacement and \$10 billion for PFAS and emerging contaminants.²⁴ None of that capital delivers public health value without trained operators and craft workers to design, build, commission, and run the assets it funds.

“WEF is working to attract and develop a diverse and passionate water workforce ... Attracting people to the water sector and helping to train and strengthen the water workforce are critical parts of our work leading the transformation to a circular water economy.”

— Ralph Exton, Executive Director, Water Environment Federation⁸

When utilities, contractors, and the broader sector commit together to formal, structured workforce development, the result is more than a stronger company. It is a more resilient industry — one that can absorb retirements, meet new regulations, and deliver the water and wastewater services that every community in the country depends on.

Slater Infrastructure Group believes the water sector's workforce challenge is also its greatest opportunity. The organizations that treat training as a strategic investment will define the next decade of the industry. We intend to be one of them — and to help our clients and partners do the same.

Let's build the water workforce together.

Slater Infrastructure Group invites utilities, municipalities, engineering partners, and state workforce agencies to put structured workforce development to work on their toughest staffing, compliance, and capital-delivery challenges. Whether you need Grade 1–4 operators ready to deploy, a certification pathway for your new hires, or an integrated training, staffing, and operations solution through Slater Certified®, we are ready to help you convert workforce risk into competitive advantage. To start the conversation, visit slatergrp.com or contact us at info@slatergrp.com.

About Slater Infrastructure Group

Slater Infrastructure Group, LLC is an infrastructure services company serving the water and wastewater sector. We work alongside utilities, municipalities, engineering partners, and program owners on the assets that move, treat, and protect the nation's water.

Our work spans the lifecycle of water infrastructure — from underground utility construction and rehabilitation to treatment plant services and operations support. We invest in our people because the work demands it: every project we deliver depends on certified operators, trained craft professionals, and the consistent standards that come from structured workforce development.

Our Motto: Building the Future of Infrastructure Through People, Technology and Performance

To learn more about Slater Infrastructure Group, visit slatergrp.com or contact us at info@slatergrp.com.

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