# Building a Decentralized Wastewater Training Program

EPA Office of Wastewater Management

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# Overview

This document is a guide to building a decentralized wastewater training program. It is designed to provide information and resources for decentralized wastewater sector stakeholders interested in creating training programs with community colleges.

The decentralized wastewater sector encompasses thousands of well-paying jobs that contribute to a cleaner environment.[1] However, the sector is currently experiencing a shortage of qualified workers to design, install, maintain, and inspect these systems. There are many reasons for this shortage, including the high number of existing systems that require routine maintenance, an increase in the number of systems installed annually, and an aging decentralized workforce that is expected to retire in high numbers over the next 5–10 years. These factors make the need to recruit and train an adequate workforce more critical now than ever.

Although decentralized wastewater employers experience this first hand, workforce shortages are often too large in scope for any one business to address on its own. This guide provides decentralized wastewater employers a step-by-step process to create a sector partnership and bring together an employer "demand." This serves to make resources available that are not accessible at the level of an individual business. The sector partnership can leverage its collective demand for workers and engage the local or regional community college system. Together, the decentralized wastewater employers and the community college partners can create training programs for decentralized industry skills and competencies.

This guide helps decentralized wastewater employers identify the right partners to develop and maintain new decentralized training programs. These programs will recruit new workers into the industry and will bolster skills for existing and potential employees. This guide is intended for decentralized wastewater small business owners, state regulators, and industry associations at the state and regional levels.

[1] U.S. Environmental Protection Agency, Office of Wastewater Management, "Pipeline to a Sustainable Workforce: A Report on the Decentralized/Onsite Wastewater Occupations, February 2021. Accessed April 16, 2021: https://www.epa.gov/sites/production/files/2021-02/documents/career-pathways_report.pdf

## What Is the Decentralized Wastewater Industry?

The decentralized wastewater industry is an integral part of the nation's wastewater infrastructure, serving approximately 20 percent of all U.S. households (or 1 in 5 homes).[2] Recent studies indicate that one-third of single-family homes built between 2016–2018 are served by decentralized systems.[3] The U.S. Environmental Protection Agency (EPA) reports that decentralized systems treat roughly four billion gallons of water per day in the U.S.[4]

Decentralized wastewater treatment systems are onsite or clustered systems used to collect, treat, and disperse or reclaim wastewater from a single residence, multiple residences, small community, or service area. In comparison to a centralized system, a decentralized system uses small pipes and treats small volumes of domestic wastewater. Decentralized systems include individual septic wastewater treatment systems (also referred to as "onsite" systems) and community cluster systems.

## What Is a Sector Partnership?

"Sector partnership" refers to a collaboration among organizations from the same industry or sector, in a shared labor market region, that work with education, workforce development, economic development, and community organizations to tackle common needs.[5] The decentralized wastewater industry is a subset of larger sectors, such as manufacturing or professional services.[6]

Sometimes referred to as "demand-driven," sector partnerships are a tool in building a community's workforce to spur economic growth and upward mobility. Effective sector partnerships are critical for workforce development and job training programs to upskill or reskill workers.

Sector partnerships address workforce shortages that are too large in scope for any one business to address on its own. Through a partnership, decentralized wastewater access resources unavailable at an individual small business scale. Once established, a decentralized wastewater business leadership group speaks on behalf of the industry or broader sector to guide workforce development and training initiatives regionally.[7] When decentralized wastewater employers convene with local workforce system partners and other local organizations to engage community colleges, the effort can result in sector-focused, high quality training programs.

## Why Partner with Community Colleges?

Community colleges are a critical component of postsecondary education and training infrastructure in the U.S. The community college system includes over 1,100 public and independent community colleges, serving 11.8 million students.[8] Community colleges are uniquely well-positioned to upskill or reskill decentralized wastewater workers through flexible credit and noncredit courses. Key aspects of community colleges include:

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[2] According to the 2015 U.S. Census Bureau's American Housing Survey (AHS).
[3] 2020 Onsite Wastewater Installation Assessment, National Environmental Services Center
[4] EPA, "Case Studies of Individual and Clustered (Decentralized) Wastewater Management Programs," 2012. Accessed April 16, 2021: https://www.epa.gov/sites/production/files/2015-06/documents/decentralized-case-studies-2012.pdf
[5] Next Generation Sector Partnerships, "Training Manual," 2020. Accessed April 7, 2021: https://www.nextgensectorpartnerships.com/toolkit
[6] https://www.bls.gov/emp/tables/employment-by-major-industry-sector.htm
[7] Ibid
[8] American Association of Community Colleges, "Fast Facts 2021" 2021. Accessed April 7, 2021: https://www.aacc.nche.edu/research-trends/fast-facts/

- They are often located in rural areas where decentralized and onsite systems are prevalent.
- They can deliver training in the format that works best for decentralized wastewater employers and their workers.
- They provide students with more affordable educational opportunities than a four-year school and frequently have diverse student populations.[9]
- They offer established programs that provide the technical skills needed for employees in many trades, such as those required by the decentralized wastewater industry.[10]
- They can help students access federal and state financial aid to offset the costs of learning, advising, tutoring, internships, career advising, and job placement.[11]

For more information on community college structure and purpose visit Appendix A: The Community College Training Landscape.

## Advancing Decentralized Wastewater Management through Partnerships

Since 2005 EPA and organizations involved in managing decentralized wastewater systems have worked in tandem to identify key objectives, share information and promote decentralized systems as a viable means of wastewater treatment. In 2020 EPA and 20 partners signed the latest in a series of Memoranda of Understanding, representing a shared and continued commitment to the decentralized wastewater industry. Within this commitment was a goal to "Expand mechanisms to address workforce, education, training and research needs related to the decentralized wastewater industry to improve future sustainability." This guide is one in a series of documents produced by EPA, with guidance from the Memorandum of Understanding (MOU) partners, to help advance education and training opportunities for the workers that design, install, maintain, and inspect decentralized systems.

For more information on the MOU and associated resources, visit EPA's Decentralized Wastewater Management Memorandum of Understanding (MOU) Partnership webpage.[12]

[9] Juszkiewicz, J., "Community College Students and Federal Student Financial Aid: A Primer," American Association of Community Colleges" 2014. Accessed April 16, 2021: https://files.eric.ed.gov/fulltext/ED557996.pdf
[10] Opportunity America Working Group on Community College Workforce Education, "The Indispensable Institution: Reimagining Community College," 2020. Accessed April 16, 2021: https://opportunityamericaonline.org/wp-content/uploads/2020/06/Indispensable_Inst_FullReport.pdf
[11] Juszkiewicz, J., "Community College Students and Federal Student Financial Aid: A Primer," American Association of Community Colleges" 2014. Accessed April 16, 2021: https://files.eric.ed.gov/fulltext/ED557996.pdf
[12] https://www.epa.gov/septic/decentralized-system-partners

# Steps for Partnering with Community Colleges to Develop Training Programs

The following steps are intended to guide decentralized wastewater employers on how to create a new training program with community colleges. These steps outline the information necessary to successfully identify sector partners, work with community colleges and align the appropriate training, credentials, and licensing. These steps include:

- Step 1: Find Decentralized Wastewater Sector Partners
- Step 2: Connect with the Right Community College Representatives
- Step 3: Identify Skills and Competencies Needs for Training
- Step 4: Identify Industry Credentials and State Licensing Requirements
- Step 5: Compare the Training Needed to the Training That Exists
- Step 6: Develop New or Modify Existing Curriculum
- Step 7: Enroll Students and Provide Program Support
- Step 8: Assess, Improve, and Expand

## STEP 1: Find Decentralized Wastewater Sector Partners

Businesses that design, install, and maintain decentralized wastewater systems may be small, medium, or large in size. However, workforce shortages are often too large in scope for any one business to address on its own. For this reason, decentralized wastewater industry stakeholders could form a "sector partnership" to develop training programs together at the necessary scale. Importantly, sector partnerships are led by employers and focused on the skills and competency needed within a region. Sector partnerships may include the following types of stakeholders:

- Decentralized wastewater employers, regulators, and partners
- Related industry employers and business intermediaries
- Local public workforce system partners

The following section includes more information on potential partners and approaches to engagement.

## Connect with Other Decentralized Wastewater Employers, Regulators, and Partners

A decentralized wastewater business can work with similar employers to build the necessary scale to launch a training program. These employers may be small to medium business owners that design, install, and maintain decentralized systems, as well as state or local regulatory agencies that permit and inspect those systems. Regulators provide a key role in this partnership in that they may be responsible for licensing or certification criteria as defined by state or local regulations, as well as educating staff to the level needed to adequately permit decentralized systems for use.

Across the U.S. there are state and regional associations that provide support to decentralized wastewater industry professionals. These associations often maintain a network of decentralized employers and can help build sector partnerships by making connections, providing information on existing training programs, or acting as a convenor for the effort. Visit MOU Partner websites, such as the National Onsite Wastewater Recycling Association (NOWRA) [13] and Water Environment Federation (WEF) [14] for more information on regional and state associations that provide support to decentralized wastewater industry partners. Utilizing a decentralized wastewater network is a practical way to "speak with one voice" in a state or region.

As discussed in EPA's report, "Education and Training Landscape: Providing a Supply of Talent for Decentralized/Onsite Wastewater Occupations," decentralized wastewater training programs already exist in many states and localities. Before launching a new training effort, check with the state or regional association to find out if something similar is already underway. For example, NOWRA provides an online directory of training by state.[15]

## Reach out to Employers in Related Industries

The lack of skilled workers across many industries and occupations is a prevalent issue in the U.S. Often, decentralized wastewater employers are fiercely competing for talent with other employers across multiple industries within the broader manufacturing sector. This competition may be turned into collaboration by partnering with employers in other industries. These partnerships can then upskill workers in common job roles, such as installation, maintenance, and/or operations. Cross-industry collaboration can create greater demand in the region for training programs. The programs enhance general business skills for all employers and industry-specific, technical skills for certain employers. Business intermediaries, such as local Chambers of Commerce, often support workforce initiatives and assist businesses to improve the skills of the regional workforce.

## Engage Workforce System Partners

Every U.S. community has a local workforce system that is federally-funded. [16] While this support has been in place for many years, the federal government signed the Workforce Innovation and Opportunity Act (WIOA) [17] in 2014 to better coordinate federal programs investing in skills development. Every year the federal government provides over $9 billion to support an efficient labor market through the public workforce system. [18] State and local workforce boards support sector partnerships to develop regional, industry-focused approaches for workforce and economic

[13] http://nrwa.org/about/state-associations/
[14] https://www.wef.org/membership/wef-member-associations/
[15] https://www.nowra.org/training/
[16] https://www.dol.gov/agencies/odep/program-areas/workforce-system
[17] https://workforce.urban.org/strategy/workforce-innovation-and-opportunity-act

development. These efforts improve access to good jobs and increase job quality in ways that strengthen an industry's workforce. Workforce system partners can connect workers seeking employment with available decentralized wastewater industry positions. Employers can identify job requirements and what is considered a good match to enhance referrals by workforce system partners.

## Public Workforce System: Additional Resources

### American Job Centers

There are over 2,400 job centers across America designed to support businesses in recruiting, hiring, and training employees. American Job Centers assist employers with workforce training and information about local and federal resources to assist with business decisions, including marketing and economic development opportunities. These centers also provide job seekers with employment information, career development training opportunities, and connections to training programs in their area. Find a local American Job Center: American Job Center Finder.

### CareerOneStop Business Center

CareerOneStop Business Center is an online platform for employers that includes information and links to possible funding to help recruit, hire, train, and retain a strong workforce. On this platform, employers access a wide variety of tools, including a Business Services Toolkit, designed to help employers develop customized solutions for their workforce challenges. Visit the Career One Stop Business Center for more information: CareerOneStop | Business Center.

### Registered Apprenticeship and On-the-Job Training

Registered Apprenticeship Programs (RAPs) are "work and learn" training programs that combine paid work and classroom training. RAP resources include assistance with wages paid to apprentices as they learn on the job (known as on-the-job training, or OJT) or the tuition costs of the classroom training at the community college. Local workforce partners can help decentralized wastewater employers with approvals needed to sponsor apprentices and establish RAPs. For more information on apprenticeships, please visit www.apprenticeship.gov.

### Tuition Assistance and Job Referrals

State and local workforce partners may have tuition assistance benefits through federal or state-funded sources. Individual Training Accounts (ITAs) [19] are one example of this type of tuition assistance and states have a wide variety of other specialized financial assistance programs for worker training. These resources can be used by the decentralized wastewater sector partnership to support training efforts. For more information on the public workforce system, visit the Department of Labor Fact Sheet, "Workforce Resources for Employers." [20]

[19] ITA Example, Alabama, "Individual Training Accounts," 2019. Accessed September 13, 2021: https://wioa-alabama.org/individual-training-accounts/
[20] https://www.dol.gov/sites/dolgov/files/ETA/employers/pdfs/Factsheet_Resources_for_Employers.pdf

## Foundational Sector Partnership Questions

Once identified, sector partners work together to discuss and answer the following questions:

- What is the core goal(s) of the partnership?
- How many workers can you employ now and in the near future?
- What are the target occupations where you need more workers?
- What specific skills and competencies are needed for your jobs?
- Are you aware of decentralized wastewater training programs or curricula the community college can review or implement?
- Does the community college need specific equipment or tools to effectively teach decentralized wastewater skills?

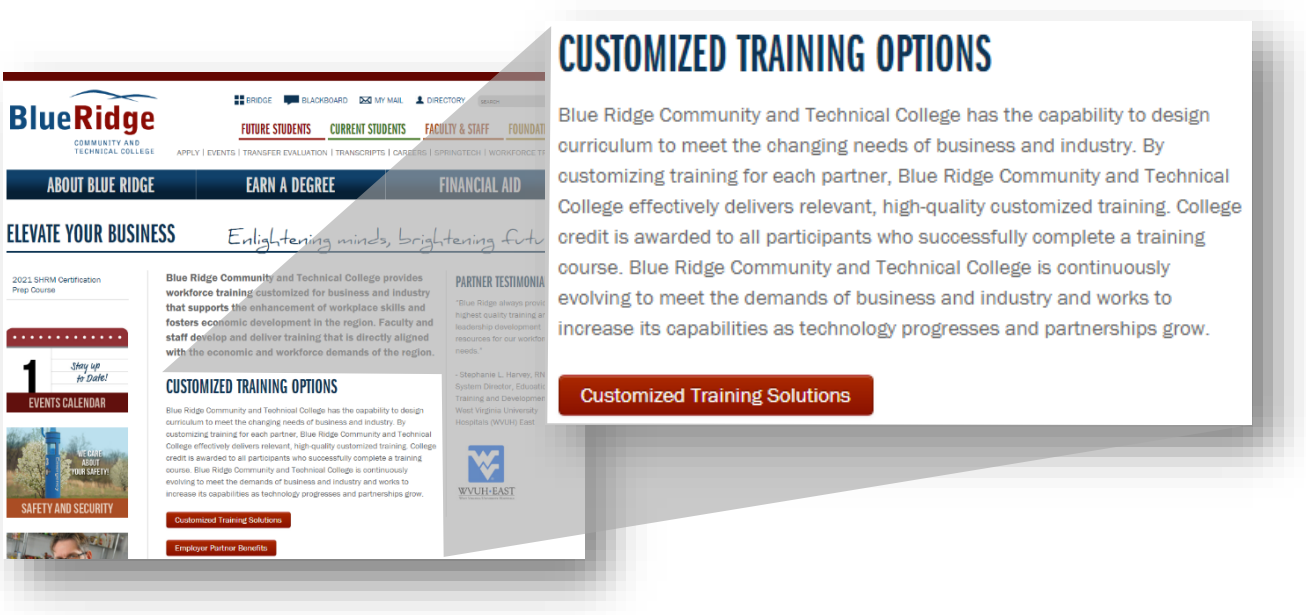
At the outset, the sector partnership may be unable to provide comprehensive answers to all these questions. However, initial answers can start the conversation with community college partners. The following steps provide additional details on ways partners can identify skill and competency needs and training requirements.

# STEP 2: Connect with the Right Community College Representatives

After developing a sector partnership, identify 1–2 community colleges in a state to pilot a new training program. Look for colleges that have existing business or workforce training programs, offer training programs in related fields and are in geographic proximity to decentralized wastewater businesses.

Existing water treatment programs within community colleges could serve as a foundational location to build a decentralized training program. When conducting research on local community colleges, look for information on existing collaborations with wastewater treatment providers, including private businesses and water utilities. For example, Blue Ridge Community and Technical College (Blue Ridge CTC) in Martinsburg, WV, developed a Water

**Figure: 1 Blue Ridge CTC's Customized Training Webpage for Employers**



Operator I course with its local utility to prepare students for the West Virginia Water Operator I test. This provides a strong starting point to incorporate decentralized wastewater training into an existing program.

Search for the workforce development, corporate, or community education department on a community college's website. Community colleges, large and small, have "workforce development" or "community education" departments. These departments are tasked with creating employer-based training programs. Some have their own "corporate college" and support employers through customized training, business incubation and other training alternatives to upskill workers. Figure 1 provides an example using Blue Ridge CTC. Once the sector partnership identifies community college(s) to contact, it can identify the appropriate person there to explore training and program development.

During initial discussions, describe specific decentralized wastewater workforce challenges, training goals and industry characteristics. Assume a new community college contact knows very little about the decentralized wastewater industry. The following types of information and resources will help advance discussions between the sector partnership and community college:

- **Industry Overview:** Provide an overview of industry characteristics. EPA's Septic System webpage [21] provides a starting point of information on the decentralized wastewater industry's technologies, processes, and services.
- **Job Information and Challenges:** The community college will want information on the labor characteristics for the industry. EPA's Report, "Pipeline to a Sustainable Workforce: Report on Decentralized/Onsite Wastewater Occupations" provides an overview of the career pathways available to decentralized workers, growth projections and the specific challenges leading to shortages in the supply of workers. The report also provides details on high-need occupations and job characteristics for the industry. [22]

College officials may also want to discuss their required baseline conditions to develop an initial pilot training program. For example, the community college may have a minimum number of students needed to develop a training course. The college may also have a threshold for the number of students expected to attend a training course to offer that course in a semester. They may discuss financial constraints and work with decentralized wastewater partners to develop both short-and long-term plans to make the training program viable. Once these baseline conditions are discussed and addressed, the sector partners and community college may identify skill and competency requirements.

For more information on credit and noncredit training, see Appendix A: The Community College Training Landscape.

## STEP 3: Identify Skills and Competencies Needs for Training

Once community college staff better understand the decentralized wastewater industry and its workforce challenges, the sector partnership can begin the process of designing the training program. To start, the partners identify decentralized wastewater skill and competency requirements. College staff may use checklists and interviews with the sector partners to gather the information needed to develop training programs.

Decentralized wastewater employers utilize a variety of technologies for both traditional and advanced systems. They employ a wide range of occupations in skilled trades and professional positions across both the private and

[21] https://www.epa.gov/septic

[22] U.S. Environmental Protection Agency, Office of Wastewater Management, "Pipeline to a Sustainable Workforce: A Report on the Decentralized/Onsite Wastewater Occupations." 2021. Accessed April 16, 2021: https://www.epa.gov/sites/production/files/2021-02/documents/career-pathways_report.pdf

public sectors. Though these jobs vary greatly, decentralized workers often engage in one or more key job functions specific to occupations and careers in the decentralized wastewater industry: site evaluation; design; installation; inspection and monitoring; or operations and maintenance. Presenting these job functions to the community college partner helps jumpstart a conversation on the types of skills and competencies needed to be successful as a decentralized wastewater professional.

## Key Job Functions [23]

| | |
|---|---|
|  Site Evaluation | A site evaluation is conducted to assess the system site and relationship to other features, such as groundwater and surface water. Basic activities include a characterization of the landscape, soils, ground and surface water location, lot size, and other conditions. Advanced activities may include an assessment of the site and cumulative watershed impacts, groundwater mounding potential, long-term specific pollutant trends, and cluster system needs. |
|  Design | The design of a decentralized wastewater system ensures that the system is appropriate for the site, watershed, and wastewater characteristics. A basic design may prescribe a limited number of acceptable options for site-specific conditions. While most designs present one option based on prescriptive standards, some may evaluate a wider range of options due to varying regulation or challenging site conditions. |
|  Installation | Installation at a site involves the activities needed to construct an operational system, including repairs, for a home or business. |
|  Inspection & Monitoring | Inspections are conducted to minimize health or environmental risks from handling, use and dispersal of septage and wastewater. Inspections often include a full in-person review of the entire system to ensure compliance with approved local/state plans and permit requirements for new construction, replacement, or major repair. They also ensure the system is working properly. Some states and localities require inspections when properties change ownership, while others may require inspections at different intervals, such as in the event of a loan application or permit. |
|  Operations & Maintenance | Proper operations and maintenance (O&M) ensure a system performs as designed. Basic operations often include tank cleaning and service work and may also provide homeowner education and reminder programs that promote adequate O&M. Advanced systems may require service contracts or renewable, revocable operating permits with periodic reporting to ensure responsibility for O&M activities. |

[23] Definitions were developed using EPA, "Handbook for Managing Onsite and Clustered (Decentralized) Wastewater Treatment Systems EPA No. 832-B-05-001" 2005. Accessed August 21, 2020: https://pdhonline.com/courses/c241/onsite_handbook.pdf

In addition to broader industry job functions, competencies, and skills, community colleges will want to know the expectations of the decentralized wastewater employers in the sector partnership. For example:

- How do employees demonstrate they have the skills and competencies to perform in a particular decentralized wastewater occupation?
- What credentials or basic requirements are mandatory to hire a person for a particular decentralized wastewater occupation?
- What are the best methods for workers to learn the skills and competencies needed—on the job, classroom, simulated workplace training, etc.?
- What are the career advancement opportunities and requirements that may require ongoing skills development?
- What are the employers' final learning objectives?

## STEP 4: Identify Industry Credentials and State Licensing Requirements

Next, the sector partnership will want to identify credentials that employees must hold to perform the job functions identified in Step 3. Two common types of decentralized wastewater industry credentials are state license requirements and industry-recognized credentials. The legal authority for regulating decentralized systems resides at the state, tribal, or local level. Industry-recognized credentials are developed and provided by an industry association and used to verify the skills and competencies for workers. The Registered Environmental Health System/Registered Sanitarian (REHS/RS) certification [24] provided by the National Environmental Health Association (NEHA) is one of the most recognized credentials connected to the decentralized wastewater industry. Decentralized wastewater employers and state or regional association representatives within the sector partnership likely are aware of these licensing or credentials requirements. These partners should inform the community college partners of any licensing or credentialling their employees will need to complete so the training programs can be aligned with those requirements.

Training programs aligned to a specific license or credential are typically noncredit programs. Noncredit programs are competency-based and built around obtaining a credential or license upon program completion. Because noncredit training programs are not subject to accreditation requirements like college credit programs, community colleges can work with decentralized wastewater partners to implement these quickly.

Noncredit learning by decentralized wastewater workers can also be translated into college credit through a process known as credit for prior learning (CPL). CPL recognizes certain noncredit training, industry experiences, and credential attainment and applies college credits to student transcripts. Some state onsite wastewater associations offer their own training and credentialing programs, which may be eligible for CPL consideration. Community colleges, onsite associations, and industry organizations can work together to develop CPL opportunities
for workers.

[24] https://www.neha.org/professional-development/credentials/rehsrs-credential

## Credentials and Licensing: Two Decentralized Wastewater Examples

**Delaware Technical Community College: Training to Meet State Licensing Needs**

Delaware Technical Community College (DTCC) [25] developed Wastewater Operator [26] certifications tied to Delaware state licensing requirements. This allowed Delaware to educate and train more decentralized wastewater workers on state-specific requirements. DTCC's "Wastewater Operator Certification Level I" course of study includes the passing of the Delaware Level I licensing exam as a final outcome. DTCC also provides "Level II/III" certification for students.

**Iowa Onsite Waste Water Association Credential Program**

The Iowa Onsite Waste Water Association (IOWWA) developed the Certified Installer of Onsite Wastewater Treatment System (CIOWTS) credential.[27] Currently, 23 Iowa counties require their onsite installers to hold the CIOWTS. IOWWA provides a course that aligns with the test and now includes IOWWA-specific requirements. The Installation Overview Course is a two-day seminar and counts toward 12 continuing education hours in Iowa. The course is not required to sit for the CIOWTS exam. Using credits for prior learning, a community college can partner with IOWWA and decentralized wastewater employers to offer college credit for workers who obtain the CIOWTS credential. This initiative may serve as an example for other states interested in scaling up similar programs. For more information on credit and noncredit training options, see Appendix A: The Community College Training Landscape.

# STEP 5: Compare the Training Needed to the Training That Exists

In Step 5, the sector partnership compares the skills, competencies, licensing, and credentials needed to the current curriculum and training offered at the community college. Existing courses and programs serve as a resource that can be modified for the decentralized wastewater industry. For example, a community college installer or maintenance worker training program teaches many of the skills needed for septic system maintenance or installation. However, specific technologies or processes utilized in a decentralized wastewater employment setting are not covered. In this instance, the sector partnership and community college work together to highlight the specific elements that are needed. In turn, this informs the curriculum development process outlined in Step 6 of this document.

Comparing decentralized wastewater training needs to current community college training programs is a dynamic process. To begin with, the community college representative provides the partners with a list of current programs in their course catalog that are similar to identified decentralized wastewater training requirements. The decentralized wastewater partners then review those training programs and give feedback on the relevance of those

[25] https://www.dtcc.edu/
[26] https://www.dtcc.edu/continuing-education/workforce-training/stanton/certificate-programs/wastewater-operator
[27] https://www.iowwa.com/pages/certification

programs to their industry. Once the community college and decentralized wastewater partners understand where overlap and gaps exist, they can identify a path forward.

The path forward may involve different scenarios. First, some current curriculum may be highly relevant and incorporated into a decentralized wastewater training program. Second, there may be curriculum that is relevant but requires modification. Finally, any curriculum that does not exist is identified for development. This curriculum review step offers an accelerated and cost-effective means to build a decentralized wastewater training program and provides a framework for decentralized wastewater partners to use and build upon.

## STEP 6: Develop New or Modify Existing Curriculum

Previous steps pinpointed training goals, identified credentials for employment, and compared needs to existing curriculum. The next step is for the sector partnership to work closely with community college staff to modify or develop new coursework

Creating curriculum is a collaborative process. Community college faculty are responsible for writing and implementing courses through curriculum. Decentralized wastewater partners contribute to the process in several ways:

- **Existing Decentralized Curriculum**: Previous collaborative efforts have produced curriculum specific to decentralized wastewater workers. These curriculum resources can be found at NOWRA's Education Portal[28] as well as through the Consortium of Institutes for Decentralized Wastewater Treatment (CIDWT)'s http://cidwt.org/resources.html.[29]
- **Decentralized Expertise:** Decentralized wastewater partners support community college faculty by answering questions and giving feedback to ensure the final curriculum covers the skills and credential attainment needed for employment.

Content development is just one piece of the curriculum development process. Determining the appropriate training delivery is key to ensuring these training programs translate to real world experience. For instance, training programs will likely benefit from a combination of applied and classroom learning. Other options, such as online curriculum and hybrid learning (i.e., combination of in-person and online), are useful for students who are already in the workforce and have time constraints. The following is an overview of the types of training formats available:

- **Classroom Instruction:** Training takes place in-person in a class or lab format. This is the most traditional form of training.
- **Online Instruction:** Training uses online or remote technology where the instructor and student are not in physical proximity as concepts and courses are taught.
- **Hybrid Instruction:** Training incorporates both classroom and online instruction. For skills training programs, components without the use of equipment are provided online whereas in-person labs are used to teach skills for competencies and jobs.
- **On-the-Job Training (OJT):** Training occurs at an employer worksite and the program provides reimbursement of a portion of the worker's wages to offset the costs of training. An employer will sign an agreement with the organization. That agreement will include information on the negotiated provisions,

[28] https://www.nowra.org/education/
[29] http://cidwt.org/resources.html

such as how long the training lasts, the wages paid and a commitment to retain the worker if the person successfully completes the training.

- **Apprenticeship:** Training occurs in a "work and learn" format where individuals obtain paid work experience, classroom instruction and a nationally recognized, portable credential.[30] A typical apprenticeship requires 1,000 hours of paid work experience and 144 hours of related training instruction to complete the apprenticeship. Programs are registered with either the U.S. Department of Labor or a State Apprenticeship Agency (SAA).
- **Customized Training:** Customized training programs are developed by community colleges for a particular employer, or group of employers, where courses and curriculum are individualized for them. Employers engaged in customized training often refer their incumbent workforce for the training, but new entrants can also enroll.
- **Incumbent Worker Training:** Incumbent worker training is limited to an employer's incumbent workforce and should include an outcome, such as a wage increase, new job within the company, or layoff aversion for participating employees.

Curriculum development is not a one-time event. After training begins, community college and decentralized wastewater partners monitor the use of curriculum to meet learning objectives, such as licensure pass rates. Ongoing curriculum revisions incorporate changing regulatory requirements or new decentralized technologies. Decentralized wastewater employers play a particularly important role in keeping decentralized training programs relevant and contemporary.

## STEP 7: Enroll Students and Provide Program Support

After decentralized wastewater curriculum and courses are in place, student enrollment begins. Decentralized wastewater partners themselves represent one direct source for recruiting students. Student recruitment is a critical, ongoing, and long-term effort for a sector partnership. To meet the decentralized wastewater industry's workforce needs through training, a steady supply of trainees is needed. Community colleges typically bear the costs of training by paying instructors, procuring decentralized wastewater equipment, and supplies and providing student advising and tutoring services. Therefore, a focused effort on all the options for student recruitment and partnership ensures that fixed college training costs are covered, and decentralized wastewater employer jobs remain filled. While community colleges may do recruitment of their own, success requires the participation of the sector partnership as well. Below is an overview of the ways in which the partnership can help increase enrollment and provide program support.

The partnership can support enrollment by referring its incumbent workers for skills upgrades or refer job candidates who need additional skills or licensing. Marketing materials can also be a powerful tool in recruiting students. To catch student's attention, the sector partnership can include examples of decentralized wastewater projects and workplaces, entry level salaries, and time commitments needed for training. Sector partners may consider using the career pathway and job profiles included as Appendices[31] to EPA's "Pipeline to a Sustainable Workforce: Report on Decentralized/Onsite Wastewater Occupations"[32] report as a starting place for these marketing materials. Job fairs, open houses, and employer worksite tours are all ways to attract workers into

[30] https://www.apprenticeship.gov/

[31] https://www.epa.gov/septic/pipeline-sustainable-workforce-decentralizedonsite-wastewater-occupations

[32] U.S. Environmental Protection Agency, Office of Wastewater Management, "Pipeline to a Sustainable Workforce: A Report on the Decentralized/Onsite Wastewater Occupations," 2021. Accessed April 16, 2021: https://www.epa.gov/sites/production/files/2021-02/documents/career-pathways_report.pdf

training programs. Events that create positive exposure to the decentralized wastewater industry and inform the community also provide opportunities for recruitment.

Decentralized wastewater partners can also support program implementation and operations in other ways.

- **Instructors:** Community colleges are often challenged in finding qualified instructors for technical skills training programs. Decentralized wastewater partners can identify qualified individuals interested in serving as adjunct instructors and teaching specific decentralized wastewater courses.
- **Equipment:** Decentralized wastewater employers can help provide students with hands on training by donating equipment or supplies for applied learning in decentralized wastewater courses. Many community colleges have processes in place for accepting these types of donations.

## Employer Equipment Donation at Delaware Technical Community College

Delaware Technical Community College (DTCC) is home to the Environmental Training Center (ETC) [33], one of the premier training centers in the country for the certification of water and wastewater operators. This training center also allows students to learn about decentralized wastewater systems using operational field equipment at their onsite training field. The use of potable water to simulate the movement of wastewater through the systems allows the trainee to visualize how each system works.

DTCC received a grant from the U.S. Department of Agriculture (USDA) in the early 2000s. The grant funded construction of the onsite training field, showcasing conventional onsite systems which included: gravity, pressure-dosed, low pressure pipe, elevated sand mound, sloping systems, septic tank treatment, and pumping chambers. The ETC expanded its onsite course offerings at that time to include system installation, inspection, and maintenance techniques. Students received classroom training and were then able to apply it in the field.

More recently, local regulators and various industry manufacturers partnered with DTCC to donate multiple advanced treatment systems at no cost to the college. Local installers, college staff, and regulators volunteered time and materials to complete the system installations. These partnerships have been vital in the growth and maintenance of the ETC. Many manufacturers continue to support their donated systems with annual service inspections and maintenance activities.

**Figure 2: Drip Dispersal System**

**Figure 3: Peat Filter Treatment Unit**

[33] https://www.dtcc.edu/continuing-education/workforce-training/georgetown/environmental-training-center

These partnerships have allowed for growth in instructor numbers and course offerings and ensure licensees always have the most up to date technology available for continuous learning.

This example demonstrates how a partnership between local decentralized system manufacturers/providers and a community college can allow for the development or enhancement of a decentralized wastewater curriculum. There was a low financial impact to the college and local industry and a net gain of more highly educated decentralized wastewater professionals in the community overall.

## STEP 8: Assess, Improve, and Expand

After establishing a training program at a community college, tracking results is vital in determining the program's success. For example:

- Number of training participants gaining a new credential or passing a licensing exam
- Number of training participants gaining new employment
- Number of training participants receiving wage increases
- Number of training participants obtaining job promotions to new decentralized wastewater positions

Decentralized wastewater partners and community colleges will develop success metrics and many states require colleges to report on the impact of skills training programs. For this reason, decentralized wastewater partners should establish processes for providing ongoing data to community colleges for continuous improvement and gauging training success.

Community colleges serve as repositories of training data and results. Their partner(s) can track training program data to share with others outside the initial sector partnership and support training expansion and scaling. State onsite associations and decentralized wastewater employers can use this data to approach additional community colleges and training providers, promote the sector partnership with state policymakers, and expand student recruitment efforts.

As the decentralized sector partnership develops and implements the training program, data collected by partners serves as evidence to attract funding support and for future decentralized training program efforts. This includes federal workforce grant applications, as well as state resources to assist workers with costs of tuition or training.

By working together in sector partnerships, the decentralized wastewater industry can expand opportunities for workers and build the current and future decentralized wastewater industry workforce.

# Appendix A: The Community College Training Landscape

## Community Colleges: The Basics

Community colleges are a critical component of the U.S. educational system. In 2019, the community college system, which includes over 1,100 public and independent community colleges, served 11.8 million students—6.8 million credit students (58 percent) and 5.0 million noncredit students (42 percent).[34]

Community colleges provide students with affordable education opportunities and serve diverse student populations. In 2019, 29 percent of students were the first in their family to attend college and the average student age was 28 years old. [35]

Generally, community colleges incorporate two primary missions: [36]

1. They serve as "transfer" institutions where students earn college credits toward an undergraduate degree and have the option of obtaining a bachelor's degree elsewhere. Students often obtain an Associate of Science (AS) degree prior to transferring to a four-year university.
2. They serve as "workforce" institutions where students earn either college credits toward a two-year Associate of Applied Science (AAS) degree or attend noncredit training and earn a certification, certificate, or other non-degree credential aligned to employment.

Community colleges provide both college credit and noncredit training programs. Training may be in-person, online, or hybrid, where students learn through both methods. Community colleges can deliver industry-specific training in the format that works best for employers and their workers.

Community colleges may be a large, multi-campus facility, or a smaller 1–3 building operation. Regardless of size, the community college will offer an array of education and training programs for jobs in multiple industries, such as healthcare, manufacturing, and the water sector. Even if a local college does not offer programs specifically related

[34] American Association of Community Colleges, "Fast Facts 2021," 2021. Accessed April 7, 2021: https://www.aacc.nche.edu/research-trends/fast-facts/
[35] Ibid.
[36] Opportunity America Working Group on Community College Workforce Education, "The Indispensable Institution: Reimagining Community College," 2020. Accessed April 16, 2021: https://opportunityamericaonline.org/wp-content/uploads/2020/06/Indispensable_Inst_FullReport.pdf

to wastewater treatment, other training programs provide a foundation for developing new decentralized wastewater courses and curriculum.

Community colleges provide numerous student services including access to federal and state sources of financial aid to offset the costs of learning, advising, tutoring, internships, career advising, and job placement.

Funding to support community college operation comes from a variety of state and federal sources. Some community colleges have local taxing authority and obtain a portion of local property tax revenue. Others receive state appropriations based upon funding formulas in law. Many colleges apply for and receive federal grants for specific education and training programs. Federal grants provide an opportunity for decentralized training programs to ramp up and be replicated in many communities once successful training approaches are established.

## College Credit and Noncredit Training

Workforce training at community colleges typically falls into one of two categories: (1) college credit training and (2) noncredit training.[37] College credit courses are offered on a semester or time block basis. Typically, noncredit courses start when there are enough students to participate in a course.

Community colleges also have processes that allow students to complete noncredit training and translate that experience into college credit.[38]

- **Credit Training:** Training for college credit is based upon regional accreditation requirements and students typically receive credit toward either an associate or bachelor's degree. Credit-based training programs are characterized as "time-based" and credits are issued upon successful completion of a course of study that has seat time requirements. Students demonstrate competence through testing after finishing the requisite time spent in class and doing homework.
- **Noncredit Training:** Noncredit skills training can be tailored to an employer or industry by utilizing different learning delivery formats. It may be more flexible and quickly implemented than training based on regional accreditation requirements. It can be either time-based or competency-based and usually results in some type of credential to demonstrate completion and competency. Credentials may include certificates, licenses, or industry certifications other than an associate or bachelor's degree and should be aligned to an employers' baseline hiring requirements.

As decentralized wastewater stakeholders create sector partnerships to expand training options for workers, both college credit and noncredit options should be explored. Training options can help workers quickly upskill for available jobs while promoting upward mobility and careers.

[37] Anne Arundel Community College, "Credit vs. Noncredit," 2021. Accessed April 20, 2021: https://www.aacc.edu/programs-and-courses/credit-vs-noncredit/
[38] The Kansas Board of Regents, "Credit for Prior Learning," 2021. Accessed April 20, 2021: https://www.kansasregents.org/students/credit-for-prior-learning#:~:text=Credit%20for%20Prior%20Learning%20(CPL,equivalent%20to%20college%2Dlevel%20learning