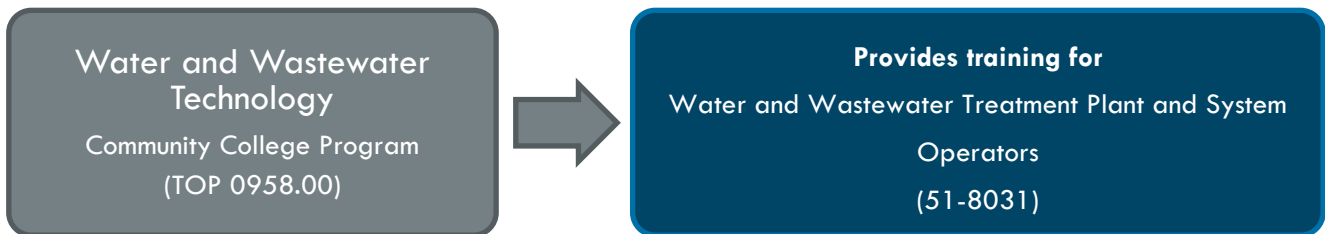


Water and Wastewater Treatment Plant and System Operators

Inland Empire/Desert Region (Riverside and San Bernardino counties)

Summary



Over the next five years (2022-2027), employment for water and wastewater treatment plant and system operators is projected to:



The Inland Empire/Desert Center of Excellence
 **Recommends**
 the water and wastewater technology program
 in the Inland Empire/Desert Region

Introduction

California Community College water and wastewater technology (TOP 0958.00) programs focus on principles, technical skills and equipment used to process, purify, store and distribute potable water, and dispose of wastewater. Design, construction, operation, and maintenance of equipment for water or wastewater treatment systems (Taxonomy of Programs, 2023). The knowledge, skills, and abilities trained by water and wastewater technology programs lead to employment as:

- Water and Wastewater Treatment Plant and System Operators (51-8031)

Job Demand

In 2022, there were 1,447 jobs for water and wastewater treatment plant and system operators in the region. Employment for water and wastewater treatment plant and system operators is projected to increase by 8% through 2027 in the two counties; 163 job openings are projected annually. Exhibit 1 displays the job counts, five-year projected job growth, and job openings in the Inland Empire/Desert region.

Exhibit 1. Five-year projections for water and wastewater treatment plant and system operators, Inland Empire/Desert Region, 2022-2027

Occupation	2022 Jobs	2027 Jobs	5-Yr % Change	5-Yr Openings (New + Replacement Jobs)	Annual Openings (New + Replacement Jobs)
Water and Wastewater Treatment Plant and System Operators	1,447	1,563	8%	815	163
Total	1,447	1,563	8%	815	163

Source: Lightcast 2023.4

An online job ad search for water and wastewater treatment plant and system operators was conducted to reveal the employers seeking these workers, including the median posting duration, earnings information, and in-demand skills. Exhibit 2 displays the number of job ads posted for water and wastewater treatment plant and system operators over the last 12 months and the median posting duration. Over the previous 12 months, there were 224 job ads for water and wastewater treatment plant and system operators in the Inland Empire/Desert Region.

Exhibit 2. Job ads and posting duration, Inland Empire/Desert Region, April 2023 through March 2024

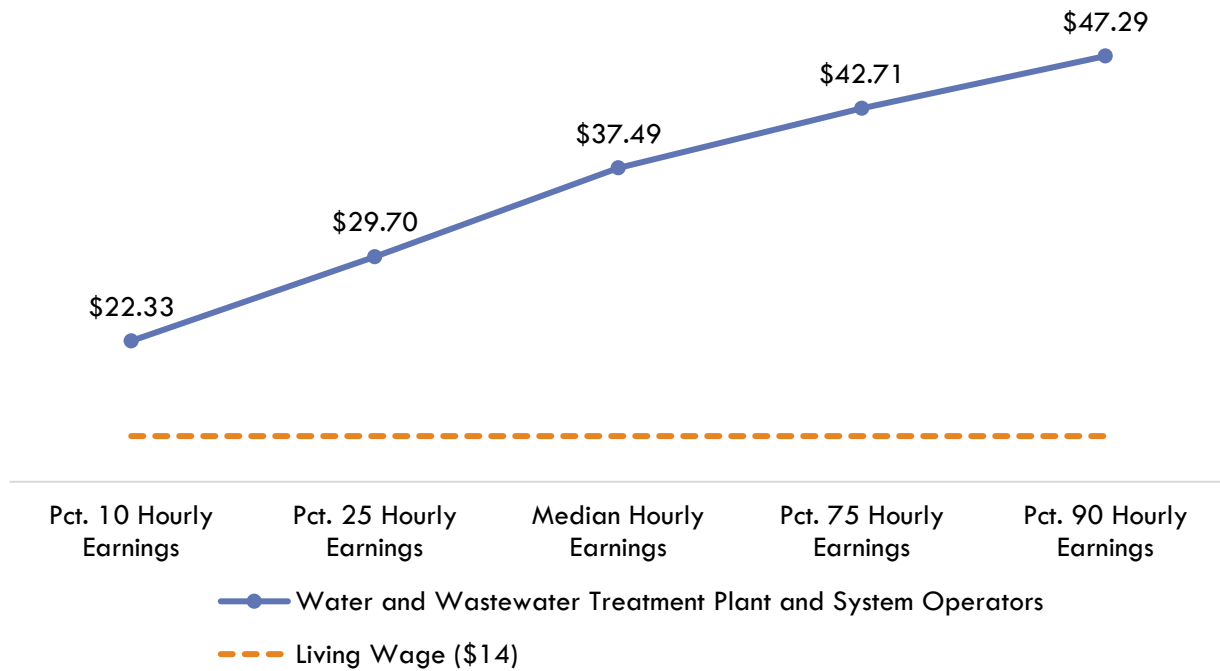
Occupation	Job Ads	Median Posting Duration (Days)
Water and Wastewater Treatment Plant and System Operators	224	27

Source: Lightcast 2023.4

Earnings

The living wage for one adult in the Inland Empire/Desert Region (Riverside and San Bernardino Counties) is \$14 per hour or \$29,120 annually. Exhibit 3 displays the hourly earnings for water and wastewater treatment plant and system operators in the Inland Empire/Desert Region. Notably, all hourly wages for water and wastewater treatment plant and system operators are above the living wage estimate.

Exhibit 3. Hourly earnings by percentile for water and wastewater treatment plant and system operators, Inland Empire/Desert Region

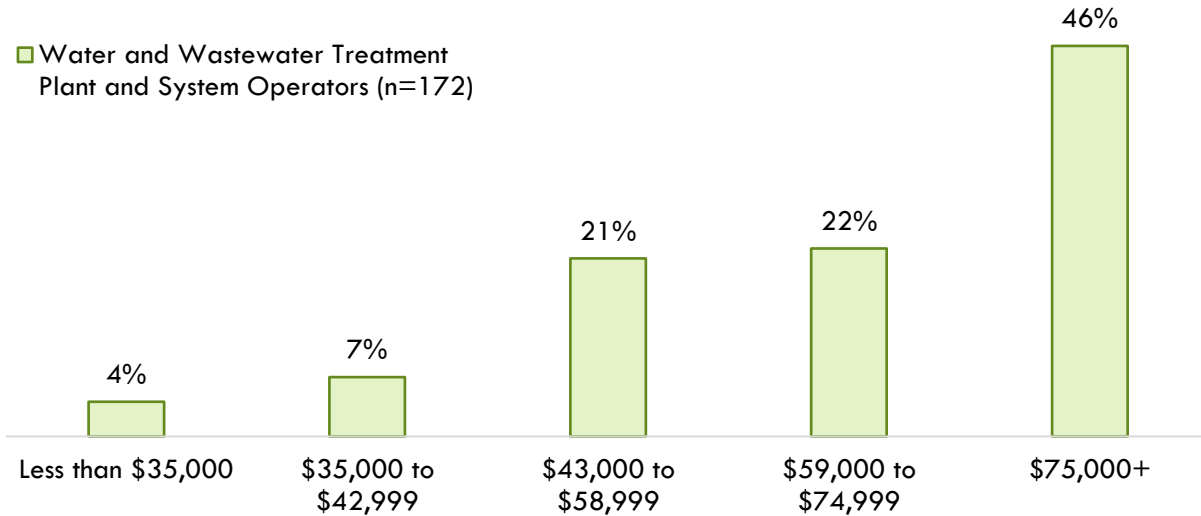


Source: Lightcast 2023.4

Advertised Salary from Online Job Ads

Exhibit 4 displays the regional online advertised salaries for water and wastewater treatment plant and system operators over the last 12 months. Online job ad salary information reveals that the majority of employers (46%) advertise an annual salary above \$75,000.

Exhibit 4. Online advertised salaries for water and wastewater treatment plant and system operators, Inland Empire/Desert Region, April 2023 through March 2024



Source: Lightcast 2023.4

Online Job Advertisements: Job Titles, Employers, Skills, Education, & Work Experience

Exhibit 5 displays the job titles most frequently used in job ads over the last 12 months. Displaying advertised job titles may provide insight into the types of positions sought by employers posting job ads.

Exhibit 5. Job titles most frequently used in job ads, Inland Empire/Desert Region, April 2023 through March 2024

Job Titles	Unique Job Ads
Water Distribution Operators	31
Water Treatment Operators	19
Sanitation Supervisors	14
Wastewater Treatment Plant Operators	14
Wastewater Plant Operators	12
Wastewater Operators	9
Water Utility Workers	8
Wastewater Technicians	8
Water Quality Specialists	7
Water Operators	7

Source: Lightcast 2023.4

Exhibit 6 displays the employers posting the most job ads for water and wastewater treatment plant and system operators during the last 12 months. Showing employer names provides insight into where students may find employment after completing a program. The top employers are Transdev and City of Riverside.

Exhibit 6. Employers posting the most job ads for water and wastewater treatment plant and system operators, Inland Empire/Desert Region, April 2023 through March 2024

Top Employer	Unique Job Ads
Transdev	18
City of Riverside	13
Liberty	11
City of Redlands	8
Liberty Utilities	7
Choice Water Solutions	6
City of Riverside	5
City of Ontario	5
Athens Services	5
Inland Empire Utilities Agency	5

Source: Lightcast 2023.4

Exhibit 7 lists a sample of specialized and employability skills employers seek when seeking workers to fill positions for water and wastewater treatment plant and system operators. Specialized skills are occupation-specific skills that employers request for industry or job competency. Common skills are foundational skills that transcend industries and occupations; this category is often referred to as "soft skills." The skills requested in job ads may be utilized to guide curriculum development.

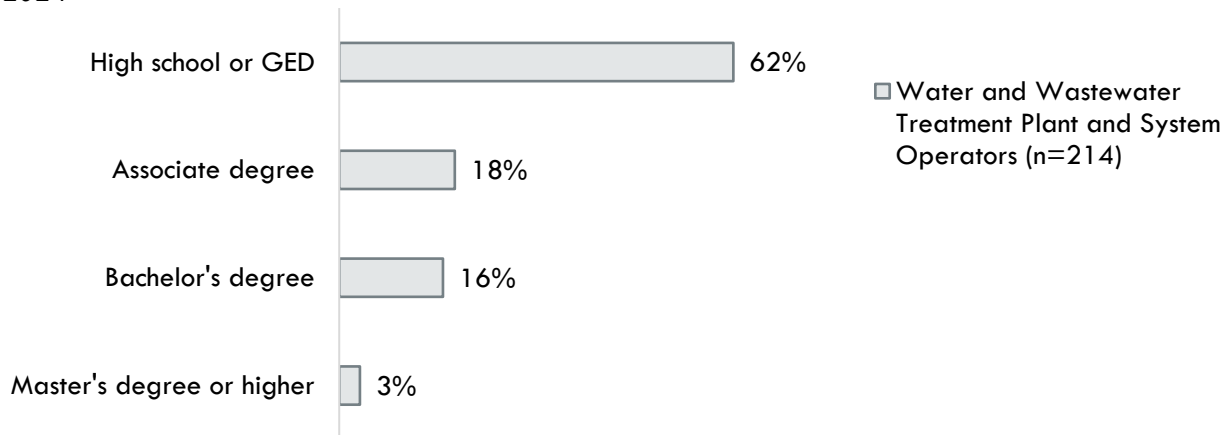
Exhibit 7. Sample of in-demand skills from employer job ads, Inland Empire/Desert Region, April 2023 through March 2024

Specialized skills	Common skills
<ul style="list-style-type: none"> • Water Distribution • Wastewater • Valves (Piping) • Sewage Treatments • Water Resources • Water Treatments Operation • Water Treatment • Laboratory Testing • Water Supply Networks • Wastewater Treatment Plant 	<ul style="list-style-type: none"> • Operations • Communication • Management • Customer Service • Troubleshooting • Leadership • English Language • Good Driving Record • Problem Solving • Sanitation

Source: Lightcast 2023.4

Exhibit 8 displays the minimum advertised education requirements for water and wastewater treatment plant and system operators. According to the Bureau of Labor Statistics, 46% of incumbent workers in this occupation hold a community college-level of educational attainment; "some college, no degree," and an "associate degree." The majority (96%) of employer job ads included minimum education requirements. Most employer job ads (62%) sought a high school diploma or GED as the minimum education requirement.

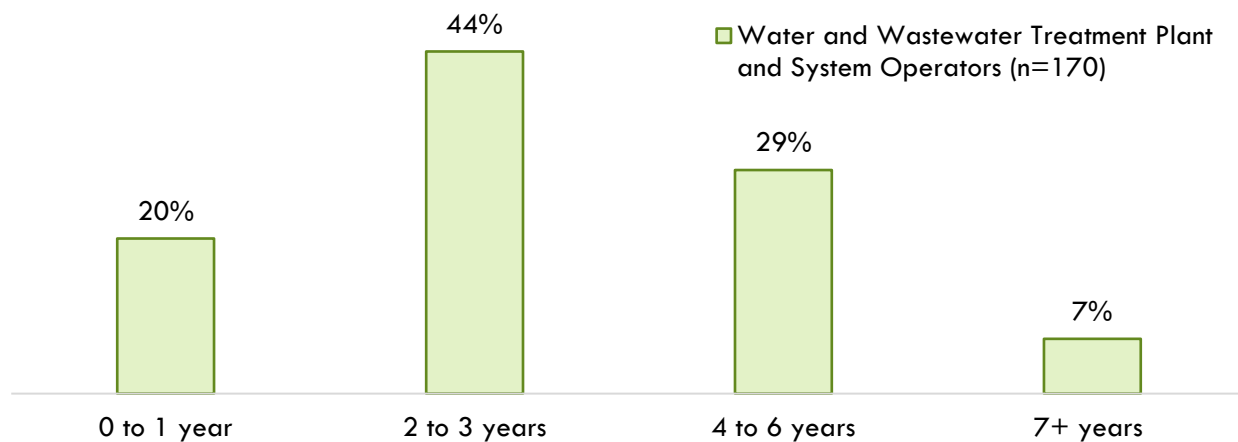
Exhibit 8. Minimum advertised education requirements, Inland Empire/Desert Region, April 2023 through March 2024



Source: Lightcast 2023.4

Exhibit 9 displays the work experience typically required from employer job ads for water and wastewater treatment plant and system operators. Nearly half (46%) of employers listing minimum experience requirements sought candidates with two to three years of previous work experience.

Exhibit 9. Real-time work experience requirements, Inland Empire/Desert Region, April 2023 through March 2024



Source: Lightcast 2023.4

Certifications

Exhibit 10 displays the most frequently requested certifications by employers in job advertisements.

Exhibit 10. Certifications most frequently required by employers, Inland Empire/Desert Region, April 2023 through March 2024

Certification	Jobs Ads
Operator Certification	16
Tanker Endorsement	12
Forklift Certification	10
CDL Class B License	10
Wastewater Operator Certification	10

Source: Lightcast 2023.4

Student Completions and Programs Outcomes

Exhibit 11 displays student completions for water and wastewater technology (TOP 0958.00) programs over the last three academic years (2020-2023). In the previous three academic years, two regional community colleges issued an average of 59 awards in water and wastewater technology programs.

Exhibit 11. Annual average community college awards for water and wastewater technology programs, Inland Empire/Desert Region, Academic Years 2020-2023

TOP Code	Program	College	2020-21 Awards	2021-22 Awards	2022-23 Awards	3-Year Award Average
0958.00	Water and Wastewater Technology	Mt. San Jacinto	32	43	22	32
		San Bernardino	26	33	22	27
Supply Total/Average			58	76	44	59

Source: MIS Data Mart

California program outcome data may provide useful insight into the likelihood of success for the proposed program. Community college student outcome information based on the selected TOP code and region is provided in Exhibit 12.

Exhibit 12. TOP 0958.00 – Water and Wastewater Technology strong workforce program outcomes, Inland Empire/Desert Region, most recent academic year

Strong Workforce Program Metrics: 0958.00 – Water and Wastewater Technology	Inland Empire/Desert Region	California
Unduplicated count of enrolled students (2021-22)	534	2,621
Completed 9+ career education units in one year (2021-22)	20%	27%
Students who attained a noncredit workforce milestone in a year (2021-22)	57%	58%
Students who earned a degree, certificate, or attained apprenticeship (2021-22)	62	270
Job closely related to the field of study (2019-20)	75%	74%
Median annual earnings (all exiters) (2020-21)	\$55,180	\$62,010
Median change in earnings (all exiters) (2020-21)	34%	24%
Attained a living wage (completers and skills-builders) (2020-21)	84%	79%

Sources: LaunchBoard Community College Pipeline and Strong Workforce Program Metrics

Exhibit 13 displays awards for other postsecondary education providers reported in Water Quality and Wastewater Treatment Management and Recycling Technology/Technician programs. Completion data is compiled from the Integrated Postsecondary Education Data System (IPEDS) for the most recent three years. No non-community college institutions issued any awards over the last three academic years.

Exhibit 13. Other educational providers for Water Quality and Wastewater Treatment Management and Recycling Technology/Technician programs, Inland Empire/Desert Region, Academic Years 2019-2022

CIP Code	Program	Institution	2019-20 Awards	2020-21 Awards	2021-22 Awards	3-Year Award Average
15.0506	Water Quality and Wastewater Treatment Management and Recycling Technology/Technician	-	-	-	-	-
Supply Total/Average			-	-	-	-

Source: IPEDS

Summary of Findings & Recommendation

Over the next five years, the occupation – water and wastewater treatment plant and system operators – is projected to have 163 annual job openings and increase employment by 8% in the Inland Empire/Desert Region. All hourly wages for water and wastewater treatment plant and system operators are above the region’s living wage estimate (\$14). Over the last 12 months, there were 224 job ads posted for water and wastewater treatment plant and system operators in the Inland Empire/Desert Region.

Over the last three academic years, there were 59 award completions for Water and Wastewater Technology (TOP 0958.00) programs in the Inland Empire/Desert Region. There were no non-community college postsecondary education institutions that issued any awards across the following program: Water Quality and Wastewater Treatment Management and Recycling Technology/Technician (CIP 15.0506). In total, regional institutions issued an average of 59 awards in relevant training programs.

Based on the 163 annual job openings (demand) and the annual average of 59 awards conferred (supply), there appears to be an undersupply in the Inland Empire/Desert Region. Due to this, the Centers of Excellence finds that there is a regional need for programs that train students to become water and wastewater treatment plant and system operators. Colleges considering this program should partner with applicable employers to document their demand for water and wastewater treatment plant and system operators and the skills/certifications required for students to earn a living wage after exiting the program.

Contact

Juan Madrigal

Center of Excellence, Inland Empire/Desert Region

juan@coeccc.net

April 2024

References

California Community Colleges Chancellor's Office. (2023). *Chancellor's Office Curriculum Inventory (COCI), version 3.0*. Retrieved from <https://coci2.ccctechcenter.org/programs>

California Community Colleges Chancellor's Office Management Information Systems (MIS) Data Mart. (2023). *Data Mart*. Retrieved from <https://datamart.cccco.edu/datamart.aspx>

California Community Colleges Chancellor's Office, Curriculum and Instructional Unit, Academic Affairs Division. (2023). *Taxonomy of Programs, 7th Edition*. Retrieved from <https://www.cccco.edu/-/media/CCCCO-Website/docs/curriculum/final-top-code-manual-2023edit-4-a11y.pdf?la=en&hash=28074BFE9915B49A7688B8BDEF0DB7E55FEB3A2C>

Lightcast. (2023). *Datarun 2023.4*. Retrieved from <https://www.economicmodeling.com/>

National Center for O*NET Development. (2023). *O*NET OnLine*. Retrieved from <https://www.onetonline.org/>

U.S. Department of Education. Institute of Education Sciences, National Center for Education Statistics. Integrated Postsecondary Education System (IPEDS). (2023). Retrieved from <https://nces.ed.gov/ipeds/use-the-data>

Appendix: Methodology

Community college student outcome information is from LaunchBoard and based on the selected TOP code and region. These metrics are based on records submitted to the California Community Colleges Chancellor's Office Management Information Systems (MIS) by community colleges, which come from self-reported student information from CCC Apply and the National Student Clearinghouse. Employment and earnings metrics are sourced from California's Employment Development Department's Unemployment Insurance database. When available, outcomes for completers are reported to demonstrate the impact that earning a degree or certificate can have on employment and earnings. For more information on the types of students included for each metric, please see the web link for LaunchBoard's Strong Workforce Program Metrics Data Element Dictionary in the References section (LaunchBoard, 2023a). Finally, employment in a job closely related to the field of study comes from self-reported student responses on the CTE Employment Outcomes Survey (CTEOS) administered by Santa Rosa Junior College (LaunchBoard, 2023a).

Table 1. 2022 to 2027 job growth, wages, entry-level education, training, and work experience required for water and wastewater treatment plant and system operators in the Inland Empire/Desert Region

Occupation (SOC)	2022 Jobs	5-Year Change	5-Year % Change	Annual Openings (New + Replacement Jobs)	Entry-Experienced Hourly Wage (10 th to 90 th percentile)	Median Hourly Wage (50 th percentile)	Average Annual Earnings	Entry-Level Education & On-The-Job-Training	Work Experience Required
Water and Wastewater Treatment Plant and System Operators (51-8031)	1,447	1,563	8%	163	\$22.33 - \$47.29	\$37.49	\$75,500	High school diploma or equivalent & Long-term	None
Total	1,447	1,563	8%	163	-	-	-	-	-

Source: Lightcast 2023.4