










# Water and Wastewater Occupations

Labor Market Analysis: San Diego County

February 2024

## Summary

NEW PROGRAM RECOMMENDATION?	EVIDENCE OF A SUPPLY GAP?	AT OR ABOVE THE LIVING WAGE?	EXPECTED LEVEL OF EDUCATION
 <b>Proceed with New Program</b>	 	 	<input type="checkbox"/> Doctorate Degree <input type="checkbox"/> Master's Degree <input type="checkbox"/> Bachelor's Degree <input type="checkbox"/> Associate Degree <input type="checkbox"/> Some College or Certificate <input checked="" type="checkbox"/> HS Diploma or Equivalent <input type="checkbox"/> Less Than a HS Diploma <input type="checkbox"/> Apprenticeship
SUPPORT FOR PROGRAM MODIFICATION?	NUMBER OF INSTITUTIONS THAT PROVIDE TRAINING	NUMBER OF ANNUAL JOB OPENINGS	
 	<div style="background-color: #4a7c9c; color: white; padding: 2px; font-weight: bold;">LOW</div> 	<div style="background-color: #4a7c9c; color: white; padding: 2px; font-weight: bold;">MEDIUM</div> 	

The San Diego & Imperial Center of Excellence (COE) developed this brief to assist the region’s community colleges with strategic planning and program development. *Water and Wastewater Occupations* include “Meter Readers, Utilities,” “Pump Operators, Except Wellhead Pumpers,” and “Water and Wastewater Treatment Plant and System Operators.” According to available data, *Water and Wastewater Occupations* in San Diego County have a labor market demand of 121 annual job openings (while average demand for a single occupation in San Diego County is 289 annual job openings), and two institutions supply 50 awards for these occupations, suggesting that there is a supply gap in the labor market. Entry-level wages are above the living wage for these occupations, and recent online job postings (2021-2023) show that average median earnings posted by employers are also above the living wage. This brief recommends proceeding with developing a new program because there is a supply gap in the region, and entry-level wages pay above the living wage. The colleges should note, however, that a high school diploma or equivalent is the typical entry-level education for these occupations.

## Introduction

This report provides labor market information in San Diego County for the following occupational code in the Standard Occupational Classification (SOC)<sup>1</sup> system:

- **Meter Readers, Utilities** (SOC 43-5041): Read meter and record consumption of electricity, gas, water, or steam.
- **Pump Operators, Except Wellhead Pumpers** (SOC 53-7072): Tend, control, or operate power-driven, stationary, or portable pumps and manifold systems to transfer gases, oil, other liquids, slurries, or powdered materials to and from various vessels and processes.
- **Water and Wastewater Treatment Plant and System Operators** (SOC 51-8031): Operate or control an entire process or system of machines, often through the use of control boards, to transfer or treat water or wastewater.

For the purpose of this report, these occupations are referred to as *Water and Wastewater Occupations*.

## Projected Occupational Demand

Between 2023 and 2028, employers in San Diego County will need to hire 121 workers annually to fill new jobs and backfill jobs in *Water and Wastewater Occupations* due to attrition caused by turnover and retirement, for example (Exhibit 1). “Water and Wastewater Treatment Plant and System Operators” are projected to have the most labor market demand between 2023 and 2028, with 93 annual job openings.

**Exhibit 1: Number of Jobs for Water and Wastewater Occupations (2023-2028)<sup>2</sup>**

Occupational Title	2023 Jobs	2028 Jobs	2023 – 2028 Net Jobs Change	2023 - 2028 % Net Jobs Change	Annual Job Openings (Demand)
Water and Wastewater Treatment Plant and System Operators	903	940	37	4%	93
Pump Operators, Except Wellhead Pumpers	157	161	4	3%	17
Meter Readers, Utilities	116	119	3	3%	11
<b>Total</b>	<b>1,176</b>	<b>1,220</b>	<b>44</b>	<b>4%</b>	<b>121</b>

<sup>1</sup> The Standard Occupational Classification (SOC) system is used by federal statistical agencies to classify workers into occupational categories for the purpose of collecting, calculating or disseminating data. [bls.gov/soc](https://www.bls.gov/soc).

<sup>2</sup> Lightcast 2024.01; QCEW, Non-QCEW, Self-Employed.

## Earnings

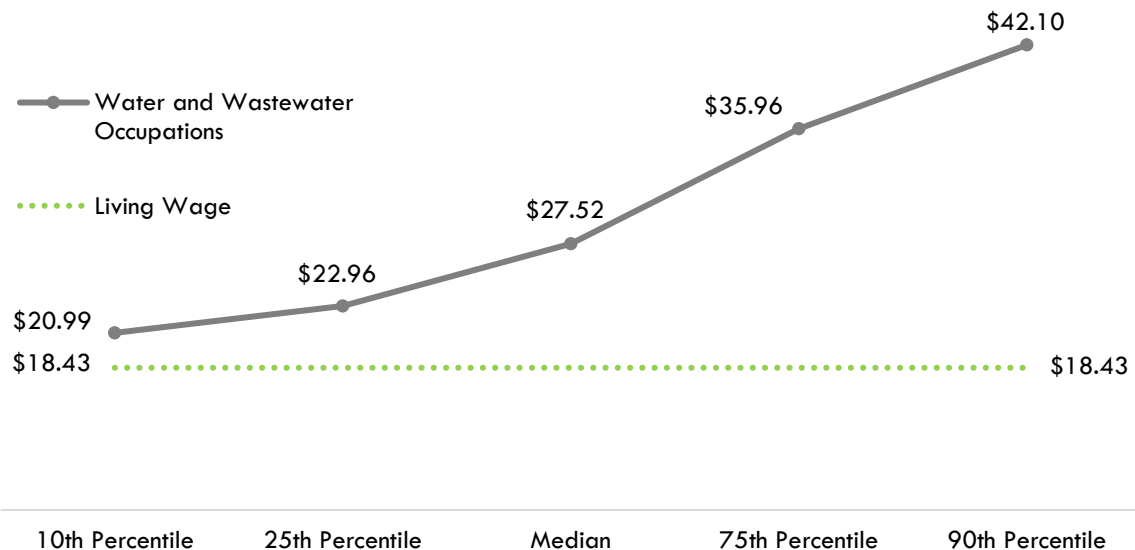
According to traditional<sup>3</sup> labor market information (LMI), entry-level hourly earnings for *Water and Wastewater Occupations* range from \$21.28 to \$25.90 (Exhibit 2).

**Exhibit 2: Hourly Earnings for Water and Wastewater Occupations in San Diego County<sup>4</sup>**

Occupational Title	Entry-Level Hourly Earnings (25 <sup>th</sup> Percentile)	Median Hourly Earnings	Experienced Hourly Earnings (75 <sup>th</sup> Percentile)
Water and Wastewater Treatment Plant and System Operators	\$25.90	\$32.28	\$40.85
Pump Operators, Except Wellhead Pumpers	\$21.69	\$26.19	\$32.99
Meter Readers, Utilities	\$21.28	\$24.09	\$34.05

On average, the entry-level hourly earnings are \$22.96—or \$47,750 annual salary<sup>5</sup>; this is more than the living wage for a single adult in San Diego County, which is \$18.43 per hour (Exhibit 3).<sup>6</sup>

**Exhibit 3: Hourly Earnings<sup>7</sup> for Water and Wastewater Occupations in San Diego County<sup>8</sup>**



<sup>3</sup> Traditional LMI is generally historical data captured by the U.S. Bureau of Labor Statistics (BLS) or the California Employment Development Department (EDD). It does not account for recent technological, economic, or legislative changes that may affect labor market demand and wages.

<sup>4</sup> Lightcast 2024.01; QCEW, Non-QCEW, Self-Employed.

<sup>5</sup> Annualized salaries assume a full-time position with 2,080 hours. Multiplying the hourly wage with 2,080 yields the annual salary.

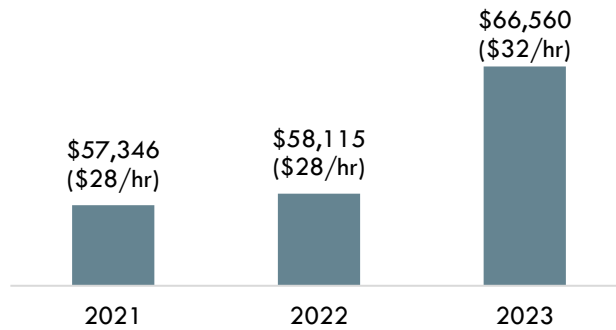
<sup>6</sup> "Family Needs Calculator (formerly the California Family Needs Calculator)," Insight: Center for Community Economic Development, last updated 2022. [insightccd.org/family-needs-calculator](https://insightccd.org/family-needs-calculator).

<sup>7</sup> 10th and 25th percentiles could be considered entry-level wages, and 75th and 90th percentiles could be considered experienced wages for individuals who may have been in the occupation longer, received more training than others, etc.

<sup>8</sup> Lightcast 2024.01; QCEW, Non-QCEW, Self-Employed.

Between January 1, 2021 and December 30, 2023, employers advertised between \$28 to \$32 per hour in online job postings for *Water and Wastewater Occupations* in San Diego County (Exhibit 4).<sup>9</sup> This suggests that employers in recent years are increasing wages due to labor market forces that may not be captured by traditional LMI.

**Exhibit 4: Median Advertised Salaries in Online Job Postings for *Water and Wastewater Occupations* in San Diego County (2021-2023)**



## Expected Level of Education

According to traditional LMI, *Water and Wastewater Occupations* have a national educational attainment of a high school diploma or equivalent.<sup>10</sup> (Exhibit 5).

**Exhibit 5: National Educational Attainment for *Water and Wastewater Occupations*<sup>11</sup>**

Occupational Title	Typical Entry-Level Education
Water and Wastewater Treatment Plant and System Operators	High school diploma or equivalent
Pump Operators, Except Wellhead Pumps	High school diploma or equivalent
Meter Readers, Utilities	High school diploma or equivalent

<sup>9</sup> Lightcast 2024.01; "Job Posting Analytics." 2021-2023.

<sup>10</sup> Lightcast 2024.01; QCEW, Non-QCEW, Self-Employed.

<sup>11</sup> Lightcast 2024.01; QCEW, Non-QCEW, Self-Employed.

Similarly, online job postings between January 1, 2021 and December 31, 2023 in San Diego County had a high school diploma or equivalent as the most requested educational requirement for *Water and Wastewater Occupations*; however, employers also expected the following certifications (Exhibit 6).<sup>12</sup>

**Exhibit 6: Top Certifications for Water and Wastewater Occupations in San Diego County in Online Job Postings (2021-2023)<sup>13</sup>**

- |                                                      |                                           |
|------------------------------------------------------|-------------------------------------------|
| 1. CDL Class C License                               | 8. Security Clearance                     |
| 2. First Aid Certification                           | 9. Certified First Responder (CFR)        |
| 3. Wastewater Operator Certification                 | 10. Forklift Certification                |
| 4. Operator Certification                            | 11. Tanker Endorsement                    |
| 5. Cardiopulmonary Resuscitation (CPR) Certification | 12. Applied Structural Drying             |
| 6. CDL Class B License                               | 13. Commercial Driver's License (CDL)     |
| 7. CDL Class A License                               | 14. IV (Intravenous) Certification        |
|                                                      | 15. Tanker And Hazmat Combo X Endorsement |

## Educational Supply

Educational supply for an occupation can be estimated by analyzing the number of awards in related Taxonomy of Programs (TOP) or Classification of Instructional Programs (CIP) codes. There is **one** TOP code and **one** CIP code related to *Water and Wastewater Occupations* (Exhibit 7).

**Exhibit 7: Related TOP and CIP Codes for Water and Wastewater Occupations<sup>14</sup>**

TOP or CIP Code	TOP or CIP Program Title
TOP 0958.00	Water and Wastewater Technology
CIP 15.0506	Water Quality and Wastewater Treatment Management and Recycling Technology/Technician

<sup>12</sup> Lightcast 2024.01; "Job Posting Analytics." 2021-2023.

<sup>13</sup> Lightcast 2024.01; "Job Posting Analytics." 2021-2023.

<sup>14</sup> This brief uses a conservative estimate of program supply and only calculates awards from the TOP code listed in Exhibit 7.

According to TOP data, **two** community colleges supply the region with awards for these occupations: **Cuyamaca College** and **Palomar College**. According to CIP data, **no** non-community-college institution supplies the region with awards (Exhibit 8).

**Exhibit 8: Number of Awards (Certificates and Degrees) Conferred by Postsecondary Institutions  
(Program Year 2019-20 Through Program Year 2021-22 Average)**

TOP6 or CIP Code	TOP6 or CIP Program Title	3-Yr Annual Average CC Awards (PY19-20 to PY21-22)	Other Educational Institutions 2-Yr Annual Average Awards (PY19-20 to PY20-21)	Total Average Supply (PY19-20 to PY21-22)
0958.00	Water and Wastewater Technology	<b>50</b>	<b>0</b>	<b>50</b>
	Cuyamaca	<b>19</b>	<b>0</b>	
	• Associate Degree	7	0	
	• Certificate 30 < 60 units	7	0	
	• Certificate 16 < 30 units	5	0	
	Palomar	<b>31</b>	<b>0</b>	
	• Associate Degree	12	0	
	• Certificate 30 < 60 units	15	0	
	• Certificate 16 < 30 units	4	0	
			<b>Total</b>	<b>50</b>

## Demand vs. Supply

Comparing labor demand (annual openings) with labor supply<sup>15</sup> suggests that there is a **supply gap** for these occupations in San Diego County, with **121** annual openings and **50** awards. Comparatively, there are **1,358** annual openings in California and **538** awards, suggesting that there is also a **supply gap** across the state<sup>16</sup> (Exhibit 9).

**Exhibit 9: Labor Demand (Annual Openings) Compared with Labor Supply (Average Annual Awards)**

	<b>Demand</b> (Annual Openings)	<b>Supply<sup>17</sup></b> (Annual Awards)	<b>Supply Gap or Oversupply</b>
San Diego	121	50	<b>71</b>
California	1,358	538	<b>820</b>

**Please note:** This is a basic analysis of supply and demand of labor. The data does not include workers currently in the labor force who could fill these positions or workers who are not captured by publicly available data. This data should be used to discuss the potential gaps or oversupply of workers; however, it should not be the only basis for determining whether or not a program should be developed.

<sup>15</sup> Labor supply can be found from two different sources: Lightcast or the California Community Colleges Chancellor's Office MIS Data Mart. Lightcast uses CIP codes while MIS uses TOP codes. Different coding systems result in differences in the supply numbers.

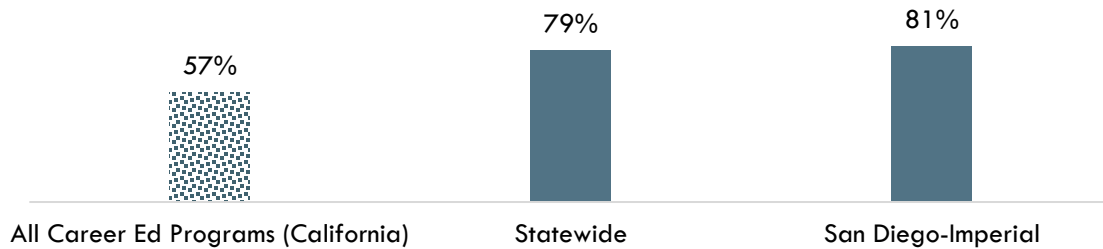
<sup>16</sup> "Supply and Demand," Centers of Excellence Student Outcomes, [coecc.net/our-resources](http://coecc.net/our-resources).

<sup>17</sup> Awards included: associate degree; award <1 year; award 1<2 years; and postsecondary awards.

## Student Outcomes and Regional Comparisons

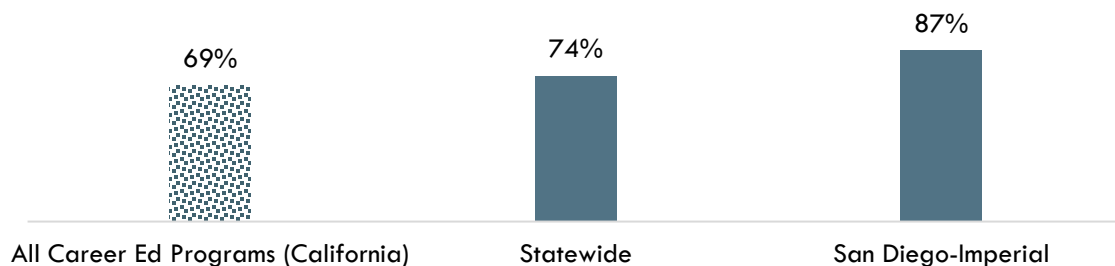
According to the California Community Colleges LaunchBoard, 81 percent of students in the San Diego-Imperial region earned a living wage after completing a Water and Wastewater Technology (TOP 0958.00) program, compared to 79 percent statewide and 57 percent of students in Career Education programs in general across the state (Exhibit 10).<sup>18</sup>

**Exhibit 10: Percentage of Students Who Earned a Living Wage by Program, PY2020-21<sup>19</sup>**



According to the California Community Colleges LaunchBoard, 87 percent of students in the San Diego-Imperial region obtained a job closely related to their field of study after completing a Water and Wastewater Technology (TOP 0958.00) program, compared to 74 percent statewide and 69 percent of students in Career Education programs in general across the state (Exhibit 11).<sup>20</sup>

**Exhibit 11: Percentage of Students in a Job Closely Related to Field of Study by Program, PY2019-20<sup>21</sup>**



<sup>18</sup> "California Community Colleges Strong Workforce Program," California Community Colleges, [calpassplus.org/LaunchBoard/SWP.aspx](http://calpassplus.org/LaunchBoard/SWP.aspx).

<sup>19</sup> Most recent year with available data is Program Year 2020-21. Among completers and skills builders who exited, the percentage of students who attained a living wage.

<sup>20</sup> "California Community Colleges Strong Workforce Program," California Community Colleges, [calpassplus.org/LaunchBoard/SWP.aspx](http://calpassplus.org/LaunchBoard/SWP.aspx).

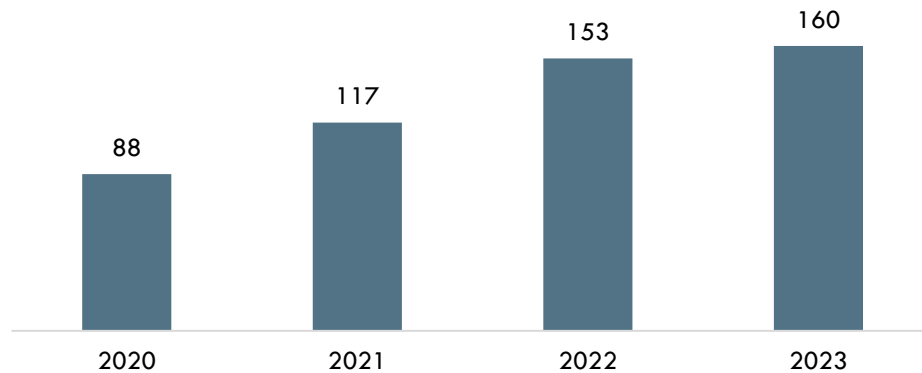
<sup>21</sup> Most recent year with available data is Program Year 2019-20. Percentage of Students in a Job Closely Related to Field of Study: Among students who responded to the CTEOS, the percentage reporting employment in the same or similar field as their program of study.



## Online Job Postings

This report analyzes not only historical and projected (traditional LMI) data, but also recent data from online job postings (real-time LMI). Online job postings may provide additional insight about recent changes in the labor market that are not captured by historical data. Between 2020 and 2023, there was an average of 130 online job postings per year for *Water and Wastewater Occupations* in San Diego County (Exhibit 12). Please note that online job postings do **not** equal labor market demand; demand is represented by annual job openings (see Exhibit 1). While this brief includes online jobs postings data to help with curriculum development, the community colleges should note that this type of data is impacted by several variables: employers may post a position multiple times to increase the pool of applicants; a job posting can remain posted after a business decides not to fill a position; or an employer may use one posting to fill multiple positions, for example.

**Exhibit 12: Number of Online Job Postings for *Water and Wastewater Occupations* in San Diego County (2020-2023)<sup>22</sup>**



<sup>22</sup> Lightcast 2024.01; "Job Posting Analytics." 2020-2023.

## Employers

Between January 1, 2021 and December 31, 2023, the top five employers in San Diego County for *Water and Wastewater Occupations* were [City of San Diego](#), [ServiceMaster](#), [Aerotek](#), [City of Escondido](#), and [Transdev](#) based on online job postings (Exhibit 13).

**Exhibit 13: Top Employers for *Water and Wastewater Occupations* in San Diego County<sup>23</sup>**

Top Employers	
<ul style="list-style-type: none"> <li>• City of San Diego</li> <li>• ServiceMaster</li> <li>• Aerotek</li> <li>• City of Escondido</li> <li>• Transdev</li> </ul>	<ul style="list-style-type: none"> <li>• City of Oceanside</li> <li>• Helix Water District</li> <li>• Hollandia Dairy</li> <li>• TTM Technologies</li> <li>• Otay Water District</li> </ul>

## Skills

Exhibit 14 lists the top specialized, soft, and software skills that appeared in online job postings between January 1, 2021 and December 31, 2023.

**Exhibit 14: Top Skills for *Water and Wastewater Occupations* in San Diego County<sup>24</sup>**

Specialized Skills	Soft Skills	Software Skills
<ul style="list-style-type: none"> <li>• Wastewater</li> <li>• Wastewater Treatment Plant</li> <li>• Sewage Treatments</li> <li>• Valves</li> <li>• Water Resources</li> <li>• Water Treatment</li> <li>• Supervisory Control And Data Acquisition</li> <li>• Machinery</li> <li>• Plumbing</li> <li>• Water Distribution</li> <li>• Biology</li> <li>• Forklift Truck</li> <li>• Electric Motors</li> <li>• Preventive Maintenance</li> <li>• Water Supply Networks</li> </ul>	<ul style="list-style-type: none"> <li>• Operations</li> <li>• Communication</li> <li>• Customer Service</li> <li>• Management</li> <li>• Mathematics</li> <li>• Good Driving Record</li> <li>• Lifting Ability</li> <li>• Troubleshooting</li> <li>• English Language</li> <li>• Detail Oriented</li> <li>• Planning</li> <li>• Writing</li> <li>• Computer Literacy</li> <li>• Record Keeping</li> <li>• Defensive Driving</li> </ul>	<ul style="list-style-type: none"> <li>• Spreadsheets</li> <li>• Microsoft Excel</li> <li>• Microsoft Outlook</li> <li>• Microsoft Word</li> <li>• Microsoft Access</li> <li>• Geographic Information Systems</li> <li>• Microsoft PowerPoint</li> <li>• IBM Maximo</li> <li>• AutoCAD</li> <li>• Microsoft Operating Systems</li> <li>• Operational Data Store</li> <li>• Database Software</li> <li>• AutoCAD Civil 3D</li> <li>• Java</li> <li>• Visual Basic</li> </ul>

<sup>23</sup> Lightcast 2024.01; "Job Posting Analytics." 2021-2023.

<sup>24</sup> Lightcast 2024.01; "Job Posting Analytics." 2021-2023.

Prepared by:

Tina Ngo Bartel, Director ([tngobartel@miracosta.edu](mailto:tngobartel@miracosta.edu))

John Edwards, Research Analyst ([jedwards@miracosta.edu](mailto:jedwards@miracosta.edu))

San Diego & Imperial Center of Excellence

## **SAN DIEGO & IMPERIAL COUNTIES**

---

## **COMMUNITY COLLEGES**

### **Important Disclaimers**

All representations included in this report have been produced from primary research and/or secondary review of publicly and/or privately available data and/or research reports. This study examines the most recent data available at the time of the analysis; however, data sets are updated regularly and may not be consistent with previous reports. Efforts have been made to qualify and validate the accuracy of the data and the report findings; however, neither the Centers of Excellence for Labor Market Research (COE), COE host district, nor California Community Colleges Chancellor's Office are responsible for the applications or decisions made by individuals and/or organizations based on this study or its recommendations.