PRIORITY SECTO

Life Sciences

LABOR MARKET ANALYSIS
SAN DIEGO COUNTY

October 2014

A proud partner of Americ
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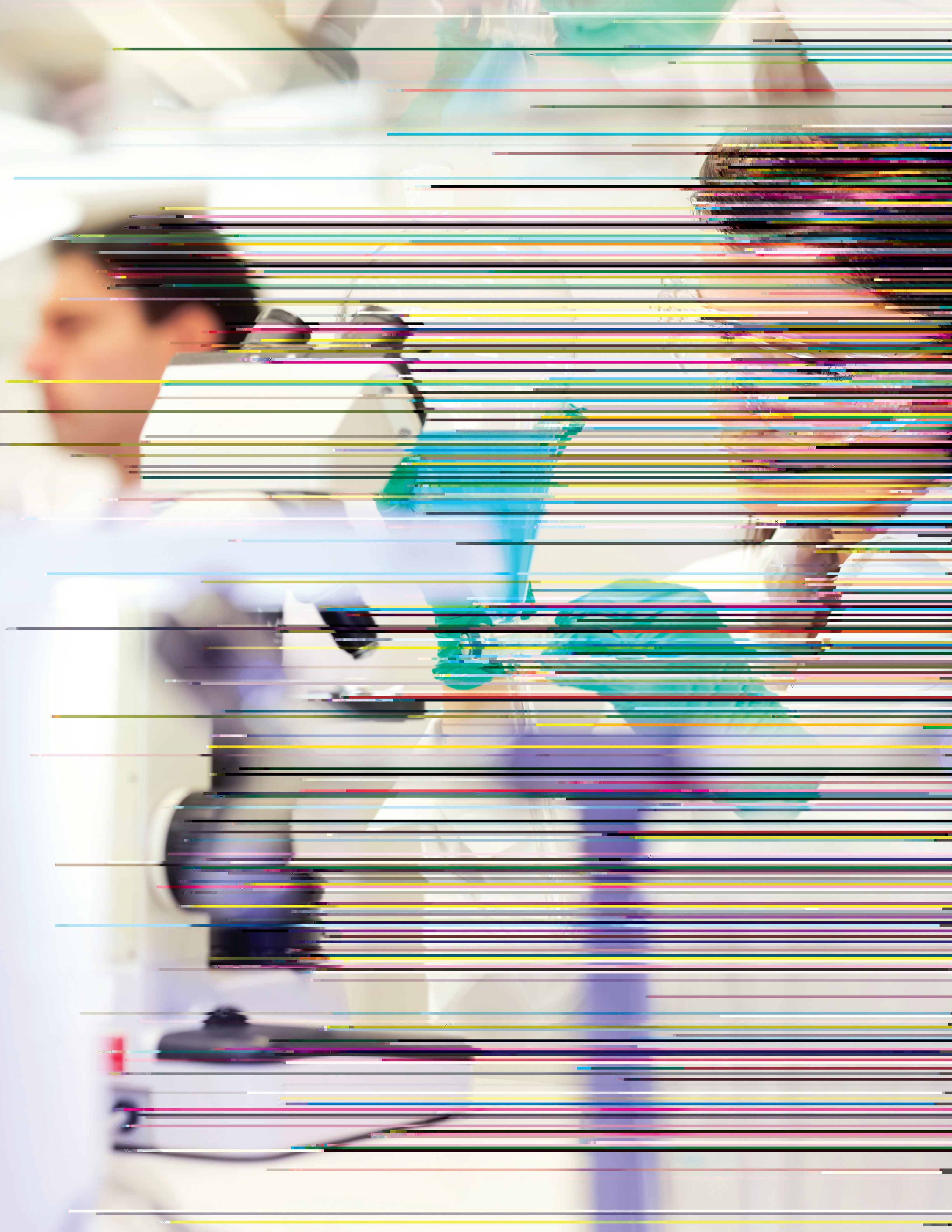

INTRODUCTION

Life Sciences is a sector that exists at the crossroads of innovative scientific research and the dynamic market economy. This sector, also referred to as Biotechnology (or Biotech), is focused on finding solutions IRU WKH ZRUOGèV JUHD care, agriculture and sustainability. The Life Sciences sector is a significant employer in San Diego County (more than 45,000 jobs in 2013), and the County has been LGHQWLILHG DV RQH RI regions for biotechnology business and research.[2]

Since 2001, San Diego has consistently been ranked as one of the top 10 regions for this sector in the country.[3] A 2004 stud

Employment in San Diego County

With approximately 45,000 workers in San Diego County averaging over $125,000 in annual earnings, the Life Sciences sector has demonstrated that it is a strong and steady job generator, growing employment over the past decade at a pace well above the national average. It also has fared much better than the overall economy through the recent U.S. recession and into the first few years of the recovery. This can partially be attributed to the diverse set of markets that the sector serves.

> **Life Sciences Employment in California**
>
> California has the largest biotechnology employment base in the U.S. with more than 235,000 jobs spanning over 8,000 individual business establishments.

The occupations selected for this study are found across many industries including Professional, Scientific and Technical Services, Ambulatory Health Care Services, Chemical Manufacturing, Computer and Electronic Product Manufacturing, Miscellaneous Manufacturing, Educational Services, and Administrative and Support Services. Geographically speaking the Life Sciences sector spans across San Diego County, but is concentrated in Sorrento Valley and Carlsbad. Figure 1 demonstrates where Life Sciences employment is found in the region.

Figure 1: Life Sciences Employment in San Diego County

According to the San Diego Association of Governments (SANDAG), employment in the Life Sciences subsectors are located primarily in North County or the Metro area. Ninety-eight percent of pharmaceutical employment is found in either North County (49 percent) or the Metro area (49 percent), biomedical device employment is largely split between the Sorrento Valley and the Carlsbad area, and the majority of research and development jobs (89 percent) are centered in the Sorrento Valley. Additional maps by subsector can be found in Appendix E.

Table 2: Employment Distribution by Geographic Area, 2013[15]

National employment in the Life Sciences sector saw a slight decline nationally from 2008 to 2010 during the Great Recession. At the same time, San Diego & R X Q W \ ¶ V Life Sciences sector experienced considerable growth. The significant spike in growth for Life Sciences between 2009 and 2010 was due to the expansion of research and development in the County. Research and development[18] added approximately 8,700 jobs in this time period, a 39 percent growth, contributing to this sector being recession-proof in San Diego.

Between 2005 and 2014, employment was not driven by growth in only one or two industries in the Life Sciences sector. Sixteen industries experienced growth, while two declined. Thirteen of the 26 Life Sciences industries[19] had over 30 percent employment growth from 2005 to 2014. The Life Sciences industries in San Diego with the highest overall growth are:

1. Irradiation Apparatus Manufacturing (617 jobs, 1,870% growth)
2. Analytical Laboratory Instrument Manufacturing (504 jobs, 229% growth)
3. Medical Laboratories (2,577 jobs, 179% growth)
4. Testing Laboratories (4,595 jobs, 130% growth)
5. Medicinal and Botanical Manufacturing (273 jobs, 85% growth)

Fifty percent of Life Sciences firms in San Diego anticipate adding more employees over the next 12 months, totaling 9.4 percent growth (Figure 3). Only 2 percent of firms surveyed expected to have fewer permanent employees in 12 months, while approximately two out of every five firms predicted that they would maintain current permanent employment levels.

Figure 3: Fir M S Overall Expected 12-Month Growth[20]

2014 Jobs		2015 Jobs		Projected Growth
45,636	Æ	49,926	=	9.4%

Life Sciences firms engaged in multiple subsectors (those that perform more than one type of work) were the most optimistic about their growth expectations with 67 percent expecting to have more employees 12 months from now (Figure 4). Businesses involved across multiple subsectors in Life Sciences are likely more optimistic as they represent a larger swath of the industry; an industry that has experienced prominent and steady growth over the last decade.[21] Agricultural and industrial biotechnology and pharmaceuticals were the other two subsectors above the industry average for increased hiring expectations atTJ [(19ie)6(c(e)6((d))&4e)6(nt)-10

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Figure 4: Hiring Expectations of Life Sciences Companies in the Next 12 Months, by Subsector[23] (n=137)

Medium and large Life Sciences firms with 10 or more employees were more likely to indicate they expect to have more employees 12 months from now compared to small- and micro-employers with fewer than 10

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Difficulties in Hiring

Life Sciences firms were tasked with ranking their difficulty in finding both entry-level and experienced applicants at their San Diego County locations. Over half of Life Science businesses indicated at least some difficulty finding qualified applicants (either for entry-level or experienced workers) who meet their R U J D Q L] D W L R Q è V V W D Q G D U G V

Employers in Life Sciences are more likely to emphasize the challenge and difficulty associated with finding and retaining experienced employees than entry-level employees. This is typical for most sectors that are growing and tend to have a higher percentage of high-skill and high-wage occupations. Interestingly, Life Sciences employers emphasize more importance of technical skills for experienced applicants than non-technical skills or industry experience.

Figure 9 demonstrates the difficulty San Diego Life Sciences employers have in finding both entry-level and experienced applicants. Employers reported having more difficulty in finding qualified experienced workers (57 percent) than qualified entry-level workers (41 percent).

Figure 9: Employer Reported Difficulty in Hiring Qualified Candidates, Entry-level and Experienced

Each subsector had at least half of business respondents indicate they are having some or great difficulty in finding qualified applicants (Figure 10).

Figure 10: Employer Reported Difficulty in Hiring Qualified Candidates, by Subsectors[31] have in es

Table4

they are expected to possess advanced industry knowledge and interpersonal communication skills (to maintain interactive relationships) that may be obtained through an advanced degree program or several years of experience in the industry.

Figure12: Educational Requirements by Occupation[35]

Employers indicated lower educational requirements for lab assistants, technicians or specimen accessioners or processors (55 percent require an associate degree or less), manufacturing or production technicians or assemblers (61 percent require an associate degree or less), and materials handlers or supply-chain technicians (73 percent require an associate degree or less). Fifty-seven Life Sciences employers in San Diego County are satisfied with the completion of high school or equivalency for materials handlers or supply-chain technicians.

The nine occupations in this study largely represent the entry-level positions with lower educational requirements in the Life Sciences sector. Even with the emphasis on entry-level positions, over 70 percent RI HPSOR\HUV H[SHFWHG D EDFKHORUèV RU JUDGXDWH GHJUHH IRU VL[third to over half of employers indicated that they sometimes or rarely would hire individuals with less than the typical education requirements.

To understand if education was a deal-breaker in hiring, Life Sciences firms were asked how often they hired applicants with less than the typical education requirements for the position. At least 30 percent of

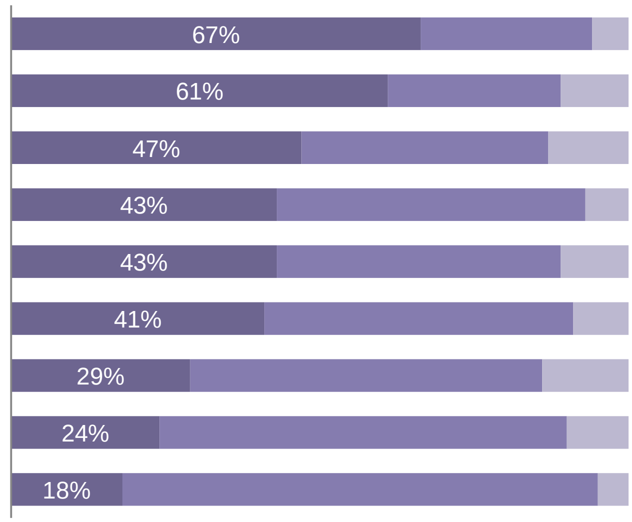
-To un

Figure 13: Frequency of Hiring Applicant with Less than Requirements (n=137)

Education Versus Work Experience

To discern employer needs and expectations for each occupation, employers who completed the survey were asked to state their preference

Figure14: Employer Preference for Hiring: Education versus Work Experience



Regional Supply

In San Diego, approximately 20 programs across eight institutions train workers for the nine occupations studied in this report, graduating over 400 students in fields related to these jobs. Regional institutions that train in Life Sciences include MiraCosta College, Miramar College, San Diego City College, Southwestern College, University of California San Diego (UCSD), San Diego State University, University of San Diego and National University, graduating students with credentials ranging from certificates and associate degrees XS WR EDFKHORUèV DQG[36] PDVWHUèV GHJUHHV

The regional supply of educated and trained entry-level workforce was determined by examining the regional community college, public and private university programs related to Life Sciences. The supply data LQFOXGHG LQIRUPDWLRQ IURP WKH &DOLIRUQLD &RPPXQLW\ &ROOHJHV[37] for community colleges and the Integrated Postsecondary Education Data System (IPEDS) completions data for four-year universities and proprietary institutions in the San Diego region.

Education data was collected by using O*NETèV occupational crosswalk in order to determine technical skills for each occupation and to obtain the taxonomy of programs (TOP) codes (for community colleges) and Classification of Instructional Programs (CIP) codes (for all other institutions) that are associated with the standard occupational classification (SOC) codes. A gap analysis is particularly difficult for the Life Sciences occupations selected for this report, as they are not easily classified using available SOC codes. The following analysis matches occupations, educational programs and program completions using their approximate matches. DataMart and IPEDS were used to retrieve the number of educational programs that were offered over the last three years for each educational institution. For lab assistant occupations, information from faculty interviews with community colleges was utilized.

[36] For the full breakdown of programs, institutions and completions, see Appendix B.
[37] http://datamart.cccco.edu

Table 5 is a summary of the occupational TOP codes, number of programs that are offered for each occupation and the number of institutions that offer the programs. This table includes programs in the U H J L R Q è V community colleges and public and private universities. Tuniversities

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Medical and Clinical Laboratory Technologists

Standard Occupational Code: 29-2011
Other Job Title(s):

Medical Scientists, Except Epidemiologists

Standard Occupational Code: 19-1042
Other Job Title(s): Research Associate, Research Assistant, Clinical Laboratory Scientist, Laboratory Technologist, Scientist

Description:

Sales Representatives, Wholesale and Manufacturing, Technical and Scientific Products

Standard Occupational Code: 41-4011
Other Job Title(s): Business Development Specialist, Sales Representative, Account Manager, Sales Specialist, Sales Executive, Inside Sales Representative, Outside Sales Representative

Description: Sell goods for wholesalers or manufacturers where technical or scientific knowledge is required in such areas as biology, engineering, chemistry and electronics, normally obtained from at least 2 years of post-secondary education.

Fast Facts	
Current Employment (2013)	4,079
Projected Employment (2018)	4,531
Growth Rate (2013-2018)	11%
Average Annual Openings (2013-2018)	183
Hourly Pay Range	

Laborers and Freight Stock Materials Movers, Hand

Production, Planning, and Expediting Clerks

Standard Occupational Code: 43-5061
Other Job Title(s): Materials Handler, Supply Chain Technician, Scheduler, Operations Specialist, Production Assistant, Production Coordinator

Description: Coordinate and expedite the flow of work and materials within or between departments of an establishment according to production schedule. Duties include reviewing and distributing production, work and shipment schedules; conferring with department supervisors to determine progress of work and completion dates; and compiling reports on progress of work, inventory levels, costs and production problems.

Fast Facts	
Current Employment (2013)	3,610
Projected Employment (2018)	

Sales Representative CIP: 52.1804			
San Diego State University	Business, Management, Marketing, and Related Support	Master	24
	Sub Total		24
		Total Completions	269

7KH &DOLIRUQLD &RPPXQLW\ &ROOHJHVè /LIH 6FLHQFHV %LRWHFKQRORJ\ ,QLW research in 2014 that determined that the Data Mart data reported for these programs by colleges was incomplete and not reflective of actual supply. The research team conducted interviews with faculty members of the four community colleges in San Diego County and determined the numbers shown in this table as actual annual supply of job ready laboratory workforce.

Job Title nSOC Crosswalk

Employers advertise open positions using job titles that differ significantly from the standard occupational classification (SOC) titles used by the U.S. Department of Labor, Bureau of Labor Statistics (BLS)

Crosswalk of Job Titles & SOCs

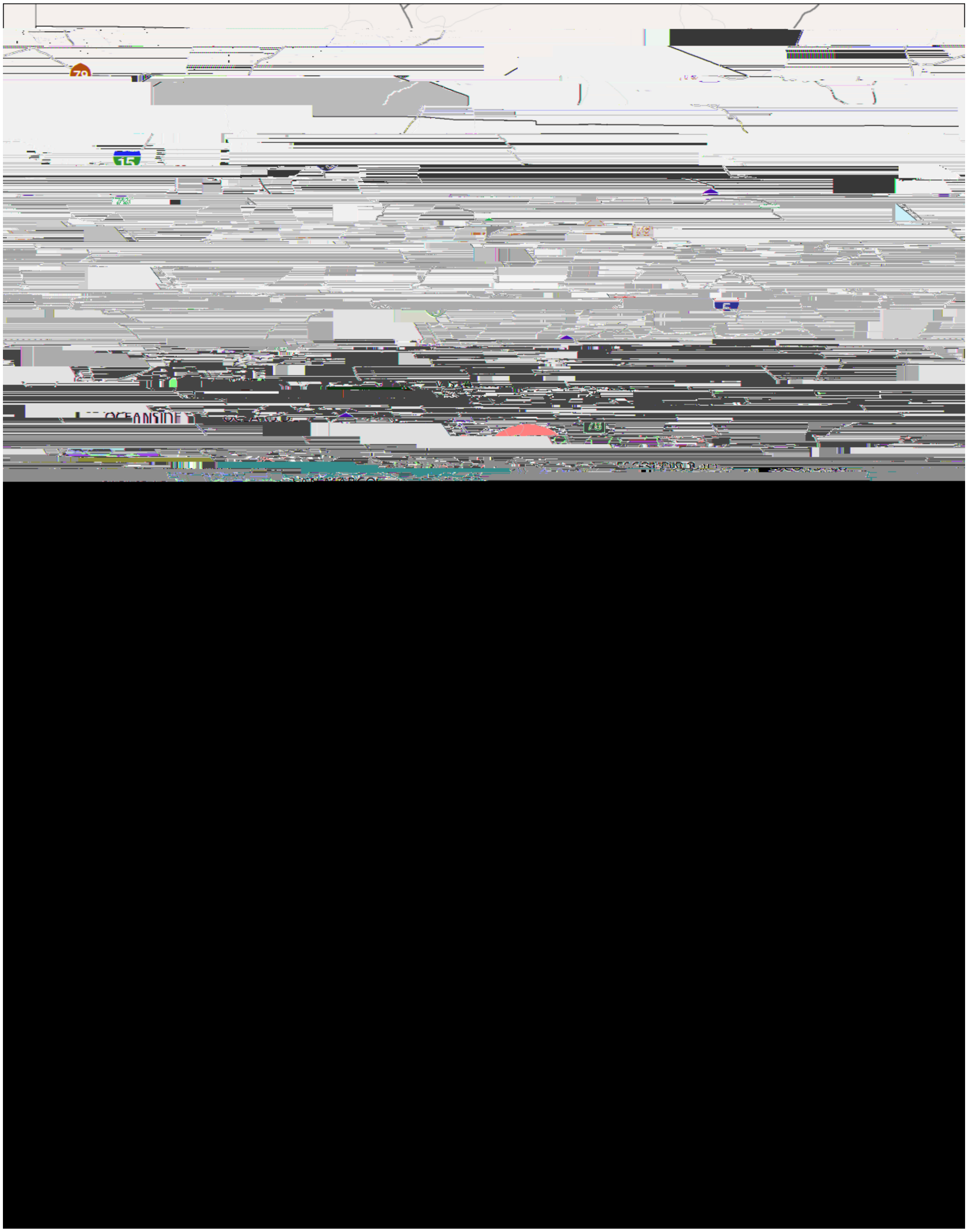
Job Title	SOC Title	SOC Code
Materials handler or supply-chain technician	Laborers and Freight Stock Materials Movers, Hand	53-7062
Quality assurance analyst, auditor, or specialist Quality control associate, assistant, or coordinator	Inspectors, Testers, Sorters, Samplers, and Weighers Industrial Production Managers	51-9061 11-3051
Medical lab technician or clinical lab scientist Lab assistant, technician, specimen accessioner or processor	Medical and Clinical Laboratory Technologists Medical and Clinical Laboratory Technicians	29-2011 29-2012
Manufacturing or production technician or assembler	Engineering Technicians, Except Drafters, All Other	17-3029
Regulatory affairs specialist or analyst	Compliance Officers	13-1041
Sales representative or business development specialist	Sales Representatives, Wholesale and Manufacturing, Technical and Scientific Products	41-4011
Research associate or assistant (preclinical, R&D, or clinical)	Medical Scientists, Except Epidemiologists	19-1042

- Distribution åNAICS 42
- Healthcare Labs åNAICS 62
- Information and Professional, Scientific, & Technical Services åNAICS 51 & 54
- Manufacturing åNAICS 31-33

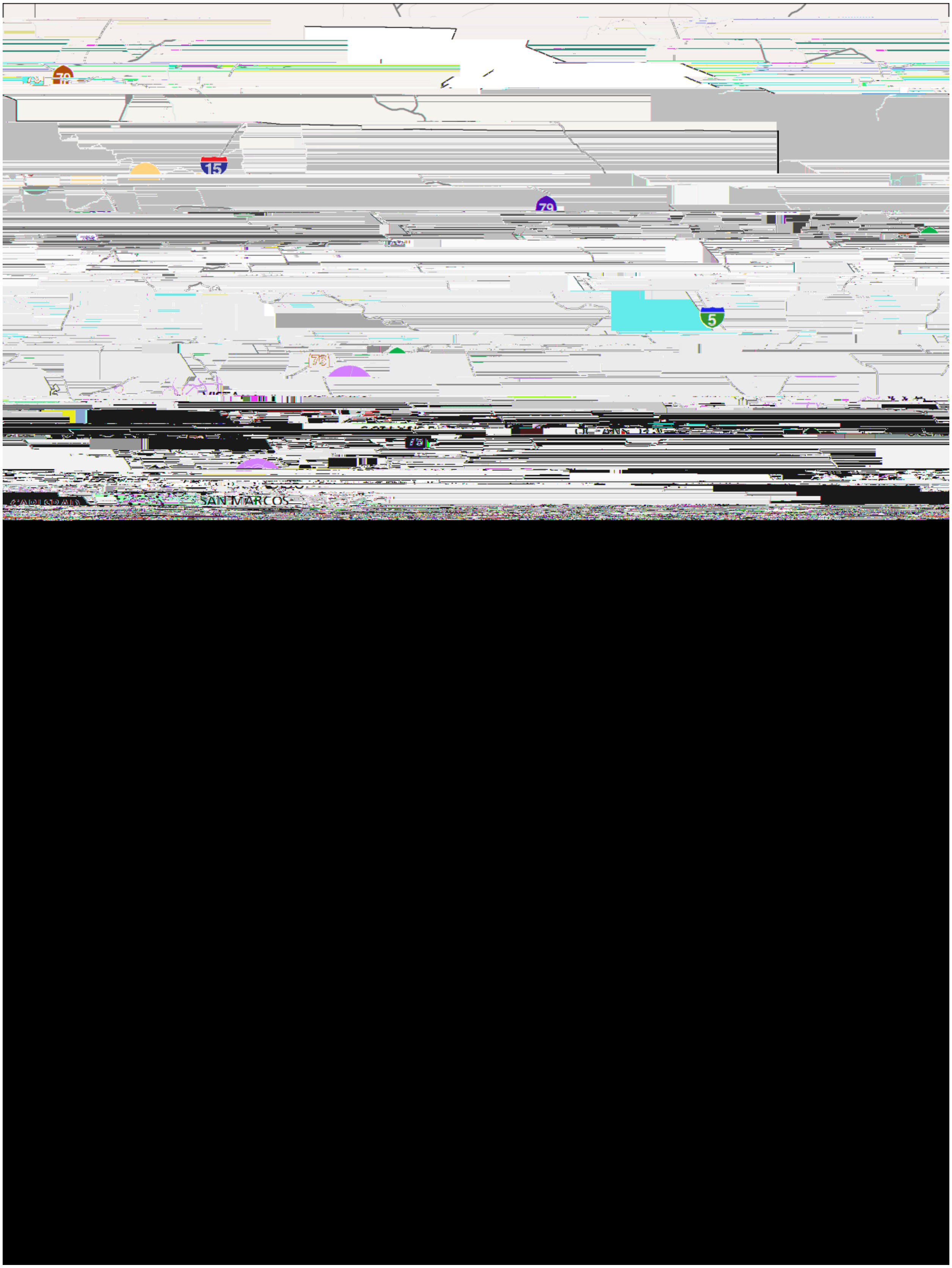
Phase 2: Compile and clean the disposition file of all unknown firms that were called for the survey component of the study and organize the list into the four sectors listed previously. Next, San Diego employment and establishment information for the corresponding 2-digit NAICS industries were downloaded from Economic

APPENDIX E: SUBSECTOR MAPS

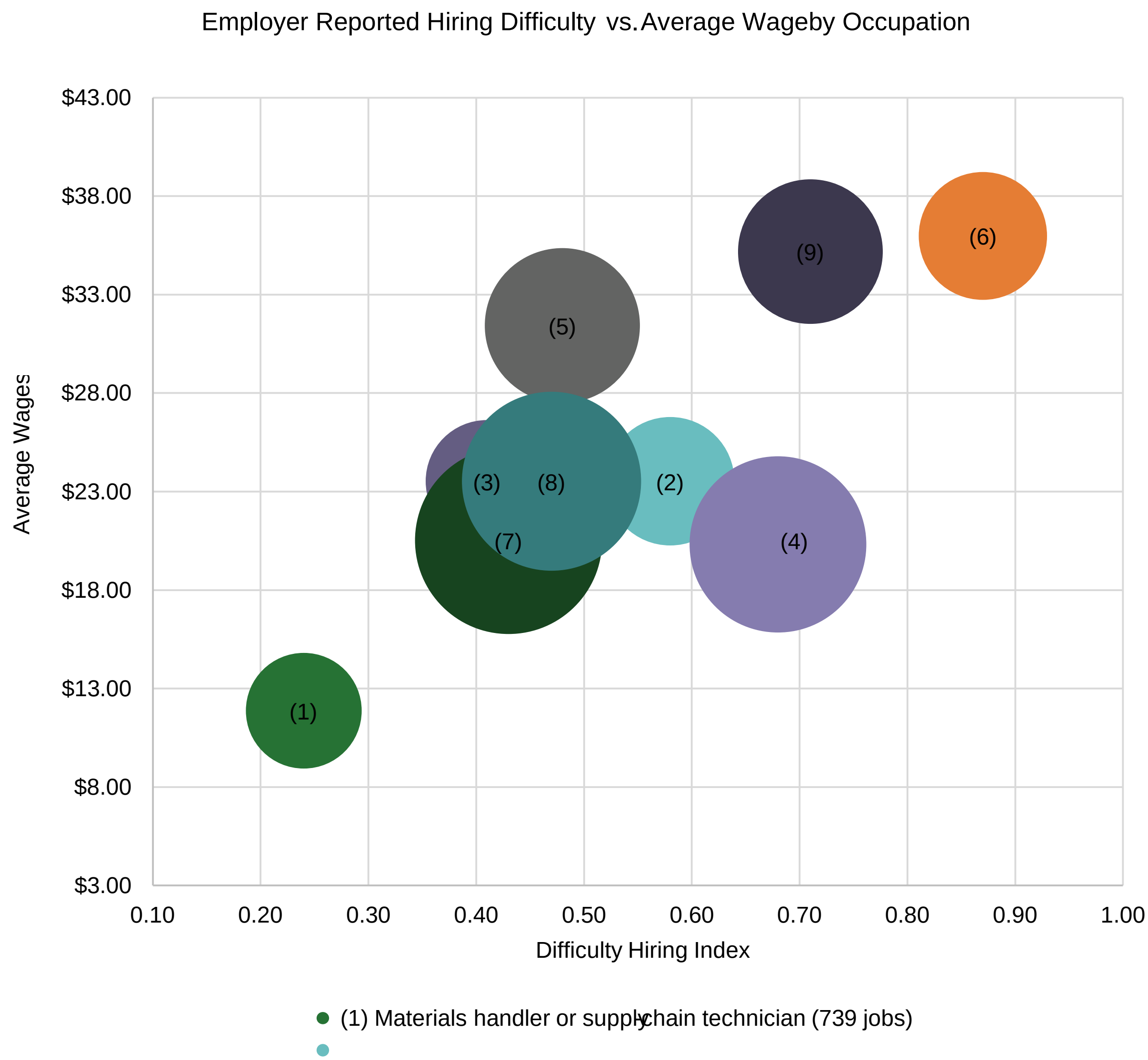
Pharmaceutical Employment in San Diego County



Biomedical Devices Employment in San Diego County



Research & Development (Life Sciences) Employment in San Diego


Employer Reported Hiring Difficulty vs. Average Wage by Occupation
$43.00
$38.00
$33.00
$28.00
$23.00
$18.00
$13.00
$8.00
$3.00
Average Wages
0.10
0.20
0.30
0.40
0.50
0.60
0.70
0.80
0.90
1.00
Difficulty Hiring Index
(1)
(2)
(3)
(4)
(5)
(6)
(7)
(8)
(9)
(1) Materials handler or supply chain technician (739 jobs)

APPENDIX: G TOPLINE SURVEY RESULTS

Introduction:

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their talent needs.

The survey should take approximately 10 to 14 minutes of your time. By answering this survey, you can help inform how investments should be made to train and prepare workers to meet the needs of industry.

The San Diego Workforce Partnership and the local community colleges, which are committed to developing the regional workforce, commissioned this study. BW Research Partnership, an independent research organization, conducted the study.

Your individual responses will not be published; only aggregate information will be used in the reporting of the study results.

Screener Questions

A. Does your firm work in any of the following life science industry segments? (n=137)

16.1%	Pharmaceuticals
10.2%	Agricultural & industrial biotechnology
27.0%	Medical devices
14.6%	Research, testing & medical laboratories
16.8%	Other
15.3%	Multiple

B. Do you have one or more office locations with employees in San Diego County, California? (n=137)

88.3%	Yes, just one location in San Diego County [CONTINUE]

100.0%

2.2%	Fewer
40.1%	' 2 1 è 7 5 ($ ' 6 D P
7.3%	' 2 1 è 7 5 ($ ' ' . 1

	Current	12 months
n	122	122
Mean	53.30	56.75
Median	7.00	8.00
Total Employees	6,258	6,848
Change		590
% Growth		9.4%

[IF UNABLE TO PRw424 510/MCID * 367.

5.2%   ' 2 1 è 7   5 ($ '   ' .   1 $

[Q8 should be less than o equal to Q2 -

26.1%	No permanent employees
44.8%	1 to 4 permanent employees
9.7%	5 to 9 permanent employees
6.7%	10 to 24 permanent employees
3.0%	25 to 49 permanent employees
0.7%	50 to 99 permanent employees
2.2%	100 to 249 permanent employees
0.7%	250 to 499 permanent employees
6.0%	'21è7 5($' '. 1$

[Q8 + Q10 + Q12 should be less than or equal to Q2 BUILD IN CHECK]

13. Thinking about the [TAKE Q12 #] full-time and part-time permanent Business Development, finance and administration employees, do you expect to have more, less or the same number of these employees 12 months from now? (n=104)

18.0%	More
3.0%	Fewer
75.2%	Same number
3.8%	'21è7 5($' '. 1$

SECTION 3 å Occupational Assessment Occupation-Related Questions

[NOTE - PLEASE COMMUNICATE TO RESPONDENT THAT WE WILL BE USING GENERAL OCCUPATIONAL TITLES RATHER THAN SPECIFIC JOB TITLES THAT MAY BE USED WITHIN EACH ORGANIZATION]

14. Now, examine specific occupations within your organization related to the work you do. The occupational titles we are using may differ from the specific position titles used in your organization. For WKHVH TXHVWLRQV , ZRXOG OLNH \RX WR WU\ WR HTXDWH \RXU RUJ more general ones we will use here.
Please only assign one occupation to each employee. If they fall into more than one category, please assign them to the occupation in which they devote more of their time.
Please tell us if your organization employs individuals in positions matching the following general occupational titles in your (current) San Diego County location(s): (n=371)

Mean	Occupation
33.7%	1: Materials handler or supply-chain technician
40.4%	2: Quality assurance analyst, auditor or specialist
38.5%	3: Quality control associate, assistant or coordinator
5.8%	4: Animal technician
25.0%	5: Medical lab technician or clinical lab scientist

35.6%	6: Manufacturing or production technician or assembler
27.9%	7: Regulatory affairs specialist or analyst
41.3%	

5

19. We are interested how often you hire applicants how have less than the typical education requirements for the position. Please indicate whether yousometimes, rarely or never hire individuals with less than the typical education requirements for that position. (PRESENT IN ORDER THEY WERE PREVIOUSLY PRESENTED)

	Occupation	Sometimes	Rarely	Never	DK/NA
1	Materials handler or supply-chain technician(n=30)	20.0%	20.0%	60.0%	0.0%
2	Quality assurance analyst, auditor or specialist (n=34)	23.5%	29.4%	44.1%	2.9%
3	Quality control associate, assistant or coordinator (n=31)	25.8%	25.8%	48.4%	0.0%
4	Animal technician (n=5)	40.0%	0.0%	60.0%	0.0%
5	Medical Lab Technician or Clinical lab Scientist (n=19)	21.1%	15.8%	63.2%	0.0%
6	Manufacturing or production technician or assembler (n=23)	17.4%	26.1%	43.5%	13.0%
7	Regulatory affairs specialist or analyst (n=16)	18.8%	37.5%	43.8%	0.0%
8	Lab assistant, technician or specimen accessioner or processor (n=22)	27.3%	18.2%	45.5%	9.1%
9	Research associate or assistant (Preclinical, R & D or Clinical) (n=20)	10.0%	20.0%	70.0%	0.0%
10	Sales representative or business development specialis(n=31)	16.1%	22.6%	58.1%	3.2%

20. 1RZ ZHèG OLNH WR NQRZ KRZ \RX SUHIHU WR WUDLQ \RXU H[LVWLQJ OPTIONS). Please indicate how you prefer to train people for each occupation in the life sciences.

Check all that apply RANDOMIZEORDER 1- 5

1 On the job training

2 Customized training programs or courses at your location

3 Courses at a local training or education provider

4 Provide tuition reimbursement

5 Other, specify_

6 '21è7 5($' '. 1$

Occupation	1	2	3	4

86.4%