

Workforce Demands In the Mining Industry

Workforce Solutions

April 2015

**Workforce Solutions is an affiliate of the Gulf Coast Workforce Board, which manages a regional workforce system that helps employers solve their workforce problems and residents build careers so both can compete in the global economy. The workforce system serves the City of Houston and the surrounding 13 Texas Gulf Coast counties including: Austin, Brazoria, Chambers, Colorado, Fort Bend, Galveston, Harris Liberty, Matagorda, Montgomery, Walker, Waller, and Wharton.*

This report is intended to provide an overview from a workforce stance on the state of the mining industry, its subsectors, and the challenges the Gulf Coast Region faces now and in the future to serve the industry.

An Overview of Mining (Oil and Gas)

The economy of the Gulf Coast Region is largely centered on the energy industry with roughly half of all jobs tied to it in some way. Mining is at the heart of it contributing to employment in many other industries such as manufacturing, engineering, professional business services, construction, transportation, and warehousing. Virtually all mining employment in the Gulf Coast Region is tied to the extraction of crude petroleum and natural gas.

The oil and gas industry is commonly referred to as three major sectors:

- Upstream – where the mining industry is found, involves the exploration, production, and extraction of oil and gas
- Midstream - involves the transportation, storage, and wholesale marketing of crude or refined petroleum products
- Downstream - the oil and gas operations that take place after production and up to the point of sale

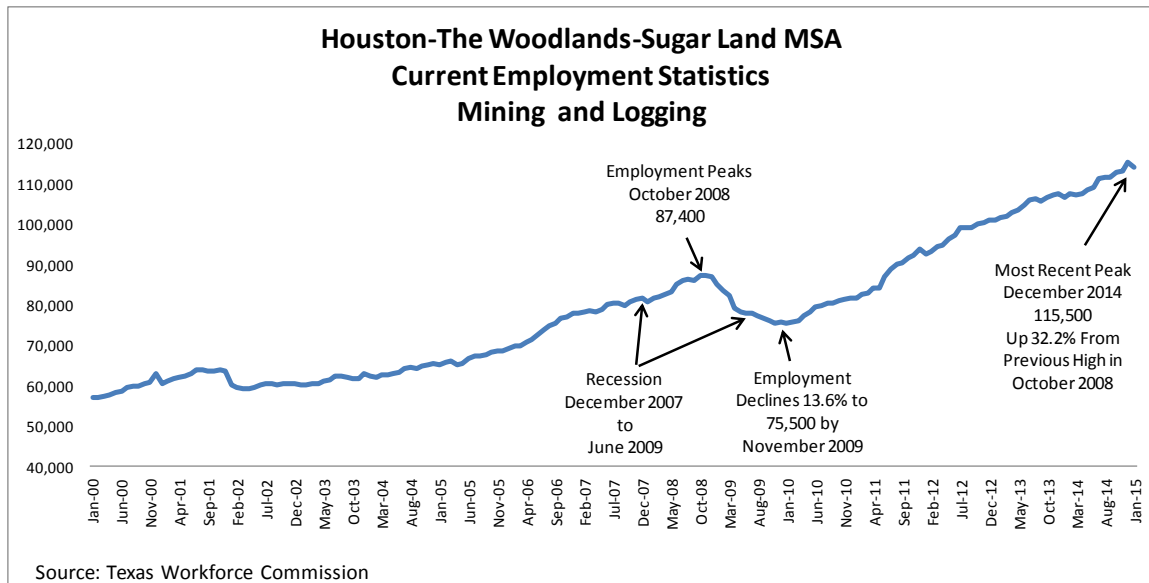
Upstream statistics provided within are based on the North American Industry Classification System (NAICS) for Mining which defines it as establishments that extract naturally occurring solid minerals, liquid minerals, and gases.

As of January 2015 the Gulf Coast Region's mining industry employed more than 100,000 people providing an extensive range of career opportunities. Job growth has been phenomenal over the last few years as seen in the data that follows. Many of these positions have offered good wages with varying education and training requirements ranging anywhere from short term on-the-job training to post-secondary degrees.

Employment and the Great Recession

Each month the Current Employment Statistics (CES) program of the Bureau of Labor Statistics produces nonfarm industry employment estimates based on a monthly employer's survey. The data is produced for the Houston-The Woodlands-Sugar Land Metropolitan Statistical Area (MSA).

Mining industry employment continued to add jobs through the first half of the recession driven by rising prices for West Texas Intermediate crude oil which reached a high of \$133.88 per barrel in June of 2008. By February 2009 oil prices plummeted by 70% to \$39.09 per barrel resulting in a sharp decline in drilling activity and a period of decline where payrolls fell 13.6% by November 2009. By late 2010 oil prices recovered to the \$80 range and thus began a period of expansion with payrolls rising to more than 115,000 jobs by December 2014, 32.2% higher than its previous peak in October 2008.



Mining Subsectors and the Great Recession

There are two subsectors that make up 99% of mining employment in the Gulf Coast Region: **Oil and Gas Extraction** and **Support Activities for Mining**. A third subsector, **Mining, Except Oil and Gas**, employs some 1,000 individuals in the Gulf Coast Region and will not be discussed in this report.

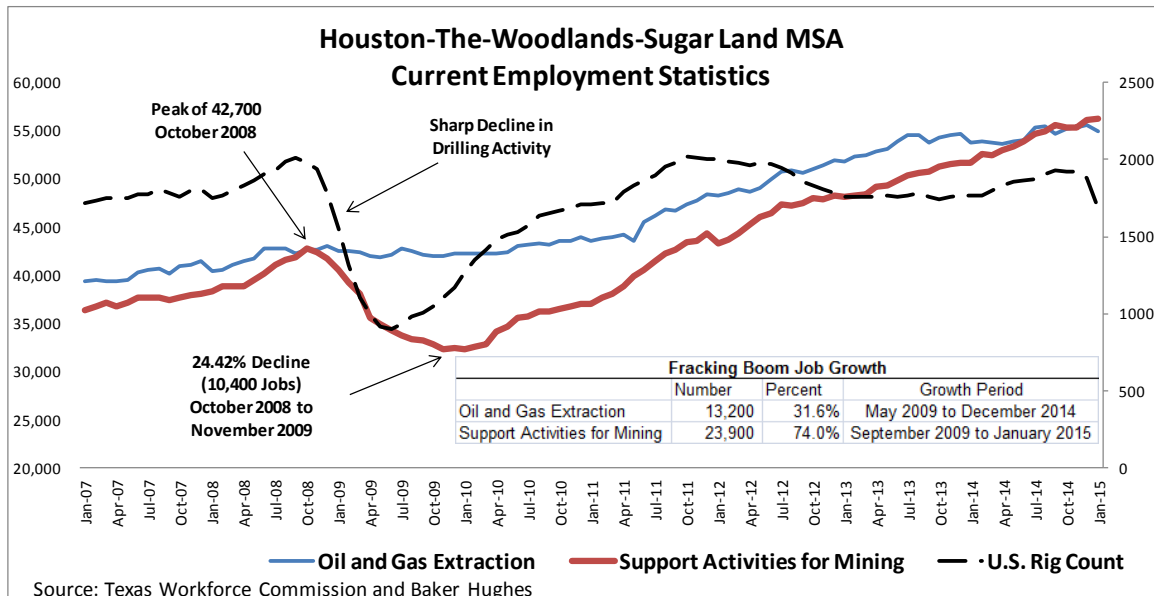
The **Oil and Gas Extraction** subsector **operates and/or develops** oil and gas field properties. Activities may include exploration for crude petroleum and natural gas; drilling, completing, and equipping wells; operating separators, emulsion breakers, desilting equipment, and field gathering lines for crude petroleum and natural gas; and all other activities in the preparation of oil and gas **up to the point of shipment from the producing property**.

The **Support Activities for Mining** subsector provides support services required for the mining and quarrying of minerals and for the extraction of oil and gas. Establishments performing exploration (except geophysical surveying and mapping) for minerals, on a contract or fee basis, are included in this subsector. Exploration includes traditional prospecting methods, such as taking core samples and making geological observations at prospective sites.

The pace of job growth in Oil and Gas Extraction and Support Activities for Mining has been very strong with payrolls up 39.9% and 54.4% respectively over the last eight years, more than double the pace of total private sector employment over the same time period.

When drilling activity declines, job losses in the Mining sector are primarily in Support Activities for Mining where the largest concentrations of oil field jobs are found. While job losses in Support Activities for Mining were especially large during the last downturn job growth returned quickly with payrolls rising 74% from September 2009 to January 2015.

Oil and Gas Extraction experienced a minor loss of 2,200 jobs during the last downturn and subsequently entered a period of expansion from May 2009 to December 2014 where payrolls rose 31.6%.



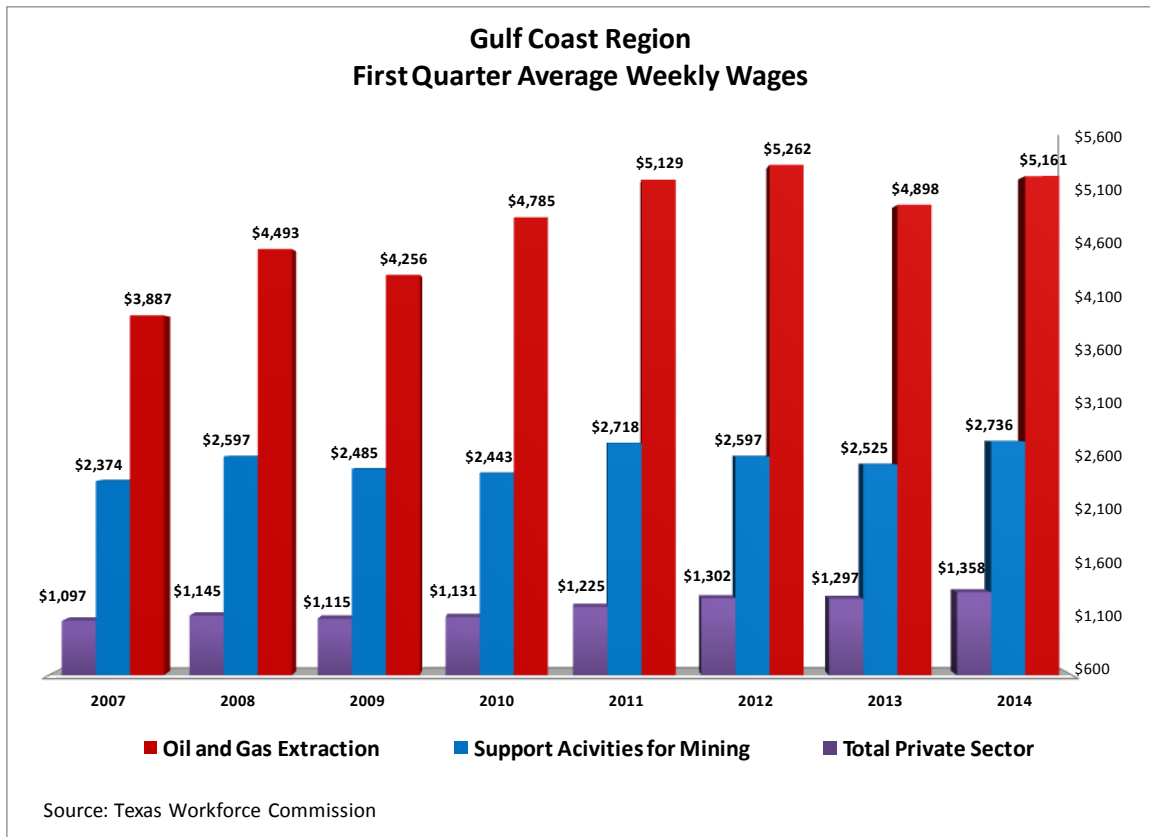
January Employment	2007	2009	2011	2013	2015	Percent Inc 2007 to 2014
Total Private Sector	2,153,500	2,226,400	2,177,100	2,387,100	2,571,300	19.4%
Oil and Gas Extraction	39,300	42,500	43,600	51,800	55,000	39.9%
Support Activities for Mining	36,400	40,600	37,000	48,100	56,200	54.4%

Wages

Each of the two subsectors of mining makes significant contributions to the region with wages that are more than double the average private sector wage. Oil and Gas Extraction had the largest payroll of over \$3.6 billion in first quarter 2014 representing 66 percent of all wages in the mining industry.

- While average wages in the private sector increased by 23.8 percent from 2007 to 2014, wages in Oil and Gas Extraction have increased by 32.8 percent.
- Average wages in Support Activities for Mining experienced a more moderate increase of 15.3%.

The wage data that follows was compiled from quarterly employment and wage reports submitted by employers subject to the Texas Unemployment Compensation Act.



First Quarter Average Weekly Wages	2007	2008	2009	2010	2011	2012	2013	2014	Percent Inc 2007 to 2014
Total Private Sector	\$ 1,097	\$ 1,145	\$ 1,115	\$ 1,131	\$ 1,225	\$ 1,302	\$ 1,297	\$ 1,358	23.8%
Oil and Gas Extraction	\$ 3,887	\$ 4,493	\$ 4,256	\$ 4,785	\$ 5,129	\$ 5,262	\$ 4,898	\$ 5,161	32.8%
Support Activities for Mining	\$ 2,374	\$ 2,597	\$ 2,485	\$ 2,443	\$ 2,718	\$ 2,597	\$ 2,525	\$ 2,736	15.3%

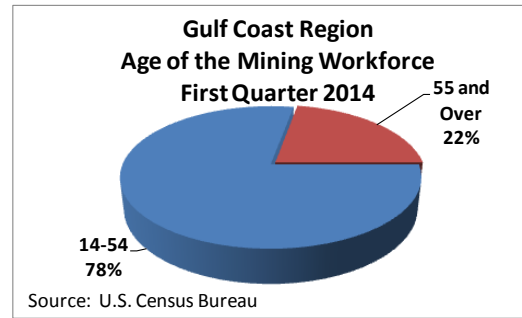
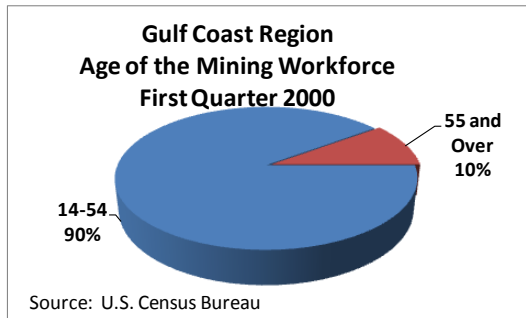
Challenges

An Aging Workforce

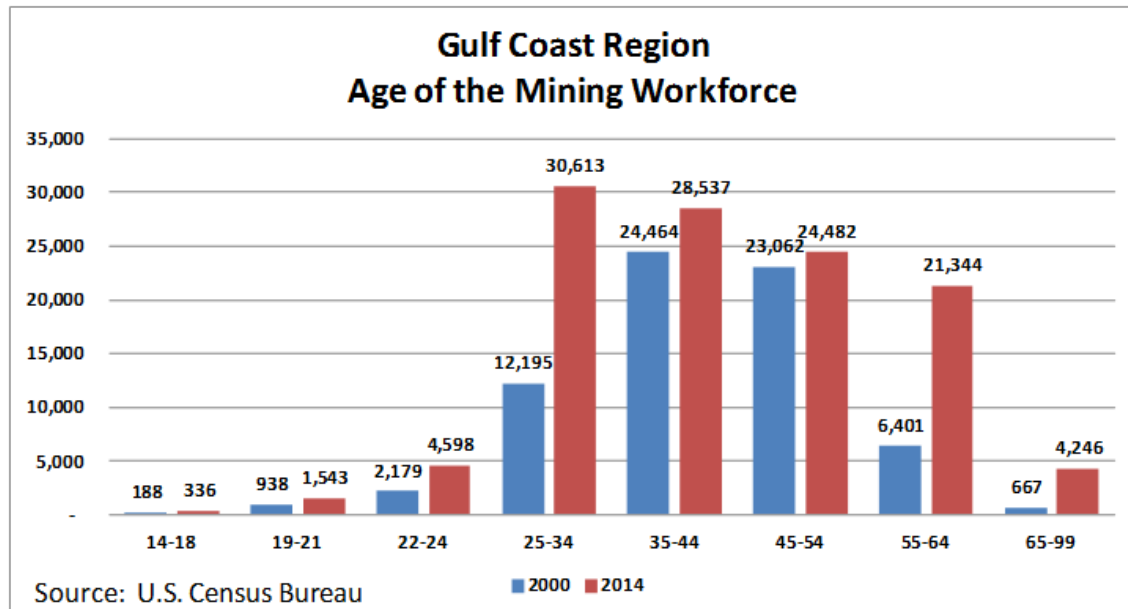
A large factor which has contributed to recent workforce shortages is an aging population. The percentage of the population that is 55 and over has risen by 5 percent since 2000 and is expected to rise another 3 percent by 2018 to 23.36 percent.

Population by Age								
	2000 Census		2010 CENSUS		2013 ESTIMATE		2018 FORECAST	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Total	4,854,389	100.00%	6,087,133	100.00%	6,366,422	100.00%	7,064,464	100.00%
Age 55+	739,122	15.23%	1,156,059	18.99%	1,294,545	20.33%	1,650,040	23.36%

The age of the mining workforce is increasing rapidly with the number approaching retirement age compounding the severity of workforce shortages in the region over the recent expansion period. The percentage of workers ages 55 and over in the mining industry more than doubled from 10 percent in 2000 to 22 percent in 2014.



More than 25,000 individuals with expertise in the industry are approaching retirement age.



Competition for Skilled Workers

Unlike many historical recessions, the Gulf Coast Region's economy escaped a slow recovery that is often seen due to reduced energy demand. Strong drilling activity in shale regions helped place the region in the national spotlight for creating jobs. As of November 2014 the region recovered all jobs lost during the recession and added an additional 200,000 jobs. The entire Gulf Coast Region economy has benefitted from the energy boom which also drove strong demand in many additional industries.

Many individuals that were working in construction prior to the recession left to work in the energy industry. Fortunately, easy access to affordable natural gas and the resulting expansions in the petrochemical manufacturing industry offer opportunities to those affected during the current downturn in the mining industry. Attracting these individuals back to the energy sector will be a new challenge as growth returns to the industry.

Public Image and the Next Generation

Attracting the next generation to the oil and gas industry is another barrier to meeting future workforce needs. The mining industry is often viewed as unstable with many jobs perceived as low-skilled. This can in part be remedied by informing the public the many high skilled high paying opportunities offered. Efforts have been made recently to encourage interests in the field while increasing accessibility to career and technology education in the industry.

Where the Jobs Will Be

Plunging oil prices are currently forcing producers to cancel or postpone drilling projects. Concerns have been increasingly heightened in recent months as drilling activity tumbles. The U.S. rig count has fallen 42 percent from a high of 1,929 in November 2014 to 1,125 as of March 13, 2015 with more declines likely.

The depth and duration of the current downturn is uncertain with expectations for a recovery varying greatly among experts.

In the years ahead the US Energy Information Administration (EIA) predicts world energy consumption to grow by 56% between 2010 and 2040 hence the question is not if U.S. drilling activity will increase but when.

Industry Projections: 2012 to 2022

The Gulf Coast Region's total employment is projected to add **712,430 jobs** from **2012 to 2022**. This 23.8% growth rate is higher than the previously projected 22.7% for the period 2010 to 2020.

The pace of job **growth in mining** is predicted to be above average in the Gulf Coast Region with a **projected 32.4%** increase over the ten year period. Employment in mining is projected to increase from 103,520 jobs in 2012 to 137,110 jobs in 2022 adding 33,590 jobs.

More than half of the increase in mining employment is expected to be in Oil and Gas Extraction (NAICS 211), up 21,230 jobs, or 39.4% over the ten year period. The pace of job growth in Support Activities for Mining is expected to be above average at 25.3% with payrolls rising 12,000 jobs.

GULF COAST REGION PROJECTIONS

Industry Codes	Industry Title	Annual Average Employment		Number Change	Growth Rate
		2012	2022		
21	Mining	103,520	137,110	33,590	32.4%
211	Oil & Gas Extraction	53,930	75,160	21,230	39.4%
212	Mining, Ex. Oil & Gas	1,100	1,280	180	16.4%
2121	Coal Mining	10	10	0	0.0%
2123	Nonmetallic Mineral Mining & Quarrying	1,080	1,260	180	16.7%
213	Support Activities for Mining	47,400	59,400	12,000	25.3%

Source: Texas Workforce Commission

Occupations in Mining, Where the Jobs Are 2014

The following table represents the top 20 occupations in the mining industry and their estimated 2014 employment levels **in the mining industry**.

Gulf Coast Region Mining (NAICS 21) Top 20 Occupations

OCC. CODE	OCCUPATIONAL TITLE	Estimated 2014 Employment	Percent of Mining Industry Employment	2013 Average Hourly Wage*
47-5071	Roustabouts, Oil & Gas	9,050	8.5	\$16.91
47-5013	Service Unit Operators, Oil, Gas, & Mining	8,522	8.0	\$24.11
17-2171	Petroleum Engineers	8,346	7.8	\$78.60
47-1011	First-Line Supervisors of Construction Trades & Extraction Workers	4,134	3.9	\$31.01
19-2042	Geoscientists, Ex. Hydrologists & Geographers	3,544	3.3	\$80.54
53-3032	Heavy & Tractor-Trailer Truck Drivers	3,522	3.3	\$22.51
47-5012	Rotary Drill Operators, Oil & Gas	3,508	3.3	\$40.47
47-5011	Derrick Operators, Oil & Gas	3,425	3.2	\$23.64
13-2011	Accountants & Auditors	2,841	2.7	\$38.62
11-1021	General & Operations Managers	2,651	2.5	\$62.77
43-6014	Secretaries & Administrative Assistants, Ex. Legal, Medical, & Executive	2,111	2.0	\$16.31
47-5081	Helpers--Extraction Workers	1,984	1.9	\$17.61
11-9041	Architectural & Engineering Managers	1,966	1.8	\$87.88
13-1199	Business Operations Specialists, All Other	1,898	1.8	\$45.56
43-9061	Office Clerks, General	1,844	1.7	\$15.68
49-9041	Industrial Machinery Mechanics	1,740	1.6	\$24.61
19-4041	Geological & Petroleum Technicians	1,712	1.6	\$31.50
53-7073	Wellhead Pumpers	1,693	1.6	\$23.48
43-3031	Bookkeeping, Accounting, & Auditing Clerks	1,557	1.5	\$18.56
51-8093	Petroleum Pump System Operators, Refinery Operators, & Gaugers	1,488	1.4	\$30.02

*Not industry specific.

Seven of the top 20 mining occupations are currently on the Gulf Coast Workforce Board's list of targeted high-skill high-growth occupations:

- Service Unit Operators
- Petroleum Engineers
- Geoscientists
- Accountants & Auditors
- Industrial Machinery Mechanics
- Geological & Petroleum Technicians
- Petroleum Pump System Operators, Refinery Operators, & Gaugers

Occupational Demand for Oil and Gas Extraction (NAICS 211)

The following table represents the top 20 occupations in the oil and gas extraction subsector and their projected employment levels in 2012 and 2014. Total demand for each occupation is actually higher since replacement demand by industry is unavailable.

Gulf Coast Region Top 20 Occupations in Oil and Gas Extraction (NAICS 211)

OCC. CODE	OCCUPATIONAL TITLE	2012	2022	10 YEAR NUMBER CHANGE	10 YEAR PCT CHG
17-2171	Petroleum Engineers	6,600	10,800	4,200	63.6
19-2042	Geoscientists, Ex. Hydrologists & Geographers	3,320	4,510	1,190	35.8
13-2011	Accountants & Auditors	2,500	3,390	890	35.6
47-5071	Roustabouts, Oil & Gas	2,010	2,730	720	35.8
11-9041	Architectural & Engineering Managers	1,920	2,600	680	35.4
13-1199	Business Operations Specialists, All Other	1,720	2,330	610	35.5
11-1021	General & Operations Managers	1,540	2,090	550	35.7
47-5013	Service Unit Operators, Oil, Gas, & Mining	1,520	2,060	540	35.5
43-6014	Secretaries & Administrative Assistants, Ex. Legal, Medical, & Executive	1,410	2,020	610	43.3
47-1011	First-Line Supervisors of Construction Trades & Extraction Workers	1,390	1,950	560	40.3
53-7073	Wellhead Pumpers	1,380	1,880	500	36.2
17-2112	Industrial Engineers	1,220	1,660	440	36.1
47-5012	Rotary Drill Operators, Oil & Gas	1,210	1,650	440	36.4
15-1121	Computer Systems Analysts	1,060	1,590	530	50.0
47-5011	Derrick Operators, Oil & Gas	1,160	1,580	420	36.2
11-3031	Financial Managers	1,040	1,420	380	36.5
43-3031	Bookkeeping, Accounting, & Auditing Clerks	980	1,340	360	36.7
43-9061	Office Clerks, General	1,010	1,310	300	29.7
19-4041	Geological & Petroleum Technicians	930	1,260	330	35.5
51-8093	Petroleum Pump System Operators, Refinery Operators, & Gaugers	920	1,250	330	35.9

Eight of the top 20 oil and gas extraction occupations are currently on the Gulf Coast Workforce Board's list of targeted high-skill high-growth occupations:

- Petroleum Engineers
- Geoscientists
- Accountants & Auditors
- Service Unit Operators, Oil, Gas & Mining
- Industrial Engineers
- Computer Systems Analysts
- Geological & Petroleum Technicians
- Petroleum Pump System Operators, Refinery Operators, & Gaugers

Occupational Demand for Support Activities for Mining (NAICS 213)

The following table represents the top 20 occupations in the support activities for mining subsector, where the largest concentrations of oil field jobs are found, and their projected employment levels in 2012 and 2014. Total demand for each occupation is actually higher since replacement demand by industry is unavailable.

Gulf Coast Region

Top 20 Occupations in Support Activities for Mining (NAICS 213)

SOC	Occupation Title	2012	2022	Change	Rate
47-5071	Roustabouts, Oil & Gas	6,620	8,220	1,600	24.2
47-5013	Service Unit Operators, Oil, Gas, & Mining	6,410	8,160	1,750	27.3
53-3032	Heavy & Tractor-Trailer Truck Drivers	2,920	3,630	710	24.3
47-1011	First-Line Supervisors of Construction Trades & Extraction Workers	2,450	3,130	680	27.8
47-5012	Rotary Drill Operators, Oil & Gas	2,170	2,690	520	24.0
47-5011	Derrick Operators, Oil & Gas	2,140	2,650	510	23.8
47-5081	Helpers--Extraction Workers	1,620	2,000	380	23.5
47-2061	Construction Laborers	1,260	1,570	310	24.6
49-9041	Industrial Machinery Mechanics	900	1,340	440	48.9
11-1021	General & Operations Managers	1,050	1,300	250	23.8
43-9061	Office Clerks, General	860	1,010	150	17.4
19-4041	Geological & Petroleum Technicians	750	940	190	25.3
47-2073	Operating Engineers & Other Construction Equipment Operators	670	830	160	23.9
51-9198	Helpers--Production Workers	610	760	150	24.6
43-6014	Secretaries & Administrative Assistants, Ex. Legal, Medical, & Executive	540	720	180	33.3
53-7062	Laborers and Freight, Stock, and Material Movers, Hand	550	690	140	25.5
43-3031	Bookkeeping, Accounting, & Auditing Clerks	550	680	130	23.6
51-8093	Petroleum Pump System Operators, Refinery Operators, & Gaugers	550	680	130	23.6
17-2171	Petroleum Engineers	530	660	130	24.5
51-4121	Welders, Cutters, Solderers, and Brazers	530	650	120	22.6

Six of the top 20 oil and gas extraction occupations are currently on the Gulf Coast Workforce Board's list of targeted high-skill high-growth occupations:

- Service Unit Operators, Oil, Gas, & Mining
- Industrial Machinery Mechanics
- Geological & Petroleum Technicians
- Petroleum Pump System Operators, Refinery Operators, & Gaugers
- Petroleum Engineers
- Welders, Cutters, Solderers, and Brazers

Projection Limitations

Industry and occupation projections are funded by the Employment and Training Administration, U.S. Department of Labor and updated every two years. The methodology involves four primary steps:

- Identify industry historical trends
- Develop industry employment projections
- Develop occupation staffing patterns for each industry
- Develop occupation employment projections

The projections will foretell the general industry and occupational trends and act as an indicator of relative magnitude and probable direction as opposed to an estimate of absolute values. Additional detail on projection methodology and its limitations can be found at: <http://www.tracer2.com/?PAGEID=67&SUBID=114>