

Information Circular 9527

## **National Survey of the Mining Population**

### **Part I: Employees**

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## Acronyms and Abbreviations

CI	Confidence Interval
DEFF	Design Effect
DSU	Data suppressed
FPC	Finite population corrected
FTE	Full-time Equivalent
IC	Information Circular
LCL	Lower Confidence Limit
MIPS	Mining Industry Population Survey
MSHA	Mine Safety and Health Administration
NA	Not applicable
NIOSH	National Institute for Occupational Safety and Health
OMB	Office of Management and Budget
OMSHR	Office of Mine Safety and Health Research
SIC	Standard Industrial Classification
UCL	Upper Confidence Limit

## Definition of Terms

Confidence Interval:	An interval that gives an estimated range of values which is likely to include an unknown population parameter, the estimated range being calculated from a given set of sample data
Jackknife Repeated Replication:	A commonly used resampling approach to variance estimation
Lower Confidence Limit:	The lower bound of a confidence interval
National Estimate:	A weighted statistical calculation which uses the results from a probability sample survey to estimate a national number
Survey Count:	The actual number of responses obtained from the National Survey of the Mining Population
Upper Confidence Limit:	The upper bound of a confidence interval



# **National Survey of the Mining Population Part I: Employees**

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## **Abstract**

The National Institute for Occupational Safety and Health (NIOSH) conducted the first comprehensive survey of the U.S. mining population in more than 20 years. The National Survey of the Mining Population captured the current profile of the U.S. mining workforce. Data collection began in March 2008 and continued through August 2008. Randomly selected mining operations in all of the major mining sectors (i.e., coal, metal, nonmetal, stone, and sand and gravel) received the survey and had the option of completing a paper or web-based questionnaire. A total of 737 mining operations returned completed questionnaires and reported data for 9,008 employees.

Two sets of data were collected in this national survey. There were questions about the mining operation, including employee training, work schedules, the use of independent contractor employees, and mine communication and safety systems. The employee questions included demographic and occupational questions about individual employees. The survey sample data were weighted in order to provide national estimates of mine and employee characteristics.

This Information Circular (IC) is published in two parts—"Part I: Employees" presents the employee-level data and "Part II: Mines" presents the mine-level data. Both parts of this IC include an overview of the survey background, development of the survey materials, sample design and sample selection, data collection and processing, statistical weighting, and lessons learned. The survey data are summarized for the overall U.S. mining industry and the five major mining sectors. The information gathered from the survey respondents is being published only as summarized data so that no single mining operation or employee can be identified.

## Introduction

Surveillance of occupational injuries, illnesses, and exposures has been an integral part of the work of the National Institute for Occupational Safety and Health (NIOSH) since its creation by the Occupational Safety and Health Act in 1970. Surveillance activities at the Office of Mine Safety and Health Research (OMSHR) are focused on the nation's mining workforce. These surveillance activities make extensive use of data from a number of different national databases. The most frequently used databases are those maintained by the Mine Safety and Health Administration (MSHA). Included are databases of reported employment, accidents/injuries/illnesses, hazardous exposures, coal production, mine inspections, violations and citations, etc. Two of the most commonly used databases are the mine operator and contractor address/employment file and the file listing reports of accidents, injuries, and illnesses.

Analysis of data from the existing MSHA employment and accident/injury/illness databases has been able to meet some, but not all, of the OMSHR surveillance needs. For example, to identify subpopulations in each major mining sector or type of mining operation at risk of adverse health and safety outcomes, OMSHR needs the capability to calculate age-, gender-, and occupation-specific rates of injuries, fatalities, and disease. Additionally, due to the reduced reporting requirements for independent contractors, OMSHR cannot determine the number of contractor employees working separately in metal, nonmetal, stone, or sand and gravel operations. The National Survey of the Mining Population was designed to collect mine- and employee-level information to address these and other data gaps.

## Background and Overview

The last national survey targeting the mining workforce, the Mining Industry Population Survey (MIPS), was conducted in 1986 by the U.S. Bureau of Mines (USBM) in the U.S. Department of the Interior. The mining industry has experienced many changes since the MIPS was conducted, and its data are too outdated to be considered useful for surveillance on the current mining workforce. In addition, the MIPS did not include any information on independent contractor employees. Therefore, the National Institute for Occupational Safety and Health, Office of Mine Safety and Health Research conducted this survey to provide updated demographic and occupational information on the mining workforce. The National Survey of the Mining Population collected information from each of the five major mining sectors (coal, metal, nonmetal, stone, and sand and gravel). The survey's main objectives were to:

- Collect basic information about mining operations.
- Establish the demographic and occupational characteristics of mine operator employees.
- Estimate the number of independent contractor employees used by mining operations.

Data collection began in March 2008 and continued through August 2008. A survey packet was mailed to each sampled mining operation. Respondents were given the option of completing a paper questionnaire or using a web questionnaire. Two sets of data were collected

in this survey. The mine questions included items about the mining operations, communication and safety systems, and the mine's use of independent contractor employees. The employee questions included demographic and occupational questions about individual employees. The survey's employee-level data will be used by OMSHR to determine the accident rates for various demographic and occupational categories as well as provide information that will be used to improve the safety and health of miners.

This Information Circular (IC) is published in two parts—"Part I: Employees" presents the employee-level data and "Part II: Mines" presents the mine-level data. The employee and mine data are summarized for the overall U.S. mining industry and the major mining sectors. In addition, the data in the Mines IC is stratified by underground and surface for the coal, metal, nonmetal, and stone sectors. The information gathered from the survey respondents is being published only as summarized data so that no single mining operation or employee can be identified. The intent of this IC is to present the methodology used to design and conduct the survey and to provide up-to-date information about U.S. mining operations and their employees.

## Survey Materials

A survey packet was developed which contained a cover letter, a questionnaire booklet with employee sampling instructions (Appendix A), directions for accessing the Internet version of the questionnaire, a Questions and Answers (Q&A) brochure (Appendix B), and a stamped, self-addressed return envelope.

### The Paper Questionnaire

Each survey paper questionnaire booklet was personalized with a box at the top of page 1 which included: the mine ID number, the mine name, the reporting week (date), and a "submit-by" date. The Questionnaire Overview section presented general instructions and guidelines for completing the survey. The survey consisted of five parts as summarized below:

- Mine Questions—This first part of the questionnaire included sections on: Training; Other Languages; Work Schedules for Production Workers, Production Support Workers, and Preparation Plant/Mill Workers; Shift Work for these same three types of workers; Independent Contractor Employees; and Safety, Communication, and Rescue Measures.
- Employee Selection Instructions—This page contained step-by-step instructions for selecting the sample of employees to be included in the Employee Questions. Personalized mine information was preprinted at the top of this page, including: the mine ID number, the mine name, the reporting week (date), the range of the estimated number of employees working at the mine, a "start-with" number and a "take-every" number for selecting employees from the mine's employee roster.
- Instructions for Employee Questions—This two-page section of the questionnaire provided item-by-item explanations for the Employee Questions.

- Employee Questions—These items were formatted as a fold-out answer form. The sections included: Regular Job Title, Mining Experience, Number of Hours Worked During the Reporting Week, Primary Work Location, Gender, Race, Ethnicity, Birth Year, and Education Level. Two pages of the form were included, with the first page containing lines for reporting up to 15 employees and the second page containing lines for reporting up to 14 additional employees, or a maximum of 29 sampled employees.
- Final Questions and Comments—This two-page section of the questionnaire included: questions for reporting unusual events or circumstances at the mine during the designated reporting week; the date the questionnaire was completed; the name, title and telephone number of the company representative who should be contacted regarding questionnaire completion; space for entering comments or explanations related to specific responses; and mailing instructions.

## The Internet Questionnaire

Beginning in October 2004, a pilot study was conducted to evaluate the recruitment materials, questionnaire, and survey procedures developed for the nationwide survey of the mining population. This study allowed OMSHR to explore the feasibility of developing a web-based version of the questionnaire. The pilot study debriefing interview contained several questions to determine whether the mine had access to the Internet and how convenient this would be for completion of the questionnaire. The majority of respondents indicated that an Internet connection was available at their mine and more than 50 percent reported preferring an electronic response option. Thus, for the National Survey of the Mining Population, a web-based survey was made available. The survey contractor developed the web survey, including programming of the administrative interface, Section 508 compliance, data validation, quality assurance, and programming of the critical questions.

## Sample Design and Selection

### Definition of the Target Population

The target population for a survey is the entire set of population units about which the survey data are to be used to make inferences. Establishment surveys such as the National Survey of the Mining Population must delineate the level of the business organization that constitutes the units of the target population. Because hazards vary across mines, the target population for this survey was defined in terms of the individual mining operation.

The target population of mines consisted of active mines in current production. The survey was further restricted to operations that were covered under Title 30 of the U.S. Code, specifically mines whose mineral output was sold or used in commerce. The target population of employees was restricted to those mine employees for whom the mine operator must report hours worked using the MSHA Form 7000-2: *Quarterly Mine Employment and Coal Production*

*Report* (Appendix C). This includes all direct employees working at the mine, but not contract employees brought in periodically or regularly to perform work at the mine.

There is an important temporal aspect to these definitions for mines and for mine operator employees. Over time, some mines will go in and out of operation. Similarly, employees join the mining labor force and leave the labor force over time. Accordingly, the National Survey of the Mining Population focused on mines in operation during a particular calendar quarter and the current employees of those mines.

## Construction of the Sampling Frame

The sampling frame for a survey is the list or mechanism used to enumerate target population members for sample selection purposes. Individual sampling frames for each of the five major mining sectors (see Figures 1–5) were constructed using the 2007 second quarter data released by the Mine Safety and Health Administration, so that the sampling frames would be in sync with the actual time period when data collection would begin (the second quarter of 2008). To ensure that any startup or intermittent mining operations would not be missed, all mines reporting zero employment hours were included in these frames. Any mines with a status of abandoned or abandoned/sealed were excluded from the sampling frames. The Standard Industrial Classification (SIC) for the active coal, metal, nonmetal, stone, and sand and gravel mines used in the sampling frames is presented in Appendix D.

## Stratification Guidelines

For the National Survey of the Mining Population, mine-level and employee-level analyses were planned, which required adequate sample sizes of mines and of employees. Because multiple employees were to be sampled from each responding mine, sample size requirements for mine-level analyses tended to drive the total number of mines that needed to be sampled. The sample size for employees was determined by the number of sampled mines responding and the average number of employees sampled per mine.

The competing needs of mine-level analysis versus employee-level analysis required the use of a compromise design that supported the objectives of both types of analyses. For mine-level analyses, the best design was one that selected mines with equal probability, while for employee-level analyses the best design was one that selected mines with probability proportional to the number of employees. The compromise design met both needs by stratifying by the number of employees and then sampling mines with equal probability within strata. Strata associated with large mines (in terms of employment) were given greater selection probabilities than small mines, which would facilitate employee-level analyses by making the employee selection probabilities less variable across mines.

Mine size was an important domain for study at the mine level as well as at the employee level. For example, mines might be more likely to vary in their training procedures based upon employee size. Small mines may be more likely to use trainers from outside the organization, while large mines may be more likely to rely on in-house trainers. Hence, stratifying by the number of employees when sampling mines served an analytic purpose, as well as facilitated the over sampling of large mines needed for employee-level analyses (see Figure 6).

From an analysis standpoint, it was also desirable to control for underground versus surface mines when sampling mines and employees (see Figures 7 and 8). Underground coal mines, in particular, have higher injury and fatality rates than surface mines. There is substantial diversity in the incidence of injuries and fatalities at underground mines versus surface mines across all mining sectors. Nearly one-third of coal and metal mines are underground. Less than ten percent of nonmetal and stone mines are underground and sand and gravel mines are surface only. Stratification by underground mines versus surface mines allows for the control over sample sizes needed for effective comparisons of underground mines to surface mines. A more in-depth discussion of the stratum size formation and sample size guidelines used in this survey can be found in Appendix E.

# Coal Mining Operations, 2007

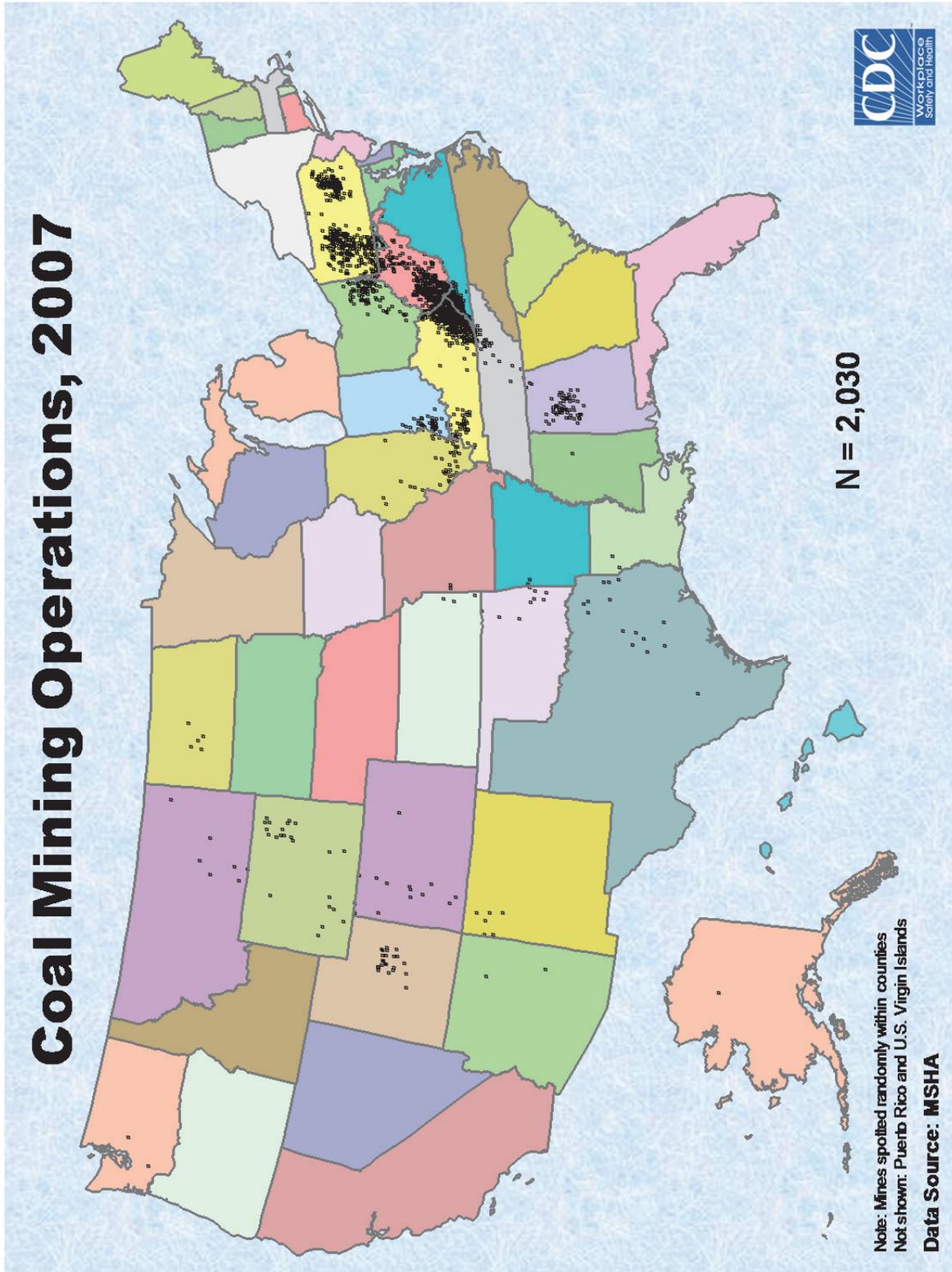


Figure 1. Map of Active Coal Mining Operations for 2007.

# Metal Mining Operations, 2007

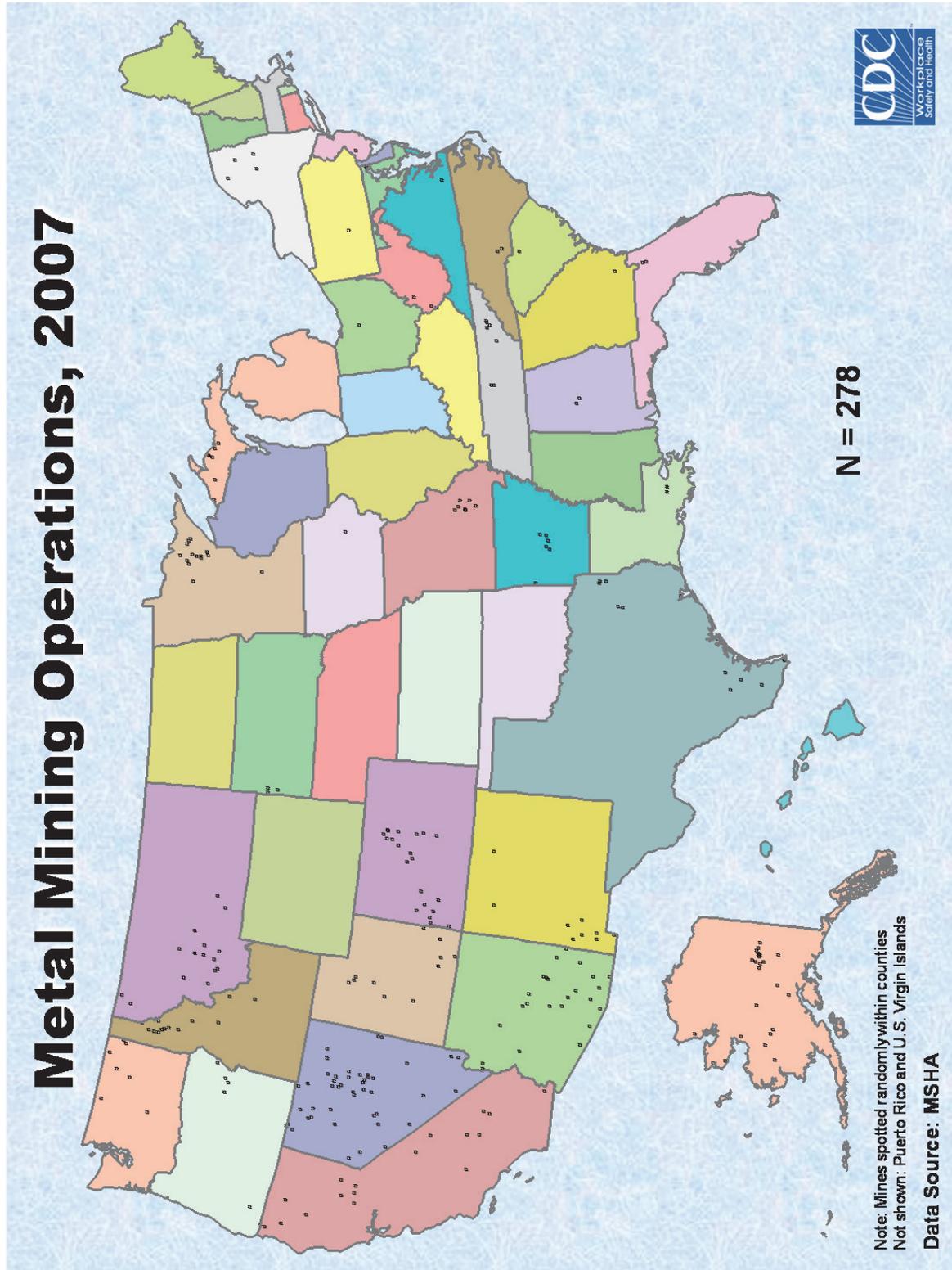


Figure 2. Map of Active Metal Mining Operations for 2007.

# Nonmetal Mining Operations, 2007

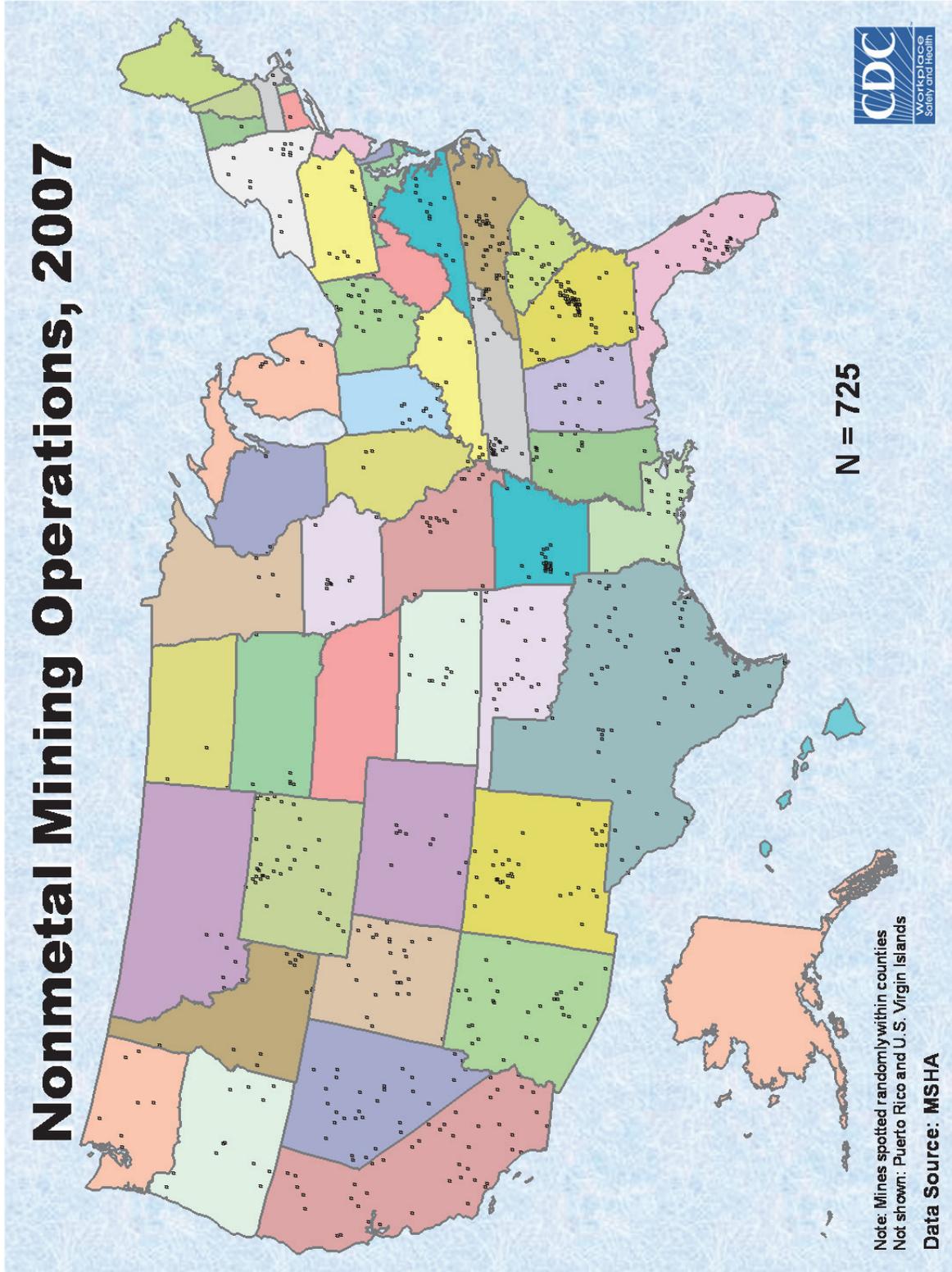


Figure 3. Map of Active Nonmetal Mining Operations for 2007.

# Stone Mining Operations, 2007

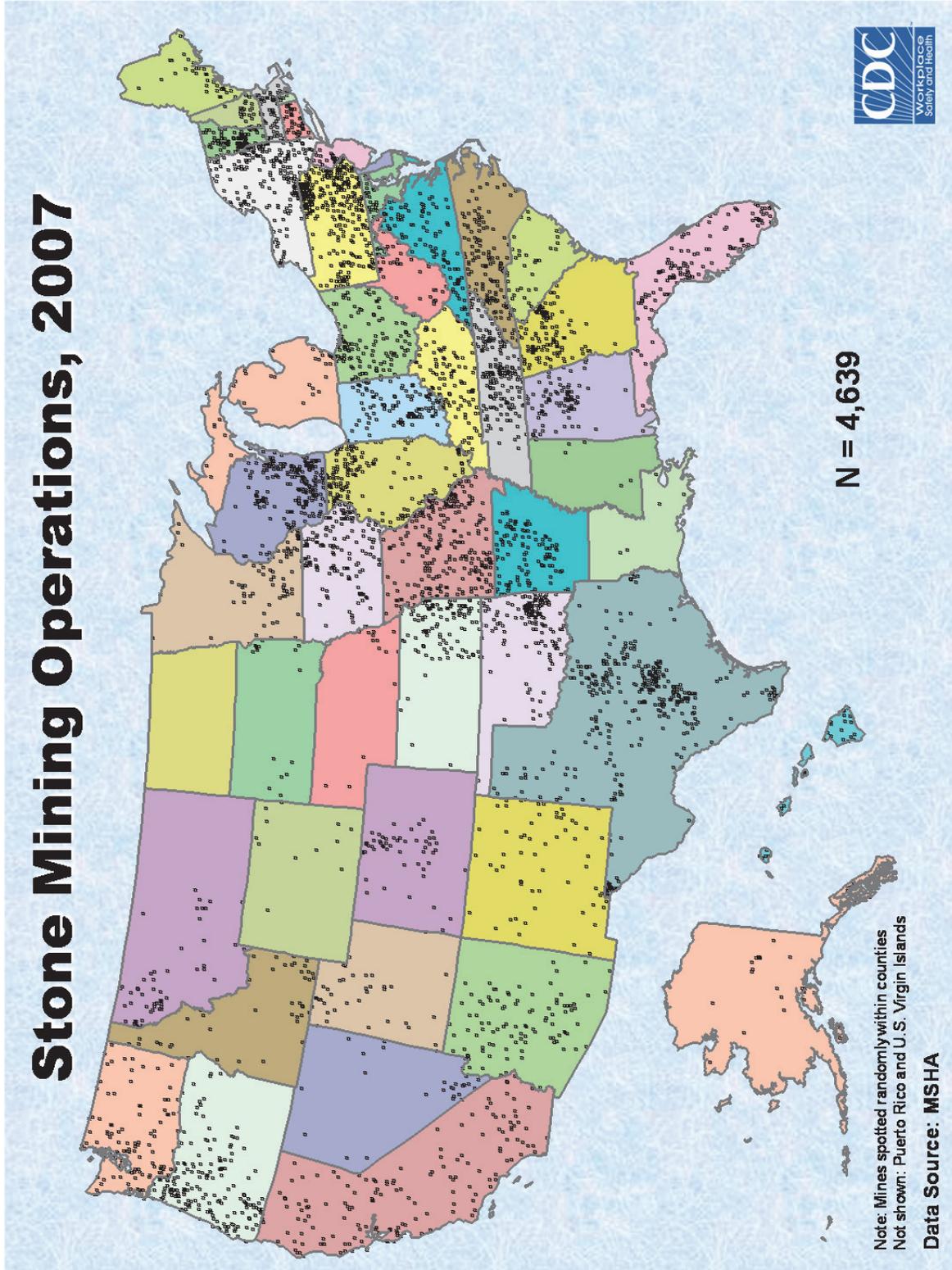


Figure 4. Map of Active Stone Mining Operations for 2007.

# Sand & Gravel Mining Operations, 2007

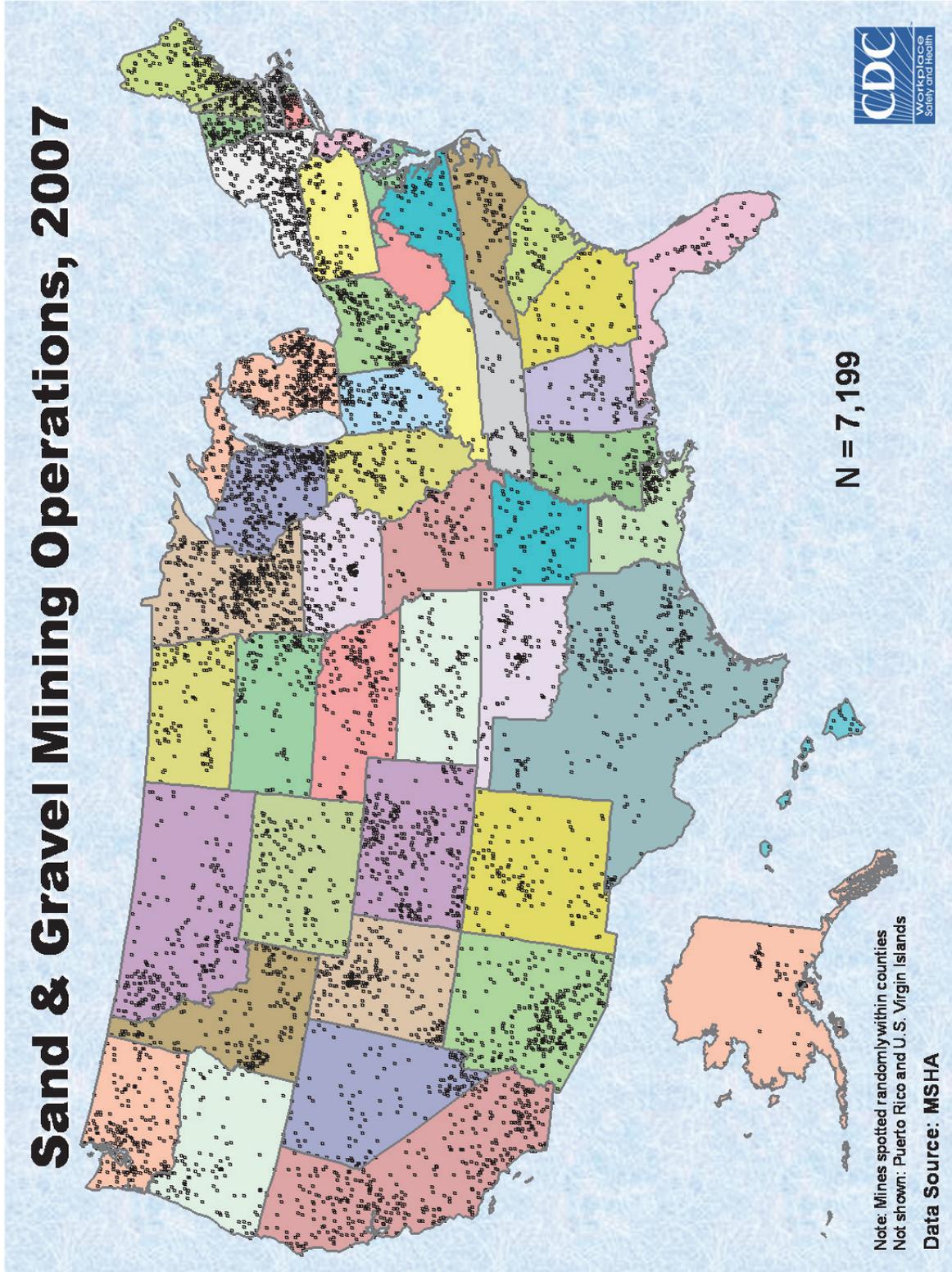


Figure 5. Map of Active Sand and Gravel Mining Operations for 2007.

# Mine Operator Employees, 2007

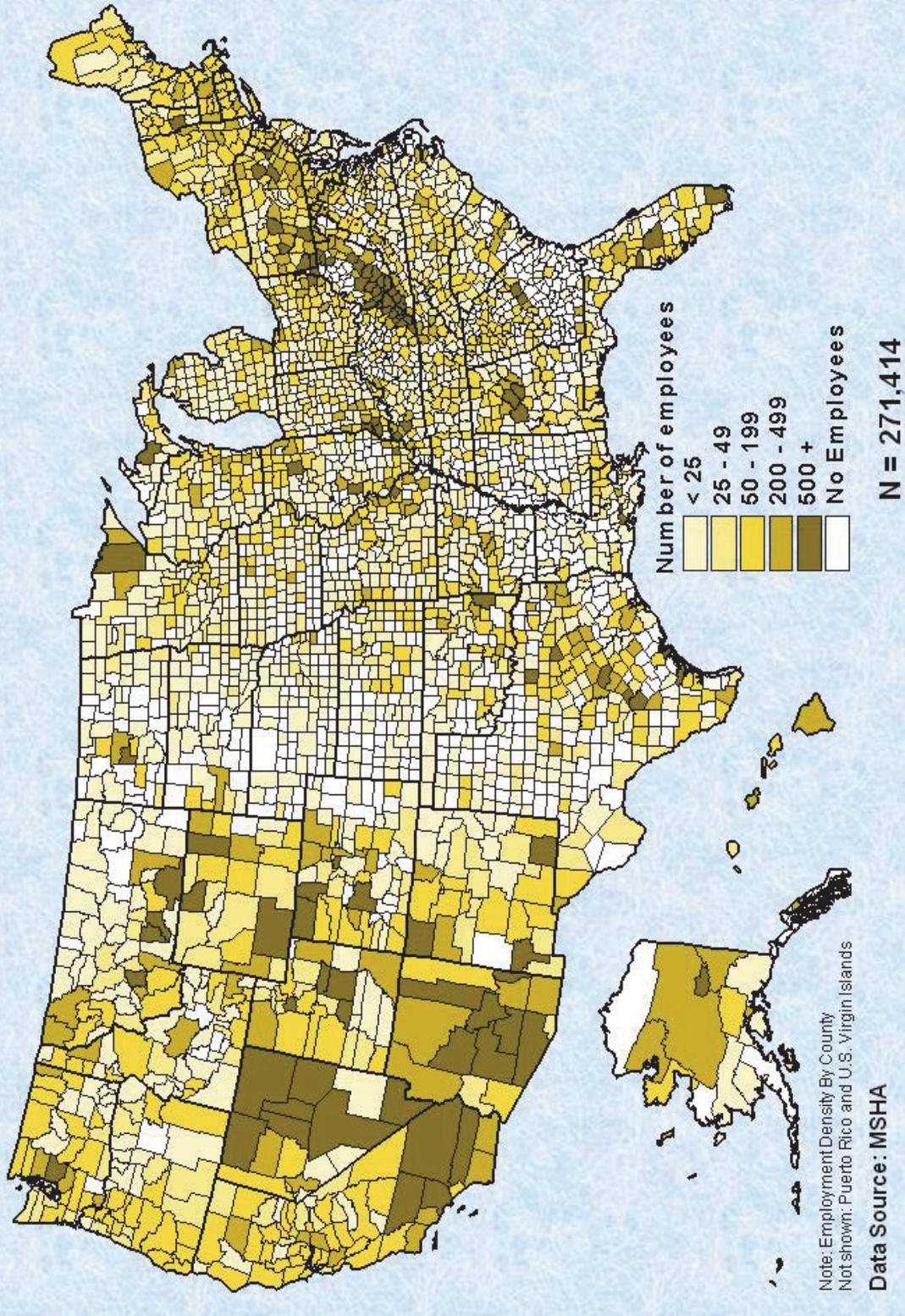


Figure 6. Density Map for Mine Operator Employees for 2007.

# Mine Operator Employees Working at Underground Locations, 2007

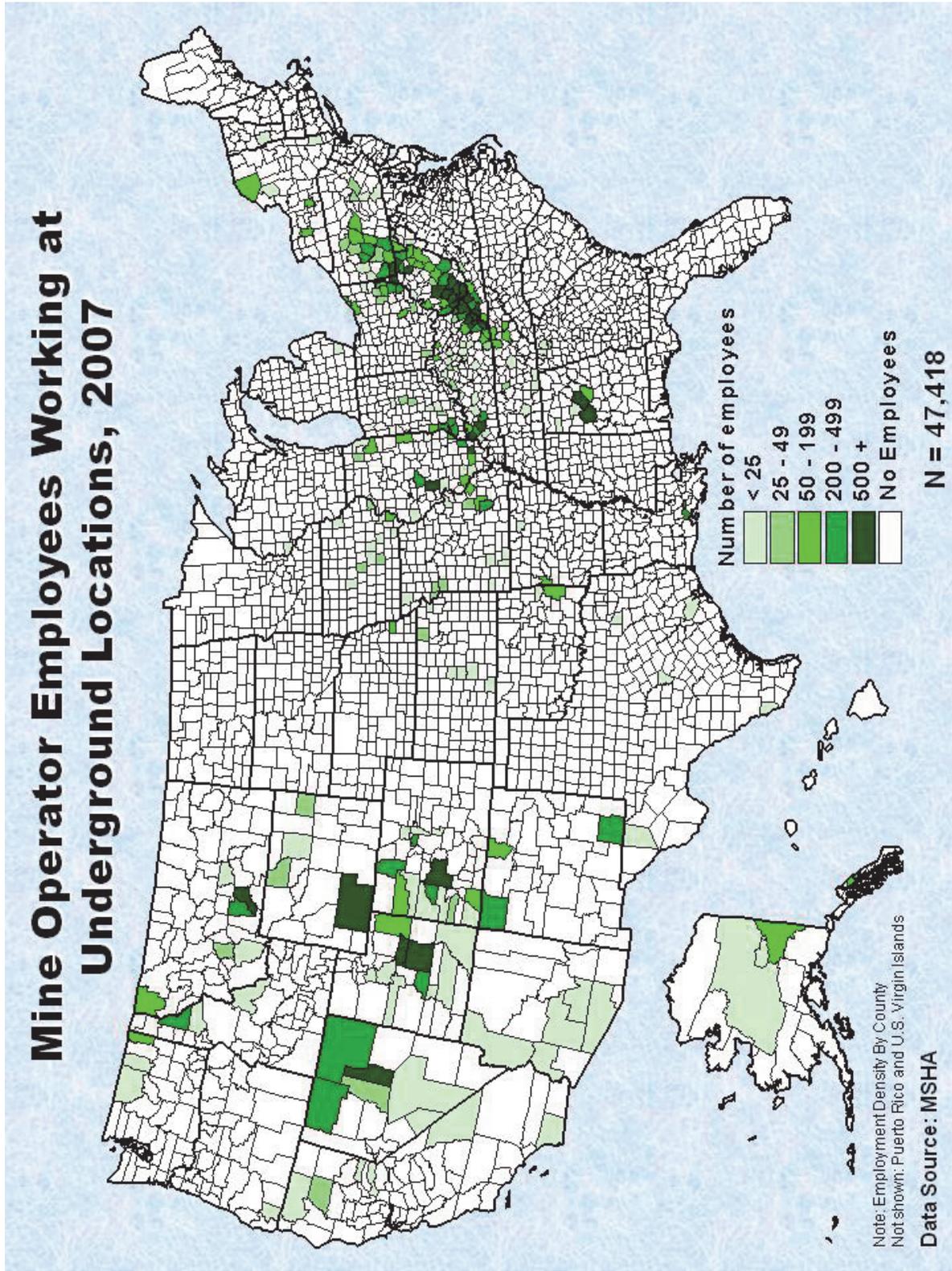


Figure 7. Density Map for Underground Mine Operator Employees for 2007.

# Mine Operator Employees Working at Surface Locations, 2007

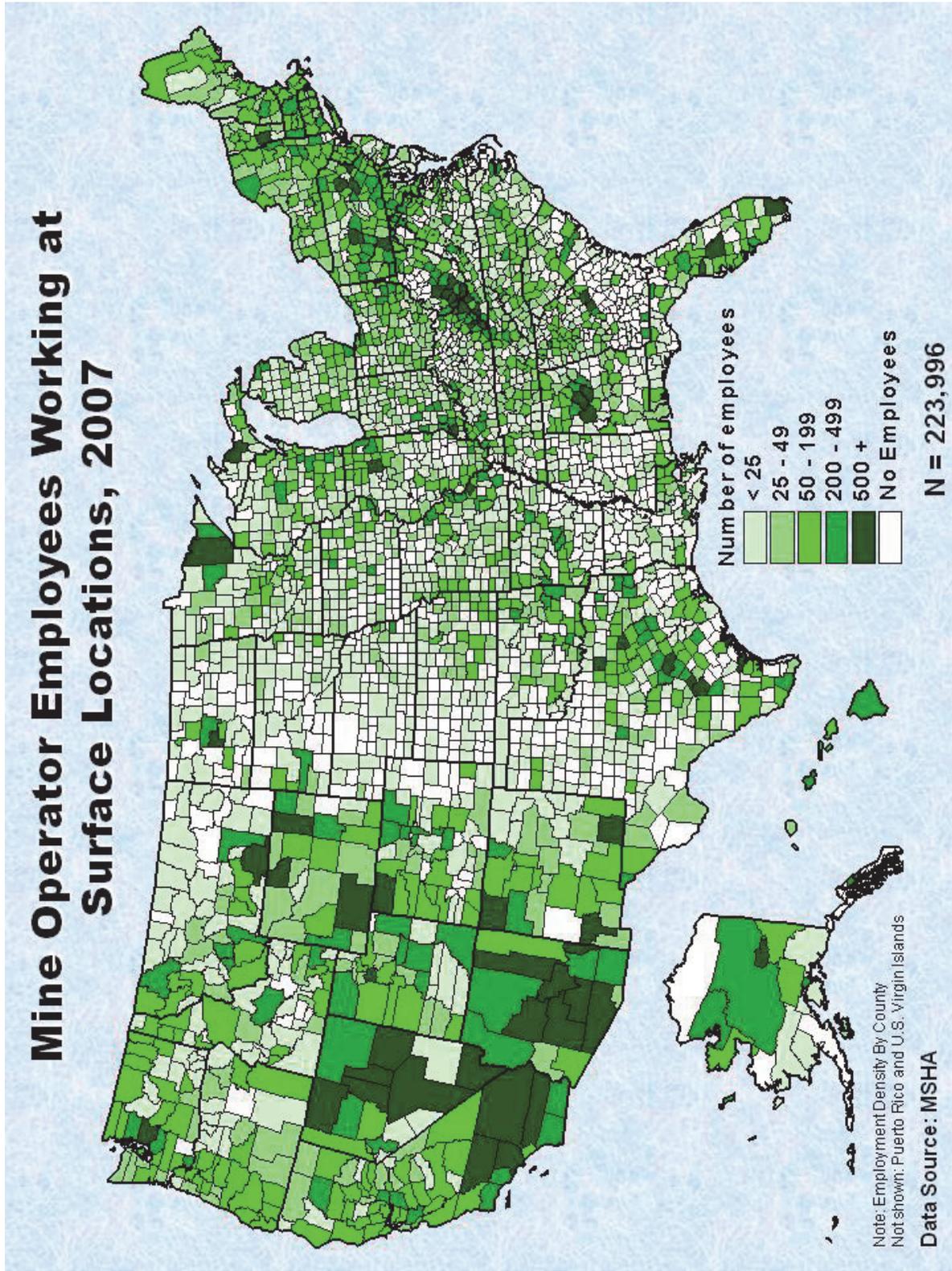


Figure 8. Density Map for Surface Mine Operator Employees for 2007.

## Sampling Plans

The original sampling plans were finalized in 2004 after a pretest with eight mining operations. These plans were developed using MSHA data from the second quarter of 2002. The number of actual employees was used to develop these designs rather than the number of full-time equivalent (FTE) employees, because the mine operator would be sampling based upon counts of actual employees, not FTEs. Mines were classified as surface or underground based upon MSHA subunit codes. Mines reporting any employment at underground work locations were classified as underground mining operations.

Because there would actually be two surveys, one for mines and one for employees, the sampling allocation needed to be balanced. An approach that Cochran [1977] suggested was used where the size strata were defined so that they were equal in terms of the square root of the size measure (in this case, the number of employees). The square root was used as a compromise between the needs of mine-level estimation where equal selection probabilities were best (size = 1) and employee-level estimation was best (size = number of employees). Detailed sample size allocation tables based on 2002 data for coal, metal, nonmetal, stone, and sand and gravel mines can be found in Appendix F.

Following the Office of Management and Budget (OMB) approval to conduct the national survey, the final sampling allocations were updated using 2007 second quarter MSHA data. Nine sampling frames were constructed based on the mining sector and mine type (underground or surface). The sampling was conducted using the SurveySelect procedure in the SAS statistical software package (SAS Institute Inc., Cary, NC). Systematic random sampling within the employee size strata was used together with controlled sorting by the state where the mine was located. The latter was done to ensure that the sample of mines was geographically representative. All metal mines and all underground nonmetal mines were selected with certainty from every stratum. The final survey sample of mines consisted of 331 underground coal, 385 surface coal, 74 underground metal, 159 surface metal, 39 underground nonmetal, 286 surface nonmetal, 96 underground stone, 498 surface stone, and 453 sand and gravel, for a total of 2,321 mining operations. Tables 1–9 present the sample allocations by mining sector and mine type.

**Table 1. Sample Allocation for Underground Coal Mines**

<b>Stratum</b>	<b>Number of Mines</b>	<b>Percentage of Total Mines</b>	<b>Number of Employees</b>	<b>Percentage of Total Employees</b>	<b>Sample Mines</b>
1–9	146	25.4%	331	0.8%	56
10–25	118	20.5%	1,972	4.8%	68
26–50	117	20.3%	4,460	10.8%	67
51–75	58	10.1%	3,622	8.8%	35
76–100	32	5.6%	2,790	6.8%	22
101–250	61	10.6%	9,267	22.5%	49
251+	43	7.5%	18,750	45.5%	34
<b>Total</b>	<b>575</b>	<b>100%</b>	<b>41,192</b>	<b>100%</b>	<b>331</b>

**Table 2. Sample Allocation for Surface Coal Mines**

<b>Stratum</b>	<b>Number of Mines</b>	<b>Percentage of Total Mines</b>	<b>Number of Employees</b>	<b>Percentage of Total Employees</b>	<b>Sample Mines</b>
1–9	725	51.8%	2,147	5.7%	101
10–25	302	21.6%	4,945	13.1%	84
26–50	209	14.9%	7,305	19.4%	75
51–75	65	4.6%	4,057	10.8%	36
76–100	30	2.1%	2,612	6.9%	20
101–250	44	3.1%	7,235	19.2%	44
251+	25	1.8%	9,407	24.9%	25
<b>Total</b>	<b>1,400</b>	<b>100%</b>	<b>37,708</b>	<b>100%</b>	<b>385</b>

**Table 3. Sample Allocation for Underground Metal Mines**

<b>Stratum</b>	<b>Number of Mines</b>	<b>Percentage of Total Mines</b>	<b>Number of Employees</b>	<b>Percentage of Total Employees</b>	<b>Sample Mines</b>
1–9	26	35.1%	137	1.8%	26
10–25	8	10.8%	134	1.8%	8
26–50	9	12.2%	327	4.3%	9
51–75	7	9.5%	443	5.8%	7
76–100	2	2.7%	168	2.2%	2
101–250	13	17.6%	2,312	30.4%	13
251+	9	12.2%	4,077	53.7%	9
<b>Total</b>	<b>74</b>	<b>100%</b>	<b>7,598</b>	<b>100%</b>	<b>74</b>

**Table 4. Sample Allocation for Surface Metal Mines**

<b>Stratum</b>	<b>Number of Mines</b>	<b>Percentage of Total Mines</b>	<b>Number of Employees</b>	<b>Percentage of Total Employees</b>	<b>Sample Mines</b>
1-9	60	37.7%	217	0.9%	60
10-25	21	13.2%	325	1.3%	21
26-50	13	8.2%	454	1.9%	13
51-75	4	2.5%	239	1.0%	4
76-100	3	1.9%	254	1.0%	3
101-250	26	16.4%	4,518	18.7%	26
251+	32	20.1%	18,204	75.2%	32
<b>Total</b>	<b>159</b>	<b>100%</b>	<b>24,211</b>	<b>100%</b>	<b>159</b>

**Table 5. Sample Allocation for Underground Nonmetal Mines**

<b>Stratum</b>	<b>Number of Mines</b>	<b>Percentage of Total Mines</b>	<b>Number of Employees</b>	<b>Percentage of Total Employees</b>	<b>Sample Mines</b>
1-9	7	17.9%	30	0.6%	7
10-25	5	12.8%	95	1.9%	5
26-50	6	15.4%	258	5.2%	6
51-75	4	10.3%	257	5.2%	4
76-100	2	5.1%	170	3.5%	2
101-250	11	28.2%	1,980	40.3%	11
251+	4	10.3%	2,125	43.2%	4
<b>Total</b>	<b>39</b>	<b>100%</b>	<b>4,915</b>	<b>100%</b>	<b>39</b>

**Table 6. Sample Allocation for Surface Nonmetal Mines**

<b>Stratum</b>	<b>Number of Mines</b>	<b>Percentage of Total Mines</b>	<b>Number of Employees</b>	<b>Percentage of Total Employees</b>	<b>Sample Mines</b>
1-9	339	53.6%	1,305	7.5%	92
10-25	128	20.2%	1,990	11.4%	65
26-50	81	12.8%	3,052	17.6%	46
51-75	32	5.1%	2,026	11.7%	32
76-100	19	3.0%	1,689	9.7%	17
101-250	25	3.9%	3,805	21.9%	25
251+	9	1.4%	3,520	20.2%	9
<b>Total</b>	<b>633</b>	<b>100%</b>	<b>17,387</b>	<b>100%</b>	<b>286</b>

**Table 7. Sample Allocation for Underground Stone Mines**

<b>Stratum</b>	<b>Number of Mines</b>	<b>Percentage of Total Mines</b>	<b>Number of Employees</b>	<b>Percentage of Total Employees</b>	<b>Sample Mines</b>
1-9	15	14.0%	78	2.0%	14
10-25	42	39.3%	733	18.8%	32
26-50	30	28.0%	1,030	26.4%	30
51-75	13	12.1%	812	20.8%	13
76-100	2	1.9%	174	4.5%	2
101-250	4	3.7%	511	13.1%	4
251+	1	0.9%	560	14.4%	1
<b>Total</b>	<b>107</b>	<b>100%</b>	<b>3,898</b>	<b>100%</b>	<b>96</b>

**Table 8. Sample Allocation for Surface Stone Mines**

<b>Stratum</b>	<b>Number of Mines</b>	<b>Percentage of Total Mines</b>	<b>Number of Employees</b>	<b>Percentage of Total Employees</b>	<b>Sample Mines</b>
1-9	2,034	49.6%	9,039	11.9%	116
10-25	1,345	32.8%	21,224	28.0%	114
26-50	426	10.4%	15,002	19.8%	95
51-75	107	2.6%	6,537	8.6%	51
76-100	56	1.4%	4,903	6.5%	36
101-250	128	3.1%	18,294	24.1%	83
251+	3	0.1%	911	1.2%	3
<b>Total</b>	<b>4,099</b>	<b>100%</b>	<b>75,910</b>	<b>100%</b>	<b>498</b>

**Table 9. Sample Allocation for Sand and Gravel Mines**

<b>Stratum</b>	<b>Number of Mines</b>	<b>Percentage of Total Mines</b>	<b>Number of Employees</b>	<b>Percentage of Total Employees</b>	<b>Sample Mines</b>
1-3	2,846	44.3%	5,555	13.0%	119
4-6	1,615	25.1%	7,761	18.2%	80
7-9	729	11.3%	5,682	13.3%	37
10-25	1,010	15.7%	14,629	34.4%	110
26-50	190	3.0%	6,411	15.1%	70
51-75	27	0.4%	1,632	3.8%	27
76-100	8	0.1%	684	1.6%	8
101-250	2	0.0%	219	0.5%	2
251+	0	0.0%	0	0.0%	0
<b>Total</b>	<b>6,427</b>	<b>100%</b>	<b>42,573</b>	<b>100%</b>	<b>453</b>

## Data Collection

### Survey Packet

The survey packet mailed to each sampled mining operation contained the following materials:

- A cover letter from NIOSH that introduced the study to the selected mines and stressed the importance of the study to the safety and health of miners. The letter was personalized and addressed to the best respondent identified through initial contacts with the mine.
- A Questions and Answers brochure that answered frequently asked questions.
- A copy of the paper questionnaire.
- Personalized directions for accessing the Internet questionnaire.
- A postage-paid return envelope for returning the hard-copy questionnaire.

The mine respondents were given the option of completing either the paper questionnaire booklet or the web-based survey questionnaire. The Questions and Answers brochure explained that both surveys asked the same questions. To minimize the employee-level questionnaire burden, mines with 30 or more employees were asked to provide data for only a sample of the total employees working during the specific reporting week. Mines with less than 30 employees were asked to report for all of them.

For mines with 30 or more employees working in the reference week, the mine respondent was asked to select the sample of employees by following sampling instructions included in the survey questionnaire. The sampling instructions were designed to select from 15 to 25 employees per mine, with employee counts from the frame used to determine the sampling rate. The employees were selected using systematic sampling with custom-generated “start-with” and “take-every” numbers included on the instructions page of the questionnaire. The “take-every” number was determined by dividing the number of employees the mine reported to MSHA by 30 and then rounding down. A random number table was consulted to get a random number between 1 and the “take-every” number which would be the “start-with” number. The “start-with” number constituted the first selection made from the list, prepared by the mine, of employees working during the reference week. The “take-every” number needed to be added repeatedly to the “start-with” number to determine the remaining selections. The variable number of employees selected per mine resulted from the need to use an integer as the “take-every” number to simplify the mathematics for the respondent.

The MSHA employment data printed on the mine’s questionnaire may not have been current for the data collection period. This limitation was handled by instructing the mine respondents to call in when their mine employment for the reference week was 20 percent greater or 20 percent less than the employment projected from the MSHA data. The survey contractor would then provide alternative “start-with” and “take-every” numbers to these mine respondents, after determining that the respondents were reporting for the correct mine.

Each sampled mining operation was randomly assigned a reporting week, balanced by mine type and sector. The reporting week was a seven-day period that the mine respondent was asked to reference when answering some items in the questionnaire. The reporting week was

described in the questionnaire as the mine's payroll week, which included the date that was preprinted on the first page of the questionnaire. Over the course of the survey, there were a total of 12 reporting weeks. On average, 193 mines were assigned to each reporting week (see Table 10).

**Table 10. Number of Mines in the Final Sample by Sector, Type, and Reporting Week**

<b>Week</b>	<b>Total Mines</b>	<b>Coal</b>	<b>Metal</b>	<b>Nonmetal</b>	<b>Stone</b>	<b>Sand and Gravel</b>	<b>Surface</b>	<b>Underground</b>
1	193	59	20	27	50	37	147	46
2	193	60	19	27	49	38	148	45
3	194	60	19	28	50	37	148	46
4	193	60	19	27	49	38	148	45
5	194	60	19	27	50	38	149	45
6	194	60	19	27	50	38	149	45
7	193	59	20	27	49	38	149	44
8	194	60	20	27	50	37	148	46
9	193	60	19	27	49	38	148	45
10	193	59	20	27	49	38	149	44
11	193	59	20	27	49	38	149	44
12	194	60	19	27	50	38	149	45
<b>Total</b>	<b>2,321</b>	<b>716</b>	<b>233</b>	<b>325</b>	<b>594</b>	<b>453</b>	<b>1,781</b>	<b>540</b>

## Survey Promotion

Several initiatives were implemented before the start of data collection to promote the survey and to maximize response rates. OMSHR undertook considerable efforts to publicize the survey. At the start of data collection in March 2008, the National Mining Association offered to prepare and publish an article about the survey in its newsletter. Throughout the data collection period, OMSHR continued to pursue additional publicity efforts, promoting the survey both within NIOSH and to the mining community. A sand and gravel industry newsletter included an article about the survey. A notice about the survey was also published in the May 2008 issue of *CoalUSA* magazine.

Prior to the mailing of the survey packet, initial telephone calls were made to the contacts identified for each selected mine. In some cases the same contact individuals were found to be associated with multiple mines; for example, nine contacts were affiliated with mining companies that each had seven or more mines in the sample. A special effort was made by OMSHR to contact these individuals and inform them of the selection of multiple mining operations, determine the most appropriate addressee/recipient of the survey packet, and encourage participation in the survey. Throughout the data collection period, OMSHR continued to assist the survey contractor in both initiating and receiving calls with mine contacts and in responding to e-mails from the sampled mining operations.

## Follow-up Contacts

Once the survey packet had been sent to the contact person at the mine, the data collection schedule provided for a three-week waiting period, to allow the contact the opportunity to complete the survey. After the waiting period, follow-up reminder calls were made to those mines that did not return their questionnaires or complete the web surveys by the “please submit” date printed on the survey. The main functions of the follow-up calls were to:

- Ensure that the survey materials had been received and that the materials were delivered to the appropriate person.
- Answer any questions regarding completing the survey.
- Serve as a reminder to complete the survey.

The most difficult challenge of follow-up was simply reaching the contacts. To deal with this issue, various approaches and initiatives were implemented. Because e-mail addresses were often available for mine contacts, an e-mail initiative was developed whereby an e-mail reminder was sent to anyone who had: (1) started, but did not complete a web survey; (2) not yet opened a web survey; (3) not returned a questionnaire; or (4) not made contact during the follow-up calls. This resulted in some immediate responses to the e-mails, along with many calls to the toll-free study telephone line and directly to OMSHR, often from contact persons who had a question on how to complete the survey. There were also a number of out-of-office replies that were useful in determining when another follow-up attempt could be made.

In addition, OMSHR also prepared a follow-up letter, cosigned by the study project director and the director of the NIOSH Office of Mine Safety and Health Research, with space at the bottom for the web survey login information and mine-specific password. This letter was mailed to contacts at more than 1,000 mining operations. As a result, OMSHR received some additional completed questionnaires. However, a large number of letters were returned as undeliverable.

## Data Imputation and Statistical Weighting Procedures

A questionnaire was considered completed if it was missing no more than two of the 52 critical items listed in Appendix G. Returned questionnaires with more than two missing critical items were considered partially complete and, when possible, data imputation was used to complete these missing items.

### Data Imputation

Imputation is the process of replacing missing data with legitimate values derived through logical deduction, regression models, or other probabilistic means. For the National Survey of the Mining Population, an attempt was made to impute missing data for the questions in the Training; Prep Plant/Mill Workers (found in the Work Schedules and Shift Work sections); Independent Contractor Employees; Safety, Communication, and Rescue Measures; and Employee Length of Service sections of the questionnaire. The Prep Plant/Mill Workers questions were imputed via information retrieved from the MSHA data on mines not having a

preparation plant. In these cases, the relevant questionnaire items were set equal to zero or to the “not applicable” response. The questions in the Training; Independent Contractor Employees; and Safety, Communication and Rescue Measures sections were imputed via logical deduction, that is, when one or more responses were affirmative within the section and no negative responses were recorded, all missing items were set to the negative response. The Employee Length of Service section was completed via a regression model that predicted one or more missing items for the Total Years in this Job Title, Total Years at this Mine, and Total Years in Mining questions from those of the three that were reported.

## Data Weighting, Estimation, and Variance Estimation

Sample survey data are weighted in order to provide unbiased or nearly unbiased estimates. The weights take into account variable probabilities of selection as well as compensate for bias introduced by differences between respondents and nonrespondents. For the National Survey of the Mining Population, weights were calculated in two steps. First, a base weight was calculated as the reciprocal of a given mine’s probability of selection. These probabilities varied by major mining sector (coal, metal, nonmetal, stone, and sand and gravel), mine type (underground or surface), and mine size (number of employees). Second, a nonresponse adjusted weight was calculated as the product of the base weight and a nonresponse adjustment factor. The nonresponse adjustment factor was calculated as the ratio of the sum of weights for all eligible mines within a primary stratum (sector by mine type) to the sum of the weights for all responding mines.

Survey sampling implies some imprecision in the estimates and this imprecision is measured as variance and standard errors. For this survey, the Jackknife Repeated Replication (JRR) method was used to support variance estimation. One hundred replicate weights were created for each record in the dataset, with every replicate weight repeating the two steps described previously. Each replicate weight was used to derive a replicate estimate, and the variance in the replicate estimates (across the 100 replicates) could then be used to estimate the variance and standard error of each survey estimate.

## Lessons Learned

The following lessons learned are based on project staff observations (by both OMSHR and the survey contractor) and the feedback obtained from the survey respondents. Also presented are any additional methods that could have been implemented to potentially increase the response rate or the efficiency of the study management.

- The questionnaire, with its foldout employee section and sample selection approach, appeared to be a barrier to completion. It is possible that the perceived level of effort for completing the survey prevented some mines from participating.
- Comments regarding ease of use of the survey were similar for both paper and web-based respondents. Partial responses on both versions of the questionnaire often stopped at the beginning of the employee section. This may have occurred when the mine contact realized that he/she could not complete the full questionnaire without retrieving information from other people in the mine organization, or from records not conveniently

located, or that other staff may have been unable or unwilling to complete the questionnaire.

- There was no incentive provided for completion of the survey, other than to assist OMSHR.
- Most refusal information related to time/burden issues. Some contacts refused after learning that they were assigned to complete questionnaires for multiple mines in their organization. Health and safety contacts often said that the survey content focused too little on health and safety issues and too much on human resource questions.
- The e-mail follow-up reminders and OMSHR follow-up letter were helpful initiatives, but may have been more effective had they been initiated at an earlier time in the data collection process.
- Even though multiple contact attempts and various response modes were used in this survey, conducting a nonresponse survey could have helped to ascertain whether the population of nonresponders differed measurably from the participants. It also could have been very useful in understanding and characterizing barriers to participation.
- Some suggestions for future surveys are the following:
  - Conducting the survey to focus on one major mining sector at a time in order to improve performance.
  - Reducing the length of the questionnaire, in response to complaints from mines that did not have the staff or the time to complete it.
  - Involving large mining companies in early reviews of the survey to obtain their input on questions they might find objectionable and their feedback on how to best administer the survey.

## **Survey Results**

Overall, 954 completed or partial surveys were returned from the sampled mining operations. The outcomes of data collection for each of the sampled mines are summarized in Table 11. The 651 “critical items complete” and 86 “final missing critical items” questionnaires were the 737 survey responses that were used for the estimates presented in this IC. The mode of completion by the respondents is shown in Table 12.

**Table 11. Summary of Final Results for All Sampled Mines**

<b>Result Code Description</b>	<b>Total</b>
Critical items complete *	651
Final missing critical items *	86
Partial response	217
Final refusal—explicit refusal by corporate management	56
Final refusal, other reason—explicit refusal by local mine management	77
Final refusal, records unavailable—explicit refusal by local mine management	5
Final refusal, staff time—explicit refusal by local mine management	85
Ineligible mine	85
Ineligible, no contact	32
Initialized, no response	1,020
Hard-copy questionnaire received, but blank	7
<b>Total</b>	<b>2,321</b>

\*Comprised final survey dataset

**Table 12. Number of Completed Surveys by Mode**

<b>Mode</b>	<b>Count</b>	<b>Percentage</b>
Web questionnaire	360	49%
Paper questionnaire	377	51%
<b>Total</b>	<b>737</b>	<b>100%</b>

Based on the review of the results of all contact attempts, 117 mines were determined to be ineligible. A summary of the ineligible mines by sector is presented in Table 13. Some of the reasons for ineligibility were:

- Mine has been closed.
- No contact was ever made with anyone at the mine.
- Mine is nonproducing.
- Construction work on the mine has not yet begun.
- Mine is shutting down and moving out equipment.
- Mine was just an exploration mine and was never in a producing status.
- Mine contracts out all of its mining operations.

**Table 13. Summary of Ineligible Mines by Sector**

<b>Mine Sector</b>	<b>Ineligible Mine</b>	<b>Ineligible No Contact</b>	<b>Total</b>
Coal	53	14	67
Metal	10	7	17
Nonmetal	9	4	13
Stone	7	3	10
Sand and Gravel	6	4	10
<b>Total</b>	<b>85</b>	<b>32</b>	<b>117</b>

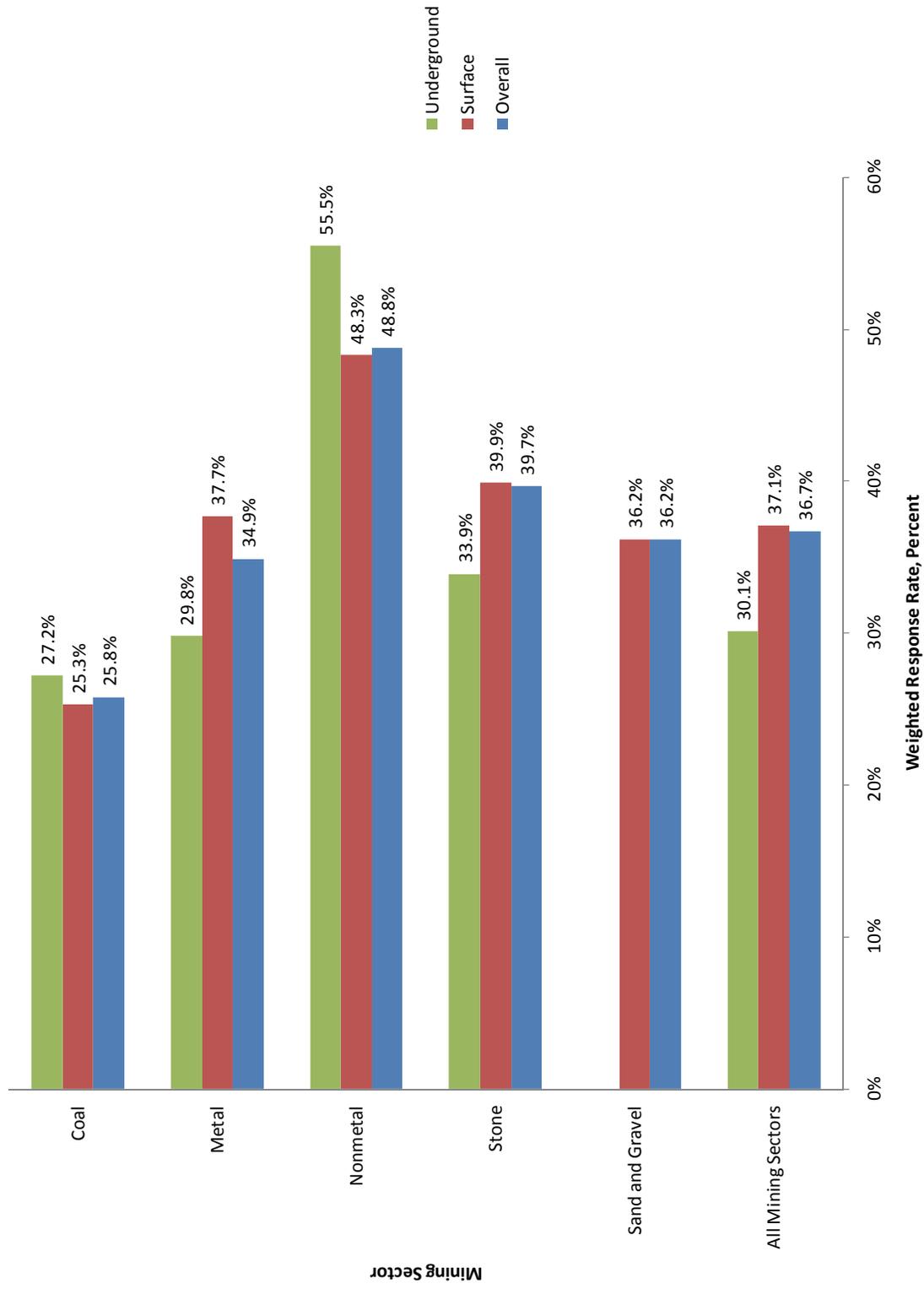
Refusals to participate in the survey were received from 223 mines. The major reasons for refusal are shown in Table 14.

**Table 14. Summary of Refusal by Mine Sector and Type of Refusal**

<b>Reason for Refusal</b>	<b>Coal</b>	<b>Metal</b>	<b>Nonmetal</b>	<b>Stone</b>	<b>Sand and Gravel</b>	<b>Total</b>
Corporate refusal	20	1	11	16	8	56
General refusal	18	7	13	23	16	77
Records unavailable	1	3	0	0	1	5
Staff time	27	8	12	16	22	85
<b>Total</b>	<b>66</b>	<b>19</b>	<b>36</b>	<b>55</b>	<b>47</b>	<b>223</b>

The overall weighted response rate for the survey was 36.7 percent, with the lowest response rate for coal mines (25.8 percent) and the highest for nonmetal mines (48.8 percent). Underground mines responded at 30.1 percent compared to surface mines at 37.1 percent. The response rate data are presented in Figure 9.

The weighted response rates were calculated as the ratio of the sum of the weights of responding mines divided by the sum of the weights for all eligible sampled mines. The denominator included all nonresponding mines that were known to be eligible along with a percentage,  $p$ , of the weight corresponding to mines which did not respond but for whom it was not possible to determine whether in fact they were eligible. The percentage,  $p$ , was computed as the ratio of the weights of known eligible nonrespondents, plus respondents, plus ineligible mines. The ratios were computed separately for each nonresponse adjustment cell, which was defined by sector, mine type, and mine size.



**Figure 9. Weighted Response Rates by Sector and Mine Type.**

Based on the data collected in this survey, Table 15 represents national estimates of the number of mines and the mine operator employees (with associated 95 percent confidence intervals) by sector during a typical week in the spring/summer of 2008. There were an estimated 231,549 employees working in 12,321 mines. Of these employees, 53,326 worked in 668 underground mines and the remaining 178,222 worked in 11,654 surface mines.

**Table 15. National Estimates of Mines and Mine Employees in Spring/Summer 2008**

Mine Sector	Number of Mines*		Number of Employees*	
		95% CI		95% CI
Coal, underground	454	(411, 498)	38,290	(31,088, 45,492)
Coal, surface	1,053	(925, 1,181)	31,717	(23,810, 39,625)
Metal, underground	71	(62, 79)	8,653	(2,419, 14,887)
Metal, surface	130	(113, 147)	30,430	(9,332, 51,528)
Nonmetal, underground	38	(29, 47)	3,424	(1,919, 4,928)
Nonmetal, surface	577	(506, 647)	15,925	(10,668, 21,182)
Stone, underground	105	(92, 118)	2,959	(2,491, 3,427)
Stone, surface	3,852	(3,600, 4,104)	68,006	(62,641, 73,372)
Sand and Gravel	6,042	(4,774, 7,309)	32,144	(26,275, 38,013)
<b>Total</b>	<b>12,321</b>	<b>(11,003, 13,640)</b>	<b>231,549</b>	<b>(204,685, 258,413)</b>

\*Data do not sum to total due to independent rounding.

## Employee Job Titles

The information for the mine operator employee job titles was collected using an open-ended format in which the survey respondent was asked to “write in” the job title for each of his/her sampled employees. A detailed listing of the job titles supplied by the respondents can be found in Appendix H. This approach allowed flexibility and lessened burden by not constraining the respondent to determine the most appropriate fit from a list of predefined job-title categories.

Initially, the Mine Safety and Health Administration (MSHA) Part 50 Data User’s Handbook [MSHA 2007] was used to code the job titles supplied by the survey respondents. In some cases, slang terms or the name of a piece of mining equipment were provided as the employee’s job title. To handle these situations, job codes were assigned by researching the equipment, mine type or commodity, and consulting *A Dictionary of Mining, Mineral, and Related Terms* [Thrush 1968] and *The Dictionary of Mining and Mineral Terms* [Infomine Inc. 2010]. Mining program researchers who were former mine employees also assisted by reviewing the “difficult-to-code” job titles and defining the occupation. In some instances, where logical, multiple job titles were combined under a single occupation code. For example, a “Belt Worker” and “Belt Man” were assigned the same code.

Once the job titles were coded, they were grouped into occupational categories. The four major categories are Administration/Professional, Maintenance, Production, and Service and

Utility. When a reported job title did not fit within any of these four categories, it was put into a Miscellaneous category. Within the four major occupational categories, there are subunits with up to four levels. Each of these subunits is further divided based on the type of work performed. National estimates of the number of workers have been computed for each major category (excluding Miscellaneous where only survey counts are reported) and the first three subunit levels.

## **Statistical Analysis**

The statistical analysis of the data from the National Survey of the Mining Population was conducted using the SAS statistical software package. The SAS SURVEYFREQ and SURVEYMEANS procedures were used to create the weighted summary statistics that are reported in the IC. These procedures properly analyze data from complex sample surveys by taking the sample design into account. The variance estimation method used with these data was the Jackknife Repeated Replication (JRR). At this time, the subpopulation analysis for JRR is not available in SAS 9.2. In order to provide national estimates for the coal, metal, nonmetal, stone, and sand and gravel mining sectors, a SAS macro, using a reweighting method, proposed by Wang and Waldron [2010] was adopted for these subpopulation analyses. In their paper, Wang and Waldron compared the results of a subgroup analysis using their macro with PROC SURVEYMEANS and found these results were almost identical to those obtained when using the standard subpopulation analysis procedure in both the Stata 10.0 (StataCorp LP) and SUDAAN 10 (RTI International) statistical analysis software packages. In order to provide a measure of precision, a 95 percent confidence interval (CI) has been calculated for all survey estimates reported in this IC. Data were suppressed, and no national estimates were computed when the unweighted survey count was fewer than five responses (i.e., the number of responses was too small to be able to produce a reliable estimate) [NCHS 2002, 2004]. Due to independent rounding, the percentages shown in the individual bar charts may not sum to exactly 100 percent.

# **Employee Statistics for All Mines**



## Summary of Employee Statistics for All Mines

The demographic and occupational characteristics of employees in the U.S. mining industry are presented in Tables 16 and 17 and Figures 10–12. The weighted estimate for gender indicates that the workforce is composed predominately of male employees (92.5 percent). The major racial category is White (93.6 percent) followed by Black or African American (4.3 percent). Twelve percent of these employees have an ethnicity of Hispanic or Latino. Sixty-five percent are high school graduates, with another 24.1 percent having an education level beyond high school. A review of the weighted estimates indicates that the average worker is 43.3 years of age and has worked in mining for 12.9 years, 9.0 years at the current mine, and 7.1 years in his/her job title. The number of hours worked per week averages 45.4 with the “Surface Mine: Strip, Open Pit or Quarry” being the primary work location for the majority, or 34.1 percent of miners. An additional 23.0 percent of employees work in “Mill Operations, Preparation Plants, or Breakers,” and another 18.3 percent are employed in the “Underground Mine: Underground” work location.

Tables 18, 19, 21, 22, and Figure 13 present the national estimates of the number of workers by four major occupational categories. (No estimates were calculated for Table 20: “Miscellaneous.”) An estimated 62,646 (27.2 percent) mine workers are employed in the “Administration/Professional” category; 35,276 (15.3 percent) in the “Maintenance” category; 90,495 (39.4 percent) in the “Production” category; and 41,851 (18.2 percent) in the “Service and Utility” category.

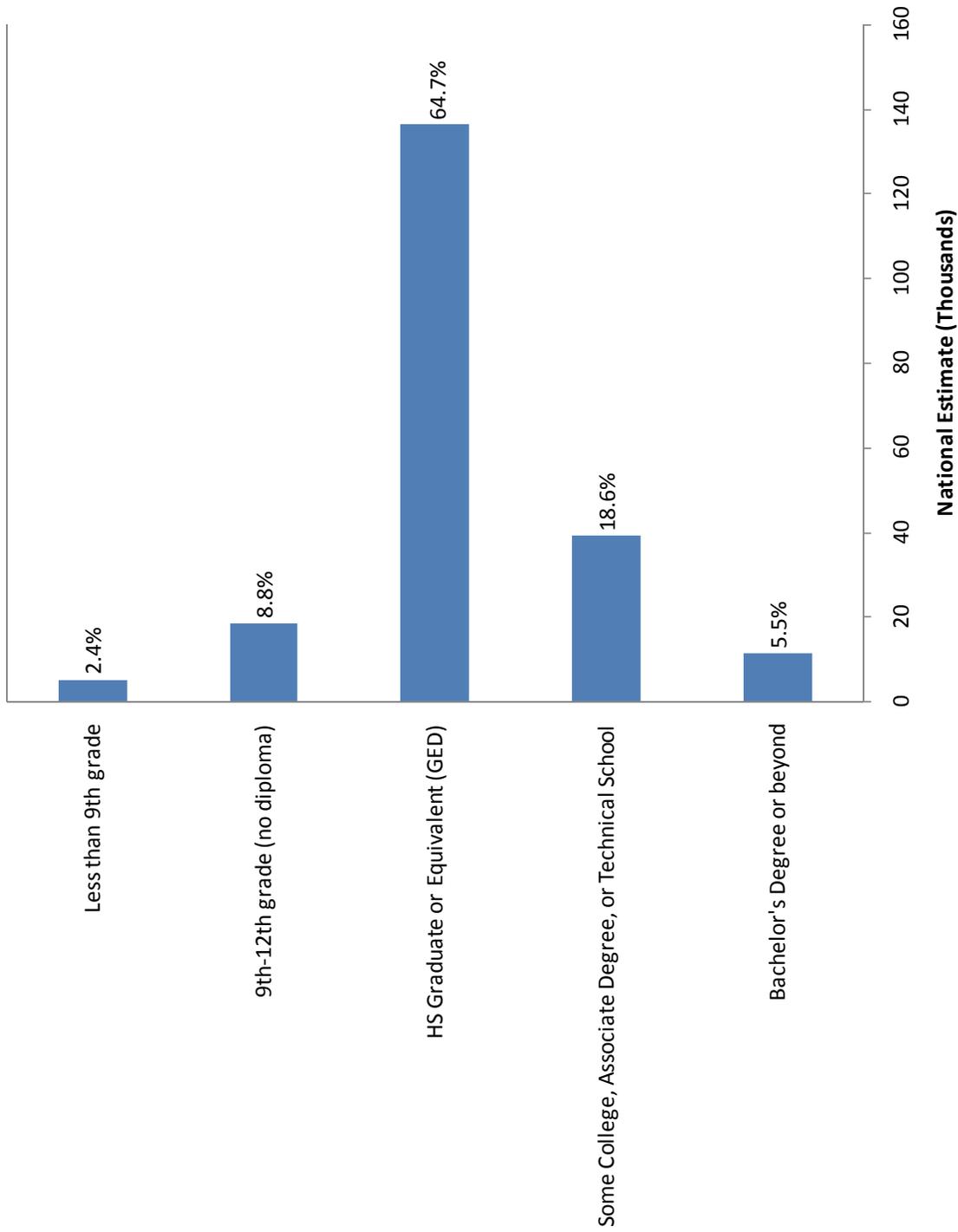


**Table 16. Demographic Characteristics of Employees at All Mines**

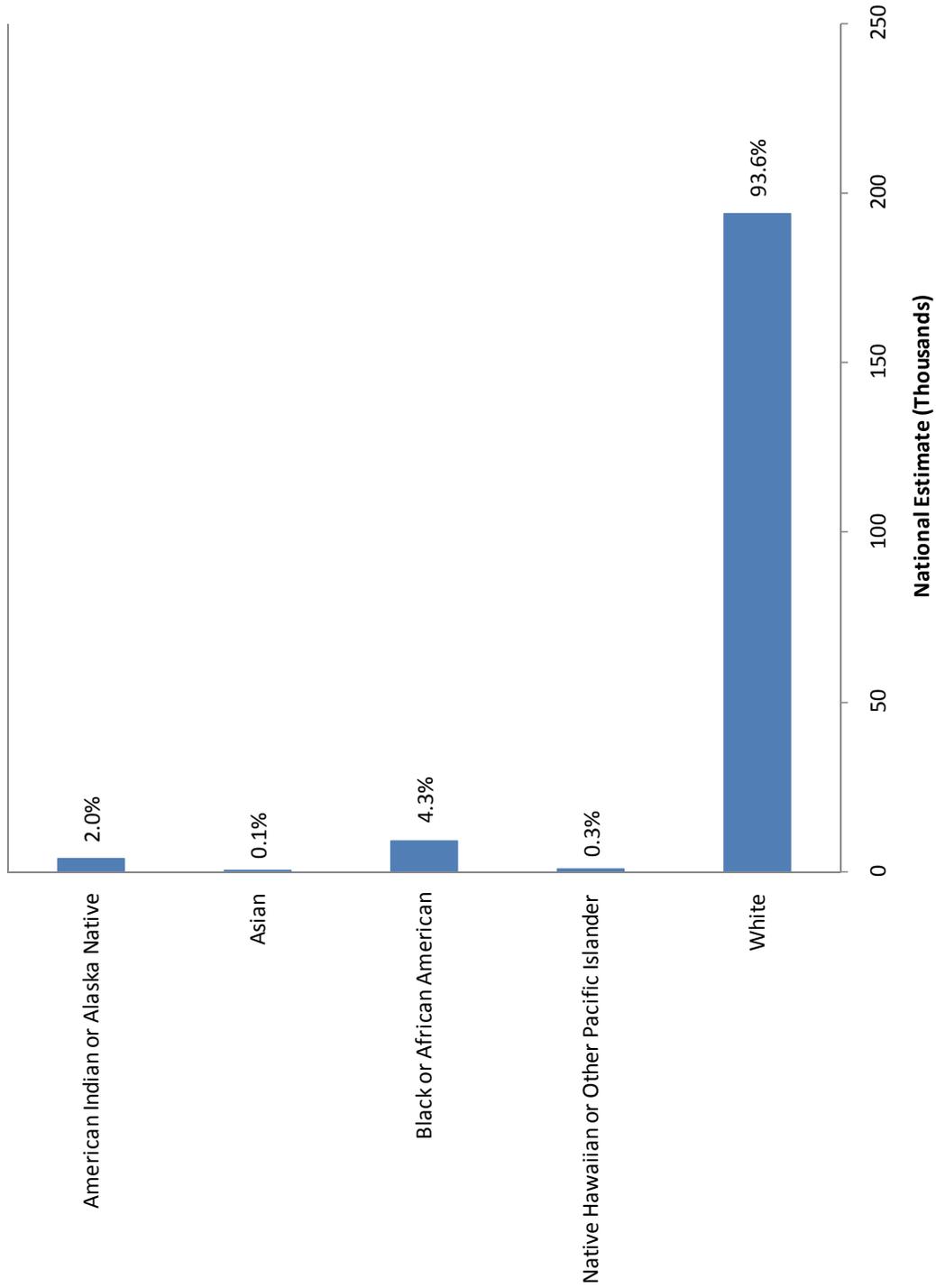
<b>Demographic Characteristic</b>	<b>Survey Count</b>	<b>National Estimate</b>	<b>95% LCL</b>	<b>95% UCL</b>	<b>National Percent</b>	<b>95% LCL</b>	<b>95% UCL</b>
<b>Gender:</b>							
Male	8,414	211,471	188,671	234,270	92.5	91.1	93.9
Female	577	17,213	12,403	22,024	7.5	6.1	8.9
<b>Age (years)</b>	8,673	43.3	42.4	44.1			
<b>Highest level of education:</b>							
Less than 9th grade	222	4,996	3,062	6,930	2.4	1.5	3.3
9th–12th grade (no diploma)	800	18,600	15,299	21,902	8.8	7.3	10.3
HS Graduate or Equivalent (GED)	5,452	136,599	121,769	151,429	64.7	61.3	68.1
Some College, Associate Degree, or Technical School	1,392	39,326	30,655	47,996	18.6	15.9	21.3
Bachelor's Degree or beyond	452	11,516	9,017	14,014	5.5	4.5	6.4
<b>Ethnicity:</b>							
Hispanic or Latino	927	26,622	17,120	36,123	12.1	8.9	15.4
Non-Hispanic or Non-Latino	7,766	192,839	172,663	213,016	87.9	84.6	91.1
<b>Race:</b>							
American Indian or Alaska Native	119	4,050	1,851	6,249	2.0	0.9	3.0
Asian	9	183	56	311	0.1	0.0	0.2
Black or African American	397	8,893	6,419	11,367	4.3	3.2	5.4
Native Hawaiian or Other Pacific Islander	14	634	140	1,127	0.3	0.1	0.5
White	7,717	194,016	174,955	213,077	93.6	92.1	95.0

**Table 17. Occupational Characteristics of Employees at All Mines**

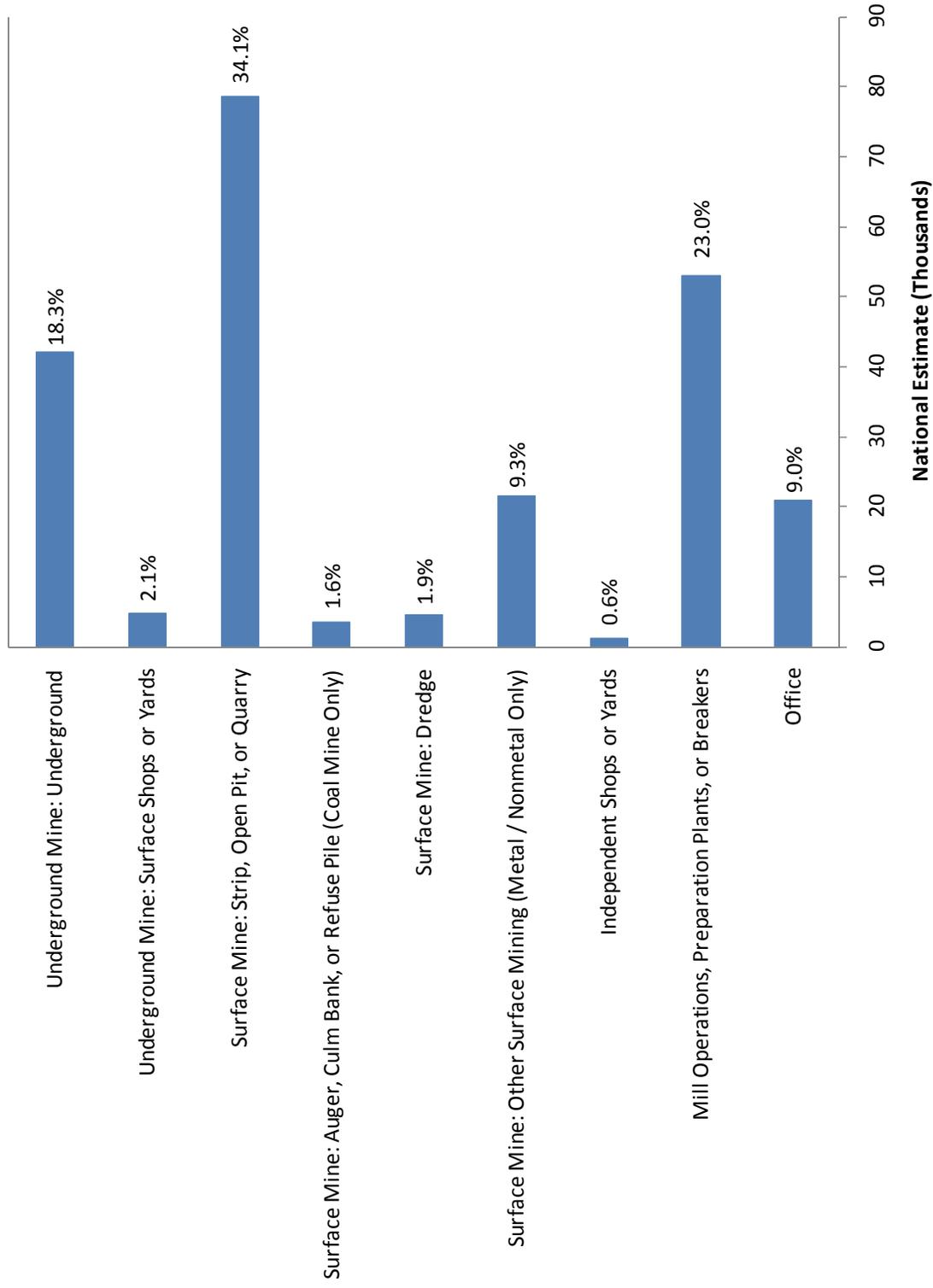
<b>Occupational Characteristic</b>	<b>Survey Count</b>	<b>National Estimate</b>	<b>95% LCL</b>	<b>95% UCL</b>	<b>National Percent</b>	<b>95% LCL</b>	<b>95% UCL</b>
Hours worked (per week)	8,363	45.4	44.6	46.2			
<b>Experience:</b>							
Experience in this Job Title (years)	8,641	7.1	6.4	7.8			
Experience at this Mine (years)	8,773	9.0	8.3	9.6			
Total Mining Experience (years)	8,539	12.9	12.1	13.7			
<b>Primary Work Location:</b>							
Underground Mine: Underground	1,585	42,191	34,049	50,333	18.3	15.0	21.6
Underground Mine: Surface Shops or Yards	287	4,884	3,461	6,307	2.1	1.5	2.7
Surface Mine: Strip, Open Pit, or Quarry	2,722	78,493	58,106	98,879	34.1	28.4	39.7
Surface Mine: Auger, Culm Bank, or Refuse Pile (Coal Mine Only)	78	3,581	267	6,896	1.6	0.1	3.0
Surface Mine: Dredge	185	4,491	2,551	6,430	1.9	1.1	2.8
Surface Mine: Other Surface Mining (Metal/Nonmetal Only)	922	21,492	14,757	28,227	9.3	6.4	12.3
Independent Shops or Yards	64	1,304	205	2,404	0.6	0.1	1.0
Mill Operations, Preparation Plants, or Breakers	2,251	53,052	45,563	60,541	23.0	19.2	26.9
Office	889	20,835	16,764	24,906	9.0	7.8	10.3



**Figure 10. Education Level of Employees at All Mines.**



**Figure 11. Race of Employees at All Mines.**



**Figure 12. Primary Work Location of Employees at All Mines.**

**Table 18. Estimated Number of Administration/Professional Employees at All Mines**

<b>Occupation by Category</b>	<b>Survey Count</b>	<b>National Estimate</b>	<b>95% LCL</b>	<b>95% UCL</b>
<b>ADMINISTRATION/PROFESSIONAL</b>	<b>2,453</b>	<b>62,646</b>	<b>54,584</b>	<b>70,708</b>
<u>Office Staff</u>	<u>408</u>	<u>10,181</u>	<u>8,304</u>	<u>12,057</u>
<i>Administrative Staff</i>	<u>225</u>	<u>5,493</u>	<u>4,299</u>	<u>6,687</u>
Administration				
Administrative Assistant				
Clerk				
Coal Distribution Coordinator				
Communications				
Customer Service				
Human Resources				
Information Technology				
Mine Clerk				
Office Clerk				
Office Staff				
Plant Clerk				
Receptionist				
Secretary				
Systems Analyst				
Technical Coordinator				
<i>Business</i>	<b>136</b>	<b>3,510</b>	<b>2,257</b>	<b>4,762</b>
Accounting				
Bookkeeper				
Buyer				
Cost Coordinator				
Payroll				
Procurement				
Purchasing				
Sales				
Shipping				
Terminal Operator				
<i>Security</i>	<b>14</b>	<b>346</b>	<b>119</b>	<b>573</b>
Guard				
Security				
<i>Supplies</i>	<b>31</b>	<b>818</b>	<b>404</b>	<b>1,232</b>
Supply Clerk				
Warehouse				
Warehouse Technician				
Warehouseman				
<i>Union Representative</i>	<b>2</b>	<b>DSU</b>	<b>DSU</b>	<b>DSU</b>
<u>Professional Engineer</u>	<u>334</u>	<u>10,304</u>	<u>7,332</u>	<u>13,276</u>
Director of Engineering	<u>61</u>	<u>1,722</u>	<u>860</u>	<u>2,584</u>
Engineer				
(Electrical/Mining/Ventilation)				
Engineer, not otherwise specified				
Environmental Engineer				
Plant Engineer				

**Table 18. Estimated Number of Administration/Professional Employees at All Mines  
(continued)**

<b>Occupation by Category</b>	<b>Survey Count</b>	<b>National Estimate</b>	<b>95% LCL</b>	<b>95% UCL</b>
Process Engineer				
Production Engineer				
Project Engineer				
<b><i>Non-engineer</i></b>	<b>90</b>	<b>3,408</b>	<b>1,568</b>	<b>5,249</b>
Chemist				
Control Person/Analyst				
Environmental				
Environmental Specialist				
Geologist				
Metallurgist				
Operating Engineer				
Operations				
Operations Specialist				
Physical Tester				
Planner				
Production Scheduler				
Reliability Engineer				
Surveyor				
Utility Engineer				
<b><i>Technician</i></b>	<b>183</b>	<b>5,174</b>	<b>3,148</b>	<b>7,199</b>
Coal Sampler				
Electrical Technician				
Electronic Technician				
Engineering Technician				
Fuel Operator/Technician				
Lab Technician				
Laboratory Technician/Refiner				
Materials Technician				
Mechanic Technician				
Mill Technician				
Mine Technician				
Plant Technician				
Process Control				
Operator/Technician				
Production Technician				
Quarry Technician				
Sampler/Lab Technician				
Technician				
Utility Technician				
<b><u>Safety</u></b>	<b><u>51</u></b>	<b><u>1,425</u></b>	<b><u>854</u></b>	<b><u>1,996</u></b>
Inspector				
Safety				
Safety Director				
Safety Manager				
Safety Supervisor				

**Table 18. Estimated Number of Administration/Professional Employees at All Mines  
(continued)**

<b>Occupation by Category</b>	<b>Survey Count</b>	<b>National Estimate</b>	<b>95% LCL</b>	<b>95% UCL</b>
<b>Supervisory</b>	<b>1,660</b>	<b>40,736</b>	<b>35,454</b>	<b>46,018</b>
<b>Executive</b>	<b>71</b>	<b>1,365</b>	<b>1,005</b>	<b>1,726</b>
CEO				
General Manager				
Mine Owner				
President				
Vice President				
<b>Foreman</b>	<b>626</b>	<b>15,807</b>	<b>12,870</b>	<b>18,744</b>
Assistant Superintendent				
Belt Foreman (underground)				
Electrical Foreman (underground)				
Foreman				
Foreman/Manager				
Foreman/Shift Boss				
Labor Foreman				
Lead Man				
Maintenance Foreman				
Maintenance Lead Man				
Mill Foreman				
Mine Foreman				
Outby Foreman				
Pit Foreman				
Plant Foreman				
Preparation Plant Foreman				
Production Foreman				
Section Foreman				
Section Foreman/Boss				
Shift Foreman				
Shop Foreman				
Superintendent				
Track Foreman				
Underground Foreman				
<b>Manager</b>	<b>339</b>	<b>8,224</b>	<b>6,266</b>	<b>10,182</b>
Area Manager				
Assistant Manager				
Assistant Mine Foreman/Assistant Mine Manager				
Concentrator Manager				
Customer Service Manager				
Distribution Manager				
Dredge Manager				
Dry Plant Manager				
Engineer/Operations Manager				
Engineering Manager				
Environmental Manager				
Equipment Maintenance Manager				
Equipment Manager				
Facility Manager				
Financial Manager				
Human Resources Manager				

**Table 18. Estimated Number of Administration/Professional Employees at All Mines  
(continued)**

<b>Occupation by Category</b>	<b>Survey Count</b>	<b>National Estimate</b>	<b>95% LCL</b>	<b>95% UCL</b>
Lab Manager				
Maintenance Manager				
Management Manager				
Mill Manager				
Mine Foreman/Mine Manager				
Mine Manager				
Office Manager				
Operations Manager				
Plant Manager				
Plant Superintendent				
Process Manager				
Production Manager				
Project Manager				
Purchasing Manager				
Quality Control Manager				
Quarry Manager				
Raw Material Manager				
Regulatory Manager				
Sales Manager				
Scale Office Manager				
Shift Manager				
Shipping Manager				
Shop Manager				
Storeroom Manager				
Technical Services Manager				
<b>Supervisor</b>	<b>624</b>	<b>15,340</b>	<b>13,052</b>	<b>17,627</b>
Assistant Mine Supervisor				
Assistant Supervisor				
Auger Crew Supervisor				
Backhoe Supervisor				
Bagging/Baghouse Supervisor				
Belt Coordinator				
Blasting Supervisor				
Clay Operator				
Concentrator Supervisor				
Control Room Supervisor				
Crusher Supervisor				
Dozer Supervisor				
Electrical Supervisor				
Engineering Supervisor				
Equipment Supervisor				
Gold House Supervisor				
Lab Supervisor				
Leaching Supervisor				
Loader Supervisor				
Loadhouse Supervisor				
Maintenance Supervisor				
Mechanic Supervisor				
Mine Operations				
Mine Operator				

**Table 18. Estimated Number of Administration/Professional Employees at All Mines  
(continued)**

<b>Occupation by Category</b>	<b>Survey Count</b>	<b>National Estimate</b>	<b>95% LCL</b>	<b>95% UCL</b>
Mine Supervisor				
Mobile Equipment Supervisor				
Pit Operator				
Pit Supervisor				
Plant Operator				
Plant Supervisor				
Prep Plant Operator				
Process Supervisor				
Production Supervisor				
Quality Assurance Supervisor				
Quarry Operator				
Quarry Supervisor				
Shift Supervisor				
Shipping Supervisor				
Supervisor				
Tailings Supervisor				
Transportation Supervisor				
Warehouse Supervisor				
Wash Plant Supervisor				

Abbreviation: DSU, data suppressed.

**Table 19. Estimated Number of Maintenance Employees at All Mines**

<b>Occupation by Category</b>	<b>Survey Count</b>	<b>National Estimate</b>	<b>95% LCL</b>	<b>95% UCL</b>
<b>MAINTENANCE</b>	<b>1,311</b>	<b>35,276</b>	<b>29,913</b>	<b>40,639</b>
<u>Specialty</u>	<u>272</u>	<u>8,234</u>	<u>6,445</u>	<u>10,022</u>
<i>Electrician</i>	<i>190</i>	<i>6,291</i>	<i>4,592</i>	<i>7,990</i>
Diagnostic Electrician				
Electrician				
Electrician/Wireman				
Electrician Trainee				
Maintenance Electrician				
Master Electrician				
Trainer Electrician				
<i>Welder</i>	<i>82</i>	<i>1,942</i>	<i>1,312</i>	<i>2,572</i>
Certified Welder				
Maintenance Welder				
Repair/Welder				
Welder				
Welder (nonshop)				
Welder/Fabricator				
Welder/Mechanic				
<u>Support</u>	<u>1,039</u>	<u>27,043</u>	<u>22,718</u>	<u>31,367</u>
<i>Maintenance</i>	<i>392</i>	<i>8,873</i>	<i>7,065</i>	<i>10,682</i>
Continuous Miner Maintenance				
Crusher Maintenance				
Dragline Oiler				
Electrical Maintenance				
Equipment Maintenance				
Fixed Maintenance				
Greaser/Oiler				
Liquid Fuel Handler				
Maintenance				
Maintenance Clerk				
Maintenance Coordinator				
Maintenance Planner				
Maintenance Technician				
Mechanic Clerk				
Mechanical Maintenance				
Mill Maintenance				
Millwright				
Mobile Maintenance				
Pipefitter				
Plant Maintenance				
Production/Process Maintenance				
Road Maintenance				
Skilled Maintenance				
Truck Maintenance				
Underground Belt Maintenance				
Underground Maintenance				

**Table 19. Estimated Number of Maintenance Employees at All Mines (continued)**

<b>Occupation by Category</b>	<b>Survey Count</b>	<b>National Estimate</b>	<b>95% LCL</b>	<b>95% UCL</b>
<b><i>Mechanic</i></b>	<b>556</b>	<b>14,368</b>	<b>11,607</b>	<b>17,129</b>
Aggregate Mechanic				
Automotive Mechanic				
Belt Mechanic				
Diagnostic Mechanic				
Diesel Mechanic				
Equipment Mechanic				
Heavy Equipment Mechanic				
Maintenance Mechanic				
Master Mechanic				
Mechanic				
Mechanic/Electrician				
Mechanic/Welder				
Mechanic Helper				
Mechanic Trainee				
Mobile Equipment Mechanic				
Mobile Maintenance Mechanic				
Mobile Mechanic				
Plant Mechanic				
Prep Plant Mechanic				
Shop Mechanic				
Underground Belt Mechanic				
Wrens Mechanic				
<b><i>Repairman</i></b>	<b>91</b>	<b>3,801</b>	<b>739</b>	<b>6,864</b>
Automotive Repairman				
Crusher Repairman				
Electronic/Electrical Repairman				
Heavy Duty Repairman				
Instrument Repairman				
Maintenance Repairman				
Mechanical Repairman				
Plant Repairman				
Repairman				
Skilled Repairman				
Tailings Repairman				
Underground Belt Repairman				
Underground Repairman				

**Table 20. Number of Miscellaneous Employees at All Mines**

<b>Occupation by Category</b>	<b>Survey Count</b>
<b>MISCELLANEOUS</b>	<b>35</b>
<u>Trainee</u>	<u>19</u>
<u>Unknown</u>	<u>16</u>

**Table 21. Estimated Number of Production Employees at All Mines**

<b>Occupation by Category</b>	<b>Survey Count</b>	<b>National Estimate</b>	<b>95% LCL</b>	<b>95% UCL</b>
<b>PRODUCTION</b>	<b>3,571</b>	<b>90,495</b>	<b>76,183</b>	<b>104,807</b>
<b><u>Equipment Operator</u></b>	<b><u>1,860</u></b>	<b><u>49,707</u></b>	<b><u>40,495</u></b>	<b><u>58,920</u></b>
<b><i>Dragline Operator</i></b>	<b>24</b>	<b>677</b>	<b>275</b>	<b>1,079</b>
<b><i>Equipment Operator</i></b>	<b>944</b>	<b>23,373</b>	<b>19,276</b>	<b>27,469</b>
Backhoe Operator				
Bobcat Operator				
Bulldozer Operator				
Crane Operator				
Dredge Operator				
End Dump Driver				
End Dump Driver/Operator				
Equipment Operator				
Forklift Operator				
Front End Loader				
Front End Loader Operator				
Grader Operator				
Gravity Mag Operator				
Heavy Equipment Operator				
Highlift Operator				
Hopper Operator				
Large Shovel/Backhoe/Load Operator				
Machine Operator				
Mobile Bridge Operator				
Mobile Equipment Operator				
Mucking Machine Operator				
Paver Operator				
Payloader Operator				
Raise Borer Operator				
Road Grader Operator				
Rock Duster				
Rotary Bucket Excavator Operator				
Rotary Dump Operator				
Scaler (mechanical)				
Scraper Operator				
Stationary Equipment Operator				
Stripping Operator				
Tower Operator				
Track Hoe				
Tractor Operator				
Tractor Operator/Motorman				
<b><i>Hoist</i></b>	<b>36</b>	<b>430</b>	<b>93</b>	<b>766</b>
Hoist Engineer				
Hoist Operator				
Hoistman				
Skip Tender/Cager/Station Attendant				

**Table 21. Estimated Number of Production Employees at All Mines (continued)**

<b>Occupation by Category</b>	<b>Survey Count</b>	<b>National Estimate</b>	<b>95% LCL</b>	<b>95% UCL</b>
<b><i>Material Mover</i></b>	<b>704</b>	<b>18,923</b>	<b>14,005</b>	<b>23,841</b>
Dump Truck Driver				
Haul Truck Operator				
Haul Truck Operator/Driver				
Hauler/Haul Unit Operator				
Hauler Operator				
Off Road Truck Driver				
Ore Truck Driver/Operator				
Pit Truck Driver				
Quarry Truck Driver				
Refuse Truck Driver/Backfill Truck Driver				
Rock Truck Driver				
Rubber Tire Operator				
Scoop Car Operator				
Scoop Loader				
Scoop Tram Operator				
Shuttle Car Operator				
Stock Truck/Stock Pile Driver				
Truck Driver				
Underground Coal Hauler				
Underground Haulage Operator				
Water Truck Operator				
<b><i>Mining Machines</i></b>	<b>106</b>	<b>4,056</b>	<b>2,635</b>	<b>5,477</b>
Continuous Miner Helper				
Continuous Miner Operator				
Face Operator				
Head Operator				
Jacksetter				
Longwall Operator				
Shearer Operator				
Undercutter Operator				
<b><i>Operator/Driver</i></b>	<b>29</b>	<b>740</b>	<b>300</b>	<b>1,179</b>
Dump Operator				
Motorman				
Motorman/Locomotive Operator				
Operator/Driver Transportation				
<b><i>Shovel Operator</i></b>	<b>17</b>	<b>1,510</b>	<b>0</b>	<b>3,434</b>
<b><u>Extraction Labor</u></b>	<b><u>212</u></b>	<b><u>5,229</u></b>	<b><u>2,590</u></b>	<b><u>7,868</u></b>
Coal Miner				
Heading Prep				
Mine Production				
Mine Spec				
Mine Support				
Miner				
Miner Support				
Production Miner				

**Table 21. Estimated Number of Production Employees at All Mines (continued)**

<b>Occupation by Category</b>	<b>Survey Count</b>	<b>National Estimate</b>	<b>95% LCL</b>	<b>95% UCL</b>
<b><u>Material Preparation</u></b>	<b><u>304</u></b>	<b><u>6,178</u></b>	<b><u>4,598</u></b>	<b><u>7,758</u></b>
<b><i>Additives</i></b>	<b>14</b>	<b>271</b>	<b>9</b>	<b>532</b>
Additive Press Operator				
Additives Utility				
Calcine Operator				
Thickener Operator				
<b><i>Crusher</i></b>	<b>122</b>	<b>2,891</b>	<b>1,732</b>	<b>4,050</b>
Blunging Operator				
Breaker Operator				
Crusher Attendant				
Crusher Helper				
Crusher Operator/Pan Feeder Operator				
Crusher Plant Operator				
Hammer Mill Operator				
Jaw Operator				
Mill Crusher Operator				
Rock Breaker Operator				
Screenhouse Crusher				
<b><i>Cutter</i></b>	<b>70</b>	<b>1,194</b>	<b>286</b>	<b>2,102</b>
Cutting Machine Operator				
Sawyer				
Splitter				
Stone Cutter				
Trimmer				
<b><i>Mill</i></b>	<b>98</b>	<b>1,822</b>	<b>1,101</b>	<b>2,543</b>
Dry Mill Operator				
Limestone Prep Operator				
Mill Hand/Helper				
Mill Operator (ball/pebble/rod)				
Mill Production Worker				
Milling Machine Operator				
Mill Man				
Roller Mill Operator				
Roller Operator				
<b><u>Process</u></b>	<b><u>186</u></b>	<b><u>5,769</u></b>	<b><u>2,649</u></b>	<b><u>8,890</u></b>
<b><i>Belt Vulcanizer</i></b>	<b>9</b>	<b>464</b>	<b>0</b>	<b>1,197</b>
<b><i>Dry Processing</i></b>	<b>42</b>	<b>763</b>	<b>362</b>	<b>1,164</b>
Dry Plant/Process Operator				
Dryer Operator				
Fluid Bed Dryer Operator				
Kiln Operator				
<b><i>Other</i></b>	<b>32</b>	<b>825</b>	<b>300</b>	<b>1,351</b>
Fabricator				
Process Attendant				
Process Operator				

**Table 21. Estimated Number of Production Employees at All Mines (continued)**

<b>Occupation by Category</b>	<b>Survey Count</b>	<b>National Estimate</b>	<b>95% LCL</b>	<b>95% UCL</b>
<b>Separation</b>	<b>83</b>	<b>3,244</b>	<b>275</b>	<b>6,212</b>
Centrifuge Utility				
Digestion Operator				
Extruder Operator				
Filter Evaporation Operator				
Filter Operator				
Flotation Plant Operator				
Flotation/Concentrator Operator				
Froth Cell Operator				
Grinder Operator				
Leach Utility				
Leaching Operations Worker				
Mix Chemist				
Mix Operator				
Pan Operator				
Pelletizing Operations Worker				
Pug Operator/Mixer Tender				
Rotex Operator				
Screen Plant Labor				
Screen Plant Operator				
Slurry Operator				
Tailings Operator				
<b>Wash Process</b>	<b>12</b>	<b>410</b>	<b>105</b>	<b>715</b>
Wash Operator				
Washer Operator				
<b>Wet Processing</b>	<b>8</b>	<b>63</b>	<b>7</b>	<b>120</b>
Wet Plant Attendant				
Wet Plant Operator				
<b>Support</b>	<b>1,009</b>	<b>23,611</b>	<b>19,052</b>	<b>28,170</b>
<b>Drill Operator</b>	<b>101</b>	<b>1,684</b>	<b>1,179</b>	<b>2,189</b>
Auger Operator				
Coal Drill Operator				
Drill Helper/Chuck Tender				
Drill Operator				
Highwall Drill Operator				
Rotary Electric/Hydraulic Drill Operator				
<b>Electronics</b>	<b>4</b>	<b>DSU</b>	<b>DSU</b>	<b>DSU</b>
Console Operator				
Power Systems				
Robot Operator				
<b>Explosives</b>	<b>82</b>	<b>1,524</b>	<b>864</b>	<b>2,183</b>
Blaster				
Driller/Blaster				
Explosives/Powder Man				
Shooter				
Shot Firer				

**Table 21. Estimated Number of Production Employees at All Mines (continued)**

<b>Occupation by Category</b>	<b>Survey Count</b>	<b>National Estimate</b>	<b>95% LCL</b>	<b>95% UCL</b>
<b><i>Other</i></b>	<b>579</b>	<b>14,279</b>	<b>9,944</b>	<b>18,614</b>
Control Room				
Controller				
Control Man				
Dispatcher				
Operator, not otherwise specified				
Panel Operator				
Port Operator				
Production Operator				
Rak Handler				
Scaler (hand)				
Top Operator				
Underground Operator				
Underground Plant Operator				
<b><i>Quality Control</i></b>	<b>75</b>	<b>1,609</b>	<b>1,090</b>	<b>2,128</b>
Quality Control				
Quality Control/Quality Assurance				
<b><i>Roof Bolter</i></b>	<b>168</b>	<b>4,321</b>	<b>3,073</b>	<b>5,569</b>
Roof Bolter				
Roof Control Operator				

Abbreviation: DSU, data suppressed.

**Table 22. Estimated Number of Service and Utility Employees at All Mines**

<b>Occupation by Category</b>	<b>Survey Count</b>	<b>National Estimate</b>	<b>95% LCL</b>	<b>95% UCL</b>
<b>SERVICE and UTILITY</b>	<b>1,638</b>	<b>41,851</b>	<b>36,921</b>	<b>46,781</b>
<u>General Labor</u>	<u>817</u>	<u>21,603</u>	<u>17,514</u>	<u>25,692</u>
<b>Cleaners</b>	<b>10</b>	<b>212</b>	<b>68</b>	<b>356</b>
Cleanup Man				
Dry Attendant				
Janitor				
Steamer				
Tank Car Washer				
Tower Cleaner				
<b>Construction</b>	<b>35</b>	<b>1,064</b>	<b>394</b>	<b>1,734</b>
Cement Man/Concrete Worker				
Construction				
Curb Cutter				
Ground Control/Timberman				
Packer				
Screed Person				
Shaft Miner/Shaft Repairer				
<b>Laborer</b>	<b>490</b>	<b>13,000</b>	<b>9,958</b>	<b>16,042</b>
Cook				
Ground Hand				
Ground Man				
Inside Laborer				
Laborer				
Miller				
Outby Laborer				
Outside Laborer				
Plant Helper				
Plant Man				
Production Support				
Production Worker				
Quarry Worker				
Root Picker				
Shop Man				
Stick Picker				
Surface Support				
Track Man				
<b>Material Handling</b>	<b>145</b>	<b>2,867</b>	<b>1,880</b>	<b>3,853</b>
Bagger/Bagging Operations Worker				
Crude Pile Operator				
Material Handler				
Mudpicker				
Palletizer				
Reclaim Operator				
Rolling Stock Crew				
Silo Operator				
Stacker				
Storage Operator				

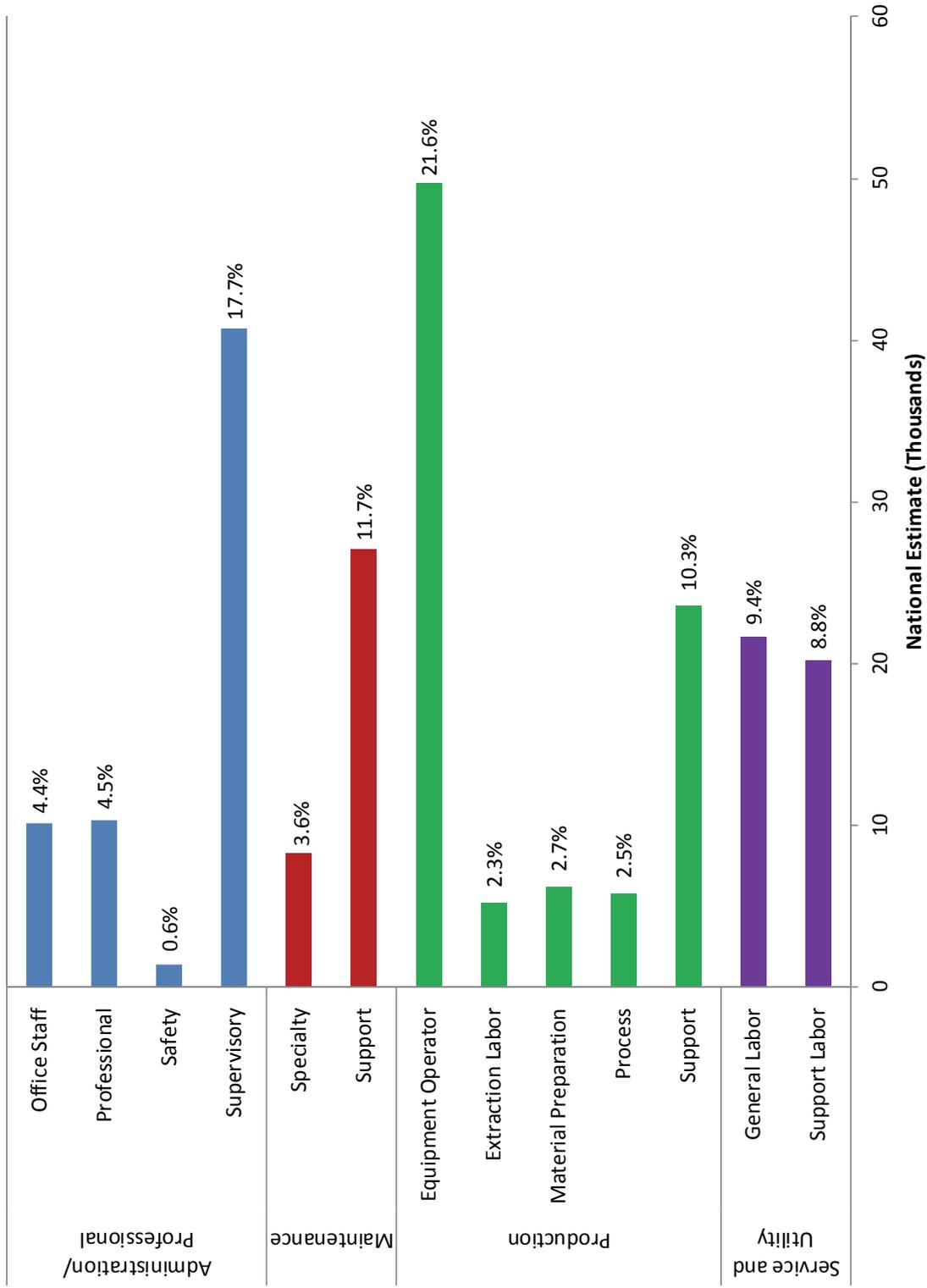
**Table 22. Estimated Number of Service and Utility Employees at All Mines (continued)**

<b>Occupation by Category</b>	<b>Survey Count</b>	<b>National Estimate</b>	<b>95% LCL</b>	<b>95% UCL</b>
Storeroom				
Sweeper Operator				
Yard Laborer				
Yard Man				
<b>Tradesman</b>	<b>33</b>	<b>1,928</b>	<b>0</b>	<b>3,966</b>
Apprentice/Journeyman				
Boiler Operator				
Boilermaker				
Carpenter/Plumber/Painter				
Craftsman				
Machinist				
Trades Person				
<b>Weighman</b>	<b>104</b>	<b>2,532</b>	<b>1,869</b>	<b>3,195</b>
Scale Clerk/Operator				
Weighman				
Weighmaster				
<b>Support Labor</b>	<b>821</b>	<b>20,249</b>	<b>17,248</b>	<b>23,249</b>
<b>Barge Operations</b>	<b>28</b>	<b>442</b>	<b>120</b>	<b>763</b>
Barge Attendant/Boat Operator				
Boat Pilot				
Deck Hand				
Dock Hand				
Dock Worker				
<b>Conveyor Operator</b>	<b>56</b>	<b>1,557</b>	<b>771</b>	<b>2,343</b>
Belt Cleaner/Conveyor Man				
Belt Man/Conveyor Man				
<b>Distribution</b>	<b>35</b>	<b>564</b>	<b>106</b>	<b>1,021</b>
Packaging Operations Worker				
Packhouse				
<b>Examiner</b>	<b>34</b>	<b>1,006</b>	<b>408</b>	<b>1,605</b>
Fire Boss				
Mine Examiner				
Underground Belt Examiner				
<b>Loading</b>	<b>462</b>	<b>11,020</b>	<b>9,083</b>	<b>12,958</b>
Bin Attendant				
Bin Puller/Truck Loader				
Bulk Loader				
Chute Puller				
Load Haul Dump—Complete Cycle				
Loader Operator				
Loading				
Loadman				
Loadout Operator				
Operator/Loader				
Pit Loader Operator				
Plant Loader Operator				

**Table 22. Estimated Number of Service and Utility Employees at All Mines (continued)**

<b>Occupation by Category</b>	<b>Survey Count</b>	<b>National Estimate</b>	<b>95% LCL</b>	<b>95% UCL</b>
Production Loader				
Quarry Loader Operator				
Rail Loader Operator				
Shipping Loader				
Stock Loader/Piler				
Tipple Operator				
Underground Loader				
Yard Loader Operator				
<b><i>Pumper</i></b>	<b>10</b>	<b>467</b>	<b>0</b>	<b>982</b>
Gravel Pumper				
Pumper				
<b><i>Supplies</i></b>	<b>15</b>	<b>214</b>	<b>87</b>	<b>341</b>
Parts				
Parts Runner				
Supply Hauler				
Supply Man				
Supply Man/Nipper				
<b><i>Utility</i></b>	<b>177</b>	<b>4,853</b>	<b>3,328</b>	<b>6,377</b>
Crusher Utility				
E.O. Utility				
Equipment Utility				
Lampman				
Mill Utility				
Operator Utility				
Outside Utility				
Pit Utility Person				
Plant Utility				
Production Utility				
Quarry Utility				
Utility Beltline				
Utility Belts				
Utility Bolter				
Utility Lubricator				
Utility Man				
Utility Scaler				
Wet Utility				
<b><i>Ventilation</i></b>	<b>4</b>	<b>DSU</b>	<b>DSU</b>	<b>DSU</b>
Brattice Man				
Ventilation Man				

Abbreviation: DSU, data suppressed.



**Figure 13. Occupational Categories of Employees at All Mines.**



# **Employee Statistics for Coal Mines**



## Summary of Employee Statistics for Coal Mines

The demographic and occupational characteristics of employees in the U.S. coal mining industry are presented in Tables 23 and 24 and Figures 14–16. The weighted estimate for gender indicates that the workforce is composed predominately of male employees (96.2 percent). The majority of coal mine employees are White (96.4 percent) followed by American Indian or Alaska Native (2.5 percent). Only 1.9 percent of these employees have an ethnicity of Hispanic or Latino. Seventy-seven percent are high school graduates, with another 16.8 percent having an education level beyond high school. A review of the weighted estimates indicates that the average coal mine worker is 43.8 years of age and has worked in mining for 16.0 years, with 8.2 years at the current mine, and 7.8 years in his/her job title. The national estimate for the average number of hours worked per week is 47.3. The primary work location for an estimated 46.8 percent of coal mine employees is “Underground Mine: Underground.” An additional 24.0 percent of these employees work at a “Surface Mine: Strip, Open Pit, or Quarry,” while another 15.3 percent are employed in the “Mill Operations, Preparation Plants, or Breakers” work location.

Tables 25, 26, 28, 29, and Figure 17 present the national estimates of the number of coal mine workers by four major occupational categories. (No estimates were calculated for Table 27: “Miscellaneous.”) An estimated 16,048 (23.2 percent) are employed in the “Administration/Professional” category; 12,000 (17.3 percent) in the “Maintenance” category; 29,562 (42.7 percent) in the “Production” category; and 11,791 (17.0 percent) in the “Service and Utility” category.



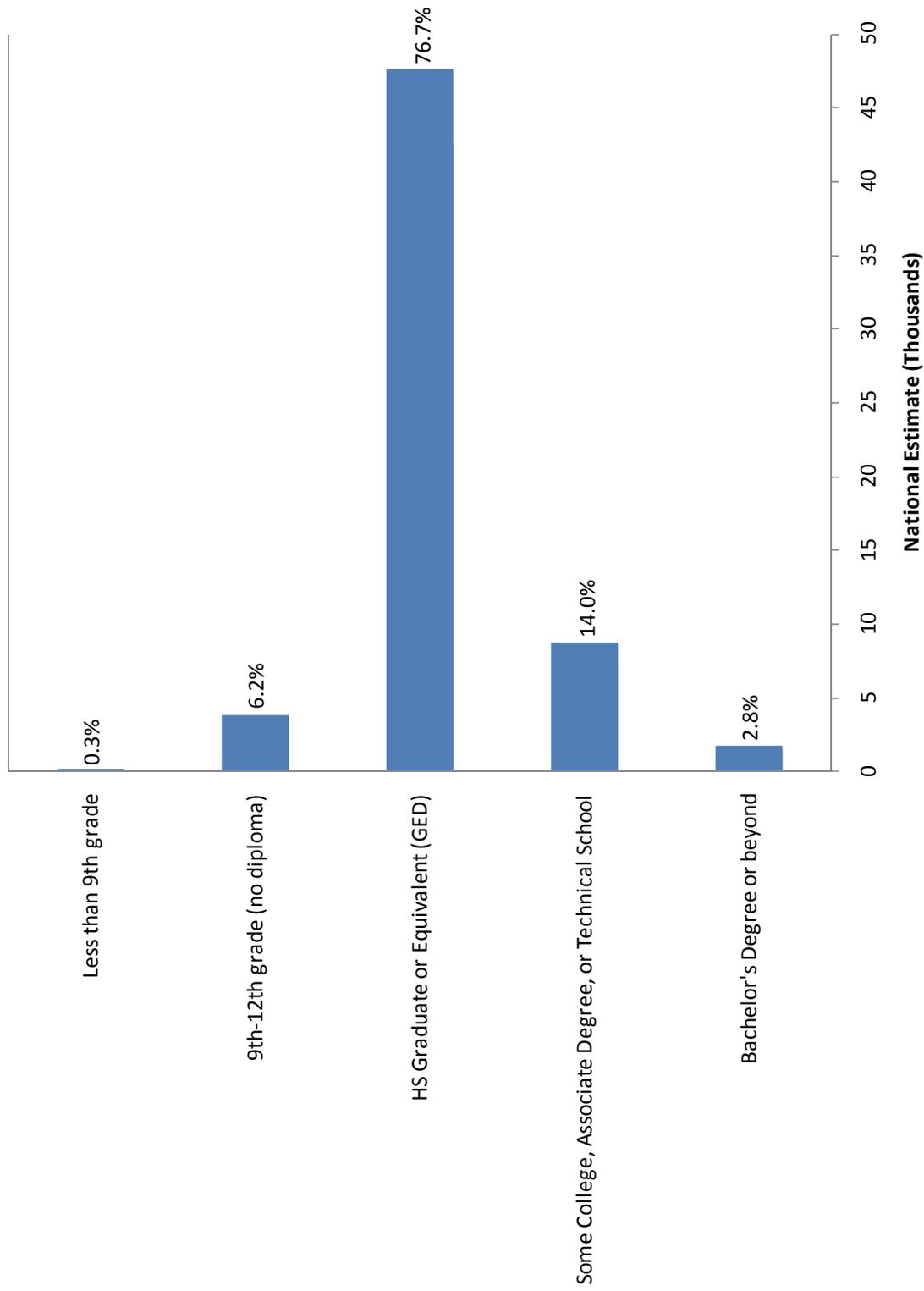
**Table 23. Demographic Characteristics of Employees at Coal Mines**

<b>Demographic Characteristic</b>	<b>Survey Count</b>	<b>National Estimate</b>	<b>95% LCL</b>	<b>95% UCL</b>	<b>National Percent</b>	<b>95% LCL</b>	<b>95% UCL</b>
<b>Gender:</b>							
Male	2,260	65,374	54,760	75,989	96.2	94.7	97.7
Female	66	2,559	1,406	3,713	3.8	2.3	5.3
<b>Age (years)</b>	2,255	43.8	42.5	45.1			
<b>Highest level of education:</b>							
Less than 9th grade	14	182	66	299	0.3	0.1	0.5
9th–12th grade (no diploma)	149	3,839	2,040	5,638	6.2	3.5	8.9
HS Graduate or Equivalent (GED)	1,644	47,548	38,760	56,336	76.7	72.4	80.9
Some College, Associate Degree, or Technical School	273	8,698	6,097	11,300	14.0	10.7	17.4
Bachelor's Degree or beyond	56	1,742	973	2,512	2.8	1.7	3.9
<b>Ethnicity:</b>							
Hispanic or Latino	37	1,222	430	2,015	1.9	0.7	3.0
Non-Hispanic or Non-Latino	2,224	64,548	53,859	75,237	98.1	97.0	99.3
<b>Race:</b>							
American Indian or Alaska Native	37	1,635	0	3,434	2.5	0.0	5.2
Asian	0	NA	NA	NA	NA	NA	NA
Black or African American	26	774	189	1,358	1.2	0.3	2.1
Native Hawaiian or Other Pacific Islander	0	NA	NA	NA	NA	NA	NA
White	2,209	62,528	51,932	73,125	96.4	93.5	99.3

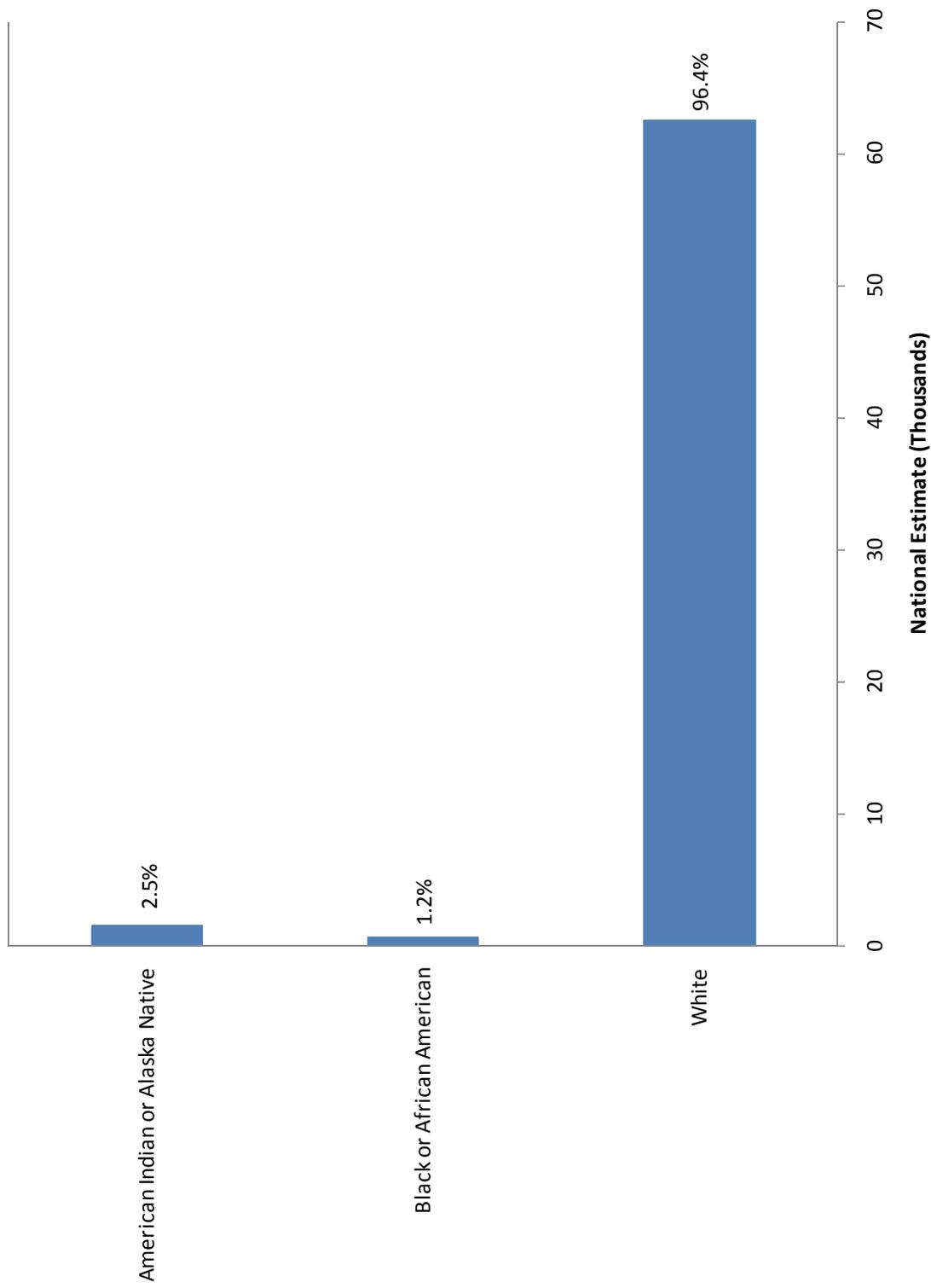
Abbreviation: NA, not applicable.

**Table 24. Occupational Characteristics of Employees at Coal Mines**

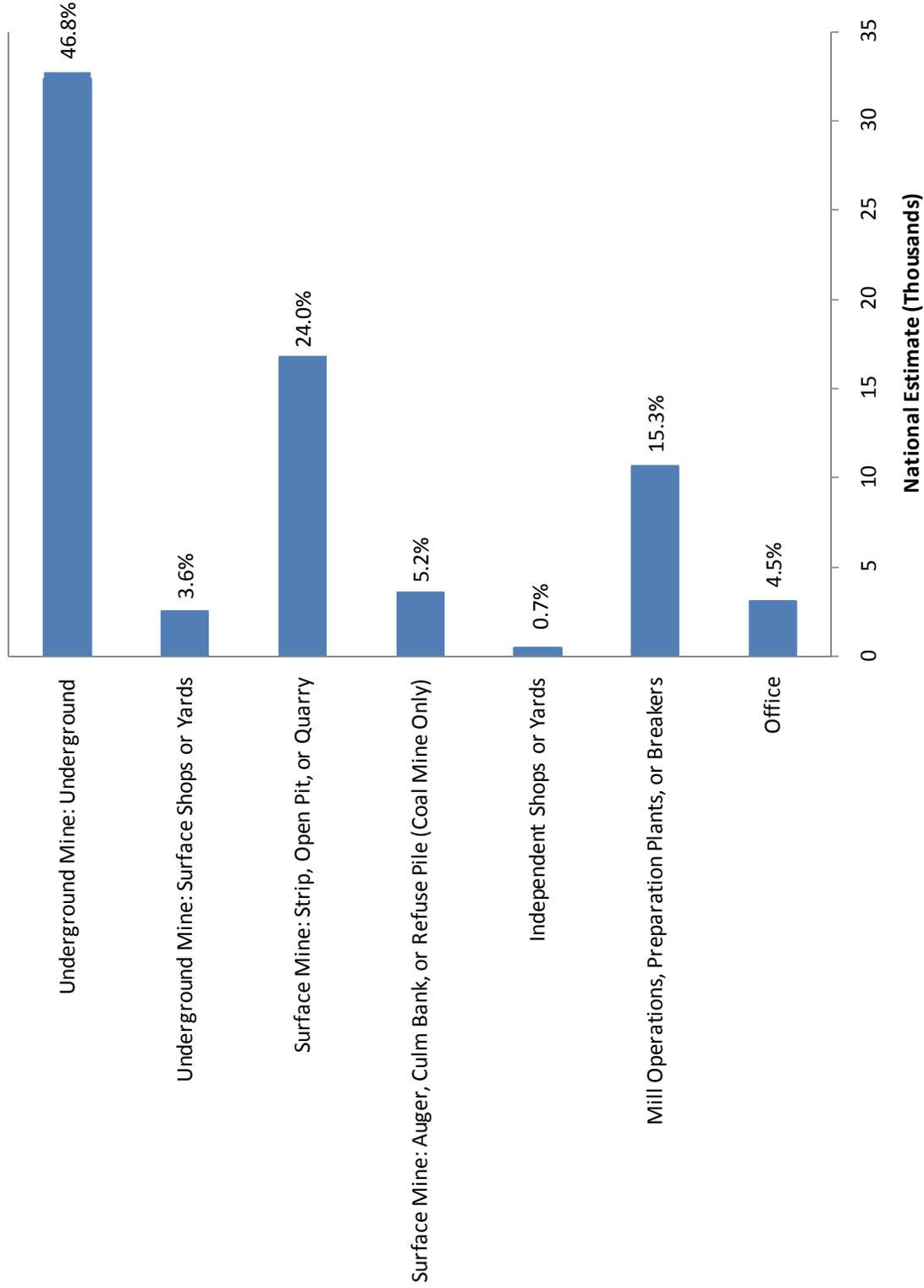
<b>Occupational Characteristic</b>	<b>Survey Count</b>	<b>National Estimate</b>	<b>95% LCL</b>	<b>95% UCL</b>	<b>National Percent</b>	<b>95% LCL</b>	<b>95% UCL</b>
Hours worked (per week)	2,131	47.3	45.9	48.7			
<b>Experience:</b>							
Experience in this Job Title (years)	2,209	7.8	6.9	8.7			
Experience at this Mine (years)	2,294	8.2	6.6	9.8			
Total Mining Experience (years)	2,166	16.0	14.3	17.7			
<b>Primary Work Location:</b>							
Underground Mine: Underground	1,021	32,358	26,196	38,519	46.8	40.5	53.1
Underground Mine: Surface Shops or Yards	82	2,477	1,447	3,508	3.6	2.0	5.1
Surface Mine: Strip, Open Pit, or Quarry	613	16,620	11,106	22,135	24.0	17.5	30.6
Surface Mine: Auger, Culm Bank, or Refuse Pile (Coal Mine Only)	78	3,581	267	6,896	5.2	0.6	9.8
Independent Shops or Yards	19	462	0	1,344	0.7	0.0	1.9
Mill Operations, Preparation Plants, or Breakers	407	10,565	6,984	14,147	15.3	10.8	19.7
Office	107	3,103	1,956	4,249	4.5	3.0	6.0



**Figure 14. Education Level of Employees at Coal Mines.**



**Figure 15. Race of Employees at Coal Mines.**



**Figure 16. Primary Work Location of Employees at Coal Mines.**

**Table 25. Estimated Number of Administration/Professional Employees at Coal Mines**

<b>Occupation by Category</b>	<b>Survey Count</b>	<b>National Estimate</b>	<b>95% LCL</b>	<b>95% UCL</b>
<b>ADMINISTRATION/PROFESSIONAL</b>	<b>523</b>	<b>16,048</b>	<b>12,552</b>	<b>19,544</b>
<u>Office Staff</u>	<u>69</u>	<u>2,120</u>	<u>1,395</u>	<u>2,846</u>
<b>Administrative Staff</b>	<b>43</b>	<b>1,323</b>	<b>730</b>	<b>1,916</b>
Administration				
Administrative Assistant				
Clerk				
Coal Distribution Coordinator				
Human Resources				
Mine Clerk				
Office Staff				
Secretary				
Technical Coordinator				
<b>Business</b>	<b>16</b>	<b>479</b>	<b>254</b>	<b>704</b>
Accounting				
Purchasing				
Sales				
Shipping				
<b>Security</b>	<b>2</b>	<b>DSU</b>	<b>DSU</b>	<b>DSU</b>
<b>Supplies</b>	<b>8</b>	<b>254</b>	<b>49</b>	<b>459</b>
Supply Clerk				
Warehouse Technician				
Warehouseman				
<u>Professional</u>	<u>59</u>	<u>2,214</u>	<u>683</u>	<u>3,746</u>
<b>Engineer</b>	<b>10</b>	<b>303</b>	<b>42</b>	<b>564</b>
Engineer				
(Electrical/Mining/Ventilation)				
Engineer, not otherwise specified				
<b>Non-engineer</b>	<b>7</b>	<b>176</b>	<b>7</b>	<b>344</b>
Environmental				
Professional, not otherwise specified				
Surveyor				
<b>Technician</b>	<b>42</b>	<b>1,736</b>	<b>178</b>	<b>3,293</b>
Coal Sampler				
Electronic Technician				
Engineering Technician				
Fuel Operator/Technician				
Lab Technician				
Plant Technician				
Technician				

**Table 25. Estimated Number of Administration/Professional Employees at Coal Mines  
(continued)**

<b>Occupation by Category</b>	<b>Survey Count</b>	<b>National Estimate</b>	<b>95% LCL</b>	<b>95% UCL</b>
<b><u>Safety</u></b>	<b><u>12</u></b>	<b><u>464</u></b>	<b><u>143</u></b>	<b><u>785</u></b>
Safety				
Safety Director				
Safety Supervisor				
<b><u>Supervisory</u></b>	<b><u>383</u></b>	<b><u>11,249</u></b>	<b><u>8,753</u></b>	<b><u>13,745</u></b>
<b><u>Executive</u></b>	<b><u>3</u></b>	<b><u>DSU</u></b>	<b><u>DSU</u></b>	<b><u>DSU</u></b>
CEO				
Mine Owner				
<b><u>Foreman</u></b>	<b><u>208</u></b>	<b><u>5,346</u></b>	<b><u>4,296</u></b>	<b><u>6,397</u></b>
Assistant Superintendent				
Belt Foreman (underground)				
Electrical Foreman (underground)				
Foreman				
Foreman/Manager				
Labor Foreman				
Lead Man				
Maintenance Foreman				
Outby Foreman				
Pit Foreman				
Preparation Plant Foreman				
Section Foreman				
Section Foreman/Boss				
Shift Foreman				
Superintendent				
Track Foreman				
Underground Foreman				
<b><u>Manager</u></b>	<b><u>76</u></b>	<b><u>3,187</u></b>	<b><u>1,456</u></b>	<b><u>4,918</u></b>
Assistant Manager				
Assistant Mine Foreman/Assistant Mine Manager				
Engineer/Operations Manager				
Maintenance Manager				
Management Manager				
Mine Foreman/Mine Manager				
Office Manager				
Plant Manager				
Plant Superintendent				

**Table 25. Estimated Number of Administration/Professional Employees at Coal Mines  
(continued)**

<b>Occupation by Category</b>	<b>Survey Count</b>	<b>National Estimate</b>	<b>95% LCL</b>	<b>95% UCL</b>
<b><i>Supervisor</i></b>	<b>96</b>	<b>2,657</b>	<b>1,677</b>	<b>3,636</b>
Assistant Supervisor				
Auger Crew Supervisor				
Belt Coordinator				
Electrical Supervisor				
Engineering Supervisor				
Maintenance Supervisor				
Mine Operator				
Mine Supervisor				
Pit Operator				
Pit Supervisor				
Plant Operator				
Plant Supervisor				
Prep Plant Operator				
Production Supervisor				
Supervisor				
Warehouse Supervisor				

Abbreviation: DSU, data suppressed.

**Table 26. Estimated Number of Maintenance Employees at Coal Mines**

<b>Occupation by Category</b>	<b>Survey Count</b>	<b>National Estimate</b>	<b>95% LCL</b>	<b>95% UCL</b>
<b>MAINTENANCE</b>	<b>370</b>	<b>12,000</b>	<b>8,929</b>	<b>15,071</b>
<u><b>Specialty</b></u>	<u><b>118</b></u>	<u><b>3,719</b></u>	<u><b>2,569</b></u>	<u><b>4,869</b></u>
<b>Electrician</b>	<b>98</b>	<b>3,137</b>	<b>2,073</b>	<b>4,202</b>
Electrician				
Electrician Trainee				
Maintenance Electrician				
Master Electrician				
Trainer Electrician				
<b>Welder</b>	<b>20</b>	<b>582</b>	<b>205</b>	<b>959</b>
Welder				
Welder (nonshop)				
Welder/Fabricator				
Welder/Mechanic				
<u><b>Support</b></u>	<u><b>252</b></u>	<u><b>8,281</b></u>	<u><b>5,764</b></u>	<u><b>10,798</b></u>
<b>Maintenance</b>	<b>51</b>	<b>1,550</b>	<b>763</b>	<b>2,337</b>
Continuous Miner Maintenance				
Dragline Oiler				
Greaser/Oiler				
Maintenance				
Maintenance Technician				
Mechanic Clerk				
Pipefitter				
Underground Belt Maintenance				
Underground Maintenance				
<b>Mechanic</b>	<b>184</b>	<b>6,334</b>	<b>4,071</b>	<b>8,597</b>
Belt Mechanic				
Diesel Mechanic				
Mechanic				
Mechanic/Electrician				
Mechanic Helper				
Mechanic Trainee				
Mobile Equipment Mechanic				
Plant Mechanic				
Prep Plant Mechanic				
Shop Mechanic				
Underground Belt Mechanic				
<b>Repairman</b>	<b>17</b>	<b>397</b>	<b>76</b>	<b>717</b>
Automotive Repairman				
Repairman				
Underground Belt Repairman				
Underground Repairman				

**Table 27. Number of Miscellaneous Employees at Coal Mines**

<b>Occupation by Category</b>	<b>Survey Count</b>
<b>MISCELLANEOUS</b>	<b>15</b>
<u>Trainee</u>	<u>14</u>
<u>Unknown</u>	<u>1</u>

**Table 28. Estimated Number of Production Employees at Coal Mines**

<b>Occupation by Category</b>	<b>Survey Count</b>	<b>National Estimate</b>	<b>95% LCL</b>	<b>95% UCL</b>
<b>PRODUCTION</b>	<b>1,016</b>	<b>29,562</b>	<b>23,638</b>	<b>35,485</b>
<u>Equipment Operator</u>	<u>626</u>	<u>18,710</u>	<u>14,430</u>	<u>22,990</u>
<i>Dragline Operator</i>	11	369	21	718
<i>Equipment Operator</i>	276	7,391	5,196	9,587
Backhoe Operator				
Bulldozer Operator				
Crane Operator				
End Dump Driver/Operator				
Equipment Operator				
Front End Loader				
Heavy Equipment Operator				
Highlift Operator				
Large Shovel/Backhoe/Load Operator				
Machine Operator				
Mobile Bridge Operator				
Mobile Equipment Operator				
Road Grader Operator				
Rock Duster				
Rotary Bucket Excavator Operator				
Rotary Dump Operator				
Scraper Operator				
Stationary Equipment Operator				
Tractor Operator/Motorman				
<i>Hoist</i>	2	DSU	DSU	DSU
Hoistman				
<i>Material Mover</i>	227	6,423	4,140	8,707
Dump Truck Driver				
Haul Truck Operator				
Hauler Operator				
Off Road Truck Driver				
Refuse Truck Driver/Backfill Truck Driver				
Rock Truck Driver				
Rubber Tire Operator				
Scoop Car Operator				
Shuttle Car Operator				

**Table 28. Estimated Number of Production Employees at Coal Mines (continued)**

<b>Occupation by Category</b>	<b>Survey Count</b>	<b>National Estimate</b>	<b>95% LCL</b>	<b>95% UCL</b>
Truck Driver				
Underground Coal Hauler				
Underground Haulage Operator				
Water Truck Operator				
<b>Mining Machines</b>	<b>97</b>	<b>3,906</b>	<b>2,484</b>	<b>5,328</b>
Continuous Miner Helper				
Continuous Miner Operator				
Face Operator				
Jacksetter				
Longwall Operator				
Shearer Operator				
<b>Operator/Driver</b>	<b>12</b>	<b>354</b>	<b>61</b>	<b>647</b>
Motorman				
Motorman/Locomotive Operator				
Transportation				
<b>Shovel Operator</b>	<b>1</b>	<b>DSU</b>	<b>DSU</b>	<b>DSU</b>
<b>Extraction Labor</b>	<b>53</b>	<b>1,609</b>	<b>256</b>	<b>2,963</b>
Coal Miner				
Mine Spec				
Miner Support				
Production Miner				
<b>Material Preparation</b>	<b>5</b>	<b>116</b>	<b>0</b>	<b>302</b>
<b>Crusher</b>	<b>4</b>	<b>DSU</b>	<b>DSU</b>	<b>DSU</b>
Crusher Attendant				
<b>Cutter</b>	<b>1</b>	<b>DSU</b>	<b>DSU</b>	<b>DSU</b>
Cutting Machine Operator				
<b>Process</b>	<b>13</b>	<b>334</b>	<b>85</b>	<b>584</b>
<b>Conveyor Operator</b>	<b>5</b>	<b>96</b>	<b>0</b>	<b>230</b>
Belt Vulcanizer				
<b>Separation</b>	<b>4</b>	<b>DSU</b>	<b>DSU</b>	<b>DSU</b>
Flotation Plant Operator				
Froth Cell Operator				
<b>Wash Process</b>	<b>3</b>	<b>DSU</b>	<b>DSU</b>	<b>DSU</b>
Washer Operator				
<b>Wet Process</b>	<b>1</b>	<b>DSU</b>	<b>DSU</b>	<b>DSU</b>
Wet Plant Attendant				
<b>Support</b>	<b>319</b>	<b>8,791</b>	<b>6,547</b>	<b>11,036</b>
<b>Drill Operator</b>	<b>25</b>	<b>616</b>	<b>245</b>	<b>986</b>
Auger Operator				
Coal Drill Operator				
Highwall Drill Operator				

**Table 28. Estimated Number of Production Employees at Coal Mines (continued)**

<b>Occupation by Category</b>	<b>Survey Count</b>	<b>National Estimate</b>	<b>95% LCL</b>	<b>95% UCL</b>
<b>Explosives</b>	<b>15</b>	<b>638</b>	<b>130</b>	<b>1,145</b>
Blaster				
Driller/Blaster				
Explosives/Powder Man				
Shooter				
Shot Firer				
<b>Other</b>	<b>126</b>	<b>3,349</b>	<b>1,777</b>	<b>4,920</b>
Control Man				
Dispatcher				
Operator, not otherwise specified				
Underground Operator				
Underground Plant Operator				
<b>Quality Control</b>	<b>1</b>	<b>DSU</b>	<b>DSU</b>	<b>DSU</b>
<b>Roof Bolter</b>	<b>152</b>	<b>4,169</b>	<b>2,927</b>	<b>5,411</b>

Abbreviation: DSU, data suppressed.

**Table 29. Estimated Number of Service and Utility Employees at Coal Mines**

<b>Occupation by Category</b>	<b>Survey Count</b>	<b>National Estimate</b>	<b>95% LCL</b>	<b>95% UCL</b>
<b>SERVICE and UTILITY</b>	<b>410</b>	<b>11,791</b>	<b>9,398</b>	<b>14,184</b>
<b>General Labor</b>	<b>163</b>	<b>4,863</b>	<b>3,101</b>	<b>6,625</b>
<b>Cleaner</b>	<b>3</b>	<b>DSU</b>	<b>DSU</b>	<b>DSU</b>
Cleanup Man				
Janitor				
Steamer				
<b>Construction</b>	<b>2</b>	<b>DSU</b>	<b>DSU</b>	<b>DSU</b>
<b>Laborer</b>	<b>138</b>	<b>4,229</b>	<b>2,472</b>	<b>5,985</b>
Inside Laborer				
Laborer				
Outby Laborer				
Outside Laborer				
Production Support				
Production Worker				
Shopman				
Surface Support				
Track Man				
<b>Material Handling</b>	<b>4</b>	<b>DSU</b>	<b>DSU</b>	<b>DSU</b>
Rolling Stock Crew				
Yard Man				
<b>Tradesman</b>	<b>5</b>	<b>102</b>	<b>0</b>	<b>248</b>
Apprentice/Journeyman				

**Table 29. Estimated Number of Service and Utility Employees at Coal Mines (continued)**

<b>Occupation by Category</b>	<b>Survey Count</b>	<b>National Estimate</b>	<b>95% LCL</b>	<b>95% UCL</b>
<b>Weighman</b>	<b>11</b>	<b>239</b>	<b>73</b>	<b>404</b>
Weighman				
Weighmaster				
<b>Support Labor</b>	<b>247</b>	<b>6,928</b>	<b>4,770</b>	<b>9,085</b>
<b>Barge Operations</b>	<b>12</b>	<b>180</b>	<b>0</b>	<b>383</b>
Barge Attendant/Boat Operator				
Boat Pilot				
Deck Hand				
Dock Hand				
<b>Conveyor Operator</b>	<b>45</b>	<b>1,254</b>	<b>511</b>	<b>1,996</b>
Belt Cleaner/Conveyor Man				
Belt Man/Conveyor Man				
<b>Examiner</b>	<b>34</b>	<b>1,006</b>	<b>408</b>	<b>1,605</b>
Fire Boss				
Mine Examiner				
Underground Belt Examiner				
<b>Loading</b>	<b>74</b>	<b>1,514</b>	<b>988</b>	<b>2,040</b>
Bin Attendant				
Loader Operator				
Loadout Operator				
Tipple Operator				
Underground Loader				
<b>Pumper</b>	<b>9</b>	<b>400</b>	<b>0</b>	<b>902</b>
<b>Supplies</b>	<b>8</b>	<b>151</b>	<b>34</b>	<b>267</b>
Parts Runner				
Supply Man				
<b>Utility</b>	<b>61</b>	<b>2,298</b>	<b>1,043</b>	<b>3,552</b>
Outside Utility				
Utility Belts				
Utility Bolter				
Utility Man				
<b>Ventilation</b>	<b>4</b>	<b>DSU</b>	<b>DSU</b>	<b>DSU</b>
Brattice Man				
Ventilation Man				

Abbreviation: DSU, data suppressed.

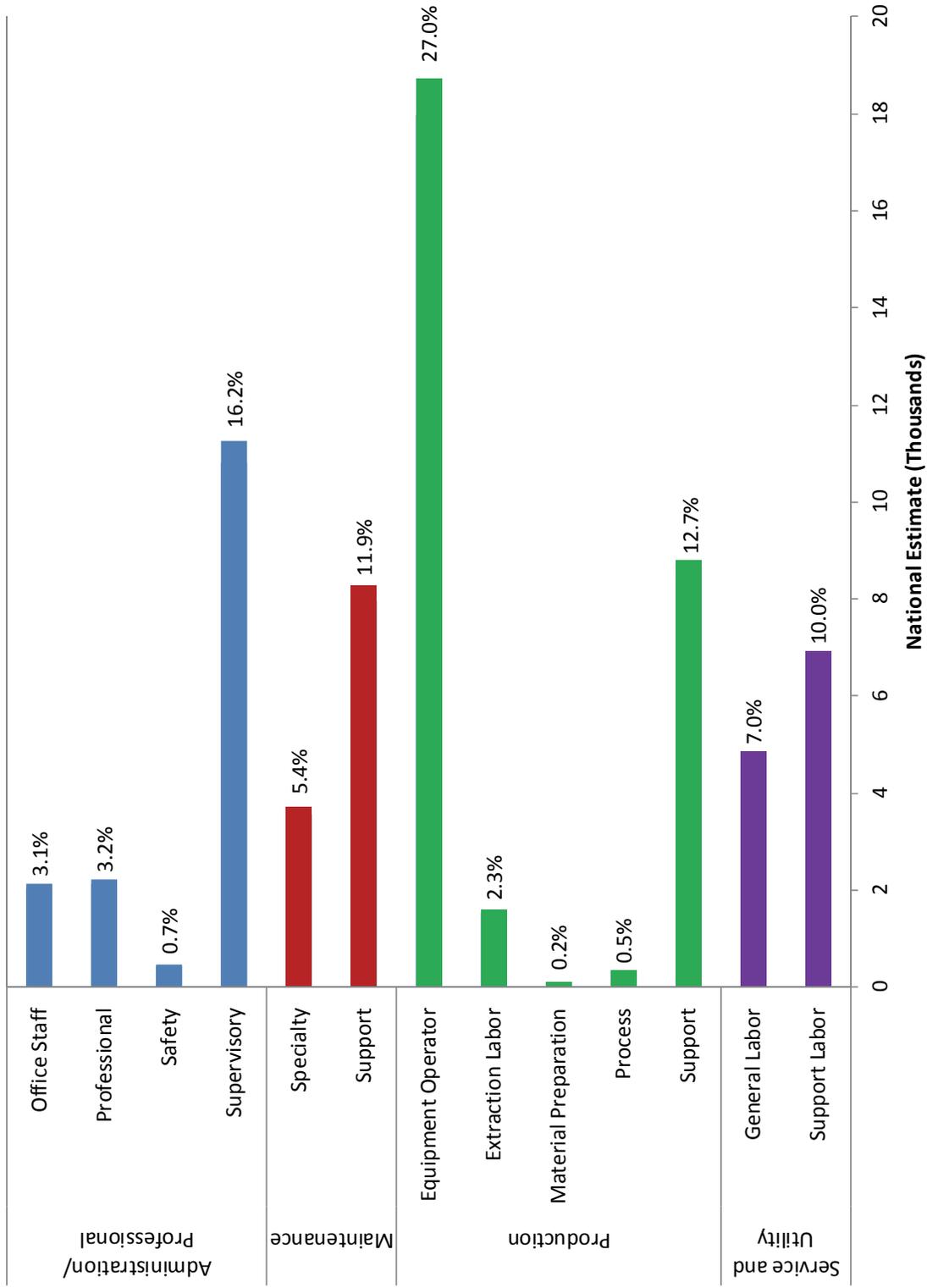


Figure 17. Occupational Categories of Employees at Coal Mines.

# **Employee Statistics for Metal Mines**



## Summary of Employee Statistics for Metal Mines

The demographic and occupational characteristics of employees in the U.S. metal mining industry are presented in Tables 30 and 31 and Figures 18–20. The weighted estimate for gender indicates that the workforce is composed predominately of male employees (86.2 percent). The majority of metal mine workers are White (91.4 percent), with another 4.7 percent of the workers having a racial category of Black or African American. Twenty-five percent of these employees are Hispanic or Latino. An estimated 53.3 percent are high school graduates and 43.6 percent have a level of education beyond high school. A review of the weighted estimates indicates that the average metal miner is 41.5 years of age and has worked in mining for 10.7 years, 8.7 years at the current mine, and 4.7 years in his/her job title. The national estimate for the average number of hours worked per week is 42.7. The primary work location for an estimated 42.7 percent of metal mine employees is a “Surface Mine: Strip, Open Pit or Quarry.” An additional 23.9 percent of these employees work in “Mill Operations, Preparation Plants, or Breakers,” while another 15.8 percent are employed in the “Underground Mine: Underground” work location.

Tables 32, 33, 35, 36, and Figure 21 present the national estimates of the number of workers by four major occupational categories. (No estimates were calculated for Table 34: “Miscellaneous.”) An estimated 10,652 (27.5 percent) metal mine workers are employed in the “Administration/Professional” category; 7,238 (18.7 percent) in the “Maintenance” category; 17,581 (45.3 percent) in the “Production” category; and 3,339 (8.6 percent) in the “Service and Utility” category.



**Table 30. Demographic Characteristics of Employees at Metal Mines**

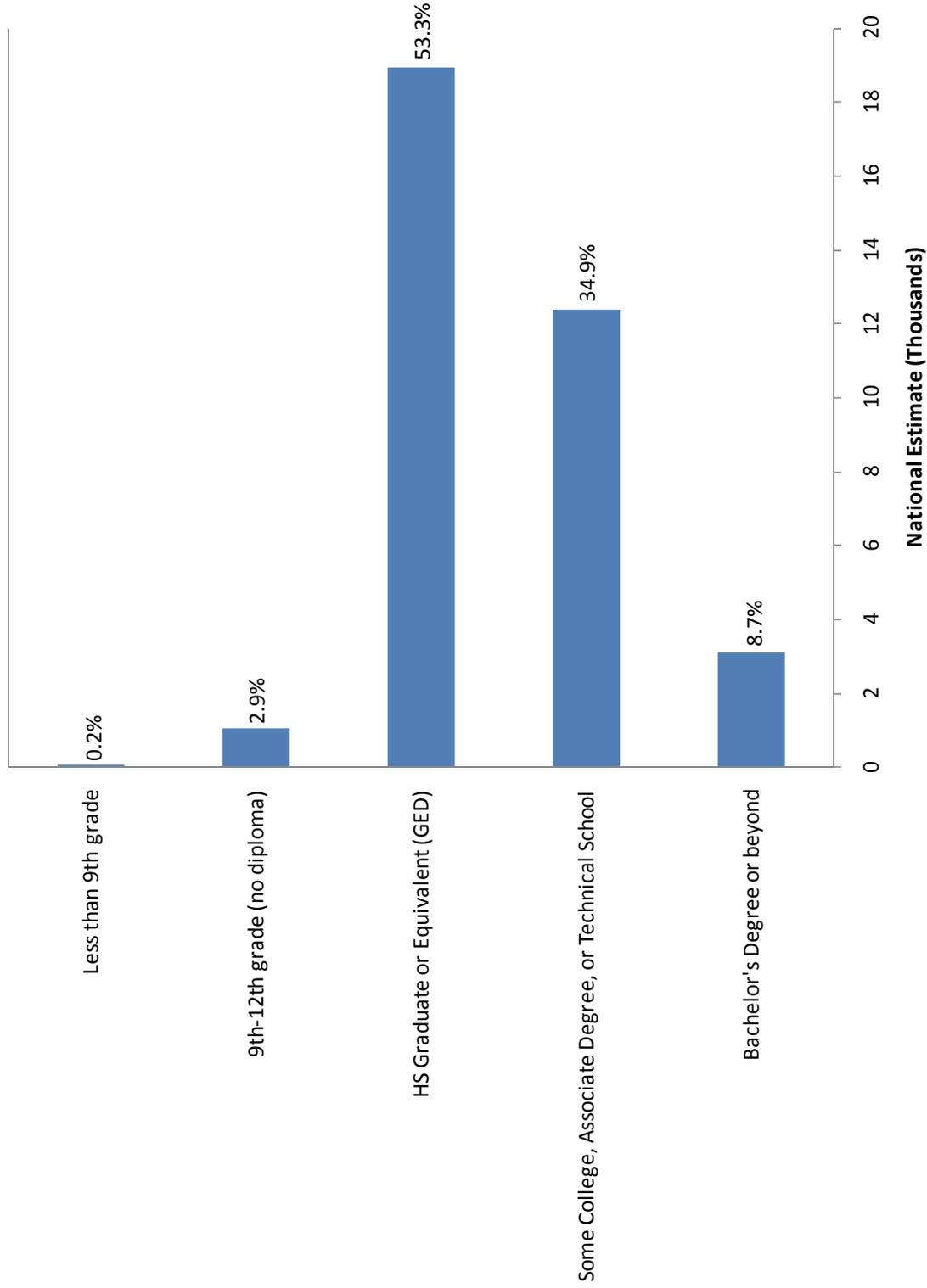
Demographic Characteristic	Survey			National			
	Count	Estimate	95% LCL	95% UCL	Percent	95% LCL	95% UCL
<b>Gender:</b>							
Male	871	33,562	15,620	51,504	86.2	81.9	90.4
Female	93	5,383	1,152	9,615	13.8	9.6	18.1
Age (years)	958	41.5	39.3	43.8			
<b>Highest level of education:</b>							
Less than 9th grade	7	63	0	153	0.2	0.0	0.4
9th–12th grade (no diploma)	32	1,030	276	1,784	2.9	0.9	4.9
HS Graduate or Equivalent (GED)	496	18,934	9,552	28,317	53.3	44.0	62.6
Some College, Associate Degree, or Technical School	242	12,377	4,629	20,125	34.9	27.2	42.5
Bachelor's Degree or beyond	87	3,104	1,515	4,692	8.7	6.1	11.3
<b>Ethnicity:</b>							
Hispanic or Latino	137	9,483	1,132	17,834	24.6	14.4	34.9
Non-Hispanic or Non-Latino	783	29,008	14,213	43,803	75.4	65.1	85.6
<b>Race:</b>							
American Indian or Alaska Native	17	1,073	0	2,156	3.3	1.3	5.4
Asian	0	NA	NA	NA	NA	NA	NA
Black or African American	35	1,492	0	3,059	4.7	0.6	8.7
Native Hawaiian or Other Pacific Islander	3	DSU	DSU	DSU	DSU	DSU	DSU
White	818	29,276	16,297	42,255	91.4	86.8	96.0

Abbreviations: DSU, data suppressed; NA, not applicable.

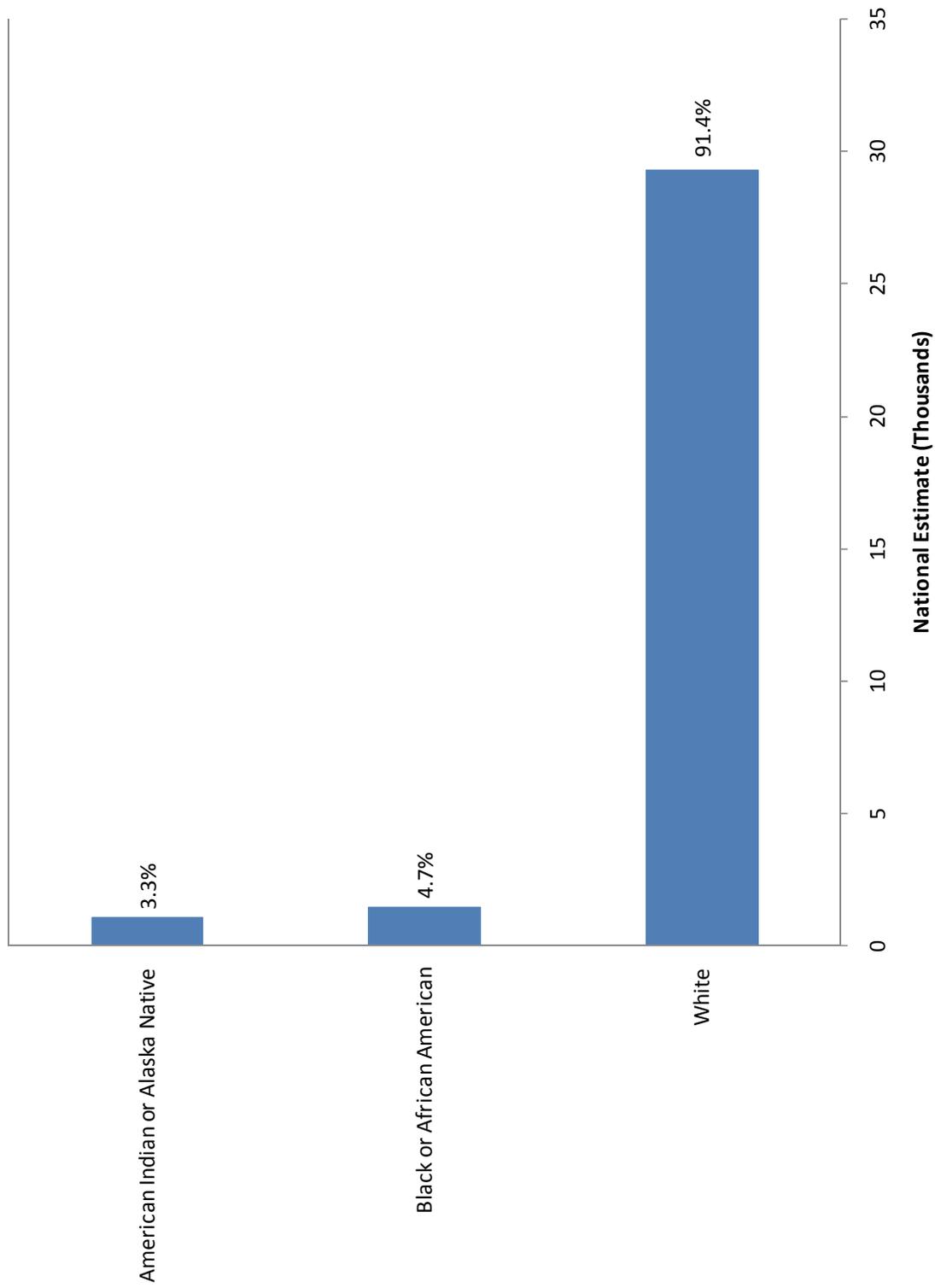
**Table 31. Occupational Characteristics of Employees at Metal Mines**

<b>Occupational Characteristic</b>	<b>Survey Count</b>	<b>National Estimate</b>	<b>95% LCL</b>	<b>95% UCL</b>	<b>National Percent</b>	<b>95% LCL</b>	<b>95% UCL</b>
Hours worked (per week)	922	42.7	41.4	44.0			
<b>Experience:</b>							
Experience in this Job Title (years)	916	4.7	2.9	6.5			
Experience at this Mine (years)	928	8.7	7.3	10.0			
Total Mining Experience (years)	871	10.7	9.4	12.0			
<b>Primary Work Location:</b>							
Underground Mine: Underground	172	6,152	876	11,428	15.8	2.0	29.5
Underground Mine: Surface Shops or Yards	53	1,252	327	2,177	3.2	0.6	5.8
Surface Mine: Strip, Open Pit, or Quarry	204	16,624	0	34,516	42.7	20.9	64.4
Surface Mine: Dredge	1	DSU	DSU	DSU	DSU	DSU	DSU
Surface Mine: Other Surface Mining (Metal/Nonmetal Only)	127	1,876	405	3,348	4.8	0.5	9.1
Mill Operations, Preparation Plants, or Breakers	301	9,307	4,644	13,970	23.9	9.1	38.7
Office	106	3,751	782	6,720	9.6	6.9	12.4

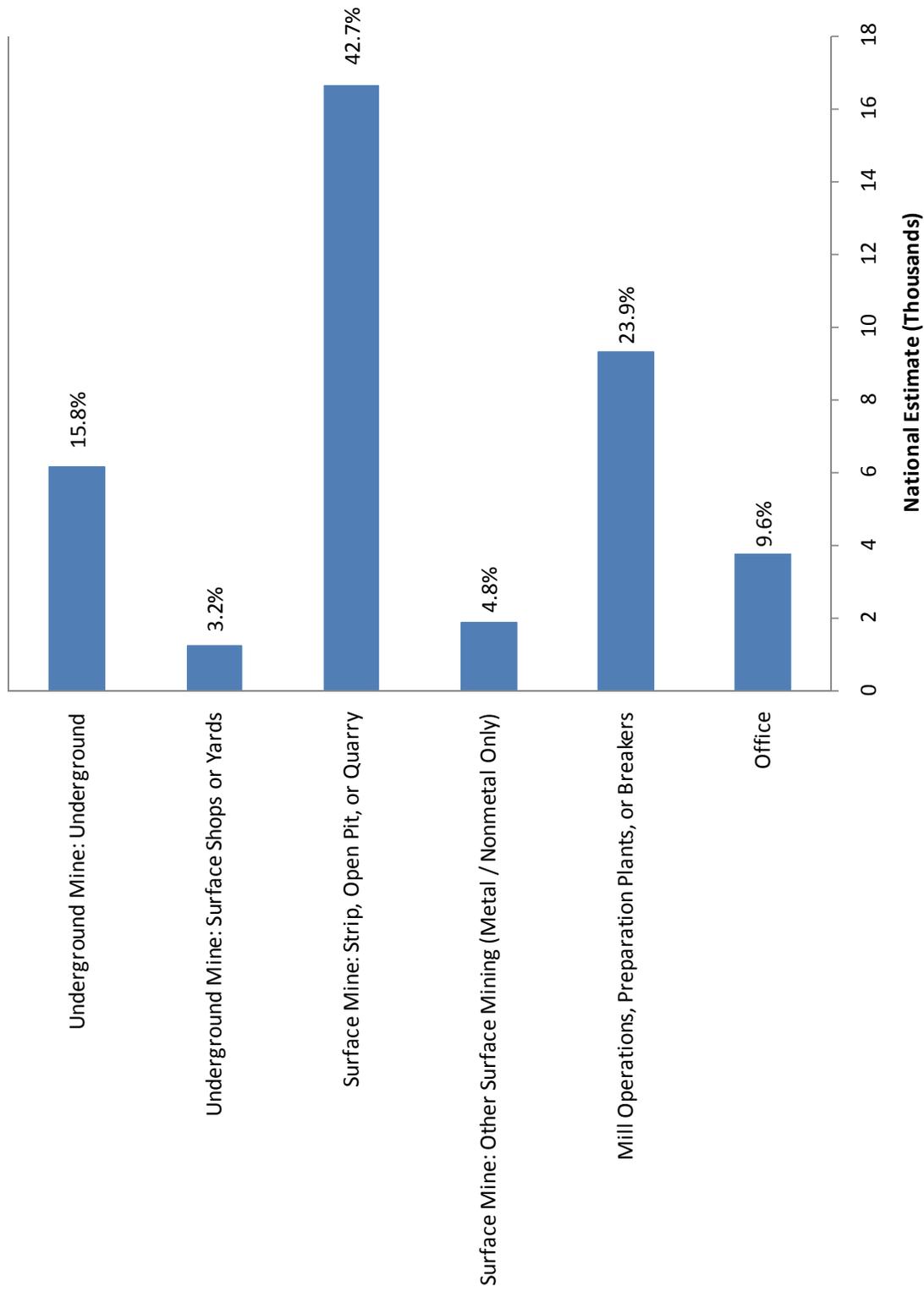
Abbreviation: DSU, data suppressed.



**Figure 18. Education Level of Employees at Metal Mines.**



**Figure 19. Race of Employees at Metal Mines.**



**Figure 20. Primary Work Location of Employees at Metal Mines.**

**Table 32. Estimated Number of Administration/Professional Employees at Metal Mines**

<b>Occupation by Category</b>	<b>Survey Count</b>	<b>National Estimate</b>	<b>95% LCL</b>	<b>95% UCL</b>
<b>ADMINISTRATION/PROFESSIONAL</b>	<b>308</b>	<b>10,652</b>	<b>5,754</b>	<b>15,550</b>
<b><u>Office Staff</u></b>	<b>49</b>	<b>1,889</b>	<b>725</b>	<b>3,053</b>
<b><i>Administrative Staff</i></b>	<b>24</b>	<b>811</b>	<b>241</b>	<b>1,381</b>
Administration				
Administrative Assistant				
Clerk				
Human Resources				
Office Staff				
Receptionist				
Secretary				
Systems Analyst				
<b><i>Business</i></b>	<b>16</b>	<b>804</b>	<b>0</b>	<b>1,782</b>
Accounting				
Bookkeeper				
Buyer				
Cost Coordinator				
Payroll				
Purchasing				
Shipping				
<b><i>Security</i></b>	<b>5</b>	<b>96</b>	<b>0</b>	<b>222</b>
Guard				
<b><i>Supplies</i></b>	<b>4</b>	<b>DSU</b>	<b>DSU</b>	<b>DSU</b>
Warehouse				
<b><u>Professional</u></b>	<b>85</b>	<b>3,368</b>	<b>1,260</b>	<b>5,475</b>
<b><i>Engineer</i></b>	<b>12</b>	<b>496</b>	<b>0</b>	<b>1,131</b>
Engineer (Electrical/Mining/Ventilation)				
Engineer, not otherwise specified				
Environmental Engineer				
Plant Engineer				
<b><i>Non-engineer</i></b>	<b>42</b>	<b>2,027</b>	<b>342</b>	<b>3,712</b>
Environmental Specialist				
Geologist				
Metallurgist				
Operations				
Operations Specialist				
Planner				
Professional, not otherwise specified				
Surveyor/Transit Man				
Utility Engineer				
<b><i>Technician</i></b>	<b>31</b>	<b>845</b>	<b>6</b>	<b>1,684</b>
Electrical Technician				
Laboratory Technician/Refiner				

**Table 32. Estimated Number of Administration/Professional Employees at Metal Mines  
(continued)**

<b>Occupation by Category</b>	<b>Survey Count</b>	<b>National Estimate</b>	<b>95% LCL</b>	<b>95% UCL</b>
Mechanic Technician				
Mill Technician				
Mine Technician				
Process Control Operator/Technician				
Sampler/Lab Technician				
Technician				
Utility Technician				
<b><u>Safety</u></b>	<b><u>11</u></b>	<b><u>303</u></b>	<b><u>87</u></b>	<b><u>519</u></b>
Safety				
Safety Manager				
Safety Supervisor				
<b><u>Supervisory</u></b>	<b><u>163</u></b>	<b><u>5,092</u></b>	<b><u>2,545</u></b>	<b><u>7,640</u></b>
<b><i>Executive</i></b>	<b><i>13</i></b>	<b><i>120</i></b>	<b><i>8</i></b>	<b><i>232</i></b>
CEO				
General Manager				
President				
Vice President				
<b><i>Foreman</i></b>	<b><i>69</i></b>	<b><i>2,235</i></b>	<b><i>941</i></b>	<b><i>3,530</i></b>
Assistant Superintendent				
Foreman				
Foreman/Shift Boss				
Lead Man				
Maintenance Foreman				
Mill Foreman				
Mine Foreman				
Plant Foreman				
Production Foreman				
Shift Foreman				
Superintendent				
<b><i>Manager</i></b>	<b><i>26</i></b>	<b><i>410</i></b>	<b><i>85</i></b>	<b><i>735</i></b>
Area Manager				
Concentrator Manager				
Engineering Manager				
Environmental Manager				
Human Resources Manager				
Manager				
Mill Manager				
Mine Manager				
Office Manager				
Plant Manager				
Process Manager				
Production Manager				
Project Manager				
Storeroom Manager				

**Table 32. Estimated Number of Administration/Professional Employees at Metal Mines  
(continued)**

<b>Occupation by Category</b>	<b>Survey Count</b>	<b>National Estimate</b>	<b>95% LCL</b>	<b>95% UCL</b>
<i>Supervisor</i>	<b>55</b>	<b>2,327</b>	<b>1,020</b>	<b>3,634</b>
Concentrator Supervisor				
Crusher Supervisor				
Gold House Supervisor				
Leaching Supervisor				
Maintenance Supervisor				
Mechanic Supervisor				
Mine Operations				
Mine Operator				
Mine Supervisor				
Plant Operator				
Process Supervisor				
Shift Supervisor				
Supervisor				
Tailings Supervisor				
Transportation Supervisor				
Warehouse Supervisor				

Abbreviation: DSU, data suppressed.

**Table 33. Estimated Number of Maintenance Employees at Metal Mines**

<b>Occupation by Category</b>	<b>Survey Count</b>	<b>National Estimate</b>	<b>95% LCL</b>	<b>95% UCL</b>
<b>MAINTENANCE</b>	<b>179</b>	<b>7,238</b>	<b>3,058</b>	<b>11,418</b>
<u>Specialty</u>	<u>28</u>	<u>1,585</u>	<u>350</u>	<u>2,819</u>
<i>Electrician</i>	22	1,483	264	2,702
Diagnostic Electrician				
Electrician/Wireman				
<i>Welder</i>	6	102	0	252
Maintenance Welder				
Welder				
<u>Support</u>	<u>151</u>	<u>5,653</u>	<u>2,515</u>	<u>8,791</u>
<i>Maintenance</i>	55	1,670	677	2,664
Crusher Maintenance				
Greaser/Oiler				
Maintenance				
Maintenance Planner				
Maintenance Technician				
Mill Maintenance				
Millwright				
Skilled Maintenance				
<i>Mechanic</i>	84	2,088	1,325	2,851
Automotive Mechanic				
Diagnostic Mechanic				
Diesel Mechanic				
Equipment Mechanic				
Heavy Equipment Mechanic				
Maintenance Mechanic				
Mechanic				
Mechanic/Welder				
Mechanic Helper				
Mobile Equipment Mechanic				
Mobile Maintenance Mechanic				
Plant Mechanic				
<i>Repairman</i>	12	1,895	0	4,796
Automotive Repairman				
Crusher Repairman				
Electronic/Electrical Repairman				
Heavy Duty Repairman				
Instrument Repairman				
Plant Repairman				
Repairman				
Tailings Repairman				

**Table 34. Number of Miscellaneous Employees at Metal Mines**

Occupation by Category	Survey Count
<b>MISCELLANEOUS</b>	<b>3</b>
<u>Trainee</u>	<u>1</u>
<u>Unknown</u>	<u>2</u>

**Table 35. Estimated Number of Production Employees at Metal Mines**

Occupation by Category	Survey Count	National Estimate	95% LCL	95% UCL
<b>PRODUCTION</b>	<b>373</b>	<b>17,581</b>	<b>5,896</b>	<b>29,266</b>
<u>Equipment Operator</u>	<u>113</u>	<u>7,185</u>	<u>0</u>	<u>14,993</u>
<i>Equipment Operator</i>	53	2,280	167	4,394
Bulldozer Operator				
Crane Operator				
Dredge Operator				
Equipment Operator				
Grader Operator				
Heavy Equipment Operator				
Mucking Machine Operator				
Raise Borer Operator				
<i>Hoist</i>	6	93	4	182
Hoist Operator				
Hoistman				
Skip Tender/Cager/Station Attendant				
<i>Material Mover</i>	42	3,569	0	7,682
Haul Truck Operator/Driver				
Truck Driver				
<i>Mining Machines</i>	4	DSU	DSU	DSU
Head Operator				
<i>Shovel Operator</i>	8	1,186	0	3,088
<u>Extraction</u>	<u>60</u>	<u>2,192</u>	<u>119</u>	<u>4,265</u>
<u>Material Preparation</u>	<u>35</u>	<u>1,315</u>	<u>534</u>	<u>2,096</u>
<i>Additives</i>	3	DSU	DSU	DSU
Additive Press Operator				
Thickener Operator				
<i>Crusher</i>	17	650	0	1,340
Crusher Helper				
Crusher Operator/Pan Feeder Operator				
Mill Crusher Operator				

**Table 35. Estimated Number of Production Employees at Metal Mines (continued)**

<b>Occupation by Category</b>	<b>Survey Count</b>	<b>National Estimate</b>	<b>95% LCL</b>	<b>95% UCL</b>
<b>Mill</b>	<b>15</b>	<b>594</b>	<b>162</b>	<b>1,025</b>
Mill Operator (ball/pebble/rod)				
Mill Production Worker				
<b>Process</b>	<b>54</b>	<b>3,088</b>	<b>78</b>	<b>6,098</b>
<b>Conveyor Operator</b>	<b>3</b>	<b>DSU</b>	<b>DSU</b>	<b>DSU</b>
Belt Vulcanizer				
<b>Other</b>	<b>17</b>	<b>366</b>	<b>0</b>	<b>753</b>
Process Operator				
<b>Separation</b>	<b>34</b>	<b>2,360</b>	<b>0</b>	<b>5,284</b>
Digestion Operator				
Filter Evaporation Operator				
Flotation/Concentrator Operator				
Grinder Operator				
Leach Utility				
Leaching Operations Worker				
Screen Plant Operator				
Tailings Operator				
<b>Support</b>	<b>111</b>	<b>3,801</b>	<b>503</b>	<b>7,099</b>
<b>Drill Operator</b>	<b>17</b>	<b>237</b>	<b>57</b>	<b>416</b>
Drill Operator				
Rotary Electric/Hydraulic Drill Operator				
<b>Electronics</b>	<b>1</b>	<b>DSU</b>	<b>DSU</b>	<b>DSU</b>
Power Systems				
<b>Explosives</b>	<b>9</b>	<b>145</b>	<b>10</b>	<b>279</b>
Blaster				
Driller/Blaster				
<b>Other</b>	<b>75</b>	<b>3,212</b>	<b>0</b>	<b>6,461</b>
Control Room Controller				
Dispatcher				
Operator, not otherwise specified				
Port Operator				
Production Operator				
Top Operator				
<b>Quality Control</b>	<b>4</b>	<b>DSU</b>	<b>DSU</b>	<b>DSU</b>
Quality Control/Quality Assurance				
<b>Roof Bolter</b>	<b>5</b>	<b>42</b>	<b>0</b>	<b>104</b>

Abbreviation: DSU, data suppressed.

**Table 36. Estimated Number of Service and Utility Employees at Metal Mines**

<b>Occupation by Category</b>	<b>Survey Count</b>	<b>National Estimate</b>	<b>95% LCL</b>	<b>95% UCL</b>
<b>SERVICE and UTILITY</b>	<b>103</b>	<b>3,339</b>	<b>1,155</b>	<b>5,523</b>
<b><u>General Labor</u></b>	<b><u>61</u></b>	<b><u>2,474</u></b>	<b><u>367</u></b>	<b><u>4,580</u></b>
<b><i>Cleaners</i></b>	<b><i>1</i></b>	<b><i>DSU</i></b>	<b><i>DSU</i></b>	<b><i>DSU</i></b>
Dry Attendant				
<b><i>Construction</i></b>	<b><i>6</i></b>	<b><i>537</i></b>	<b><i>0</i></b>	<b><i>1,130</i></b>
Cement Man/Concrete Worker				
Construction				
Shaft Miner/Shaft Repairer				
<b><i>Laborer</i></b>	<b><i>30</i></b>	<b><i>160</i></b>	<b><i>14</i></b>	<b><i>307</i></b>
Cook				
Laborer				
Production Worker				
<b><i>Material Handling</i></b>	<b><i>5</i></b>	<b><i>156</i></b>	<b><i>0</i></b>	<b><i>390</i></b>
Bagger/Bagging Operations Worker				
Material Handler				
<b><i>Tradesman</i></b>	<b><i>18</i></b>	<b><i>1,590</i></b>	<b><i>0</i></b>	<b><i>3,617</i></b>
Apprentice/Journeyman				
Boiler Operator				
Boilermaker				
Carpenter/Plumber/Painter				
Craftsman				
Trades Person				
<b><i>Weighman</i></b>	<b><i>1</i></b>	<b><i>DSU</i></b>	<b><i>DSU</i></b>	<b><i>DSU</i></b>
Weighmaster				
<b><u>Support Labor</u></b>	<b><u>42</u></b>	<b><u>865</u></b>	<b><u>253</u></b>	<b><u>1,478</u></b>
<b><i>Conveyor Operator</i></b>	<b><i>4</i></b>	<b><i>DSU</i></b>	<b><i>DSU</i></b>	<b><i>DSU</i></b>
Belt Cleaner/Conveyor Man				
<b><i>Distribution</i></b>	<b><i>9</i></b>	<b><i>48</i></b>	<b><i>0</i></b>	<b><i>140</i></b>
Packaging Operations Worker				
<b><i>Loading</i></b>	<b><i>14</i></b>	<b><i>186</i></b>	<b><i>45</i></b>	<b><i>326</i></b>
Chute Puller				
Load Haul Dump—Complete Cycle Loader Operator				
<b><i>Supplies</i></b>	<b><i>5</i></b>	<b><i>39</i></b>	<b><i>0</i></b>	<b><i>78</i></b>
Parts				
Supply Hauler				
Supply Man/Nipper				
<b><i>Utility</i></b>	<b><i>10</i></b>	<b><i>380</i></b>	<b><i>0</i></b>	<b><i>890</i></b>
Lampman				
Utility Man				

Abbreviation: DSU, data suppressed.

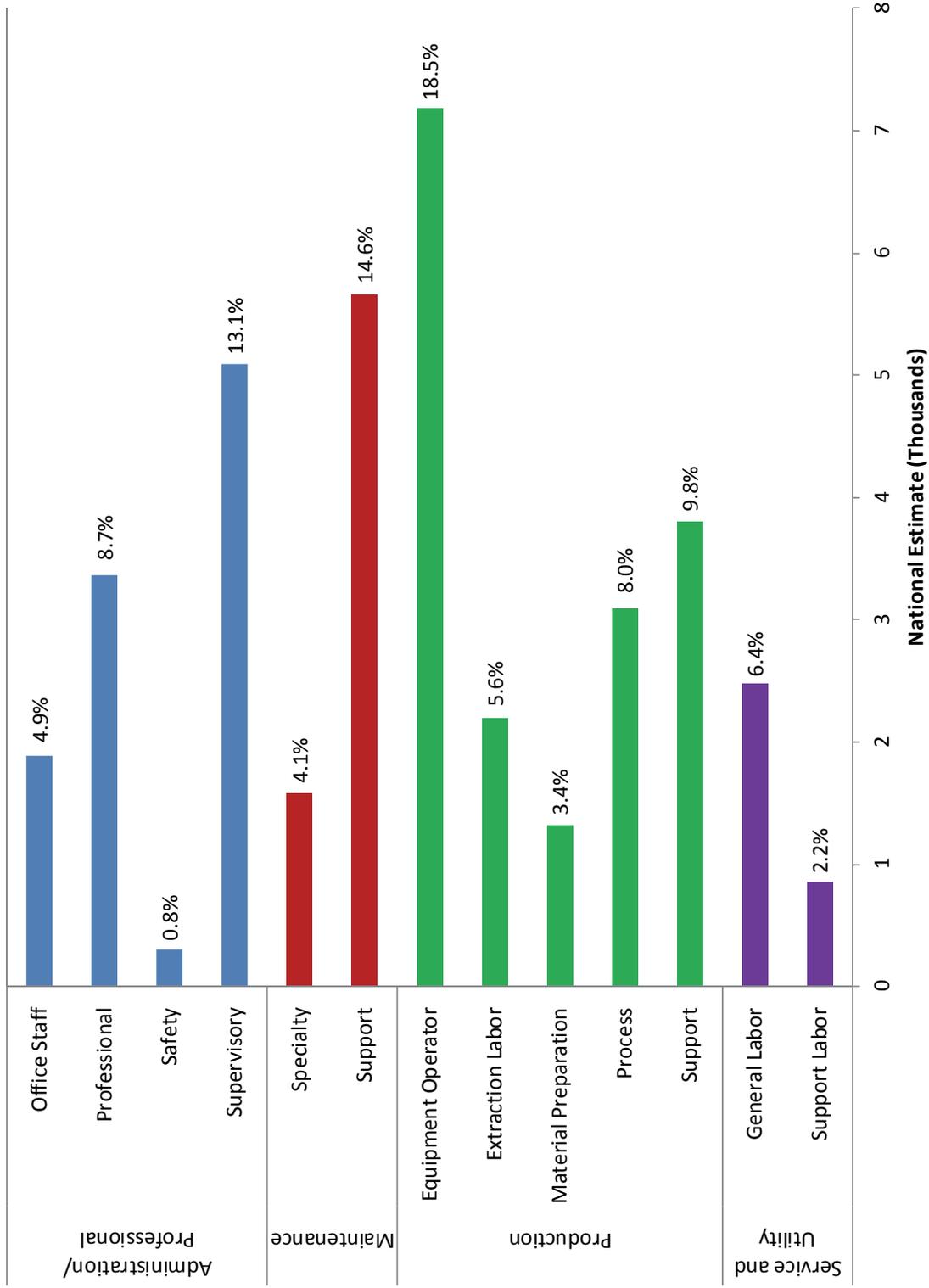


Figure 21. Occupational Categories of Employees at Metal Mines.



# **Employee Statistics for Nonmetal Mines**



## Summary of Employee Statistics for Nonmetal Mines

The demographic and occupational characteristics of employees in the U.S. nonmetal mining industry are presented in Tables 37 and 38 and Figures 22–24. The weighted survey estimate for gender indicates that the workforce is composed predominately of male employees (89.3 percent). The majority of nonmetal mine employees are White (85.6 percent) followed by Black or African American (13.6 percent). Eight percent of these employees have an ethnicity of Hispanic or Latino. An estimated 64.2 percent are high school graduates, with another 28.1 percent having a level of education beyond high school. A review of the weighted estimates indicates that the average nonmetal mine worker is 42.0 years of age and has worked in mining for 12.0 years, with 10.3 years at the current mine, and 6.7 years in his/her job title. The national estimate for the average number of hours worked per week is 42.4. The primary work location for an estimated 37.0 percent of nonmetal mine employees is “Mill Operations, Preparation Plants, or Breakers.” An additional 24.4 percent of these employees work at a “Surface Mine: Other Surface Mining,” while another 13.0 percent are employed in the “Surface Mine: Strip, Open Pit, or Quarry” work location.

Tables 39, 40, 42, 43, and Figure 25 present the national estimates of the number of nonmetal mine workers by four major occupational categories. (No estimates were calculated for Table 41: “Miscellaneous.”) An estimated 7,066 (36.7 percent) are employed in the “Administration/Professional” category; 2,836 (14.7 percent) in the “Maintenance” category; 6,426 (33.3 percent) in the “Production” category; and 2,968 (15.4 percent) in the “Service and Utility” category.



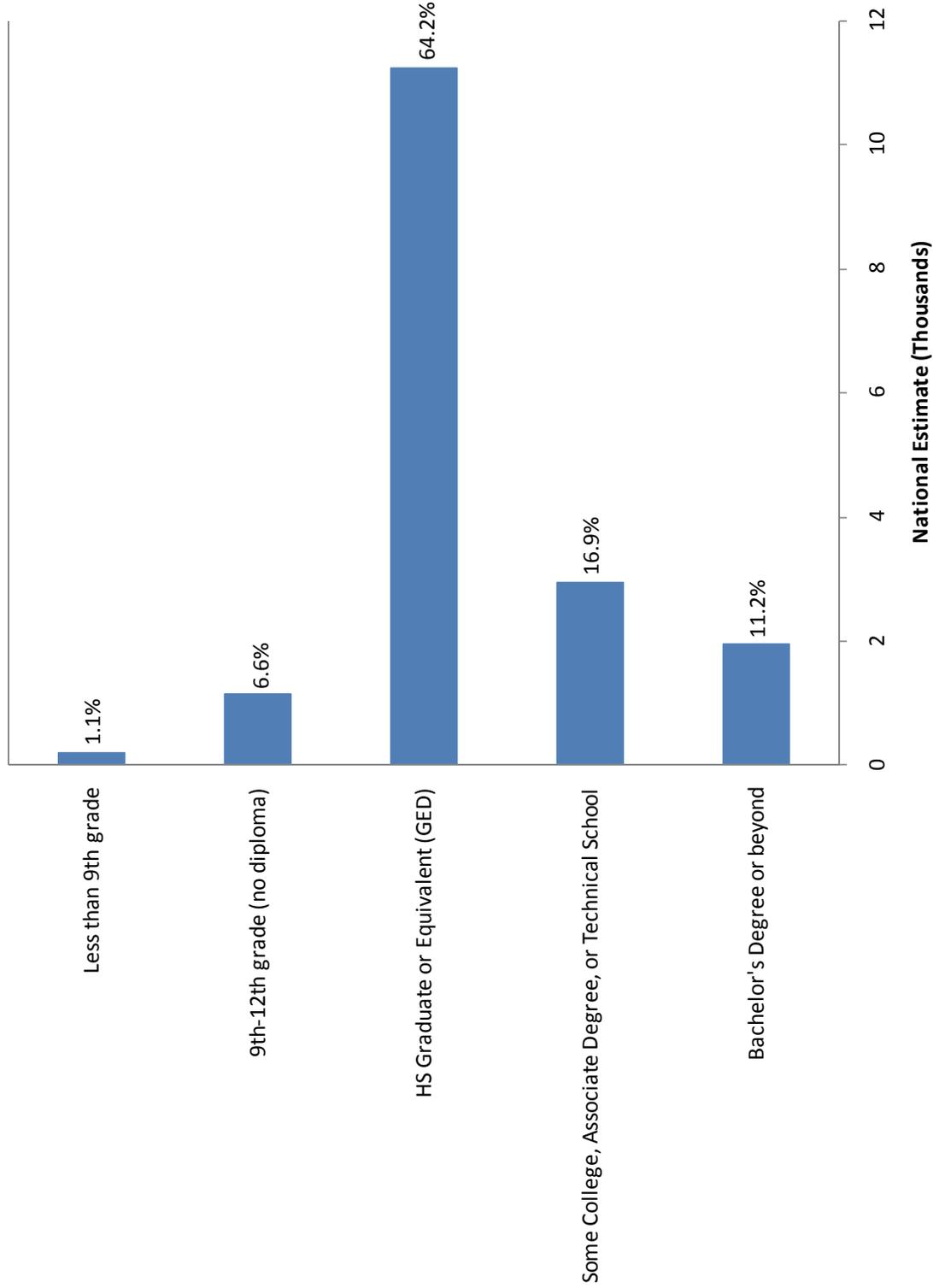
**Table 37. Demographic Characteristics of Employees at Nonmetal Mines**

Demographic Characteristic	Survey			National			
	Count	Estimate	95% LCL	95% UCL	Percent	95% LCL	95% UCL
<b>Gender:</b>							
Male	1,458	17,241	12,526	21,956	89.3	86.6	91.9
Female	136	2,074	1,174	2,973	10.7	8.1	13.4
Age (years)	1,505	42.0	40.2	43.8			
<b>Highest level of education:</b>							
Less than 9th grade	21	193	80	305	1.1	0.4	1.8
9th–12th grade (no diploma)	123	1,154	720	1,589	6.6	3.6	9.6
HS Graduate or Equivalent (GED)	888	11,242	6,837	15,647	64.2	58.1	70.3
Some College, Associate Degree, or Technical School	286	2,956	2,371	3,540	16.9	11.6	22.1
Bachelor's Degree or beyond	120	1,958	922	2,993	11.2	7.9	14.5
<b>Ethnicity:</b>							
Hispanic or Latino	158	1,368	854	1,883	8.3	5.7	10.9
Non-Hispanic or Non-Latino	1,384	15,171	12,851	17,491	91.7	89.1	94.3
<b>Race:</b>							
American Indian or Alaska Native	12	87	24	150	0.5	0.1	0.8
Asian	1	DSU	DSU	DSU	DSU	DSU	DSU
Black or African American	174	2,479	1,483	3,474	13.6	8.0	19.3
Native Hawaiian or Other Pacific Islander	3	DSU	DSU	DSU	DSU	DSU	DSU
White	1,262	15,567	10,412	20,721	85.6	79.8	91.4

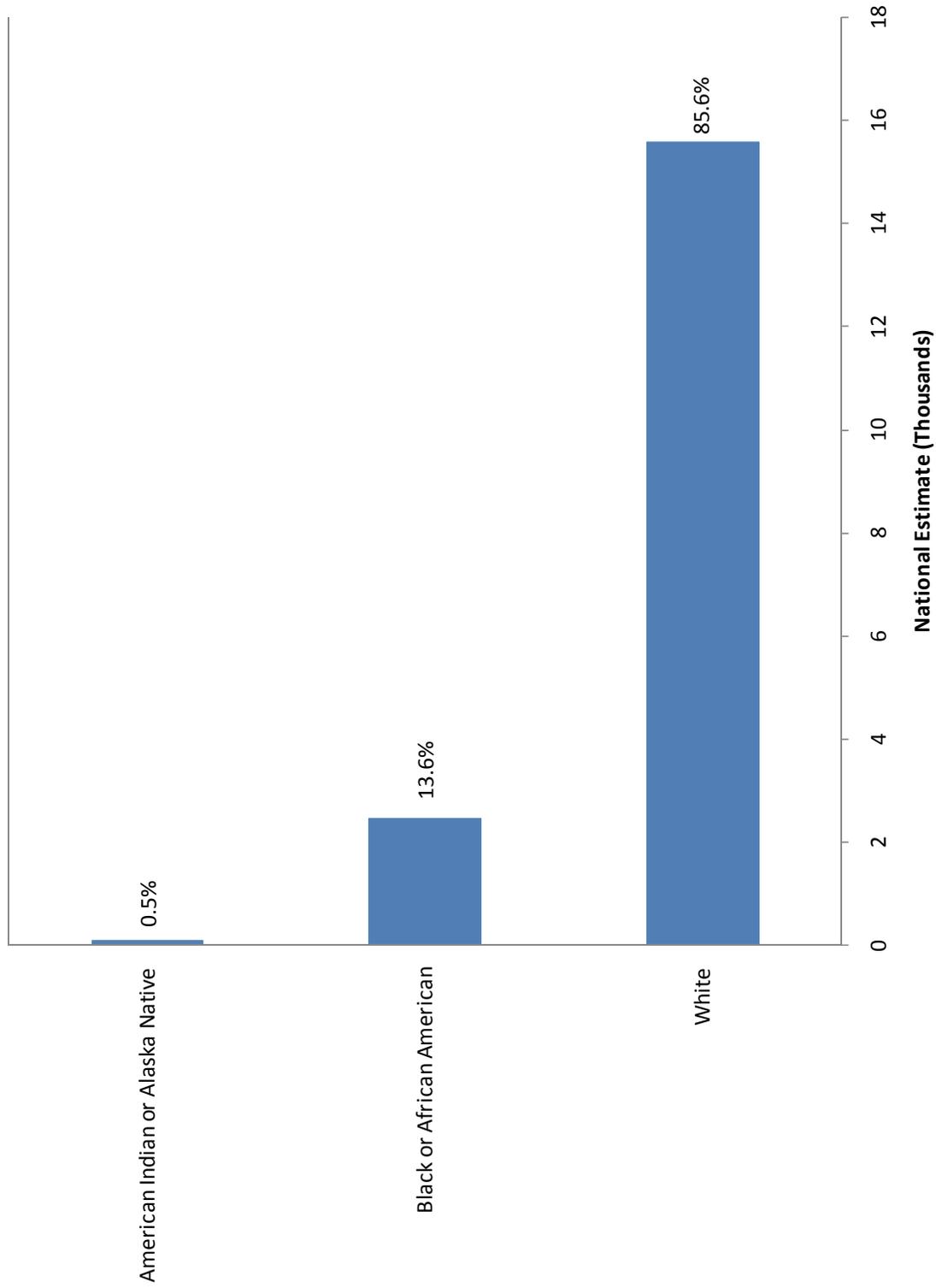
Abbreviation: DSU, data suppressed.

**Table 38. Occupational Characteristics of Employees at Nonmetal Mines**

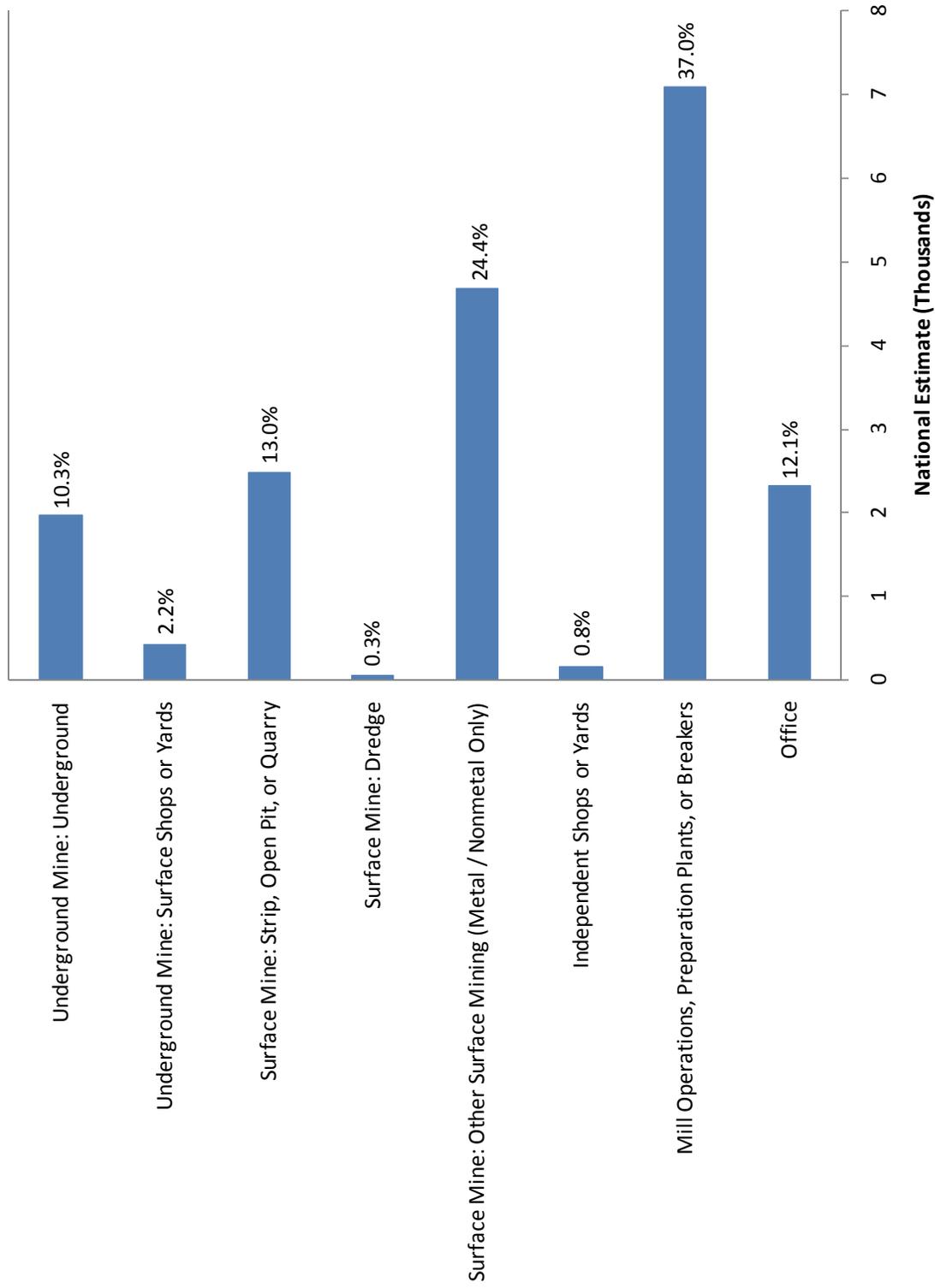
<b>Occupational Characteristic</b>	<b>Survey Count</b>	<b>National Estimate</b>	<b>95% LCL</b>	<b>95% UCL</b>	<b>National Percent</b>	<b>95% LCL</b>	<b>95% UCL</b>
Hours worked (per week)	1,489	42.4	41.6	43.3			
<b>Experience:</b>							
Experience in this Job Title (years)	1,570	6.7	5.3	8.1			
Experience at this Mine (years)	1,581	10.3	8.9	11.7			
Total Mining Experience (years)	1,507	12.0	10.9	13.2			
<b>Primary Work Location:</b>							
Underground Mine: Underground	175	1,971	1,050	2,892	10.3	5.5	15.0
Underground Mine: Surface Shops, Yards	31	422	94	751	2.2	0.5	3.9
Surface Mine: Strip, Open Pit, or Quarry	310	2,483	1,515	3,450	13.0	6.9	19.0
Surface Mine: Dredge	7	49	0	130	0.3	0.0	0.7
Surface Mine: Other Surface Mining (Metal/Nonmetal Only)	199	4,673	0	9,870	24.4	5.2	43.6
Independent Shops or Yards	16	159	5	313	0.8	0.0	1.7
Mill Operations, Preparation Plants, or Breakers	632	7,088	4,880	9,296	37.0	24.0	50.0
Office	213	2,324	1,502	3,146	12.1	7.2	17.0



**Figure 22. Education Level of Employees at Nonmetal Mines.**



**Figure 23. Race of Employees at Nonmetal Mines.**



**Figure 24. Primary Work Location of Employees at Nonmetal Mines.**

**Table 39. Estimated Number of Administration/Professional Employees at Nonmetal Mines**

<b>Occupation by Category</b>	<b>Survey Count</b>	<b>National Estimate</b>	<b>95% LCL</b>	<b>95% UCL</b>
<b>ADMINISTRATION/PROFESSIONAL</b>	<b>499</b>	<b>7,066</b>	<b>3,597</b>	<b>10,536</b>
<b><u>Office Staff</u></b>	<b><u>108</u></b>	<b><u>1,504</u></b>	<b><u>901</u></b>	<b><u>2,107</u></b>
<b><i>Administrative Staff</i></b>	<b>46</b>	<b>514</b>	<b>292</b>	<b>735</b>
Administration				
Administrative Assistant				
Clerk				
Customer Service				
Human Resources				
Office Staff				
Receptionist				
Secretary				
<b><i>Business</i></b>	<b>49</b>	<b>745</b>	<b>327</b>	<b>1,164</b>
Accounting				
Bookkeeper				
Buyer				
Payroll				
Purchasing				
Sales				
Shipping				
<b><i>Security</i></b>	<b>1</b>	<b>DSU</b>	<b>DSU</b>	<b>DSU</b>
Guard				
<b><i>Supplies</i></b>	<b>12</b>	<b>227</b>	<b>0</b>	<b>463</b>
Supply Clerk				
Warehouse				
<b><u>Professional</u></b>	<b><u>65</u></b>	<b><u>987</u></b>	<b><u>618</u></b>	<b><u>1,355</u></b>
<b><i>Engineer</i></b>	<b>18</b>	<b>297</b>	<b>84</b>	<b>509</b>
Director of Engineering				
Engineer (Electrical/Mining/Ventilation)				
Engineer, not otherwise specified				
Environmental Engineer				
Plant Engineer				
Process Engineer				
Project Engineer				
<b><i>Non-engineer</i></b>	<b>13</b>	<b>309</b>	<b>61</b>	<b>557</b>
Control Person/Analyst				
Environmental Specialist				
Geologist				
Planner				
Production Scheduler				
Professional, not otherwise specified				
Reliability Engineer				
Surveyor/Transit Man				

**Table 39. Estimated Number of Administration/Professional Employees at Nonmetal Mines (continued)**

<b>Occupation by Category</b>	<b>Survey Count</b>	<b>National Estimate</b>	<b>95% LCL</b>	<b>95% UCL</b>
<b><i>Technician</i></b>	<b>34</b>	<b>381</b>	<b>182</b>	<b>581</b>
Electrical Technician				
Process Control Operator/Technician				
Sampler/Lab Technician				
Technician				
<b><u>Safety</u></b>	<b><u>7</u></b>	<b><u>147</u></b>	<b><u>0</u></b>	<b><u>314</u></b>
Inspector				
Safety				
<b><u>Supervisory</u></b>	<b><u>319</u></b>	<b><u>4,429</u></b>	<b><u>1,704</u></b>	<b><u>7,154</u></b>
<b><i>Executive</i></b>	<b>25</b>	<b>179</b>	<b>89</b>	<b>269</b>
General Manager				
Mine Owner				
President				
Vice President				
<b><i>Foreman</i></b>	<b>98</b>	<b>2,102</b>	<b>0</b>	<b>4,363</b>
Foreman				
Foreman/Shift Boss				
Lead Man				
Maintenance Foreman				
Maintenance Lead Man				
Mill Foreman				
Mine Foreman				
Pit Foreman				
Plant Foreman				
Production Foreman				
Shift Foreman				
Shop Foreman				
Superintendent				
<b><i>Manager</i></b>	<b>72</b>	<b>737</b>	<b>467</b>	<b>1,006</b>
Assistant Manager				
Customer Service Manager				
Environmental Manager				
Financial Manager				
Human Resources Manager				
Lab Manager				
Maintenance Manager				
Manager				
Mill Manager				
Mine Manager				
Office Manager				
Plant Manager				
Production Manager				
Project Manager				
Quality Control Manager				
Quarry Manager				
Raw Material Manager				
Sales Manager				

**Table 39. Estimated Number of Administration/Professional Employees at Nonmetal Mines (continued)**

<b>Occupation by Category</b>	<b>Survey Count</b>	<b>National Estimate</b>	<b>95% LCL</b>	<b>95% UCL</b>
Shipping Manager				
<b>Supervisor</b>	<b>124</b>	<b>1,411</b>	<b>828</b>	<b>1,995</b>
Assistant Mine Supervisor				
Bagging/Baghouse Supervisor				
Blasting Supervisor				
Clay Operator				
Electrical Supervisor				
Lab Supervisor				
Maintenance Supervisor				
Mine Operations				
Mine Operator				
Mine Supervisor				
Plant Operator				
Plant Supervisor				
Production Supervisor				
Quality Assurance Supervisor				
Quarry Supervisor				
Shift Supervisor				
Shipping Supervisor				
Supervisor				

Abbreviation: DSU, data suppressed.

**Table 40. Estimated Number of Maintenance Employees at Nonmetal Mines**

<b>Occupation by Category</b>	<b>Survey Count</b>	<b>National Estimate</b>	<b>95% LCL</b>	<b>95% UCL</b>
<b>MAINTENANCE</b>	<b>202</b>	<b>2,836</b>	<b>1,781</b>	<b>3,890</b>
<u><b>Specialty</b></u>	<u><b>30</b></u>	<u><b>437</b></u>	<u><b>168</b></u>	<u><b>706</b></u>
<b>Electrician</b>	<b>25</b>	<b>401</b>	<b>136</b>	<b>667</b>
Electrician/Wireman				
Maintenance Electrician				
<b>Welder</b>	<b>5</b>	<b>35</b>	<b>0</b>	<b>81</b>
Welder				
Welder/Mechanic				
<u><b>Support</b></u>	<u><b>172</b></u>	<u><b>2,399</b></u>	<u><b>1,531</b></u>	<u><b>3,267</b></u>
<b>Maintenance</b>	<b>98</b>	<b>1,246</b>	<b>486</b>	<b>2,005</b>
Electrical Maintenance				
Greaser/Oiler				
Maintenance				
Maintenance Clerk				
Maintenance Planner				
Maintenance Technician				
Mechanical Maintenance				
Millwright				
Plant Maintenance				
Road Maintenance				
<b>Mechanic</b>	<b>70</b>	<b>1,099</b>	<b>554</b>	<b>1,644</b>
Diesel Mechanic				
Heavy Equipment Mechanic				
Maintenance Mechanic				
Master Mechanic				
Mechanic				
Mechanic Helper				
Mobile Equipment Mechanic				
Mobile Maintenance Mechanic				
Mobile Mechanic				
Plant Mechanic				
Wrens Mechanic				
<b>Repairman</b>	<b>4</b>	<b>DSU</b>	<b>DSU</b>	<b>DSU</b>
Automotive Repairman				
Heavy Duty Repairman				
Maintenance Repairman				

Abbreviation: DSU, data suppressed.

**Table 41. Number of Miscellaneous Employees at Nonmetal Mines**

<b>Occupation by Category</b>	<b>Survey Count</b>
<b>MISCELLANEOUS</b>	<b>4</b>
<u>Trainee</u>	<u>2</u>
<u>Unknown</u>	<u>2</u>

**Table 42. Estimated Number of Production Employees at Nonmetal Mines**

<b>Occupation by Category</b>	<b>Survey Count</b>	<b>National Estimate</b>	<b>95% LCL</b>	<b>95% UCL</b>
<b>PRODUCTION</b>	<b>636</b>	<b>6,426</b>	<b>5,142</b>	<b>7,710</b>
<u>Equipment Operator</u>	<u>221</u>	<u>1,892</u>	<u>1,308</u>	<u>2,477</u>
<i>Equipment Operator</i>	<i>124</i>	<i>1,058</i>	<i>603</i>	<i>1,512</i>
Backhoe Operator				
Bulldozer Operator				
Crane Operator				
Dredge Operator				
Equipment Operator				
Forklift Operator				
Front End Loader Operator				
Grader Operator				
Gravity Mag Operator				
Heavy Equipment Operator				
Mobile Equipment Operator				
Rotary Bucket Excavator Operator				
Scraper Operator				
Stripping Operator				
Tractor Operator				
<i>Hoist</i>	<i>12</i>	<i>117</i>	<i>22</i>	<i>211</i>
Hoist Engineer				
Hoist Operator				
Hoistman				
Skip Tender/Cager/Station Attendant				
<i>Material Mover</i>	<i>75</i>	<i>548</i>	<i>284</i>	<i>812</i>
Haul Truck Operator/Driver				
Hauler/Haul Unit Operator				
Off Road Truck Driver				
Ore Truck Driver/Operator				
Pit Truck Driver				
Rock Truck Driver				
Scoop Loader				
Scoop Tram Operator				
Truck Driver				
Water Truck Operator				

**Table 42. Estimated Number of Production Employees at Nonmetal Mines (continued)**

<b>Occupation by Category</b>	<b>Survey Count</b>	<b>National Estimate</b>	<b>95% LCL</b>	<b>95% UCL</b>
<b><i>Mining Machines</i></b>	<b>5</b>	<b>93</b>	<b>0</b>	<b>204</b>
Continuous Miner Operator				
Head Operator				
Undercutter Operator				
<b><i>Operator/Driver</i></b>	<b>3</b>	<b>DSU</b>	<b>DSU</b>	<b>DSU</b>
Dump Operator				
Transportation				
<b><i>Shovel Operator</i></b>	<b>2</b>	<b>DSU</b>	<b>DSU</b>	<b>DSU</b>
<b><u>Extraction Labor</u></b>	<b><u>77</u></b>	<b><u>1,018</u></b>	<b><u>363</u></b>	<b><u>1,673</u></b>
Mine Production				
Mine Support				
Miner				
<b><u>Material Preparation</u></b>	<b><u>106</u></b>	<b><u>918</u></b>	<b><u>544</u></b>	<b><u>1,293</u></b>
<b><i>Additives</i></b>	<b>10</b>	<b>121</b>	<b>0</b>	<b>286</b>
Calcine Operator				
<b><i>Crusher</i></b>	<b>30</b>	<b>180</b>	<b>83</b>	<b>276</b>
Blunging Operator				
Crusher Helper				
Crusher Operator/Pan Feeder Operator				
Screenhouse Crusher				
<b><i>Cutter</i></b>	<b>11</b>	<b>45</b>	<b>0</b>	<b>124</b>
Cutting Machine Operator				
Sawyer				
<b><i>Mill</i></b>	<b>55</b>	<b>572</b>	<b>271</b>	<b>873</b>
Dry Mill Operator				
Mill Hand/Helper				
Mill Operator (ball/pebble/rod)				
Mill Production Worker				
Roller Mill Operator				
<b><u>Process</u></b>	<b><u>61</u></b>	<b><u>659</u></b>	<b><u>370</u></b>	<b><u>948</u></b>
<b><i>Conveyor Operator</i></b>	<b>1</b>	<b>DSU</b>	<b>DSU</b>	<b>DSU</b>
Belt Vulcanizer				
<b><i>Dry Processing</i></b>	<b>20</b>	<b>199</b>	<b>56</b>	<b>342</b>
Dry Plant/Process Operator				
Dryer Operator				
Kiln Operator				
<b><i>Other</i></b>	<b>6</b>	<b>90</b>	<b>0</b>	<b>210</b>
Fabricator				
Process Attendant				
Process Operator				

**Table 42. Estimated Number of Production Employees at Nonmetal Mines (continued)**

<b>Occupation by Category</b>	<b>Survey Count</b>	<b>National Estimate</b>	<b>95% LCL</b>	<b>95% UCL</b>
<b>Separation</b>	<b>28</b>	<b>337</b>	<b>132</b>	<b>541</b>
Centrifuge Utility				
Extruder Operator				
Filter Operator				
Flotation/Concentrator Operator				
Grinder Operator				
Leaching Operations Worker				
Mix Operator				
Pan Operator				
Screen Plant Labor				
Screen Plant Operator				
Slurry Operator				
<b>Wet Process</b>	<b>6</b>	<b>28</b>	<b>0</b>	<b>58</b>
Wet Plant Operator				
<b>Support</b>	<b>171</b>	<b>1,938</b>	<b>988</b>	<b>2,889</b>
<b>Drill Operator</b>	<b>11</b>	<b>72</b>	<b>21</b>	<b>123</b>
<b>Electronics</b>	<b>2</b>	<b>DSU</b>	<b>DSU</b>	<b>DSU</b>
Robot Operator				
<b>Explosives</b>	<b>8</b>	<b>175</b>	<b>0</b>	<b>406</b>
Blaster				
Driller/Blaster				
Explosives/Powder Man				
<b>Other</b>	<b>129</b>	<b>1,412</b>	<b>525</b>	<b>2,298</b>
Control Room				
Controller				
Operator, not otherwise specified				
Production Operator				
Rak Handler				
<b>Quality Control</b>	<b>15</b>	<b>186</b>	<b>51</b>	<b>320</b>
Quality Control/Quality Assurance				
<b>Roof Bolter</b>	<b>6</b>	<b>61</b>	<b>0</b>	<b>124</b>

Abbreviation: DSU, data suppressed.

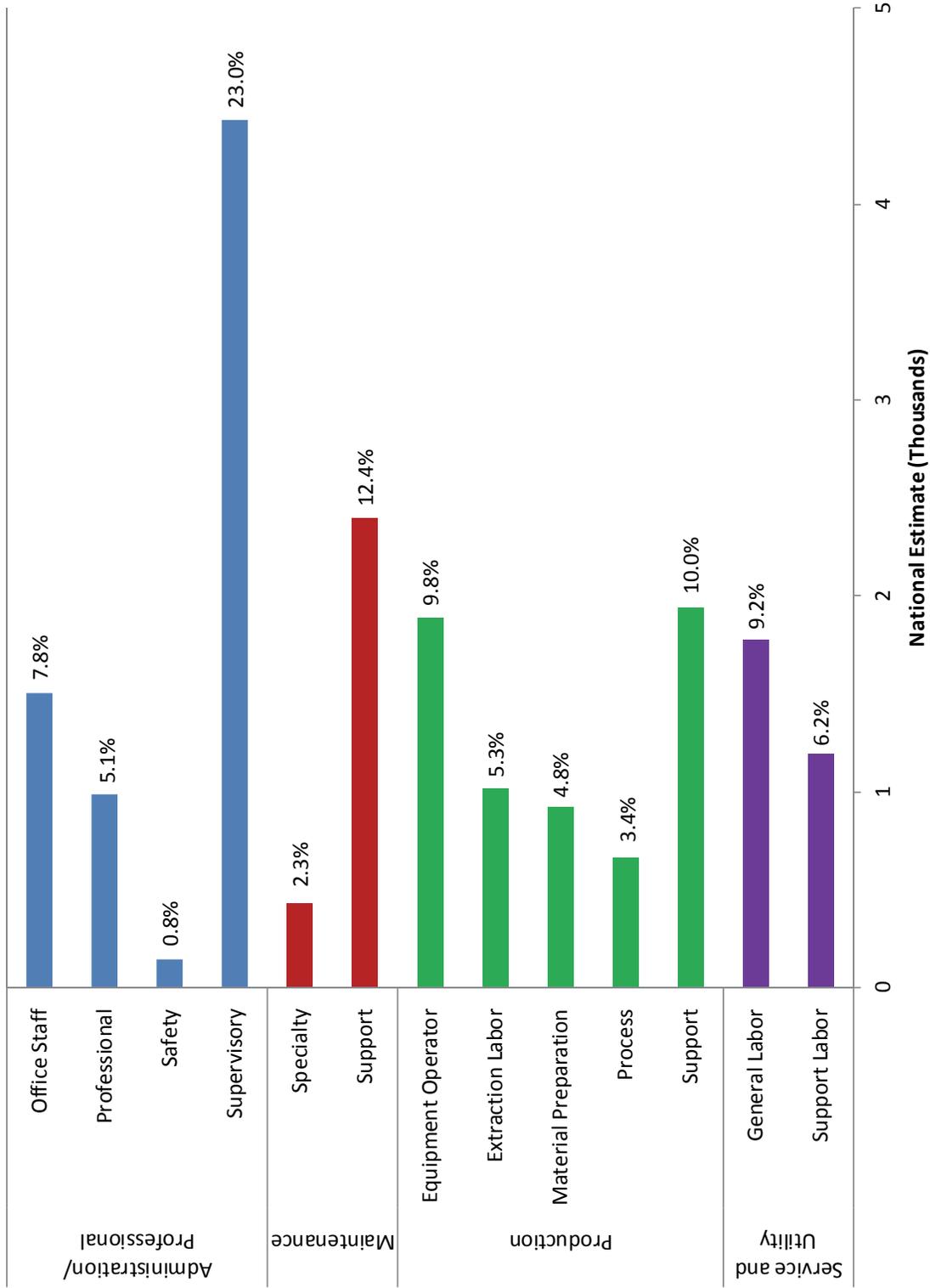
**Table 43. Estimated Number of Service and Utility Employees at Nonmetal Mines**

<b>Occupation by Category</b>	<b>Survey Count</b>	<b>National Estimate</b>	<b>95% LCL</b>	<b>95% UCL</b>
<b>SERVICE and UTILITY</b>	<b>254</b>	<b>2,968</b>	<b>2,236</b>	<b>3,699</b>
<b>General Labor</b>	<b>150</b>	<b>1,776</b>	<b>1,217</b>	<b>2,334</b>
<b>Cleaner</b>	<b>2</b>	<b>DSU</b>	<b>DSU</b>	<b>DSU</b>
Janitor				
Tank Car Washer				
<b>Construction</b>	<b>16</b>	<b>198</b>	<b>18</b>	<b>378</b>
Construction				
Packer				
Shaft Miner/Shaft Repairer				
<b>Laborer</b>	<b>51</b>	<b>587</b>	<b>256</b>	<b>918</b>
Laborer				
Miller				
Plant Helper				
Plant Man				
Production Worker				
Quarry Worker				
<b>Material Handling</b>	<b>78</b>	<b>928</b>	<b>502</b>	<b>1,355</b>
Bagger/Bagging Operations Worker				
Crude Pile Operator				
Material Handler				
Palletizer				
Reclaim Operator				
Stacker				
Storage Operator				
Storeroom				
Yard Laborer				
<b>Tradesman</b>	<b>2</b>	<b>DSU</b>	<b>DSU</b>	<b>DSU</b>
Boiler Operator				
<b>Weighman</b>	<b>1</b>	<b>DSU</b>	<b>DSU</b>	<b>DSU</b>
Scale Clerk/Operator				
<b>Support Labor</b>	<b>104</b>	<b>1,192</b>	<b>742</b>	<b>1,641</b>
<b>Barge Operations</b>	<b>6</b>	<b>46</b>	<b>0</b>	<b>111</b>
Barge Attendant/Boat Operator				
Deck Hand				
<b>Conveyor Operator</b>	<b>1</b>	<b>DSU</b>	<b>DSU</b>	<b>DSU</b>
Belt Cleaner/Conveyor Man				
<b>Distribution</b>	<b>18</b>	<b>316</b>	<b>0</b>	<b>697</b>
Packaging Operations Worker				

**Table 43. Estimated Number of Service and Utility Employees at Nonmetal Mines  
(continued)**

<b>Occupation by Category</b>	<b>Survey Count</b>	<b>National Estimate</b>	<b>95% LCL</b>	<b>95% UCL</b>
<b><i>Loading</i></b>	<b>49</b>	<b>561</b>	<b>344</b>	<b>779</b>
Bulk Loader				
Load Haul Dump—Complete Cycle				
Loader Operator				
Loading				
Plant Loader Operator				
Production Loader				
Rail Loader Operator				
Shipping Loader				
Stock Loader/Piler				
Tipple Operator				
<b><i>Utility</i></b>	<b>30</b>	<b>252</b>	<b>79</b>	<b>425</b>
Operator Utility				
Plant Utility				
Quarry Utility				
Utility Lubricator				
Utility Man				

Abbreviation: DSU, data suppressed.



**Figure 25. Occupational Categories of Employees at Nonmetal Mines.**



# **Employee Statistics for Stone Mines**



## Summary of Employee Statistics for Stone Mines

The demographic and occupational characteristics of employees in the U.S. stone mining industry are presented in Tables 44 and 45 and Figures 26–28. The weighted estimate for gender indicates that the workforce is composed predominately of male employees (93.4 percent). The majority of stone mine workers are White (93.8 percent), with another 4.7 percent of the workers having a racial category of Black or African American. Fourteen percent of these employees are Hispanic or Latino. An estimated 62.0 percent are high school graduates and 20.9 percent have a level of education beyond high school. A review of the weighted estimates indicates that the average stone miner is 43.8 years of age and has worked in mining for 12.5 years, 10.3 years at the current mine, and 7.8 years in his/her job title. The national estimate for the average number of hours worked per week is 45.7. The primary work location for an estimated 36.3 percent of stone mine employees is a “Surface Mine: Strip, Open Pit or Quarry.” An additional 33.5 percent of these employees work in “Mill Operations, Preparation Plants, or Breakers,” while another 14.4 percent are employed in the “Surface Mine: Other Surface Mining” work location.

Tables 46, 47, 49, 50, and Figure 29 present the national estimates of the number of workers by four major occupational categories. (No estimates were calculated for Table 48: “Miscellaneous.”) An estimated 19,435 (27.5 percent) stone mine workers are employed in the “Administration/Professional” category; 10,563 (14.9 percent) in the “Maintenance” category; 24,955 (35.3 percent) in the “Production” category; and 15,826 (22.3 percent) in the “Service and Utility” category.



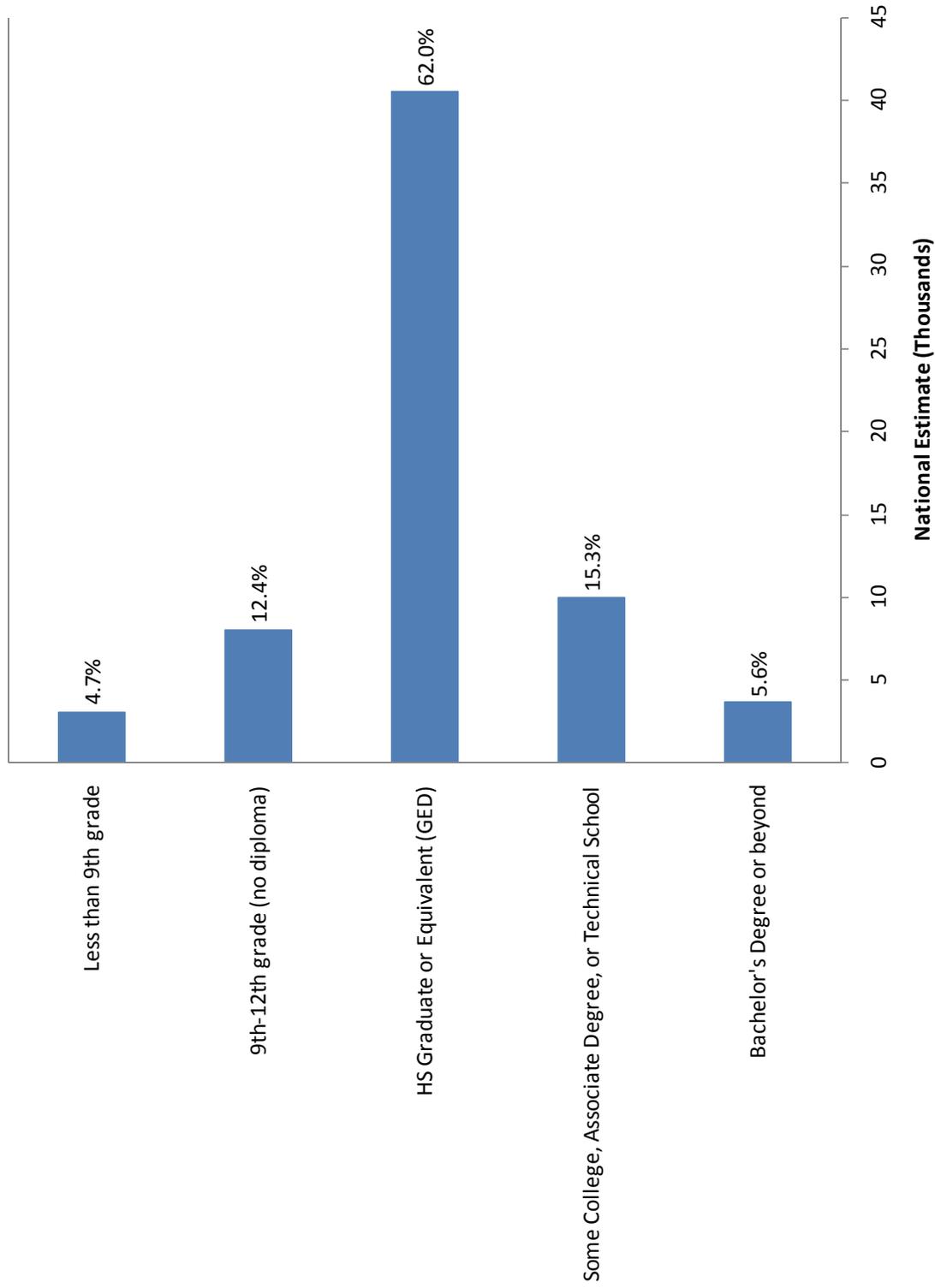
**Table 44. Demographic Characteristics of Employees at Stone Mines**

<b>Demographic Characteristic</b>	<b>Survey Count</b>	<b>National Estimate</b>	<b>95% LCL</b>	<b>95% UCL</b>	<b>National Percent</b>	<b>95% LCL</b>	<b>95% UCL</b>
<b>Gender:</b>							
Male	2,545	65,950	60,931	70,970	93.4	92.3	94.4
Female	173	4,666	3,802	5,530	6.6	5.6	7.7
<b>Age (years)</b>	2,629	43.8	42.9	44.7			
<b>Highest level of education:</b>							
Less than 9th grade	111	3,094	1,630	4,558	4.7	2.5	6.9
9th–12th grade (no diploma)	320	8,075	6,195	9,956	12.4	9.6	15.1
HS Graduate or Equivalent (GED)	1,607	40,481	35,504	45,457	62.0	56.9	67.1
Some College, Associate Degree, or Technical School	353	10,020	7,927	12,112	15.3	12.6	18.1
Bachelor's Degree or beyond	129	3,647	2,686	4,607	5.6	4.2	6.9
<b>Ethnicity:</b>							
Hispanic or Latino	309	9,394	6,111	12,676	13.6	9.1	18.1
Non-Hispanic or Non-Latino	2,348	59,768	54,166	65,370	86.4	81.9	90.9
<b>Race:</b>							
American Indian or Alaska Native	25	815	306	1,323	1.3	0.5	2.1
Asian	4	DSU	DSU	DSU	DSU	DSU	DSU
Black or African American	104	3,040	1,551	4,529	4.7	2.5	7.0
Native Hawaiian or Other Pacific Islander	6	198	0	441	0.3	0.0	0.7
White	2,362	60,494	55,116	65,872	93.8	91.5	96.0

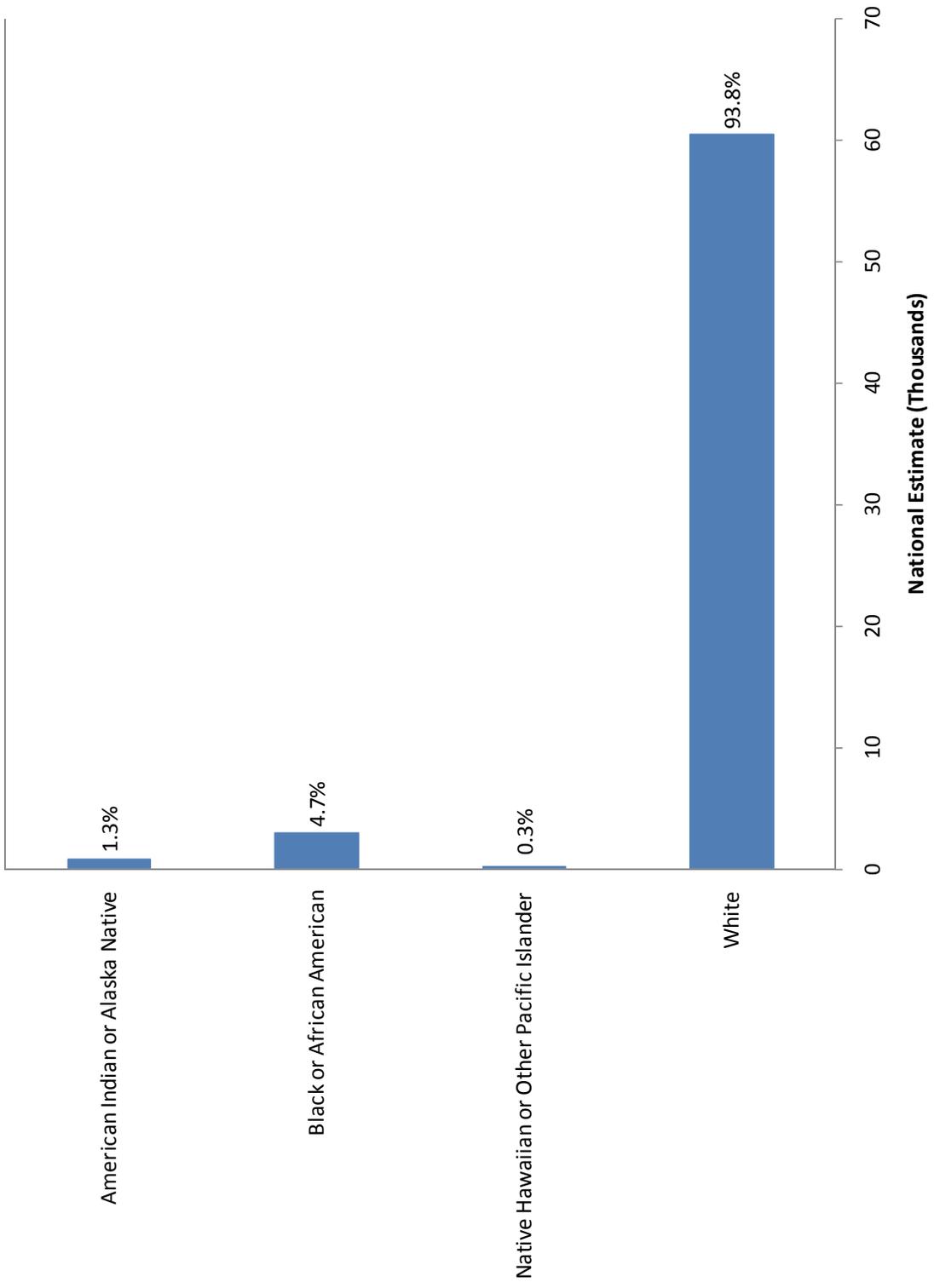
Abbreviation: DSU, data suppressed.

**Table 45. Occupational Characteristics of Employees at Stone Mines**

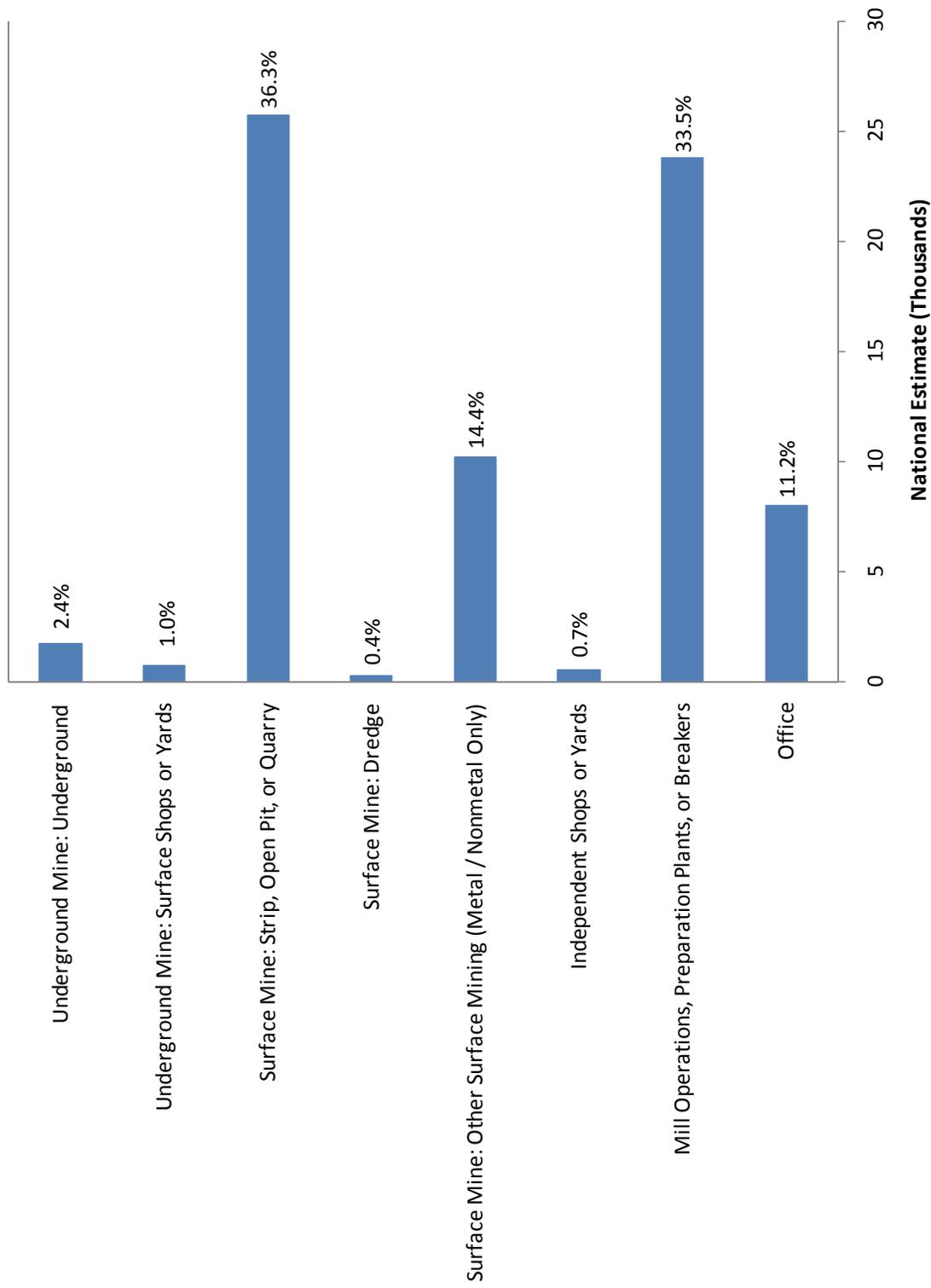
<b>Occupational Characteristic</b>	<b>Survey Count</b>	<b>National Estimate</b>	<b>95% LCL</b>	<b>95% UCL</b>	<b>National Percent</b>	<b>95% LCL</b>	<b>95% UCL</b>
Hours worked (per week)	2,601	45.7	44.2	47.2			
<b>Experience:</b>							
Experience in this Job Title (years)	2,596	7.8	7.2	8.3			
Experience at this Mine (years)	2,635	10.3	9.3	11.2			
Total Mining Experience (years)	2,643	12.5	11.7	13.3			
<b>Primary Work Location:</b>							
Underground Mine: Underground	217	1,710	1,305	2,115	2.4	1.8	3.0
Underground Mine: Surface Shops, Yards	121	732	482	983	1.0	0.7	1.4
Surface Mine: Strip, Open Pit, or Quarry	917	25,736	21,819	29,654	36.3	31.6	41.0
Surface Mine: Dredge	6	248	0	584	0.4	0.0	0.8
Surface Mine: Other Surface Mining (Metal/Nonmetal Only)	352	10,203	7,034	13,372	14.4	10.0	18.8
Independent Shops or Yards	22	530	0	1,077	0.7	0.0	1.5
Mill Operations, Preparation Plants, or Breakers	782	23,787	19,554	28,021	33.5	28.3	38.8
Office	301	7,957	6,438	9,475	11.2	9.3	13.1



**Figure 26. Education Level of Employees at Stone Mines.**



**Figure 27. Race of Employees at Stone Mines.**



**Figure 28. Primary Work Location of Employees at Stone Mines.**

**Table 46. Estimated Number of Administration/Professional Employees at Stone Mines**

<b>Occupation by Category</b>	<b>Survey Count</b>	<b>National Estimate</b>	<b>95% LCL</b>	<b>95% UCL</b>
<b>ADMINISTRATION/PROFESSIONAL</b>	<b>725</b>	<b>19,435</b>	<b>16,978</b>	<b>21,891</b>
<u>Office Staff</u>	<u>117</u>	<u>3,155</u>	<u>2,320</u>	<u>3,990</u>
<b>Administrative Staff</b>	<b>69</b>	<b>1,748</b>	<b>1,250</b>	<b>2,245</b>
Administration				
Administrative Assistant				
Clerk				
Communications				
Customer Service				
Human Resources				
Information Technology				
Office Clerk				
Office Staff				
Plant Clerk				
Secretary				
<b>Business</b>	<b>38</b>	<b>1,131</b>	<b>609</b>	<b>1,653</b>
Accounting				
Bookkeeper				
Buyer				
Payroll				
Procurement				
Purchasing				
Sales				
Shipping				
Terminal Operator				
<b>Security</b>	<b>3</b>	<b>DSU</b>	<b>DSU</b>	<b>DSU</b>
Guard				
<b>Supplies</b>	<b>7</b>	<b>158</b>	<b>8</b>	<b>308</b>
Supply Clerk				
Warehouse				
Warehouse Technician				
<u>Professional</u>	<u>92</u>	<u>3,139</u>	<u>1,947</u>	<u>4,332</u>
<b>Engineer</b>	<b>14</b>	<b>566</b>	<b>234</b>	<b>897</b>
Engineer				
(Electrical/Mining/Ventilation)				
Engineer, not otherwise specified				
Environmental Engineer				
Plant Engineer				
Process Engineer				
Production Engineer				
Project Engineer				
<b>Non-engineer</b>	<b>16</b>	<b>596</b>	<b>166</b>	<b>1,025</b>
Chemist				
Control Person/Analyst				
Environmental Specialist				
Physical Tester				
Planner				

**Table 46. Estimated Number of Administration/Professional Employees at Stone Mines  
(continued)**

<b>Occupation by Category</b>	<b>Survey Count</b>	<b>National Estimate</b>	<b>95% LCL</b>	<b>95% UCL</b>
Professional, not otherwise specified Reliability Engineer				
<b>Technician</b>	<b>62</b>	<b>1,978</b>	<b>990</b>	<b>2,966</b>
Electrical Technician				
Materials Technician				
Process Control Operator/Technician				
Production Technician				
Quarry Technician				
Sampler/Lab Technician				
Technician				
Utility Technician				
<b>Safety</b>	<b>11</b>	<b>346</b>	<b>80</b>	<b>613</b>
Inspector				
Safety				
Safety Manager				
<b>Supervisory</b>	<b>505</b>	<b>12,794</b>	<b>11,322</b>	<b>14,265</b>
<b>Executive</b>	<b>22</b>	<b>659</b>	<b>390</b>	<b>929</b>
General Manager				
Mine Owner				
President				
Vice President				
<b>Foreman</b>	<b>165</b>	<b>4,255</b>	<b>3,512</b>	<b>4,998</b>
Assistant Superintendent				
Foreman				
Foreman/Shift Boss				
Lead Man				
Maintenance Foreman				
Maintenance Lead Man				
Mine Foreman				
Pit Foreman				
Plant Foreman				
Shop Foreman				
Superintendent				
<b>Manager</b>	<b>105</b>	<b>2,406</b>	<b>1,880</b>	<b>2,933</b>
Assistant Manager				
Distribution Manager				
Environmental Manager				
Equipment Maintenance Manager				
Equipment Manager				
Facility Manager				
Human Resources Manager				
Maintenance Manager				
Manager				
Mine Manager				
Office Manager				

**Table 46. Estimated Number of Administration/Professional Employees at Stone Mines  
(continued)**

<b>Occupation by Category</b>	<b>Survey Count</b>	<b>National Estimate</b>	<b>95% LCL</b>	<b>95% UCL</b>
Operations Manager				
Plant Manager				
Production Manager				
Project Manager				
Purchasing Manager				
Quality Control Manager				
Quarry Manager				
Regulatory Manager				
Sales Manager				
Scale Office Manager				
Technical Service Manager				
<b>Supervisor</b>	<b>213</b>	<b>5,473</b>	<b>4,284</b>	<b>6,662</b>
Blasting Supervisor				
Control Room Supervisor				
Crusher Supervisor				
Electrical Supervisor				
Equipment Supervisor				
Lab Supervisor				
Loader Supervisor				
Loadhouse Supervisor				
Maintenance Supervisor				
Mine Operator				
Mine Supervisor				
Mobile Equipment Supervisor				
Plant Operator				
Plant Supervisor				
Process Supervisor				
Production Supervisor				
Quality Assurance Supervisor				
Quarry Operator				
Quarry Supervisor				
Shift Supervisor				
Shipping Supervisor				
Supervisor				
Transportation Supervisor				
Warehouse Supervisor				
Wash Plant Supervisor				

Abbreviation: DSU, data suppressed.

**Table 47. Estimated Number of Maintenance Employees at Stone Mines**

<b>Occupation by Category</b>	<b>Survey Count</b>	<b>National Estimate</b>	<b>95% LCL</b>	<b>95% UCL</b>
<b>MAINTENANCE</b>	<b>384</b>	<b>10,563</b>	<b>8,999</b>	<b>12,127</b>
<u><b>Specialty</b></u>	<u><b>79</b></u>	<u><b>2,219</b></u>	<u><b>1,533</b></u>	<u><b>2,904</b></u>
<b>Electrician</b>	<b>39</b>	<b>1,191</b>	<b>709</b>	<b>1,674</b>
Electrician/Wireman				
Maintenance Electrician				
<b>Welder</b>	<b>40</b>	<b>1,027</b>	<b>572</b>	<b>1,483</b>
Maintenance Welder				
Repair/Welder				
Welder				
Welder/Mechanic				
<u><b>Support</b></u>	<u><b>305</b></u>	<u><b>8,344</b></u>	<u><b>6,908</b></u>	<u><b>9,780</b></u>
<b>Maintenance</b>	<b>132</b>	<b>3,604</b>	<b>2,585</b>	<b>4,624</b>
Electrical Maintenance				
Equipment Maintenance				
Fixed Maintenance				
Greaser/Oiler				
Liquid Fuel Handler				
Maintenance				
Maintenance Clerk				
Maintenance Coordinator				
Maintenance Planner				
Maintenance Technician				
Mechanical Maintenance				
Millwright				
Mobile Maintenance				
Plant Maintenance				
<b>Mechanic</b>	<b>149</b>	<b>3,721</b>	<b>2,632</b>	<b>4,811</b>
Heavy Equipment Mechanic				
Maintenance Mechanic				
Master Mechanic				
Mechanic				
Mechanic Helper				
Mobile Equipment Mechanic				
Mobile Maintenance Mechanic				
Mobile Mechanic				
Plant Mechanic				
<b>Repairman</b>	<b>24</b>	<b>1,019</b>	<b>258</b>	<b>1,780</b>
Automotive Repairman				
Electronic/Electrical Repairman				
Instrument Repairman				
Mechanical Repairman				
Repairman				

**Table 48. Number of Miscellaneous Employees at Stone Mines**

Occupation by Category	Survey Count
<b>MISCELLANEOUS</b>	<b>7</b>
<u>Trainee</u>	<u>1</u>
<u>Unknown</u>	<u>6</u>

**Table 49. Estimated Number of Production Employees at Stone Mines**

Occupation by Category	Survey Count	National Estimate	95% LCL	95% UCL
<b>PRODUCTION</b>	<b>1,040</b>	<b>24,955</b>	<b>21,960</b>	<b>27,951</b>
<u>Equipment Operator</u>	<u>589</u>	<u>14,803</u>	<u>12,345</u>	<u>17,261</u>
<i>Dragline Operator</i>	<i>4</i>	<i>DSU</i>	<i>DSU</i>	<i>DSU</i>
<i>Equipment Operator</i>	<i>297</i>	<i>8,113</i>	<i>6,018</i>	<i>10,208</i>
Bobcat Operator				
Bulldozer Operator				
Crane Operator				
Dredge Operator				
End Dump Driver				
Equipment Operator				
Forklift Operator				
Front End Loader Operator				
Grader Operator				
Heavy Equipment Operator				
Highlift Operator				
Machine Operator				
Mobile Equipment Operator				
Paver Operator				
Payloader Operator				
Rotary Bucket Excavator Operator				
Scaler (mechanical)				
Tower Operator				
Track Hoe				
Tractor Operator				
<i>Material Mover</i>	<i>275</i>	<i>6,209</i>	<i>4,898</i>	<i>7,521</i>
Dump Operator				
Haul Truck Operator/Driver				
Hauler/Haul Unit Operator				
Motorman				
Off Road Truck Driver				
Operator/Driver				
Pit Truck Driver				
Quarry Truck Driver				
Rock Truck Driver				
Stock Truck/Stock Pile Driver				
Transportation				
Truck Driver				
Water Truck Operator				

**Table 49. Estimated Number of Production Employees at Stone Mines (continued)**

<b>Occupation by Category</b>	<b>Survey Count</b>	<b>National Estimate</b>	<b>95% LCL</b>	<b>95% UCL</b>
<b><i>Shovel Operator</i></b>	<b>3</b>	<b><i>DSU</i></b>	<b><i>DSU</i></b>	<b><i>DSU</i></b>
<b><u>Extraction Labor</u></b>	<b><u>22</u></b>	<b><u>410</u></b>	<b><u>0</u></b>	<b><u>950</u></b>
Heading Prep Miner				
<b><u>Material Preparation</u></b>	<b><u>115</u></b>	<b><u>2,718</u></b>	<b><u>1,728</u></b>	<b><u>3,709</u></b>
<b><i>Additives</i></b>	<b><u>1</u></b>	<b><i>DSU</i></b>	<b><i>DSU</i></b>	<b><i>DSU</i></b>
Additives Utility				
<b><i>Crusher</i></b>	<b>45</b>	<b>978</b>	<b>586</b>	<b>1,369</b>
Breaker Operator				
Crusher Operator/Pan Feeder Operator				
Crusher Plant Operator				
Hammer Mill Operator				
Jaw Operator				
Rock Breaker Operator				
<b><i>Cutter</i></b>	<b>47</b>	<b>1,115</b>	<b>215</b>	<b>2,015</b>
Sawyer				
Splitter				
Stone Cutter				
Trimmer				
<b><i>Mill</i></b>	<b>22</b>	<b>547</b>	<b>167</b>	<b>927</b>
Limestone Prep Operator				
Mill Man				
Mill Operator (ball/pebble/rod)				
Milling Machine Operator				
Roller Operator				
<b><u>Process</u></b>	<b><u>34</u></b>	<b><u>1,177</u></b>	<b><u>588</u></b>	<b><u>1,767</u></b>
<b><i>Dry Processing</i></b>	<b><u>10</u></b>	<b><u>373</u></b>	<b><u>33</u></b>	<b><u>713</u></b>
Dryer Operator				
Kiln Operator				
<b><i>Other</i></b>	<b>9</b>	<b>369</b>	<b>50</b>	<b>689</b>
Fabricator				
Process Attendant				
<b><i>Separation</i></b>	<b>15</b>	<b>435</b>	<b>93</b>	<b>776</b>
Grinder Operator				
Mix Chemist				
Mix Operator				
Pelletizing Operations Worker				
Pug Operator/Mixer Tender				
Rotex Operator				
Screen Plant Operator				

**Table 49. Estimated Number of Production Employees at Stone Mines (continued)**

<b>Occupation by Category</b>	<b>Survey Count</b>	<b>National Estimate</b>	<b>95% LCL</b>	<b>95% UCL</b>
<b>Support</b>	<b>280</b>	<b>5,847</b>	<b>4,387</b>	<b>7,308</b>
<b>Drill Operator</b>	<b>46</b>	<b>730</b>	<b>442</b>	<b>1,019</b>
Drill Helper/Chuck Tender				
Drill Operator				
<b>Electronics</b>	<b>1</b>	<b>DSU</b>	<b>DSU</b>	<b>DSU</b>
Console Operator				
<b>Explosives</b>	<b>48</b>	<b>561</b>	<b>288</b>	<b>834</b>
Blaster				
Driller/Blaster				
Explosives/Powder Man				
Shooter				
<b>Other</b>	<b>142</b>	<b>3,500</b>	<b>2,176</b>	<b>4,823</b>
Control Room				
Controller				
Dispatcher				
Operator, not otherwise specified				
Panel Operator				
Production Operator				
Scaler (hand)				
<b>Quality Control</b>	<b>38</b>	<b>965</b>	<b>638</b>	<b>1,292</b>
Quality Control/Quality Assurance				
<b>Roof Bolter</b>	<b>5</b>	<b>49</b>	<b>0</b>	<b>107</b>
Roof Bolter				
Roof Control Operator				

Abbreviation: DSU, data suppressed.

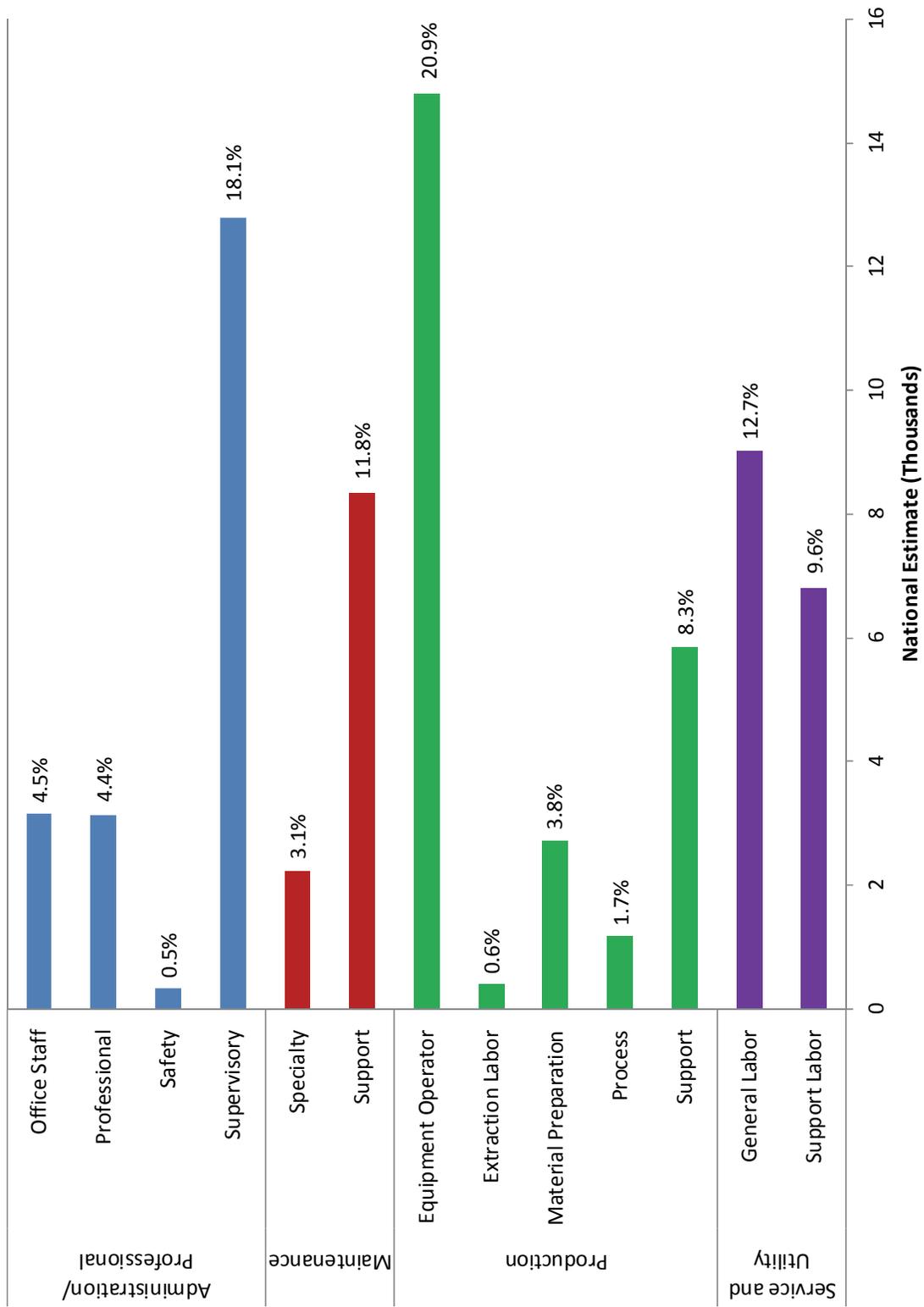
**Table 50. Estimated Number of Service and Utility Employees at Stone Mines**

<b>Occupation by Category</b>	<b>Survey Count</b>	<b>National Estimate</b>	<b>95% LCL</b>	<b>95% UCL</b>
<b>SERVICE and UTILITY</b>	<b>565</b>	<b>15,826</b>	<b>13,213</b>	<b>18,439</b>
<b><u>General Labor</u></b>	<b><u>293</u></b>	<b><u>9,020</u></b>	<b><u>6,871</u></b>	<b><u>11,169</u></b>
<b><i>Cleaner</i></b>	<b>3</b>	<b><i>DSU</i></b>	<b><i>DSU</i></b>	<b><i>DSU</i></b>
Janitor				
Tower Cleaner				
<b><i>Construction</i></b>	<b>11</b>	<b>271</b>	<b>0</b>	<b>547</b>
Curb Cutter				
Ground Control/Timberman				
Packer				
Screed Person				
<b><i>Laborer</i></b>	<b>190</b>	<b>6,107</b>	<b>4,029</b>	<b>8,184</b>
Ground Man				
Laborer				
Miller				
Plant Man				
Quarry Worker				
<b><i>Material Handling</i></b>	<b>36</b>	<b>1,215</b>	<b>518</b>	<b>1,911</b>
Bagger/Bagging Operations Worker				
Material Handler				
Palletizer				
Silo Operator				
Stacker				
Storeroom				
Yard Laborer				
<b><i>Tradesman</i></b>	<b>5</b>	<b>141</b>	<b>0</b>	<b>319</b>
Apprentice/Journeyman				
Machinist				
<b><i>Weighman</i></b>	<b>48</b>	<b>1,183</b>	<b>836</b>	<b>1,529</b>
Scale Clerk/Operator				
Weighmaster				
<b><u>Support Labor</u></b>	<b><u>272</u></b>	<b><u>6,806</u></b>	<b><u>5,172</u></b>	<b><u>8,440</u></b>
<b><i>Barge Operations</i></b>	<b>6</b>	<b>188</b>	<b>0</b>	<b>407</b>
Barge Attendant/Boat Operator				
Deck Hand				
Dock Worker				
<b><i>Conveyor Operator</i></b>	<b>2</b>	<b><i>DSU</i></b>	<b><i>DSU</i></b>	<b><i>DSU</i></b>
Belt Cleaner/Conveyor Man				
<b><i>Distribution</i></b>	<b>7</b>	<b>187</b>	<b>0</b>	<b>407</b>
Packaging Operations Worker				
Packhouse				

**Table 50. Estimated Number of Service and Utility Employees at Stone Mines (continued)**

<b>Occupation by Category</b>	<b>Survey Count</b>	<b>National Estimate</b>	<b>95% LCL</b>	<b>95% UCL</b>
<b><i>Loading</i></b>	<b>202</b>	<b>4,840</b>	<b>3,396</b>	<b>6,284</b>
Bin Puller/Truck Loader				
Bulk Loader				
Load Man				
Loader Operator				
Loading				
Loadout Operator				
Pit Loader Operator				
Plant Loader Operator				
Production Loader				
Quarry Loader Operator				
Rail Loader Operator				
Stock Loader/Piler				
Yard Loader Operator				
<b><i>Utility</i></b>	<b>55</b>	<b>1,561</b>	<b>912</b>	<b>2,210</b>
Crusher Utility				
E.O. Utility				
Equipment Utility				
Mill Utility				
Pit Utility Person				
Plant Utility				
Production Utility				
Quarry Utility				
Utility Man				
Utility Scaler				

Abbreviation: DSU, data suppressed.



**Figure 29. Occupational Categories of Employees at Stone Mines.**



# **Employee Statistics for Sand and Gravel Mines**



## Summary of Employee Statistics for Sand and Gravel Mines

The demographic and occupational characteristics of employees in the U.S. sand and gravel mining industry are presented in Tables 51 and 52 and Figures 30–32. The weighted survey estimate for gender indicates that the workforce is composed predominately of male employees (92.1 percent). The majority of sand and gravel mine employees are White (94.1 percent), followed by Black or African American (4.0 percent). Almost 18 percent of these employees have an ethnicity of Hispanic or Latino. An estimated 59.9 percent are high school graduates, with another 20.7 percent having a level of education beyond high school. A review of the weighted estimates indicates that the average sand and gravel mine worker is 44.0 years of age and has worked in mining for 10.3 years, with 7.4 years at the current mine, and 7.4 years in his/her job title. The national estimate for the average number of hours worked per week is 46.1. The primary work location for an estimated 53.0 percent of sand and gravel mine employees is a “Surface Mine: Strip, Open Pit, or Quarry.” An additional 14.8 percent of these employees work at a “Surface Mine: Other Surface Mining,” while another 13.0 percent are employed in the “Surface Mine: Dredge” work location.

Tables 53, 54, 56, 57, and Figure 33 present the national estimates of the number of sand and gravel mine workers by four major occupational categories. (No estimates were calculated for Table 55: “Miscellaneous.”) An estimated 9,445 (29.5 percent) are employed in the “Administration/Professional” category; 2,640 (8.3 percent) in the “Maintenance” category; 11,971 (37.5 percent) in the “Production” category; and 7,928 (24.7 percent) in the “Service and Utility” category.



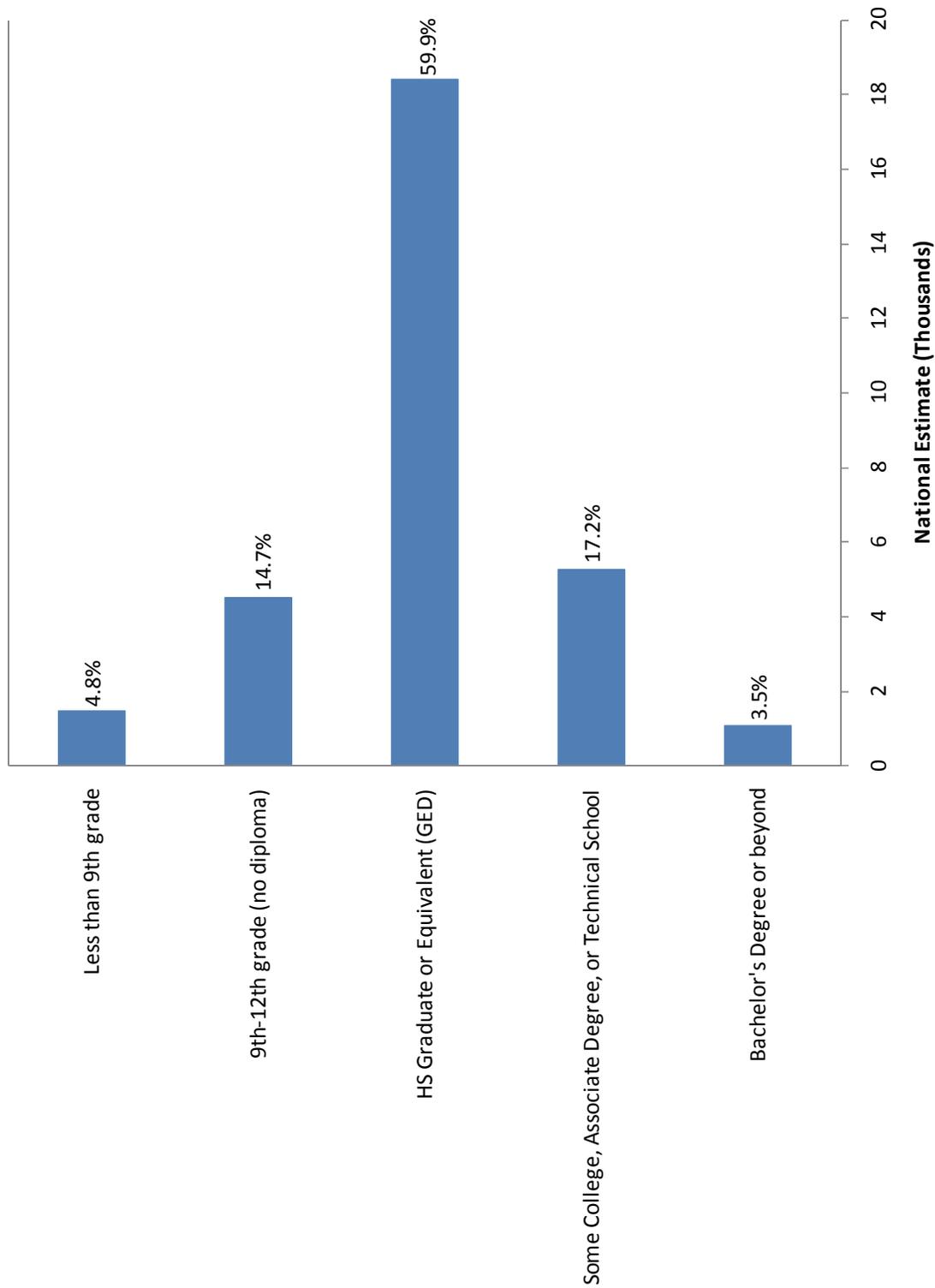
**Table 51. Demographic Characteristics of Employees at Sand and Gravel Mines**

<b>Demographic Characteristic</b>	<b>Survey Count</b>	<b>National Estimate</b>	<b>95% LCL</b>	<b>95% UCL</b>	<b>National Percent</b>	<b>95% LCL</b>	<b>95% UCL</b>
<b>Gender:</b>							
Male	1,280	29,343	24,178	34,508	92.1	90.0	94.2
Female	109	2,531	1,607	3,456	7.9	5.8	10.0
<b>Age (years)</b>	1,326	44.0	43.0	45.1			
<b>Highest level of education:</b>							
Less than 9th grade	69	1,464	310	2,619	4.8	1.1	8.4
9th–12th grade (no diploma)	176	4,502	3,122	5,881	14.7	10.3	19.1
HS Graduate or Equivalent (GED)	817	18,394	14,222	22,566	59.9	54.0	65.9
Some College, Associate Degree, or Technical School	238	5,276	3,850	6,701	17.2	14.4	19.9
Bachelor's Degree or beyond	60	1,065	656	1,475	3.5	2.3	4.6
<b>Ethnicity:</b>							
Hispanic or Latino	286	5,154	2,850	7,458	17.5	9.3	25.6
Non-Hispanic or Non-Latino	1,027	24,345	18,596	30,093	82.5	74.4	90.7
<b>Race:</b>							
American Indian or Alaska Native	28	441	210	673	1.6	0.7	2.5
Asian	4	DSU	DSU	DSU	DSU	DSU	DSU
Black or African American	58	1,109	277	1,940	4.0	1.6	6.3
Native Hawaiian or Other Pacific Islander	2	DSU	DSU	DSU	DSU	DSU	DSU
White	1,066	26,151	20,354	31,948	94.1	92.1	96.1

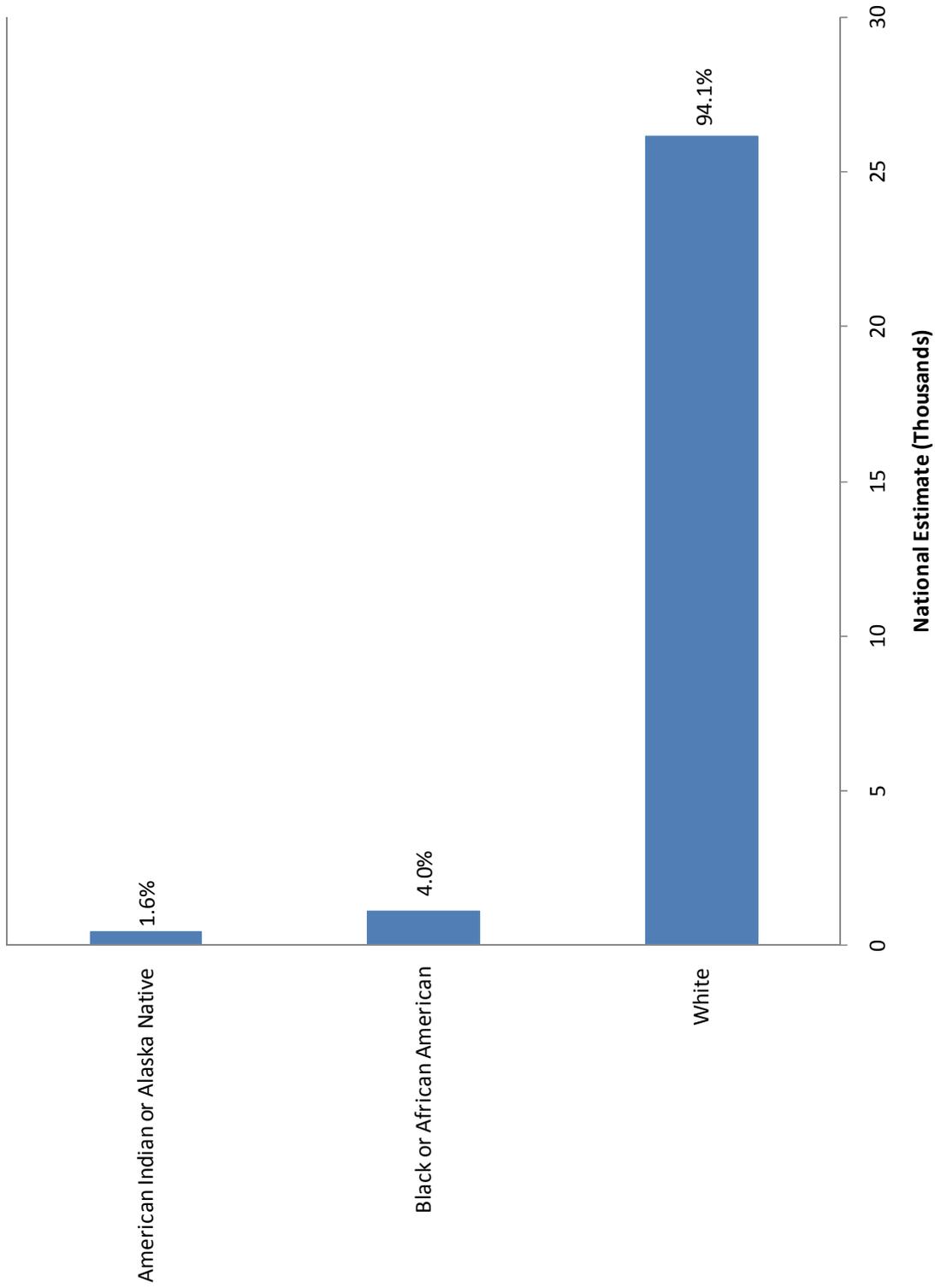
Abbreviation: DSU, data suppressed.

**Table 52. Occupational Characteristics of Employees at Sand and Gravel Mines**

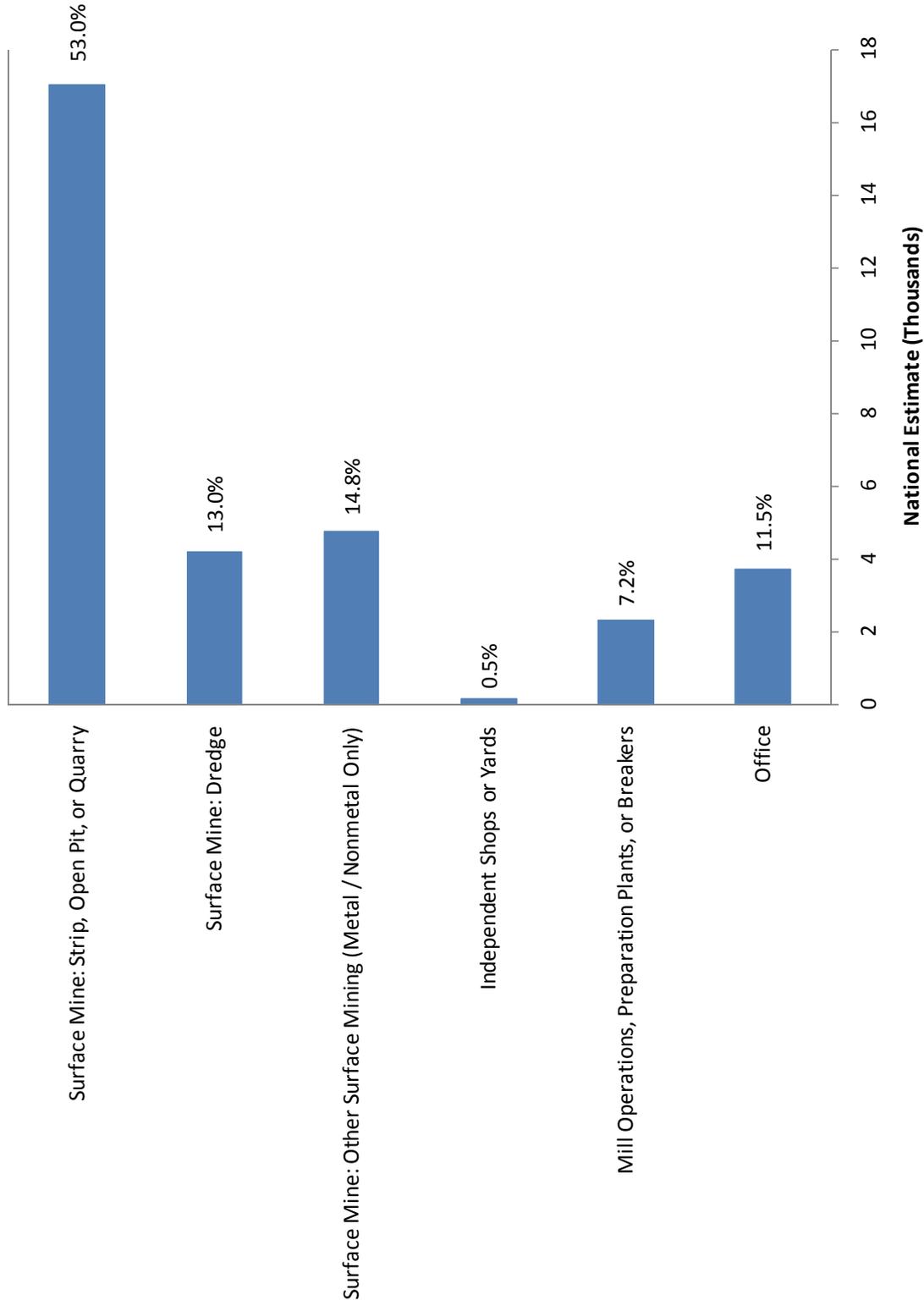
<b>Occupational Characteristic</b>	<b>Survey Count</b>	<b>National Estimate</b>	<b>95% LCL</b>	<b>95% UCL</b>	<b>National Percent</b>	<b>95% LCL</b>	<b>95% UCL</b>
Hours worked (per week)	1,220	46.1	43.6	48.5			
<b>Experience:</b>							
Experience in this Job Title (years)	1,350	7.4	6.2	8.6			
Experience at this Mine (years)	1,335	7.4	6.2	8.7			
Total Mining Experience (years)	1,352	10.3	9.5	11.2			
<b>Primary Work Location:</b>							
Surface Mine: Strip, Open Pit, or Quarry	678	17,029	12,145	21,913	53.0	42.3	63.7
Surface Mine: Dredge	171	4,190	2,281	6,100	13.0	7.8	18.3
Surface Mine: Other Surface Mining (Metal/Nonmetal Only)	244	4,740	2,462	7,018	14.8	7.3	22.2
Independent Shops or Yards	7	153	27	278	0.5	0.1	0.8
Mill Operations, Preparation Plants, or Breakers	129	2,305	1,078	3,532	7.2	3.3	11.0
Office	162	3,701	2,470	4,932	11.5	8.6	14.4



**Figure 30. Education Level of Employees at Sand and Gravel Mines.**



**Figure 31. Race of Employees at Sand and Gravel Mines.**



**Figure 32. Primary Work Location of Employees at Sand and Gravel Mines.**

**Table 53. Estimated Number of Administration/Professional Employees at Sand and Gravel Mines**

<b>Occupation by Category</b>	<b>Survey Count</b>	<b>National Estimate</b>	<b>95% LCL</b>	<b>95% UCL</b>
<b>ADMINISTRATION/PROFESSIONAL</b>	<b>398</b>	<b>9,445</b>	<b>6,998</b>	<b>11,892</b>
<b><u>Office Staff</u></b>	<b><u>65</u></b>	<b><u>1,512</u></b>	<b><u>745</u></b>	<b><u>2,279</u></b>
<b><i>Administrative Staff</i></b>	<b>43</b>	<b>1,098</b>	<b>401</b>	<b>1,795</b>
Administration				
Administrative Assistant				
Clerk				
Customer Service				
Office Clerk				
Office Staff				
Plant Clerk				
Receptionist				
Secretary				
<b><i>Business</i></b>	<b>17</b>	<b>350</b>	<b>88</b>	<b>612</b>
Accounting				
Bookkeeper				
Payroll				
Purchasing				
Sales				
<b><i>Security</i></b>	<b>3</b>	<b>DSU</b>	<b>DSU</b>	<b>DSU</b>
Guard				
<b><i>Union Representative</i></b>	<b>2</b>	<b>DSU</b>	<b>DSU</b>	<b>DSU</b>
<b><u>Professional</u></b>	<b><u>33</u></b>	<b><u>596</u></b>	<b><u>185</u></b>	<b><u>1,007</u></b>
<b><i>Engineer</i></b>	<b>7</b>	<b>61</b>	<b>0</b>	<b>124</b>
Engineer				
(Electrical/Mining/Ventilation)				
Engineer, not otherwise specified				
Environmental Engineer				
Plant Engineer				
<b><i>Non-engineer</i></b>	<b>12</b>	<b>302</b>	<b>0</b>	<b>671</b>
Environmental Specialist				
Operating Engineer				
Production Scheduler				
<b><i>Technician</i></b>	<b>14</b>	<b>234</b>	<b>74</b>	<b>393</b>
Sampler/Lab Technician				
Technician				
<b><u>Safety</u></b>	<b><u>10</u></b>	<b><u>165</u></b>	<b><u>68</u></b>	<b><u>262</u></b>
Safety				
Safety Manager				
Safety Supervisor				

**Table 53. Estimated Number of Administration/Professional Employees at Sand and Gravel Mines (continued)**

<b>Occupation by Category</b>	<b>Survey Count</b>	<b>National Estimate</b>	<b>95% LCL</b>	<b>95% UCL</b>
<b>Supervisory</b>	<b>290</b>	<b>7,172</b>	<b>5,188</b>	<b>9,156</b>
<b>Executive</b>	<b>8</b>	<b>348</b>	<b>147</b>	<b>550</b>
General Manager				
Mine Owner				
President				
Vice President				
<b>Foreman</b>	<b>86</b>	<b>1,868</b>	<b>1,352</b>	<b>2,383</b>
Foreman				
Foreman/Shift Boss				
Lead Man				
Maintenance Foreman				
Maintenance Lead Man				
Shop Foreman				
Plant Foreman				
Superintendent				
<b>Manager</b>	<b>60</b>	<b>1,485</b>	<b>848</b>	<b>2,121</b>
Area Manager				
Assistant Manager				
Dredge Manager				
Dry Plant Manager				
Equipment Manager				
Manager				
Office Manager				
Operations Manager				
Plant Manager				
Production Manager				
Purchasing Manager				
Quarry Manager				
Sales Manager				
Shift Manager				
Shop Manager				
<b>Supervisor</b>	<b>136</b>	<b>3,471</b>	<b>2,234</b>	<b>4,708</b>
Backhoe Supervisor				
Dozer Supervisor				
Lab Supervisor				
Maintenance Supervisor				
Mine Operator				
Plant Operator				
Plant Supervisor				
Production Supervisor				
Quarry Supervisor				
Shift Supervisor				
Supervisor				

Abbreviation: DSU, data suppressed.

**Table 54. Estimated Number of Maintenance Employees at Sand and Gravel Mines**

<b>Occupation by Category</b>	<b>Survey Count</b>	<b>National Estimate</b>	<b>95% LCL</b>	<b>95% UCL</b>
<b>MAINTENANCE</b>	<b>176</b>	<b>2,640</b>	<b>2,135</b>	<b>3,145</b>
<b>Specialty</b>	<b>17</b>	<b>274</b>	<b>88</b>	<b>460</b>
<b>Electrician</b>	<b>6</b>	<b>78</b>	<b>0</b>	<b>184</b>
Electrician/Wireman				
Maintenance Electrician				
<b>Welder</b>	<b>11</b>	<b>196</b>	<b>40</b>	<b>351</b>
Certified Welder				
Repair/Welder				
Welder				
Welder/Mechanic				
<b>Support</b>	<b>159</b>	<b>2,365</b>	<b>1,910</b>	<b>2,820</b>
<b>Maintenance</b>	<b>56</b>	<b>803</b>	<b>583</b>	<b>1,022</b>
Electrical Maintenance				
Fixed Maintenance				
Greaser/Oiler				
Maintenance				
Maintenance Planner				
Plant Maintenance				
Production/Process Maintenance				
Truck Maintenance				
<b>Mechanic</b>	<b>69</b>	<b>1,125</b>	<b>775</b>	<b>1,476</b>
Aggregate Mechanic				
Equipment Mechanic				
Maintenance Mechanic				
Mechanic				
Mechanic Helper				
Mechanic/Welder				
Mobile Equipment Mechanic				
Mobile Maintenance Mechanic				
Mobile Mechanic				
Plant Mechanic				
<b>Repairman</b>	<b>34</b>	<b>437</b>	<b>108</b>	<b>766</b>
Automotive Repairman				
Heavy Duty Repairman				
Plant Repairman				
Repairman				
Skilled Repairman				

**Table 55. Number of Miscellaneous Employees at Sand and Gravel Mines**

Occupation by Category	Survey Count
<b>MISCELLANEOUS</b>	<b>6</b>
<u>Trainee</u>	<u>1</u>
<u>Unknown</u>	<u>5</u>

**Table 56. Estimated Number of Production Employees at Sand and Gravel Mines**

Occupation by Category	Survey Count	National Estimate	95% LCL	95% UCL
<b>PRODUCTION</b>	<b>506</b>	<b>11,971</b>	<b>7,813</b>	<b>16,130</b>
<u>Equipment Operator</u>	<u>311</u>	<u>7,118</u>	<u>4,308</u>	<u>9,927</u>
<i>Dragline Operator</i>	9	194	21	367
<i>Equipment Operator</i>	194	4,530	2,398	6,663
Backhoe Operator				
Bobcat Operator				
Bulldozer Operator				
Dredge Operator				
Equipment Operator				
Front End Loader Operator				
Grader Operator				
Heavy Equipment Operator				
Highlift Operator				
Hopper Operator				
Mobile Equipment Operator				
Mucking Machine Operator				
Rotary Bucket Excavator Operator				
Stripping Operator				
Tower Operator				
Track Hoe				
Tractor Operator				
<i>Hoist</i>	16	111	0	368
Hoist Engineer				
<i>Material Mover</i>	85	2,174	1,024	3,323
Haul Truck Operator/Driver				
Pit Truck Driver				
Rock Truck Driver				
Stock Truck/Stock Pile Driver				
Truck Driver				
Water Truck Operator				
<i>Operator</i>	4	DSU	DSU	DSU
Motorman				
<i>Shovel Operator</i>	3	DSU	DSU	DSU

**Table 56. Estimated Number of Production Employees at Sand and Gravel Mines  
(continued)**

<b>Occupation by Category</b>	<b>Survey Count</b>	<b>National Estimate</b>	<b>95% LCL</b>	<b>95% UCL</b>
<b><u>Material Preparation</u></b>	<b><u>43</u></b>	<b><u>1,110</u></b>	<b><u>359</u></b>	<b><u>1,861</u></b>
<b><i>Crusher</i></b>	<b>26</b>	<b>973</b>	<b>225</b>	<b>1,722</b>
Crusher Operator/Pan Feeder Operator Crusher Plant Operator				
<b><i>Cutter</i></b>	<b>11</b>	<b>27</b>	<b>0</b>	<b>75</b>
Splitter				
<b><i>Mill</i></b>	<b>6</b>	<b>110</b>	<b>0</b>	<b>265</b>
Mill Operator (ball/pebble/rod)				
<b><u>Process</u></b>	<b><u>24</u></b>	<b><u>511</u></b>	<b><u>224</u></b>	<b><u>798</u></b>
<b><i>Dry Processing</i></b>	<b>12</b>	<b>191</b>	<b>37</b>	<b>344</b>
Dry Plant/Process Operator Dryer Operator Fluid Bed Dryer Operator				
<b><i>Separation</i></b>	<b>2</b>	<b>DSU</b>	<b>DSU</b>	<b>DSU</b>
Pug Operator/Mixer Tender Slurry Operator				
<b><i>Wash Process</i></b>	<b>9</b>	<b>267</b>	<b>15</b>	<b>519</b>
Wash Operator				
<b><i>Wet Process</i></b>	<b>1</b>	<b>DSU</b>	<b>DSU</b>	<b>DSU</b>
Wet Plant Operator				
<b><u>Support</u></b>	<b><u>128</u></b>	<b><u>3,233</u></b>	<b><u>2,071</u></b>	<b><u>4,395</u></b>
<b><i>Drill Operator</i></b>	<b>2</b>	<b>DSU</b>	<b>DSU</b>	<b>DSU</b>
<b><i>Explosives</i></b>	<b>2</b>	<b>DSU</b>	<b>DSU</b>	<b>DSU</b>
Blaster				
<b><i>Other</i></b>	<b>107</b>	<b>2,806</b>	<b>1,626</b>	<b>3,987</b>
Dispatcher Operator, not otherwise specified Production Operator				
<b><i>Quality Control</i></b>	<b>17</b>	<b>393</b>	<b>70</b>	<b>716</b>
Quality Control/Quality Assurance				

Abbreviation: DSU, data suppressed.

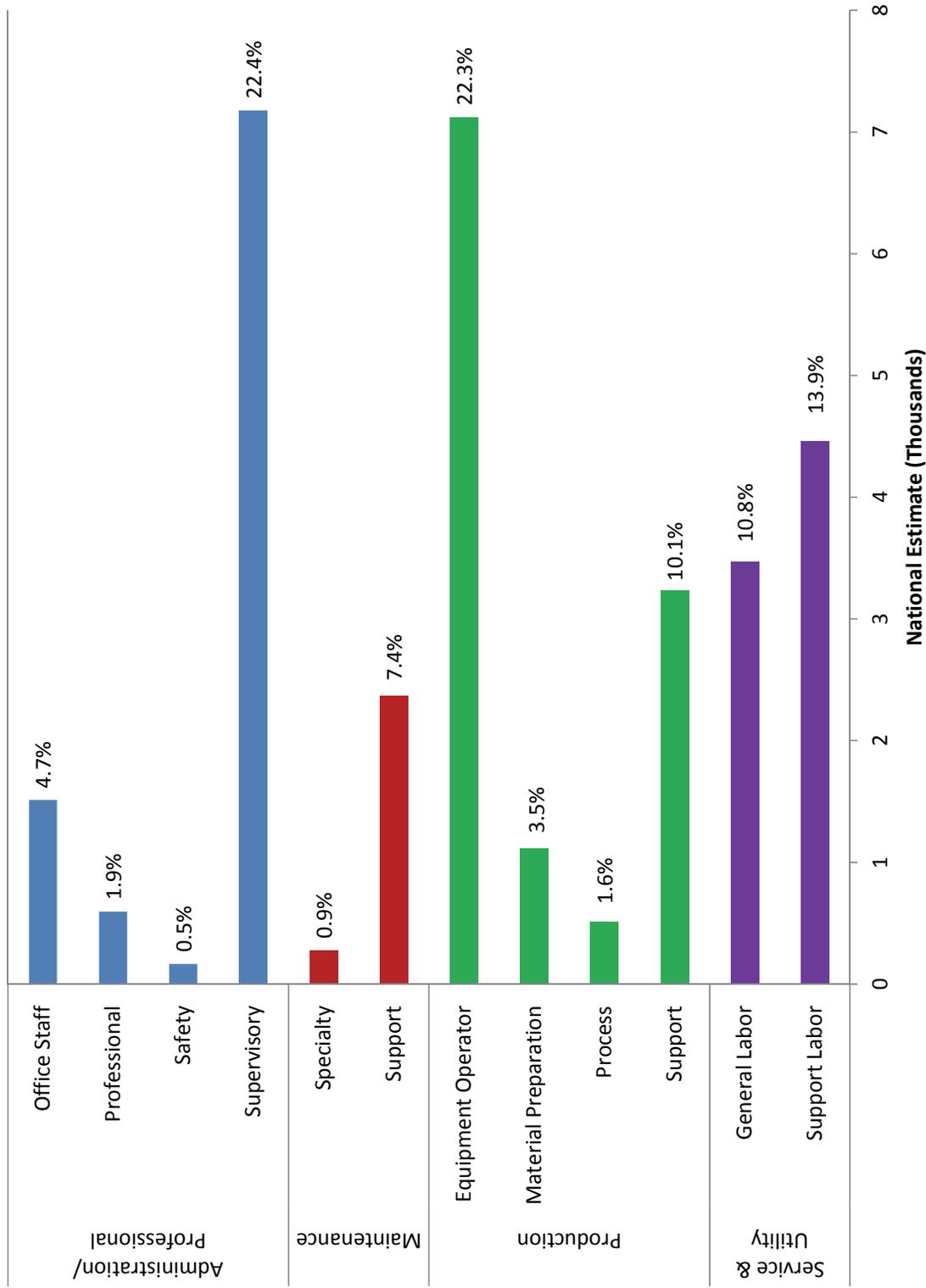
**Table 57. Estimated Number of Service and Utility Employees at Sand and Gravel Mines**

<b>Occupation by Category</b>	<b>Survey Count</b>	<b>National Estimate</b>	<b>95% LCL</b>	<b>95% UCL</b>
<b>SERVICE and UTILITY</b>	<b>306</b>	<b>7,928</b>	<b>6,032</b>	<b>9,824</b>
<b>General Labor</b>	<b>150</b>	<b>3,470</b>	<b>2,119</b>	<b>4,822</b>
<b>Cleaners</b>	<b>1</b>	<b>DSU</b>	<b>DSU</b>	<b>DSU</b>
Cleanup Man				
<b>Laborer</b>	<b>81</b>	<b>1,916</b>	<b>876</b>	<b>2,957</b>
Ground Hand				
Ground Man				
Laborer				
Plant Helper				
Plant Man				
Root Picker				
Stick Picker				
<b>Material Handling</b>	<b>22</b>	<b>380</b>	<b>0</b>	<b>772</b>
Bagger/Bagging Operations Worker				
Mudpicker				
Reclaim Operator				
Storeroom				
Sweeper Operator				
<b>Tradesman</b>	<b>3</b>	<b>DSU</b>	<b>DSU</b>	<b>DSU</b>
Apprentice/Journeyman				
<b>Weighman</b>	<b>43</b>	<b>1,104</b>	<b>577</b>	<b>1,631</b>
Scale Clerk/Operator				
Weighmaster				
<b>Support Labor</b>	<b>156</b>	<b>4,458</b>	<b>3,352</b>	<b>5,563</b>
<b>Barge Operations</b>	<b>4</b>	<b>DSU</b>	<b>DSU</b>	<b>DSU</b>
Barge Attendant/Boat Operator				
Deck Hand				
<b>Conveyor Operator</b>	<b>4</b>	<b>DSU</b>	<b>DSU</b>	<b>DSU</b>
Belt Cleaner/Conveyor Man				
<b>Distribution</b>	<b>1</b>	<b>DSU</b>	<b>DSU</b>	<b>DSU</b>
Packaging Operations Worker				
<b>Loading</b>	<b>123</b>	<b>3,919</b>	<b>2,766</b>	<b>5,072</b>
Bulk Loader				
Loader Operator				
Loadout Operator				
Operator/Loader				
Plant Loader Operator				
Rail Loader Operator				
Shipping Loader				
Stock Loader/Piler				
Yard Loader Operator				

**Table 57. Estimated Number of Service and Utility Employees at Sand and Gravel Mines  
(continued)**

<b>Occupation by Category</b>	<b>Survey Count</b>	<b>National Estimate</b>	<b>95% LCL</b>	<b>95% UCL</b>
<b><i>Pumper</i></b> Gravel Pumper	<b>1</b>	<b><i>DSU</i></b>	<b><i>DSU</i></b>	<b><i>DSU</i></b>
<b><i>Supplies</i></b> Parts	<b>2</b>	<b><i>DSU</i></b>	<b><i>DSU</i></b>	<b><i>DSU</i></b>
<b><i>Utility</i></b> Equipment Utility Pit Utility Person Plant Utility Utility Beltline Utility Man Wet Utility	<b>21</b>	<b>361</b>	<b>200</b>	<b>523</b>

Abbreviation: DSU, data suppressed.



**Figure 33. Occupational Categories of Employees at Sand and Gravel Mines.**



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# Appendices



## **Appendix A. Questionnaire Booklet**





Form Approved  
OMB NO. 0920-0754  
Exp. Date 10/31/2010

# National Survey of the Mining Population Questionnaire



**SAFER • HEALTHIER • PEOPLE™**

Centers for Disease Control and Prevention  
National Institute for Occupational Safety and Health  
Pittsburgh Research Laboratory  
P.O. Box 18070  
Pittsburgh, Pennsylvania 15236



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Public reporting burden of this collection of information is estimated to average 120 minutes per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. An agency may not conduct or sponsor, and a person is not required to respond to a collection of information unless it displays a currently valid OMB control number. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden to CDC/ATSDR Reports Clearance Officer, 1600 Clifton Road NE, MS E-11, Atlanta, Georgia 30333; ATTN: PRA (0920-0633).

Mine ID Number:  
«MineIDNumber»

Mine Name:  
«MineName»

Reporting Week:  
«ReportingWeek»

## QUESTIONNAIRE OVERVIEW

This questionnaire contains five parts:

- ◆ Mine Questions Pages 1-13
- ◆ Employee Selection Instructions Page 14
- ◆ Employee Questions Instructions Pages 15-16
- ◆ Employee Questions Pages 17-18
- ◆ Final Questions and Comments Pages 19-20

### Items of Special Importance:

1. All responses you give should be for the specific Mine ID and name shown in the box above. Some items in the questionnaire are for a specific one-week period called the REPORTING WEEK, which is your payroll week that includes the date shown in the box above.
2. You have the option of completing either this survey questionnaire booklet or an Internet web-based survey questionnaire. The contents of both versions of the survey questionnaire are the same. Instructions to access the web-based questionnaire ([www.miningsurvey.org](http://www.miningsurvey.org)) are attached to the cover letter included in the survey mailing.
3. If you have a question regarding your REPORTING WEEK, how to access the web-based questionnaire, or if you need assistance in completing any of the items, please call 1-888-814-4707. This is the toll-free number for Westat, the survey contractor.
4. Use the Comments section (Item F8 on Page 20) to explain any responses or situations unique to your mine.

## MINE QUESTIONS

### TRAINING

The first series of questions asks about miner training. This includes both **annual miner refresher training** and **new miner training**.

**M1.** In the past 12 months, did this mining operation use its *employees* to conduct. [Please check "Yes" or "No" for each question a, b, and c below.]

- |  | Yes                      | No                       |
|--|--------------------------|--------------------------|
| a. annual miner refresher training?                      | <input type="checkbox"/> | <input type="checkbox"/> |
| b. training for newly hired <i>inexperienced</i> miners? | <input type="checkbox"/> | <input type="checkbox"/> |
| c. training for newly hired <i>experienced</i> miners?   | <input type="checkbox"/> | <input type="checkbox"/> |

**M2.** In the past 12 months, did this mining operation use an *outside trainer* to conduct **annual miner refresher training**?

- Yes → Go to Question M3  
 No → Go to Question M4  
(next page)

**M3.** [IF YES TO Question M2]: What type of *outside trainer* did you use? [Please check ALL that apply.]

- Contract trainer  
 State grantee  
 Other (Please specify):

---

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TRAINING (continued)

**M4.** In the past 12 months, did this mining operation use an *outside trainer* to conduct training for newly hired *inexperienced* miners?

- Yes → Go to Question M5
- No → Go to Question M6

**M5.** [IF YES TO Question M4]: What type of *outside trainer* did you use? [Please check ALL that apply.]

- Contract trainer
- State grantee
- Other (Please specify):

---

---

**M6.** In the past 12 months, did this mining operation use an *outside trainer* to conduct training for newly hired *experienced* miners?

- Yes → Go to Question M7
- No → Go to Question M8

**M7.** [IF YES TO Question M6]: What type of *outside trainer* did you use? [Please check ALL that apply.]

- Contract trainer
- State grantee
- Other (Please specify):

---

---

**M8.** How frequently are periodic safety meetings (e.g., "toolbox talks"), for employees engaged in mining operations, conducted at this mine? [Please check one.]

- Less than once a year
- Annually
- Less than once a month
- Once a month
- Once every 2 weeks
- Once a week
- Several times a week
- Daily

**M9.** When conducting employee safety training and retraining, which of the following training materials and methods are used as part of your training program? [Please check ALL that apply.]

- Lectures
- Written materials
- Videos
- Self-guided interactive computer programs
- Demonstrations
- Hands-on training exercises
- Group exercises (role playing, games, problem solving, etc.)
- Classroom simulations (e.g., virtual reality)
- Worksite simulations
- Narrative story telling
- Other (Please specify):

---

---

## OTHER LANGUAGES

The next series of questions asks about the use of languages other than English.

- M10.** Approximately what percentage of employees currently working at the mine use a language other than English to communicate?

\_\_\_\_\_ %

- M11.** Does this mining operation currently provide training materials, signs, or other written materials in a language other than English?

- Yes → Go to Question M12  
 No → Go to Question M14

- M12.** [IF YES TO Question M11]: What language(s) is/are provided? [Please check ALL that apply.]

- Spanish  
 Other (Please specify):

\_\_\_\_\_  
\_\_\_\_\_

- M13.** Would it be helpful to have training materials, signs, or written materials in any other languages, *in addition* to those already provided by your mining operation?

- Yes → Go to Question M15  
 No → Go to Work Schedules Section (next page)

- M14.** Would it be helpful to have training materials, signs, or other written materials in language(s) other than English?

- Yes → Go to Question M15  
 No → Go to Work Schedules Section (next page)

- M15.** [IF YES TO Question M13 or M14]: Which languages? [Please check ALL that apply.]

- Spanish  
 Other (Please specify):

\_\_\_\_\_  
\_\_\_\_\_

## WORK SCHEDULES

The next series of questions asks about how the mine schedules work for the following types of mine operator employees:

- ◆ **Production Workers** are 'face workers' and others who work extracting coal/ore/stone.
- ◆ **Production Support Workers** are those who aid and maintain production (e.g., by cleaning or moving belts, maintaining ventilation, delivering supplies, repairing equipment, etc. Office workers are also counted here).
- ◆ **Preparation Plant/Mill Workers** are those who operate or perform support activities in a preparation plant or mill.

We suggest, for this section and the next, that you first respond to all questions in Column A for Production Workers, and then go back to complete them in Column B for Production Support Workers, followed by the Column C items for Preparation Plant/Mill Workers.

WORK SCHEDULES	A. Production Workers	B. Production Support Workers	C. Preparation Plant/ Mill Workers
<p><b>M16.a.</b> On average, how many days per week are these workers <i>scheduled</i> to work?</p>	<div style="border: 1px solid black; padding: 5px; background-color: #cccccc;"> <input type="checkbox"/> <b>CHECK</b> If this mine does not have any Production Workers and leave this column blank. If Box is <b>NOT CHECKED</b>, continue with this column.                 </div> <div style="text-align: center; margin-top: 10px;">                         Scheduled days per week                 </div>	<div style="border: 1px solid black; padding: 5px; background-color: #cccccc;"> <input type="checkbox"/> <b>CHECK</b> if this mine does not have any Production Support Workers (and no office workers), then leave this column blank. If Box is <b>NOT CHECKED</b>, continue with this column.                 </div> <div style="text-align: center; margin-top: 10px;">                     □ Scheduled days per week                 </div>	<div style="border: 1px solid black; padding: 5px; background-color: #cccccc;"> <input type="checkbox"/> <b>CHECK</b> if this mine does not have any Preparation Plant/Mill Workers and leave this column blank.  If Box Is <b>NOT CHECKED</b>, continue with this column.                 </div> <div style="text-align: center; margin-top: 10px;">                     □ Scheduled days per week                 </div>
<p><b>b.</b> On average, how many hours per day are these workers <i>scheduled</i> to work?</p>	<div style="text-align: center;">                           Scheduled hours per day                 </div>	<div style="text-align: center;">                     □ □ □ Scheduled hours per day                 </div>	<div style="text-align: center;">                           Scheduled hours per day                 </div>

**WORK SCHEDULES (continued)**

WORK SCHEDULES	A. Production Workers	B. Production Support Workers	C. Preparation Plant/ Mill Workers
<p><b>M16.c.</b> During the REPORTING WEEK (which includes the date shown in the box on Page 1), what was the average number of hours per week these workers <i>actually</i> worked (including overtime)?</p>	<p align="center"> <input type="text"/> <input type="text"/>                      Actual work hours during REPORTING WEEK                 </p>	<p align="center"> <input type="text"/> <input type="text"/>                      Actual work hours during REPORTING WEEK                 </p>	<p align="center"> <input type="text"/> <input type="text"/>                      Actual work hours during REPORTING WEEK                 </p>
<p><b>d.</b> Do work crews generally change shifts at the active mining site (e.g., the face or long wall - also known as a 'hot seat' change)?</p>	<p> <input type="checkbox"/> Yes  <input type="checkbox"/> No                 </p>	<p> <input type="checkbox"/> Yes  <input type="checkbox"/> No                 </p>	<p>QUESTIONS M16.d &amp; e. NOT APPLICABLE FOR PREPARATION PLANT MILL WORKERS</p>
<p><b>e.</b> On average, how much time per shift do workers spend traveling to and from the active mining site on-shift (while being paid)?</p>	<p align="center"> <input type="text"/> <input type="text"/> <input type="text"/>                      Hours Minutes                      round trip, per shift                       GO TO COLUMN B                 </p>	<p align="center"> <input type="text"/> <input type="text"/> <input type="text"/>                      Hours Minutes                      round trip, per shift                       GO TO COLUMN C                 </p>	<p>GO TO SHIFT WORK SECTION (Next Page)</p>

## SHIFT WORK

For the next series of questions, assume that the:

- ◆ Day shift begins in the morning hours (e.g., 6 a.m., 7 a.m., or 8 a.m.)
- ◆ Afternoon shift begins in the afternoon hours (e.g., 2 p.m. or 3 p.m.)
- ◆ Night or Midnight shift begins in the late evening hours (e.g., 11 p.m. or 12 a.m.)

SHIFT WORK	A. Production Workers	B. Production Support Workers	C. Preparation Plant/ Mill Workers
M17. Typically how many shifts per day does the mine operate for these workers?	<input type="checkbox"/> CHECK if this mine does not have any Production Workers and leave this column blank. If Box is <b>NOT CHECKED</b> , continue with this column.	<input type="checkbox"/> CHECK if this mine does not have any Production Support Workers (and no office workers), then leave this column blank. If Box is <b>NOT CHECKED</b> , continue with this column.	<input type="checkbox"/> CHECK if this mine does not have any Preparation Plant/Mill Workers and leave this column blank. If Box is <b>NOT CHECKED</b> , continue with this column.
	<input type="text"/> Shifts per day	<input type="text"/> Shifts per day	<input type="text"/> Shifts per day
M18. Do they work rotating shifts?	<input type="checkbox"/> Yes → GO TO QUESTION M19 <input type="checkbox"/> No → GO TO QUESTION M21 (Next Page)	<input type="checkbox"/> Yes → GO TO QUESTION M19 <input type="checkbox"/> No → GO TO QUESTION M21 (Next Page)	<input type="checkbox"/> Yes → GO TO QUESTION M19 <input type="checkbox"/> No → GO TO QUESTION M21 (Next Page)
M19. [IF YES TO QUESTION M18]: How frequently do these workers change their assigned shift?	<input type="checkbox"/> Weekly <input type="checkbox"/> Twice a Month <input type="checkbox"/> Monthly <input type="checkbox"/> Other (specify):	<input type="checkbox"/> Weekly <input type="checkbox"/> Twice a Month <input type="checkbox"/> Monthly <input type="checkbox"/> Other (specify): _____ _____	<input type="checkbox"/> Weekly <input type="checkbox"/> Twice a Month <input type="checkbox"/> Monthly <input type="checkbox"/> Other (specify):

**SHIFT WORK (continued)**

SHIFT WORK	A. Production Workers	B. Production Support Workers	C. Preparation Plant/ Mill Workers
<p><b>M20.</b> Do they rotate shifts clockwise or counterclockwise?</p> <p>Note that <i>Clockwise</i> is <b>day→afternoon→night</b> <i>Counterclockwise</i> is <b>night→afternoon→day</b></p>	<input type="checkbox"/> Clockwise <input type="checkbox"/> Counterclockwise <input type="checkbox"/> Other (specify): _____ _____	<input type="checkbox"/> Clockwise <input type="checkbox"/> Counterclockwise <input type="checkbox"/> Other (specify): _____ _____	<input type="checkbox"/> Clockwise <input type="checkbox"/> Counterclockwise <input type="checkbox"/> Other (specify): _____ _____
<p><b>M21.</b> Are there any regularly scheduled <b>unique</b> work shifts that do not fit into the previous descriptions (e.g., a shift of three 12-hour days on Friday, Saturday, and Sunday, known as an “alternative work schedule” or “Weekend Warrior” shift)?</p>	<input type="checkbox"/> Yes → GO TO QUESTION M22 <input type="checkbox"/> No → GO TO COLUMN B	<input type="checkbox"/> Yes → GO TO QUESTION M22 <input type="checkbox"/> No → GO TO COLUMN C	<input type="checkbox"/> Yes → GO TO QUESTION M22 <input type="checkbox"/> No → GO TO NEXT PAGE
<p><b>M22. [IF YES TO QUESTION M21]:</b> Please either:</p> <p>a. describe this shift. If you need additional space, use the ‘comments’ section (Item F8) on Page 20;</p> <p>or:</p> <p>b. send us an example of your mine’s shift schedule(s) and check the appropriate box(es).</p>	_____ _____ _____ <input type="checkbox"/> Schedule enclosed	_____ _____ _____ _____ _____ <input type="checkbox"/> Schedule enclosed	_____ _____ _____ <input type="checkbox"/> Schedule enclosed

### INDEPENDENT CONTRACTOR EMPLOYEES

The next series of questions asks about the mine's use of independent contractor employees for various activities. Take special note of these two definitions:

- ◆ **Independent contractor** means "any person, partnership, corporation, firm, association, subsidiary of a corporation, or other organization that contracts to perform services or construction of a mine."
- ◆ **REPORTING WEEK** is your specific 7-day payroll period that includes the date shown in the box on Page 1. The number of independent contractors you report should be for that week only.

M23. In the REPORTING WEEK, did this mining operation use independent contractor employees to do . . .	M24. How many independent contractor employees did you use for this activity during the REPORTING WEEK?	M25. How many total hours did independent contractor employees work in this activity during the REPORTING WEEK?
<p>a. Mine development, including shaft and slope sinking, or "driving a decline"?</p> <p><input type="checkbox"/> Yes      →</p> <p><input type="checkbox"/> No</p>	<p>a. _____ →</p> <p style="text-align: center;"># of Contractor employees</p>	<p>a. _____</p> <p style="text-align: center;">Contractor hours</p>
<p>b. Construction or reconstruction of mine facilities, including building or rebuilding preparation plants and mining equipment, maintenance, and building additions to existing facilities?</p> <p><input type="checkbox"/> Yes      →</p> <p><input type="checkbox"/> No</p>	<p>b. _____ →</p> <p style="text-align: center;"># of Contractor employees</p>	<p>b. _____</p> <p style="text-align: center;">Contractor hours</p>

**INDEPENDENT CONTRACTOR EMPLOYEES (continued)**

<b>M23.</b> In the REPORTING WEEK, did this mining operation use independent contractor employees to do . . .	<b>M24.</b> How many independent contractor employees did you use for this activity during the REPORTING WEEK?	<b>M25.</b> How many total hours did independent contractor employees work in this activity during the REPORTING WEEK?
<p>c. Demolition of mine facilities?</p> <p><input type="checkbox"/> Yes      →</p> <p><input type="checkbox"/> No</p>	<p>c. _____ →</p> <p align="center"># of Contractor employees</p>	<p>c. _____</p> <p align="center">Contractor hours</p>
<p>d. Construction of dams?</p> <p><input type="checkbox"/> Yes      →</p> <p><input type="checkbox"/> No</p>	<p>d. _____ →</p> <p align="center"># of Contractor employees</p>	<p>d. _____</p> <p align="center">Contractor hours</p>
<p>e. Excavation or earthmoving activities involving mobile equipment?</p> <p><input type="checkbox"/> Yes      →</p> <p><input type="checkbox"/> No</p>	<p>e. _____ →</p> <p align="center"># of Contractor employees</p>	<p>e. _____</p> <p align="center">Contractor hours</p>
<p>f. Equipment installation, such as crushers and mills?</p> <p><input type="checkbox"/> Yes      →</p> <p><input type="checkbox"/> No</p>	<p>f. _____ →</p> <p align="center"># of Contractor employees</p>	<p>f. _____</p> <p align="center">Contractor hours</p>

**INDEPENDENT CONTRACTOR EMPLOYEES (continued)**

<b>M23.</b> In the REPORTING WEEK, did this mining operation use independent contractor employees to do . . .	<b>M24.</b> How many independent contractor employees did you use for this activity during the REPORTING WEEK?	<b>M25.</b> How many total hours did independent contractor employees work in this activity during the REPORTING WEEK?
<p><b>g.</b> Equipment service or repair of equipment on mine property for a period exceeding 5 consecutive days at a particular mine?</p> <p><input type="checkbox"/> Yes      →</p> <p><input type="checkbox"/> No</p>	<p>g. _____ → # of Contractor employees</p>	<p>g. _____ Contractor hours</p>
<p><b>h.</b> Material handling such as hauling of coal, ore, or refuse within mine property? (Only include material handling conducted primarily on mine property.)</p> <p><input type="checkbox"/> Yes      →</p> <p><input type="checkbox"/> No</p>	<p>h. _____ → # of Contractor employees</p>	<p>h. _____ Contractor hours</p>
<p><b>i.</b> Drilling and blasting?</p> <p><input type="checkbox"/> Yes      →</p> <p><input type="checkbox"/> No</p>	<p>i. _____ → # of Contractor employees</p>	<p>i. _____ Contractor hours</p>

**INDEPENDENT CONTRACTOR EMPLOYEES (continued)**

<b>M23.</b> In the REPORTING WEEK, did this mining operation use independent contractor employees to do . . .	<b>M24.</b> How many independent contractor employees did you use for this activity during the REPORTING WEEK?	<b>M25.</b> How many total hours did independent contractor employees work in this activity during the REPORTING WEEK?
<p>j. Production support work (belt moves, building stoppings, installing roof support, moving a longwall, relocating a large piece of mining equipment (including dismantling and reassembly), surveying, engineering work, etc.)?</p> <p><input type="checkbox"/> Yes      →</p> <p><input type="checkbox"/> No</p>	<p>i. _____ →</p> <p align="center"># of Contractor employees</p>	<p>j. _____</p> <p align="center">Contractor hours</p>
<p>k. Mineral extraction?</p> <p><input type="checkbox"/> Yes      →</p> <p><input type="checkbox"/> No</p>	<p>k. _____ →</p> <p align="center"># of Contractor employees</p>	<p>k. _____</p> <p align="center">Contractor hours</p>
<p>l. Any other types of work?</p> <p><input type="checkbox"/> Yes      →</p> <p><input type="checkbox"/> No → GO TO NEXT PAGE</p>	<p>l. _____ →</p> <p align="center"># of Contractor employees</p>	<p>l. _____</p> <p align="center">Contractor hours</p>
<p align="center">↓</p> <p>Please describe this activity:</p> <p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p>		

**SAFETY, COMMUNICATION, AND RESCUE MEASURES**

**M26.** Which of the following types of communication devices and systems does this mine currently use? **[Please check ALL that apply.]**

- Dedicated telephones
- Mine page phones
- Trolley phones
- Shaft or hoist phones
- Cell phones
- Voice Over Internet Protocol (VOIP) phones
- Handheld two-way radios
- Wireless paging devices
- Leaky feeder communications system (not running a PED)
- Personal emergency device (PED) cap lamp/pager
- Through-the-Earth (TTE) technology (other than a PED, e.g., Flexalert or TeleMag)
- Inductive coupled radios
- Ethernet
- TRACKER Tagging System
- Longwall face communication systems
- None of the above
- Other (Please specify):

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**M27.** Which of the following personal locators, trackers, or other devices does this mine currently use to make miners more visible and to support escape in limited visibility situations? **[Please check ALL that apply.]**

- Electronic or computerized tagging or tracking systems/devices
- Tag boards (check-in/check-out)
- Reflective vests/clothing
- Chemical light sticks
- Lighted vests
- Laser lights/pointers
- Strobe lights
- None of the above
- Other (Please specify):

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**M28.** Which of the following methods does this mine use for emergency incident early warning systems for miners? **[Please check ALL that apply.]**

- Stench gas
- Audible systems
- Visual systems (lights)
- Pager phones
- Telephones
- Messengers
- Electronic personal communication systems (e.g., PED)
- None of the above
- Other (Please specify):

---



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**SAFETY, COMMUNICATION, AND RESCUE MEASURES (continued)**

**M29.** Does this mine have its own mine rescue team?

Yes → **[IF YES]** How many individual members are assigned to the mine's rescue team?

\_\_\_\_\_

Record total members above and  
Go to Question M30

No → **[IF NO]** Go to NOTE box in next column

**M30.** How frequently is team training conducted for the members of the mine rescue team? **[Please check one.]**

- Less than once a year
- Annually
- Less than once a month
- Once a month
- Once every 2 weeks
- Once a week
- Some other time interval (**Please specify**):

\_\_\_\_\_

\_\_\_\_\_

**NOTE** – The next two questions (M31 and M32) apply only to underground mines. Surface mine respondents should skip to the next section (Employee Selection Instructions).

**M31.** Which of the following types of emergency equipment or emergency supplies does this mine currently rely on for miner safety? **[Please check ALL that apply.]**

- Belt-worn self-contained-self-rescuers (SCSRs)
- Cached self-contained-self-rescuers (SCSRs)
- Filter self-rescuers (FSRs) (e.g., W65)
- Stationary emergency refuge chambers
- Mobile emergency refuge chambers
- Sealing materials
- Cached water/food supplies
- First aid kits
- Defibrillator
- None of the above
- Other (**Please specify**):

\_\_\_\_\_

\_\_\_\_\_

**M32.** Which of the following types of escapeway aids does this mine use? **[Please check ALL that apply.]**

- Lifelines
- Directional lifelines
- Signage
- Colored reflectors
- Lighting
- Strobe lights
- None of the above
- Other (**Please specify**):

\_\_\_\_\_

\_\_\_\_\_

<b>Mine ID Number:</b> «MineIDNumber»	<b>Reporting Week:</b> «ReportingWeek»	<b>Estimated Number of Employees:</b> Between «EstimatedEmpMin» and «EstimatedEmpMax»
<b>Mine Name:</b> «MineName»	<b>Start With Number:</b> «StartWithNumber»	<b>Take Every Number:</b> «TakeEveryNumber»

### EMPLOYEE SELECTION INSTRUCTIONS

The Employee Questions ask you to report the demographic characteristics of a sample of your employees. This page contains instructions for selecting the sample of employees to include in the Employee Questions. (Please DO NOT include independent contractor employees in this part of the questionnaire, and DO NOT include any mine employee who was not at work during the REPORTING WEEK.)

- Step 1. Print or copy a list from your files of the names and job titles of all mine employees who worked during the REPORTING WEEK (which includes the date shown in the box above) for the mining operation associated with the Mine ID and name (shown above). (Hourly and salaried employees can be combined, or listed separately, on the REPORTING WEEK list.)
- Step 2. Sequentially number the salaried and hourly employees on your list, starting with the first name on the top of the list, e.g., 1, 2, 3, ... This number will be the *employee sequence number*. [NOTE: The sequential numbering may be done by computer.]
- Step 3. Record the total number of employees who worked during the REPORTING WEEK.

→ \_\_\_\_\_ = **TOTAL NUMBER WHO WORKED DURING REPORTING WEEK**

If this total number is . . .

... equal to 0, [not applicable] Go to Page 19.	... fewer than 30, [all are to be included] Please circle every one of the numbers you have recorded in Step 2, and Go to next page.	... 30 or more, [select a sample] Continue with Step 4
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- Step 4. Quarterly reports indicate that this mine employs the Estimated Number of Employees shown in the box above. Does the number of employees recorded in Step 3 fall within the range of Estimated Number of Employees shown in the box above?
- Yes → Continue with Step 5.
- No → If estimated number is incorrect, please call 1-888-814-4707 for assistance. This is the toll-free number for Westat, the survey contractor.
- Step 5. In these next steps, you will circle the *employee sequence numbers* for employees to be selected for the survey. To do this, you will use the **Start With Number** and **Take Every Number** printed in the box above.
- Step 6. First, circle the *employee sequence number* that matches the **Start With Number** in the box above. This is the first employee selected for the survey.
- Step 7. Next, start counting the *employee sequence numbers*, beginning with the sequence number after the one just circled. Count until you reach the **Take Every Number** listed in the box above. Circle that *employee sequence number*. This is the next selection.
- Step 8. Repeat Step 7 until you come to the end of your employee list.

**EXAMPLE:** If total employees = 49, Start With Number = 2, and Take Every Number = 3, then you would circle the following employee sequence numbers: 2, 5, 8, 11, 14, 17, 20, 23, 26, 29, 32, 35, 38, 41, 44, 47.

- Step 9. Refer to the detailed instructions on the next page and record the sequence numbers you have circled in the first column of the Employee Questions.

## INSTRUCTIONS FOR EMPLOYEE QUESTIONS

This section provides you with an item-by-item explanation for the Employee Questions. Please read these instructions carefully before completing the fold-out answer form on Page 17, or Employee Question screens on web version.

### E1. Employee sequence number

This is the circled number from your employee roster list.

- If there are **fewer than 30** employees who worked during the REPORTING WEEK at your mine, all employees are included in the survey. Write each circled number on a separate line and provide the information corresponding to that employee.
- If there are **30 or more** employees who worked during the REPORTING WEEK at your mine, according to Steps 5-9 of the selection instructions, you have circled and recorded the sequence numbers of the employees being sampled. For example, if John Doe is fifth on your list, and he is selected to be included in the employee survey, then write "5" as the employee sequence number, and provide the information corresponding to that employee.

### E2. Employee's regular job title

*Regular job title* means the title that specifies the employee's current position in the mine structure (e.g., manager). This information may be in an employee's personnel file or in the payroll system.

### E3. Months or years of experience in this job title

*Experience in this job title* means the number of months or years that this employee has had his or her current job title. Report months only for those employees with less than 1 year of experience.

- **Months (MM) Column:** If the employee has been in the current job title **less than a year** at this mine, please **record** the number of **months** in the month's column.

Round partial months up if one-half or more.

- **Years (YY) Column:** If the employee has been in the current job title **1 year or more**, please **record** number of **years** in the year's column. Round partial years up if one-half or more.

### E4. Months or years of experience in this mine

*Experience in this mine* means the number of months or years that this employee has been working at this mine, from the time that the mine hired him or her. Report months only for those employees with less than 1 year of experience.

- **Months (MM) Column:** If the employee has worked for the mine **less than a year**, please **record** the number of **months** in the month's column. Round partial months up if one-half or more.
- **Years (YY) Column:** If the employee has worked for the mine **1 year or more**, please **record** number of **years** in the year's column. Round partial years up if one-half or more.

### E5. Months or years of total mining experience

*Total mining experience* means the number of months or years that an employee has been employed in the mining industry overall. Please include years spent at other mining companies and at other ranks or job titles. Report months only for those employees with less than 1 year of experience.

- **Months (MM) Column:** If the employee has worked in the mining industry **less than a year**, please **record** the number of **months** in the month's column. Round partial months up if one-half or more.
- **Years (YY) Column:** If the employee has worked in the mining industry **1 year or more**, please **record** number of **years** in the year's column. Round partial years up if one-half or more.

## INSTRUCTIONS FOR EMPLOYEE QUESTIONS (continued)

### E6. Number of hours worked during the REPORTING WEEK

*Number of hours worked* means the number of hours for which the employee was paid conducting mining business during the REPORTING WEEK. The REPORTING WEEK includes the date shown in the box at the top of Page 1 or Page 14.

- **Do not include** vacation time, sick time, medical leave, or other time spent on non-work activities.

This information may be found in the employee's time reporting records.

### E7. Employee's primary work location

*Primary work location* means the location where this employee worked the most hours in the REPORTING WEEK.

- Check **ONLY** one location.

Location categories (listed on the answer form/screen) are adapted from MSHA's Quarterly Mine Employment and Coal Production Report (MSHA Form 7000-2) with the exception that the following operational subunits have been combined into one work location: Auger, Culm Bank or Refuse Pile. This information may be found in the same employee work records that are used as source data to compile the MSHA quarterly report.

### E8. Gender

Please specify by checking if the employee is male (M) or female (F). This information may be found in the employee's personnel file.

### E9. Hispanic or Latino

Please specify ethnicity by checking whether or not the employee is Hispanic or Latino. Note that an additional question on the employee's race follows in the next question. This information may be found in the employee's personnel file.

### E10. Race

Please specify the employee's race by checking one or more categories.

### E11. Year of birth

Please record the employee's year (YY) of birth. Use two digits for year (e.g., 1980 is "80").

This information may be found in the employee's personnel file.

### E12. Highest level of education completed

Please check one category for *highest level of education completed*. This means the last grade that the employee completed.

This information is most likely included in the employee's personnel file.





**FINAL QUESTIONS AND COMMENTS**

F1. In the REPORTING WEEK, were there any events or circumstances that would make what you have reported unusual (e.g., severe weather conditions, trouble in production, a labor strike, etc.)?

Yes → Go to Question F2

No → Go to Question F3

F2. **[IF YES TO Question F1]:** Please specify the unusual events:

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F3. What is today's date?      

M	M	D	D	Y	Y	Y	Y

F4. Please make a copy of this completed questionnaire and your list of sampled employees (keep these on file for 60 days) in case we need to contact you for clarification.

F5. Please provide the company representative to be contacted regarding the completion of the questionnaire:

Name: \_\_\_\_\_

Title: \_\_\_\_\_

Telephone: (    ) \_\_\_\_\_

F6. Reminder: If you so indicated in question M22, please enclose an example of your mine schedule with your completed questionnaire.

F7. Please mail this completed questionnaire in the provided business reply envelope to the survey contractor: **Westat, Room TC-1046F, 1650 Research Boulevard, Rockville, MD 20850-3195.**

*Please record any comments on the next page.*





*Delivering on the Nation's promise:  
Safety and health at work for all people  
through research and prevention*

*If you have any questions regarding the  
National Survey of the Mining Population, please contact:*

Linda J. McWilliams  
Project Director  
NIOSH, Pittsburgh Research Laboratory  
P.O. Box 18070  
626 Cochran's Mill Road  
Building 01  
Pittsburgh, PA 15236

Telephone: (412) 386-6116  
Fax: (412) 386-6780  
E-mail: [L.McWilliams@cdc.gov](mailto:L.McWilliams@cdc.gov)

<http://www.cdc.gov/niosh/mining/statistics/survey.htm>

## **Appendix B. Questions and Answers Brochure**



**Do I need to report data for all employees of our mining operation?**

If you have **less than 30** employees at this mining operation, we ask you to report for all of them.

If you have **30 or more** employees at this mine, we ask you to report data for only a sample of them.

In order to get good data about the mining industry, it is very important that you sample accurately. Our aim is to make the sampling of employees as simple as possible. Step by step instructions are provided in the survey booklet.

**Should I include independent contractors in the employee questions?**

Contractor information should only be included when responding to the **mine questions**. Contractors should **not** be counted as employees when completing the **employee questions**. Only data for mine operator employees should be included on the employee questions.

If the mining operation is being run by your company under contract to the owner, report for your employees but exclude workers associated with other independent contractors.

**How long will the survey take?**

Although this varies by mining operation, on average it will take 120 minutes to complete the survey. This includes obtaining information from personnel records, and should take less time for smaller mines.

**For further information on the purpose of this survey, please contact:**

Linda McWilliams  
Project Director  
NIOSH, Pittsburgh Research Laboratory  
P.O. Box 18070  
626 Cochrans Mill Road  
Building 01  
Pittsburgh, PA 15236  
(412) 386-6116  
E-mail: [LMcWilliams@cdc.gov](mailto:LMcWilliams@cdc.gov)

<http://www.cdc.gov/niosh/mining/statistics/survey.htm>

**For further information on how to fill out the questionnaire, please contact:**

Westat  
Attn: National Mining Survey  
1650 Research Boulevard  
Room TC-1046F  
Rockville, MD 20850  
(888) 814-4707



National Survey of the  
Mining Population

## Questions and Answers



Sponsored by the  
National Institute for Occupational  
Safety and Health (NIOSH)  
Pittsburgh Research Laboratory  
P.O. Box 18070  
Pittsburgh, PA 15236

#### Why is this survey being done?

The mission of the National Institute for Occupational Safety and Health (NIOSH) is working to improve the safety and health of American workers. As part of this effort, NIOSH/Pittsburgh Research Laboratory (PRL) is collecting demographic and other data on the mining industry.

Since 1986, there has been little research on the demographics of the mining labor force, such as age, gender, job title, languages used, educational attainment, race, ethnicity, and years of mining experience. These data are needed to understand the risk of work-related injuries, disease, and fatalities and to customize safety and health interventions for specific groups of the mining industry. These data can also be used to learn more about the underlying causes of work-related incidents and to identify ways to reduce their occurrence.

NIOSH/PRL is sponsoring this survey of mining operations and their employees to fill this data gap. Our main objectives are to:

- collect basic information about mining operations;
- establish the demographic and occupational characteristics of mine operator employees for each mining commodity (i.e., coal, metal, nonmetal, stone, and sand and gravel); and
- estimate the number of independent contractor employees used by mining operations and their occupational characteristics.

#### What will the mining industry and my mine get out of this survey?

The ultimate goal of the survey is to minimize and prevent work-related injuries and diseases that harm miners and reduce productivity. NIOSH will use the information you provide to clarify safety and health issues and calculate injury rates for various occupations. For example, we now know how many electricians are reported as injured in mine accidents, but we don't know how many total electricians work in the mining industry, in order to calculate their injury rates. Once the survey is completed, such rates will be available, and NIOSH will send you a copy of the final report.

#### What data will be collected?

There are two sets of data being collected:

- The **mine questions** include items about the mining operation, its use of independent contractors, safety, and communication measures.
- The **employee questions** include demographic and occupational questions about individual mine employees.

It is important that you complete *both* parts of the survey. You have the option of completing either the survey questionnaire booklet or an Internet survey questionnaire. Both versions ask the same questions. Instructions to access the Internet questionnaire are attached to the cover letter included in this mailing.

#### Am I required to participate?

Your participation is voluntary and you may refuse to answer any question for any reason. However, the participation of each selected mining operation is vital to the success of the survey.

#### Why was my mining operation chosen?

Your mining operation was randomly selected from a list of all mining operations nationwide. The sample must represent the diversity of mining operations across the Nation. The information you provide is essential to obtain an accurate picture of the mining industry.

#### Who will see my responses?

Only NIOSH researchers, and researchers from Westat, NIOSH's data collection contractor, will see your responses. Both organizations are firmly committed to protecting the survey data and will not release this information unless compelled by law. The answers from all participating mines will be published only as summarized data so that no single company or individual employee can be identified.

#### Is it appropriate for me to release information about employees who work here?

You will not be reporting the names or other identifying information of individual employees. The data you provide cannot be linked to any of your individual employees.

**Appendix C. MSHA Form 7000-2: Quarterly Mine Employment and  
Coal Production Report**



DOL - MSHA - PEIR - OIEI  
P.O. Box 25367  
Denver, Colorado 80225 - 0367

Quarterly Mine Employment  
and Coal Production Report  
(SEE INSTRUCTIONS ON REVERSE SIDE OF COPY 2)

Date Report Completed  
Mo. Day Yr.

For Quarter Year  
Mall Before

Check here if this report is being submitted by a contractor  
If any information below is incorrect, please enter correct information here:  
County:

Operating Company Name and Mailing Address:  
County:  
MSHA ID Number Contractor ID  
Operation Name  
Operating Company Name and Mailing Address

(1) Operation Sub Unit Code(s)	(2) Average number of persons working during quarter	(3) Total employee hours worked during the quarter	(4) Production of clean coal during quarter, (short tons)
<b>Underground Mine</b>			
01 Underground			
02 Surface Shops, Yards, etc.			
<b>Surface Mine</b>			
03 Strip, Open Pit, or Quarry			
04 Auger (Coal Mine Only)			
05 Cullin Bank or Refuse Pits (Coal Mine Only)			
06 Dredge			
12 Other Surface Mining (Metal/Nonmetal Only)			
<b>Independent Shops or Yards</b>			
17 Mill Operations, Preparation Plants, or Breakers (include associated shops and yards)			
30 Office (professional and clerical employees at the mine or plant working in an office)			
99			

**2. Other Reportable Data**  
How many MSHA reportable injuries or illnesses did you have this quarter?  
Person to be contacted regarding this report: Name \_\_\_\_\_ Tel. No. (\_\_\_\_\_) \_\_\_\_\_  
Title \_\_\_\_\_ (area code)

**Quarterly Mine Employment  
and Coal Production Report**

**U.S. Department of Labor**

Mine Safety and Health Administration

OBM Control Number 1219-0007; Approval Expires April 30, 2011

READ  
↓

This report is required by law (30 U.S.C. subsection 813; 30 C.F.R. Part 50). Failure to report may result in the issuance of a citation or order under 30 U.S.C. subsection 814 to an operator of a coal or other mine, the assessment of a civil penalty against an operator of a coal or other mine under 30 U.S.C. subsection 820(a), and the institution of a civil action under 30 U.S.C. subsection 818. An individual who knowingly makes a false statement in any report shall, upon conviction, be punished by a fine of not more than \$10,000 or by imprisonment for not more than 5 years, or both, under 30 U.S.C. subsection 820(f). Whoever, in any matter within the jurisdiction of any department or agency of the United States knowingly and willfully falsifies, conceals or covers up by any trick scheme, or device, a material fact, or makes or uses any false writing or document knowing the same to contain any false, fictitious or fraudulent statement or entry, shall be fined under 18 U. S. C. or imprisoned not more than five years, or both, under 18 U. S. C. subsection 1001.

INSTRUCTIONS  
→



**Important:**

**(INSTRUCTIONS)**

**This form must be completed and mailed or faxed within 15 days after the end of each calendar quarter.**

1. Fill out this form as completely as possible and return Copy 1 of this report to:  
MSHA  
PEIR - Office of Injury and Employment Information   **OR**   You may FAX Copy 1 to Fax # 1- 888 - 231 - 5515  
P.O. BOX 25367  
Denver, CO 80225-0367
2. If it is necessary to make any address changes, indicate correct information on this form.
3. When pre-addressed, this form is only for the operation with I. D. number as shown. Do not use for any other operation.
4. **Sand and Gravel** operators report employment data under code 03 or 06 as appropriate, except for data on office workers which should be reported under code 99.
5. All mine operators and independent contractors reporting as required by 30 C.F.R. Part 50, should show persons working and employee hours worked; those producing coal should also show production date.
6. **Independent Contractors** should complete quarterly only **one** form for activities at all coal locations, and one form for activities at metal and nonmetal locations.

↑  
READ

The public reporting burden for this collection of Information is estimated to average 30 minutes per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of Information. Send comments regarding this estimated response time or any other aspect of this collection of information, including suggestions for reducing this burden, to Mine Safety and Health Administration, U.S. Department of Labor, 1100 Wilson Boulevard, Arlington, VA 22209-3939.

Persons are not required to respond to this collection of information unless this form displays a currently valid OMB control number.

MSHA Form 7000-2, July 97 (revised)

**Appendix D. Standard Industrial Classification (SIC) for Active Mines  
in 2007**



**Coal Mining Sector**

Anthracite Coal  
Bituminous Coal

**Metal Mining Sector**

Alumina (Mill)  
Aluminum Ore  
Beryl  
Chromite  
Copper Ore  
Gold (Lode & Placer)  
Iron Ore  
Lead and/or Zinc Ore  
Manganese  
Metal Ores, NEC  
Molybdenum  
Platinum Group  
Rare Earths  
Silver Ores  
Titanium  
Uranium  
Uranium – Vanadium Ores  
Vanadium  
Zircon

**Nonmetal Mining Sector**

Aplite  
Barite  
Boron Materials  
Brucite  
Chemical and Fertilizer, NEC  
Clay (Common)  
Clay (Fire)  
Clay, Ceramic and Refractory, NEC  
Feldspar  
Fluorspar  
Gemstones  
Gilsonite  
Gypsum  
Kyanite

**Nonmetal Mining Sector (Cont.)**

Leonardite  
Magnesite  
Mica  
Nonmetallic Minerals, NEC  
Oil Sand  
Oil Shale  
Perlite  
Phosphate Rock  
Pigment Mineral  
Potash  
Potash, Soda, & Borate Minerals, NEC  
Pumice  
Salt (Evaporated)  
Salt (Rock)  
Shale (Common)  
Sodium Compounds  
Talc, Soapstone, & Pyrophyllite  
Trona  
Vermiculite

**Stone Mining Sector**

Cement  
Granite (Crushed & Broken)  
Granite (Dimension)  
Lime  
Limestone (Crushed & Broken)  
Limestone (Dimension)  
Marble (Crushed & Broken)  
Marble (Dimension)  
Sandstone (Crushed & Broken)  
Sandstone (Dimension)  
Slate (Crushed & Broken)  
Slate (Dimension)  
Stone, Crushed & Broken, NEC  
Stone, Dimension, NEC  
Traprock (Crushed & Broken)  
Traprock (Dimension)

**Sand and Gravel Mining Sector**

Sand & Gravel

**Abbreviation: NEC, not elsewhere classified**



## **Appendix E. Stratification and Sample Size Guidelines**



## Stratification

The cum  $\sqrt{f}$  rule is often suggested for use in forming strata for surveys of businesses, which typically have a large number of small businesses with very few employees and a small number of large businesses with quite substantial payrolls [Cochran 1977]. Using this approach, strata that have approximately equal sizes in terms of the square root of the size measure are established. The cum  $\sqrt{f}$  rule was used in determining the initial size-based strata for each mining sector with an assumption of about 4–5 strata per sector for underground mines and for surface mines. Except for sand and gravel mines, the large mines account for 25 percent or more of total employment. These initial stratum definitions for each commodity varied somewhat across mining sectors but were similar.

The next step in stratum formation was to recognize that data from the five mining sectors would be combined to study mining as a whole. Using common definitions for strata across the five sectors facilitated these combined analyses. The initial stratum definitions were compared to determine a common stratification approach. The stratum definitions that met the needs for all five commodities were formed by the cross of underground versus surface mines with these size groupings of employees: 1–9, 10–25, 26–50, 51–75, 76–100, 101–250, and 251 and up.

## Sample Size

To determine the stratum sample sizes, the precision of percentage estimates under various sample sizes was considered. Table E-1 presents the half-length of confidence intervals around an estimated percentage  $\hat{P}$  under various sample size and design effects and assuming large population sizes. For this table, the confidence interval was approximated for design purposes as:

$$\hat{P} \pm z_{1-\alpha} \sqrt{\text{Var}(\hat{P})} \quad (1)$$

Here  $z_{1-\alpha}$  is the value of the critical point  $x$  at which the normal cumulative distribution function equals  $1-\alpha$ , and  $\text{Var}(\hat{P})$  is the variance of  $\hat{P}$ . The half-length  $HL$  is:

$$HL = z_{1-\alpha} \sqrt{\text{Var}(\hat{P})} \quad (2)$$

That is,  $\hat{P}$  can be expected to fall within the range  $[P-HL, P+HL]$  with 95 percent confidence for the indicated sample sizes.

To determine these half-lengths of confidence intervals, there is a need to estimate the variance of the estimated percentage  $\hat{P}$ . Ignoring finite population correction factors, Table E-1 models the variance for an estimated percentage  $\hat{P}$  as:

$$Var(\hat{P}) = \frac{P(100-P)}{n} DEFF \quad (3)$$

where  $n$  is the sample size,  $P$  is the percentage being estimated, and  $DEFF$  is the design effect. The design effect for a survey estimate is defined to be the ratio of the statistic under the actual design divided by the variance that would have been achieved from a simple random sample of the same size. The design effect represents the cumulative effect of design components such as stratification, unequal weighting, and clustering, and varies with each design. The design effects for this survey were estimated to be about 1.00 for mine-level and employee-level estimates within strata. Crosscutting estimates were likely to have larger design effects, particularly for employee-level estimates. The design effect differs from 1.00 for the crosscutting estimates due to the variation in sampling rates used across strata. Fortunately, these crosscutting estimates often have large sampler sizes due to combining samples across strata.

Sample sizes were set with the guideline that the precision for stratum estimates was constrained as that shown for sample sizes of 100 in Table E-1. Some mine strata have very small population sizes and some mining sectors are small overall. In such situations, the variance as given in equation (3) is reduced by the factor  $(N - n)/(N - 1)$ , where  $n$  is the sample size and  $N$  is the population size. Rather than create versions of Table E-1 for all possible population sizes, finite-population-corrected (*fpc*) sample sizes were developed. An actual sample size of  $n$  for a population of size  $N$  is equivalent to the precision achieved with a sample size of  $n' = \frac{n(N-1)}{N-n}$  from a population so large that *fpc* effects are ignorable. Initial sample sizes were set for each stratum so that the finite-population-corrected sample size was about 100 and then inflated to account for a projected 80 percent response rate. These initial sample sizes were then adjusted to prevent excessive variations in the sampling rates across strata for mines and for employees.

Besides the number of mines selected, the employee sample size is affected by the eligibility and response rates for mines and the average number of employees sampled per mine. The average number of employees sampled per mine would be about 20 except for the smallest stratum where approximately 5 employees would tend to be sampled. It was assumed that 80 percent of all eligible mines would respond, providing both mine-level and employee-level data. For sample design purposes, the assumption was made that a variable percentage of mines would be eligible for the survey, depending upon employment size. An eligibility rate of 85 percent was assumed for mines with 1–9 employees. These mines are most likely to shut down operations or go out of business. An eligibility rate of 90 percent was assumed for mines with 10–50 employees, and 95 percent for mines with 51–100 employees. For very large mines with employment of more than 100, an eligibility rate of 99 percent was assumed, as they should be most stable in terms of their operations.

In designing the commodity samples, an effort was made to minimize the design effects for mine-level and employee-level analyses. In particular, the goal was to achieve design effects of 1.0 for within-stratum estimates and design effects of 2.0 or less for crosscutting estimates. Following standard practice, the design effect  $DEFF$  was modeled as the product of the design effect associated with unequal weighting  $D_w$  and the design effect for clustering  $D_c$ , that is

$DEFF = D_w * D_c$ . A simple random sample has both design effect components equal to one—therefore  $DEFF=1$ .

Both mine-level and employee-level estimates could potentially be subject to an unequal weighting effect greater than one, particularly for crosscutting estimates that combine data from multiple strata. The design effect for unequal weighting can be estimated as:

$$D_w = \frac{n \sum_{i=1}^n W_i^2}{\left( \sum_{i=1}^n W_i \right)^2} \quad (4)$$

where  $n$  is the total sample size and  $W_i$  is the weight for the  $i^{\text{th}}$  observation. When the weights (the inverse of the selection probabilities) are equal for all selections,  $D_w = 1$ . For mines,  $D_w = 1$  within all strata for the proposed designs and was often only slightly greater than one across strata. For employees,  $D_w = 1$  except for the two largest strata that collapsed employee size categories. These strata tended to have all mines selected with certainty, so the only way to reduce  $D_w$  was to increase the number of employees sampled per mine from 25 to 50. Adjusting the sample size for the very large mines could even out the employee-level weights within these strata and across strata. However, the increase in employee sample size also increased the burden for the mine respondent and increased the design effect for clustering.

The design effect associated with clustering measures the loss of precision of a clustered sample as compared with a simple random sample. Clustered samples tend to have less precision than simple random samples of the same size, because units within the same cluster usually are more homogeneous than units from different clusters. The design effect for clustering can be estimated as:

$$D_c = 1 + \rho(b-1) \quad (5)$$

where  $\rho$  is the intracluster correlation coefficient and  $b$  is the cluster size. Because stratified simple random sampling would be used to select mines, the mines would not be clustered ( $b = 1$ ) and mine-level estimates would not be subject to a clustering effect ( $D_c = 1$ ). However, multiple employees would be selected from each mine, so employee-level estimates would be subject to a design effect due to clustering. For the purpose of modeling the clustering design effect, it was assumed that variable values for  $\rho$  be based upon the size of the mine. Employees within small mines with 1 to 50 employees were expected to be more homogeneous, so a value of  $\rho = 5$  percent was assumed. Medium size mines were assumed to be less homogeneous, so a value of  $\rho = 3$  percent was assumed. Large mines with more than 100 employees were expected to be quite diverse, so a value of  $\rho = 1$  percent was assumed. A value of  $\rho = 3$  percent was assumed for estimates compiled across strata.

**Table E-1. Half-Length of 95% Confidence Intervals in Percentage Points for Various Percentages Being Estimated for Domains of Various Sizes with Various Design Effects**

<i>DEFF</i>	<i>P</i>	50	75	100	150	200	250	350	400	500
1.00	10	8	7	6	5	4	4	3	3	3
1.00	20	11	9	8	6	6	5	4	4	4
1.00	25	12	10	8	7	6	5	5	4	4
1.00	30	13	10	9	7	6	6	5	4	4
1.00	40	14	11	10	8	7	6	5	5	4
1.00	50	14	11	10	8	7	6	5	5	4
1.25	10	9	8	7	5	5	4	4	3	3
1.25	20	12	10	9	7	6	6	5	4	4
1.25	25	13	11	9	8	7	6	5	5	4
1.25	30	14	12	10	8	7	6	5	5	4
1.25	40	15	12	11	9	8	7	6	5	5
1.25	50	15	13	11	9	8	7	6	5	5
1.50	10	10	8	7	6	5	5	4	4	3
1.50	20	14	11	10	8	7	6	5	5	4
1.50	25	15	12	10	8	7	7	6	5	5
1.50	30	16	13	11	9	8	7	6	6	5
1.50	40	17	14	12	10	8	7	6	6	5
1.50	50	17	14	12	10	8	8	6	6	5
2.00	10	12	10	8	7	6	5	4	4	4
2.00	20	16	13	11	9	8	7	6	6	5
2.00	25	17	14	12	10	8	8	6	6	5
2.00	30	18	15	13	10	9	8	7	6	6
2.00	40	19	16	14	11	10	9	7	7	6
2.00	50	20	16	14	11	10	9	7	7	6
3.00	10	12	10	8	7	6	5	4	4	4
3.00	20	16	13	11	9	8	7	6	6	5
3.00	25	17	14	12	10	8	8	6	6	5
3.00	30	18	15	13	10	9	8	7	6	6
3.00	40	19	16	14	11	10	9	7	7	6
3.00	50	20	16	14	11	10	9	7	7	6

**Appendix F. Sample Size Allocation Using MSHA Data from the  
Second Quarter of 2002**



Table F-1. Sample Allocation for Underground Coal Mines

Stratum	Number of Mines		Percentage of Total Mines		Number of Employees		Percentage of Total Employees		Sample Mines	Eligibility Rate	Response Rate	Responding Eligible Mines
	Mines	Employees	Mines	Employees	Employees	Employees	Rate	Rate				
1-9	102	461	19%	1%	56	85%	80%	38				
10-25	149	2,589	27%	7%	68	90%	80%	49				
26-50	146	5,206	26%	15%	67	90%	80%	48				
51-75	49	3,098	9%	9%	35	95%	80%	27				
76-100	22	1,917	4%	5%	22	95%	80%	17				
101-250	49	8,301	9%	24%	49	99%	80%	39				
251+	34	13,477	6%	38%	34	99%	80%	27				
<b>Total</b>	<b>551</b>	<b>35,049</b>	<b>100%</b>	<b>100%</b>	<b>331</b>			<b>244</b>				

Stratum	Employees Sampled Per Mine	Total Sample Employees		Nonresponse		Average Employee Weight		Mine DEFF	Employee $D_w$	Employee $\rho$	Employee $D_c$	Employee DEFF
		Employees	Employees	Mine Weight	Adjusted Weight	Employee Weight	Employee Weight					
1-9	5	172	2.3	2.3	1.0	1.0	5%	1.2	1.2			
10-25	17	851	2.7	2.7	1.0	1.0	5%	1.8	1.8			
26-50	18	860	2.7	2.7	1.0	1.0	5%	1.8	1.8			
51-75	21	561	1.8	1.8	1.0	1.0	3%	1.6	1.6			
76-100	22	364	1.3	1.3	1.0	1.0	3%	1.6	1.6			
101-250	23	908	1.3	1.3	1.0	1.0	1%	1.2	1.3			
251+	24	651	1.3	1.3	1.1	1.1	1%	1.2	1.3			
<b>Total</b>		<b>4,366</b>	<b>1.1</b>	<b>1.1</b>	<b>1.6</b>	<b>1.6</b>	<b>3%</b>	<b>1.5</b>	<b>2.5</b>			

Table F-2. Sample Allocation for Surface Coal Mines

Stratum	Number of Mines		Percentage of Total Mines		Number of Employees		Percentage of Total Employees		Sample Mines	Eligibility Rate	Response Rate	Responding Eligible Mines
	Mines	Percentage of Total Mines	Employees	Percentage of Total Employees	Mines	Employees	Mines	Employees				
1-9	518	46%	2,193	6%	101	85%	80%	69				
10-25	252	23%	4,166	12%	84	90%	80%	60				
26-50	188	17%	6,860	19%	75	90%	80%	54				
51-75	58	5%	3,500	10%	36	95%	80%	27				
76-100	24	2%	2,068	6%	20	95%	80%	15				
101-250	52	5%	8,114	23%	52	99%	80%	41				
251+	23	2%	8,823	25%	23	99%	80%	18				
<b>Total</b>	<b>1,115</b>	<b>100%</b>	<b>35,724</b>	<b>100%</b>	<b>391</b>			<b>285</b>				

Stratum	Employees Sampled Per Mine		Total Sample Employees		Nonresponse		Average Employee Weight		Mine DEFF	Employee $D_w$	Employee $\rho$	Employee $D_c$	Employee DEFF
	Per Mine	Employees	Sample Employees	Nonresponse	Adjusted Mine Weight	Weight	Employee DEFF	Employee $D_c$					
1-9	4	291	291	6.4	6.4	1.0	5%	1.2	1.2				
10-25	17	1,000	1,000	3.8	3.8	1.0	5%	1.8	1.8				
26-50	18	985	985	6.3	3.1	1.0	5%	1.9	1.9				
51-75	20	550	550	6.0	2.0	1.0	3%	1.6	1.6				
76-100	22	327	327	6.0	1.5	1.0	3%	1.6	1.6				
101-250	23	935	935	8.6	1.3	1.1	1%	1.2	1.3				
251+	25	461	461	19.0	1.3	1.1	1%	1.2	1.4				
<b>Total</b>		<b>4,549</b>	<b>4,549</b>	<b>1.3</b>	<b>1.3</b>	<b>1.4</b>	<b>5%</b>	<b>1.7</b>	<b>2.4</b>				

Table F-3. Sample Allocation for Underground Metal Mines

Stratum	Number of Mines		Percentage of Total Mines		Number of Employees		Percentage of Total Employees		Sample Mines	Eligibility Rate	Response Rate	Responding Eligible Mines
	1-9	10-25	26-50	51-75	76-100	101-250	251+	Total				
1-9	18	35%	92	2%	18	85%	80%	12				
10-25	7	14%	123	2%	7	90%	80%	5				
26-50	4	8%	171	3%	4	90%	80%	3				
51-75	2	4%	125	2%	2	95%	80%	2				
76-100	3	6%	264	5%	3	95%	80%	2				
101-250	12	24%	1,844	36%	12	99%	80%	10				
251+	5	10%	2,476	49%	5	99%	80%	4				
<b>Total</b>	<b>51</b>	<b>100%</b>	<b>5,095</b>	<b>100%</b>	<b>51</b>			<b>37</b>				

Stratum	Employees Sampled Per Mine		Total Sample Employees		Nonresponse		Adjusted Mine Weight		Average Employee Weight		Mine DEFF		Employee $D_w$		Employee $\rho$		Employee $D_c$		Employee DEFF	
	5	18	63	89	1.3	1.3	1.3	1.3	1.3	1.3	1.0	1.0	5%	1.2	5%	1.8	2.0	1.6	1.6	1.3
1-9	5	18	63	89	1.3	1.3	1.3	1.3	1.3	1.0	1.0	1.0	5%	1.2	5%	1.8	2.0	1.6	1.6	1.3
10-25	18	21	89	62	1.3	1.3	1.3	1.3	1.3	1.0	1.0	1.0	5%	1.2	5%	1.8	2.0	1.6	1.6	1.3
26-50	21	21	62	32	1.3	1.3	1.3	1.3	1.3	1.0	1.0	1.0	3%	1.6	3%	1.6	1.6	1.6	1.6	1.3
51-75	21	22	32	50	1.3	1.3	1.3	1.3	1.3	1.0	1.0	1.0	1%	1.2	1%	1.2	1.2	1.2	1.2	1.7
76-100	22	23	50	222	1.3	1.3	1.3	1.3	1.3	1.0	1.0	1.0	1%	1.2	1%	1.2	1.2	1.2	1.2	1.7
101-250	23	24	222	96	1.3	1.3	1.3	1.3	1.3	1.0	1.0	1.0	3%	1.5	3%	1.5	1.5	1.5	1.5	3.7
251+	24		96		1.3	1.3	1.3	1.3	1.3	1.0	1.0	1.0	3%	1.5	3%	1.5	1.5	1.5	1.5	3.7
<b>Total</b>			<b>613</b>		<b>1.0</b>	<b>1.0</b>	<b>1.0</b>	<b>1.0</b>	<b>1.0</b>	<b>2.5</b>	<b>2.5</b>	<b>1.0</b>	<b>3%</b>	<b>1.5</b>	<b>3%</b>	<b>1.5</b>	<b>1.5</b>	<b>1.5</b>	<b>1.5</b>	<b>3.7</b>

Table F-4. Sample Allocation for Surface Metal Mines

Stratum	Number of Mines	Percentage of Total Mines	Number of Employees	Percentage of Total Employees	Sample Mines	Eligibility Rate	Response Rate	Responding Eligible Mines
1-9	54	34%	235	1%	54	85%	80%	37
10-25	27	17%	438	2%	27	90%	80%	19
26-50	10	6%	356	2%	10	90%	80%	7
51-75	9	6%	591	3%	9	95%	80%	7
76-100	12	7%	1,094	5%	12	95%	80%	9
101-250	19	12%	2,959	13%	19	99%	80%	15
251+	30	19%	17,703	76%	30	99%	80%	24
<b>Total</b>	<b>161</b>	<b>100%</b>	<b>23,376</b>	<b>100%</b>	<b>161</b>			<b>118</b>

Stratum	Employees Sampled Per Mine	Total Sample Employees	Nonresponse Adjusted Mine Weight	Average Employee Weight	Mine DEFF	Employee $D_w$	Employee $\rho$	Employee $D_c$	Employee DEFF
1-9	4	160	1.3	1.3	1.0	1.0	5%	1.2	1.2
10-25	16	315	1.3	1.3	1.0	1.0	5%	1.8	1.8
26-50	18	128	1.3	2.5	1.0	1.0	5%	1.8	1.8
51-75	22	150	1.3	3.8	1.0	1.0	3%	1.6	1.6
76-100	23	208	1.3	5.0	1.0	1.0	3%	1.7	1.7
101-250	23	344	1.3	8.5	1.0	1.1	1%	1.2	1.3
251+	24	581	1.3	30.2	1.0	1.4	1%	1.2	1.7
<b>Total</b>		<b>1,886</b>			<b>1.0</b>	<b>2.7</b>	<b>3%</b>	<b>1.4</b>	<b>3.9</b>

Table F-5. Sample Allocation for Underground Nonmetal Mines

Stratum	Number of Mines		Percentage of Total		Number of Employees		Percentage of Total Employees		Sample Mines	Eligibility Rate	Response Rate	Responding Eligible Mines
	Mines	Employees	Mines	Employees	Mines	Employees	Mines	Employees				
1-9	12	50	29%	1%	12	85%	80%	8				
10-25	2	38	5%	1%	2	90%	80%	1				
26-50	8	290	20%	6%	8	90%	80%	6				
51-75	4	232	10%	5%	4	95%	80%	3				
76-100	1	80	2%	2%	1	95%	80%	1				
101-250	9	1,634	22%	34%	9	99%	80%	7				
251+	5	2,431	12%	51%	5	99%	80%	4				
<b>Total</b>	<b>41</b>	<b>4,755</b>	<b>100%</b>	<b>100%</b>	<b>41</b>			<b>30</b>				

Stratum	Employees Sampled Per Mine		Total Sample Employees		Nonresponse		Average Employee Weight		Mine DEFF	Employee $D_w$	Employee $\rho$	Employee $D_c$	Employee DEFF
	Per Mine	Employees	Mine	Adjusted Mine Weight	Weight	Average Employee Weight							
1-9	4	34	1.25	1.3	1.0	1.00	5%	1.2	1.2				
10-25	19	27	1.25	1.3	1.0	1.00	5%	1.9	1.9				
26-50	18	104	1.25	2.5	1.0	1.00	5%	1.9	1.9				
51-75	19	59	1.25	3.8	1.0	1.00	3%	1.6	1.6				
76-100	20	15	1.25	5.0	1.0	1.00	3%	1.6	1.6				
101-250	24	169	1.25	9.6	1.0	1.03	1%	1.2	1.3				
251+	24	96	1.25	25.1	1.0	1.26	1%	1.2	1.5				
<b>Total</b>		<b>504</b>			<b>1.0</b>	<b>2.18</b>	<b>3%</b>	<b>1.1</b>	<b>2.4</b>				

Table F-6. Sample Allocation for Surface Nonmetal Mines

Stratum	Number of Mines		Percentage of Total Mines		Number of Employees		Percentage of Total Employees		Sample Mines		Eligibility Rate		Response Rate		Responding Eligible Mines	
	Number of Mines	Percentage of Total Mines	Number of Employees	Percentage of Total Employees	Sample Mines	Eligibility Rate	Response Rate	Responding Eligible Mines								
1-9	347	53%	1,454	8%	92	85%	80%	63								
10-25	136	21%	2,094	12%	65	90%	80%	47								
26-50	73	11%	2,768	15%	46	90%	80%	33								
51-75	45	7%	2,799	16%	34	95%	80%	26								
76-100	14	2%	1,191	7%	14	99%	80%	11								
101-250	25	4%	3,790	21%	25	99%	80%	20								
251+	10	2%	3,785	21%	10	99%	80%	8								
<b>Total</b>	<b>650</b>	<b>100%</b>	<b>17,881</b>	<b>100%</b>	<b>286</b>			<b>207</b>								

Stratum	Employees Sampled Per Mine		Total Sample Employees		Nonresponse		Average Employee Weight		Mine DEFF		Employee D <sub>w</sub>		Employee ρ		Employee D <sub>c</sub>		Employee DEFF	
	Employees Sampled Per Mine	Total Sample Employees	Nonresponse Mine Weight	Adjusted Mine Weight	Average Employee Weight	Mine DEFF	Employee D <sub>w</sub>	Employee ρ	Employee D <sub>c</sub>	Employee DEFF								
1-9	4	262	4.71	4.7	1.0	1.00	5%	1.2	1.2									
10-25	15	721	2.62	2.6	1.0	1.00	5%	1.7	1.7									
26-50	19	628	1.98	4.0	1.0	1.00	5%	1.9	1.9									
51-75	21	536	1.65	5.0	1.0	1.00	3%	1.6	1.6									
76-100	21	236	1.25	5.0	1.0	1.00	3%	1.6	1.6									
101-250	23	450	1.25	8.3	1.0	1.04	1%	1.2	1.3									
251+	24	191	1.25	19.6	1.0	1.15	1%	1.2	1.4									
<b>Total</b>		<b>3,023</b>			<b>1.2</b>	<b>1.65</b>	<b>3%</b>	<b>1.0</b>	<b>1.6</b>									

Table F-7. Sample Allocation for Underground Stone Mines

Stratum	Number of Mines		Percentage of Total Mines		Number of Employees		Percentage of Total Employees		Sample Mines	Eligibility Rate	Response Rate	Responding Eligible Mines
	Mines	Employees	Mines	Employees	Employees	Employees	Rate	Rate				
1-9	20	102	18%	3%	20	85%	80%	14				
10-25	48	766	43%	22%	35	90%	80%	25				
26-50	28	955	25%	27%	23	90%	80%	17				
51-75	10	610	9%	17%	10	95%	80%	8				
76-100	1	91	1%	3%	1	95%	80%	1				
101-250	3	377	3%	11%	3	99%	80%	2				
251+	1	637	1%	18%	1	99%	80%	1				
<b>Total</b>	<b>111</b>	<b>3,538</b>	<b>100%</b>	<b>100%</b>	<b>93</b>			<b>67</b>				

Stratum	Employees Sampled Per Mine		Total Sample Employees		Nonresponse		Average Employee Weight		Mine DEFF	Employee $D_w$	Employee $\rho$	Employee $D_c$	Employee DEFF
	Per Mine	Employees	Mine	Employees	Mine	Employees	Weight	Weight					
1-9	5	69	1.3	1.3	1.0	1.000	1.3	1.0	1.000	5%	1.2	1.2	
10-25	16	402	1.7	1.7	1.0	1.000	1.7	1.0	1.000	5%	1.7	1.7	
26-50	17	282	1.5	3.0	1.0	1.000	3.0	1.0	1.000	5%	1.8	1.8	
51-75	20	155	1.3	3.8	1.0	1.000	3.8	1.0	1.000	3%	1.6	1.6	
76-100	23	17	1.3	5.0	1.0	1.000	5.0	1.0	1.000	3%	1.7	1.7	
101-250	22	53	1.3	7.1	1.0	1.007	7.1	1.0	1.007	1%	1.2	1.2	
251+	25	19	1.3	32.5	1.0	1.000	32.5	1.0	1.000	1%	1.2	1.2	
<b>Total</b>		<b>998</b>			<b>1.0</b>	<b>2.710</b>		<b>1.0</b>		<b>3%</b>	<b>1.0</b>	<b>2.6</b>	

Table F-8. Sample Allocation for Surface Stone Mines

Stratum	Number of Mines		Percentage of Total Mines		Number of Employees		Percentage of Total Employees		Sample Mines	Eligibility Rate	Response Rate	Responding Eligible Mines
	Mines	Percentage of Total Mines	Number of Employees	Percentage of Total Employees	Employees	Percentage of Total Employees						
1-9	1,698	46%	8,067	11%	116	85%	80%	79				
10-25	1,304	35%	20,497	28%	114	90%	80%	82				
26-50	402	11%	13,862	19%	95	90%	80%	68				
51-75	104	3%	6,356	9%	51	95%	80%	39				
76-100	54	1%	4,704	6%	35	95%	80%	27				
101-250	124	3%	17,528	24%	62	99%	80%	49				
251+	6	0%	1,796	2%	6	99%	80%	5				
<b>Total</b>	<b>3,692</b>	<b>100%</b>	<b>72,810</b>	<b>100%</b>	<b>479</b>			<b>349</b>				

Stratum	Employees Sampled Per Mine	Total Sample Employees		Nonresponse Adjusted Mine Weight		Average Employee Weight		Mine DEFF	Employee $D_w$	Employee $\rho$	Employee $D_c$	Employee DEFF
		Sample Employees	Nonresponse Mine Weight	Adjusted Mine Weight	Average Employee Weight							
1-9	5	375	18.3	18.3	1.0	1.000	5%	1.2	1.2			
10-25	16	1,290	14.3	14.3	1.0	1.000	5%	1.7	1.7			
26-50	17	1,179	5.3	10.6	1.0	1.000	5%	1.8	1.8			
51-75	20	790	2.5	7.6	1.0	1.000	3%	1.6	1.6			
76-100	22	579	1.9	7.7	1.0	1.000	3%	1.6	1.6			
101-250	23	1,126	2.5	15.4	1.0	1.046	1%	1.2	1.3			
251+	24	114	1.3	15.7	1.0	1.028	1%	1.2	1.3			
<b>Total</b>		<b>5,453</b>	<b>1.5</b>	<b>1.092</b>	<b>1.5</b>	<b>1.092</b>	<b>3%</b>	<b>1.0</b>	<b>1.1</b>			

Table F-9. Sample Allocation for Sand and Gravel Mines

Stratum	Number of Mines	Percentage of Total Mines	Number of Employees	Percentage of Total Employees	Sample Mines	Eligibility Rate	Response Rate	Responding Eligible Mines
1-3	2,589	42.6%	5,504	13.3%	119	85%	80%	81
4-6	1,572	25.9%	7,570	18.4%	80	85%	80%	54
7-9	748	12.3%	5,872	14.2%	37	85%	80%	25
10-25	963	15.9%	13,995	33.9%	110	90%	80%	79
26-50	168	2.8%	5,743	13.9%	70	95%	80%	53
51-75	27	0.4%	1,607	3.9%	16	95%	80%	12
76-100	3	0.0%	264	0.6%	3	99%	80%	2
101-250	4	0.1%	683	1.7%	4	99%	80%	3
251+	0	0.0%	0	0.0%	---	---	---	---
<b>Total</b>	<b>6,074</b>	<b>100.0%</b>	<b>41,238</b>	<b>100%</b>	<b>439</b>	<b>---</b>	<b>---</b>	<b>311</b>

Stratum	Employees Sampled Per Mine	Total Sample Employees	Nonresponse Adjusted Mine Weight	Average Employee Weight	Mine DEFF	Employee $D_w$	Employee $\rho$	Employee $D_c$	Employee DEFF
1-3	2	172	27	27	1.00	1.00	5%	1.1	1.06
4-6	5	262	25	25	1.00	1.00	5%	1.2	1.19
7-9	8	198	25	25	1.00	1.00	5%	1.3	1.34
10-25	15	1,151	11	11	1.00	1.00	5%	1.7	1.68
26-50	17	909	3	6	1.00	1.00	5%	1.8	1.80
51-75	20	241	2	6	1.00	1.00	3%	1.6	1.57
76-100	22	52	1	5	1.00	1.00	3%	1.6	1.63
101-250	24	75	1	9	1.00	1.01	1%	1.2	1.24
251+	---	---	---	---	---	---	---	---	---
<b>Total</b>	<b>---</b>	<b>3,060</b>	<b>---</b>	<b>---</b>	<b>1.35</b>	<b>1.37</b>	<b>5%</b>	<b>1.0</b>	<b>1.30</b>



## **Appendix G. Critical Items from the Questionnaire**



## National Survey of the Mining Population.

Final List of Critical Items  
October 31, 2008

Question Number	Variable Name
M1a	EMP_TRAIN_REF
M1b	EMP_TRAIN_INEXP
M1c	EMP_TRAIN_EXP
M10	LANG_NON_ENG
M11	MATS_NON_ENG
M14	ADD_MATS_NON_ENG
M16aa	PROD_WORKERS SCH_DAYS_PROD
M16ab	SCH_HOURS_PROD
M16ac	ACT_HOURS_PROD
M16ad	CH_SHIFTS_PROD
M16ae	TRAV_HOURS_PROD TRAV_MINUTES_PROD
M16ba	PROD_SUP_WORKERS SCH_DAYS_PROD_SUP
M16bb	SCH_HOURS_PROD_SUP
M16bc	ACT_HOURS_PROD_SUP
M16bd	CH_SHIFTS_PROD_SUP
M16be	TRAV_HOURS_PROD_SUP TRAV_MINUTES_PROD_SUP
M16ca	PREP_WORKERS SCH_DAYS_PREP
M16cb	SCH_HOURS_PREP
M16cc	ACT_HOURS_PREP
M17a	PROD_WORKERS SHIFTS_DAY_PROD

<b>Question Number</b>	<b>Variable Name</b>
M17b	PROD_SUP_WORKERS SHIFTS_DAY_PROD_SUP
M17c	PREP_WORKERS SHIFTS_DAY_PREP
M23a	USE_CONT_DEVELOP
M23b	USE_CONT_CONST
M23c	USE_CONT_DEMO
M23d	USE_CONT_DAMS
M23e	USE_CONT_EXCAV
M23f	USE_CONT_EQUIP
M23g	USE_CONT_EQUIP_SRV
M23h	USE_CONT_MATERIAL
M23i	USE_CONT_DRILL
M23j	USE_CONT_PROD
M23k	USE_CONT_MINERAL
M23l	USE_CONT_OTHER
M24a	NUM_CONT_DEVELOP
M24b	NUM_CONT_CONST
M24c	NUM_CONT_DEMO
M24d	NUM_CONT_DAMS
M24e	NUM_CONT_EXCAV
M24f	NUM_CONT_EQUIP
M24g	NUM_CONT_EQUIP_SRV
M24h	NUM_CONT_MATERIAL
M24i	NUM_CONT_DRILL
M24j	NUM_CONT_PROD
M24k	NUM_CONT_MINERAL
M24l	NUM_CONT_OTHER
Step3	TOTAL_NUMBER

Question Number	Variable Name
E2	JOB_TITLE
E3,  E4, or  E5	TITLE_EXP_MNTHS TITLE_EXP_YRS  THIS_MINE_MNTHS THIS_MINE_YRS  TOTAL_MINE_MNTHS TOTAL_MINE_YRS
E7	WORK_LOCATE
E8	GENDER
E9 or  E10	LATINO  RACE_INDIAN RACE_ASIAN RACE_BLACK RACE_HAWAIIAN RACE_WHITE



## **Appendix H. Job Titles as Submitted by Survey Respondents**



2nd Floor Operator (Froth Cells)	Administrative Technician
3rd Stationary Equipment Floor SEO Operator	Administrator
777 Operator	Administrator III
7820 Operator	Advanced Operator
ABMO Operator	Aggregate Area Manager
AC Mill/Screen 3 Operator	Aggregate Plant Laborer
Accountant	Aggregate Plant Mechanic
Accountant 3 Mine Ops	Aggregate Welder
Accountant Operations Technician	A-Helper
Accounting AP-AR	Airplane Pilot
Accounting Assistant	A/P Clerk
Accounting Associate	Apprentice
Accounting Associate, Senior	A/R/Dispatch
Accounting Clerk	Area Leader
Accounting Clerk & HR	Area Manager
Accounting Coordinator	Area Production Manager
Accounting Manager	Assay Lab Technician V
Accounting Specialist	Assayer
Acting CCD Manager	Assistant Accounts Payable
Additive Press Operator	Assistant Aggregate Mechanic
Additives Utilityman	Assistant Asphalt Plant Operator
Administration	Assistant Belt Coordinator
Administration Accounting	Assistant Filter Evaporation Operator
Administration Assistant	Assistant Foreman
Administration Technician	Assistant Manager
Administrative	Assistant Mechanic
Administrative Assistant	Assistant Mine Foreman
Administrative Assistant I	Assistant Mine Supervisor
Administrative Assistant Coordinator	Assistant Office Manager
Administrative Clerk	Assistant Operation Manager
Administrative Coordinator	Assistant Plant Manager
Administrative Lead Man	Assistant Plant Operator
Administrative Manager	Assistant Preventative Maintenance Engineer
Administrative Office Plant 3	Assistant Shift Manager
Administrative Office Plant 4	Assistant Superintendent
Administrative Secretary	Assistant Supervisor
Administrative Services Manager	Auger Crew Operator
Administrative Specialist	Auger Crew Supervisor
Administrative Superintendent	Auger Operator
Administrative Support	Auto Bagger

Automation Engineer  
Automation Process Engineer  
Automotive Mechanic/Standard  
Automotive Repairman  
Automotive Serviceman—Hostler  
Backhoe Operator  
Bag Crew  
Bag Handler  
Bagged Car Loader  
Bagger  
Bagger 50-lb  
Bagger/Labor  
Bagger/Operator  
Bagger/Sealer  
Bagging and Quality Control  
Bagging/Loading  
Bagging Facility Foreman  
Bagging Laborer  
Bagging Operator  
Bagging Operator Supervisor  
Bagging Supervisor  
Baghouse Supervisor  
Ball Mill Operator  
Barge Controller  
Barge Loader  
Barge Tender  
Batch Plant Operator  
Bathhouse/Yard  
Belo Man  
Belt Attendant  
Belt Cleaner  
Belt Crew  
Belt Crew Foreman  
Belt Examiner  
Belt Foreman  
Belt Maintenance  
Belt Man  
Belt Mechanic  
Belt Operator  
Belt Patrolman  
Belt Piler  
Belt Press Operator  
Belt Repairman

Belt Tender  
Belt Walker Examiner  
Belt Worker  
Belts  
Belts Electrician  
Belts General Labor  
Beneficiator  
Benefits Administrator  
Big Bagger Lead Operator  
Bin Puller  
Bin Tender  
Bin Truck Driver  
Blade Operator  
Blaster  
Blaster Helper  
Blaster/Primary Operator  
Blasting  
Blasting Assistant  
Blasting Supervisor  
Block Press Operator  
Block Sawyer  
Blunging Operator  
Blunging Operator 1  
Blunging Operator 4  
Boat Operator  
Boat Pilot  
Bob Cat Operator  
Bobcat  
Bobcat Operator  
Bobcat & Stone Cutter  
Boiler/Coating Operator  
Boiler Operator  
Boiler Plant Operator  
Boilermaker  
Boilermaker/Welder  
Bolter  
Bolter Operator  
Bookkeeper  
Bookkeeper/Accounts Manager  
Boss  
Bratticeman  
Breaker Operator  
Bridge Operator

Buggy Runner	CM Operator
Buggy/Shuttle Car	CM Unit Operator IV
Bulk Loader	CMMS Planner
Bull Cook	Coal Cleaner
Bulldozer Operator	Coal Distribution Coordinator
Burner	Coal Handling Manager
Burner Operator	Coal Hauler
Business Manager	Coal Hauler Operator
Buyer	Coal Miner
Buyer/Coordinator II	Coal Sampler
Buying Associate	Coal Testing
Calcine Big Bagger Lead Operator	Coal Unloader
Calcine Operator	Communications Supervisor
Calcine Operator 1	Concentrator Supervisor
Calciner	Concrete Man
Car Operator	Console Operator
Carpenter	Construction Crew
Carpenter/Painter	Construction Equipment Operator
Cat Operator	Continuous Miner
Cedar Rapids Operator	Continuous Miner Operator
Cement Regional Sales Manager	Control Analyst
Central Control Operator	Control Person
CEO	Control Room
CEO/President	Control Room Electrician
Certified Welder	Control Room Operator
Chief Chemist	Control Room Supervisor
Chief Clerk	Controller
Chief Electrician	Conveyor Man
Chief Executive Officer	Conveyor Operator
Chief Mechanic	Conveyor Technician
Chief Mechanic/Electrician	Cook
Chief Metallurgist	Co-op Student
Chief Mine Engineer	Coordinator
Chute Puller	Coordinator Financial Reporting and Controls
CKD Dust Truck Operator	Cost Coordinator
Classification/Operator Sandgrinder	Cowles Operator
Clay Operator	Craftsman A
Cleanup Man	Craftsman C
Clerk	Crane Operator
Clerk II	Crane Operator/Truck Driver
Clerk Scale	Crew Foreman
Clerk/Scale I	Crew Leader—Surface
Clerk Scale III	

Crude Clay Controller	Customer Service—SF
Crude Lab Technician	Cutstone A
Crude Ore Loader	Cutstone B
Crude Pile Operator	Cutter Operator
Crude Prep	D-10 Dozer
Crush & Convey Mechanic	Data Processor
Crush Operator	Deck Hand
Crusher	Degritter Operator
Crusher Attendant	Delivery Driver
Crusher Foreman	Demurrage Clerk
Crusher Foreperson	Department Helper
Crusher Helper	Diagnostic Mechanic
Crusher Helper III	Diamond Drill Lead Man
Crusher Laborer	Diamond Sawyer
Crusher/Loader Operator	Diesel Mechanic
Crusher Maintenance	Digestion Operator
Crusher Man	Director Environmental Services
Crusher Operator	Director of Coal Sales
Crusher Operator Technician V	Director of Engineering
Crusher Plant	Director of Scheduling & Logistics
Crusher Plant Operator	Dispatcher
Crusher Repairman	Dispatcher II
Crusher Rock Loader	Dispatcher Assistant
Crusher Supervisor	Dispatcher/Weighman
Crusher Technician	Distribution Coordinator
Crusher—Telsmith Operator	Distribution Manager
Crusher Utility Person	Dock Hand
Crusher Worker	Dock Man
Crushing Foreman	Dock Worker
Crushing Leader	Dozer
Crushing Plant Loader	Dozer Driver
Crushing Plant Operator	Dozer, Excavator, Operator
Crushing Supervisor	Dozer/Hilift Operator
CS	Dozer Man/Haul Truck Driver
Ctrl/Electrical Systems Integrator	Dozer Operator
Curb Cutter	Dozer Operator 1
Curb Shed Foreman/Curb Cutter	Draftsman
Curtain Man	Dragline
Customer Loader	Dragline Assistant
Customer Loader Operator	Dragline Oiler
Customer Service	Dragline Operator
Customer Service Manager	Dragline Technician
Customer Service Representative	Dredge & Dozer

Dredge Manager	E/I Technician IV
Dredge Operator	Electrical Apprentice
Dredge/Plant Operator	Electrical Control Technician
Dredger	Electrical Coordinator
Drill/Blast Supervisor	Electrical Department Coordinator
Drill Mucker	Electrical Engineer
Drill Operator	Electrical Foreman
Drill Rig Operator	Electrical/Instrumentation Apprentice
Driller	Electrical/Instrumentation Coordinator
Driller III	Electrical Maintenance
Driller Blaster	Electrical Maintenance Level C
Driller/Miscellaneous	Electrical Resource
Drilling	Electrical Supervisor
Drilling/Blaster Leader	Electrical Technician
Driver	Electrical Technician I
Driver/Equipment Operator	Electrician
Driver Haul Truck	Electrician I
Driver Haul Truck I	Electrician II
Driver Haul Truck II	Electrician III
Driver Off Road Truck	Electrician IV
Driver/Operator	Electrician A
Driver/Shop Work	Electrician H
Driver Stockpile Truck	Electrician/Maintenance
Dry Attendant	Electrician/Maintenance Supervisor
Dry Plant Lead Man	Electrician/Mechanic
Dry Plant Manager	Electrician Mine
Dry Plant Operator	Electrician STD
Dry Plant Sacker Operator	Electrician Technician
Dry Plant Worker	Electrician Trainee
Dry Process	Electro-Instrumentist
Dry Section Operator	Electronic Repairman
Dryer	Electronic Technician
Dryer/Loader Operator	Electronic Technician—Standard
Dryer Operator	Electrowinner
Drymill Operator	Emergency Response Coordinator
Dump Truck Driver	End Dump
Dump Truck Operator	End Dump Driver
Earth Strip	End Dump Operator
EHS Coordinator	End Loader Operator
EHS Coordinator Customer Service	Engineer
EHS Manager	Engineer II
EHS Technician	Engineer Analyst Senior
	Engineer/Operations Manager

Engineer Plant Operator	Equipment Trainer
Engineering Intern	Equipment Training Supervisor
Engineering Manager	ER Plant
Engineering Supervisor	Euclid
Engineering Technician	Euclid Operator
Entry Bagger	Evening Dozer/Loader Operator
Entry Level Miner	Evening Driller
Environmental Engineer	Evening Loader Operator
Environmental Engineer I	EW Operator
Environmental, Health & Safety Coordinator	Examiner
Environmental Health & Safety Manager & RSO	Excavator
Environmental Manager	Excavator Operator
Environmental Officer	Executive Assistant
Environmental Specialist	Executive Assistant to President
Environmental Staff	Exploration Driller
Environmental Technician	Explosives Loader
E.O. Utility	Explosives Specialist
Equipment Maintenance Manager	Explosives Technician
Equipment Management	Extruder Operator
Equipment Manager	Fabricator
Equipment Mechanic	Face Boss
Equipment Mechanic/Fueler	Face Driller
Equipment Oiler	Face Loader
Equipment Operator	Face Loader Operator
Equipment Operator I—SF	Face Man
Equipment Operator II—SF	Face Operative
Equipment Operator III	Facility Manager
Equipment Operator III—SF	Facility Operator
Equipment Operator IV	Facility Service Maintenance I
Equipment Operator V	FEL wa 800
Equipment Operator VI	Field Electrical Repairman
Equipment Operator/Laborer	Field Loader
Equipment Operator/Manager	Field Mechanic
Equipment Operator—Material Supplier	Field Supervisor
Equipment Operator/Mechanic	Filter Operator
Equipment Operator (mobile)	Fine Grind—Surface Plant Manager
Equipment Operator/Supervisor	Finish End Plant Trainee
Equipment Operator—Surface	Finish Grinder Operator
Equipment/Plant Operator	Fire Boss
Equipment Relief	Fire Boss/Belt Man
Equipment/Shift Manager	Fire Boss Pumper
	Fire Equipment SV
	First Line Supervisor

Fixed Equipment Maintenance	General Inside/Roof Bolter
Fixed Main Supervisor	General Labor & Equipment Operator
Fixed Maintenance I	General Labor/Shop Work
Flagman	General Laborer
Floating Utility	General Maintenance
Flock	General Manager
Flotation Operator	General Mine Foreman
Flotation Plant Operator	General Mine Manager
Fluid Bed Dryer Operator	General Miner Support
Foreman	General Operation Manager
Foreman 1st Shift	General Outside
Foreman 2nd Shift	General Outside Laborer
Foreman/Dredge Operator	General Plant Helper
Foreman Maintenance	General Repairer
Foreman/Manager/Staff	General Superintendent
Foreman/Miner	General Supervisor
Foreman Operator	General Underground
Foreman/Operator	General Underground Laborer
Foreman—Quarry	General Utility
Foreman Scoop & Buggy Man	Geo Technician II
Foreman Trainee	Geologist
Fork Truck Operator	Geologist II
Forklift	Geophysicist
Forklift Operator	Gold House Supervisor
Forklift Operator & Utility	Gradall Operator
Front End Loader Operator	Grader Operator
Froth Cell Operator	Granule Superintendent
Fuel Electrician	Gravel Pumper
Fuel & Lube Truck Operator	Gravity Mag Operator
Fuel Mechanic	Greaser
Fuel Mechanic Helper	Greaser & Fueler
Fuel Oiler	Greaser/Oiler
Fuel Operator	Grinder Operator
Fuel Technician	Grinding
Fuel Truck	Grinding Float
Fueler	Ground Control Technician
Gantry Crane Operator	Ground Hand
Garage/Machine Shop Maintenance Group	Ground Man
Gate Keeper	Grounds Keeper
General Foreman	Group Leader
General Inside	Group Leader Ground Packaging
General Inside Laborer	Group Leader Milling
	Grouter

Guard, Security II	Heavy Equipment Operator—Water Truck
Gyp Mine Manager	Heavy Equipment Repair MT III
Hammer Operator	Heavy Equipment Repairman
Haul Truck	Heavy Mechanic
Haul Truck Driver	Heavy Media Plant Operator
Haul Truck Driver I	Helper
Haul Truck Driver II	Helper/Laborer
Haul Truck Driver—Off Road	High Lift Loader Operator
Haul Truck Driver—On Road	High Lift Operator
Haul Truck/Loader	High Scaler
Haul Truck Operator	Highwall Drill Operator
Haul Unit Driver	HMS Operator
Haul Unit Operator	Hoe Operator
Haul Unit Operator/Stock	Hoist Engineer
Haulage	Hoist Operator
Haulage Driver	Hoisting Engineer
Haulage Operator	Hoistman
Hauler	Hopper Operator
Hauler Operator	Hot Plant Operator/Loader Operator
Hauling	HR Generalist II
HDR	HR Manager
Head Blaster	Human Resources
Head Operator	Human Resources/Accounts Receivable
Heading Prep	Human Resources Area Manager
Health & Safety Manager	Human Resources Assistant
Health & Safety Officer	Human Resources Intern
Health & Safety Technician	Human Resources Manager
Heap Leach Operator	Human Resources Specialist
Heavy Duty Mechanic	Hydraulic Scaler
Heavy Duty Mechanic Welder	Hydromet Helper
Heavy Duty Repair	I & C Technician
Heavy Duty Repair Trainee	Idle Work
Heavy Equipment Electrician	Industrial Diagnostic Electrician
Heavy Equipment Mechanic	Industrial Electrician
Heavy Equipment Mechanical Electrician	Industrial Maintenance Technician IA
Heavy Equipment Operator	Industrial Maintenance Technician II
Heavy Equipment Operator B	Industrial Plant Bagging
Heavy Equipment Operator (Dozer)	Information Technology Coordinator
Heavy Equipment Operator—Front End Loader	Inglett Bagger
Heavy Equipment Operator—Haul Truck	Inglett Operator
Heavy Equipment Operator—Lead	Inspector
Heavy Equipment Operator—Scrapers	Instrument Electrician

Instrument Repair	Laborer Equipment Operator
Instrument Repairer	Laborer/Ground Person
Instrumentation Supervisor	Laborer Helper
Intern	Laborer/Maintenance
Intern Student	Laborer/Plant Operator
IT Support	Laborer Roof Slate
IT Technician	Laborer—Pit 2
Janitor	Laborer/Site Manager
Janitor/Utility	Laborer (Summer)
Jaw Operator	Laborer—Utility
Jet Mill Operator	Lamp Man
Jig Plant Operator	Land Manager
Journeyman	Large Shovel/Backhoe/Load Operator II
Journeyman Electrician	Large Truck Driver
Jumbo Driller	Leach Pad Operator I
Junior Geologist	Leach/Roast Operations Helper
Kiln Assistant	Leach Utilityman
Kiln Burner	Lead Bagger
Kiln Feed Operator	Lead Electrician
Kiln Laborer	Lead Equipment Mechanic
Kiln Operator	Lead Laborer
Lab	Lead Man
Lab Analyst	Lead Man—Mill
Lab Assistant	Lead Man—Mine
Lab Chemist	Lead Man—Quarry
Lab Clerk	Lead Man Roller Mill Plant Operator
Lab Electrician	Lead Man—SF
Lab Manager	Lead Man Wet Process
Lab Operator	Lead Mechanic
Lab Person	Lead Miner
Lab Supervisor	Lead Operator Mill
Lab Systems Technician	Lead Operator Quarry
Lab Technician	Lead Payloader
Lab Technician I	Lead Person
Lab Technician II	Lead Person II
Lab Technician III	Lead Plant Operator
Lab Tester	Lead Primary Mobile
Lab Worker	Lead Process Operator
Labor Foreman	Lead Warehouse
Labor Pool	Ledge Foreman
Laboratory Technician	Ledge Worker
Laborer	Leech Pad Operator
Laborer II—SF	Level A Certified Blaster

Level A Chief Op or PSO	Longwall Area Manager
Level A Millwright 1C	Longwall Foreman
Level B Millwright 2C	Longwall Mechanic Operator Helper
Level B Miner	Longwall Production Operator
Level C Mine Helper plus Truck	Longwall Propman
Level C Supply Specialist	Longwall Shearer Operator
Level D Entry	Longwall Support
LHD Operator	Longwall Trainee
Lift Driver Lead	Lube Bay Oiler
Light Vehicle Mechanic II	Lube Maintenance
Limestone Prep Operator	Lube Man
Line 2 Loadout Operator	Lube Specialist
Line Leader	Lube Technician
Liquid Fuel Handler	Lube Truck
Load Explosives	Luber
Load Out Operator	Luber—Fixed Equipment
Loader	Lubrication Maintenance
Loader Crusher Operator II	Lubrication Repairman
Loader/Excavator Operator	Lubricator
Loader/Ground Bagger	LWDF Attendant
Loader Man/Driller	M.E.O.
Loader Mine	Machine Loader Operator
Loader/Miner	Machine Operator
Loader Operator	Machinist
Loader Operator—Feeds Crusher	Main/Truck Driver
Loader Operator—Loads Trucks	Maintenance
Loader Operator Supervisor	Maintenance V
Loader Operator—Truck Driver	Maintenance A Electrician
Loader (Portable)	Maintenance A/Utility Leader
Loader - Setter	Maintenance B
Loader/Stock Truck	Maintenance Chief
Loader, Stockpile	Maintenance Clerk
Loader (Yard)	Maintenance Coordinator
Loadhouse Supervisor	Maintenance Craft
Loading Equipment Operator	Maintenance Crew
Loading Hauler Trucks	Maintenance Electrician
Loading Rock in Process	Maintenance Electrician II
Loading Trucks	Maintenance Engineer
Loading & Warehouse	Maintenance/Equipment
Loadman	Maintenance Fixed I
Loadout	Maintenance Fixed II
Loadout Operator	Maintenance Fixed III
Locomotive Engineer	Maintenance Foreman

Maintenance/General Supervisor	Maintenance Technician II
Maintenance Group	Maintenance Technician Senior
Maintenance Group Lead Man	Maintenance Trainee
Maintenance Helper	Maintenance Welder
Maintenance Inspector	Maintenance Worker
Maintenance Inst.	Maintenances Facilities Technician 1A
Maintenance Journey	Maintenances Facilities Technician B
Maintenance Lead Man	Maintenances Supervisor
Maintenance Lead Person	Makedown Technician
Maintenance Leader	Management
Maintenance Level C	Manager
Maintenance/Loader Operator	Manager Assistant Plant 2
Maintenance Lube	Manager/Global Screening
Maintenance/Machine Shop Supervisor	Manager—New Polymer Composites
Maintenance Man	Manager of Administration
Maintenance Man Level A-1	Manager of Concentrator
Maintenance Man Machine Lube	Manager of Engineering
Maintenance Manager	Manager of Financial Reporting
Maintenance Mechanic	Manager/Owner/Equipment Operator
Maintenance Mechanic I	Manager Plant 3
Maintenance Mechanic II	Manager Trainee
Maintenance Mechanic III	Manager Transmission/Sales
Maintenance Mechanic—Standard	Manager/Vice President
Maintenance Mechanic Supervisor	Managerial
Maintenance Mobile I	Manager's Assistant
Maintenance Mobile II	Manufacturing Supervisor
Maintenance Mobile III	Mark Up/Layout
Maintenance/Off-road Truck Driver	Marketing Services Director
Maintenance Operator	Mass Excavator 5130 cat
Maintenance Planner	Master Electrician
Maintenance Planner II	Master Heavy Equipment Operator
Maintenance Planner/Mechanic	Master Mechanic
Maintenance/Plant Operator	Master Mill Technician
Maintenance/Plant Supervisor	Master Process Operator
Maintenance Repairman	Material Handler
Maintenance Superintendent	Material Handler II
Maintenance Supervisor	Material Operator
Maintenance System Site Administrator	Material Sampler
Maintenance Systems Administration	Material Unloader
Maintenance Team Leader	Materials Coordinator
Maintenance Team Member	Materials Operator
Maintenance Technician	Materials Planner
Maintenance Technician I	Materials & Planning Manager

Materials Technician  
MBC Operator  
Mechanic  
Mechanic I  
Mechanic II  
Mechanic V  
Mechanic A  
Mechanic B  
Mechanic B—Group Leader  
Mechanic/Chief  
Mechanic Clerk  
Mechanic D  
Mechanic Electrician  
Mechanic/Electrician  
Mechanic/Electrician II  
Mechanic/Fabricator  
Mechanic G  
Mechanic Helper  
Mechanic Lead Person  
Mechanic Level IV  
Mechanic Level V  
Mechanic/Maintenance  
Mechanic Mobile  
Mechanic/Operator  
Mechanic—Plant  
Mechanic Specialist  
Mechanic Technician II  
Mechanic Technician III  
Mechanic Technician IV  
Mechanic Trainee  
Mechanic—Truck Driver  
Mechanic—Underground  
Mechanic Utility  
Mechanic/Welder  
Mechanical Engineer  
Mechanical Engineer/EMR  
Mechanical Maintenance  
Mechanical Maintenance A  
Mechanical Repairman  
Mechanical Scaler Operator  
Mechanical Technician  
Mechanics Helper  
Mechanics Helper—Lead

Mechanics Welder  
Messenger  
Met Lab Technician VII  
Metallurgist  
Metallurgist II  
Mill  
Mill Crusher Operator  
Mill E&I Technician  
Mill Foreman  
Mill Hand  
Mill Helper  
Mill Kiln Operator  
Mill Lead Man  
Mill Lead Technician IV  
Mill Maintenance  
Mill Maintenance Technician  
Mill Manager  
Mill Mechanic  
Mill Mechanic Foreman  
Mill Mechanic Technician II  
Mill Operations  
Mill Operator  
Mill Operator/Lead Man  
Mill/Packaging Operator 1  
Mill/Packaging Operator 2  
Mill/Packaging Operator 3  
Mill Production  
Mill Production Laborer  
Mill Production Worker  
Mill Superintendent  
Mill Technician  
Mill Technician II  
Mill Technician IV  
Mill Utility  
Mill/Warehouse Operator  
Miller  
Millerman 1  
Millerman 1—Lead Man  
Milling Lead Man  
Milling Machine Operator  
Millman  
Millman's Helper  
Millwright

Millwright I	Mine Operations
Millwright IV	Mine Operations I
Millwright STD	Mine Operations—Equipment Operator
Millwright STR	Mine Operations Technician I
Mine A	Mine Operations Technician IV
Mine Apprentice	Mine Operations Technician V
Mine Clerk	Mine Operator
Mine Driller	Mine Operator C
Mine Electrician	Mine Production
Mine Engineer	Mine Production—Hoist operator
Mine Equipment Operator	Mine Production Operator
Mine Examiner	Mine Production Superintendent
Mine Foreman	Mine Production Supervisor
Mine Foreman—Miner Operator	Mine & Quarry Maintenance
Mine Foreman/Superintendent	Mine & Quarry Manager
Mine General Foreman	Mine Relief Utility
Mine Haul Truck Driver	Mine Shift Supervisor
Mine—Haul Truck Driver	Mine Spec I
Mine Hauler	Mine Spec II
Mine Labor	Mine Spec III
Mine Lead	Mine Superintendent
Mine Lead Man	Mine Supervisor
Mine Lead Technician IV	Mine Supplier
Mine Leader	Mine Support
Mine Loader	Mine Surveyor
Mine Loader Operator	Mine Technician III
Mine Maintenance	Mine Technician IV
Mine Maintenance Clerk	Mine Truck Driver
Mine Maintenance Foreman	Mine—Truck Driver
Mine Maintenance Mechanic	Mine Utility
Mine Maintenance MT 3	Mine Utility B
Mine Maintenance Production Supervisor	Mine Worker
Mine Maintenance Specialist	Miner
Mine/Maintenance Superintendent	Miner 1
Mine Maintenance Technician II	Miner 1st Class
Mine Maintenance Technician V	Miner 2
Mine Manager	Miner 3
Mine Mechanic	Miner 4
Mine Mechanic I	Miner 5
Mine Mechanic II	Miner Helper
Mine Mechanic III	Miner Lead Man
Mine Mechanic A	Miner Operator
Mine Oiler/Fueler I	Miner Section Operator

Mines	Office Administrator
Mining	Office Assistant
Mining Engineer	Office Attendant
Mining Lead Man	Office Clerk
Mining Supervisor	Office Coordinator
Miscellaneous Operator	Office Manager
Mix Chemist	Office Manager Loader Operator/Scale
Mix Control Chemist	Office Salesman
Mix Control Fill-in	Office Scale
Mix Man	Office/Scale
Mixer	Office Staff
Mixer Operator	Office Staff 1
Mobile Bridge Operator	Office Staff 2
Mobile Equipment	Office Staff 3
Mobile Equipment Maintenance	Oil Helper
Mobile Equipment Mechanic	Oil Pit Technician
Mobile Equipment Mechanic STD	Oiler
Mobile Equipment Operator	Oiler/Maintenance
Mobile Maintenance	Oiler/Repairman
Mobile Maintenance Foreman	On Road Truck Driver/Loader Operator
Mobile Maintenance Mechanic	Op. Tech. Pel
Mobile Mechanic	Open Pit 1
Mobile Repair	Operating Engineer
Mobile Utility Operator	Operations
Motor Grader 873 JD	Operations Administrator
Motor Grader Operator	Operations Associate
Motor Grader Operator—Lead	Operations Engineer
Motorman	Operations Engineer/Labor Engineer
Mucker	Operations Maintenance Technician
Mud Picker	Operations Manager
Multi Craft Maintenance	Operations Specialist
Nashtec Operator	Operations Superintendent
Net Work Coordinator	Operations Supervisor
Night Foreman/Evening Dozer	Operations Support Clerk
Night Lead Man	Operations Support Coordinator
Night Mechanic	Operations Technician Filter Attendant
Night Supervisor	Operations Technician Material Handler
Night Watchman	Operations Technician Prim. Cr. Attd
Nipper	Operations Technician/Shovel Operator
Off Road Truck Driver	Operator
Off Road Truck Operator	Operator I
Off Sider	Operator II
Office Administration	Operator III

Operator III Utility	Operator—Underground
Operator IV	Order Processor
Operator V	Ore Technician
Operator A	Ore Truck
Operator A Prime Leader	Ore Truck 77D
Operator Apprentice	OTR Truck Driver
Operator B	Outby
Operator B—Heavy Equipment Operator	Outby Electrician
Operator C	Outby Foreman
Operator CM	Outby General Laborer
Operator/CM	Outby Labor
Operator D 6	Outby Support
Operator D Utility Equipment Operator	Outby Support UG
Operator/Dozer	Outside
Operator/Driver	Outside Clerk
Operator Equipment I	Outside Communication
Operator Equipment II	Outside Man
Operator Equipment III	Outside Utility/Clerk
Operator Equipment IV	Outside Worker
Operator Equipment V	Outside Yard Man
Operator (Extra)	Over the Road Truck Driver
Operator Foreman	Overburden Driller
Operator/Ground Person	Owner
Operator In Charge	Owner/Manager
Operator K	Owner/Miner
Operator Loader	Owner Operator
Operator/Loader	Owner/Operator
Operator Maintenance	Owner/Partner
Operator/Maintenance	Owner/Sales/Shipping
Operator/Maintenance Laborer	PA
Operator Maintenance Man	Pack & Ship Lead Man
Operator/Mechanic	Packaging
Operator—Mobile	Packaging/Blending
Operator Plant 2	Packaging Operator
Operator Plant 4	Packaging Supervisor
Operator/Repairman	Packaging Team Member
Operator—Scoop	Packer
Operator/Shovel	Packer Crewman
Operator/Supervisor	Packer/Forklift
Operator Supervisor	Packer/Loader
Operator Technician II	Packer Man
Operator Trainee	Packer Operator
Operator/Truck Driver	Packer—Pit 2

Packer—SS	Planner
Packhouse	Planner I
Packhouse Utility	Planner II
Packing Operator	Plant
Packing/Shipping Foreman	Plant 1 Operator
Palleter	Plant 2 Operator
Palletizer/Meo	Plant 3 Operator
Pan Operator	Plant Accountant
Panel Operator	Plant Administrator
Part Time Laborer	Plant Attendant
Part Time Shop	Plant Clerk
Part Time Yard Worker	Plant Controller
Parts	Plant Controlman
Parts Clerk	Plant Electrician
Parts Coordinator	Plant Engineer
Parts Runner	Plant Engineer/HSE
Parts Runner/Accounts Payable	Plant/Equipment Operator
Paver Operator	Plant Foreman
Payables Clerk	Plant Foreman/Loader Man
Payloader	Plant Foreperson
Payroll	Plant Generalist
Payroll Assistant	Plant Ground Man
Payroll Clerk	Plant Helper
Payroll/Personnel	Plant Laborer
Pebble Mill Operator	Plant Lead
Pellet Plant Technician	Plant Leader
Permit Coordinator	Plant Loader
Physical Tester	Plant Loader Operator
Picker/Laborer	Plant Maintenance
Pinner Operator	Plant Maintenance Group
Pipe Fitter	Plant Maintenance Superintendent
Pit and Plant Truck Driver	Plant Man
Pit Foreman	Plant Manager
Pit Hauler	Plant Manager Intern
Pit Laborer	Plant Manufacturing Supervisor
Pit Lead Man	Plant Mechanic
Pit Loader	Plant Mobile Equipment Operator
Pit Loader Operator	Plant Office Administration
Pit Operator	Plant Office Administrator
Pit Superintendent	Plant Oiler
Pit Supervisor	Plant Operations
Pit Truck Driver	Plant Operator
Pit Truck Operator	Plant Operator I

Plant Operator I—SF	Prep Plant Operator
Plant Operator II—SF	Prep Plant Technician
Plant Operator 2A	President
Plant Operator IV	President/COO
Plant Operator (Apprentice)	President/Developer/Operator
Plant Operator (Beginning Operator)	President/Owner
Plant Operator—Foreman	President/Owner/Retired
Plant Operator/Truck Driver	Pricing Coordinator
Plant Person	Primary Control Operator
Plant/Pit Foreman	Primary Crusher
Plant/Pit Truck Driver	Primary Crusher Operator
Plant Production Worker	Primary Mobile Operator
Plant Quality & Shipping	Primary Operator
Plant Repair	Primary Operator (Jaw)
Plant Repair Foreman	Process Assistant
Plant Repair/Welder	Process Attendant
Plant Repairman	Process Control Operator
Plant Repairman I	Process Control Superintendent
Plant Repairman II	Process Control Supervisor
Plant Sampler	Process Control Technician
Plant Superintendent	Process Engineer
Plant Supervisor	Process/Equipment Operator
Plant Supervisor II	Process Foreman
Plant Supervisor Manager	Process Lab Technician
Plant Technician	Process Laborer
Plant Technician—Crew Leader	Process Maintenance Mechanic
Plant Trainee	Process Maintenance Technician IV
Plant Utility	Process Maintenance Technician VI
Plant Utility Operator	Process Maintenance Utility
Plant Wash Operator	Process Manager
Plant Welder	Process Operations Technician III
Plant Working Foreman	Process Operator
Plants Manager	Process Operator II
Poly Packer Crewman	Process Production Engineer III
Polygloss Bagger Technician	Process Supervisor
Port Operator B	Process Technician
Portable Plant Operator	Processing Assistant 1
Powder Loader	Processing Plant
Powder Man	Processing Team Member
Powder Person	Processor
Power Screen Operator	Procurement Manager
Power Systems Operator B	Procurement Specialist
Prep Plant Mechanic	Product Loading

Production	Production Technician II
Production 1st shift	Production Technician IV
Production 2nd shift	Production Technician V
Production 3rd shift	Production Truck
Production Assistant	Production Truck Driver
Production Coordinator	Production Utility Man
Production Driller	Production Worker
Production Employee	Professional
Production Engineer	Project Engineer
Production Expeditor	Project Manager
Production Foreman	Prospecting
Production Generalist	Pug Mill Operator
Production Inspector	Pug Operator
Production Journeyman	Pump Man
Production Lead Man	Pump Operator
Production Lead Operator	Pumper
Production Leader	Purchase Agent
Production Loader	Purchaser
Production Loader Operator	Purchasing
Production Maintenance	Purchasing Agent
Production/Maintenance Manager	Purchasing Clerk
Production/Maintenance Supervisor	Purchasing Coordinator
Production Manager	Purchasing Equipment Manager
Production Mechanic	Purchasing Manager
Production Miner	Purchasing/Shop
Production Operator	Q-line II
Production Operator I	Quality Analyst
Production Operator II	Quality and Safety Manager
Production Operator Level I	Quality Assistant
Production Operator Level II	Quality Assurance
Production Operator Level III	Quality Assurance Coordinator
Production Operator Screening Plant	Quality Assurance Lab Technician Level II
Production Quality Control Manager	Quality Assurance Lab Technician Level III
Production Resource Manager	Quality Assurance Manager
Production & Sales Service Lab Technician	Quality Assurance & Mine Supervisor
Production Scheduler	Quality Assurance/Quality Control Laboratory Technician
Production Scheduler/Safety Manager	Quality Assurance Supervisor
Production Shift Foreman	Quality Assurance Technician
Production Superintendent	Quality Control
Production Supervisor	Quality Control III Lab Technician
Production Support	
Production Technician	

Quality Control/HS&E	Rail Road
Quality Control Lab	Rail Runner
Quality Control Lead Technician	Rail Runner Operator
Quality Control Man	Rail Supervisor
Quality Control Manager	Raisebore Operator
Quality Control Physical Tester	Rak Handler
Quality Control & Sales Coordinator	Ram Car Operator
Quality Control Supervisor	Raw Material Manager
Quality Control Technician	Raymond Mill Operator
Quality Control Technician II	Receiving Clerk
Quality Loader Operator	Receiving Supervisor
Quality Manager	Receptionist
Quality Supervisor	Receptionist/Shipping Coordinator
Quality Technician	Reclaim Operator
Quarry Coordinator	Reclamation Labor
Quarry Crusher Operator	Refuse Site Operator
Quarry Driller/Blaster	Refuse Truck Operator
Quarry Equipment Operator	Regional Human Resources Manager— U.S.
Quarry Extra	Regulatory Manager
Quarry Foreman	Reliability Engineer
Quarry Laborer	Repair Lead Man
Quarry Loader Operator	Repair Worker
Quarry Manager	Repairman
Quarry Mechanic	Repairman A
Quarry Night Foreman	Representative Trade Relations
Quarry Operator	Research Scientist
Quarry Saw Operator	Road Grader Operator
Quarry Superintendent	Road Maintenance
Quarry Supervisor	Robot Operator
Quarry Technician	Rock Breaker
Quarry Truck Driver	Rock Breaker Operator
Quarry Utility	Rock Crusher Superintendent
Quarry Worker	Rock Duster
Quarryman	Rock Haul Driver
Quarryman A	Rock Plant Operator
Quarryman B	Rock Truck
R&D Supervisor	Rock Truck/Dozer Operator
Rail Lead Man	Rock Truck Driver
Rail Loader	Rock Truck Operator
Rail Loader Operator	Roller Mill Operator
Rail Loadout	Roller Mill Plant Operator Fine Grind
Rail Loadout Operator	Roller Operator
Rail Operator	

Rolling Stock Crew 2	Sales Coordinator
Rolling Stock Crew 4	Sales Loader
ROM Operator	Sales Manager
Roof Bolter	Sales & Marketing
Roof Bolter Operator	Sales Person
Roof Bolter—Scaler	Sales Representative
Roof Control	Sales Representative I
Roof Control Operator	Sales/Safety Director
Roof Drill	Sales & Technical Manager
Roof Person	Sales/Traffic
Roofing Slate Splitter	Salesman
Roofing Slate Trimmer	Salesman Manager
Roofing Slate Trimming Machine Operator	Sample Prep
Root Picker	Sampler
Rotary Drill Operator	Sampler—Lab
Rotary Dump Operator	Sampler Technician
Rotex Operator	SAMS Technician
Roustabout	Sand Plant Lead Man
Roving Clerk	Sand Plant Operator
RP Operator	Saw
Rubber Tire Operator	Saw & Equipment Repair
Sacker	Saw Operator
Sacking	Saw & Stone Cutter
Safety	Saw Table Laborer
Safety Advisor	Sawyer
Safety Clerk	Scale
Safety Coordinator	Scale Attendant
Safety Director	Scale Clerk
Safety Engineer	Scale House
Safety & Health	Scale House Clerk
Safety & Health Professional	Scale House Master
Safety/HR Manager	Scale House Operator
Safety & Inventory Coordinator	Scale Man
Safety Manager	Scale Master
Safety Officer	Scale Office
Safety Representative	Scale/Office
Safety/Security Director	Scale Office Dispatcher
Safety Specialist	Scale Office Manager
Safety Supervisor	Scale Operator
Safety Technician	Scale Operator/Office
Sales	Scale Operator/Parts
Sales Administration Manager	Scale Person
	Scale/Sales Office

Scaler	Senior Geologist
Scaler Operator	Senior Human Resources Manager
Scales/Weights	Senior Human Resources Representative
Scheduler	Senior Lab Technician
Scoop	Senior Lead Plant Operator
Scoop Loader	Senior Maintenance Mechanic
Scoop Man	Senior Maintenance Planner
Scoop Operator	Senior Maintenance Planner I
Scoop Tractor Operator	Senior Mill Operator
Scraper Operator	Senior Mine Engineer
Screed Person	Senior Mine Geologist
Screen & Mill Operator	Senior Mining Engineer
Screen Operator	Senior Operator
Screen Plant Labor	Senior Operator Maintenance
Screen Plant Operator	Senior Planning Clerk
Screenhouse/Crusher	Senior Plant Office Administrator
Seasonal Production	Senior Plant Operator
Secondary Foreman	Senior Process Control Engineer
Secondary Plant Operator	Senior Process Control Specialist
Secretary	Senior Process Controller
Secretary—Treasurer	Senior Process Operator
Section Boss	Senior Quality Control Technician
Section Electrician	Senior Research Technician
Section Foreman	Senior Stores Specialist
Section Trainee	Senior Vibration Technician
Section Trainee IV	Senior Welder
Sectional Dock Manager	Service Foreman
Security	Service Man
Security Chief/Safety Trainer	Service Mechanic
Security Guard	Service Technician
Security Guard/General Laborer	Service Truck Driver
Security Officer	Setup Foreman
Security Supervisor	Shaft Crew
Security Watch	Shaft Repair
Senior Accountant	Shearer Operator
Senior Accountant II	Shedder
Senior Accounting Assistant	Shift Foreman
Senior Accounting Clerk	Shift Foreman Mill
Senior Administrative Clerk	Shift Laborer
Senior Controller	Shift Maintenance
Senior Designer	Shift Manager
Senior Drafter	Shift Mine Manager
Senior Engineer	Shift Repairman

Shift Supervisor	Shuttle Car Driver
Shift Tire Attendant	Shuttle Car Operator
Shift Utility	Shuttle Car Operator 21
Shift Welder Repair A	Silo Operator
Shiftbreaker—Lewis	Site Mechanic/Welder I
Shiftbreaker—Pit 2	Site Superintendent
Shifter	Skid Steer Operator
Shipping	Skilled Instrument Electrician 1C
Shipping Assistant	Skilled Laborer
Shipping Clerk	Skilled Maintenance Mechanic
Shipping Coordinator	Skilled Maintenance Worker
Shipping Foreman	Skilled Repairman
Shipping Lead Man	Skip Loader
Shipping Loader	Skip Tender
Shipping Loader Operator	Slate Carrier
Shipping Manager	Slate Splitter
Shipping Operator	Slate Trimmer
Shipping & Receiving	Sloop Operator
Shipping & Receiving Clerk	Slurry Operator
Shipping Scales Lead person	Slurry Operator 1& 2
Shipping Specialist	Slurry Track Technician
Shipping Supervisor	Small Bagger Lead Operator
Shipping Team Member	Special Loader
Shipping Technician	Splitter
Shooter	Stacker
Shop	Stacker Operator
Shop/Drag Line	Staff Accounting Specialist
Shop Foreman	Staff Chemical Engineer
Shop Manager	Station Operator
Shop Mechanic	Stationary Equipment Operator
Shop Person	Steamer
Shop/Plant	Stick Picker
Shop Serviceman	Stock Loader
Shop Supervisor	Stock Out Truck Driver
Shot Crew	Stock Pile Driver
Shot Firer	Stock Pile Hauler
Shovel Dragline Operator	Stock Pile Loader
Shovel Loader Operator	Stock Pile Operator
Shovel/Loader Operator	Stock Pile Truck
Shovel OB pc1800	Stock Pile Truck Driver
Shovel Operator	Stock Piler
Shovel Pit Loader Operator	Stock Truck
Shuttle Car	Stock Truck Driver

Stock Truck/Plant Operator	Supply Clerk
Stockroom Attendant	Supply Hauler
Stone Cutter	Supply Man
Stone Cutter, Driver—MAC	Supply/Track Man
Stone Packaging Operator	Support Foreman
Stone Splitter	Support Opr. 5
Stone Stacker	Surface
Storage Operator	Surface Coordinator
Storeroom	Surface Electrician
Storeroom Attendant	Surface Foreman
Storeroom Clerk	Surface General Laborer
Storeroom Floorman	Surface Laborer
Storeroom Manager	Surface Maintenance
Storeroom Supervisor	Surface Maintenance Manager
Stove Plant Operator	Surface Maintenance Mechanic
Stripping Dredge Operator	Surface Manager
Stripping Operator	Surface Mechanic A
Sublevel Miner	Surface Mechanic C
Summer Grounds Keeper	Surface Mine Supervisor
Super Sack Operator	Surface Operations Manager
Superintendent	Surface Operations Technician IV
Superintendent/Secretary	Surface Operator B
Superintendent Maintenance	Surface Operator C
Supervisor	Surface Outside
Supervisor 2nd Shift	Surface Plant Operator
Supervisor & Backhoe Operator	Surface Production
Supervisor Concentrator	Surface Production Operator
Supervisor Crush/Convey	Surface Production Supervisor
Supervisor/Dozer Operator	Surface Shift Foreman
Supervisor Leach Pad	Surface Supervisor
Supervisor Mechanics	Surface Support
Supervisor Mine	Surface Utility
Supervisor—Mine	Surface Utility Man
Supervisor Mobile Equipment Quarry	Surveyor
Supervisor —Moly Processing	Sweeper Operator
Supervisor/Operator	Swingman
Supervisor Plant 1	SX Helper
Supervisor Plant 2	SX Operator
Supervisor/Plant Operator	System Administrator
Supervisor Quality Assurance	Systems Analyst
Supervisor—Shovel/Drill Maintenance	Tailings Dam Operator
Supervisor—Tailings	Tailings Foreman
Supervisor Trainee	Tailings Pond Operator

Tailings Repairman	Tractor Operator
Tandem Tractor	Tractor Operator Loader
Tank Car Washer	Tractor Trailer Driver
Tank Car Washout Technician	Tractor Worker
Tank House Harvester	Trades Person I
Team Leader	Trades Person II
Teamster	Traffic Coordinator
Tech II	Traffic Representative
Tech III	Train Engineer
Technical Coordinator	Train Operator
Technical Services Manager	Trainee
Technical Specialist I	Trainer/Assessor
Technician	Trainer Electrician
Technician Quality Control	Transportation
Technician Quality Control II	Coordinator/Administrative Assistant
Technician Quality Control IV	Transportation Supervisor
Technician Quality Control V	Treasurer
Technician Senior	Truck Bin Attendant
Technologist—Analytical Lab	Truck Driver
Temporary Section Foreman	Truck Driver I
Temporary Worker	Truck Driver II
Terminal Operator	Truck Driver 50T
Thickener Operator	Truck Driver/Blaster Helper
Third Shift Foreman	Truck Driver Heavy
Tipple Foreman	Truck Driver/Mechanic
Tipple Helper	Truck Dump Operator
Tipple Hilift Operator	Truck Lead Man
Tipple Operator	Truck Loader
Tire Man	Truck Maintenance
Tire Technician	Truck Operator
Top Lab Analyst	TSP General Laborer
Top Operator	TSP Mobile Equipment Operator
Tower Cleaner	TSP Pumper
Tower Operator	TSP Worker
Tower Ranger	Undercutter Operator
Track	Underground Belt Man
Track Bolter	Underground Blaster
Track Driller	Underground CM Maintenance
Track Foreman	Operations
Track Hoe	Underground CM Production
Track Hoe Operator	Underground CM Set-up
Track Man	Underground Construction
Track Operator	Underground Construction I

Underground Construction Crew	Utility Person Pit
Underground Electrician	Utility Person Plant
Underground Equipment Operator	Utility Person/Warehouse
Underground Foreman	Utility Scaler
Underground Laborer	Utility Technician
Underground Lead Man	Utility Technician Equipment Cleaner
Underground Loader Operator	Ventilation
Underground Manager	Vertical Driller
Underground Mechanic	Vice President
Underground Miner	Vice President Cement Operations
Underground Miner 2/1	Vice President & General Manager
Underground Miner 3/1	Vice President/Manager of Aggregate
Underground Miner 3/2	Division
Underground Miner 3/3	Vice President of Finance/CAO
Underground Operator	Vice President/Office Manager
Underground Operator I	Vice President Sales
Underground Plant Operator	Vice President Sales & Marketing
Underground Roof Bolter Operator	Vice President/Secretary
Underground Scaler	Vice President Technology
Underground Shift Foreman	Warehouse
Underground Superintendent	Warehouse 1
Underground Supervisor	Warehouse Coordinator
Underground Truck Driver	Warehouse Man
Underground Utilityman	Warehouse Meo
Unit Helper	Warehouse Operator
Universal Operator	Warehouse Person
Utility	Warehouse Supervisor
Utility/Beltline	Warehouse Supervisor/Purchasing Agent
Utility/Belts	Warehouse Team Leader
Utility/Bolter	Warehouse Technician
Utility Centrifuge Technician	Warehouse Worker
Utility Engineer Technician	Warehouser
Utility Equipment Operator	Wash Operator
Utility Field	Wash Plant
Utility Laborer	Wash Plant Operator
Utility Lubricator	Wash Plant Super
Utility Man	Watchman
Utility Man/Surface	Water/Sweeper Truck Operator
Utility Operator	Water Truck
Utility Operator C	Water Truck Driver
Utility Person	Water Truck/Fueler
Utility Person Field	Water Truck Operator
Utility Person Laborer	Water Wagon Operator

W'Coat Packer	Wet Plant
Weigh Man	Wet Plant Attendant
Weigh Scale Operator	Wet Plant Operator
Weighmaster	Wet Process Operator
Weighmaster/Dispatch	Wet Utility
Weld Shop Maintenance Manager	Worker
Welder	Working Foreman
Welder I	Working Foreman Loading
Welder/Fabricator	Working Foreman Quarry
Welder/Laborer	Wrens Maintenance II
Welder/Maintenance	Wrens Maintenance IV
Welder/Mechanic	Wrens Maintenance V
Welder Mill Maintenance	Yard
Welder/Pipe Fitter	Yard Foreman
Welder/Plant Maintenance I	Yard Laborer
Welder/Plant Maintenance III	Yard Loader
Welder/Plant Operator	Yard Loader Operator
Welder Repair A	Yard Loaderman (Front End Loaders)
Welder/Repairman	Yard Production Laborer
Welder—Standard	Yard Truck Driver
Wet Grind Operator	

## **Appendix I. Glossary**

Unless otherwise noted, the source of the definitions in this Glossary is the Dictionary of Mining, Mineral, and Related Terms [American Geological Institute 1997].



**Auger.** A rotary drilling device used to drill shot holes or geophone holes in which the cuttings are removed by the device itself without the use of fluids.

**Backhoe.** A versatile rig used for trenching.

**Bagger/bagging operations worker.** A worker who typically works at a two or four station filling machine, placing empty bags (generally 50 or 100 lb capacity) on each of the machine's fill nozzles. When each bag is filled, either the filling machine mechanically ejects the bag onto a conveyor, or the operator manually removes the bag and places it on a conveyor or on a pallet for shipping [Cecala and Thimons 1992].

**Belt vulcanizer.** Equipment that consists essentially of two heavy metal plattens that are placed one on each side of the previously prepared joint and clamped firmly together. Each platten is heated, and this combined application of heat and pressure over a period completes the joint.

**Beltman/conveyor man.** A worker who sets up and tends chain, belt, or shaker (reciprocating) conveyors to transport coal or metal ore about a tippie at the surface from working the working face in a mine.

**Bin puller.** A worker who transfers material from a storage bin or chute into mobile equipment for transportation.

**Blunging.** The process of amalgamating, blending, or beating up or mixing in water.

**Bob cat.** A miniature front-end loader.

**Brattice.** A wall or partition in underground mines to control proper circulation of air through work places and passageways. Can be made of wood, canvas, or other materials.

**Breakers.** A machine used for the primary reduction of coal, ore, or rock [Thrush 1968].

**Bull dozer.** A tractor on the front end of which is mounted a vertically curved steel blade held at a fixed distance by arms secured on a pivot or shaft near the horizontal center of the tractor. The blade can be lowered or tilted vertically by cables or hydraulic rams. It is a highly versatile piece of earth excavating and moving equipment especially useful in land clearing and leveling work, in stripping topsoil, in road and ramp building, and in floor or bench cleanup and gathering operations. Also called dozer.

**Calcine.** By heating, to expel volatile matter as carbon dioxide, water, or sulfur, with or without oxidation; to roast; to burn.

**Cleanup man.** A worker who collects all the valuable product of a given period of operation in a stamp mill, or in a hydraulic or placer mine. Collects and loads spillage resulting from normal operations.

**Coal sampler.** A worker who cuts a representative part of an ore (or coal) deposit, which should truly represent its average value, and who collects and prepares samples of coal for analysis.

**Continuous miner.** A mining machine designed to remove coal from the face and to load that coal into cars or conveyors without the use of cutting machines, drills, or explosives.

**Controller.** Any mechanical or electrical device that is part of or added to a machine or device for automatic regulation or control.

**Crude pile.** A substance in its natural unprocessed, unrefined state. Crude ore or crude oil, for example. In a natural state; not cooked or prepared by fire or heat; not altered or prepared for use by any process.

**Crusher operator/ pan feeder operator.** In the mineral and nonmineral industry, including coal, quarry products, mineral and nonmineral ores, a worker who operates a machine that crushes rock or other material and regulates the flow of such material into and from the crusher to the next point of processing or use.

**Culm.** In anthracite terminology, the waste accumulation of coal, bone, and rock from old dry breakers. In bituminous coal preparation, culm corresponds to slurry or slime, depending upon the size distribution of the suspended solids.

**Culm bank.** The deposit on the surface of culm usually kept separate from deposits of larger pieces of slate and rock.

**Curb.** A timber frame, circular or square, wedged in a shaft to make a foundation for walling or tubbing, or to support, with or without other timbering, the walls of the shaft; the heavy frame or sill at the top of a shaft.

**Cutting machine.** A power-driven machine used to undercut or shear.

**Dragline.** A type of excavating equipment that casts a rope-hung bucket a considerable distance, collects the dug material by pulling the bucket toward itself on the ground with a second rope, then elevates the bucket, and dumps the material on a spoil bank, in a hopper, or on a pile.

**Digestion operator.** A worker who tends the battery of digester vessels that dissolve bauxite in plant liquor by: turning valves on pumps to transfer liquid and bauxite slurry through heaters into digester vessels, turning valves to inject milk of lime into vessels, adjusting pumps and valves to circulate cleaning solution through process lines, and collecting samples of slurry and alumina solution for laboratory analysis [DOT 2003].

**Dredge.** A large floating machine used in underwater excavation for developing and maintaining water depths in canals, rivers, and harbors; raising the level of lowland areas and improving drainage; constructing dams and dikes; removing overburden from submerged ore bodies prior to open pit mining; or recovering subaqueous deposits having commercial value.

**Dry plant/dry process.** A method of treating ores by heat as in smelting; used in opposition to the wet process.

**End dump.** Process in which earth is pushed over the edge of a deep fill and allowed to roll down the slope [Infomine Inc. 2010].

**Face.** The exposed surface of a coal or ore deposit in the working place where mining is proceeding.

**Fire boss.** A person designated to examine the mine for gas and other dangers usually before but also during the shift. Also known as a mine examiner.

**Floatation/concentrator.** A plant where ore is separated into values (concentrates) and rejects (tails) or an appliance in such a plant, e.g., flotation cell, jig, electromagnet, shaking table.

**Front end loader.** A tractor loader with a digging bucket mounted and operated at the front end of the tractor that both digs and dumps in front.

**Froth cell.** The process for cleaning fine coal, copper, lead, zinc, phosphate, kaolin, etc. with the aid of a reagent; the coal or minerals become attached to air bubbles in a liquid medium and float as a froth.

**Geologist.** One who studies planet Earth, the materials of which it is made, the processes that act on these materials, the products formed, and the history of the planet and its life forms since its origin.

**Grader.** A self-propelled or towed machine provided with a row of removing or digging teeth and (behind) a blade to spread and level the material.

**Ground control/timberman.** A worker who installs timbers in a mine to support the roof and walls of haulage ways, passageways, and the shaft.

**Hammer mill.** A pulverizing unit consisting of a rotor, fitted with movable hammers that is revolved rapidly in a vertical plane within a closely fitting steel casing. The hammers hit falling rock, which is fractured on impact, or by collision with other rocks or with the casing. When sufficiently reduced in size, the pulverized rock escapes through grids in the casing.

**Haulage.** The drawing or conveying, in cars or otherwise, or movement of workers, supplies, ore, and waste both underground and on the surface. Generally refers to track mining as opposed to conveyor mining, although belt conveyor systems are sometimes referred to as belt haulage; the system of hauling coal or minerals out of a mine.

**Head area.** The top portion of a seam in the coal face.

**Highwall.** The unexcavated face of exposed overburden and coal or ore in an opencast mine or the face or bank on the uphill side of a contour strip mine excavation.

**Hoist operator.** In mining, a person who operates steam or electric hoisting machinery used to lower cages (elevators) and skips (large, metal, boxlike containers) into a mine and to raise them to the surface from different levels. The worker may be designated according to the type of power used, as an electric-hoist person or steam-hoist person.

**Hopper.** A storage bin or a funnel that is loaded from the top and discharges through a door or chute in the bottom.

**Inby.** Toward the working face, or interior, of the mine; away from the shaft or entrance; opposite of outby.

**Inspector.** One who checks the mine to determine the health and safety conditions. This person makes examinations of and reports on mines and surface plants relative to compliance with mining laws, rules and regulations, safety methods, etc. State inspectors have authority to enforce State laws regulating the working of the mines. Federal inspectors have authority to enforce Federal laws in coal mines.

**Jack setter.** Miner who assists in the operation of an auger-type underground mining machine; duties include seeing that the roof of the mine at or near the machine is in a safe condition.

**Jaw operator.** One who operates a machine for reducing the size of materials by impact or crushing between a fixed plate and an oscillating plate, or between two oscillating plates, reducing large rocks, or ores to sizes capable of being handled by any of the secondary crushers.

**Kiln.** A large furnace used for baking, drying, or burning firebrick or refractories, or for calcining ores or other substances.

**Lab technician.** One who conducts chemical and physical laboratory tests to assist scientists in making qualitative and quantitative analyses of solids, liquids, and gaseous materials for research and development of new products or processes, quality control, maintenance of environmental standards, and other work involving experimental, theoretical, or practical application of chemistry and related sciences [BLS 2010].

**Lampman.** In mining, one who cleans, tests, and repairs lamps used underground by miners.

**Leaching operator.** In ore dressing, smelting, and refining, one who dissolves valuable metal out of ore or slime, using chemical solutions.

**Longwall.** A long face of coal. A method of working coal seams. The workings advance (or retreat) in a continuous line, which may be several hundred yards in length. The space from which the coal has been removed (the gob, goaf, or waste) which is either allowed to collapse (caving) or is completely or partially filled or stowed with stone and debris.

**Metallurgist.** One who is skilled in, or who practices, the science and art of separating metals and metallic minerals from their ores by mechanical and chemical processes; one involved in the preparation of metalliferous materials from raw ore.

**Mill (rod/ball/pebble).** A mineral treatment plant in which crushing, wet grinding, and further treatment of ore is conducted. The plant separates components, such as ball mill, hammer mill, and rod mill that grinds material, with or without liquid, using a rotating cylinder or conical mill, and using balls, rods, or pebbles as grinding material.

**Millwright.** One who installs, dismantles, or moves machinery and heavy equipment according to layout plans, blueprints, or other drawings [BLS 2010].

**Mine examiner.** A person designated to examine the mine for gas and other dangers usually before but also during the shift. Also known as a fire boss.

**Mobile bridge.** A continuous haulage system commonly consisting of an alternating series of piggyback mobile bridge carriers (MBCs) and chain bridge conveyors. They are either physically attached to the continuous miner or detached and independently trammed behind the miner [MSHA 2011].

**Mucker.** In mining and quarrying, a laborer who shovels ore or rock into mine cars or onto a conveyor from which mine cars are loaded and at some point are removed from the working face or surfaces of natural stone deposits; or one who works in a stope shoveling ore into chutes from which it is loaded into cars on haulage level below.

**Open pit.** A mining operation designed to extract minerals that lie near the surface. Waste, or overburden, is first removed, and the mineral is broken and loaded, as in a stone quarry.

**Outby.** Nearer to the shaft, and therefore away from the face, toward the pit bottom or surface; toward the mine entrance. The opposite of inby.

**Overburden.** Material of any nature, consolidated or unconsolidated, that overlies a deposit of useful materials, ores, or coal, and especially those deposits that are mined from the surface by open cuts.

**Palletizer.** One who secures battens (grooved strips of wood) around bundles of packaged metal extrusions to form protective shipping pallets, using strapping tool [DOT 2003].

**Payloader.** Equipment used for excavating.

**Pelletizing operations worker.** An operator of an apparatus in which finely divided material is formed into small spherical pellets by the use of pressure, centrifugal force, or additives.

**Pit.** A mine, quarry, or excavation worked by the open-cut method.

**Preparation plant.** Any facility where coal, or other mixed material, is prepared for market; through common usage, it has come to mean a rather elaborate collection of facilities where mixed material is separated from its impurities, washed and sized, and loaded for shipment.

**Pug operator/mixer tender.** One who mixes ground preheated magnesia and carbon with hot asphalt in a pug mill to form a viscous mixture suitable for processing into pellets.

**Pumper.** In bituminous coal mining, a person who works a hand pump to force water, accumulated underground in low places, into a drainage ditch flowing to a natural outlet or pumping station.

**Quarry.** An open or surface mineral working, usually used for the extraction of building stone, such as slate, limestone, etc. It is distinguished from a mine because a quarry usually is open at the top and front, and, in ordinary use of the term, by the character of the material extracted.

**Raise borer.** A machine used to produce a circular excavation either between two existing levels in an underground mine or between the surface and an existing level in a mine. In raise boring, a pilot hole is drilled down to the lower level; the drill bit is removed and replaced by a reamer head having a diameter with the same dimension as the desired excavation. This head then is rotated and pulled back up towards the machine.

**Reclaim.** The process of digging from stockpiles; also, the reprocessing of previously rejected material.

**Refuse (pile).** Waste material in the raw coal that has been removed in a cleaning or preparation plant; also called tailings.

**Rock breaker.** A kind of hammer which is used to crush (break) rocks; it is a static piece of equipment; to be operated, it must be attached to another implement [Infomine Inc. 2010].

**Rock duster.** In bituminous coal mining, a laborer who sprinkles rock dust by hand or with a machine throughout mine workings as a precaution against explosions.

**Rolling mill.** A rolling mill or establishment for rolling metal into forms.

**Roof bolter.** In bituminous coal mining, one who reinforces roofs of mine haulage ways, side drifts, and working places with metal or timber to prevent rock and slate falls.

**Rotary excavator.** Earth-moving machine with a vertical wheel that carries digging buckets peripherally. These loosen soil and deliver to a short conveyor loader, the assembly being mounted on crawler track. Capacity up to 5,000 st/h (4,500 t/h). Also called bucket wheel excavator.

**Rotary dump car.** A standard small car in which the car body is mounted on a turntable in the car frame. The car body may be swung by hand to dump over either side or either end.

**Rubber-tired haulage.** The underground use of tractors and dump truck haulage, of the battery or diesel type, and battery-driven shuttle cars.

**Safety director.** One who promotes worksite or product safety by applying knowledge of industrial processes, mechanics, chemistry, psychology, and industrial health and safety laws [BLS 2010].

**Sawyer.** In stonework industry, a general term applied to workers engaged in cutting stone with power-driven saws.

**Scaler (hand or mechanical).** A laborer who knocks the roasted lead ore off grates with a bar as it is dumped from conveyors into cars below, prior to melting, to separate and recover the lead. Lead ore is loaded on grates attached to a conveyor and carried through a furnace in which the sulfur is driven off by roasting.

**Scoop car.** Diesel or battery-powered equipment with a scoop attachment for cleaning up loose material, for loading mine cars or trucks, and hauling supplies.

**Scraper.** a. A rod for cleaning out a shothole prior to charging with explosives. b. A mechanical contrivance used at collieries to scrape the culm or slack along a trough to the place of deposit. c. A machine used in mines for loading cars and transporting ore or waste for short distances. There are two basic types of scraper: (1) the hoe or open type, which is particularly suitable for moving coarse, lumpy ore; and (2) the box or closed type, which is particularly suited for handling fine material, especially on a loading slide. d. A digging, hauling, and grading machine having a cutting edge, a carrying bowl, a movable front wall (apron), and a dumping or ejecting mechanism. Also called carrying scraper or pan. e. An apparatus used to take up coal from the floor of a mine, after it has been shot and deposit it either in cars or in a conveyor [Infomine Inc. 2010].

**Screed.** a. A strip of plaster or wood applied to a surface to be plastered to serve as a guide for making a true surface. b. A wooden strip serving as a guide for making a true level surface on a concrete pavement. c. A board or metal strip dragged across a freshly poured concrete slab to give it its proper level [Dictionary.com 2011].

**Screening machine.** An apparatus having a shaking, oscillatory, or rotary motion, used for screening or sifting coal, stamped ores, and the like.

**Shaft.** An excavation of limited area compared with its depth; made for finding or mining ore or coal, raising water, ore, rock, or coal, hoisting and lowering workers and material, or ventilating underground workings. The term is often specifically applied to an approximate vertical shaft, as distinguished from an incline or inclined shaft. A shaft is provided with a hoisting engine at the top for handling workers, rock, and supplies; or it may be used only in connection with pumping or ventilating operations.

**Shaft mine.** A mine in which the coal seam is reached by a vertical shaft which may vary in depth from less than 100 ft (30 m) to several thousand feet.

**Shearer operator.** In bituminous coal mining, one who operates a type of coal-cutting machine that shears (cuts) out a channel down the sides of the working face of coal (as distinguished from undercutting) prior to blasting the coal down.

**Shooter.** One who sets off blasts in a mine or quarry.

**Shuttle car operator.** One who operates a vehicle on rubber tires or continuous treads to transfer raw materials, such as coal and ore, from loading machines in trackless areas of a mine to the main transportation system.

**Skip tender/cager/station attendant.** One who directs station operations and movement of cages used to raise and lower workers, mine cars, and supplies between various levels and surface; one who works at the top of a shaft or at an intermediate level inside a mine.

**Slurry operator.** In ore dressing, smelting, and refining, a laborer who sprays the inner surfaces of furnace walls and roofs with a slurry of silica, water, and fireclay to protect brick, using a compressed-air gun.

**Splitter.** One who separates blocks of rough dimension stone from quarry mass using jackhammer and wedges [BLS 2010].

**Stope.** An excavation from which ore has been removed in a series of steps. A variation of steps. This term is usually applied to highly inclined or vertical veins.

**Strip.** In mining, to remove the earth, rock, and other material from the mineral to be mined, usually by power shovels. Generally practiced only where the mineral lies close to the Earth's surface.

**Surface shops.** Mining operations do much of their repair work in-house. This work is carried out in shops located on the surface [Vaught 2008].

**Surveyor/transit man.** One who applies special knowledge and techniques gained through experience or training to make surface and underground surveys at a mine, locating himself/herself on the Earth's surface by taking instrument shots of the sun or stars and making necessary calculations, surveying and calculating the volume of material in dumps, carrying survey lines underground by shaft plumbing (cord or wire with attached bob is suspended from the shaft surface) and instrument shots taken on the bob at a shaft station, controlling by underground surveys and calculations, the driving and connection of underground passages on and between various levels, computing the volume of coal in portions of the mine from survey notes, and drafting maps of the mine workings.

**Tailings.** a. The gangue and other refuse material resulting from the washing, concentration, or treatment of ground ore. b. Those portions of washed ore or coal that are regarded as too poor to be treated further. c. Applied to sectional residue, e.g., table tailings, which is the residue from shaking screens and tables. d. The reject from froth flotation cells.

**Tailings machine.** A machine for sifting the tailings and collecting the gold from the detritus after it has passed through the washer.

**Thickener.** The concentration of the solids in a suspension with a view to recovering one fraction with a higher concentration of solids than in the original suspension.

**Tipple.** Originally the place where the mine cars were tipped and emptied of their coal, and still used in that sense, but more generally applied to the surface structures of a mine, including the preparation plant and loading tracks.

**Top operator.** A worker who is employed at surface jobs around the mine plant.

**Tower crane.** A swing-jib (crane with one horizontal boom on which there is a counterweight) or other type of crane mounted on top of a tower, the base of which may sometimes move on rails. These cranes are especially effective in congested sites.

**Tram.** a. A trip of coal cars or a single tramcar. b. Generally, to move a self-propelled piece of equipment other than a locomotive. c. A boxlike wagon of steel, running on a tramway or railway in a mine, for conveying coal or ore.

**Trimmer.** An apparatus for trimming a pile of coal into a regular form (such as a cone or prism).

**Undercutter.** In salt mining, an electrically driven machine somewhat like a gigantic chain saw. It has a long, thin horizontal bar, about which revolves an endless chain with cutting bits. The most common type is an adaptation of the shortwall coal cutter, a drag-type machine with continuous pick-filled chains to cut at the floor or bottom of the seam. It can make a rapid, continuous cut across the entire width of the face.

**Underground mine.** A mine that accesses a coal seam or other mineral through a shaft instead of removing the overburden to expose the seam [Vaught 2008].

**Utility man.** A worker expected to serve in any capacity when called on [Dictionary.com 2011].

**Ventilation.** Mine workings are usually subdivided to form a number of separate ventilating districts. Each district is given a specified supply of fresh air and is free from contamination by the air of other districts. Accordingly, the main intake air is split into the different districts of the mine. Later, the return air from the districts reunites to restore the single main return air current at or near the upcast shaft.

**Wash plant.** The place at which ore, coal, or crushed stone is freed from impurities or dust by washing.

**Washery.** A place at which ore, coal, or crushed stone is freed from impurities or dust by washing. Also called wet separation plant, washing plant, dense-medium washer, or efficiency of separation [Infomine Inc. 2010].

**Weighman.** One who weighs, measures, and checks materials, supplies, and equipment for the purpose of keeping relevant records [BLS 2010].

**Wet plant operator.** A person who works as a member of a crew performing any one or a combination of duties concerned with extracting cadmium, lead sulfate, and zinc oxide from dust recovered in Cottrell precipitators.

**Yard.** An area on the surface where mines store many of their supplies, such as bundles of roof bolts. These supplies are then sent underground or to the surface area of mining when needed [Vaught 2008].