



**Profile of North Dakota's
COAL MINE
and
ELECTRIC POWER PLANT
OPERATING WORK FORCE**

ARLEN LEHOLM, F. LARRY LEISTRITZ
AND JAMES S. WIELAND

Department of Agricultural Economics
North Dakota Agricultural Experiment Station
North Dakota State University
Fargo, North Dakota

FOREWORD

This report is a continuation of research on the economic and social effects of coal development in western North Dakota. The purpose of the report is to provide a profile of the characteristics of the operating work force in North Dakota's coal mines and electric power generating plants. The authors express gratitude to the coal industry employees for completing the questionnaire and to the coal and power company officials for their full cooperation in this endeavor. The study would not have been possible without their cooperation and effort in completing the questionnaire instrument.

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HIGHLIGHTS

This report provides a description of socioeconomic characteristics of the operating work force in North Dakota's coal mines and electric power generating plants. The objectives of the report are: (1) to determine types of employment in North Dakota's coal mines and electric power plants; (2) to identify the socioeconomic characteristics of the existing coal industry work force; (3) to determine employee earnings from present and previous employment, employee tenure, commuting patterns, and locational origin of the work force. An understanding of the characteristics of the current industry work force could provide insights that may help state and local decision makers plan most effectively for labor market and population impacts associated with expanded coal development.

A 58 percent return was obtained from a questionnaire that was administered in June, 1974, to the 416 employees working in four electric generating plants and four coal mines located in western North Dakota.

Results of the study indicate a very stable work force. The employees have lived an average of 22 years in the community in which they now reside and have worked an average of 8.6 years with their present company. Current coal industry workers are more highly paid than the average of the North Dakota labor force with median incomes between \$12,000-\$13,000. The average salary increase between the coal industry workers' ending salary at their previous job and starting salary with their present company was \$2,302. The workers revealed they were quite satisfied with their present employment, indicating a ranking of 4.20 out of a possible 5 points on a likert scaling.

The employees who have worked less than six years with their present company commuted considerably longer distances to work than employees who have worked more than six years with their present company. Nearly half of the employees traveled less than five miles to their location of work, one in five traveled between six to 10 miles, 22 percent traveled between 11 to 20 miles, while only 8 percent over 20 miles to work. A high percentage of the salaries over \$18,000 went to employees whose previous employment was out of state, which may indicate an in-migration of people for top management positions.

Approximately 72 percent of the work force has 12 years or less formal education which indicates the coal industry does not require a highly educated work force. Nine coal industry job classifications were identified in the study. Seven former employment job classifications were identified with common laborer being the previous job classification of one-third of the employees.

More than one-half of the work force resided within the county before they were hired, one-third moved to their present community from another North Dakota county, while nearly one in six moved to the area from out of state.

PROFILE OF NORTH DAKOTA'S COAL MINE AND ELECTRIC
POWER PLANT OPERATING WORK FORCE

by

Arlen G. Leholm, F. Larry Leistritz, and James S. Wieland*

North Dakota's coal resources have recently become a major concern of state and national policy makers as a result of a national energy shortage. An abundance of low-cost energy has been a prime contributor to rapid economic growth in the United States, but low-cost nonpolluting energy is becoming a scarce resource in most states. As a result, lignite reserves located in western North Dakota are expected to play a major role in supplying energy to meet growing national needs. North Dakota's coal industry, relying primarily upon "strip" mining methods, may expand considerably over the remainder of this century. However, the prospect of expanded coal mining and conversion raises complex policy issues regarding natural and human resources.

Significant expansion of the coal industry poses such questions as: (1) Where will North Dakota get the manpower to construct and operate the plants and mines? (2) Will local people be able to fill some of the positions? (3) What skill requirements are necessary to run the plants and mines? (4) Where will the new employees live? This report describes the profile of North Dakota's existing coal mine and power plant operation work force.

Purpose of the Study

This study provides a profile of North Dakota's existing coal mine and electric power plant work force. Knowledge of the existing coal industry labor force characteristics is an essential ingredient in planning for future development. The study was undertaken with the following objectives:

1. To determine types of employment in North Dakota's coal mines and electric power plants.
2. To identify the socioeconomic characteristics of the existing coal industry work force.
3. To determine employee earnings from present and previous employment, employee tenure, commuting patterns, and locational origin of the work force.

An understanding of the characteristics of the current coal industry work force may prove to be beneficial in helping state and local decision makers plan for expanded coal development. Analysis carried out in pursuit of the above three objectives may provide insights into policies that could help state and local decision makers plan more effectively for expanded coal development.

*The authors are respectively--research associate, associate professor, and research assistant in the Department of Agricultural Economics, North Dakota State University, Fargo, North Dakota.

The Study Procedure

In 1974 North Dakota had four major electric power generating plants (electric generating plants with electrical generating capacity of 100 MW or more) and four major coal mines (coal mines with at least one million tons of production per year). Figure 1 illustrates the location of the major power plants and coal mines in North Dakota. A 57.9 percent return was obtained from a survey administered to the 416 employees working in the four major electric power plants and three of the four major coal mines in North Dakota. Power plants with less than 100 MW of electrical generating capacity and coal mines with less than one million tons of production per year were excluded from the study with one exception. Knife River Coal Company's Gascoyne mine, although not then producing over 1,000,000 tons per year, was included because of plans for rapid expansion to fuel the Big Stone Plant in South Dakota. Table 1 shows the power plants and coal mines included in the study, their productive capacity, location, the number of employees in each plant and mine, and the number of employees answering the questionnaire.

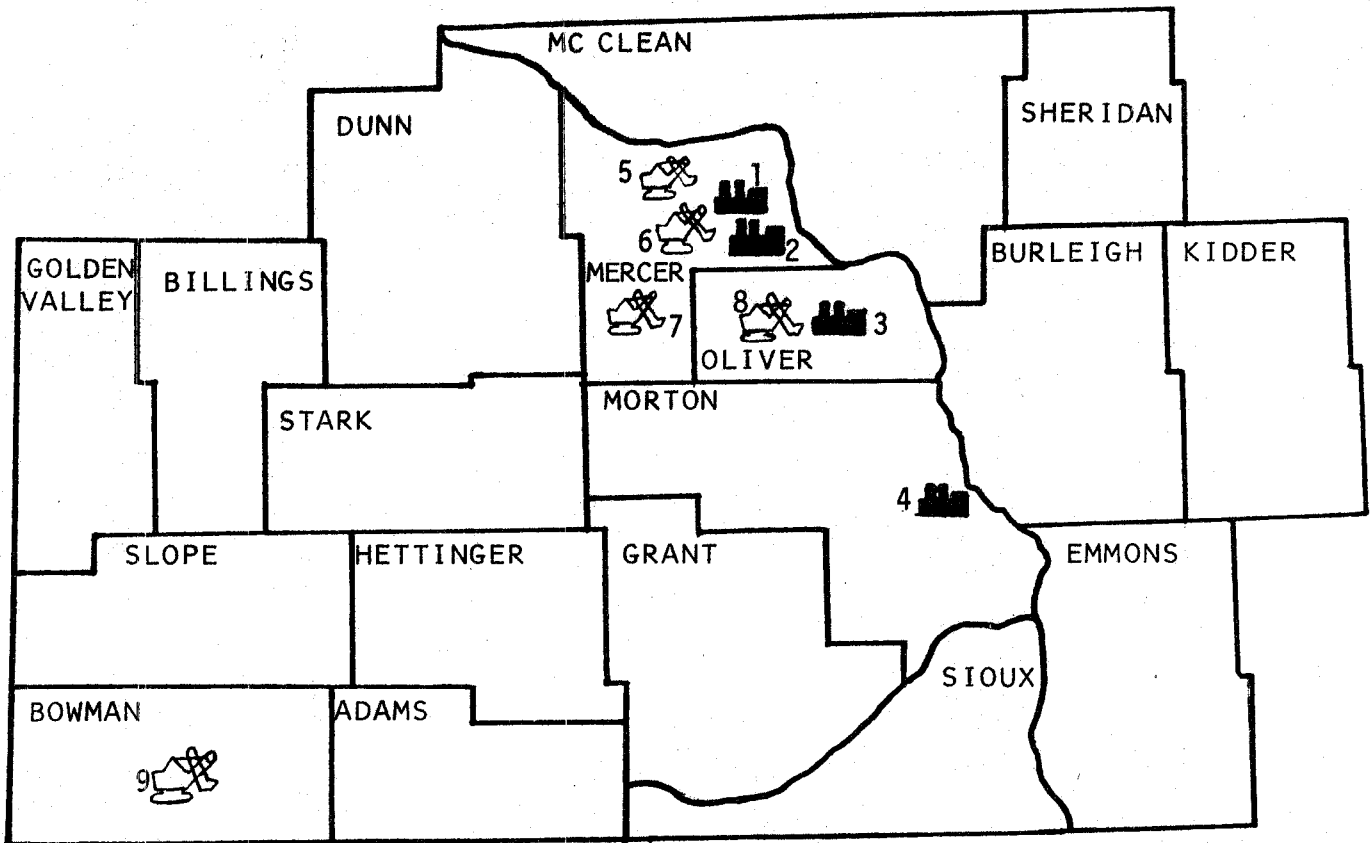
TABLE 1. POWER PLANT AND COAL MINE EMPLOYEES, LOCATION, PRODUCTION, AND EMPLOYEES ANSWERING WORKER PROFILE SURVEY

Power Plant or Coal Mine	Number of Employees ^a	Employees Answering Survey	Production ^b	County Located
R. M. Heskett Plant (Montana Dakota Utilities)	45	20	100 MW	Morton
Leland Olds Plant (Basin Electric Co-op)	47	31	215.7 MW	Mercer
Stanton Plant (United Power Cooperative)	53	24	172 MW	Mercer
Milton R. Young Plant (Minnkota Power Co-op)	42	16	234.6 MW	Oliver
Beulah Mine (Knife River Coal Co.)	69	69	1,585,769 tons	Mercer
Gascoyne Mine (Knife River Coal Co.)	37	37	182,161 tons	Bowman
Glen Harold Mine (Consolidation Coal Co.)	73	14	1,327,314 tons	Mercer
Indianhead Mine (North American Coal Co.)	<u>50</u>	<u>30</u>	1,049,416 tons	Mercer
Total	416	241		

^aNumber of employees in June, 1974.

^bPower plant nameplate capacity and fiscal year 1973 coal production, respectively.

SOURCE: State Coal Mine Inspector, Coal Mine Inspection Department, Biennial Reports, State of North Dakota, Bismarck, 1973.



1. United Power Cooperative	172.0 megawatts
2. Basin Electric Power Cooperative	215.7 megawatts
3. Minnkota Power Cooperative	234.6 megawatts
4. Montana Dakota Utilities	100.0 megawatts
5. North American Coal Co. (Indianhead Mine)	1,049,416 tons
6. Consolidation Coal Co. (Glen Harold Mine)	1,327,314 tons
7. Knife River Coal Co. (Beulah Mine)	1,585,769 tons
8. Baukol-Noonon, Inc. (Center Mine)	1,563,446 tons
9. Knife River Coal Co. (Gascoyne Mine)	182,161 tons

FIGURE 1. MAJOR POWER PLANTS AND LIGNITE MINES IN NORTH DAKOTA, 1974^a

^aCoal production tonnage is for the year 1973.

A questionnaire (Appendix A) was developed in June, 1974, and mailed to the Indianhead Mine employees (North American Coal Corporation) and the R. M. Heskett electric generating station employees (Montana Dakota Utilities). At the other coal mine and power plant sites, the questionnaire was distributed to the employees by a coal mine or power plant supervisor.

Analysis of the coal industry work force relies on tabular and cross-variable analysis and contains the combined analysis of the employees of all eight power plants and coal mines.

This report is more a description of the existing work force than a prediction of worker characteristics in future developments. Inferences may be drawn from the characteristics of the existing work force toward employee characteristics of a greatly expanded work force. However, the reader should be cautioned assuming new employees will have exactly the same characteristics as those of the existing work force. The rate of development may greatly affect worker characteristics. For example, a slow developing industry can absorb more local labor, all other things being equal, than a fast developing industry because labor demand expands with young people entering the job market. Future expansion of North Dakota's coal industry may occur at a faster rate than the historical rate of growth of the industry.

General Socioeconomic Characteristics

The 241 employees who completed the survey administered at the eight electric power plants and coal mines were 99 percent Caucasian; 93 percent were males and their average age was 37 years, with a range in age from 18 to 67 years. Over 87 percent of the employees were married, 12 percent had never been married, and 1 percent were either divorced or widowed. They had an average of 1.8 children living at home, with a range from 0 to 10 children.

More than 86 percent of the 241 respondents were born in North Dakota, 11.6 percent were born in a state other than North Dakota, and nearly 2 percent of the employees were born in a foreign country. Almost 45 percent of the employees lived in a city between 1,000 and 2,500 population, 15.8 percent lived in cities under 500 population, and 13.3 percent lived on farms (Table 2).

TABLE 2. LOCATION OF COAL INDUSTRY EMPLOYEE RESIDENTS IN NORTH DAKOTA, 1974

Type of Residence	Number of Employees	Percent of Total Employees
Farm	32	13.3
Outside the City Limits, but not a Farm	15	6.2
In a City Under 500 Population	38	15.8
In a City Between 500-1,000 Population	27	11.2
In a City Between 1,000-2,500 Population	107	44.4
In a City Between 2,500-5,000 Population	4	1.7
In a City Between 5,000-10,000 Population	0	0.0
In a City Over 10,000 Population	16	6.6
No Answer	2	0.8
Total	241	100.0

The 241 respondents have lived an average of 22 years in the community in which they now live, which may indicate a high percentage of the work force was hired locally. The coal employee population was very stable, over 45 percent of the population have lived at their current address more than 10 years (Table 3). Two-thirds of the employees owned their own house, while another 14.7 percent owned a mobile home. More than 15 percent of the employees rented a house, an apartment, or a mobile home.

Most of the employees who had lived in another community had moved to their present community from another North Dakota county (Table 4).

TABLE 3. NUMBER OF YEARS EMPLOYEES HAVE LIVED AT PRESENT ADDRESS, NORTH DAKOTA, 1974

Number of Years	Number of Employees	Percent of Total
Less than 1 Year	37	15.4
1 to 3 Years	33	13.7
4 to 5 Years	21	8.7
5 to 10 Years	40	16.6
Over 10 Years	109	45.2
No Answer	<u>1</u>	<u>.4</u>
Total	241	100.0

TABLE 4. PREVIOUS RESIDENCE OF COAL INDUSTRY WORK FORCE, NORTH DAKOTA, 1974

Residence	Number of Employees	Percent of Total
Never Have Moved	90	37.3
Within County You Now Reside	35	14.5
From Another North Dakota County	79	32.8
Out of State	35	14.5
Foreign Country	1	.4
No Answer	<u>1</u>	<u>.4</u>
Total	241	100.0

Almost 22 percent of the employees had eight years or less of education, 40.7 percent had 12 years, while almost 27 percent had 13 or more years of education (Table 5). Seventy-five employees indicated they had received some vocational training. The number of months spent at vocational training is illustrated in Table 6. Sixty-five employees indicated the nature of their vocational training (Table 7). Training in electronics, mechanics, and welding accounted for 61.5 percent of the total of those employees with vocational training.

TABLE 5. FORMAL EDUCATION OF COAL INDUSTRY EMPLOYEES, NORTH DAKOTA, 1974^a

Years of Education	Number of Employees	Percent of Total
8 Years or Less	52	21.6
9-11 Years	21	8.7
12 Years	98	40.7
13-15 Years	42	17.4
16 or More Years	23	9.5
No Answer	5	2.1
Total	241	100.0

^aExcludes vocational training beyond high school.

TABLE 6. VOCATIONAL TRAINING OF COAL INDUSTRY EMPLOYEES, NORTH DAKOTA, 1974^a

Months of Training	Number of Employees	Percent of Total
6 Months or Less	16	6.6
7-12 Months	19	7.9
13-18 Months	11	4.6
19-24 Months	8	3.3
25 or More Months	14	5.8
Time Unknown	7	2.9
No Vocational Training	119	49.4
No Answer	47	19.5
Total	241	100.0

^aVocational training does not include on-the-job training.

TABLE 7. TYPE OF VOCATIONAL TRAINING OF COAL INDUSTRY EMPLOYEES, NORTH DAKOTA, 1974^a

Type of Vocational Training	Number of Employees	Percent of Total
Electrical	14	21.5
Mechanic	16	24.6
Welding	10	15.4
Machinist	4	6.3
Secretary	3	4.6
Basic Engineering and Maintenance	5	7.7
Miscellaneous	13	20.0
Total	65	100.0

^aIncludes only those respondents indicating their type of vocational training.

Present Employment Characteristics

The nature of North Dakota's coal industry employment opportunities is described in this section. Job descriptions for the coal industry were condensed into nine categories. Some difficulty was experienced in interpreting job classifications because some jobs were referred to by several names. However, with the help of several coal industry representatives, the authors were able to fit all job descriptions into nine categories. The categories are defined as follows:¹

1. Yard operator or car spotter--one who is employed at the tipple and lines up coal cars for loading and performs other miscellaneous tasks.
2. Dragline or shovel operators and oilers--dragline operator is one who operates an electric dragline or shovel in the removal of overburden in strip mines. A dragline oiler provides maintenance to the dragline and assists the operator.
3. General laborer--one who works at the mine or power plant performing any combination of tasks, such as cleaning working areas, painting, or as a general handyman.
4. Mechanics, welders, carpenters--one who provides a maintenance function on the coal mine or power plant equipment.
5. Electricians, engineers, boiler attendants--one who is skilled in electronics or engineering and works in this capacity at either the coal mine or power plant.
6. Accountants and office personnel--one who performs record keeping, accounting, and general office functions for the coal or power companies.
7. Manager and foremen--one who performs a supervisory or managerial function and is responsible to various degrees for the overall operation of the coal mines or power plants.
8. Dozer operator and truck driver--one who operates power equipment used in the removal of overburden and the reclamation process. One who drives a vehicle used in moving or replacing overburden, coal, or other material.
9. Miscellaneous--one who performs a wide array of tasks. Included in this category are coal shooters (dynamiters), night watchmen, and other miscellaneous workers.

General laborer was the largest job classification with 19.1 percent of the employees, followed by dozer operators and truck drivers with 17 percent, and managers and foremen with 16.6 percent of the work force (Table 8).

¹Information obtained from coal industry personnel and personal judgment was used in developing these categories.

TABLE 8. NORTH DAKOTA COAL INDUSTRY JOB CLASSIFICATION, 1974

Job Classification	Number of Employees	Percent of Total
Yard Operator or Car Spotter	15	6.2
Dragline or Shovel Operator and Dragline Oiler	16	6.7
General Laborer	46	19.1
Mechanics, Welders, Carpenters	29	12.0
Electricians, Engineers, Boiler Attendants	20	8.3
Accountants and Office Personnel	15	6.2
Managers and Foremen	40	16.6
Dozer Operators and Truck Drivers	41	17.0
Miscellaneous	19	7.9
Total	241	100.0

Job Classification

Characteristics of the coal industry work force are discussed by job classification in this section.

Yearly Earnings

Almost 40 percent of the coal industry employees had yearly earnings of \$11,000 to \$12,999 (Table 9). Approximately two-thirds of all coal industry employees had earnings above \$11,000. The dragline operator category had the highest percent (93.3) of its employees with earnings over \$11,000; while the accountant and office personnel category had only 26.7 percent of its employees earning more than \$11,000. The manager and foreman job classification had the highest percent of employees (37.8) earning \$15,000 or more. The miscellaneous job category had 60 percent of its employees earning less than \$6,000. This includes a substantial number of part-time workers. Managers and dragline operators were at the top in terms of yearly earnings; whereas, office personnel and miscellaneous employees had the lowest yearly earnings in the coal industry.

Education and Vocational Training

About 42 percent of all coal employees terminated their formal education after 12 years (Table 10). The manager, electrician and engineer, and the accountant categories had the highest percentage of employees with 16 or more years of education. Mechanics, welders, carpenters, dozer operators, and truck drivers had high percentages of their employees with eight years or less of formal education. Many job classifications in the coal industry do not require a great deal of formal education (Table 10). However, the mechanic, welder, and carpenter category had 82.6 percent of the employees with some vocational training (Table 11). Over 17 percent

TABLE 9. YEARLY EARNINGS OF COAL INDUSTRY EMPLOYEES BY JOB CLASSIFICATION, NORTH DAKOTA, 1974^a

Job Classification	Earning Categories														Total	
	Less Than \$6,000		\$6,000- \$8,999		\$9,000- \$10,999		\$11,000- \$12,999		\$13,000- \$14,999		\$15,000- \$16,999		Over \$17,000			
	No.	% of Row Total	No.	% of Row Total	No.	% of Row Total	No.	% of Row Total	No.	% of Row Total	No.	% of Row Total	No.	% of Row Total	Row Total	Percent
Yard Operator or Coal Spotter	0	0.0	0	0.0	5	41.7	4	33.3	3	25.0	0	0.0	0	0.0	12	5.5
Dragline Operator or Dragline Oiler	0	0.0	0	0.0	1	6.7	5	33.3	8	53.3	1	6.7	0	0.0	15	6.8
General Laborer	4	8.7	6	13.0	19	41.3	16	34.8	1	2.2	0	0.0	0	0.0	46	20.9
Mechanics, Welders, Carpenters Electricians, Engineers, Boiler Attendants	1	3.5	0	0.0	3	10.3	16	55.2	8	27.6	0	0.0	1	3.5	29	13.2
Accountants and Office Personnel	1	5.3	0	0.0	3	15.8	7	36.8	6	31.6	2	10.5	0	0.0	19	8.6
Managers and Foremen	6	40.0	1	6.7	4	26.7	3	20.0	0	0.0	1	6.7	0	0.0	15	6.8
Dozer Operators, Truck Drivers	1	2.7	1	2.7	3	8.1	9	24.3	9	24.3	8	21.6	6	16.2	37	16.8
Miscellaneous	0	0.0	1	2.7	7	18.9	24	64.9	4	10.8	1	2.7	0	0.0	37	16.8
	6	60.0	0	0.0	1	10.0	3	30.0	0	0.0	0	0.0	0	0.0	10	4.6
Total	19	8.7	9	4.1	46	20.9	87	39.6	39	17.7	13	5.9	7	3.2	220	100.0

^aThe "no answers" and "do not know" responses were excluded from the analysis.

TABLE 10. EDUCATION OF COAL INDUSTRY EMPLOYEES BY JOB CLASSIFICATION, NORTH DAKOTA, 1974^a

Job Classification	Years of Education										Total	Percent
	8 Years or Less		9-11 Years		12 Years		13-15 Years		16 or More Years			
	No.	% of Row	No.	% of Row	No.	% of Row	No.	% of Row	No.	% of Row		
Yard Operator and Coal Spotter	3	20.0	6	40.0	5	33.3	1	6.7	0	0.0	15	6.7
Dragline Operator or Dragline Oiler	4	25.0	2	12.5	7	43.8	3	18.8	0	0.0	16	7.1
General Laborer	6	13.3	4	8.9	25	55.6	8	17.8	2	4.4	45	20.1
Mechanics, Welders, Carpenters	10	35.7	1	3.6	11	39.3	5	17.9	1	3.6	28	12.5
Electricians, Engineers, Boiler Attendants	0	0.0	0	0.0	9	45.0	4	20.0	7	35.0	20	8.9
Managers and Foremen	4	10.0	4	10.0	17	42.5	7	17.5	8	20.0	40	17.9
Accountants and Office Personnel	0	0.0	0	0.0	5	33.3	6	40.0	4	26.7	15	6.3
Dozer Operators, Truck Drivers	16	44.4	1	2.8	14	38.9	1	2.8	4	11.1	36	16.1
Miscellaneous	4	44.4	0	0.0	2	22.2	3	33.3	0	0.0	9	4.0
Total	47	21.0	18	8.0	95	42.4	38	17.0	26	11.6	224	100.0

^aThe "no answer" and "do not know" responses were excluded from the analysis.

TABLE 11. VOCATIONAL TRAINING OF COAL INDUSTRY EMPLOYEES BY JOB CLASSIFICATION, NORTH DAKOTA, 1974^a

Job Classification	Months of Vocational Training												No. Voc. Training		Total	
	6 or Less Months		7-12 Months		13-18 Months		19-24 Months		25 or More Months		Time Unknown					
	No.	% of Row Total	No.	% of Row Total	No.	% of Row Total	No.	% of Row Total	No.	% of Row Total	No.	% of Row Total	No.	% of Row Total	Row Total	Percent
Yard Operator and Coal Spotter	1	10.0	1	10.0	1	10.0	0	0.0	0	0.0	0	0.0	7	70.0	10	5.4
Dragline Operator or Dragline Oiler	0	0.0	0	0.0	1	8.3	1	8.3	0	0.0	0	0.0	10	83.3	12	6.4
General Laborer	3	7.9	4	10.5	1	2.6	2	5.3	1	2.6	3	7.9	24	63.2	38	20.3
Mechanics, Welders, Carpenters	6	26.1	3	13.0	4	17.4	2	8.7	4	17.4	0	0.0	4	17.4	23	12.3
Electricians, Engineers, Boiler Attendants	1	5.6	3	16.7	1	5.6	0	0.0	3	16.7	1	5.6	9	50.0	18	9.6
Managers and Foremen	2	6.5	3	9.7	0	0.0	1	3.2	2	6.5	2	6.5	21	67.7	31	16.6
Accountants and Office Personnel	1	7.7	2	15.4	0	0.0	0	0.0	1	7.7	1	7.7	8	61.5	13	6.9
Dozer Operators, Truck Drivers	0	0.0	2	5.6	1	2.8	1	2.8	3	8.3	0	0.0	29	80.6	36	19.3
Miscellaneous	0	0.0	0	0.0	1	16.7	0	0.0	0	0.0	0	0.0	5	83.3	6	3.2
Total	14	7.5	18	9.6	10	5.3	7	3.7	14	7.5	7	3.7	117	62.6	187	100.0

^aThe "no answer" and "do not know" responses were excluded from the analysis.

of the mechanic, welder, and carpenter category employees had 25 or more months of training. There is an apparent tendency for on-the-job training. For example, only 16.7 percent of the dragline operators had vocational training and only 19.4 percent of the dozer operators and truck drivers had vocational training, although for an employee to perform well in these job classifications may require extensive job training.

Age

Approximately 82 percent of all coal industry employees were 47 years of age or younger (Table 12). However, more than 43 percent of the dragline operators were over 48 years of age. This may suggest much experience and knowledge is required to operate a dragline. The managers and foremen category had 30 percent of its employees older than 48 years of age. The electrician and engineer category had the highest percent (63.2) of its employees in the 18 to 27 age category. Many of the electricians and engineers were required to have at least some college training, which may help explain why they were relatively young compared to other employees. The general laborer category had only 4.4 percent of its employees over 48 years of age. The general laborer category may have job requirements requiring very strenuous activity, which may explain the very high percentage of young employees. Also this may be an entry level job from which employees progress to jobs requiring greater knowledge and experience.

Number of Years Employed by Coal Industry Company

About 30 percent of all coal industry employees have worked less than one year with their present company (Table 13). Managers, dozer operators, truck drivers, and dragline operators have a longer tenure with their present company than other job classifications. This suggests a considerable degree of promotion within the company. General laborer category workers had the largest percentage of employees who had been employed less than one year. The North Dakota coal industry has a relatively stable work force with more than one-half of its employees having been employed five years or more with their present company.

Number of Previous Positions With Present Coal Company

One indication of the internal promotion policy of any company is the number of previous positions its employees have had with that company. Dragline operators have held more positions with their present company than any other job classification (Table 14). More than 63 percent of the dragline operators have held four or more positions with their company. Many of the managers and foremen also have held more than one job position with their company before being promoted to their present position. Over 36 percent of the employees in the manager category have held four or more positions with their company. Approximately 44 percent of the total work force surveyed have held no other position, other than their current position with their present company.

TABLE 12. PRESENT AGE OF COAL INDUSTRY EMPLOYEES BY JOB CLASSIFICATION, NORTH DAKOTA, 1974^a

Job Classification	Age Categories										Total	
	18-27		28-37		38-47		48-57		58-67			
	No.	% of Row	No.	% of Row	No.	% of Row	No.	% of Row	No.	% of Row	Total	Percent
Yard Operator and Car Spotter	2	13.3	6	40.0	5	33.3	1	6.7	1	6.7	15	6.4
Dragline Operator or Dragline Oiler	1	6.3	1	6.3	7	43.8	3	18.8	4	25.0	16	6.9
General Laborer	22	47.8	13	28.3	9	19.6	2	4.4	0	0.0	46	19.7
Mechanics, Welders, Carpenters	4	13.3	9	30.0	11	36.7	4	13.3	2	6.7	30	12.9
Electricians, Engineers, Boiler Attendants	12	63.2	3	15.8	4	21.1	0	0.0	0	0.0	19	8.2
Managers and Foremen	6	15.0	11	27.5	11	27.5	7	17.5	5	12.5	40	17.2
Accountants and Office Personnel	9	60.0	3	20.0	2	13.3	1	6.7	0	0.0	15	6.4
Dozer Operators, Truck Drivers	5	12.2	12	29.2	14	34.2	5	12.2	5	12.2	41	17.6
Miscellaneous	5	45.5	1	9.1	2	18.2	2	18.2	1	9.1	11	4.7
Total	66	28.3	59	25.3	65	27.9	25	10.7	18	7.7	233	100.0

^aThe "no answer" and "do not know" responses were excluded from the analysis.

TABLE 13. YEARS WORKED WITH COAL INDUSTRY COMPANY BY JOB CLASSIFICATION, NORTH DAKOTA, 1974^a

Job Classification	Years										Total Row	Total Percent
	1 or Less Year		1-5 Years		5-10 Years		10-20 Years		20-42 Years			
	No.	% of Row Total	No.	% of Row Total	No.	% of Row Total	No.	% of Row Total	No.	% of Row Total		
Yard Operator and Coal Spotter	2	16.7	6	50.0	2	16.7	0	0.0	2	16.7	12	5.3
Dragline Operator or Dragline Oiler	0	0.0	1	6.7	4	26.7	6	40.0	4	26.7	15	6.7
General Laborer	31	67.4	9	19.6	5	10.9	0	0.0	1	2.2	46	20.4
Mechanics, Welders, Carpenters	5	17.2	3	10.3	12	41.4	4	13.8	5	17.2	29	12.9
Electricians, Engineers, Boiler Attendants	9	47.4	5	26.3	2	10.5	3	15.8	0	0.0	19	8.4
Managers and Foremen	5	12.8	4	10.3	17	43.6	4	10.3	9	23.1	39	17.3
Accountants and Office Personnel	9	60.0	1	6.7	3	20.0	1	6.7	1	6.7	15	6.7
Dozer Operators, Truck Drivers	3	7.3	11	26.8	9	22.0	12	29.2	6	14.6	41	18.2
Miscellaneous	<u>3</u>	<u>33.3</u>	<u>3</u>	<u>33.3</u>	<u>1</u>	<u>11.1</u>	<u>1</u>	<u>11.1</u>	<u>1</u>	<u>11.1</u>	<u>9</u>	<u>4.0</u>
Total	67	29.8	43	19.1	55	24.4	31	13.8	29	12.9	225	100.0

^aThe "no answer" and "do not know" responses were excluded from the analysis.

TABLE 1. NUMBER OF PREVIOUS POSITIONS HELD AT PRESENT COAL INDUSTRY COMPANY BY JOB CLASSIFICATION, NORTH DAKOTA, 1974^a

Job Classification	Number of Positions												Total Row	Percent
	1		2		3		4		5		6 or More			
	No.	% of Total	No.	% of Total	No.	% of Total	No.	% of Total	No.	% of Total	No.	% of Total		
Yard Operator and Coal Spotter	1	12.5	7	87.5	0	0.0	0	0.0	0	0.0	0	0.0	8	6.3
Dragline Operator or Dragline Oiler	0	0.0	1	9.1	3	27.3	3	27.3	2	18.2	2	18.2	11	8.6
General Laborer	2	20.0	2	20.0	2	20.0	4	40.0	0	0.0	0	0.0	10	7.8
Mechanics, Welders, Carpenters	1	7.1	3	21.4	5	35.7	3	21.4	1	7.1	1	7.1	14	10.9
Electricians, Engineers, Boiler Attendants	2	14.3	7	50.0	1	7.1	4	28.6	0	0.0	0	0.0	14	1.09
Managers and Foremen	0	0.0	10	30.3	11	33.3	5	15.2	6	18.2	1	3.0	33	25.8
Accountants and Office Personnel	0	0.0	0	0.0	1	100.0	0	0.0	0	0.0	0	0.0	1	1.0
Dozer Operators, Truck Drivers	2	5.9	12	35.3	8	23.5	6	17.7	2	5.9	4	11.8	34	26.6
Miscellaneous	0	0.0	2	66.7	0	0.0	1	33.3	0	0.0	0	0.0	3	2.3
Total	8	6.3	44	34.4	31	24.2	26	20.3	11	8.6	8	6.3	128	100.0

^aThe "no answer" and "do not know" responses were excluded from the analysis.

Job Satisfaction of Coal Industry Employees

The coal industry employees have indicated a high degree of satisfaction with their jobs. Employees were asked to rate their job satisfaction by choosing one of five possible responses: very satisfied, satisfied, so-so, unsatisfied, and very unsatisfied. The manager and electrician categories had the highest percent (45.0) of respondents indicating a job satisfaction rating of very satisfied. Assigning a satisfaction rating of five points to "very satisfied," four points for "satisfied," three points to "so-so," and two points for "unsatisfied"--the average job satisfaction rating was 4.21. No employee indicated he was very unsatisfied with his job.

Distance Commuted to Work

About 72 percent of the work force traveled 10 miles or less to their location of work (Table 16). Only 7.8 percent commuted over 21 miles to their work location. Most coal industry employees reside within a relatively short distance from their place of work. The electrician and engineer job category commuted considerably farther to work than the average of all coal industry employees.

More than 71 percent of the employees commuted to work in their own private car, 24.1 percent commuted by car pool, and 4.6 percent by other means of transportation. The average distance traveled to work was 9.2 miles with a range from less than one mile to just over 100 miles.

Years Resided in Present Community

More than one-half of the coal industry employees have lived in their present community over 20 years (Table 17). Two job classification categories--electricians and engineers, and accountants and office personnel--have a high percentage of employees who have resided less than one year in the community. At least 48 percent of the employees in each other job category had resided over 10 years in the community. With the exception of electricians, engineers, and office personnel, the North Dakota coal industry has obviously recruited many of its employees from the local community.

Previous Residence

Only 14.7 percent of the industry employees had previously resided out of state; however, 30 percent of the electricians and engineers category and 27.5 percent of the manager and foremen personnel were recruited from out of state (Table 18). One-half of the coal industry employees have either never lived at a previous residence or they previously resided within the county of their present residence. With the exception of the manager and electricians and engineers categories, at least 80 percent of the other employees' previous residence was from within the state of North Dakota.

TABLE 15. JOB SATISFACTION OF COAL INDUSTRY EMPLOYEES BY JOB CLASSIFICATION, NORTH DAKOTA, 1974^a

Job Classification	Job Satisfaction											
	Very Satisfied		Satisfied		So-So		Unsatis- fied		Very Un- satisfied		Total	
	% of Row		% of Row		% of Row		% of Row		% of Row		Row	
	No.	Total	No.	Total	No.	Total	No.	Total	No.	Total	Total	Percent
Yard Operator and Coal Spotter	3	33.3	6	66.7	0	0.0	0	0.0	0	0.0	9	4.2
Dragline Operator or Dragline Oiler	3	18.8	13	81.3	0	0.0	0	0.0	0	0.0	16	7.5
General Laborer	11	26.8	30	73.2	0	0.0	0	0.0	0	0.0	41	19.2
Mechanics, Welders, Carpenters	5	20.0	17	68.0	3	12.0	0	0.0	0	0.0	25	11.7
Electricians, Engineers, Boiler Attendants	8	40.0	8	40.0	4	20.0	0	0.0	0	0.0	20	9.4
Managers and Foremen	18	45.0	17	42.5	4	10.0	1	2.5	0	0.0	40	18.7
Accountants and Office Personnel	5	35.7	8	57.1	1	7.1	0	0.0	0	0.0	14	6.5
Dozer Operators, Truck Drivers	14	35.9	19	48.7	6	15.4	0	0.0	0	0.0	39	18.2
Miscellaneous	<u>2</u>	<u>20.0</u>	<u>5</u>	<u>50.0</u>	<u>2</u>	<u>20.0</u>	<u>1</u>	<u>10.0</u>	<u>0</u>	<u>0.0</u>	<u>10</u>	<u>4.7</u>
Total	69	32.2	123	57.5	20	9.4	2	1.0	0	0.0	214	100.0

^aThe "no answer" and "do not know" responses were excluded from the analysis.

TABLE 16. DISTANCE COAL INDUSTRY EMPLOYEES TRAVELED TO WORK BY JOB CLASSIFICATION, NORTH DAKOTA, 1974^a

Job Classification	Miles												Total	
	0-2		3-5		6-10		11-15		16-20		21 & Over			
	No.	% of Row Total	No.	% of Row Total	No.	% of Row Total	No.	% of Row Total	No.	% of Row Total	No.	% of Row Total	Row Total	Percent
Yard Operator and Coal Spotter	1	6.7	4	26.7	6	40.0	3	20.0	1	6.7	0	0.0	15	6.5
Dragline Operator or Dragline Oiler	2	12.5	7	43.8	6	37.5	0	0.0	1	6.3	0	0.0	16	7.0
General Laborer	0	0.0	25	55.6	5	11.1	8	17.8	3	6.7	4	8.9	45	19.6
Mechanics, Welders, Carpenters	4	13.8	8	27.6	8	27.6	2	6.9	4	13.8	3	10.3	29	12.6
Electricians, Engineers, Boiler Attendants	2	10.0	6	30.0	4	20.0	1	5.0	4	20.0	3	15.0	20	8.7
Managers and Foremen	6	15.0	11	27.5	7	17.5	8	20.0	3	7.5	5	12.5	40	17.4
Accountants and Office Personnel	2	13.3	2	13.3	5	33.3	4	26.7	2	13.3	0	0.0	15	6.5
Dozer Operators, Truck Drivers	4	10.0	25	62.5	6	15.0	1	2.5	2	5.0	2	5.0	40	17.4
Miscellaneous	1	10.0	4	40.0	4	40.0	0	0.0	0	0.0	1	10.0	10	4.4
Total	22	9.6	92	40.0	51	22.2	27	11.7	20	8.7	18	7.8	230	100.0

^aThe "no answer" and "do not know" responses were excluded from the analysis.

TABLE 17. NUMBER OF YEARS COAL INDUSTRY EMPLOYEES HAVE LIVED IN THEIR PRESENT COMMUNITY BY JOB CLASSIFICATION, NORTH DAKOTA, 1974^a

Job Classification	Years											
	Less than 1 Year		1-5 Years		6-10 Years		11-20 Years		Over 20 Years		Total	
	% of Row		% of Row		% of Row		% of Row		% of Row		Row	
	No.	Total	No.	Total	No.	Total	No.	Total	No.	Total	Total	Percent
Yard Operator and Coal Spotter	0	0.0	2	14.3	3	21.4	2	14.3	7	50.0	14	6.1
Dragline Operator or Dragline Oiler	0	0.0	0	0.0	0	0.0	3	18.8	13	81.3	16	7.0
General Laborer	0	0.0	5	10.9	5	10.9	8	17.4	28	60.9	46	20.2
Mechanics, Welders, Carpenters	2	6.9	3	10.3	4	13.8	4	13.8	16	55.2	29	12.7
Electricians, Engineers, Boiler Attendants	10	50.0	2	10.0	3	15.0	3	15.0	2	10.0	20	8.8
Managers and Foremen	7	18.9	3	8.1	9	24.3	3	8.1	15	40.5	37	16.2
Accountants and Office Personnel	7	46.7	0	0.0	0	0.0	2	13.3	6	40.0	15	6.6
Dozer Operators, Truck Drivers	2	4.9	4	9.8	4	9.8	5	12.2	26	63.4	41	18.0
Miscellaneous	0	0.0	2	20.0	3	30.0	2	20.0	3	30.0	10	4.4
Total	28	12.3	21	9.2	31	13.6	32	14.0	116	50.9	228	100.0

^aThe "no answer" and "do not know" responses were excluded from the analysis.

TABLE 18. PREVIOUS RESIDENCE OF COAL INDUSTRY EMPLOYEES BY JOB CLASSIFICATION, NORTH DAKOTA, 1974^a

Job Classification	Previous Residence									
	Never Moved		Within County		Another ND County		Out of State		Total	
	% of Row	% of Row	% of Row	% of Row	% of Row	% of Row	% of Row	Total	Percent	
	No.	Total	No.	Total	No.	Total	No.	Total	Total	Percent
Yard Operator and Coal Spotter	7	46.7	0	0.0	5	33.3	3	20.0	15	6.5
Dragline Operator and Dragline Oiler	8	50.0	2	12.5	6	37.5	0	0.0	16	6.9
General Laborer	20	44.4	11	24.4	8	17.8	6	13.3	45	19.5
Mechanics, Welders, Carpenters	9	31.0	1	3.5	16	55.2	3	10.3	29	12.6
Electricians, Engineers, Boiler Attendants	3	15.0	2	10.0	9	45.0	6	30.0	20	8.7
Managers and Foremen	8	20.0	7	17.5	14	35.0	11	27.5	40	17.3
Accountants and Office Personnel	7	46.7	2	13.3	5	33.3	1	6.7	15	6.5
Dozer Operators, Truck Drivers	18	43.9	9	22.0	11	26.8	3	7.3	41	17.8
Miscellaneous	5	50.0	1	10.0	3	30.0	1	10.0	10	4.3
Total	85	36.8	35	15.2	77	33.3	34	14.7	231	100.0

^aThe "no answer" and "do not know" responses were excluded from the analysis.

Earnings

Characteristics of the coal industry work force are discussed, by earning categories, in the following section.

Education

More than 40 percent of the coal industry employees had earnings between \$11,000 and \$12,999 (Table 19). Approximately 28 percent of these employees in the \$11,000 to \$12,999 income category had eight years or less of formal education. Only 17.8 percent of these employees with earnings between \$11,000 and \$12,999 had formal education beyond high school. In general, coal industry earnings appear quite independent of formal education. However, a college education was highly related to incomes above \$17,000. This no doubt reflects top management positions in the coal industry.

Age

Age of the coal industry employees was not highly related to earnings (Table 20). However, a high percent (84.2) of the respondents whose earnings were under \$6,000 were between the ages of 18 to 27. Earnings over \$13,000 were evenly distributed in the age categories above 18 to 27 years.

Job Satisfaction of Coal Industry Employees

A high degree of job satisfaction was expressed by employees regardless of earnings (Table 21). However, no employees with incomes between \$6,000 and \$8,999 indicated they were very satisfied with their employment, while employees with incomes over \$17,000 had a higher percent (62.5) of its employees than all other categories indicating they were very satisfied.

Previous Location of Coal Industry Employees

Only 15 percent of the coal industry employees' previous location of residence was out of state (Table 22). However, 50 percent of those earning over \$17,000 and 38.4 percent of those earning between \$15,000 and \$16,999 were previously located out of state. This seems to indicate an importation of high-level management or technical skills from out of state.

Age

Age of the coal industry workers is discussed in the following section.

TABLE 19. FORMAL EDUCATION OF COAL INDUSTRY EMPLOYEES BY YEARLY EARNINGS, NORTH DAKOTA, 1974^a

Yearly Earnings	Years											Total Row	Total Percent
	8 Years		9-11 Years		12 Years		13-15 Years		16 Years		Total		
	No.	% of Row Total	No.	% of Row Total	No.	% of Row Total	No.	% of Row Total	No.	% of Row Total			
Less than \$6,000	2	11.1	0	0.0	7	38.9	8	44.4	1	5.6	18	8.1	
\$6,000-\$8,999	3	37.5	0	0.0	4	50.0	1	12.5	0	0.0	8	3.6	
\$9,000-\$10,999	5	11.1	4	8.9	21	46.7	8	17.8	7	15.6	45	20.3	
\$11,000-\$12,999	25	27.8	7	7.8	42	46.7	10	11.1	6	6.7	90	40.5	
\$13,000-\$14,999	10	25.0	6	15.0	12	30.0	8	20.0	4	10.0	40	18.0	
\$15,000-\$16,999	1	7.7	0	0.0	8	61.5	3	23.1	1	7.7	13	5.9	
Over \$17,000	1	12.5	0	0.0	0	0.0	3	37.5	4	50.0	8	3.6	
Total	47	21.2	17	7.7	94	42.3	41	18.5	23	10.4	222	100.0	

^aThe "no answer" and "do not know" responses are excluded from the analysis.

TABLE 20. AGE OF COAL INDUSTRY EMPLOYEES BY YEARLY EARNINGS, NORTH DAKOTA, 1974^a

Yearly Earnings	Age										Total Row	Percent
	18-27		28-37		38-47		48-57		58-67			
	No.	% of Total	No.	% of Total	No.	% of Total	No.	% of Total	No.	% of Total		
Less than \$6,000	16	84.2	1	5.3	2	10.5	0	0.0	0	0.0	19	8.4
\$6,000-\$8,999	3	30.0	1	10.0	3	30.0	2	20.0	1	10.0	10	4.4
\$9,000-\$10,999	24	52.2	12	26.1	6	13.0	3	6.5	1	2.2	46	20.3
\$11,000-\$12,999	18	19.4	27	29.0	32	34.4	9	9.7	7	7.5	93	41.0
\$13,000-\$14,999	5	13.2	8	21.1	11	29.0	7	18.4	7	18.4	38	16.7
\$15,000-\$16,999	1	7.7	4	30.8	4	30.8	3	23.1	1	7.7	13	5.7
Over \$17,000	0	0.0	3	37.5	2	25.0	2	25.0	1	12.5	8	3.5
Total	67	29.5	56	24.7	60	26.4	26	11.5	18	7.9	227	100.0

^aThe "no answer" and "do not know" responses were excluded from the analysis.

TABLE 21. SATISFACTION OF COAL INDUSTRY EMPLOYEES BY YEARLY EARNINGS, NORTH DAKOTA, 1974^a

Yearly Earnings	Satisfaction									
	Very Satisfied		Satisfied		So-So		Unsatisfied		Total	
	No.	% of Row Total	No.	% of Row Total	No.	% of Row Total	No.	% of Row Total	Row Total	Percent
Less than \$6,000	6	33.3	10	55.6	1	5.6	1	5.6	18	8.6
\$6,000-\$8,999	0	0.0	7	87.5	1	12.5	0	0.0	8	3.8
\$9,000-\$10,999	13	33.3	24	61.5	2	5.1	0	0.0	39	18.7
\$11,000-\$12,999	26	28.9	53	58.9	11	12.2	0	0.0	90	43.1
\$13,000-\$14,999	11	33.3	17	51.5	4	12.1	1	3.0	33	15.8
\$15,000-\$16,999	5	38.5	7	53.8	1	7.7	0	0.0	13	6.2
Over \$17,000	5	62.5	3	37.5	0	0.0	0	0.0	8	3.8
Total	66	31.6	121	57.9	20	9.6	2	1.0	209	100.0

^aThe "no answer" and "do not know" responses were excluded from the analysis.

TABLE 22. PREVIOUS LOCATION OF COAL INDUSTRY EMPLOYEES BY YEARLY EARNINGS, NORTH DAKOTA, 1974^a

Yearly Earnings	Previous Location											
	Never Moved		Within County		Another ND County		Out of State		Foreign Country		Total	
	No.	% of Row	No.	% of Row	No.	% of Row	No.	% of Row	No.	% of Row	Total	Percent
Less than \$6,000	8	42.1	3	15.8	5	26.3	3	15.8	0	0.0	19	8.4
\$6,000-\$8,999	5	50.0	4	40.0	1	10.0	0	0.0	0	0.0	10	4.4
\$9,000-\$10,999	19	41.3	6	13.0	19	41.3	2	4.4	0	0.0	46	20.3
\$11,000-\$12,999	38	42.2	16	17.8	25	27.8	11	12.2	0	0.0	90	39.8
\$13,000-\$14,999	13	32.5	4	10.0	14	35.0	9	22.5	0	0.0	40	17.7
\$15,000-\$16,999	4	30.8	1	7.7	3	23.1	5	38.4	0	0.0	13	5.8
Over \$17,000	0	0.0	0	0.0	3	37.5	4	50.0	1	12.5	8	3.6
Total	87	38.5	34	15.0	70	31.0	34	15.0	1	0.1	226	100.0

^aThe "no answer" and "do not know" responses were excluded from the analysis.

Marital Status

Nearly 87 percent of the employees in North Dakota's coal industry are married (Table 23). As would be expected, the highest percent (34.3) of employees who had never married was in the youngest age category.

TABLE 23. MARITAL STATUS OF COAL INDUSTRY EMPLOYEES BY AGE, NORTH DAKOTA, 1974^a

Age	Marital Status							
	Married		Never Married		Other		Total	
	No.	% of Row Total	No.	% of Row Total	No.	% of Row Total	Row Total	Percent
18-27	44	65.7	23	34.3	0	0.0	67	28.2
28-37	59	95.2	2	3.2	1	1.6	62	26.1
38-47	62	96.9	2	3.1	0	0.0	64	26.9
48-57	25	96.2	1	3.9	0	0.0	26	10.9
58-67	18	94.7	0	0.0	1	5.3	19	8.0
Total	208	87.4	28	11.8	2	.8	238	100.0

^aThe "no answer" responses were excluded from the analysis.

Formal Education

A very high percent (41.9) of all respondents had 12 years of education (Table 24). Sixty percent of the employees between 48 and 57 years and over 72 percent of the employees between 58 and 67 years had eight years or less of formal education. A higher percentage of employees in the two age categories under 37 years had college training than did employees in the age categories over 37 years.

Distance Commuted to Work

Younger employees commute farther distances to work than the older respondents (Table 25). For example, 26.8 percent of those 18 to 27 years and 21 percent of those between 28 and 37 years commuted 16 or more miles to their location of work. This compares to 11.6 percent between 48 and 57 years and no respondents between the ages 48 and 57 years commuting over 16 miles to work. The present coal industry has only 17.7 percent of its employees commuting more than 16 miles to work.

TABLE 24. FORMAL EDUCATION OF COAL INDUSTRY EMPLOYEES BY AGE, NORTH DAKOTA, 1974^a

Age	Formal Education											Total Row Total	Percent
	8 Years or Less		9-11 Years		12 Years		13-15 Years		16 Years				
	No.	% of Row Total	No.	% of Row Total	No.	% of Row Total	No.	% of Row Total	No.	% of Row Total			
18-27	0	0.0	0	0.0	30	46.2	21	32.3	14	21.5	65	27.8	
28-37	4	6.4	8	12.7	35	55.6	9	14.3	7	11.1	63	26.9	
38-47	19	30.2	10	15.9	26	41.3	7	11.1	1	1.6	63	26.9	
48-57	15	60.0	1	4.0	4	16.0	4	16.0	1	4.0	25	10.7	
58-67	<u>13</u>	<u>72.2</u>	<u>2</u>	<u>11.1</u>	<u>3</u>	<u>16.7</u>	<u>0</u>	<u>0.0</u>	<u>0</u>	<u>0.0</u>	<u>18</u>	<u>7.7</u>	
Total	51	21.8	21	9.0	98	41.9	41	17.5	23	9.8	234	100.0	

^aThe "no answer" and "do not know" responses were excluded from the analysis.

TABLE 25. DISTANCE COAL INDUSTRY EMPLOYEES TRAVELED TO WORK BY AGE, NORTH DAKOTA, 1974^a

Age	Miles												Total Row	Percent
	0-2		3-5		6-10		11-15		16-20		21-Over			
	No.	% of Total	No.	% of Total	No.	% of Total	No.	% of Total	No.	% of Total	No.	% of Total		
18-27	2	3.0	19	28.4	17	25.4	11	16.4	9	13.4	9	13.4	67	28.3
28-37	4	6.5	23	37.1	13	21.0	9	14.5	7	11.3	6	9.7	62	26.2
38-47	8	12.5	31	48.4	11	17.2	6	9.4	6	9.4	2	3.1	64	27.0
48-57	4	15.4	9	34.6	7	26.9	3	11.5	1	3.9	2	7.7	26	11.0
58-67	3	16.7	11	61.1	3	16.7	1	5.6	0	0.0	0	0.0	18	7.6
Total	21	8.9	93	39.2	51	21.5	30	12.7	23	9.7	19	8.0	237	100.0

^aThe "no answer" and "do not know" responses were excluded from the analysis.

Job Satisfaction

The coal industry employees expressed a high degree of satisfaction with their employment (Table 26). Respondents 28 to 37 years old had 20.3 percent of its employees indicating a "so-so" rating of job satisfaction. All other age categories had no more than 12 percent of its employees who did not indicate their job satisfaction as either "satisfied" or "very satisfied."

Education

Education of the coal industry employees is discussed in this section.

Job Tenure

Employees who have worked less than five years with their present company are characterized by much higher levels of formal education than longer tenured employees (Table 27). Much of this is due to age alone, with the older employees having less formal education. Nearly 70 percent of the employees with 16 years or more of formal education have worked less than one year for their present company; whereas, 60.8 percent of the employees that have worked 11 years or more for their present company have less than eight years of education.

Job Satisfaction

The categories with 12 years of education and eight years or less education had fewer employees with a "very satisfied" rating than the other education categories (Table 28). However, employees, as a whole, in all education categories expressed a high degree of satisfaction with their employment.

Job Satisfaction

The job satisfaction of the coal industry employees is discussed in this section.

Place of Birth

Employees who were born out of state expressed a higher degree of satisfaction with their employment than employees that were born in North Dakota (Table 29). Assigning a ranking of five to a "very satisfied" job rating, four for "satisfied," three for "so-so," and two for "unsatisfied,"

TABLE 26. SATISFACTION OF COAL INDUSTRY EMPLOYEES BY AGE, NORTH DAKOTA, 1974^a

Age	Job Satisfaction									
	Very Satisfied		Satisfied		So-So		Unsatisfied		Total	
	No.	% of Row Total	No.	% of Row Total	No.	% of Row Total	No.	% of Row Total	Row Total	Percent
18-27	24	38.1	34	54.0	4	6.4	1	1.6	63	28.1
28-37	17	28.8	29	49.2	12	20.3	1	1.7	59	26.3
38-47	13	23.2	38	67.9	5	8.9	0	0.0	56	25.0
48-57	12	44.4	13	48.2	2	7.4	0	0.0	27	12.1
58-67	7	36.8	10	52.6	2	10.5	0	0.0	19	8.5
Total	73	32.6	124	55.4	25	11.2	2	0.9	224	100.0

^aThe "no answer" and "do not know" responses were excluded from the analysis.

TABLE 27. YEARS WORKED WITH COAL INDUSTRY COMPANY BY FORMAL EDUCATION, NORTH DAKOTA, 1974^a

Formal Education	Years										Total	
	1 or Less		1-5		6-10		11-20		20 and Over		Total Row	Percent
	No.	% of Row Total	No.	% of Row Total	No.	% of Row Total	No.	% of Row Total	No.	% of Row Total		
8 Years	1	2.0	5	9.8	14	27.5	13	25.5	18	35.3	51	22.1
9-11 Years	3	15.8	5	26.3	4	21.1	4	21.1	3	15.8	19	8.2
12 Years	27	28.1	22	22.9	33	34.4	9	9.4	5	5.2	96	41.6
13-15 Years	19	45.2	9	21.4	9	21.4	3	7.1	2	4.8	42	18.2
16 Years	16	69.6	3	13.0	2	8.7	2	8.7	0	0.0	23	10.0
Total	66	28.6	44	19.0	62	26.8	31	13.4	28	12.1	231	100.0

^aThe "no answers" and "do not know" responses were excluded from the analysis.

TABLE 28. SATISFACTION OF COAL INDUSTRY EMPLOYEES BY FORMAL EDUCATION, NORTH DAKOTA, 1974^a

Formal Education	Job Satisfaction									
	Very Satisfied		Satisfied		So-So		Unsatisfied		Total	
	No.	% of Row Total	No.	% of Row Total	No.	% of Row Total	No.	% of Row Total	Row Total	Percent
8 Years or Less	15	29.4	33	64.7	3	5.9	0	0.0	51	23.5
9-11 Years	8	47.1	8	47.1	1	5.9	0	0.0	17	7.8
12 Years	23	25.6	53	58.9	12	13.3	2	2.2	90	41.5
13-15 Years	15	41.7	17	47.2	4	11.1	0	0.0	36	16.6
16 or More Years	11	47.8	10	43.5	2	8.7	0	0.0	23	10.6
Total	72	33.2	121	55.8	22	10.1	2	0.9	217	100.0

^aThe "no answers" and "do not know" responses were excluded from the analysis.

TABLE 29. SATISFACTION OF COAL INDUSTRY EMPLOYEES BY PLACE OF BIRTH, NORTH DAKOTA, 1974^a

Place of Birth	Job Satisfaction									
	Very Satisfied		Satisfied		So-So		Unsatisfied ^a		Total	
	No.	% of Row Total	No.	% of Row Total	No.	% of Row Total	No.	% of Row Total	Row Total	Percent
North Dakota	58	30.4	111	58.1	20	10.5	2	1.0	191	86.4
Out of State	11	42.3	13	50.0	2	7.7	0	0.0	26	11.8
Foreign Country	3	75.0	0	0.0	1	25.0	0	0.0	4	1.8
Total	72	32.6	124	56.1	23	10.4	2	0.9	221	100.0

^aThe "no answers" and "do not know" responses were excluded from the analysis.

the employees born out of state had a job satisfaction rating of 4.35 out of a possible five points. This compares to a job satisfaction rating of 4.12 out of a possible five points for employees born in North Dakota.

Years Resided in Present Community

Over 61 percent of the employees who had resided in their present community less than one year were "very satisfied" with their employment (Table 30). This is a substantially higher job satisfaction rating (a 4.53 out of a possible 5 points) than employees who have resided a longer period of time in the community. Employees who have resided in their present community between one to five years had the lowest job satisfaction rating (a 3.66 out of a possible 5 points) of all length of community residence categories. Those employees who have resided less than one year in their community are characterized by more formal education and more technical positions than employees who have resided a longer time in the community.

Distance Commuted to Work

Years Worked With Company

An inverse relationship between the number of miles the coal employees traveled to work and job tenure with their present company was found (Table 31). Those employees who have worked less than one year for their present company commuted substantially farther to work than employees with 20 years or more of job tenure. Employees with shorter job tenure apparently prefer to live in a larger city and commute greater distances to work than employees with over 20 years of job tenure. However, a greater percentage of employees with over 20 years of job tenure may have been hired from the local labor force.

Previous Employment Characteristics

One hundred ninety-four of the 241 coal industry employees that responded to the questionnaire had worked for another employer. The previous job classification types of the coal industry employees are shown in Table 32. General laborer was the previous employment of 33 percent of the employees. Another 21.1 percent were equipment operators; while 17 percent were mechanics, welders, and carpenters, and an additional 15 percent of the employees' previous employment was office or management related. More than 18 percent of the employees' previous employment was out of state and 2.5 percent was in a foreign country. The present coal industry employees worked an average of four years for their previous employer and they traveled an average of 18.8 miles to work. A higher salary and better working conditions were the reasons given by over 50 percent of the present employees for leaving their previous employer.

TABLE 30. JOB SATISFACTION OF COAL INDUSTRY EMPLOYEES BY YEARS LIVED IN PRESENT COMMUNITY, NORTH DAKOTA, 1974^a

Years	Job Satisfaction									
	Very Satisfied		Satisfied		So-So		Unsatisfied		Total	
	No.	% of Row Total	No.	% of Row Total	No.	% of Row Total	No.	% of Row Total	Row Total	Percent
Less than 1 Year	16	61.5	8	30.8	2	7.7	0	0.0	26	11.8
1-5 Years	2	11.1	9	50.0	6	33.3	1	5.6	18	8.2
6-10 Years	11	35.5	15	48.4	4	12.9	1	3.2	31	14.1
10-20 Years	8	24.2	22	66.7	3	9.1	0	0.0	33	15.0
Over 20 Years	35	31.3	69	61.6	8	7.1	0	0.0	112	50.9
Total	72	32.7	123	55.9	23	10.5	2	0.9	220	100.0

^aThe "no answers" and "do not know" responses were excluded from the analysis.

TABLE 31. YEARS WORKED WITH COAL INDUSTRY COMPANY BY DISTANCE TRAVELED TO WORK, NORTH DAKOTA, 1974^a

Distance Traveled	Years										Total	
	1 or Less		1-5		6-10		11-20		20 & Over			
	No.	% of Row Total	No.	% of Row Total	No.	% of Row Total	No.	% of Row Total	No.	% of Row Total	Row Total	Percent
0-2 Miles	1	4.5	3	13.6	5	22.7	4	18.2	9	40.9	22	9.4
3-5 Miles	21	23.6	10	11.2	22	24.7	24	27.0	12	13.5	89	38.2
6-10 Miles	16	32.0	19	38.0	6	12.0	3	6.0	6	12.0	50	21.5
11-15 Miles	10	33.3	3	10.0	15	50.0	0	0.0	2	6.7	30	12.9
16-20 Miles	11	47.8	4	17.4	7	30.4	0	0.0	1	4.3	23	9.9
21 and Over	7	36.8	5	26.3	7	36.8	0	0.0	0	0.0	19	8.2
Total	66	28.3	44	18.9	62	26.6	31	13.3	30	12.9	233	100.0

^aThe "no answers" and "do not know" responses were excluded from the analysis.

TABLE 32. PREVIOUS JOB CLASSIFICATION OF COAL INDUSTRY EMPLOYEES, NORTH DAKOTA, 1974^a

Job Classification	Number of Employees	Percent of Total
General Laborers	64	33.0
Electricians and Engineers	12	6.2
Office and Management Personnel	29	15.0
Mechanics, Welders, and Carpenters	33	17.0
Equipment Operators	41	21.1
Farmers	7	3.6
Miscellaneous	8	4.1
Total	194	100.0

^aForty-four employees have had no previous employment and three employees failed to answer if they had previous employment.

Earnings at Last Job

Yearly earnings of the coal industry employees are shown by their previous job classification in Table 33. More than 82 percent of the employees' earnings were under \$9,000 at the time they left their previous employment. Over 71 percent of the employees whose previous employment was farming had yearly earnings under \$6,000 and all had incomes under \$9,000. The average salary differential between the ending salary of the previous employment and the starting salary of the present employment was \$2,302. Approximately 92 percent of the employees received a net pay increase, while 8 percent had a net pay decrease.

Comparison of Coal Mine and Power Plant Employees

The coal mine and power plant employees have many similar socioeconomic characteristics. However, there are some notable differences in their work force profiles. Approximately 49 percent (91 employees) of the power plant work force and almost 66 percent (150 employees) of the coal mine work force responded to the survey questionnaire. The age of the coal mine and power plant workers averaged 37.1 years and 36.2 years, respectively. The power plant workers had an average of 2.1 children living at home compared to 1.6 children for the coal mine employees. The coal mine employees have lived an average of 7.7 years longer in their present community than the power plant workers, and have worked 9.1 years with their present company compared to 8.0 years for the power plant employees. However, the power plant employees had worked an average of 10 months longer for their previous employer.

Virtually the same percentage of employees in the coal mine and power plant work forces are married. Approximately 87 percent of the two work forces were born in North Dakota. A higher percentage of the coal mine workers (44.3 percent compared to 26.4 percent of the power plant employees) have always lived in the community where they currently reside. There were no

TABLE 33. PREVIOUS YEARLY EARNINGS OF PRESENT COAL INDUSTRY EMPLOYEES BY PREVIOUS JOB CLASSIFICATION, NORTH DAKOTA, 1974^a

Previous Job Classification	Less than \$6,000		\$6,000-\$8,999		\$9,000-\$10,999		\$11,000-\$12,999		\$13,000-\$14,999		\$15,000-\$16,999		Total	
	% of Row		% of Row		% of Row		% of Row		% of Row		% of Row		Total	
	No.	Total	No.	Total	No.	Total	No.	Total	No.	Total	No.	Total	Total	Percent
General Laborer	34	54.8	19	30.6	6	9.7	0	0.0	2	3.2	1	1.6	62	33.5
Electricians and Engineers	1	9.1	5	45.5	3	27.3	2	18.2	0	0.0	0	0.0	11	5.9
Office and Management Personnel	6	22.2	15	55.6	3	11.1	0	0.0	3	11.1	0	0.0	27	14.6
Mechanics, Welders, and Carpenters	12	40.0	15	50.0	2	6.7	1	3.3	0	0.0	0	0.0	30	16.2
Equipment Operators	17	42.5	14	35.0	6	15.0	3	7.5	0	0.0	0	0.0	40	21.6
Farmers	5	71.4	2	28.6	0	0.0	0	0.0	0	0.0	0	0.0	7	3.8
Miscellaneous	6	75.0	2	25.0	0	0.0	0	0.0	0	0.0	0	0.0	8	4.3
Total	81	43.8	72	38.9	20	10.8	6	3.2	5	2.7	1	0.5	185	100.0

^aThe "no answers" and "do not know" responses were excluded from the analysis.

appreciable differences in type of home ownership between the two work forces; however, a greater percentage of the coal mine employees have resided 10 years or more at their present address.

Power plant employees have more formal education and a higher percentage of these employees have some vocational training. More than 32 percent of the power plant employees had 13 or more years of formal education, while 24.8 percent of the coal industry employees had 13 or more years of formal education. However, over 28 percent of the coal mine employees had eight years or less of formal education compared to 11.5 percent for the power plant employees.

The power plant work force has a higher percentage of its work force in management and in the electrician and engineer job categories than the coal mine work force (Table 34). The coal mine work force has a greater percentage of its employees in the dragline and shovel operator category and dozer operator job category. The coal mine employees have held an average of three positions and the power plant employees have held an average of 3.5 positions with their present company.

TABLE 34. JOB CLASSIFICATION OF POWER PLANT AND COAL MINE EMPLOYEES, NORTH DAKOTA, 1974

Job Classification	Coal Mine		Power Plant	
	Number	Percent	Number	Percent
Yard Operator or Car Spotter	5	3.3	10	11.0
Dragline or Shovel Operator and Dragline Oiler	15	10.0	1	1.1
General Laborer	29	19.3	17	18.7
Mechanics, Welders, and Carpenters	17	11.3	12	13.2
Electricians, Engineers, Boiler Attendants	9	6.0	11	12.1
Accountants and Office Personnel	10	6.7	5	5.5
Managers and Foremen	17	11.3	23	25.3
Dozer Operators and Truck Drivers	37	24.7	4	4.4
Miscellaneous	11	7.3	8	8.8
Total	150	99.9	91	100.1

The salary increase between the coal industry employees starting salary with their present company and ending salary with their previous employer averaged \$2,540 for the coal mine employees and \$1,803 for the power plant employees. The median income for the power plant employees was between \$11,000 and \$12,000; whereas, the median income of the coal mine employees was between \$12,000 and \$13,000. Almost 72 percent of the coal mine employees earned over \$11,000, while 59 percent of the power plant employees earned over \$11,000 per year. Comparing the job satisfaction

rating on a five-point scale, the average was 4.27 for coal mine employees, while the average for power plant employees was 4.06.

The two work forces differ in means of travel to work. Over 50 percent of the power plant employees commuted to work by use of a car pool, while only 8 percent of the coal mine employees used a car pool. The power plant employees averaged 12.6 miles to work and the coal mine employees averaged 7.1 miles to work.

Eighty-two percent of the coal mine workers and 85.1 percent of the power plant employees had worked for another employer. General laborer was the previous job classification of 30.9 percent and 36.6 percent of the coal mine and power plant work forces, respectively.

Implications of the Study

This profile of North Dakota's coal industry work force provides information that may prove to be beneficial to coal industry officials and state and local level decision makers. An abundance of low-cost nonpolluting energy is becoming a scarce resource in the United States. As a result, the lignite reserves located in western North Dakota are expected to play a major role in supplying energy to meet growing national demands. The future for the coal industry in North Dakota may call for massive expansion of coal conversion plants and accompanying mines to meet the challenge of supplying energy for the nation's growing energy demands. Significant expansion of the coal industry poses such questions as: (1) Where will we get the manpower to construct and operate the plants and mines? (2) Can local people fill some of the positions? (3) What skill requirements are required to run the plants and mines? (4) Where will the new employees live?

This study of the current coal industry work force indicates the coal industry does not require a work force with a high level of formal education. Furthermore, many of the current employees received on-the-job training and a considerable degree of internal promotion to the very skilled jobs (such as dragline operators) is possible. It is quite likely a rural labor force, with basic mechanical skills acquired from a farm background, would make good recruits for manpower expansion in the coal industry.

Analysis of the characteristics of the current work force that has been employed five years or less with their present company may provide some indication of the characteristics of the work force that will be required to meet the expansion of the coal industry. These employees are characterized by a much higher level of formal education than longer tenured employees and commute substantially longer distances to work. Much of the education difference between recent employees and longer tenured employees may be due to age alone. Employees with shorter job tenure apparently prefer to live in a larger city and commute greater distances to work than employees with longer job tenure.

Expansion of the coal industry may provide employment opportunities for the rural labor force. The industry does not require a highly formally trained work force. Many of the jobs are skilled positions, but vocational training in electronics, mechanics, welding, and similar skills will enhance job opportunities for local people. There will also be a large increase in employment created indirectly as a result of expanded coal development. This secondary employment includes trade and service jobs to meet the needs of the coal industry work force and their families. Employment opportunities also will be created in areas of reclamation and economic and community planning to meet the challenge of an expanding population associated with expanded coal development.

APPENDIX A

ELECTRIC POWER PLANT AND COAL MINE WORK FORCE QUESTIONNAIRE

Electric Power Plant and Coal
Mine Work Force Questionnaire

DO NOT WRITE YOUR NAME ON THIS QUESTIONNAIRE. YOUR RESPONSES WILL REMAIN ANONYMOUS.

Directions: Please read and answer each of the following questions with the answer which best describes your situation. Fill in the blank or check the appropriate response.

1. Name of power plant or coal mine at which you work _____
2. Name of county in which you live _____
3. Sex: Male Female
4. Your age: _____ Years
5. Race: White Negro Other
 Indian Spanish American
6. Marital status: Married Separated Never married
 Divorced Widowed
7. Number of children living at home: _____
8. Where were you born?
 North Dakota
 Out of state
 Foreign country
9. Where do you live?
 On a farm. If a farm, how many acres? _____ Acres
 Outside the city limits, but not on a farm
 In a city under 500 population
 In a city between 500-1,000 population
 In a city between 1,000-2,500 population
 In a city between 2,500-5,000 population
 In a city between 5,000-10,000 population
 In a city over 10,000 population
10. How long have you lived in this community? _____ Years

11. How long have you lived at your present address?

- Under 1 year 5-10 years
 1-3 years Over 10 years
 4-5 years

12. Do you own or rent a home? Own Rent

- | | | |
|--------------------------------|-------|-------|
| House----- | _____ | _____ |
| Apartment----- | _____ | _____ |
| Trailer home----- | _____ | _____ |
| Condominium or town house----- | _____ | _____ |
| Other----- | _____ | _____ |

13. From where did you move to this community?

- Never have moved
 Within the county you now reside
 From another North Dakota county. Name of county _____
 Out of state. Name of state _____
 Foreign country. Name of foreign country _____
 Other

14. Formal education (exclude vocational training beyond high school):

- 8 years or less 13-15 years
 9-11 years 16 or more years
 12 years

15. Vocational training (months):

- 6 or less months 25 or more months
 7-12 months Time unknown
 13-18 months No vocational training
 19-24 months

16. Type of vocational training, if any _____

NOW WE WOULD LIKE TO ASK SOME QUESTIONS ABOUT YOUR PRESENT EMPLOYMENT.

17. Job title of your present job _____

18. Have you held more than one position with the company you are currently working for? Yes. If yes, how many positions? _____
 No

19. How long have you worked with the company by which you are presently employed? _____ Years

20. Have you been unemployed at any time during the past 12 months?
 Yes No

21. Yearly earnings at your present job:

<input type="checkbox"/> Less than \$5,000	<input type="checkbox"/> \$10,000-\$10,999	<input type="checkbox"/> \$16,000-\$16,999
<input type="checkbox"/> \$5,000-\$5,999	<input type="checkbox"/> \$11,000-\$11,999	<input type="checkbox"/> \$17,000-\$17,999
<input type="checkbox"/> \$6,000-\$6,999	<input type="checkbox"/> \$12,000-\$12,999	<input type="checkbox"/> \$18,000-\$18,999
<input type="checkbox"/> \$7,000-\$7,999	<input type="checkbox"/> \$13,000-\$13,999	<input type="checkbox"/> \$19,000-\$19,999
<input type="checkbox"/> \$8,000-\$8,999	<input type="checkbox"/> \$14,000-\$14,999	<input type="checkbox"/> Over \$20,000
<input type="checkbox"/> \$9,000-\$9,999	<input type="checkbox"/> \$15,000-\$15,999	

22. How far do you travel (one-way) to get to work? _____ Miles

23. By what means of transportation do you travel to work?

Privately owned car Walk
 Car pool Other
 Public transportation

24. How satisfied are you with your present job?

Very satisfied
 Satisfied
 So-so
 Unsatisfied
 Very unsatisfied

THE NEXT FEW QUESTIONS CONCERN YOUR LAST EMPLOYMENT BEFORE WORKING FOR YOUR PRESENT EMPLOYER.

25. I have never worked for another employer
26. Name of company where you were last employed _____
27. Job title of your last job _____
28. Location of work:
- Within same county you now reside
- In another North Dakota county
- In another state
- Other
29. Total years of employment with previous employer? _____ Years
30. How far did you travel to work in your last job? _____ Miles
31. Reason for leaving your past employment _____
-
32. Yearly earnings of last job at time of leaving:
- | | | |
|--|--|--|
| <input type="checkbox"/> Less than \$5,000 | <input type="checkbox"/> \$10,000-\$10,999 | <input type="checkbox"/> \$16,000-\$16,999 |
| <input type="checkbox"/> \$5,000-\$5,999 | <input type="checkbox"/> \$11,000-\$11,999 | <input type="checkbox"/> \$17,000-\$17,999 |
| <input type="checkbox"/> \$6,000-\$6,999 | <input type="checkbox"/> \$12,000-\$12,999 | <input type="checkbox"/> \$18,000-\$18,999 |
| <input type="checkbox"/> \$7,000-\$7,999 | <input type="checkbox"/> \$13,000-\$13,999 | <input type="checkbox"/> \$19,000-\$19,999 |
| <input type="checkbox"/> \$8,000-\$8,999 | <input type="checkbox"/> \$14,000-\$14,999 | <input type="checkbox"/> Over \$20,000 |
| <input type="checkbox"/> \$9,000-\$9,999 | <input type="checkbox"/> \$15,000-\$15,999 | |
33. What was the difference between your yearly earnings at your last job and your starting salary with your present energy-related company?
- \$ _____

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