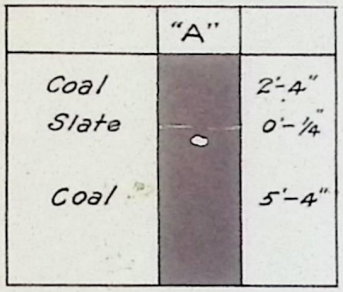
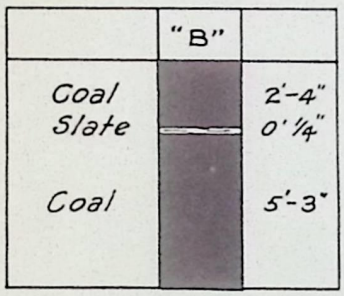
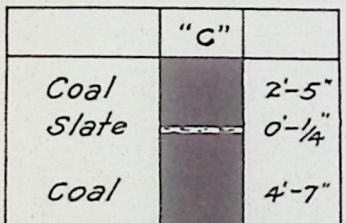
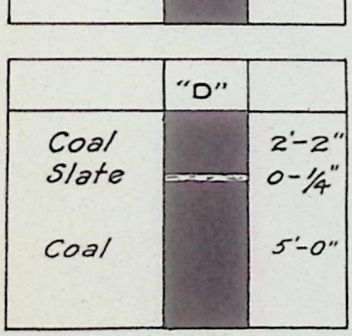
SHEET OF DIAGRAMS
OF
Nos 8 & 10 MINES
AT
ROCK SPRINGS WYOMING

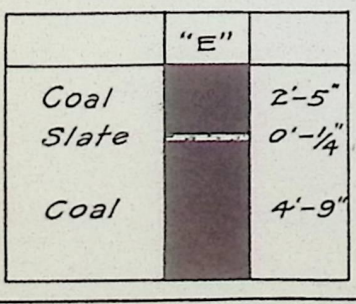
No 8 MINE

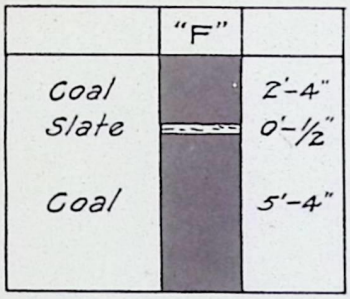


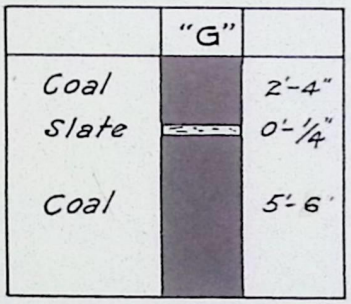


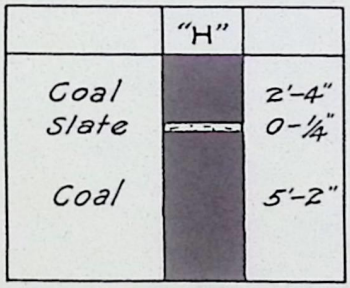


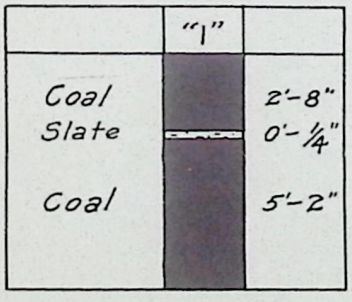


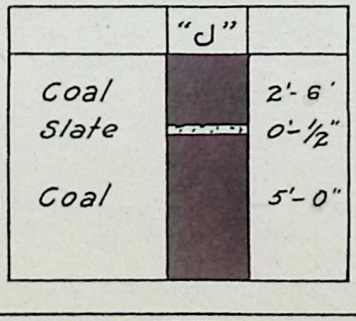


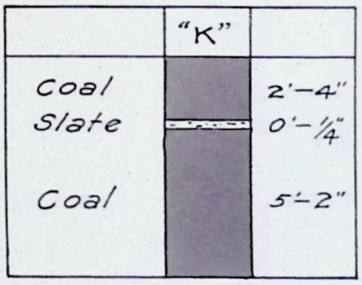


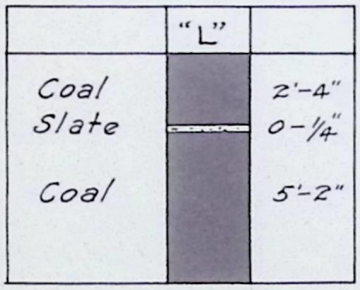


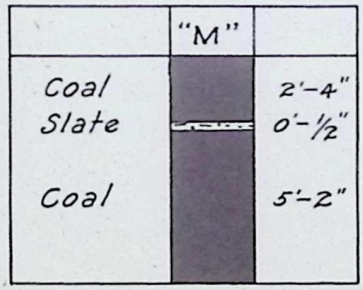


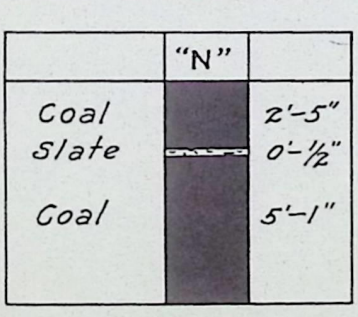


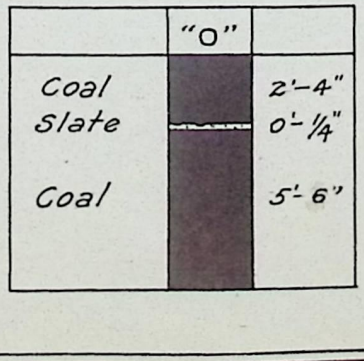


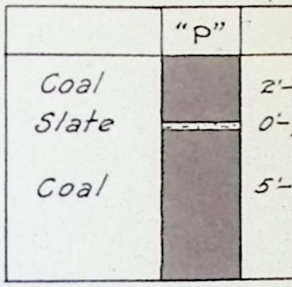




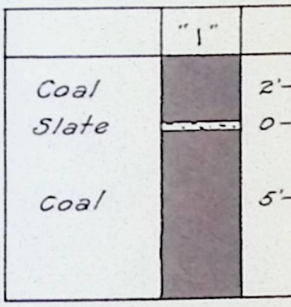


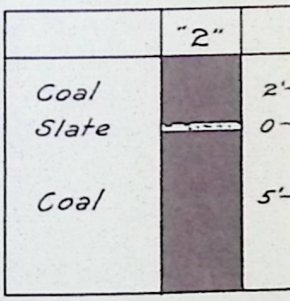


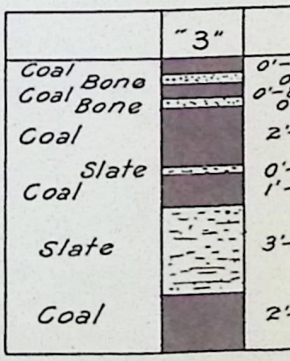


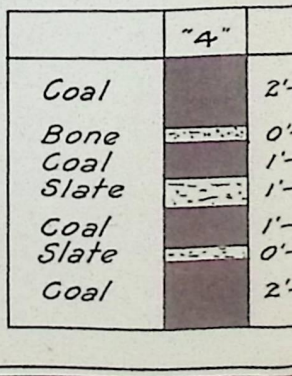


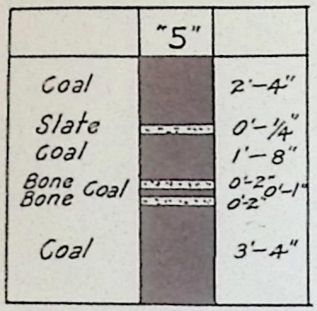
No 10 MINE

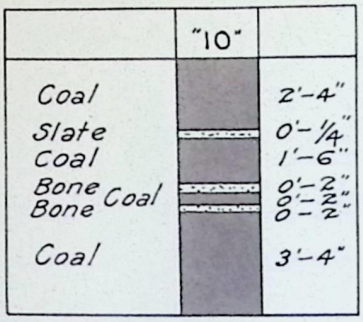


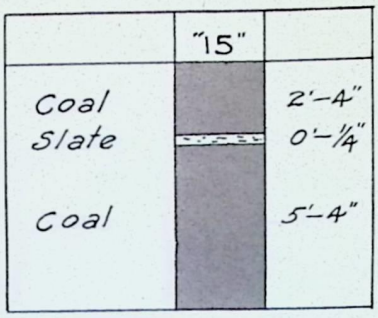


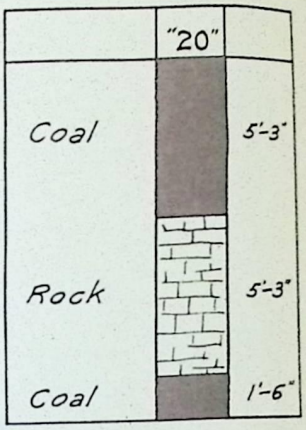


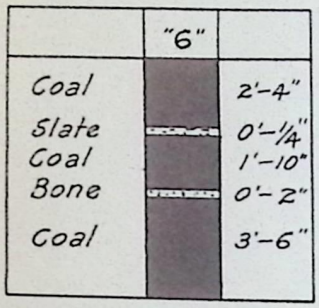


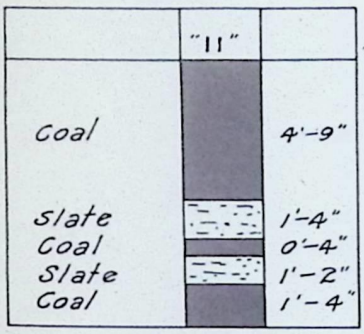


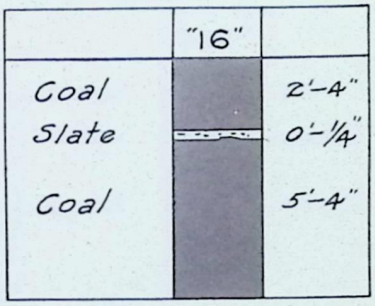


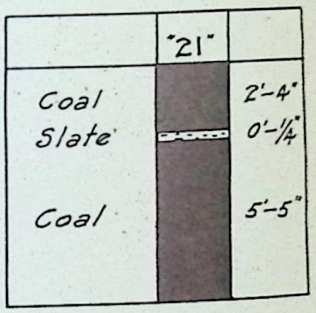


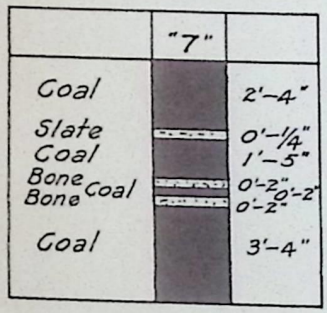


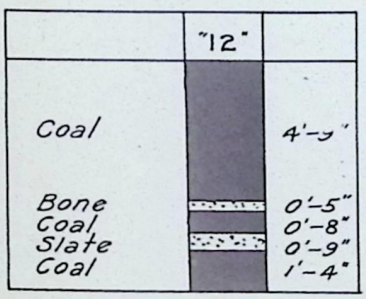


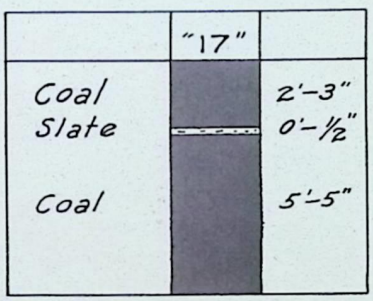


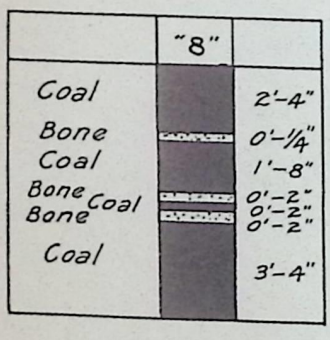


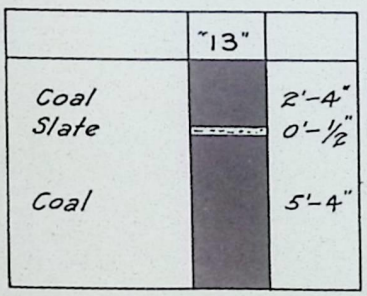


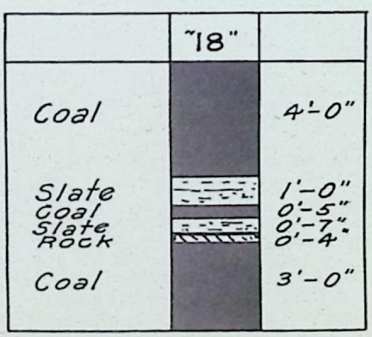


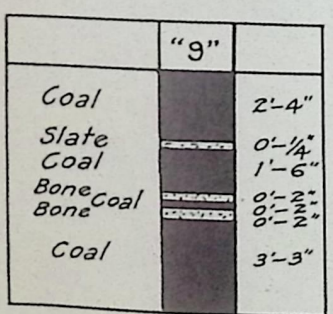


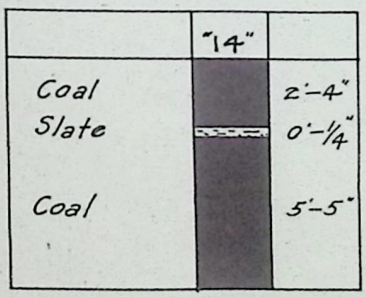


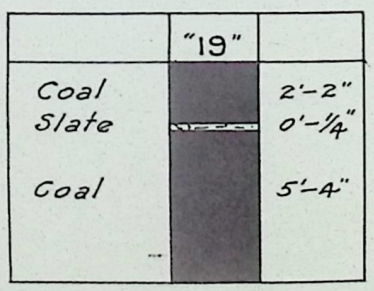












To illustrate Report of John McNeil

I N D E X.

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...n McNeil, M.E.
...ulting Engineer
...QUITABLE BUILDING.
...DENVER, COLO.
...ON WORK, EXAMINING AND REPORTING ON
...AL PROPERTIES A SPECIALTY.

TWENTY-FIVE YEARS EXPERIENCE IN COLORADO.
TEN YEARS AS STATE INSPECTOR OF COAL MINES.
CLASS 1884.

R E P O R T

On

THE WORKING CONDITIONS

and

SAFETY OF EMPLOYEES

In

N O S. 8 A N D 10 M I N E S

Of

THE UNION PACIFIC COAL COMPANY,

At

ROCK SPRINGS, WYOMING.

By

JOHN McNEIL, M. E.,
Consulting Engineer,
Equitable Building,
Denver, Colorado,
MARCH, 1911.

To: D. O. CLARK, ESQ.,
Vice-President & General Manager,
Union Pacific Coal Company,
Omaha, Nebraska.

Dear Sir:

I n t r o d u c t o r y:

In accordance with your instructions, I made an examination of Nos. 8 and 10 Mines at Rock Springs, Wyoming, and herewith respectfully submit my report on the same.

No. 8 Mine, is a shaft opening with double hoisting compartments, sunk to a vertical depth of 180 feet, is equipped with modern hoisting engines and dumping and screening appliances, and has an output of about 1200 tons per day.

The Main Entry, is driven north-easterly on a level from the bottom of the shaft (see map) and intersects the different engine planes from which the daily output is mined. See accompanying map attached to end of this report.

The Haulage Of The Coal, in these mines is becoming an expensive item, requiring a great deal of motive power and the employment of men, hence a maximum expenditure of money, in hauling the coal from the now very far off coal faces to the R. R. cars at the mine tipples.

Electric hoists deliver the coal from the planes and slope to stations on the main entry. From these stations to the tipple, the haulage is by electric locomotives.

The cost, the care and maintenance of so many miles of roadways and other items charged to haulage, is becoming a serious matter, as will be seen by the following figures:

Cost of haulage in Rock Springs Mines for:

Year 1908, $ .288 per ton,
" 1909, .279 " "
" 1910, .320 " "

The indications are, that for the present year, the cost of haulage will be higher.

The Ventilation, is produced by a Murphy fan, 10 feet in diameter, situated at the top of the air shaft (at No. 8), and is run, "forcing", at a velocity of 150 revolutions per minute, and is assisted by a 20-ft. Guibal fan at No. 7 Mine.

The volume of air from the main intake in cubic feet per minute, is,---------- 43,128

Intake air from No. 7 Split, is,---------- 5,700

48,828

Volume at outlet is 49,500 cubic feet per minute.

Reading of air in cu. ft. per mi.,	face 41	Entry, 6,225
" " " " " "	" " " 42	" 6,050
" " " " " "	" " " 43	" 5,400
" " " " " "	" " " Main	" 7,020
" " " " " "	" " " 2 on 5	Pl. 6,600
" " " " " "	" " " 3 " 5	" 6,490

Number of men employed, about 280,

" " mules and horses,-- 28.

After making a due allowance of air for mules and horses, there is left, about the quantity required by law for each person, 150 cu. ft. per minute. But, owing to the depleted condition of the air currents, in being conducted a number of miles throughout the workings, giving off deleterious gases from the strata in a greater or less degree, from the burning

of some hundreds of lamps using low grades of oil, powder fumes and gases, fine coal dust, and the excrement of mules and men.

At the time of my examination, I was fully convinced that the air at the working faces was impure and unwholesome.

It is not the volume of air that registers on our anemometer that counts for life giving principles, it is purity that is required.

It has been said (and I think truly) that the foul air of poorly ventilated coal mines, may carry prematurely to the grave, a greater number of men during the average working life period of coal miners, than mines generating "fire damp". The latter must, of necessity, be well ventilated, and for this reason we sometimes meet miners who prefer to work in gaseous mines.

A person not accustomed to being in coal mines, on traveling in one poorly ventilated, for a few hours, is surprised at the quantity of dust and foreign matter inhaled. The throat, lungs and nose become liberally charged, and he expectorates fine carbonaceous matter for a few days afterwards.

A continuously active miner, in such an atmosphere, is never free from such black discharges. The lung tissues, with years of service, become thickened, and their original color almost destroyed.

Dr. William Thompson (of Edinburgh, Scotland), has recorded a number of cases of coal miner's lungs which were infiltrated with black matter; the following are a few of them:

D. C., aged 58, miner 12 years, lungs uniformly dark in color.

D. G., aged 54, coal miner from boyhood, lungs uniformly black, not a vestige of natural color left.

G. H., aged 62, coal miner all his life, whole lungs dyed with matter resembling lamp black, and above one ounce of charcoal was obtained out of the mass.

Pathologists all attribute what is known as coal miner's consumption, to the inhalation of impure dust-ladened air.

Note:--I feel that if the eminent Dr. Thompson could examine the lungs of the writer, he might find a stiffening of the tissues and traces of coal miner's consumption as a result of breathing foul air in the gloomy depths of coal mines, fighting "gob" fires and examining the indiscriminate mass of colliery explosions.
I also feel very sure, that had Dr. Thompson made a post-mortem of the lungs of your late superintendent (faithful to a fault), and my sincere friend, Mr. Morgan Griffiths, his diagnosis would have been that the principal cause of his death was "coal miner's consumption".

I trust you will order a good fan to be erected on air-shaft at head of "E" plane, No. 7 Mine.

The cost of ventilation in these mines has also become an expensive item. The air bridges and stoppings must of necessity be built in a very substantial manner, and the

repairs on the same, from time to time, must be dilligently looked after, must be continually clayed up so that the air currents will not leak through, and as there are hundreds of stoppings to care for, in conducting the air several miles, the cost becomes high.

The following is the average cost of all the Rock Springs Mines:

Cost of ventilation for year 1908, $ .038 per ton,
" " " " " 1909, .039 " "
" " " " " 1910, .049 " "

Many of the air-courses parallel to the entries, are fallen-in to a considerable extent, and I would advise that they be cleaned out as much as possible, i. e. drive rooms through the pillar and therein "gob" debris from the air - courses. It is needed badly.

The General Mining Conditions, are quite favorable throughout this mine. The coal seam is exceptionally uniform, of good thickness, and practically free from impurities, as will be seen by the diagrams representing sections of the seam taken by me.

Please unfold sheet of diagrams at front of this report.

For	Sec.	of	coal	seam,	#54	Room,	5th	Entry,	4th	Pl.,	see	Dia. A
"	"	"	"	"	Face	of	"	"	"	"	"	" B
"	"	"	"	"	#43	Room,	"	"	"	"	"	" C
"	"	"	"	"	#12	Pillar	4th	"	"	"	"	" D
"	"	"	"	"	#45	Room,	3rd	"	"	"	"	" E
"	"	"	"	"	Face	of	"	"	5th	"	"	" F
"	"	"	"	"	#53	Room,	1st	"	4th	"	"	" G
"	"	"	"	"	Face	of	Main	"	...	"	"	" H
"	"	"	"	"	#20	Room,	"	"	5th	"	"	" I
"	"	"	"	"	Face	of	2nd	"	"	"	"	" J
"	"	"	"	"	# 8	Room,	"	"	"	"	"	" K
"	"	"	"	"	Face	of	"	"	5	Slope,	"	" L
"	"	"	"	"	# 4	Room,	"	"	"	"	"	" M
"	"	"	"	"	Face	of	...		"	"	"	" N
"	"	"	"	"	"	"	1st	"	"	"	"	" O
"	"	"	"	"	#47	Room,	"	"	4	"	"	" P

The Coal Seam Is Undermined, and no blasting from the solid is permitted under any circumstances.

The entries, cross-cuts and the drawing of pillars are worked by pick miners; but the major portion of the output is mined by machines.

There are now in use in this mine:

5 Goodman chain breast machines,
1 Jeffrey " " "
1 Sullivan "long-wall" "

For drilling purposes, there are now in use 4 Jeffrey electric drills.

Note:--In No. 7 Mine, there are :
3 Jeffrey electric chain breast machines,
4 Goodman chain breast machines,
1 Jeffrey short-wall "
4 Jeffrey electric drills

In No. 9 Mine, there are:
6 Jeffrey chain breast machines,
4 Jeffrey electric drills.

In No. 10 Mine, there are:
2 Harrison compressed air "puncher" machines,
4 cutter-bar Legg machines,
2 Goodman chain machines,
1 Jeffrey Electric Drill,
4 Compressed air drills.

Average No. of Tons of Coal Mined Per Keg of Powder Used, for year 1910, was 110. We think this a fairly good showing, but hope to see, in the near future, the present quantity of explosives used reduced at least by 75%, through the successful operation of the Hydraulic Cartridge, which you are now testing out, as a humane measure, at the Superior Mines; for in such proportions as we can reduce the percentage of blasting powder in our coal mines, we will, in a like measure, be rewarded in reducing the possibility of underground fires and explosions.

Coal "breaking" by Hydraulic pressure, may be a seeming trifle more expensive, per ton of coal mined, but it will not fail to save that which money cannot buy--the lives of men, and in the end, may save to your company expenses untold. Continue the test.

The Stables Underground, 32 stalls, are made practically fire proof. The partition between the stalls consist of old smoke stack sheet iron, and all supporting posts and the manger troughs are securely covered with powder keg iron.

A well constructed stone wall, with an iron door, protects the entrance to the stable and to the motor hoist.

In and about the stables, everything is kept clean. No old sacks, waste, or other combustible matter of any kind is permitted to accumulate.

No open lamps are allowed within the stable door. Electric lights are used entirely in the stables and in the underground hoist room.

A pipe line, with a good pressure of water, is kept on hand at all times.

The Drawing Of Pillars, in this mine, is being followed at the present time quite extensively and with good results; probably over 90% of the coal is being taken out.

Under-ground Telephone Connections, and electric light signals, and many other safeguards I noticed in substantial evidence throughout the mine.

Printed instructions, framed under glass, I found at prominent places, also showing by diagrams how to resuscitate persons overcome by an electric shock, by Augustin H. Goelet, M. D.

I found a fairly good degree of natural moisture throughout the mine and a perceptible saturation in the air.

The haulage ways were kept fairly well cleaned up and dust kept damp, and upon the whole, the mine is well kept and cared for.

Your general foreman, Mr. George Pryde, accompanied me throughout my examination, and to him and the pit-bosses, I gave my opinions and ideas freely, when considered for the company's welfare.

No. 10 Mine, as will be noticed on the accompanying map, is to the dip of No. 8, and consists of a slope opening, its portal being in proximity to No. 8 Shaft.

The slope is driven through the strata overlying the coal on an inclination of 10 degrees from the horizontal, and intersects the seam at a point about 700 feet from the entrance.

No. 10 Mine is operated on the same coal seam as Nos. 7, 8 and 9 Mines, which lies about 260 feet lower in the measures than the seam known as "No. 1".

The Daily Production Of The Mine, is about 1,000 tons, and the general mining conditions are about the same as those already described in my report of No. 8 Mine, i. e., as to the dip of the coal seam (which runs from 4 to 5 degrees), the

character of the roof and the floor, mode of working, etc.

The Ventilation, is produced by a 20-ft. Guibal fan.

The volume of air at the intake, is 73,710 cubic feet per minute.

The volume of air at the outlet is 74,700 cubic feet per minute.

Reading at face of #2 Entry, is 3,000 cu. feet per minute,

"	"	"	"	5	"	"	6,720	"	"	"
"	"	"	"	7 So.	"	"	5,100	"	"	"
"	"	"	"	7 No.	"	"	4,800	"	"	"
"	"	"	"	8	"	"	4,700	"	"	"
"	"	"	"	9	"	"	4,800	"	"	"

There are employed,---------- 190 men,

The number of horses, about,- 25.

There is a good degree of natural moisture throughout this mine, it being to the dip of the other openings, and water from them drains to No. 10 Mine, which keeps the coal dust damp.

The Haulage, consists of mules on entries that haul the coal to the planes; from there the coal is delivered to stations on the main level by electric and compressed air

hoists. From the main entry stations to the tipple, the coal is hauled by electric locomotives.

The Underground Stables, consisting of 29 stalls, are made as nearly fire proof as possible. All posts and woodwork is carefully covered with sheet iron; no open lamps are allowed within the stable gate, electric lights being the only kind in use. Pipes and water for fire protection were in good evidence, and the stables were clean and in a good sanitary condition.

The Coal Seam Is Undermined, by pick and machine mining, and no shooting from the solid is permitted.

The Tonnage Of Coal Mined Per Keg Of Powder Used, is 135 tons. This is an excellent showing.

The Thickness Of The Coal Seam, ranges from about 5 to 7-1/2 feet, and is interstratified with slate and bone to a greater extent than in the other mines, as will be seen by the following description of the coal seam in sections showing impurities (see sheet of diagrams at front of this report, which were taken by me during my examination of the mine).

For sec.	of	coal	seam,	Face	of	3rd	Entry,	4th	Slope,	see	Dia.	#1
"	"	"	"	"	#26	Room	"	"	"	"	"	"	2
"	"	"	"	"	Face	of	4th	"	5th	"	"	"	3
"	"	"	"	"	"	"	"	"	4th	"	"	"	4
"	"	"	"	"	"	"	5th	"	5th	"	"	"	5
"	"	"	"	"	#10	Room	"	"	"	"	"	"	6
"	"	"	"	"	# 3	"	"	"	"	"	"	"	7
"	"	"	"	"	Face	of	6th	"	"	"	"	"	8
"	"	"	"	"	"	"	7th	"	"	"	"	"	9
"	"	"	"	"	"	"	...		"	"	"	"	10
"	"	"	"	"	"	"	...		4th	"	"	"	11
"	"	"	"	"	"	"	10 So.	"	"	"	"	"	12
"	"	"	"	"	"	"	9 No.	"	"	"	"	"	13
"	"	"	"	"	# 8	Room	9	"	"	"	"	"	14
"	"	"	"	"	# 3	"	9	"	"	"	"	"	15
"	"	"	"	"	Face	of	8	"	"	"	"	"	16
"	"	"	"	"	# 7	Room	8	"	"	"	"	"	17
"	"	"	"	"	Face	of	7	"	"	"	"	"	18
"	"	"	"	"	#27	Room	7	"	"	"	"	"	19
"	"	"	"	"	Face	of	7 So.	"	"	"	"	"	20
"	"	"	"	"	#17	Room	7	"	"	"	"	"	21

It will be observed, by looking over the diagrams showing the character of the coal seam, that it deteriorates, in becoming interstratified with foreign matter, particularly to the west;

and judging from the record of diamond drill holes, Nos. 14, 16 and 19 shown on the map to the west of No. 10 Slope, there is no indication that the coal seam cleans up in that direction.

On No. 5 Slope, between Nos. 4 and 5 Entries, I observed a point which appeared to be the center of a badly disturbed portion of the coal seam, containing, at that place, about 8 feet of black rock in the center of the seam, section, as follows:

Coal, 3' 4"
Rock, 8' 0"
Coal, 3' 6"

From this central point, the intervening rock gradually gets thinner in both directions, almost disappearing at either side, showing the disturbed distance to be about 800 feet in length.

In talking with your general foreman, Mr. George Pryde, we decided that a considerable area of this disturbed portion of the seam might be worked to advantage, and a goodly quantity of coal recovered, by the system of "Long-wall Retreating". I would certainly favor an effort by that system of working, to recover the major portion of this coal.

We have, in connection with this disturbance, a rather strange feature, geologically, in the fact that the divided parts of the coal seam hold their usual thickness seemingly throughout the disturbed area.

The face of the 7th North Entry from the Main Slope is now being driven through "faulted" ground, in which it has now entered about 80 feet, and from work done ahead, it is known that it will get into good coal after passing through 75 feet more of this faulted ground.

The Pumping Of Water, from Nos. 7, 8, 9 and 10 Mines is all done at No. 10, but from this coal seam, very little water is made.

Pumps with a capacity of about 250 gallons per minute are in place, with a six-inch column pipe to the surface. The volume of water pumped, however, is much less than the pumps' capacity.

The cost of drainage, for the past two years, is as follows:

Cost of drainage for 1909, was $ .019 per ton,
" " " " 1910, " .013 " "

The Cost Of Coal, during the past few years (at Rock Springs), has gradually increased, on account of long haulage-ways, the nature of the roof requiring more timber, increased cost of ventilation, and cost of materials, all being items that have advanced materially.

The following will show the increase in timber used from 1904 to 1910, inclusive:

	1904.	1905.	1906.	1907.	1908-9.	1909-10.
Lineal feet Per Ton.	0.75	0.89	0.85	0.92	1.15	1.18

The Cost of Materials for 1908, $ .213 per ton,
" " " " " 1909, .178 " "
" " " " " 1910, .193 " "

The following is the average cost of coal of all charges made at the mines:

	1908.	1909.	1910.
Total Tons Of Coal Mined,	1,247,985	1,350,874	1,212,779
Mining,----------	$ .636	$ .625	$ .655
Hauling,----------	.288	.279	.320
Loading,----------	.062	.062	.071
Entry,----------	.012	.015	.027
Ventilation,----------	.038	.039	.049
Drainage,----------	.051	.019	.013
Deadwork,----------	.031	.025	.027
Total Cost,----------	$1.118	$1.064	$1.162

The increase in the costs from ill-advised Unionism must also aggregate a material quantum, not only from the advance in wages or reduction in hours, but also from a marked absence of interest in the work by employees, generally.

Their teaching seems to be: get all you can and give as little in return, as possible.

The docile foreigner of former days has changed into a bold conspirator to the "cause", and many english-speaking miners seem to have a false honor they must adhere to. Should a small fall of slate occur on the room roadway that five minutes work would clean up, it may be the cause of the room being a non-producer for two hours, waiting for the boss to send a laborer to do the work. The moto being: Do nothing without pay, the "committee" will see that no harm shall come from it.

New demands, is the object point in view. Advance wages and raise the price of coal on the public. Will they always stand for it? There will come a time when you cannot concede to further demands and may have to fight.

Colorado coal operators came to that pass sometime ago, and for self-preservation, did fight, and won, and now enjoy the right to run their own business, notwithstanding that you kept off, in your offices, dues, fines and assessments from employees and gave it to the walking deligates to send to Colorado to fight the coal operators. Of course, this was something you did not like to do, but thought you had to do it.

If you could but stop acting as secretary for Union collections, it would be easier to assert your rights some day.

Your disciplining in the mines has been seriously affected.

It seems to me that the time has come, for the coal operators of Wyoming, Colorado and Utah to understand each other with a view of some day standing together.

Trusting this report will meet with your approval, I am,

Sincerely yours,

John McNeil M. E.

Consulting Engineer.