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REPORT ON

THE ALASKA COAL SITUATION

MARCH - APRIL 1946

Prepared By

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Serial #1

ALASKA COAL SITUATION

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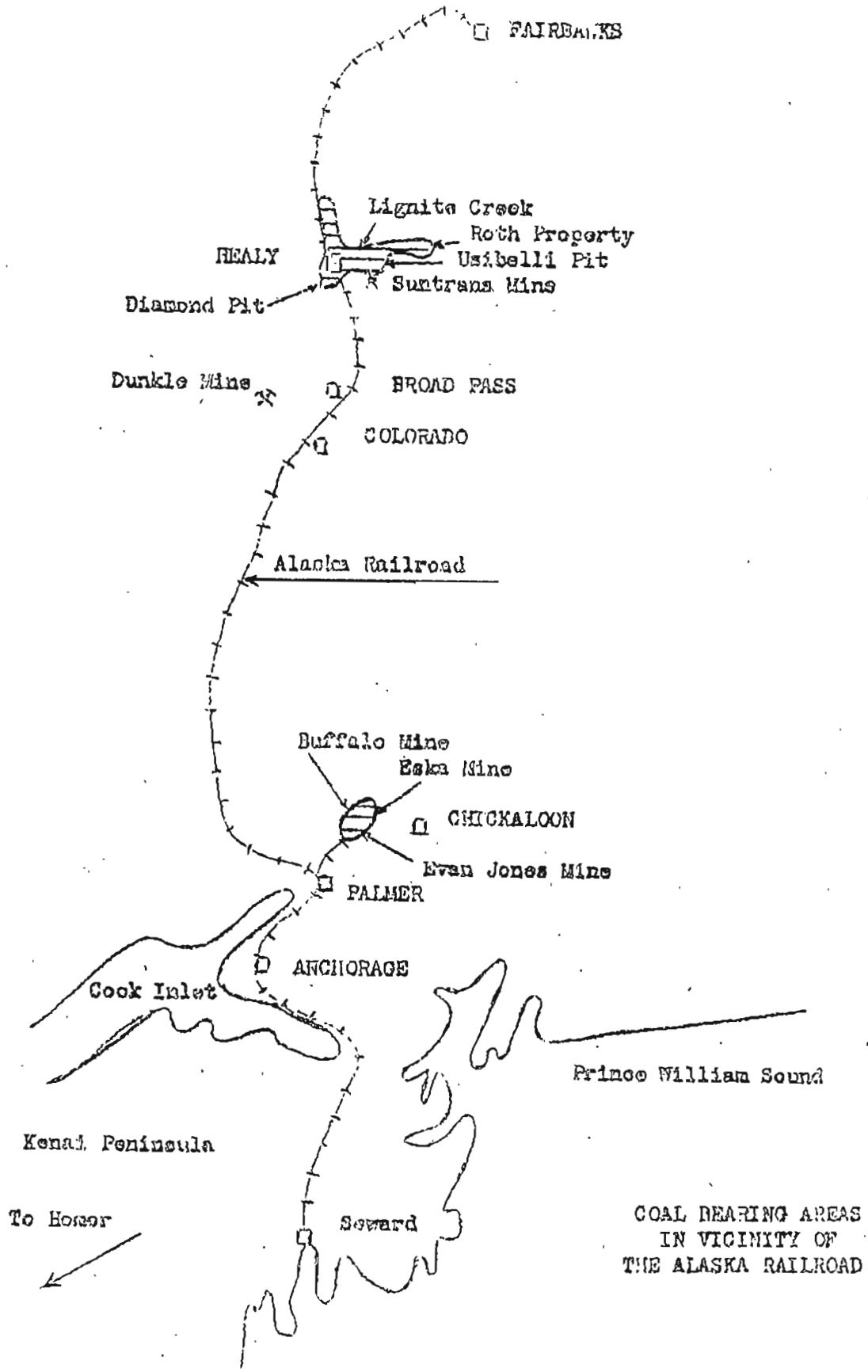

COAL BEARING AREAS
IN VICINITY OF
THE ALASKA RAILROAD

Aleis "B Glen

SAVE

IN REPLY REFER TO ________

ARMY SERVICE FORCES

OFFICE OF THE QUARTERMASTER GENERAL

WASHINGTON 25, D. C.

FOR VICTORY BUY UNITED STATES WAR BONDS AND STAMPS

17 March 1947

Mr. B. D. Stewart
U.S. Geological Survey
Department of The Interior
Juneau, Alaska

Dear Mr. Stewart:

In accordance with verbal request of Mr. H. I. Smith, Chief Mining Division, U.S. Geological Survey, Washington, D. C. to Mr. C. W. Kurtz of this office, there is forwarded herewith for your information copy of report on the Alaskan coal situation for the period March - April 1946 prepared by this office.

Very truly yours,

Webster Anderson
WEBSTER ANDERSON
Lt. Colonel, QMC
Supply Division

1 Incl.
#1-cy.Report on
Alaskan Coal Situation
Mar-Apr 46

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SUMMARY - Direction of attention to the coal situation in Alaska has been prompted by the decline in production and stockpiles during the past twelve months. During this period consumption exceeded production by about 22,000 net tons and stockpile inventory decreased 27,521 tons.

For the period from April 1945 to March 1946, inclusive, total production amounted to 267,729 tons. Approximately 10,000 tons were collected in the Aleutian Islands and were added to the available supply, thus bringing the actual deficit down to about 11,500 tons. A study of the individual mines indicates that if some of the recommended improvements are made and if there is no decline in the number of employees the production for the next twelve months should be about 400,000 tons.

The estimated requirements for the next twelve months amount to about 333,000 net tons. Fifty-five thousand tons additional will be required to bring the stockpiles at Ladd Field and Ft. Richardson to the desired level. After allowing for possible contingencies that may hinder production there is every reason to believe that Alaska can meet all requirements from indigenous production during the period.

On a tonnage basis all requirements should be met but some changes in the grade of coal used may become necessary since production of only 150,000 tons of bituminous coal will not meet the estimated requirement of 197,000 tons. This difference may be lowered if the Alaska railroad reduces consumption by the replacement of coal-burning equipment with Diesel locomotives and if the proposed mine at Homer can contribute any substantial tonnage during the year. There is every indication that these two programs will be carried out as scheduled.

Bituminous coal is produced by two underground mines and the lignite is produced by one underground mine and two strip pits. Due to lack of enforcement of safety regulations the conditions in the three underground mines are poor. Spontaneous combustion and dust or gas explosion are not only possible but very probable under present conditions. The loss of any one of these mines would immediately affect the general fuel situation. The loss of either of the two bituminous mines would be the most serious since they are the sole source of supply for the southern end of the rail belt. The loss of Suntrana mine would seriously affect the civilian supply in the north although steps could be taken to mine emergency coal from many of the numerous outcrops. This opportunity does not exist in the bituminous field.

During the past several months there has been a renewal of interest in new mines and with a little encouragement an adequate fuel supply would be assured. There is no immediate danger of over-production since a large portion of the population of Anchorage and Fairbanks use wood for fuel. This is a matter of cost rather than convenience. If coal could be sold at a reasonable price a much larger domestic market would be opened up and absorb a considerable tonnage

In general, the coal mines of Alaska have not kept pace with the advancement in the states. With the exception of haulage and drilling equipment

there is no labor-saving machinery underground. This fact accounts, in a large measure, for the difficulty of securing and holding miners. Mining conditions closely resemble those found in the Pennsylvania anthracite field and call for men trained in steep pitch mining methods. The present practice is to recruit labor from the comparatively flat mines of the western states and the results are disappointing. Wages are high and should attract sufficient labor if the recruiting is done in the proper area.

The present fuel situation in Alaska is not alarming and with some intelligent forward planning no major problems should arise in the foreseeable future.

PRODUCTION - During the period from April 1945 to March 1946, inclusive, three underground mines were in production every month and one produced only seven months. During the same period two strip pits were in operation, one for four months and one for 8 months.

The following table shows a summary of production during the period:

Table No. 1 - Alaska's Coal Production - April 1945 - March 1946, inc.

(Net Tons)

Bituminous Coal

Mine	Production	Type of Mine	Months in Production
Eska	45,901	Underground	12
Evan Jones	98,741	"	12
Buffalo	3,693	"	7
TOTAL	148,335		

Lignite Mines

Suntrana	108,587	Underground	12
Diamond	6,437	Strip	4
Usibelli	24,370	"	8
TOTAL	139,394		
GRAND TOTAL	287,729	All Grades	

Table No. 2 shows the production of each mine by months together with estimate for the next twelve months.

In addition to the production of bituminous coal, 9,923 tons were brought from the Aleutian Islands bringing the total available supply of bituminous coal for the period to 156,258 net tons.

Table No. 2 - Alaska Coal Production by Mines (Net Tons)

MONTH	ESKA Bituminous	EVAN JONES Bituminous	SUNTRANA Lignite	BUFFALO Bituminous	USIBELLI Lignite	DIAMOND Lignite	TOTAL
April 1945	6,451	9,538	6,611	598	3,000	-	26,198
May	5,776	6,783	6,829	914	-	-	20,302
June	4,310	6,330	7,155	-	-	-	17,795
July	5,197	6,329	8,393	300	-	-	20,219
Aug	3,260	8,109	8,242	375	-	-	19,986
Sept	2,303	8,338	7,472	335	1,874	-	20,322
Oct	3,008	10,027	10,174	966	4,384	-	28,559
Nov	3,851	10,823	11,455	205	1,750	-	28,084
Dec	3,016	7,338	11,589	-	3,138	441	25,522
Jan 1946	3,587	6,991	11,662	-	3,450	1,656	27,346
Feb	2,596	8,829	9,432	-	3,592	1,589	26,038
Mar	2,546	9,306	9,573	-	3,182	2,751	27,358
TOTAL	45,901	98,741	108,587	3,693	24,370	6,437	287,729
April 46-Mar 47 (Estimated)	30,000	120,000	120,000	-	80,000	40,000	400,000

Suggested improvements at the mine, a better railroad car supply and full time operation of the strip pits should result in a larger total production for the ensuing twelve months.

Eska mine cannot be expected to continue an average production of much over 100 tons per day but all others should show a substantial increase. Buffalo mine is not expected to be in production during the period in question. There is a possibility that a small amount of lignite and sub-bituminous coal will be produced in the Homer and Broad Pass fields respectively but this is too problematical to include it in the total available supply.

The fuel needs for the next twelve months were discussed with the management of all companies and after considering all angles, it appears reasonable to expect a production, from all sources, of about 400,000 tons. With no major troubles this figure could be exceeded.

DISTRIBUTION - Largely because of the length of haul from the mines to the principal consuming centers the lignite production is consumed in the area around the northern end of the railroad and the bituminous coal is consumed around the southern end. The single exception to this is that under normal conditions all fuel used by the Alaska Railroad is bituminous coal which is produced in the south. Practically all coal used at Ladd field, Fairbanks and at the commercial plants in the Fairbanks area comes from Suntrana, Diamond and Usibelli mines which produce lignite. Bituminous coal for the railroad, Ft. Richardson and the areas around Palmer, Seward and Anchorage is supplied by the Evan Jones and Eska mines.

During the past twelve months there have been some irregularities in the distribution pattern of the two fuels because of a shortage of stocks at one point or another. The tonnages so distributed were relatively small and have no bearing on the overall picture.

Table No. 3 shows the distribution of each mine's production. Railroad fuel is considered as a civilian requirement and is included under that heading.

CONSUMPTION - Consumption of fuel in Alaska varies with the seasons, the smallest, of course, being during the summer months. The use of fuel by the railroad is heavier in the winter than in the summer because of the coal-burning equipment used for snow removal.

During the war years the placer dredges of the Fairbanks Exploration Company (a subsidiary of U.S. Smelting and Refining Company) were idle and relatively small amounts of fuel were used in their power plants. Some fuel was used for keeping thawed out ground in workable condition but no large scale operations were attempted. Consumption for this purpose averaged about 25 tons a day.

The Alaska Railroad has a normal consumption of about 70,000 tons a year. This fuel is largely bituminous coal and, insofar as possible, is furnished

Table No. 3 - Distribution of Production (Net Tons)

	FT. RICHARDSON				LADD FIELD				WHITTIER	CIVILIAN			
MONTH	EVAN JONES	SUN-TRANA	DIAMOND	USIBELLI	EVAN JONES	SUN-TRANA	DIAMOND	USIBELLI	EVAN JONES	EVAN JONES	SUN-TRANA	ESKA	BUFFALO
April 1945	6,812				1,039	3,443		3,000		1,687	3,166	6,451	598
May	2,992				2,424	5,006			148	1,219	1,823	5,776	914
June	2,617				2,294	3,400			175	1,244	3,755	4,310	
July	5,189				236	4,989			39	865	3,404	5,197	300
Aug	6,785					5,680				1,324	2,562	3,260	375
Sept	4,647					1,814		1,874		3,691	5,658	2,303	335
Oct	7,319					2,842		4,384		2,708	7,332	3,008	966
Nov	5,865			200		2,243		1,550		4,958	9,212	3,851	205
Dec	3,573	2,216	441	2,438		1,535		700		3,765	7,838	3,016	
Jan 1946	4,217		456			2,639	1,200	3,450		2,774	9,023	3,587	
Feb	6,267					1,874	1,589	3,592		2,562	7,558	2,596	
Mar	6,030					1,245	2,751	3,182		3,276	8,326	2,546	
TOTAL	62,313	2,216	897	2,638	5,993	36,710	5,540	21,732	362	30,073	66,661	45,901	3,693

	Ft. Richardson	Ladd	Whittier	Civilian	Total
Evan Jones	62,313	5,993	362	30,073	98,741
Suntrana	2,216	36,710		69,661	108,587
Diamond	897	5,540			6,437
Usibelli	2,638	21,732			24,370
Buffalo				3,693	3,693
Eska				45,088	45,088
Total from Production	68,064	69,975	362	149,328	287,729
From Aleutians					
Total Available	9,406	0	0	517	
	77,470	69,975	362	149,845	

Table No. 4 - Receipts of Coal (Net Tons)

MONTHS	WHITTIER	LADD FIELD	FT. RICHARDSON	TOTAL ARMY	CIVILIAN	TOTAL DELIVERIES
April 1945		7,482	6,812	14,294	11,904	26,198
May	148	7,430	2,992	10,570	9,732	20,302
June	175	5,694	2,617	8,486	9,309	17,795
July	39	5,225	5,189	10,453	9,766	20,219
Aug		5,680	6,785	12,465	7,521	19,986
Sept		3,688	4,647	8,335	11,987	20,322
Oct 8		7,226	7,319	14,545	14,014	28,559
Nov		3,793	6,055	9,858	18,226	28,084
Dec		2,235	8,668	10,903	14,619	25,522
Jan 1946		7,289	4,673 a/	11,962	15,384	27,346
Feb		7,055	6,267 b/	13,322	12,716	26,038
Mar		7,178	6,030 c/	13,208	14,150 d/	21,651
TOTAL	362	69,975	68,064	138,401	149,328	287,729

a/ + 4,760 from Aleutian Islands

b/ + 1,196 from Aleutian Islands

c/ + 3,450 from Aleutian Islands

d/ + 517 from Aleutian Islands

TOTAL 9,923 tons

by the company's Eska mine while the Evan Jones mine furnishes a large part of the remainder.

The consumption figures for Ft. Richardson and Ladd Field are somewhat confusing when considered on a monthly basis. When coal is added to the boiler house bins at these two power plants it is considered as being consumed. The bins in question hold about 5,000 tons and are filled when the weather is the most suitable. Frequently wet coal freezes solid in the railroad cars and, in spite of some thawing in the thawing shed, dumping does not keep pace with consumption. When the weather is favorable and the bin stocks are low dumpings exceed consumption. Monthly consumption, as shown in Table No. 5 varies widely from month to month because of the above reasons.

Table No. 5 - Consumption (Net Tons)

Month	Ft. Richardson	Ladd Field	Civilian	GRAND TOTAL
April 1945	8,904	7,176	12,115	
May	7,662	4,910	13,094	
June	5,734	4,152	9,197	
July	4,714	3,082	9,469	
Aug	5,359	3,801	8,576	
Sept	6,163	4,248	12,685	
Oct	8,626	4,971	13,973	
Nov	10,256	6,652	17,285	
Dec	9,676	6,577	14,980	
Jan 1946	6,174	7,400	14,460	
Feb	8,644	5,548	13,543	
Mar	9,094	11,278	9,116	
Total	91,006	69,795	148,493	309,294

STOCKS - Aside from the stockpiles at Ladd Field and Ft. Richardson very little coal is held in reserve. The Healy River Corporation owns the coal yard at Fairbanks and can store about 1500 tons of lignite. The stock on hand in this yard varies with the weather since no coal is shipped unless it is reasonably certain that it will be delivered in a dry condition. An effort is made to keep all wet coal out of the bins thereby avoiding the necessity of handling frozen coal.

No large stockpiles are maintained by the railroad. On April 15th an inventory of all coal in stock by the railroad totalled about 1,200 tons. This coal was scattered along the line and at the Fairbanks and Anchorage yards.

The Anchorage electric power plant normally carries about 100 tons in stock and relies upon regular arrival of coal for its operation. During the last week in April the railroad requisitioned some of the coal intended for the plant and the plant shut down when stocks were depleted. Ft. Richardson then supplied sufficient electricity to the town to tide it over the

emergency.

The stockpiles at Ladd Field have undergone a considerate reduction during the last year as shown by Table No. 6. An inventory adjustment in December brought the condition of the piles into the limelight and an effort was made to divert more coal to this area. Diamond and Usibelli strip mines were just coming into production and prevented a further decline.

The Ft. Richardson stockpile dropped considerably during the past year. This was due largely to a shortfall in deliveries. The estimate of available stock was adjusted downward in August when the plant engineers made a new estimate of available supply. The new estimate indicated that the previous figures were over 14,000 tons too high. After dropping to a low of slightly over 17,000 tons in January an increase was noted for the following three months. Part of this increase was accounted for by the addition of coal collected from various bases in the Aleutian Islands.

Estimates of available stocks along the rail belt are made monthly. A summary for the past year is as follows:

Table No. 6 - Estimated Stocks at End of Month (Net Tons)

MONTH	FT. RICHARDSON	LADD FIELD	CIVILIAN	TOTAL
April 1945	45,543	11,236	4,401	61,180
May	40,873	11,332	3,464	55,669
June	37,756	12,874	3,576	54,206
July	38,231	15,017	3,873	57,121
Aug	25,319 a/	16,896	2,818	45,033
Sept	23,803	16,336	2,120	42,259
Oct	22,496	18,638	2,114	43,248
Nov	18,305	15,736	3,098	37,139
Dec	17,297	8,222 b/	2,737	28,256
Jan 1946	20,556	8,111	3,661	32,328
Feb	19,375	9,618	2,629	31,822
Mar	19,761	5,518	2,673	33,659

a/ 14,338 inventory adjustment.

Stockpile decrease for year 27,521

b/ 3,173 inventory adjustment.

Stockpile estimates at Ladd Field and Ft. Richardson are misleading since coal is not considered as being in stock until it is unloaded from the railroad cars. On April 15th, 49 unloaded cars were reported at Ladd Field and 50 unloaded cars at Ft. Richardson. If this coal had been considered the stocks at each plant would have been increased by about 2,500 tons. This practice had its advantages in the past since the Alaska Department felt obligated to divert coal to any required point that needed it. If coal had to be taken from one of the two army posts it called for no adjustment in the stockpile estimate.

Because of the variable weather conditions and the probability of

reduced shipments from the mines the engineers at the two army posts deem it necessary to maintain large stockpiles. This reasoning is justified and until the mines are put into better condition and the railroad is better equipped to handle snow adequate stock should be maintained to last for about 6 months. Allowing for possible losses 50,000 tons of stock at Ft. Richardson and 30,000 tons at Ladd Field are not excessive.

The production program for the next 12 months should provide sufficient coal to allow the two army stock piles to be built up to the required level.

There was no indication of heating in any of the stockpiles. At Ladd Field it was found that by spreading the lignite with a bull dozer and limiting the height of the pile to 8 feet there was little danger of spontaneous combustion. The continuous travel over the pile by the bull dozer packs the coal so that there is a minimum of air circulation, thus preventing heating and disintegration.

REQUIREMENTS - The estimated requirements for Alaska for the period April 1946 to March 1947, inclusive, have been estimated to be 333,000 tons of all classes of solid fuels. This is exclusive of coal required to increase stocks.

The Fairbanks Exploration Company has resumed operation of their placer mines on a small scale but will gradually step up their program until four of the seven available dredges are in operation. This company is following the usual custom of thawing well ahead of the dredging operations and as a result their fuel requirements are on the increase. All dredges are electrically operated and the energy is supplied by a central power plant. Solid Fuel requirements, mostly lignite, run between 225 and 250 tons a day or about 80,000 tons for the year.

Prior to the war all fuel was furnished by the Suntrana mine and present indications are that this will be their principal source during the coming year.

The city of Fairbanks has an annual requirement of about 16,000 tons of lignite. The Northern Commercial Company supplies electric power to the area and their requirements are included in the total for the city.

Ladd Field has an average consumption of about 200 tons of lignite a day or 70,000 tons a year. The main power plant is the largest consumer and is followed by the twelve small central heating plants, all of which are equipped with mechanical stokers. All buildings not heated from the main plant or the small central plants have small units of their own, all hand-fired.

Ft. Richardson, in the south, is the largest coal consumer. Annual requirements have averaged about 90,000 tons a year but the post engineers have estimated that their requirements for the next twelve months will be

about 5,000 tons higher. The main point of consumption is in the power plant. Numerous small heating plants are scattered throughout the coal and these serve all buildings in a given group. Many of the buildings have their own handfired heating system.

The coal that is in common use is furnished by the Evan Jones mine although some shipments of lignite from the north were made in November, December and January when the stockpiles appeared to be running low.

The Anchorage area, which includes the Matanuska Valley, has an annual requirement of about 12,000 tons. The electric power plant at Anchorage is the largest single consumer in the area. While there is considerable discussion as to the advisability of increasing the capacity of a small hydroelectric plant so that the present steam plant can be closed, there is no indication that the project will be carried out and certainly not within the next twelve months.

The Alaska Railroad's requirements for the next twelve months will follow much the same pattern as in the past. Peace-time schedules have been established and the road's fuel requirements have been fairly well established. Because of heavy grades and the danger of forest fires from flying sparks, the railroad has never seriously considered the use of lignite as fuel. On several occasions during the past year there was no bituminous coal available and lignite was used. While not a very satisfactory fuel, it served its purpose and, based on this experience, the management of the road is taking steps to put spark controlling devices on the locomotives so that should another emergency develop, or if bituminous coal is not available in sufficient quantities the lignite can be used. This program has not been carried out and the next twelve months' requirements have been set up for bituminous coal.

A summary of the requirements by areas is as follows:

Table No. 7 - Coal Requirements - April 1946 to March 1947, Inc.

(Net Tons)

		Stock Pile
South - Bituminous Coal -		
Ft. Richardson	95,000	30,000
Alaska Railroad	60,000	
Anchorage Area	12,000	
Total	167,000	
North - Lignite		
Ladd Field	70,000	25,000
Fairbanks Area	16,000	
Fairbanks Exploration Co.	80,000	
Total	166,000	55,000
Total all Solid Fuel	333,000	
GRAND TOTAL	333,000	

In addition to the above requirements, 55,000 tons will be required to raise the stockpiles at Ladd Field and Ft. Richardson to the desired level, bringing the total for all purposes to 388,000 tons.

ANALYSES - For all practical purposes there is very little difference in the heating value of the lignite which is shipped from Suntrana, Diamond and Usibelli operations.

Table No. 8 shows the proximate analyses of coal from these mines on "as received" basis. All samples were taken from shipments of mine run coal and were analyzed in the coal laboratory of the Alaska Railroad at Anchorage.

Table No. 8 - Analyses of Lignite from Healy River Field

	Suntrana	Diamond	Usibelli
Moisture	21.2%	17.6%	18.3%
Volatile Matter	43.3%	40.5%	40.8%
Fixed Carbon	28.1%	30.6%	31.6%
Ash	7.4%	11.1%	9.3%
Sulphur	0.2%	0.2%	0.2%
B.T.U.	8,490	8,500	8,610

No analyses of the bituminous coal from Eska mine was obtained since none of this coal is used on Army posts. Coal from the Evan Jones mine is bituminous and has the following analysis:

Table No. 9 - Analysis of Lump-Nut Coal from Evan Jones Mine

(As Received)

Moisture	3.5%
Volatile Matter	41.1%
Fixed Carbon	32.4%
Ash	23.0%
Sulphur	0.4%
B.T.U.	9,965

An engineer from the R.F.C. office, Fairbanks, Alaska, took a sample of coal from a prospect pit in the Homer area in 1943. As far as is known this sample came from the 7½ foot seam that is now under consideration for development. Analysis of this sample is as follows:

Table No. 10 - Analysis of Coal From Homer Area

	As Received	Air Dried
Moisture	20.7%	7.3%
Volatile Matter	40.2%	46.9%
Fixed Carbon	35.2%	41.3%
Ash	3.8%	4.5%
Sulphur	0.2%	0.2%
B.T.U.	9,505	11,115

TRANSPORTATION - The main line of the Alaska Railroad, of standard gauge, runs from Seward north to Fairbanks, a distance of 470.3 miles. Branch lines have an aggregate length of 49.6 miles.

The railroad, on which work was started by private interests in 1903, was purchased by the Federal government in 1915, at which time construction work had reached mile post 70 near Kern; track laying was completed to Fairbanks in July, 1923. The railroad is now operated under the direction of the Department of the Interior, the general manager of the railroad reporting to the Secretary.

After the outbreak of the present war the military activity in Alaska placed an unexpected and heavy load on the facilities of the railroad. It was found that the entire plant was incapable of handling the increased traffic and steps were taken to remedy the situation. Rolling stock was secured through purchase or loan and the tracks and communications system improved by the use of a battalion of Army engineers. According to the Alaska Department, U.S. Department of the Interior, all equipment and labor furnished by the Army was paid for as billed.

Much of the equipment now in use for hauling coal is worn out and should be replaced. Many of the later model cars are badly in need of repair. Some of the cars are of wood construction and originally served in the building of the Panama Canal. Until very recently all locomotives were coal burners. Several Diesel locomotives are now in use and, according to the management, 10 more are on order for fall delivery. The size of these new locomotives was not ascertained but it is known that the railroad engineers have checked all bridges on the line and state that they will carry the new equipment.

The present equipment that can haul coal consists of 199 gondolas and 100 steel hoppers. The steel hoppers are in fair condition but most of the gondolas, all with solid bottoms, are in very poor condition. The latter cars were built with low sides and when it became necessary to use them for hauling coal the sides were built from 1½ to 2 feet higher so that full weight could be carried. The clam shells at the Ft. Richardson and Ladd Field continually break these extensions and they must be repaired in the mine yards before they can be loaded. Some of the hoppers have been partially unloaded by clam shells and many of the steel braces inside of the cars have been bent. At both Army posts many of the cars are moved by a tractor. The chain is hooked on to any convenient place on the car, usually the step or break rod, with the result that practically all such parts are badly bent. The railroad has continually complained of this practice and there is a reported decrease in damage although considerable shop work remains to be done before all such damage has been repaired.

There has been considerable interruption of coal mine operation because of an inadequate car supply. This shortage has been partially due to the failure of the two Army posts to promptly unload the cars and partially to lack of sufficient cars.

Until very recently there has been no equal distribution of empty cars

among the mines in the Healy River Area. For some unexplained reason Suntrana mine needs were supplied first, Usibelli and Diamond strip pits receiving what was left, if any. There were several instances when cars were taken from the sidings of the latter two mines and placed at Suntrana for loading even though the two strip pits could not complete a full day's run on account of car shortage.

Complaint was made to the management of the railroad with the result that the mines are presently receiving cars on a more equitable basis.

The poor condition of the present equipment and need of additional coal cars is fully appreciated by the management of the railroad and steps have been taken to purchase or borrow additional cars.

Colonel Johnson, manager of the railroad, made a trip to Washington, in the early part of May, with the express purpose of expediting the car program. In an effort to strengthen his case for additional cars this office wrote to the Alaska Department, Department of the Interior and suggested that an effort be made to acquire the needed equipment.

When this matter was discussed with Colonel Johnson in Alaska it was decided that if possible he should acquire an additional 100 gondolas and 60 hoppers. These quantities were again suggested in the above-mentioned letter.

If the suggested new equipment is acquired and if cars are promptly unloaded at the Army posts there should be ample car supply to permit the mines to operate full time. It should be remembered, however, that the cars normally used for coal are also used for handling other bulk material and that any heavy demand for cars for the latter purpose will probably interfere with coal production.

The two large coal fields, containing immense reserves of coal, of which no accurate area or tonnage estimate is available, are directly served by the Alaska Railroad. At the present time a considerable portion of the railroad's revenue freight is made up of coal.

Table No. 11 gives the distances by rail between the coal mines and the three principal centers, together with the tariff rates to each.

Table No. 11 - Distance and Freight from Mines to Consuming Centers

Healy River Field	Miles	Rate Per Ton
Suntrana, Diamond & Usibelli Mines		
To Fairbanks	116.6	$3.00
To Anchorage	248.2	3.50
To Seward	362.5	NR - No Record
Matanuska Field		
Jonesville Mine		
To Fairbanks	341.4	No Record
To Anchorage	58.2	2.10
To Seward	172.5	No Record
To Whittier		3.00

UNLOADING AT ARMY POSTS - The unloading equipment at the stockpiles of the two Army posts consists of Diesel powered clam shells. These unload the cars as nearly as possible and the remaining coal is shoveled out by hand. Many of the cars arrive with the coal frozen solid and it is evident that there is considerable damage to the cars by the clam shells.

At Ladd Field, hoppers containing stoker coal are run over an elevated track and dumped into a small storage bin. Most of this fuel arrives in a fairly dry condition and can readily be loaded into truck for distribution.

Only hopper cars can be dumped for direct power plant use at both posts. Run of mine coal is dumped over a 6-inch grizzley at Ft. Richardson and over an 8-inch grizzley at Ladd Field. All material above this size must be broken on the grizzley with hammers but the quantity of oversize lumps is not excessive and causes very little delay.

There is considerable delay in unloading cars at the two Army posts. At Ft. Richardson all coal not dumped into the power house bin must go into the stockpiles. Much of the coal arriving at this plant is the washed coal from Evan Jones mine. During the winter months most cars are frozen solid by the time they reach the post. While a thawing room of ten car capacity is available it does not appear to be a common practice to thaw the cars that are to be unloaded at the stockpile. The excuse offered for this is that there are not sufficient locomotives available for this work. Full use of the thawing room is not practiced for the power plant coal. On one of the days that the power plant was visited the engineer complained that four men had spent the entire morning picking the coal out of a single car. He admitted that the car had not been in the thawing room over night even though there was track space for 6 additional cars. On this particular day 50 unloaded cars were on track at the post and only four were being thawed out in the shed. Total capacity of the shed is 10 cars.

Much the same conditions were found at Ladd Field. On the same day as the 50 loaded cars were at Ft. Richardson, ~~and~~ Ladd Field had 49 on track. These, however, were not frozen so hard since most of the coal had come from the Suntrana mine and was comparatively dry.

At both plants the handling of coal at the stockpiles is very crude. At the time the power plants were designed apparently no thought was given to coal storage and the present layout is a poor make shift. The ground on which the coal is stored was not leveled off and no drainage is provided. Thousands of tons of coal have been lost around the stockpiles at both plants due to the operation of the bull-dozers and cranes. There has also been a heavy loss of coal around the bins of the central heating plants and at the small barracks bins. In many cases there was as much coal outside as inside the bins. When the next truck load of coal arrived it ground the outside coal into the dirt or scattered it to such an extent that considerable quantities are lost.

The coal procurement officer of the Alaska Department estimates that a

saving of at least 10% in fuel consumption can be attained if the several post engineers pay proper attention to distribution and stockpiles for space heating units alone.

The above facts were called to the attention of the post engineers and some corrective measures will no doubt be taken.

HEALY RIVER AREA - LIGNITE

The Healy River or Nenana Field contains the largest known deposits of lignite in the Alaska rail belt area. No comprehensive drilling program has been carried out and the geology of the area has not been fully worked out, therefore there is no reliable estimate of the possible reserves. All mining to date has been in drift mines that operated to the raise and in no case has any attempt been made to determine the depth to which the seams extend.

The most important part of the field at the present time is the Healy Fork area.

The Suntrana mine, an underground project and the Diamond and Usibelli strip pits are the only coal producers in the area although several attempts have been made to operate underground mines in the vicinity of the Healy station, on the Alaska Railroad.

Suntrana Mine - Suntrana mine is owned by the Healy River Coal Corporation and is located on Healy Fork, several miles east of Healy. It is the only underground mine in the Healy River lignite field.

Underground fires and their effects have seriously handicapped production and at present all mining is confined to relatively new workings in No. 3 and "F" seams. In the latter part of February a serious fire broke out in a pillar section of No. 3 seam and for a short time it appeared that it would spread through all of the live workings. All hands were used to install a sand seal ahead of the fire. The fire was sealed off but not until it had reached a point within 50 feet of the new seal. The Bureau of Mines has made numerous recommendations and has submitted mining plans that would eliminate the possibility of loosing the mine on account of fire but none of these recommendations or plans have been used. There is no enforcement of safety rules and as a result the mine is in an extremely unsafe condition. Aside from the fact that the loss of production would seriously affect the area around Fairbanks the loss of such huge quantities of coal should not be tolerated by the government. As far as is known no penalty has ever been imposed on the company for loss of coal underground. Royalties are paid only on the amount of coal shipped. Enforcement of safety rules and collection of royalties is in the hands of the Territorial Commissioner of Mines, an appointee of the governor.

In 1945 the Suntrana mine was the largest producer in Alaska. Of the 297,165 net tons total coal production for the territory the Suntrana mine accounted for 109,145 net tons.

The coal is a fair grade of lignite but is unsuitable for large scale stocking. Analyses of car samples, by the U.S. Bureau of Mines, as delivered to Army bases are as follows:

Table No. 12 - Analyses of Suntrana Mine

Run of Mine Coal

	Air Dried	As Received	Moisture Free	Moisture & Ash Free
Moisture	16.9%	21.2%		
Volatile Matter	44.6%	43.3%	55.0%	60.7%
Fixed Carbon	28.9%	28.1%	35.6%	39.3%
Ash	7.6%	7.4%	9.4%	
Sulphur	0.2%	0.2%	0.2%	0.2%
B.T.U.	8,735	8,490	10,770	11,885

Lump-Nut Coal

Moisture	17.3%	16.6%		
Volatile Matter	41.3%	40.6%	49.9%	54.2%
Fixed Carbon	34.8%	34.3%	42.1%	45.8%
Ash	6.6%	6.5%	8.0%	
Sulphur	0.2%	0.2%	0.2%	0.2%
B.T.U.	9,180	9,035	11,100	12,065

The above analyses are of a mixture of the coal from the two seams now being mined.

At the time the mine was visited all of the production was coming from No. 3 and "F" beds. No. 3 bed is reached through a rock tunnel, tipple height, that was driven to penetrate all workable seams in the series. The "F" bed is reached through a rock tunnel to the east of the main opening.

A modified room and pillar system of mining is employed throughout. No attention is paid to the coal cleavage since all rooms are driven at right angles to the gangway so as to allow all coal to run down the chutes by gravity. The main gangway and air course or "counter" are driven on the strike and are parallel on 60-foot centers. Cross cuts between the gangway and counter are on 60-foot centers. In both beds first mining is in the lower 6-foot bench and the full seam mining begins only when the room has been driven to its limit and pillar work started.

While the air course is driven in solid coal the gangway is driven in the footwall and is the cause of expensive and delaying track work due to the soft condition of the rock. It was suggested to the local management that the gangway also be driven in the coal and light conveyors used to handle the coal from the chute to the cars. They agreed that this would eliminate much of the track trouble and in a short time pay for the conveying equipment but doubted if they could convince the company that the expenditure would be justified.

Under the present system the coal from the cross-cuts between the rooms is hauled to the coal chute in wheelbarrows. Installation of short conveyors would eliminate much hard work and release men for more productive work.

The underground haulage system is a contributing factor to low production. Light rail, irregular spacing of the ties, and poor drainage are the causes of most of the haulage road troubles. Money spent on improving and draining the track in the gangways and rock tunnel would pay big dividends. Lack of sufficient cars and locomotives is in evidence but the present equipment could handle more coal if the track would be put in good condition. One battery locomotive is capable of working a full shift and one other can work only four hours on account of bad batteries. One new locomotive and two sets of batteries are on order. Delivery is expected in May or June.

The mine cars are the drop bottom type and are in good condition. Fifteen cars of similar construction were purchased from the Buffalo mine and will be placed in service as soon as steel is available to raise the sides to the height of the cars now in use. The new car sides are too low for loading from the present chutes.

The coal dump on the tipple is without doubt the biggest drawback to a larger production. Trips of 12 cars are hauled to the tipple and dumped into a track bin which has a capacity of slightly more than 2 mine cars. This requires the locomotive and cars to remain on the tipple until practically all coal has been run over the screens. After all coal has been run from the bin the tipple then remains idle until another trip arrives.

It was suggested to the management that a new 400-500 ton bin be built directly under the present dump. A feeder and conveyor could carry the coal along the side of the present structure and discharge to the screens at the same point from which they are now fed. Such an arrangement would permit the mine to operate on days when no railroad cars are available and allow the tipple to work a full shift when cars did arrive.

As at the Evan Jones mine the management must provide a day's work every day if it expects to maintain a full working force. When no railroad cars are available a considerable portion of the crew is employed on dead work, the value of which is questionable.

The company is producing coal for the Army for the current fiscal year, and is obligated to furnish 70,000 tons. The following table shows the size, quantity, and contract price:

Healy River Coal Corporation Contract, 1945-1946 Fiscal Year

Size	Quantity	Rate of Delivery	Price
R/M	30,000 tons	2,500 tons per month	$8.25 per T
Stoker	20,000 tons	1,600 tons per month	7.25 per T
Lump Nut	20,000 tons	1,600 tons per month	9.25 per T

Total deliveries to March 1st were 20,040 tons short as shown by the following table:

Table No. 13 - Deliveries on Contract

	R/M	Stoker	Lump-Nut
1945 July	3,576.45 tons	438.30 tons	857.35 tons
Aug	4,092.40 "	544.45 "	1,096.95 tons
Sept	1,100.45 "	177.95 "	240.25 tons
Oct	1,751.80 "	0 "	1,429.55 tons
Nov	1,193.05 "	336.60 "	972.30 tons
Dec	3,575.00 "	176.25 "	493.30 tons
1946 Jan	1,615.95 "	49.45 "	927.40 tons
Feb	892.75 "	175.25 "	912.30 tons
TOTAL	17,797.85 tons	1,898.25 tons	6,929.40 tons

Deliveries to March 1st totaled 26,625.50 tons or at the rate of 3,328 tons per month. If deliveries for the remaining four months continue at the same rate the company will fall short of its contracted tonnage by 30,064 tons.

The Army extended an invitation to the company to bid on coal for the next fiscal year but as of April 18 no bid had been received. This is no doubt due to the fact that the company can dispose of its coal in the Fairbanks area at higher prices than it will receive for coal delivered to the Army. Prior to the present war all coal used by the Fairbanks Exploration Company was furnished by this company. Operations of the Fairbanks Company were suspended during the war but are again becoming active. According to Mr. Lathrop, president of the company, he feels obligated to furnish all coal that they require and therefore does not want to obligate himself under an Army contract when there is a question of his ability to deliver the coal.

While it does not appear that this company will furnish any coal for the Army during the next fiscal year all of its production will be available for the civilian supply. Such an arrangement would allow all other production from the Healy River area to be available for Army use.

Diamond Strip Pit - The strip pit of the Diamond Coal Company is located on 2,200 acre lease and lies in rolling country about 5 miles west of Healy.

The lease is in the name of Gus Parris and several attempts have been made to mine coal but the operation was not very successful until taken over by the present company. In an effort to ease the critical coal shortage about two years ago the Army graded a dirt road from the pit to a point just north of Healy. A contract was entered into with Lytle-Greene to produce coal but several factors, notably a railroad car shortage, caused this company to loose interest in the pit.

The principal stockholders of the present company are Mr. Parris, Mr. Monohan, power house engineer at Suntrana mine and Mr. Sharlock, manager of operations at Diamond pit.

The outcrop of No. 1 seam, a lignite, of the Healy River series is being stripped. The seam averages about 42 feet thick, has a dip of about 36° and has the same general qualities as the coal from Suntrana and the Usibelli strip pit.

At the present time all of the stripping is done with a bull-dozer. After the coal is uncovered it is shot loose and then pushed to a loading platform by the bull dozer. Three 5-ton dump trucks are available for hauling coal to the railroad siding.

While the bull-dozer can readily handle the loose cover over the coal it is not adapted to coal loading. Continued operation of this equipment over the raw coal produces much fine coal and at the same time mixes much foreign material with it. With the help of the coal procurement officer, Quartermaster Office, Alaskan Department, the company is working on a deal for the purchase of a second-hand diesel shovel, of about 1½ yards capacity, for coal loading. Indications were that this purchase would be made during the latter part of April and that the shovel would be moved to the pit immediately.

Until the present time the two factors that limit production at this pit are lack of railroad cars and the drifting of snow on the road to the pit. Some improvements can be made to take care of the drifting at a few points on the road but due to its location on a broad flat, snow will always be a problem. It was suggested to the management that provision be made to stock coal at the railroad so that cars could be loaded at such times as the road was closed. This suggestion appealed to the operators and provisions will be made to stock coal as soon as the weather permits.

With a single 5-ton truck in operation one railroad car can be loaded each day that cars are available. The company owns 3-5 dump trucks and on the basis of 250 working days should be able to load 37,500 tons a year. It is possible that the average daily loading could exceed 250 tons in favorable weather and that a production of 40,000 tons a year can reasonably be expected from this pit.

Some idea of the advantage of a stockpile at the railroad may be gained from the fact that during the week of April 5 to 12th the mine road drifted shut four times. The bull-dozer was kept busy on this work and no coal was loaded. With a shovel in operation the bull-dozer could be kept in operation on the roads and on stripping in all but the severest weather.

The company is operating on a 20,000 ton contrct at $4.40 per ton. As of April 1st only 7,000 tons had been delivered but with better weather ahead it is believed that all coal contracted for will be delivered by June 30th. The company has a contract to deliver 30,000 tons at $4.40 per ton during the next fiscal year, all coal to be run of mine. Unless unforseen difficulties appear this amount of coal should be delivered. It is also probable that some coal in excess of that contracted for will be available during the coming year.

Analysis of the coal shows it to run slighly higher in ash than that

from Suntrana or the Usibelli pit. The ash content of delivered coal should be lower after the power shovel is used for loading. Foreign material that falls in the pit can be better handled with the shovel.

Table No. 14 - Analysis of Coal - Diamond Pit - Mine Run

	Air Dried	As Rec'd	Moisture Free	Moisture & Ash Free
Moisture	16.1%	17.6%		
Volatile Matter	42.3%	40.5%	49.2%	56.9%
Fixed Carbon	31.3%	30.6%	37.3%	43.1%
Ash	10.3%	11.1%	13.5%	
Sulphur	0.2%	0.2%	0.2%	0.2%
B.T.U.	8,675	8,500	10,340	11,955

It is believed that with a little encouragement this company will be willing to put a large part of their profits into improvements and eventually be in a position to compete with any producer in the Healy River Field.

This property affords an excellent opportunity to do deep mining on several seams, principally No. 1. This work would all be above drainage. While confronted with a 5-mile truck haul of the coal to the railroad the cost of the entire operation should leave a sufficient margin of profit to make any such operation profitable. The present management has no plans for going into underground mining.

Due to heavy snow at the time the pit was visited it was not possible to estimate the amount of coal available for stripping. Since all of the seams of the Healy River series appear to outcrop on the property and above drainage several years of stripping appear to be ahead of this company if production averages around 50,000 tons a year.

Usibelli Strip Pit - The Usibelli strip pit is located on the left side of Healy Fork and about 1½ miles east of Suntrana mine. The present operation is on a 10 acre mining permit issued to the U.S. Army. The time limit on the present lease is for the duration of the war plus six months and the coal is royalty free.

The Army has entered into a contract with Mr. Emil Usibelli for the stripping and loading of coal into railroad cars at the rate of $4.75 per net ton. A new road, 1½ miles long, was graded and a chute constructed down the side of a steep hill. The contractor also constructed his own 5-car side track although the rails were furnished by the railroad. The side track is an extension of the Suntrana mine tail track.

At the present time Mr. Usibelli is working on a 25,000 ton contract but has contracted for 75,000 tons during the next fiscal year. Since the coal that lies above drainage on the present lease is nearing exhaustion the Army made application for and approval was received for mining rights on 360 acres that include the present lease together with new acreage adjacent to the east

side of the Healy River Coal Corporation lease. The acquisition of this new territory will permit the stripping of a large quantity of the No. 1 seam and affords an opportunity for underground mining of the same seams as have been worked in the Suntrana mine. Due to the heavy snow when this area was visited it was not possible to estimate the amount of coal available for stripping. Mr. Usibelli states that there will be more than enough coal available in No. 1 seam alone to fill his 1946-47 contract.

In the area of the pit the No. 1 seam is about 42 feet thick and has a pitch of about 38°. The coal shows very little evidence of weathering except where directly exposed to the elements and it is believed that the new workings will furnish a fuel that is as good as or better than that from the present pit.

At present the equipment consists of one bull-dozer and two 5-ton dump trucks. With this equipment it is possible to load about 4 railroad cars daily. A new combination power shovel and drag-line was purchased on April 11 and will be delivered before the end of April. A new 5-ton dump truck has also been ordered. When the new equipment is at work this pit should be able to produce from 300 to 350 tons per day.

It is Mr. Usibelli's intention to do future stripping with the bull-dozer and by the hydraulic method. He also intends to install side track space for 5 more railroad cars and build a storage bin with a capacity of about 100 tons. Changes will be made in the present chute so that stoker, lump and slack sizes can be made. The new bin will be so constructed that these sizes can be stored separately.

By extending the side tracks to twice their present capacity it will be possible to have more than one day's run of cars on hand and, in case deep snow blocks the Healy Fork branch of the railroad, will permit the pit to operate several days.

Considerable improvement in the delivered coal may be expected after all improvements have been made. At present the coal is loaded by the bull-dozer and much fine coal results from its continued travel over loose coal.

Car samples, analyzed by the U.S. Bureau of Mines at Anchorage show the following:

Table No. 15 - Usibelli Strip Pit - Run of Mine

	Air Dried	As Rec'd	Moisture Free	Moisture & Ash Free
Moisture	16.2%	18.3%		
Volatile Matter	4.6%	40.6%	49.9%	55.3%
Fixed Carbon	32.4%	31.6%	38.7%	43.7%
Ash	9.6%	9.3%	11.4%	
Sulphur	0.2%	0.2%	0.2%	0.2%
B.T.U.	8,830	8,610	10,535	11,690

While the ash is slightly higher than that of the Suntrana coal the fault does not lie in the coal itself. Bull-dozer loading makes it impossible to work around any foreign material that may fall into the pit.

Mr. Usibelli appears to be a resourceful individual and, if sufficiently encouraged, should be able to produce a substantial amount of coal for the Alaskan pool as long as required.

Lignite Creek - Lignite Creek runs almost parallel to and about five miles north of Healy Fork. This property was not visited because of deep snow but a plane trip was made up the creek and several photographs were taken. The general topography is somewhat similar to that of Healy Fork but there are indications that the strata are not so steeply pitched. Several thick seams of coal were visible and apparently extend over a wide area. Natives report that at one point a 70-foot seam of lignite is exposed but that the quality is not as good as that found on Healy Fork. As far as is known no mining has been done in this area and it is therefore possible that the appraisal of quality may have been based on weathered coal.

There is no indication that the coal beds that are exposed on Healy Fork outcrop south of Lignite Creek. This would place the Lignite Creek beds in a younger series which would naturally carry a lower grade of lignite.

With so much coal available on Healy Fork any new development on Lignite Creek would not be justified at this time.

The Roth Property - The Roth property gets its name from the original owner of a mining permit on a 2,080 acre lease on Healy Fork and is located eight or nine miles from the end of the Suntrana mine spur.

Natives in the area advised against a trip to the property because of deep snow and lack of shelter along the river. A plane trip over the area disclosed that little information could have been obtained if the property had been reached on foot. Heavy snow covered the hillsides and only occasional showing of the coal outcrops were visible.

The best available information on this property is contained in a report dated January 10, 1932, titled "The Coal Situation in Alaska and on the Alaska Railroad" by F. R. Wadleigh, Consulting Engineer. This report is in the files of the U.S. Bureau of Mines, Anchorage, and is quoted as follows:

> "This property, of 2,080 acres, is located from eight to nine miles from the end of the Suntrana mine spur, on Healy River, at the southeastern end of the Nenana field.
>
> "A series of coal beds, claimed to be 20 in number, outcrop on the right side and left limit (north and south end of the syncline) and a considerable amount of prospect work has been done, in order to determine the continuity of the beds and their possible commercial value; this work was stopped at the close of 1925."

"Many samples were taken from the Basal bed, at the outcrop on Healy River, where the measures had been much disturbed by faulting and the consequent pressure had altered the coal. A part of the bed, about 12 ft. thick, proved to be a sub-bituminous cannel, of sporehumic type, as determined by Dr. Thiessen, of the United States Bureau of Mines, to whom a sample was sent for determination of its rank and character.

"Most of the coal exposed at the point from which the test coal and samples were taken has been extracted; efforts were made to locate this coal westward to Gold Run Creek, on the opposite side of the river, a distance of about two miles, but, while it was found there, it has not been satisfactorily correlated with either the Basal or the Mammoth bed.

"The Moose bed, 40 ft. thick between walls, also outcrops on the river; it is probable that a large tonnage can be mined cheaply from both this and the Mammoth bed, if proper methods of mining are used and provided the beds are continuous for a reasonable distance, which has yet to be determined.

"Both of these beds contain sub-bituminous coal of excellent quality, better than that mined at Suntrana.

"A memorandum brief report on the Roth property and its coal was made by Mr. B.D. Stewart (Supervising Mining Engineer, U.S. Geological Survey), in 1925, the contents of which are given below; a more detailed report was also made by Mr. Stewart in the same year, which is on file at Anchorage.

"Mr. Stewart's memorandum report reads as follows:

"1. Cannel coal of excellent quality has been proved to occur in the Basal bed on the Roth property, but sufficient development work has not been done to prove the tonnage available or to determine a number of factors that would control the choice of the proper mining method to be adopted and the cost of mining. The Basal bed is the only bed that has been proven to contain cannel coal.

"2. The coals of the Moose and Mammoth beds, from which most of the coal already shipped for commercial test was mined, rank as sub-bituminous coal of superior grade. With respect to calorific value they rank about 25 percent better than the coal being mined at Suntrana, in the Nenana field, and about 10 percent below the best coal of the Moose Creek section of the Matanuska field. They contain about double the moisture contained in the Moose Creek coal and about 25 percent less than that contained in Suntrana coal.

'3. The Roth beds would yield a high percentage of lump of attractive appearance that would probably withstand the handling incident to shipment to distant points better than any other coal of either the Nenana or Matanuska field, and, because of its lower moisture content, would withstand storage better than other coals of the Nenana field.

'4. Coals from beds on the Roth holdings other than the three above mentioned have not been shown to be of higher rank than that now being mined at Suntrana.

'5. Owing to the fact that all the beds on the Roth property are steeply dipping, the application of open cut mining methods is not feasible. The claim that exceedingly low mining costs could be attained by the use of open cut methods has not been substantiated.

'6. The excessive widths of the Roth steeply-dipping beds render difficult the successful application of approved underground mining methods. Without excessive loss of coal in place seams of such width cannot be mined as cheaply as narrower ones.

'7. Topographic conditions on the Roth property render it not feasible to develop the beds by tunnel entries (with the possible exception of the Basal bed), as the length of gangways required would be excessive compared to the tonnage developed by them. For successful large scale mining entry by slopes would be required, and, for this reason, it is believed mining costs at the Roth property would be higher than at Suntrana, not taking into consideration the longer freight haul involved.'

"Professor E. N. Patty, Dean of the College and Head of the School of Mines, Alaska Agricultural College and School of Mines, at Fairbanks, made a detailed report on the Roth property, the coals it contains, their mining, use and markets, as the result of considerable prospecting work on the property.

"Dean Patty's report puts a high value on the property and its coals and predicts very cheap mining costs, but, in my opinion, his conclusions regarding mining methods and costs, uses and markets, cannot be substantiated.

"Dean Patty divides the coals on the property into three grades and estimates give an estimate of the tonnage in the ground, as follows:

A-1 - Cannel coal of high run sub-bituminous grade.
A-2 - Sub-bituminous coal.
A-3 - Poorer beds between Coal Creek and Healy River.

"Tonnage estimate:

A-1 - 10,000,000 long tons above water level.
A-2 - 7,000,000 " " " " "
A-3 - 1,000,000 " " " " "
18,000,000 Total long tons above water level.

"The method by which Dean Patty arrives at the tonnage estimate is not given; the data contained in his report are hardly sufficient for any satisfactory estimate.

"It should be understood that the Roth property has no rail connection with the Alaska Railroad at present. According to an estimate made by Mr. C. H. Holmes, Chief Engineer, the cost of building such a connection would be approximately $498,000. - eight and three tenths miles at $60,000. per mile.

"The following summary of the contents of his report is given by Dean Patty:

"Contained by the Roth coal holdings are 9,500,000 long tons of first grade coal above water level. This is a cannel coal of high sub-bituminous rank which will average as mine run without sorting or washing, over 10,000 BTU's and an ash content varying from 5 to 10 percent. The coal is non-coking.

'In a section of 2,488 feet across the series there are 345 feet of first grade coal and 2,143 feet of sediments. The largest bed is 54 feet in thickness; the second 40 feet, while 10 beds vary between 15 and 22 feet in thickness.

'Due to the unusual topographic condition of these beds, I estimate that 70 percent of the first grade coal above water level can be directly recovered by open-cut mining at a cost of $1.00 per ton, based on a daily production of 300 tons.

'Enormous tonnage of this coal exists below water level, but since there are such large reserves available above water level, the lower coal is disregarded in this report.

'This coal is within six to eight miles of a spur of the Government Railway and is readily accessible.

'With a moderate outlay of capital the property can be placed in position to make a large scale output.

'I appreciate that this is a strongly worded summary, but the facts as set forth in this report are substantiated by field evidence.

'The quality of the coal has been demonstrated through trial shipments made during the months of March and April, 1924. The results secured indicate that for household use the Roth coal is superior to

any other coal now being mined in Alaska. Steaming tests conducted by the Alaska Railroad indicate that the coal is fully equal to any coal now being mined in Alaska for steaming purposes. The competitive coals are not favored with low mining costs".

"Analyses of the Roth Property Coals as Reported by the U.S.Bureau of Mines

Data	5/6/24	5/8/24 Cannel	4/20/25	4/11/24	3/27/25 Mine Run	- Mine Run	-
Sample from	Bed	Bed	Car	Car	Car	Car	Bed
Name of Bed	Basal	Basal	Mammoth	"	"	"	Moose
Moisture, as Rec'd	12.7	12.9	16.2	12.98	17.84	13.02	17.09
Volatile Matter, Dry Basis	47.9	46.6	49.6	48.55	51.84	47.53	51.67
Fixed Carbon, Dry Basis	42.7	44.7	45.8	42.00	44.56	43.50	43.53
Ash, Dry Basis	9.4	8.7	4.6	9.45	3.60	8.97	4.80
Sulphur, Dry Basis	0.4	0.3	0.1	0.32	0.09	0.30	0.21
BTU, As Rec'd.	10,730	10,680	10,500	10,916	10,483	10,698	10,335
BTU, Dry Basis	12,280	12,250	12,530	12,544	12,759	12,529	12,455
Hydrogen, Dry Basis	5.4	5.5	5.5	-	-	-	-
Carbon, " "	68.9	69.6	70.5	-	-	-	-
Nitrogen, " "	1.1	1.1	1.3	-	-	-	-
Oxygen, " "	14.8	14.8	18.0	-	-	-	- ".

While the Roth property does appear to be an attractive mining proposition, there has been no explanation, local or otherwise, for the desire to by-pass other accessible coal in order to start operations there. The beds that have been worked at Suntrana continue eastward for a considerable distance and, with the possible exception of some of the lower beds in the series, present just as favorable mining conditions as prevail at Suntrana.

There is every indication that the coal to be found above drainage and lying between Suntrana mine and the Roth property is in sufficient quantity to fill Alaska's lignite requirements for a great many years. Mining in the Roth area at this time is not justified, and any such proposal should be objected to. It might be well, however, to make an attempt to have this area set aside as an Army reservation.

Reservation at Mouth of Healy Fork - Some years ago an attempt was made to operate a deep mine on the west side of the Nenana River at Healy. The original opening was made below the railroad grade and just south of the railroad side track. For some unexplained reason the mine was not a success and was closed down. The operating company next obtained a mining permit on Healy Fork and opened the Suntrana mine. After a short time the company needed additional capital and some of the present owners came to their rescue. After the mine was in operation for several years sufficient work had been done to establish the fact that the coal beds continued under the hills between

the mine and Healy. The possibility of a competitor for the limited market for lignite prompted the Suntrana management to have the coal at and near Healy declared a public reserve. This was accomplished by Congressional action. The above comments cannot be substantiated but the story was repeated several times by natives and is accepted locally as being the reason for the public reserve. While there may not be as much coal above drainage as on the Suntrana lease, there is sufficient to maintain a fairly large scale mine for many years.

Of special interest is the outcrop of No. 1, 2, and 3 beds on the south side of Healy Fork and near its mouth. The beds appear to have about the same pitch and thickness as at Suntrana and outcrop for almost a half a mile on a gently sloping hillside. With proper equipment and a bridge across either the Nenana River or Healy Fork this area could be developed into a low cost stripping operation.

A rough estimate of available coal in the stripping area showed about 200,000 tons available. There undoubtedly would be some waste in mining and in reaching unweathered coal but this would not greatly reduce the estimate.

Stripping could be done well above drainage and the workings would present no serious problem when coal was mined from lower levels. All pits could be cut so that all water could be handled by gravity.

The reserves extends in all directions from Healy and is said to contain about 1-1/2 townships.

The exact status of this reserve should be determined and serious consideration should be given to having it made available for the Army in case of an emergency since it affords the best opportunity for producing quick coal along the rail belt.

MATANUSKA AREA

Bituminous Coal - The Matanuska field contains the largest deposits of bituminous coal and the only anthracite deposit in the Alaska rail belt.

The commercially important coal in the Matanuska valley at the present time are the bituminous beds found in the valley of Eska and Moose Creek. The beds occur in the Chickaloon series and are intruded by numerous bodies of igneous rock in fairly large masses, and by many sills and dikes. Locally the beds are relatively undisturbed by igneous intrusions but several large faults are found in the area that contains the active mines.

The principal deposit lies between Eska and Moose Creek and forms a narrow syncline with the legs pitching about 38°. Eska and Evan Jones mines are operating in this deposit and are removing coal on the south side. Premier, Buffalo, and Baxter mines operated on the north side, but these have either been worked out or temporarily closed down.

Anthracite - The anthracite deposits are limited to Anthracite Ridge, 12 to 15 miles east of Chickaloon. While there had been some prospecting in the area in previous years, the work of the U. S. Geological Survey during the summer of 1931 was the first systematic attempt to determine the location, extent, and condition of the coals found there.

Results of the prospecting were disappointing as it was found that the limited supply of anthracite was badly faulted and the beds have been disturbed by numerous intrusions of igneous rock.

Eska Mine - Eska mine owned by the Alaska Railroad, is located on Eska Creek, a branch of the Matanuska River and is operating in the same coal bearing series as the Evan Jones mine.

Many development plans have been made for this mine and each appears to have been made with the idea of obtaining quick, cheap coal. The result has been that large bodies of coal have been hopelessly lost while other areas that were neglected are too small to be worth the development cost necessary for their recovery.

The common practice in Alaska is to drive rooms to the raise and have the coal slide down iron chutes to the gangway. One essential requirement of the method is that the coal seam has a pitch of about 30°. When the pitch fell below this angle in Eska mine little or no effort was made to recover the flatter section of the seams and the area was abandoned. New work would then be started in other seams and mining continued until all of the steeply pitching coal was removed.

There has been no long range planning of operations and much valuable coal has been lost. Present plans call for new rock tunnels that will open up some of the flat sections of the basin. If suitable equipment is provided for handling coal in the low pitch rooms this work should be justified since it will make available several hundred thousand tons of coal.

The coal is hauled to the surface by storage battery motors and run through a McNally-Pittsburgh washer. The washer has a capacity of about 300 tons of washed coal a day but when visited was producing only about 125 tons, due to lack of raw coal. The washer is in excellent condition but could be made more efficient by the addition of a crusher and an auxiliary launder for recovering the coal in the large material that is handpicked and sent to the rock dump.

The Alaska Railroad is seriously considering closing the mine on account of the high cost per ton. The cost is currently running between $18. and $20. a ton of coal produced but if a proper amount were to be considered as a capital investment the actual cost of the coal produced would be about half of the present figured cost. This, however, is a matter of accounting and has no bearing on production.

It was suggested to the management of the Alaska Railroad that operations be continued at least until such time as new or existing properties could be developed to supply all of Alaska's needs. With the daily production averaging about 125 tons a day or about 40,000 tons a year this mine is badly needed to keep supply and demand somewhere near a balance.

If sufficient coal can be developed by the program now in effect there is a possibility that the proposed railroad spur up Moose Creek will be extended to reach Eska mine. Such an arrangement would insure a more regular car supply and a resulting increase in production, since the new line would permit all weather delivery of railroad cars. The present spur up Eska Creek is easily blocked by drifting snow and is hard to keep open.

Coal from Eska mine is used exclusively by the Alaska Railroad and none has ever been available for public consumption. In the event that the mine is closed down very little coal of comparable quality will be available to the railroad unless new mines are opened. The Evan Jones mine produces about the same grade of coal but practically all production from the mine has been contracted for by the Army or other interests.

Evan Jones Mine - Bituminous Coal - The Evan Jones mine is located at Jonesville and is owned by the Evan Jones Coal Company of Anchorage. The mine was opened in 1920 and has been in continuous operation since that time.

The mine was originally opened by a drift, at an elevation of approximately 942 feet, which penetrated the Nos. 3 and 4 coal beds. Coal from No. 1 level was hauled through this drift. Later a second tunnel was driven at an elevation of 1,007 feet and from this a slope was sunk to level No. 2 at 850 feet, and the Nos. 3 and 4 beds' coal removed. In 1923 the present main haulage and ventilation tunnel was driven through the rock, on water level, for a distance of about 4,000 feet. This tunnel runs almost due north and penetrated 5 coal seams on the south limb of the syncline and 9 coal seams on the north limb of the same syncline. Most of the mining to date has been in an area where the seam pitch varies between 35° and 40°.

Geologically, the coal beds in this synclinal area are the Tertiary-Eocene formation and are locally designated as the Chickaloon formation of the Eska series. The coal is bituminous and occurs in beds of varying thickness. Only two beds, Nos. 3 and 5 are being mined at the present time. No. 3 bed was not measured for the reason that it was not sufficiently exposed to get a good section. The mine management stated that the total thickness of the seam was about 12.5 feet. The bottom 5.5 feet of the seam is clean coal and is separated from the top bench by a 2-inch parting of bone and slate. The top bench resembles No. 5 seam in that it is composed of alternate layers of bone, coal and slate with the coal predominating. A section of No. 5 seam is as follows:

Evan Jones Mine - No. 5 Seam

	Feet	Inches
Coaly slate	0	5
Coal	0	10
Bone	0	2
Coal	0	9
Bone	1	11
Coal	1	3

Evan Jones Mine - No. 5 Seam (cont'd.)

	Feet	Inches
Coaly shale	3	2
Bone	0	2
Coal	1	6
Coaly slate	0	8
Coal	1	7
Bone	0	1
Total Seam Thickness	12	6
Total Coal	6	9

Analyses of Run of Mine coal from the No. 5 bed, on an "as received basis", as furnished by the U. S. Bureau of Mines at Anchorage is as follows:

Table No. 16 - Analysis of Evan Jones Mine Run Coal

Moisture	4.1 percent
Volatile Matter	36.3 "
Fixed Carbon	36.6 "
Ash	23.0 "

From the analysis, the ration of the volatile to the total combustible matter in No. 5 seam is calculated to be .50 which indicates that the coal dust is definitely hazardous from an explosion point of view.

No analyses of No. 3 seam were available but with a higher percentage of coal than in the No. 5 seam the coal dust would naturally be more of a hazard.

Method of Mining and Timbering - A modified room and pillar system of mining is employed in this mine. Butt and face cleavages are disregarded to enable them to take advantage of the pitch of the bed for handling coal on the room chutes. The main haulage level gangway and return air course or "counter" are driven on the strike and are parallel on about 60 foot centers. Cross cuts between the gangway and air course are on 60 to 70 foot centers. About half of these cross cuts are used for room coal chutes, using them in groups of three, then skipping three before the next three are used. At 200 to 250 feet above the gangway "slants" are driven off the two outside rooms and for a sufficient distance to allow for turning new rooms. The center room is used for men and supplies and two other rooms are used for handling coal to the gangway.

The rooms are not driven on sights and vary in width from 8 to 20 feet. This causes a variation in pillar thickness which in turn causes considerable trouble in establishing and maintaining an effective break line when mining pillar coal. The irregular pillars also are the cause of many of the local squeezes and the resulting bad top and bottom conditions, with the consequent loss of much coal. It has been estimated that 30% of the coal is extracted in first mining and an additional 30% in pillar work.

The present plans of the management call for all advance room work to be in the lower bench of No. 3 seam and for the removal of the remaining pillars in the No. 5 seam. The top bench and all pillars in No. 3 seam will be mined on the retreat.

Gangway timbering consists of timber sets, irregularly spaced and lagged with poles. Many of the sets are broken or rotten and should be replaced.

Two or 3 rows of timbers are used in the rooms, the number depending upon the room width. Posts and caps are the most common form of room timbering. In general the timbering practice leaves much to be desired.

Ventilation - A Jeffrey double inlet type fan, 60 x 36 inches and belt driven by a 40-horsepower steam engine, is located on the surface about 180 feet southwest of the main portal. The fan is operated as a blower and has a capacity of about 50,000 cubic feet per minute when operating at 200 R.P.M. against a 1-inch water gauge. The air current in the mine can be reversed by the manipulation of iron doors in the fan housing. A small standby, electrically driven, booster is located above the main haulage tunnel and about 180 feet from the main fan. Several small booster fans are in use for ventilating rooms or entries that are ahead of the main ventilation system.

While this mine cannot be considered as having much gas there is a constant danger of minor explosions. There are numerous unconfirmed reports of gas ignitions in the coal mines of the Matanuska field and in 1944 an explosion occurred in Buffalo mine, on the same limb of the syncline, that was attributed to gas.

There are many accumulations of coal dust along the haulways, especially at the loading chutes. A very serious explosion could develop from a combination of gas and dust accumulations. The seriousness of this situation cannot be over emphasized since the loss of this mine would shut off all but a very small supply of the type of coal now used by the railroad and by Ft. Richardson.

An inspection of this mine by the U. S. Bureau of Mines was made in the early part of 1945 and an extended list of recommendations was made to the management. Unfortunately, the enforcement of the mining law is in the hands of the Territorial Commissioner of Mines, an appointee of the governor, and due to lack of enforcement, the mine is in about the same condition as at the time of the inspection. Aside from the possible loss of the mine as a current source of fuel, the loss of such large quantities of the best available coal in Alaska is serious. While the suggested improvements in safety and mining practices may be expensive for the company they should be carried out in the interests of the employees and as a matter of conservation. Available supplies of this quality of coal are very limited in Alaska and waste should not be tolerated.

Haulage and Preparation - At present all cars are loaded directly from the room chutes and hauled to the surface by storage battery locomotives. All coal, regardless of quality, is run through the washer. This washer is little more than an excuse for a preparation plant and is the bottleneck of the entire plant. There appears to be sufficient haulage equipment available

to handle a larger tonnage but until some means are provided whereby the No. 3 seam coal can by-pass the washer there is little chance of much of an increase in production. The condition of the washer does not permit its operating for more than one shift a day. Repair work is done on the night shift except in case of a major breakdown.

All coal is hauled from the mine in drop bottom cars and dumped into a bin from which it is conveyed to the washer. After being washed the coal is screened into fines, stoker and lump-nut sizes. Separate bins are provided for each size and the railroad cars are loaded from the bins.

It was suggested to the management that a dump be built so that coal from No. 3 seam could be run over screens and dumped directly into railroad cars, thus allowing the washer to handle No. 5 seam coal only. Such an arrangement would remove the present bottleneck, and at the same time permit the washer to do a better job on the No. 5 seam coal.

The management fully realizes that the present washer is outdated and inquiry has been made in the states for a new one. When delivery could not be promised within a year the proposition was dropped. The rumors that Eska mine would soon close caused the manager to consider purchasing the washing plant at that mine. At the time Eska mine was visited no definite decision had been reached as to when, if at all, the mine would be closed. The acquisition of this washer is therefore temporarily out of the picture.

Some idea of the efficiency of the washer may be gained from the analysis of lump-nut coal delivered to Fort Richardson in March 1946, and analyzed by the U. S. Bureau of Mines, Anchorage.

Table No. 17 - Analysis of Evan Jones Lump-Nut Coal, Nos. 5 & 8 Beds

	Air Dried	As Rec'd.	Moisture Free	Moisture & Ash Free
Moisture	1.5%	3.5%		
Volatile Matter	41.9	41.1	42.5%	55.8%
Fixed Carbon	33.1	32.4	33.6	44.2
Ash	23.5	23.0	23.9	
Sulphur	0.4	0.4	0.4	0.5
B.T.U.	10,170	9,965	10,325	13,570

Under the terms of the 1945-46 contract the producer is penalized for all ash in excess of 16%.

Labor and Production - Ample working places are available to accommodate about 25 additional men, but the present railroad car supply does not warrant any such addition to the working force. In an effort to retain men the management guarantees a full day's work every working day. When no cars are available the bins at the washer are filled and all hands then go on dead work. This is a rather expensive but necessary arrangement and could be eliminated if a better railroad car supply became available. The decline in number of men employed from 118 in October to 98 in February was caused by not attempting to replace the men that quit work. The remaining force was

able to do all work necessary to fill the available cars.

The present average daily production from the mine is about 375 tons. With proper loading facilities, manpower, and railroad car supply this mine is capable of producing about 500 tons a day. When sufficient additional development work has been done in No. 3 seam, this mine should be able to produce about 600 tons a day.

On the basis of 500 tons a day and 250 working days a year, the mine should produce 125,000 tons a year. If No. 3 seam development is carried out as scheduled the 600 tons per day could be attained in about one year. This would raise production to the rate of 150,000 tons a year. 1945 production was 99,908 net tons.

At the present time the mine is working on an Army contract for 85,000 tons for the fiscal year. To date, 70,000 tons have been delivered and indications are that they will deliver all coal contracted for by June 30.

The company has entered into a new contract for the 1946-47 fiscal year for 87,000 tons and if the present plans of the company are carried out and if railroad cars are available, they should be able to fill the contract and have a substantial amount of coal available for use by the Alaskan railroad.

General - The Alaska Railroad is considering the construction of a new line from Wasilla, thence up Moose Creek to the head of Eska Creek. This new line would eliminate the branch up Eska Creek since the cost of maintenance on this branch is fast becoming prohibitive. Moose Creek lies on the opposite side of the mountain from Evan Jones portal and could be reached by extending the present rock tunnel through the mountain. At the time that the new railroad was being constructed a tipple and washer could be built at a new location on Moose Creek. If this program could be carried out the present setup, with the suggested dump for No. 3 seam coal, could continue to operate and no production lost on account of a change-over.

There is nothing to indicate that the Moose Creek line will definitely be built. It would therefore appear expedient for the mine management to improve the present surface plant and keep it in working order until such time as the Moose Creek improvements are assured.

Buffalo Mine - Buffalo mine was opened on a lease of about 900 acres on Moose Creek in the Matanuska field. Due to the pressing need for coal and the lack of washing facilities the Territorial Commissioner of Mines permitted the mining of a relatively clean seam of coal that occurs near the base of the coal bearing series. Locally the seam that was mined is known as the No. 2 seam, but it is believed by those familiar with the entire field that it is the same as the No. 3 seam now being mined by Evan Jones mine on the other side of the mountain.

The mine was opened by driving a 480 ft. slope along the pitch of the seam. A gallery was driven on the strike at the foot of the slope and rooms were driven to the raise. Since the seam lies at the bottom of the series

which contain other mineable seams permission was not granted for the removal of any pillars. Another condition upon which the permit was granted was that all room and entry work be driven narrow so as to protect the overlying seams. An inspection of the latest available maps of the mine indicates that these terms were fully complied with.

After the Army withdrew its financial support from the mine at the end of the war the management continued to operate the mine and as late as November 1945 produced a small amount of coal. Differences of opinion among the stockholders as to the course that the company should follow resulted in a complete shutdown and the mine has been allowed to flood. This mine was visited on April 15, 1946 and according to Mr. Buffalo, who was the only person at the mine at the time, the water was within 160 feet of the top of the slope. All underground equipment, with the exception of the electric motor from the pump and the storage battery locomotive, is now under water.

Mr. Buffalo was doing his best to keep the surface plant in as good a condition as possible and from all appearances none of the surface equipment is in any worse condition than at the time operations ceased.

Due to the fact that the emergency is over it is believed that the Territorial Commissioner of Mines will prohibit any further mining of the No. 2 seam. Some rock tunnel work will therefore be necessary before production can be begun in any of the overlying seams. This rock work together with the time required for gangway driving precludes the early production of any appreciable amount of coal for some time after operations have been resumed. Dewatering the mine, rock tunnel work and entry driving will require several months time.

A section of the strata as shown by diamond drill cores indicates that the No. 2 seam is the only one that can be mined and shipped without being processed in a washer.

This mine cannot be counted upon to produce coal for some time. The mine must be dewatered before new work can be started and the procurement and installation of a washer will require considerable time. There is no harmony among the stockholders of the company regarding a definite policy to be followed and there is some doubt as to their ability to finance any program of improvement.

Transportation has been one of the drawbacks to this property since all coal must be trucked about twelve miles to the railroad. The management of the Alaska railroad is considering the construction of a new line up Moose Creek, from Wasilla, so that they can abandon the troublesome branch up Eska Creek. This proposed line will pass near the Buffalo mine and it will be possible to build a spur into the mine.

It is believed that if a washer could be installed, suitable mine cars purchased and some additional electric power provided this mine could produce about 100 tons of good bituminous coal a day. However, this mine cannot be counted on to furnish any coal until the various factions among the stockholders can agree on a definite policy to be followed.

Mr. Stoll, who apparently has control of a majority of the voting stock of the company outlined his plan for reopening the mine as follows:

The mine will be reopened as soon as finances can be arranged for. This appears to be contingent upon the company's ability to sell the Army the idea of accepting a high ash product from No. 5 seam until development extends to all areas under which the No. 2 seam was removed. At this point work on the pillars of No. 5 seam rooms will be started and with a lag of about two rooms, the pillars in No. 2 seam will be taken out. The ash content of unwashed coal from No. 5 seam averages about 26% and that from No. 2 seam about 9%. A mixture of equal amounts of coal from the two seams will have an ash content of about 17.5% and will exceed the 16% ash content allowed by the Army. Mr. Stoll believes that after being penalized for excessive ash the company will still have enough money left to liquidate any loan that may have been made to start operations.

When sufficient cash becomes available a washer will be installed and, if necessary, additional diesel-electric power plant equipment will be purchased.

Before this mine can produce more than 100 tons in an eight-hour shift, it will be necessary to install a larger skip. If this is done it may be necessary to install a larger hoisting engine and enlarge the area of the present slope at several points.

Under present plans the coal would have to be hauled to the railroad as before. Both Mr. Stoll and Mr. Buffalo stated that sufficient trucks were available to haul from 150 to 200 tons a day over the present road if the road could be kept free of snow.

From the above it is evident that the Army will be called upon to accept a very inferior grade of fuel until such time as a washer can be installed, therefore it is recommended that no coal be purchased from this property until such time as the army can expect delivery of penalty free coal.

CHICKALOON FIELD

About 25 years ago the Navy became interested in the bituminous coal in the vicinity of Chickaloon, at the head of Matanuska Valley. The Navy's work in the field was considered as a war emergency measure and was in charge of the Navy Alaska Coal Commission. Work was stopped in 1922 and has never been resumed.

A complete surface plant, except washer, was built at Chickaloon and a washer was built at Sutton 18.5 miles to the west. After deducting all credits for materials, etcetera, sold, the investment amounted to $1,315,354. All of this was a total loss. Only a few thousand tons of coal were mined and washed.

Several reasons have been advanced for the decision of the Navy to abandon the project. The termination of War I, faulty seams with resulting high

production costs and the sudden switch to oil are among the reasons given.

It is generally known that the coal in this area is a good grade of bituminous and that it occurs in a badly faulted area. The workable seams contain a considerable amount of foreign material and the coal as mined must be washed if it is to be made into a marketable product.

In addition to the work done at Chickaloon and Sutton the Navy Commission carried on exploration work on Coal Creek, on the south side of the Matanuska river and about two miles southeast of Chickaloon. Several hundred feet of tunnels were driven and drill holes were put down in an effort to determine the extent of the coal beds in that area. The cost of this work is included in the figures given above.

After making an examination of the property and weighing the possibility of future returns, the Alaska Railroad management decided that there was no future in this coal field. The 18-mile track extension was lifted about 1932 and within the last few years a highway was built over the old right of way.

The conclusion drawn from the above facts is that this area cannot be considered as a desirable source of fuel for Alaska under present conditions.

MISCELLANEOUS FIELDS

Dunkle Mine - The Dunkle or Colorado mine is in an isolated area of lignite that lies above the timber line and about 12 miles west of Colorado station of the Alaska Railroad.

The only mineable seam on the property averages about 6 feet in thickness and is all clean coal. The original estimate of available coal was several million tons, but subsequent drilling has narrowed the reserves to about 300,000 tons. Other seams outcrop in the area, but these are either thin or dirty and unmineable under present conditions.

This property was not producing coal in April 1946 and Mr. Dunkle stated that his present plans call for only 2,000 or 3,000 tons during the coming summer. He also plans to make some small improvements so that next year he will be in a position to bid on some of the Army's requirements. The probable tonnage for next year could not be estimated by Mr. Dunkle due to such uncertain factors as the labor and railroad car supply.

The coal is hauled by trucks over 12 miles of rolling country to the railroad. This area is in the heavy snow belt and it is impractical to operate during the winter months.

The mine never was much of a factor in the Alaskan coal trade and cannot now be considered as a source of a sufficient tonnage to have any appreciable effect upon the general fuel situation.

Broad Pass Field - There is quite a large deposit of coal in the Broad Pass district that appears to be well adopted to strip mining.

The eastern edge of the stripping area lies a few hundred yards east of the Alaska Railroad and at a level that will permit railroad cars to be run into the pit for loading.

The coal is reported to be a good grade of lignite and the seam to be stripped is reported to be about 9 feet thick with the cover ranging from 5 to 35 feet. The area of 500 to 600 acres that can be stripped is on a 2,200 acre permit that was granted to Archie Lewis, passenger conductor on the Alaska railroad.

Early in the spring of 1945 the owner of the lease decided to mine some coal and, being unable to secure stripping equipment, decided to operate the property as an underground mine. A drift had been driven into the outcrop for only a short distance before the war ended and the demand for coal fell off. With no assured market to warrant additional work the project was abandoned and no attention has been paid to the property since that time. However, Mr. Lewis now states that the Fairbanks Exploration Company say that they will examine the property this summer with the idea of developing their own fuel supply. Regardless of who operates this field it appears to have decided possibilities of furnishing a substantial amount of fuel for the Alaskan coal pool.

According to the natives of the area there are several coal outcrops on Coal River that show a mineable thickness on the outcrop. All of the exposed seams underlie the Lewis lease, but their thickness and extent can best be determined by diamond drilling. Any mining in these lower seams, which lie comparatively flat, will be by underground mining.

The U. S. Bureau of Mines has asked this office for suggestion of locations for prospective drill holes to be put down during the coming summer. It has been recommended that several holes be put down on this property and that they be given a high priority as to date. This recommendation is concurred in by the Alaskan representative of the Bureau of Mines.

If this field contains the amount and quality of coal as reported and if proved by drilling it would afford an excellent source of lignitic fuel for either the northern or southern areas of the rail belt.

One serious drawback to the property is the fact that it lies in an area where heavy snows and deep drifting is common. This condition could be overcome by operating the strip mines during the summer months and the underground mines during the severe winter months. Sufficient timber is available in the surrounding territory to supply the needs of a fairly large scale underground operation.

With proper preparation this field could produce a substantial amount of lignite and its possibilities should be thoroughly investigated.

KENAI PENINSULA

According to a report that was made by the U. S. Geological Survey there is an extensive field of lignite on the Kenai Peninsula along the shore of Cook Inlet.

The area is said to contain lignite beds up to 7 feet thick aand which underlie an area of at least 460 square miles of unconsolidated sandstone. There is a probability that the beds extend under gravel deposits over a much larger area.

On the basis of this and other information it was deemed advisable to make a brief inspection of the outcrops near Homer. It was found that some interest was being taken in the field by Mr. Evan Jones of Anchorage, and Mr. Sinclair of Portland, Oregon. These two men were contacted and arrangements made to visit the area in the company of Mr. Anderson of the U. S. Bureau of Mines.

An automobile trip was taken over the available roads near Homer with the idea of roughly determining the amount of cover over the mineable seams and the outcrops were inspected on foot for about 2-1/2 miles along the beach. Reports from various sources stated that the fuel supply of the natives in the Homer area came from "float coal" on these beaches. This was verified by the visit, when piles of lump coal were seen at all homes that were passed. The natives state that several times during the summer scows are brought from as far east as Cordova and loaded with coal picked up on the beach.

Trucks are run along the beach at low tide and the coal is hauled to the dock on a spit near the Homer Airport. Coal for local use is hauled directly to the various homes.

Several seams of mineable thickness, one 7-1/2 feet thick, outcrop for a considerable distance along the steep hillside above the beach. The coal weathers considerably better than the intermediate sandstone. This no doubt accounts for the large amount of loose coal found on the beach. High tides, normally 28 to 30 feet, work on the soft sandstone until the coal beds are undermined to the point where they break off and fall on the beach.

The strata dips about 5° to the north and the indications are that a large part of the Cook Inlet side of the peninsula carries at least one workable bed. There is no record of core drilling in this area. There are indications that other beds lie just below water level at low tide but their thickness is not known. It has been recommended to the Bureau of Mines that some drilling be done in this area so that more intelligent mine planning may be carried out.

The present owners of a lease in the Homer area are sinking a prospect slope to the 7-1/2 foot seam and will develop a small scale mine. The extent of these workings should depend upon what beds underlie the seam to be mined.

Coal from the prospect pit will be hauled by truck to the dock below the airport, loaded into scows and towed to Anchorage. Cook Inlet is navigable for about 9 months of the year, but in 3 of these months floating ice creates quite a hazard. It was, therefore, decided to plan the new mine for year round operation but also to provide storage space near the mine for any coal mined during the winter. All such coal would be transported to Anchorage during the following summer.

Mr. Sinclair had with him a young geologist, Mr. Olson, a graduate of the Colorado School of Mines. Mr. Olson was of the opinion, and all agreed, that the exposed coal was of the semi-bituminous variety. This is borne out by the analysis.

The 7-1/2 foot bed contains coal with a conchoidal fracture and vitreous lustre. Its general appearance resembles anthracite. Judging from reports by the natives and by the looks of the coal found on the beach this coal would be excellent for stocking.

If this field could be actively developed it would be an excellent source of fuel for the area along the southern end of the rail belt. Since the demand for bituminous coal by the railroad and Fort Richardson can barely be met by the mines in the Matanuska field, a mine in the Homer area would be good insurance. There is little reason to believe that any trouble will be found in finding a market for any coal that will come from this area during the next few years.

It was suggested to the owners of the lease that they submit to the Army samples from the new pit. In the event that the structure and analysis are as represented the Alaska Department has signified its willingness to contract for 10,000 tons of the coal. While the tonnage is small it would permit the lease owners sufficient revenue to pay for their development cost. Developments in this area should be watched closely.

RECOMMENDATIONS

After a study of the various operating mines, potential coal producing areas, and the transportation problem the following suggestions are offered so that sufficient coal could be produced and stocked to maintain an adequate supply along the rail belt.

1. Enforcement of mining regulations so that there is considerably less danger of losing a whole mine due to fire or explosion or both.

2. Construction of a suitable surge bin at Suntrana mine.

3. Increase side track capacity at Usibelli pit.

4. Use of power shovels rather than bull-dozers for coal loading at Usibelli and Diamond strip pits.

5. Construction of bin and sizing screens at the Usibelli side track.

6. Storage of coal at the railroad dump of Diamond pit.

7. Construction of new dump for loading No. 3 seam coal directly into railroad cars at Evan Jones mine.

8. Recommended to owner of lease in Broad Pass area that the coal be further prospected and a strip pit be put in operation if the coal and mining conditions proved suitable.

9. Recommended to the owners of a coal lease in the Homer area that operations be started on a small scale so that, if the Army was to be the principal customer, actual firing tests could be made on the coal before a substantial contract be considered.

10. Recommended to the Alaska railroad that additional coal cars be acquired.

11. Recommended to the post engineers at Ladd Field and Fort Richardson that a study be made of present unloading facilities and that suitable equipment be installed.

12. Offered various suggestions, upon invitation by the mine managements, for more efficient operation of all of the mines.

The following recommendations and suggestions, while not contributing to the solution of present difficulties, have considerable bearing on the future coal supply for the Army.

1. Suggest than an officer be assigned to the coal procurement office, Quartermaster Department to assist in the many duties now being handled by one man.

2. Recommend that, if possible, the Roth property be classed as an Army reserve even though its use may not be necessary for many years.

3. Recommend that the area lying between Suntrana mine and Diamond pit be removed from its status as a restricted area, and that if possible placed under Army control.

4. Work out an agreement with the Department of Interior whereby the Army is assured of an area upon which to mine coal for an indefinite period. Present mining permits are for the duration of the war plus six months. Leases for an indefinite period prevents the installation of efficient equipment and adds to the current cost of Army fuel.

5. Recommend a drilling program to the U. S. Bureau of Mines. Initial drilling should be done in the Homer and Broad Pass fields.