MI 84-1

MINERAL INVESTIGATION REPORT

BELUGA RIVER COAL FIELD

KK 84-42

Phil R. Holdsworth
March 1957

Introduction

This report is based on a brief examination of a known coal bed on the Beluga River located 21 river miles upstream from the mouth and 46 miles by air west of Anchorage. The need for additional electrical energy in the Anchorage area and the possible lifting of a military withdrawal covering the known deposit has revived interest in it.

History

The prospect was first examined by Mike F. Goggans and Joe Schneller in 1951 after an aerial reconnaissance. In 1952, Goggans and Mel Rogers flew into Beluga Lake with a rubber boat and, after a rough trip downstream, spent some time tracing coal beds in the immediate area and sampling them.

Application was made on October 23, 1952 by Ed Coffey and J. Vic Brown of Anchorage for prospecting permits covering the area under discussion. These applications were given Anchorage Serial Nos. 022626 and 022627. After a study of the area involved and the apparent conflict with the military withdrawal covered by Executive Order 8872 (Cook Inlet Bombing and Gunnery Range) was determined, the Bureau of Land Management suspended the applications in 1953. These applications remain on file with the Bureau of Land Management and will be reconsidered should the area become open by revocation of the military withdrawal.

On November 8, 1952, George O. Gates, Chief, Alaskan Geology Branch, U. S. Geological Survey, made a brief aerial reconnaissance of the area at the request of Mel Rogers, which resulted in the programing of future field work by the Geo-

logical Survey.

In August of 1954, the area was examined by F. F. Barnes accompanied by Goggans and Schneller. Results of this examination appear in an open file report released by the Alaskan Geology Branch, U. S. Geological Survey, entitled "Notes on a Coal Deposit on the Beluga River, Alaska." This report is available for public inspection at U. S. Geological Survey offices at College, Anchorage and Juneau, Alaska, and at the Territorial Department of Mines office at Juneau.

Following publication of this report, Robert R. May, Mining Engineer with the U. S. Bureau of Mines, made a two-day examination of the area on July 13 and 14, 1955. This examination resulted in certain recommendations as to the method of approach for a proposed Bureau of Mines exploration program. The fact that the area was within a military withdrawal prevented any future action on the part of the Bureau of Mines.

Field Work

The writer, accompanied by Mike Goggans, made a brief aerial reconnaissance of the most promising section of the Beluga River on September 17, 1956. At this time, a suitable helicopter landing was selected on a river bar near the central portion of the thick coal bed exposed in the left-limit cut-bank of the river. On September 20, 1956, the writer, accompanied by Wiley D. Robinson, Territorial Coal Mine Inspector, flew by helicopter to the selected site.

The elevation of the river bar at this point is just under 200 feet. The Beluga River has cut through a rolling piedmont plain which at this point has an elevation of approximately 600 feet. A thick coal bed is traceable for about 3000 feet along the river bank. The bed at the point sampled is a full 30 feet thick, has a strike of N 35° W and a dip of 7° to the northeast. The immediate roof rock is a soft sandstone, which is overlain by a mantle of glacial material. The total cover over the exposed section along the river bank varies from less

than 100 feet on the south end to about 250 feet on the north end. Figure 1 was prepared from vertical aerial photography magnified to the limit of the equipment available in Juneau.

Coal Deposits

The coal bed sampled is traceable along the cut-bank of the river for about 3000 feet. What happens to its northward extension beyond the left-limit stream shown in Figure 1 is not known. A 400-foot section of the bed near the southern end appears to be slightly offset as shown due to block faulting. This section does not appear to be displaced for any great distance back from the river bank, and is probably the result of an undercutting action by the river. Two apparent faults striking N 20° E and lying to the east of the outcrop are indicated in the aerial photographs and also shown in Figure 1. Coal outcrops in the faulted areas indicate little, if any, vertical displacement.

Properly planned strip mining of this bed, taking into consideration the stripping limits for 30 feet of coal and providing proper drainage into the Beluga River, indicates 100 acres of strippable coal or approximately 4-1/2 million tons in this block. Drilling in the area, especially to the east of the outcropping, may prove up considerably more tonnage which could be strip mined.

A large channel sample was taken across 30 feet of unbroken coal at the point indicated on Figure 1 (61° 15' 14" N Lat., 151° 14' 30" W Long.). This sample was flown into Anchorage, crushed, quartered, and sealed in cans within a few hours. The sample was considered as "crop" coal and the moisture was slightly above normal as it had been raining and snowing for several hours just prior to the actual sampling. Splits of the sample were analyzed by Daniel C. Boteler of the U. S. Bureau of Mines at Anchorage (Lab. No. A-13) and checked by the U. S. Bureau of Mines laboratory at Pittsburgh (Lab. No. F-25317). The results were as follows:

	Coal (As received)	Coal (Moisture free)	Coal (Moisture & ash free)
PROXIMATE ANALYSIS			
Moisture	27.6		
Volatile matter*	32.1	44.3	52.1
Fixed carbon	29.5	40.8	47.9
Ash	10.8	14.9	
	100.0	100.0	100.0
*Determined by modified method			
ULTIMATE ANALYSIS			
Hydrogen	6.3	4.5	5.3
Carbon	42.1	58.1	68.3
Nitrogen	.8	1.1	1.3
Oxygen	39.9	21.2	24.9
Sulphur	.1	.2	.2
Ash	10.8	14.9	
	100.0	100.0	100.0
British thermal units	7240	10000	11750

FUSIBILITY of Ash, °F	
Initial deformation temperature	2150
Softening temperature	2230
Fluid temperature	2280

A study of the aerial photographs covering an area six miles north of here and on the same side of the Beluga River shows numerous coal outcrops. This is outside the northern boundary of the Cook Inlet Bombing and Gunnery Range. This area, just east of Lower Beluga Lake and covering about 15 square miles, appears to contain one or more relatively flat lying coal beds of undetermined thickness. The erosion and drainage pattern indicates possible block faulting with the fault strikes trending from east-west on the northern limits to N 60° W on

the southern limit. If the outcrops are all exposures of the same bed, no great vertical displacement has taken place. Similar outcrops appear at about the same elevation on the southwest side of Lower Beluga Lake.

Economic Considerations

Past interest in the Beluga coal has been based on shipping the coal to power plants in the Anchorage area. When the possibility of burning the coal and transmitting the power is considered, the economic feasibility appears more reasonable. The total transmission distance from this area to Anchorage, via a Susitna River crossing at Bell Island and a submarine crossing of less than two miles at Cairn Point on Cook Inlet, is less than 60 miles.

Assuming that exploratory drilling of the Beluga River area would prove up sufficient reserves of strippable coal to justify construction of a coal burning plant in the 100,000 KW class, it is believed that electrical energy can be furnished the Anchorage area for seven mills per KWH. These figures are based on present-day construction costs as published by the Federal Power Commission, converted to Alaskan costs. It is also inferred that one and the same company or corporation would mine the coal, generate and transmit the power in order to attain the most economical over-all operating cost.

Phil R. Holdsworth
Commissioner of Mines

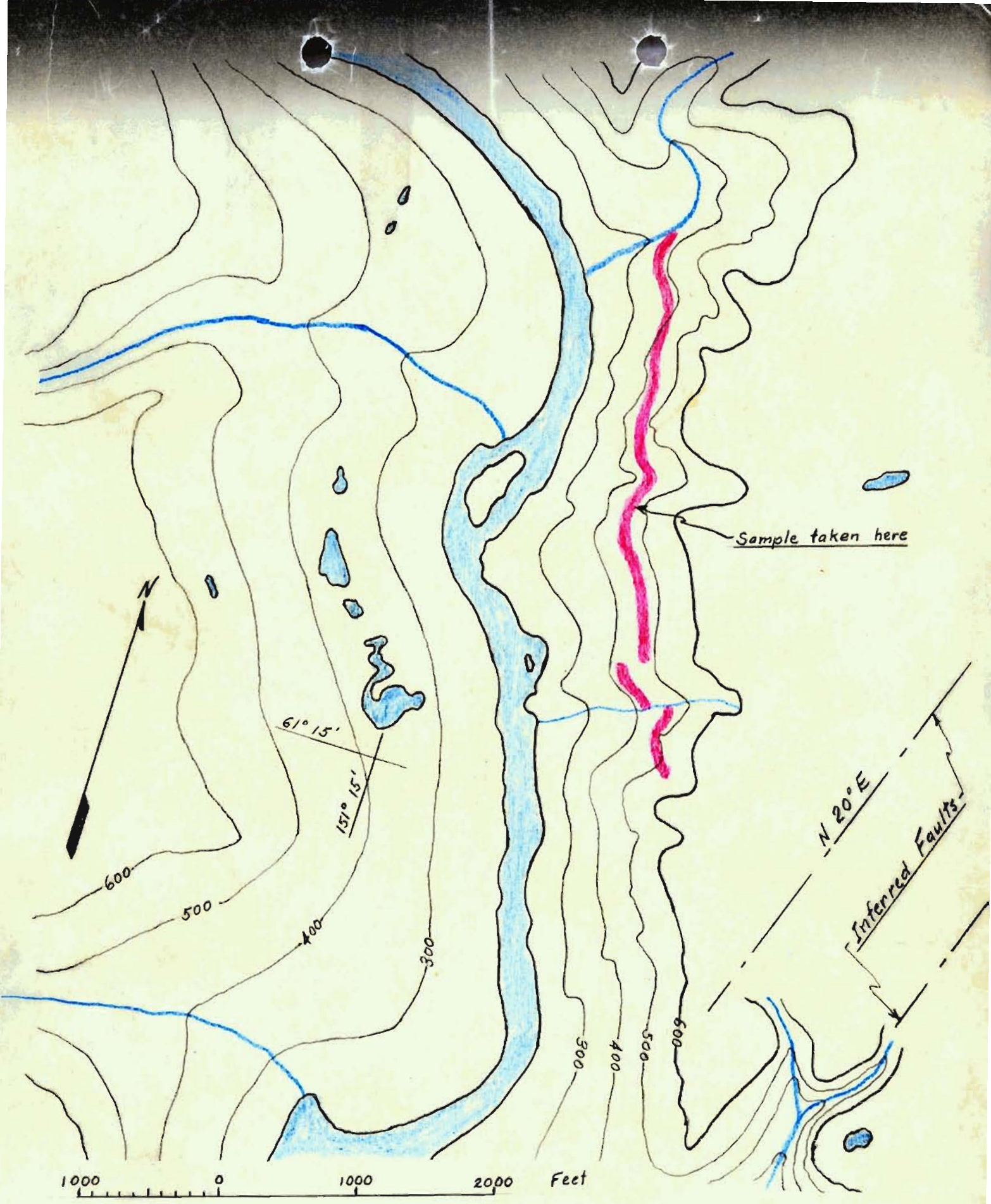

Figure 1. Sketch map of coal bed, Beluga River, Alaska.

Form 6—188

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF MINES

Can No. 6605

F—SAMPLING REPORT

Lab. No. F-25317

(1) ~~State~~ Alaska (2) County _____ (3) Town Anchorage (Post office) (4) Mine Outcrop

(5) Sample of Coal (6) Analysis desired Prox., Ult., Btu, ST.

(7) Method of sampling Face, 6" x 6" x 30' across bed (Describe if other than standard)

(8) Location in ~~bank~~ of bed 45 mi. west of Anchorage, 20 river or 12 air mi. upstream from mouth of Beluga River (Distance and direction from opening. Locate with respect to rib, room, pillar, aircourse, entry, etc.)

(9) Date (Of sampling) 9/20, 19 56

(10) Coal, dry or moist Moist (11) Gross wt., lbs. (Sample cut) approx. 100 (12) Net wt., lbs. (Sample mailed) 3

(13) Sample from fresh or weathered coal Weathered

(14) Roof None (Kind and quality)

(15) Draw slate or roof coal Missing (Description and thickness)

(16) Floor Obscured (Kind, soft or hard, smooth or rough)

(17) Vertical depth from surface to point of sampling, feet 6 inches

No.	Section of Bed	Ft.	Ins.	No.	Section of Bed	Ft.	Ins.
1	Coal	30	0	10			
2				11			
3				12			
4				13			
5				14			
6				15			
7				16			
8				Total thickness of bed		30	0
9				Thickness in sample		30	0

(18) Excluded from sample, marked X, section Nos. _____

(19) Send analysis to Phil R. Holdsworth ~~Commissioner, Territorial Dept. of Mines~~ (20) Collector Phil R. Holdsworth (21) Office Juneau Alaska

Above information copied from B card by BBK on October 29, 19 56

U.S. GOVERNMENT PRINTING OFFICE 6—6098

Form 6—138

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF MINES

Can No. 6605

F—SAMPLING REPORT

Lab. No. F-25317

(1) ~~Xxx~~ Alaska (2) County ____ (3) Town Anchorage (Post office) (4) Mine Outcrop

(5) Sample of Coal (6) Analysis desired Prox., Ult., Btu, ST.

(7) Method of sampling Face, 6" x 6" x 30' across bed (Describe if other than standard)

(8) Location of bed ~~Xxxx~~ 45 mi. west of Anchorage, 20 river or 12 air mi. upstream from mouth of Beluga River (Distance and direction from opening. Locate with respect to rib, room, pillar, aircourse, entry, etc.)

(9) Date 9/20 (Of sampling), 19 56

(10) Coal, dry or moist Moist (11) Gross wt., lbs. approx. 100 (Sample cut) (12) Net wt., lbs. 3 (Sample mailed)

(13) Sample from fresh or weathered coal Weathered

(14) Roof None (Kind and quality)

(15) Draw slate or roof coal Missing (Description and thickness)

(16) Floor Obscured (Kind, soft or hard, smooth or rough)

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No.	Section of Bed	Ft.	Ins.	No.	Section of Bed	Ft.	Ins.
1	Coal	30	0	10			
2				11			
3				12			
4				13			
5				14			
6				15			
7				16			
8					Total thickness of bed	30	0
9					Thickness in sample	30	0

(18) Excluded from sample, marked X, section Nos. ____

(19) Send analysis to Phil R. Holdsworth Commissioner, Territorial Dept. of Mines (20) Collector Phil R. Holdsworth (21) Office Juneau Alaska

Above information copied from B card by EBK on October 29, 19 56

U. S. GOVERNMENT PRINTING OFFICE 6—6088

G-139
(September 1943)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF MINES

G—COAL-ANALYSIS REPORT

Test No. _____ Lab. No. F-25317

Sample of Coal - NAa Can No. 6605

Operator _____ Mine Outcrop

~~State~~ Alaska County _____ Bed Unknown

Town Anchorage

Location ~~of bed~~ 45 mi. west of Anchorage, 20 river or 12 air mi. upstream from mouth of Beluga River approx.

Method of sampling Face, 6" x 6" x 30' across bed Gross weight, lbs. 100 Net weight, grams 1072.5

Date of sampling 9/20/56 Date of Lab. sampling 10/10/56 Date of analysis _____

B. of M. ~~section~~ Region I, Alaska Collector Phil R. Holdsworth
Territorial Department of Mines

	Air-dry Loss	Coal (Air dried)	Coal (As received)	Coal (Moisture free)	Coal (Moisture and ash free)
Proximate Analysis	Moisture		27.6		
	Volatile matter *		32.1	44.3	52.1
	Fixed carbon		29.5	40.8	47.9
	Ash		10.8	14.9	
			100.0	100.0	100.0
Ultimate Analysis	Hydrogen		6.3	4.5	5.3
	Carbon		42.1	58.1	68.3
	Nitrogen		.8	1.1	1.3
	Oxygen		39.9	21.2	24.9
	Sulphur		.1	.2	.2
	Ash		10.8	14.9	
			100.0	100.0	100.0
British thermal units			7240	10000	11750

Fusibility of Ash, °F.
- Initial deformation temperature 2150
- Softening temperature 2230
- Fluid temperature 2280

*Determined by modified method

Date October 29, 1956 (Signed) Roy F. Abernethy
BBK *Chemist.*

6-204
(August 1952)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF MINES
PITTSBURGH 13, PENNSYLVANIA

Wiley D. Robinson
Territorial Department of Mines
P. O. Box 2139
Anchorage, Alaska

Anchorage, Alaska
October 2, 1956

Gentlemen:

The analysis of the sample submitted by Territorial Dept. of Mines , covering tons of Beluga River Outcrop #1 coal delivered on your contract No. and order No. by the on , 19 is as follows:

	AS RECEIVED	DRY COAL
Moisture	27.2	
Volatile matter	32.0	44.0
Fixed carbon	30.1	41.3
Ash	10.7	14.7
Total		
Sulphur	.1	.2
British thermal units	7300	10030

This information is for the use of the Government and the dealer or operator furnishing the coal. It is confidential until it is published by the United States Government.

Sample No. Lab. No. A-13 Mine Beluga Outcrop # 1

Sampler No. Ash Fusion temperature degrees F.

RR cars Nos.

OCT 1 1956

Remarks:

Respectfully,

[redacted]

Coal Technologist

Analysis supervised by

[redacted]
Chief, Analysis Section
Branch of Bituminous Coal, Region V

[redacted]
Chief, Fuel Inspection Section
Branch of Bituminous Coal, Region V

FOR RELEASE
THURSDAY, MARCH 21, 1957

Territorial Dept. of Mines
Box ~~1391~~ 2139
Juneau, Alaska

A brief report on a known coal bed in the Beluga field and some observations on other coal outcrops, both within and without the Cook Inlet Bombing and Gunnery Range west of Anchorage, has been released by the Territorial Department of Mines.

Copies of this report are available for public inspection at the following TDM offices: Alaska Office Building, Juneau; 329 Second Avenue, Anchorage; Mines Building, College; and 314 Main Street, Ketchikan.

Form SA 1a

MEMORANDUM State of Alaska

RECEIVED

JAN 19 1962

Petroleum Branch
Division of Mines and Minerals
Alaska Dept. of Natural Resources

TO: Bobby Jo Brasch

DATE : January 18, 1962

FROM: Jean Crosby

SUBJECT: Beluga Coal Report

Am sending, under separate cover and by certified mail, the Beluga River Coal Report which you recently sent down for our use. We want to thank you for so promptly answering our request that it be sent down. We had hunted for some time in the files when Jim happened to remember that it had been sent to Wiley. And so it goes.

If you should get any other request for renewal for Coal Age, you can ignore them as I have renewed it and requested a billing in triplicate which takes forever from McGraw-Hill.

Jean

Form SA 1a

MEMORANDUM

State of Alaska

TO : Wiley D. Robinson

DATE : April 17, 1961

FROM: James A. Williams

SUBJECT: Beluga Coal Report

Here is the Beluga Coal Report, sent by registered mail. Guard it with your life. It may be copied in the office, but not taken from the office. We have no way of copying it here, and you need it worse than we do, so we are sending it to you.

Jim

je

Form SA 1a

MEMORANDUM State of Alaska

TO: [

DATE: JAN. 11, 1962

FROM:

SUBJECT: BELUGA COAL "OPEN FILE" REPORT.

RETURNED TO J. A. U., TODAY, REG. MAIL, PER HIS TELETYPE REQUEST REC'D 10 AM..

MJ.

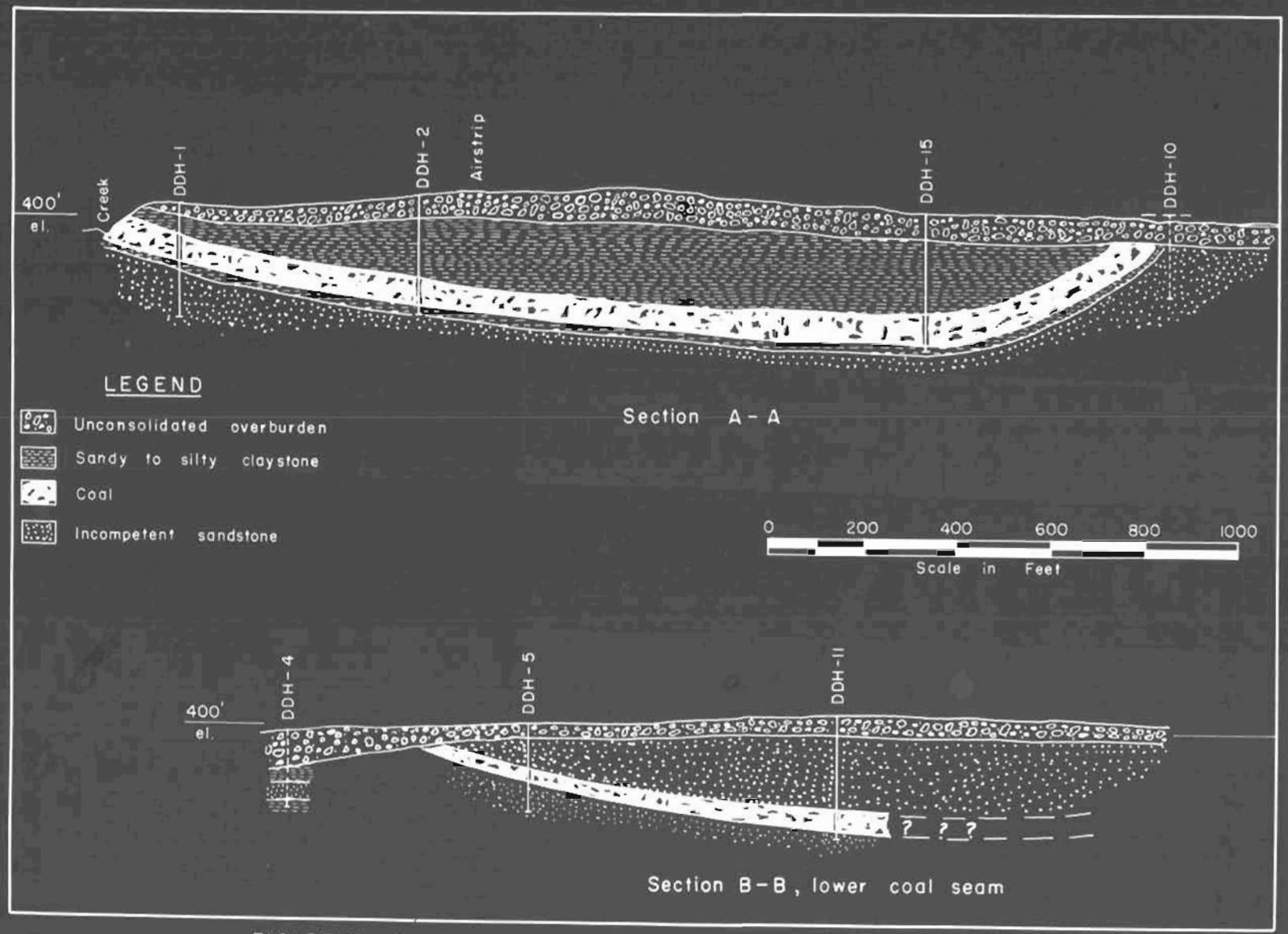

FIGURE 3.- Sections A-A & B-B, Beluga River Project Area.

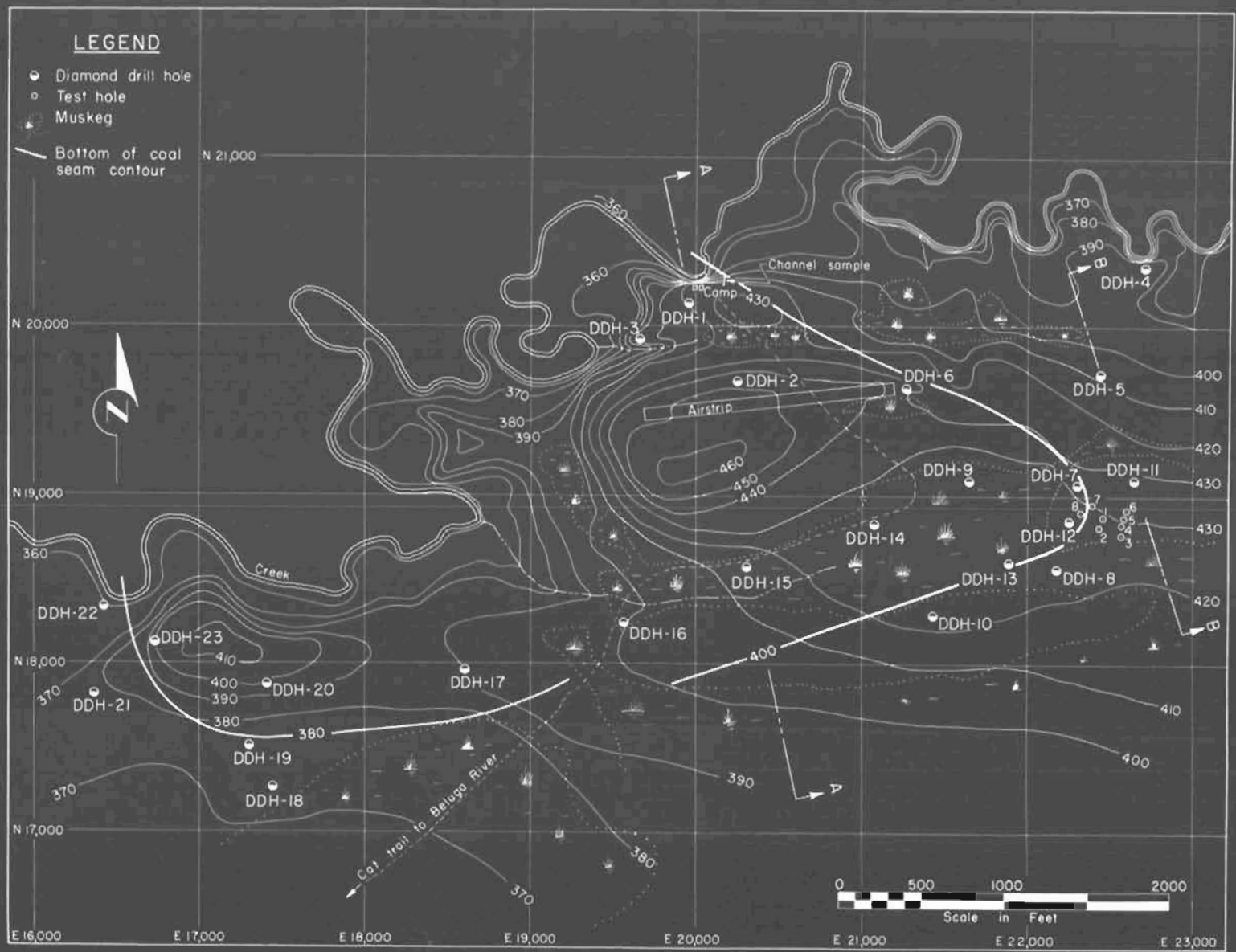

FIGURE 2.-Plan of Beluga River Project Area.

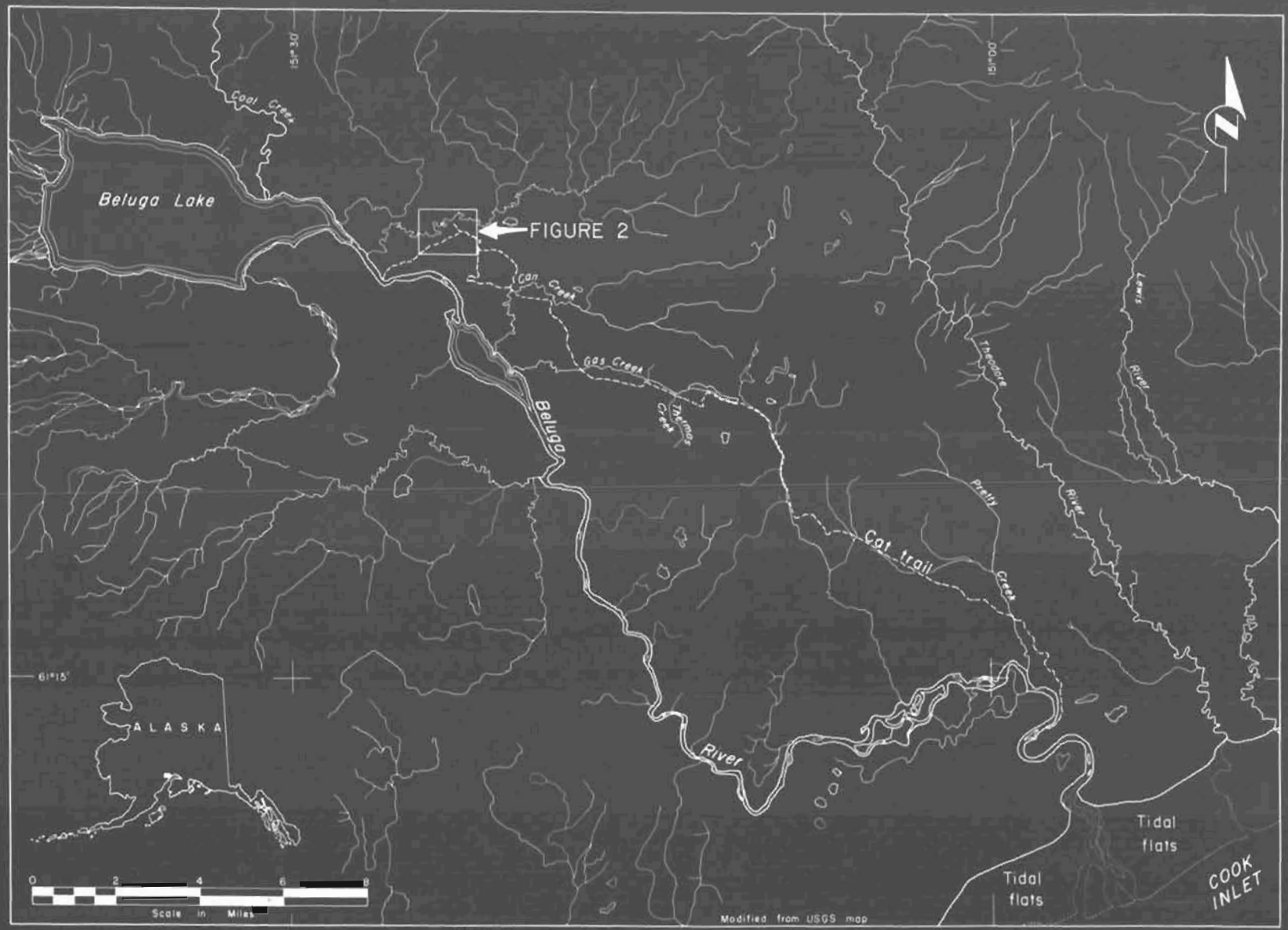

FIGURE 1.-Location Map, Beluga River Project Area.

Figure 4. - Discovery outcrop, approximately 40 feet of coal exposed.

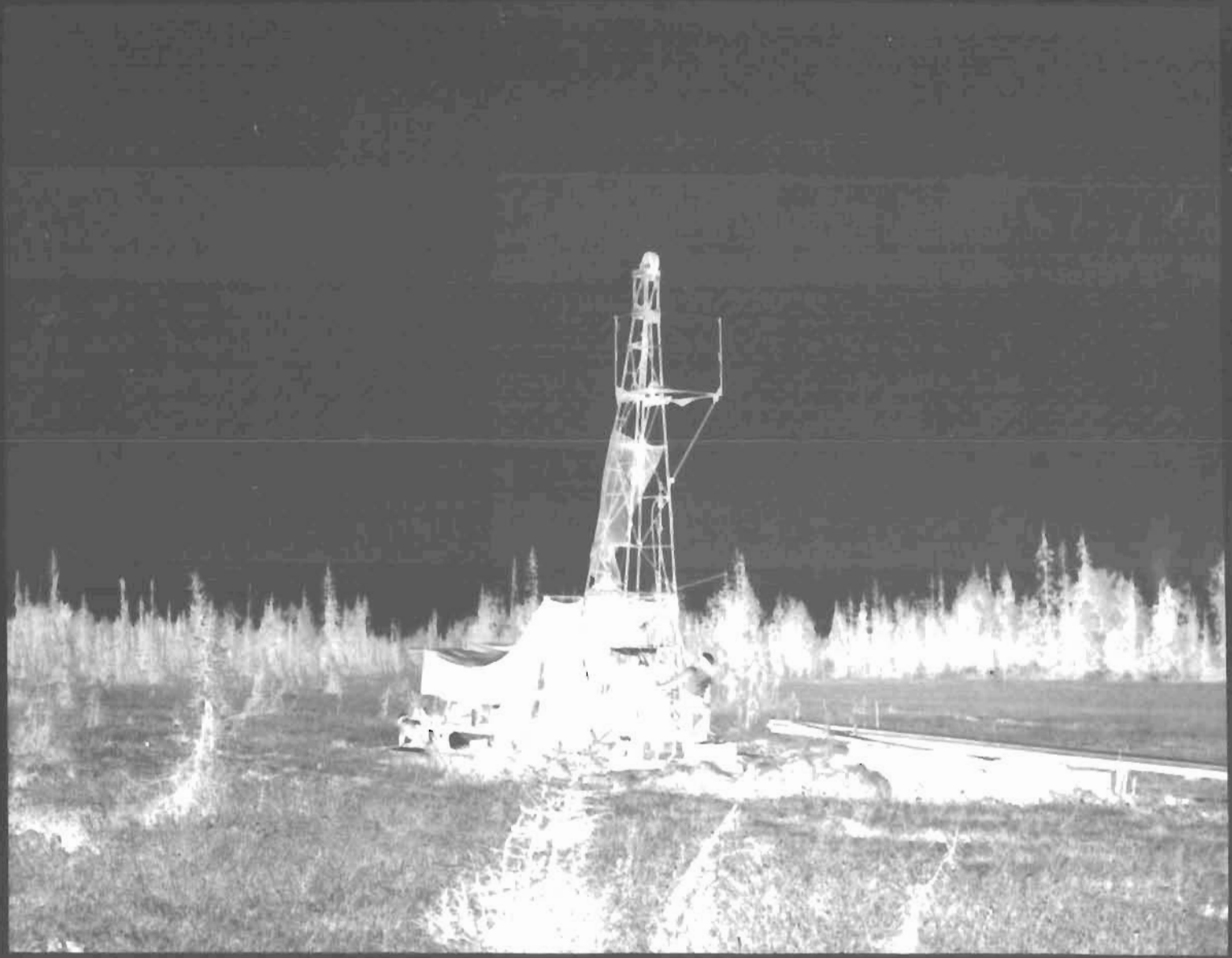

Figure 5.-Typical topography and vegetation, core drill operating in muskeg area.