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NORTHWEST COAL/TRANSPORTATION STUDY

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THIS REPORT HAS NOT BEEN REVIEWED FOR
TECHNICAL CONTENT (EXCEPT AS NOTED IN
TEXT) OR FOR CONFORMITY TO THE
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Division of Geological & Geophysical Surveys
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Sote: The enclosed blue-line copies of overlays showing the locations of known coal deposits, transportation options, and a composite of the two, are to be viewed as preliminaries only.

The overlays and text are in rough draft phase.

A conprshensive bibliography of references will accompany the final report upon publication.

An cpen-file report cn work to date will-be available by April, 1983.

The final report should be available for study by December, 1983.

This document has not received official DGGS review and publication status, snd should not be quoted as such.

NORTHWEST COAL INVESTIGATIONS MAP

KEY FOR MAP

Tc — TERTIARY, MOSTLY CONTINENTAL, CONGLOMERATE, SANDSTONE, SHALE AND COAL

TKc — TERTIARY AND/OR CRETACEOUS, MOSTLY CONTINENTAL, CONGLOMERATE, SANDSTONE, SHALE, AND COAL,

Tb — POSSIBLE EXTENT OF TERTIARY BASINS, SOME ARE STILL ACTIVE; THOSE INDICATED ONLY BY ISOLATED DEPOSITS OR EROSIONAL REMNANTS ARE QUERIED (?). THE KNOWN SIZE OF TC AND TKC DEPOSITS IS COMMONLY EXAGGERATED TO SHOW ON A MAP OF THIS SCALE,

Kc — CRETACEOUS, MOSTLY CONTINENTAL, CONGLOMERATE, SANDSTONE, SHALE AND COAL,

K — CRETACEOUS, MOSTLY MARINE, CONGLOMERATE, SANDSTONE, SHALE, LIMESTONE AND SOME COAL,

Mc — MISSISSIPPIAN, PARTLY CONTINENTAL, SANDSTONE SHALE, LIMESTONE AND COAL,

COAL BED WITH LOCAL MINING HISTORY,

A — RECOGNIZED COAL BED,

⊕ — COAL FRAGMENTS OR REPORTED COAL OCCURRENCES WITHOUT INFORMATION,

(A)(⊕) — APPROXIMATELY LOCATED,

AREAS VISITED, 1982 FIELD SEASON,

BASE METAL LODE DEPOSITS LIKELY TO DEVELOP WITHIN 10 YEARS,

T O S T WELLS.

Test well logs showing coal beds. All NPRA wells (a - j) are from Bird (1981).

a	Tunalik #1:	27 beds at least 10' thick to 3600' depth 6 beds at least 10' thick to 900' depth
b	Kaolak 81:	15 beds at least 10' thick to 9900' depth 6 beds at-least-10' thick to 700' depth
c	Peard #1:	12 beds at least 10' thick to 1200' depth
d	Rugra #1:	14 beds at least 10' thick to 1200' depth 8 beds at least 10' thick to 700' depth
e	Meade #1:	16 beds at least 10' thick to-1800' depth 5 beds at least-10' thick to 400' depth
f	South Meade #1:	6 beds at least 10' thick to 1400' depth 4 beds at least 10' thick to 400' depth
g	Topagoruk #1:	13 beds at least 10' thick to 1000' depth 10 beds at least 10' thick to 600' depth
h	East Topagoruk #1:	1 bed 10' thick at 100' depth
i	Oumalik # 1:	12 beds at least 10' thick to 2700' depth 7 beds at least 10' thick to 900' depth
j	East Oumalik #1:	6 beds at least 10' thick to 1100' depth

Test well logs (non-NPRA)

k Cape Espenberg C1 (Standard Oil Co. of California)
Lignitic coal beds occur down to 5500' but dimish.in the upper part of the well. Forbes (1980)

l Nimiuk Point #1 (Standard Oil Co. of California)
Thin bed of lignitic coal intersected at 2700'. Forbes (1980)

i-n Nulato #1 (Paul G. Bonedum)
Poor logs indicate that some coal is present, possibly three separate seams between 300 and 400 feet. Renshaw (1980)

ALL RESOURCE ESTIMATES ARE IN
MILLIONS OF SHORT TONS (MT.)

1 North Slope Alaska Total

Cretaceous (Nanushuk and Colville Groups)

Subbituminous beds (2.5' < 3000' deep)

Bituminous beds (14" < 3000')

Est. Resources:	Indicated	Inferred	= total
Subbituminous:	1609	99,296	100,905
Bituminous:	838	18,454	19,292
Total			120,197 mt.

Barnes (1967)

Combined bituminous and subbituminous

Est. Resources:	Minimum	Maximum
Hypothetical (Subsurface Info)	115,000	3,700,000
Speculatives (Eastern N. Slope and Offshore)	110,000	1 ,000,000
Identified:	120,000	(Barnes 1967)
Total:	345,000	4,700,000 mt.

OR: 345 billion - 4.7 trillion tons

Tailleur and Brosge (1975)

Combined bituminous and subbituminous.

Est. strippable reserves (14"< 120' deep) = 478 mt.

USBM (1971)

Western North Slope Only (Map Area)

Cretaceous Nanushuk Group (Corwin Formation)

Subbituminous (2.5' < 4000')	=	478,000
Bituminous (1.2' < 6000')	=	370,000
Total Bituminous and Subbituminous		848,000 mt.

Callahan (1980)

2 Chukchi Sea (Offshore)

Cretaceous subbituminous and bituminous

Est. resources available for liquefaction or gasification: 3,000 mt.

McGee and O'Connor (1974)

3 Meade River

Cretaceous Bituminous and Subbituminous

Est. resources	subbituminous	(> 5' < 120' deep)	= 135.9 mt.
		(> 5' < 1000' deep)	= 1,132.5 mt.
		(> 2.5 < 3000' deep)	= 39,756.3 mt.
	Bituminous	(>42" < 120')	= 145.5 mt.
		(>42" < 1000')	= 1,212.4 mt.
		(>14" < 3000')	= 2,948.3 mt.

Horizontal to shallow dips, analyses, local production

Barnes (1967), Kaiser Engineers (1977), Rao (1980)

4 Kugra River (Peard Bay)

Cretaceous Subbituminous

4 beds approximately 5' thick

Est. Resources (<120' deep) = 100.9 mt.

((1000' deep) = 840.2 mt.

Horizontal beds, analyses

Barnes (1967), Kaiser Engineers (1977)

5 Kuk River

Cretaceous Subbituminous B

5 beds: 2 beds < 5', 2 beds 5'-10', 1 bed > 10'

Est. Resources (>10' <120' deep) = 111.0 mt.

(>10' <1000') = 925.2 mt.

(>2.5' (1000') = 1,457.7 mt.

4, 5 Kugra - Kuk Rivers Area

Beds correlated by Callahan (1980)

6 Utukok River

Cretaceous Subbituminous C - High Volatile A Bituminous

Subbituminous: 4 beds 4' x 12' thick

Est. Resources	(>10' < 120')	=	89.7 mt.
	(710' (1000')	=	717.0 mt.
	(>2.5' < 3000')	=	44,738.1 mt.

Bituminous: 14 beds: 4 beds 28", 2 beds 28" - 42", 7 beds 42"

Est. Resources	(> 42" < 120')	=	134.9 mt.
	(> 42" < 1000')	=	1,124.5 mt.
	(> 14" < 3000')	=	2,737.9 mt.

Dips 0-25°, analyses

Barnes (1967), Kaiser Engineers (1977),. Affolter ~~Et Al~~ et al (1980)

7 Kokolik River

Cretaceous Bituminous with coking qualities

17 beds: 4 beds < 28", 3 beds 28"-42", 10 beds> 42"

Est. resources	(>42" < 120')	=	88.9 mt.
	(>42" < 1000')	=	741.0 mt.
	(>14" < 3000')	=	2,336.1 mt.

Dips 0-22°, Analyses

Barnes (1967), Warfield (1969)) Kaiser Engineers (1977)

8 Kukpowruk Study Area (Howard Syncline)

Cretaceous High Volatile A-B Bituminous, with significant coking properties.

8 beds over 14" overlying a 20' bed.

Est. Resources (≥ 42" ≤ 100') = 257 mt.

with 10:1 stripping ratio = 20 mt.

Dips 0 -Near Verticle, Analyses, Local Production

. Callahan (1969), Warfield (1966)

Cretaceous HVA-B Bituminous, Soft Coking, with low ash and sulfur

Strippable Resources (≥ 42", ≤ 120' deep, Stripping ratio 5:1, Maximum dip 20°) = 115.3 mt.

Underground Resources (≥ 42" ≤ 2000' deep) = > 100 mt.

Knutson (1980)

9 Kukpowruk River

40 beds: 11 beds< 28" cretaceous bituminous, 23 beds 28" - 42", 17 beds > 42"

Est. Resources (≥42" ≤ 1000') = 961.1 mt.

(≥14" ≤ 3000') = 3,065.3 mt.

Dips 0" near verticle, analyses, local production

Barnes (1967)

10 Dead Fall Syncline

Cretaceous Bituminous

Est. Reserves = 500-750 mt.

Dip 0-20°, Analyses

Callahan (1975)

11 Cape Beaufort (Liz-A Syncline)

Cretaceous high volatile B-C Bituminous with coking properties increasing at depth.

More than 20 beds are correlated.

Est. Resources,	measured	35. mt
	Indicated	312 mt
	Inferred	186 mt
	Total	533 mt

Dips 15' - 40" (?) Analyses

Callahan (1975, 1980)

12 Corwin Bluff (Corwin & Thetis Mines)

Cretaceous Bituminous

80 beds > 1 foot, 17 beds 2.5'-9' thick total 74'

Est. Resources ((60 feet deep) = 12 mt.

Dips 30-45°, Analyses, Production for Steamers

Sable and Chapman (1955), Chapman and Sable (1960)

1, 12 Cape Beaufort - Corwin Bluff Area

60 beds: 42 beds< 28", 9 beds 28"-42", 9 beds >42"

Est. Resources	(> 42" < 120')	=	12.1 mt.
	(>42" <1000')	=	100.7 mt.
	(>14' <3000')	=	982.3 mt.

Barnes (1967), Kaiser Engineers (1977)

13 Niak Creek (Cape Lisburne)

Mississippian Semi-bituminous

4-5' bed and faulted exposures

Analyses

Collier (1906)

14 Cape Lewis

Mississippian Semi-bituminous

4' bed and 2 smaller beds

40" dip, Analyses

Collier (1906)

15 Cape Dyer (Kapaloak Creek Section)

Mississippian low volatile bituminous

13 beds 2.5-11' thick totaling 70'

Dips 30' - Berticle, Analyses

Tailleur (1966)

16 Kukpuk River

Mississippian Semi-anthracite

6' bed and other beds

23" dip, Analyses, local production

Conwell and Triplehorn (1976)

17 Cape Thompson

Mississippian Semi-anthracite?

1 foot Bep, sheared

Verticle, Partial Analyses

Conwell and Triplehorn (1976)

18 Noatak River

Tertiary Lignite

2 inch bed

Dip 30°-75°

Ellersieck et al (1979)

19 Eockley Hills

Cretaceous Lignite,:

Thin coaly stringers can be traced from creek to creek

Chadwick (1960)

20 Singarouk ~~Singarouk~~ Creek

Cretaceous Subbituminous C

4 beds 2' - 3.5' thick total 13'

10" dip, Analyses

Burand (1959)

21 Kallarichuck River

Cretaceous Bituminous:

2 beds 2' thick

Dips 20" and 45°, Analyses in Progress, Local Production

Eakins (1982)

22 Kobuk River (I)

Cretaceous Bituminous

1 or more 2-3 foot bed(s)

Dip 30°, Analyses, Local Production

Smith (1913)

23 Kobuk River (II)

Cretaceous High Volatile C Bituminous

18' bed and many several inch beds

25° dip, Analyses

Eakins (1979)

24 Elephant Point (Dick Slough)

Tertiary Lignite

2 foot and 4 inch beds

Flat lying

Quakenbush (1909), Patton (1973), Klein (1980)

25 Perry Creek

Tertiary? Lignite

2-4' bed

Klein (1980)

26 Chicago Creek Mine

Tertiary? Lignite

80-88' bed

Est. Resources = 2 mt.

Dip 53" or 70°, Analyses,= 100,000 tons produced

Henshaw (1909), Reed (1933), Chadwick (1960)

27 Kugruk (Wallin) Mine

Tertiary? Subbituminous?

66 foot or 19 foot bed

50°-62° or 67" - 70" dip, analyses ≈ 10,000 tons. produced

Reed (1933), Toenges and Holley (1947)

28 Superior Coal Mine

Tertiary? Lignite

52' bed

Small production

Reed (1933)

29 Kuzitrin River

Tertiary Lignite

1' - 12' bed

Local production

Hopkins (1963). Sainsbury (1973)

30 Wilson Creek

Tertiary? Lignite

3'-10' bed and a smaller bed

Slight dip

Harrington (1919)

31 Sinuk River (Coal Creek)

Tertiary/Cretaceous? Bituminous?

17 beds 3" - 16"

Dip 30°, Local Production

Collier (1908) Herreid (1970) Sainsbury ~~Et.Al~~ et al (1973)

32 Omilak Creek

Tertiary Lignite

18" bed, 24" float

Smith and Eakins (1910). Resource Associates of Alaska (1980)

33 Grouse Creek

Tertiary Lignite/Subbituminous C?

15'-35' bed

East-west extent of more than one mile

(West 1948)) Miller (1980)

34 Tubutulik River (Location Uncertain)

Cretaceous Lignite/Subbituminous?

Steep dips, thin beds extend for miles

Miller/ et al (1972)

35 Koyuk River

Tertiary/Cretaceous? Lignite

4 foot bed, 2 foot bed, and a few several inch seams.

Analysis

Harrington (1919)

36 Unalakleet (Coal Mine Creek)

Tertiary Lignite

At least one 4'-8' bed

Flat lying, analyses in production

Patton (1973). Rao (in preparation)

37 Ulukok River (Location Uncertain)

Tertiary? Lignite

2 foot bed

Dall (1892)

38 Anvik River

Cretaceous? Bituminous?

10' bed and several 2' beds reported

Local production for black paint

Collier (1903), Harrington (1918)

39 #1 Mine

Cretaceous Bituminous

2.5 - 3 foot bed, 18" bed and two smaller beds

35" dip, Analyses, ≈900 tons produced

Collier (1903), Chapman (1963)

40 Williams Mine (Thein Mine)

Cretaceous Bituminous

39" bed and thin stringers

45° dip, Analyses%1700 tons produced

Collier (1903), Chapman (1963)

41 Adolph Huller Prospect

Cretaceous Bituminous

54' bed

20" dip, Analysis

USBM (1946); Chapman (1963)

42 Blatchford Coal Mine

Cretaceous High Grade Bituminous

Sheared Bed with 2'-8' pockets and 2 beds inches thick

45°-55° dip, Analyses, ≈300 tons produced

Dall (1892), Collier (1903), Chapman (1963)

43 Bush Mine

Cretaceous Bituminous

Bed at least 4 feet thick

40" dip, Analysis, 400 tons produced?

Collier (1903)

44 Nulato Bed

Cretaceous Bituminous

2.5 foot bed containing 6" of clean coal

40" dip

Collier (1903)

45 Pickart Mine

Cretaceous Bituminous Coking

18" - 30" bed and 1 foot bed with smaller beds

dip 35°, Analyses, Hundreds of tons produced

Collier (1903)

TRANSPORTATION SYMBOLS

PROPOSED BARGE ROUTES; (KAISER, 1977), (M. I. R.L., 1973).

- PROPOSED HARBOR LOCATIONS;
(W.A.A.T.S., 1981) (NOS. 1 THROUGH 6, IN ORDER OF PREFERENCE),
(LONGYEAR, 1958), (OPTIONS A AND B, IN ORDER OF PREFERENCE),

PROPOSED RAILROAD ROUTES; (W.A.A.T.S., 1981), (LONGYEAR, 1958)

PROPOSED NEW ROADS; (W.A.A.T.S., 1981), (D.O.T., 1982), (LONGYEAR, 1958)

EXISTING ROADS, PROPOSED FOR IMPROVEMENTS; (W.A.A.T.S., 19811

PROPOSED MINERAL SLURRY PIPELINES: (W.A.A.T.S., 1981).

PROPOSED TRANSPORTATION ROUTES AND OPT-IONS,
STATE OF ALASKA DEPARTMENT OF TRANSPORTATION, 1982 (IN PRESS)
(A., B., C., D. IN ORDER OF PREFERENCE),

Transportation Alternatives Composite

Explanation of D.O.T. proposed alternative transportation routes and options; (D.O.T., 1982)

D.O.T. 40; Minerals-Locators	option a:	Road or railroad west through Kobuk River Valley to Cape Krusenstern.
	option b:	Road or railroad southwest to Cape Darby.
	option c:	Road through Bettles to the James Dalton Highway at Prospect Creek area, or railroad to the Alaska Railroad at Nenana.
	option d:	Railroad southeast to Nenana.
D.O.T. 42; Minerals, NANA and others	option a:	Road, railroad, pipeline (tramway), to the east, north of the Wulik River to the coast.
	option b:	Road, railroad, pipeline (tramway), to the east, south of the Wulik River to the coast.
D.O.T. 43; Coal - state and private	option a:	Road east to the coast and barge facility. These options would be intended to supply coal as heating fuel for communities in the region, and possibly fuel for the Red Dog and Lik mines.
	option b:	Road or railroad south to transportation system developed by NANA and others.
D.O.T. 44; Coal - owners	option a:	Road north to Kotzebue Sound and shipping.
D.O.T. 45; Minerals - locators	option a:	Road or railroad to Port Clarence.
	option b:	Road or railroad to Nome.
D.O.T. 94; state and federal	option a:	Road to the coast. This coal would be used to Coal - generate power and for heating in villages in the region. It might also be a source of power for the region's mineral industry.

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