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PRELIMINARY REPORT ON THE HOCKLEY HILLS-
SINGARUK RIVER AREA COAL OCCURRENCES

By

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Geological and Geophysical Surveys

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Preliminary Report on the Hockley Hills -
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by Jim Clough¹, Gil Eakins¹, and Mike Menge²

Locations: Selawik D-3 Quadrangle, T17N, R8W, Sections 16, 21; and T16N, R8W, Section 14, Kateel River Meridian (see map). These coal occurrences are within the Selawik National Wildlife Refuge.

Introduction: In an effort to select potential reconnaissance drilling sites for evaluation of coal resources in northwest Alaska as mandated by Alaska Senate Bill 26, Sec. 43, a field investigation of nine areas was made from June 10 to June 18, 1982. The Hockley Hills - Singauruk River coal occurrences were examined on June 12, 1982 under a Special Use Permit (No. SEL-06-82) granted by the U.S. Fish and Wildlife Service. The Singauruk River coal occurrence was reexamined on August 31, 1982 in order to show a representative of NANA Regional Corporation the nature of the coal deposit. Participants in this investigation were Gil Eakins, DGGGS Chief Mining Geologist, Jim Clough, DGGGS Geologist, and Mike Menge, MMS Geologist. Transportation into the area was by helicopter.

Investigation: North of Hockley Hills - An occurrence of coal was located along a series of exposed bluffs (fig. 1) on the west side of a north-east flowing map (section 21, see map). Bedding attitudes of rocks in these exposed bluffs are generally striking N20°E and dipping 40°W. The lithology is predominantly gray shale and gray to brown siltstone to sandstone (fig. 2) with thin interbeds of carbonaceous shale and minor coal streaks (generally less than 1 inch thick). Thin gypsum and calcite layers (less than 1/8 inch thick) occur within the carbonaceous shale and coal intervals. Abundant carbonaceous plant imprints occur within some of the siltstone and sandstone beds. Sample 82JCl was taken of a coal streak and carbonaceous shale interval and the proximate analysis results are given in table 1.

The overabundance of sand and silt sized grains suggests a relatively high, energy unstable depositional environment. This is further supported by the presence of thinly laminated coal streaks and the absence of any quantity of dark, silt free clay beds. Organic material, preserved as coal in the observed outcrops, appears to have been transported to the point of deposition as a concentrated organic sludge. All the evidence points to this area as representing a transitional environment between active channel systems and the quiet backwater coal accumulation areas. The observed location would probably be a lot closer to the channels than the swamps.

The outcrops observed do indicate the likely presence of thicker, cleaner coal beds somewhere within the locality (5 to 10 miles?).

Singauruk River - Four distinct beds (designated "A, B, C and D") containing coal (figs. 3 and 4) are exposed in a steep cutbank on the north side of the

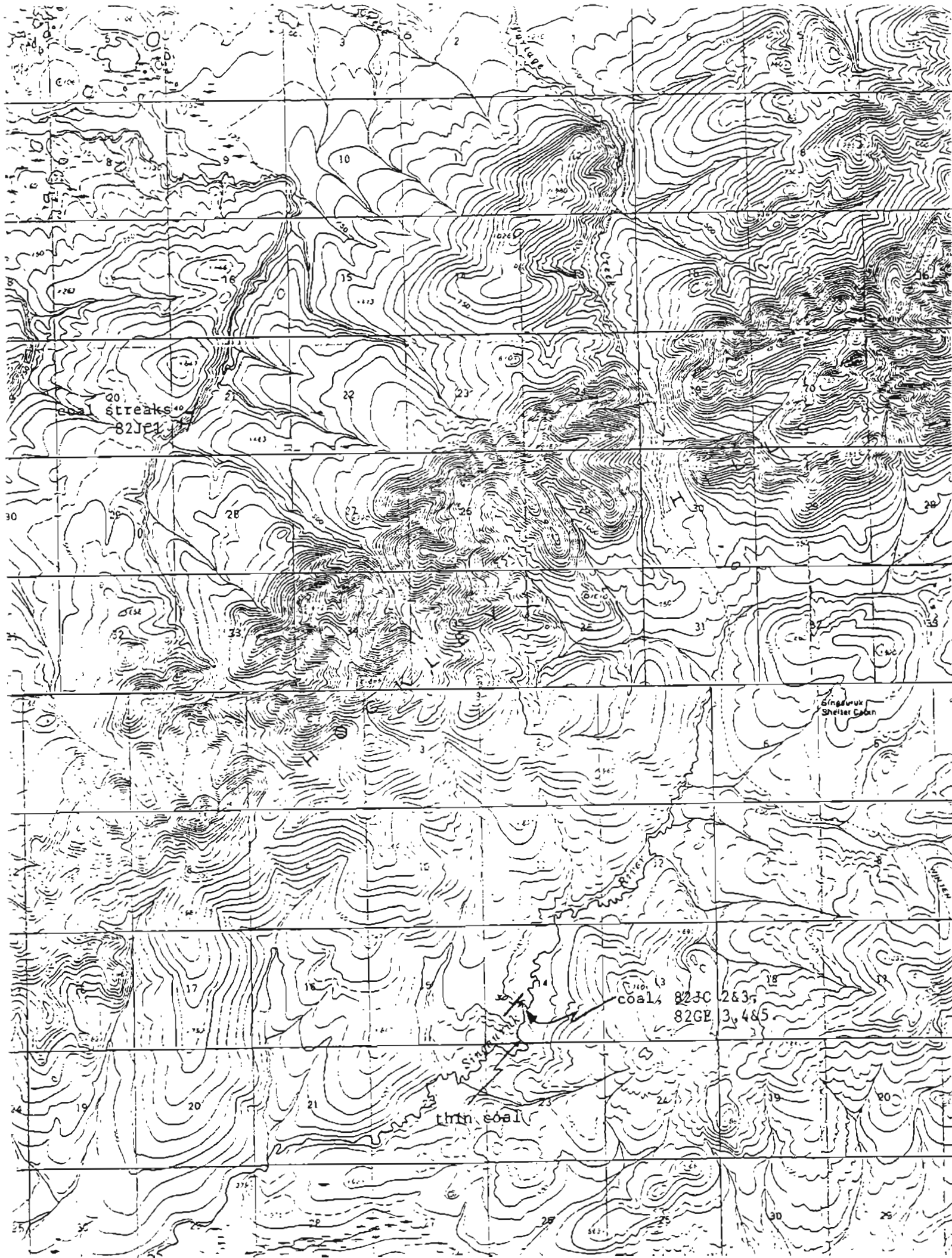
1. State of Alaska, Department of Natural Resources, Division of Geological & Geophysical Surveys (DGGGS)
2. U.S. Department of Interior, Minerals Management Service (MMS)

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. Singauruk River (section 14, see map). The beds are between 3 and 6 feet thick and have 6 to 8 inches of brown underclay. All but the lower 3 feet of coal bed "B" have a high concentration of silt and clay material mixed into the coal matrix. Intervals between the coaly beds are comprised of gray to brown siltstone to sandstone and shale. The strike and dip of the rocks at this locality is N40°E 30°W. Four high-grade coal samples (82JC2 and 3 and 82GE 3 and 5) and one channel coal sample (82GE4 - bed "A") were taken at this site for proximate and ultimate analyses and the results are given in table 1. Descriptions of coal beds and sample locations are shown in figure 3. The sedimentary characteristics of this location points towards it as being at or very near to the stabilized inter-basinal coal deposition environment. Thinner coaly seams were also observed in a predominantly sandstone and shale outcrop on the west side of the Singauruk River 1/4 mile downstream.

Analyses: All samples collected were weathered and the results of analyses given in table 1 should be interpreted accordingly. Sample 82JC3 has an apparent rank of high-volatile C bituminous coal, however, due to the 12% ash content, vitrinite reflectance will be necessary to determine the ASTM coal classification. All of the other samples collected contain between 27% and 58% ash content and are now being analyzed using the float-and-sink technique to separate the coal from the ash. This process is used commercially by the coal industry to remove as much as 85% of the ash content thus enhancing the coal quality.

Recommendations: Detailed geologic mapping is necessary in this area before a drilling program can be initiated. With coal present on the north and south sides of the Rockley Hills it is possible that a coal basin could be delineated. This would require construction of a geologic map of sufficient complexity to determine strike, dip, and general rock type. This information would then provide the framework upon which a small scale drilling project could be constructed. A preliminary series of test holes would have to be drilled and geophysically logged before any definitive statement concerning geometry, quality, and quantity of coal in this area could be made. Because of terrain and vegetation, the location would most probably have to be tested using breakdown equipment that could be transported via helicopter. However, because this area is within a national wildlife refuge, no drilling can be performed at present.



coal streaks
82JE1
82JE2

Singreux
Shelter Cabin

coal, 82JC
82GE
2&3,
3, 4&5

thin coal

TABLE 1

PROXIMATE AND ULTIMATE ANALYSES OF RAW COALS FROM NORTH
OF THE HOCKLEY HILLS AND SINGAURUK RIVER OCCURRENCES

Sample Numbers	Basis*	Moisture %	Volatile Matter, %	Fixed Carbon, %	Ash %	Heating Value					Sulfur	
						BTU/Lb.	C, %	H, %	N, %	O, %	Pyritic	Total
North of Hockley Hills												
82JC1	1	1.46	11.11	28.78	58.67	5,196						0.25
	2		11.28	29.18	59.54	5,273						
	3		27.87	72.13		13,031						
Singauruk River												
82JC2	1	9.13	21.27	27.39	42.21	5,959						0.24
Bed B	2		23.41	30.14	48.45	6,558						
	3		43.72	56.28		12,247						
82JC3	1	12.77	26.52	48.90	11.81	9,496	57.24	4.88	0.96	24.65	0.14	0.46
Bed C	2		30.40	56.06	13.54	10,886	65.61	3.96	1.10	15.26	0.17	0.53
	3		35.16	64.84		12,590	76.21	4.58	1.27	17.33	0.19	0.61
82GE3	1	15.23	22.18	34.97	27.62	6,948						0.35
Bed A	2		26.17	41.25	32.58	8,196						
high-grade	3		38.82	61.18		12,156						
82GE4	1	9.91	16.51	21.07	52.51	4,125	26.59	3.10	0.46	17.08	0.01	0.26
Bed A	2		18.33	23.38	58.29	4,579	29.52	2.21	0.52	9.18	0.02	0.28
channel	3		43.93	56.07		10,979	70.77	5.30	1.25	22.00	0.04	0.68
82GE5	1	15.86	21.46	30.11	32.57	5,937						0.28
Bed D	2		25.51	35.78	38.71	7,056						
	3		41.62	58.38		11,512						

* 1 Equilibrium Moisture
2 Moisture Free
3 Moisture and Ash Free

Coal samples were analyzed by the Mineral Industry Research Laboratory in Fairbanks, Alaska under the direction of Dr P.D. Rao.

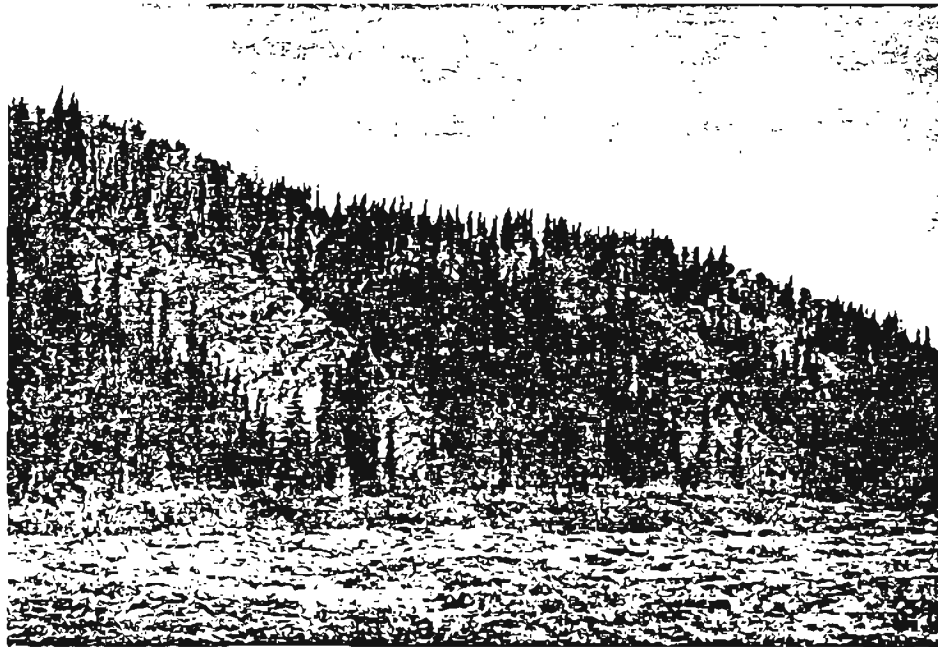


Figure 1. North of the Hockley Hills, 200' high bluffs of gray to brown siltstone to sandstone and gray shale with thin interbeds of carbonaceous shale and minor coal streaks. Sample 82JC1 was taken near the base of the bluff on the left. View is towards the northwest.



Figure 2. View looking down from the top of the bluff shown in figure 1. Sample 82JC1 taken at the base near the stream.

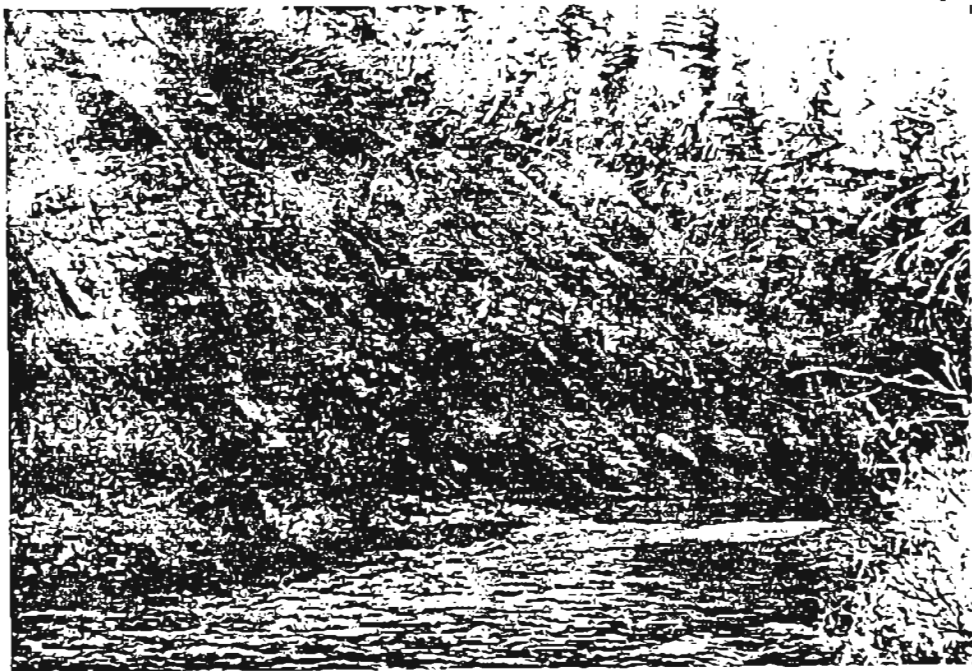
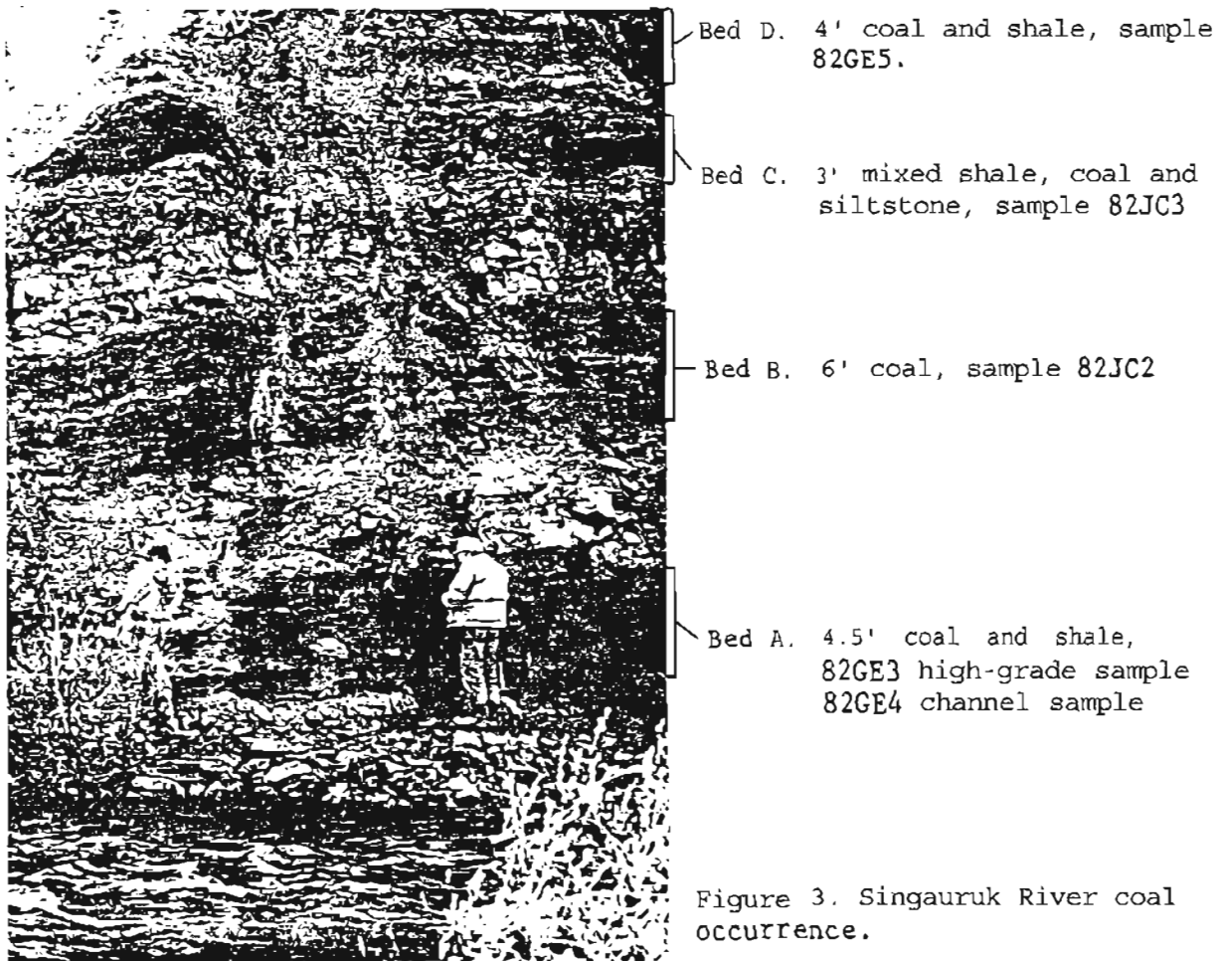


Figure 4. Singauruk River coal occurrence. Same locality as shown in figure 3. View towards the northeast.