The main gangway has now advanced 106 feet beyond Station 236. The dip is followed what is apparent to be the continuation of the main coal seam beyond the "fault". Some carbonaceous material present throughout this distance, although at 86 feet the seam pinched down to the quarter inch. The average width of coal has been 2-3 feet, and in the present face it is from 2-5 feet wide. The coal is of poor grade and is plain throughout only.

The foot wall of the seam has been sandstone all the way. The dip has been from 50° to 55°. The hanging wall has shown alternating beds of sandstone and conglomerate, with seams of coal and carbonaceous partings.

Coal is a deposit formed in still waters. The interfingering of sandstone and conglomerate in the new drifting indicates the action of water currents, unfavourable to coal deposition. This is a condition not previously noted.

The coal in the productive portion of the mine is underlain by a considerable thickness of very fine sediments. This is covered by a small thickness of layers of sandstone in most places, upon which the overlying conglomerate rests. The underlying rocks are exposed in the main entry, but the mine workings do not penetrate the overlying conglomerate. There is thus some information

available on the character of the underlying rocks but none on the higher strata.

There appear to be two possible explanations for the present situation.

(a) The new drifting has, in fact, been along the continuation of the coal seam; which has been so affected by local stream action that it is not commercial. In these circumstances, there is no information at hand upon which to base ~~an appreciation of the~~ a forecast of the result of further drifting.

This situation does not readily explain the apparent fault occurring in the vicinity of station 236.

(b) The new drift has been along a carbonaceous horizon which by mere coincidence has been faulted into place directly opposite the coal seam proper.

The second situation is the more favourable, in that it can be tested fairly readily. There are ~~many~~ exposures of the underlying conglomerate on surface which should indicate whether or not local sandy and carbonaceous horizons occur in these rocks. The new drifting provides a base from which drill holes can be put out to both foot and hanging walls to search for the possible faulted extension of the coal seam.

It is recommended that this be

done, and if no coal is found, the attempt to find the extension of the seam be abandoned

TANTALUS BUTTE 1972 DIAMOND DRILLING.

D.D.H. C-72-1

HOLE 1 drilled at +10° from shoot 12622N 10238E at about 176°

CONGLOMERATE 0 — 138'	minor sandstone at 2', 6', 60' 71', 90', 100' and 137' 138' - 141' missing
SANDSTONE 141 - 154'	cross bedding in sandstone in places.
SHALE 1 154 - 203	coaly shale occurs at 169 and 172 ; coal lumps at 174-175 black shale 176, 163 ; and sandstone 179-186 black shale occurs 191' — poor recovery near end probably missing coaly shale —

TANTALUS BUTTE 1972 DIAMOND DRILLING

D.D.H. C-72-2

HOLE 2. drilled at +10° from about 12222N 10300E at about 260°

FINE GRAINED SANDSTONE 0-25'±	gradational changes from siltstone to shale with shale at 3' and 14'; pebbles at beginning
SHALE 25'-46'	crumbly black shale varies to grey silty shale; prominent siltstone 38-43'; minor conglomerate at 44'.
CONGLOMERATE. 46'-163'	chert pebble conglomerate with pebble about 1" varying to pebbly sandstone at 54', 57'; sandstone occurs at 92', 135', 147 and 15
(163-168) LOSTCORE	— possible fault zone —
SHALE. 168-218	varies from grey fine sandstone to coal; probable loss of zone coaly shale very friable and coal in minor crumbly pieces; sandstone 17 coaly shale 179, lostcore/coal 179-181, coal 181, sandstone-coaly shale 184'
184'	change in core size — possible fault ??
CONGLOMERATE. 219-281'	medium grained conglomerate with soft zones; crumbly conglomerate 276' (fault), sandstone 266-268'; ground core (fault?) 21
PEBBLY SANDSTONE. 281-305	medium to fine conglomerate varying to coarse sandstone good conglomerate at 287' 297' 300'
FINE CONGLOMERATE. 305-346'	homogeneous fine conglomerate possibly ending in shale ((this may be contamination due to overflow of the badly weathered crumbly shale in superjacent zones))

Doug

Please excuse the formal letter

I enclose the small scale interpretion (sketch of letter) interpreted plan the Nacquebard report and the formal letter.

the rest of the stuff I will bring up next week.

Mike

400 21 8400.00

immediately

2500 5000)

immediately

24 400 $9600 10,000

ACCOMMODATED 1811

Indian and Northern Affairs
Affaires indiennes et du Nord

Rm. 211 Federal Bldg.,
Whitehorse, Y.T.,
Feb. 22, 1973.

Your file Votre référence

Our file Notre référence

Mr. D. Coley,
Mine Manager,
Tantalus Butte Coal Mine,
Carmacks, Y.T.

Dear Mr. Coley:

My brief mapping project in the Tantalus Butte mine, performed partly for my own familiarization with the Tantalus formation rocks and partly to contribute geological observations on fault and stratigraphic problems related to coal reserves, results in the enclosed map, sketch, and the following comments.

(a) The exploration tunnel of 1972 meets the upper seam in the fault zone as shown. It should be extended to the north 50-100 feet to test the coal away from the disturbed zone.

(b) The coaly shale seam 50 feet from the tunnel entrance is probably the same rock unit as that followed by the "rock tunnels" in the main gangway north of the first two major faults. This same unit is likely the "H W seam" followed by the secondary entry portal located about 150 feet west and above the main protal.

(c) The rock blocks encountered in the coal at the end of the main gangway may just be a minor problem caused by a bedding plane fault in the upper part of the seam or it may be a major cross cutting fault.

Respectfully yours,

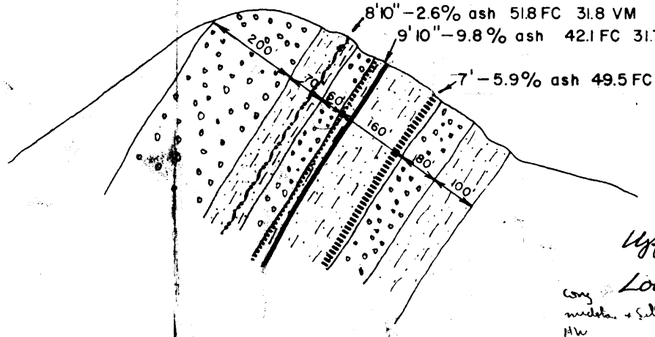
Michael W. Milner

M.W. Milner,
District Geologist.

c.c. P.A. Haquebard
R.L. Hoffner

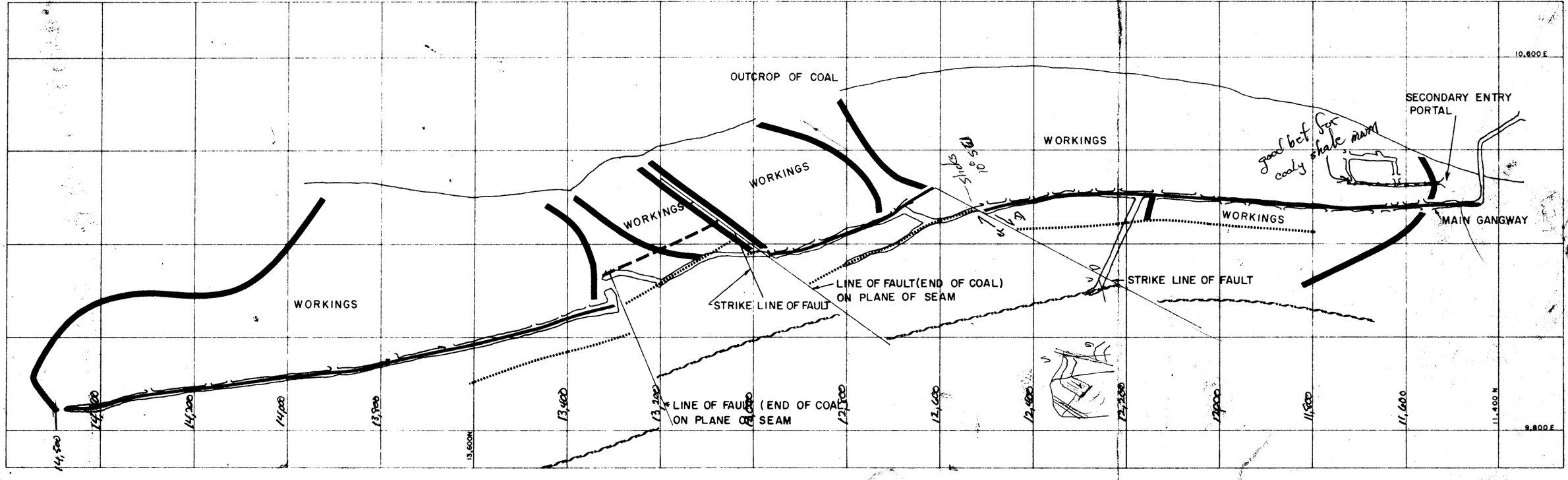
Doug & Ralph have

TANTALUS BUTTE LOOKING NORTH



Upper Meas. = Tantalus
Lower Meas. – Jk (5 fingers) coking

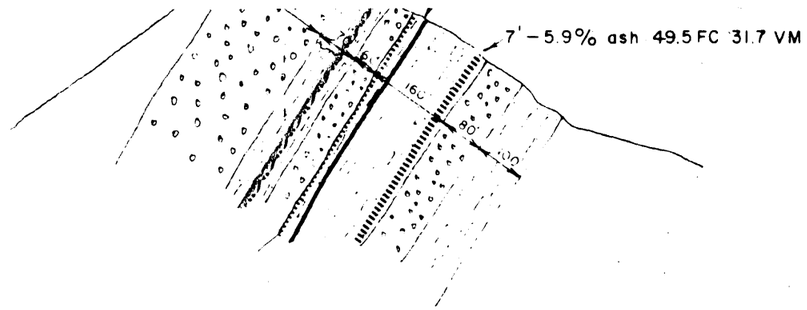
POSITION OF MAIN SEAM (9'10" SEAM OF CAIRNES 1910)
PROBABLE POSITIONS OF COALY SHALE HORIZON
PROBABLE POSITION OF WEST SEAM (8'10" SEAM OF CAIRNES 1910)



POSITION OF MAIN SEAM (9'10" SEAM OF CAIRNES 1910)

PROBABLE POSITIONS OF COALY SHALE HORIZON

PROBABLE POSITION OF WEST SEAM (8'10" SEAM OF CAIRNES 1910)



10,600 E

OUTCROP OF COAL

WORKINGS

WORKINGS

WORKINGS

WORKINGS

WORKINGS

SECONDARY ENTRY PORTAL

MAIN GANGWAY

STRIKE LINE OF FAULT

LINE OF FAULT (END OF COAL) ON PLANE OF SEAM

D.D.H. 72-2 204'

STRIKE LINE OF FAULT

D.D.H. 72-1 351'

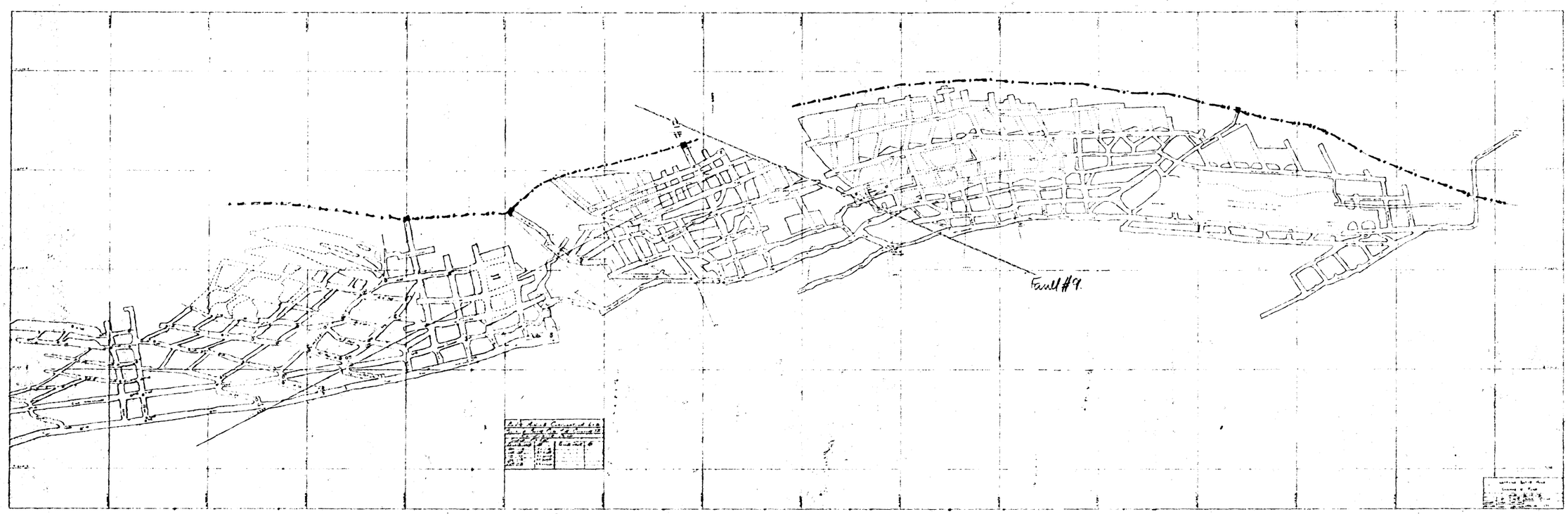
LINE OF FAULT (END OF COAL) ON PLANE OF SEAM

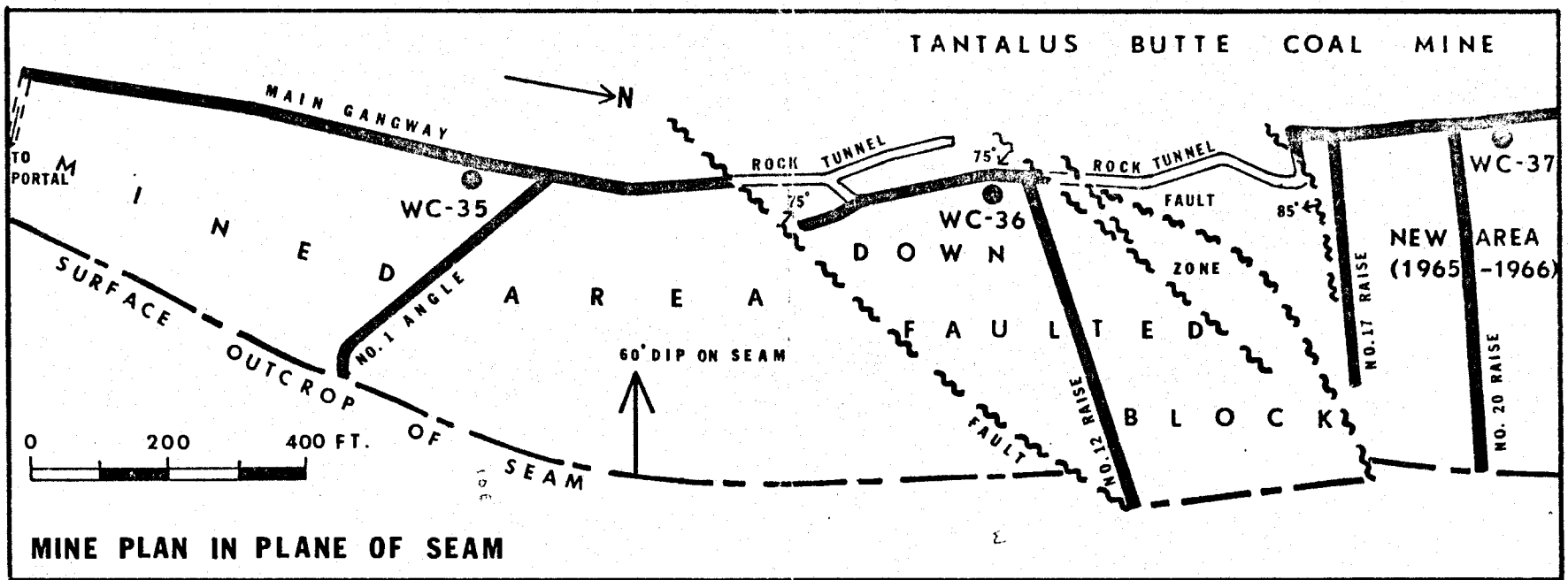
600N

11,400 N

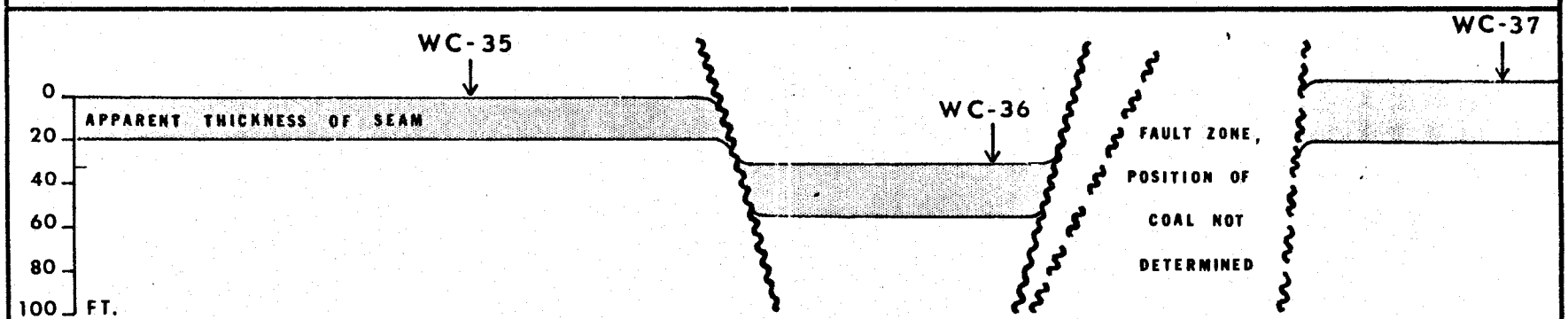
9,800 E

ANVIL MINING CORPORATION LTD.
CARMACK Y. T.
TANTALUS COAL MINE
GEOLOGICAL INTERPRETATION
BY: M. MILNER DISTRICT GEOLOGIST
SCALE: 1" = 200'
DATE: MAR. 9th, 1973

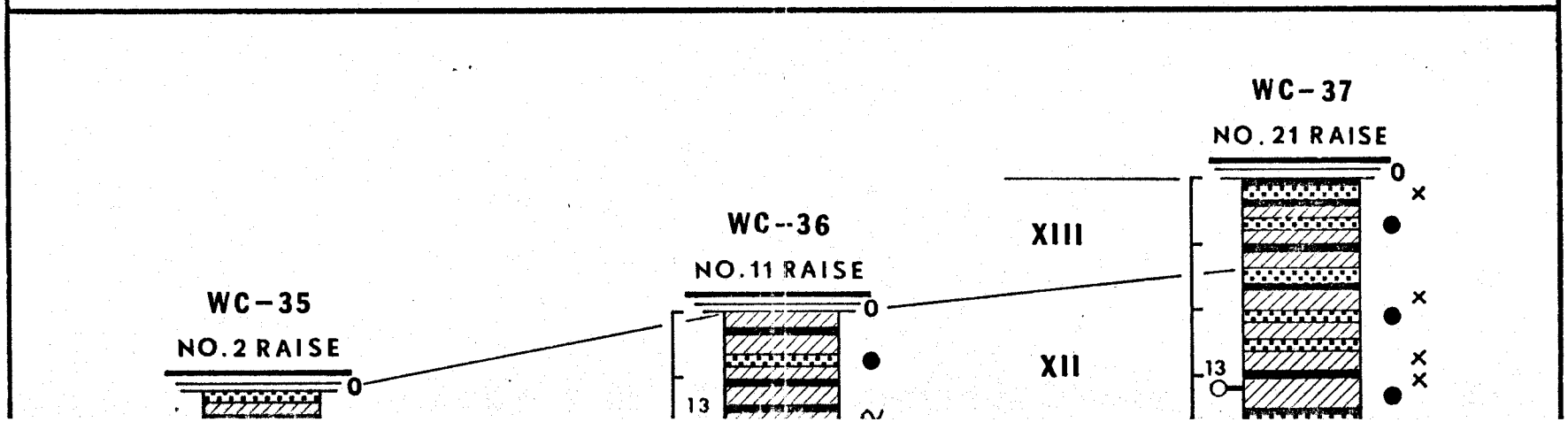

Well #9



MINE PLAN IN PLANE OF SEAM



SECTION ALONG MAIN GANGWAY (APPROXIMATE)



1914

Introductory Note

In his Summary Report for 1914, page 3, R. G. McConnell, Deputy Minister, Department of Mines, submits the following note on field work in Yukon:

"D. D. Cairnes spent the summer in general exploratory work in the southwestern part of Yukon Territory. A large part of the area was little known either geologically or geographically and, since placer gold, gold ores, copper ores and lignite were known to occur there, it was considered important that its mineral resources generally should be reported on. Mr. Cairnes made a number of traverses across the district and examined most of the creeks."

EXPLORATION IN SOUTHWESTERN YUKON

by D. D. Cairnes

Introduction

Reasons for Work

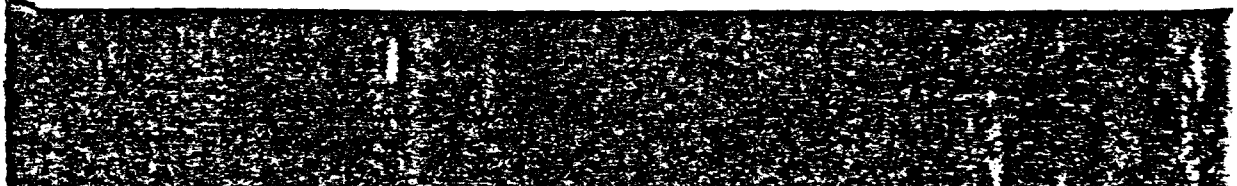
The summer of 1914 was spent by the writer in conducting general exploratory work throughout the southwestern portion of Yukon Territory north of the latitude of Whitehorse. The work was undertaken for the purpose of obtaining as much information as possible relative to this extensive region, concerning the greater part of which very little was known of a geological or even, in places, of a geographical nature.

Placer gold has been mined on a number of creeks in Kluane district since 1903, and has also been produced in small quantities from Nansen district since 1910, having been originally discovered there in 1899. Deposits of lignite were also known to occur in Kluane district, and placer gold, gold ores, copper ores, lignite, and other minerals were reported to have been found at a number of other points throughout this general region. Nevertheless, although this section of Yukon would thus seem to possess considerable promise of future economic importance, almost the only authentic information available concerning it was the result of the work of Mr. R. G. McConnell who spent the summers of 1903 and 1904 in Kluane district[1] and along certain headwaters of White river[2], and even these investigated areas include only a very small portion of Southwestern Yukon. Moreover, since 1904 practically no information at all had been obtained concerning the entire region here under consideration, until 1913 when the writer devoted part of the summer to the examination of Upper White River district,[3] which, however, also occupies only a small section of the extreme western part of this wide, largely unexplored tract.

[1] McConnell, R. G., "Headwaters of White River": Geol. Surv., Canada, Sum. Rept. for 1905, pp. 19-26.

[2] McConnell, R. G., "The Kluane Mining district": Geol. Surv., Canada, Sum. Rept. for 1904, pp. 1A-18A.

[3] Cairnes, D. D., "Upper White River district": Geol. Surv., Canada, Sum. Rept. for 1913. "Upper White River district": Geol. Surv., Canada, Mem. No. 50, 1914.



rock, amygdaloidal in places, throughout which for a width of 70 feet or more, green copper stain is somewhat evenly and plentifully distributed. An average sample was taken across the best 70 feet of this deposit, which was assayed by the Mines Branch of the Department of Mines, Ottawa, and proved to contain: copper 1·43 per cent, gold, none, silver, none.

None of the copper deposits that have so far been discovered in this locality could be profitably worked at present even under much more favourable conditions than now exist, as none of them are sufficiently extensive or persistent to afford any considerable tonnage of merchantable ore. However, as copper is so generally disseminated throughout the belt, it is quite possible that somewhere workable deposits will yet be discovered; therefore further prospecting is recommended.

Coal

Measures containing valuable seams of coal, have for a number of years been known to be somewhat extensively developed in southeastern Yukon, mainly in three localities—Tantalus[1], Braeburn-Kynocks[2], and Whitehorse[3] coal areas, all of which have already been described somewhat in detail by the writer. Tantalus coal area extends along Lewes and Nordenskiöld rivers; Braeburn-Kynocks coal area crosses Klusha creek and Hutshi river, tributaries of the Nordenskiöld; and Whitehorse coal area lies a few miles to the southwest of the town of Whitehorse.

Two small areas of lignite-bearing beds, occurring respectively on Sheep creek and on Kimberley and Telluride creeks in Kluane Mining district, have been briefly described by Mr. McConnell[4]. In addition, a coal field, which contains a number of valuable seams of lignite of good quality, and is here designated the 'Duke River Coal area', has recently been discovered in the northwest corner of Kluane district.

The lignite-bearing beds, which occur along the upper portion of Sheep creek, include mainly greyish sandstones, and conglomerates, grey to black shales, also occasional beds of tuff. These beds include several seams of lignite of good quality, one of which is at least 6 feet in thickness. An average sample taken across a seam, 3 feet thick, exposed in the lower or southeastern end of this Sheep Creek area, was analysed by the Mines Branch of the Department of Mines, Ottawa, and proved to contain:

	Per cent
Moisture	10·9
Ash	9·6
Volatile matter	41·0
Fixed carbon (by difference)	38·5

The rocks of the Duke River Coal area resemble those along Sheep creek, except that at the points where sections are best exposed and were examined, no tuff beds were noticed with the sediments. The beds of this

[1] Cairnes, D. D., "Preliminary Memoir on the Lewes and Nordenskiöld Rivers Coal District": Geol. Surv., Canada, Memoir No. 5, 1910, pp. 30-38, 48-55; *also see* Map 10A.

[2] Cairnes, D. D., Geol. Surv., Canada, Memoir No. 5, 1910, pp. 30-38, 49-50, *also see* Map 11A.

[3] Cairnes, D. D., "Report on a portion of Conrad and Whitehorse Mining Districts, Yukon": Geol. Surv., Canada, 1908, pp. 20-21.

[4] McConnell, R. G., "The Kluane Mining District": Geol. Surv., Canada, Sum. Rept. for 1904, pp. 7A, 18A.

area include mainly loosely or only partly consolidated black and greyish shales and clays, and yellowish to greyish sands and conglomerates, which include occasional intercalated seams of lignite. Fossil plants were collected from the beds of this area, and from those along Sheep creek; these after a preliminary examination have been forwarded to a specialist for more definite determination. They are, however, known to be of Tertiary age and they appear to indicate that the beds from which they were obtained, belong to the Kenai series* which includes the oldest known Tertiary sediments in Yukon and Alaska, and is generally referred to the upper Eocene.

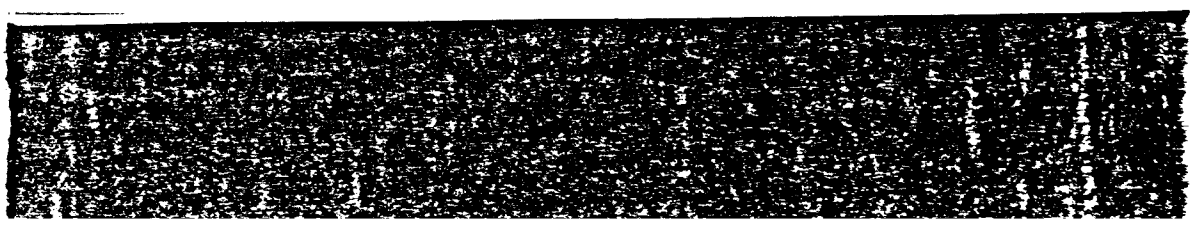
The beds of the Duke River area are developed throughout a belt having a width of from 1 mile to 5 miles, which extends at least from Duke river to the Donjek, a distance of about 15 miles. Good sections of these rocks are exposed along the head of the left fork of Burwash creek, and along the left bank of a tributary of Duke river. At one point along this tributary of Duke river, a small sub-tributary has cut a huge amphitheatre about 1,000 feet deep into these beds, and along the walls of this great natural excavation, and extending up the sidehills above it, a section from 1,200 to 1,500 feet in thickness is exposed. In this vicinity the sediments have been little disturbed, and are practically flat-lying. They are imperfectly consolidated, and weather very readily, so that at a short distance they resemble ordinary unconsolidated Pleistocene or Recent deposits. Overlying them at this point are at least 500 feet of lavas and tuffs of Tertiary or Pleistocene age.

These Tertiary sediments, where exposed in the amphitheatre, include at least 12 seams over 12 inches in thickness, that contain in the aggregate at least 30 feet and probably nearly 50 feet of lignite of good quality. The seams are distributed irregularly throughout the beds, occurring from top to bottom of the section.

Three samples of these lignites were taken. No. A is an average surface sample of 4 feet 6 inches of lignite exposed near the head of the left fork of Burwash creek. Neither top nor bottom of this seam was seen, the top having been removed by erosion, and the bottom not being accessible owing to its frozen condition. No. B is an average surface sample of a seam 4 feet 5 inches in thickness, which was exposed near the top of the huge amphitheatre on the sub-tributary of Duke river. No. C is an average of a number of pieces of lignite from 1 foot to 3 feet in diameter from a seam at least 3 feet in thickness outcropping in the amphitheatre. Owing to excessive weathering it was not feasible to strip this seam for a more satisfactory sample. These samples have been assayed by the Mines Branch of the Department of Mines, Ottawa, and proved to contain:

——	A.	B.	C.
Moisture	10·2	11·2	9·8
Ash	9·1	5·4	1·6
Volatile matter	42·0	40·9	43·9
Fixed carbon (by difference)	38·7	42·5	44·7

*Brooks, A. H., "The Geography and Geology of Alaska": U.S. Geol. Surv., Prof. Paper, No. 45, 1906, pp. 237-244, and Cairnes, D. D., "The Yukon Coal Fields": Trans. Can. Min. Inst., vol. xv, 1912, pp. 365-367.



able for lode deposits. These areas include a variety of rocks besides those of the Yukon group, with which placers are generally associated in other districts of Yukon. Thus the best known placers of Carmacks district, those of Nansen and Victoria creeks, are mainly in areas of Tertiary acid intrusives.

When searching for placers it is important also to consider whether the country has been glaciated. This particularly applies in Carmacks district as parts of it have escaped glaciation. Placers formed before the glacial period would in most cases be scoured away by ice movement or buried beneath drift deposits. The features of the last glaciation are still fresh and unmodified by post-glacial erosion, showing that the time since the disappearance of the ice-sheet has been too short for placers to form. For this reason the western limit of the last ice-sheet has been indicated on the map.

It has already been mentioned that parts of the district, in the vicinities of Selkirk and Nansen creek, outside the limit of the last glaciation, were subjected to an earlier glaciation. The importance and extent of the earlier glaciations are not fully known. However, the placers of Nansen and Victoria creeks lie on top of the old boulder clay and have, therefore, been formed since the earlier glaciation. For this reason the areas that were subjected only to the earlier glaciation are not to be regarded as being unfavourable for placer prospecting ground.

COAL

Coal has been known in the district since the earliest explorations by Dawson, in 1887[1], who noted the presence of thin seams in the Laberge series at a locality that subsequently became the site of the Five-finger coal mine some 5½ miles above Five-finger rapid. Later, coal was found at what became the Tantalus and Tantalus Butte mines on Lewes river above Carmacks. The Tantalus Butte mine continues to produce a few hundred tons each year, most of which is sold in Dawson, but the other two mines are closed.

Tantalus Mine

This mine is on the south side of Lewes river, a mile above Carmacks, and was operated by the Five Fingers Coal Company. It has been abandoned for some years and its workings were not examined by the writer. The Tantalus conglomerates outcrop along the river bank both above and below the mine, and by their attitudes indicate the presence of a minor anticline west of the mine and a minor syncline to the east. The following account is taken from reports by Cairnes.[2]

"The coal outcrop on the river bank is well situated for economical working. . . . . Three seams have been opened up, only the lower two of which have been worked to any extent. The seams vary somewhat in thickness, but average about 7 feet 6 inches, 6 feet 6 inches, and 3 feet

[1] Dawson, G. M.: "Report on an Exploration in the Yukon District, N.W.T., and Adjacent Northern Portion of British Columbia, 1887"; Geol. Surv., Canada, Ann. Rept. 1887-88, pt. B, p. 147.
[2] Cairnes, D. D.: Geol. Surv., Canada, Sum. Repts.: 1907, p. 28; 1908, p. 14; 1909, p. 28. "Lewes and Nordenskiöld Rivers Coal District"; Mem. 5, pp. 49-54 and 59-62 (1910). Guide Book No. 10, pp. 82-87 (1913).

of coal in the bottom, middle, and top seams respectively. The lower two seams have, in places, not more than 4 feet of rock between them, and the middle and top seams are generally about 7 feet apart. The coal is worked by the pillar-and-stall system, from two level entries, which have been driven about 2,000 feet. The beds in the mine workings dip to the east at angles varying from 24 degrees to 40 degrees.

"A 500-pound sample from each of these seams taken by the writer in 1908 was treated and analysed by the Mines Branch, the following being part of the results of this work.

—	Upper seam		Middle seam		Lower seam	
	Raw	Washed	Raw	Washed	Raw	Washed
	%	%	%	%	%	%
Moisture in sample as received in laboratory	0·9	.....	0·7	.....	0·7	.....
Proximate analysis of coal dried at 105 degrees—						
Fixed carbon	58·0	59·9	54·1	60·3	56·0	59·2
Volatile matter	25·0	26·3	26·7	25·7	27·8	28·1
Ash	17·0	13·8	19·2	14·0	16·2	12·7
Ultimate analysis of dried coal—						
Carbon	6·98	.....	.....	.....	71·1	.....
Hydrogen	4·0	.....	.....	.....	4·3	.....
Sulphur	0·5	0·5	0·5	0·4	0·5	0·5
Nitrogen	0·8	0·8	0·9	0·8	0·7	0·8
Oxygen	7·9	.....	.....	.....	7·2	.....
Ash	17·0	.....	.....	.....	16·2	.....
Calorific value of dried coal in calories per gramme	6·700	7·110	6·310	7·070	6·790	7·210 "

The Tantalus mine was operated from 1905 or earlier until 1922. In earlier years from 3,000 to 8,500 tons a year were produced for a period of seven years or more. Much of the coal was used by the river steamers but was not found altogether satisfactory owing largely to the difficulty of distributing it to coaling points up and down the river, and the steamers reverted to the practice of using wood as fuel. Production dropped in 1918 below 1,000 tons and in succeeding years fell to a few hundred tons, until in 1922 the mine was closed.

Tantalus Butte Mine

The presence of coal seams in Tantalus butte, across the river from Tantalus mine and Carmacks, has been known from about the same time as the Tantalus mine started operation. The Five Fingers Coal Company closed the Tantalus mine in 1922 and opened the Tantalus Butte mine in 1923; because compared with the Tantalus mine it is cheaper to operate on a small scale. Since 1923 this mine has produced from 300 to 600 tons a year, most of which is used for domestic heating in Dawson.

Tantalus butte is composed of conglomerates, sandstones, etc., of the Tantalus formation. The strata strike almost due north and dip at an angle of approximately 50 degrees to the west. Cairnes reports[1] the presence of three seams near the top of the butte, 8 feet 10 inches, 9 feet 10 inches, and 7 feet thick, respectively. He gives the following analysis, made by the Mines Branch, Department of Mines, of samples from each seam.

—	Average outcrop of 8 feet 10 inches seam	Sample of 9 feet 10 inches seam	Sample of best 6 feet of 7-foot seam
Water	13·64	10·32	12·87
Volatile combustible matter	31·84	31·72	31·72
Fixed carbon	51·84	42·13	49·51
Ash	2·69	9·83	5·90
	100·00	100·00	100·00
Ratio of volatile combustible matter to fixed carbon	1·63	1·33	1·56
Potash reaction	Dark	Brownish	Red
Colour of ash	Pale reddish brown	Pale brownish yellow	Yellowish brown
Kind of fuel	Lignite	Lignite	Lignite

These do not give a coherent coke.

In 1932 when the writer visited the locality the excavations exposing the three seams had caved. The mine workings now expose two seams, an upper one approximately 2 feet thick and a lower one that varies in thickness from 7 to 14 feet. The workings consist of a main entry which crosscuts to the lower seam and follows it to a point 700 feet or more in from the portal. The entry is about 350 feet above the river. An upper entry, 135 feet above the lower, runs in on the upper seams for approximately 100 feet to where a winze reaches the lower seam connecting with the rooms in it and providing ventilation. Most of the coal that has been mined has come from parts of the upper seam that are within 300 feet from the surface measured down the dip of the seam.

In 1933 the writer took a sample across the lower seam close to the inner end of the main entry where it had been exposed for over a year. The sample was a channel sample across the whole seam, which here measured 9 feet 9 inches. The best coal is in the lower third. The central part of the seam breaks up easily and is not so clean. The second best part of the seam is the upper part. The sample was analysed by the Mines Branch, Department of Mines, with the following results.

[1] Cairnes, D. D.: Geol. Surv., Canada, Mem. 8, p. 82. Guide Book No. 10, p. 82.

Condition of sample	As received	Dry basis
Proximate analysis:		
Moisture	6·1	.....
Ash	8·9	9·5
Volatile matter	31·2	33·2
Fixed carbon (by difference)	53·8	57·3
Ultimate analysis:		
Carbon	69·6	74·1
Hydrogen	5·2	4·8
Ash	8·9	9·5
Sulphur	0·4	0·4
Nitrogen	1·0	1·0
Oxygen (by difference)	14·9	10·2
Calorific value:		
Determined in calories per gramme, gross	6,555	6,950
Determined B.T.U. per lb., gross	11,800	12,560
Fuel ratio, fixed carbon, volatile matter	1·70	
Carbon-hydrogen ratio	13·4	15·5
Coking properties	Agglomerate	
Softening temperature of ash	2,330	

In 1934 seven other samples were collected by Mr. Andrew R. Johnstone and analysed by the Mines Branch, Department of Mines. The results follow:

Laboratory No.	13717		13718		13719		13720	
Condition of sample	R	D	R	D	R	D	R	D
Proximate analysis:								
Moisture.....Per cent	5·4	.....	4·5	.....	3·7	.....	5·6	.....
Ash..... "	10·5	11·1	11·5	12·0	9·1	9·5	11·3	12·0
Volatile matter..... "	30·7	32·5	30·9	32·4	32·9	34·2	33·7	35·7
Fixed carbon (by difference)..... "	53·4	56·4	53·1	55·6	54·3	56·3	49·4	52·3
Ultimate analysis:								
Carbon.....Per cent	.....		.....		.....		.....	
Hydrogen..... "	.....		.....		.....		.....	
Ash..... "	.....		.....		.....		.....	
Sulphur..... "	0·4	0·4	0·3	0·4	0·4	0·4	0·3	0·4
Nitrogen..... "	.....		.....		.....		.....	
Oxygen (by difference) "	.....		.....		.....		.....	
Calorific value:								
Calories per gramme, gross	6,625	7,005	6,660	6,975	6,935	7,200	6,580	6,970
B.T.U. per pound, gross	11,930	12,610	11,990	12,550	12,490	12,960	11,840	12,550
Fuel ratio, fixed carbon, volatile matter	1·75		1·72		1·65		1·45	
Carbon-hydrogen ratio	.....		.....		.....		.....	
Coking properties	Agglomerate		Agglomerate		Agglomerate		Agglomerate	
Softening temperature of ash	.....		.....		.....		.....	

13717—From 9-foot 4-inch seam, face exposed one year.
13718—From 8-foot 6-inch seam, face exposed 45 days.
13719—From 8-foot seam, face exposed 40 days, face main tunnel.
13720—From 9-foot seam, freshly broken face.

Laboratory No.		13721		13722		13723	
Condition of sample		R	D	R	D	R	D
Proximate analysis:							
Moisture	Per cent	4·2	.....	4·4	.....	4·4	.....
Ash	"	10·0	10·5	11·5	12·0	10·0	10·5
Volatile matter	"	32·8	34·2	32·9	34·4	33·4	34·9
Fixed carbon (by difference)	"	53·0	55·3	51·2	53·6	52·2	54·6
Ultimate analysis:							
Carbon	"	.....	.....	69·5	72·8	.....	.....
Hydrogen	"	.....	.....	4·7	4·4	.....	.....
Ash	"	.....	.....	11·5	12·0	.....	.....
Sulphur	"	0·3	0·4	0·4	0·4	0·4	0·4
Nitrogen	"	.....	.....	1·0	1·0	.....	.....
Oxygen (by difference)	"	.....	.....	12·9	9·4	.....	.....
Calorific value:							
Calories, per gramme, gross		6,805	7,110	6,670	6,975	6,810	7,120
B.T.U. per pound, gross		12,250	12,800	12,000	12,560	12,260	12,820
Fuel ratio, fixed carbon, volatile matter		1·60		1·55		1·55	
Carbon-hydrogen ratio		.....		14·8	16·5	.....	
Coking properties		Agglomerate		Agglomerate		Agglomerate	
Softening temperature of ash, °F		2290		2280		2295	

13721—Run of 5 tons of hand-screened slack coal.
13722—From last 5 tons mined in year 1934.
13723—From last 5 tons mined in this season, 1934.

Five-finger Mine

The Five-finger mine is on the east bank of Lewes river, 15 miles below Carmacks by river, or 8 miles in a direct line. The mine is abandoned and its workings filled with water. The information here given with regard to it is summarized from reports by Cairnes[1] who visited it in 1907. "Some years ago a slope was sunk about 350 feet and rooms driven off it on the best seam so far found in these measures, and which dips at 16 degrees to the east; the seam in the lower rooms being 3½ to 4 feet thick. A considerable amount of coal was mined and sold, chiefly in Dawson, but the workings have now been closed for several years.

"As the top of this old slope is subject to mud slides—being situated in the steep clay and sand bank of the river—when work was re-commenced in 1906, under new management, it was on safer ground—some distance south. Here a new slope was sunk 783 feet on a seam higher in the measures than the seam in the old workings, and which also dips at 16 degrees to the east. This seam—which in places in the slope is not more than 6 inches thick—at the bottom contains 22 inches of good clean coal, and 24 inches of coal and shale.

"During 1907 and 1908 very little work was done on this property. In the former year a 25-foot winze was sunk at 450 feet down the new slope to a seam of coal 4½ feet thick, which is apparently the same seam as that in the old slope. Since 1908 the mine has been closed.

"The following samples were taken by the writer: sample A is an average of the 22 inches of good coal in the bottom of the 783-foot slope;

[1] Cairnes, D. D.: Geol. Surv., Canada, Sum. Rept. 1907, p. 98. "Lewes and Nordenskiöld Rivers Coal District"; Mem. 4, p. 53.

and B is an average of the bottom of the 26-foot winze. Assayed by the Mines Branch, Department of Mines, at Ottawa, these samples gave the following results:

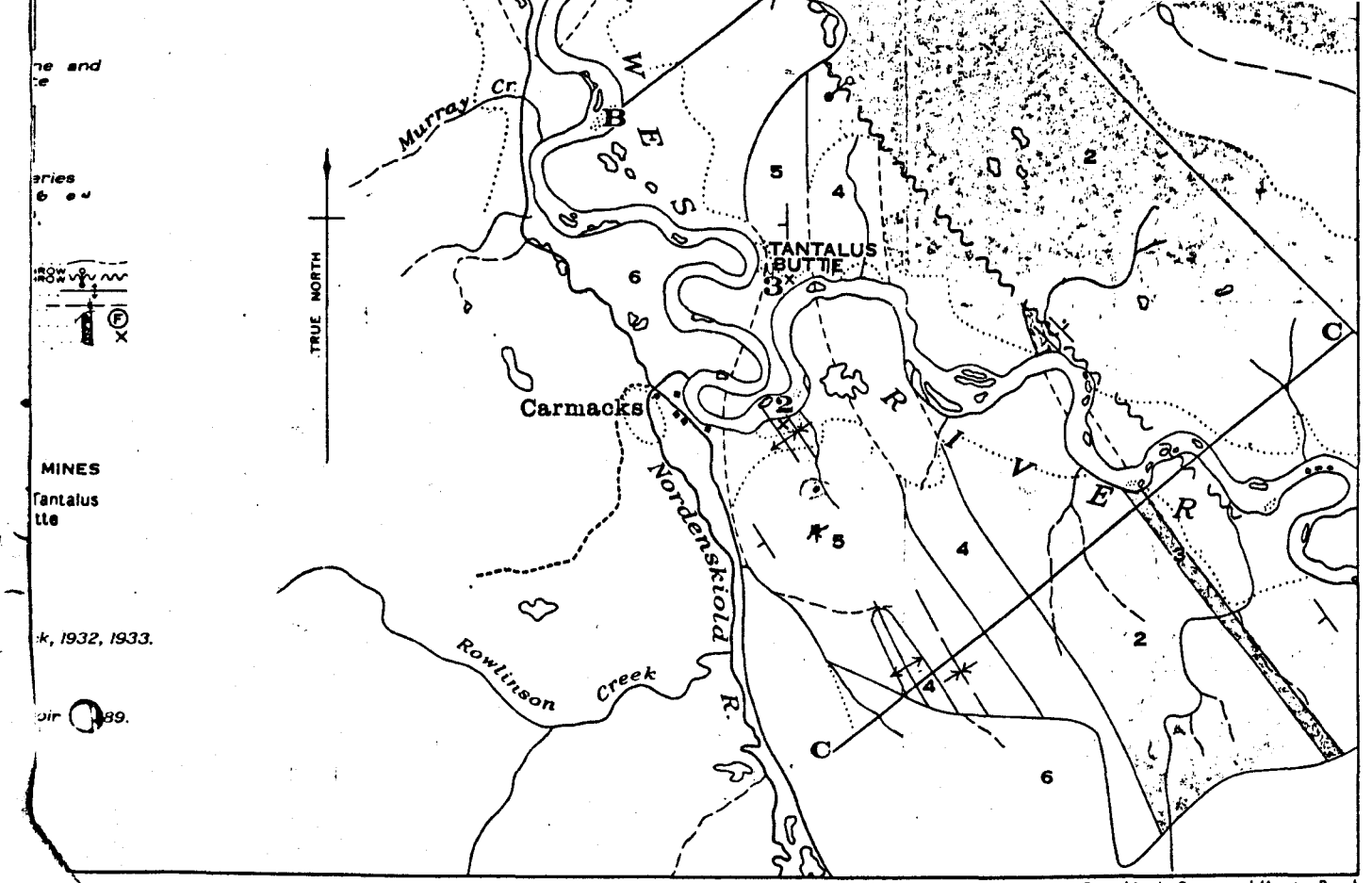
Sample	A	B
Water	5·05	5·29
Volatile combustible matter	40·46	36·14
Fixed carbon	45·16	40·12
Ash	8·43	18·45
	100·00	100·00
Coke per cent	53·59	58·57
Character of coke	Firm Coherent	.....
Ratio of volatile combustible to fixed carbon	1 to 1·11	1 to 1·11
Colour of ash	Reddish	Reddish "
Kind of fuel	Coal	Coal

Other Localities

Coal has been reported from two other localities. One of these on the west bank of Lewes river, 5 miles above Selkirk, was reported by Cairnes[1] to display bituminous coal of good quality. This locality was examined by the writer in 1933. The workings formerly consisted of a shaft now filled with water, probably 20 to 30 feet deep, and an adit, now caved in, at the water's edge. Both dumps are small and composed of black shale in which a few pieces of coaly shale or poor coal occur. On the bank is an outcrop of conglomerate containing plant fragments. The shale and conglomerate strongly resemble those of the upper part of the Laberge series and may very well belong to the Laberge coal horizon. The coal-bearing beds probably extend beneath the Selkirk volcanics which outcrop 50 yards to the west but only for a comparatively short distance, as intrusives believed to be younger than the Laberge series outcrop within a mile on almost all sides.

It has been known from the beginning of the century that coal float occurs in the gravels of Mica creek, and McConnell[2] mentions that "a shaft sunk on an easterly branch of Mica creek, about 8 miles from the Pelly, is reported to have passed through several small seams of lignite." The easterly branch mentioned by McConnell is Ptarmigan creek. This locality was visited by the writer in 1934. At the forks of Ptarmigan creek the ruins of two old cabins with the stone chimneys and fire-places characteristic of the first years of the century were found. The creeks follow a canyon-like valley 200 to 300 feet deep in which no outcrops were observed, the walls appearing to be composed entirely of glacial drift. A few hundred yards up the branch coming from the southwest side of Ptarmigan mountain, old piles of logs apparently cut for mine timber were discovered. The workings were probably located on the south

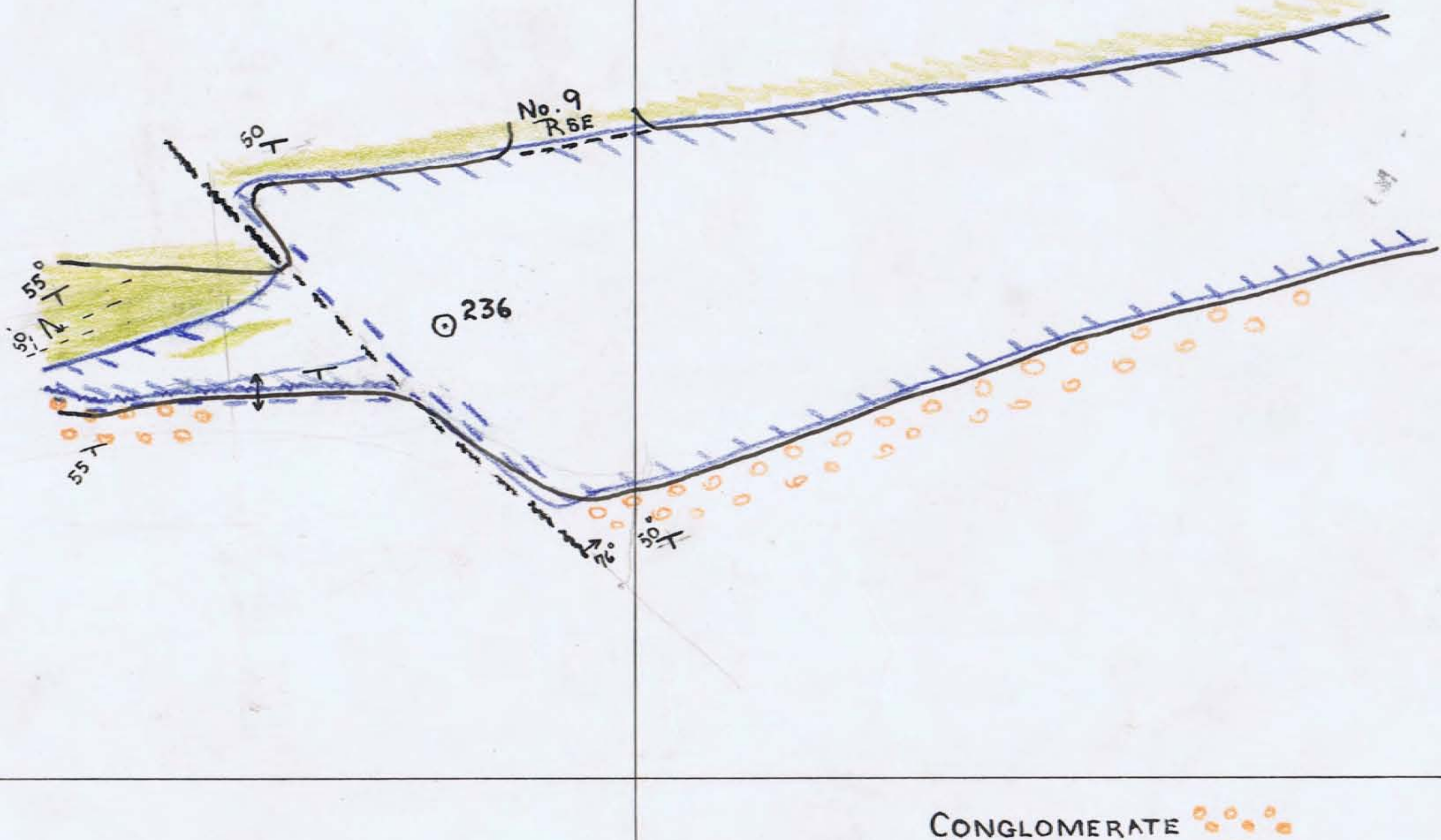
[1] Cairnes, D. D.: Geol. Surv., Canada, Guide Book No. 10, p. 91 (1913).
[2] McConnell, R. G.: Geol. Surv., Canada, Sum. Rept. 1903, pt. A, p. 38.



RE 1. TANTALUS BUTTE—TATCHUN LAKE AREA,
ATING PROBABLE CHIEF STRUCTURAL FEATURES

Scale, 1 inch or 1 Inch to 2 Miles
Miles

Breather bowl for D13000 Cat compressor unit

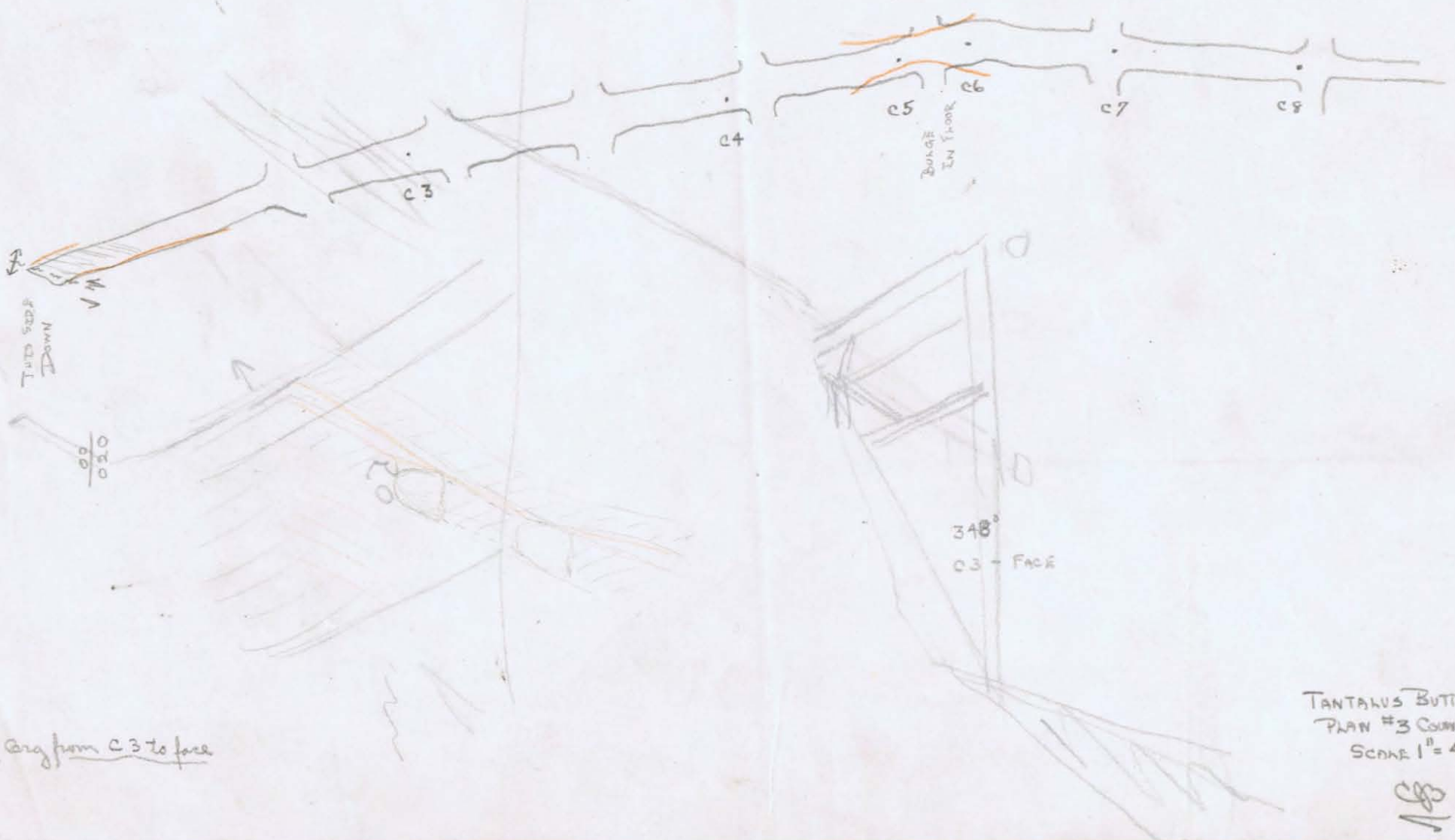


TANTALUS BUTTE
COAL MINE

SCALE 1" = 10' AP 23-53

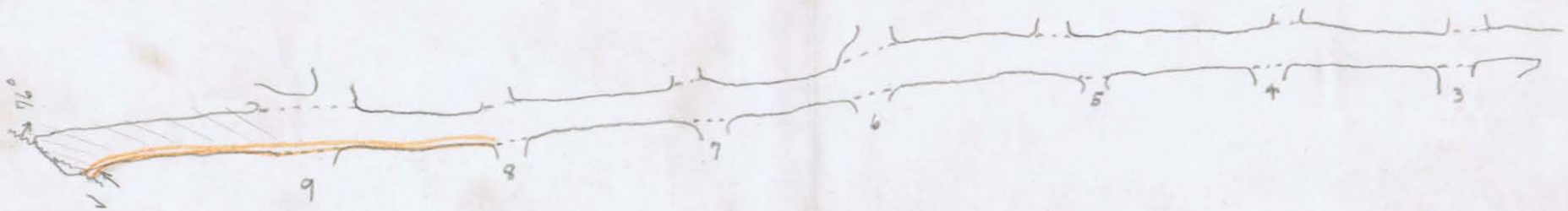
ogs.


BONE PINCHES OUT
POLISHED SURFACE OF COAL ON BED.
DRAG NORMAL HWW
76/030
355°30
235-236
TANTALUS BUTTE
PLAN GANGWAY
SCALE 1"=40'



check brg from C3 to face

TANTALUS BUTTE
PLAN #3 COUNTER
SCALE 1" = 40'

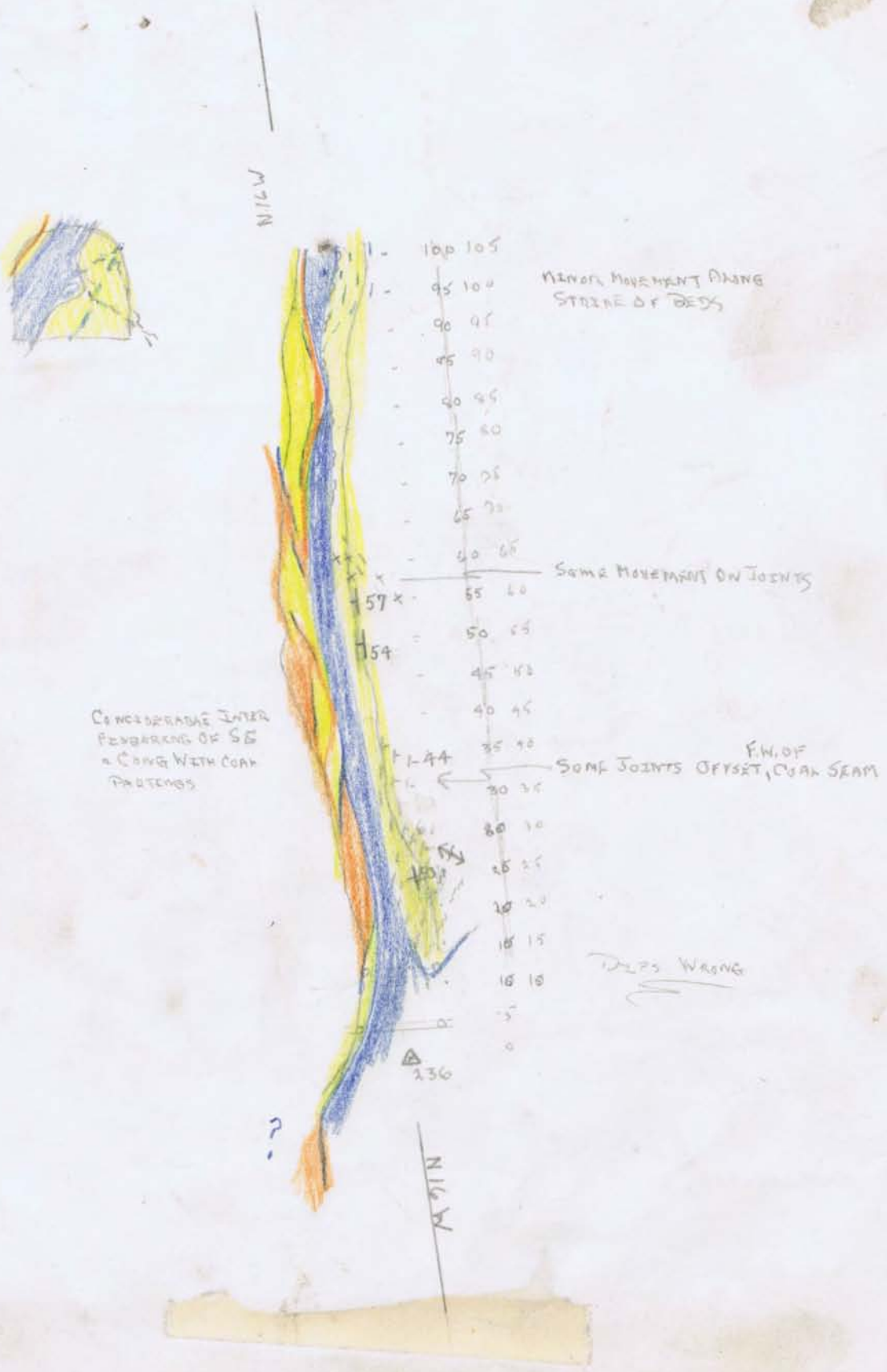


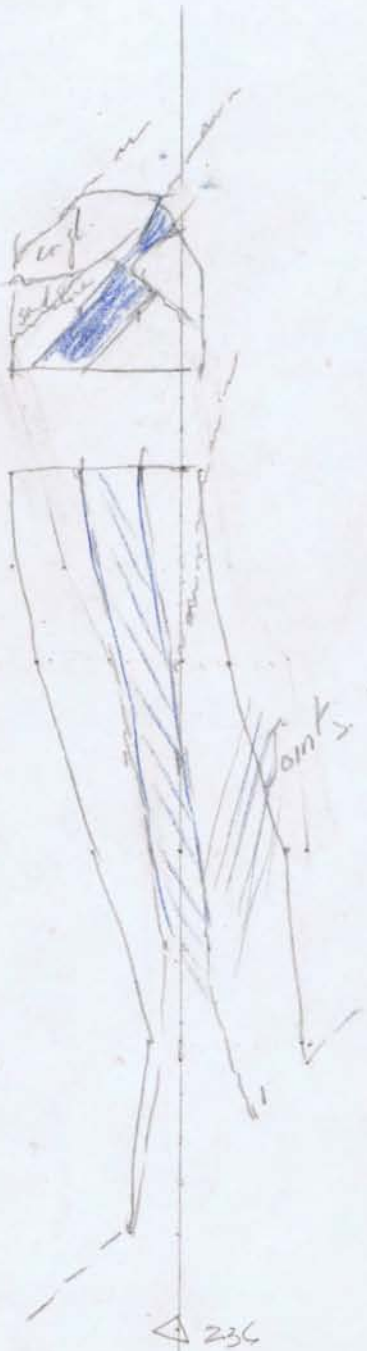
76/030 F.W Down

349°
C 1 - Face

37

Tantanus Butte
Plan #1 Counter
Scale 1" = 40'


N16W
Minor Movement Along Strike of Beds
Some Movement on Joints
Some Joints Offset, Coal Seam
F.W. of
Considerable Inter Fingering of SS & Cong With Coal Partings
Beds Wrong
N16W
236


Pants
236
235

UNITED KENO HILL MINES LTD.

DIAMOND DRILL HOLE LOG

PROPERTY Yukon Coal Co. Ltd.

LOCATION See map - not surveyed LAT. ELEVATION STARTED

DEP. COMPLETED

BEARING DIP 0" SURVEYS

DEPTH 54 PURPOSE

HOLE NO. 1

SHEET NO. 1

SECTION FROM 0 TO 54

LOGGED BY R6/0

FOOTAGE FROM	FOOTAGE TO	MINOR STRUCTURES FROM	MINOR STRUCTURES TO	RECOVERY	FORMATION
0	5				SANDSTONE
		0	5	5	Micaceous partings
5	20				PEBBLY SANDSTONE, MINOR MUDSTONE
		5	20	13.8	Micaceous partings evidence of carbonaceous material-plant fossils? 1" of coal from 11 - 0" to 11.1', narrow fractures with coal at 7.8' and 11.5'
20	31				MUDSTONE
		20	31	10.3	Grades towards sandstone as depth increases, carbonaceous material; broken core from 25' to 29'
31	38.7				SANDSTONE, MINOR MUDSTONE
		31	38.7	6.7	Grades toward pebbly sandstone as depth increases
38.7	47.8				PEBBLY SANDSTONE
		38.7	47.8	8.5	Micaceous partings, broken core from minor carbonaceous of fractures.
47.8	50.0				MUDSTONE, MINOR PEBBLY SANDSTONE
		47.8	50.0	2.2	Pebbly sandstone from 49.6' to 50.0' - some carbonaceous material in mudstone
50.0	54.0				COAL
		50.0	54.0	1.8	Broken core - lost bit in coal
				48.3	END OF HOLE
					% Recovery 48.3/54 = 90.0%

CORE SAMPLES SAMPLE NO.	CORE SAMPLES FOOTAGE FROM	CORE SAMPLES FOOTAGE TO	CORE SAMPLES WIDTH	CORE SAMPLES AG OZ/TON	CORE SAMPLES Pb %	CORE SAMPLES Zn %

SLUDGE SAMPLES SAMPLE NO.	SLUDGE SAMPLES FOOTAGE FROM	SLUDGE SAMPLES FOOTAGE TO	SLUDGE SAMPLES AG OZ/TON	SLUDGE SAMPLES Pb %	SLUDGE SAMPLES Zn %

UNITED KENO HILL MINES LTD.

DIAMOND DRILL HOLE LOG

PROPERTY TANTALUS BUTTE COAL MINE

HOLE NO. 7

SHEET NO. 1

SECTION FROM ____ TO ____

LOGGED BY A.H.M.

LOCATION Carmacks LAT. 13,159 N ELEVATION ____ STARTED Sept. 14, 1961

DEP. 10,149 E COMPLETED Sept. 15, 1961

BEARING N 52 E DIP Horizontal SURVEYS ____

DEPTH 82 PURPOSE To locate the commercial coal seam.

FOOTAGE		MINOR STRUCTURES			FORMATION	CORE SAMPLES							SLUDGE SAMPLES					
FROM	TO	FROM	TO	RECOVERY		SAMPLE NO.	FOOTAGE FROM	FOOTAGE TO	WIDTH	AG OZ/TON	Pb %	Zn %	SAMPLE NO.	FOOTAGE FROM	FOOTAGE TO	AG OZ/TON	Pb %	Zn %
0.0	14.5			14.0	Light grey argillaceous sandstone with carbonaceous particles.													
		7.5	8.5		Finely textured conglomerate.													
		11.4	11.6		Coal.													
14.5	22.0			6.5	Dark brownish grey sandy shale.													
22.0	29.5			7.0	Light grey finely textured sandstone with thin bands of shale.													
29.5	34.5			5.0	Light grey coarse impure sandstone with carbonaceous fragments.													
34.5	41.5			5.5	Medium textured conglomerate with carbonaceous fragments. - Quartz, chert, shale and sandstone pebbles.													
41.5	51.0			9.0	Light grey sandstone with shale bands.													
		42.0	42.2		Coal.													
51.0	70.0			18.5	Dark grey shale with bands of light grey sandstone.													
		54.0	54.3		Carbonaceous shale.													
		67.7	68.0		Coal.													
70.0	73.5			3.5	Light grey argillaceous sandstone.													
73.5	82.0			8.0	Light to dark grey sandy shale.													
		79.0	79.6		Carbonaceous shale.													

UNITED KENO HILL MINES LTD.

DIAMOND DRILL HOLE LOG

PROPERTY TANTALUS BUTTE COAL MINE

HOLE NO. 8
SHEET NO. 1
SECTION FROM ____ TO ____
LOGGED BY A.H.M.

LOCATION Carmacks LAT. 13,013 N ELEVATION ____ STARTED Sept. 15, 1961
DEP. 10,171 E COMPLETED Sept. 16, 1961

BEARING S 67 W DIP Horizontal SURVEYS ____

DEPTH 95 PURPOSE To locate the commercial coal seam

FOOTAGE		MINOR STRUCTURES			FORMATION	CORE SAMPLES							SLUDGE SAMPLES					
						SAMPLE NO.	FOOTAGE		WIDTH	AG OZ/TON	Pb %	Zn %	SAMPLE NO.	FOOTAGE		AG OZ/TON	Pb %	Zn %
FROM	TO	FROM	TO	RECOVERY			FROM	TO						FROM	TO			
0.0	95.0			77.0	Coarse conglomerate with pebbles up to several inches - shale, quartz, sandstone and minor chert.													
		31.0	37.0	0.5	6 inches of coarse sandstone and some rusty fragments of conglomerate.													
		49.0	50.5		Impure sand with a few pebbles.													
		50.5	51.0		Dark grey shale.													
					Recovery - 81 %													