

1980 REPORT OF EXPLORATION ACTIVITIES
ON THE SOUTH MOUNT GETHING PROPERTY

Coal Licence Numbers 4129 to 4152 Inclusive
Peace River Land Dist. & Liard Mining Divis.

N.T.S. Designation 93 O/16W. & 94 B/1W.

LAT. 55° 58' N: LONG. 122° 25' W.

Owned and Operated by Utah Mines Ltd.

Report by: P. S. Cowley of Utah Mines Ltd.

Field Work Performed Between
May 14, 1980 and August 19, 1980

Report Submitted February, 1981

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National Topographic System Designation

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CONFIDENTIAL

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ABSTRACT

The twenty-four contiguous coal licences, numbered 4129 to 4152 inclusive, which comprises the South Mount Gething Property were issued to Utah Mines Ltd. on August 15, 1980. The property is located in the Liard Mining District and the Peace River Land District.

The 1980 exploration program was designed to provide further information on the extent, metallurgical quality and continuity of coal seams on the property, pursuant to the 1978 and 1979 programs. In particular, the program had three objectives; to conduct an extensive mapping program, determine an adit entry for the Superior and Trojan seams by a rotary program near the property's northeastern boundary, and to determine the extent of the thick coal seam intersected in D.D.H. SMG 78-1. The extensive mapping enhanced the understanding of the stratigraphic and structural complexity on the property which previously was poorly understood. The twenty-seven rotary drill holes, totalling 1151.1m, on C.L.'s 4131 and 4132 were unsuccessful in locating adit entries for the Superior and Trojan seams as the seams subcropped below excessive overburden thickness. Two diamond drill holes, totalling 354m, were drilled in the western part of the property to locate the thick seam penetrated in D.D.H. SMG 78-1. Diamond drill hole SMG 80-11, 1.0km away, successfully penetrated this seam and another thick seam not previously intersected.

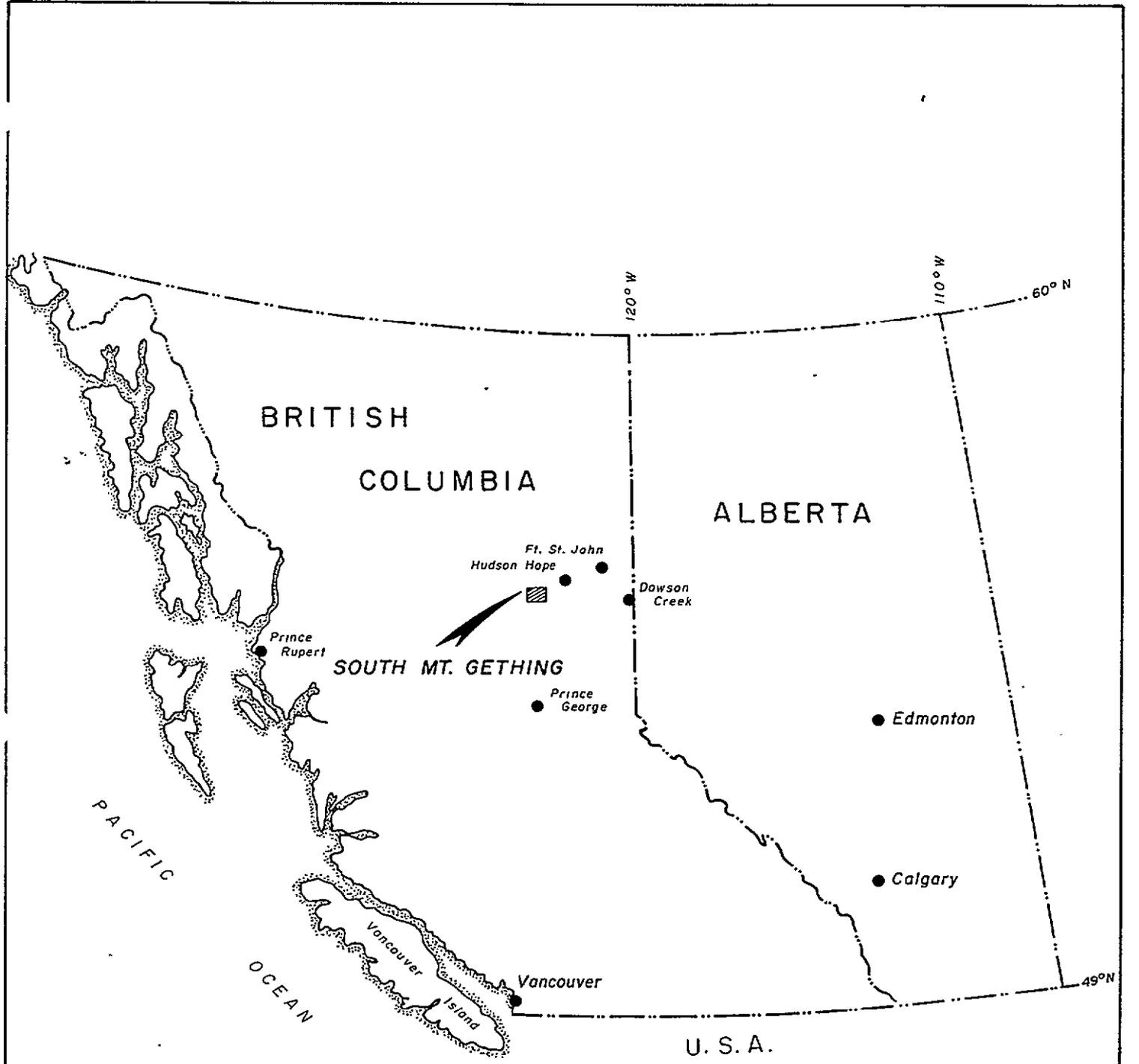
The 1980 exploration program greatly improved the understanding of the property's geology and economic potential and provides a base for further exploration of the South Mount Gething Property. In addition, we ask Paul Hagan, the Coal Administrator to terminate the following Coal Licences:
C.L.'s 4143, 4144, 4147, 4148, 4149, and 4151.

LOCATION AND ACCESS

South Mount Gething Property is located in the designated "Northeast Coal Block", lying within the Liard Mining Division and the Peace River Land District. Geographical coordinates of the centre of the property are $55^{\circ} 58' N$; $122^{\circ} 25' W$. The coal licences are within the area covered by the National Topographic System designation 93-0-16 and 94-B-1W. The property, which is roughly triangular in shape, is largely confined between Dowling Creek on the east and Gaylard Creek on the north, with two licences lying within and north of the Gaylard Creek Valley.

The central part of the property lies approximately 15 kilometres west-southwest from the W.A.C. Bennett Dam, 36 kilometres west-southwest of the town of Hudson's Hope and 60 kilometres northwest of the town of Chetwynd. Vancouver is approximately 770 kilometres south of the property. (See Figure 1, page 3 , figure 2, 4 .)

Highway 29, joining Chetwynd, Hudson's Hope and Fort St. John, passes approximately 31 kilometres to the east of the property. Canfor Limited's (a major forest products company) Johnson Creek-Track Creek Road, which joins Highway 29 at 19 kilometres south of Hudson's Hope, and several secondary logging roads provide direct road access to various parts of the property. (See maps 1 and 2 in pocket.)



UTAH MINES LTD.
SOUTH MT. GETHING
LOCATION MAP

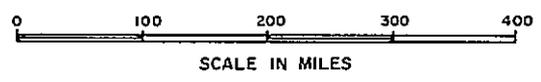
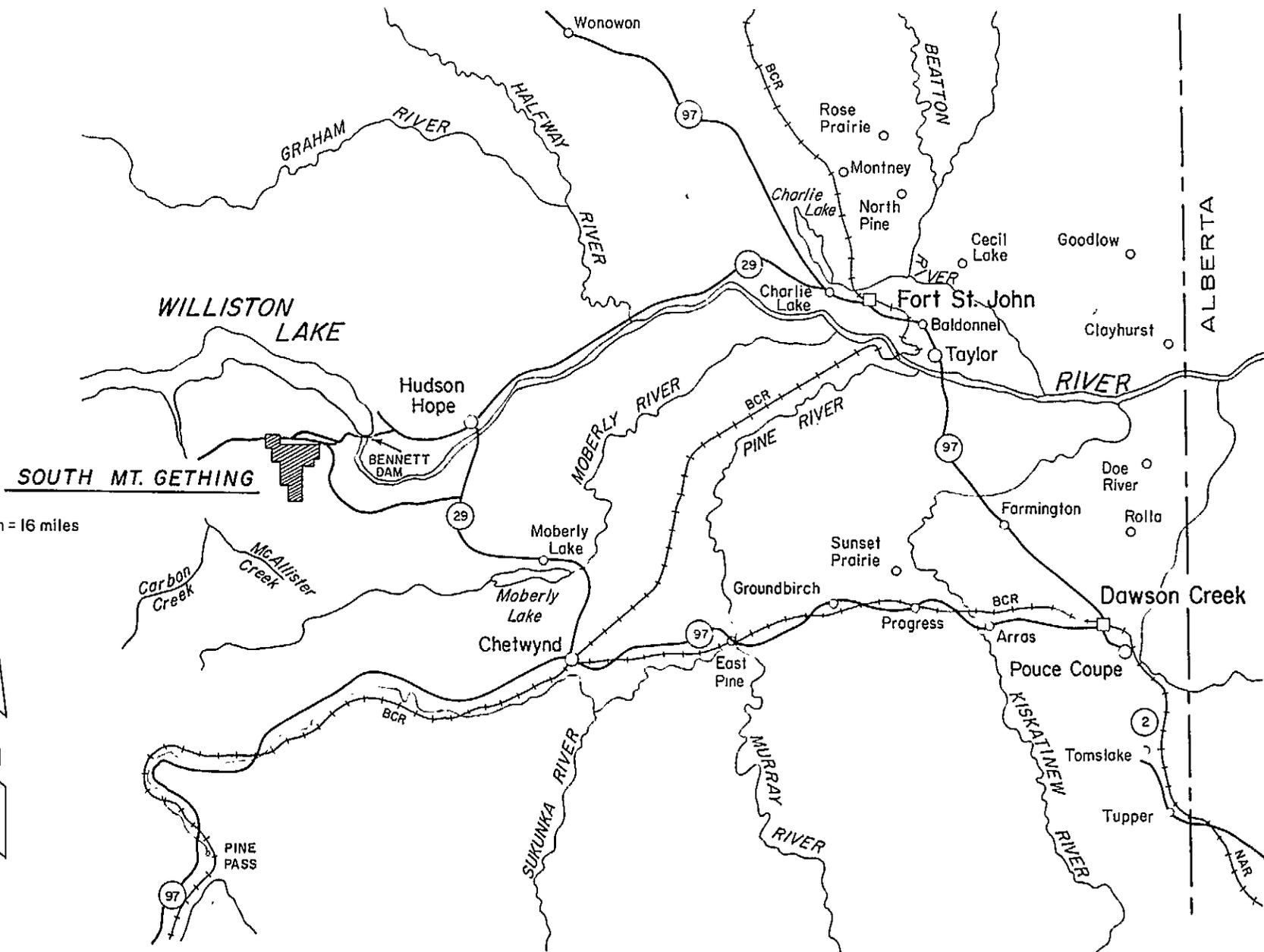


FIGURE — 1

FIGURE - 2
REGIONAL MAP
SOUTH MT. GETHING



14

SCALE: 1 inch = 16 miles



Alternate access to the Johnson Creek - Track Creek Road is possible by travelling over the 13.7 kilometres of Utah Mines Ltd. road from the west end of the W.A.C. Bennett Dam. Drill access roads to diamond drill hole sites SMG-78-2, SMG-79-4, SMG-79-5 and SMG-79-6 provide road access to the northeastern portion of the property. Away from these roads, access to much of the property is possible only by helicopter or on foot. The diamond drill holes in the western and southern portions of the property have helicopter landing pads which provide easier access to this portion of the property. (See maps 1 and 2 in pocket.)

PROPERTY AND TITLE

The South Mount Gething Property comprises 24 contiguous coal licences number 4129 to 4152 inclusive. These licences encompass 6892 hectares (rounded upward from, more precisely, 6880.99 hectares.) (See Figure 3, page 7 .)

Application for title to the licences included in the South Mount Gething Property was made in the prescribed manner by the Utah Mines Ltd. in the spring of 1978. The licences were issued on August 15, 1978 and, subsequently, signed by the Minister of Energy, Mines and Petroleum Resources. This property forms a natural westward extension of the Bri Coal Property, held by Utah Mines Ltd. under an agreement formed with Bri Coal Mining Ltd., Bow River Resources Ltd. and Rainier Energy Resources Ltd.

With the exception of part of the northern boundary, the property is surrounded by other adjoining coal properties. Shell Canada Resources Limited holds adjacent coal licences to the northwest, west, south and southeast. The East Mount Gething Property, also owned by Utah Mines Ltd., adjoins the South Mount Gething Property on the northeast. (See Figure 3, page 7 .)



56°00'

4152 4151

EAST MT. GETHING

Gaylard Creek

4150 4149 4148 4147 4134 4133
4146 4145 4144 4143 4132 4131

4142 4141 4140
4139 4138 4137

BRI COAL PROPERTY

Dowling Creek

SHELL CANADA

4136 4135
4130 4129

Gething Creek

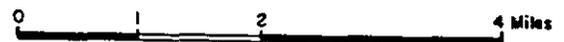
SHELL CANADA

122° 25'

FIGURE -3

SOUTH MT. GETHING

COAL LICENCES



Scale - 1:100,000

PHYSIOGRAPHY

The South Mount Gething Property is situated in the outer (eastern) belt of the Rocky Mountain Foothills. (See Figure 4, page 9.) To the west, the margin of the Foothills belt is considered to be the easternmost major fault which thrusts Paleozoic strata over Mesozoic strata. The eastern margin is a series of en-echelon thrust faults, which separate the folded and faulted strata of the Foothills from the gently dipping to flat-lying strata of the Alberta Plateau (Holland, 1976.) Within this belt, major fold axes and thrust faults trend in a northerly to northeasterly direction with the thrusts dipping to the southwest. Structural deformation is considerable near the western margin of the Foothills and diminishes in extent and complexity toward the eastern margin.

The Property is underlain by a broad, south plunging anticline. This prominent structural feature is reflected in the topography of the property. South Mount Gething itself approximates the form of a slice from a cone, with the apex to the south. This conic form is contained to the west, south and east by numerous hills and ridges occurring in a roughly parabolic pattern. Segments of many streams follow and accentuate this pattern.

Topographic relief in the immediate area of the property is moderate. Elevations range from approximately 770 metres in Gething Creek Valley at the eastern property boundary, to 1532 metres at the summit of South Mount Gething. Surface slopes are generally shallow to moderate. A few areas of steep slopes and vertical cliffs occur on South Mount Gething to the north and northwest. Stream valleys are commonly broad and V-shaped with moderate to shallow gradients. Gaylard Creek Valley and the lower part of Gething Creek Valley are alluvium filled and relatively broad and flat bottomed in form.

EXPLORATION OF THE SOUTH MOUNT GETHING PROPERTY

Previous Exploration

Coal has been known to exist in the Peace River area since 1792, when Sir Alexander MacKenzie noted the existence of a "bituminous substance which resembles coal" in Peace River Canyon. Exploration, specifically designed to test the coal potential of the area covered by South Mount Gething Property, had not been undertaken prior to the acquisition of the property by Utah Mines Ltd. in 1978.

General reference to the area is made in various Geological Survey of Canada and British Columbia Ministry of Energy, Mines and Petroleum Resources publications (eg. McLearn and Kindle, 1950; Hughes, 1964; Stott, 1963.) Geological Survey of Canada Map 11 - 1961 provides a useful basic interpretation of the geology of the property. There are several reports which deal with specific adjacent map areas and contain information which is useful in the interpretation of the geology of this property (eg. Stott, 1969; LeNobel, 1975, 1977; Anderson and Armstrong, 1978.)

The 1978 exploration program for the South Mount Gething Property provided a preliminary appraisal of the coal potential of the property. A program of geological mapping and limited diamond drilling was undertaken which resulted in coverage of the property area at 1:10,000 scale and the drilling of three widely spaced diamond drill holes. In total, 606.86 metres of diamond drilling were completed in the three holes. Thirty-seven samples were taken from the core recovered from the drill holes and four samples were taken from trenches.

The 1979 exploration program for the South Mount Gething Property was designed to provide further information on the extent, metallurgical quality and continuity of coal seams on the property, pursuant to the 1978 program. The determination of the extent of the thick coal seam intersected in D.D.H. SMG-78-1, which was drilled during the 1978 program, was considered a priority. It was also particularly important to determine the continuity of coal seams from the Bri Coal Property to the South Mount Gething Property. A program of seven (7) diamond drill holes and limited geological mapping was undertaken to provide the information required to fulfill the objectives of the program.

Forty-six (46) coal samples from the total 1493 metres of diamond drilling were taken. All data and logs derived from the 1979 exploration program may be referred to in the 1979 Report of Exploration Activities on the South Mount Gething Property by D. N. Duncan of Utah Mines Ltd.

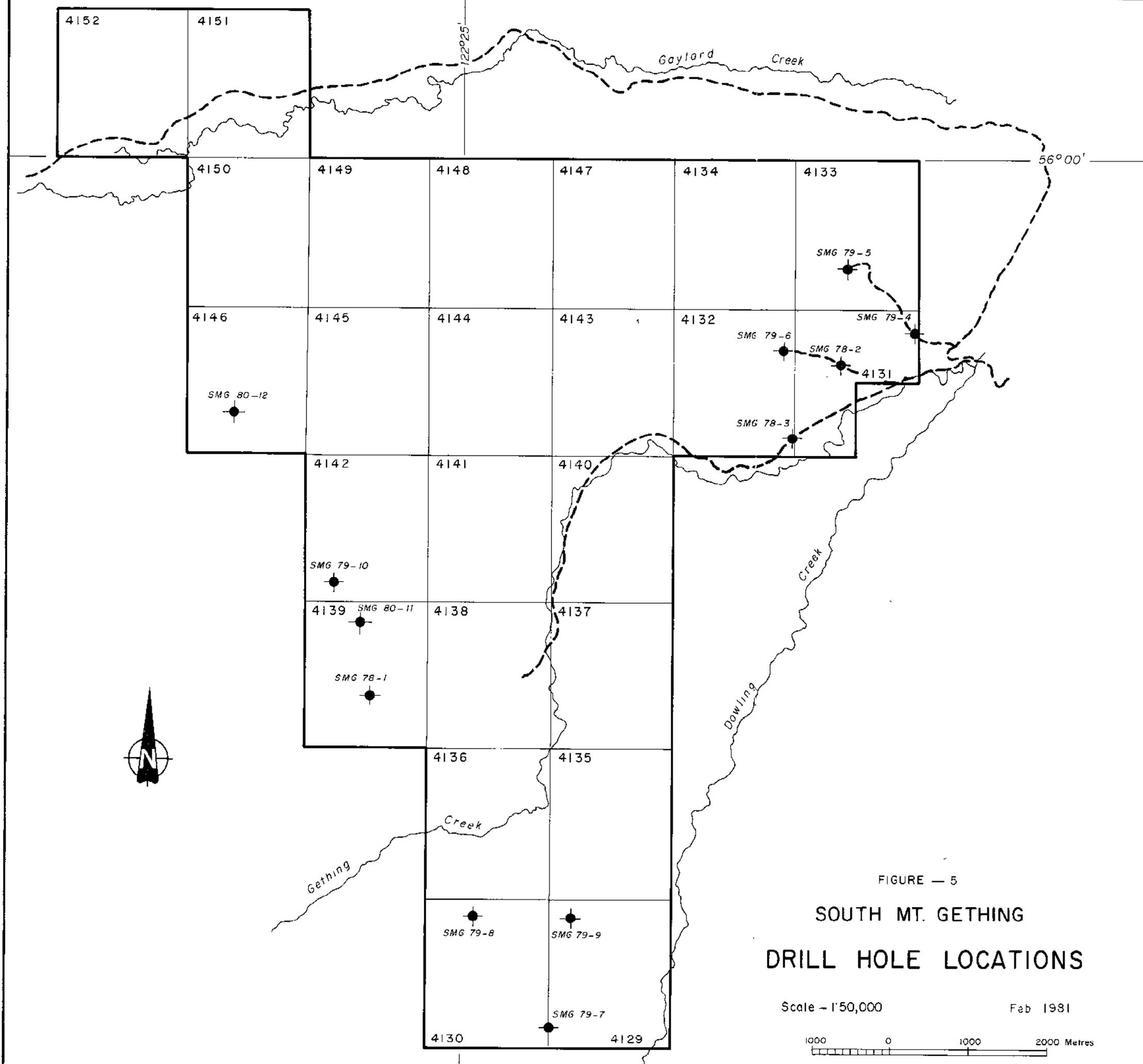
The 1980 exploration program was designed to provide further information on the extent, metallurgical quality and continuity of coal seams on the South Mount Gething Property. Specifically, the program had three objectives; to conduct an extensive mapping program, determine an adit entry for the Superior and Trojan seams by a rotary program near the property's northeastern boundary with Bri-Dowling Creek Property, and to determine the extent of the thick coal seam intersected in SMG-78-1.

The extensive mapping program was conducted intermittently between May 14, 1980 and August 15, 1980. Mapping was done on 1:10,000 scale maps augmented with 1:30,000 scale air photographs. Field crews were led by P. Cowley, D. N. Duncan, and J. Ridley

and assisted by E. Anderson, K. Yip, R. Olason, K. Hartmann, and C. Corney. Limited road access compelled field crews to rely heavily on a Bell 206 helicopter supplied by Okanagan Helicopters from Chetwynd. The mapping carried out enhanced the understanding of the stratigraphy and structural complexity on the property which previously was poorly understood (see map in pocket).

Diamond drilling was limited to two (2) helicopter assisted drill holes near the western boundary of the property (see figure 5). P. Demeulemeester provided slashing crews for each 50m x 100m drill clearing. Drilling, contracted to Longyear Canada Ltd., commenced July 29, 1980 and was completed August 11, 1980. Drilling was performed by W. Castle and A. Hayes, assisted by . Hayes and L. Martin and expedited by G. Stothart. Northern Mountain Helicopters from Prince George provided a Bell 205 helicopter for each Longyear '38' drill move. Okanagan Helicopters with minor back up from Maple Leaf Helicopters both from Chetwynd supplied Bell 206 helicopters for drill crews and supplies.

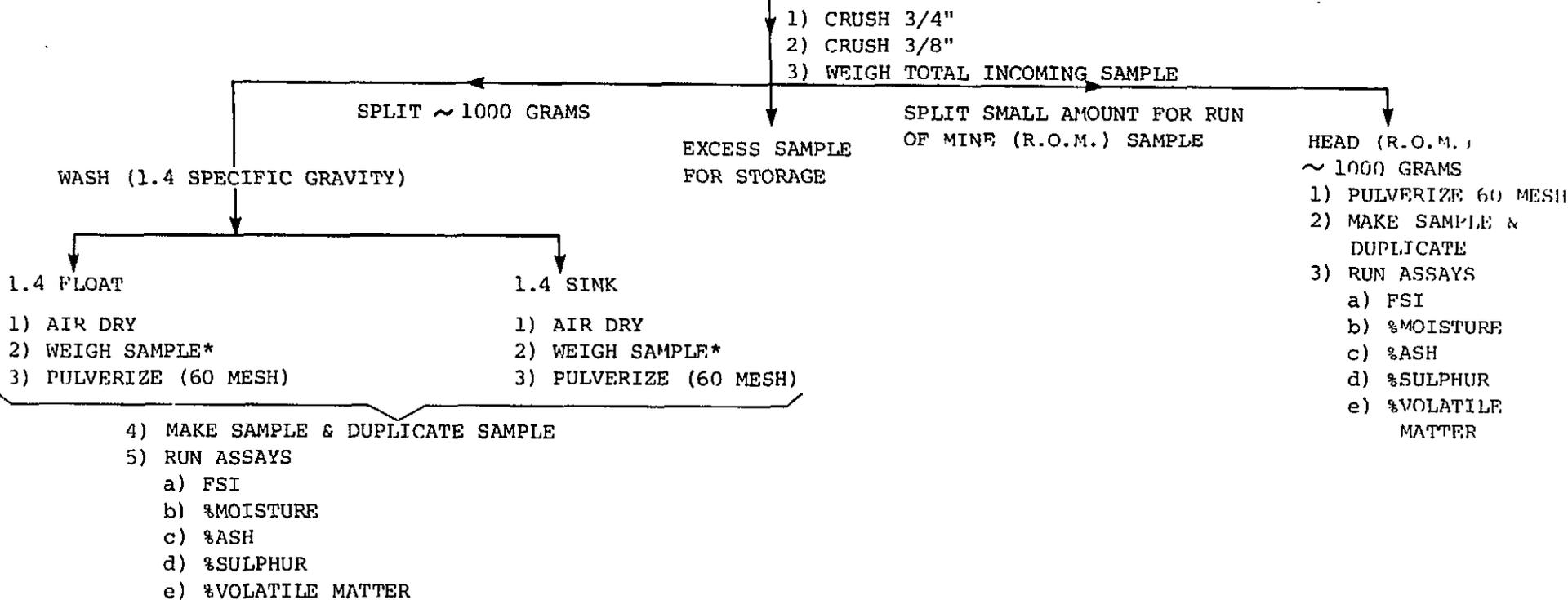
A total of 354.48 metres were drilled in the two holes. Core description was by P. Cowley. Roke Oil Enterprises of Calgary was contracted for geophysical logging of D.D.H. SMG 80-11. Seven (7) coal samples were taken from the core. These samples were submitted for analysis to the Utah International Inc. Minerals Laboratory at 1190 Bordeaus Drive, Sunnyvale, California, 94086. Analyses were conducted following the procedures outlined on the laboratory flow chart on the following page (Table 1). Drill core from D.D.H. SMG 80-11 was shipped to Charlie Lake core storage facility of the British Columbia Ministry of Energy, Mines and Petroleum Resources. Drill core from D.D.H. SMG 80-12 was stored on the Bri-Dowling Creek Property.



FLOW CHART FOR ANALYSIS OF DIAMOND DRILL HOLE SAMPLES

INCOMING SAMPLE

AIR DRIED

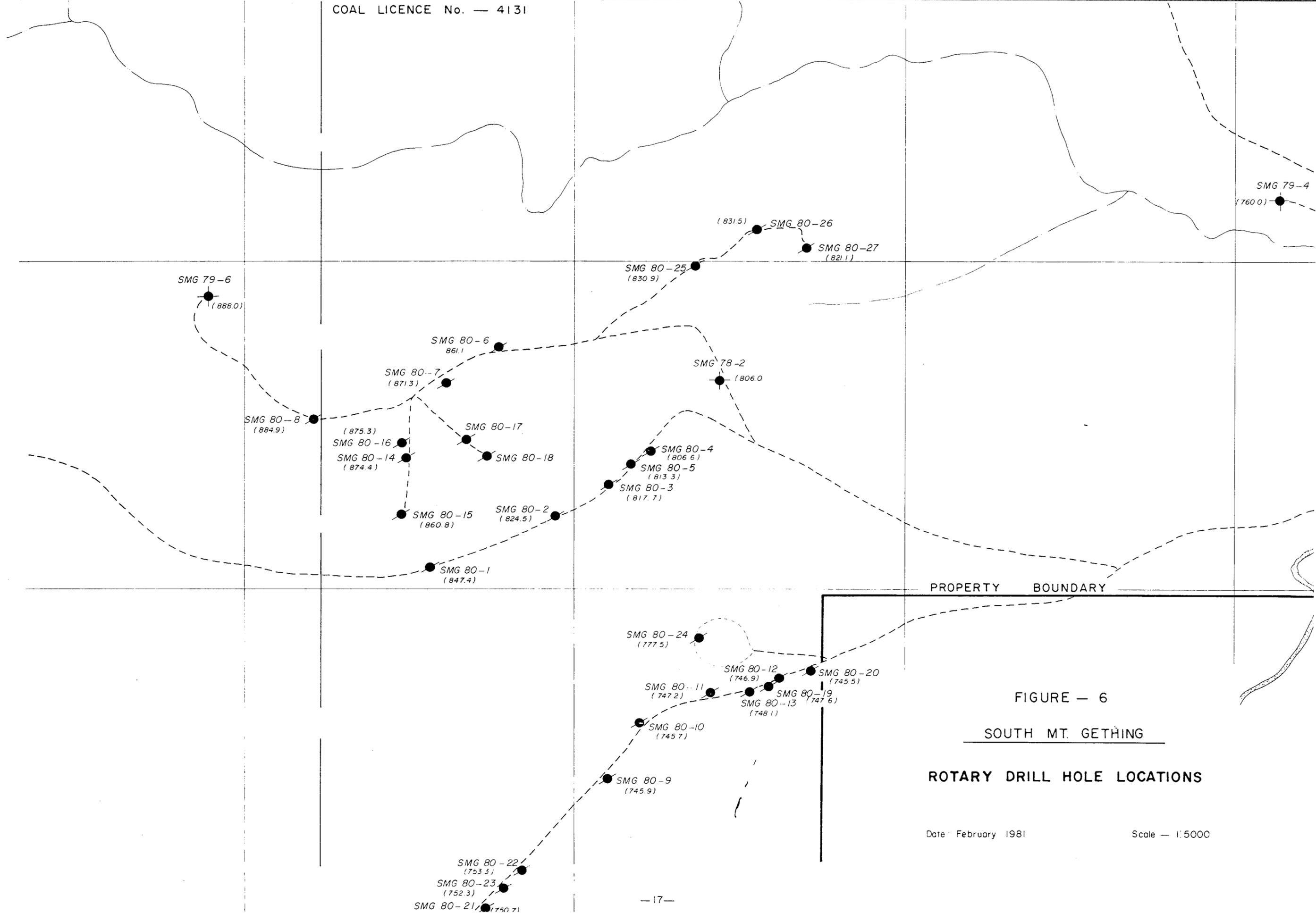


*WEIGHT RECOVERY OF COAL INSIDE SAMPLE

A total of twenty-seven (27) rotary drill holes were completed on the northeast portion of the property to determine an adit entry location for the Superior and Trojan Seams. Elgin Exploration Ltd. of Calgary was contracted for the rotary drilling program. Drilling with a track mounted rig and an accompanying track mounted water carrier commenced on July 10, 1980 and was completed on August 19, 1980. This rig was operated by K. Kelley and assisted by E. Waldner later replaced by J. Waldner. A second tandem truck mounted rig with an attendant water truck commenced drilling on August 14, 1980 and completed on August 20, 1980. This rig was operated by D. Holtorf and assisted by P. Phillips.

The majority of the rotary drill holes were located on existing drill and logging roads (see figure 6). However, when three (3) rotary trails were required, they were built in such a manner as to snake between trees to avoid slashing and minimize soil disturbance. These trails were pushed by a D7G Caterpillar owned by P. Demeulemeester. These trails and portions of existing Utah Mines Ltd. drill roads were sown on August 21, 1980 by P. Demeulemeester with grass seed mixture recommended by the Reclamation Branch of the British Columbia Ministry of Energy, Mines and Petroleum Resources for forested areas of the Northeast Coal Block.

A total of 1151.56 metres were drilled in the twenty-seven (27) rotary drill holes. Rock chips were described by K. Yip, K. Hartmann, R. Olauson, D. N. Duncan, P. Cowley, J. Ridley and R. B. Anderson. A portable Gearhart-Owens Model 06-3200 Widco Logger with an electric hoist was used by Utah Mines Ltd. personnel on holes warranting geophysical logging up to and excluding R.D.H. SMG 80-16. This hole caved while logging with



PROPERTY BOUNDARY

FIGURE — 6
SOUTH MT. GETTING
ROTARY DRILL HOLE LOCATIONS

Date: February 1981 Scale — 1:5000

resultant loss of the probe which luckily was not carrying a radioactive source. The inavailability of a substitute probe prevented the remaining holes from being logged. The results of the program will be discussed on page 36 . Descriptive logs for each hole are found in Appendix III. Geophysical logs, where available, are to be found in the map pocket.

GEOLOGY - GENERAL AND LOCAL

The South Mount Gething Property is underlain by folded and faulted sediments of Upper Jurassic to Lower Cretaceous age. The oldest, the Upper Jurassic to Lower Cretaceous Minnes Group consists of Monteith, Beattie Peaks, Monach Formations and an unnamed unit. Unconformably overlying these rocks are sediments of the Lower Cretaceous Bullhead Group which comprises Cadomin and Gething Formations. The Bullhead Group is, in turn, disconformably overlain by the Fort St. John Group. The Moosebar Formation and Gates Member are the only units of the Fort St. John Group exposed on the property.

Formations within the Minnes Group find their type section in the Carbon Creek basin. Each formation varies in thickness away from this location. The Monteith Formation thins from 64m in the Carbon Creek basin to 287m in the eastern part of the Foot-hills (Hughes, 1964). Beach and Spivak (1944) measured 447m of Monteith Formation on Mount Gething, 3km north of the South Mount Gething Peak. The Beattie Peaks and Monach Formations thin from 373m and 131m at Beattie Peaks in the Carbon Creek basin to 21m and 40m respectively in drill core near Butler Ridge, 20km north-east of South Mount Gething. The Monach is completely absent in areas on Butler Ridge and Grant's Knob 17km east of South Mount Gething (Hughes, 1964). The unnamed formation is 750m beneath the Carbon Creek Coal Licences and is absent in the Peace River Canyon (Stott, 1966).

The marine Monteith Formation may be divided into two lithofacies on South Mount Gething as in the Carbon Creek basin; an upper unit of clean quartzitic sandstones and conglomerates, dirty sandstones and minor siltstone; and a lower unit of dirty sandstones. The upper Monteith unit contains approximately 300m of

FORMATIONAL NOMENCLATURE

FORT ST. JOHN, BULLHEAD AND MINNES GROUP

TABLE - 2

Mathews 1946		Stott 1968 Pine River Foothills		(used in this report) Stott 1968 Upper Peace River		Flynn 1976				
Upper Cretaceous	Dunvegon Fm.		Dunvegon Fm.		Dunvegon Fm.					
	Fort St. John Group		Cruiser Fm.		Cruiser Fm.		Fort St. John Group			
Goodrich Fm.			Goodrich Fm.							
Hasler Fm.			Hasler Fm.							
Commotion Fm.			Commotion Fm.		Commotion Fm.					
Commotion Fm.			Boulder Creek Member		Hasler Fm.			Boulder Creek Member		
			Hulcross Member					Hulcross Member		
			Gates Fm.					Gates Fm.		
Moosebar Fm.			Moosebar Fm.		Moosebar Fm.			Moosebar Fm.		
Lower Cretaceous			Bullhead Group		Gething Fm.			Gething Fm.		
					Cadomin Fm.			Cadomin Fm.		
Lower Cretaceous & Jurassic		Minnes Group		Monach Fm.		Monach Fm.				
				Beattie Peaks Fm.		Beattie Peaks Fm.				
				Montieth Fm.		Montieth Fm.				
Jurassic		Ferne Group		Ferne Group		Ferne Group				
								Ferne Group		Ferne Group

an almost continuous sequence of fine-grained orthoquartzites to quartzite granular conglomerate with minor interbeds of fine-grained dirty sandstones and siltstones. The orthoquartzites may be white to light grey on a fresh surface and weather light grey. The clean quartzitic sandstones are massive with occasional cross-bedding but rarely may be thick to thin bedded. Beds range from 0.01m to 20m thick. Interbedded with the orthoquartzites are fine-grained, medium brown, thin to thick bedded sandstones and medium brown siltstones. The upper lithofacies of the Monteith Fm. is easily recognized on the landscape by the light grey prominent orthoquartzites.

The lower lithofacies of the Monteith Fm. conformably overlies the Jurassic Fernie shales and is overlain conformably by the Lower Cretaceous Beattie Peaks Fm. The Monteith-Beattie Peaks contact is assumed to be the contact between massive quartzose sandstones and the recessive Beattie Peaks Fm.

The recessive nature of the Beattie Peaks Fm. restricts its exposure to two isolated outcrops on the South Mount Gething Property. Therefore, because of recessive characteristics, also exhibited in the Carbon Creek basin, the description given for this formation will be that from Carbon Creek basin. The only marked difference between the two localities is thickness. The Beattie Peaks Fm. is estimated to be 40m thick on the South Mount Gething Property.

The Beattie Peaks Fm. is conformably overlain by the Lower Cretaceous Monach Fm. It is distinguished from overlying and underlying strata by its recessive, thinly interbedded siltstone, fine-grained sandstone, mudstone and rare coals. Casts

and worm tracks and burrows are common. The sandstone may contain abundant pelecypods in medium beds.

The Monach Fm. varies considerably away from Carbon Creek basin. Stott (1967) states: "As Muller (1961) was unable to distinguish typical Monach sediments throughout parts of the Pine Pass map-area, the Monach sandstones may be prominent only as a local facies in the Carbon Creek basin." Sediments that may be correlated to the Monach Fm. are exposed on the property. The sediments consist of fine to medium-grained sandstones interbedded with siltstone and mudstone. The sandstones have a high quartz content displaying a salt and pepper appearance. Frequently these cross-bedded sandstones are massive, forming 20m cliffs on the property. Despite an erosional unconformity between the Monach and Cadomin Formations, the prominent sandstones of both formations appear so similar as to be transitional. The separation is then made at the first conglomeratic band of the Cadomin Fm.

The uppermost unit in the Minnes Group is an unnamed non-marine unit. The formation consists of strata similar to the Gething Fm., including coals. However, the pre-Cadomin regional erosional unconformity bevelled off this unit in the vicinity of the South Mt. Gething Property. "In the vicinity of Peace River canyon, the Cadomin is in contact with strata low in the Beattie Peaks Fm." (Stott, 1966). The total amount of sediments removed by the erosional event is not known and may vary from area to area in the region.

Stott considers the Lower Cretaceous Bullhead and Fort St. John Groups to form a non-marine to marine sequence:

"The basal succession of Lower Cretaceous coal-bearing sediments and massive conglomerates is included in the Bullhead Group. The overlying Lower Cretaceous marine sediments with tongues of carbonaceous, sandy sediments are included in the Fort St. John Group. The lower part of the sequence records widespread fluvial conditions that developed after initial deposition of conglomeratic sediments. The upper part records the complex intertonguing of marine transitional and flood plain environments along the coast line of the Early Cretaceous epicontinental sea."

In the property area, the Cadomin Formation is most commonly a sequence of interbedded sandstones and conglomerates. The sandstone beds are typically medium to coarse-grained, massive to coarsely cross-bedded and weather light red-brown in colour. The sandstones contain abundant quartz, chert and volcanic rock fragments, which gives them a salt and pepper appearance on fresh surfaces. The sandstone beds range from less than one metre to over seven metres in thickness. The conglomerate units contain well rounded pebbles and cobbles of chert, quartz and volcanic fragments. These conglomerates range in thickness from pebble bands to massive units over two metres thick.

The contact between the Cadomin and Gething Formations is not clearly defined in the property area. McLearn and Kindle (1950, page 65) noted that the contact may occur at the same stratigraphic horizon from area to area. Irish (1970, page 68) noted that, to the northeast of the Bri-Dowling Creek Property:

"In Peace River Canyon, coarse sandstones of the Cadomin Formation grade laterally into interbedded coal, sandstones and shale of the Gething Formation, and therefore the formations are in part lateral equivalents."

This indicates that the contact between the two formations is transitional, not abrupt. Stott (1963, page 3) noted that the Cadomin and Gething Formations are actually "facies of a vertical transition from the Cadomin Formation to the Gething Formation. The contact between the two formations is placed at the top of the uppermost thick, coarse grained sandstone bed of the Cadomin Formation.

The character of the Gething Formation sediments underlying the property is typical; as described by Irish (1979, page 69), a sequence of:

"Interbedded, grey-and buff-weathering, medium-to fine grained, grey to dark brown sandstone, grey to black shales, dark siltstones and coal seams."

These sediments represent deposition in an aggrading flood plain environment. Some of the fine grained sandstones may represent bar finger and levee deposits and others may represent flood plain splay deposits (Stott, 1968, page 111). Sedimentary features attributable to these types of deposits are present in drill core and in outcrop on the Bri-Dowling Creek Property.

Stott (1968, page 111) lists some of the features found in sandstones in the Gething Formation; well sorted nature but often containing considerable matrix, festoon cross-beds, laminae of plant debris and thin layers of silt and clay. The finer silts and clays represent deposition from water in areas practically devoid of current on the flood plain proper (Stott, 1968, page 112). These silts and clays accumulated between the river channels and the swamp and forest areas. The swamp and forest areas are the source of the present coals and are thought to be of several differing occurrences. Stott (1968, page 112) suggests that some may have originated in abandoned river channels, some paralleling major river channels and some on deltas.

Work by Stott (1969, page 4) indicated a minimum thickness of 1,600 feet (490 metres) for the Gething Formation in the area. The total thickness approaches 1,800 feet (550 metres) if a postulated fault is absent. This formation contains the coal seams of interest on the South Mount Gething Property.

The Bullhead Group is overlain by marine sediments of the Fort St. John Group, which comprises, from oldest to youngest, the Moosebar Formation, the Gates Formation, the Hasler Formation, the Goodrich Formation and the Cruiser Formation (see Table 2). Of these formations, only the Moosebar Formation and the Gates Formation have been observed on the property in outcrop or in drill core.

The Moosebar Formation of the Fort St. John Group disconformably overlies the Gething Formation. It consists of dark grey to black, rubbly to blocky mudstones throughout most of the section. The

lower part of the Moosebar Formation is typically strongly glauconitic with abundant pyrite nodules and thin volcanic ash (bentonite) bands. The Moosebar-Gething contact has not been observed in drill core or outcrop on the South Mount Gething Property. However, on the Bri-Dowling Creek Property adjacent to South Mount Gething, the contact is observed as a thin pebbly basal sandstone to conglomerate lying abruptly on carbonaceous Gething Formation sediments. This basal unit is very poorly sorted with a mud matrix and often contains abundant glauconite and pyrite. McKechnie (1955) noted that the basal conglomerate of the Moosebar Formation:

"...is a typical mud-flats conglomerate ranging from a few inches to about 4 feet thick, and is composed of well rounded grey and black chert pebbles about one quarter inch in diameter in a mudstone matrix."

Ironstone concretions occur in bands at various levels throughout the section. Toward the top of the formation, the mudstones become gritty and thin beds of fine-grained sandstone and siltstone are present. Stott (1968, page 51) considers that the upper boundary with the overlying Gates Formation should be "drawn at the base of the first thick succession of sandstone."

The Gates Formation, as observed from drill core and field mapping, consists of interbedded, grey to brownish-grey, often green weathering, fine to medium grained sandstone, dark grey shales and grey to brownish-grey siltstone. The sandstone units often resemble Gething Formation sandstones, with very minor coaly streaks observed in rare cases. Ironstone concretions were observed in the Gates Formation in siltstone beds in outcrop on the property. Formations overlying the Gates Formation were not observed.

STRUCTURE

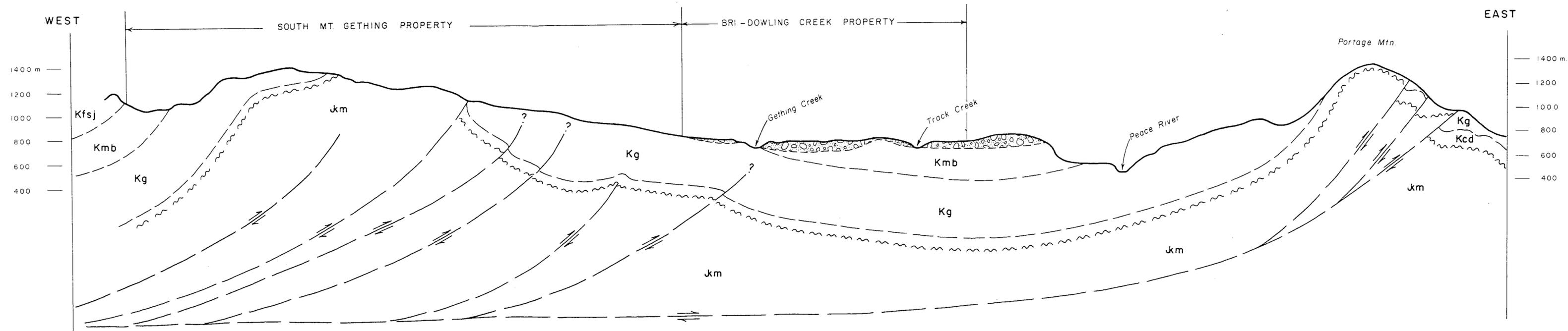
The South Mount Gething Property is located within the Rocky Mountain Foothills structural belt, which is underlain by folded and thrust faulted Mesozoic Strata (Irish, 1968). The general trend of the structures is northwesterly, with most of the thrust faults dipping in a southwesterly direction.

The property is underlain by Minnes, Bullhead and Fort St. John Group sediments which have been folded into a broad, south plunging anticline and thrust faulted at its base. The displacement of the thrust fault is suggested by mapping and air photo interpretation. Irish, (1968), on his structural map of northeastern British Columbia, shows the South Mount Gething anticline into two thrust faults to the north of the property. Generally, the intensity of structures increase to the north of the property.

Strata on the over thrust side exhibit several northwest trending flexures along the northwest face of South Mount Gething. The structures throw strata steeper in the same dip direction making the flexures impossible to represent on the geologic map save for bedding attitudes. Only a major flexure can be seen in cross-sections. This particular flexure extends the full length of the property's western boundary, losing its intensity to the south. A discontinuous thrust fault to the west of South Mount Gething summit postulated in the 1979 report has been discarded. This flexure appears to be a thrust of Cadomin strata onto older strata, but the flexure continues into the older strata. In addition, the thickness of strata between the Cadomin and Monteith Formations at this locality seems to be consistent across the property.

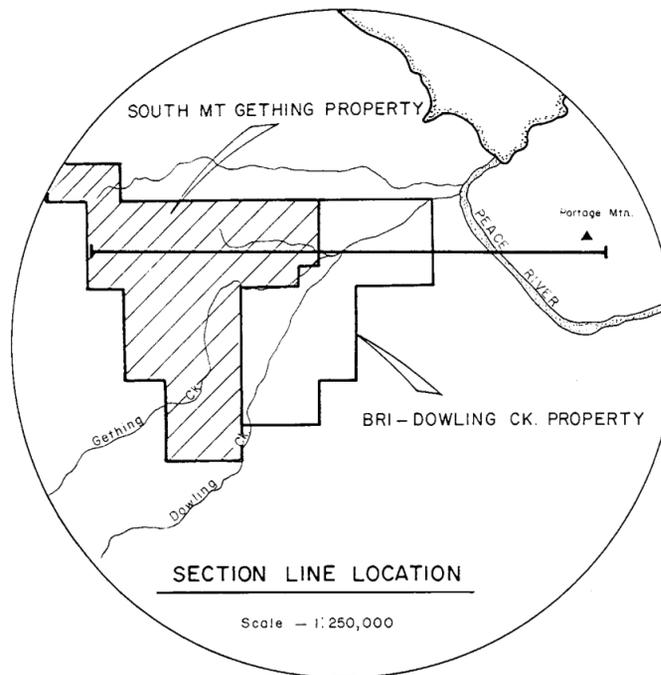
The eastern part of the property consists of strata on the under thrust side of the major thrust fault. Minor faulting is evident in drill core and outcrop. Some of the faulting noted in drill core closely approximated bedding dip angles and are probably the result of slight movement, in response to folding, along bedding surfaces. Fractures have been produced as an accommodation to stress associated with folding and thrust faulting. Bedding dips in the upper part of D.D.H. SMG 78-3 and the lower part of D.D.H. SMG 79-5 each show a minor scale tight fold which may be faulted. The faulted lobe of Moosebar strata in the lower east corner of the property was delineated by the rotary drill program. Minor folding and faulting have been noted in several road cuts along Gething Creek Road. In several localized areas, widely variable bedding attitudes suggest small scale folding.

Structural geology for the property area is shown on 1:10,000 scale cross-sections (figures 8, 9, 10) which are included in the map pocket. A 1:50,000 scale cross-section showing structural form and stratigraphic relationships is found on the following page.



LEGEND

-  Quaternary Alluvium
-  Fort St John Group (undifferentiated)
-  Moosebar Formation
-  Gething Formation
-  Cadomin Formation
-  Minnes Group
-  Unconformity
-  Thrust Fault



(2 X VERTICAL EXAGGERATION)

FIGURE - 7
SOUTH MT. GETHING
EAST - WEST SECTION
ALONG 6,204,000 N
LOOKING NORTH

Date - Dec 1980
NTS - 93 0/16

Horizontal Scale - 1:50,000
Vertical Scale - 1:25,000

DRILL HOLE DATA

D.D.H. SMG 80-11:

A. WELL COMPLETION REPORT:

Location: - On a ridge beside a north flowing distributary
of a major tributary of Gething Creek, near the
west south western boundary of the property.

- U.T.M. Coordinates 6,200,413N x 535,034E
- Coal Licence No. 4139

Elevation: 996m

Orientation: Vertical

Date Collared: 29 July, 1980

Date Completed: 2 August, 1980 Plugged: No, next season.

Overburden Depth: 34.14 metres

Casing Depth: 34.14 metres Casing Size: HW 4.5"-not recovered

Final Depth: 181.66 metres

Formations Encountered: 0 to 34.14m Overburden
 34.14m to Gething Fm.
 181.66 metres

Core Description By: P. S. Cowley

Coal Seams Sampled:

<u>Sample No.</u>	<u>Seam Name</u>	<u>Interval</u>	<u>Thickness</u>	
			<u>Core</u>	<u>Density Log</u>
1		38.41m to 39.86m	1.45m	1.45m
2		44.85m to 46.02m	1.17m	1.05m
3	Trojan	79.10m to 84.12m	5.02m	5.20m
4	Titan	134.85m to 141.88m	7.03m	6.60m

<u>Sample No.</u>	<u>Seam Name</u>	<u>Interval</u>	<u>Thickness</u>	
			<u>Core</u>	<u>Density Log</u>
5		128.66m to 129.43m	0.77m	1.35m
6		130.74m to 131.07m	0.33m	0.35m
7		133.04m to 133.79m	0.75m	0.60m

Logs Run: Gamma Ray, Neutron, and Density - by Roke Oil Enterprises.

B. COMMENTS:

A clearing measuring approximately 50m x 100m was slashed for Site D.D.H. SMG 80-11. All felled trees were limbed and bucked into four foot or shorter lengths. All equipment, including the drilling rig, mud tanks and mixer, and drilling supplies were flown into the site using a Bell 205 helicopter. Crew changes and additional supplies were flown by a Bell 206 helicopter. Upon removal of the drill, the site was cleaned.

Below 34.14m of overburden, D.D.H. SMG 80-11 cored 147.52m of typical Gething Formation sediments. The sediments cored included interbedded to interlaminated sandstones, siltstones, mudstones and coals. The stratigraphic column cored may be divided into three (3) deltaic depositional environments. The lowest package of sediments 128.66m to 181.66m, indicate deposition in low energy backswamps and their fringes. The lower portion of the sequence contains minor coals and frequent mudstones, grading to still a lower energy environment near the top where there is abundant peat accumulation without sediment invasion. The lowest package of sediments grades rapidly upward to a high energy environment typified by fining upward channel deposition. The second package, 84.12m to 128.66m,

contains abundant sandstones, minor siltstones, rare mudstones and no coals. The high energy environment dies abruptly and is succeeded by yet another low energy back-swamp environment. Frequent coals and mudstones with worm burrows, and minor sandstones and siltstones characterize the third package of sediments.

Bedding angles, measured from the vertical core axis, range between 37° and 45° throughout the drill column. The high angles of folding were accommodated by slippage along bedding surfaces. The entire sequence contains abundant minute calcite veinlets and slickensides, and occasional 1cm calcite veins, vugs, and welded breccias subparallel to bedding. Occasionally, calcite veinlets exist perpendicular to bedding. Crushed rock is common in the core, particularly in the coals.

Twelve (12) coal seams were intersected in core ranging in true thickness from 0.07m to 4.50m. Seven (7) of the coal seams were removed for analysis. Core recovery of the seams typically ranged from 80% to 99% but two seams yielded 20% recovery. The majority of the seams were sheared and occasionally ground. The seams varied from 100% blocky, poorly cleated claro-durain to 50% blocky, well cleated vitrain and 50% poorly cleated claro-durain. Fusain was found in trace quantities in two coal seams. The seams found in the top depositional environment described above invariably contained at least one mudstone split, some with disseminated pyrite. However, the 3.21m coal seam contained five sandstone splits. The coal seams in the depositional environment were free of splits.

Analyses of the seven (7) coal seams sampled show a range of volatile matter from 26.1% to 36.2% and sulphur concentrations

from 0.48% to 1.08%. Ash contents ranged from 3.87% to 24.79% and B.T.U. values from 10, 815 B.T.U./lb. to 14,789 B.T.U./lb. Free Swelling Indices ranged from 1 to 8 1/2.

A 1.4 specific gravity float separation was conducted on samples 1 through 5. Samples 6 and 7 used a 1.3 and 1.35 specific gravity float separation. In most cases, a higher quality of coal resulted. In all cases, ash contents were reduced below 5.37% and B.T.U. values exceeded 14,510 B.T.U./lb. Sulphur content was not changed significantly except for samples 1, 5 and 7 which increased. Free Swelling Indices were improved in one sample, decreased in four samples and remained the same in two samples.

D.D.H. SMG 80-11 was not cemented. Due to the loss of Utah Mines Ltd. geophysical probe, the hole was left open with casing to be probed by Roke Oil Enterprises Ltd. at a later date. The hole was logged on August 20, 1980. It is our intension to cement the open hole in the 1981 field season.

D.D.H. SMG 80-12

A. WELL COMPLETION REPORT:

Location: - Beside an east flowing distributary of a major tributary of Gaylard Creek, near the western property boundary.

- U.T.M. Coordinates 6,203,084N x 533,445E
- Coal Licence No. 4146

Elevation: 988.0m

Orientation: 35° From Vertical

Date Collared: 5 August, 1980

Date Completed: 11 August, 1980 Plugged: No

Overburden Depth: 15.85 metres

Casing Size: HW 4.5" - recovered

Casing Depth: 172.82 metres

Formations Encountered: 0 to 15.85m Overburden
15.85m to 172.82m Moosebar Formation

Core Description By: P. S. Cowley

Logs Run: No

B. COMMENTS:

Site D.D.H. SMG 80-12 was a helicopter accessible site measuring approximately 50m x 100m. The site was slashed with all felled trees limbed and buched to four foot or shorter lengths. The site was cleaned up after the drill was removed.

Below 15.85m of overburden, D.D.H. SMG 80-12 penetrated 156.97m of Moosebar Fm. Strata. The sediments cored were typical of upper Moosebar Fm.: dark grey siltstone at top grading to silty mudstone. Occasional pyrite nodules and occasional very fine-grained sandstone lamina were found in the entire column. Two zones of broken and crushed rock with rare slickensides were observed. Bedding in the drill hole, connected for drill angle ranged from 60° at the top shallowing to 48° at the base.

D.D.H. SMG 80-12 was terminated in Moosebar Fm. when it appeared as if several hundred metres of Moosebar mudstone would be drilled before intersecting Gething Strata. The drill hole location was selected by P. Cowley from extensive mapping in an area where exposure was rare.

ROTARY PROGRAM

The purpose of the rotary program was to determine adit entries for the Superior and Trojan seams. This involved locating each seam in subcrop below a workable thickness of overburden.

The Superior seam was penetrated in seven rotary drill holes on the property. From the closely spaced rotary drilling the Superior seam subcrop could be delineated (see Figure 11, 12, 13 and 14). Superior seam thickness averaged 2.06m but ranged from 1.65m to 2.59m. The Superior seam subcrop was found to be below excessive overburden making adit entry impractical.

The Trojan seam was penetrated in two rotary holes. A split seam intersected was correlated with the Trojan seam from the expected stratigraphic Trojan-Superior seam separation. The Trojan seam thins excessively from the Bri-Dowling Creek Property to the South Mount Gething Property and contains the typical frequent splits. Subcrop of the Trojan seam was estimated from cross-sections and was also expected below excessive overburden (see Figures 11, 12, 13 and 14).

Although overburden proved excessive, the rotary program accurately located a fault not previously detected and simplified coal seam correlation in the area.

Descriptive logs can be found in Appendix III. Geophysical logs can be found in the map pocket.

WEST

EAST

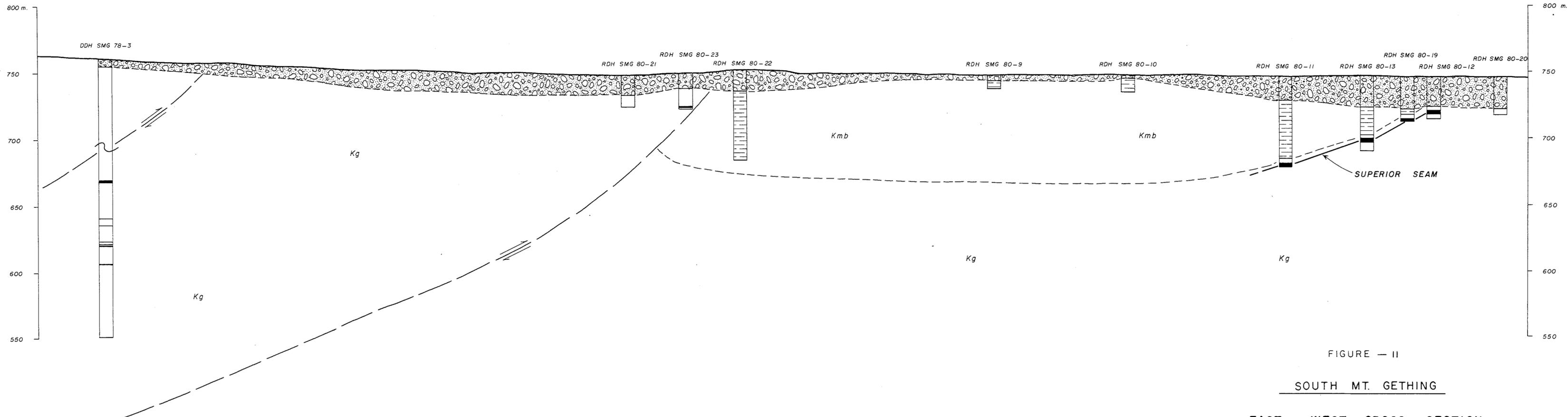


FIGURE — II
SOUTH MT. GETHING
 EAST — WEST CROSS — SECTION
 OF
 SUPERIOR SEAM

Vertical & Horizontal Scale — 1:2000 February 1981

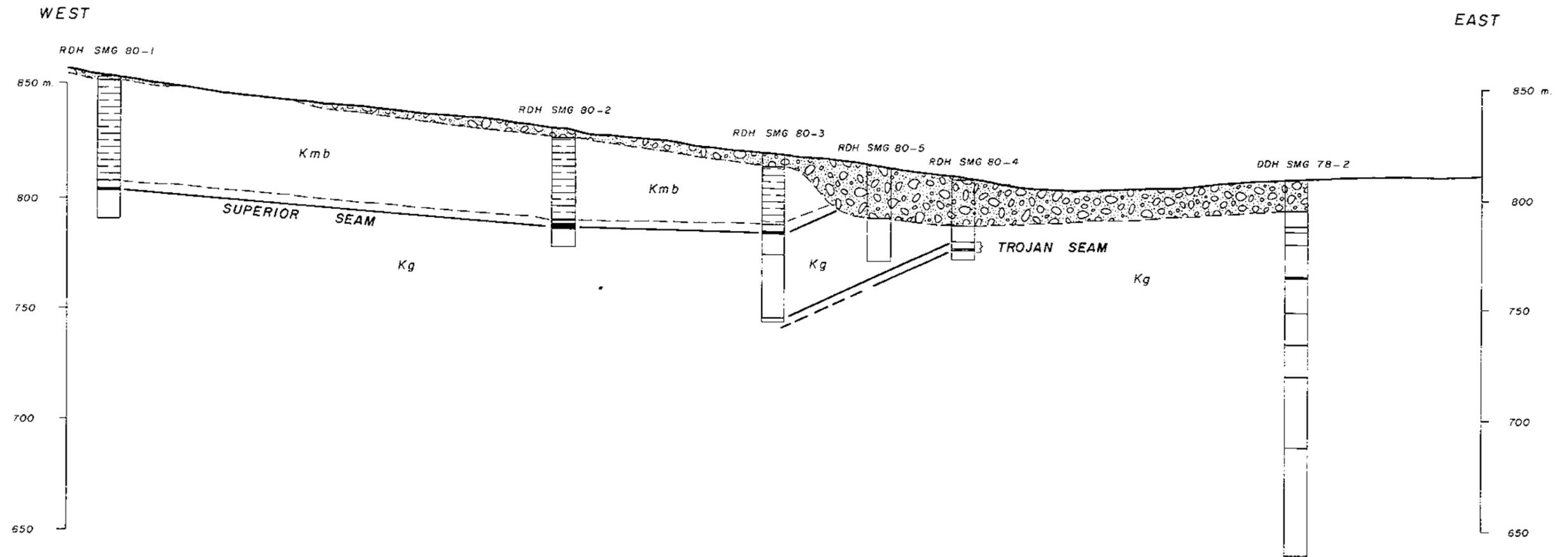


FIGURE --12

SOUTH MT. GETHING

EAST — WEST CROSS — SECTION
OF
SUPERIOR AND TROJAN SEAMS

Vertical & Horizontal Scale — 1:2000

February 1981

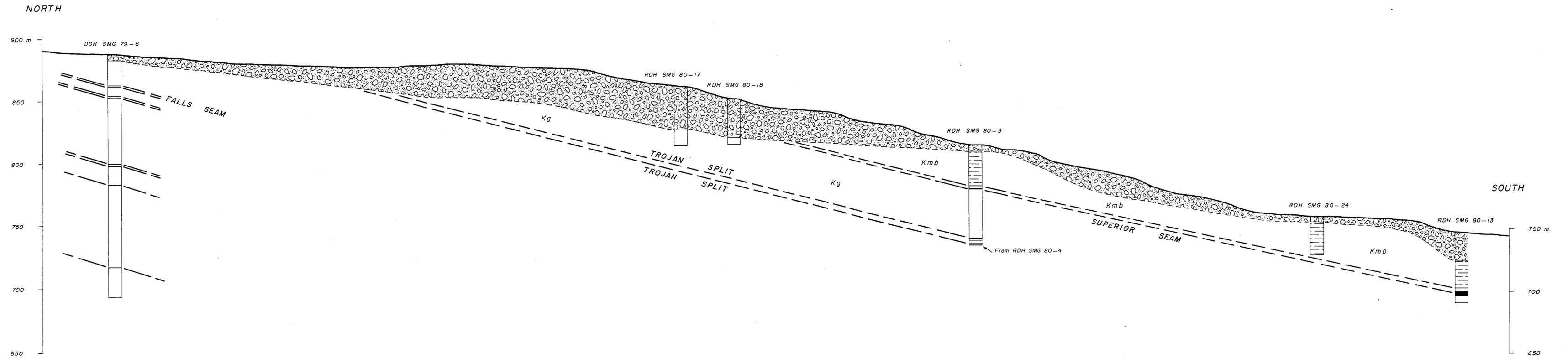


FIGURE - 13
 SOUTH MT. GETHING
 NORTH - SOUTH CROSS - SECTION OF
 SUPERIOR, TROJAN AND FALLS SEAMS

Vertical & Horizontal Scale - 1:2,000 February 1981

CORRELATION OF COAL SEAMS

In the Peace River area, the coal seams of the Gething Fm. show significant variability in thickness and lateral extent. While coal seams are correlatable over one or two kilometre distances, correlations are at best tentative when drill holes are more widely separated.

In the South Mount Gething Property area, the most precisely correlatable horizon is the Moosebar-Gething contact. Failing intersection of this contact correlation of coal seams between drill holes becomes complex, involving physical, chemical and geophysical drill derived data.

In the northeast corner of the property, none of the diamond drill holes intersected the contact. However, with the aid of the South Mount Gething 1980 rotary drill program and data from nearby 1980 Bri-Dowling Creek Property drill holes, the coal seams in the northeast of the property may be correlated with respect to the Moosebar-Gething contact. The coal seams in the diamond drill holes in the southwest part of the property are correlated with an assumed relationship with the Moosebar-Gething contact which from mapping suggests a close proximity to certain holes.

Diamond drill holes SMG-78-2, SMG-78-3, SMG-79-4, SMG-79-5 and SMG-79-6 and pertinent rotary drill holes 80-3 and 80-4 located in the northeast corner of the property were correlated together. This grouping is close to the Bri-Dowling Creek Property and information from Bri drill holes were utilized in the correlation. The Superior seam was intersected in seven (7) 1980 rotary drill holes. The seam averaged 2.06m but ranged from 1.65m to 2.59m thick. The R.D.H. SMG-80-3, used as a representative case, intersected the Superior seam 1.5m below the Moosebar-Gething contact. In R.D.H. SMG 3, 4 and 7 two, closely spaced seams 42m below the

Moosebar-Gething contact were correlated to the Trojan seam. The Trojan seam, if the correlation is correct, thins and splits from the Bri-Dowling Creek Property to South Mount Gething Property. The Titan seam normally approximately 65m below the Moosebar-Gething contact appears to be channelled in D.D.H. SMG-78-2. In D.D.H. SMG 78-3 the upper 1/3 of the hole has been faulted, losing the upper seams, but below the fault the coal seams are correlatable. The Falls seam, typically 90m below the Moosebar-Gething contact was intersected in D.D.H.'s SMG 78-2, 78-3 and 79-6. The Falls seam is thickest (1.40m) in SMG 78-3, gradually thins to 1.25m in SMG 78-2, and finally splits into two 0.60m seams in SMG 79-6. The seams below the Falls seam were not named. In D.D.H. SMG 78-3 and SMG 79-6 a thick split seam was cored approximately 145m below the Moosebar-Gething contact. This seam thins to the northeast in D.D.H. SMG 78-2.

Diamond drill holes SMG 78-1, 79-7, 79-8, 79-9, 79-10 and 80-11, located in the southwest part of the property were correlated together.

A 3.21m thick coal seam correlated as the "Trojan" seam was penetrated only in SMG 80-11. Its lateral extent is unknown. A 4.56m average seam, 32m below the "Trojan" seam was penetrated in SMG 78-1 and SMG 80-11. This seam has been correlated as the "Titan" seam. Coal seams below the "Titan" seam, all minor, were correlated but not named.

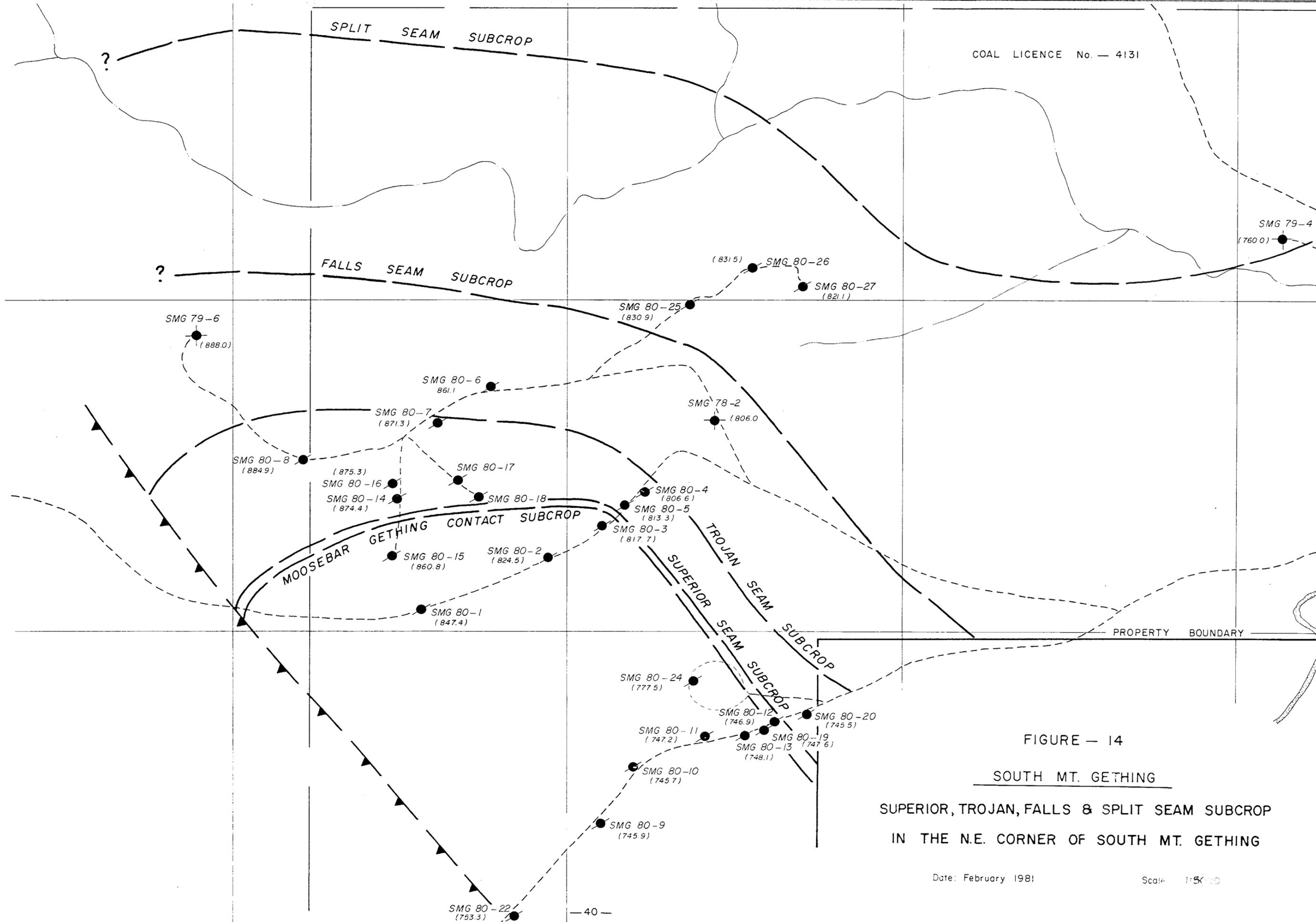


FIGURE — 14
 SOUTH MT. GETHING
 SUPERIOR, TROJAN, FALLS & SPLIT SEAM SUBCROP
 IN THE N.E. CORNER OF SOUTH MT. GETHING

Date: February 1981

Scale: 1:5000

CONCLUSIONS AND RECOMMENDATIONS

Coal licences in the northeastern, southern and western areas of the South Mount Gething Property have potential for discovery of economically mineable coal seams. Exploration work to date has primarily involved 2454m of diamond drilling in 12 widely spaced holes, 1151m of rotary drilling in 27 shallow, closely spaced holes, and extensive geological mapping.

The three diamond drill holes cored during the 1978 exploration program provided an initial examination of the coal seams underlying the property. The results of this program provided areas of interest for further exploration in 1979.

In 1979, seven diamond drill holes, in 2 groups, were drilled on the property. Diamond drill holes SMG 79-4, 79-5 and 79-6 further examined the northeastern portion of the property. Three coal seams in these holes were of significant (70.90m) thickness but were of limited areal extent.

A split seam penetrated in SMG 78-3 and 79-6, with an average aggregate thickness of 2.21m of coal, should be investigated in 1981 with a rotary program drilling on 50m x 200m centres along the projected subcropping of this seam in Figure 14.

Diamond drill holes SMG 79-7, 79-8, 79-9 and 79-10 in the southern portion of the property, did not intersect the 4.62m thick coal seam in D.D.H. SMG 78-1, having each been spotted east of what is now thought to be its subcrop. The four holes did not intersect any coal seams thicker than 1.37m, and correlations, though tentative, do not suggest reliable seam continuity.

In 1980, D.D.H. SMG 80-11 penetrated a seam with a true thickness of 4.50m correlated to the 4.62m thick seam in SMG 78-1. D.D.H. SMG 80-11 also penetrated a seam with a true thickness of 3.09m which overlies the afore mentioned seam. These two significant seams, though dipping up to 45°, should be examined as to their lateral extent by a rotary program in 1981. The rotary program extending from SMG 79-10 to SMG 79-7, would concentrate along the Moosebar-Gething contact where these seams are closely related. Diamond drill hole SMG 80-12, located to penetrate these thick western seams was unsuccessful, having been located east of what is now thought to be their subcrop.

The 1980 rotary drill program in the northeast on C.L.'s 4131 and 4132 was not successful in locating adit entries for the Superior and Trojan seams. These seams subcrop below excessive overburden thickness. However, the program did more completely define the structural complexity of the area by delineating a fault previously undetected and by assisting in seam correlation.

Extensive geological mapping in 1980 added greatly to the structural and stratigraphic interpretation of the property. Coal licences (C.L.'s 4143, 4144, 4147 to 4149 and 4151) centrally located over the top of South Mount Gething are underlain by Minnes Group, Cadomin and lowermost Gething Formations. The high energy depositional regime of the assemblage was unfavourable to the development of significant coal swamps except in the uppermost "unnamed" unit of the Minnes Group as in the case of the Carbon Creek Property. However, this unit apparently had been removed during a regional pre-Cadomin erosional event in the property area. Coal licences underlain by the Minnes-Cadomin-lowermost Gething

assemblage (C.L.'s 4143, 4144, 4147 to 4149, and 4151) have virtually non-existent mineable coal seam potential and we ask the afore mentioned Coal Licences to be terminated. Figure 17 shows the Gething-Cadomin contact and the coal licences to be terminated.

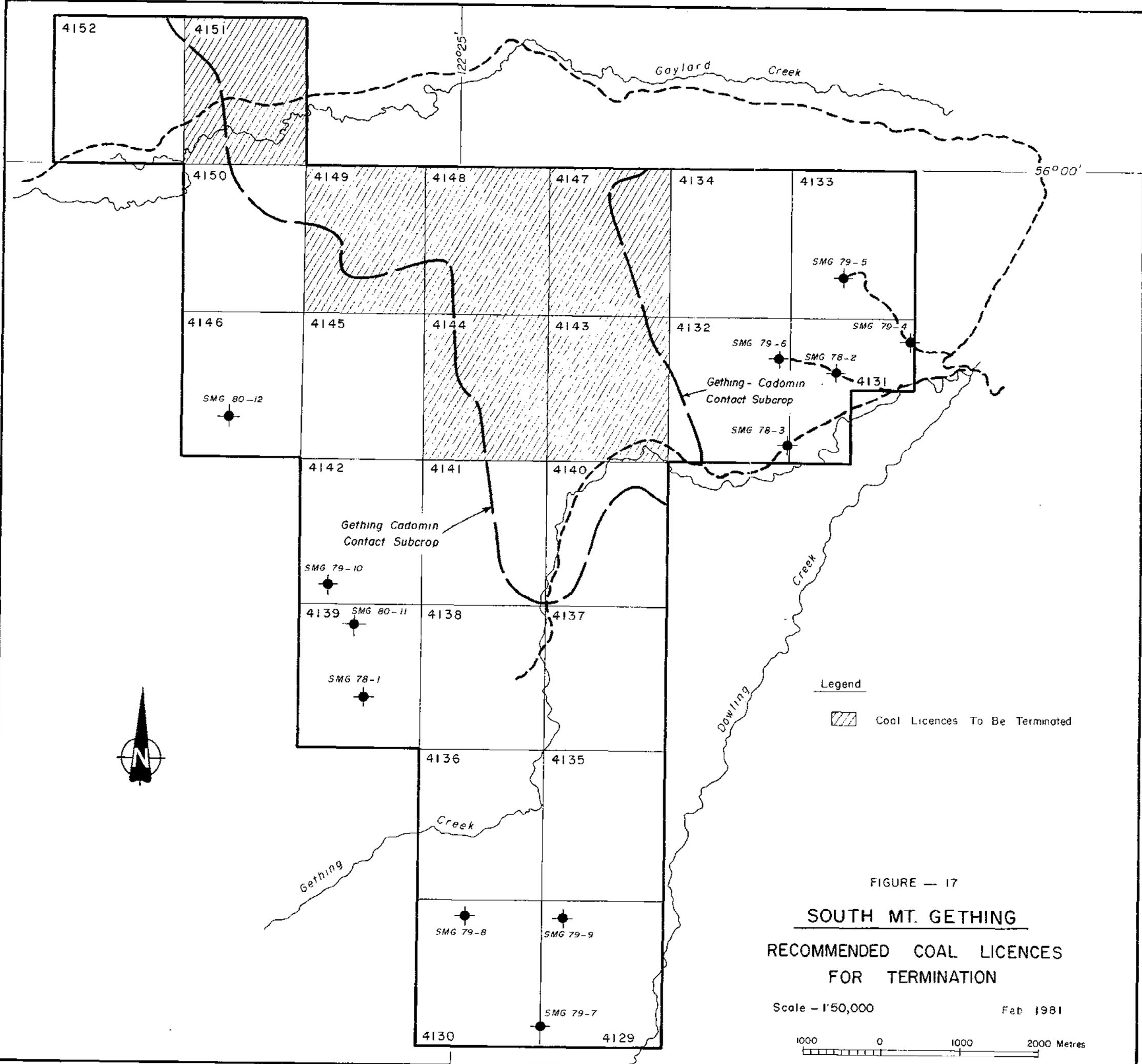


FIGURE — 17
SOUTH MT. GETHING
 RECOMMENDED COAL LICENCES
 FOR TERMINATION

Scale — 1:50,000 Feb 1981

1000 0 1000 2000 Metres

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APPENDIX IV
COST STATEMENT

Note: represents a consolidation of the costs included in the Application to Extend the Term of Licence for Coal Licence Numbers 4129 to 4142 inclusive, 4145, 4146, 4150, and 4152.

ON PROPERTY COSTS:

(1) Operators Fees, Salaries and Wages: Professional and Technical	\$ 12,527.40
(2) Contractors and Consultants:	
Longyear Canada Ltd. (includes charges for direct drilling costs, drill mud, additives, expenses for additional staff, etc.)	\$ 41,752.83
P. Demeulemeester (includes charges for slashing, clearing and construction of roads, trails, drill site and reclamation work).	\$ 25,154.07
Elgin Exploration Co. Ltd. (includes charges for direct rotary drilling costs).	\$ 37,851.09
Roke Oil Enterprises Ltd. (geophysical probing of D.D.H. SMG 80-11)	\$ 1,158.00

(3) Equipment and Instructions Used:

Gearhart-Owen Model 3200 logging unit	\$	3,192.23
(density-gamma @ \$3.05/metre for the first 300 metres, then \$1.83/metre; resistivity-gamma @ \$3.75/metre for the first 300 metres, then \$2.25/metre.)		

(4) Field Camp Costs:

Food	\$	3,028.14
Accommodation	\$	3,530.41
Telephone	\$	110.03

(5) Sampling, Analysis and Testing: \$ 210.00

(Laboratory analysis of coal samples performed by Utah International Inc. Minerals Laboratory, Sunnyvale, California)

(6) Supplies and Materials Costs:

Operating and maintenance supplies	\$	4,252.18
Office and technical supplies	\$	119.90

(7) Transportation Costs:

Bell 206B Jet Ranger from Okanagan Helicopters Ltd. and Maple Leaf Helicopters Ltd., Chetwynd, B.C., Bell 205 from Northern Mountain Helicopters Ltd., Prince George, B.C.	\$	40,921.49
1 Chevrolet van from Westminister Chev-Olds Leasing	\$	2,759.18

(7) 1-3 ton Flatdeck Chevrolet Truck from Canuck Rentals Ltd.	\$	1,297.49
Repairs, Parts and Fuel (for trucks, bulldozers, helicopters and camp)	\$	6,679.48
(8) Reclamation Work:	\$	3,783.25
(Grass seed mixture supplied by Buckerfields Seed Division and B.C. Forest Service stumpage charges)		
Total On Property Costs	\$	188,327.17
<u>OFF PROPERTY COSTS:</u>		
(1) Logistics and Field Support	\$	5,790.00
(2) Technical and Feasibility Studies	\$	3,075.00
(3) Supplies and Services	\$	680.67
(4) Mobilization and Demobilization of Equipment and Supplies	\$	2,485.00
(5) Travelling Expenses	\$	1,600.90
Total Off Property Costs	\$	13,631.57
Total Project Costs	\$	201,958.74

APPENDIX V

STATEMENT OF QUALIFICATIONS

I, PAUL STUART COWLEY, of 3180 W. 3rd Avenue, Vancouver, British Columbia, do hereby certify that:

I am a graduate of the University of British Columbia, with a Bachelor of Science Degree in Geology, 1979.

Since graduation I have been engaged in Coal Exploration in British Columbia for Utah Mines Ltd.



Paul S. Cowley
Geologist

Vancouver, B. C.

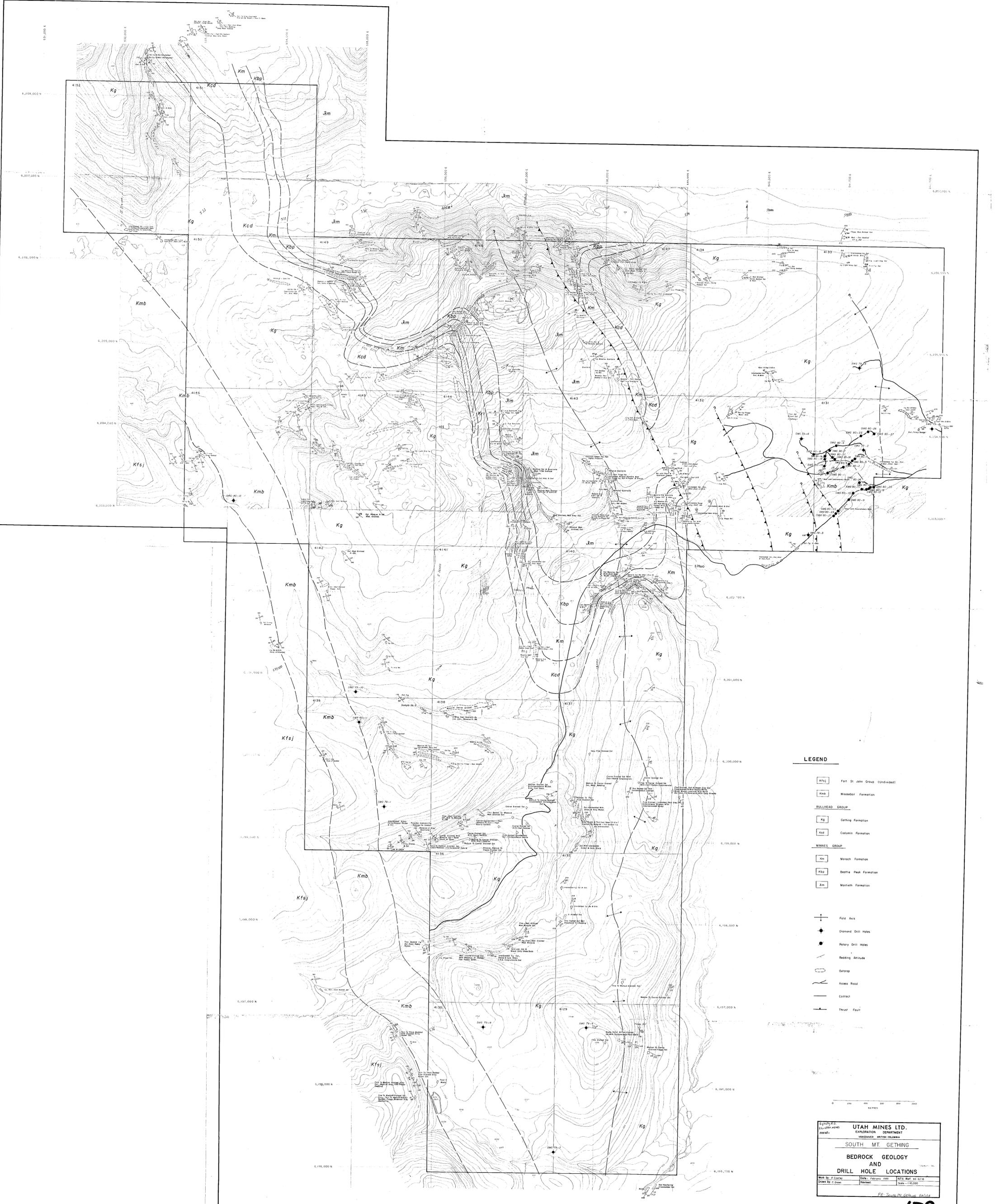
PR. South Mt. Gething 80 (2)A

"1980 Report of Exploration Activities
on the South Mt. Gething Property"

Utah Mines Ltd.

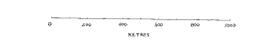
MAPS, CROSS SECTIONS

639



LEGEND

- [Kfsj] Fort St. John Group (Undivided)
- [Kmb] Moose Formation
- BULLHEAD GROUP**
- [Kg] Gething Formation
- [Kcd] Cedonia Formation
- MINNEE GROUP**
- [Km] Moose Formation
- [Kbp] Beattie Peak Formation
- [Xm] Moose Formation
- [+/-] Fold Axis
- [◆] Diamond Drill Holes
- [●] Rotary Drill Holes
- [---] Bedding Strike
- [---] Outcrop
- [---] Access Road
- [---] Contact
- [---] Thrust Fault



UTAH MINES LTD.
 EXPLORATION DEPARTMENT
 VANCOUVER BRITISH COLUMBIA

SOUTH MT. GETTING

BEDROCK GEOLOGY AND DRILL HOLE LOCATIONS

Work by J. Green Date: February 1958
 Drawn by J. Green Date: February 1958

Scale: 1:10,000

PR SOUTH MT. GETTING 63/54

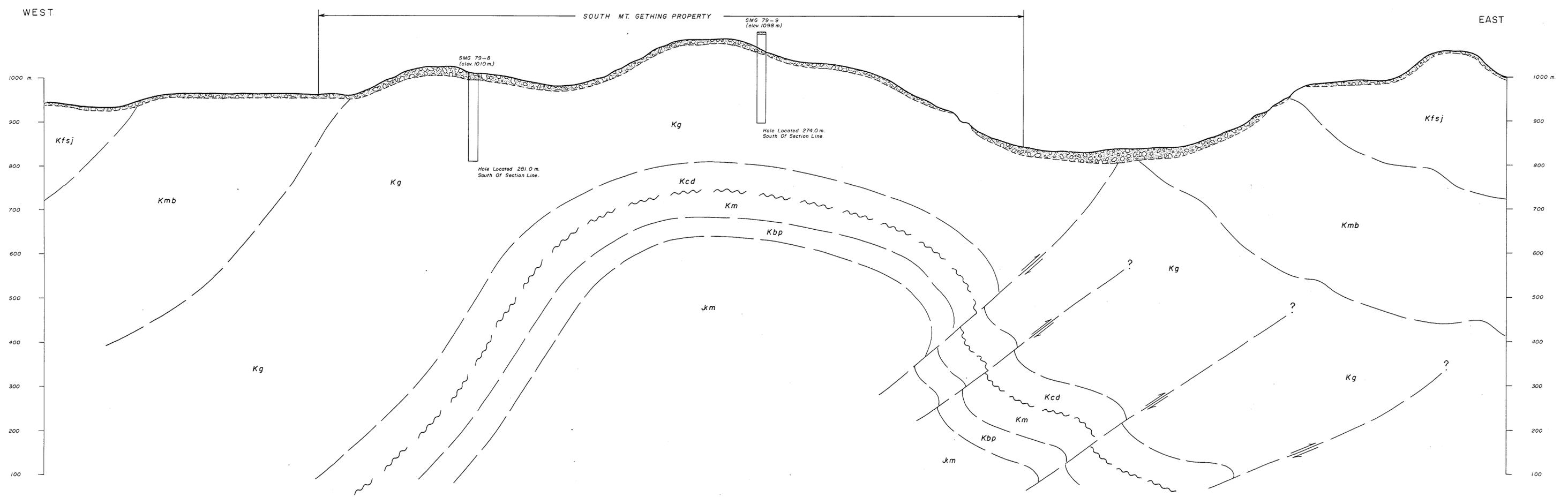
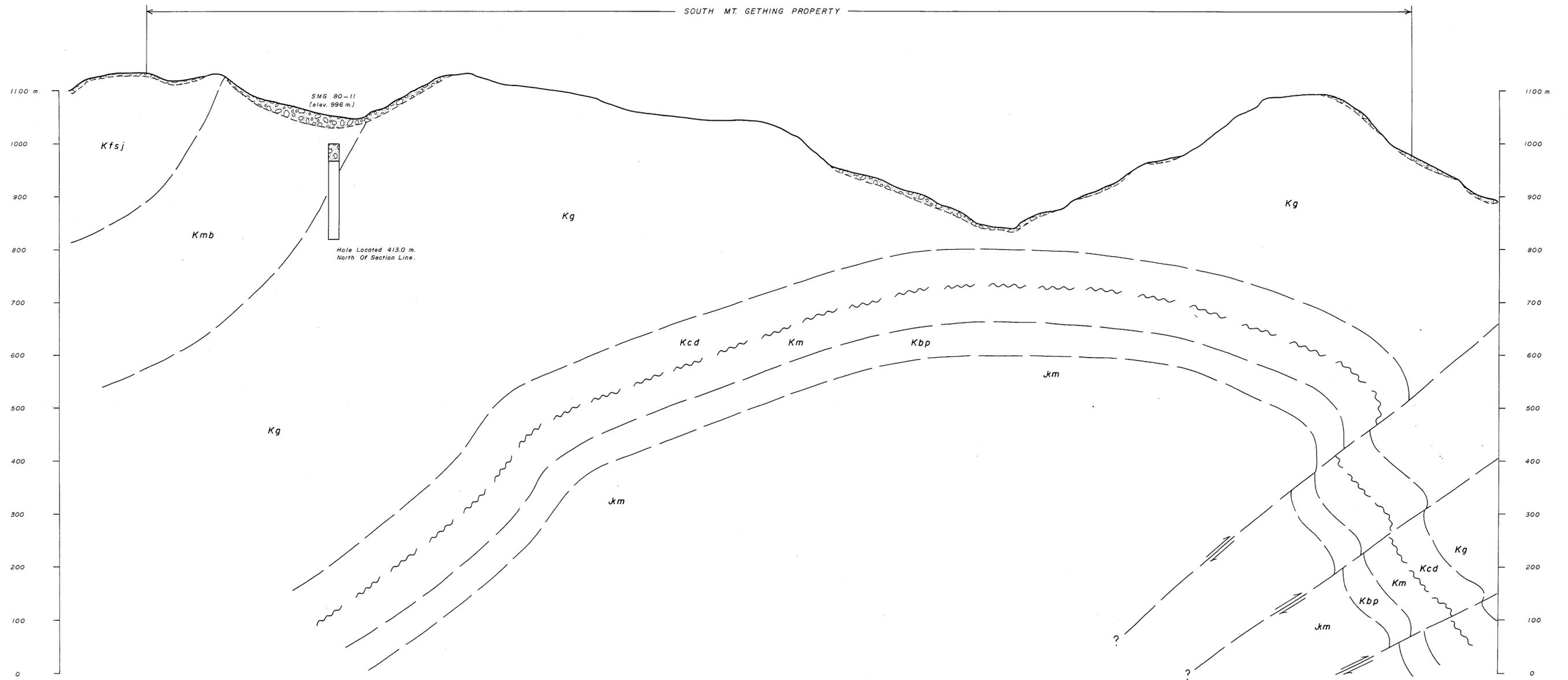


FIGURE - 8

UTAH MINES LTD.		
EXPLORATION DEPARTMENT		
VANCOUVER BRITISH COLUMBIA		
SOUTH MT. GETHING		
EAST - WEST SECTION		
ALONG 6,197,000 N		
LOOKING NORTH		
Work by: P. Cowley	Date: Feb. 1981	NTS Ref. 93/0/16
Drawn by: T. Drews	Revised:	Horizontal Scale - 1:10,000
		Vertical Scale - 1:5,000
PR. South Mt. Gething Feb 21A		

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FIGURE— 9

UTAH MINES LTD. EXPLORATION DEPARTMENT VANCOUVER BRITISH COLUMBIA		
SOUTH MT. GETHING EAST — WEST SECTION ALONG 6,200,000 N LOOKING NORTH		
Work by: P. Cowley	Date: Feb. 1981	NTS Ref. 93/O/16
Drawn by: T. Drews	Revised:	Horizontal Scale — 1:10,000
		Vertical Scale — 1:5,000
PR-South Mt. Gething 80(2)A		

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WEST

EAST

SOUTH MT. GETHING PROPERTY

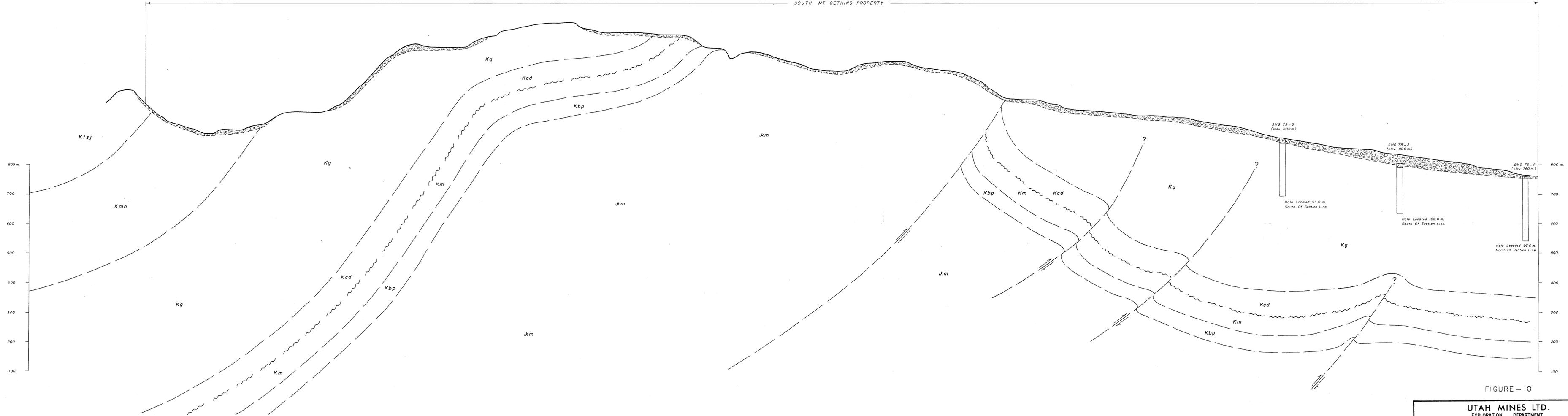


FIGURE - 10

UTAH MINES LTD. EXPLORATION DEPARTMENT VANCOUVER BRITISH COLUMBIA		
SOUTH MT. GETHING EAST - WEST SECTION ALONG 6,204,000 N LOOKING NORTH		
Work by: P Cowley	Date: Feb. 1981	NTS Ref. 93 / 0 / 16
Drawn by: T Drews	Revised:	Horizontal Scale - 1:10,000
		Vertical Scale - 1:5,000
PR. South Mt. Gething 80(2)A		

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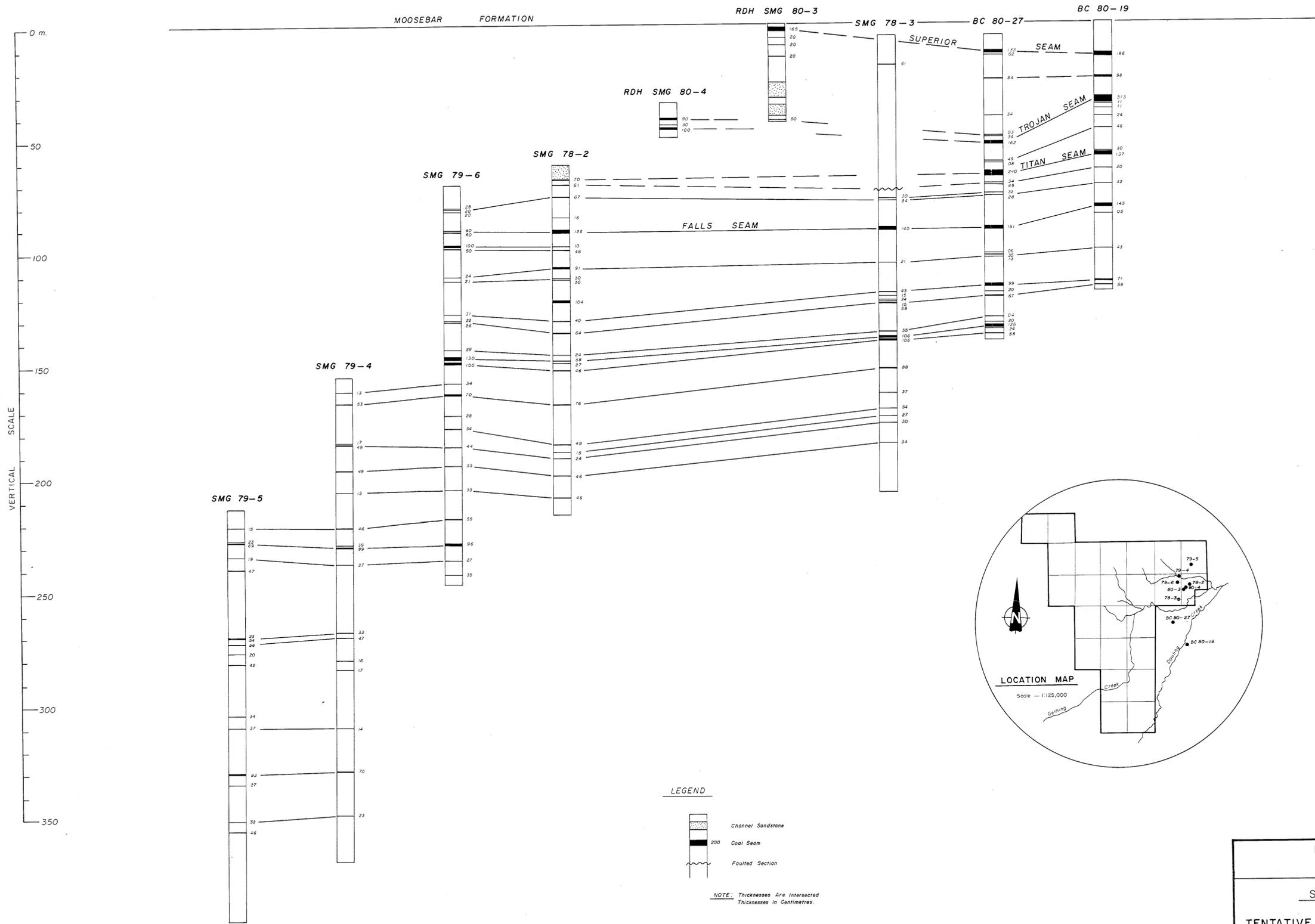
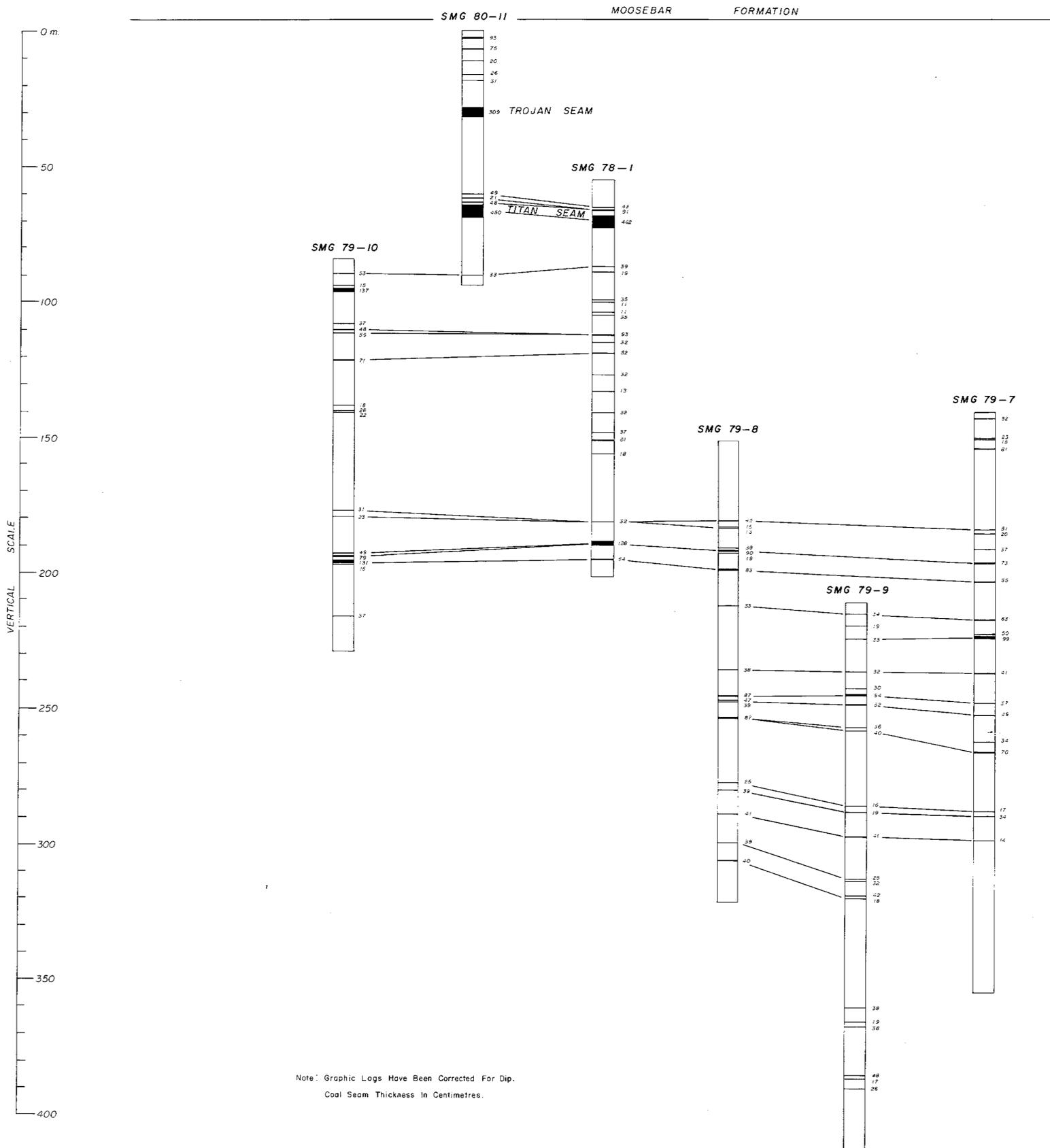


FIGURE - 15

UTAH MINES LTD. EXPLORATION DEPARTMENT VANCOUVER BRITISH COLUMBIA		
SOUTH MT. GETHING		
TENTATIVE COAL SEAM CORRELATION OF N.E. CORNER OF SOUTH MT. GETHING		
Work by: P. Cowley	Date: Feb. 1981	NTS Ref. 93 O/16
Drawn by: T. Drews	Revised:	Vertical Scale - 1:1000

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P.R. South Mt. Gething 80(2)A



Note: Graphic Logs Have Been Corrected For Dip.
Coal Seam Thickness In Centimetres.

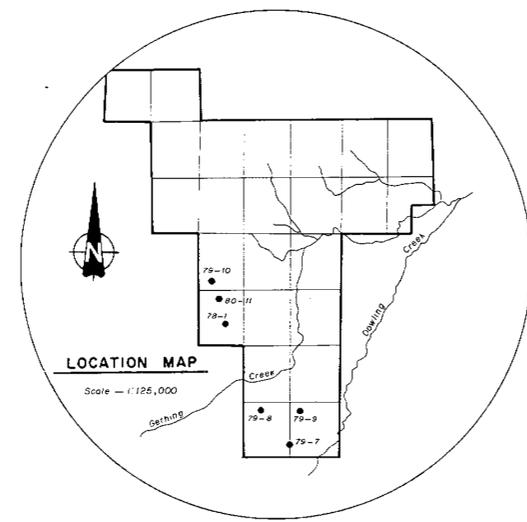


FIGURE — 16

UTAH MINES LTD.		
EXPLORATION DEPARTMENT		
VANCOUVER BRITISH COLUMBIA		
SOUTH MT. GETHING		
TENTATIVE COAL SEAM CORRELATION OF S.W. CORNER OF SOUTH MT. GETHING		
Work by: P. Cowley	Date: Feb. 1981	NTS Ref. 93 O/16
Drawn by: T. Drews	Revised:	Vertical Scale — 1:1000
<i>PR-South Mt Gething 80(A)</i>		

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"Rec. Report of Exploration Activities
on the South Mt. Gelling Property"

Utah Mines Ltd.

Borehole Logs

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APPENDIX I

DESCRIPTIVE LITHOLOGIC LOGS FOR
D.D.H. SMG 80-11 and SMG 80-12

OPEN FILE
GEOLOGICAL BRANCH
ASSESSMENT REPORT
CONFIDENTIAL
00 639

HOLE# SMG 80-11

From 0.00m To 47.12m

South Mt. Gething

P. Cowley

FROM	TO	DESCRIPTION
0.00	34.14	Overburden GETHING FM
34.14	37.86	Sandstone and siltstone thinly interbedded - sandstone - medium grey, fine grained; siltstone medium grey; sharp lower contact, iron stain on many surfaces, minor pyrite at base of unit, minute calcite veinlets throughout but 2-1cm calcite veins - at 35.22m @ 30° to C/A and at 36.22m @ 30° to C/A, bedding 38° to C/A @ 37.50m.
37.86	38.41	Mudstone - dark grey, slickensides present, rare pyrite nodules, lower half of unit has been ground and broken.
38.41	39.86	Coal - 1.45m - corrected for dip is 0.89m, black, sheared, 100% claro-durain, trace fusain, siltstone split 39.20m to 39.28m, sample #1.
39.86	40.40	Mudstone - dark grey, slickensides present, moderate sharp lower contact.
40.40	41.23	Sandstone - fine grained, medium grey, carb. debris throughout, occasional mudstone laminae, minute calcite veinlets throughout, sharp lower contact.
41.23	41.45	Siltstone - dark grey, slickensides present
41.45	41.81	Sandstone - fine grained, medium grey, 0.5m calcite vug and minute calcite veinlets, rare carb. debris, bedding 35° to C/A @ 41.55m, sharp lower contact
41.48	44.85	Sandstone and minor siltstone - sandstone - fine grained, medium grey, heavily bioturbated, minute calcite veinlets throughout, rare thin siltstone bands, broken rock from 43.89m to 44.16m, from 44.16m to 44.18m is zone of breccia welded by calcite also vuggy because of size of calcite crystals.
44.85	46.02	Coal - 1.17m - true thickness is 0.67m, black, sheared, 99% claro-durain, trace vitrain, trace fusain, dirty coal band 45.60 to 45.70m, 100% recovery sample #2.
46.02	46.60	Mudstone - dark grey, minor siltstone laminae
46.60	47.12	Sandstone - siltstone and mudstone interbedded -

CORE DESCRIPTION

HOLE# SMG 80-11 From 47.12 To 59.66
 Area _____ By P. Cowley

FROM	TO	DESCRIPTION
		sandstone predominant, fine grained, medium grey; siltstone medium grey, mudstone dark grey, slightly disturbed beds, sharp lower contact
47.12	47.26	Mudstone and siltstone interbedded - mudstone dark grey, siltstone medium gray
47.26	51.66	Sandstone, siltstone and mudstone thinly interbedded - sandstone - fine grained, medium grey, cross-bedded siltstone medium grey, mudstone dark grey occasionally with worm burrows, at top unit is predominantly sandstone with minor siltstone interbeds but unit grades to predominantly mudstone with minor siltstone interbeds at base, bedding 42° to C/A @ 50.75m, sharp lower contact
51.66	51.85	Siltstone, mudstone and sandstone interlaminated - sandstone fine grained, medium grey; siltstone medium grey; mudstone dark grey, wavy lam, sharp lower contact
51.85	52.17	Coal - 0.32m, 95% recovery, ground in places, black, 51.85 to 51.87m - 100% claro-durain 51.87 to 51.94m - 100% vitrain, blocky, well cleated 51.94 to 52.00 m - carb. mudstone with 50% disseminated pyrite
52.17	53.44	Mudstone, siltstone and sandstone - carb. mudstone at top grades rapidly to siltstone medium grey with abundant plant fossils at base, 2 fine grained medium bands 0.05m thick at 52.72 to 52.77 and 53.16 to 53.20m. sharp lower contact
53.44	57.46	Sandstone - fine grained to medium grained, light grey, X-bedded, occasional plant debris, occasional minor zones of ripup clasts, occasional 0.5cm calcite veinlets in the upper part of unit, sharp lower contact, calcite veinlets 60° to C/A and being perpendicular to bedding
57.46	59.66	Siltstone and sandstone mixed - siltstone medium grey; sandstone fine grained medium grey, bioturbated, sharp lower contact

CORE DESCRIPTION

HOLE# SMG 80-11 From 59.66 To 67.16
 Area _____ By P. Cowley

FROM	TO	DESCRIPTION
59.66	60.06	Coal - 0.40m, 90% recovery, black, ground in places, 50% vitrain, 50% claro-durain - banded, well cleated, 7-2cm bands of mudstone with disseminated pyrite
60.06	60.41	Mudstone - dark grey, siltstone at base, gradational lower contact
60.41	62.27	Siltstone and sandstone - interlaminated, sandstone fine-grained medium grey; siltstone medium grey, grades to predominantly sandstone with occasional siltstone laminae at base, minute calcite veinlets throughout, sharp lower contact.
62.27	62.78	Siltstone and mudstone thinly interbedded and interlain - siltstone medium grey; mudstone dark grey, wavy bedding planes, rare worm burrows
62.78	63.26	Coal - 0.48m, recovery 20%, black, 70% claro-durain, 30% vitrain, poorly cleated
63.26	63.74	Siltstone, sandstone and mudstone thinly interbedded and interlain - sandstone - very fine grained, medium grey; siltstone medium grey; mudstone dark grey, wavy bedding surfaces, occasional worm burrows, gradational lower contact, bedding 38° to C/A @ 63.50m
63.74	65.80	Sandstone and siltstone - sandstone fine grained, medium grey, cross bedded, siltstone medium grey, predominantly sandstone with occasional thin siltstone interbeds at top with worm burrows but grades rapidly to all sandstone towards base, occasional minute calcite veinlets throughout, sharp lower contact.
65.80	66.25	Siltstone, mudstone and rare sandstone thinly interbedded - sandstone fine grained medium grey; siltstone medium grey; mudstone dark grey, worm burrows in mudstone, slickensides on mudstone beds, sharp lower contact
66.25	67.16	Sandstone - fine grained medium grey, cross-bedded, rare thin mudstone interbedded with worm burrows,

CORE DESCRIPTION

HOLE# SMG 80-11 From 67.16 To 84.12
 Area _____ By _____

FROM	TO	DESCRIPTION
		occasional minute calcite veinlets throughout
67.16	67.41	Mudstone, siltstone and sandstone thinly interbedded and interlam - sandstone fine grained, medium grey; siltstone medium grey; mudstone dark grey with abundant worm burrows, sharp lower contact
67.41	67.72	Sandstone - fine grained, medium grey, cross bedded, calcite veinlets, sharp lower contacts
67.72	71.20	Mudstone, siltstone and sandstone - sandstone-fine grained medium grey; siltstone medium grey; mudstone dark grey with worm burrows at top of unit, equal proportion of each rock interbedded at top but becomes predominantly mudstone with frequent very thin siltstone interbeds and interlam, gradational lower contact
71.20	79.10	Mudstone and siltstone - predominantly mudstone with occasional very thin siltstone lense and interlam, rare siltstone band with calcite veinlets from 76.45 to 76.68m parrallel to bedding
79.10	84.12	Coal - 5.02m - true thickness is 3.09m, 85% recovery 79.10 to 79.30 - coal - 90% claro-durain, 9% vitrain, 1% fusain, sheared, sample # 3 79.30 to 79.32 m - sandstone - fine grained medium brown, 79.32 to 79.47m - coal - 70% claro-durain, 30% vitrain, one laminae of sandstone 79.47 to 79.52 sandstone - fine grained medium brown 79.52 to 79.70 coal - 100% claro-durain 79.70 to 79.72 - sandstone - fine grained, medium brown 79.72 to 81.05 - coal - 95% claro-durain, 5% vitrain 81.05 to 81.07 - sandstone - fine grained, medium brown 81.07 to 82.09 - coal - 100% claro-durain 82.09 to 82.19 - sandstone - fine grained 82.19 to 84.12 - coal - 100% claro-durain

CORE DESCRIPTION

HOLE# SMG 80-11 From 84.12 To 99.36
 Area _____ By _____

FROM	TO	DESCRIPTION
84.12	88.93	Silty sandstone - medium grey, non-laminae, minute calcite veinlets throughout, 2 breccia zones welded with calcite. 88.00 to 88.02m and 88.48 to 88.50m, sharp lower contact, breccia zones parallel to bedding
88.93	92.71	Sandstone and siltstone thinly interbedded and inter-laminated - sandstone - fine grained, medium grey; siltstone medium grey, bedding disturbed in places, abundant calcite veinlets throughout unit, bedding 37° to C/A. Sharp lower contact, many calcite veinlets parallel to bedding
92.71	93.05	Sandstone - medium grained, light grey, Cross bedded, abundant calcite veinlets, rare coal streaks, 0.5 cm calcite vein 40° to C/A perpendicular to bedding
93.05	93.63	Mudstone, siltstone, sandstone - mudstone, carb dark grey at top grades to medium grey siltstone then to fine grained medium grey sandstone at base, sandstone crossbedded, minute calcite veinlets throughout
93.63	95.86	Siltstone and sandstone highly broken and slickensided siltstone medium grey; sandstone - fine grained, medium grey.
95.86	97.54	Siltstone and sandstone - medium grey siltstone at top grades to fine grained medium grey sandstone at base, calcite veinlets throughout, a breccia zone from 95.92 to 95.44m welded with calcite, mederately sharp contact, breccias 35° to C/A and perpendicular to bedding.
97.54	97.78	Siltstone and mudstone interlam - siltstone medium grey; mudstone dark grey, moderately sharp contact
97.78	98.15	Mudstone - dark grey, some slippage on bedding surfaces, gradational lower contact
98.15	99.36	Siltstone with minor mudstone interlam - siltstone medium grey; mudstone dark grey, slippage on many surfaces, calcite veinlets throughout unit, gradational lower contact

CORE DESCRIPTION

HOLE* SMG 80-11 From 99.36 To 134.85
 Area _____ By _____

FROM	TO	DESCRIPTION
99.36	99.88	Mudstone - dark grey, some slippage surfaces, minor calcite veinlets, gradational lower contact
99.88	101.42	Siltstone with minor mudstone laminae - siltstone medium grey, mudstone dark grey, minor calcite veinlets, gradational lower contact
101.42	101.59	Mudstone - dark grey, gradational lower contact
101.59	102.13	Siltstone - medium grey, gradational lower contact
102.13	104.23	Mudstone - dark grey, at 103.09 to 103.15m is a sandy mudstone, unit then becomes very carb. and sheared, lower contact gradational
104.23	105.08	Siltstone and sandstone - siltstone medium grey, sandstone fine grained medium grey, siltstone at top grades to fine grained siltstone with occasional carb laminae, 2-0.5cm calcite veins (vuggy) at 104.33 and 104.91m 50° to C/A gradational lower contact, calcite veins are perpendicular to bedding
105.08	106.13	Siltstone and sandstone interlam and very thinly interbedded - sandstone - fine grained medium grey; siltstone medium grey, bedding disturbed, gradational lower contact
106.13	107.59	Mudstone - dark grey, carb, base has some crushed carb. mudstone, sharp lower contact
107.59	109.83	Siltstone - medium grey, poorly laminae, minor minute calcite veinlets, carb. laminae, plant fossils present
109.83	117.87	Sandstone and siltstone - sandstone fine grained, medium grey; siltstone medium grey, at top siltstone and sandstone interlam and interbedded, rapidly grades to predominantly sandstone with frequent siltstone interlam and interbeds, beds slightly disturbed, numerous 0.5 cm thick calcite veins and vugs 60° to C/A but perpendicular, minor slickensides along bedding surfaces, gradational lower contact
117.87	127.05	Sandstone - fine grained, medium grey, cross bedded, occasional mudstone laminae, numerous 1.0cm

CORE DESCRIPTION

HOLE# SMG 80-11 From 134.85 To 145.93
 Area _____ By _____

FROM	TO	DESCRIPTION
		calcite veins and vugs 50° to C/A perpendicular to bedding, bedding 37° to C/A, moderately sharp lower contact
127.05	128.66	Sandstone and siltstone interlam. interbedded and mixed - sandstone fine grained medium grey; siltstone medium grey, carb. bedding slightly disturbed, calcite veinlets throughout unit
128.66	129.43	Coal- 0.77m, 99% recovery, sheared, black, 100% claro-durain, sample #5
129.43	130.74	Mudstone with minor siltstone interlam - mudstone dark grey, siltstone medium grey, rare slickensides on bedding surface
130.74	131.07	Coal - 0.33m, 99% recovery, sheared, black 80% claro-durain, 20% vitrain, sample #6
131.07	132.83	Mudstone and Siltstone - mudstone dark grey; siltstone medium grey, mudstone at top grades to interlam. mudstone and siltstone to base, gradational lower contact
132.83	133.04	Mudstone - dark grey
133.04	133.74	Coal - 0.75m, 24% recovery, sheared, black, 100% claro-durain, sample #7
133.79	135.85	Mudstone, siltstone and sandstone - dark grey mudstone at top becomes medium grey siltstone near base then fine grained medium grey carb sandstone at base, sandstone disturbed bedding
134.85	141.88	Coal - 7.03m, true thickness is 4.50m, 80% recovery, black, sheared
141.88	142.79	Mudstone and siltstone - dark grey mudstone at top grades to medium grey siltstone at base, slickensides throughout unit
142.79	145.72	Siltstone and mudstone - dark grey mudstone at top rapidly grades to siltstone with muddy zones. Zone 145.17 to 145.34m of minute white calcite specks, gradational lower contact, bedding 45° to C/A @ 143.20
145.72	145.93	Mudstone, siltstone and sandstone interbedded and

CORE DESCRIPTION

HOLE # SMG 80-11 From 145.93 To 160.75
 Area _____ By _____

FROM	TO	DESCRIPTION
		interlam. - sandstone - fine grained medium grey; siltstone medium grey; mudstone dark grey, sharp lower contact
145.93	146.32	Muddy siltstone - dark grey, gradational lower contact
146.32	146.50	Mudstone - dark grey, gradational lower contact
146.50	146.80	Siltstone - medium grey, gradational lower contact
146.80	148.16	Mudstone - dark grey, carb., coaly in one zone 147.36 to 147.60m, this zone is also crushed rock, gradational lower contact
148.16	151.70	Siltstone and Sandstone - Siltstone medium grey; sandstone fine grained medium grey, siltstone with occasional sandstone interlam. and very thin beds, sharp lower contact
151.70	152.89	Sandstone - fine to medium grained, medium grey, Cross bedded, carb. lam, rare 0.5cm calcite veins 60° to C/A and perpendicular to bedding, sharp lower contact
152.89	155.74	Mudstone, siltstone and sandstone - dark grey mudstone at top grades to medium grey siltstone to middle then grades to fine grained medium grey to base, sandstone poorly lam. but some carb. lam, abundant calcite veinlets in the sandstone part of the unit, sharp lower contact
155.74	157.36	Siltstone, mudstone and sandstone - medium interbedded siltstone, mudstone and sandstone, sandstone fine grained medium grey; siltstone medium grey; mudstone dark, slickensides common along bedding surfaces, minute calcite veinlets present, mildly disturbed beds in places, gradational lower contact
157.36	159.91	Mudstone - dark grey
159.91	160.32	Mudstone - broken badly, dark grey, carb., coaly in places
160.32	160.75	Mudstone and Siltstone interlam - mudstone dark grey; siltstone medium grey, minor calcite veinlets, sharp lower contact, slickensides along bedding

CORE DESCRIPTION

HOLE* SMG 80-11 From 160.75 To 191.66
 Area _____ By _____

FROM	TO	DESCRIPTION
160.75	161.87	Mudstone - dark grey, minute calcite veinlets, slickensides along bedding
161.87	162.19	Siltstone, sandstone and mudstone interlam - siltstone medium grey; sandstone fine grained medium grey, mudstone dark grey, bedding 42° to C/A, slickensides along bedding, gradational lower contact
162.19	162.85	Mudstone - dark grey, rare silty zones, base carb.
162.85	166.19	Siltstone and Sandstone - medium grey siltstone at top grades to fine grained medium sandstone at base, sandstone contains minute calcite veinlets, minor breccias weld with calcite, carb. lam and coal streaks
166.19	166.28	Coal - 0.09m, black, 50% vitrain, 50% claro-durain moderately cleated
166.28	175.83	Sandstone and Siltstone - Medium grey siltstone interlam with medium grey fine grained sandstone at top rapidly grades to fine grained and medium grained sandstone medium grey with carb. lam. and slickensides along these surfaces, abundant calcite veinlets frequently perpendicular to bedding at 45° to C/A, frequent minor breccias and vugs, and zone from 175.02 to base contains abundant ripup clusts, sandstone cross bedded, sharp lower contact
175.83	176.12	Mudstone and minor siltstone lam. - dark grey mudstone with minor medium grey siltstone lam.
176.12	176.63	Coal - 0.51m, 85% recovery, mildly sheared 176.12 to 176.22m 100% vitrain 176.22 to 176.42m 100% claro-durain 176.42 to 176.63m 50% vitrain, 50% claro-durain
176.63	180.96	Sandstone, Siltstone and mudstone - dark grey mudstone at top grades to medium grey siltstone rapidly grades to fine grained medium grey sandstone cross bedded, occasional calcite veinlets
180.96	181.66	Sandstone, siltstone and mudstone interlam and very thinly interbedded - sandstone fine grained

CORE DESCRIPTION

HOLE# SMG 80-12 From 0.00m To 172.82
 Area SOUTH MOUNT GETHING By P. Cowley

FROM	TO	DESCRIPTION
0.00	15.85	Overburden
15.85	172.82	Moosebar
15.85	66.00	dark grey slst - occasional pyrite nodules, from 15.85m to 41.00m there are occasional light grey, very fine grained sandstone lamina resembling delta front sloughing, from 41.00m to the lamina became frequent; abundant minute mudstone clasts throughout; bedding 70° to C/A @ 21.00m 68° to C/A @ 21.00m 68° to C/A @ 32.00m 72° to C/A @ 43.00m 73° to C/A @ 55.00m 68° to C/A @ 65.00m - zone of broken and crushed rock with rare slicken sides 31.06m to 31.90m and 36.57m to 37.49m
66.00	172.82	Silty mudstone - dark grey, occasional salt and pepper very fine grained sandstone lamina and abundant mudstone clasts, occasional pyrite nodules, slicken side surface at 70.78m bedding 80 to C/A @ 86.00m 80 to C/A @ 88.00m 80 to C/A @ 95.00m 75 to C/A @ 97.00m 80 to C/A @ 108.50m 80 to C/A @ 121.50m Slicken sides at 138.20m, 141.60m to 143.64 @ 55° to C/A, bedding 82° to C/A @ 147.43m - the occasional salt and pepper very fine grained sandstone lamina are absent from 154.00m to End of Hole, bedding attitudes unobtainable in this zone

APPENDIX III

DESCRIPTIVE LITHOLOGIC LOGS FOR
R.D.H. SMG 80-~~11~~ to 80-27 INCLUSIVE

01

R.D.H. SMG 80-1

A. WELL COMPLETION REPORT:

Location: - On a Canfor logging road, an off-shoot from
D.D.H. SMG 78-2 drill road.
- U.T.M. coordinates 6,203,533N x 540, 780E
- Coal Licence No. 4131

Elevation: 847.4m

Orientation: Vertical

Date Collared: 10 July, 1980

Date Completed: 11 July, 1980 Plugged: No

Overburden Depth: 1.52m

Final Depth: 64.01m

Lost Circulation at Depth: No

Water Invasion at Depth: No

Formations Encountered:

0m to 1.52m	Overburden
1.52m to 47.24m	Moosebar Fm.
47.24m to 64.01m	Gething Fm.

Rock Chip Description By: D. N. Duncan

Drilling Contractor: Elgin Exploration Ltd.

Logs Run: Gamma, Density and Resistivity -
by Utah Mines Ltd.

R.D.H. SMG 80-2

A. WELL COMPLETION REPORT:

Location: - On a Canfor logging road, an off-shoot from .
D.D.H. SMG 78-2 drill road; 205m east of R.D.H.
SMG 80-2.
- U.T.M. coordinates 6,203,610N x 540,971E
- Coal Licence No. 4131

Elevation: 824.5m

Orientation: Vertical

Date Collared: 11 July, 1980

Date Completed: 12 July, 1980

Overburden Depth: 3.05m

Final Depth: 53.34m

Lost Circulation at Depth: No

Water Invasion at Depth: No

<u>Formations Encountered:</u>	0m to 3.05m	Overburden
	3.05m to 41.15m	Moosebar Fm.
	41.15m to 53.34m	Gething Fm.

Rock Chip Description By: D. N. Duncan, R. Olauson, K. Yip

Drilling Contractor: Elgin Exploration Ltd.

Logs Run: Gamma, Density and Resistivity -
by Utah Mines Ltd.

R.D.H. SMG 80-3

A. WELL COMPLETION REPORT:

Location: - On a Canfor logging road, an off-shoot from
D.D.H. SMG 78-2 drill road; 95m east of R.D.H.
SMG 80-2.
- U.T.M. coordinates 6,203,658N x 541,053E
- Coal Licence No. 4131

Elevation: 817.7m

Orientation: Vertical

Date Collared: 12 July, 1980

Date Completed: 14 July, 1980

Overburden Depth: 5.49m

Final Depth: 76.20m

Lost Circulation at Depth: No

Water Invasion at Depth: No

Formations Encountered:

0m to 5.49m	Overburden
5.49m to 33.22m	Moosebar Fm.
33.22m to 76.20m	Gething Fm.

Rock Chip Description By: D. N. Duncan, K. Yip, R. Olauson,
J. Ridley.

Drilling Contractor: Elgin Exploration Ltd.

Logs Run: Gamma, Density, and Resistivity -
by Utah Mines Ltd.

CORE DESCRIPT N

HOLE # RDH-SMG-80-3 From 0.00m To 50.29m
 Area South Mount Gething By N.D., K.Y., R.O., J.R.

FROM	TO	DESCRIPTION
0.00	5.49	Overburden
		<u>Moosebar Formation</u>
5.49	33.22	dark grey mudstone - minor siltstone concretions, minor ash bands - basal conglomerate from 32.00m to 33.22m with chert fragments and sand in a muddy matrix - glauconitic toward base formation
		<u>Gething Formation</u>
33.22	34.75	Sandstone, siltstone, mudstone - sandstone is fine grained and salt & pepper - siltstone is medium grey mudstone is dark grey. Siltstone and mudstone interbedded
34.75	36.27	Coal - black - with mudstone toward base - mudstone dark grey to black
36.27	39.62	Sandstone, siltstone mudstone - interbedded - sandstone is fine grained salt & pepper - siltstone is medium grey - mudstone is dark grey. Minor coal seam at 37.80m - coal occurs throughout in minor coaly bands and thin seams
39.62	41.15	Siltstone, sandstone, minor mudstone and coal interbedded - medium grey siltstone is predominant - sandstone finegrained salt & pepper - mudstone dark grey - coal occurs in thin seams
41.15	44.20	Mudstone, siltstone, sandstone - interbedded - sandstone fine grained salt & pepper - mudstone dark grey, some carbonaceous - siltstone dark grey to medium brown
44.20	45.72	Sandstone, mudstone, siltstone - interbedded
45.72	48.77	Siltstone, sandstone, mudstone - siltstone dark grey sandstone fine grained, brown and medium grey - mudstone very dark grey, very hard - also slight coal and pyrite
48.77	50.29	Sandstone, siltstone and slight mudstone - with calcite on some sandstone fracture surfaces (?) - all interbedded

R.D.H. SMG 80-4

A. WELL COMPLETION REPORT:

Location: - On a Canfor logging road, an off-shoot from
D.D.H. SMG 78-2 drill road; 82m east of R.D.H.
SMG 80-3
- U.T.M. coordinates 6,203,711N x 541,115E
- Coal Licence No. 4131

Elevation: 806.6m

Orientation: Vertical

Date Collared: 14 July, 1980

Date Completed: 15 July, 1980

Overburden Depth: 21.34m

Final Depth: 36.58m

Lost Circulation at Depth: No

Water Invasion at Depth: No

Formations Encountered: 0m to 21.34m Overburden
21.34m to 36.58m Gething Fm.

Rock Chip Description By: D. N. Duncan

Drilling Contractor: Elgin Exploration Ltd.

Logs Run: Gamma, Density, and Resistivity -
by Utah Mines Ltd.

R.D.H. SMG 80-5

A. WELL COMPLETION REPORT:

Location: - On a Canfor logging road, an off-shoot from
D.D.H. SMG 78-2 drill road; 47m east of R.D.H.
SMG 80-3
- U.T.M. coordinates 6,203,689N x 541,085E
- Coal Licence No. 4131

Elevation: 813.3m

Orientation: Vertical

Date Collared: 15 July, 1980

Date Completed: 16 July, 1980

Overburden Depth: 22.86m

Final Depth: 42.67m

Lost Circulation at Depth: No

Water Invasion at Depth: No

Formations Encountered: 0m to 22.86m Overburden
22.86m to 42.67m Gething Fm.

Rock Chip Description By: D. N. Duncan, R. Olauson, K. Yip,
J. Ridley

Drilling Contractor: Elgin Exploration Ltd.

Logs Run: Gamma, Density, and Resistivity -
by Utah Mines Ltd.

R.D.H. SMG 80-6

A. WELL COMPLETION REPORT:

Location: - On the road to D.D.H. SMG 79-6
- U.T.M. coordinates 6,203,869N x 540,885E
- Coal Licence No. 4131

Elevation: 861.1m

Orientation: Vertical

Date Collared: 16 July, 1980

Date Completed: 17 July, 1980

Overburden: 27.43m

Final Depth: 36.58m

Lost Circulation at Depth: No

Water Invasion at Depth: No

Formations Encountered: 0m to 27.43m Overburden
27.43m to 36.58m Gething Fm.

Rock Chip Description By: K. Yip, R. Olauson, K. Hartmann

Drilling Contractor: Elgin Exploration Ltd.

Logs Run: Gamma, Density, and Resistivity -
by Utah Mines Ltd.

R.D.H. SMG 80-7

A. WELL COMPLETION REPORT:

Location: - On the road to D.D.H. SMG 79-6; 100m west
of R.D.H. SMG 80-6
- U.T.M. coordinates 6,203,814N x 540,805E
- Coal Licence No. 4131

Elevation: 871.3m

Orientation: Vertical

Date Collared: 17 July, 1980

Date Completed: 18 July, 1980

Overburden Depth: 28.96m

Final Depth: 35.97m

Lost Circulation at Depth: No

Water Invasion at Depth: No

Formations Encountered: 0m to 28.96m Overburden
28.96m to 35.97m Gething Fm.

Rock Chip Description By: K. Yip, R. Olauson, K. Hartmann

Drilling Contractor: Elgin Exploration Ltd.

Logs Run: Gamma, Density, and Resistivity -
by Utah Mines Ltd.

R.D.H. SMG 80-8

A. WELL COMPLETION REPORT:

Location: - On the road to D.D.H. SMG 79-6; 208m west of
R.D.H. SMG 80-7
- U.T.M. coordinates 6,203,759N x 540,605E
- Coal Licence No. 4131 ?

Elevation: 884.9m

Orientation: Vertical

Date Collared: 19 July, 1980

Date Completed: 19 July, 1980

Overburden Depth: 25.91m

Final Depth: 35.66m

Lost Circulation at Depth: No

Water Invasion at Depth: No

Formations Encountered: 0m to 25.91m Overburden
25.91m to 35.66m Gething Fm.

Rock Chip Description By: K. Yip, R. Olauson, P. Cowley

Drilling Contractor: Elgin Exploration Ltd.

Logs Run: No - overburden caved

R.D.H. SMG 80-9

A. WELL COMPLETION REPORT:

Location: - On Gething Creek Rd.
- U.T.M. coordinates 6,203,213N x 541,050E
- Coal Licence No. 4131

Elevation: 745.9m
Orientation: Vertical
Date Collared: 20 July, 1980
Date Completed: 20 July, 1980
Overburden Depth: 4.57m
Final Depth: 10.67m
Lost Circulation at Depth: No
Water Invasion at Depth: No
Formations Encountered: 0m to 4.57m Overburden
4.57m to 10.67m Moosebar Fm.
Rock Chip Description By: R. Olauson, K. Yip, K. Hartmann
Drilling Contractor: Elgin Exploration Ltd.
Logs Run: None

R.D.H. SMG 80-10

A. WELL COMPLETION REPORT:

Location: - On Gething Creek Rd.; 100m northeast of R.D.H.
SMG 80-9
- U.T.M. coordinates 6,203,295N x 541,100E
- Coal Licence No. 4131

Elevation: 745.7m

Orientation: Vertical

Date Collared: 20 July, 1980

Date Completed: 20 July, 1980

Overburden Depth: 3.05m

Final Depth: 13.72m

Lost Circulation at Depth: No

Water Invasion at Depth: No

Formations Encountered: 0m to 3.05m Overburden
3.05m to 13.72m Moosebar Fm.

Rock Chip Description By: K. Yip, R. Olauson

Drilling Contractor: Elgin Exploration Ltd.

Logs Run: None

R.D.H. SMG 80-11

A. WELL COMPLETION REPORT:

Location: - On Gething Creek Rd.; 120m east of R.D.H.
SMG 80-10
- U.T.M. coordinates 6,203,341N x 541,207E
- Coal Licence No. 4131

Elevation: 747.2m

Orientation: Vertical

Date Collared: 20 July, 1980 Recollared: 14 Aug. 1980

Date Completed: 20 July, 1980 Recompleted: 16 Aug. 1980

Overburden Depth: 18.29m

Final Depth: 68.58m

Lost Circulation at Depth: No

Water Invasion at Depth: No

Formations Encountered:

0m to 18.29m	Overburden
18.29m to 62.48m	Moosebar Fm.
62.48m to 68.58m	Gething Fm.

Rock Chip Description By: R. Olauson, K. Yip, K. Hartmann

Drilling Contractors: Elgin Exploration Ltd.

Logs Run: None

R.D.H. SMG 80-12

A. WELL COMPLETION REPORT:

Location: - On Gething Creek Rd.; 108m east of R.D.H.
SMG 80-11
- U.T.M. coordinates 6,203,364N x 541,310E
- Coal Licence No. 4131

Elevation: 746.9m

Orientation: Vertical

Date Collared: 21 July, 1980

Date Completed: 21 July, 1980

Overburden Depth: 22.86m

Final Depth: 32.00m

Lost Circulation at Depth: No

Water Invasion at Depth: ~27m

Formations Encountered: 0m to 22.86m Overburden
22.86m to 32.00m Gething Fm.

Rock Chip Description By: K. Yip, R. Olauson

Drilling Contractor: Elgin Exploration Ltd.

Logs Run: None

R.D.H. SMG 80-13

A. WELL COMPLETION REPORT:

Location: - On Gething Creek Rd.; 60m east of R.D.H.
SMG 80-11
- U.T.M. coordinates 6,203,343N x 541,265E
- Coal Licence No. 4131

Elevation: 748.1m

Orientation: Vertical

Date Collared: 21 July, 1980

Date Completed: 23 July, 1980

Overburden Depth: 22.86m

Final Depth: 56.39m

Lost Circulation at Depth: No

Water Invasion at Depth: ~48m

Formations Encountered:

0m to 22.86m	Overburden
22.86m to 44.20m	Moosebar Fm.
44.20m to 56.39m	Gething Fm.

Rock Chip Description By: K. Yip, R. Olauson

Drilling Contractor: Elgin Exploration Ltd.

Logs Run: Gamma, Density, and Resistivity -
by Utah Mines Ltd.

HOLE* RDH-SMG-80-13

From 0.00m To 56.39m

Area South Mount Gething

By R.O., K.Y.

FROM	TO	DESCRIPTION
0.00	22.86	<u>Overburden</u>
		<u>Moosebar Formation</u>
22.86	44.20	Dark grey mudstone, minor siltstone concretions, basal conglomerate from 52.98m to 44.20m with chert fragments and sand in a muddy matrix
		<u>Gething Formation</u>
44.20	47.24	Sandstone, minor siltstone and mudstone - sandstone fine grained, salt & pepper - siltstone medium grey - mudstone dark grey
47.24	47.55	Coaly mudstone - black
47.55	50.60	Coal - black, shiny, fairly hard
50.60	53.34	Siltstone, minor sandstone and coal - siltstone medium grey - sandstone fine grained, salt & pepper - coal (washed from above?)
53.34	54.86	Sandstone, coal and minor siltstone - sandstone very fine grained, salt & pepper - siltstone medium grey - coal (washed from above?)
54.86	56.39	Sandstone, minor siltstone - sandstone salt & pepper, mostly very fine grained, minor fine grained - siltstone medium grey
	T.D.	END OF HOLE

R.D.H. SMG 80-14

A. WELL COMPLETION REPORT:

Location: - 70m along a south trending trail which leads
off the D.D.H. SMG 79-6 road
- U.T.M. coordinates 6,203,700N x 540,745E
- Coal Licence No. 4131

Elevation: 874.4m

Orientation: Vertical

Date Collared: 23 July, 1980

Date Completed: 27 July, 1980

Overburden Depth: 40.23m

Final Depth: 42.98m

Lost Circulation at Depth: in overburden but regained in
bedrock.

Water Invasion at Depth: No

Formations Encountered: 0m to 40.23m Overburden
40.23m to 42.98m Gething Fm.

Rock Chip Description By: K. Yip, R. Olauson

Drilling Contractor: Elgin Exploration Ltd.

Logs Run: None

R.D.H. SMG 80-15

A. WELL COMPLETION REPORT:

- Location: - On south trending trail which leads off the
D.D.H. SMG 79-6 road; 110m south of R.D.H.
SMG 80-14
- U.T.M. coordinates 6,203,614N x 540,739E
 - Coal Licence No. 4131

Elevation: 860.8m

Orientation: Vertical

Date Collared: 28 July, 1980

Date Completed: 29 July, 1980

Overburden Depth: 9.14m

Final Depth: 22.86m

Lost Circulation at Depth: No

Water Invasion at Depth: No

Formations Encountered: 0m to 9.14m Overburden
9.14m to 22.86m Moosebar Fm.

Rock Chip Description By: R. Olauson, K. Hartmann, K. Yip

Drilling Contractor: Elgin Exploration Ltd.

Logs Run: None

R.D.H. SMG 80-16

A. WELL COMPLETION REPORT:

Location: - On south trending trail which leads off the
D.D.H. SMG 79-6 road; 25m north of R.D.H.
SMG 80-14

- U.T.M. coordinates 6,203,723N x 540,239E
- Coal Licence No. 4131

Elevation: 875.3m

Orientation: Vertical

Date Collared: 28 July, 1980

Date Completed: 30 July, 1980

Overburden Depth: 33.53m

Final Depth: 41.15m

Lost Circulation at Depth: No

Water Invasion at Depth: No

Formations Encountered: 0m to 33.53m Overburden
33.53m to 41.15m Gething Fm.

Rock Chip Description By: K. Yip, R. Olauson

Drilling Contractor: Elgin Exploration Ltd.

Logs Run: None

R.D.H. SMG 80-17

A. WELL COMPLETION REPORT:

Location: - 102m along a south-east trending trail which leads off the D.D.H. SMG 79-6 road.
- U.T.M. coordinates 6,203,728N x 540,834E
- Coal Licence No. 4131

Elevation: 860.8m

Orientation: Vertical

Date Collared: 30 July, 1980

Date Completed: 1 August, 1980

Overburden Depth: 35.05m

Final Depth: 47.24m

Lost Circulation at Depth: In overburden

Water Invasion at Depth: No

Formations Encountered: 0m to 35.05m Overburden
35.05m to 47.24m Gething Fm.

Rock Chip Description By: K. Yip, R. Olauson

Drilling Contractor: Elgin Exploration Ltd.

Logs Run: None

R.D.H. SMG 80-18

A. WELL COMPLETION REPORT:

Location: - On a south-east trending trail which leads
off the D.D.H. SMG 79-6 road; 38m south-east
of R.D.H. SMG 80-17.
- U.T.M. coordinates 6,203,705N x 540,865E
- Coal Licence No. 4131

Elevation: 854.6m

Orientation: Vertical

Date Collared: 9 August, 1980

Date Completed: 9 August, 1980

Overburden Depth: 31.09m

Final Depth: 36.58m

Lost Circulation at Depth: No

Water Invasion at Depth: No

Formations Encountered: 0m to 31.09m Overburden
31.09m to 36.58m Gething Fm.

Rock Chip Description By: K. Yip

Drilling Contractor: Elgin Exploration Ltd.

Logs Run: None

R.D.H. SMG 80-19

A. WELL COMPLETION REPORT:

Location: - On Gething Creek Rd; 20.5m west of R.D.H.
SMG 80-12
- U.T.M. coordinates 6,203,705N x 540,865E
- Coal Licence No. 4131

Elevation: 747.6m

Orientation: Vertical

Date Collared: 9 August, 1980

Date Completed: 9 August, 1980

Overburden Depth: 25.60m

Final Depth: 34.14m

Lost Circulation at Depth: No

Water Invasion: No

<u>Formations Encountered:</u>	0m to 25.60m	Overburden
	25.60m to 28.35m	Moosebar Fm.
	28.35m to 34.14m	Gething Fm.

Rock Chip Description By: K. Yip

Drilling Contractor: Elgin Exploration Ltd.

Logs Run: None

R.D.H. SMG 80-20

A. WELL COMPLETION REPORT:

Location: - On Gething Creek Rd; 48m east of R.D.H. SMG 80-12
- U.T.M. coordinates 6,203,376N x 541,357E
- Coal Licence No. 4131

Elevation: 745.5m

Orientation: Vertical

Date Collared: 10 August, 1980

Date Completed: 10 August, 1980

Overburden Depth: 23.47m

Final Depth: 28.96m

Lost Circulation at Depth: No

Water Invasion at Depth: No

Formations Encountered: 0m to 23.47m Overburden
23.47m to 28.96m Gething Fm.

Rock Chip Description By: K. Yip

Drilling Contractor: Elgin Exploration Ltd.

Logs Run: None

R.D.H. SMG 80-21

A. WELL COMPLETION REPORT:

Location: - On Gething Creek Rd; 390m east of D.D.H. SMG
78-3.

- U.T.M. coordinates 6,203,013N x 540,862E

- Coal Licence No. 4131

Elevation: 750.7m

Orientation: Vertical

Date Collared: 10 August, 1980

Date Completed: 11 August, 1980

Overburden Depth: 15.24m

Final Depth: 24.38m

Lost Circulation at Depth: No

Water Invasion at Depth: No

Formations at Depth: 0m to 15.24m Overburden
15.24m to 24.38m Gething Fm.

Rock Chip Description By: K. Hartmann

Drilling Contractor: Elgin Exploration Ltd.

Logs Run: None

HOLE* RDH-SMG-80-21

From 0m To 24.38m

FROM	TO	DESCRIPTION
0m	15.24m	Overburden
		Gething Fm
15.24m	16.76m	Siltstone - medium grey
16.76m	18.24m	Mudstone and minor Sandstone and Siltstone - mudstone dark grey, sandstone medium-grained, light grey, dark grey
18.29m	19.81m	Mudstone, Siltstone and Sandstone - mudstone dark grey, siltstone dark grey, sandstone medium-grained to very-coarse-grained, medium grey, rare coal
19.81m	21.34m	Sandstone, Siltstone and minor Mudstone - sandstone fine-grained, medium grey, siltstone medium to dark grey.
21.34m	24.38m	Sandstone - medium-grained, carbonaceous, brown-grey, rare coal
		TOTAL DEPTH 24.38m

R.D.H. SMG 80-22

A. WELL COMPLETION REPORT:

Location: - On Gething Creek Rd; 199m west of R.D.H.
SMG 80-9
- U.T.M. coordinates 6,203,071N x 540,918E
- Coal Licence No. 4131

Elevation: 753.3m

Orientation: Vertical

Date Collared: 11 August, 1980

Date Completed: 12 August, 1980

Overburden Depth: 16.76m

Final Depth: 68.58m

Lost Circulation at Depth: No

Water Invasion: No

Formations Encountered: 0m to 16.76m Overburden
16.76m to 68.58m Moosebar Fm.

Rock Chip Description By: R. B. Anderson, K. Hartmann

Drilling Contractor: Elgin Exploration Ltd.

Logs Run: None

R.D.H. SMG 80-23

A. WELL COMPLETION REPORT:

Location: - On Gething Creek Rd; 40m west of R.D.H. SMG
80-22.
- U.T.M. coordinates 6,203,041N x 540,890E
- Coal Licence No. 4131

Elevation: 752.3m

Orientation: Vertical

Date Collared: 12 August, 1980

Date Completed: 13 August, 1980

Overburden Depth: 12.19m

Final Depth: 27.43m

Lost Circulation at Depth: No

Water Invasion at Depth: No

Formations Encountered: 0m to 12.19m Overburden
12.19m to 27.43m Gething Fm.

Rock Chip Description By: K. Hartmann, K. Yip

Drilling Contractor: Elgin Exploration Ltd.

Logs Run: None

HOLE* RDH-SMG 80-23

From 0m To 27.43m

40m west of SMG-80-22

FROM	TO	DESCRIPTION
0m	12.19m	<u>Overburden</u>
		<u>Gething Fm</u>
12.19m	13.72m	Mudstone and minor Siltstone - Mudstone dark grey, siltstone brown, rare coal fragments
13.72m	16.00m	Mudstone - dark grey
16.00m	17.50m	Mudstone, Siltstone and Sandstone - mudstone dark grey, siltstone medium grey, sandstone fine-grained, salt and pepper
17.50m	18.29m	Sandstone and Siltstone - sandstone fine-grained, salt and pepper, siltstone medium grey
18.29m	21.34m	Mudstone and minor Sandstone and Siltstone - mudstone dark grey, sandstone fine-grained medium grey, siltstone brown
21.34m	22.86m	Sandstone and minor Mudstone - sandstone medium-grained salt and pepper, mudstone dark grey, minor calcite chips
22.86m	24.38m	Sandstone and minor Siltstone - sandstone fine-grained, salt and pepper, siltstone dark grey
24.38m	24.99m	Sandstone and Mudstone - sandstone fine-grained, salt and pepper, mudstone dark grey
24.99m	26.21m	Coal - 1.22m - block
26.21m	27.43m	Sandstone and minor Siltstone - sandstone fine-grained, dark grey, siltstone medium grey
		TOTAL DEPTH 27.43m

R.D.H. SMG 80-24

A. WELL COMPLETION REPORT:

Location: - On a log landing leading off Gething Creek Rd;
85m north of R.D.H. SMG 80-24
- U.T.M. coordinates 6,203,851N x 541,380E
- Coal Licence No. 4131

Elevation: 760.0m

Orientation: Vertical

Date Collared: 13 August, 1980

Date Completed: 13 August, 1980

Overburden Depth: 4.88m

Final Depth: 30.48m

Lost Circulation at Depth: No

Water Invasion at Depth: No

Formations Encountered: 0m to 4.88m Overburden
4.88m to 30.48m Moosebar Fm.

Rock Chip Description By: K. Yip

Drilling Contractor: Elgin Exploration Ltd.

Logs Run: None

R.D.H. SMG 80-25

A. WELL COMPLETION REPORT:

Location: - 185m along a north-east trending trail leading
off D.D.H. SMG 79-6 road.
- U.T.M. coordinates 6,203,994N x 541,183E
- Coal Licence No. 4131

Elevation: 830.9m

Orientation: Vertical

Date Collared: 14 August, 1980

Date Completed: 16 August, 1980

Overburden Depth: 60.96m

Final Depth: 70.10m

Lost Circulation at Depth: No

Water Invasion at Depth: No

Formations Encountered: 0m to 60.96m Overburden
60.96m to 70.10m Gething Fm.

Rock Chip Description By: K. Hartmann

Drilling Contractor: Elgin Exploration Ltd.

Logs Run: None

R.D.H. SMG 80-26

A. WELL COMPLETION REPORT:

- Location: - On a north-east trending trail leading off the
D.D.H. SMG 78-6 road; 112m east of R.D.H. SMG
80-25.
- U.T.M. coordinates 6,204,046N x 541,277E
- Coal Licence No. 4131

Elevation: 831.5m

Orientation: Vertical

Date Collared: 16 August, 1980

Date Completed: 17 August, 1980

Overburden Depth: 46.33m

Final Depth: 48.77m

Lost Circulation at Depth: Minor loss at 47m

Water Invasion at Depth: No

Formations Encountered: 0m to 46.33m Overburden
46.33m to 48.77m Gething Fm.

Rock Chip Description By: K. Hartmann

Drilling Contractor: Elgin Exploration Ltd.

Logs Run: None

R.D.H. SMG 80-27

A. WELL COMPLETION REPORT:

Location: - On north-east trending trail leading off the
D.D.H. SMG 79-6 road; 92m east of R.D.H. SMG
80-26.

- U.T.M. coordinates 6,204,020N x 541,350E
- Coal Licence No. 4131

Elevation: 821.1m

Orientation: Vertical

Date Collared: 19 August, 1980

Date Completed: 19 August, 1980

Overburden Depth: 18.29m

Final Depth: 18.29m

Lost Circulation at Depth: No

Water Invasion at Depth: No

Formations Encountered: 0m to 18.29m Overburden

Rock Chip Description By: K. Hartmann

Drilling Contractor: Elgin Exploration Ltd.

Logs Run: None

UTAH MINES LTD.
GRAPHIC CORE LOG

PR - South Mt. Gething 80(3)A

HOLE NO. SMG 80-11

LOG BY: K. Hartmann

DATE: August 10, 1980

ELEV: 996.0m
 N: 6,200,413
 E: 535,034

HOLE SIZE: HQ (96mm)
 AIR WATER
 ID: 81.66mm P.D.

HOLE NO. SMG 80-11

PROJECT: SOUTH MT. GETHING

LEASE: 4139

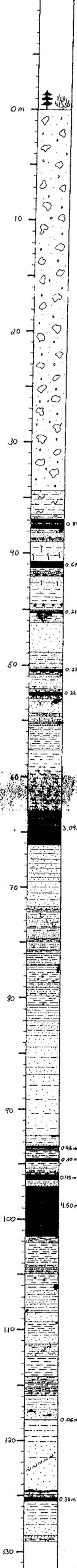
SEC. T. R.

80-11

% REC	DEPTH	STRIP LOG	THICK	SAMPLE NO.	GRAV.
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LITHOLOGY ANALYSIS

639



OVERBURDEN 0-34.14m

GETHING FORMATION

SECTION HAS BEEN CORRECTED FOR DIP

639

80-1

PR-South Mt. Gething 80(3)A

Widco

WELL LOG

COMPANY Utah Mines Ltd.
 WELL RDH-SMG-80-1
 LOCATION 6203.533N x
540.780E
South Mt. Gething

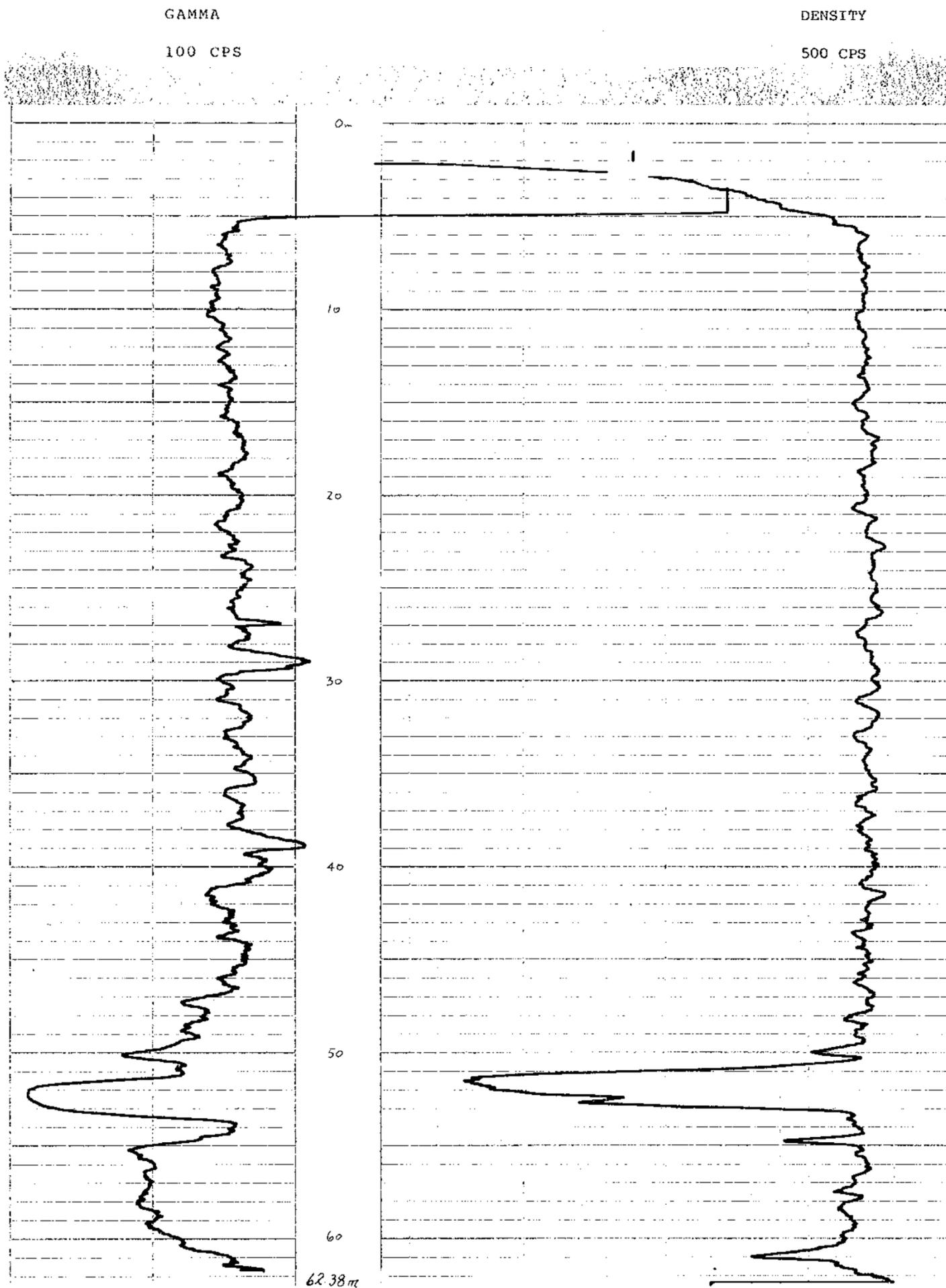
COMPANY Utah Mines Ltd.
 AREA South Mt. Gething
 WELL RDH-SMG-80-1
 COUNTY Peace R. Land STATE B.C.
District

COORDINATES:
 N 6,203,533N x
 S 540,780E
 ELEVATION: 847.4m
 D.F. _____
 K.B. _____
 G.I. _____

	Run No. 1	Run No. 2	MUD	Run No. 1	Run No. 2
Date	10 July 1980		Nature		
First Reading	62.38m		Density		
Last Reading	0.00m		Viscosity	@ °F	@ °F
Footage Logged	64.01m		Resistivity	@ °F	@ °F
Bottom (Driller)	64.01m		Res. @ 8HT	@ °F	@ °F
Casing (From Log)			pH		
Casing (Driller)			Circ. Temp.		
Casing Size			B.H. Temp.		
Bit Size: Surface	4 5/8"				
Bit Size: Main	4 1/2"				
			Logged by	K.Yip, R.Olauson	
			Witnessed by	N.Duncan	

REMARKS

* Reg. U.S. Pat. Off.



FO-139

639

80-1

PR - South Mt. Gething 80(3)A

Widco

WELL LOG

COMPANY Utah Mines Ltd.

AREA South Mt. Gething

WELL RDH-SMG-80-1

COUNTY Peace R. Land District STATE B.C.

COORDINATES:
N 6,203,533N X
S 540,780E
ELEVATION: 847.4m
D.F.
K.B.
G.L.

COMPANY Utah Mines Ltd.
WELL RDH-SMG-80-1
LOCATION 61203.533N-X
540.780E
South Mt. Gething

	Run No. 1	Run No. 2	MUD	Run No. 1	Run No. 2
Date	10 July 1980		Nature		
First Reading	62.05m		Density		
Last Reading	0.00m		Viscosity	@ °F	@ °F
Footage Logged	64.01m		Resistivity	@ °F	@ °F
Bottom (Driller)	64.01m		Res. @ BHT	@ °F	@ °F
Casing (From Log)			pH		
Casing (Driller)			Circ. Temp.		
Casing Size			B.H. Temp.		
Bit Size: Surface	4 5/8"		Logged by	K. Yip, R. Olouson	
Bit Size: Main	4 1/2"		Witnessed by	N. Duncan	

REMARKS

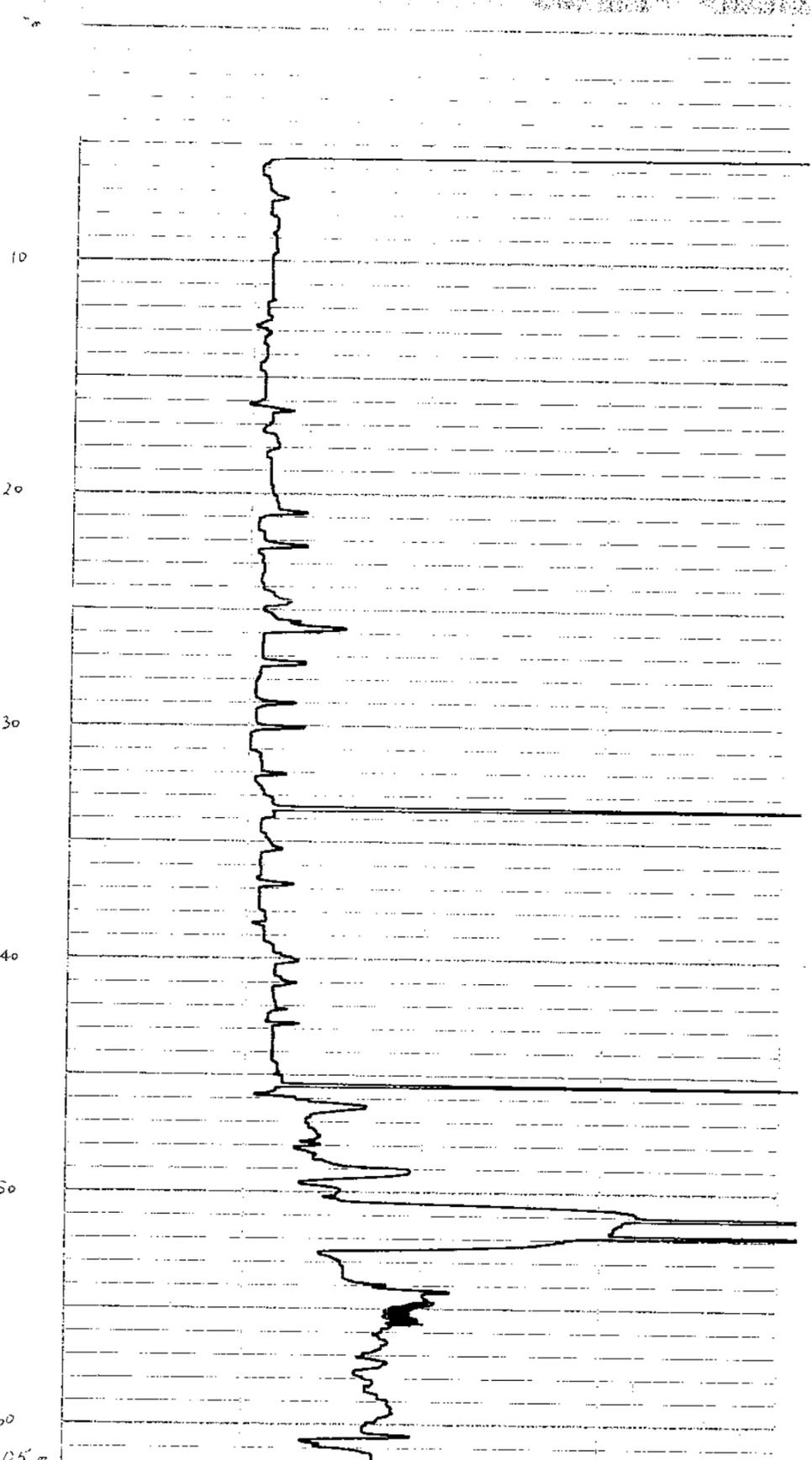
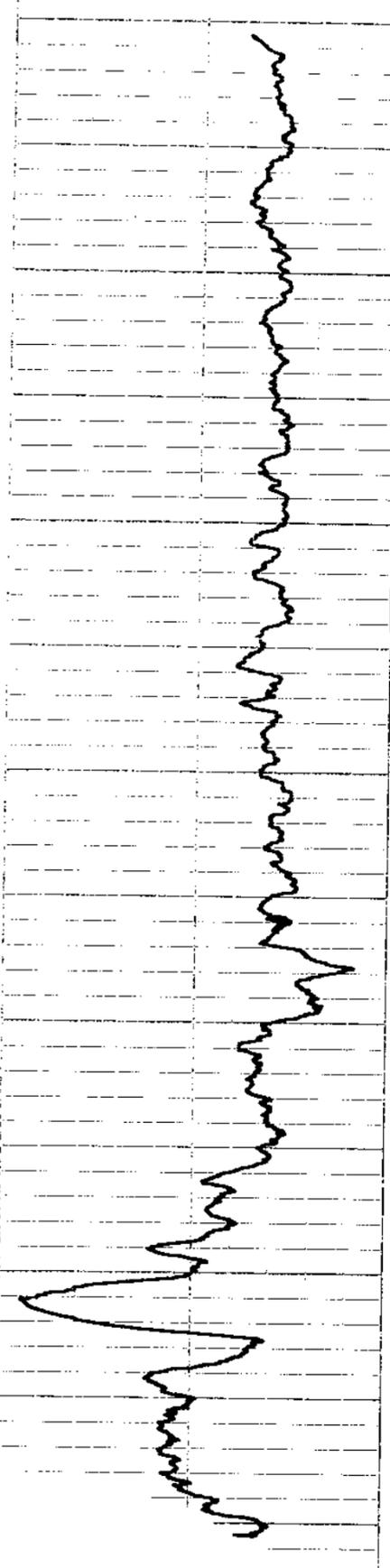
* Reg. U.S. Pat. Off.

GAMMA

100 CPS

RESISTIVITY

100 OHMS



60
62.05 m

FO-139

639

80-2

PR: South Mt. Gething 80(3)A

Widco * WELL LOG

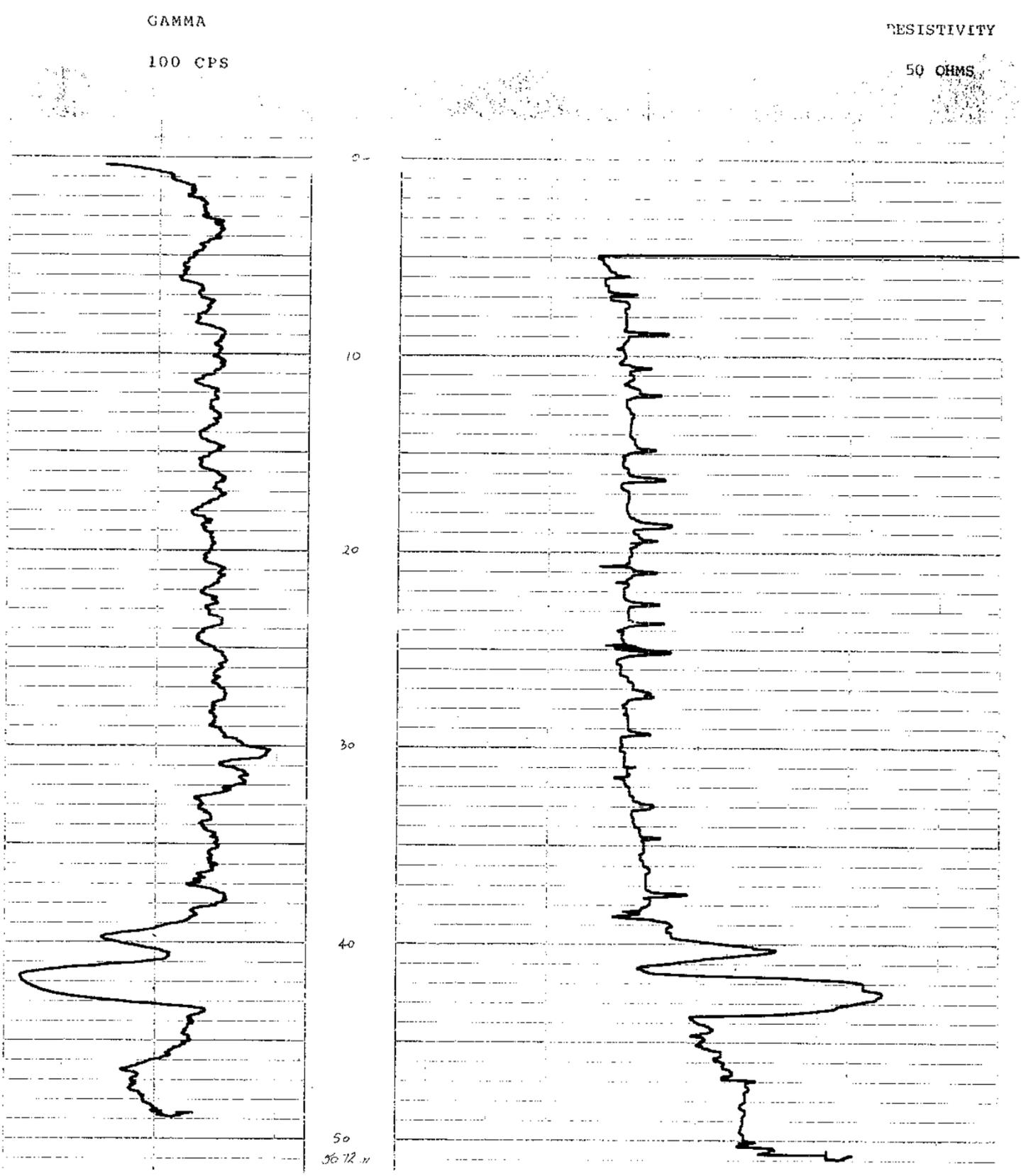
COMPANY <u>Utah Mines Ltd.</u>		COORDINATES:	
AREA <u>South Mt. Gething</u>		N. <u>6,203,610N</u> x	
WELL <u>RDH-SMG-80-2</u>		S <u>540,971 E</u>	
COUNTY _____ STATE _____		ELEVATION: <u>824.5m</u>	
		D.F. _____	
		K.B. _____	
		G.I. _____	

COMPANY Utah Mines Ltd.
 WELL RDH-SMG-80-2
 LOCATION 6,203,610N x
540,971E

	Run No. 1	Run No. 2	MUD	Run No. 1	Run No. 2
Date	11 July 1980		Nature		
First Reading	50.72m		Density		
Last Reading	0.00m		Viscosity	@ °F	@ °F
Footage Logged	53.34m		Resistivity	@ °F	@ °F
Bottom (Driller)	53.54m		Res. @ BHT	@ °F	@ °F
Casing (From Log)			pH		
Casing (Driller)			Circ. Temp.		
Casing Size			B.H. Temp.		
Bit Size: Surface	4 5/8"				
Bit Size: Main	4 1/2"				
			Logged by		
			Witnessed by		

REMARKS

* Reg. U.S. Pat. Off.



FO-139

50
56.72 m

639

80-2

PR-South Mt. Gething 80(3)A

Widco

WELL LOG

COMPANY Utah Mines Ltd.

AREA South Mt. Gething

WELL RDH-SMG-80-2

COUNTY Peace R. Land District STATE B.C.

COORDINATES:

N 6,203,610 Nx

S 540,971 E

ELEVATION: 824.5m

D.F. _____

K.B. _____

G.I. _____

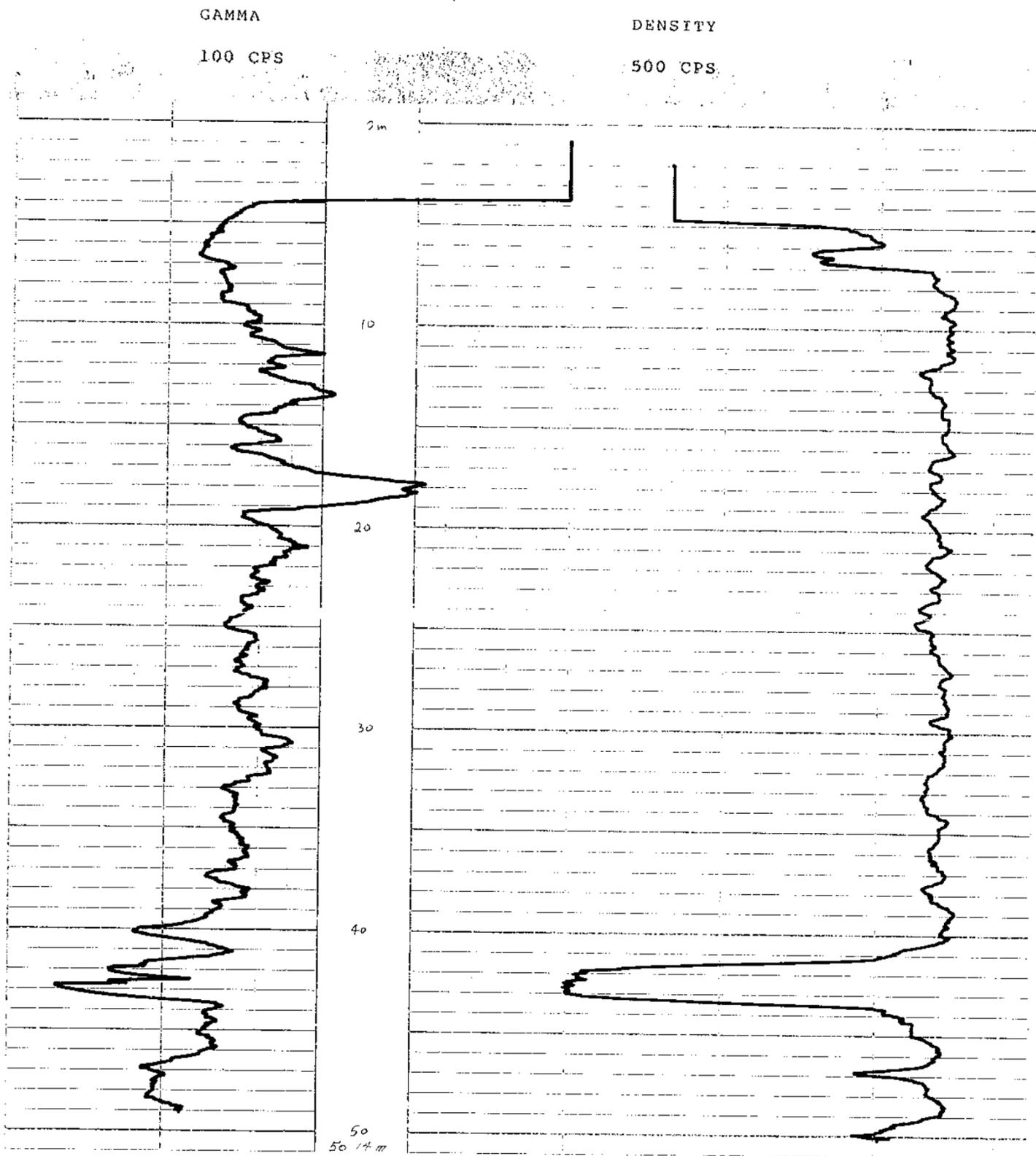
COMPANY Utah Mines Ltd.
WELL RDH-SMG-80-2
LOCATION 6,203,610 N x
540,971 E
South Mt. Gething

	Run No. 1	Run No. 2	MUD	Run No. 1	Run No. 2
Date	11 July 1980		Nature		
First Reading	50.14m		Density		
Last Reading	0.00m		Viscosity	@ °F	@ °F
Footage Logged	53.34m		Resistivity	@ °F	@ °F
Bottom (Driller)	53.34m		Res. @ BHT	@ °F	@ °F
Casing (From Log)			pH		
Casing (Driller)			Circ. Temp.		
Casing Size			B.H. Temp.		
Bit Size: Surface	4 5/8"				
Bit Size: Main	4 1/2"				
			Logged by	R. Olanson, K. Vip	
			Witnessed by	N. Duncan	

REMARKS

REMARKS

* Reg. U.S. Pat. Off.



FO-139

639

80-3

PR - South Mt. Gething 80(3)A

Widco

WELL LOG

COMPANY Utah Mines Ltd.
 AREA South Mt. Gething
 WELL RDH-SMG-80-3
Peace R. Land
 COUNTY District STATE B.C.

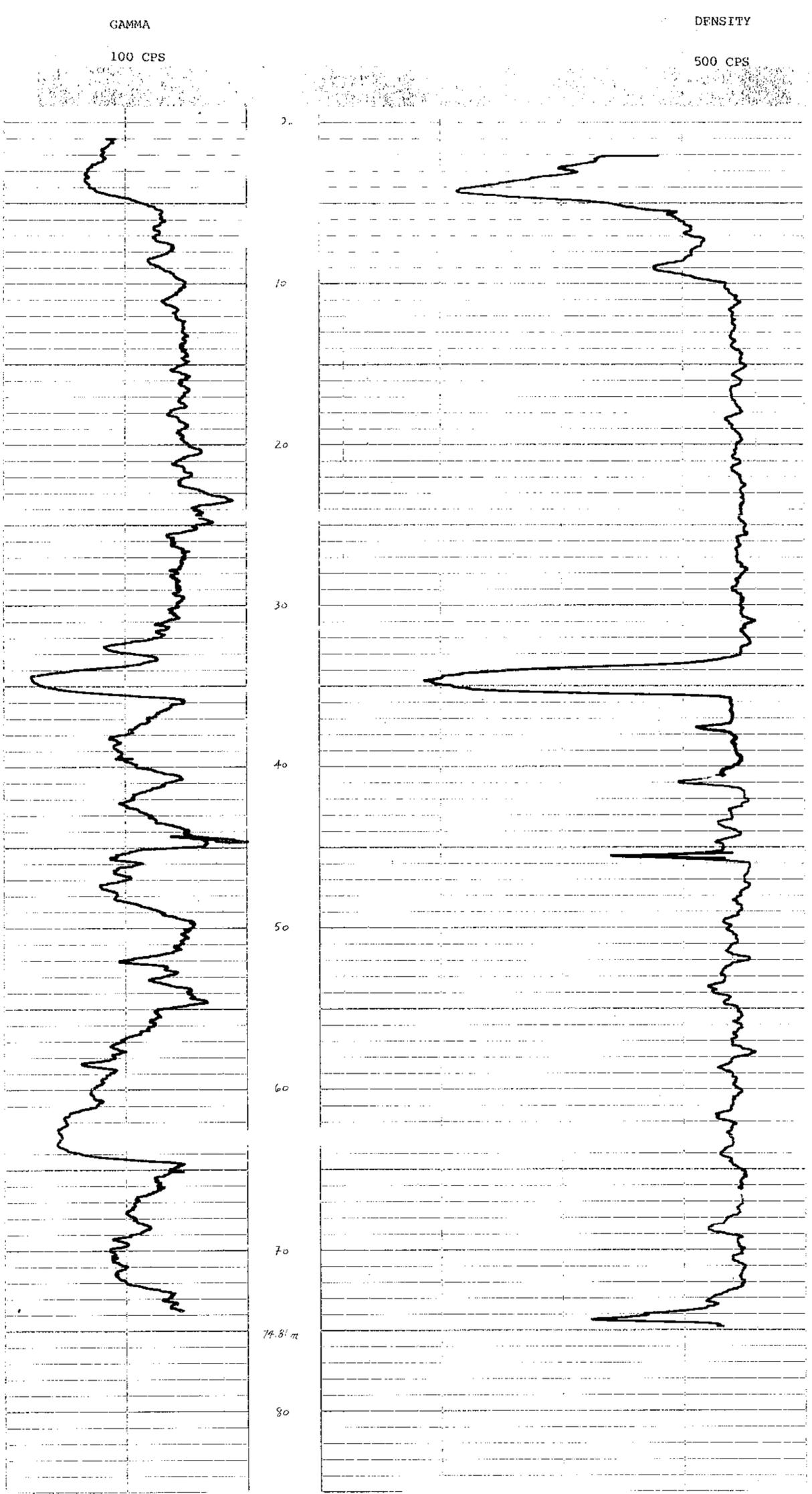
COORDINATES:
 N 6,203,658N X
 S 541,053E
 ELEVATION: 817.7m
 D.F. _____
 K.B. _____
 G.L. _____

COMPANY Utah Mines Ltd.
 WELL RDH-SMG-80-3
 LOCATION 6,203,658N X
541,053E
South Mt. Gething

	Run No. 1	Run No. 2	MUD	Run No. 1	Run No. 2
Date	12 July 1980		Nature		
First Reading	74.81m		Density		
Last Reading	0.00m		Viscosity	@ °F	@ °F
Footage Logged	76.20m		Resistivity	@ °F	@ °F
Bottom (Driller)	76.20m		Res. @ BHT	@ °F	@ °F
Casing (From Log)			pH		
Casing (Driller)			Circ. Temp.		
Casing Size			B.H. Temp.		
Bit Size: Surface	4 5/8"				
Bit Size: Main	4 1/2"				
			Logged by	N. Duncan, R. Olafson	
			Witnessed by	J. Ridley, K. Yip	

REMARKS

* Reg. U.S. Pat. Off.



FO-139

639

80-3

PR-South Mt Gething 80(3)A

Widco

WELL LOG

COMPANY Utah Mines Ltd.
 AREA South Mt. Gething
 WELL RDH-SMG-80-3
 COUNTY Peace R. Land STATE B.C.
 District

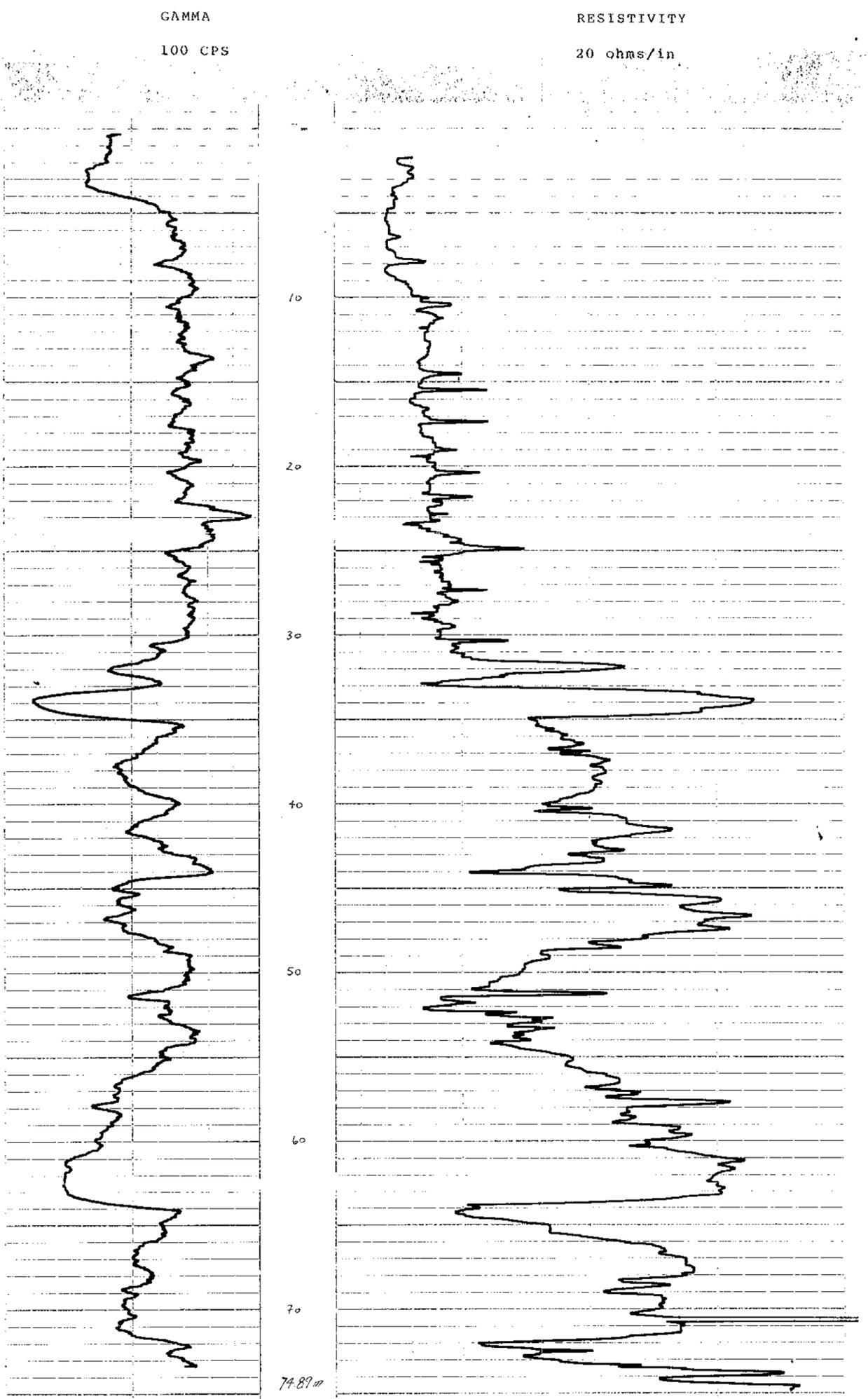
COORDINATES:
 N 6,203,658N x
 S 541,053E
 ELEVATION: 817.7m
 D.F.
 K.B.
 G.L.

COMPANY Utah Mines Ltd.
 WELL RDH-SMG-80-3
 LOCATION 6,203,658N x
541,053E
South Mt. Gething

	Run No. 1	Run No. 2	MUD	Run No. 1	Run No. 2
Date	12 July 1980		Nature		
First Reading	74.89m		Density		
Last Reading	0.00m		Viscosity	@ °F	@ °F
Footage Logged	76.20m		Resistivity	@ °F	@ °F
Bottom (Driller)	76.20m		Res. @ BHT	@ °F	@ °F
Casing (From Log)			pH		
Casing (Driller)			Circ. Temp.		
Casing Size			B.H. Temp.		
Bit Size: Surface	4 5/8"		Logged by	N. Duncan, R. Olafson	
Bit Size: Main	4 1/2"		Witnessed by	J. Ridley, K. Yip	

REMARKS

* Reg. U.S. Pat. Off.



FO-139

639

80-4

PR- South Mt. Gething 80(3)A

Widco

WELL LOG

COMPANY Utah Mines Ltd.
 WELL RDH-SMG-80-4
 LOCATION _____

COMPANY Utah Mines Ltd.
 AREA South Mt. Gething
 WELL RDH-SMG-80-4
 COUNTY Peace R. Land STATE B.C.
 District _____

COORDINATES:
 N 6,203,711N x
 S 541,115E
 ELEVATION: 806.6m
 D.F. _____
 K.B. _____
 G.L. _____

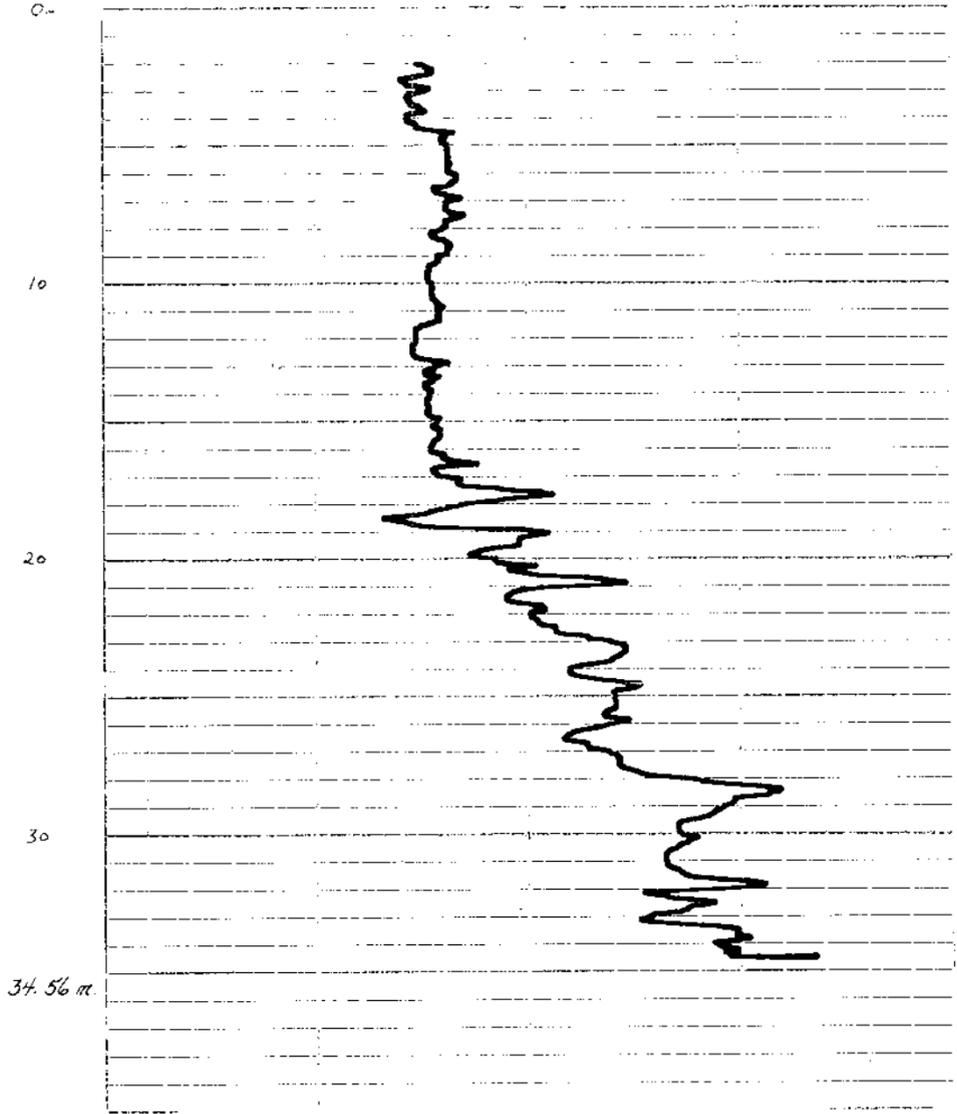
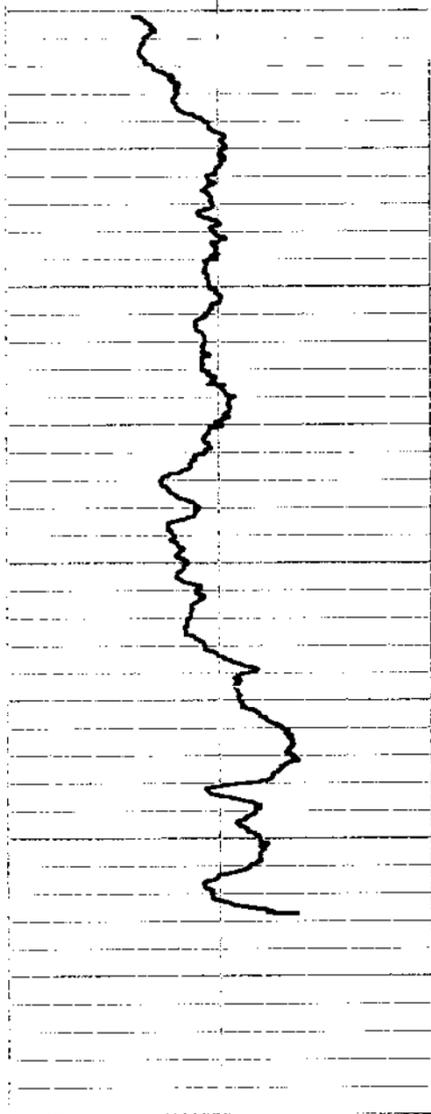
	Run No. 1	Run No. 2	MUD	Run No. 1	Run No. 2
Date	14 July 1980		Nature		
First Reading	34.56m		Density		
Last Reading	0.00m		Viscosity	@ °F	@ °F
Footage Logged	36.38m		Resistivity	@ °F	@ °F
Bottom (Driller)	36.58m		Res. @ BHT	@ °F	@ °F
Casing (From Log)			pH		
Casing (Driller)			Circ. Temp.		
Casing Size			S.H. Temp.		
Bit Size: Surface	4 5/8"				
Bit Size: Main	4 1/2"				
			Logged by		
			Witnessed by		

REMARKS _____

* Reg. U.S. Pat. Off.

GAMMA
 100 CPS

RESISTIVITY
 20 OHMS



FO-139

639

80-4

PR- South Mt. Gething 80(3)A

Widco

WELL LOG



COMPANY Utah Mines Ltd.
 AREA South Mt. Gething
 WELL RDH-SMG-80-4
 COUNTY Peace R. Land District STATE B.C.

COORDINATES:
 N. 6,203,711N
 S 541,115E
 ELEVATION: 806.6m
 D.F. _____
 K.B. _____
 G.L. _____

COMPANY Utah Mines Ltd.
 WELL RDH-SMG-80-4
 LOCATION 6,203,711N x
541,115E
South Mt. Gething

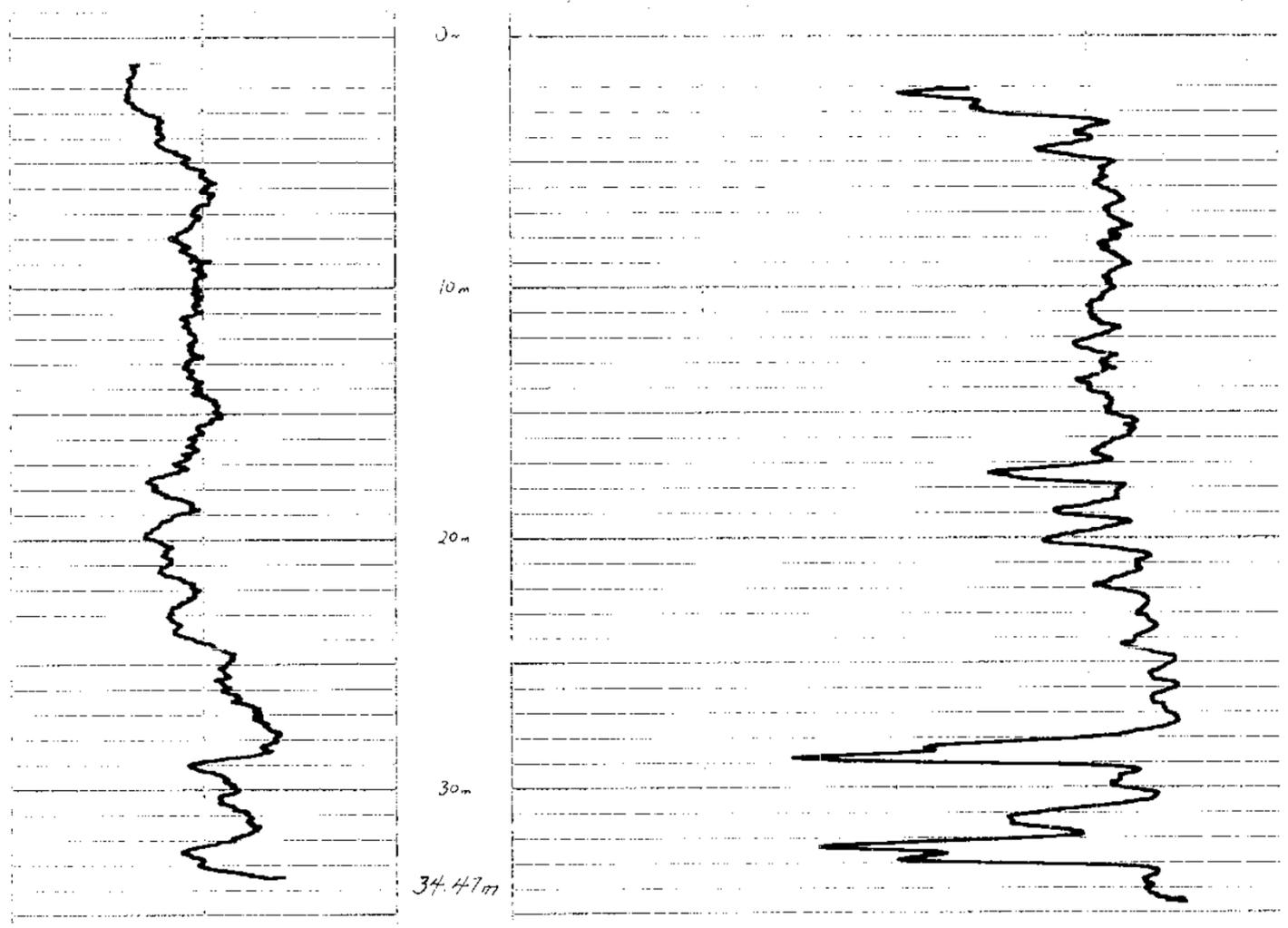
	Run No. 1	Run No. 2	MUD	Run No. 1	Run No. 2
Date	14 July 1980		Nature		
First Reading	34.47m		Density		
Last Reading	0.00m		Viscosity	@ °F	@ °F
Footage Logged	36.58m		Resistivity	@ °F	@ °F
Bottom (Driller)	36.58m		Res. @ BHT	@ °F	@ °F
Casing (From Log)			pH		
Casing (Driller)			Circ. Temp.		
Casing Size			B.H. Temp.		
Bit Size: Surface	4 5/8"				
Bit Size: Main	4 1/2"				
			Logged by	N. Duncan	
			Witnessed by		

REMARKS _____

* Reg. U.S. Pat. Off.

GAMMA
100 CPS

DENSITY
500 CPS



FO-139

639

80-5

PR - South Mt. Gething 80(3)A

Widco

WELL LOG

COMPANY Utah Mines Ltd.
 AREA South Mt. Gething
 WELL RDH-SMG-80-5
 COUNTY Peace R. Land Dist. STATE B.C.

COORDINATES:
 N 6,203,689N x
 S 541,085E
 ELEVATION: 813.3m
 D.F. _____
 K.B. _____
 G.I. _____

COMPANY Utah Mines Ltd.
 WELL RDH-SMG-80-5
 LOCATION 6,203,689N x 541,085E
South Mt. Gething

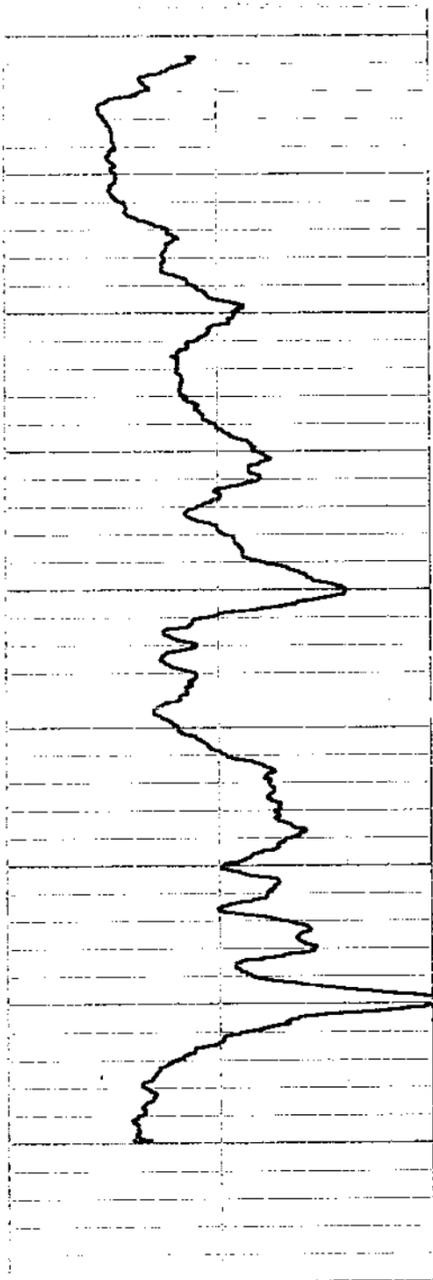
	Run No. 1	Run No. 2	MUD	Run No. 1	Run No. 2
Date	15 July 1980		Nature		
First Reading	41.48m		Density		
Last Reading	0.00m		Viscosity	@ °F	@ °F
Footage Logged	42.67m		Resistivity	@ °F	@ °F
Bottom (Driller)	42.67m		Res. @ BHT	@ °F	@ °F
Casing (From Log)			pH		
Casing (Driller)			Circ. Temp.		
Casing Size			B.H. Temp.		
Bit Size: Surface	4 5/8"				
Bit Size: Main	4 1/2"				
			Logged by	N. Duncan, R. Olduson	
			Witnessed by	J. Ridley, K. Yip	

REMARKS _____

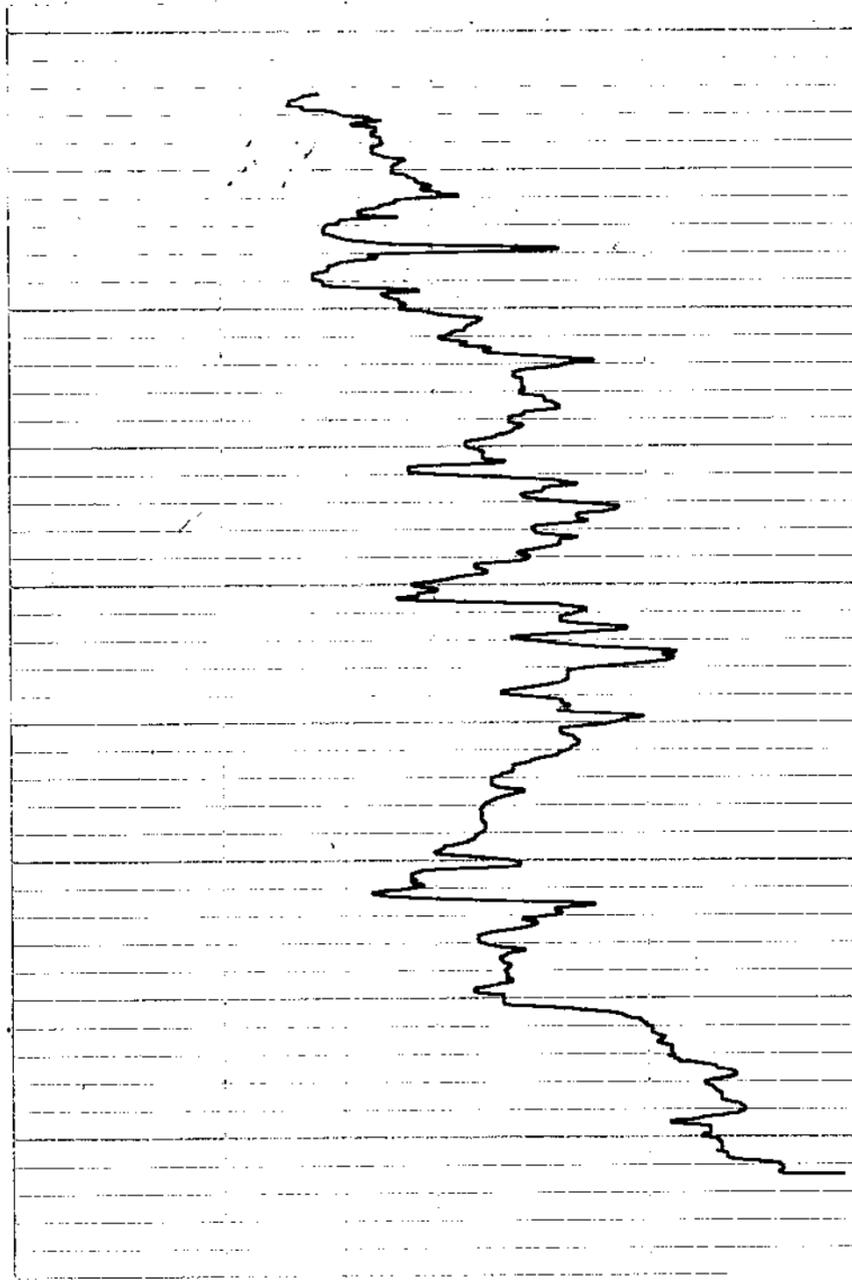
* Reg. U.S. Pat. Off.

GAMMA
100 CPS

RESISTIVITY
20 OHMS



41.48m



FO-139

639

80-5

PR-South Mt Gething 80(2)A

Widco

WELL LOG

COMPANY Utah Mines Ltd.
 AREA South Mt. Gething
 WELL RDH-SMG-80-5
 COUNTY Peace R. Land STATE B.C.
 District

COORDINATES:
 N 6,203,689N X
 S 541,085E
 ELEVATION: 813.3m
 D.F. _____
 K.B. _____
 G.L. _____

COMPANY Utah Mines Ltd.
 WELL RDH-SMG-80-5
 LOCATION 6,203,689N 541,085E
 South Mt. Gething

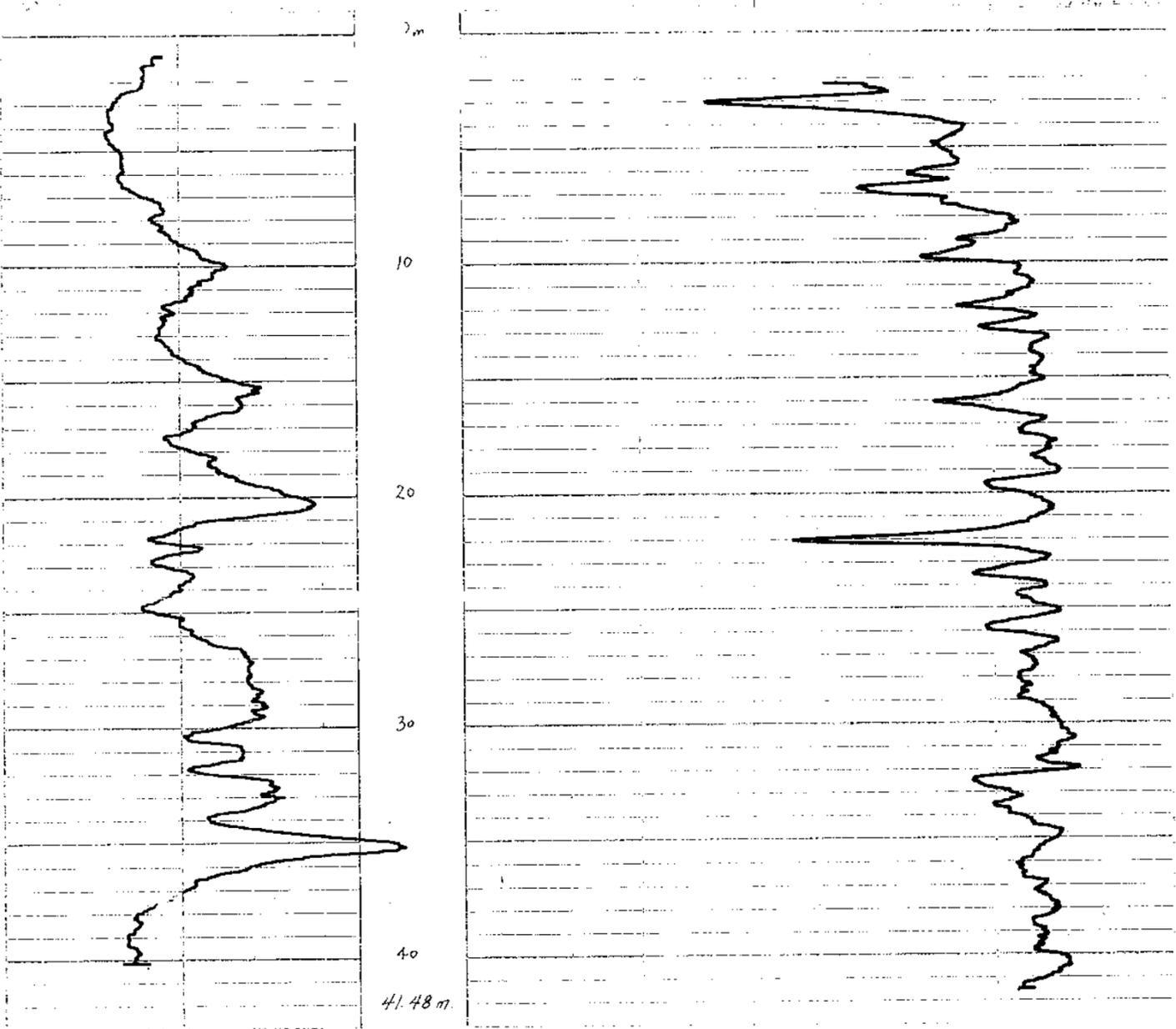
	Run No. 1	Run No. 2	MUD	Run No. 1	Run No. 2
Date	15 July 1980		Nature		
First Reading	41.48m		Density		
Last Reading	0.00m		Viscosity	@ °F	@ °F
Footage Logged	42.67m		Resistivity	@ °F	@ °F
Bottom (Driller)	42.67m		Res. @ BHT	@ °F	@ °F
Casing (From Log)			pH		
Casing (Driller)			Circ. Temp.		
Casing Size			B.H. Temp.		
Bit Size: Surface	4 5/8"				
Bit Size: Main	4 1/2"				
			logged by	N. Dunca, R. Olousch	
			Witnessed by	J. Ridley, K. Yip	

REMARKS _____

* Reg. U.S. Pat. Off.

GAMMA
100 CPS

Density
500 CPS



FO-139

639

80-6

PR-South Mt. Gething 80(3)A

Widco

WELL LOG

COMPANY Utah Mines Ltd.
 WELL RDH-SMG-80-6
 LOCATION 6,203,869Nx540,885E

COMPANY Utah Mines Ltd.
 AREA South Mt. Gething
 WELL RDH-SMG-80-6
 COUNTY Peace R. Land STATE B.C.
 District

COORDINATES:
 N 6,203,869Nx
 S 540,885E
 ELEVATION: 861.1m
 D.F. _____
 X.B. _____
 G.I. _____

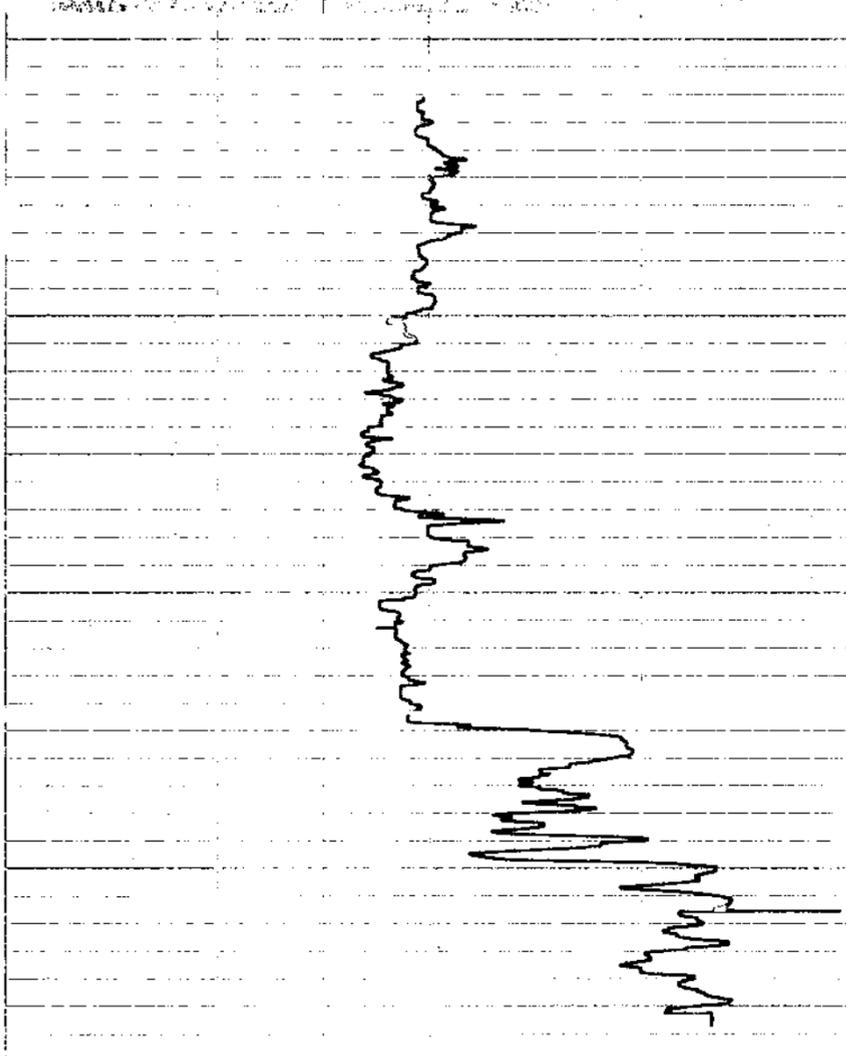
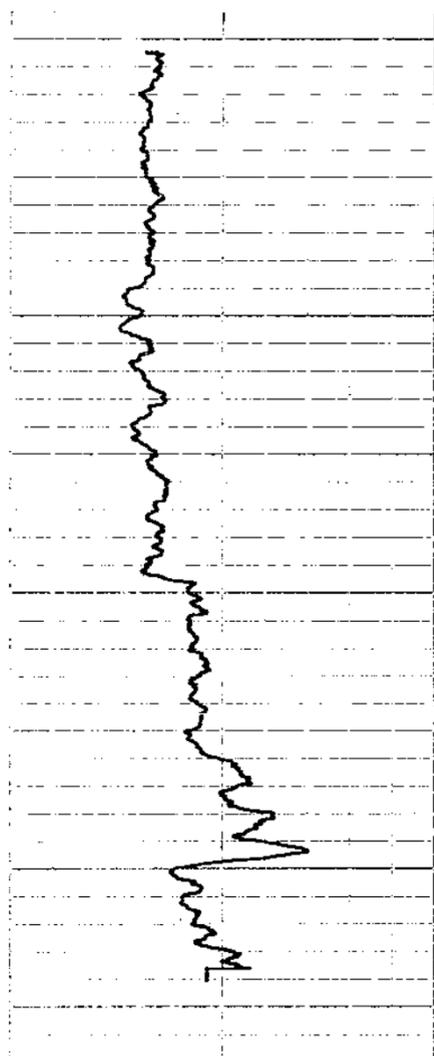
	Run No. 1	Run No. 2	MUD	Run No. 1	Run No. 2
Date	16 July 1980		Nature		
First Reading	35.39m		Density		
Last Reading	0.00m		Viscosity	@ °F	@ °F
Footage Logged	36.58m		Resistivity	@ °F	@ °F
Bottom (Driller)	36.58m		Res. @ BHT	@ °F	@ °F
Casing (From Log)			pH		
Casing (Driller)			Circ. Temp.		
Casing Size			B.H. Temp.		
Bit Size: Surface	4 5/8"				
Bit Size: Main	4 1/2"				
			Logged by	K.Yip, K. Hartman	
			Witnessed by	R. Olason	

REMARKS _____

* Reg. U.S. Pat. Off.

GAMMA
100 CPS

RESISTIVITY
20 OHMS



FO-139

639

80-6

PE-South Mt. Gething 80(3)A

Widco

WELL LOG

COMPANY Utah Mines Ltd.
 AREA South Mt. Gething
 WELL RDH-SMG-80-6
 COUNTY Peace R. Land STATE B.C.
 District

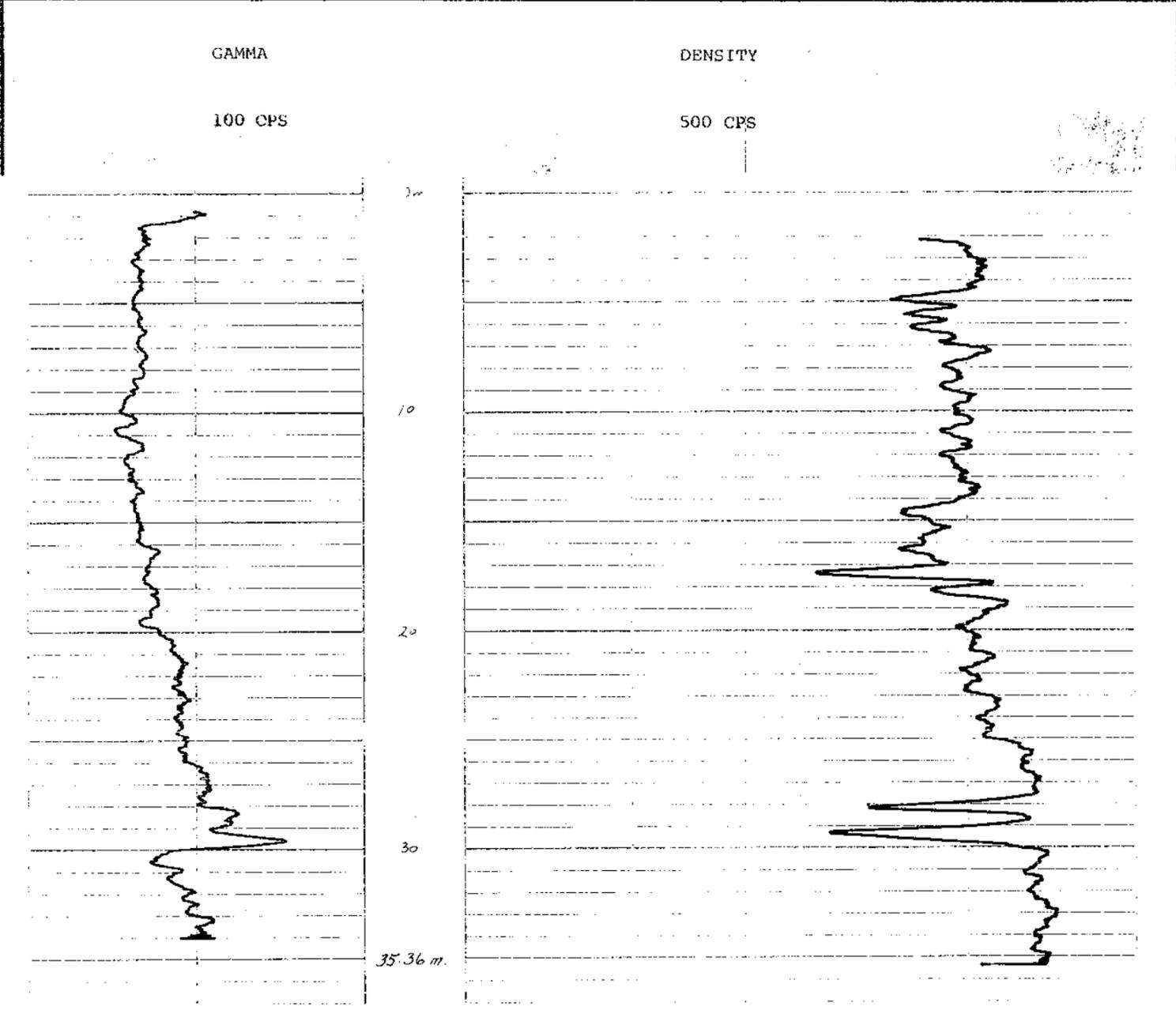
COORDINATES:
 N 6,203,869N
 S 540,885E
 ELEVATION: 861.1m
 D.F. _____
 K.B. _____
 G.I. _____

COMPANY Utah Mines Ltd.
 WELL RDH-SMG-80-6
 LOCATION 6,203,869N
540,885E
South Mt. Gething

	Run No. 1	Run No. 2	MUD	Run No. 1	Run No. 2
Date	16 July 1980		Nature		
First Reading	35.36m		Density		
Last Reading	0.00m		Viscosity	@ °F	@ °F
Footage Logged	36.58m		Resistivity	@ °F	@ °F
Bottom (Driller)	36.58m		Res. @ BHT	@ °F	@ °F
Casing (From Log)			pH		
Casing (Driller)			Circ. Temp.		
Casing Size			B.H. Temp.		
Bit Size: Surface	4 5/8"				
Bit Size: Main	4 1/2"				
			Logged by	K.Yip, K.Hartman	
			Witnessed by	R.Olouson	

REMARKS _____

* Reg. U.S. Pat. Off.



FO-139

639

80-7

PR- South Mt. Gething 80(3)A

Widco

WELL LOG

COMPANY Utah Mines Ltd.
WELL RDH-SMG-80-7

LOCATION 6,203,814NS40,805E
South Mt. Gething

COMPANY Utah Mines Ltd.
AREA South Mt. Gething
WELL RDH-SMG-80-7
COUNTY Peace R. Land STATE B.C.
District

COORDINATES:
N 6,203,814 NX
S 540,805E
ELEVATION: 871.3m
D.F. _____
K.B. _____
G.I. _____

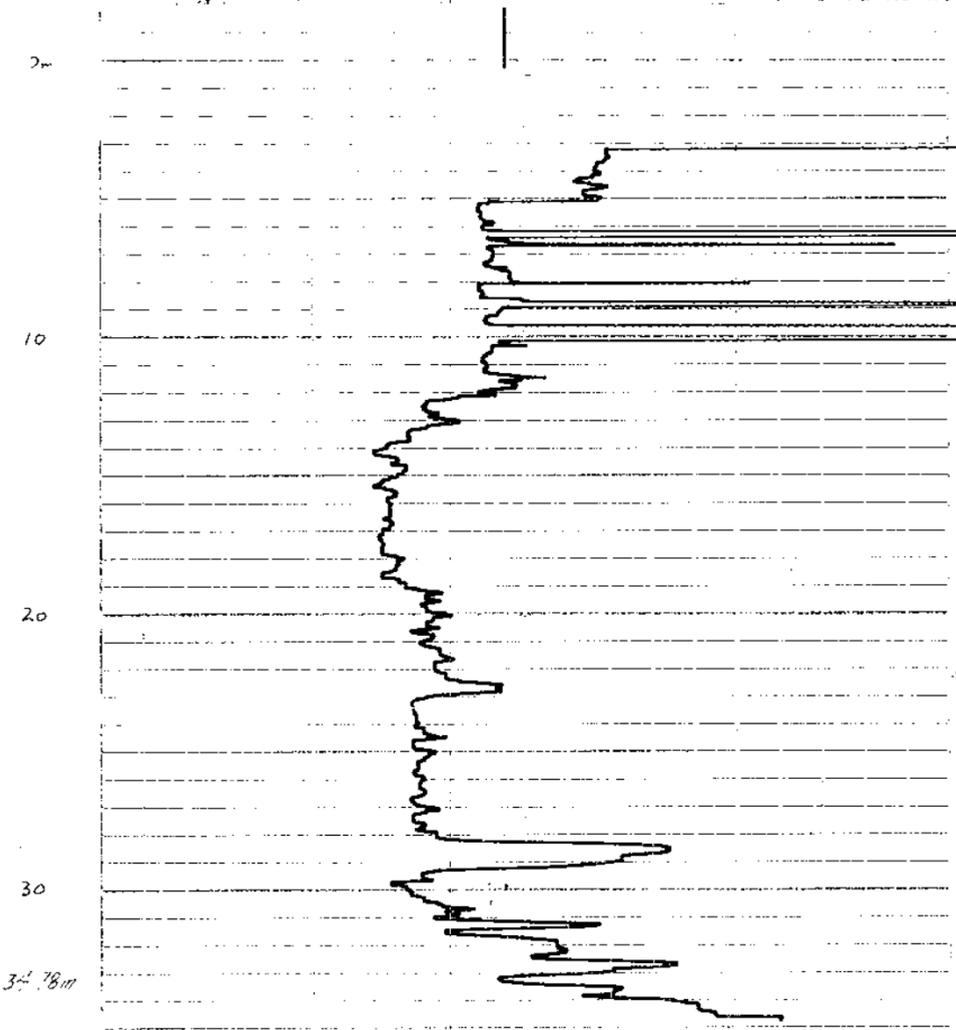
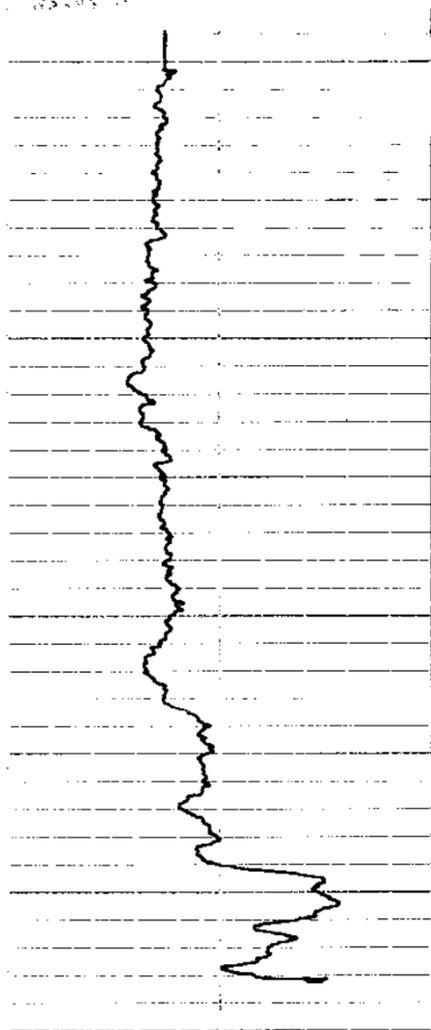
	Run No. 1	Run No. 2	MUD	Run No. 1	Run No. 2
Date	17 July, 1980		Nature		
First Reading	34.78m		Density		
Last Reading	0.00m		Viscosity	@ °F	@ °F
Footage Logged	35.97m		Resistivity	@ °F	@ °F
Bottom (Driller)	35.97m		Res. @ BHT	@ °F	@ °F
Casing (From Log)			pH		
Casing (Driller)			Circ. Temp.		
Casing Size			B.H. Temp.		
Bit Size: Surface	4 5/8"				
Bit Size: Main	4 1/2"				
			Logged by	K. Yip, E. Anderson	
			Witnessed by	. Hartman, R. Clouston	

REMARKS _____

* Reg. U.S. Pat. Off.

GAMMA
100 CPS

RESISTIVITY
20 OHMS



FO-139

639

80-7

PR-South Mt. Gething 80 (3)A

Widco

WELL LOG

COMPANY Utah Mines Ltd.
 WELL RDH-SMG-80-7
 LOCATION 6, 203, 814NX540, 805E
South Mt. Gething

COMPANY Utah Mines Ltd.
 AREA South Mt. Gething
 WELL RDH-SMG-80-7
 COUNTY Peace R. Land STATE B.C.
District

COORDINATES:
 N 6,203,814 NX
 S 540,805E
 ELEVATION: 871.3m
 D.F. _____
 K.B. _____
 G.L. _____

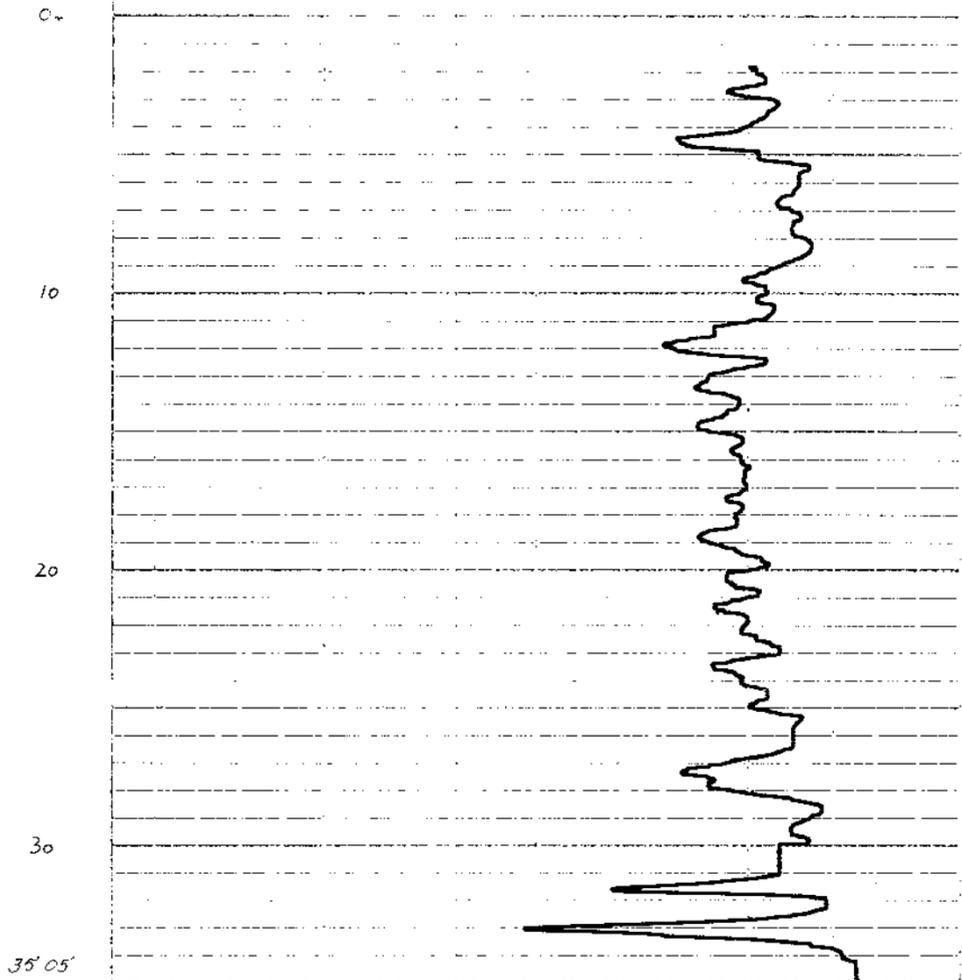
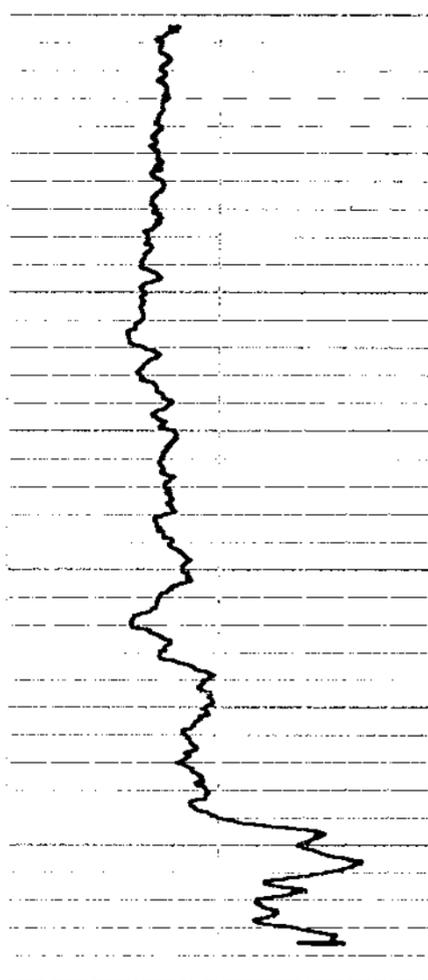
	Run No. 1	Run No. 2	MUD	Run No. 1	Run No. 2
Date	17 July 1980		Nature		
First Reading	35.05m		Density		
Last Reading	0.00m		Viscosity	@ °F	@ °F
Footage Logged	35.97m		Resistivity	@ °F	@ °F
Bottom (Driller)	35.97m		Res. @ BHT	@ °F	@ °F
Casing (From Log)			pH		
Casing (Driller)			Circ. Temp.		
Casing Size			B.H. Temp.		
Bit Size: Surface	4 5/8"				
Bit Size: Main	4 1/2"				
			Logged by	K. Yip, R. Olauson	
			Witnessed by	E. Anderson, K. Hartman	

REMARKS

Reg. U.S. Pat. Off.

GAMMA
100 CPS

DENSITY
500 CPS



FO-139

639

PR. South Mt Gething 80(3)A

Widco*

WELL LOG

COMPANY Utah Mines Ltd.
 WELL S.M.G. 80-8 R.D.H.
 LOCATION South Mt. Gething

COMPANY Utah Mines Ltd.
 AREA South Mt. Gething
 WELL SMG 80-8 RDH
 COUNTY Peace R. Land District STATE B.C.

COORDINATES: 6,203,759m N
N 540,605 m E
 S
 ELEVATION: 884.9m
 D.F. _____
 K.B. _____
 G.I. _____

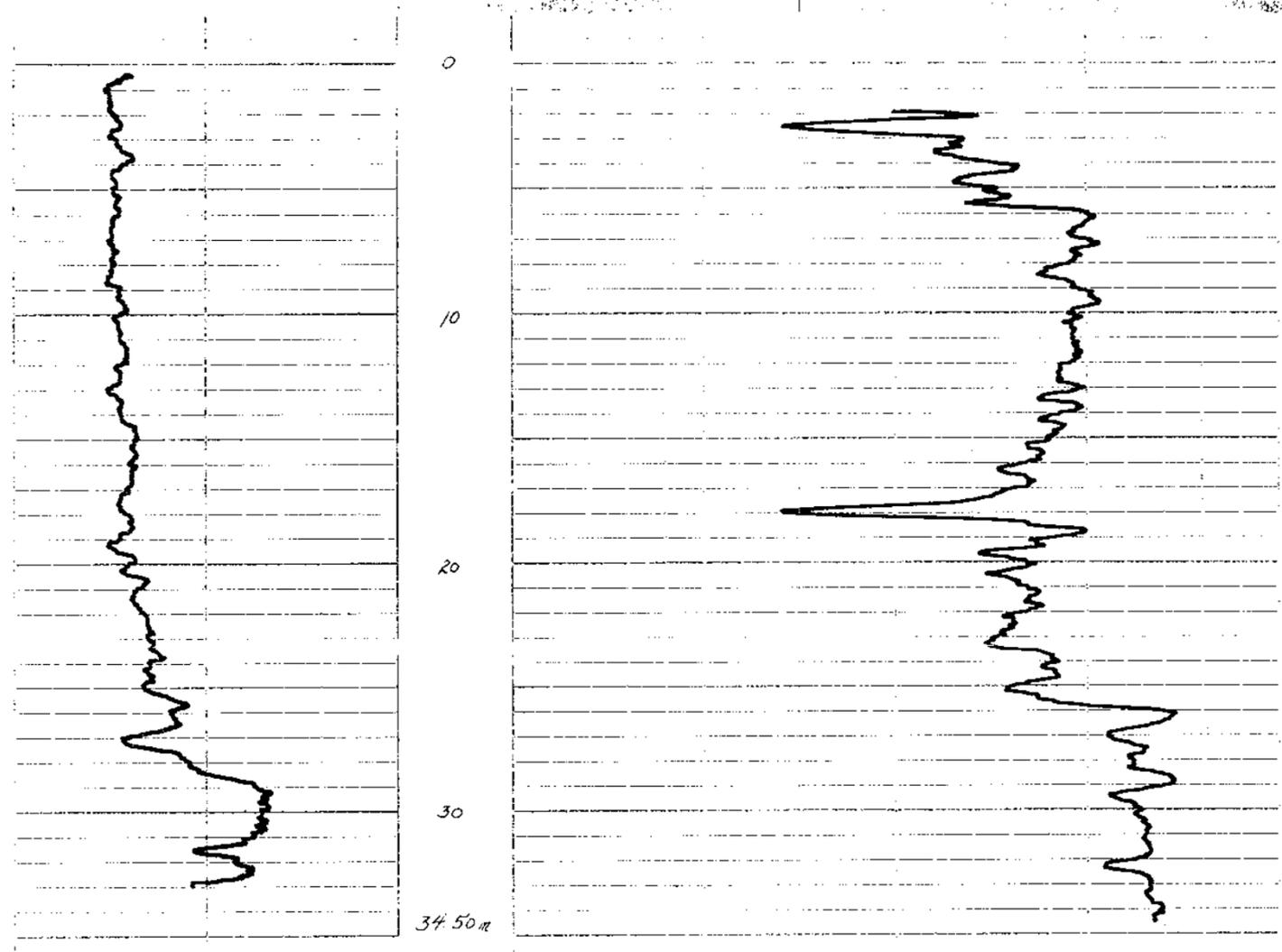
	Run No. 1	Run No. 2	MUD	Run No. 1	Run No. 2
Date	July 19, 1980		Nature		
First Reading	34.5 m		Density		
Last Reading	0 m		Viscosity	@ °F	@ °F
Footage Logged	34.5 m		Resistivity	@ °F	@ °F
Bottom (Driller)	35.7 m		Res. @ BHT	@ °F	@ °F
Casing (From Log)	-		pH		
Casing (Driller)	-		Circ. Temp.		
Casing Size	-		B.H. Temp.		
Bit Size:	4.5" (11.43 cm)				
Bit Size:					
			Logged by	K. Yip	
			Witnessed by	R. Olason	

REMARKS _____

* Reg. U.S. Pat. Off.

GAMMA
 100 cps

DENSITY
 500 cps



FO-139

639

80-8

PR-South Mt. Gething 80(3)A

Widco

WELL LOG

COMPANY Utah Mines Ltd.
 WELL SMG 80-8 RDH
 LOCATION South Mt. Gething

COMPANY Utah Mines Ltd.
 AREA South Mt. Gething
 WELL SMG 80-8 RDH
 COUNTY Peace R. Land District STATE B.C.

COORDINATES:
 N 6,203,759 m N
 S 540,605 m E
 ELEVATION: 884.9m
 D.F. _____
 K.B. _____
 G.L. _____

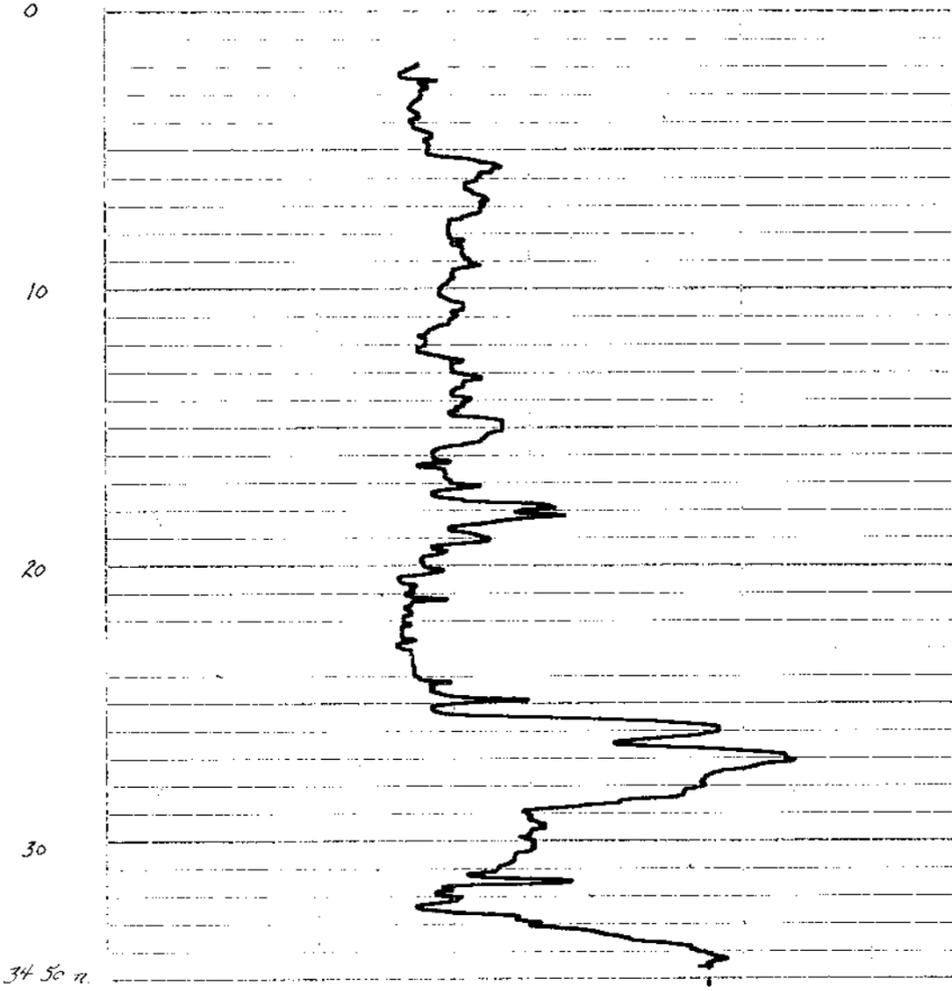
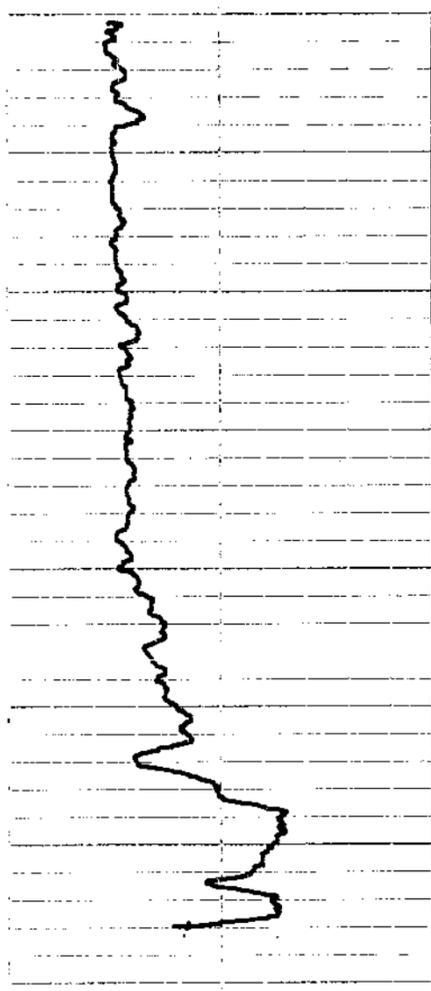
	Run No. 1	Run No. 2	MUD	Run No. 1	Run No. 2
Date	July 19, 1980		Nature		
First Reading	34.5 m		Density		
Last Reading	0		Viscosity	@ °F	@ °F
Footage Logged	34.5 m		Resistivity	@ °F	@ °F
Bottom (Driller)	35.7 m		Res. @ BHT	@ °F	@ °F
Casing (From Log)	-		pH		
Casing (Driller)	-		Circ. Temp.		
Casing Size	-		B.H. Temp.		
Bit Size:	4.5" (11.43 cm)				
Bit Size:					
			Logged by	K. Yip	
			Witnessed by	R. Olafson	

REMARKS _____

* Reg. U.S. Pat. Off.

GAMMA
100 cps

RESISTIVITY
20 ohms/in



FO-139

639

PR. South Mt. Gething 80 (3)A

Widco WELL LOG

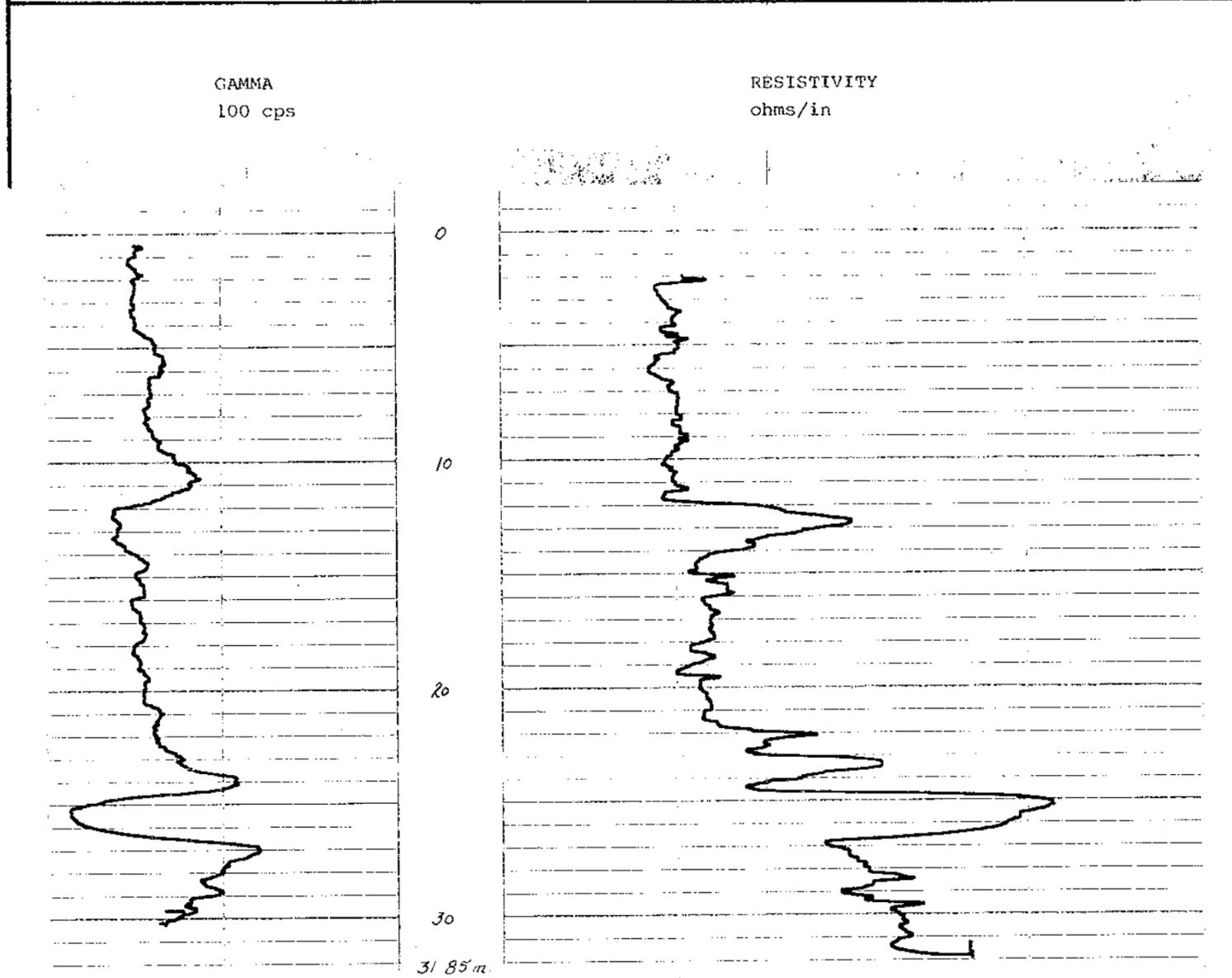
COMPANY Utah Mines Ltd.
 WELL SMG 80-12 R.D.H.
 LOCATION South Mt. Gething

COMPANY	Utah Mines Ltd.	COORDINATES: 6,203,364m.N
AREA	South Mt. Gething	N 541,310 m. E.
WELL	SMG 80-12 R.D.H.	S
COUNTY	Peace R. Land District	ELEVATION: 746.9 m.
STATE	B.C.	D.F.
		K.B.
		G.L.

	Run No. 1	Run No. 2	MUD	Run No. 1	Run No. 2
Date	July 21, 1980		Nature		
First Reading	31.85m		Density		
Last Reading	0		Viscosity	@ °F	@ °F
Footage Logged	31.85 m		Resistivity	@ °F	@ °F
Bottom (Driller)	-		Res. @ BHT	@ °F	@ °F
Casing (From Log)	-		pH		
Casing (Driller)	-		Circ. Temp.		
Casing Size	-		B.H. Temp.		
Bit Size:	4.5 (11.43cm)				
Bit Size:					
			Logged by	K. Yip	
			Witnessed by	R. Olauson	

REMARKS

* Reg. U.S. Pat. Off.



FO-139

639

PR - South Mt Gething 80(3)A

Widco*

WELL LOG

COMPANY Utah Mines Ltd.
 WELL SMG-80-12 RDH
 LOCATION South Mt. Gething

COMPANY Utah Mines Ltd.
 AREA South Mt. Gething B.C.
 WELL SMG 80-12 RDH
 COUNTY Peace River Land District STATE B.C.

COORDINATES: 6,203,364 N
541,310 E
S
 ELEVATION: 746.9
 D.F. _____
 K.B. _____
 G.I. _____

	Run No. 1	Run No. 2	MUD	Run No. 1	Run No. 2
Date	July 21, 1980		Nature		
First Reading	31.67 m		Density		
Last Reading	0		Viscosity	@ °F	@ °F
Footage Logged	31.67 m		Resistivity	@ °F	@ °F
Bottom (Driller)	32.0 m		Res. @ BHT	@ °F	@ °F
Casing (From Log)	-		pH		
Casing (Driller)	-		Circ. Temp.		
Casing Size	-		B.H. Temp.		
Bit Size:	4 1/2" (11.43 cm)				
Bit Size:					
			Logged by	K. Yip	
			Witnessed by	R. Olauson	

REMARKS _____

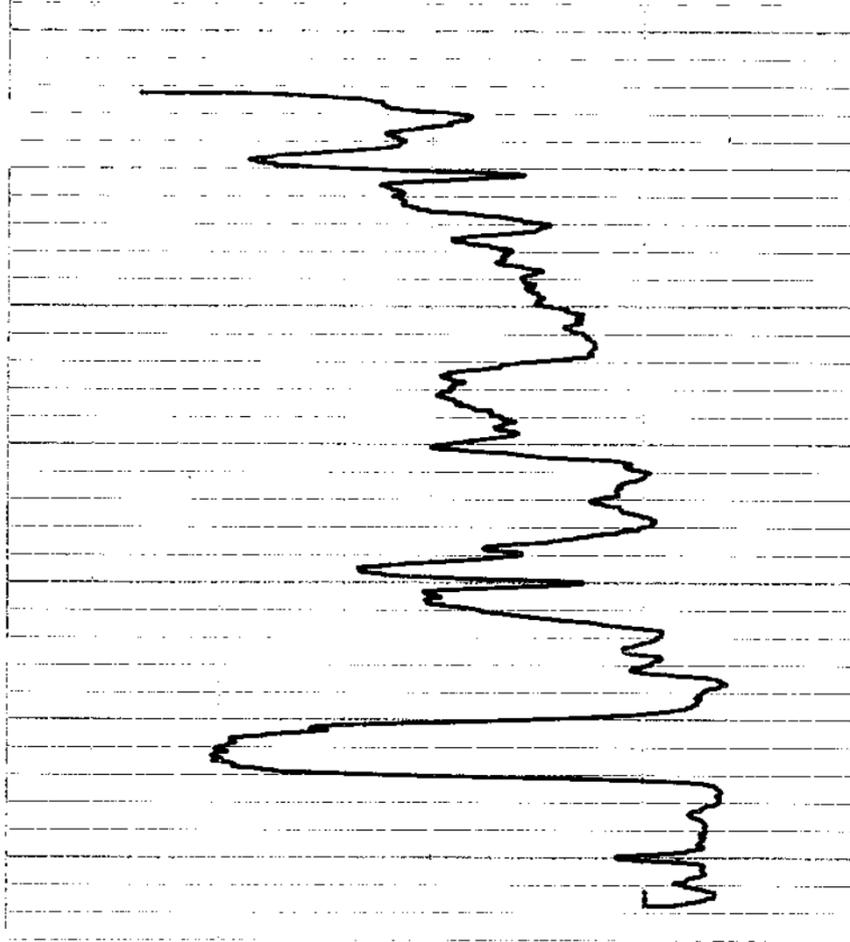
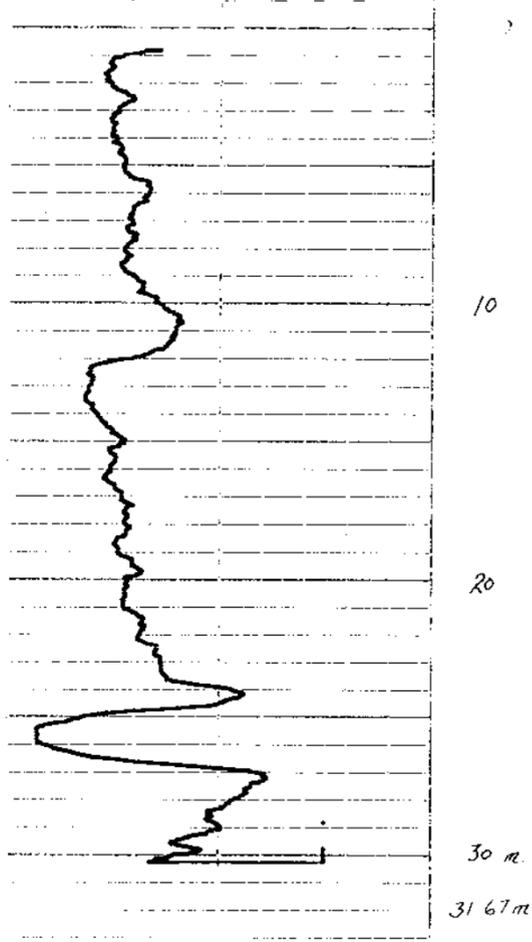
* Reg. U.S. Pat. Off.

GAMMA

100 cps

DENSITY

500 cps



639

PR-South Mt. Gething 80(3)A

Widco

WELL LOG

COMPANY Utah Mines Ltd.
 AREA South Mt. Gething
 WELL RDH-SMG-80-13
 COUNTY Peace R. Land Dist STATE B.C.

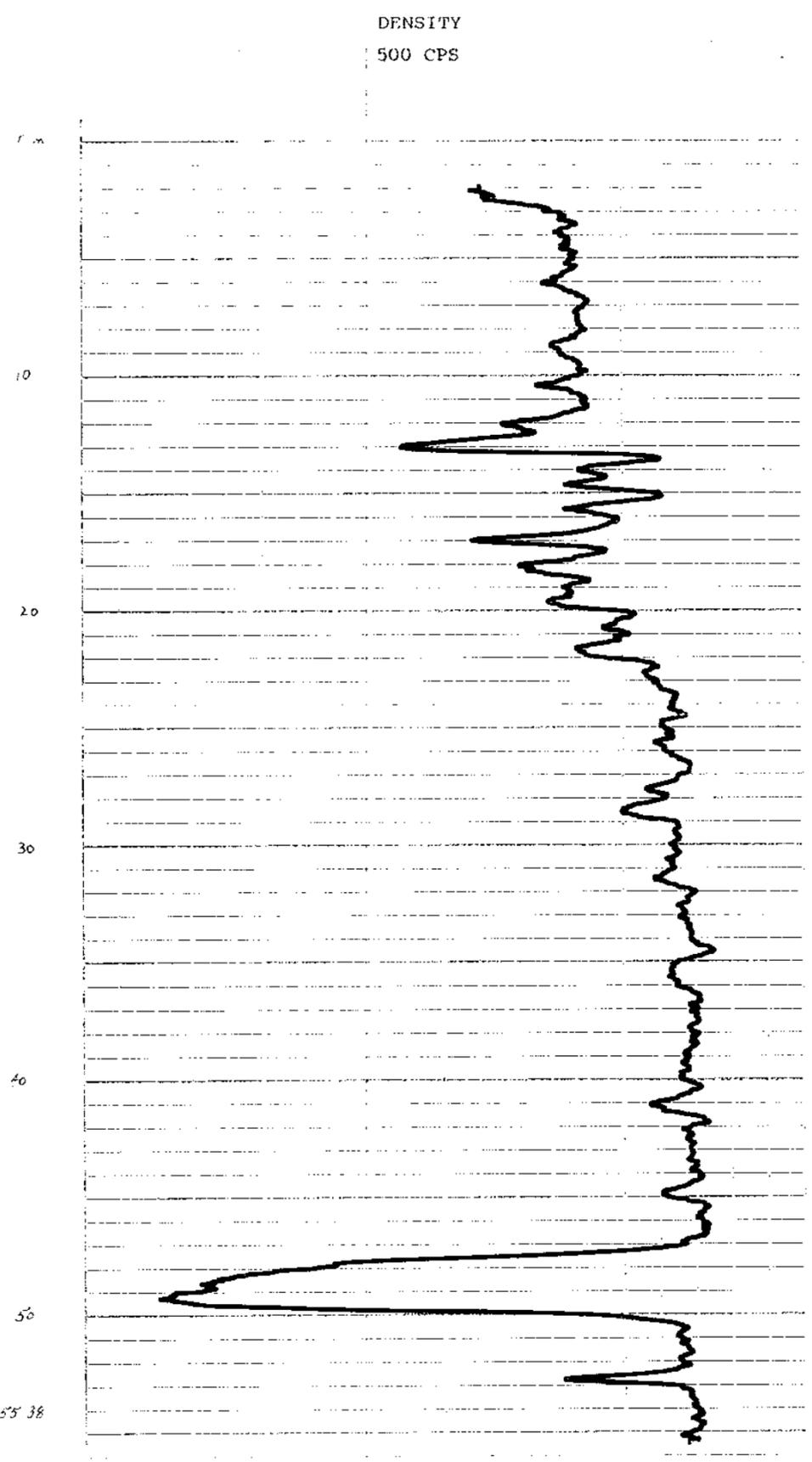
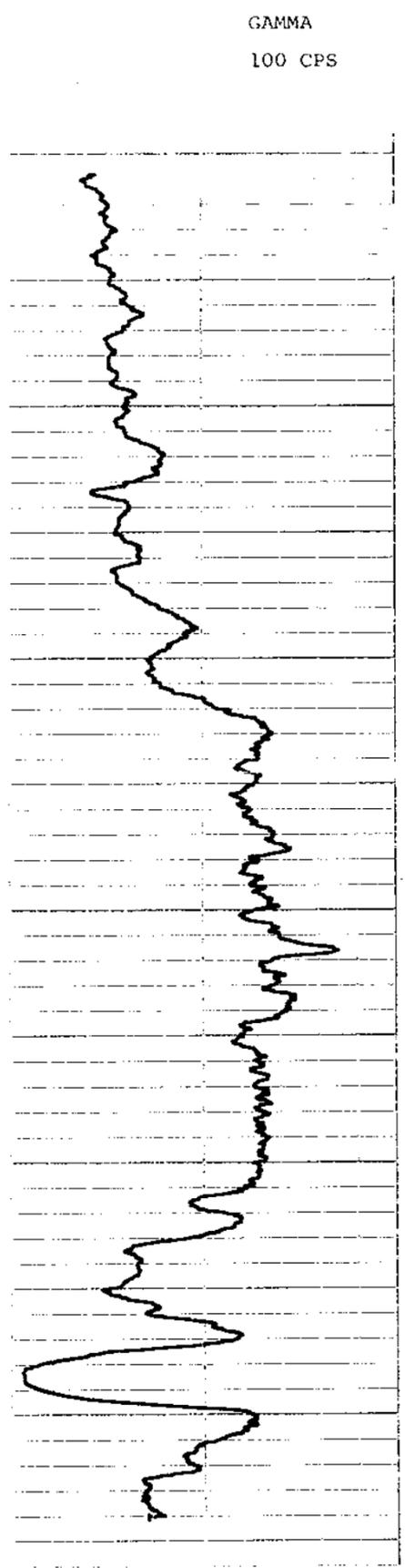
COORDINATES:
 N 6,203,343N
 S 541,265E
 ELEVATION: 748.1m
 D.F. _____
 K.B. _____
 G.I. _____

COMPANY Utah Mines Ltd.
 WELL RDH-SMG-80-13
 LOCATION 6,203,343N X 541,265E
South Mt. Gething

	Run No. 1	Run No. 2	MUD	Run No. 1	Run No. 2
Date	21 July 1980		Nature		
First Reading	55.38m		Density		
Last Reading	0.00m		Viscosity	@ °F	@ °F
Footage Logged	56.39m		Resistivity	@ °F	@ °F
Bottom (Driller)	56.39m		Res. @ BHT	@ °F	@ °F
Casing (From Log)			pH		
Casing (Driller)			Circ. Temp.		
Casing Size			B.H. Temp.		
Bit Size: Surface	4 5/8"		Logged by	K. Yip	
Bit Size: Main	4 1/2"		Witnessed by	R. Olauson	

REMARKS _____

* Reg. U.S. Pat. Off.



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DR. South Mt. Gething 80(3)A

Widco WELL LOG

COMPANY Utah Mines Ltd.
 AREA South Mt. Gething
 WELL RDH-SMG-80-13
 COUNTY Peace R. Land STATE B.C.
District

COORDINATES:
 N 6,203,343N
 S 541,265E
 ELEVATION: 748.1m
 D.F. _____
 K.B. _____
 G.I. _____

COMPANY Utah Mines
 WELL RDH-SMG-80-13
 LOCATION 6,203,343N X 541,265E
South Mt. Gething

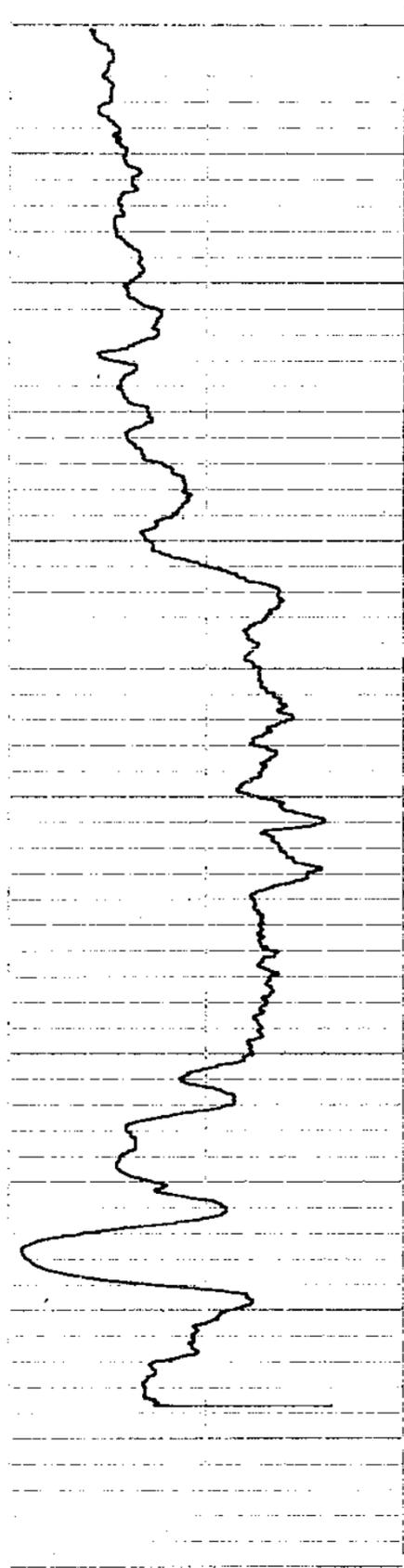
	Run No. 1	Run No. 2	MUD	Run No. 1	Run No. 2
Date	21 July 1980		Nature		
First Reading	55.41m		Density		
Last Reading	0.00m		Viscosity	@ °F	@ °F
Footage Logged	56.39m		Resistivity	@ °F	@ °F
Bottom (Driller)	56.39m		Res. @ BHT	@ °F	@ °F
Casing (From Log)			pH		
Casing (Driller)			Circ. Temp.		
Casing Size			B.H. Temp.		
Bit Size: Surface	4 5/8"				
Bit Size: Main	4 1/2"				
			Logged by	K. Yip	
			Witnessed by	R. Olouson	

REMARKS _____

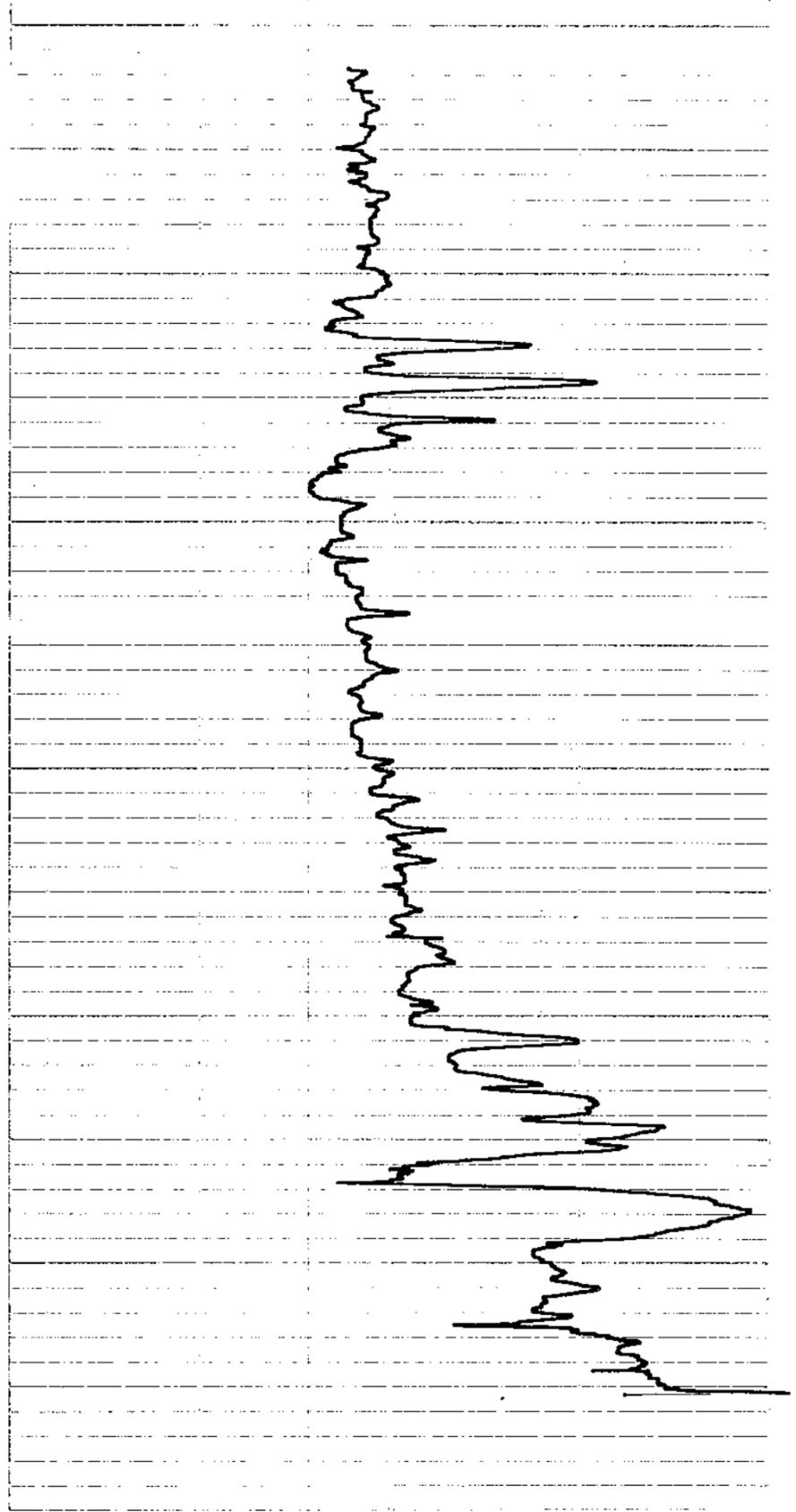
* Reg. U.S. Pat. Off.

GAMMA
100 CPS

RESISTIVITY
20 OHMS



10
20
30
40
50
55.4



PR-South Mt. Getting 80(4)A

"1980 Report of Exploration Activities
on the South Mt. Getting Property"
Utah Mines Ltd.

COAL QUALITY DATA

639

APPENDIX II

ANALYTICAL DATA FOR
D.D.H. SMG 80-11

~~CONFIDENTIAL~~
LOGICAL BRANCH
ASSESSMENT REPORT

00 639

SUNNYVALE MINERALS LABORATORY

SOUTH MOUNT GETTING COAL

HOLE SMG-80-11

38.41-39.86 METERS

SAMPLE #1

3/8" X 28M

WASHABILITY TEST

PRODUCT	AIR DRY BASIS							MOISTURE FREE BASIS				
	% H2O	% ASH	% S	% VM	% FC	BTU	FSI	% ASH	% S	% VM	% FC	BTU
HEAD	1.16	24.79	1.08	28.29	45.76	10815	7 1/2	25.08	1.09	28.62	46.30	10942

MOISTURE FREE BASIS

SP. GR.	% WT.	ELEMENTARY DATA						CUMULATIVE DATA					
		% ASH	% S	% VM	% FC	BTU	FSI	% WT.	% ASH	% S	% VM	% FC	BTU
1.300F	26.76	3.22	1.08	33.65	63.13	14879	8	26.76	3.22	1.08	33.65	63.13	14879
1.350F	18.80	6.31	1.13	31.87	61.82	14381	7 1/2	45.56	4.50	1.10	32.92	62.58	14674
1.400F	5.56	12.57	1.32	27.09	60.34	13172	6 1/2	51.12	5.37	1.12	32.28	62.35	14510
1.450F	3.13	19.45	1.19	25.05	55.50	12278	7	54.25	6.19	1.13	31.87	61.94	14382
1.500F	5.51	25.69	1.18	24.84	49.47	11261	6 1/2	59.76	7.99	1.13	31.22	60.79	14094
1.550F	5.72	32.05	1.75	23.84	44.11	10288	6	65.48	10.09	1.19	30.57	59.34	13761
1.600F	3.66	35.78	1.16	23.05	41.17	9644	6	69.14	11.45	1.18	30.18	58.37	13543
1.800F	6.08	42.62	1.07	22.39	34.99	8362	4 1/2	75.22	13.97	1.17	29.55	56.48	13125
1.800S	24.78	66.25	0.56	18.96	14.79	3816	0	100.00	26.92	1.02	26.92	46.16	10818
TOTAL	100.00	26.92	1.02	26.92	46.16	10818							

SUNNYVALE MINERALS LABORATORY

SOUTH MOUNT GETTING COAL

HOLE SMG-80-11

38.41-39.86 METERS

SAMPLE #1 (28M X 0)

FLOTATION TEST

MOISTURE FREE BASIS

SP. GR.	% WT.	ELEMENTARY DATA						% DISTRIBUTION				
		% ASH	% S	% VM	% FC	BTU	FSI	ASH	S	VM	FC	BTU
CONC I.	59.70	8.34	1.09	26.90	64.76	13910	7	26.44	55.31	63.70	69.09	68.86
CONC II.	32.42	25.43	1.17	23.04	51.53	10974	3 1/2	43.78	32.20	29.63	29.85	29.51
REFUSE	7.88	71.14	1.87	21.34	7.52	2488	0	29.78	12.49	6.67	1.06	1.63
TOTAL	100.00	18.83	1.18	25.21	55.96	12058		100.00	100.00	100.00	100.00	100.00

STRUCTURES

<u>SIZE</u>	<u>% WEIGHT</u>	<u>CUM. %WT.</u>
3/8" X 28M	87.09	87.09
28M X 0	12.91	100.00
<u>TOTAL</u>	<u>100.00</u>	

SUNNYVALE MINERALS LABORATORY

SOUTH MOUNT GETTING COAL

HOLE SMG-80-11

SAMPLE #1

3/8" X 0

HEAD ANALYSIS

MINERAL ANALYSIS OF ASH PERCENT WEIGHT IGNITED BASIS

Silica, SiO ₂	39.90
Alumina, Al ₂ O ₃	28.30
Titania, TiO ₂	0.81
Ferric oxide, Fe ₂ O ₃	9.25
Lime, CaO	2.21
Magnesia, MgO	1.48
Potassium oxide, K ₂ O	1.23
Sodium oxide, Na ₂ O	0.16
Sulfur trioxide, SO ₃	2.20
Phos. pentoxide, P ₂ O ₅	<u>5.78</u>
Undetermined	<u>8.68</u>
Total	100.00

ALKALIES AS Na ₂ O, DRY COAL BASIS	= 0.24
SILICA VALUE	= 75.51
BASE: ACID RATIO	= 0.21
FOULING INDEX	= 0.03
SLAGGING INDEX	= 0.23

SUNNYVALE MINERALS LABORATORY

SOUTH MOUNT GETTING COAL

HOLE S-MG-80-11

SAMPLE #1

3/8" X 0

HEAD ANALYSIS

ULTIMATE ANALYSIS

	<u>AIR DRY BASIS</u>	<u>MOISTURE FREE BASIS</u>
% MOISTURE	1.16	--
% CARBON	62.52	63.25
% HYDROGEN	4.18	4.23
% NITROGEN	1.02	1.03
% CHLORINE	0.02	0.02
% SULFUR	1.08	1.09
% ASH	24.79	25.08
% OXYGEN (DIFF.)	5.23	5.30
TOTAL	100.00	100.00

FUSION TEMP. OF ASH

	<u>Oxidizing</u>	<u>Reducing</u>
Initial deformation	2268	2218
Softening (H=W)	2443	2293
Softening (H=1/2 W)	2518	2343
Fluid	2708	2668

SUNNYVALE MINERALS LABORATORY

SOUTH MOUNT GETHING COAL

HOLE SMG-80-11

44.85-46.02 METERS

SAMPLE #2

3/8" X 28M

WASHABILITY TEST

AIR DRY BASIS

MOISTURE FREE BASIS

<u>PRODUCT</u>	<u>% H2O</u>	<u>% ASH</u>	<u>% S</u>	<u>% VM</u>	<u>% FC</u>	<u>BTU</u>	<u>FSI</u>	<u>% ASH</u>	<u>% S</u>	<u>% VM</u>	<u>% FC</u>	<u>BTU</u>
HEAD	1.41	9.91	0.98	31.86	56.82	13393	7 1/2	10.05	0.99	32.32	57.63	13585

MOISTURE FREE BASIS

<u>SP. GR.</u>	<u>% WT.</u>	<u>ELEMENTARY DATA</u>						<u>CUMULATIVE DATA</u>					
		<u>% ASH</u>	<u>% S</u>	<u>% VM</u>	<u>% FC</u>	<u>BTU</u>	<u>FSI</u>	<u>% WT.</u>	<u>% ASH</u>	<u>% S</u>	<u>% VM</u>	<u>% FC</u>	<u>BTU</u>
1.300F	61.20	2.39	0.90	34.39	63.22	15065	9	61.20	2.39	0.90	34.39	63.22	15065
1.350F	19.83	4.01	0.83	33.43	62.56	14719	8 1/2	81.03	2.79	0.88	34.16	63.05	14980
1.400F	2.96	11.85	0.94	30.68	57.47	13275	8	83.99	3.11	0.89	34.03	62.86	14920
1.450F	1.45	17.13	1.17	29.37	53.50	12187	8 1/2	85.44	3.34	0.89	33.95	62.71	14874
1.500F	0.86	21.59	1.23	28.24	50.17	11147	8	86.30	3.53	0.89	33.90	62.57	14837
1.550F	0.45	22.47	1.72	27.97	49.56	10956	7	86.75	3.62	0.90	33.87	62.51	14816
1.800F	1.96	33.87	1.39	27.19	38.94	8698	6 1/2	88.71	4.29	0.91	33.72	61.99	14681
1.800S	11.29	51.07	1.25	19.39	29.54	5035	1 1/2	100.00	9.57	0.95	32.10	58.33	13592
TOTAL	100.00	9.57	0.95	32.10	58.33	13592							

SUNNYVALE MINERALS LABORATORY

ROUTE MOUNT TESTING COAL

HOLE SMG-80-11

44.85-46.02 METERS

SAMPLE #2 (28M X 0)

FLOTATION TEST

MOISTURE FREE BASIS

SP. GR.	% WT.	ELEMENTARY DATA						% DISTRIBUTION				
		% ASH	% S	% VM	% FC	BTU	FSI	ASH	S	VM	FC	BTU
CONC I.	67.02	4.95	0.91	31.63	63.42	14492	8	35.39	56.74	72.50	69.24	71.73
CONC II.*	32.98	18.36	1.41	24.38	57.26	11604	6 1/2	64.61	43.26	27.50	30.76	28.27
TOTAL	100.00	9.37	1.07	29.24	61.39	13540		100.00	100.00	100.00	100.00	100.00

* CONTAINS 2.27 % OF REFUSE

STRUCTURES

SIZE	% WEIGHT	CUM. %WT.
3/8" X 28M	88.66	88.66
28M X 0	11.34	100.00
TOTAL	100.00	

SUNNYVALE MINERALS LABORATORY

SOUTH MOUNT GETHING COAL

HOLE SNG-80-11

SAMPLE #2

3/8" X 0

HEAD ANALYSIS

MINERAL ANALYSIS OF ASH PERCENT WEIGHT IGNITED BASIS

Silica, SiO ₂	21.10
Alumina, Al ₂ O ₃	6.05
Titania, TiO ₂	0.34
Ferric oxide, Fe ₂ O ₃	51.40
Lime, CaO	4.49
Magnesia, MgO	7.85
Potassium oxide, K ₂ O	0.39
Sodium oxide, Na ₂ O	0.36
Sulfur trioxide, SO ₃	4.75
Phos. pentoxide, P ₂ O ₅	0.46
Undetermined	2.81
Total	<u>100.00</u>

ALKALIES AS Na ₂ O, DRY COAL BASIS	= 0.06
SILICA VALUE	= 24.87
BASE: ACID RATIO	= 2.35
FOULING INDEX	= 0.84
SLAGGING INDEX	= 2.32

SUNNYVALE MINERALS LABORATORY

SOUTH MOUNT GETHING COAL

HOLE SMG-80-11

SAMPLE #2

3/8" X 0

HEAD ANALYSIS

ULTIMATE ANALYSIS

	<u>AIR DRY BASIS</u>	<u>MOISTURE FREE BASIS</u>
% MOISTURE	1.41	—
% CARBON	76.20	77.29
% HYDROGEN	4.50	4.56
% NITROGEN	1.09	1.11
% CHLORINE	0.02	0.02
% SULFUR	0.98	0.99
% ASH	9.91	10.05
% OXYGEN (DIFF.)	5.89	5.98
TOTAL	100.00	100.00

FUSION TEMP. OF ASH

	<u>Oxidizing</u>	<u>Reducing</u>
Initial deformation	2733	2248
Softening (H=W)	> 2777	2328
Softening (H=1/2 W)	> 2777	2493
Fluid	> 2777	2568

SUNNYVALE MINERALS LABORATORY

SOUTH MOUNT GEIHING COAL

HOLE SMG-80-11

79.10-84.12 METERS

SAMPLE #3

3/8" X 28M

WASHABILITY TEST

AIR DRY BASIS

MOISTURE FREE BASIS

<u>PRODUCT</u>	<u>% H2O</u>	<u>% ASH</u>	<u>% S</u>	<u>% VM</u>	<u>% FC</u>	<u>BTU</u>	<u>FSI</u>	<u>% ASH</u>	<u>% S</u>	<u>% VM</u>	<u>% FC</u>	<u>BTU</u>
HEAD	1.15	21.63	0.48	25.38	51.84	11608	4	21.88	0.49	25.68	52.44	11743

MOISTURE FREE BASIS

<u>SP. GR.</u>	<u>% WT.</u>	<u>ELEMENTARY DATA</u>						<u>CUMULATIVE DATA</u>					
		<u>% ASH</u>	<u>% S</u>	<u>% VM</u>	<u>% FC</u>	<u>BTU</u>	<u>FSI</u>	<u>% WT.</u>	<u>% ASH</u>	<u>% S</u>	<u>% VM</u>	<u>% FC</u>	<u>BTU</u>
1.300F	37.49	3.00	0.51	30.39	66.61	14998	8	37.49	3.00	0.51	30.39	66.61	14998
1.350F	23.11	5.25	0.47	29.11	65.64	14537	1 1/2	60.60	3.86	0.50	29.90	66.24	14822
1.400F	8.34	10.04	0.41	27.26	62.70	13715	1	68.94	4.61	0.48	29.58	65.81	14688
1.450F	4.55	16.79	0.40	26.88	56.33	12528	1	73.49	5.36	0.48	29.41	65.23	14554
1.500F	1.73	23.75	0.42	26.01	50.24	11361	1	75.22	5.78	0.48	29.34	64.88	14481
1.550F	1.06	28.36	0.48	25.04	46.60	10596	1	76.28	6.10	0.48	29.28	64.62	14427
1.600F	0.86	32.97	0.45	24.49	42.54	9747	1	77.14	6.40	0.48	29.22	64.38	14375
1.800F	2.79	43.35	0.78	23.67	32.98	8111	1	79.93	7.69	0.49	29.03	63.28	14156
1.800S	20.07	81.87	0.32	16.07	2.06	2008	0	100.00	22.58	0.45	26.43	50.99	11718
TOTAL	100.00	22.58	0.45	26.43	50.99	11718							

SUNNYVALE MINERALS LABORATORY

SOUTH MOUNT GETTING COAL

HOLE SMG-80-11

79.10-84.12 METERS

SAMPLE #3 (28M X 0)

FLOTATION TEST

MOISTURE FREE BASIS

SP. GR.	% WT.	ELEMENTARY DATA						% DISTRIBUTION				
		% ASH	% S	% VM	% FC	BTU	FSI	ASH	S	VM	FC	BTU
CONC I.	62.82	8.93	0.56	27.09	63.98	13886	6 1/2	22.30	73.48	71.62	78.68	78.96
CONC II.	19.58	21.92	0.55	24.35	53.73	11620	1 1/2	17.06	22.55	20.07	20.59	20.60
REFUSE	17.60	86.67	0.11	11.22	2.11	275	0	60.64	3.97	8.31	0.73	0.44
TOTAL	100.00	25.16	0.48	23.76	51.08	11047		100.00	100.00	100.00	100.00	100.00

STRUCTURES

<u>SIZE</u>	<u>% WEIGHT</u>	<u>CUM. %WT.</u>
3/8" X 28M	81.59	81.59
28M X 0	18.41	100.00
<u>TOTAL</u>	<u>100.00</u>	

SUNNYVALE MINERALS LABORATORY

SOUTH MOUNT GETHING COAL

HOLE SMG-80-11

SAMPLE #3

3/8" X 0

HEAD ANALYSIS

MINERAL ANALYSIS OF ASH PERCENT WEIGHT IGNITED BASIS

Silica, SiO ₂	57.30
Alumina, Al ₂ O ₃	33.20
Titania, TiO ₂	0.96
Ferric oxide, Fe ₂ O ₃	2.07
Lime, CaO	1.53
Magnesia, MgO	0.15
Potassium oxide, K ₂ O	0.95
Sodium oxide, Na ₂ O	1.58
Sulfur trioxide, SO ₃	0.99
Phos. pentoxide, P ₂ O ₅	0.47
Undetermined	0.80
Total	<u>100.00</u>

ALKALIES AS Na₂O, DRY COAL BASIS = 0.48

SILICA VALUE = 93.86

BASE: ACID RATIO = 0.07

FOULING INDEX = 0.11

SLAGGING INDEX = 0.03

SUNNYVALE MINERALS LABORATORY

SOUTH MOUNT GETHING COAL

HOLE SNG-80-11

SAMPLE #3

3/8" X 0

HEAD ANALYSIS

ULTIMATE ANALYSIS

	<u>AIR DRY BASIS</u>	<u>MOISTURE FREE BASIS</u>
% MOISTURE	1.15	—
% CARBON	67.07	67.85
% HYDROGEN	4.07	4.12
% NITROGEN	0.96	0.97
% CHLORINE	0.02	0.02
% SULFUR	0.48	0.49
% ASH	21.63	21.88
% OXYGEN (DIFF.)	4.62	4.67
TOTAL	100.00	100.00

FUSION TEMP. OF ASH

	<u>Oxidizing</u>	<u>Reducing</u>
Initial deformation	> 2777	> 2777
Softening (H=W)	> 2777	> 2777
Softening (H=1/2 W)	> 2777	> 2777
Fluid	> 2777	> 2777

SUNNYVALE MINERALS LABORATORY

SOUTH MOUNT GETHING COAL

HOLE SMG-80-11

134.85-141.88 METERS

SAMPLE #4

3/8" X 28M

WASHABILITY TEST

PRODUCT	AIR DRY BASIS						MOISTURE FREE BASIS					
	% H2O	% ASH	% S	% VM	% FC	BTU	FSI	% ASH	% S	% VM	% FC	BTU
HEAD	1.39	5.10	0.48	25.93	67.58	14163	2	5.17	0.49	26.30	68.53	14363

MOISTURE FREE BASIS

SP. GR.	% WT.	ELEMENTARY DATA						CUMULATIVE DATA					
		% ASH	% S	% VM	% FC	BTU	FSI	% WT.	% ASH	% S	% VM	% FC	BTU
1.300F	60.21	1.54	0.48	29.00	69.46	15103	3	60.21	1.54	0.48	29.00	69.46	15103
1.350F	29.09	3.16	0.40	28.61	68.23	14639	1 1/2	89.30	2.07	0.45	28.87	69.06	14952
1.400F	3.68	8.34	0.38	28.43	63.23	13782	1 1/2	92.98	2.32	0.45	28.86	68.82	14906
1.450F	1.46	14.27	0.33	27.53	58.10	12689	1 1/2	94.44	2.50	0.45	28.84	68.66	14872
1.500F	0.88	19.17	0.33	27.14	53.69	11699	1 1/2	95.32	2.65	0.45	28.82	68.53	14842
1.550F	0.65	23.35	0.33	25.30	51.35	10311	1 1/2	95.97	2.79	0.45	28.80	68.41	14812
1.600F	0.75	26.28	0.35	24.01	49.71	9173	2	96.72	2.98	0.45	28.76	68.26	14768
1.800F	1.32	32.09	0.27	21.77	46.14	8244	1 1/2	98.04	3.37	0.44	28.66	67.97	14680
1.800S	1.96	65.30	0.19	14.30	20.40	3952	0	100.00	4.58	0.44	28.38	67.04	14470
TOTAL	100.00	4.58	0.44	28.38	67.04	14470							

SUNNYVALE MINERALS LABORATORY

SOUTH MOUNT GEIHING COAL

HOLE SMG-80-11

134.85-141.88 METERS

SAMPLE #4 (28M X 0)

FLOTATION TEST

MOISTURE FREE BASIS

SP. GR.	% WT.	ELEMENTARY DATA						% DISTRIBUTION				
		% ASH	% S	% VM	% FC	BTU	FSI	ASH	S	VM	FC	BTU
CONC I.	51.25	4.00	0.54	25.70	70.30	14651	2	24.55	54.42	53.29	53.82	54.37
CONC II.	44.95	8.71	0.51	23.88	67.41	13748	1	46.88	44.99	43.44	45.27	44.74
REFUSE	3.80	62.79	0.09	21.25	15.96	3228	0	28.57	0.59	3.27	0.91	0.89
TOTAL	100.00	8.35	0.51	24.71	66.94	13811		100.00	100.00	100.00	100.00	100.00

STRUCTURES

SIZE	% WEIGHT	CUM. %WT.
3/8" X 28M	81.42	81.42
28M X 0	18.58	100.00
TOTAL	100.00	

SUNNYVALE MINERALS LABORATORY

SOUTH MOUNT GETHING COAL

HOLE S-MG-80-11

SAMPLE #4

3/8" X 0

HEAD ANALYSIS

MINERAL ANALYSIS OF ASH PERCENT WEIGHT IGNITED BASIS

Silica, SiO ₂	31.50
Alumina, Al ₂ O ₃	17.40
Titania, TiO ₂	0.65
Ferric oxide, Fe ₂ O ₃	20.60
Lime, CaO	12.10
Magnesia, MgO	5.06
Potassium oxide, K ₂ O	0.66
Sodium oxide, Na ₂ O	1.85
Sulfur trioxide, SO ₃	7.13
Phos. pentoxide, P ₂ O ₅	0.36
Undetermined	2.69
Total	<u>100.00</u>

ALKALIES AS Na ₂ O, DRY COAL BASIS	= 0.12
SILICA VALUE	= 45.48
BASE: ACID RATIO	= 0.81
FOULING INDEX	= 1.50
SLAGGING INDEX	= 0.40

SUNNYVALE MINERALS LABORATORY

SOUTH MOUNT GETHING COAL

HOLE SMG-80-11

SAMPLE #4

3/8" X 0

HEAD ANALYSIS

ULTIMATE ANALYSIS

	<u>AIR DRY BASIS</u>	<u>MOISTURE FREE BASIS</u>
% MOISTURE	1.39	--
% CARBON	82.24	83.40
% HYDROGEN	4.80	4.87
% NITROGEN	1.12	1.14
% CHLORINE	0.02	0.02
% SULFUR	0.48	0.49
% ASH	5.10	5.17
% OXYGEN (DIFF.)	4.85	4.91
TOTAL	100.00	100.00

FUSION TEMP. OF ASH

	<u>Oxidizing</u>	<u>Reducing</u>
Initial deformation	2243	2099
Softening (H=W)	2343	2130
Softening (H=1/2 W)	2368	2140
Fluid	2418	2237

SUNNYVALE MINERALS LABORATORY

SOUTH MOUNT GETTING COAL

HOLE SMG-80-11

128.66-129.43 METERS

SAMPLE #5

3/8" X 28M

WASHABILITY TEST

AIR DRY BASIS

MOISTURE FREE BASIS

<u>PRODUCT</u>	<u>% H2O</u>	<u>% ASH</u>	<u>% S</u>	<u>% VM</u>	<u>% FC</u>	<u>BTU</u>	<u>FSI</u>	<u>% ASH</u>	<u>% S</u>	<u>% VM</u>	<u>% FC</u>	<u>BTU</u>
HEAD	0.54	16.63	0.72	25.13	57.70	12494	5	16.72	0.72	25.27	58.01	12562

MOISTURE FREE BASIS

ELEMENTARY DATA

CUMULATIVE DATA

<u>SP. GR.</u>	<u>% WT.</u>	<u>% ASH</u>	<u>% S</u>	<u>% VM</u>	<u>% FC</u>	<u>BTU</u>	<u>FSI</u>	<u>% WT.</u>	<u>% ASH</u>	<u>% S</u>	<u>% VM</u>	<u>% FC</u>	<u>BTU</u>
1.300F	49.11	2.01	0.83	30.48	67.51	15044	7 1/2	49.11	2.01	0.83	30.48	67.51	15044
1.350F	9.85	4.88	0.72	29.62	65.50	14517	2 1/2	58.96	2.49	0.81	30.34	67.17	14956
1.400F	2.11	10.51	0.69	28.78	60.71	13362	2	61.07	2.77	0.81	30.28	66.95	14901
1.450F	3.52	16.79	0.60	26.30	56.91	12447	1 1/2	64.59	3.53	0.80	30.07	66.40	14768
1.500F	12.81	23.77	0.59	26.01	50.22	11474	1	77.40	6.88	0.76	29.40	63.72	14222
1.550F	5.95	26.03	0.50	25.72	48.25	11051	1	83.35	8.25	0.75	29.13	62.62	13996
1.600F	1.35	29.55	0.54	23.31	47.14	10329	1 1/2	84.70	8.59	0.74	29.04	62.37	13938
1.800F	1.07	39.51	0.48	20.52	39.97	8549	1 1/2	85.77	8.97	0.74	28.93	62.10	13870
1.800S	14.23	76.25	0.29	13.46	10.29	2850	0	100.00	18.55	0.67	26.73	54.72	12302
TOTAL	100.00	18.55	0.67	26.73	54.72	12302							

SUNNYVALE MINERALS LABORATORY

SOUTH MOUNT GETHING COAL

128.66-129.43 METERS

SAMPLE #5 (28M X 0)

FLOTATION TEST

MOISTURE FREE BASIS

SP. GR.	% WT.	ELEMENTARY DATA						% DISTRIBUTION				
		% ASH	% S	% VM	% FC	BTU	FSI	ASH	S	VM	FC	BTU
CONC I.	71.57	7.02	0.81	25.90	67.08	14215	5	35.50	79.34	74.82	78.61	78.07
CONC II.	21.87	19.57	0.65	24.45	55.98	12165	2 1/2	30.24	19.43	21.58	20.05	20.41
REFUSE	6.56	73.92	0.13	13.60	12.48	3017	0	34.26	1.23	3.60	1.34	1.52
TOTAL	100.00	14.15	0.73	24.78	61.07	13032		100.00	100.00	100.00	100.00	100.00

STRUCTURES

SIZE	% WEIGHT	CUM. %WT.
3/8" X 28M	81.27	81.27
28M X 0	18.73	100.00
TOTAL	100.00	

SUNNYVALE MINERALS LABORATORY

SOUTH MOUNT GETHING COAL

HOLE SMG-80-11

SAMPLE #5

3/8" x 0

HEAD ANALYSIS

MINERAL ANALYSIS OF ASH PERCENT WEIGHT IGNITED BASIS

Silica, SiO ₂	73.70
Alumina, Al ₂ O ₃	9.16
Titania, TiO ₂	0.59
Ferric oxide, Fe ₂ O ₃	6.91
Lime, CaO	2.24
Magnesia, MgO	1.23
Potassium oxide, K ₂ O	1.27
Sodium oxide, Na ₂ O	0.35
Sulfur trioxide, SO ₃	2.33
Phos. pentoxide, P ₂ O ₅	0.08
Undetermined	2.14
Total	<u>100.00</u>

ALKALIES AS Na ₂ O, DRY COAL BASIS	= 0.20
SILICA VALUE	= 87.65
BASE: ACID RATIO	= 0.14
FOULING INDEX	= 0.05
SLAGGING INDEX	= 0.10

SUNNYVALE MINERALS LABORATORY

SOUTH MOUNT GETHING COAL

HOLE SMG-80-11

SAMPLE #5

3/8" X 0

HEAD ANALYSIS

ULTIMATE ANALYSIS

	<u>AIR DRY BASIS</u>	<u>MOISTURE FREE BASIS</u>
% MOISTURE	0.54	—
% CARBON	71.11	71.50
% HYDROGEN	4.27	4.29
% NITROGEN	0.98	0.99
% CHLORINE	0.03	0.03
% SULFUR	0.72	0.72
% ASH	16.63	16.72
% OXYGEN (DIFF.)	5.72	5.75
TOTAL	100.00	100.00

FUSION TEMP. OF ASH

	<u>Oxidizing</u>	<u>Reducing</u>
Initial deformation	2298	2266
Softening (H=W)	2706	2707
Softening (H=1/2 W)	> 2777	2761
Fluid	> 2777	> 2777

SUNNYVALE MINERALS LABORATORY

SOUTH MOUNT GETHING COAL

HOLE SMG-80-11

130.74-131.07 METERS

SAMPLE #6

3/8" X 28M

WASHABILITY TEST

PRODUCT	AIR DRY BASIS							MOISTURE FREE BASIS				
	% H ₂ O	% ASH	% S	% VM	% FC	BTU	FSI	% ASH	% S	% VM	% FC	BTU
HEAD	0.72	3.87	0.73	30.65	64.76	14789	8 1/2	3.90	0.74	30.87	65.23	14896

MOISTURE FREE BASIS

SP. GR.	% WT.	ELEMENTARY DATA						CUMULATIVE DATA					
		% ASH	% S	% VM	% FC	BTU	FSI	% WT.	% ASH	% S	% VM	% FC	BTU
1.300F	97.03	2.59	0.68	31.95	65.46	15074	8 1/2	97.03	2.59	0.68	31.95	65.46	15074
1.300S	2.97	36.39	0.57	28.00	35.61	9384	3 1/2	100.00	3.59	0.68	31.83	64.58	14905
TOTAL	100.00	3.59	0.68	31.83	64.58	14905							

SUNNYVALE MINERALS LABORATORY

SOUTH MOUNT GETHING COAL

HOLE SMG-80-11

130.74-131.07 METERS

SAMPLE #6 (28M X 0)

FLOTATION TEST

MOISTURE FREE BASIS

SP. GR.	% WT.	ELEMENTARY DATA						% DISTRIBUTION				
		% ASH	% S	% VM	% FC	BTU	FSI	ASH	S	VM	FC	BTU
CONC I.	53.19	3.34	0.81	29.93	66.73	14914	8	25.79	55.47	54.16	55.71	55.52
CONC II.*	46.81	10.92	0.74	28.79	60.29	13579	7	74.21	44.53	45.84	44.29	44.48
TOTAL	100.00	6.89	0.78	29.40	63.71	14289		100.00	100.00	100.00	100.00	100.00

* ALSO CONTAINS 4.12 % OF REFUSE

STRUCTURES

SIZE	% WEIGHT	CUM. %WT.
3/8" X 28M	88.18	88.18
28M X 0	11.82	100.00
<u>TOTAL</u>	<u>100.00</u>	

SUNNYVALE MINERALS LABORATORY

SOUTH MOUNT GETHING COAL

HOLE S4G-80-11

SAMPLE #6

3/8" X 0

HEAD ANALYSIS

MINERAL ANALYSIS OF ASH PERCENT WEIGHT IGNITED BASIS

Silica, SiO ₂	44.10
Alumina, Al ₂ O ₃	34.10
Titania, TiO ₂	0.64
Ferric oxide, Fe ₂ O ₃	2.86
Lime, CaO	4.99
Magnesia, MgO	0.79
Potassium oxide, K ₂ O	1.07
Sodium oxide, Na ₂ O	4.24
Sulfur trioxide, SO ₃	3.00
Phos. pentoxide, P ₂ O ₅	1.33
Undetermined	2.88
Total	<u>100.00</u>

ALKALIES AS Na ₂ O, DRY COAL BASIS	= 0.19
SILICA VALUE	= 83.62
BASE: ACID RATIO	= 0.18
FOULING INDEX	= 0.75
SLAGGING INDEX	= 0.13

SUNNYVALE MINERALS LABORATORY

SOUTH MOUNT GETHING COAL

HOLE SMG-80-11

SAMPLE #6

3/8" X 0

HEAD ANALYSIS

ULTIMATE ANALYSIS

	<u>AIR DRY BASIS</u>	<u>MOISTURE FREE BASIS</u>
% MOISTURE	0.72	—
% CARBON	83.19	83.79
% HYDROGEN	5.29	5.33
% NITROGEN	0.00	0.00
% CHLORINE	1.34	1.35
% SULFUR	0.03 0.73	0.03
% ASH	0.73 3.87	0.74
% OXYGEN (DIFF.)	8.70	8.76
TOTAL	100.00	100.00

FUSION TEMP. OF ASH

	<u>Oxidizing</u>	<u>Reducing</u>
Initial deformation	2454	2413
Softening (H=W)	2531	2503
Softening (H=1/2 W)	2757	2530
Fluid	> 2777	> 2777

SUNNYVALE MINERALS LABORATORY

SOUTH MOUNT GEIHING COAL

HOLE SMG-80-11

133.04-133.79 METERS

SAMPLE #7

3/8" X 28M

WASHABILITY TEST

<u>PRODUCT</u>	<u>AIR DRY BASIS</u>							<u>MOISTURE FREE BASIS</u>				
	<u>% H2O</u>	<u>% ASH</u>	<u>% S</u>	<u>% VM</u>	<u>% FC</u>	<u>BTU</u>	<u>FSI</u>	<u>% ASH</u>	<u>% S</u>	<u>% VM</u>	<u>% FC</u>	<u>BTU</u>
HEAD	1.26	14.74	0.60	22.97	61.03	12871	1	14.93	0.61	23.26	61.81	13035

MOISTURE FREE BASIS

<u>SP. GR.</u>	<u>% WT.</u>	<u>ELEMENTARY DATA</u>						<u>CUMULATIVE DATA</u>					
		<u>% ASH</u>	<u>% S</u>	<u>% VM</u>	<u>% FC</u>	<u>BTU</u>	<u>FSI</u>	<u>% WT.</u>	<u>% ASH</u>	<u>% S</u>	<u>% VM</u>	<u>% FC</u>	<u>BTU</u>
1.300F	29.51	2.75	0.69	26.41	70.84	14912	1 1/2	29.51	2.75	0.69	26.41	70.84	14912
1.350F	55.17	3.87	0.64	25.49	70.64	14720	1	84.68	3.48	0.66	25.81	70.71	14787
1.350S	15.32	68.25	0.60	18.25	13.50	4263	0	100.00	13.40	0.65	24.65	61.95	13175
TOTAL	100.00	13.40	0.65	24.65	61.95	13175							

SUNNYVALE MINERALS LABORATORY

SOUTH MOUNT GETHING COAL

HOLE SMG-80-11

133.04-133.79 METERS

SAMPLE #7 (28M X 0)

FLOTATION TEST

MOISTURE FREE BASIS

SP. GR.	% WT.	ELEMENTARY DATA						% DISTRIBUTION				
		% ASH	% S	% VM	% FC	BTU	FSI	ASH	S	VM	FC	BTU
CONC I.	56.13	5.95	0.72	23.03	71.02	14381	1	12.73	67.67	61.74	75.44	73.13
REFUSE *	43.87	52.17	0.44	18.26	29.57	6761	0	87.27	32.33	38.26	24.56	26.87
TOTAL	100.00	26.23	0.60	20.94	52.84	11038		100.00	100.00	100.00	100.00	100.00

* COMBINATION OF 20.45 % OF CONC II. AND 23.42 % OF REFUSE.

STRUCTURES

SIZE	% WEIGHT	CUM. %WT.
3/8" X 28M	90.55	90.55
28M X 0	9.45	100.00
TOTAL	100.00	

SUNNYVALE MINERALS LABORATORY

SOUTH MOUNT GETHING COAL

HOLE SMG-80-11

SAMPLE #7

3/8" X 0

HEAD ANALYSIS

MINERAL ANALYSIS OF ASH PERCENT WEIGHT IGNITED BASIS

Silica, SiO ₂	72.40
Alumina, Al ₂ O ₃	16.00
Titania, TiO ₂	0.77
Ferric oxide, Fe ₂ O ₃	2.31
Lime, CaO	2.36
Magnesia, MgO	0.92
Potassium oxide, K ₂ O	2.23
Sodium oxide, Na ₂ O	0.76
Sulfur trioxide, SO ₃	1.01
Phos. pentoxide, P ₂ O ₅	0.12
Undetermined	1.12
Total	<u>100.00</u>

ALKALIES AS Na ₂ O, DRY COAL BASIS	= 0.33
SILICA VALUE	= 92.83
BASE: ACID RATIO	= 0.10
FOULING INDEX	= 0.07
SLAGGING INDEX	= 0.06

SUNNYVALE MINERALS LABORATORY

SOUTH MOUNT GEIHING COAL

HOLE SMG-80-11

SAMPLE #7

3/8" X 0

HEAD ANALYSIS

ULTIMATE ANALYSIS

	<u>AIR DRY BASIS</u>	<u>MOISTURE FREE BASIS</u>
% MOISTURE	1.26	--
% CARBON	75.22	76.18
% HYDROGEN	4.17	4.22
% NITROGEN	0.88	0.89
% CHLORINE	0.03	0.03
% SULFUR	0.60	0.61
% ASH	14.74	14.93
% OXYGEN (DIFF.)	3.10	3.14
TOTAL	100.00	100.00

FUSION TEMP. OF ASH

	<u>Oxidizing</u>	<u>Reducing</u>
Initial deformation	2335	2298
Softening (H=W)	2644	2601
Softening (H=1/2 W)	2773	2735
Fluid	>2777	>2777

SUNNYVALE MINERALS LABORATORY

SOUTH MOUNT GETHING COAL

HOLE SMG-80-11

3/8" X 0

HEAD ANALYSIS

SULFUR FORMS

AIR DRY BASIS

MOISTURE FREE BASIS

<u>PRODUCT</u>	<u>AIR DRY BASIS</u>				<u>MOISTURE FREE BASIS</u>			
	<u>SULFATE SULFUR AS % S</u>	<u>PYRITIC SULFUR</u>	<u>ORGANIC SULFUR</u>	<u>TOTAL</u>	<u>SULFATE SULFUR AS % S</u>	<u>PYRITIC SULFUR</u>	<u>ORGANIC SULFUR</u>	<u>TOTAL</u>
SAMPLE #1	< 0.01	0.37	0.71	1.08	< 0.01	0.37	0.72	1.09
SAMPLE #2	< 0.01	0.30	0.68	0.98	< 0.01	0.30	0.69	0.99
SAMPLE #3	< 0.01	0.05	0.43	0.48	< 0.01	0.05	0.44	0.49
SAMPLE #4	< 0.01	0.01	0.47	0.48	< 0.01	0.01	0.48	0.49
SAMPLE #5	< 0.01	0.03	0.69	0.72	< 0.01	0.03	0.69	0.72
SAMPLE #6	< 0.01	< 0.01	0.73	0.73	< 0.01	< 0.01	0.74	0.74
SAMPLE #7	< 0.01	0.06	0.54	0.60	< 0.01	0.06	0.55	0.61

SUNNYVALE MINERALS LABORATORY

SOUTH MOUNT GETHING COAL

HOLE SMG-80-11

3/8" X 0

HEAD ANALYSIS

WATER SOLUBLE ALKALIES

<u>PRODUCT</u>	<u>AIR DRY BASIS</u>			<u>MOISTURE FREE BASIS</u>		
	<u>% K2O</u>	<u>% Na2O</u>	<u>% Cl</u>	<u>% K2O</u>	<u>% Na2O</u>	<u>% Cl</u>
SAMPLE #1	< 0.01	< 0.01	0.02	< 0.01	< 0.01	0.02
SAMPLE #2	< 0.01	0.01	0.04	< 0.01	0.01	0.04
SAMPLE #3	< 0.01	0.01	0.02	< 0.01	0.01	0.02
SAMPLE #4	< 0.01	0.01	0.01	< 0.01	0.01	0.01
SAMPLE #5	< 0.01	0.01	0.02	< 0.01	0.01	0.02
SAMPLE #6	< 0.01	0.01	0.01	< 0.01	0.01	0.01
SAMPLE #7	< 0.01	0.01	0.03	< 0.01	0.01	0.03

<u>PRODUCT</u>	<u>% EQUILIBRIUM MOISTURE</u>	<u>HGI</u>
SAMPLE #1	2.05	70
SAMPLE #2	1.77	58
SAMPLE #3	1.95	48
SAMPLE #4	2.44	60
SAMPLE #5	1.86	61
SAMPLE #6	----	---
SAMPLE #7	----	---