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PRINCETON BASIN GRAVITY SURVEY

OPEN FILE

SUMMARY

Three reconnaissance gravity profiles over the Princeton basin area, B.C. have indicated that the basin is about 2400 feet thick, thins toward the north, has a convex shaped bottom with sides that slope moderately inward. Two possible coal anomalies are in the vicinity of known coal zones, a third anomaly is well located with respect to proposed drill holes, and several others of unknown potential are identified as well. The best possibility for another Hat Creek type of occurrence^{re} exists in the north, on line 675N, where a sufficiently large 6 mgal anomaly is observed. If follow up geological work proves the significance of gravity as a diagnostic tool for coal in this basin, then further gravity surveying is recommended as an aid in fully defining the coal potential of the basin.

Respectfully submitted,

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LOCATION & DATA OF SURVEY

Location: Princeton Easin area, Princeton, B.C.

49° 27.8' North Latitude by 120° 30.2 West Longitude

NTS 92H 7, 8, 9, 10

Date: Field Work; November 7 - November 23, 1975

Office Work; November 24- December 18, 1975

INTRODUCTION

The intent of the reconnaissance gravity survey over the Princeton Basin area (Figure 1) was to investigate the gross geometry of the basin and to test for the presence of coal anomalies within it. Because the sedimentary rocks are surrounded by denser Tertiary and Nicola volcanic units, a significant gravity low was expected to be present over the basin. As well, the less dense coal beds were expected to exhibit themselves as subtle gravity low zones of 1 mgal or less within the broader basin gravity low feature. The possibility also remained open as to whether or not the gravity data would indicate the presence of unknown and thicker coal beds similar to those found in the Hat Creek area of B.C.

FIELD PROCEDURES & INSTRUMENTATION

Three reconnaissance gravity lines were established over the Princeton basin. The survey grid with line locations is shown on Figure 1. Station positions are shown in detail on Figure 5 and a listing of grid co-ordinates is given in the Appendix.

The survey grid was established by C.A. Ager & Assoc. Ltd. using chain and compass. Blue flagging marks every survey line. In densely

wooded areas lines were either cut or alternate routes were selected as shown on Figure 1. Compass bearing of each line is 110° using magnetic declination 22.5° E. Station spacing is 200 feet.

In total 401 gravity stations were observed using a LaCoste & Romberg gravity meter (No. G199) with reading accuracy of ± 0.02 mgal. Most observations were within the dial range 4000-4100 for which the instrument constant was 1.05890 mgal/division. Diurnal and instrument drift was monitored and accounted for by tying into the National Network Base Station (9031-54) at Princeton during the course of each survey day. Drift averaged 0.12 mgal/8 hour day. Observed gravity values so determined are considered accurate to ± 0.04 mgal. All gravity values have been calculated relative to the base station (9031-54) which has the following parameters:

Latitude	$49^{\circ} 27.8'$ North
Longitude	$120^{\circ} 30.2'$ West
Elevation	2098 feet
Grid Coord	235E + 444N
Observed Gravity	980778.38 mgal
C.B. Gravity	-129.83 mgal

The relative elevation of each station was calculated from the angle and slope chainage between adjoining stations. Angles were determined to instrument height on the stadia rod using a theodolite with reading accuracy of $20''$ of arc. Slope chainage was measured

using a standard nylon/vinyl surveyors chain to an accuracy of ± 0.3 feet for each station. Relative elevations accurate to ± 0.10 feet or better were determined in this manner. Absolute elevations for each station were determined by tying each line into a geodetic bench mark using the same survey technique. A listing of all data is given in the Appendix.

DATA REDUCTION

As is well known, the observed gravity field (g_0) contains much information of non-interest in exploration geophysics. Simply stated, the problem is to separate the effects caused by the earth itself (g_E) from the g_0 field. The complete Bouguer gravity value so determined is defined as follows

$$\Delta g_B = g_0 - g_E \quad (1)$$

where

$$g_E = g_L + g_{FA} + g_{BS} + g_{TE} \quad (2)$$

Latitude effect

Free Air effect

Bouguer slab effect

Terrain effect

The complete Bouguer gravity values for each station were determined by solving Equation (1) above using standard procedures. Bouguer slab and terrain densities were taken as 2.20 g/cc. Terrain

effects were calculated to a radius of 4800 feet about each station using the method of Ager(1972). The complete Bouguer gravity values are all relative to station 9031-54 where the aforesaid Network value of -129.83 mgal was assigned. A complete listing of all values is given in the Appendix.

The 'elevation datum' used for data reduction was mean sea level (MSL). The choice of datum bears no special significance to the 'form' of each gravity profile, but only to its absolute amplitude. The gravity anomaly values still exist at the co-ordinates of the station and any interpretation of the data must keep this in mind.

There are two accuracies involved when considering the gravity data. They are the 'relative' accuracy between adjoining stations and the 'absolute' accuracy between any two stations within the entire survey area. As summarized by the following table, the relative accuracy is ± 0.14 mgal and the absolute accuracy is ± 0.28 mgal. This means that coal anomalies of less than 0.14 mgals will not be seen and basin features of less than 0.28 mgals will also not be discernable. In terms of our search problem, these errors are sufficiently small to resolve coal anomalies as well as gross basin features. The height of the 'triangle' marking each station gravity value on Figure 5 is 0.30 mgals and gives an indication of the size of the error at each station.

TABLE 1 - SURVEY ERRORS

Source of Error	Relative Amount		Absolute Amount	
Observation		<u>+0.02</u>		<u>+0.02</u>
Drift	(10%)	0.01	(20%)	0.02
Position				
x,y	(+10')	0.002	(+200')	0.024
z	(+1.0')	0.007	(+1.0')	0.066
Terrain	(10%)	0.10	(20%)	0.15
		<u> </u>		<u> </u>
Maximum Error		<u>+ 0.14 mgal</u>		<u>+ 0.28 mgal</u>

Plotted profiles of survey lines are given at two scales in this report. Figures 1, 2, 3 and 4 are at scale 1:50,000 and give an overview of the basin anomaly. Figure 5 gives the data at scale 1"=1320' and indicates detailed information regarding possible coal anomalies. In each case, vertical exaggeration of the elevation profile is two times the horizontal scale. The profiles are named according to the y co-ordinate of the western segment of each line and are called 190N, 300N and 675N as shown on the accompanying illustrations.

INTERPRETATION OF RESULTS

As mentioned before, the basic intent of the survey was twofold: 1) to determine something about the gross geometry of the basin, and

2) to outline possible coal anomaly zones within the basin itself.

Because of the difference in order of magnitude of the gravity anomalies relating to each of these objectives, each interpretation is treated separately below.

1) Basin Geometry

The basin margins are marked rather well by the abrupt changes in gradient on the flanks of each profile that traverses the contact. The continuing steep gradient on the west of lines 190N and 300N is caused by the denser gabbroic units in this area (McMechan, 1975). The eastern part of line 190N terminates at a lake at the base of a steep cliff. Here it was physically impossible to extend the line due to the snow and ice at the time of the survey. However, it is anticipated that the gravity values will follow closely the effect observed in line 300N. The regional field is estimated at -116.0 mgals for lines 190N and 300N, and at -117.3 mgals for line 675N.

By assigning density of 2.20 g/cc for sedimentary rocks and 2.70 g/cc for host units, it is possible to make 'first approximations' to the thickness of various sections of each profile. These values when combined with information regarding the position of the half-width relative to the mapped contact then produce depth section estimates. The cross-sections so determined are shown on Figures 3,4 and 5. For more precise estimates, rock density measurements and more sophisticated modelling should be done. It is therefore clear that the depth values given on the cross-sections are only estimates and any interpretation of the basin structure should bear this in mind.

Inspection of the gravity/depth sections indicates several features about the gross geometry of the basin:

- 1) The basin is shallower in the north than in the south.
- 2) Of the lines surveyed, the basin is thickest (2365') under line 300N.
- 3) Lines 190N and 675N exhibit similar convex geometry. This indicates that the sedimentary rocks are either denser in the middle of the basin profile or the basin is shallower here (Figure 2 and 4).
- 4) The basin boundaries generally slope inward at moderate angles except on the east of 675N where the boundary is apparently near vertical.

LINE 190N GRAVITY/DEPTH SECTION

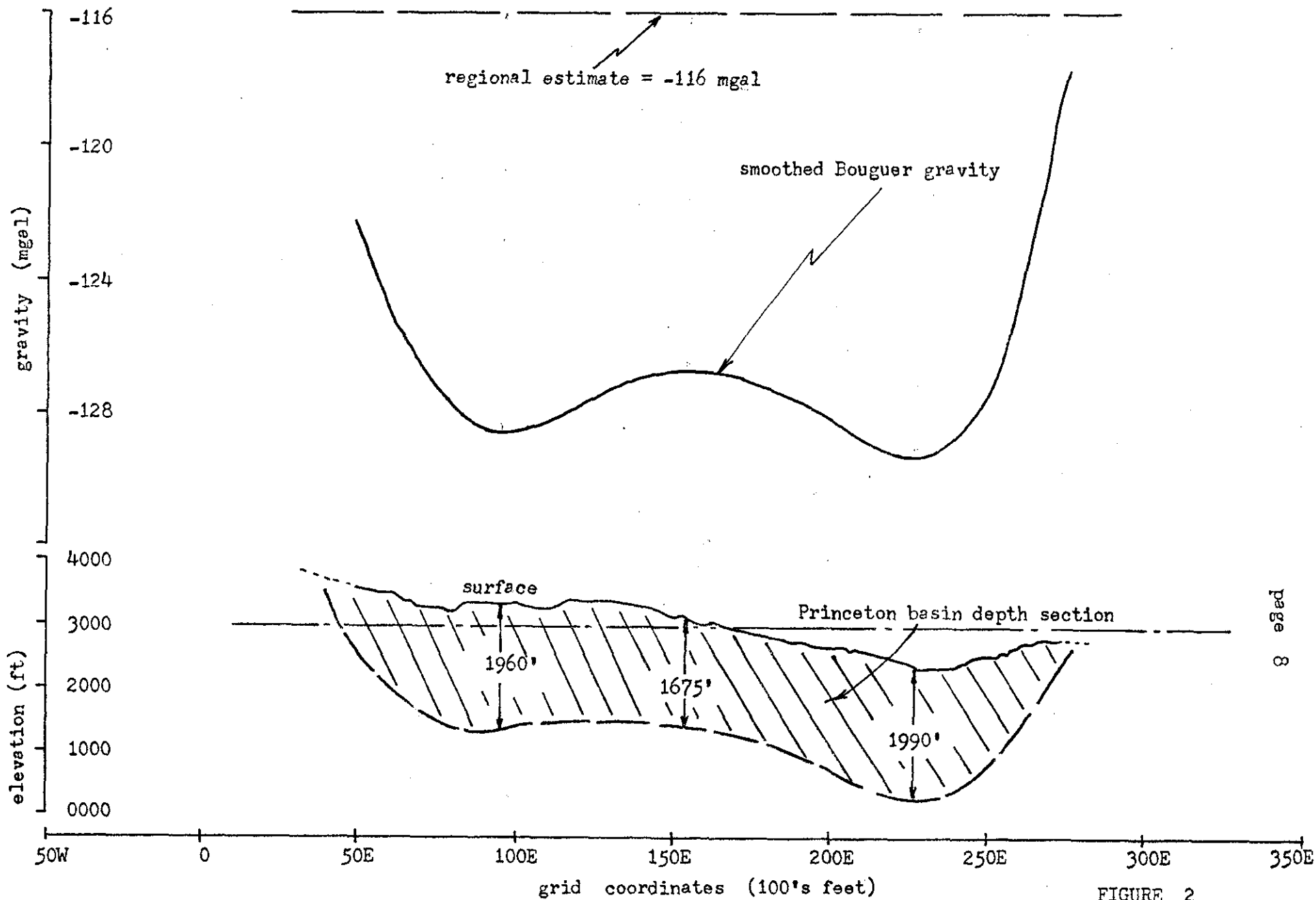


FIGURE 2

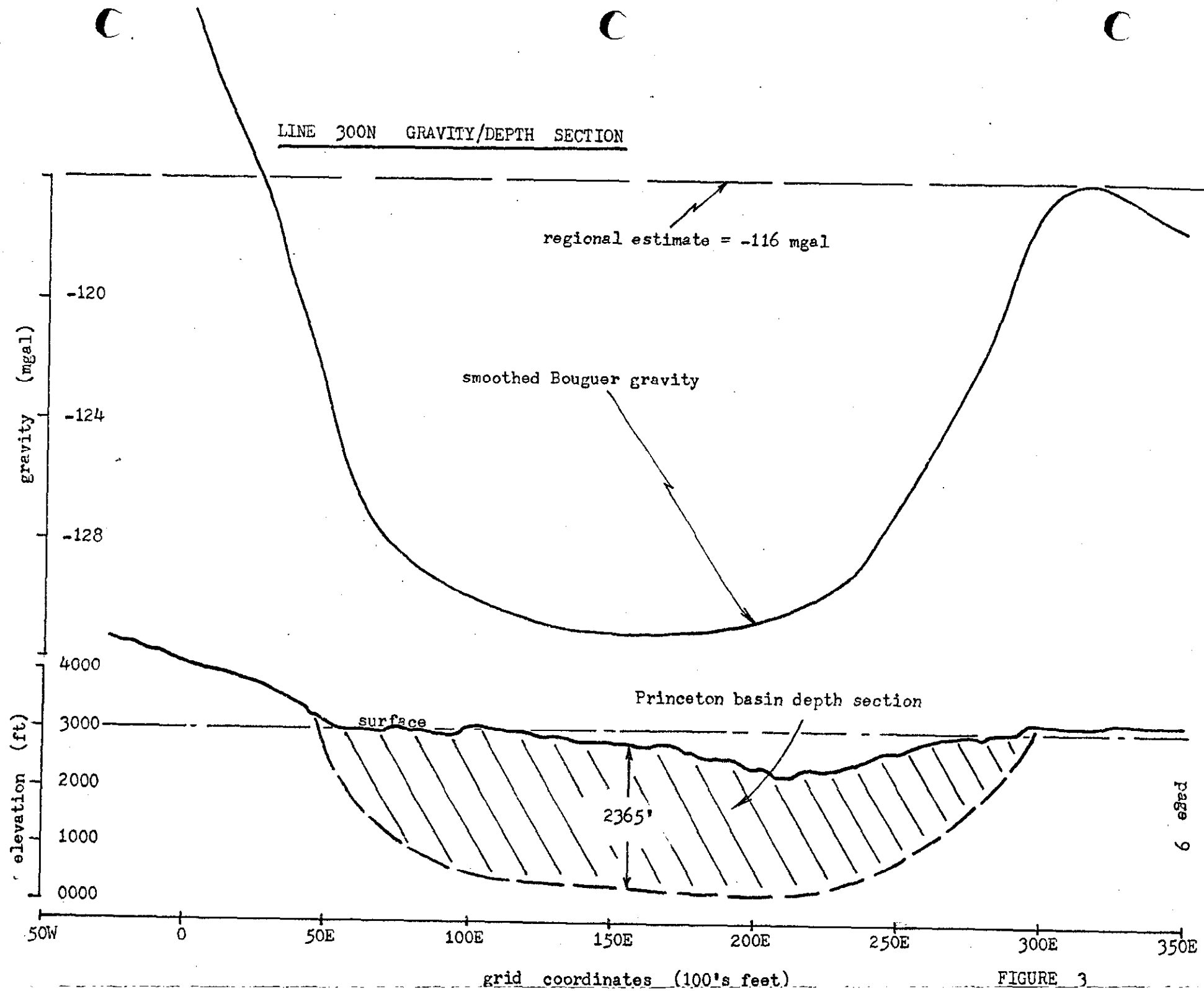
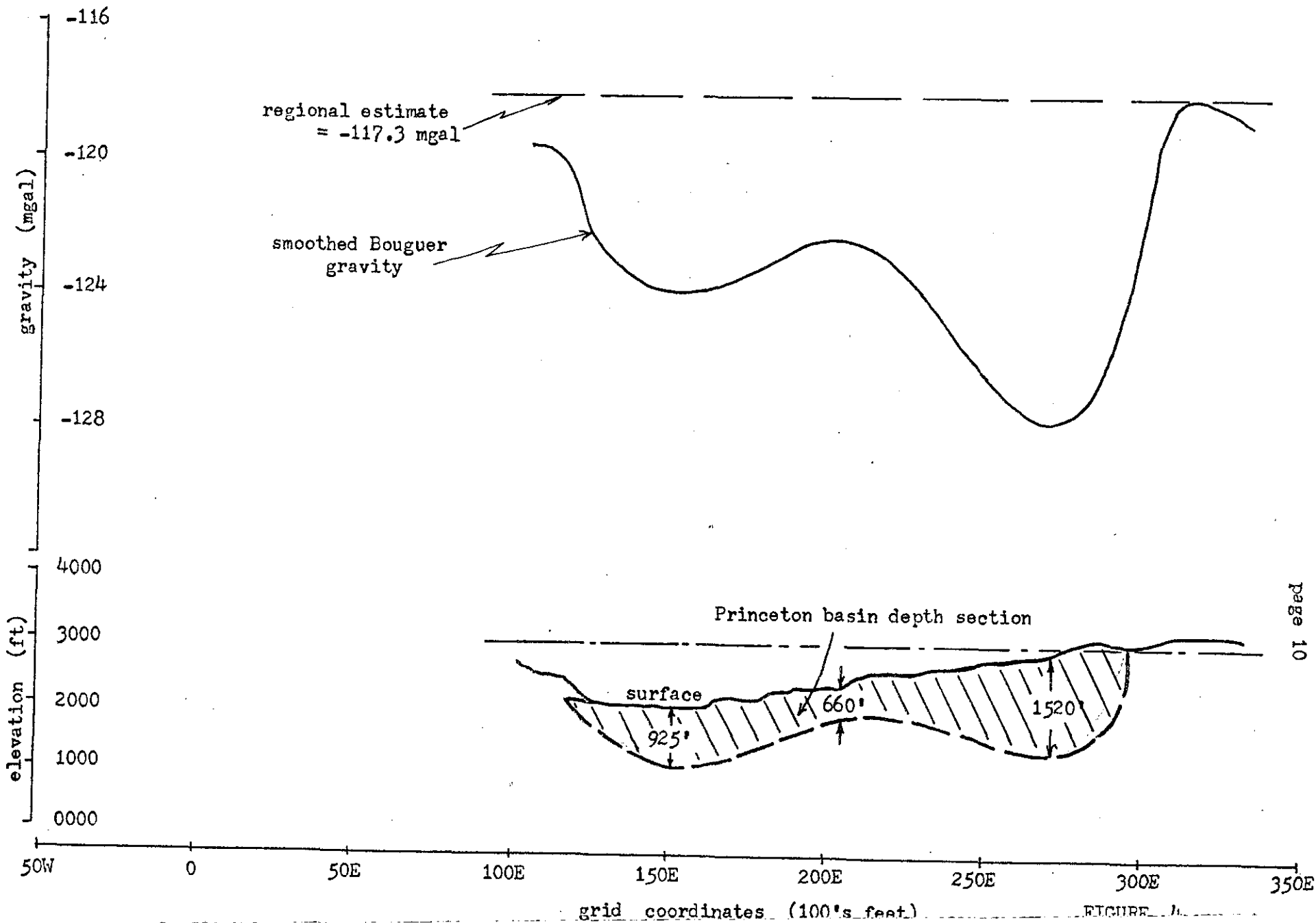


FIGURE 3

LINE 675N GRAVITY/DEPTH SECTION



2) Coal Anomalies

Very definite density boundaries can be identified along each of the profiles. These are signified by arrows on each of the gravity profiles of Figure 5. These features are interpreted to indicate contacts or density change boundaries between adjoining interbasin sedimentary units. As well, there are several subtle, but distinct, gravity low features which have been identified by open circles on each of the profiles. These anomalies are caused by less dense geological units within or on top of the basin rocks.

Because coal is less dense than ordinary sedimentary rocks, it is expected to reveal itself as a gravity low feature. For the Princeton basin, the known coal beds are generally narrow with moderate dips. This would infer a similar narrow gravity response of probably less than 1 mgal amplitude. Coal anomalies are therefore expected to be evidenced by either small amplitude gravity low regions or by locally steep changes in the gravity gradient or by both. The areas marked by open circles and the arrows labeled with 'C' on Figure 5 are therefore prime possibilities for coal locations. Several of these anomalies are in areas where changes in overburden thickness are suspect. For example, at the Similkameen River on lines 190N and 300N and under the field where

the creek presently runs (150E) on line 675N.

It is difficult to rank the possible coal anomalies in any order of economic importance. However, obvious correlation of the anomalies centered at 54E and 84E on line 300N to previously known coal deposits near the surveyed line make this area of prime importance. As well, the anomaly centered around 80E on line 190N is well situated with respect to Bethlehem's proposed drill sites and should therefore be considered important. Whether an anomaly is caused by coal or some other less dense unit (such as overburden) can only be ascertained after careful on site inspection and correlation to known geology in the area.

If one anticipates locating coal deposits within the basin of the same magnitude as Hat Creek, then these would be indicated by anomalies of 5-10 mgals within the gravity low trough regions of each profile. In this regard, the most obvious and unknown possibility is the 6 mgal gravity low trough anomaly centered ← at about 268E on line 675N. The other trough regions hold some promise too as there are already some coal deposits known in their vicinity as previously mentioned above.

RECOMMENDATIONS & CONCLUSIONS

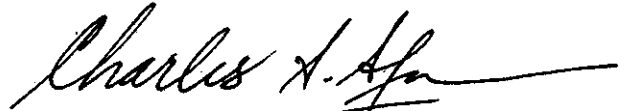
The gravity survey data has indicated that the Princeton basin has a thickness of about 2365' under the middle of line 300N and thins to about 660' in the north under line 675N. As well there are indications that its base geometry is convex as evidenced by the gravity data on lines 190N and 675N. The edges of the basin appear to have moderate dips inward except on the eastern boundary of the basin on line 675N where near vertical dips are indicated.

Several areas are identified which may indicate the presence of coal. Two of these anomaly zones are well located with respect to known coal deposits (line 300N) and a third is in the vicinity of proposed drill holes (line 190N). If one expects to find another Hat Creek type deposit here, then attention should be placed on the 5-10 mgal anomalies within the gravity low trough(s) of each line, especially line 675N.

It is recommended that the gravity data be correlated to all known geology about the Princeton basin. On site inspection should be made of those anomalies which cannot be readily explained by the geological information at hand. Every effort should be made to identify the geological source for each possible coal anomaly.

If the reconnaissance gravity data proves to be sufficiently diagnostic for coal search, then the entire Princeton basin area should be surveyed in a similar manner as described in this report with line spacing 1000-2000 feet and station spacing 200 feet.

Respectfully submitted,



December 18, 1975

Charles A. Ager, Ph.D.

Geophysicist

REFERENCES

- Ager, C.A. (1972). Gravity model for the Guichon Creek batholith, Unpubl. M.Sc. thesis, Dept of Geophysics, U.B.C.
- McNechan, R. (1975). Preliminary geological sketch map, Princeton basin, B.C., Unpubl. map, ECDM.

X, Y, ELEV IN FEET C.B. GRAV IN MGALS

STN NO	X COORD	Y COORD	ELEV	C.B. GRAV
1	23500.	44400.	2098.00	-129.83
2	-2700.	28800.	4539.50	-101.42
3	-2200.	28700.	4459.40	-102.77
4	-1800.	28600.	4440.60	-103.89
5	-1600.	28200.	4367.50	-104.64
6	-1300.	28000.	4321.20	-105.53
7	-800.	28000.	4274.10	-107.01
8	-600.	28200.	4208.00	-108.12
9	-300.	27900.	4126.40	-109.35
10	0.	28000.	4075.60	-110.07
11	200.	28800.	4038.20	-110.89
12	400.	29000.	4015.30	-111.58
13	700.	28900.	3978.10	-112.38
14	1100.	28800.	3928.30	-113.38
15	1600.	28800.	3894.20	-114.60
16	1900.	28800.	3843.10	-114.96
17	2200.	28600.	3786.00	-116.04
18	2600.	28600.	3730.40	-116.12
19	2900.	28300.	3648.30	-117.15
20	3200.	28200.	3573.80	-117.86
21	3500.	28300.	3503.40	-118.98
22	3800.	28600.	3432.20	-119.90
23	4100.	28400.	3378.40	-121.11
24	4300.	28200.	3319.30	-122.43
25	4400.	30000.	3157.60	-121.05
26	4600.	30000.	3178.00	-121.11
27	4800.	30000.	3134.20	-123.03
28	5000.	30000.	3067.70	-124.02
29	5200.	30000.	3009.60	-124.93
30	5400.	30000.	2965.40	-125.53
31	5600.	30000.	2960.90	-125.97
32	5800.	30000.	2951.90	-125.93
33	6000.	30000.	2944.80	-126.44
34	6200.	30000.	2939.50	-126.87
35	6400.	30000.	2935.70	-127.35
36	6600.	30000.	2932.20	-127.77
37	6800.	30000.	2927.30	-127.91
38	7000.	30000.	2923.90	-128.10
39	7200.	30000.	3008.70	-129.15
40	7400.	30000.	3019.00	-129.15
41	7600.	30000.	2969.90	-129.12
42	7800.	30000.	2934.80	-129.27
43	8000.	30000.	2913.70	-129.02
44	8200.	30000.	2929.40	-129.00
45	8400.	30000.	2928.70	-129.58
46	8600.	30000.	2893.60	-129.83
47	8800.	30000.	2877.90	-129.78
48	9000.	30000.	2875.00	-129.79
49	9200.	30000.	2873.30	-129.84

50	9400.	30000.	2871.60	-129.90
51	9600.	30000.	2928.20	-130.44
52	9800.	30000.	3042.90	-130.19
53	10000.	30000.	3044.80	-129.85
54	10200.	30000.	3044.30	-129.82
55	10400.	30000.	3031.90	-129.88
56	10600.	30000.	3009.10	-129.88
57	10800.	30000.	2978.40	-130.10
58	11000.	30000.	2955.50	-130.13
59	11200.	30000.	2947.90	-130.09
60	11400.	30000.	2934.10	-130.22
61	11600.	30000.	2933.10	-130.22
62	11800.	30000.	2937.40	-130.45
63	12000.	30000.	2912.80	-130.47
64	12200.	30000.	2893.20	-130.70
65	12400.	30000.	2864.50	-130.95
66	12600.	30000.	2830.50	-131.05
67	12800.	30000.	2832.70	-131.00
68	13000.	30000.	2833.30	-131.05
69	13200.	30000.	2808.20	-131.25
70	13400.	30000.	2815.00	-131.33
71	13600.	30000.	2799.10	-131.58
72	13800.	30000.	2750.90	-131.56
73	14000.	30000.	2748.90	-131.23
74	14200.	30000.	2757.40	-131.13
75	14400.	30000.	2752.90	-131.39
76	14600.	30000.	2753.70	-131.16
77	14800.	30000.	2754.10	-131.10
78	15000.	30000.	2755.20	-131.14
79	15200.	30000.	2754.30	-131.07
80	15400.	30000.	2746.10	-131.04
81	15600.	30000.	2732.00	-131.26
82	15800.	30000.	2696.40	-131.36
83	16000.	30000.	2695.10	-130.89
84	16200.	30000.	2675.50	-130.75
85	16400.	30000.	2707.70	-130.74
86	16600.	30000.	2739.00	-130.57
87	16800.	30000.	2730.50	-130.37
88	17000.	30000.	2708.70	-130.69
89	17200.	30000.	2683.40	-130.70
90	17400.	30000.	2644.10	-130.99
91	17600.	30000.	2592.60	-131.19
92	17800.	30000.	2588.70	-131.07
93	18000.	30000.	2550.20	-131.01
94	18200.	30000.	2501.70	-130.91
95	18400.	30000.	2506.30	-130.72
96	18600.	30000.	2503.60	-130.57
97	18800.	30000.	2489.30	-130.51
98	19000.	30000.	2475.60	-130.49
99	19200.	30000.	2493.50	-130.52
100	19400.	30000.	2447.10	-130.51
101	19600.	30000.	2396.40	-130.90
102	19800.	30000.	2337.40	-131.27
103	20000.	30000.	2319.50	-131.28
104	20200.	30000.	2358.90	-130.85
105	20400.	30000.	2285.70	-131.38
106	20600.	30000.	2263.70	-131.47
107	20700.	30000.	2215.30	-131.73
108	21000.	30000.	2218.60	-131.08
109	21200.	30300.	2213.50	-131.10

110	21400.	30700.	2231.10	-131.23
111	21600.	31000.	2295.10	-130.92
112	21800.	31000.	2321.60	-130.72
113	22000.	31000.	2334.60	-130.41
114	22200.	31000.	2320.50	-130.50
115	22400.	31000.	2322.10	-130.04
116	22600.	31000.	2323.00	-129.97
117	22800.	31000.	2315.80	-129.52
118	23000.	31000.	2342.80	-129.37
119	23200.	31000.	2395.20	-129.29
120	23400.	31000.	2425.90	-129.15
121	23600.	31000.	2452.80	-128.85
122	23800.	31000.	2478.60	-128.57
123	24000.	31000.	2526.20	-128.31
124	24200.	31000.	2566.60	-127.91
125	24400.	31000.	2608.40	-127.69
126	24600.	31000.	2619.30	-127.36
127	24800.	31000.	2619.30	-126.85
128	25000.	31000.	2622.60	-126.55
129	25200.	31000.	2660.70	-126.27
130	25400.	31000.	2700.10	-126.01
131	25600.	31000.	2737.30	-125.94
132	25800.	31000.	2791.20	-125.60
133	26000.	31000.	2815.60	-125.11
134	26200.	31000.	2837.40	-124.67
135	26400.	31000.	2862.40	-124.37
136	26600.	31000.	2891.40	-124.04
137	26800.	31000.	2896.80	-123.56
138	27000.	31000.	2914.60	-123.10
139	27200.	31000.	2923.70	-122.78
140	27400.	31000.	2925.30	-122.44
141	27600.	31000.	2916.20	-122.10
142	27800.	31000.	2918.50	-121.78
143	28000.	31000.	2884.70	-121.28
144	28200.	31000.	2910.80	-120.89
145	28400.	31000.	2949.30	-120.33
146	28600.	31000.	2954.30	-119.67
147	28800.	31000.	2974.60	-118.97
148	29000.	31000.	2979.30	-118.28
149	29200.	31000.	3009.30	-117.93
150	29400.	31000.	3101.20	-117.48
151	29600.	31000.	3141.30	-116.98
152	29800.	31000.	3142.00	-116.40
153	30000.	31000.	3143.20	-116.29
154	30200.	31300.	3112.60	-115.72
155	30400.	31600.	3104.50	-115.87
156	30800.	31800.	3106.60	-116.14
157	31100.	32100.	3099.10	-116.22
158	31500.	32200.	3079.50	-116.15
159	31800.	32400.	3082.00	-115.88
160	32100.	32700.	3091.50	-115.47
161	32400.	32300.	3112.80	-115.95
162	32600.	32100.	3141.60	-116.41
163	33000.	31900.	3148.10	-116.49
164	33400.	31700.	3123.40	-116.89
165	33800.	31600.	3098.30	-117.21
166	34000.	31600.	3111.40	-117.31
167	34200.	31600.	3109.10	-117.33
168	34400.	31600.	3110.60	-117.53
169	34600.	31600.	3103.80	-117.60

170	34800.	31600.	3105.20	-117.50
171	35000.	31600.	3099.40	-117.33
172	4800.	19000.	3550.80	-122.11
173	5000.	19000.	3516.30	-122.71
174	5200.	19000.	3498.20	-123.30
175	5400.	19000.	3488.90	-123.60
176	5600.	19000.	3485.00	-124.23
177	5800.	19000.	3481.60	-124.69
178	6000.	19000.	3455.90	-125.10
179	6200.	19000.	3422.40	-125.38
180	6400.	19000.	3353.00	-125.55
181	6600.	19000.	3306.90	-125.85
182	6800.	19000.	3284.80	-126.00
183	7000.	19000.	3249.10	-126.41
184	7200.	19000.	3228.00	-126.99
185	7400.	19000.	3212.20	-127.31
186	7600.	19000.	3203.60	-127.74
187	7800.	19000.	3196.90	-127.68
188	8000.	19000.	3194.80	-128.37
189	8200.	19000.	3247.80	-128.33
190	8400.	19000.	3304.20	-128.85
191	8600.	19000.	3294.00	-128.20
192	8800.	19000.	3290.40	-128.31
193	9000.	19000.	3287.70	-128.49
194	9200.	19000.	3286.80	-128.56
195	9400.	19000.	3288.20	-128.61
196	9600.	19000.	3279.60	-128.63
197	9800.	19000.	3299.80	-128.51
198	10000.	19000.	3304.20	-128.42
199	10200.	19000.	3259.10	-128.52
200	10400.	19000.	3238.40	-128.42
201	10600.	19000.	3231.90	-128.29
202	10800.	19000.	3232.00	-128.25
203	11000.	19000.	3231.30	-128.33
204	11200.	19000.	3244.70	-128.31
205	11400.	19000.	3297.50	-128.00
206	11600.	19000.	3350.20	-127.63
207	11800.	19000.	3344.70	-127.44
208	12000.	19000.	3324.30	-127.50
209	12200.	19000.	3320.80	-127.50
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213	13000.	19000.	3326.00	-127.41
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215	13400.	19000.	3318.10	-126.51
216	13600.	19000.	3300.00	-126.61
217	13800.	19000.	3275.80	-126.54
218	14000.	19000.	3244.90	-126.65
219	14200.	19000.	3223.40	-126.59
220	14400.	19000.	3212.30	-126.62
221	14600.	19000.	3188.20	-126.84
222	14800.	19000.	3121.70	-126.97
223	15000.	19000.	3086.10	-126.65
224	15200.	19000.	3117.60	-126.72
225	15400.	19000.	3089.00	-126.76
226	15600.	19000.	3031.40	-126.64
227	15800.	19000.	2981.50	-126.73
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229	16200.	19000.	3016.30	-125.88

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233	17000.	19300.	2905.30	-126.88
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238	18000.	19300.	2807.10	-127.09
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241	18500.	19300.	2740.00	-127.50
242	18800.	19300.	2711.00	-127.59
243	19000.	19300.	2718.90	-127.71
244	19200.	19300.	2694.30	-127.83
245	19400.	19300.	2672.60	-127.77
246	19600.	19300.	2647.30	-127.90
247	19800.	19300.	2622.50	-128.18
248	20000.	19300.	2621.90	-128.19
249	20200.	19300.	2620.20	-128.30
250	20400.	19300.	2655.10	-128.38
251	20600.	19300.	2586.20	-128.34
252	20800.	19300.	2597.10	-128.41
253	21000.	19300.	2552.70	-128.64
254	21200.	19300.	2542.30	-128.59
255	21400.	19300.	2525.00	-128.84
256	21600.	19300.	2506.10	-128.94
257	21800.	19300.	2480.90	-129.14
258	22000.	19300.	2442.50	-129.27
259	22200.	19300.	2416.40	-129.38
260	22400.	19300.	2372.20	-129.63
261	22600.	19300.	2354.70	-130.28
262	22800.	19300.	2287.10	-130.58
263	23000.	19300.	2289.50	-130.12
264	23200.	19300.	2297.90	-130.01
265	23400.	19300.	2299.00	-130.08
266	23600.	19300.	2302.20	-129.78
267	23800.	19300.	2309.00	-129.78
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269	24200.	19300.	2402.40	-128.92
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271	24600.	19300.	2461.70	-127.89
272	24800.	19300.	2493.40	-127.55
273	25000.	19300.	2490.30	-127.23
274	25200.	19300.	2473.30	-126.84
275	25400.	19300.	2563.10	-126.04
276	25600.	19300.	2543.20	-125.78
277	25800.	19300.	2617.70	-124.33
278	26000.	19300.	2640.20	-124.05
279	26200.	19300.	2703.20	-123.25
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241	18500.	19300.	2740.00	-127.50
242	18800.	19300.	2711.00	-127.59
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272	24800.	19300.	2493.40	-127.55
273	25000.	19300.	2490.30	-127.23
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275	25400.	19300.	2563.10	-126.04
276	25600.	19300.	2543.20	-125.78
277	25800.	19300.	2617.70	-124.33
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282	26800.	19300.	2750.20	-120.26
283	27000.	19300.	2725.00	-119.86
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285	27400.	19300.	2745.50	-117.66
286	10200.	67500.	2970.40	-118.78
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288	10600.	67500.	2847.60	-119.22
289	10800.	67500.	2830.40	-119.20

290	11000.	67500.	2816.30	-118.84
291	11200.	67500.	2817.60	-118.66
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370	27000.	67500.	3184.10	-127.02
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373	27600.	67500.	3261.20	-126.77
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390	31000.	67500.	3463.70	-117.36
391	31200.	67500.	3477.60	-117.23
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400	33000.	67500.	3468.80	-117.90
401	33200.	67500.	3445.60	-118.28

EXECUTION TERMINATED

‡SIGNOFF

TO ACCOMPANY REPORT TITLED
Princeton Basin
Gravity Survey
 BY *C.A. Ager M.P.*
 DATED *18 Dec 75* PROJECT # *Prince*



C·B· GRAVITY PROFILES	
PRINCETON BASIN	
B·C· DEPT OF MINES & P·R.	
FIGURE <u>1</u>	
C·A· AGER & ASSOC· LTD· 15423 34 Ave. Surrey B·C.	
DATE DEC· 1975	

193 (1)

FIGURE 5

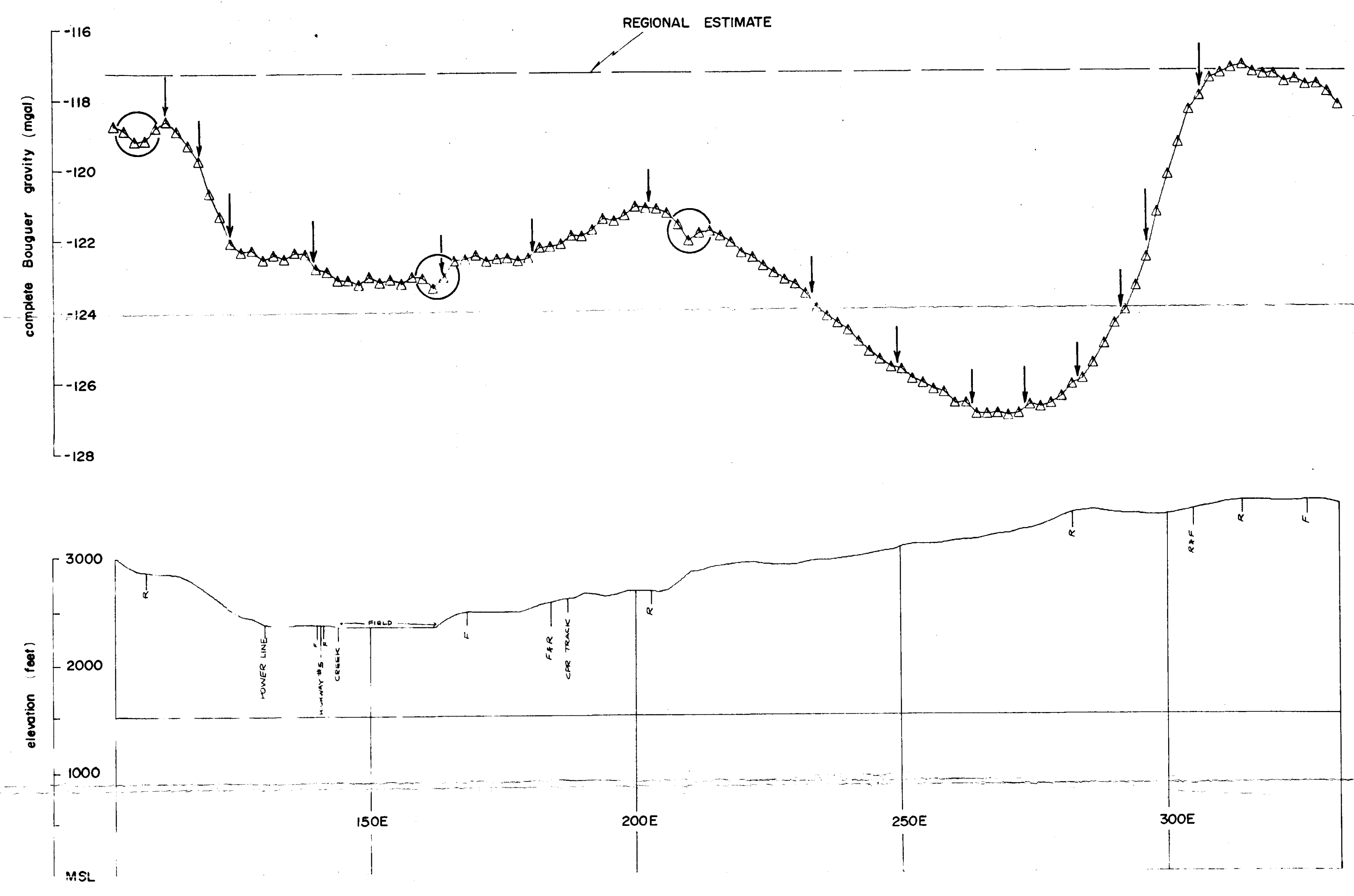
GRAVITY/ELEVATION PROFILES	
PRINCETON BASIN	SCALE horizontal 1" = 1320'
B.C. DEPT. OF MINES & P.R.	vertical 1" = 660' 1" = 2 mgal
DATE DEC. 1975	C.A. AGER & ASSOC. LTD. 15423 34 Ave. Surrey B.C.

LEGEND

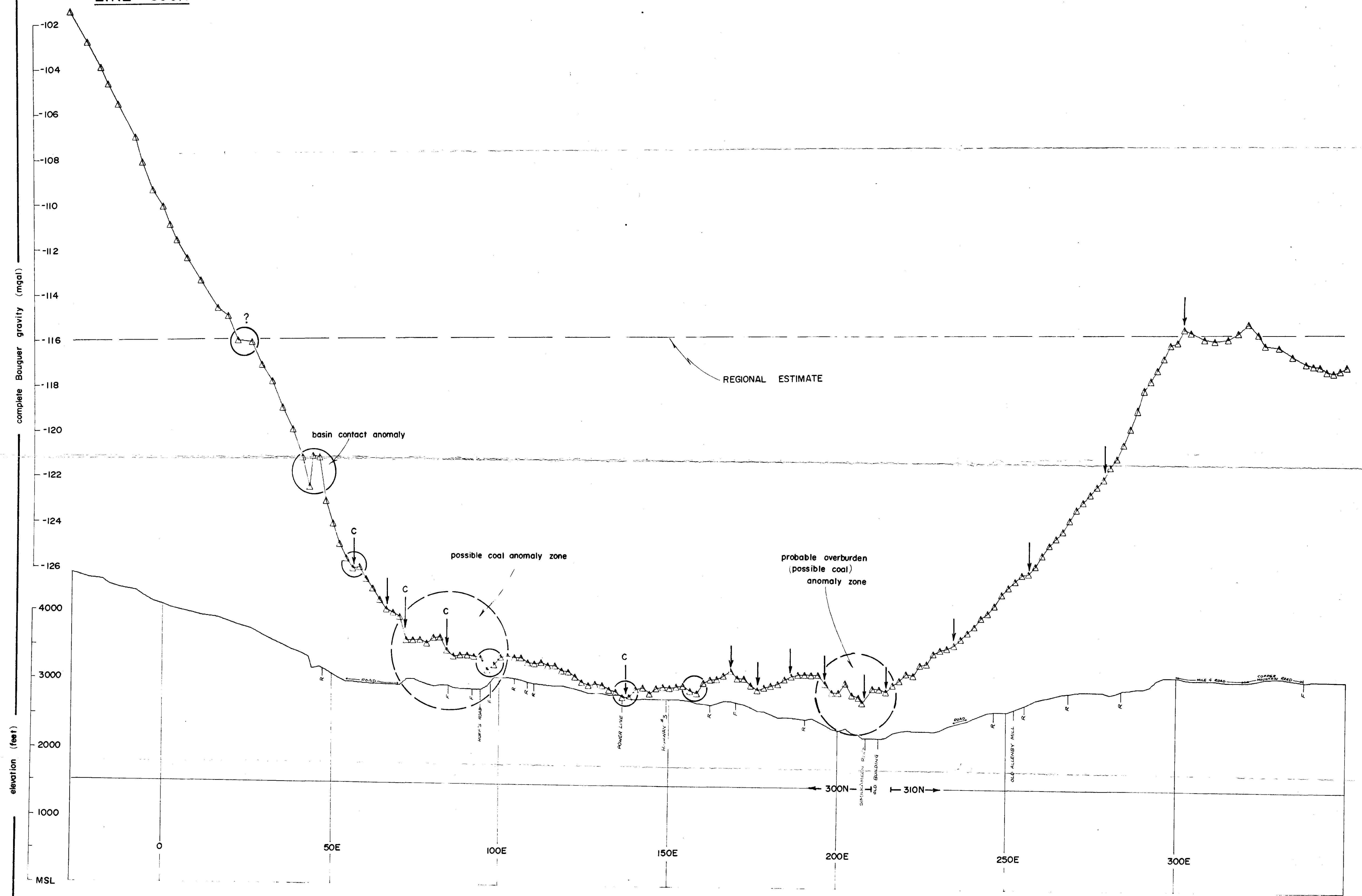
TOPOGRAPHIC FEATURES
R road
F fence

GRAVITY FEATURES
○ overburden or coal anomaly
↓ density change contact
C possible coal zone contact
Δ gravity station

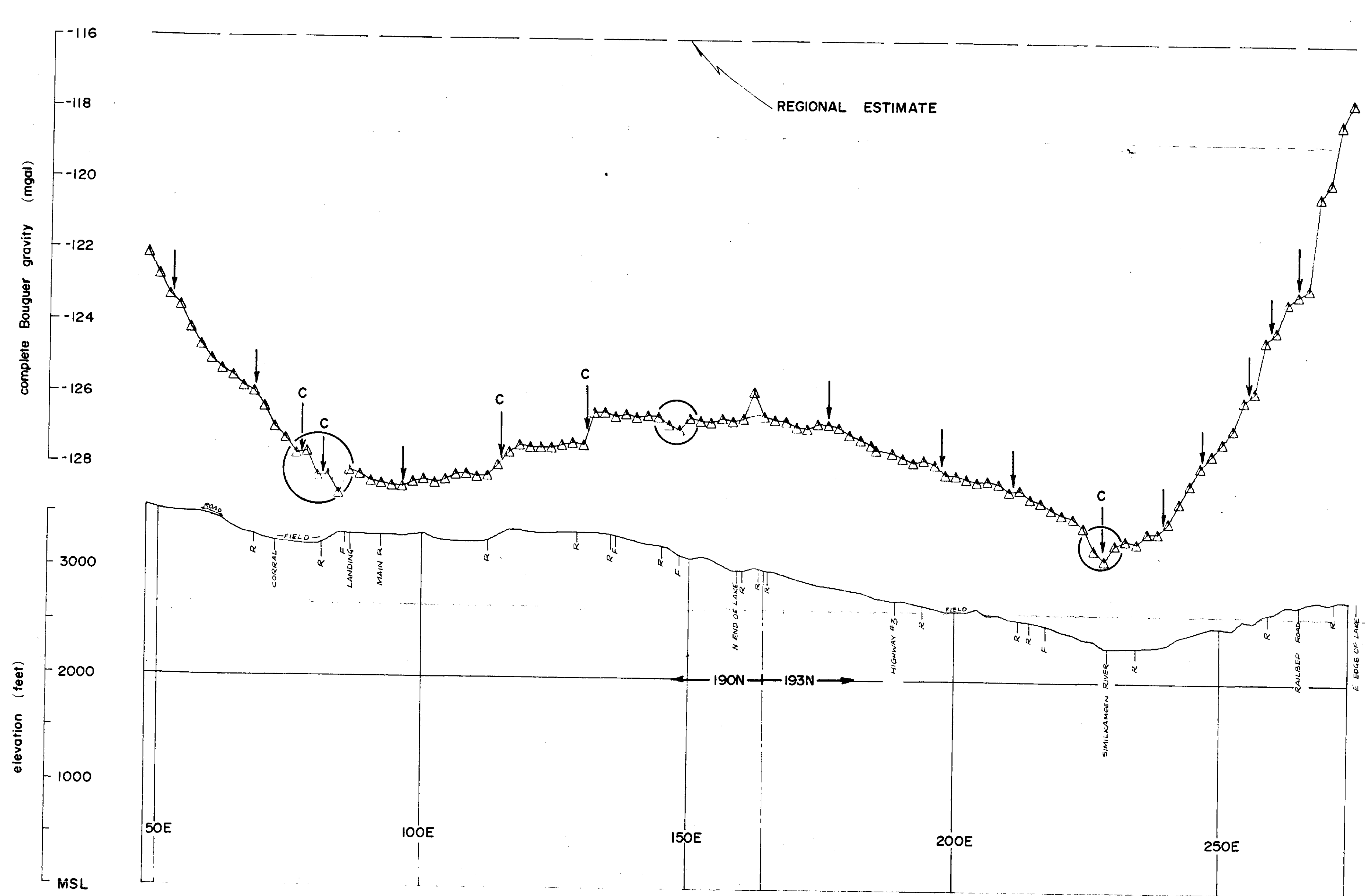
LINE 675N



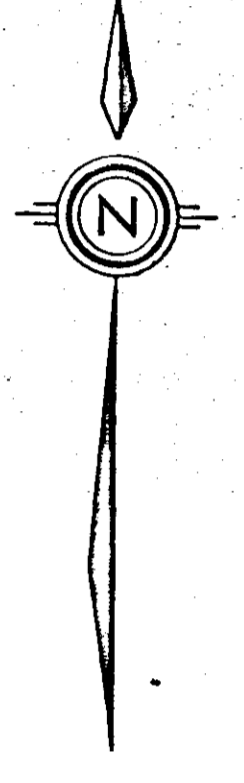
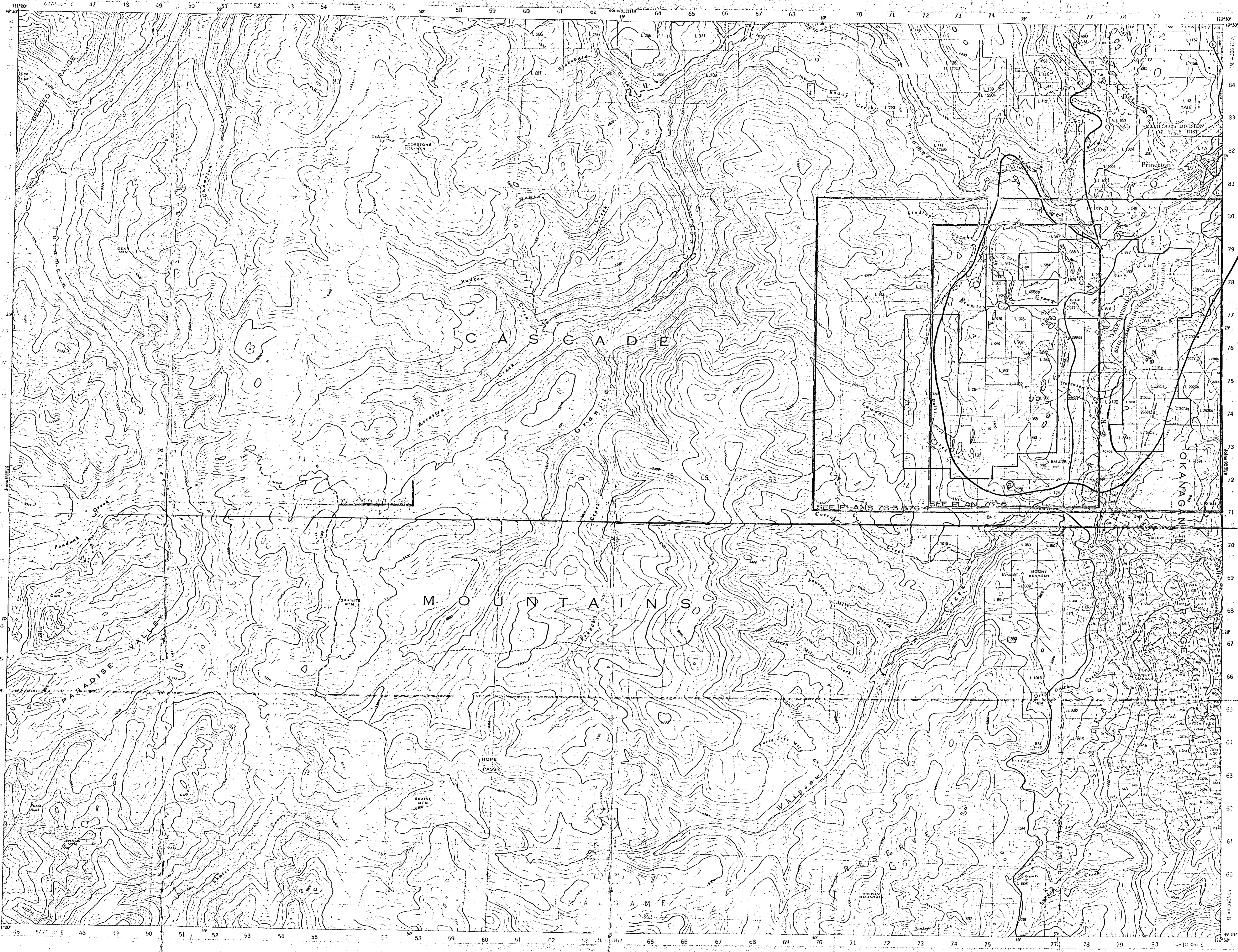
LINE 300N



LINE 190N



TO ACCOMPANY REPORT TITLED
Princeton Basin Gravity Survey
BY *C.A. Ager, P.D.*
DATED *18 Dec 75* PROJECT # *Prince*



LEGEND

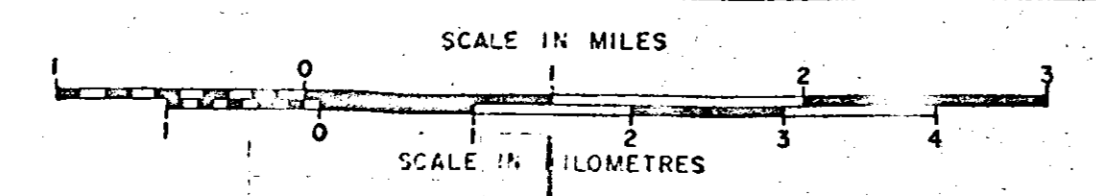
- TERTIARY**
 ALLENBY FORMATION
 Sandstone, Shale, Claystone Conglomerate, Coal
- MESOZOIC**
 Undifferentiated Volcanic Rocks

- COAL MINES**
- GOLDEN GLOW SEAM
 - GEM-BROMLEY VALE SEAM
 - PLEASANT VALLEY-JACKSON SEAM
 - PRINCETON-BLACK SEAM
 - OTHERS ?
- OUTLINE OF THE PRINCETON COAL BASIN
- BEDDING ATTITUDES

McCulloch showed distribution of Tertiary outcrop from McMillan field maps during Aug/75 and a revision of same maps during Oct. 1975. R.D.M.

Drawing No. 76-2 to accompany DEAYOND DRILLING and CONTROL SURVEY REPORT on the PRINCETON COAL PROJECT,
 by *R.D. McMillan*, P. Eng.
 dated March 22, 1976

193 (2)

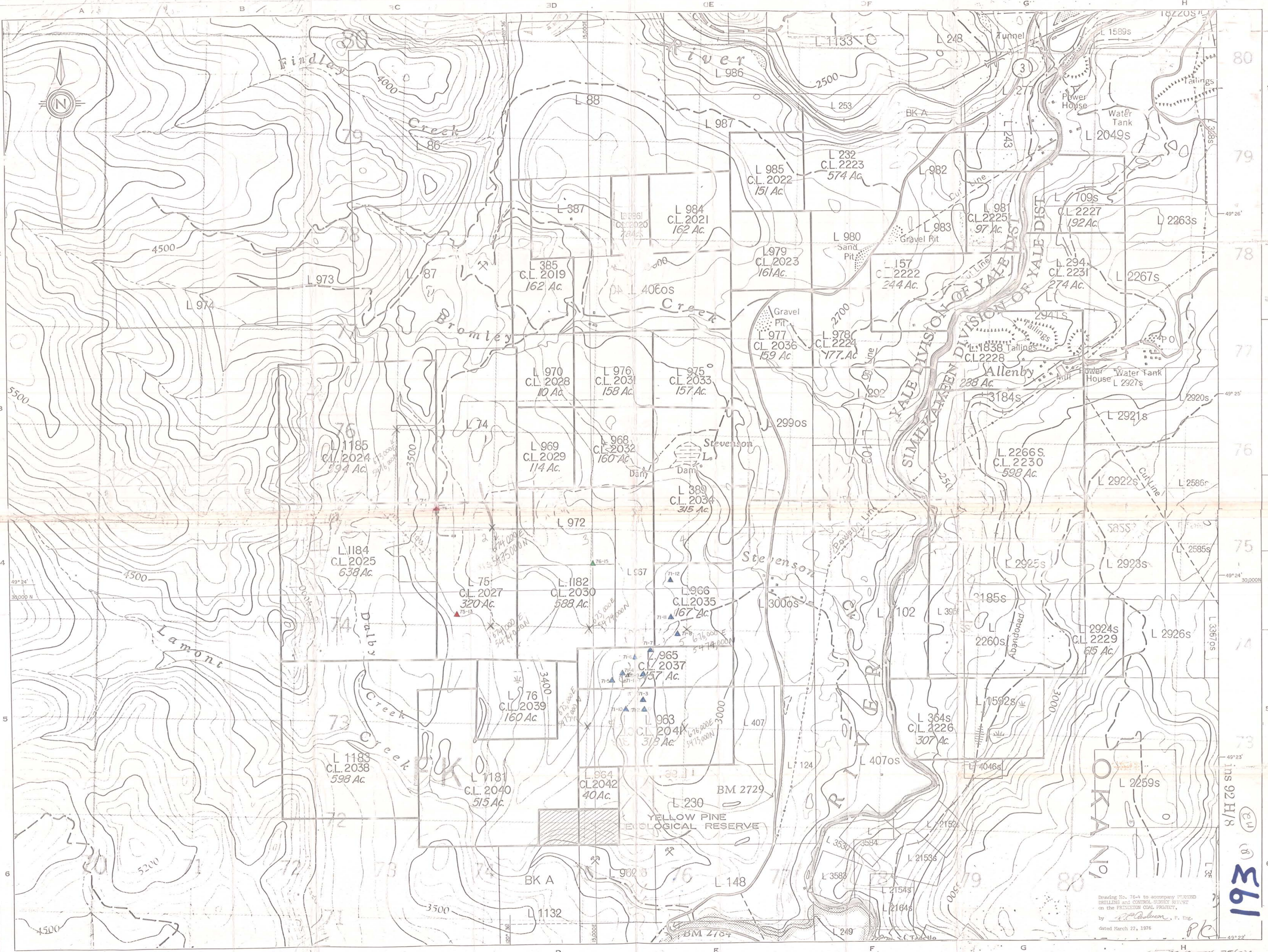


NOTE
 GEOLOGICAL INTERPRETATION DERIVED FROM EVALUATION OF THE PRINCETON COALFIELD DEC. 1975. PREPARED BY DR. P.T. McCULLOUGH FOR B.C. HYDRO AND POWER AUTHORITY.

DATE REVISED	BY	REASON
		EXPLORATION
		DRAWN BY - A.T.H. / M.K.
		CHECKED - E.A.
		APPROVED -
		DATE - APR. / 1976
		SCALE - 1:50,000



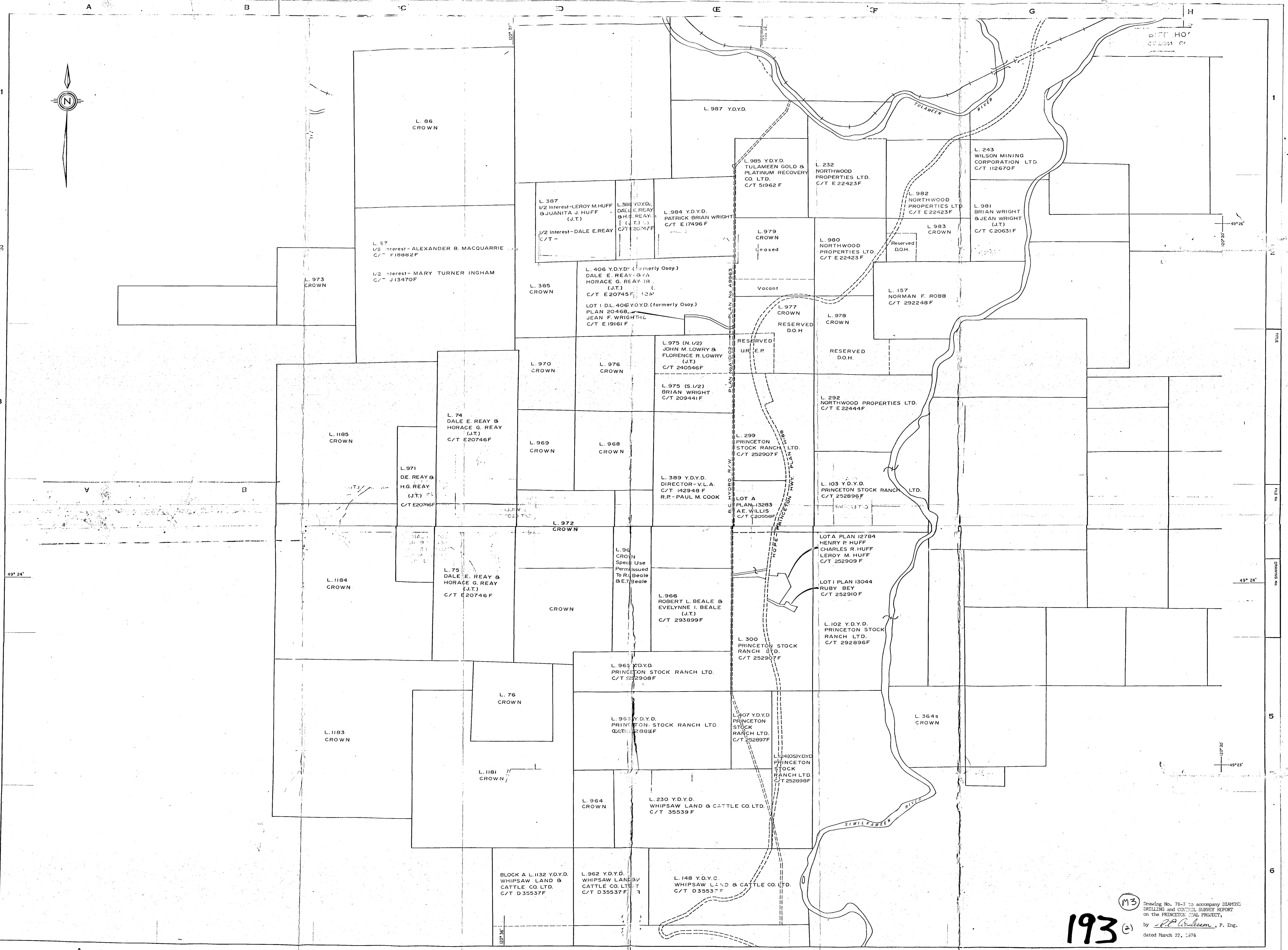
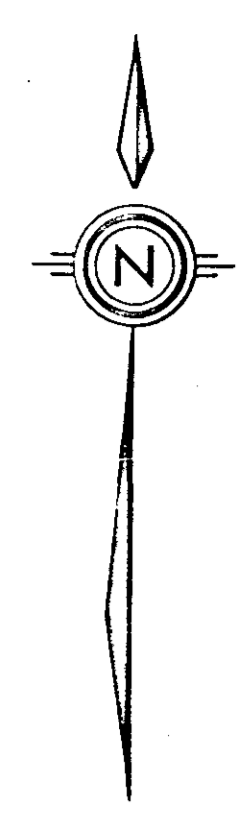
TITLE - PRINCETON COAL PROJECT GEOLOGICAL PLAN	
FILE NUMBER -	DRAWING NUMBER -
	76-2



Drawing No. 76-4 to accompany MINARD DRILLING and CONTROL SURVEY REPORT on the PRINCETON COAL PROPERTY, by *W. A. Johnson, P. Eng.* dated March 22, 1976

193 (21) 8
 ins 92H/8
 PK

SCALE IN METRES 0 100 200 300 400 500 600 700 800 900 1000		DATE REVISION BY EXP. - EXPLORATION DRAWN BY - CHECKED - E.A. APPROVED - DATE - OCT 7 1975 SCALE - 1" = 2,500'	Leithem Copper INCORPORATED VANCOUVER BRITISH COLUMBIA	TITLE - <i>ST. PRINCETON 75(2)A</i> PRINCETON COAL PROJECT DRILL HOLE PLAN FILE NUMBER - DRAWING NUMBER - H 76-4
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NOTE:
INFORMATION BASED ON SEARCHES CONDUCTED IN LAND REGISTRY OFFICE IN NANAIMO DURING OCTOBER & NOVEMBER 1975.

SCALE IN METRES
0 100 200 300 400 500 600 800 1000

DATE REVISION	BY	DEPT. - EXPLORATION
		DRAWN BY - Aitair/m.s.
		CHECKED - E.A.
		APPROVED -
		DATE - NOV. / 1975
		SCALE - 1: 12,500

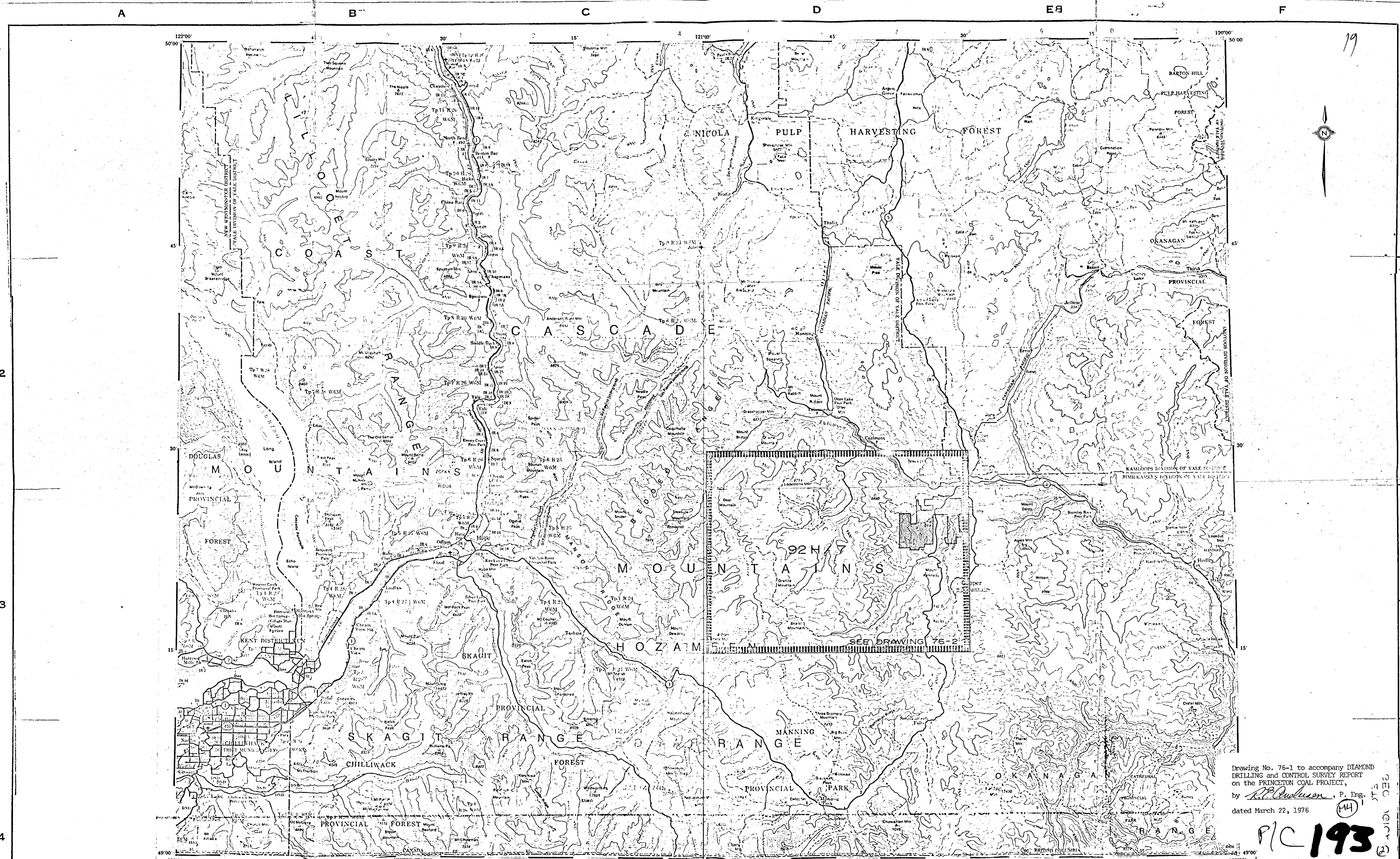
Bethlehem Copper *PK*

193 (2)

M3 Drawing No. 76-3 to accompany DEAMOND DRILLING and CONICAL SURVEY REPORT on the PRINCETON COAL PROJECT, by *R.P. Anderson*, P. Eng. dated March 22, 1976

TITLE - **30-PRINCETON 75(2)A**
PRINCETON COAL PROJECT
LAND STATUS

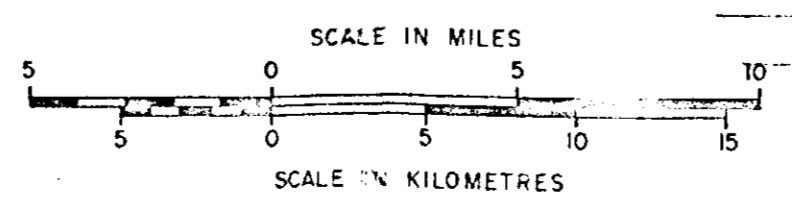
FILE NUMBER - **76-3**
DRAWING NUMBER -



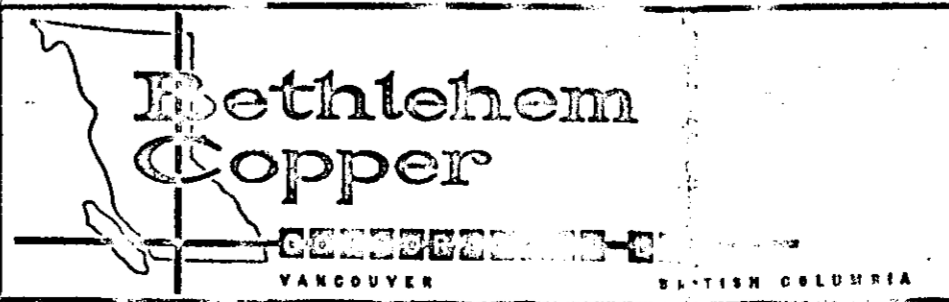
Drawing No. 76-1 to accompany DIAMOND DRILLING and CONTROL SURVEY REPORT on the PRINCETON COAL PROJECT, by *R.P. Coulson*, P. Eng. dated March 22, 1976

PIC 193

SPR. PRINCETON 75(2)A



DATE REVISED	BY	DEPT. - EXPLORATION
		DRAWN BY -
		CHECKED - E. A.
		APPROVED -
		DATE - APR. / 1976
		SCALE - 1:250,000



TITLE - PRINCETON COAL PROJECT LOCATION PLAN	
FILE NUMBER - N.T.S. 92 H	DRAWING NUMBER - 76-1

TITLE FILE NO. DRAWING NO. SECTION

19

DIAMOND DRILLING and CONTROL SURVEY REPORT

on the

PRINCETON COAL PROJECT

Coal Licence Nos. 2025, 2027 and 2030

PRINCETON AREA - SIMILKAMEEN MINING DIVISION

SIMILKAMEEN and YALE DIVISIONS of YALE LAND DISTRICT

LATITUDE 49° 24' N LONGITUDE 120° 36' W

N.T.S. No. 92 H/7E

BETHLEHEM COPPER CORPORATION
Suite 2100 - Guinness Tower
1055 West Hastings Street
Vancouver, B.C.
V6E 2H8

MINING RECORDER
RECEIVED and RECORDED

MAY 7 1976

M.R. #
VICTORIA, B. C.

MARCH 22, 1976

R. E. Anderson, P. Eng.

OPEN FILE

00193 (3)

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19

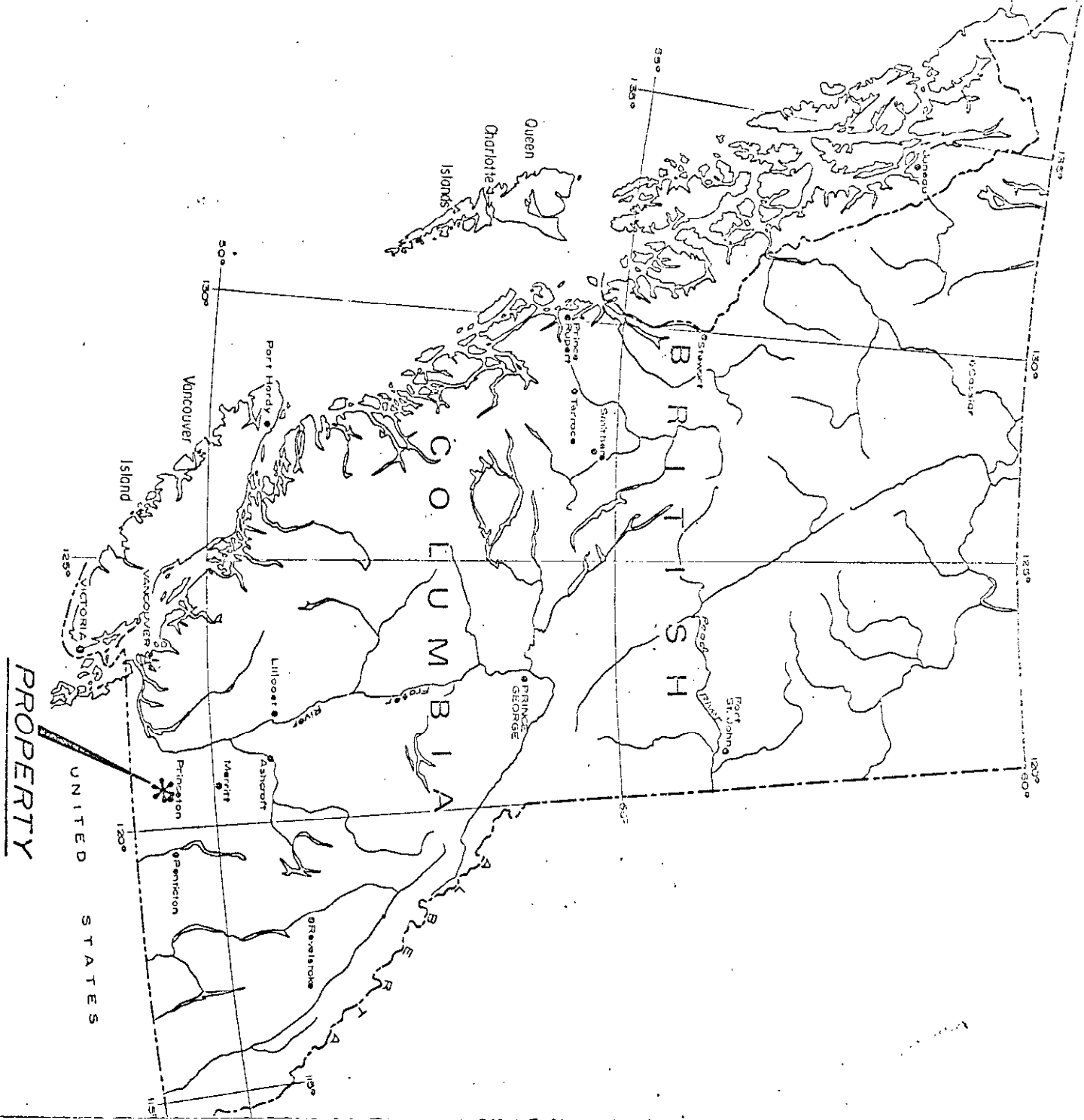
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BETHLEHEM COPPER CORPORATION
PRINCETON COAL PROJECT
LOCATION PLAN



SECTION A - SUMMARY OF WORK

Introduction

Bethlehem Copper Corporation acquired its coal licence holdings in the Princeton Coalfield in 1971. During the period from March to July in 1971 an exploration drilling program was carried out with 12 NQ diamond drill holes being completed for a total of 3002.9 meters (9852'). This drilling was concentrated in the southern portion of the holdings on Coal Licence Nos. 2035, 2037 and 2041. Coal intersections were encountered in 8 of the 12 holes and the results of the 1971 work is detailed in the report filed with the Department of Mines and Petroleum Resources in 1972 entitled "Summary Report-Princeton Coal by R. E. Anderson, P. Eng. dated April 4, 1972".

The drilling program set out in this report was primarily intended to test the area to the west of the 1971 work and involved drilling on a much wider spacing than that previously carried out. Unfortunately, the results were largely negative with very minor intersections being encountered in only one of the three holes completed.

Location and Access

The thirty-three coal licences are located on both sides of the Similkameen River valley in an area extending from 2 Km. to 10 Km. south and southwest of Princeton. Geographic co-ordinates in the centre of the drill area are 49° 24' latitude and 120° 36' longitude. The Hope-Princeton highway (No.3) extends through the general area in a north-south direction.

Access to the western portion of the licence holdings is gained from highway No. 3 via numerous logging and ranch roads.

The coal licences on the eastern side of the Similkameen River are reached via an access road that travels through the former Granby concentrator site of Allenby.

Topography and Physical Environment

The main topographic feature is the Similkameen River valley which bisects the area in a south to north direction. The altitude in the valley floor is in the area of 700 meters A.S.L. and to the west the walls rise fairly rapidly to the 820-30 meter range where a more moderate topography begins, and a series of gently rolling hills occur for some 12 Km. Elevations through this area range from 830 to 1035 meters.

Vegetation throughout the area is a mix between stands of Ponderosa Pine and open grassland areas. The Canada Land Inventory Forestry Classification ranges from Class 5 to 7 with Subclasses A (droughty or arid conditions) and M (soil moisture deficiency) being the primary kinds of limitation.

Logging operations have been underway in the west portion of the licence area for the past five or six years.

Cattle and hay ranching is also practised throughout the area.

History

The Princeton Coal Basin has long been an area of interest with mining operations being conducted on an intermittent basis from the early 1900's until 1961 when the last production occurred at the Blue Flame Mine. A total of 13 underground mines and one surface operation were developed and the total production throughout this period was 1,873,347 tonnes (2,064,990 short tons).

Bethlehem's interest in the area began in late 1970 following a regional mapping and sampling program. Twenty-four coal licences were initially applied for with additional licences being acquired later in 1971.

Land Status

Coal licence nos. 2019-2025 and 2027-2042 were originally issued on March 22, 1971 and re-issued under the terms and conditions

of the Coal Act 1974 on March 22, 1975. Licence no. 2026 was not re-issued at this date as it had been found to be a duplication over other licences. The other ten licences, nos. 2222-2231 were originally obtained on June 11, 1971 and re-issued on June 11, 1975. The total area contained within the licence holdings is 3783.1 hectares or 9348 acres.

The licence holdings are situated over an area that contains many different forms of land tenure. In addition to the private land holdings and crown land there is land under lease from the crown, various Lands Branch reserves, timber sale limits, special use permits, and highway and hydro right of ways. The Land Management Branch carried out a comprehensive status search over the area and Bethlehem conducted detailed Land Registry Searches in order to determine all private ownership. This information is shown on Drawing No. 76-3.

Discussions were carried out with the private land owners over whose property Bethlehem would require access. Visits were made to the area by members of Bethlehem's exploration department on two occasions prior to the commencement of drilling in order to finalize land use negotiations.

Geology

The coal measures of the Princeton Coal basin occur throughout the central 500 meters of the Middle Eocene Allenby formation. This basin occurs on an inferred northeasterly striking tectonic trough some 3.6 to 7.2 kilometers in width by 24 kilometers in length. The volcano-sedimentary pile in the basin lies unconformably on andesites and basalts of the Upper Triassic Nicola Group and are themselves overlain in the north and east by andesites and basalts of the upper volcanic unit. This latter unit, the Allenby formation and a lower volcanic unit lying conformably below the Allenby in the west, comprise the approximately 1770 meter thick Princeton Group.

The Allenby formation consists of fluvial and lacustrine conglomerates, sandstones, shales interbedded with coal, carbonaceous siltstones and bentonite horizons. The four major coal zones (Princeton-Black Pleasant Valley-Jackson, Gem-Bromley Vale and Golden Glow in

ascending order after Shaw 1952) were deposited in this alluvial flood plain environment and hence have lateral lithologic changes that make correlation between drill holes and between drill holes and surface coal exposures difficult. This lateral discontinuity of sedimentary beds and the lack of surface bedrock exposures has to date made it impossible to construct an accurate type section applicable to the entire southern basin. Fault zones and the apparent asymmetrical anticlinal structures encountered in the southern part of the basin further complicate the interpretation of the sedimentary succession relative to the coal measures.

Past diamond drilling results have indicated that the sedimentary units dip steeply inwards from the south and west margins of the basin and flatten upsection towards the centre of the basin. In the central area only the thin upper seams of the coal measures are within reach of a strip mining operation. Along the margins of the basin extensive glacial drift and the lack of stratigraphic section markers have frustrated attempts to locate the subcropping Princeton-Black coal zone which is the thickest and most extensive of the coal zones. Below is a generalized section through the Princeton coal measures indicating the widths of the respective seams:-

<u>Coal Zones</u>	<u>Thickness (Meters)</u>
Golden Glow Zones Waste	7.3 (with 1.5 meters of coal) 105
Gem-Bronley Vale Zone Waste	25.9 (with 4.6 meters of coal) 198
Pleasant Valley-Jackson Zone Waste	30.5 (with 1.8 meters of coal) 137
Princeton-Black Zone	18.3 (with 9.1 meters of coal)

The A.S.T.M. classification of the above coal is sub-bituminous A.

Diamond Drilling

Connors Drilling Ltd. of Vancouver was selected to carry out the drilling program following tenders being solicited from a total of six contractors. They employed a Boyles Bros. Model 25-A drilling unit complete with a unitized top mount mast. Power source for this machine was a British Ford Model 2711 diesel. Core size obtained was NQ.

Drilling commenced on November 13, 1975 under the field supervision of M. E. Herbster, P. Eng. Hole No. DDH-75-13 which was located on licence no. 2027 was carried to a final depth of 232.26 meters (762') and was completed on November 27, 1975. Minor coal intersections were encountered in the area from 191.11 meters (627') down to 212.45 meters (697') but they were not cored over any consistent width and the subsequent laboratory analysis (see Section E) revealed very poor qualities.

Hole No. DDH-75-14 was sited some 1100 meters to the NNW on coal licence no. 2025. It was drilled during the period from December 3 to 16, 1975 and penetrated to 293.53 meters (963'). No coal traces were visible in the core and as a result there were no laboratory tests.

Hole No. DDH-76-15 was located on licence no. 2030 at a point 1700 meters to the ESE of hole no. 14. It was completed between January 15 and 29, 1976 and was also unsuccessful in intersecting any coal seams. It's final depth was 243.84 meters (800').

The following table summarizes the drilling that was carried out:-

<u>Hole No.</u>	<u>Dip</u>	<u>Overburden</u>	<u>Cored Material</u>	<u>Total Depth</u>
75-13	90°	45.42 m.(149')	186.84 m.(613')	232.26 m.(762')
75-14	90°	48.77 m.(160')	244.76 m.(803')	293.53 m.(963')
76-15	90°	<u>46.33 m.(152')</u>	<u>197.51 m.(648')</u>	<u>243.84 m.(800')</u>
		140.51 m.(461')	629.11 m.(2064')	769.63 m.(2525')

The locations of the aforementioned drill holes are shown on Drawing Nos. 76-4 and 76-5 which are appended in Section G.

The NQ core obtained from the drill program is presently stored in core racks located adjacent to the Hope-Princeton on Surface Lot A Plan 12784 (See Drawing 76-3). The core was examined in detail by J. R. Bellamy and R. J. Nethery, P. Eng., geologists on the staff of Bethlehem Copper Corporation. Their logs are appended in Section D.

Geophysical logging in the form of Gamma Ray Neutron and Sidewall Densilogs were conducted on each of the three holes by Roke Oil Enterprises Ltd. of Calgary. Copies of these logs are contained in Section F.

Survey Control

Survey control work was performed during the periods November 5 to 7, 1975 and January 15 and 16, 1976. McWilliam, Whyte, Goble and Associates of Kamloops utilized previous control established in 1971 and expanded it to cover the much larger lateral extent of the drill program. A discussion of the survey method employed and a table of co-ordinates and elevations are appended in Section C. Drawing No. 76-5 details the survey work and is found in Section G.

Summary of Costs

Total expenditures incurred during the aforementioned program were \$57,222.86 or \$74.35 per meter of completed drilling. These expenditures are set out in detail in Section B which also includes copies of contractors' invoices and employee expense accounts. Expenditures for the services of contractors' (exclusive of accommodation charges) totalled \$48,740.40 or 85.18% of the gross outlay, while costs generated within the Bethlehem organization came to \$8,482.46 or 14.82%.

Tabulated below is a distribution of the costs on a per hole basis. This distribution is set out in greater detail in Section B.

<u>Hole No.</u>	<u>Coal Licence No.</u>	<u>Expenditures</u>	<u>Cost/Meter</u>
75-13	2027	\$ 17,036.60	\$ 73.35
75-14	2025	19,780.09	67.39
76-15	2030	<u>20,406.17</u>	<u>83.69</u>
Total		\$ 57,222.86	\$ 74.35

Respectfully submitted,



R. E. Anderson, P. Eng.
Exploration Manager

SECTION B - STATEMENT OF EXPENDITURES

CONTRACTORS (see accompanying invoices)

- 1. Connors Drilling Ltd. - diamond drilling
(Nov. 10/75 to Jan. 30/76)
 - Invoice 6327 \$ 1,899.75
 - Invoice 6351 9,641.73
 - Invoice 6428 14,121.90
 - Invoice 6477 3,739.70
 - Invoice 6490 10,419.77
 - TOTAL \$39,822.85

- 2. Huff Bros. Sawmills Ltd. - bulldozer used
for road and site preparation
 - Invoice No. 8830 \$ 1,280.00
 - TOTAL \$ 1,280.00

- 3. Roke Oil Enterprises Ltd. - drill hole logging
(Gamma Ray Neutron and Density)
 - Invoice No. 817 \$ 1,351.40
 - Invoice No. 831 1,554.35
 - Invoice No. 846 1,383.80
 - TOTAL \$ 4,289.55

- 4. Commercial Testing and Engineering Co.
- drill core analysis
 - Invoice No. 6,412,024 \$ 108.00
 - TOTAL \$ 108.00

- 5. McWilliam, Whyte, Goble and Associates
- ground control survey contractor
 - Invoice dated
Nov. 21, 1975 \$ 2,150.00
 - Invoice dated
Mar. 3, 1976 1,090.00
 - TOTAL \$ 3,240.00

TOTAL CONTRACTORS' EXPENDITURES

\$48,740.40

BETHLEHEM EXPENDITURES

1. Personnel

R. E. Anderson, P. Eng. - Exploration Manager
- a total of 10 days during the period from
Nov. 1, 1975 to March 22, 1976.
10 days @ \$140.00/day = \$ 1,400.00

E. Andersen - Property Agent
- Oct. 15, 16, 29, 30, Nov. 5, 1975
and March 18, 19 and 22, 1976
8 days @ \$80.00/day = \$ 640.00

M. E. Herbster, P. Eng. - Project Engineer
- Oct. 15, 16, 29, 30, 1975 (4)
Nov. 11-14, 17-27, 29, 30, 1975 (13)
Dec. 9-12, 16, 17, 1975 (6)
Jan. 9-16, 19-23, 29-31, 1976 (16)
39 days @ \$95.00/day = \$ 3,705.00

J. R. Bellamy - Geologist
- Dec. 4, 1975
1 day @ \$95.00/day = \$ 95.00

R. J. Nethery, P. Eng. - Geologist
- Mar. 4, 8 and 9, 1976
3 days @ \$105.00/day = \$ 315.00

S. Noble - Secretary
- a total of 5 days during the
period from Nov. 1, 1975 to Mar. 22, 1976
5 days @ \$40.00/day = \$ 200.00

TOTAL \$6,355.00

2. Transportation

E. Andersen -- Ford F-250 4 x 4 Pickup 5 days @ \$25.00/day	- \$ 125.00
M. E. Herbster - Ford F-250 4 x 4 Pickup 35 days @ \$25.00/day	- \$ 875.00
R. J. Nethery - Ford F-150 Pickup 2 days @ \$20.00/day	- \$ <u>40.00</u>
TOTAL	- \$1,040.00

3. Accommodation and Food

(See copies of invoices from Sandman Inns Ltd.
and Bethlehem expense accounts)

E. Andersen - accommodation and meals in Princeton on the following dates:-	
Oct. 15, 16, 1975	- \$ 59.65
Oct. 29, 30, 1975	- \$ 58.15
	<u>\$117.80</u>

M. E. Herbster - accommodation and meals in Princeton on the following dates:-	
Nov. 11-14, 1975	- \$106.78
Nov. 17-27, 1975	- \$290.04
Nov. 29-30, 1975	- \$ 47.25
Dec. 9-12, 1975	- \$ 97.69
Dec. 16-17, 1975	- \$ 30.00
Jan. 9-16, 1976	- \$213.35
Jan. 19-23, 1976	- \$126.70
Jan 29-31, 1976	- \$ 57.85
	<u>\$969.66</u>

TOTAL \$1,087.46

TOTAL BETHLEHEM EXPENDITURES - \$ 8,482.46

TOTAL EXPENDITURES - \$57,222.86
Average Cost Per Metre (769.63) \$ 74.35

DISTRIBUTION OF COSTS PER HOLE

1. Hole No. DDH-75-13 - 232.26 meters

- (a) Connors Drilling Ltd. \$11,541.48
- (b) Roke Oil Enterprises Ltd. 1,351.40
- (c) McWilliam, Whyte, Goble and Assoc. 1,080.00
- (d) Commercial Testing and Eng. Co. 108.00
- (e) Bethlehem Personnel:

On Property - E. Andersen 2 days @ \$80.00 \$ 160.00
 M. E. Herbster 13 days @
 \$95.00 \$1,235.00

Off Property- R. E. Anderson 3 days @
 \$140.00 \$ 420.00
 E. Andersen 2 days @ \$80.00 \$ 160.00
 J. R. Bellamy 1 day @
 \$ 95.00 \$ 95.00
 S. Noble 2 days @ \$40.00 \$ 80.00
 \$2,150.00

(f) Bethlehem Transportation:-

E. Andersen 3 days @ \$25.00 \$ 75.00
 M. E. Herbster 11 days @ \$25.00 \$275.00
 \$350.00

(g) Bethlehem Accommodation:-

E. Andersen - Food \$ 31.60
 Accommodation \$ 27.30
 Sub-Total \$ 58.90
 M. E. Herbster-Food \$140.55
 Accommodation \$191.10
 Telephone \$ 65.17
 Sub-Total \$396.82

TOTAL \$455.72

TOTAL COST OF DDH-75-13 \$17,036.60

Cost Per Meter \$ 73.35

2. Hole No. DDH-75-14 - 293.53 meters

- (a) Connors Drilling Ltd. \$14,721.90
- (b) Roke Oil Enterprises Ltd. 1,554.35
- (c) McWilliam, Whyte, Goble and Assoc. 1,080.00
- (d) Bethlehem Personnel:-

<u>On Property</u> - E. Andersen 2 days @ \$80.00	\$ 160.00
M.E. Herbster 10 days @ \$95.00	950.00
R.J. Nethery 2 days @ \$105.00	210.00

<u>Off Property</u> - R.E. Anderson 3 days @ \$140.00	\$ 420.00
E. Andersen 1 day @ \$80.00	80.00
S. Noble 2 days @ \$40.00	80.00
	<u>\$1,900.00</u>

(e) Bethlehem Transportation:-

E. Andersen 2 days @ \$25.00	\$ 50.00
M.E. Herbster 8 days @ \$25.00	\$200.00
R.J. Nethery 2 days @ \$20.00	\$ 40.00
	<u>\$290.00</u>

(f) Bethlehem Accommodation:-

E. Andersen	Food	\$ 31.60
	Accommodation	27.30
	Sub-Total	<u>\$ 58.90</u>
M.E. Herbster	Food	80.75
	Accommodation	75.60
	Telephone	18.59
	Sub-Total	<u>\$174.94</u>

TOTAL \$233.84

TOTAL COST OF DDH-75-14 \$19,780.09

Cost Per Meter \$67.39

3. Hole No. DDH-76-15 -- 243.84 meters

- (a) Connors Drilling Ltd. \$13,559.47
- (b) Huff Bros. Sawmills Ltd. 1,280.00
- (c) Roke Oil Enterprises Ltd. 1,383.80
- (d) McWilliam, Whyte, Goble and Assoc. 1,080.00
- (e) Bethlehem Personnel:-

On Property - M.E. Herbster 16 days @ \$95.00	\$1,520.00
<u>Off Property-</u> R.E. Anderson 4 days @ \$140.00	560.00
E. Andersen 1 day @ \$80.00	80.00
R.J. Nethery 1 day @ \$105.00	105.00
S. Noble 1 day @ \$40.00	40.00
	<u>\$2,305.00</u>

(f) Bethlehem Transportation:-

M.E. Herbster 16 days @ \$25.00 - \$400.00

(g) Bethlehem Accommodation:-

M.E. Herbster	Food	\$154.35
	Accommodation	177.45
	Telephone	66.10
	<u>Total</u>	<u>\$397.90</u>

TOTAL COST OF DDH-76-15 \$20,406.17

Cost Per Meter \$83.69

19

BETHLEHEM COPPER CORPORATION

DATE	INVOICE No.	AMOUNT	DATE	INVOICE No.	AMOUNT
1976					
Jan. 13	Invoice #6327	\$1,899.75			

BETHLEHEM COPPER CORPORATION

No 4759

SUITE 2100, GUINNESS TOWER, 1055 WEST HASTINGS STREET

VANCOUVER, B.C. V6E 2N8

13th January 1976

PAY TO THE ORDER OF CONNORS DRILLING LTD.

\$ 1,899.75

100 DOLLARS

BETHLEHEM COPPER CORPORATION

TO THE
BANK OF MONTREAL
 MAIN OFFICE - THREE BENTALL CENTRE
 593 BARRARD STREET
 VANCOUVER, B.C.
 V7X 1L7

PER NON-NEGOTIABLE

PER _____

VOUCHERS PAYABLE

CHARGE	ACCOUNT No.	DR.	CR.
	938-004 ✓	\$1,899.75 ✓	
	110-002 ✓		\$1,899.75 ✓

VOUCHER ENTERED

APPROVED OR PAYMENT

[Handwritten Signature]
[Handwritten Signature]
[Handwritten Signature]

19



Subsidiary of
Bow Valley Industries Ltd.

205-

207- 1201 WEST PENDER STREET, VANCOUVER, B.C. CANADA V6E 2V2
AREA CODE 604/683 - 2222

DEC. 3, 1975

Job #22-605

INVOICE NO: 6327
DATE: Nov. 25th, 1975.

Bethlehem Copper Corporation,
Suite 2100 Guinness Tower,
1055 West Hastings Street,
Vancouver, B.C.,
V6E 2H8.

SURFACE DIAMOND DRILLING
PRINCETON, B.C.
NOVEMBER 10-15th, 1975

938-004
110-002

FOOTAGE FEE:

D.D. Hole #75-13 0-'149' 149' @ 12.75

\$1,899.75

ok for payment
204-938
R.E.
W

FT:ew

Invoice #6327

19

BETHLEHEM COPPER CORPORATION

DATE	INVOICE No.	AMOUNT	DATE	INVOICE No.	AMOUNT
1976 January 8	Ret Job 22-605	\$9,641.73			

BETHLEHEM COPPER CORPORATION

SUITE 2100, GUINNESS TOWER, 1055 WEST HASTINGS STREET

No 4729

VANCOUVER, B.C. V6E 2H0

8th January 19 76

PAY TO THE ORDER OF CONNORS DRILLING LTD.

\$9,641.73

100 DOLLARS

BETHLEHEM COPPER CORPORATION

TO THE
BANK OF MONTREAL
 MAIN OFFICE - THREE BENTALL CENTRE
 595 BARRARD STREET
 VANCOUVER, B.C.
 V7X 1L7

PER NON-NEGOTIABLE

PER _____

VOUCHERS PAYABLE

CHARGE	ACCOUNT No.	DR.	CR.
	938-004	\$9,641.73	
	110-002		\$9,641.73

VOUCHER ENTERED

APPROVED FOR PAYMENT



205-
281-1201 WEST PENDER STREET, VANCOUVER, B.C. CANADA V6E 2V2
DEC - 3 1975
AREA CODE 604/683 - 2222

Job 22-605

BETHLEHEM COPPER CORPORATION
SUITE 2100, GUINNESS TOWER
1055 WEST HASTINGS STREET
VANCOUVER, B. C.
V6E 2H8

INVOICE NO: 6351
DATE: December 2, 1975

SURFACE DIAMOND DRILLING
PRINCETON, B. C.
NOVEMBER 16 - 30, 1975

<u>FOOTAGE FEE</u>			
D.D. Hole #75-13	149 - 500'	351' @ 10.50	3,685.50 ✓
	500 - 762'	262' @ 11.50	3,013.00 ✓
		613'	6,698.50 ✓

FIELD COST WORK

<u>DATE</u>	<u>SHIFT</u>	<u>MAN HRS.</u>	<u>DRILL HRS.</u>	<u>REMARKS</u>
Nov. 18/75	Day	4	2	Ream casing 149'-157'
"	Night	12	6	" " 157'-183'
21	Day	2	1	Mix mud lost circulation
"	Night	2	1	" " " "
22	Day	2	1	" " " "
"	Night	2	1	" " " "
23	Day	2	1	" " " "
24	"	2	1	" " " "
"	Night	2	1	" " " "
25	Day	2	1	" " " "
"	Night	2	1	" " " "
26	Day	2	1	" " " "
"	Night	2	1	" " " "
27	"	1	1	Mix mud
28	"	1	1	" "
29	Day	2	1	" "
30	"	12	4	Probe hole
		54 ✓	26 ✓	



205 - 1201 WEST FINDER STREET, VANCOUVER, B.C., CANADA V6E 2V2
AREA CODE 604/683-2222

To • BETHLEHEM COPPER CORPORATION
• SUITE 2100, GUINNESS TOWER
• 1055 WEST HASTINGS STREET
• VANCOUVER, B. C.
V6E 2H8

DATE December 2, 1975
INVOICE NO. 6351

- 2 -

Total man hours 54 @ 13.50 729.00 ✓
Total drill hours 26 @ 9.00 234.00 ✓ 963.00 ✓

DIP TESTING

Nov. 22/75 1 test @ 500' 28.00

MUD SUPPLIES CONSUMED (Lost circulation)

58 50# bags Quick Gel Mud @ 4.35 252.30 ✓
150 2# " Quick Trol Mud @ 6.05 907.50 ✓
1 100# " Soda Ash 13.20
2 50# " Cellex @ 121.00 242.00 ✓
1 40# " Quick Seal 23.65
1,438.65 ✓
5% tax 71.93 ✓
Freight on above 3440# @ 2.21 76.02
1,586.60
Plus 10% 158.66 ✓ 1,745.26 ✓

SUPPLIES CONSUMED REAMING

1 only NW Casing Shoe #J42W-655 179.20 ✓
5% tax 8.96 ✓
188.16
Plus 10% 18.81 ✓ 206.97 ✓
9,641.73 ✓

938-004
110-002

ok for Payment.
004-938
R Ch.
9641.73
K

BETHLEHEM COPPER CORPORATION

DATE	INVOICE No.	AMOUNT	DATE	INVOICE No.	AMOUNT
1976					
Jan. 19	Inv. #6428 January 6, 1976	\$14,121.90			

BETHLEHEM COPPER CORPORATION

SUITE 2100, GUINNESS TOWER, 1055 WEST HASTINGS STREET

No 4804

VANCOUVER, B.C. V6E 2H8

19th January

1976

PAY TO THE ORDER OF CONNORS DRILLING LTD.

\$ 14,121.90

100 DOLLARS

BETHLEHEM COPPER CORPORATION

TO THE
BANK OF MONTREAL
MAIN OFFICE - THREE BENTALL CENTRE
595 BARRARD STREET
VANCOUVER, B.C.
V7X 1L7

PER NON-NEGOTIABLE

PER _____

VOUCHERS PAYABLE

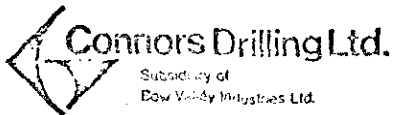
CHARGE	ACCOUNT No.	DR.	CR.
	938-004	\$14,121.90	
	110-002		14,121.90

VOUCHER ENTERED

APPROVED FOR PAYMENT

[Handwritten Signature]

19



Subsidiary of
Bow Valley Industries Ltd.

205-
281-1201 WEST PENDER STREET, VANCOUVER, B.C. CANADA V6E 2V2
AREA CODE 604/683-2222

JAN - 9 1976

Job 22-605

BETHLEHEM COPPER CORPORATION
SUITE 2100 GUINNESS TOWER
1055 WEST HASTINGS STREET
VANCOUVER, B.C.
V6E 2H8

INVOICE NO: 6428
DATE: January 6, 1976

SURFACE DIAMOND DRILLING
PRINCETON, B.C.
DEC. 1-17, 1975

FOOTAGE FEE

D.D. Hole # 75-14	0' - 161'	161' @ 12.75	2,052.75 ✓	
	161' - 500'	339' @ 10.50	3,559.50 ✓	
	500' - 963'	463' @ 11.50	5,324.50 ✓	10,936.75 X
		<u>963'</u>		

FIELD COST WORK

<u>DATE</u>	<u>SHIFT</u>	<u>MAN HRS.</u>	<u>DRILL HRS.</u>	<u>REMARKS</u>	
Dec. 1/75	day	30	10	Moving clearing site as drill site not laid out	
17/75	day	26 <u>56</u> ✓	8 <u>18</u> ✓	Probe hole	
Total man hours		56 @ 13.50	756.00 ✓		
Total drill hours		18 @ 9.00	<u>162.00</u> ✓		918.00 X

DIP TESTS

Dec. 7/75	1 test @ 500'				28.00
-----------	---------------	--	--	--	-------

6428

19



Subsidiary of
Bow Valley Industries Ltd.

205 - 1201 WEST PENDER STREET, VANCOUVER, B.C., CANADA V6E 2V2
AREA CODE 604/683-2222

To
• BETHLEHEM COPPER CORPORATION
• SUITE 2100 GUINNESS TOWER
• 1055 WEST HASTINGS STREET
• VANCOUVER, B.C.
• V6E 2H8

• DATE January 6, 1976
• INVOICE NO. 6428
•

- 2 -

CASING LEFT IN HOLE # 75-14

20 pieces NW 10' casing @ 59.70	1,194.00 ✓	
12 pieces NW 5' " @ 34.25	411.00 ✓	
1 " NW 2' "	19.75	
1 " NW casing shoe #J#ZW-656	179.20	
	<u>1,803.95 x</u>	
5% tax	90.20 ✓	1,894.15 x

TRACTOR RENTAL

Dec. 1/75 10 hours
17 13 "
23 hours @ 30.00

506 B.T.B. ——— 690.00
14,466.90
~~356.00~~
14,176.90

ask for Payment. 14,176.90
004-938
RER

938-604
110-002

RE. #14,121.90

19

BETHLEHEM COPPER CORPORATION

DATE	INVOICE NO.	AMOUNT	DATE	INVOICE NO.	AMOUNT
1976 March 9	Invoice #6477	\$3,739.70			

BETHLEHEM COPPER CORPORATION

SUITE 2100, GUINNESS TOWER, 1055 WEST HASTINGS STREET

No 5026

VANCOUVER, B.C. V6E 2H8

9th March 1976

PAY TO THE ORDER OF

CONNORS DRILLING LTD.

\$ 3,739.70

100 DOLLARS

BETHLEHEM COPPER CORPORATION

TO THE

BANK OF MONTREAL

MAIN OFFICE - THREE BENTALL CENTRE
595 BARRARD STREET
VANCOUVER, B.C.
V7X 1L7

PER NON-NEGOTIABLE

PER

VOUCHERS PAYABLE

CHARGE	ACCOUNT No.	DR.	CR.
	938-004	\$3,739.70	
	110-002		\$3,739.70

VOUCHER ENTERED

FOR OR PAYMENT
[Signature]



Subsidiary of
Bow Valley Industries Ltd.

205-
201 WEST PENDER STREET, VANCOUVER, B.C. CANADA V6E 2V2
AREA CODE 604/683 - 2222

Job 22-605

Bethlehem Copper Corporation
Suite 2100, Guinness Tower
1055 West Hastings Street
Vancouver, B. C.
V6E 2H8

INVOICE NO: 6477
DATE:

January 21, 1976

SURFACE DIAMOND DRILLING
PRINCETON, B. C.
JANUARY 1 - 15, 1976

FOOTAGE FEE

D.D. Hole #76-15 0 - 131' 131' @ 12.75 1,670.25 ✓

FIELD COSTS

ok.
not retb.
cat.

DATE	MAN HRS.	DRILL HRS.	REMARKS
Jan. 13/76	36	9	Move to 3rd hole
14	40	10	Complete setting up
15	20	10	" " "
	96 ✓	29 ✓	

Total man hours 96 @ 13.50 1,296.00 ✓
 Total drill hours 29 @ 4.50 130.50 ✓ 1,426.50 X

DELAY CHARGES (Waiting for hole to be spotted)
From attached sheet

650.45 ✓

WATER TRUCK RENTAL Dec. 2 - 17/75
Kerpan & Delfs Ltd. (copy attached)

600.00 ✓ 15-14
4,347.20 X
607.50 ✓

LESS. 40 man hrs @ 13.50 - 540.00 ✓
15 " " @ 4.50 - 67.50 ✓
607.50 X

3739.70 X

938-004
110-002

stk for Payment.
004-938
REB. K

#3739.70

6477

BETHLEHEM COPPER CORPORATION

DATE	INVOICE NO.	AMOUNT	DATE	INVOICE NO.	AMOUNT
1976 Feb. 25	Inv. #6490	\$10,419.70			

BETHLEHEM COPPER CORPORATION

SUITE 2100, GUINNESS TOWER, 1055 WEST HASTINGS STREET

No 4976

VANCOUVER, B.C. V6E 2H8

25th February

1976

PAY TO THE ORDER OF CONNORS DRILLING LTD.

\$ 10,419.77

100 DOLLARS

BETHLEHEM COPPER CORPORATION

TO THE
BANK OF MONTREAL
 MAIN OFFICE - THREE BENTALL CENTRE
 595 BARRARD STREET
 VANCOUVER, B.C.
 V7X 1L7

PER NON-NEGOTIABLE

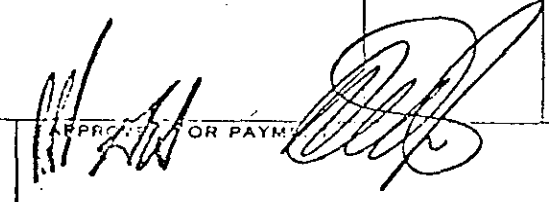
PER _____

VOUCHERS PAYABLE

CHARGE	ACCOUNT No.	DR.	CR.
	938-004 ✓	\$10,419.77 ✓	
	110-002 ✓		\$10,419.77 ✓

VOUCHER ENTERED

APPROVED FOR PAYMENT





205
207 - 1201 WEST PENDER STREET, VANCOUVER, B.C. CANADA V6E 2V2
FEB 10 1976
AREA CODE 604/683 - 2222

Job 22-605

BETHLEHEM COPPER CORPORATION
SUITE 2100, GUINNESS TOWER
1055 WEST HASTINGS STREET
VANCOUVER, B. C.
V6E 2H8

INVOICE NO: 6490
DATE: February 9, 1976

SURFACE DIAMOND DRILLING
PRINCETON, B. C.
JANUARY 16 - 31, 1976

FOOTAGE FEE

D.D. Hole #76-15	131 - 150'	19'	@ 12.75	242.25 /
	150 - 500'	350'	@ 10.50	3,675.00 ✓
	500 - 800'	300'	@ 11.50	3,450.00 ✓
		<u>669'</u>		7,367.25 X

FIELD COSTS

<u>DATE</u>	<u>SHIFT</u>	<u>MAN HRS.</u>	<u>DRILL HRS.</u>	<u>REMARKS</u>
Jan. 24/76	Day	2	1	Mix mud lost circulation
"	Night	4	2	" " " "
25	Day	4	2	" " " "
"	Night	4	2	" " " "
26	Day	4	2	" " " "
27	"	2	1	" " " "
"	Night	2	1	" " " "
28	Day	4	2	" " " "
"	Night	2	1	" " " "
29	Day	2	1	" " " "
"	"	4	2	Probe hole
		<u>34 X</u>	<u>17 X</u>	

Total man hours	34 @ 13.50	459.00 ✓
Total drill hours	17 @ 9.50	161.50 ✓ 620.50 X

19



Subsidiary of
Bow Valley Industries Ltd.

205 - 1201 WEST PENDER STREET, VANCOUVER, B.C., CANADA V6E 2V2
AREA CODE 604/683-2222

To
• BETHLEHEM COPPER CORPORATION
• SUITE 2100, GUINNESS TOWER
• 1055 WEST HASTINGS STREET
• VANCOUVER, B. C. V6E 2H8

• DATE FEBRUARY 9, 1976
• INVOICE NO. 6490
•

- 2 -

DIP TESTS

Jan. 29/76 Night 1 @ 500' 28.00

WATER TRUCK RENTAL Jan. 11-31/76

Kerpan & Delfs Ltd., Inv. #00988 (copy attached) 900.00 ✓

TRACTOR RENTAL Jan. 30/76

Landscaping drill site 4 hrs. @ 30.00 120.00 ✓

MUD SUPPLIES CONSUMED (Lost circulation)

52 50# bags Quick Gel Mud @ 4.35 226.20 ✓

145 2# Quick Trol Mud @ 6.05 877.25 ✓

1 50# " CC-16 16.85

1 100# " Asbestos 14.00

1,134.30 ✓

5% tax

56.72 ✓

Freight on above 3040# @ 2.21

1,191.02 ✓

67.18 ✓

Plus 10%

1,258.20 ✓

125.82 ✓

1,384.02 ✓

10,419.77 ✓

938-004

10,419.77

110-002

10,419.77

4-938

[Handwritten signature]

BETHLEHEM COPPER CORPORATION

DATE	INVOICE No.	AMOUNT	DATE	INVOICE No.	AMOUNT
1976 Feb. 25	Inv. #003830	\$1,280.00			

BETHLEHEM COPPER CORPORATION

No 496

SUITE 2100, GUINNESS TOWER, 1055 WEST HASTINGS STREET

VANCOUVER, B.C. V6E 2H8

25th February 19 76

PAY TO THE ORDER OF HUFF BORERS SAWMILLS LTD.

\$ 1,280.00

DOLLARS
100

BETHLEHEM COPPER CORPORATION

TO THE
BANK OF MONTREAL
 MAIN OFFICE - THREE BENTALL CENTRE
 595 BARRARD STREET
 VANCOUVER, B.C.
 V7X 1L7

PER NON-NEGOTIABLE

PER _____

VOUCHERS PAYABLE

CHARGE	ACCOUNT No.	DR.	CR.
	857-004 /	\$1,280.00 /	
	110-002 /		\$1,280.00 /

VOUCHER ENTERED

APPROVED FOR PAYMENT

Handwritten signatures and initials, including a large signature on the right and initials on the left.

FEB 10 1976

Huff Brothers Sawmills Ltd
Box 697 Princeton Bc

DATE Feb 4 19 76

NAME Bethlehem Logging

ADDRESS

QUANTITY	DESCRIPTION	PRICE	AMOUNT			
30 hrs	cat Rental @ 30 ⁰⁰ per hr D6B		\$900.00			
19 hrs	cat Rental @ 30 ⁰⁰ per hr John Deere 450		380.00			
	Total:		\$1280.00			
	857-004					
	110-002					
	<i>Please send to Bethlehem</i>					
	4-857					
RECEIVED BY	<i>A. [Signature]</i>	NO 585	TAX			
			TOTAL			
CLERK	CASH	C.O.D.	CHARGE	ON ACCT.	MOSE. RET'D.	PAID OUT

008830

BETHLEHEM COPPER CORPORATION

DATE	INVOICE NO.	AMOUNT	DATE	INVOICE NO.	AMOUNT
1976					
January 8	Inv. # 817	\$1,351.40 <small>BETHLEHEM COPPER CORP.</small>			

BETHLEHEM COPPER CORPORATION

No 4708

SUITE 2100, GUINNESS TOWER, 1055 WEST HASTINGS STREET

VANCOUVER, B.C. V6E 2H8

8th January 19 76

PAY TO THE ORDER OF ROKE OIL ENTERPRISES LTD.

\$ 1,351.40

100 DOLLARS

BETHLEHEM COPPER CORPORATION

TO THE
BANK OF MONTREAL
 MAIN OFFICE - THREE BENTALL CENTRE
 595 BARRARD STREET
 VANCOUVER, B.C.
 V7X 1L7

PER NON-NEGOTIABLE

PER _____

VOUCHERS PAYABLE

CHARGE	ACCOUNT No.	DR.	CR.
	848-004 /	\$1,351.40 /	
	110-002 /		\$1,351.40

VOUCHER ENTERED

APPROVED OR PAYMENT

[Handwritten Signature]
 1976

19

ROKE OIL ENTERPRISES LTD.

516 MORaine ROAD N.E., CALGARY, ALBERTA T2A 2P2 • TELEPHONE 273-5553

TO: Bethlehem Copper Corporation Ltd.,
1055 West Hastings Street,
Vancouver, B.C.

INVOICE **No** 817

DATE December 17, 1975

SERVICES RENDERED Re: Service Order #1970 - Dated November 29, 1975.

Total Footage Logged

\$1,351.40

INVOICE

ROKE
OIL ENTERPRISES LTD.

Telephone 262-0004
2716 - 32nd AVENUE S.W., CALGARY, ALBERTA T3E 1J3

Date: 29 NOV. / 75. Customer Order No.: _____ Service Order **NO 1970**
TO ROKE OIL ENTERPRISES LTD.

The Customer, as evidenced by its (his) duly authorized representative signature hereby retains Roke Oil Enterprises Ltd., (herein called, "the Contractor") to perform or attempt to perform the following services and to furnish the following equipment on the well described herein at the price set out in the Contractor's current price schedule and on the terms and conditions contained herein and on the reverse hereof.

N.B.: THE TERMS AND CONDITIONS ON THE REVERSE HEREOF FORM A PART OF THIS CONTRACT.

SERVICES GAMMA-RAY NEUTRON, DENSITY.

WELL IDENTIFICATION

Company BETHLEHEM COPPER CORPORATION, LTD.
Well Name 75-13
(herein called the well)
Location _____
Field PRICE TON. Province BRITISH COLUMBIA

PERFORATING INSTRUCTIONS

NO. SHOTS	FROM	TO

Customer represents the well is in good condition to _____ feet
No. Field Prints 2 No. Final Prints 3 Total Prints 5

Customer's Name BETHLEHEM COPPER CORPORATION LTD.
Mailing Address 1055 WEST HASTINGS STREET.
VANCOUVER, B.C.
By Miller E. Burkhardt
(duly authorized representative of customer)

Engr. PETERSON
Driver _____
Driver _____
Unit No. 35
Round Trip Mileage 1082
Mileage Charged 1082
Left Station 28/11/75
Time Set By Client ON ARRIVAL
Arrived on Location 29/11/75
Start Operation _____
Finish Operation _____
Returned to Station _____

ESTIMATED CHARGES

SERVICE	ITEM	QUANTITY	UNIT PRICE	AMOUNT
CRN	75-13	748 FT.	@.70/FT.	523.60 ✓
DENS	75-13	730 FT.	@.40/FT.	292.00 ✓
SER. CHG.	75-13	1 SET UP	\$100.00	100.00 ✓
MILEAGE		1082 MI.	@.30/MI.	324.60 ✓
MEALS		4 DAYS	@11.00/DAY	44.00 ✓
ACCOMMODATION		NOV. 28		25.20
		NOV. 29		27.30
		NOV. 30		
		DEC. 1		14.70
TOTAL				\$1351.40

LOGGING DATA

TYPE	SCALE	FROM	TO

Completed Perforations with _____ Gun

NO. SHOTS	FROM	TO

The Service(s) and equipment covered by this Service order have been performed or received.
Miller E. Burkhardt
Signature of customer's duly authorized representative

Ray Peterson
Roke Engineer

19

BETHLEHEM COPPER CORPORATION

DATE	INVOICE No.	AMOUNT	DATE	INVOICE No.	AMOUNT
1976 Feb. 3	Inv. 9831	\$1,554.35 <small>One thousand five hundred and 35/100</small>			

BETHLEHEM COPPER CORPORATION

No 4868

SUITE 2100, GUINNESS TOWER, 1055 WEST HASTINGS STREET

VANCOUVER, B.C. V6E 2H8

3rd February 1976

PAY TO THE ORDER OF ROKR OIL ENTERPRISES LTD.

\$ 1,554.35 ✓

100 DOLLARS

BETHLEHEM COPPER CORPORATION

TO THE
BANK OF MONTREAL
 MAIN OFFICE - THREE BENTALL CENTRE
 595 BARRARD STREET
 VANCOUVER, B.C.
 V7X 1L7

PER NON-NEGOTIABLE

PER _____

VOUCHERS PAYABLE

CHARGE	ACCOUNT No.	DR.	CR.
	854-004 ✓	\$1,554.35 ✓	
	110-002 ✓		\$1,554.35 ✓

VOUCHER ENTERED

APPROVED FOR PAYMENT

[Handwritten Signature]

19

ROKE OIL ENTERPRISES LTD.

516 MORaine ROAD N.E., CALGARY, ALBERTA T2A 2P2 • TELEPHONE 273-5553

004-854
RTR
lv

TO: Bethlehem Copper Corporation Ltd.,
1055 West Hastings Street,
Vancouver, B.C.

INVOICE No 831

DATE January 13, 1976

SERVICES RENDERED Re: Princeton - Service Order #1972 - Dated December 17, 1975

Total Footage Logged		\$ 1,146.60 ✓
Milcage: 1076 mi. @ 30¢/mi		322.80 ✓
Meals: 4 days @ \$11.00/day		44.00 ✓
Accomodation: 3 days @ \$13.65/day		<u>40.95</u> ✓

\$1,554.35 X

854-004
110-002

INVOICE

ROKE

OIL ENTERPRISES LTD.

Telephone 262-9894

2716 - 32nd AVENUE S.W., CALGARY, ALBERTA T3E 0W3

Date: 17 DEC 75

Customer Order No.:

Service Order **NO** 1972

TO ROKE OIL ENTERPRISES LTD.

The Customer, as evidenced by its (his) duly authorized representatives signature hereby retains Roke Oil Enterprises Ltd., (herein called, "the Contractor") to perform or attempt to perform the following services and to furnish the following equipment on the well described herein at the price set out in the Contractor's current price schedule and on the terms and conditions contained herein and on the reverse hereof.

N.B.: THE TERMS AND CONDITIONS ON THE REVERSE HEREOF FORM A PART OF THIS CONTRACT.

SERVICES GRANULAR NEUTRON, DENSITY,

WELL IDENTIFICATION	
Company	<u>BETHELEHEM COPPER CORPORATION LTD.</u>
Well Name	<u>75-14</u> (herein called the well)
Location	
Field	<u>PRINCETON</u> Province <u>BRITISH COLUMBIA</u>

PERFORATING INSTRUCTIONS		
NO. SHOTS	FROM	TO
		Fr.
		Fr.
		Fr.
		Fr.

Customer represents the well is in good condition to _____ feet

No. Field Prints 2 No. Final Prints 3 Total Prints 5Customer's Name BETHELEHEM COPPER CORPORATION LTD.Mailing Address 1055 WEST HASTINGS ST.,
VANCOUVER, B. C.By Milton E. Nish
(duly authorized representative of customer)

Engr.	<u>PETERSON</u>
Driver	
Driver	
Unit No.	<u>35</u>
Round Trip Mileage	<u>1076</u>
Mileage Charged	<u>1076</u>
Left Station	<u>16/12/75</u>
Time Set By Client	<u>17/12/75</u>
Arrived on Location	<u>17/12/75</u>
Start Operation	<u>17/12/75</u>
Finish Operation	
Returned to Station	

ESTIMATED CHARGES

SERVICE	ITEM	QUANTITY	UNIT PRICE	AMOUNT
SERVICE CHARGE		1 SET UP	100.00	100.00 ✓
GRN	<u>75-14</u>	958 FT.	.70 [¢] /FT.	670.60 ✓
DENS	<u>75-14</u>	940 FT.	.70 [¢] /FT.	658.00 ✓
MILEAGE		1076 MI.	.30 [¢] /MI	322.80 ✓
MEALS		4 DAYS	\$11.00/DAY	44.00 ✓
ACCOMMODATION	PRINCETON		\$13.65/DAY	13.65
	PRINCETON		13.65/DAY	13.65
	GOLDEN		13.65/DAY	13.65
<u>TOTAL</u>			<u>\$1534.35</u>	✓

LOGGING DATA

TYPE	SCALE	FROM	TO
			Fr.
			Fr.
			Fr.
			Fr.

Completed Perforations with _____

Gun

NO. SHOTS	FROM	TO
		Fr.
		Fr.
		Fr.
		Fr.

The Service(s) and equipment covered by this Service order have been performed or received.

Signature of customer's duly authorized representative

Roy Peterson
Roke Engineer

19

BETHLEHEM COPPER CORPORATION

DATE	INVOICE NO.	AMOUNT	DATE	INVOICE NO.	AMOUNT
1976 March 9	Inv. #846	<u>\$1,383.80</u>			

BETHLEHEM COPPER CORPORATION

No 5043

SUITE 2100, GUINNESS TOWER, 1055 WEST HASTINGS STREET

VANCOUVER, B.C. V6E 2H8

9th March

19 76

PAY TO THE ORDER OF ROBE OIL ENTERPRISES LTD.

\$ 1,383.80

100 DOLLARS

BETHLEHEM COPPER CORPORATION

TO THE
BANK OF MONTREAL
 MAIN OFFICE - THREE BENTALL CENTRE
 595 DUNDAS STREET
 VANCOUVER, B.C.
 V7X 1L7

PER NON-NEGOTIABLE

PER _____

VOUCHERS PAYABLE

CHARGE	ACCOUNT No.	DR.	CR.
	848-004 ✓	\$1,383.80 ✓	
	110-002 ✓		\$1,383.80 ✓

VOUCHER ENTERED

APPROVED FOR PAYMENT
[Signature] RMM

19

ROME OIL ENTERPRISES LTD.

516 MORAINÉ ROAD N.E., CALGARY, ALBERTA T2A 2P2 • TELEPHONE 273-5553

TO Bethlehem Copper Corporation Ltd.,
1055 West Hastings Street,
Vancouver, B.C.

INVOICE NO 346

DATE February 3, 1976

SERVICES RENDERED Re: Princeton Field, B.C. - Service Order #1974 - Dated January 29, 1976.

Total Footage Logged	972.60 ✓	
Mileage:: 1076 mi. @ .30/mi.	322.80 ✓	
Meals: 4 days @ 11.00/day	44.00 ✓	
Accomodation 4 days - \$15.75 Kelowna		
\$13.65 Princeton		
\$15.00 Golden	44.40 ✓	
		\$ <u>1,383.80</u> ✓

ok for Payment.
004-848
RCT.

248-004
110-002

INVOICE

ROKE

Telephone 262-9894

OIL ENTERPRISES LTD.

2116-52nd AVENUE S.W., CALGARY, ALBERTA T3E 0W3

Date: 29 JAN/76

Customer Order No.:

Service Order **NO 1974**

TO ROKE OIL ENTERPRISES LTD.

The Customer, as evidenced by its (his) duly authorized representative signature hereby retains Roke Oil Enterprises Ltd., (herein called, "the Contractor") to perform or attempt to perform the following services and to furnish the following equipment on the well described herein at the price set out in the Contractor's current price schedule and on the terms and conditions contained herein and on the reverse hereof.

N.B.: THE TERMS AND CONDITIONS ON THE REVERSE HEREOF FORM A PART OF THIS CONTRACT.

SERVICES CANADIAN NEUTRON, DENSITY

WELL IDENTIFICATION	
Company	<u>BETHLEHEM COPPER CORPORATION LTD.</u>
Well Name	<u>74-15</u> (herein called the well)
Location	
Field	<u>PRINCETON</u> Province <u>BRITISH COLUMBIA</u>

PERFORATING INSTRUCTIONS		
NO. SHOTS	FROM	TO
		Ft.
		Ft.
		Ft.
		Ft.

Customer represents the well is in good condition to _____ feet
 No. Field Prints 2 No. Final Prints 3 Total Prints 5

Customer's Name BETHLEHEM COPPER CORPORATION LTD.

Mailing Address 1053 WEST HASTINGS ST., VANCOUVER, B.C.

By Milton E. Hubert
 (duly authorized representative of customer)

Engr.	<u>PETERSON</u>
Driver	
Driver	
Unit No.	<u>35</u>
Round Trip Mileage	<u>1076</u>
Mileage Charged	<u>1076</u>
Left Station	<u>29/1/76</u>
Time Set By Client	<u>29/1/76</u>
Arrived on Location	<u>29/1/76</u>
Start Operation	
Finish Operation	
Returned to Station	

ESTIMATED CHARGES

SERVICE	ITEM	QUANTITY	UNIT PRICE	AMOUNT
GR N	74-15	798 FT.	.70 ⁰⁰ /FT	558.60 X
DENS.	74-15	785 FT	.40 ⁰⁰ /FT.	314.00 X
SERVICE CHARGE	74-15	1 SET UP	\$100.00	100.00 X
MILEAGE		1076 MI.	.30 ⁰⁰ /MI.	322.80 X
MEALS		4 DAYS	\$11.00/DAY	44.00 X
ACCOMMODATION		{ KELOWNA PRINCETON GOLDEN	15.75/DAY 13.65/DAY 15.00/DAY	15.75 X 13.65 X 15.00 X
		TOTAL.		\$1383.80

LOGGING DATA

TYPE	SCALE	FROM	TO
			Ft.
			Ft.
			Ft.
			Ft.

Completed Perforations with

Gun

NO. SHOTS	FROM	TO
		Ft.
		Ft.
		Ft.
		Ft.

The Service(s) and equipment covered by this Service order have been performed or received.

Milton E. Hubert
 Signature of customer's duly authorized representative

Roy Peterson
 Roke Engineer

19

BETHLEHEM COPPER CORPORATION

DATE	INVOICE No.	AMOUNT	DATE	INVOICE No.	AMOUNT
1976 Jan 20	Re the attached	\$ 108.00 XXXXXXXX			

BETHLEHEM COPPER CORPORATION

SUITE 2100, GUINNESS TOWER, 1055 WEST HASTINGS STREET

VANCOUVER, B.C. V6E 2H8

No 0355

January 20 19 76

U.S. \$ 108.00

PAY TO THE ORDER OF COMMERCIAL TESTING & ENGINEERING CO

/100 United States Dollars

United States Dollar Account.

BETHLEHEM COPPER CORPORATION

NOT NEGOTIABLE

PER _____

PER _____

TO THE
BANK OF MONTREAL
MAIN OFFICE - THREE BENTALL CENTRE
595 BARRARD STREET
VANCOUVER, B. C.
V7X 1L7

VOUCHERS PAYABLE

CHARGE	ACCOUNT No.	DR.	CR.
	842-004 //	\$ 108.32 //	
	110-004 //		\$ 108.00 //
	115-015 //		.32 //

rate: 100.30

VOUCHER ENTERED

[Handwritten signatures and initials]

FOR PAYMENT

19

ORIGINAL INVOICE

JAN 13 1975

EA

COMMERCIAL TESTING & ENGINEERING CO.

GENERAL OFFICES: 910 NORTH LA SALLE STREET, CHICAGO, ILLINOIS 60601 • AREA CODE 312 728-8434

DAVIS 64-702-693



BETHLEHEM COPPER CORP
10 S W HASTINGS ST
VANCOUVER B.C. CA
MR E ANDERSON

DEC 31 '75

6,412,024

DATE

INVOICE NO.

ATTN

CLIENTS P.O. NO.

TERMS NET NO CASH DISCOUNT 30 DAYS ALL BILLS PAYABLE AT CHICAGO OFFICE (U.S. FUNDS) REQN. NO.

DEPT. NO.	SERVICE CODE	DATE	CARS	TONS	QUANTITY	PRICE EACH	PER TON	AMOUNT	TOTAL
64.00	68				4	27.00		108.00 e	108.00

842-004 108.32
110-004 108.00
115-015 32

LAB NUMBERS 64 11598,11599,11600,11601

4-842

PORT/PIER YARD _____	CONS/CLASS _____
SHIPPER _____	MINE _____
BOAT/SHIP _____	DESTIN. _____ INSPECT. REPORT # _____

30 COAL INSPECTION SAMPLING/TESTS		32 COAL ANALYSIS		22 SOILS		20 CONCRETE/STEEL		OTHER	
30 - Inspection	36 - Ash Analysis	33 - Fusion, 4 Point	70 - Proximate & Fusion	77 - Inspection	83 - Inspection	83 - Miscellaneous Services	83 - Miscellaneous Services	83 - Miscellaneous Services	83 - Miscellaneous Services
31 - Sampling	37 - Ash, Sulfur & Sulfur	34 - Fusion, 8 Point	71 - Proximate & Ultimate	78 - Sampling	84 - Sampling	84 - Air Pollution Services	84 - Air Pollution Services	84 - Air Pollution Services	84 - Air Pollution Services
32 - Sampling & Inspection	38 - Ash, Dry Base	35 - Phosphorus	72 - Short Proximate	79 - Field Density	85 - Compression - Cylinders	85 - Compression - Cylinders	85 - Compression - Cylinders	85 - Compression - Cylinders	85 - Compression - Cylinders
33 - Screen Test	39 - Alkalies	36 - Grindability	73 - Short Proximate & Fusion	80 - Moisture Density	86 - Compression - Blocks	86 - Compression - Blocks	86 - Compression - Blocks	86 - Compression - Blocks	86 - Compression - Blocks
34 - Plant, Sink	40 - Ash & Sulfur	37 - Moisture	74 - Sulfur Forms	81 - Lead Bearing	87 - Design Mix	87 - Design Mix	87 - Design Mix	87 - Design Mix	87 - Design Mix
35 - Other Services	41 - Equilibrium Moisture	38 - Proximate	75 - Water Soluble Ash	82 - Other Soil Services	88 - Aggregate Tests	88 - Aggregate Tests	88 - Aggregate Tests	88 - Aggregate Tests	88 - Aggregate Tests
	42 - Free Swelling Index	39 - Proximate, Dry	76 - Other Coal Tests		89 - Steel Inspection & Testing	89 - Steel Inspection & Testing	89 - Steel Inspection & Testing	89 - Steel Inspection & Testing	89 - Steel Inspection & Testing
					90 - Other Concrete Services	90 - Other Concrete Services	90 - Other Concrete Services	90 - Other Concrete Services	90 - Other Concrete Services

WE HEREBY CERTIFY THAT THESE GOODS WERE PRODUCED IN COMPLIANCE WITH ALL APPLICABLE REQUIREMENTS OF SECTIONS 6, 7 AND 12 OF THE FAIR LABOR STANDARDS ACT, AS AMENDED, AND OF REGULATIONS AND ORDERS OF THE UNITED STATES DEPARTMENT OF LABOR ISSUED UNDER SECTION 14 THEREOF.

BETHLEHEM COPPER CORPORATION

DATE	INVOICE No.	AMOUNT	DATE	INVOICE No.	AMOUNT
1975					
Dec, 2	Your job #75-356	\$ 2,150.00			
	#75-357	1,740.00			
	#75-301	610.00			
		\$ 4,500.00			

BETHLEHEM COPPER CORPORATION

No 4566

SUITE 2100, GUINNESS TOWER, 1055 WEST HASTINGS STREET

VANCOUVER, B.C. V6E 2H6

December 2 19 75

PAY TO THE ORDER OF McWILLIAM, WHITE, GOBLE & ASSOCIATES

\$ 4,500.00

100 DOLLARS

BETHLEHEM COPPER CORPORATION

PER NON-NEGOTIABLE

PER _____

TO THE
BANK OF MONTREAL
 MAIN OFFICE - THREE BENTALL CENTRE
 595 BARRARD STREET
 VANCOUVER, B.C.
 V7X 1L7

VOUCHERS PAYABLE

CHARGE	ACCOUNT No.	DR.	CR.
	845-004 ✓	\$ 2,760.00 ✓	
	845-003 ✓	1,740.00 ✓	
	110-002 ✓		\$ 4,500.00

VOUCHER ENTERED

APPROVED FOR PAYMENT

[Handwritten Signature]

19

1146

204 - 153 SEYMOUR STREET
KAMLOOPS, BRITISH COLUMBIA

INVOICE

NOV 27 1975
TELEPHONE: 372 8635

NOVEMBER 21st, 1975

McWilliam, Whyte, Goble & Associates

BRITISH COLUMBIA LAND SURVEYORS
KAMLOOPS - PRINCE GEORGE - SMITHERS

BETHLEHEM COPPER CORPORATION

1055 WEST HASTINGS

VANCOUVER, BRITISH COLUMBIA

A service charge of 1% (\$1.00 min.) per month,
12% per annum, will be charged on statement
balances carried forward from previous month.

OUR JOB # 75-356
YOUR FILE #

RE: COAL LEASE CENTRAL SURVEY, PRINCETON,

B.C.L.S. FEES.....	\$1,020.00
FIELD WAGES.....	\$ 720.00
TRANSPORTATION & EQUIPMENT RENTAL.....	\$ 158.00
BOARD & ROOM.....	\$ 144.00
OFFICE WAGES.....	\$ 95.00
PRINTING & MISCELLANEOUS DISBURSEMENTS.....	\$ 13.00
TOTAL	<u>\$2,150.00</u>

4-845

[Handwritten initials]

17

4461

204 - 153 SEYMOUR STREET
KAMLOOPS, BRITISH COLUMBIA

INVOICE

NOV 27 1975
TELEPHONE: 372-3335

NOVEMBER 21st, 1975

McWilliam, Whyte, Goble & Associates

BRITISH COLUMBIA LAND SURVEYORS
KAMLOOPS - PRINCE GEORGE - SMITHERS

BETHLEHEM COPPER CORPORATION

1055 WEST HASTINGS

VANCOUVER, BRITISH COLUMBIA

A service charge of 1 1/2% (\$1.00 min.) per month,
18% per annum, will be charged on statement
balances carried forward from previous month.

OUR JOB # 75-356

YOUR FILE #

RE: COAL LEASE CENTRAL SURVEY, PRINCETON,

B.C.L.S. FEES.....	\$1,020.00
FIELD WAGES.....	\$ 720.00
TRANSPORTATION & EQUIPMENT RENTAL.....	\$ 158.00
BOARD & ROOM.....	\$ 144.00
OFFICE WAGES.....	\$ 95.00
PRINTING & MISCELLANEOUS DISBURSEMENTS.....	\$ 13.00

TOTAL

\$2,150.00 ✓

4-845

[Handwritten signature]

204 - 153 SEYMOUR STREET
KAMLOOPS, BRITISH COLUMBIA

INVOICE

TELEPHONE: 922-8635

MARCH 3rd,

1976

McWilliam, Whyte, Goble & Associates

BRITISH COLUMBIA LAND SURVEYORS
KAMLOOPS -- PRINCE GEORGE -- SMITHERS

BETHLEHEM COPPER CORPORATION

1055 WEST HASTINGS

VANCOUVER, BRITISH COLUMBIA

A service charge of 1½% (\$1.00 min.) per month,
15% per annum, will be charged on statement
balances carried forward from previous month.

OUR JOB # 75-356

YOUR FILE # ATTN: MR. E. ANDERSEN

RE: PRINCETON COAL LEASE PROJECT

FEES:	\$ 682.50
FIELD WAGES	256.00
TRANSPORTATION & EQUIPMENT RENTAL	90.00
ROOM & BOARD	45.50
PRINTING & MISCELLANEOUS DISBURSEMENTS	16.00
	<u>\$1,090.00</u>

007-845-
pet
A

19

BETHLEHEM COPPER CORPORATION

DATE	INVOICE No.	AMOUNT	DATE	INVOICE No.	AMOUNT
1976					
January 8	Invoice # 5098	\$306.09 <small>US DOLLARS</small>			

BETHLEHEM COPPER CORPORATION

No 4705

SUITE 2100, GUINNESS TOWER, 1055 WEST HASTINGS STREET

VANCOUVER, B.C. V6E 2H8

8th January

19 76

PAY TO THE ORDER OF SANDMAN INNS

\$ 306.09

100 DOLLARS

BETHLEHEM COPPER CORPORATION

TO THE
BANK OF MONTREAL
 MAIN OFFICE - THREE BENTALL CENTRE
 595 BARRARD STREET
 VANCOUVER, B.C.
 V7X 1L7

PER NON-NEGOTIABLE

PER

VOUCHERS PAYABLE

CHARGE	ACCOUNT No.	DR.	CR.
	902-004	\$306.09	
	110-002		\$306.09

VOUCHER ENTERED

APPROVED FOR PAYMENT

[Handwritten signature]

DEC 12 1975

HOTELS AND RESTAURANTS TO SERVE YOU IN - CACHE CREEK - PRINCETON - KAMLOOPS - SMITHERS
BLUE RIVER - CRANBROOK - WILLIAMS LAKE - PRINCE GEORGE - VERNON - McBRIDE



SANDMAN INNS

Telephone 736-7254

Bethlehem Copper
2100 Guinness Tower
1055 West Hastings Street
Vancouver, B.C.

DATE November 29th 19 75

REMIT TO:

SANDMAN INNS LTD.
STE. 201-1622 WEST 7th AVE.
VANCOUVER, B.C. V6J 1S5

10/12/75

THIS INVOICE IS DUE UPON RECEIPT. TERMS - NET CASH

FOR ACCOMMODATION PROVIDED IN:	ROOM	TAX	TELEPHONE	MEALS	OTHER	TOTAL
PRINCETON, B.C.						
PR1537, Herbster Nov. 17-23	91.00	4.55	35.80	68.80		200.15
PR1607, Herbster Nov. 24-27	39.00	1.95	15.09	28.90		84.94
PR1658, Herbster Nov. 28-30	20.00	1.00				21.00
						306.09

4-902
A R R

INVOICE N^o 5098

NO STATEMENTS WILL BE ISSUED
PLEASE PAY FROM THIS INVOICE

19

BETHLEHEM COPPER CORPORATION

DATE	INVOICE No.	AMOUNT	DATE	INVOICE No.	AMOUNT
1976					
Jan. 13	Inv. #5128 5184	\$ 87.64 <u>26.55</u> \$114.19			

BETHLEHEM COPPER CORPORATION

SUITE 2100, GUINNESS TOWER, 1055 WEST HASTINGS STREET

No 4764

VANCOUVER, B.C. V6E 2H8

13th January

19 76

PAY TO THE ORDER OF SANDMAN INNS LTD.

\$ 114.19

100 DOLLARS

BETHLEHEM COPPER CORPORATION

TO THE
BANK OF MONTREAL
 MAIN OFFICE - THREE BENTALL CENTRE
 595 BARRARD STREET
 VANCOUVER, B.C.
 V7X 1L7

PER NON-NEGOTIABLE

PER _____

VOUCHERS PAYABLE

CHARGE	ACCOUNT No.	DR.	CR.
	902-004 ✓	\$114.19 ✓	
	110-002 ✓		\$114.19 ✓

VOUCHER ENTERED

APPROVED FOR PAYMENT

[Handwritten Signature]
[Handwritten Signature]
[Handwritten Signature]



MOTELS AND RESTAURANTS TO SERVE YOU IN - CACHE CREEK - PRINCETON - KAMLOOPS - SMITHERS
 BLUE RIVER - CRANBROOK - WILLIAMS LAKE - PRINCE GEORGE - VERNON - MCBRIDE

SANDMAN INNS

Telephone 736-7254

DEC 22 1975

Bethlehem Copper Corp.
 2100 Guinness Tower
 1055 West Hastings Street
 Vancouver, B.C.

DATE December 11th 19 75

REMIT TO:

SANDMAN INNS LTD.
 STE. 201-1622 WEST 7th AVE.
 VANCOUVER, B.C. V6J 1S5

17/12/75

THIS INVOICE IS DUE UPON RECEIPT. TERMS - NET CASH

FOR ACCOMMODATION PROVIDED IN:	ROOM	TAX	TELEPHONE	MEALS	OTHER	TOTAL
PRINCETON, B.C. PR2125, Milton Herbster Dec. 9-11	39.00 ✓	1.95 ✓	18.59 ✓	28.10 ✓		87.64 ✓
INVOICE N ^o <u>5128</u> NO STATEMENTS WILL BE ISSUED PLEASE PAY FROM THIS INVOICE						

*004-902
 Feb
 by*

30/12/75

STE. 201-1622 WEST 7th AVE.
 VANCOUVER, B.C. V6J 1S5

THIS INVOICE IS DUE UPON RECEIPT. TERMS - NET CASH

FOR ACCOMMODATION PROVIDED IN:	ROOM	TAX	TELEPHONE	MEALS	OTHER	TOTAL
PRINCETON, B.C. PR2182, Milton E. Herbster Dec. 16-17	13.00	.65		12.90		26.55
INVOICE N ^o <u>5184</u> NO STATEMENTS WILL BE ISSUED PLEASE PAY FROM THIS INVOICE						

*004-702
 Feb*

K

19

BETHLEHEM COPPER CORPORATION

DATE	INVOICE NO.	AMOUNT	DATE	INVOICE NO.	AMOUNT
1976 Jan. 29	Invoice #5307	\$208.00 <small>PERMANENT</small>			

BETHLEHEM COPPER CORPORATION

SUITE 2100, GUINNESS TOWER, 1055 WEST HASTINGS STREET

No 4829

VANCOUVER, B.C. V6E 2H8 29th January 1976

PAY TO THE ORDER OF SANDMAN INNS

\$ 208.00

100 DOLLARS

BETHLEHEM COPPER CORPORATION

TO THE
BANK OF MONTREAL
MAIN OFFICE - THREE BENTALL CENTRE
595 BARRARD STREET
VANCOUVER, B.C.
V7X 1L7

PER NON-NEGOTIABLE

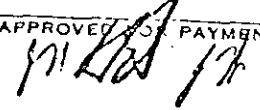
PER

VOUCHERS PAYABLE

CHARGE	ACCOUNT No.	DR.	CR.
	902-004 ✓	\$208.00 ✓	
	110-002 ✓		\$208.00 ✓

VOUCHER ENTERED

APPROVED FOR PAYMENT



19

JAN 23 1976

MOTELS AND RESTAURANTS TO SERVE YOU IN - CACHE CREEK - PRINCETON - KAMLOOPS - SMITHERS
BLUE RIVER - CRANBROOK - WILLIAMS LAKE - PRINCE GEORGE - VERNON - MCBRIDE



SANDMAN INNS

Telephone 736-7254

Bethlehem Copper Corporation,
2100 - 1055 W. Hastings St.,
Vancouver, B. C.
V6E 2H8

DATE January 15th 19 76

REMIT TO:

SANDMAN INNS LTD.
STE. 201-1622 WEST 7th AVE.
VANCOUVER, B.C. V6J 1S5

21/1/76

THIS INVOICE IS DUE UPON RECEIPT. TERMS - NET CASH

FOR ACCOMMODATION PROVIDED IN:	ROOM	TAX	TELEPHONE	MEALS	OTHER	TOTAL
PRINCETON, B. C.	✓	✓	✓	✓		✓
PR2483, Milton Herbster	91.00	4.55	36.25	76.20		208.00
<i>Jan 9-14</i>						
<i>004-902</i>						
<i>Rick</i>						
<i>M</i>						
<i>702 004</i>						
<i>110 502</i>						
INVOICE N ^o <u>5307</u>	NO STATEMENTS WILL BE ISSUED PLEASE PAY FROM THIS INVOICE					

19

BETHLEHEM COPPER CORPORATION

DATE.	INVOICE NO.	AMOUNT	DATE	INVOICE No.	AMOUNT
1976					
Feb. 25	Inv. #5329 #5382	\$124.65 <u>50.65</u> \$175.30			

BETHLEHEM COPPER CORPORATION

No 4957

SUITE 2100, GUINNESS TOWER, 1055 WEST HASTINGS STREET

VANCOUVER, B.C. V6E 2H8

25th February 1976

PAY TO THE ORDER OF SANDMAN INNS LTD.

\$175.30

100 DOLLARS

BETHLEHEM COPPER CORPORATION

PER NON-NEGOTIABLE

PER _____

TO THE
BANK OF MONTREAL
 MAIN OFFICE - THREE BENTALL CENTRE
 595 BARRARD STREET
 VANCOUVER, B.C.
 V7X 1L7

VOUCHERS PAYABLE

CHARGE	ACCOUNT No.	DR.	CR.
	902-004 /	\$145.45 /	
	923-004 /	29.85 /	
	110-002		\$175.30

VOUCHER ENTERED

APPROVED FOR PAYMENT

19

FEB 10 1976



MOTELS AND RESTAURANTS TO SERVE YOU IN - CACHE CREEK - PRINCETON - FIMLOOPS - SMITHERS
BLUE RIVER - CRANBROOK - WILLIAMS LAKE - PRINCE GEORGE - VERNON - MURRIS

SANDMAN INNS

Telephone 736-7254

Bethlehem Copper Corp.
2100, 1055 W. Hastings St.
Vancouver, B. C.
V6E 2H8

DATE January 30th 19 76

REMIT TO:

SANDMAN INNS LTD.
STE. 201-1622 WEST 7th AVE.
VANCOUVER, B.C. V6J 1S5

5/2/76

THIS INVOICE IS DUE UPON RECEIPT. TERMS - NET CASH

FOR ACCOMMODATION PROVIDED IN:	ROOM	TAX	TELEPHONE	MEALS	OTHER	TOTAL
PRINCETON, B. C.						
PR2732, Milton E. Herbster Jan 25-31	26.00	1.30	4.05	19.30		50.65
A-902 \$46.60.						
A-923 \$4.05						
INVOICE N ^o <u>5382</u> NO STATEMENTS WILL BE ISSUED PLEASE PAY FROM THIS INVOICE						

28/1/76

THIS INVOICE IS DUE UPON RECEIPT. TERMS - NET CASH

FOR ACCOMMODATION PROVIDED IN:	ROOM	TAX	TELEPHONE	MEALS	OTHER	TOTAL
PRINCETON, B. C.						
PR2604, Milton E. Herbster Jan. 15-23	52.00	2.60	25.80	44.25		124.65
A-902 \$38.85						
A-923 \$25.80						
INVOICE N ^o <u>5329</u> NO STATEMENTS WILL BE ISSUED PLEASE PAY FROM THIS INVOICE						

TD.

Expense Account Form

Week Ended OCTOBER 19/75

Oct. Date	Place	Air	Bus	Mileage	Auto	Hotel	Meals	Tel.	Miscellaneous	Totals	REMARKS
13	Monday	\$	\$	\$	\$	\$	\$	\$	\$	\$	
14	Tuesday								1.31	1.31	Lodging
15	Wednesday					27.30	18.35			45.65	Trip to Princeton with M.E.
16	Thursday				22.70		13.00			46.70	Hotel stay re: Princeton Conf.
17	Friday										
18	Saturday										
19	Sunday										
Total					32.70	27.30	32.35		1.31	93.66 X	

Allocation:

387 902 905

Property										
1	1.31									1.31
A		52.65	32.70							92.35
Total		1.31	52.65	32.70						93.66

Balance due company from previous expense account \$ 98.85
 Advances from company for this period \$ 100.00
 Expenses for this period (above) \$ 93.66
 Balance \$ 105.13

Signature *A. T. Anderson, R. Edulson*

14

THIS IS YOUR VOUCHER
FOR REIMBURSEMENT

OFFICE
 FEDERAL BUREAU OF INVESTIGATION
 DEPARTMENT OF JUSTICE
 WASHINGTON, D. C. 20535

TTTCC

Expense Account Form

Week Ended Nov. 2, 1975

Date	Place	Air	Bus	Mileage	Auto	Hotel	Meals	Tel.	Miscellaneous	Totals	REMARKS
27 Monday		\$	\$	\$	\$	\$	\$	\$	\$	\$	
28 Tuesday											
29 Wednesday						27.30	17.00			44.30	Trip to Princeton with Mi It
30 Thursday					33.17		13.85			47.02	Harbortan.
31 Friday											
Nov. 1 Saturday											
2 Sunday											
Total					33.17	27.30	30.85			91.32	

Allocation:

Property	902	905								
4	58.15	33.17								91.32
Total	58.15	33.17								91.32

Balance due company from previous expense account \$ 90.55

Advances from company for this period

Expenses for this period (above)

\$ 91.32 /
 \$ - .77

Balance

Signature

Richard L. Johnson

61

EXPENSE ACCOUNT FORM

Week Ended Nov 16, 1975

Date	Place	Air	Bus	Mileage	Auto	Hotel	Meals	Tel.	Miscellaneous	Totals	REMARKS
Monday 10		\$	\$	\$	\$	\$	\$	\$	\$	\$	
Tuesday 11	PRINCETON					13.65	6.00	-	GAS	5.00	24.65
Wednesday 12						13.65	14.05		Papers	.40	28.10
Thursday 13						13.65	8.50	9.18	MS. GEORGETOWN Dinner Exp.	22.37	53.72
Friday 14						13.65	7.35	5.10	PAPER	.20	26.30
Saturday 15											
Sunday 16											
Total						<u>54.60</u>	<u>37.90</u>	<u>14.28</u>		<u>27.99</u>	<u>134.77</u>

Allocation:

Property

Date	Place	Air	Bus	Mileage	Auto	Hotel	Meals	Tel.	Miscellaneous	Totals	REMARKS
								4.00	BOOK		120.21
								4.77	EXPENSE		100.20
Total											

Balance due company from previous expense account	230.91
Advances from company for this period	-
Expenses for this period (above)	<u>134.77</u> ✓
<u>Balance</u>	<u><u>96.14</u></u>

Signature Milton E. Hubert

Approved _____

Approved _____

Expense Account Form
 Week Ended NOV 30 1975

Date	Place	Air	Bus	Mileage	Auto	Hotel	Meals	Tel.	Miscellaneous	Totals	REMARKS
Monday 24	PRIARSTON	\$	\$	\$	\$	\$	\$	\$	Gasoline 2.45 Paper Snack \$ 6.39	\$ 6.39	
Tuesday 25								-	Paper .20	.20	
Wednesday 26									Expenses Paper 9.38	9.38	
Thursday 27									Paper .20	.20	
Friday 28											
Saturday 29							13.65			13.65	
Sunday 30							12.60			12.60	
Total							26.25		16.17	42.42	

Allocation:

PROPERTY											
Total											

Balance due company from previous expense account	78.64
Advances from company for this period	-
Expenses for this period (above)	<u>42.42</u> X
Balance	<u>36.22</u>

Signature Milton E. Hubbs

Approved _____

Approved KE

Copper Belt-Princeton Coal Co

Expense Account Form

Week Ended: Dec 14, 1975

Date	Place	Air	Bus	Mileage	Auto	Hotel	Meals	Tel.	Miscellaneous	Totals	REMARKS
Monday 7		\$	\$	\$	\$	\$	\$	\$	\$	\$	
Tuesday 8							(5.70)		Paper 9.00 Papers Electricity 15.68	8.55	
Wednesday 9									Keypunch Paper 1.96	13.68	
Thursday 10							4.35		Paper 0.20	1.96	
Friday 11								1.05		4.55	
Saturday 12										2.05	Call to Jeff Collins
Sunday 13								12.53		12.53	Call to Robin Anderson & Eric Kuyk
Total							(10.05)	11.58	11.65	47.32 X	

Allocation:

Property											
Total											

Balance due company from previous expense account: 0.00
 Advances from company for this period
 Expenses for this period (above) 47.32
 Balance 47.32

Signature: William E. White

Approved: _____ Approved: [Signature]

COPPER BELT - PRINCETON CON. 4

Expense Account Form

Week Ended DEC 21, 1975

Date	Place	Air	Bus	Mileage	Auto	Hotel	Meals	Tel.	Miscellaneous	Totals	REMARKS
Monday 15		\$	\$	\$	\$	\$	\$	\$	\$	\$	
Tuesday 16							7.95		Paper Box 4.10	6.05	
Wednesday 17							17.50		Pass 0.20	1.70	
Thursday 18											
Friday 19											
Saturday 20											
Sunday 21											
Total							34.5		4.30	7.75	

Allocation:

Property:

Date	Place	Air	Bus	Mileage	Auto	Hotel	Meals	Tel.	Miscellaneous	Totals	REMARKS
Total											

Balance due company from previous expense account	180.77
Advances from company for this period	-
Expenses for this period (above)	7.75
Balance	173.02

Signature: William E. Herbert

Approved:

Approved: [Signature]

BETHLEHEM COPPER CORPORATION LTD.

Expense Account Form

Week Ended JAN 11, 1976

Date	Place	Air	Bus	Mileage	Auto	Hotel	Meals	Tel.	Miscellaneous	Totals	REMARKS
Monday		\$	\$	\$	\$	\$	\$	\$	Bus fare \$2.50	\$ 2.50	
Tuesday											
Wednesday											
Thursday											
Friday	Princeton						2.55		Subtotal at Princeton 20.00	22.55	
Saturday									Princeton 3.45	3.45	
Sunday											
Total							2.35 X		26.50	28.71 X	

Allocation:

PROPERTY	Air	Bus	Mileage	Auto	Hotel	Meals	Tel.	Miscellaneous	Totals	REMARKS
Total										

Balance due company from previous expense account	173.02
Advances from company for this period	Nil
Expenses for this period (above)	28.71
<u>Balance</u>	<u>144.31</u>

Signature William E. Hubert

Approved: _____

Approved:

LEHIGH COPPER CORPORATION LTD.

Expense Account Form

Week Ended Jan 18, 1976

Date	Place	Air	Bus	Mileage	Auto	Hotel	Meals	Tel.	Miscellaneous	Totals	REMARKS
Monday 12	PRINCETON	\$	\$	\$	\$	\$	\$	\$	Paper \$ 0.20	\$ 0.20	
Tuesday 13									Paper, Bus 0.50	0.50	
Wednesday 14									Paper, Int 3.05	3.05	
Thursday 15									Paper, Supp 1.39	1.39	
Friday 16							\$ 3.00		Meals 0.20	3.20	
Saturday 17									Paper, Int 3.00	3.00	
Sunday 18											
Total							\$ 3.00		8.44	11.44 X	

Allocation:

Property

Date	Place	Air	Bus	Mileage	Auto	Hotel	Meals	Tel.	Miscellaneous	Totals	REMARKS
Total											

Balance due company from previous expense account: 1144.51
 Advances from company for this period: 211
 Expenses for this period (above): 11244
 Balance: 152.97

Signature: Milton E. ...

Approved: _____ Approved: KE

TULAREM COPPER CORPORATION LTD.

Expense Account Form

Week Ended Nov 25, 1976

Date	Place	Air	Bus	Mileage	Auto	Hotel	Meals	Tel.	Miscellaneous	Total	REMARKS
Monday 19	PRINCETON	\$	\$	\$	\$	\$	\$	\$	Gasoline 3.45	\$ 3.45	
Tuesday 20									Post 0.20	0.20	
Wednesday 21									Post 1.65	1.65	
Thursday 22									Post 3.05	3.05	
Friday 23							2.05		Post 0.20	2.25	
Saturday 24											
Sunday 25											
Total							2.05		8.55	10.60	

Allocation:

Property

Total											

Balance due company from previous expense account 132 87

Advances from company for this period

Expenses for this period (above) 10 60

Balance 122 27

Signature Milton S. DeL...

Approved

Approved [Signature]

UP
 NO - YOUR
 X - THE BACK
 1.0265
 1.0265
 ON DASH

BETHLEHEM COPPER CORPORATION LTD.

Expense Account Form

Week Ended FEB 1, 1976

Date	Place	Air	Bus	Mileage	Auto	Hotel	Meals	Tel.	Miscellaneous	Total	REMARKS
Monday 26	PUNNETON	\$	\$	\$	\$	\$	\$	\$	P. Pub. Coll. \$ 4.50	\$ 4.50	
Tuesday 27											
Wednesday 28											
Thursday 29							5.35		Paper Grams 1.75	6.74	
Friday 30									Office Exp 3.55	3.55	
Saturday 31							1.85		Paper 2.25	2.10	
Sunday											
Total							<u>7.20</u>		<u>19.49</u>	<u>16.69</u>	X

Allocation:

Property										
Total										

Balance due company from previous expense account 124.27

Advances from company for this period Nil

Expenses for this period (above) 16.69

Balance 107.58

Signature W. H. E. Hubert

Approved KG

SECTION C

- CONTROL SURVEY DATA

1. Correspondence from D.G. Whyte, B.C.L.S. of McWilliam, Whyte, Goble and Associates outlining the survey control work carried out on the property.
2. Table of Drill Hole Co-ordinates and Elevations.
3. Copy of Survey Plan is appended in Section G.

A.W. McWILLIAM
D.G. WHYTE
R.J. GOBLE
R.C. DOMINIK
V. BARTELL
P.G. PENNER
D.L. KEOWN
R.M. BARTELL

MAR 5 1976
HGE
RE AL
EA. V
FIGURE 372-0035

McWilliam, Whyte, Goble & Associates

British Columbia Land Surveyors

KAMLOOPS - PRINCE GEORGE - SMITHERS

OUR FILE 75-356

SUITE 204
153 SEYMOUR STREET
KAMLOOPS, B.C. V2C 2C7

3rd March, 1976

Bethlehem Copper Corporation
1055 West Hastings
Vancouver, British Columbia

ATTENTION: MR. E. ANDERSEN

Dear Sir:

RE: PRINCETON COAL LEASE PROJECT

The following is an outline of the survey control work done by the firm of McWilliam, Whyte, Goble & Associates from April 13/71 to January 17/76.

1) April 13 to April 16, 1971

- (a) Transit & tape survey to tie in existing drill holes and to establish a base survey control for future surveys and a tie to the legal survey of the Hope-Princeton Highway Right-of-Way Plan#H88 for map orientation and co-ordinate origin.
- (b) Direct levelling including a tie to geodetic Bench Mark #577-H (from which all elevations established on the project are derived) and establishment of secondary Bench Marks throughout the general area and to derive ground elevations at the existing drill holes.
- (c) Preparation of map and calculation of horizontal and vertical values.

(continued page 2)

3rd March, 1976

2) June 20 to July 15, 1971

- (a) Transit & tape survey to
 - (i) Establish a series of control grid lines for future geological exploration.
 - (ii) Co-ordinate additional holes drilled subsequent to those in (1) above.
- (b) Direct levelling to establish profiles and more control Bench Marks along the grid lines and elevations of the new drill holes.
- (c) Calculation of horizontal and vertical values and amendments and additions to map.

3) November 5 to November 7, 1975

- (a) Transit & E.D.M. (electronic distance measurement) survey to extend horizontal and vertical control to the west of the original general area of items (1) & (2). This work was done by use of Transit & Hewlett Packard Model 3800 distance meter. Elevations were established trigonometrically, not by direct method. Additional bench marks and control points were established.
- (b) Calculations of horizontal and vertical values and amendments & additions to map.


4) January 15 & 16, 1976

- (a) Transit, tape & E.D.M. survey to tie in three new drill holes including some direct levelling to establish additional bench marks.
- (b) Calculations of horizontal and vertical values & amendments & additions to map.

Herewith enclosed is an up to date print of the map of the subject property.

Yours truly

MCWILLIAN, WHYTE, COBLE & ASSOCIATES


D. G. Whyte, B.C.L.S.

DGW/nc

Enclosures - as noted in context of letter &
Account

PRINCETON COAL PROJECT

Diamond Drill Hole Co-ordinates and Elevations

<u>Hole No.</u>	<u>Latitude</u> (North)	<u>Departure</u> (East)	<u>Elevation</u> (above sea level)	<u>Bearing</u>	<u>Dip</u>
DDH-71-1	27202.0	15967.0	3101.1	S3°42'W	-60°
71-2	26012.7	16697.9	2929.78	-	90°
71-3	26285.0	16671.7	2950.7	-	90°
71-4	27202.0	15967.0	3101.1	-	90°
71-5	26978.1	15629.8	3166.17	-	90°
71-6	27742.8	16425.4	3100.0	-	90°
71-7	27949.6	16904.5	3003.68	-	90°
71-8	28482.6	17821.1	3011.79	-	90°
71-9	27136.7	16695.5	3014.9	-	90°
71-10	26003.0	16054.4	2982.1	-	90°
71-11	29048.3	17589.6	3106.0	-	90°
71-12	30273.9	17600.8	3025.2	-	90°
75-13	29251.0	10493.0	3292.0	-	90°
75-14	32782.4	9833.2	3280.9	-	90°
76-15	30857.7	14990.9	3324.6	-	90°

SECTION D

DRILL HOLE LOGS

Hole No. DDH - 75-13

Hole No. DDH - 75-14

Hole No. DDH - 76-15

SECTION E

LABORATORY REPORTS

19
193
(3)

1. Report Nos: 64-11598 to 64-11601 dated December 12, 1975 and prepared by Commercial Testing and Engineering Co.

193

DEC 17 1975

CABLE ADDRESS COMTECO
TELEX 01-352897

COMMERCIAL TESTING & ENGINEERING CO.

GENERAL OFFICES: 228 NORTH LA SALLE STREET, CHICAGO, ILLINOIS 60601 • AREA CODE 312 728-8434

Please address all correspondence to:
147 Riverside Dr., North Vancouver, B.C. V7H 1T6



Office: Tel. (604) 929-2228
Roberts Bank Tel. (604) 946-7021

December 12, 1975

BETHLEHEM COPPER CORP. LTD.,
1055 W. Hastings St.,
Vancouver, B.C.

Sample Identification:
D.D.H. No. 75-13
Box #24

Report No. 64-11598

Contained Footage Markers : 627, 632, 641 (TOTAL FOOTAGE - 15')

	AS RECEIVED	DRY BASIS
% Moisture	17.59	xxxxx
% Ash	55.63	67.50
% Volatile	14.54	17.64
% Fixed Carbon	12.24	14.86
	<u>100.00</u>	<u>100.00</u>
Btu	2703	3280
% Sulfur	0.91	1.11

Respectfully Submitted,

COMMERCIAL TESTING & ENGINEERING CO.

R.A. Houser,
District Manager

RAH/se



193/19

CABLE ADDRESS COMTECO
TELEX 04-25207

COMMERCIAL TESTING & ENGINEERING CO.

GENERAL OFFICES: 228 NORTH LA SALLE STREET, CHICAGO, ILLINOIS 60601 - AREA CODE 312 728-8434

Please address all correspondence to:
147 Riverside Dr., North Vancouver, B.C. V7H 1T6



Office: Tel. (604) 929-2228
Roberts Bank Tel. (604) 946-7021

December 12, 1975

BETHLEHEM COPPER CORP. LTD.,
1055 W. Hastings St.,
Vancouver, B.C.

Sample Identification:
D.D.H. No. 75-13
Box #25

Report No. 64-11599

Contained Footage Markers: 662, 651 (TOTAL FOOTAGE - 20')

	<u>AS RECEIVED</u>	<u>DRY BASIS</u>
% Moisture	16.75	xxxxx
% Ash	63.41	76.17
% Volatile	12.07	14.50
% Fixed Carbon	7.77	9.33
	<u>100.00</u>	<u>100.00</u>
Btu	1836	2205
% Sulfur	0.73	0.88

Respectfully Submitted,

COMMERCIAL TESTING & ENGINEERING CO.

R.A. Houser,
District Manager

RAH/se



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CABLE ADDRESS COMTECO
TELEX 0495267

COMMERCIAL TESTING & ENGINEERING CO.
GENERAL OFFICES: 228 NORTH LA SALLE STREET, CHICAGO, ILLINOIS 60601 • AREA CODE 312 720-8434

Please address all correspondence to:
147 Riverside Dr., North Vancouver, B.C. V7H 1T6



Office: Tel. (604) 929-2228
Roberts Bank Tel. (604) 946-7021

December 12, 1975

BETHLEHEM COPPER CORP. LTD.,
1055 W. Hastings St.,
Vancouver, B.C.

Sample Identification:
D.D.H. No. 75-13
Box #26

Report No. 64-11600

Contained Footage Markers: 672, 681 (TOTAL FOOTAGE - 14')

	AS RECEIVED	DRY BASIS
% Moisture	18.39	XXXXX
% Ash	59.65	73.09
% Volatile	12.96	15.88
% Fixed Carbon	9.00	11.03
	<u>100.00</u>	<u>100.00</u>
Btu	1942	2380
% Sulfur	0.87	1.06

Respectfully Submitted,

COMMERCIAL TESTING & ENGINEERING CO.

R.A. Houser
R.A. Houser,
District Manager

RAH/se



193

CABLE ADDRESS COMTECO
TELEX 04-352677

COMMERCIAL TESTING & ENGINEERING CO.

GENERAL OFFICES: 228 NORTH LA SALLE STREET, CHICAGO, ILLINOIS 60601 • AREA CODE 312 726-8434

Please address all correspondence to:
147 Riverside Dr., North Vancouver, B.C. V7H 1T6



Office: Tel. (604) 929-2228
Roberts Bank Tel. (604) 946-7021

December 12, 1975

BETHLEHEM COPPER CORP. LTD.,
1055 W. Hastings St.,
Vancouver, B.C.

Sample Identification:
D.D.H. No. 75-13
Box #27

Report No. 64-11601

Contained Footage Markers: 691, 696, 701 (TOTAL FOOTAGE -13')

	<u>AS RECEIVED</u>	<u>DRY BASIS</u>
% Moisture	17.04	xxxxx
% Ash	62.13	74.89
% Volatile	11.73	14.14
% Fixed Carbon	9.10	10.97
	<u>100.00</u>	<u>100.00</u>
Btu	2046	2466
% Sulfur	0.66	0.79

Respectfully Submitted,

COMMERCIAL TESTING & ENGINEERING CO.

R.A. Houser,
District Manager

RAH/se



193

JA - 5 1976

EA. ✓
HGE -
RE A
HEH
CABLE ADDRESS CONT
TELEX 04-34

COMMERCIAL TESTING & ENGINEERING CO.

GENERAL OFFICES: 228 NORTH LA SALLE STREET, CHICAGO, ILLINOIS 60601 • AREA CODE 312 728-8434

Please address all correspondence to:
147 Riverside Dr., North Vancouver, B.C. V7H 1T6



Office: Tel. (604) 929-2228
Roberts Bank Tel. (604) 946-7021

January 2, 1976

BETHLEHEM COPPER CORP LTD.,
1055 W. Hastings St.,
Vancouver, B.C.

ATTEN: Mr. E. Anderson

Dear Mr. Anderson:

Your office inquired about footage marker location in the coal core boxes for D.D.H. 75-13.

We have made a sketch of each box indicating location in the box of the markers and location of the material sampled. These are attached.

If you require any further assistance, please call.

Very Truly Yours,

COMMERCIAL TESTING & ENGINEERING CO.

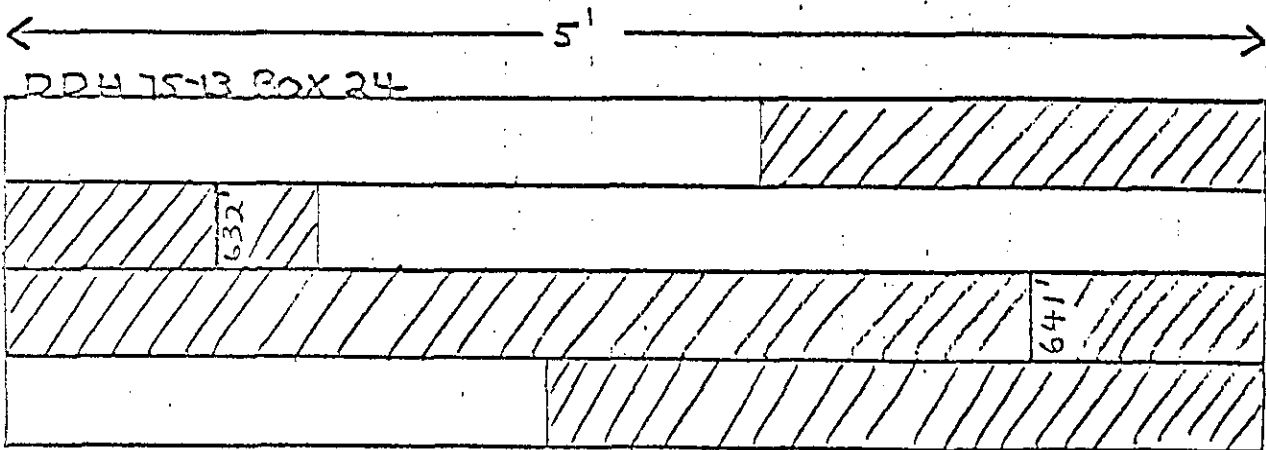
R.A. Houser,
District Manager

RAH/se

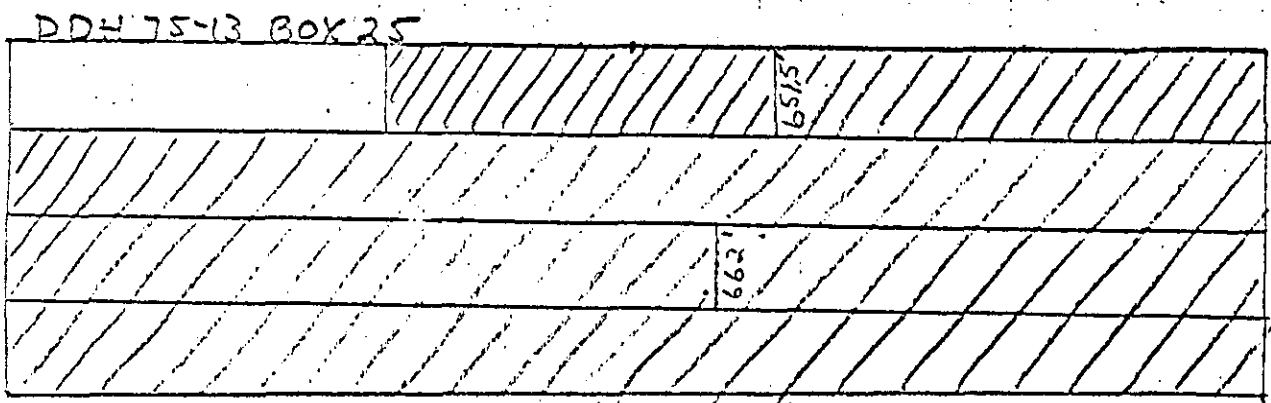


193

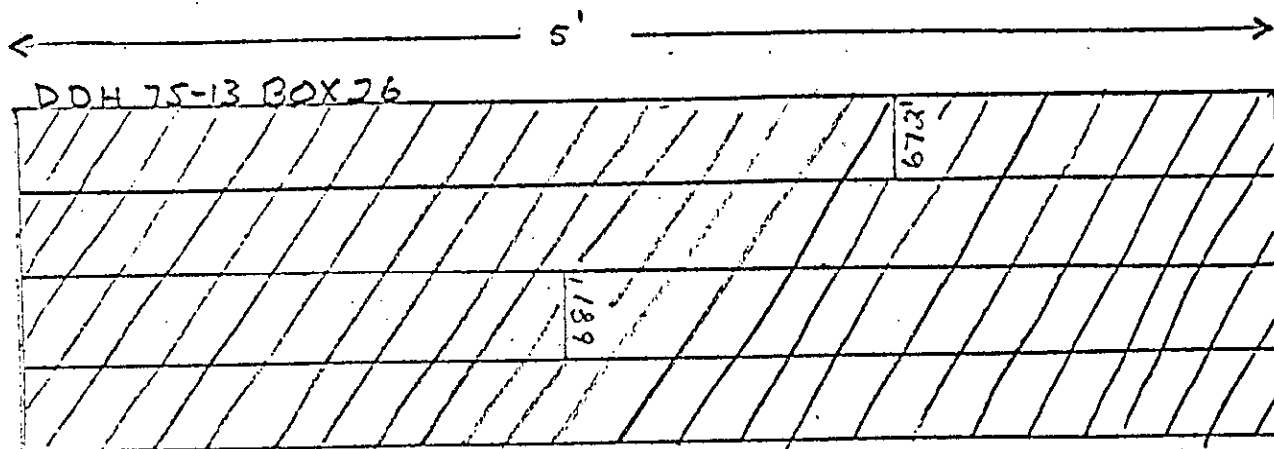
19



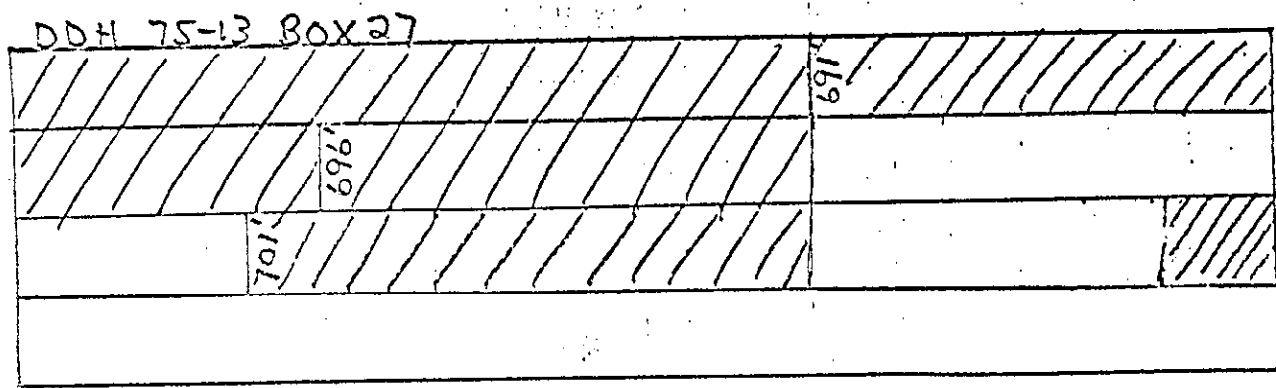

footage
samples



193




footage
sampled



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DRILL HOLE LOG

BETHLEHEM COPPER CORPORATION

SHEET No. 1

Property	PRINCETON COAL	Hole No.	DDH 75-14	Bearing	-	Elevation	3280.9'	Logged by	R. J. Nethery
District	Similkameen Mining	Length	963'	Dip	-90°	Overburden	160'	Date	March 8, 1976
Commenced	December 3, 1975	Latitude	32782.4	Hor. Comp.	-	Recovery			
Completed	December 16, 1975	Departure	9833.2	Vert. Comp.	963'	Purpose			

DESCRIPTION	SULPHIDES	OXIDES	OTHERS	FROM	TO	SAMPLE No.	% Cu.	% Mo.	Oz Au.	Oz Ag.	%	RECOV
Overburden				0	160							98
Mudstone and siltstone - mudstone has considerable plant fragments				160	186							98
Mostly siltstone and fine grained sandstone				186	203							98
Grit and very coarse sandstone				203	213							98
Sandstone - massive - appears to be derived mainly from volcanic rocks				213	217							98
Coarse sandstone and grit				217	226							98
Fine grained sandstone and siltstone (bedding 30 to 35° to core axis)				226	243							98
Fine and medium grained sandstone - mostly massive				243	260							98
Medium and coarse grained sandstone				260	305							98
Sandstone - medium grained with carbon fragments throughout				305	313							98
Medium and coarse grained sandstone				313	345							98
Sandstone - fine grained - bedding 25° to core axis)				345	355							98

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DRILL HOLE LOG

BETHLEHEM COPPER CORPORATION

SHEET No. 1

Property	PRINCETON COAL	Hole No.	DDH 76-15	Bearing	-	Elevation	3324.6	Logged by	R. J. Nethery
District	Similkameen Mining Division	Length	800'	Dip	90°	Overburden	152'	Date	March 4, 1976
Commenced	January 15, 1976	Latitude	30857.7 N	Hor. Comp.	-	Recovery	98%		
Completed	January 29, 1976	Departure	14990.9 E	Vert. Comp.	800	Purpose			

DESCRIPTION	SULPHIDES	OXIDES	OTHERS	FROM	TO	SAMPLE No.	% Cu.	% Mo.	Gz Au.	Oz. Ag.	% RECOV.
Overburden				0	152						98
Mudstone and siltstone - massive				152	170						98
Silty mudstone - thin bedding 88-87° to core axis				170	190						98
Mudstone - slightly carbonaceous				190	220						98
Mudstone - weakly carbonaceous - bedding 87° to core axis				220	260						98
Mudstone - bedding 88° to 82° to core axis				260	310						98
Silty mudstone and mudstone - bedding 87° to core axis				310	340						98
Silty mudstone, siltstone and sandstone				340	360						98
Silty sandstone - light grey and massive				360	370						98
Silty mudstone - massive				370	380						98
Siltstone and silty sandstone				380	392						98
Conglomerate				392	401						98

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DRILL HOLE LOG

BETHLEHEM COPPER CORPORATION

SHEET No. 2

Property **PRINCETON COAL** Hole No. **DDH 76-15** Logged by **R. J. Nethery** Date **March 4, 1976**

DESCRIPTION	SULPHIDES	OXIDES	OTHERS	FROM	TO	SAMPLE No.	% Cu.	% Mo.	Oz Au.	Oz Ag.	% RECOV.
Siltstone and mudstone - bedding 2° to core axis				401	415						98
Sandy siltstone and sandstone				415	450						98
Mostly silty sandstone with minor mudstone and mostly massive, some laminations 90° to axis				450	480						98
Alternating bands of mudstone, siltstone and fine grained sandstone				480	520						98
Sandstone - massive				520	527						98
Light grey siltstone and sandstone				527	530						98
Carbonaceous mudstone				530	531						98
Sandstone and siltstone				531	533½						98
Strongly carbonaceous mudstone - bedding 90° to core axis				533½	535						98
Sandstone				535	542						98
Siltstone, mudstone and sandstone - weak bedding mostly 90° to core axis				542	564						98
Highly carbonaceous mudstone (black mudstone), some approaches coal material over 1 to 4" lengths				564	584						93
Gradational layers of sandstone, siltstone and mudstone				584	593						98

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DRILL HOLE LOG

BETHLEHEM COPPER CORPORATION

SHEET No.3

Property PRINCETON COAL

Hole No. DDH 76-15

Logged by R. J. Nethery

Date March 4, 1976

DESCRIPTION	SULPHIDES	OXIDES	OTHERS	FROM	TO	SAMPLE No.	% Cu.	% Mo.	Oz Au.	Oz Ag.	% RECOV.
Mud to strongly carbonaceous mudstone				593	599						98
Sandstone, siltstone and mudstone - mostly massive				599	604						98
Mod. carbonaceous siltstone and mudstone				604	606						98
Siltstone, and silty sandstone				606	632						98
Siltstone				632	641						98
Sandstone - mostly massive Siltstone and mudstone - lamination mudstone 90° to core axis				641	663						98
Mudstone with alternating bands of black mudstone (carbonaceous)				663	668						98
Mostly fine grained sandstone and siltstone - mostly massive				668	730						98
Mostly sandstone - minor sandstone bands				730	754						95
Sandstone				754	756						98
Weakly carbonaceous mudstone - bedding 87° to core axis				756	760						98
Fine grained sandstone and siltstone - bedding 87° to core axis				760	770						98
Mudstone				770	775						98

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SECTION F

GEOPHYSICAL LOGS

Logs prepared by Roke Oil Enterprises Ltd. of Calgary,
Alberta.

Hole No.

Type of Log

DDH-75-13

- Gamma Ray Neutron
- Sidewall Densilog

DDH-75-14

- Gamma Ray Neutron
- Sidewall Densilog

DDH-76-15

- Gamma Ray Neutron
- Sidewall Densilog

19

ROKE

SIDEWALL DENSITOG

OIL ENTERPRISES LTD. CALGARY, ALBERTA

FILE NO. _____

COMPANY BETHLEHEM COPPER CORPORATION LTD

WELL 75 - 14

LOCATION _____

FIELD PRINCESTON

PROVINCE BRITISH COLUMBIA

Permanent Datum _____

Log Measured from _____

Well Depth Measured from _____

Run No. _____

Date _____

Last Reading _____

Footage Logged _____

Depth Reached _____

Casing Bore _____

Casing Driller _____

Fluid Type _____

Liquid Level _____

Min. Diam. _____

Operating Time _____

Truck No. _____

Recorded By _____

Witnessed By _____

193

(11)

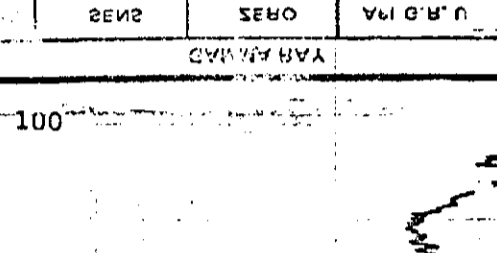
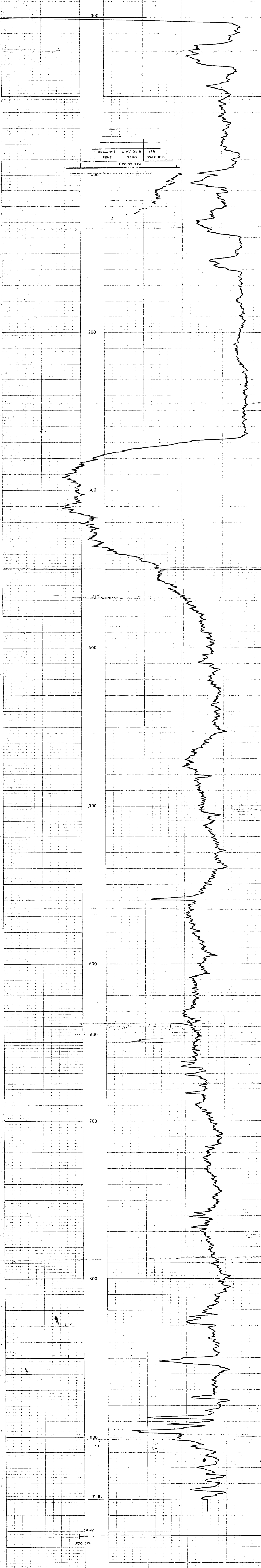
RUN NO.	DEPTHS		SPEED FT/MIN	GAMMA RAY				SIDEWALL DENSITOG			
	FROM	TO		T.C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	API G.R. UNITS PER LOG DIV.	T.C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	CPS/DIV
1	000	940	12					3	1000	1.3R	21.1

REMARKS LOGGED THROUGH NO DRILL ROD

DENSITY TOOL SERIAL NO 128

DEPTHS	CALIPER (DIAMETER - INCHES)		GAMMA RAY API	BULK DENSITY (GRAMS/CC)	
	Left	Right		1.00	1.20
000					

CONSIDERATION MUST BE GIVEN TO THE POSITION OF THE DRILL ROD WHEN USING THE BULK DENSITY VALUES



F.R.

300 FT

ROKE

©ANTON TAYLOR MEUPHON LTD

OIL ENTERPRISES LTD. CALGARY, ALBERTA

193

FILE NO.	COMPANY	BRITISH COPPER CORPORATION LTD
LSD SEC	WELL	75 - 14
TIME	DATE	17 DECEMBER 1975
W	FIELD	PRINCETON
M	PROVINCE	BRITISH COLUMBIA
	PERMITS	GROUND LEVEL
	LOG MEASURED FROM	RIG FLOOR
	WELL DEPTH MEASURED FROM	RIG FLOOR
	DATE	17 DECEMBER 1975
	LAST READING	958
	FOOTAGE LOGGED	958
	DEPTH REACHED	959
	DEPTH DRILLER	963
	CASING ROPE	258
	CASTING DRILLER	
	FLUID TYPE	WATER
	LIQUID LEVEL	00
	MIN. DIAM.	NQ
	RM @ OF	
	OPERATING TIME	2 HOURS
	TRUCK NO.	35
RECORDED BY	PETERSON	WITNESSED BY
		HEPSTER

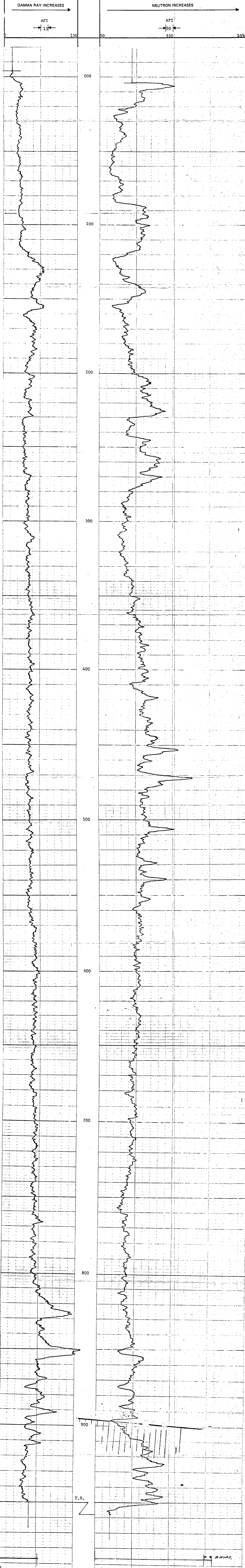
EQUIPMENT DATA

GAMMA RAY				NEUTRON			
RUN NO.	ONE			RUN NO.	ONE		
TOOL MODEL NO.				LOG TYPE	NEUTRON/NEUTRON		
DIAMETER	1 1/8			TOOL MODEL NO.			
DETECTOR MODEL NO.				DIAMETER	1 1/8		
TYPE	SCINTILLATION			DETECTOR MODEL NO.			
LENGTH	4 INCH			TYPE	PROPORTIONAL		
DISTANCE TO N. SOURCE	8.55 FT.			LENGTH	6 INCH		
GENERAL				SOURCE MODEL NO.	MRC-N-SS-W		
HOIST TRUCK NO.	35			SERIAL NO.	50		
INSTRUMENT TRUCK NO.	35			SPACING	17 INCH		
TOOL SERIAL NO.	177			TYPE	AmBe		
				STRENGTH	3 CURIES		

LOGGING DATA

RUN NO.	GENERAL			GAMMA RAY				NEUTRON			
	DEPT IN	TO	SPEED FT/MIN	T.C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	API G. R. UNITS PER LOG DIV.	T.C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	API N. UNITS PER LOG DIV.
1	00	958	12	3	500	0L	15 API	3	500	1L	50 API

REMARKS: LOGGED THROUGH NO DRILL ROD



ROKE

SIDEWALL DENSITOG

OIL ENTERPRISES LTD. CALGARY, ALBERTA

193 (L3)

FILE NO.	COMPANY	BETHLEHEM COPPER CORPORATION LTD
LSD	WELL	75 - 13
SEC	RGE	
TWP	LOCATION	
RGE	FIELD	PRINCETON
W. M.	PROVINCE	BRITISH COLUMBIA
	Permanent Datum	GROUND LEVEL
	Log Measured from	RIG FLOOR
	Well Depth Measured from	RIG FLOOR
	Elev.	
	2.5 Ft. Above Perm. Datum	
	K.B.	GRN
	CSG	
	GL	
Run No.	ONE	
Date	30 NOVEMBER 1975	
First Reading	730	
Last Reading	000	
Footage Logged	730	
Depth Reached	733	
Depth Driller	756	
Casing Driller	183	
Fluid Type	AIR/WATER	
Liquid Level		
Min. Diam.	NQ	
Operating Time	2 HOURS	
Truck No.	35	
Recorded By	PETERSON	Witnessed By
		HRSBSTER

RUN NO.	GENERAL		SPEED FT/MIN	T.C. SEC.	GAMMA RAY			SIDEWALL DENSITOG			
	DEPTHS FROM	TO			SENS SETTINGS	ZERO DIV.L OR R	API G.R. UNITS PER LOG DIV.	T.C. SEC.	SENS SETTINGS	ZERO DIV.L OR R	CPS/DIV
1	000	730	10					3	1000	1.3	21.1

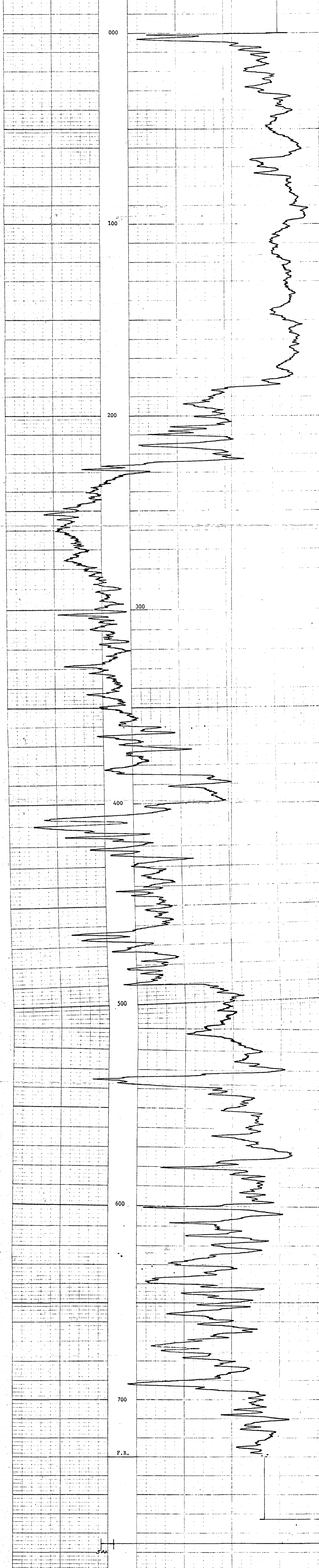
REMARKS LOGGED THROUGH DRILL ROD
 DRILLHOLE BADLY WASHED FROM 224 FT to 490 FT

DENSITY TOOL SERIAL NO 128

CALIPER (DIAMETER - INCHES)

CONSIDERATION MUST BE GIVEN TO THE POSITION OF THE DRILL ROD WHEN USING THE BULK DENSITY VALUES

BULK DENSITY (GRAMS/CC)



F.R.

520

ROKE

GAMMA RAY NEUTRON LOG
OIL ENTERPRISES LTD. CALGARY, ALBERTA

19

FILE NO. _____
COMPANY BETHLEHEM COPPER CORPORATION LTD.
WELL 75 - 13
RGE _____
M _____
LOCATION _____
FIELD PRINCETON
Other Services: _____

193
(14)

PROVINCE BRITISH COLUMBIA
Paramount Datum GROUND LEVEL
Log Measured from RIG FLOOR 2.5 Ft. Above Perm. Datum
Well Depths Measured from RIG FLOOR
K.R. _____
G.S. _____
G.L. _____

Run No. ONE
Date 30 NOVEMBER 1975
First Reading 748
Last Reading 000
Footage Logged 748
Depth Reached 749
Depth Driller 756
Casing Roke 184
Casing Driller 183
Fluid Type AIR/WATER
Liquid Level 75
Min. Diam. NQ
Rm @ 9' _____
Operating Time 2 HOURS
Truck No. 35

Recorded By PATRICKSON Witnessed By HERBSTER

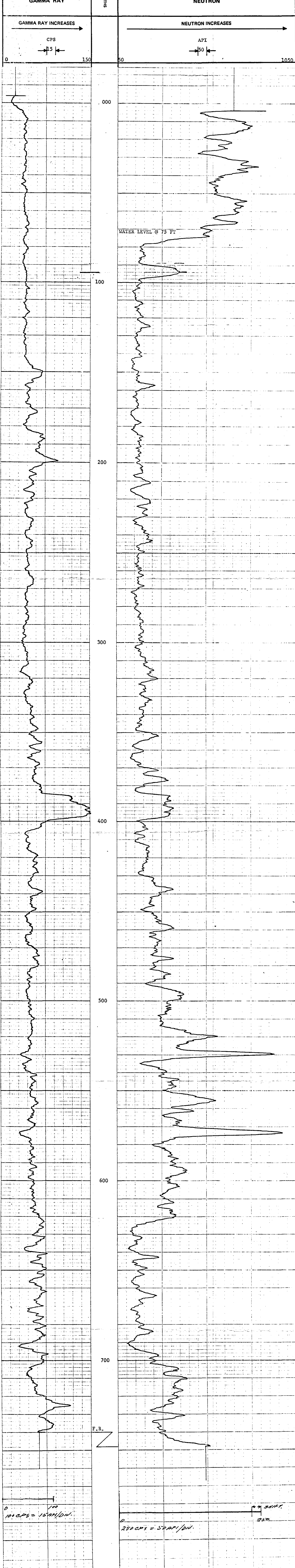
EQUIPMENT DATA

GAMMA RAY		NEUTRON	
RUN NO.	ONE	RUN NO.	ONE
TOOL MODEL NO.		LOG TYPE	NEUTRON/NEUTRON
DIAMETER	1 1/8	TOOL MODEL NO.	
DETECTOR MODEL NO.		DIAMETER	1 1/8
TYPE	SCINTILLATION	DETECTOR MODEL NO.	
LENGTH	4 INCH	TYPE	PROPORTIONAL
DISTANCE TO N. SOURCE	8.55 FT.	LENGTH	6 INCH
		SOURCE MODEL NO.	MRC-N-SS-W
GENERAL		SERIAL NO.	50
MOIST. TRUCK NO.		SPACING	17 INCH
INSTRUMENT TRUCK NO.	35	TYPE	AmBe
TOOL SERIAL NO.	177	STRENGTH	3 CURIES

LOGGING DATA

RUN NO.	GAMMA RAY			NEUTRON						
	DEPTHS	SPEED	T.C.	ZERO	API G. R. UNITS	T. C.	SENS	ZERO	API N. UNITS	
1	FROM TO	FT/MIN	SEC.	SETTINGS	DIV. L OR R	PER LOG DIV.	SEC.	SETTINGS	DIV. L OR R	PER LOG DIV.
	00 748	12	4	500	OL	15 APT	3	500	1L	50 APT

REMARKS LOGGED THROUGH NQ DRILL ROD



ROKE

SINCE 1911 DEFENSIBLE LOG

OIL ENTERPRISES LTD. CALGARY, ALBERTA

FILE NO. _____
 COMPANY BETHLEHEM COPPER CORPORATION LTD.
 WELL 76 - 15
 LOCATION _____
 FIELD PRINCETON
 PROV. BRITISH COLUMBIA
 GROUND LEVEL _____
 Log Measured from RIG FLOOR Elev. _____
 Well Depth Measured from RIG FLOOR 2 Ft. Above Perm. Datum

1973 (LS)

Run No. ONE
 Date 29 JANUARY 1976
 First Reading 786
 Last Reading 000
 Footage Logged 786
 Depth Reached 789
 Depth Driller 800
 Casing Rate 164
 Casting Driller WATER
 Fluid Type 00
 Liquid Level NQ
 Min. Diam. _____

Other Services: _____
 K.B. _____
 C.S.G. _____
 G.L. _____

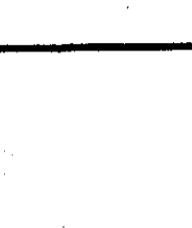
Operating Time 2 HOURS
 Truck No. 35

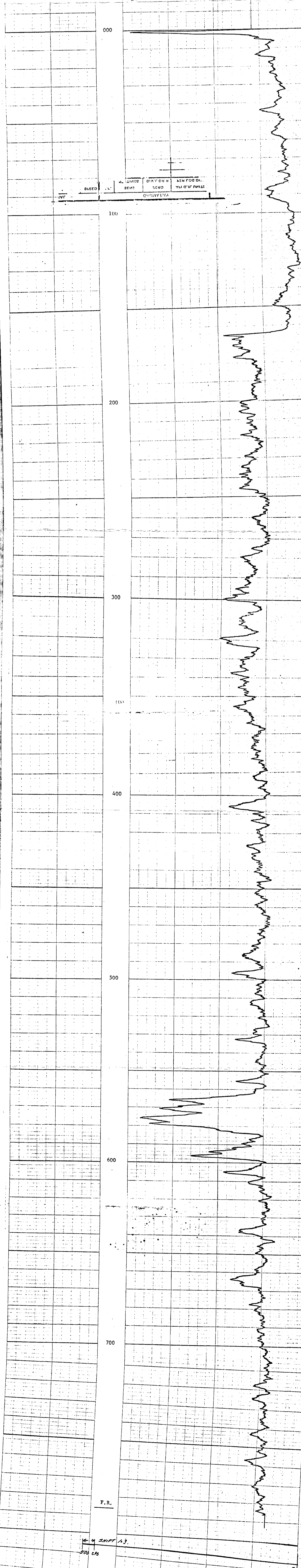
Recorded By PETERSON Witnessed By HEPENTER

GENERAL				GAMMA RAY				SIDEWALL DENSITOG			
RUN NO.	DEPTHS		SPEED FT/MIN	T.C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	API G.R. UNITS PER LOG DIV.	T.C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	CPS/DIV
	FROM	TO									
1	000	786	10					3	1000	1.3R	21.1

REMARKS LOGGED THROUGH NO DRILL ROD

DENSITY TOOL SERIAL NO 128

	CALIPER (DIAMETER - INCHES)	
GAMMA RAY API 	CONSIDERATION MUST BE GIVEN TO THE POSITION OF THE DRILL ROD WHEN USING THE BULK DENSITY VALUES	BULK DENSITY (GRAMS/CC)



F.R.
 SHIPT 13
 508 CFS

ROKE

GAMMA RAY NEUTRON LOG
 OIL ENTERPRISES LTD. CALGARY, ALBERTA

COMPANY: BETHLEHEM COPPER CORPORATION LTD
 WELL: 76 - 15
 LOCATION: PRINCESTON

FILE #10
 LSD SEC
 TWP RGE
 M

193 (3) (16)

PROVINCE: BRITISH COLUMBIA
 ELEV.:
 GROUND LEVEL: RIG FLOOR
 Log Measured from: RIG FLOOR
 Well Depth Measured from: RIG FLOOR
 K.B. CSC
 G.I.

Run No: ONE
 Date: 29 JANUARY 1976
 First Reading: 798
 Last Reading: 000
 Footage Logged: 798
 Depth Reached: 799
 Casing Driller: 800
 Casing Roke: 164
 Fluid Type: WATER
 Liquid Level: 00
 Min. Diam: NQ
 Rm @ 9f:
 Operating Time: 2 HOURS
 Truck No: 35
 Recorded By: PETERSON
 Witnessed By: HERBSTER

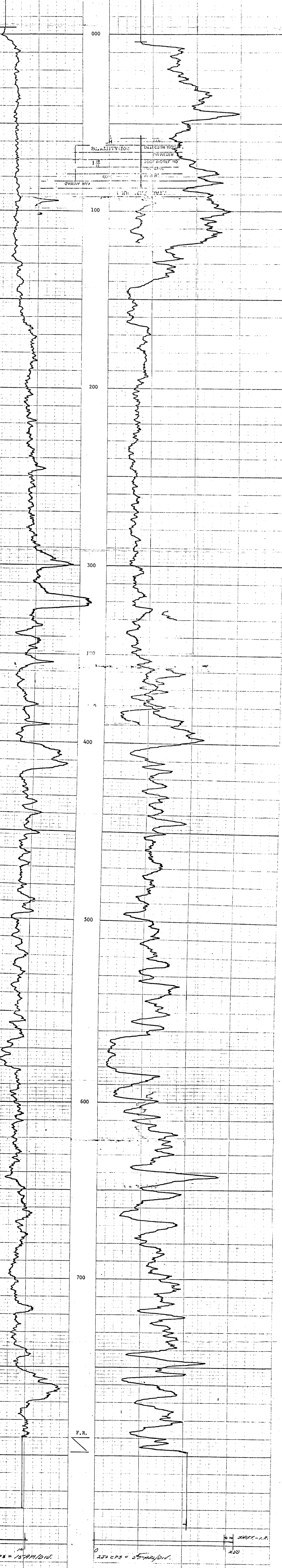
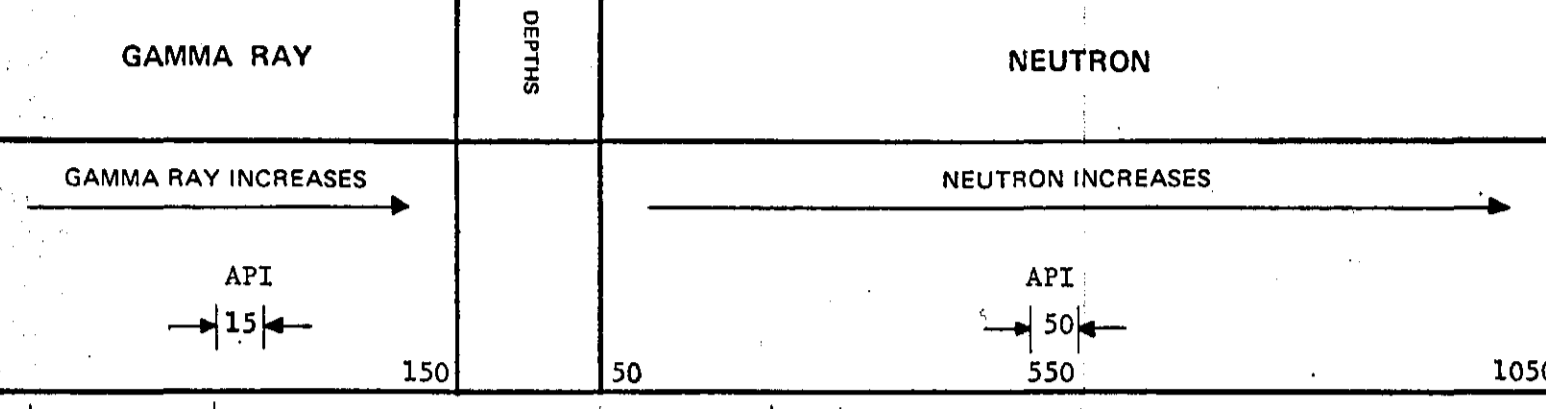
EQUIPMENT DATA

GAMMA RAY				NEUTRON			
RUN NO.	ONE			RUN NO.	ONE		
TOOL MODEL NO.				LOG TYPE	NEUTRON/NEUTRON		
DIAMETER	1 11/16			TOOL MODEL NO.			
DETECTOR MODEL NO.				DIAMETER	1 11/16		
TYPE	SCINTILLATION			DETECTOR MODEL NO.			
LENGTH	4 INCH			TYPE	PROPORTIONAL		
DISTANCE TO N. SOURCE	8.55 FT.			LENGTH	6 INCH		
GENERAL				SOURCE MODEL NO.	MRC-N-SS-W		
				SERIAL NO.	50		
				SPACING	17 INCH		
				TYPE	AmBe		
				STRENGTH	3 CURIES		

LOGGING DATA

GENERAL				GAMMA RAY				NEUTRON			
RUN NO.	DEPTHS		SPEED	T.C.	SENS	ZERO	API G. R. UNITS	T. C.	SENS	ZERO	API N. UNITS
	FROM	TO	FT/MIN	SEC.	SETTINGS	DIV. L OR R	PER LOG DIV.	SEC.	SETTINGS	DIV. L OR R	PER LOG DIV.
1	00	798	12	3	500	0L	15 API	3	500	1L	50 API

REMARKS



100 cps = 15 API/DIV.
 250 cps = 50 API/DIV.
 F.R. ✓
 S.W.P.T.-I.P.