UNITED STATES DEPARTMENT OF THE INTERIOR

GEOLOGICAL SURVEY

EXPLORATION OF THE BIG BOULDER PROSPECT LARIMER COUNTY, COLORADO

by

M. L. Thurston

ILLUSTRATIONS
(in envelope)

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The Big Boulder prospect is in SE¼ sec. 36, T.7N., R.72W., in Larimer County, Colorado. The prospect has been opened by four irregular trenches and shallow cuts, and a 10-foot discovery shaft. Hanley 1/ states that 10.5 tons of beryl were produced from

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1/Hanley, J. B., Heinrich, E. W., and Page, L. R., Pegmatite investigations in Colorado, Wyoming, and Utah, 1942-1944: U. S. Geol. Survey Prof. Paper 227, pp. 92-93, 1950

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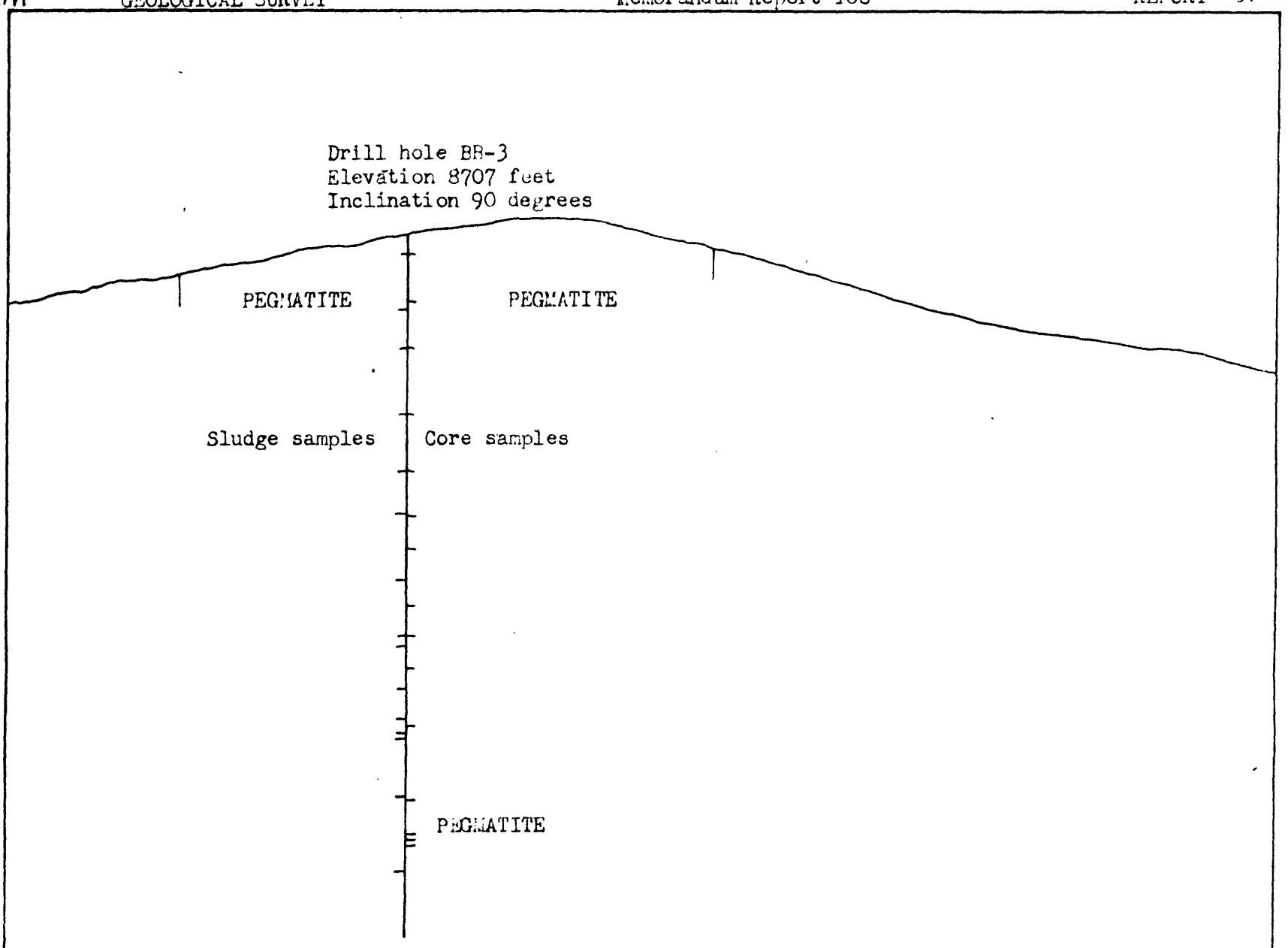
the Big Boulder prospect in 1936, and about 600 pounds in 1941. The deposit was re-examined in 1947 by Thurston, as part of the U. S. Geological Survey nation-wide investigation of beryllium resources, and explored by core drilling in 1948. The investigation and exploration were carried out in cooperation with the Atomic Energy Commission. This pegmatite was selected for exploration because (1) surface evidence suggested that not much of the body had been removed by erosion and important quantites of beryl might remain in the deposit, (2) knowledge of the extent and attitude of the core of the pegmatite might lead to finding additional beryl of hand-cobbing size along the core margin, (3) there was the remote possibility that deeper parts of the pegmatite might contain rare minerals of value as by-products if the deposit were mined, and (4) the study of other pegmatites in the district and elsewhere in the country would be aided by the more thorough scientific understanding of this deposit.

Five core holes, totalling 682 feet, were drilled.(See fig.4) Holes 1 and 2 were drilled near the north end of the pegmatite from the east side and passed beneath the body. Hole 3 was drilled vertically through the deposit, north of the center. Holes 4 and 5 were drilled from the west side, near the south end of the pegmatite. Each hole is marked on the ground by a length of 3-inch pipe penetrating the overburden to bedrock, and each pipe is covered by a cap stamped with the hole number. The length, inclination, and elevation of the collar of each hole that intersected the pegmatite are shown on the sections (figs. 1 to 3). All the core recovered by drilling in pegmatite was split and assayed for BeO(figs. 1 to 3). The core of schist wallrock was not assayed. Sludge samples collected while drilling in pegmatite were also cut and assayed. Sludge and core samples were ground and split mechanically to meet specifications for spectrographic analysis. The unused part of the core is stored in the office of the U. S. Geological Survey, Denver Federal Center. The footage interval for each sample, both core and sludge, is stated in the table of assays in each section (figs. 1 to 3), and the interval is also shown graphically on the line representing the drill hole. Throughout the drilling the core recovery was high, but the sludge recovery was only moderate.

The omega indices of the beryl found in the Big Boulder pegmatite range from about 1.574 to 1.587; assuming that the omega index of refraction of beryl is a reliable indicator of the BeO content of the mineral, the beryl of this deposit contains from about 12.2 to 13.4 percent BeO.



RESULTS OF SPECTROGRAPHIC ANALYSIS

SLUDGE SAMPLES

Sample number	Footage interval of sample	BeO content, percent
S 71	2.7 - 10.0	0.0030
S 72	10.0 - 15.0	0.026
S 73	15.0 - 24.0	0.0040
S 74	24.0 - 32.0	0.0037
	No sludge recovered	
S 75	37.8 - 47.0	0.0032
S 76	47.0 - 54.8	0.0044
	No sludge recovered	
S 77	56.2 - 62.0	0.010
	No sludge recovered	
S 78	67.2 - 68.0	0.0019
	No sludge recovered	
S 79	68.9 - 76.7	0.012
S 80	76.7 - 86.7	0.0065

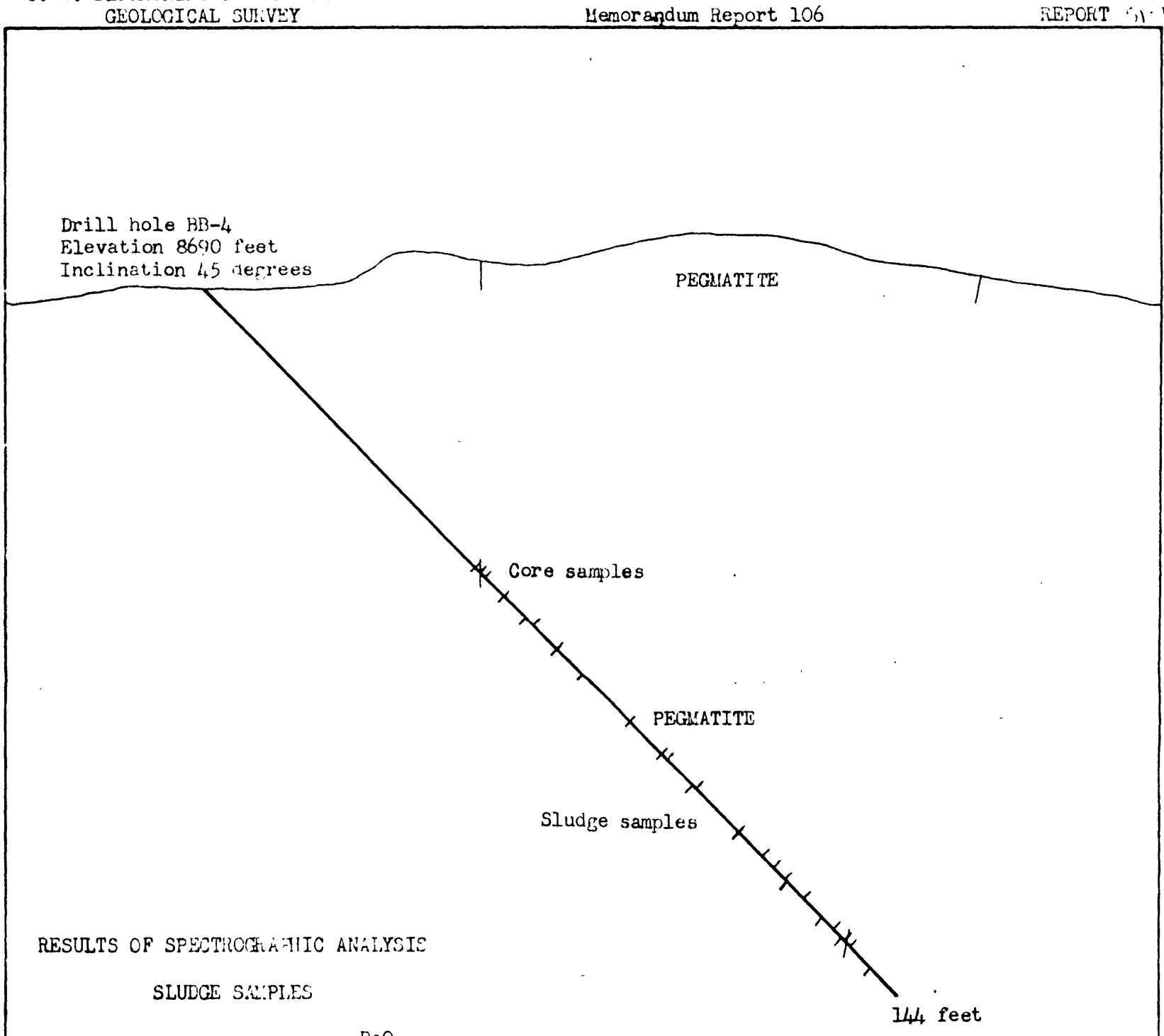
CORE SAMPLES

Sample number	Footage interval of sample	BeO content, percent
C 97	2.7 - 9.0	0.00085
C 98	9.0 - 15.0	0.0068
C 99	15.0 - 24.0	0.0072
C100	24.0 - 32.0	0.0031
C101	32.0 - 38.0	0.00085
C102	38.0 - 42.7	0.0037
C103	42.7 - 50.6	0.00085
C104	50.6 - 54.8	0.0012
C105	54.8 - 59.2	0.00090
C106	59.2 - 67.2	0.0053
C107	67.2 - 77.0	0.0011
C108	77.0 - 81.8	0.00090
C109	81.8 - 82.4	0.0015
C110	82.4 - 83.2	0.0027

Wm. R. Thurston 1950

Fig. 1 - ASSAY PLAN OF DIAMOND DRILL HOLE BB-3, BIG BOULDER PROSPECT, LARIMER COUNTY, COLORADO

SCALE
0 20 40 60 feet



RESULTS OF SPECTROGRAPHIC ANALYSIS

SLUDGE SAMPLES

Sample number	Footage interval of sample	BeO content, percent
S 81	56.0 - 62.0	0.0033
S 82	62.0 - 66.5	0.0022
S 83	66.5 - 72.8	0.013
S 84	72.8 - 78.2	0.026
S 85	78.2 - 88.2	0.048
S 86	88.2 - 95.0	0.044
S 87	95.0 -101.5	0.015
S 88	101.5 -111.0	0.0080
S 89	111.0 -121.0	0.028
S 90	121.0 -128.6	0.044
S 91	128.6 -132.5	0.023
S 92	132.5 -138.5	0.0064

CORE SAMPLES

Sample number	Footage interval of sample	BeO content, percent
C 79	56.0 - 57.0	0.0027
C 80	57.0 - 58.0	0.0017
C 81	58.0 - 62.0	0.0023
C 82	62.0 - 68.1	0.0014
C 83	68.1 - 72.8	0.013
C 84	72.8 - 78.2	0.31
C 85	78.2 - 88.2	0.039
C 86	88.2 - 95.0	0.0033
C 87	95.0 - 96.0	0.0034
C 88	96.0 -102.0	0.00075
C 89	102.0 -111.0	0.0021
C 90	111.0 -116.0	0.0033
C 91	116.0 -118.2	0.29
C 92	118.2 -120.7	0.0057
C 93	120.7 -124.6	0.015
C 94	124.6 -130.8	0.0034
C 95	130.8 -133.0	0.0045
C 96	133.0 -134.1	0.0088

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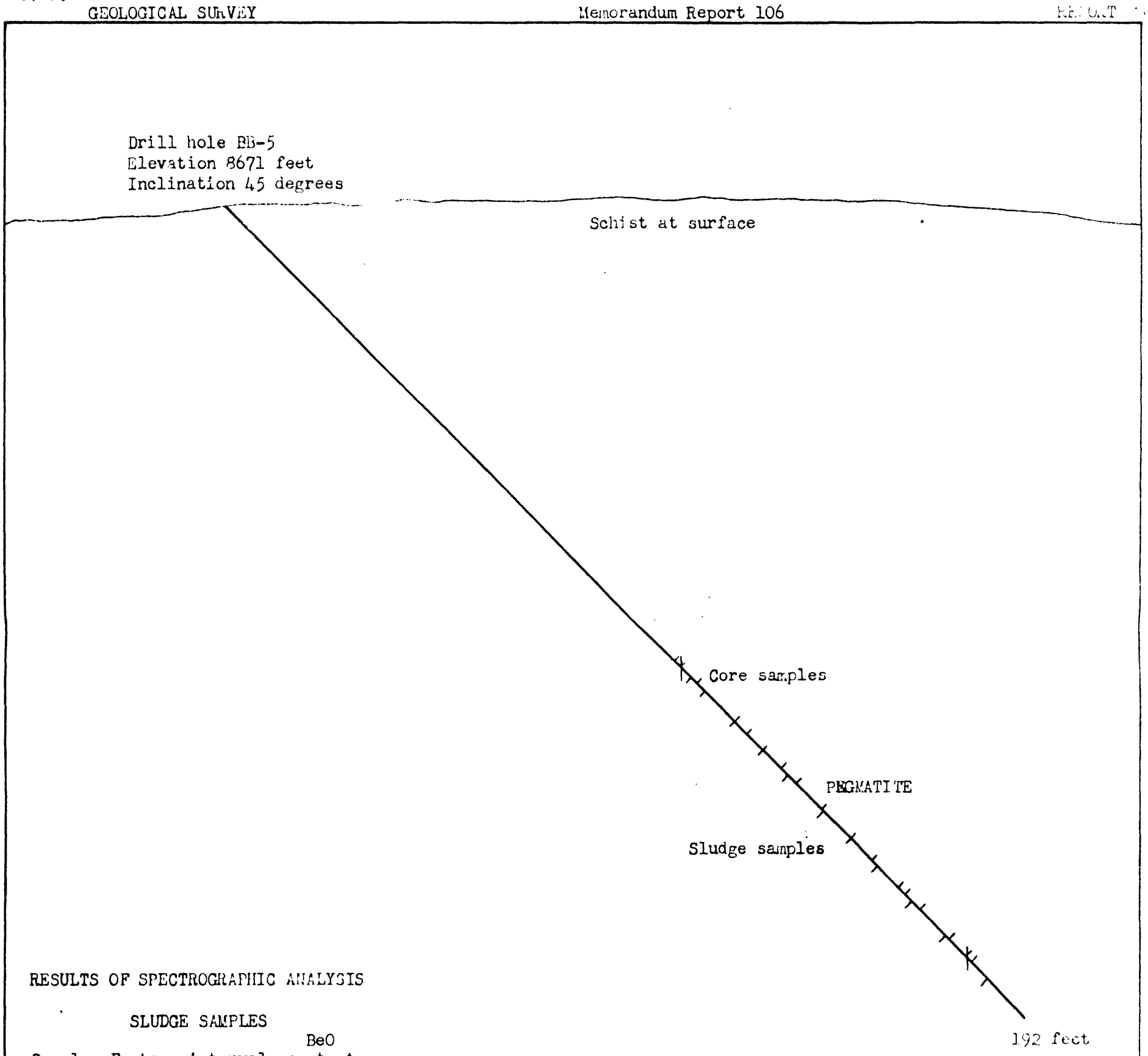
Fig. 2 - ASSAY OF DIAMOND DRILL HOLE BB-4, BIG BOULDER PROSPECT, LARIMER COUNTY, COLORADO

SCALE

0 20 40 60 feet



RESULTS OF SPECTROGRAPHIC ANALYSIS

SLUDGE SAMPLES

Sample number	Footage interval of sample	BeO content, percent
S 93	110.5 - 114.7	0.011
S 94	114.7 - 122.0	0.064
S 95	122.0 - 128.8	0.73
S 96	128.8 - 134.9	0.10
S 97	134.9 - 143.4	0.048
S 98	143.4 - 150.0	0.022
S 99	150.0 - 156.6	0.0084
S100	156.6 - 165.0	0.0067
S101	165.0 - 173.0	0.024
S102	173.0 - 183.0	0.0074

CORE SAMPLES

Sample number	Footage interval of sample	BeO content, percent
C 63	107.7 - 109.0	0.0019
C 64	109.0 - 112.8	0.0018
C 65	112.8 - 122.0	0.026
C 66	122.0 - 125.0	1.2
C 67	125.0 - 128.8	0.90
C 68	128.8 - 133.3	0.0046
C 69	133.3 - 136.8	0.0042
C 70	136.8 - 143.2	0.0016
C 71	143.2 - 150.0	0.0035
C 72	150.0 - 155.3	0.0020
C 73	155.3 - 161.7	0.0021
C 74	161.7 - 163.4	0.0024
C 75	163.4 - 167.0	0.048
C 76	167.0 - 174.0	0.0073
C 77	174.0 - 178.1	0.0042
C 78	178.1 - 179.1	0.0046

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Fig. 3 - ASSAY PLAN OF DIAMOND DRILL HOLE BB-5, BIG BOULDER PROSPECT, LARIMER COUNTY, COLORADO

SCALE
0 20 40 60 feet

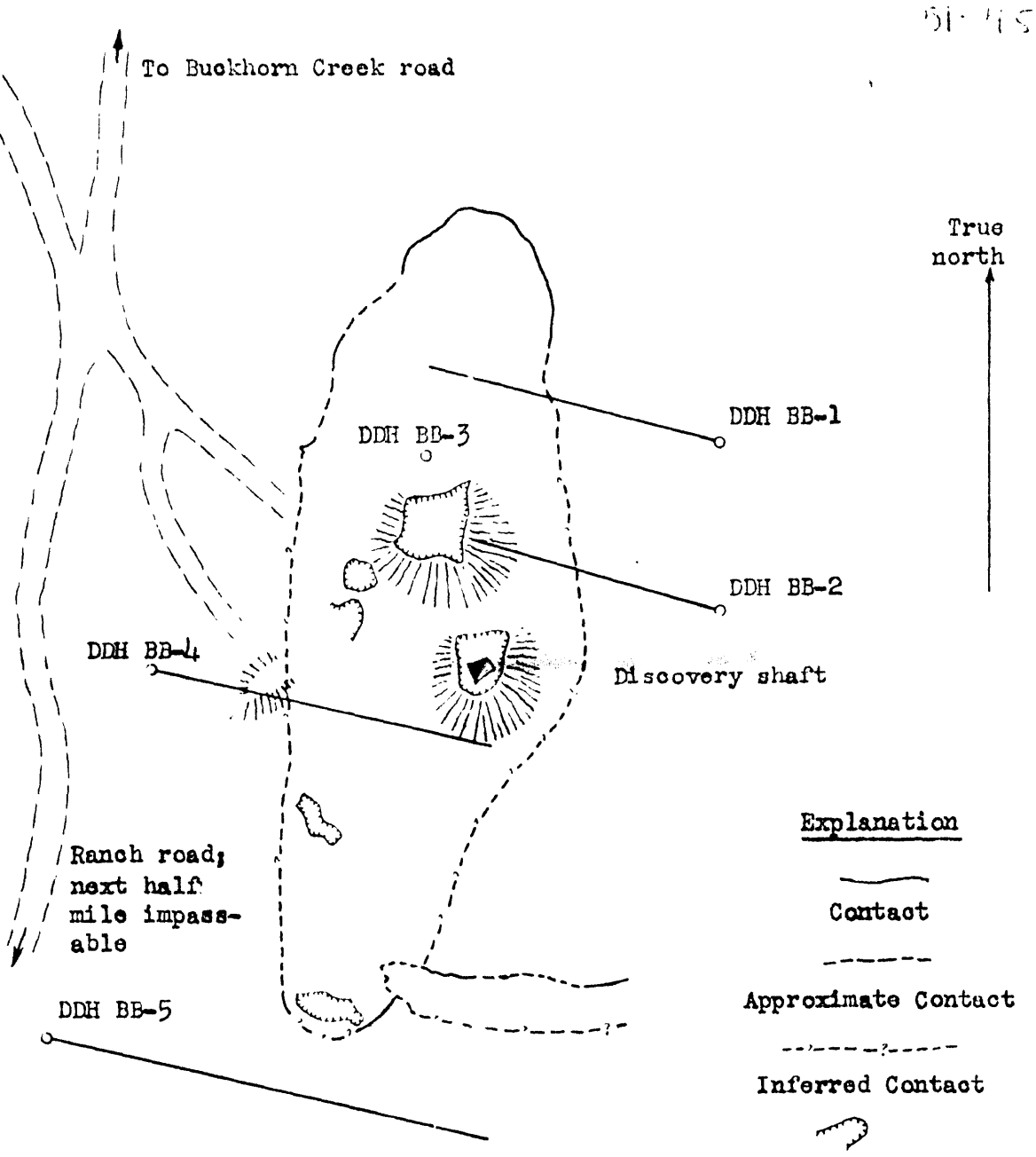

Fig. 4. - Location of diamond drill holes, Big Boulder Prospect, Larimer County, Colorado