1949

U.S. Bureau of Mines: Bumpus Quarry

U.S. Bureau of Mines

Maine Geological Survey

Core Repository Data Files

Driller: U.S. Bureau of Mines

Project: Bumpus Quarry

Town(s): Albany Twp

Contents:

1. Core Repository Intake Form(s)
2. Drill Hole Log(s)
3. Location Map(s)
4. Cross-section Diagram(s)

Maine Geological Survey

CORE REPOSITORY

Township: Albany

Company: U.S. Bureau of Mines

CORES IN REPOSITORY:

Hole	Depth	Comments
B-1	1-191	continuous
B-2	2-229	continuous
B-3	2-195	discontinuous
B-4	17-123	continuous
B-5	10-149	continuous
B-6	8-136	continuous
B-7	1-101	continuous

Approximately 36,700 tons of pegmatite and 19,000 tons of overburden and hanging-wall waste have been removed.

Two roads and ramps run into the pit, where trucks are loaded by a 3/4-cubic yard gasoline shovel. Steel barrels cut in half and flat steel trays are used to store hand-sorted material. When full, they are picked up by the shovel and loaded onto trucks.

Blast-hole drilling is done with a heavy-duty, wagon-type drill operated by air from a Diesel compressor. A jack hammer is used for secondary drilling, compressed air being supplied by a small, gasoline-powered compressor.

The ore is blasted with 40-percent gelatin dynamite and instantaneous electric detonators.

Stripping with a bulldozer and the gasoline shovel has been started on the east end of the present pit.

WORK BY BUREAU OF MINES

In connection with certain studies of the New England pegmatites begun by the Bureau of Mines in 1949, the Bumpus quarry, one of the largest beryl-producing pegmatites in the New England area, was selected for diamond-core drilling.

Seven diamond-drill holes (see fig. 2) aggregating 1,127.1 feet were drilled to obtain cores from which a study of mineral association could be made, to solve the zoning problem. It was established that diamond drilling in pegmatites can assist in delineating the extent of such deposits, thus supplying information for the development of economic mining to increase production of beryl and other important minerals associated with pegmatitic intrusives.

The drilling, done with Government-owned equipment, proved the pegmatite dike to a depth at least 110 feet extending 50 feet below the present quarry floor. It also indicated a lateral extent of the deposit at least 350 feet east and 200 feet west of the present quarry boundary. The dike extends beyond the area covered by diamond drilling. In diamond-drill hole B-4, approximately 250 feet west of the pit, it split and was found interbanded with granite, diorite, and gneiss. Details of drill holes are shown in figures 4, 5, and 6. A longitudinal vertical section, figure 3, shows the position of drill holes in relation to the present quarry opening.

Table 2 shows the altitudes and contains coordinates of the collars of drill holes, as well as other data for plotting the holes.

TABLE 2. - Location of diamond-drill holes

Diamond-drill hole number	Coordinates N	Coordinates E	Altitude	Inclination	Bearing	Depth, feet
B-1	970	1,125	700	-74	N.14 W.	191.5
B-2	925	1,150	705	-74	N.14 W.	229.0
B-3	935	980	680	-74	N.14 W.	195.5
B-4	930	800	655	Vertical	-	123.9
B-5	1,005	1,275	700	-74	N.14 W.	149.2
B-6	1,040	1,420	705	-74	N.14 W.	136.0
B-7	1,080	1,585	728	-74	N.14 W.	102.0
Total						1,127.1

Table 3 shows details of core sizes and core recoveries.

TABLE 3. - Drill-hole data

Diamond-drill hole number	Overburden, feet	Core 1/ NX, ft.	Core 1/ BX, ft.	Core 1/ AX, ft.	Depth of hole, feet	Total core, feet	Core recovery, percent
B-1	1.5	8.8	19.0	162.2	191.5	187.1	98.5
B-2	2.5	8.9	14.9	202.7	229.0	226.5	100.0
B-3	2.0	10.6	15.7	167.2	195.5	189.2	97.8
B-4	17.8	2.5	7.9	95.7	123.9	106.1	100.0
B-5	10.0	1.8	15.5	121.9	149.2	137.5	98.8
B-6	8.5	6.1	11.7	109.7	136.0	127.5	100.0
B-7	1.3	8.6	11.3	80.8	102.0	100.7	100.0
Total	43.6	47.3	96.0	940.2	1,127.1	1,074.6	99.2

1/ NX core is 2-5/32" in diameter; BX, 1-21/32", and AX, 1-3/16"

Logs of all diamond-drill holes appear in the appendix.

METALLURGICAL TESTING

Two 50-pound samples of beryl-bearing pegmatite were sent to the College Park Experiment Station. Sample 1 was mine-run fines from blasting and handling in vicinity of a nest of beryl crystals. Sample 2 was composed of small crystals of beryl in their original matrix of feldspar and quartz.

These samples were tested on an electrostatic separator. A good concentrate, plus-10-percent BeO, can be produced, from heads averaging 0.50 percent BeO, with about a 90-percent recovery, a tail loss of 1.0 percent, and a cleaner tail of 9.0 percent to be a return product. The concentration ratio was approximately 25:1. The need for additional investigation on mineral dressing is indicated.

Logs of diamond-drill holes at the Bumpus quarry, Oxford County, Maine

by

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Federal Geological Survey

Diamond-drill hole B-1

Altitude: 700.0 feet
Coordinates: N. 970 E. 1,125
Direction: N. 14° W.

Inclination: Minus 74°
Depth: 191.5 feet

Depth, in feet	Description
0 - 3.5	Overburden.
3.5 - 73.5	Foliated biotite granite. Coarse-grained. Three or four pegmatite stringers that have a maximum thickness of 6 inches are in the granite.
73.5 - 121.0	Pegmatite. Contacts are gradational.
*73.5 - 74.0	Plagioclase-quartz-muscovite pegmatite (border zone). Fine-grained.1/ The contact between the granite and pegmatite is gradational. Estimated mineral percentages are: Plagioclase - 60 percent, quartz - 30 percent, muscovite - 8 percent, and garnet - 2 percent.
*74.0 - 77.4	Plagioclase-quartz-perthite pegmatite (wall zone). Medium- to coarse-grained. Both white and cream perthite are present. In places the perthite is more abundant than the plagioclase. Estimated mineral percentages are: Plagioclase - 40 percent, quartz - 30 percent, perthite - 25 percent, muscovite - 4 percent, and biotite - 1 percent.
*77.4 - 79.2	Quartz pegmatite (core). The quartz pegmatite contains both milky and rock-crystal quartz, as well as one 4-inch ruled book of rum-colored muscovite. Estimated mineral reserves are: Quartz - 92 percent and muscovite - 8 percent.
*79.2 - 87.3	Plagioclase-quartz-perthite pegmatite (2d intermediate zone). Medium- to coarse-grained. This unit differs from the plagioclase-quartz-perthite wall zone between 74.0 and 77.4 chiefly in its higher biotite content. Estimated mineral percentages are: Plagioclase - 35 percent, quartz - 30 percent, perthite - 27 percent, muscovite - 5 percent, and biotite - 3 percent.

1/ The pegmatite textures used in the descriptions are those suggested by Cameron, E. N., Jahns, R. H., McNair, A. H., and Page, L. R. Internal structure of granitic pegmatites: Econ. Geology, Mon. 2, 1949, p. 16.

Fine	Less than 1 inch
Coarse	4 to 12 inches
Medium	1 to 4 inches
Very coarse	Greater than 12 inches

*Subsidiary interval

Diamond-drill hole B-1 (Cont.)

Depth, in feet	Description
*87.3 - 115.8	Perthite-quartz pegmatite (1st intermediate zone). Coarse-grained. Cream perthite is more abundant than white in the intermediate zone. The quartz is irregularly distributed. Individual masses have a thickness of as much as 8 to 10 inches. Cleavelandite and graphic granite are present. Estimated mineral percentages are: Perthite - 50 percent, quartz - 35 percent, plagioclase (cleavelandite) - 10 percent, and muscovite - 5 percent.
*115.8 - 120.7	Plagioclase-quartz-perthite pegmatite (wall zone). Medium to coarse-grained. Estimated mineral percentages are: Plagioclase - 40 percent, quartz - 30 percent, perthite - 25 percent, muscovite - 4 percent, and biotite and garnet - 1 percent.
*120.7 - 121.0	Plagioclase-quartz-muscovite pegmatite (border zone). Fine-grained. Estimated mineral percentages are: Plagioclase - 55 percent, quartz - 35 percent, muscovite - 9 percent, and garnet - 1 percent.
121.0 - 191.5	Foliated biotite granite, similar to the granite above 73.5 feet except for the presence of layers, lenses, and inclusions of biotite schist that have a maximum thickness of 1-1/2 feet.
191.5	End of hole.

*Subsidiary interval

Diamond-drill hole B-2

Altitude: 705.0 feet
Coordinates: N. 925 E. 1,150
Direction: N. 14° W.

Inclination: Minus 74°
Depth: 229.2 feet

Depth, in feet	Description
0 - 2.5	No core. Overburden.
2.5 - 94.4	Foliated biotite granite. The granite contains a few thin pegmatites and pegmatitic lenses that have a fine- to medium-grained texture and retain remnants of the foliation. All of the lenses are less than 1 foot thick. Chloritized biotite occurs in parts of the coarse-grained granite.
94.4 - 100.4	Fine-grained trap dike.
100.4 - 118.2	Foliated biotite granite, similar to the granite between 2.5 and 94.4 feet.
118.2 - 155.4	Pegmatite. Contacts gradational.
*118.2 - 118.6	Plagioclase-quartz-muscovite pegmatite (border zone). Fine-grained. Estimated mineral percentages are: Plagioclase - 65 percent, quartz - 25 percent, muscovite - 44 percent, and garnet - 1 percent.
*118.6 - 132.3	Plagioclase-quartz-perthite pegmatite (wall zone). Medium- to coarse-grained. Both white and cream perthite are present. In places the perthite is more abundant than the plagioclase. Some of the perthite contains graphic quartz. Estimated mineral percentages are: Plagioclase - 40 percent, quartz - 30 percent, perthite - 25 percent, and muscovite 5 percent.
*132.2 - 136.4	Quartz pegmatite core, consisting entirely of massive rock-crystal quartz.
*136.4 - 154.8	Placioclase-quartz-perthite pegmatite (wall zone). Medium- to coarse-grained. Some of the plagioclase is cleavelandite. One 4-inch ruled book of rum-colored muscovite is present. Estimated mineral percentages are: Plagioclase - 43 percent, quartz - 30 percent, perthite - 22 percent, and muscovite - 3 percent.
*154.8 - 155.4	Plagioclase-quartz-muscovite pegmatite (border zone). Fine-grained. Estimated mineral percentages are: Plagioclase - 65 percent, quartz - 30 percent, muscovite - 4 percent, and garnet and apatite - 1 percent.
155.4 - 299.2	Foliated biotite granite. In most places the granite has a uniform, coarse-grained texture. Three 6-inch to 1-foot pegmatites with gradational contacts are present.
229.2	End of hole.

*Subsidiary interval.

Diamond-drill hole B-3

Altitude: 680.0 feet
Coordinates: N. 935 E. 980
Direction: N. 14° W.

Inclination: Minus 74°
Depth: 195.5 feet

Depth, in feet	Description
0 - 2.0	No core. Overburden.
2.0 - 90.0	Foliated biotite granite. Coarse-grained. Pegmatitic lenses range from 3 to 12 inches in thickness. Biotite is chloritized in places.
90.0 - 118.0	Pegmatite. Contacts gradational.
*90.0 - 90.3	Plagioclase-quartz-muscovite pegmatite (border zone). Fine-grained. Estimated mineral percentages are: Plagioclase - 50 percent, quartz - 40 percent, and muscovite - 10 percent.
*90.3 - 97.0	Plagioclase-quartz-perthite pegmatite (wall zone). Medium- to coarse-grained. In places the perthite is more abundant than the plagioclase. Estimated mineral percentages are: Plagioclase - 35 percent, quartz - 30 percent, perthite - 25 percent, and muscovite - 10 percent.
*97.0 - 105.7	Perthite-quartz pegmatite (1st intermediate zone). Very coarse-grained. The perthite is both white and cream. The plagioclase is cleavelandite. One crystal of perthite and one quartz mass are approximately 2 feet thick. Estimated mineral percentages are: Perthite - 60 percent, quartz - 35 percent, muscovite - 3 percent, and plagioclase (cleavelandite) - 2 percent.
*105.7 - 118.0	Plagioclase-quartz-perthite pegmatite (wall zone). Medium- to coarse-grained. Some of the plagioclase is cleavelandite. In places perthite is more abundant than plagioclase. Estimated mineral percentages are: Plagioclase - 48 percent, quartz - 25 percent, perthite - 20 percent, muscovite - 6 percent, and tourmaline - 1 percent.
118.0 - 121.5	No core recovered.
121.5 - 195.5	Foliated biotite granite, similar to the granite between 2.0 and 90.0 feet, except that it has several layers of biotite schist that range from 1 to 2 feet thick.
195.5	End of hole.

*Subsidiary interval

Diamond-drill hole B-4

Altitude: 655.0 feet
Coordinates: N. 930 E. 800

Inclination: Vertical
Depth: 123.9 feet

Depth, in feet	Description
0 - 17.8	No core. Overburden.
17.8 - 23.4	Pegmatite
*17.8 - 19.0	Perthite-quartz pegmatite (1st intermediate zone). Coarse-grained. The pegmatite contains one 3-inch xenolith of biotite schist. Estimated mineral percentages are: perthite - 60 percent, and quartz 40 percent.
*19.0 - 23.4	Plagioclase-quartz-perthite pegmatite (wall zone). Medium-grained. The pegmatite contains chloritized biotite.
23.4 - 27.8	Mixture of foliated biotite granite and medium-grained plagioclase-quartz-perthite pegmatite. Chloritized biotite is present in the pegmatite.
27.8 - 59.5	Foliated biotite granite. Coarse-grained. Fine-grained biotite schist is present in the granite.
59.5 - 63.8	Plagioclase-quartz-muscovite pegmatite. Medium-grained. Accessory garnet occurs as crystals that range from 1/8 to 1/4 inch in diameter.
63.8 - 65.8	Mixture of coarse-grained foliated biotite granite and fine-grained biotite schist.
65.8 - 80.7	Pegmatite.
*65.8 - 67.5	Plagioclase-quartz-muscovite pegmatite (border zone). Medium-grained. Biotite is partly chloritized. Estimated mineral percentages are: Plagioclase - 65 percent, quartz - 30 percent, muscovite - 4 percent, and biotite - 1 percent.
*67.5 - 80.4	Plagioclase-quartz-perthite pegmatite (wall zone). Medium to coarse-grained. In places the perthite is more abundant than the plagioclase.
*80.4 - 80.7	Plagioclase-quartz-muscovite pegmatite (border zone). Fine-grained.
80.7 - 83.1	Foliated biotite granite. Coarse-grained.
83.1 - 86.5	Plagioclase-quartz-perthite pegmatite. Coarse-grained. Chloritized biotite is very abundant in places. Estimated mineral percentages are: Plagioclase - 50 percent, quartz - 30 percent, perthite - 17 percent, and biotite 3 percent.

*Subsidiary interval

Diamond-drill hole B-4 (Cont.)

Depth, in feet	Description
86.5 - 98.5	Foliated biotite granite. Coarse-grained. Layers of biotite schist are as much as 1 foot thick.
98.5 - 111.0	Trap dike. Fine-grained.
111.0 - 119.0	Pegmatite.
*111.0 - 111.3	Plagioclase-quartz-muscovite pegmatite (border zone). Fine-grained. Estimated mineral percentages are: Plagioclase - 55 percent, quartz - 40 percent, and muscovite - 5 percent.
*111.3 - 115.7	Plagioclase-quartz-perthite pegmatite (wall zone). Medium- to coarse-grained. Chloritized biotite is abundant in places. Estimated mineral percentages are: Plagiocalse - 40 percent, quartz - 30 percent, perthite - 22 percent, muscovite - 5 percent, and biotite - 3 percent.
*115.7 - 119.0	Perthite-quartz pegmatite (1st intermediate zone). Coarse-grained. The plagioclase is cleavelandite. Estimated mineral percentages are: Perthite - 55 percent, quartz - 40 percent, and plagioclase (cleavelandite) - 5 percent.
119.0 - 123.9	Trap rock. Fine-grained.
123.9	End of hole.

*Subsidiary interval

Diamond-drill hole B-5

Altitude: 700.0 feet
Coordinates: N. 1,005, E. 1,275
Direction: N. 14° W.

Inclination: Minus 74°
Depth: 149.2 feet

Depth, in feet	Description
0 - 10.0	No core. Overburden.
10.0 - 65.5	Foliated biotite granite. Coarse-grained. Layers of biotite schist range from 4 to 8 inches thick.
65.0 - 109.0	Pegmatite.
*65.0 - 65.5	Plagioclase-quartz-muscovite pegmatite (border zone). Fine-grained. Estimated mineral percentages are: Plagioclase - 60 percent, quartz - 32 percent, and muscovite - 8 percent.
*65.5 - 77.5	Plagioclase-quartz-perthite pegmatite (wall zone). Medium- to coarse-grained. The percentage of perthite is extremely variable. Estimated mineral percentages are: Plagioclase - 35 percent, quartz - 30 percent, perthite - 28 percent, and muscovite - 7 percent.
*75.5 - 103.0	Perthite-quartz pegmatite (1st intermediate zone). Very coarse-grained. Perthite occurs as crystals that are as much as 3 feet thick. One 2-inch ruled muscovite book is present. Cleavelandite aggregates have a maximum thickness of 12 inches. Estimated mineral percentages are: Perthite - 70 percent, quartz - 20 percent, plagioclase (cleavelandite) - 5 percent, and muscovite - 5 percent.
*103.0 - 108.0	Plagioclase-quartz-perthite pegmatite (wall zone). Medium-grained. Estimated mineral percentages are: Plagioclase - 40 percent, quartz - 35 percent, perthite - 20 percent, and muscovite - 5 percent.
*108.0 - 109.0	Plagioclase-quartz-muscovite pegmatite (border zone). Fine-grained. Accessory crystals of green apatite range from 1/8 to 1/4 inch in diameter. Estimated mineral percentages are: Plagioclase - 58 percent, quartz - 34 percent, muscovite - 7 percent, and apatite - 1 percent.
109.0 - 149.2	Foliated biotite granite. Coarse-grained. Pegmatitic lenses range from 2 to 24 inches thick.
149.2	End of hole.

*Subsidiary interval

Diamond-drill hole B-6

Altitude: 705.0 feet
Coordinates: N. 1,040, E. 1,420
Direction: N. 14° W.

Inclination: Minus 74°
Depth: 136.2 feet

Depth, in feet	Description
0 - 8.0	No core. Overburden.
8.0 - 32.5	Foliated biotite granite. Coarse-grained.
32.5 - 38.1	Trap dike. Fine-grained. The contacts make an angle of about 15° with the core, indicating that the dike may be approximately vertical.
38.1 - 87.0	Pegmatite.
*38.1 - 44.4	Plagioclase-quartz-perthite pegmatite (wall zone). Medium- to coarse-grained. Some of the perthite contains graphic quartz.
*44.4 - 72.3	Perthite-quartz pegmatite (1st intermediate zone). Medium- to very coarse-grained. Aggregates of medium-grained pegmatite consisting of perthite, quartz, muscovite, and plagioclase are irregularly distributed through this unit. Estimated mineral percentages are: Perthite - 50 percent, quartz - 35 percent, muscovite 9 percent, plagioclase - 5 percent, and tourmaline - 1 percent.
*72.3 - 87.0	Plagioclase-quartz-perthite pegmatite (wall zone). Medium- to coarse-grained. Perthite occurs as graphic granite and in coarse-grained mixtures with quartz. Estimated mineral percentages are: Plagioclase - 35 percent, quartz - 32 percent, perthite - 28 percent, and muscovite - 5 percent.
87.0 - 94.6	Trap dike. Fine-grained. The dip may be approximately vertical, as in the dike at 32.5 to 38.1 feet.
94.6 - 96.0	Plagioclase-quartz-perthite pegmatite (wall zone). Medium-grained. Estimated mineral percentages are: Plagioclase - 35 percent, quartz - 32 percent, perthite - 28 percent, and muscovite - 5 percent.
96.0 - 98.2	Foliated biotite granite, as between 8.0 and 32.5 feet
98.2 - 104.3	Trap dike, as between 87.0 and 94.6 feet.
104.3 - 108.0	Foliated biotite granite, as between 8.0 and 32.5 feet.
108.0 - 122.8	Trap dike, as between 87.0 and 94.6 feet.
122.8 - 133.0	Foliated biotite granite, as between 8.0 and 32.5 feet.
133.0 - 136.2	Trap dike, as between 87.0 and 94.6 feet.
136.2	End of hole.

*Subsidiary interval

Diamond-drill hole B-7

Altitude: 728.0 feet
Coordinates: N. 1,080, E. 1,585
Direction: N. 14° W.

Inclination: Minus 74°
Depth: 101.8 feet

Depth, in feet	Description
0 - 1.3	No core. Overburden.
1.3 - 31.0	Foliated biotite granite. Coarse-grained. Phenocyrsts of orthoclase are as much as 1/2 inch long.
31.0 - 72.8	Pegmatite.
*31.0 - 31.3	Plagioclase-quartz-muscovite pegmatite (border zone). Fine-grained. Estimated mineral percentages are: Plagioclase - 60 percent, quartz - 30 percent, muscovite - 7 percent, perthite - 2 percent, and biotite - 1 percent.
*31.3 - 36.2	Plagioclase-quartz-perthite pegmatite (wall zone). Medium-grained. Most of the perthite is in cream crystals that range from 1 to 4 inches thick. Some is graphic. Estimated mineral percentages are: Plagioclase - 40 percent, quartz - 30 percent, perthite - 27 percent, and muscovite - 3 percent.
*36.2 - 43.3	Perthite-quartz pegmatite (1st intermediate zone). Coarse-grained. Most of the perthite is cream. Some is graphic. Estimated mineral percentages are: Perthite - 55 percent, quartz - 39 percent, plagioclase - 5 percent, and garnet - 1 percent.
*43.3 - 72.8	Plagioclase-quartz-perthite pegmatite (wall zone). Medium- to coarse-grained. Some of the perthite contains graphic quartz. A small proportion of the plagioclase is cleavelandite. Estimated mineral percentages are: Plagioclase - 43 percent, quartz - 30 percent, perthite - 25 percent, and tourmaline and biotite - 2 percent.
72.8 - 74.2	Foliated biotite granite. Coarse-grained.
74.2 - 75.6	Plagioclase-quartz-perthite pegmatite. Same as between 43.3 and 72.8 feet except that biotite is more abundant and cleavelandite and graphic granite are absent. Estimated mineral percentages are: Plagioclase - 38 percent, quartz - 30 percent, perthite - 25 percent, biotite - 5 percent, and muscovite - 2 percent.
75.6 - 77.1	Foliated biotite granite, as between 72.8 and 74.2 feet.
77.1 - 80.5	Plagioclase-quartz-perthite pegmatite. Medium-grained. Estimated mineral percentages are: Plagioclase - 40 percent, quartz - 30 percent, perthite - 25 percent, biotite - 3 percent, and muscovite - 2 percent.
80.5 - 101.8	Foliated biotite granite. Coarse-grained. The granite contains 2.5 feet of fine-grained biotite schist.
101.8	End of hole.

*Subsidiary interval

Int. - Bu. of Mines, Pgh., Pa.

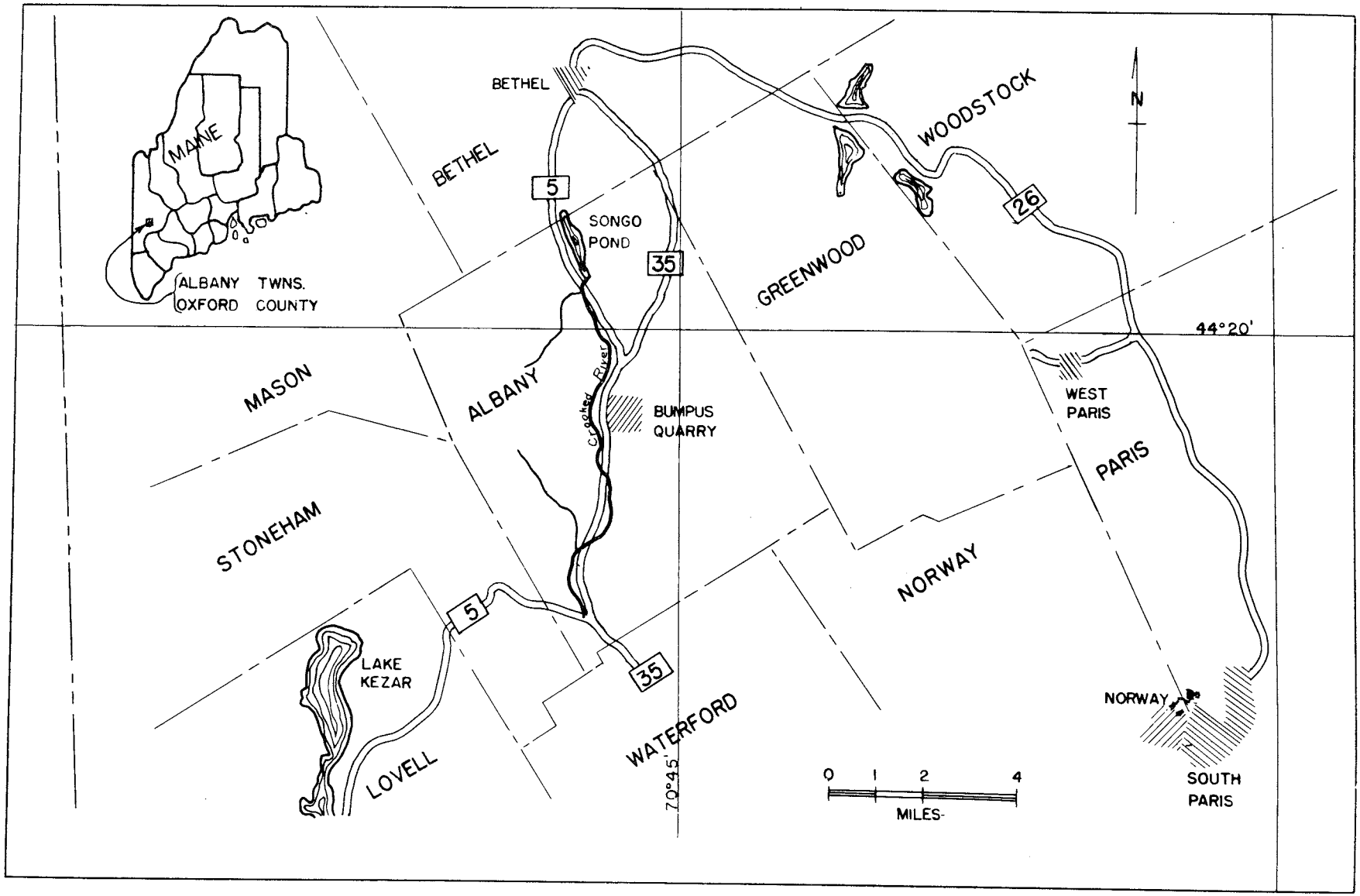

Figure 1. - Location map of Bumpus quarry.

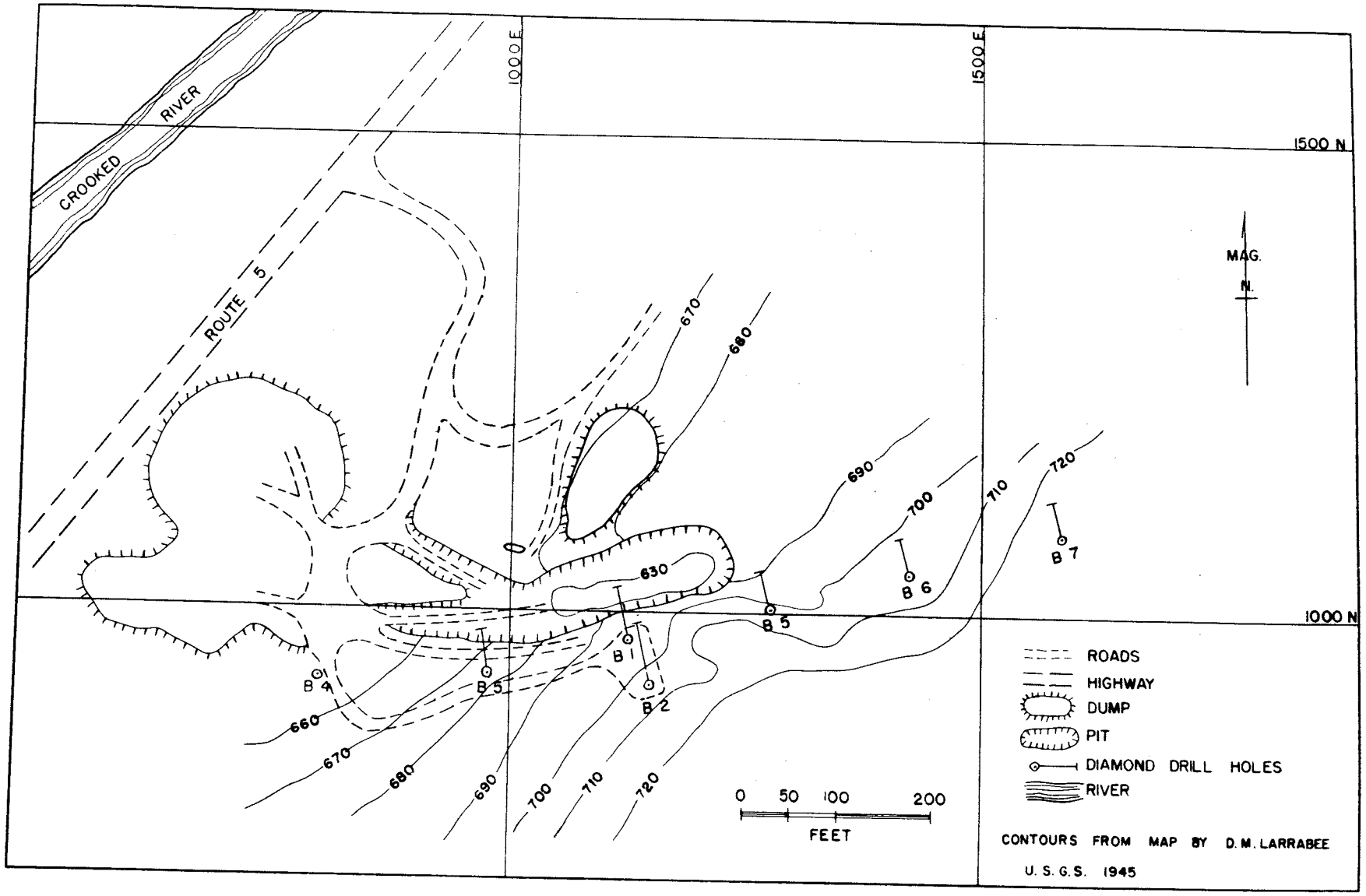

Figure 2. - Plan of Bumpus quarry.

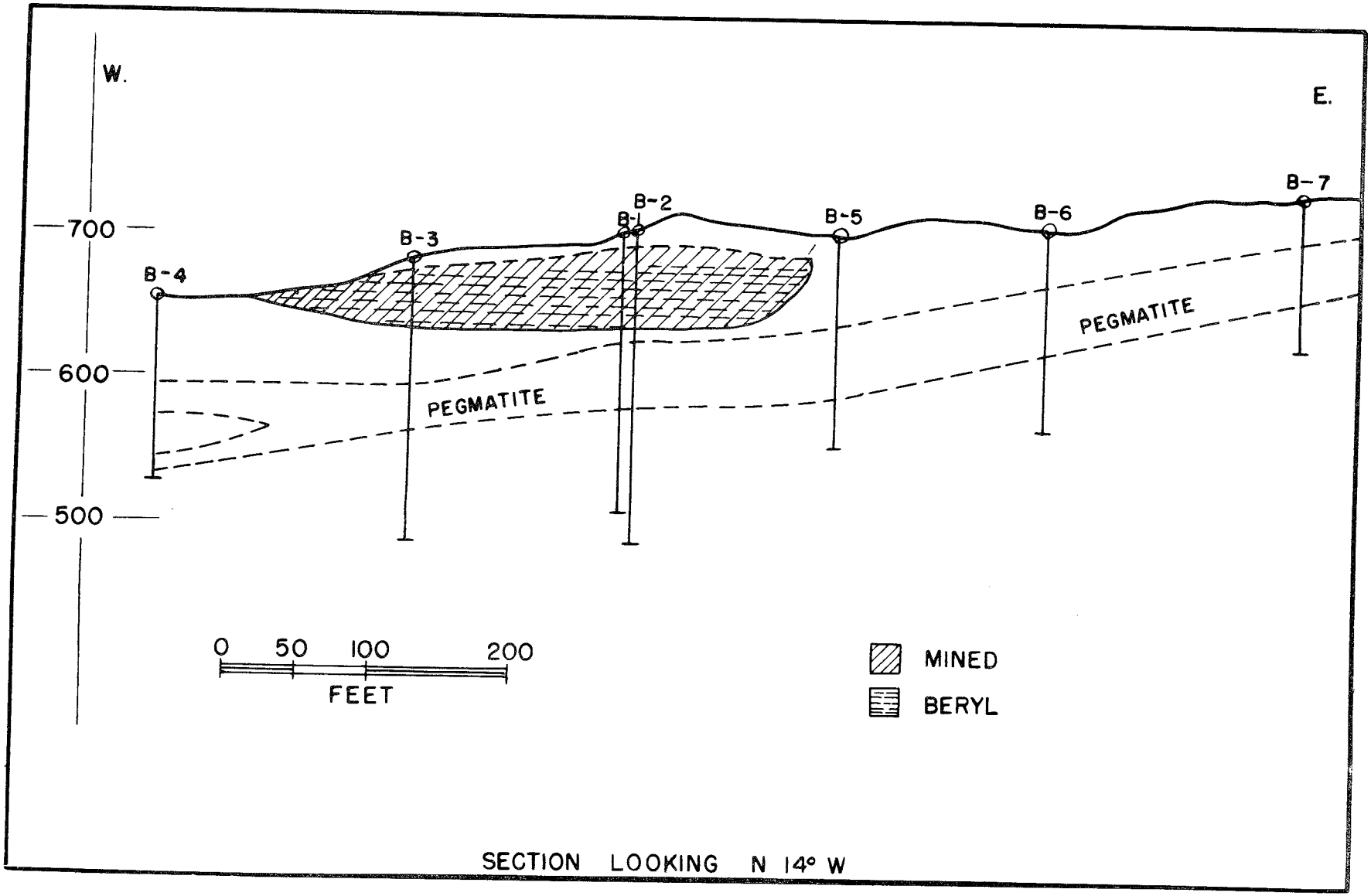

Figure 3. - Longitudinal section showing diamond-drill holes.

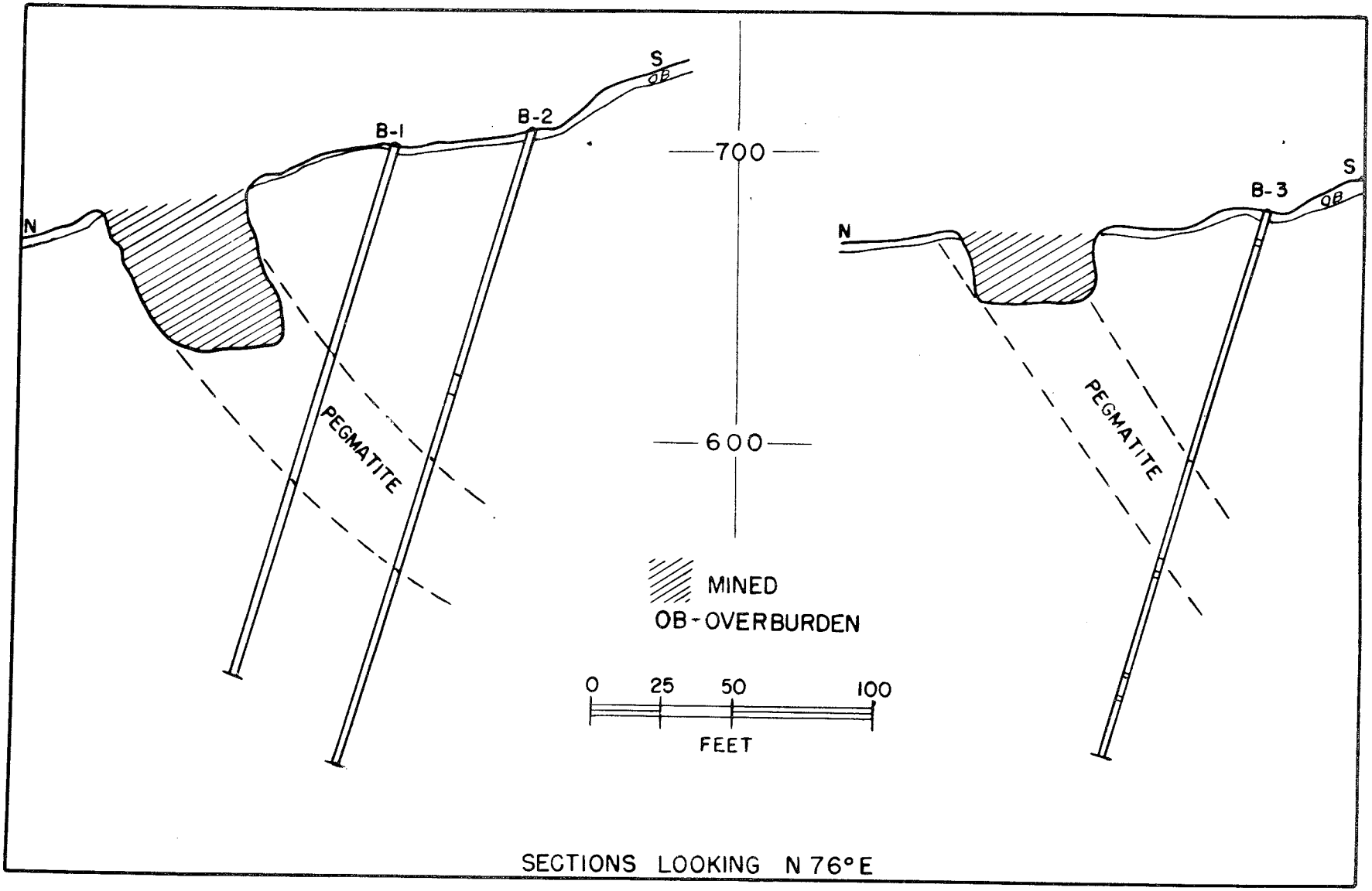

Figure 4. - Sections showing diamond-drill holes.

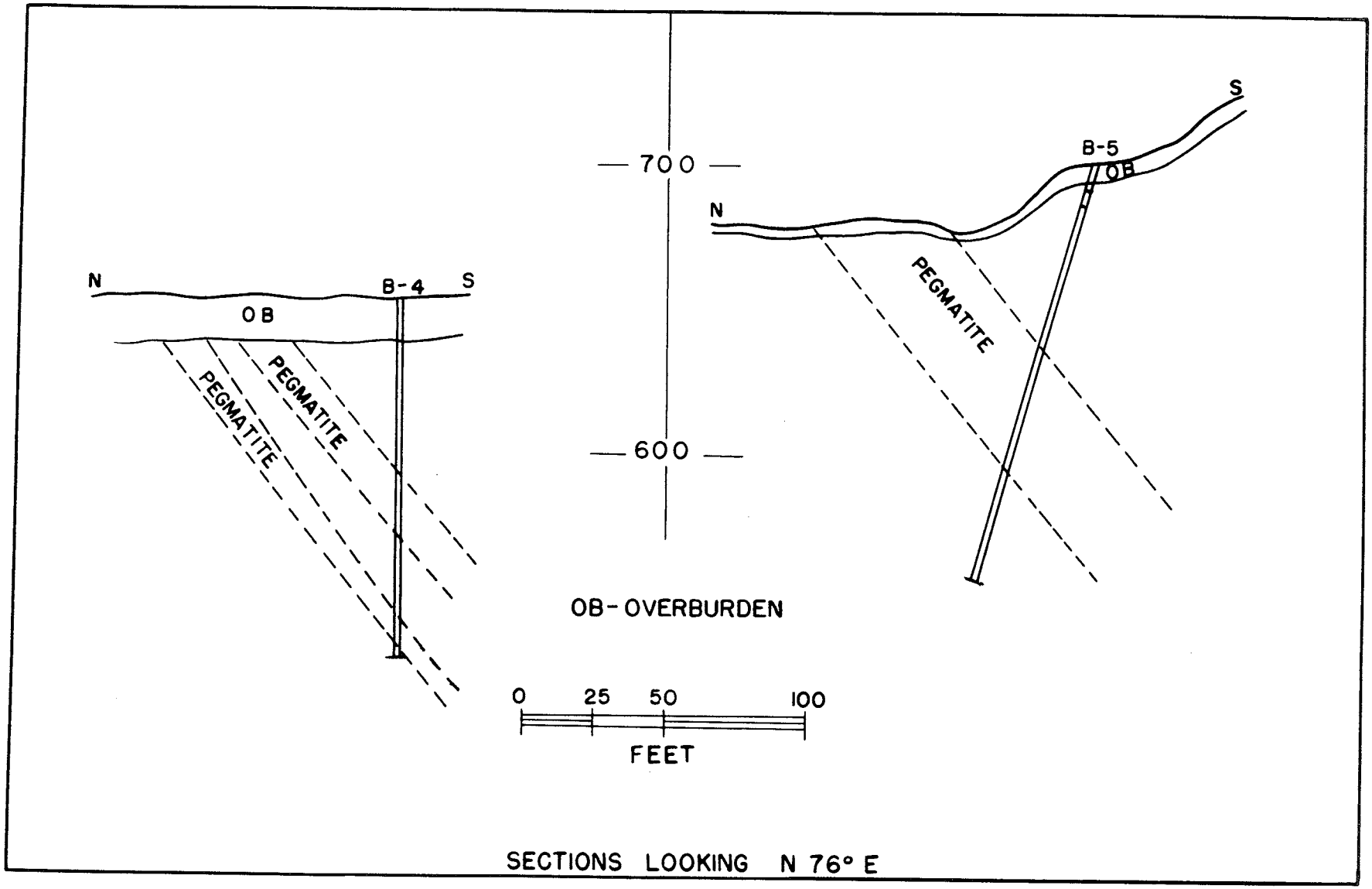

Figure 5. - Sections showing diamond-drill holes.

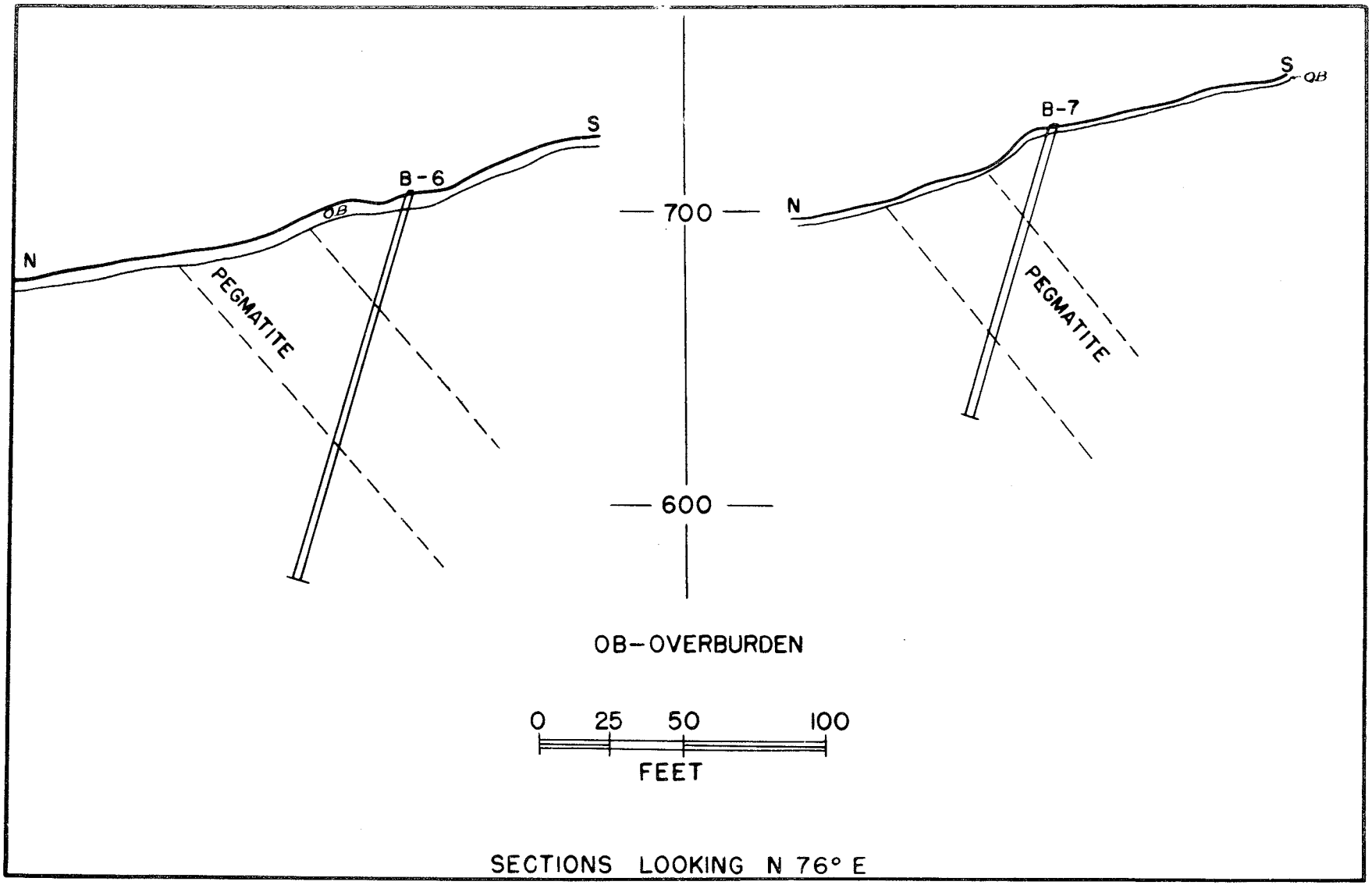

Figure 6. - Sections showing diamond-drill holes.