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Diamond-Drill Exploration of the Rousseau Talc Prospect, Cambridge, Vt. and the Barnes Hill Talc Prospect, Waterbury, Vt.

by

A. H. Chidester

U. S. Geological Survey

This report and accompanying illustrations are preliminary and have not been edited or reviewed for conformity with U. S. Geological Survey standards and nomenclature.

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ABSTRACT

The Geological Survey carried out a program of diamond-drilling at two localities in Vermont during the period July-September 1950. The deposits chosen for drilling were two of the more promising talc deposits associated with ultramafic rocks of several that had been mapped earlier by the Geological Survey, but could not be evaluated accurately because critical data were lacking that could be obtained only by sub-surface exploration.

The Rousseau talc prospect is in Cambridge township, Lamoille County, Vermont. Surface rights are owned by M. L. and N. N. Porter; mineral rights are owned by Eastern Magnesia Talc Co. Three drill holes encountered no talc; the other five penetrated from 2 to 110 feet of talc ore. The deposit lies on the west limb of the Green Mountain anticlinorium. The country rock consists of quartz-chlorite-sericite schist and chlorite-albite schist. The schistosity strikes slightly west of north and dips 20° - 40° to the west. The talc deposit is roughly lenticular, and although generally concordant in detail with the schistosity of the country rock, is slightly cross-cutting in

overall relationship. The entire deposit is composed of grit (talc-carbonate rock) and steatite, but is presumably derived from ultramafic igneous rocks which were first serpentinized. The dimensions of the lens are about 700 feet by 500 feet by 130 feet. The talc is of good quality and is suitable, either as a mine run product or as a flotation concentrate, for most industrial uses other than industrial steatite. No pencil stock was encountered.

The Barnes Hill talc prospect is in Waterbury township, Washington County, Vermont. Surface rights are divided among Donald P. and Glenola Brown, John Barnes, and Eastern Magnesia Talc Co. One drill hole at Barnes Hill was barren. The other six penetrated about 20 to 140 feet of talc ore. The deposit lies on the east limb of the Green Mountain anticlinorium. The country rock outside of the ultramafic rock body consists of quartz-chlorite-sericite schist, chlorite-albite schist, and chlorite amphibolite, which strike generally about N. 20° E. and dip steeply to the east. The ultramafic body is elliptical in plan, about 1,600 feet long and 360 feet wide. The vertical dimension is unknown. The original ultramafic rock has been almost completely serpentinized and is extensively altered to grit and steatite. The talc ore is somewhat irregularly distributed throughout the ultramafic body, but it is possible to delineate with considerable confidence portions of the body that consist predominantly of ore. The largest ore bodies are in the eastern and northern parts of the ultramafic body. The ore contains more or less admixed serpentine, and so is only of intermediate to fairly good color (whiteness). It is suitable for many industrial uses in which purity and high whiteness are not necessary. No pencil stock was seen.

INTRODUCTION

During the summer of 1950, the Geological Survey carried out a program of diamond-drilling at two localities in northern Vermont: at the Rousseau prospect in Cambridge township, and at the Barnes Hill prospect in Waterbury township, at both of which talc formed by the alteration of ultramafic rock is exposed. These localities were chosen for drilling because they had been mapped earlier by the Geological Survey and were believed to be two of the more economically promising deposits in Vermont, but could not be evaluated accurately owing to the lack of critical information that could be obtained only by subsurface exploration. The drilling program was designed to determine the grade (type and quality of talc ore) and extent of the talc deposits, to obtain certain desired geologic information, and to test certain geologic inferences.

The drilling program was planned by Chidester with the collaboration of W. M. Cady. Duane Morris supervised the drilling operations and logged the drill core. G. W. Stewart and Morris assisted in planetable mapping. The Geological Survey is indebted to Eastern Magnesia Talc Co. for the tests on color and percentage of insoluble material of samples tabulated in tables 1 and 2.

THE ROUSSEAU TALC PROSPECT

The Rousseau talc prospect is in northern Cambridge township, Lamoille County, Vermont, 2.1 miles N. 59° E. of Cambridge Junction. The deposit is on the south side of the Lamoille River, near the base of the northernmost mountain of the Sterling Range. Maximum relief within a radius of one mile is about 800 feet. The deposit crops out between the altitudes of 515 and 565 feet above sea level, about 60 to 110 feet above the flood plain of the Lamoille River. The area is drained by a small, intermittent, northward-flowing stream which empties into the Lamoille River about 1,000 feet northwest of the talc prospect. The northern and southeastern parts of the talc property are in open pasture. The rest of the area is covered with a dense growth of small spruce, balsam, and cedar trees.

To reach the locality from Johnson village, drive westward on state route 15 for 5.9 miles from the center of the village. The old mine dump is plainly visible about 200 feet south of the highway. The St. Johnsbury and Lamoille County Railroad is adjacent to the north side of the prospect, immediately north of the highway.

The talc deposit lies entirely within the limits of the Porter farm, and the surface rights are owned by M. L. and N. N. Porter. The mineral rights are owned by Eastern Magnesia Talc Co. of Burlington, Vermont.

Previous work

In the summer of 1915 a prospect adit was driven southward in talc ore along the east wall of the deposit for about 125 feet. Twenty-five feet south of the adit entrance, a cross-cut was driven to the west wall, along which an 80- feet drift was driven southward, making a total of a little more than 200 feet of workings. In late 1915 and early 1916, six diamond-drill holes that total about 1100 feet were drilled. These diamond-drill holes, numbered 25-30, and the underground workings are located on the map and cross-sections of the Rousseau locality (pl. 1).

M. P. Billings and A. H. Chidester mapped the surface and underground geology of the talc prospect in 1945, as part of the Strategic Minerals Investigations program of the Geological Survey. In July 1950, A. H. Chidester, G. W. Stewart, and D. Morris extended the mapping of Billings and Chidester for the purpose of the drilling program. The extended map and additional cross-sections are included in this report as plate 1.

The Diamond-Drilling

Eight holes that total 2,030 feet were drilled at the Rousseau prospect. The locations, bearings, and inclinations of the drill holes, numbered 1- 8, are shown on plate 1.

Three drill holes (1, 6, and 7) were barren. The other five encountered from 2 feet to 110 feet of ore. Descriptions of the drill cores are presented in graphic form in figure 1. There follow brief

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Figure 1.— Graphic log of diamond-drill cores, Rousseau talc prospect, Cambridge, Vt.

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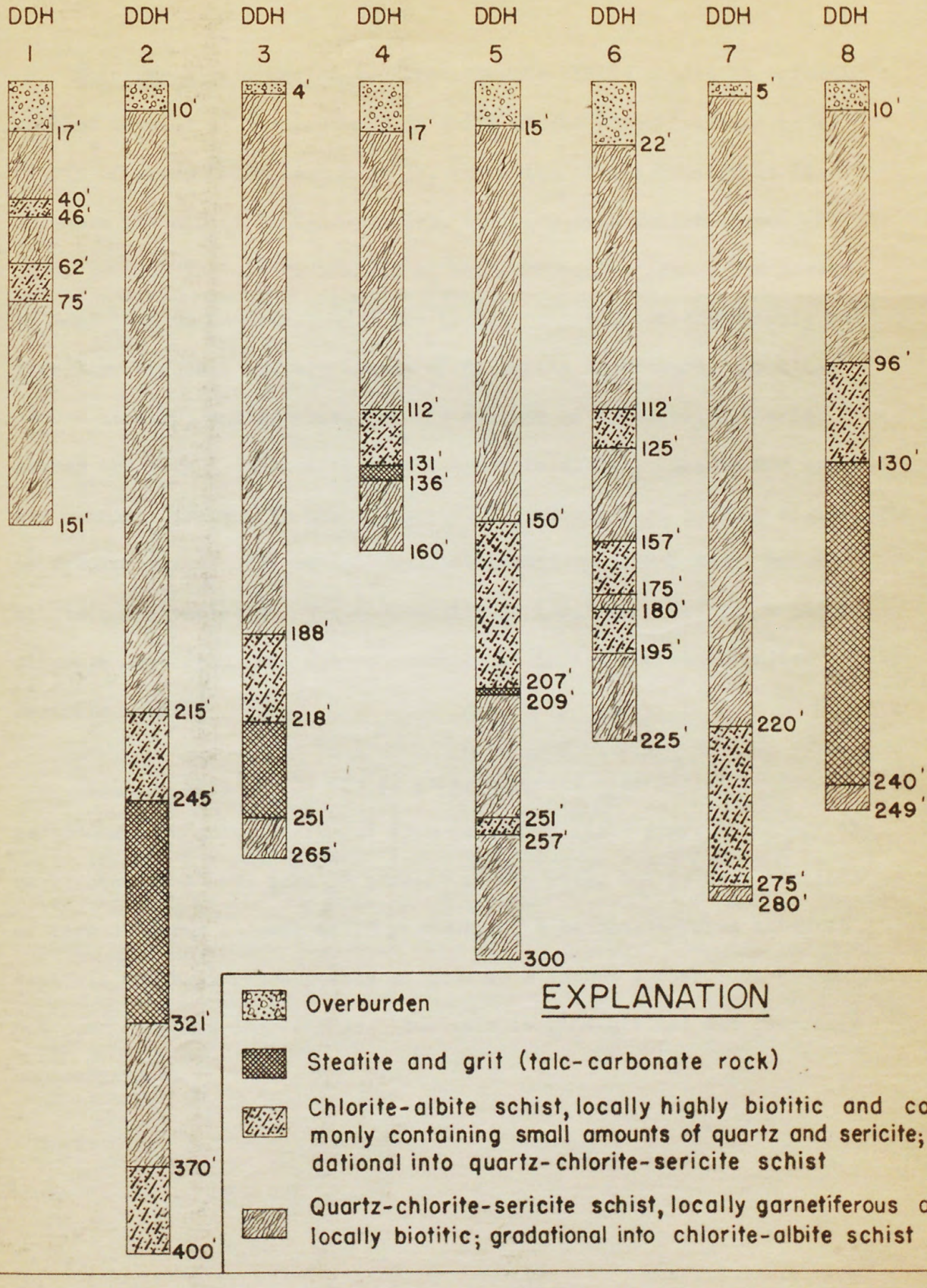
descriptions of the rock types encountered in the drilling. These descriptions are based entirely upon megascopic examination of the drill core and of outcrops.

Quartz-chlorite-sericite schist.— This rock type ranges in color from light greenish-gray to dark gray. The proportions of minerals differ considerably, but quartz and chlorite are generally dominant. Graphite is locally present in moderate amounts and forms concentrations along planes of schistosity that are parallel to bedding. Small garnets are locally abundant. The bedding schistosity is commonly wavy, and is locally much folded and contorted. A well-defined slip cleavage, parallel to the axial planes of these folds, is commonly prominent where the schistosity is folded. This rock type is gradational into chlorite-albite schist.



IGURE 1.— Graphic log of diamond-drill cores, Rousseau talc prospect, Cambridge, Vt.

Chlorite-albite schist.— The chlorite-albite schist is commonly mottled because of the presence of white albite porphyroblasts in a matrix of green chlorite. Locally, where the albite content is low or where the albite is fine-grained, the rock is a uniform green or light green. The albite content of the rock ranges from a few percent to more than 50 percent. Chlorite is the principal other mineral, but irregular crystals and aggregates of carbonate are common. Biotite occurs locally, and increases at the expense of chlorite. In a few places the rock is a biotite-albite-chlorite schist. Quartz and sericite are commonly present in small amounts. A well-defined bedding schistosity is readily discernible except where disturbed by the abundant growth of albite porphyroblasts. The schistosity is locally folded and a slip cleavage developed, but not so commonly as in the quartz-chlorite-sericite schist.

Grit.— Most of the ore is grit, composed essentially of talc and carbonate. In color it ranges from medium to light gray. Commonly the carbonate forms less than 50 percent of the rock, but in some sections of core it forms as much as 70 percent. The carbonate forms anhedral crystals and aggregates rarely as much as 2 inches across, but commonly not over one-half inch across. The talc is fine-grained and generally non-schistose.

Steatite.-- Steatite, composed essentially of the mineral talc, ranges in color from light gray to pale greenish-gray, and is commonly schistose. Some of the steatite, especially that from drill hole number 2, is gradational into schist and contains easily distinguishable relic bedding features. The relic bedding is marked by thin bands of sericite and graphite, and is folded and contorted in a manner identical to that of the unaltered schist.

Geologic Setting

The Rousseau talc deposit is on the western limb of the Green Mountain anticlinorium. The country rock consists of quartz-chlorite-sericite schist, locally graphitic, and chlorite-albite schist locally high in biotite. Small garnets are visible in a few outcrops. The rock types are described briefly on pages 9-11.

Bedding and schistosity appear everywhere to be rigorously parallel. They strike slightly west of north and dip, in general, 20° - 40° to the west. Small drag folds, which are prominent in the country rock and which in some places affect the contact between the talc deposit and the schist, show rather consistent gentle plunges to the south, comparable to the plunge of the axis of the Green Mountain anticlinorium at this latitude. The plan of the fold pattern is dominantly such as to indicate that the folds are on the western limb of a southward plunging anticline, and would seem to indicate that the minor folds were formed during the folding of the Green Mountain anticlinorium.

The contact between the talc deposit and the schist is essentially parallel to the bedding schistosity of the country rock in detail, but appears to be slightly cross-cutting in overall relationship. It is difficult, with the information available, to determine the nature of this relationship. Very probably, it is partly due to uneven steatitization of the country rock, but is probably chiefly due to an original cross-cutting relationship of the parent ultramafic rock body, expressed as a series of small offsets from parallelism with the schistosity. The relationship between the talc deposit and the lithologic units of the schist is well brought out by the bed of chlorite-albite schist shown on the map and cross-sections (pl. 1). Only the uppermost of the two distinct beds of chlorite-albite schist encountered in the drilling (see the graphic logs, fig. 1) are shown on the map and interpolated in the sections, because the lowermost one does not crop out and was encountered in only a few drill holes.

The entire deposit is composed of grit and steatite, and there is little direct evidence as to the nature of the original rock body. Presumably, the talc deposit has been derived from an ultramafic igneous rock mass which was first completely serpentinized. This derivation is suggested by the fact that the grit in a few places contains small amounts of dark green serpentine, by the cross-cutting relationship of the deposit, and by compositional, textural, and structural similarities between the Rosseau deposit and other deposits of undoubted derivation from ultramafic igneous rocks.

Size and shape of the talc deposit.-- Prior to the diamond drilling by the Geological Survey, all information available from surface exposures, underground workings, and earlier diamond drilling seemed to indicate that the talc body was wedge-shaped within reasonably inferable limits, and that it thickened westward down the dip at a fairly constant rate. The drilling by the Geological Survey established that the two westernmost holes of the earlier drilling (Nos. 29 and 30) were located at about the thickest part of the deposit, and that west of these the deposit thins. It is believed that the information now available enables one to infer rather accurately the size and shape of the deposit.

The deposit is roughly lenticular with irregularities due to folding, and probably also due to uneven steatitization of the country rock and to original irregularities of intrusion. The deposit is about 700 feet long, and the long axis plunges about 20° - 25° S. 15° W. The intermediate axis is about 500 feet long and plunges about 30° N. 60° W. The short axis, about 130 feet long, is at right angles to the other two and plunges about 50° N. 70° E. The horizontal projection of the inferred limits at depth of the talc body is shown on the map, and the shape and attitude of the deposit are depicted in the structure sections (pl. 1).

Grade and quality of the talc ore.— Nearly all of the talc ore in exposures and in drill cores is grit of good quality. The whiteness is exceptionally high for talc ore derived from ultramafic rocks. The ore is suitable without beneficiation for many intermediate grades of talc product requiring good color but in which high carbonate content is not objectionable. It is believed that flotation concentration would yield a product of sufficient whiteness and purity to qualify for most industrial needs other than industrial steatite. None of the material exposed or encountered in drilling is suitable for pencil stock.

The following table shows the results of tests on color (whiteness) and percentage of insoluble material for several samples of ore from drill holes at the Rousseau prospect. Each sample is representative of the footage indicated in the second column. The color is stated in terms of percentage of reflectance compared with standard magnesium oxide (MgO). The percent of material insoluble in hot hydrochloric acid (HCl) is a fairly good indication of the proportion of carbonate present (percent of carbonate equals roughly 100 minus % insol.).

Table 1.— Color (whiteness) and percentage of insoluble material for samples of talc ore from the Rousseau prospect 1/

DDH	Footage sample represents	Color	% Insol.
2	291- 321	78.5	88.8
3	218- 250	75.0	69.5
8	130- 232	76.0	67.5

1/ Tests by the Eastern Magnesia Talc Co.

THE BARNES HILL TALC PROSPECT

The Barnes Hill talc prospect is in northeastern Waterbury township, Washington County, Vermont, about 2.2 miles N. 35° E. of the road triangle at Waterbury Center. The deposit crops out between the altitudes of about 1150 and 1190 feet above sea level near the crest of a broad, low ridge on a gently rolling upland of low relief. The area is drained on the east by a small tributary of Thatcher Brook, and on the west by Bryant Brook. Thatcher Brook empties into the Winooski River at Waterbury; Bryant Brook flows into the Waterbury River, a tributary of the Winooski River. Most of the talc property is in open pasture, with a few scattered spruce and hemlock trees, but along the eastern side of the property there is a dense growth of maple saplings and underbrush.

To reach the locality from Waterbury, drive northeastward out of Waterbury on state route 100 for 3.5 miles from the junction with U. S. route 2. Turn right (east) off route 100 and continue east for 0.35 mile to the eastern corner of the road triangle, a few hundred feet beyond the traffic light. Turn left (northward) and continue northeastward along the main traveled road for 2.0 miles. The talc deposit is about 1000 feet east of the road at this point. The nearest railway shipping point is at Waterbury, about 6 miles to the southwest.

The talc deposit lies within the property known as the John Parker Home Farm. The surface rights are owned by three groups or individuals: Eastern Magnesia Talc Co. owns 6 acres of land in the center of the property, 3 acres on either side of the line fence that divides the property about in half (see map, pl. 2). With the exception of the 6 acres owned by the Eastern Magnesia Talc Co., Donald P. and Glenola Brown own the surface rights north of the line fence, and John Barnes owns the surface rights south of the fence. Eastern Magnesia Talc Co. owns the mineral rights to the entire property.

Previous Work

Several small pits and trenches have been dug at several places in the ultramafic body, reportedly many years ago in search for asbestos. About 1920 a prospect shaft for talc was sunk to a depth of about 15 feet in grit near the eastern edge of the deposit. M. P. Billings and A. H. Chidester mapped the geology of the prospect in 1945, as part of the Strategic Minerals Investigations program of the Geological Survey. In 1947 the Eastern Magnesia Talc Co. drilled six diamond-drill holes that total about 1300 feet along the east side of the deposit. These holes, numbered 1-6, are shown on the map and cross-sections (pl. 2).

The Diamond-Drilling

Seven holes that total 1,899 feet were drilled at Barnes Hill. The holes are numbered 7, 7A, 8, $9B_1$, $9B_2$, 11, and 12. Their locations, bearings, and inclinations are shown on the map of the area (pl. 2).

Drill hole 7A did not encounter the ultramafic rock body, although the drill hole is believed to have passed through the northward extension of the zone in which the body was emplaced. The other drill holes penetrated from about 20 to 160 feet of ore, and various amounts of barren ultramafic rock. Descriptions of the drill cores are presented in graphic form in figure 2, and the results are interpreted in the map and

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Figure 2.— Graphic log of diamond drill cores, Barnes Hill talc prospect, Waterbury, Vt.

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structure sections (pl. 2). There follows a brief description of the rock types encountered in the drilling. These descriptions are based principally upon megascopic examination of the drill core and of outcrops, but also upon brief study of a few thin sections of several of the rock types.

Quartz-chlorite-sericite schist.— This rock type is variable in composition and appearance. Locally it is highly graphitic and therefore dark gray in color. Elsewhere it is light gray with a faint greenish cast. Commonly, albite porphyroblasts as much as one-fourth inch across are present, and may form as much as 35 percent of the rock. Quartz is a major constituent, but seems to decrease with increasing albite.

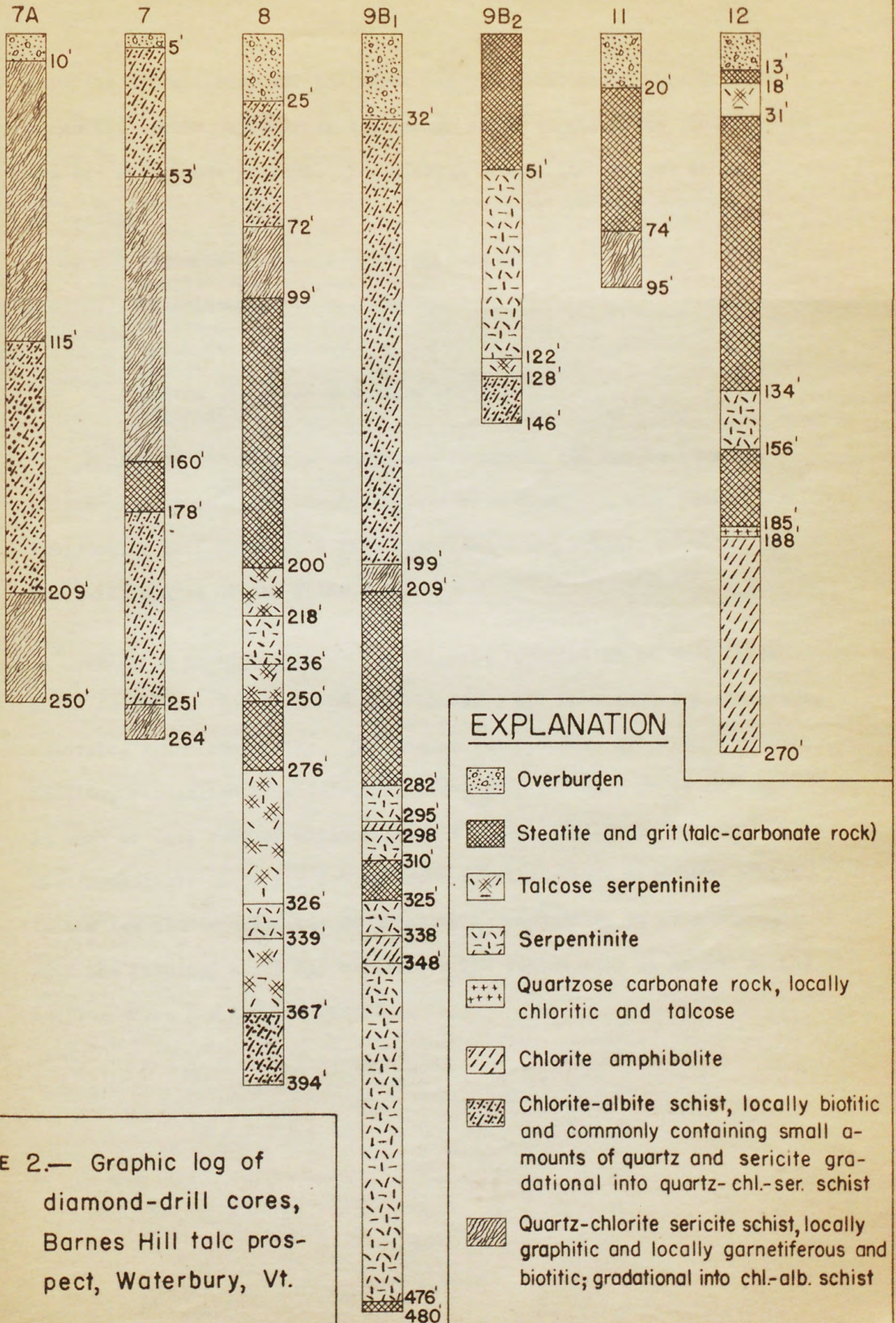

FIGURE 2.— Graphic log of diamond-drill cores, Barnes Hill talc prospect, Waterbury, Vt.

Sericite and chlorite are the other major constituents. Graphite, ilmenite, sphene, and garnet are common minor constituents, but not all are everywhere present. The mineral composition ranges about as follows:

Sericite	35- 40 percent
Quartz	15- 45 "
Chlorite	15- 25 "
Albite	0- 35 "
Graphite	0- 5 "
Garnet, Sphene, Ilmenite	minor amounts

A good schistosity is everywhere apparent, but may be somewhat obliterated by abundant porphyroblasts of albite. In many places the schistosity is folded and a slip cleavage formed roughly parallel to the axial planes of the folds.

Chlorite amphibolite.— The chlorite amphibolite is dull olive green in color. The principal constituents are hornblende, plagioclase, chlorite, and clinozoisite. Small amounts of sphene are always present. Bedding, emphasized by alternating light gray and dark green layers, is more or less readily distinguishable in most outcrops. A schistosity distinguishable in only a few outcrops parallels that of nearby schist. In the few places where the schistosity is recognized it is discordant with the bedding, which may be because the schistosity is masked by the bedding where the two are parallel.

Chlorite-albite schist.— The chlorite-albite schist ranges in color from bright green in typical specimens to dull grayish-green in types transitional into quartz-chlorite-sericite schist. No thin-sections have been studied, but chlorite and albite are the essential minerals, and epidote or clinozoisite and sphene are minor constituents. Types transitional into quartz-chlorite-sericite schist contain small to moderate amounts of quartz and sericite, commonly small amounts of graphite, and, in some places, abundant biotite.

Quartzose carbonate rock.— This rock type is light gray-buff to dark buff in color. It consists essentially of an interlocking aggregate of carbonate grains with scattered, irregular grains of quartz and minor amounts of talc; chlorite is locally fairly abundant. Magnetite is common in small grains and dustlike particles. Carbonate forms 65- 90 percent of the rock and quartz forms 5-30 percent; talc commonly forms less than 5 percent.

Grit.— The grit (talc-carbonate rock) ranges in color from dark greenish gray to medium-light gray. It is composed essentially of about equally proportions of talc and carbonate, with small amounts of serpentine. Although minor in quantity, serpentine occurs throughout most of the grit at Barnes Hill in amounts sufficient to decrease considerably the whiteness of the talc rock. Magnetite occurs in the grit in small amounts. In many places the grit has a rather coarse cleavage. A fine to medium banding is discernible in many outcrops of grit. This banding, which has survived the alteration of serpentinite to grit, is described further in the discussion of "serpentinite" below.

Steatite.— Steatite, a rock composed almost entirely of talc, is found at Barnes Hill in only small amounts. It is dark-to-medium gray in color, and generally possesses a well-defined schistosity. Chlorite occurs in small amounts.

Serpentinite.— The serpentinite varies from a very dark green, dense rock composed almost entirely of serpentine to a light green and white mottled rock composed of serpentine and carbonate. The latter type is commonly called verde antique. Asbestos is relatively abundant, although not in commercial amounts, in the darker type of serpentinite in small veinlets. The asbestos is predominantly slip fiber, though cross-fiber and transitional oblique fiber types occur. Magnetite occurs as fine dust and small grains in all varieties of serpentinite. A few grains of chromite were observed in the dark green, dense variety, and relic grains of olivine and pyroxene may be present.

The dark green serpentinite is commonly massive. The verde antique type consists of relatively unsheared units surrounded by thin zones of highly sheared serpentinite. Locally, a coarse, through-going cleavage is found in the serpentinite, especially in the verde antique type. There are all transitions between serpentinite and grit.

The majority of serpentinite outcrops show, on weathered surfaces, a fine-to-medium banding consisting of alternating layers, one-sixteenth to one-fourth inch thick, of light gray carbonate and dark-green serpentine. This banding does not show up well on the fresh surfaces of drill cores.

Geologic Setting

The Barnes Hill ultramafic body is on the east limb of the Green Mountain anticlinorium. The country rock in the immediate vicinity is quartz-chlorite-sericite schist, chlorite amphibolite, and chlorite-albite schist. The ultramafic body contains chiefly serpentinite and grit, and only small amounts of steatite. Thin, discontinuous, tabular masses of quartzose carbonate rock crop out within the ultramafic body near the eastern and northern boundaries. These may be tabular inclusions of sedimentary carbonate beds, or they may possibly be segregations formed during the alteration of serpentinite to grit and steatite. The rock types are described briefly on pages 17- 20. The chlorite-albite schist is not shown separately on the geologic map or in the structure sections because of poor surface exposures and because correlations between drill holes are doubtful owing to the gradational character and thinness of the chlorite-albite schist beds.

The average strike of the schistosity, which appears to be parallel to the bedding in most places, is about N. 20° E. and the general dip is steep to the east. The strike and dip of the country rock around the margins of the ultramafic body varies sympathetically with that of the contact; thus, at the southwestern end of the ultramafic body the amphibolite strikes far into the northwest and dips moderately northeastward in conformity with the contact between the ultramafic body and the amphibolite. Although the contacts of the ultramafic body are in general essentially parallel to the schistosity of the schist and the bedding of the amphibolite, locally they appear to be discordant.

Size and shape of the talc deposit.-- The ultramafic body is crudely elliptically in plan, and has a known length of about 1600 feet and a maximum width of 360 feet. The depth is unknown. The trend of the long axis is about N. 20° E. The western contact varies in strike from northwest to slightly east of north, and dips steeply to moderately eastward. The eastern contact is nowhere exposed, but the results of diamond drilling indicate a generally steep eastward dip.

Drill hole 7A indicates that the ultramafic body pinches out northward approximately as shown on the map (pl. 2). The southern limit was not determined, and it may continue southward as a narrow body for a considerable distance beyond the inferred limits shown on the map. It is believed, however, that the limits shown are most nearly correct.

The ore, chiefly grit, is irregularly distributed within the ultramafic body, and surface exposures are poor or lacking at many critical places, but the information obtained in diamond drilling enables one to outline with considerable confidence areas underlain principally by grit and areas underlain chiefly by serpentinite. This has been done on the map (pl. 2). The greatest concentration of grit is along the eastern border and at the northern end of the deposit. Areas designated as underlain chiefly by grit contain small masses of serpentinite, and contain at depth a few larger masses that pinch out upward before they reach the surface. Similarly, some of the areas shown as consisting chiefly of serpentinite contain small bodies of grit, and may give way downward into grit.

Grade and quality of the talc ore.— All of the ore exposed at the surface and encountered in diamond drill holes contains more or less admixed serpentine, and is of only intermediate to fairly good color (whiteness). A mine run product would be satisfactory for many industrial uses in which a high degree of whiteness is not necessary and in which a high carbonate content is not objectionable. Most of the carbonate could be separated from the talc by flotation beneficiation; by selective mining of flotation ore feed, a product of good color could probably be obtained. None of the material appears suitable for pencil stock.

The following table shows the results of tests on color (whiteness) and percentage of insoluble material for several samples of ore from drill holes at the Barnes Hill prospect. Each samples is representative of the footage indicated in the second column. The color is stated in terms of percentage of reflectance compared with standard magnesium oxide (MgO). The percentage of material insoluble in hot hydrochloric acid (HCl) is a fairly good indication of the proportion of carbonate present (percentage of carbonate equals roughly 100 minus % insol.)

Table 2.-- Color (whiteness) and percentage of insoluble material for samples of talc ore from the Barnes Hill prospect 1/

DDH	Footage samples represents	Color	% Insol.
8	99- 199	72.0	58.9
8	250- 327	69.5	52.9
8	339- 367	72.5	54.8
$9B_1$	209- 281	74.0	55.2
$9B_2$	0- 52	70.5	52.5
11	45- 48	65.0	57.7
11	49- 51	69.5	53.6
11	51- 58	73.0	59.7
11	58- 74	70.0	60.0
12	30- 54	71.0	49.6
12	54- 138	71.0	54.2
12	160- 186	70.0	57.4

1/ Tests by the Eastern Magnesia Talc Co.

SUMMARY OF RESULTS

Geologic Information

The drilling program yielded valuable data on the general and economic geology of the talc deposits. It is now possible to infer rather accurately the size, shape distribution, and quality of the talc deposits from the additional information obtained in drilling. The location of unexposed portions of the eastern and western contacts and of the probable northern and southern terminations of the Barnes Hill deposit were determined. The deposit was disclosed to have a generally uniform steep eastward dip. The Rousseau prospect was shown to be lenticular and of moderate size.

Information with regard to rock types and their inter-relations was obtained which, because of poor surface exposures, could not otherwise have been derived. The drilling at Barnes Hill shows that the distribution of grit and serpentinite, although irregular, is not entirely haphazard, and that the ore bodies can be delineated with considerable confidence. Several of the serpentinite masses exposed in outcrop are shown to pinch out downward, and the gradational relations of grit and serpentinite is clearly demonstrated. Probable correlations of beds of chlorite-albite schist that appear chiefly in the drill cores tend to support other evidence that the ultramafic body is essentially concordant with the schistosity of the country rock, although as key horizons these beds are not entirely satisfactory. The Rousseau deposit is disclosed to be composed entirely of grit and steatite. The steatite is shown to be locally gradational into schist. The uppermost bed of chlorite-albite schist encountered in the drill holes can be correlated readily with surface exposures, and shows the

relationship of the talc deposit to lithologic units of the schist.

Several sections of drill core were obtained that extend without break from the talc deposits through the altered wall rock into the bordering unaltered country rock. These cores, which provide a continuity of data not otherwise accessible, will serve as laboratory material for determining the chemical and mineralogical changes and interchanges that took place in and between the ultramafic rock bodies and the adjacent country rock during steatitization.

DEPARTMENT OF THE INTERIOR

INFORMATION SERVICE

GEOLOGICAL SURVEY

For Release JUNE 28, 1951

REPORT ON TWO VERMONT TALC DEPOSITS RELEASED

A report on diamond-drill exploration of two large Vermont talc deposits--the Rousseau prospect, Cambridge, Vt., and the Barnes Hill propsect, Waterbury, Vt.--has been completed under the direction of the Geological Survey, Secretary of the Interior Oscar L. Chapman announced today.

The exploration program was carried out under the general supervision of A. H. Chidester, Survey field geologist, as part of the program of the Survey's Vermont talc project.

Both deposits have been prospected sporadically in the last 35 years or so, but talc has not been produced commercially from either deposit.

Nearly all of the talc ore at the Rousseau prospect is of good quality and is exceptionally white for talc derived from ultramafic igneous rocks. It is suitable without beneficiation for many intermediate grades of talc product, and flotation concentration would probably yield a product suitable for most industrial uses other than industrial steatite. The talc ore at the Barnes Hill prospect is of intermediate to fairly good color. It is suitable without beneficiation for many industrial uses, and is also amenable to flotation concentration.

Mr. Chidester's report, entitled "Diamond-drill Exploration of the Rousseau Talc Prospect, Cambridge, Vt., and the Barnes Hill Talc Prospect, Waterbury, Vt.," accompanied by large-scale maps of the two talc prospects, has been approved for release by Dr. William E. Wrather, Director of the Survey. It will be placed in open file for public inspection at the offices of the Survey, Room 1033 (Library), General Services Building, Washington, D. C.; and 64 Main St., Montpelier, Vt.; and at the office of the Vermont Geological Survey, University of Vermont, Burlington, Vt.

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