NORTH CAROLINA
DEPARTMENT OF CONSERVATION AND DEVELOPMENT
GEORGE R. ROSS, DIRECTOR

DIVISION OF MINERAL RESOURCES
JASPER L. STUCKEY, STATE GEOLOGIST

Information Circular 9

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THE EASTERN PIEDMONT PEGMATITE DISTRICT OF NORTH CAROLINA

BY

WARREN G. STEEL

RALEIGH
1952

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INTRODUCTION

The Eastern Piedmont pegmatite district of North Carolina consists of several areas located in the north central part of the state, west of the fall zone. (See Plate 1). The Milton area is south and west of the town of Milton in the extreme northeast corner of Caswell County. The Inez-Wake Forest area extends from Inez in Warren County, southwestward through the central part of Franklin County, and into Wake County west and south of Wake Forest. The district is not continuous geologically. The Milton area is separated from the Inez-Wake Forest area by the Slate Belt and the Durham Triassic Basin.

The geologic investigation was sponsored by the North Carolina Department of Conservation and Development in an endeavor to locate and evaluate the pegmatite bodies of the district, with emphasis on the quantity and quality of their economic mineral constituents, feldspar and mica. The geologic mapping was done on county road maps to the scale of 1 inch equals 1 mile. The fieldwork was carried on by the writer during the summers of 1949 and 1950 and consisted of the location and detailed examination of a score of mica-feldspar mines and prospects and of a number of undeveloped pegmatites.

The author is indebted to Dr. J.L. Stuckey, North Carolina State Geologist, Dr. J.M. Parker III, and Mr. Harry Davis for their aid and to many of the residents of the district for their unlimited cooperation.

GEOGRAPHY

The topography of the district consists of an upland plateau, which has been dissected and eroded into the rolling and undulating surface of the present-day Piedmont. The rolling surface of the eastern Piedmont border, in general, has relatively low relief. The elevations vary from approximately 350 feet on the upland surface to about 200 feet along the major streams. The roughest areas with the greatest relief follow the streams, and the best developed of these are located along Country Line Creek and the Dan River in Caswell County.

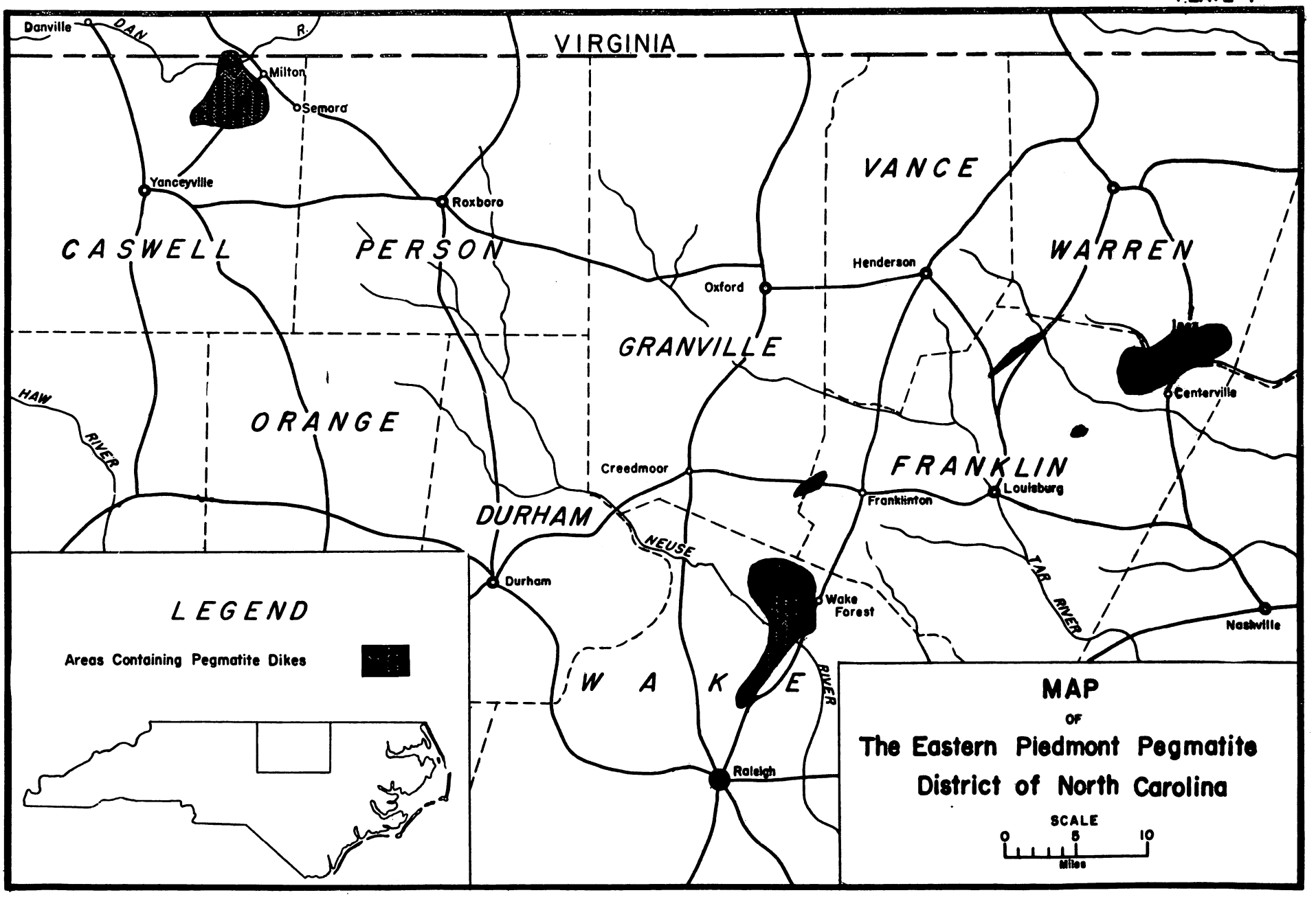
The general slope of the Milton area is to the north and northeast, except a small section on the north side of the Dan River, where the drainage is to the south. Nearly all the streams are swift flowing and have cut rather deep narrow valleys. Rattle Snake, Country Line, and Hyco Creeks flow across the district in a northeasterly direction and empty into the east-flowing Dan River. The Wake Forest-Inez area slopes predominantly to the southeast and is drained by the Tar and Neuse Rivers and their tributaries.

Excellent paved roads crisscross the district. These are interconnected by graded secondary roads which are for the most part in fair repair.

The residual mantle is thick, and exposures of fresh bedrock are seen only in roadcuts, gullies, stream valleys, and on steep hillsides. The more subdued topography seems to have been fostered by deeper weathering and, unlike the pegmatite districts farther west, outcrops of fresh pegmatite are almost nonexistent. Soil types and float were both used to a great advantage in mapping the aerial distribution of the pegmatites.

The Piedmont of North Carolina is made up of a very complicated series of metamorphic and igneous rocks. These strike approximately northeast-southwest

PLATE I


Danville
DAN
R.
VIRGINIA
Milton
Semora
Yanceyville
Roxboro
CASWELL
PERSON
VANCE
WARREN
Henderson
Oxford
GRANVILLE
Centerville
HAW
RIVER
ORANGE
Creedmoor
FRANKLIN
Louisburg
Franklinton
DURHAM
NEUSE
Durham
Wake Forest
TAR RIVER
Nashville
W A K E
RIVER
Raleigh
LEGEND
Areas Containing Pegmatite Dikes
MAP
OF
The Eastern Piedmont Pegmatite District of North Carolina
SCALE
0 5 10
Miles

through the state and are paralleled by the sediments of the Durham-Deep River Triassic basin.

The metamorphic rocks of the area include hornblende gneiss and schist, mica gneiss and schist, kyanite schist, slates, soapstone, and many less outstanding localized varieties. Contact metamorphic rock types closely associated with the intrusives are scattered throughout the district with no apparent pattern.

The igneous rocks include pegmatites and other phases of granitic rocks. Locally, but without continuity, more mafic rocks of the diorite clan are found, but these are seldom, if ever, associated with pegmatites.

LOCAL GEOLOGY

Sedimentary Rocks

In the north and northwestern part of the district along the Dan River are scattered deposits of conglomerate and gravel. These deposits crop out on hilltops and high ground at elevations of 150 feet or more above the river. Frequently hard ferruginous conglomerates and sandstones underlie the gravels. These gravels and conglomerates represent high terrace deposits of the Dan River. Blowing Hill, on the south side of the Southern Railroad, 3 miles west of Milton, is a typical deposit, and rock from this site has been used for road metal and concrete aggregate.

Recent unconsolidated sediments occur along many of the major streams. These were not studied since they have no direct bearing in the interest of the investigation.

Metamorphic Rocks

The pegmatite district is underlain predominantly by hornblende and

mica gneisses or schists. These are interlayered with each other and contain occasional lenslike layers of kyanite, garnet, or sericite schist.

In the Wake Forest-Inez area the mica schists are more abundant than other types but are usually not as well exposed. Muscovite is more prevalent than biotite. The grain size in these schists ranges from coarse gneiss or gneisslike material to extremely fine schists or phyllites. Included with the finer varieties are the sericite schists.

The Milton area is predominantly underlain by hornblende gneisses and schists. Locally these are interlayered with micaceous gneisses and schists and lesser amounts of garnetiferous mica gneiss. The very abundant hornblendic rock varies from a dense black hornblende schist, composed almost entirely of elongate hornblende crystals with sparse interstitial quartz and feldspar, to a fine, light-gray rock predominantly quartz and feldspar with scattered hornblende and localized hornblende-rich bands. Nearly all the gneisses have good cleavage parallel to the foliation. This shows up particularly well on weathered outcrops.

Small amounts of mica gneisses and schists occur in scattered patches throughout the area and are usually much less spectacular than the hornblendic rocks. An unusual garnetiferous mica gneiss crops out in a roadcut one-half mile east of Blanch. The garnet metacrysts of this rock range up to three-fourths of an inch in diameter.

Lit-par-lit injection gneisses often occur in the border zones of the intrusive masses. Frequently the gradation from fresh gneiss through lit-par-lit injection into granitic rock is so gradual that it is extremely difficult to determine the contact.

Banded granite gneiss crops out locally and, because of its siliceous nature, tends to form bold outcrops. Kyanite schist and garnetiferous gneiss and schist occur in small patches. The former crops out

southwest of Wake Forest as a narrow band in hornblende and mica gneisses and schists.

Igneous Rocks

Throughout the district granite occurs mainly as irregular masses in the gneissic country rock. These bodies vary from extremely small aplite dikes and injection nodules to large batholithic intrusives. Apparently, the granite is closely associated with the pegmatites becaurse of its proximity and similar composition. For the most part, it consists of quartz, feldspar, muscovite, and smaller amounts of the ferromagnesian minerals.

The more mafic or diorite rocks occur as border phases of the granite. Contacts between the diorite and granite are gradual, and they appear to grade into one another.

Pegmatites

Occurrence

The pegmatites of the district intrude both the granites and the metamorphics. The pegmatites usually occur as more or less lenticular dikes or occasionally as quite irregular masses. These vary in width from minute stringers to masses ranging up to 100 feet. In general, the broader dikes range between 200 and 500 feet in length but sometimes attain a length of one-half mile or more.

Pegmatites that intrude the gneisses and schists are often tabular or lenticular masses with their long axes concordant with the local forliation of the country rock. Large dikes seldom oppose the strike of the foliation, but the small dikes and stringers, apophyses of the larger bodies, often appear to follow joints and cracks in the country rock that strike in all

directions. The edges of the dikes are seldom parallel but pinch and swell throughout their length.

Irregular-shaped pegmatites are most often associated with the granite. This type shows little evidence of linear control, but some appear to be elongated, roughly parallel to the strike of the foliation in the local country rock.

No information concerning the vertical extent and irregularities with depth is available. None of the mine shafts go beyond a depth of 50 feet.

Mineral Composition

The major mineral constituents of the pegmatites are relatively similar throughout the district. The minor or accessory minerals, however, vary greatly and have no apparent connection with one another. Quartz and the feldspar group constitute over 95 percent of the minerals in the unweathered pegmatites. Kaolin, the micas, pyrite, hyalite, and garnet are common accessory minerals. That is to say, they are found in small quantities in many of the pegmatites. The rarer accessory minerals found only in one or two localities are tourmaline, apatite, lepidolite, etc.

Ever-present quartz ranges from some 35 percent to 65 percent in most of the pegmatites and occurs in several ways. It often forms a border zone on either side of a more or less linear pegmatite. These border zones are often nearly pure quartz and occasionally contain small amounts of mica. Quartz-rich medial cores, extending through the central portion of the pegmatite, are common. Such a core is not necessarily pure quartz but rather pegmatite of extremely high quartz content. Quartz occurs most

commonly throughout the pegmatite as coarse, irregualr masses and grains interground with other minerals. When quartz occurs as graphic intergrowths with the feldspars, the quartz usually composes less than 25 percent of the rock. Small veins composed entirely of milky quartz are common. In the larger veins or "quartz pegmatites," quartz predominates with small quantites of mica.

Massive white and milky quartz are the most outstanding varieties found in the pegmatites, but crystal, smoky, and fracture-stained varieties are also found.

Approximately 50 to 60 percent of the pegmatites are made up of one or more members of the feldspar group. Microcline is the commonest type, averaging slightly more than half the feldspar content. The other common feldspar is a plagioclase, usually albite-oligoclase.

The potash feldspar is found as irregular masses that vary in size from microscopic to several feet in diameter. The color range is from white, through buff, to flesh-pink with an occasional deep pink or red. No amazonstone (blue-green variety) has been observed in the district, but specimens have been reported from the Fowler property near Inez, Yarbrough Mill near Milton, and from several other scattered prospects.

The soda feldspar, albite-oligoclase, is a perthitic and interlaminated with the microcline. As a general rule, the plagioclase is light colored and has a semitransparent quality that distinctly differentiates it from the microcline. The plagioclase apparently weathers more readily than the potash-rich feldspars and is often more completely kaolinized.

Quartz and muscovite occur as intergrowths within the feldspars. Graphic intergrowth of quartz and feldspar is most common.

The weathering products are usually white to strongly iron-stained

kaolin or other clay minerals.

Mica is present in greatly varying amounts in almost all the pegmatites of the district. It is by far the most erratic of the common minerals in distribution, size, and mode of occurrence. Due to the scattering of loose cleavage flakes over the outcrop or workings, the percentage of mica present is extremely misleading. Muscovite is by far the most prevalent type, but biotite occurs in small amounts along the edges of many of the larger pegmatite masses. It is thought to have been derived from the country rock by absorption.

The muscovite varies greatly in color from prospect to prospect. Even within a single pegmatite, the color ranges from light green to brown. Much of the mica in the upper, well weathered zone of the pegmatites is mud-filled and consequently of no economic value. Iron and manganese staining in dendritic-like patterns occurs in the upper portion of the pegmatites. Twinning in the form of ruled, "A," and other deformed types of mica is common. The largest book observed in the Silver Mine in Wake County was eight inches across and nearly six inches thick. Very large books were reported from the Long Mine at Yarbrough Mill, Caswell County.

One occurrence of lepidolite, the lithium mica, $KLiAl_2Si_3O_{10}(OH_2F)_2$, was observed as float in Warren County on the northeast corner of the Fowler farm. No outcrops of lepidolite were seen, and how it occurs within the pegmatite is not known.

Garnet occurs frequently in many of the pegmatite bodies as inclusions in the feldspar, quartz, or muscovite. The red-brown almandite(?) crystals vary from a few millimeters up to several centimeters in diameter.

Structure

The pegmatites are essentially primary massive bodies and show little

evidence of metamorphism. Three, and often four, systems of joints are common, but the strike and dip of the joints vary in the different areas. Postpegmatite faulting is rarely seen. There is a poorly exposed fault in the footwall of the Long Mine at Yarbrough Mill in the Milton district. This fault apparently has sufficient displacement to reduce the width of the pegmatite mass by 8 feet.

Crushing and granulation has been observed, but always on a small scale, and is apparently of little importance. Inclusions of the country rock often occur in the border zones of the pegmatites. These do not show the same attitude or linear trend as the wall rock.

Weathering

All the pegmatites of the district are intensely weathered. There is a striking difference in the degree of weathering of the pegmatite masses of the eastern part of the belt as compared with similar pegmatites in the areas farther to the west. The pegmatites of the Milton district of Caswell County, for example, show weathering to a much less degree.

Complete kaolinization of the feldspars extends to a depth that depends primarily upon the topography and the chemical composition of the feldspars. The plagioclase group weathers more rapidly and more completely than other types. The degree of weathering decreases considerably with depth, but none of the mine shafts or prospect pits extend deep enough to expose fresh, completely unweathered rock.

The soil resulting from the weathering of pegmatites is primarily an iron-stained clay containing varying amounts of disintegrated quartz and mica flakes. Pegmatite masses usually can be traced by the residual quartz and mica float.

PEGMATITES OF THE MILTON AREA

The pegmatites of the Milton area have been worked for both mica and feldspar. Operations, beginning with the opening of the old pit of the Long Mine (see Plate 2-A) in the 1880's, were pursued intermittently on a rather small scale until about 1943. During World War I, the Carolina Mining Corporation bought the mineral rights of the Long Mine and most of the surrounding property. In 1920 the Milton Mica Company prospected the district and leased several properties, including the Long Mine. From 1915 to 1920 production increased as several small mines and many new prospects were opened by small independent operators. From 1920 until 1942, there was intermittent activity, especially in the smaller mines. During World War II, the Richmond Mica Company reopened the Long Mine primarily for mica, but a considerable quantity of high-grade feldspar was produced also. The area was again prospected, and several small pits were opened, but production from these was slight.

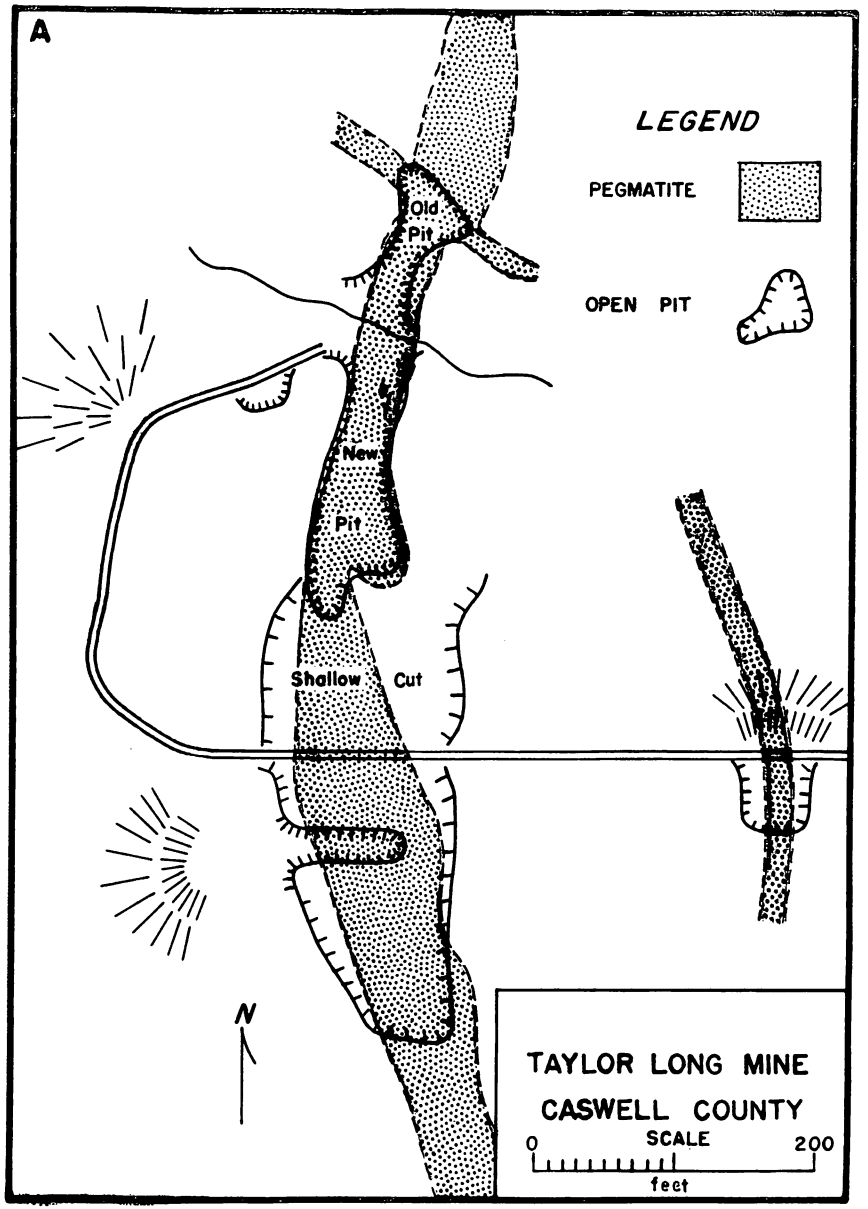
The area contains approximately 30 mines and prospects. The most productive area is in the vicinity of the Yarbrough Mill.

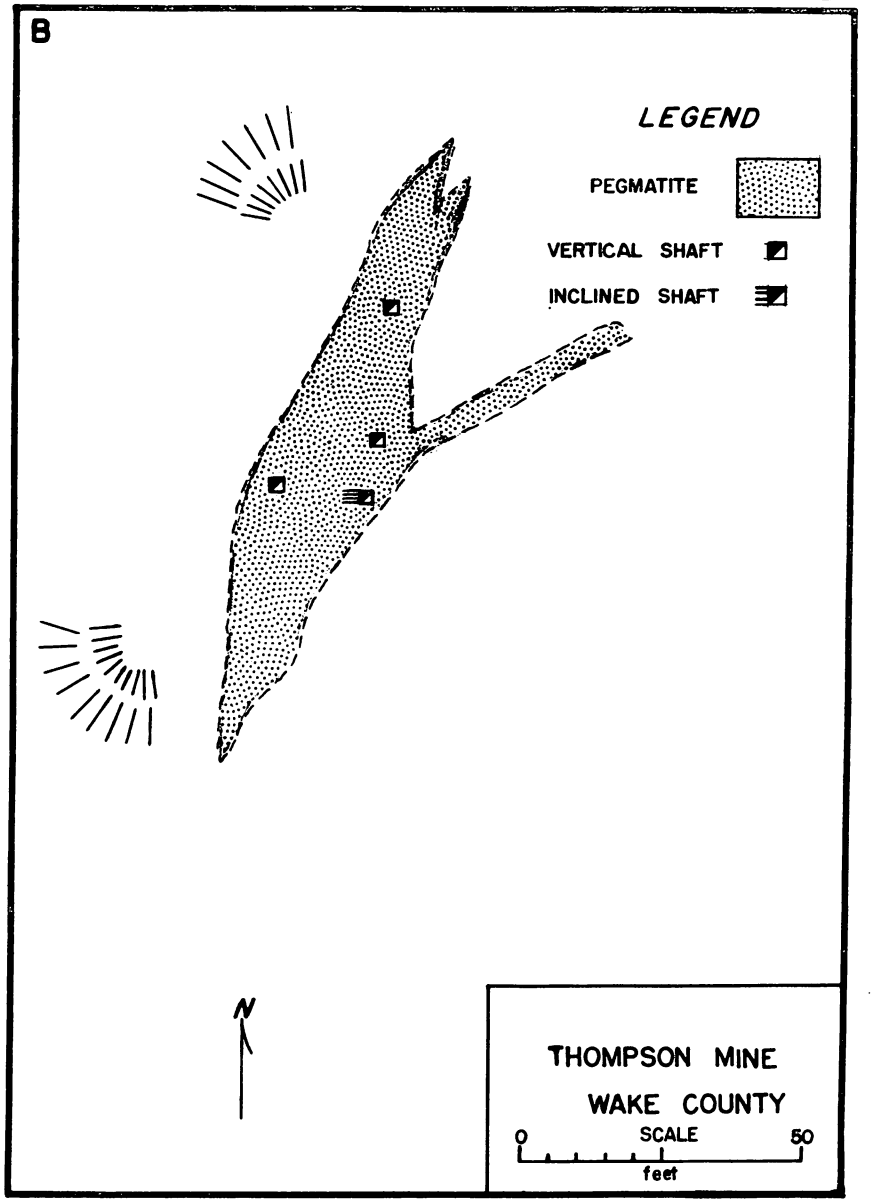
Taylor Long Property

This property is on the eastern edge of the Yarbrough Mill pegmatite area, 3 miles south of Milton. The surface and farming rights are owned by Mr. Taylor Long, and all mineral rights are owned by the Carolina Mining Corporation.

The pegmatite is a lenticular pod or bulge in a typical dike which strikes N. 12° E. to N. 8° W. and dips to the west between 65° and 90°. The major pod of the dike extends on to the W.O. Barker property to the north, but good exposures are rare. The main mass or pod is approximately

PLATE 2


A
LEGEND
PEGMATITE
OPEN PIT
Old Pit
New Pit
Shallow Cut
N
TAYLOR LONG MINE
CASWELL COUNTY
0 SCALE 200
feet


B
LEGEND
PEGMATITE
VERTICAL SHAFT
INCLINED SHAFT
N
THOMPSON MINE
WAKE COUNTY
0 SCALE 50
feet

600 feet long and 60 feet wide in the center. There is no indication of the vertical extent. Fresh, relatively unweathered material is encountered at a depth of 10 to 12 feet.

The main mine, consisting of the old and the new pits, is the largest in the district and has been worked intermittently for the past 60 or 70 years. The opening is 325 feet long, 20 to 60 feet wide, and averages approximately 25 feet in depth. In this pit the exposed pegmatite has been mined from hanging wall to footwall in several places, but the workings do not extend below the level of the quarry portal. The overburden has been removed from much of the surrounding area, exposing the main pegmatite body and several smaller parallel dikes. A few small pits and prospect trenches have been opened on strike at both ends of the main mine. The other openings on this property expose smaller pegmatites quite similar to the one described.

Large quantities of mica and feldspar are still available, and the mine is by no means worked out. In the center of the mass, high-grade pink microcline is present, and flanking this on either side are strong muscovite-rich bands. Massive to fine, white and gray quartz is disseminated throughout the pegmatite. Plagioclase, usually well kaolinized near the surface, is also common.

Most of the mica seen in the mine or on the dumps was either stained or distorted books under 4 inches across. High-grade, green muscovite books 1x2x2 feet have been reported from the mine.

The approximate mineral composition of the pegmatite is as follows:

Quartz	40%	Muscovite	2% to 5%
Microcline	35%	Biotite, Garnet, Apatite	Trace
Plagioclase	25%		

Based on the results at the Long Mine and adjacent properties, the future production possibilities for this area are good. Since in the early days the mines were worked entirely for mica, there is a large quantity of reclaimable feldspar to be found in the old dumps.

Slaughter Property

This property is located approximately 4 miles south of Milton on the southern edge of the Yarbrough producing area. Full ownership is held by Mr. Jacob G. Slaughter, who has prospected for and mined mica in several of the pegmatites on his property.

The largest and most productive pegmatite on the Slaughter property is on the northeast side of the plantation. The pegmatite body is an irregular ellipsoid, approximately 400 by 600 feet, that extends northward onto the adjacent land owned by Mr. Lemuel Yarbrough. This northern extension of the mass is rather fine-grained and appears to be of little economic value. Very few outcrops occur, and it was necessary to use soil types and pegmatite float in mapping the mass.

Four pits have been opened in this pegmatite and worked at intervals by Mr. Slaughter. The main mine consists of three closely spaced circular pits 6 to 10 feet deep and 10 to 12 feet in diameter. Between 400 and 500 cubic yards of material have been moved. The fourth pit is in a wooded area approximately 500 feet southwest of the main workings.

Feldspar, composing 50 to 60 percent of the mass, usually occurs intimately mixed with quartz. Much of the feldspar shows graphic intergrowth with the quartz, and hand-cobbing is impractical. As elsewhere in the district, the plagioclase is partially altered to kaolin to some depth below

the level of workings. Considerable muscovite, mostly stained and distorted, occurs as float and on the dumps. No books above punch size were seen in the pits.

The southern most opening was made in a 10- to 12-foot, quartz-muscovite dike. No feldspars were seen at the location. Large books of mica were reportedly taken from this pit, and the dump shows rather large mica-casts in the massive white quartz. The pit was abandoned because of blasting difficulties.

Five smaller pegmatites crop out on the property. All have been prospected to some degree and small quantities of mica removed. None of these, because of the small quantity and poor quality of the material, warrant further examination.

Moore Property

This property is located 3¼ miles south of Milton and is two-thirds of a mile west of the Yarbrough Mill. The land is owned by Mrs. J.W. Moore of Milton, and the mineral rights are leased to a Mrs. Thomas of Spruce Pine.

The pegmatite crops out 2,000 feet southeast of the tenant house and strikes S. 70° E. The overburden of an area 50 by 150 feet has been bulldozed off recently, exposing the pegmatite and the ragged western contact with the country rock. The pegmatite itself varies from 5 to 15 feet wide and pinches and swells along strike. Several small pegmatites are exposed to the north of the main mass, and considerable float is evident. Small local aplite dikes cut the country rock and are closely associated with the pegmatites.

The exposed portion of the pegmatite shows approximately the following composition:

Quartz	45%	Plagioclase	30%
Microcline	25%	Muscovite	1%

All the feldspar shows medium graphic intergrowth with quartz. Much of the plagioclase is kaolinized to some degree. The visible mica was less than 1 inch across and strongly stained.

From the surface and near-surface indications, this prospect is of little interest; however, a shaft to explore the possibilities at depth would be necessary before a definite conclusion could be made.

Thacker Property

This property, owned by William Thacker, is located 3 miles south of Milton and about three-fourths of a mile northwest of the Yarbrough Mill. The Yarbrough-Estelle road runs through the plantation.

Several pegmatite dikes are poorly exposed on the property. They strike north and northwest. The best outcrops are along the Yarbrough-Estelle road. The roadcuts expose several dikes, two of which are 15 to 20 feet wide. The easternmost of these was traced N. 50° W. along strike for some 2,500 feet. In several places this dike apparently swelled into lens-like pods about 40 by 70 feet. On the eastern side of the property near Shiloh Church there are several interconnected pegmatites. These vary in size and are separated by aplite and inclusions of hornblende gneiss. The pegmatites appear to be concentrated on the north side of the road, where there is a great deal of quartz and feldspar float covering a large area. No dimensions or other information could be obtained due to the scarcity of outcrops.

There is only one pit on the property. This evidently was abandoned long ago, as it is partially filled and covered with brush. The prospects

of feldspar and mica on this property are uncertain, but surface indications certainly warrant the opening of several prospect pits and trenches.

Prevette-Sheetz Property

These are adjoining farms located just north of the Dan River, 2.75 miles west of Milton. The easternmost farm is owned by Mr. Lee Sheetz, while the one to the west is owned by Mr. J. Prevette.

Outside of the Yarbrough Mill area, these properties have the largest visible reserve of feldspar in the area. The pegmatite is composed of feldspar, chiefly microcline with some albite, gray to white quartz, and green muscovite. No commercial mica was observed. The area contains four major pegmatite masses. All of these are lenticular swells or pods in separate dikes that strike between N. 30° W. and N. 45° W. Exposures are rather poor except on the steep hillsides, but conspicuous float silhouettes the pegmatite masses against the country rock. On the Prevette property, one pegmatite is exposed on a hilltop of 6 or 8 acres in extent. In the past all four of the major pegmatite masses have been partially prospected and several small pits worked for mica.

Miscellaneous Prospects

The Bradner, the Harris, the Powell, and the Thomas are four small prospects, 2 to 3 miles south and southeast of Blanch. In all cases the pegmatite masses are narrow, elongated dikes of similar composition to those of the Yarborough area. The old workings are small, overgrown, and show little of the pegmatites' character.

The Walker property, 1½ miles southwest of Estelle, was prospected some 50 years ago. The pegmatite is narrow but persists along the strike

for half a mile. Several old trenches expose small quantities of low-grade mica.

PEGMATITES OF THE INEZ-WAKE FOREST AREA

A few of the pegmatites of the Inez area have been worked on a small scale for both mica and feldspar, but the area has never been very productive. Most of the mines were opened during the early 1930's, but several prospect pits and at least one small mine antedates these later workings by at least 40 years, however no information pertaining to them was available. Several small prospects have been opened recently by Mr. Martin Fowler, but none has been productive.

The only work going on in the Inez area at the present time is being done by a Mr. J.C. Davis on a part-time basis.

The Fowler Property

This property is located $2\frac{1}{2}$ miles southeast of Inez on Maple Branch. Several pegmatites cross the property paralleling the lineation of the gneissic country rock. The lineation and foliation strike N. 25° to 35° E. Locally these pegmatites swell or bulge into masses 25 to 75 feet wide and usually 60 to 100 feet long. Many of these pods have been prospected and in three of the larger ones small mines have been opened.

Most of the mica seen in the mine or prospect dumps was stained or distorted books under four inches across. Mr. Fowler has, however, in his possession several large books of high-grade muscovite that measure well over ten inches across. These were obtained from several different prospects on the banks of Maple Branch.

The dump of the largest opening on Maple Branch contains fair samples

of microcline intergrown with quartz. These openings do not expose large enough areas to estimate accurately either the quantity or the quality of the feldspars in the pegmatites.

The northernmost prospects on this property uncover small quantities of beryl. This occurs as small crystals, usually under three inches in length, intergrown with the feldspars and quartz.

In the same general locality, (i.e., northeast of Maple Branch) lepidolite mica appears as float in several cultivated fields. The lepidolite observed was medium coarse flakes intergrown with clear and milky quartz. Occasionally, single crystals two to three inches across were seen. Due to the deep weathering, no further information concerning this occurrence is available.

The Davis Prospect

The Davis prospect is located on North Carolina Highway No. 58, approximately 6 miles south of Inez on the southern border of Warren County. The mineral rights of the property are controlled by Mr. J.C. Davis, who at the time of this survey was actively prospecting the pegmatite for mica.

The largest single pegmatite of the Inez district occurs in this area on Shocco Creek and is partially in Warren and partially in Franklin County. The pegmatite strikes N. to N. 40° E. The mass is roughly eliptical and is somewhat over a mile long. Closely associated with the large pegmatite are several smaller ones that parallel the main mass on either side. These closely spaced pegmatites have covered the whole area with considerable quartz float.

Three prospect pits were being worked by Mr. Davis for mica on the east side of North Carolina Highway No. 58. The workings were mainly in well weathered saprolite, but occasional large clear quartz masses were

encountered. Small amounts of low-grade muscovite were found associated with these masses. No unweathered feldspar was seen in the upper part of the pits, but fresh appearing microcline was found at depth.

The best exposure of this pegmatite is just south of Shocco Creek, where the Highway Department has quarried road metal. The extent of the work has exposed a partial cross section of the pegmatite. The contact zone between the intrusive and the country rock is clearly shown, as well as some of the interior features of the pegmatite. Biotite flakes, all under an inch across and lying parallel to the plane of the contact, crop out along the edge of the pegmatite. The other common pegmatite minerals are also present at this locality.

The approximate mineral composition of the pegmatite is, as follows:

Quartz	30%	Muscovite, less than	5%
Microcline	40%	Biotite, Garnet	Trace
Plagioclase	30%		

Approximately 400 yards northwest of the Maple Branch School a large quartz vein or "quartz" pegmatite crosses the road. This dike parallels the other pegmatites of the district, striking N. 30°-35° E. The milky white quartz is the only visible constituent of the mass on the outcrop. There are, however, molds in the quartz where large muscovite crystals have weathered out.

Pokomoke Locality

This area lies approximately 4½ miles west of Franklinton and 2 miles north of Pokomoke, on the Franklin-Granville county line. The property is the only one in Franklin County that has been worked for mica.

There is one large pegmatite with several small offshotts and apophyses. The main body is an elongate mass, approximately a half mile long, and its

widest point is slightly over 100 yards wide. The strike of the pegmatites is N. 30° E.

Three or four pits were opened in the pegmatite during the last war by Mr. William Silver, but they have since been completely filled by the present tenant farmer. The only evidence of the working is the abundance of large quantities of fresh mica, feldspar, and quartz on the surface. Pegmatite float is widespread over the whole mass and was used to delineate its shape.

No reliable information as to the quanlity or quantity of mica or feldspars present is available since all workings are inaccessible.

Gupton Locality

The Gupton area is located north and east of Gupton, along the Franklin-Warren county line. Those pegmatites cropping out on the North Carolina Highway No. 58 near the Shocco Creek Bridge are the southern extension of the Inez area and have been described above. The above pegmatite zone crosses Shocco Creek and extends several miles into Franklin County. A number of small pegmatites are exposed in the roadcuts.

A small prospect was opened on the northwest side of a branch entering Shocco Creek from the south, approximately 1½ miles upstream from the bridge on North Carolina Highway No. 58. The pegmatite is trending N. 35° E. and crops out intermittently for a little over one-half mile. The pegmatite, which is narrow, swells to a little over 25 feet in width at the center, where the pits are located. The opening itself is partially filled and overgrown, so that it was impossible to obtain any definite information.

Sycamore Creek Locality

This area is located on North Carolina Highway No. 561, approximately 5 miles northeast of Louisburg. The pegmatite parallels the highway for over one-fourth of a mile and is clearly seen in the roadcuts and as strong float. The pegmatite is a narrow dike, usually under 20 feet wide, striking N. 40° E., and can be traced more or less continuously for approximately 1¼ miles. The mineral composition of the mass is practically identical with that of the other parts of the district.

Several prospect trenches have been opened on the main mass and in several smaller parallel dikes and offshoots. Apparently neither the quality nor the quantity of even the higher grade portions warranted further examination.

Wake Forest-Falls-Purnell Locality

The major pegmatites of Wake County are located between Wake Forest, Falls, and Purnell. Prior to and during World War II, prospecting and mining on a small scale was encouraged and financed by John Sprunt Hill. Mr. William Silver and Mr. E. A. Hughs carried out most of the active work and during a period of several years opened a number of small mines and many prospect pits. No information concerning actual production of mica is available; but, if the size of some of the workings is any indication, a considerable amount was removed. Muscovite mica was the only mineral sought, and the feldspars were neglected entirely.

The Hughs Mine

This mine is located on the Wakefield Farm, approximately one mile east of Falls. Prospecting for mica was begun here about 15 years ago, and

a small quantity of muscovite was recovered. Extensive prospecting and considerable mining was carried on by Mr. Hughs during World War II. The present workings consist of several shafts which have either caved in or are filled with water, a dozen or more small pits, and many prospect trenches.

The pegmatite, so far as could be determined, is about 1,000 feet long and 50 to 60 feet wide at a maximum. It narrows in both directions but is lost beneath the thick mantle of soil and vegetation before there is definite evidence of complete pinching out. The dike strikes N. 20° E. and has a near vertical dip. Since all the deeper shafts are inaccesible, no information concerning the structure at depth is available.

The pegmatite is composed chiefly of coarse, pinkish-white microcline in masses that average 6 inches in diameter. The next most abundant mineral is quartz, which is often semitransparent. It is intergrown with the microcline and apparently forms a medial core in the pegmatite. The plagioclase occurs as perthitic intergrowths with the microline. The grains and spindles are distributed irregularly through the potash feldspars. The plagioclase is usually white to light buff and near the surface of the ground is strongly kaolinized. Muscovite generally occurs in flakes or scales and small tabular crystals intermixed with feldspar and quartz. It is commonly light green to amber-colored. Objectionable structures, such as, ruling, "A" twinning, distorted crystals, limonite staining, and inclusions, are common. Very little of the mica books observed would trim out ot 3x3 inches. Accessory minerals are rare. Isolated garnet and pyrite crystals were foundusually associated with the microcline. Biotite occurs as a border fringe along the contact of the pegmatite and country rock.

Hill Quarry

The Hill Quarry is located on Wakefield Farm, approximately one-half mile east of the farm office. The quarry, opened in a bulge in a rather narrow pegmatite, is the most recent working in the area, and the material removed has been used, without further processing, to surface all the roads on Wakefield Farm. To the best knowledge of the author, no attempt has been made to utilize the individual pegmatite minerals.

The workings in the summer of 1950 consisted of an open cut, at right angles to the strike of the dike, approximately 30 feet wide, 50 feet long, and between 8 and 15 feet deep. The dike strikes N. 20° E. and dips vertically. The pegmatite is estimated to be about a maximum of 60 feet wide but pinches down rapidly to the north to an average width of 15 feet. The mass has been traced along strike for over 1,000 feet. A short distance south of the opening, the dike is lost beneath the thick residual mantle, and no surface indications were visible.

The pegmatite here is made up chiefly of pine to buff microcline, white to cream albite, waxy-white quartz, light green muscovite, and small amounts of garnet, biotite, and other accessory minerals. The only occurrence of hyalite in the district was observed here as yellow-green, semicolloform incrustation on the feldspars.

The Thompson Mine

The Thompson Mine (see plate 2-B)worked by Mr. William Silver is located on the north side of Horse Creek, 2½ miles west of Wake Forest. The mine consists of 4 shafts, 3 of these are open and extend to depths ranging between 25 and 40 feet. Two shafts are connected by a drift which opens further on into a small partially caved stope which apparently was larger and deeper than at

present. These workings parallel the strike of the pegmatite for approximately 50 feet.

The pegmatite is a lenticular body, striking N. 20° E. and dipping steeply to the east. Quartz float can be seen intermittently along strike for a little over a quarter of a mile. This pegmatite is similar in composition to those on the Hill property. The dumps and some parts of the mine itself show a fairly good grade of muscovite. There is no information available concerning the quantity or quality of the mica produced from this mine.

The W.J. Kerney Mine

This small opening, worked by Mr. William Silver, is located a quarter of a mile north of the Thompson Mine. Of the two pits, only one is accessible at present. This consists of a small inclined shaft and drift cutting across the pegmatite at right angles. The dike exposed here is relatively narrow, reaching a maximum of 15 feet at its widest part and is traceable for 400 feet along the strike of N. 20° E.

The pegmatite is composed of weathered feldspars and kaolin, with locally strong milky-white quartz and small amounts of muscovite.

The S.H. Tharington Prospects

The Tharington property is located on the south side of Horse Creek, 3½ miles west of Wake Forest. Prospecting has been carried on intermittently since the early 1920's. During World War II, Mr. E.A. Hughs opened several small pits for mica and kyanite.

The mica-bearing permatite strikes north-south and dips 75° E.

Where the prospect pits are located, the dike is between 20 and 25 feet wide. Although the prospect pits are inaccessible, the dike is well exposed in the roadcut. The pegmatite is similar in composition to the others of the area.