VERMICULITE DEPOSITS IN PEDMONT

VERMICULITE DEPOSITS IN PIEDMONT VIRGINIA

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Introduction

Location of Area

The area studied in this report covers parts of eight counties in the Virginia Piedmont. Two of the counties are in the central Piedmont and the other six are in the southern and southwestern Piedmont. Depssits of vermiculite in Virginia are confined to that section of the State underlain by igneous and metamorphic rocks, the Piedmont and Blue Ridge. This report covers deposits known to occur in the Piedmont. The area studied covers parts of eight counties, located in the central and southwestern Piedmont.

Purpose and Scope of Report

It is the purpose of this report to give accurate information on the location and commercial possibilities of as many deposits of vermiculite as possible in the Piedmont of Virginia. As the area in which vermiculite occurs coveres such a large part of the Piedmont that a very detailed study of the entire area would be impractical, the deposits described in this study are those as exposed in road cuts with a feww that occur elswhere thatvhave been brought to the writers attention. The writer feels that such a study will revela the most promising areas in Virginia and knowns that the deposits discussed in this report are only a very small percentage of the possible deposits in Virginia. The areas have been oitlined on a map.

Samples were taken from all known vermiculite deposits. ~~These~~ Each samples was exfoliated and certain properties of each were figured. X-ray data was made on certain samples. In this way the commercial value of each deposidt was determined individually.

Thus it is the main purpose of this report to delineate the areas in which vermiculite is known to occur and to attempt to determine which areas are the most promising for possible future ~~produ~~ commercial production.

Field Work and Acknowledgments

Field upon the project was done during the summer and fall months of 1956. Laboratory investigation were done in the Dicision labs during the winter of 1956-57.

The work was done under auspices of the Virginia Division of Geology and the w iter would like ti express apprciation to members of the staff for discussions on problems and for assistance and encourgment during preparation of this report. The writer would like to express especial appreciayion to V.R.Geyer, formerly with the Division, for field assitance during the early stages of field investigation and for the location of msny of the deposis in the southern Piedmont.

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Mineralogy of Vermiculite

According to Gruner(1;932) vermiculite exists a a distinct mineral with a structural formula $(OH)2(Mg,Fe)3(Si, Al, Fe)4O10.4H2O$. The unit cell of vermiculite is monoclinic holohedral with the probable space group

varies between 28.57 and 28.77 A. The cell contains 4 molecules of the structural formula above.

The structure consists of $(OH)4Mg6(Si,Al)8O20$ sheets between which are interstratified layers of $8H2O$ which occupy a space of definite thickness close to 4.9 A.

The old term hydrobiotite is used by Gruner to designate interstratification layers of biotite with vermiculite which result in a different X-ray pattern. Apparently the hydrobiotite is a the mixed layered vermiculite and chlorite.

Vermiculite has the unique property of expanding when heated. Expansion is thought to be the mechanical separation of the laminae when the contained water is converted into steam. Expansion usually takes place, in a matter od seconds, at between 1600 degree and 2000 degress F. When expaned the volume may increase from 6 to 20 times and the color changes to a silvery orgolden hue , depending upon degree of hwating and the nature of the material.

Uses of Vermiculite

Because of it unique property of expanding when heated, vermiculite is a very useful mate ial and the uses of vermiculite have expanded rather rapidly in recent years. Although vermiculite was discovered in 1824 and its expanding properties then described, it was not until 1915 that that expanded vermiculite was first marketed from a small deposit near Hecla, Colorado. This operation was brief and not until 1921 did sucessful and

continuous production begin, this time in Montaha. Since 1921 the commercial utilization of vermixulite has expaned rapidly and in 1951 represented a 15-million-dollar-ayear industry.

Because of its indulation a fire-proffing qualities, light weight, and granular form, expaned vermiculite is a very useful material. The principal uses are based on one or more pf these prop erties. The larger expanded granules are used extensively for insulation. M dium-sized granules are used in concrete and plaster aggregate. Plaster made with vermiculite is- aggregate is extremely fireproof,almost crack resistant, and has insultating and sound-proofing qualities. Vermiculite aggregate is used in cement to form a light-weight insulating concrete. Vermiculite concrete is used for roof a d floor insulation, a d is precast into bloocks and tiles for a variety of fireproo fing, insulating and dead-weight-saving purposes. Over a period of 20 years, veemiculite has proved to to be freed from danger odf de;ayed chemical reaction or volumetric expansin, resulting in a growi g demand for vermiculite products in the building industry.

Expanded vermiculite is also used in horticulturial work, where its properties of holding air and water make it usefule fpr roo development and for starting seeds and cuttings. Additional uses include the making of insulating refractory bricks and blocks, insula- insulating plactics, pipe lagging, roof-insulation blocks, and other products.

Geology

Vermiculite is found associated with basic rocks that have undergone metamorphism and apparently these rocks must be of Precambeian or Cambrian Paleozoic age. Vermiculte is usually found in terrane that has undergone deep weathering.

In Virginia Vermiculite is confined to the Piedmont and Blue Ridge provinces. These provinces are ubderlain by crystalline schists and gneisses and granites.

Vermiculite was known as early as 1824 in Masschusetts when W ebb gave it this name from the Latin "vermicluari, to bredd worms", because of its property of expanding and unfolding into worm-like forms when heated. Vermiculite is often regarded as the result of the alteration of biotite or phlogopite dur to hydrothermal action.

In Virginia vermiculite occirs in the Poedmont and Blue Ridge provinces which are underlain by granite and crystalline schists and gneisses. These rocks have been intruded by pe'mmatote klocally and by quartz veins throughout the entire provinces. Vermiculite undoubtedly is a minor consituutent of many of the rocks in the Piedmont and Blue Ridge but occurs in only selected localitites in amount that are considered to be of commercial importannce. The most promising localities are those that contain considerale amounts of hornb;ende rocks, as gneisses, intrusives, and batolith-type bodies. Vermiculite occurs in biotite gneisses but in these rocks it does not seem to offer comedcial possibilities. The occurrences in the hornblende rocks seem to be associated with areas of pegmatite inturSives. ~~Occassionally~~* Instances are known where vermiculite will be found along the contact between quartz veins and underterm ned country rocks, probably biotite gneiss. However, the vermiculite is such cases is only found near the quartz veins and in very minor amounts. ~~The~~** Field evidence indicates that the most promising deposits of vermiculite occirs im horndlende rocks, especially where these rocks have been intruded by pegmatites. Evidenve suggests that the vermiculite ~~i~~ results from hydrothermal activitity. It is suggested that the hydrothermal fluids come into the area, change the hornblende in some fashion so that weathering can take over and change the hornblende to vermiculite, with chlorite as an intermediate product.

Not all vermiculite found in Virginia is formed in this manner as very low grade vermiculite is found in biotite gneiss and this is considered to the a weathering product.

The hydrothermal theory is supported by firld evidence. Vermiculite is found only in those hornblende bodies that are intruded by pegmaties and quartz veins. Instances have been noted in the field in which vermiculite is found along the contact between pegmatites and hornblende gneiss. The vermiculite gradually decreaese and then ceases to exist as away from the pegmaties The instance cited in which vermiculite is often noted a;ong the immediate contact between quartz veins and country rock also suggests hydrothermal joucies are active in vermiculite formation in Virginia.

Types of Deposits

Four different typts of deposits have been noted in Virginia. These may be classified as dissem nated deposits, ~~eomplete deposits,~~ pocket or vein deposits, and deposits in pegmatite, deposits along quartz veins.

The commercial deposits are considered to be mostly of the disseminated types. In this tyoe of deposit vermiculite is found scattered or disseminated throughout tthe whole deposit and will usually run up to 40 or 50 perecnt of the rocks. The gangue matetial is usually the parent material from which the vermiculite is formed, usually hornblende and occassionally biotite. The largest tonnages and the best grade vermiculite is found in these deposits, especially if the parent material is hornblende. Grensprings deposits are of this type.

Pocket or veins deposits are not considered commercial and the tonnages available from these are usually small. In this type of deposit, the vermiculite is found in a s all stringer or pocket in which the entire stringer or pocket is vermiculite. The country or host rosch, asexposed in

road cuts, is usually a deeply weathered mica schist. The material The x-ray pat'errn is usually that of vermiculite (?) and occassionally the vermiculite has crenulations in it. Such deposits noted in Bedford and Franklin counties.

Deposits along qua tz veins occurs at scattered localitites throughout the Piedmont. Such deposits are limited to the immediate area next to the quartz vein and are usually only a few inches or less tham an inch in width. The ~~vermic-~~ vein usually contains lôo percent vermiculite ~~and-~~ but amounts are so small that they are not considered as commercial possibilities.

Several of the pegmaties in Henry County were noted to have vermiculite within the pegmatite. The vermiculite was scatered throughout the pegmatite and occurs in very large flakes. However, such deposits are not considered con ercial. However, occassionally when a pegmatite cuts a hornblrnde body, very good vermiculite will occur along the contact ahd for some distance into the hornblende body.

Origin of Vermiculite

Vermiculite seems to originate in many different ways. In a deposit near Tigerville, South Carolina, vermiculire is thought tp be the result of alteration of biotite to vermiculite by the action of ~~meteric waters~~ meteoric waters. This opinion is based on (1) the gradual increse in firmess and darkening of vermiculite from the surface downward and tôwars masses of vermiculite, (2) the absence of biotite at the surface and its presence at moderate depth (10 to 15 feet), and (3) the presence of residual masses of biotite surrounded by vermiculite which has later developed along joints and slippage planes.

North Caroliba vermiculites are believed to have formed by the

hydration and alteration of chlorite. Vermiculites here properly belong to the chlorite group and have retained the optical character and cleavag cleavage of the orginal chlorite mineral from which they formed. The type of original chlorite determined the properties of the resulting vermiculite.

Vermiculite deposits in Wyoming are thought to be the result of hydrothermal alteration of horhblende, biotite, and serpentinite. The alteration of these minerals to vermiculite is duggested by (1) Crystals with ~~embayed~~ ragged, embayed, and crenulated margins containing vermiculite along fractures and cleavage directions, (2) islands of the orginial mineral in optical orientatuon and surrounded by vermiculite, (3) veinlets of vermiculite in the host mineral with unmatched walls which are enlarged at the intersections. In the alteration of hornblende to vermiculite ~~to~~ an intermediate biotite stage may or may not be present. Meteric waters are thought to have been of little or no importance in the formation of the Wyoming vermiculite.

The deposits near Libby Montants are considered to be the result of hydrothermal alteration of pyroxenites. ~~Recently~~ Formerly these deposits were thought to be the alteration products of biotite and phlogopite but a recent detailed study of these deposits showed that the vermiculite was derived from the pyroxenite and that the associated biotite was formed at the same time.

~~Geologic conditions in Virginia~~

Prospecting and Exploration

Because vermiculite is associated with basic and ultrabasic rocks, any area that is underlain by such rocks is a potential source of vermiculite, especially if the are contains pegmatites. Prospectors in the southeastern United States have used such clues with considerable success.

The best places to prospect for vermiculites are in road cuts and in gullies, since vermiculite does not outcrop prominently. The first evidence is likrly to be scattered flakes in a gully or road cut. Once flakes are found, a search in the area will usually uncover the deposit. Some idea of the quality of the material can usually be determined on the spot by use of a hand torch. To be of potential commercial value, vermiculite must expand readily when heated.

To be of commercial value a vermiculite deposit must have the following properties:

1. It must expand to a high degree when heated and the flakes must be of the sizes required by the market. Large flakes can be crushed but small flakes are not in demand.

2. The percentage of vermidulite to gangue material must be high, usually 40 percent or more vermiculite.

3. The deposit must be large, in as much a large deposit is easily worked with power loading equipment, which is required to a low cost operation. Attempted operations of small and scattered occurrences of vermiculite have not been successful.

Occurrence of Vermiculite in Virginia

The geology in Virginia is favorable for the occurrence of vermiculite

in paets of the Piedmont province, and at present there are six districts in which vermiculite is known to occur. These districts are outlined on Figure 1 and are as follows: (1) The lousia County district, in the western part of Lousia County; (2) the Buckingham County district, embracing a small area in west-centeal Buckingham County several miles northwest of Buckingham Court House; (3) The Bedford-Franklin counties district extending from central Bedford County into northeastern Franklin County; (4) the Pittsylvania Franklin counties district in northwestern Pittsylvania County and the southern half of Franklin County; (5) the Henry County district, in the southern half of Henry County; and (6) the Charlotte-Halifax counties district, in southwestern Charlotte County and western Halifax County.

Lousia County District

The Loisia County district is located in the western part of Lousia County and is referred to locally as "The Greensprings". The area lies in between Boswells Tavern on the northwest, Trevillians on the east and Poindexter on the southeast. The area is roughly oval shaped and is about 6 miles long in a north-south direction and 3.5 miles wide in an east west direction. It is traversed by. U.S.Highways 15 and State Highway 22 plus several secondary state roads. The South Anna River flows through the northern and eastern parts of the area.

The Lousia County district is underlain by a basic intrisuve consisting mainly of hornblende gabbro around the edges and becoming more acidic towards the center. The center becomes more granitic in character. The honrblende has ben intruded by small pegmatite and quartz strinfers. The vermiculite occurs disseminated throughout the hornblendite, with comms derable vermiculite in places.

The Louisa County district is considered the most promising area for possible future production. The deposits seem to be large with indications of considerable tonnages available. The vermiculite expands readily and is of good grade. X-ray work indicates that the material is hydrobiotite rather than a true vermiculite. As such, it is similar to the Libby, Montana vermicilite, except that the flake size is smaller.. The vermiculite deposits ring the Green Springs intrusive, with the best deposits occurring on the north and western sides of the body.

Description of Deposits:

Deposit Number 1. Deposit number one is located along State Highway Number 22 just to the west of South Anne River. The deposit is well exposed on the north side of the highway, with some exposed on the southern bank. Vermicilite is in the hoenble de gneiss in which it occurs disseminated. The orebody is cut by several small pegmatites and there are several non-mineralized hornblende dikes or xenoliths. The orebody as esposed in the road cut was paced off to be aboit 75 feet wide. The vermiculite, or hydrobiotite, expands readily. Exfoliation tests indicate a volume increase of ahd aweight of per cubic foot. No material larger than 10 mesh, unexpaned was found in this deposit.

Deposits Number 2. Deposit nimber is exposed by U.s.Highway 15 about one and 3/4 miles south of Boswell Tavern, near the western edge of the Greensprings ~~Intrusive~~ intrusive. The deppsit is exposed in both the eand western cuts of Highway 15. The vermiculite occurs in a hornblende gneids, throughout which it is disseminated. Several small pegmatites cut the orebody. The orebody as exposed in the road cut is about 200 feet in width and the vermiculite or hydrobiotite expands readily. ~~The~~ Exfoliation tests indicate that the ore has an volumn increase of with a weight of pounds per cubic foot.

Buckingham County District: The Buckingham County district is located several miles northwest of Buckingham Coutrt Hourt . The area is about 2 miles wide and 5 miles long and isxtravered ~~by State Roads 602-, 659,~~ in a north-south direction by State Road 602 and several state roads that branch off this one in an east-west direction.

The area is underlsin by a hornblende gabbro intnusion similar to that of the greesn Springs district in Lousia County.

Charlotte-Halifax Counties District: The Charlotte-Halifax counties district extends from near Phenix and Charlotte Court House in Charlottes County southwestward to the vicinity of Paces and Turbeville in southwestern Halifax County. The district covers an area about 35 miles long by 10 miles wide. The area is traversed by U.S.Highway 501, State Highways 26 and numerous secondary roads. The Staunton River cuts through the district along the Charlotte - Halifax County line.

The Charlotte-Halifax Counties district is underlain by a hornblende gneiss and granite. The vermiculite occurs in the hornblende gneiss, that is locally intruded by pefmatites. The district is not considered to be a comercial potential becasue the deposits are quite scattered throughout the district and the vermiculite occurs in very small flakes. However, the vermiculite from several of the deposits expands very well.

Description of Deposits:

Charlotte County Deposit Number 2. Deposit number 2 in Charlotte County occurs about 1 mile east of Phenix along the north side of State Highway 40, where an excavation has uncovered some vermiculite disseminated throughout a hornblende gneiss. The zone is about 25 to 30 feet wide and several quartz veins and pegmatites cut the hornblende gneiss. The flakes are very small qnd in exfoliation test run of samples from this deposit, expansion was only noted in the -30+ 60 mesh and expansion here was very limited. The deposit is not worthy of exploration.

Charlotte County Deposit Number 3. Deposit number 3 in Charlotte County is located about $\frac{1}{4}$ mile north of the junction of State Highway 746 and State Road 631 along State Highway 746. The vermiculite occurs in pods or lens-shaped bodies in a hornblende gneiss. The pods and lenses are almost completely mineralized but the vermiculite expands very little if any. Several pegmatites and quartz veins are found in the area. The deposit does not offer possibilities for production.

Charlotte CountyDeposit Number 4. Charlotte County deposit number 4 is located about ½ mile west of the interesction of State Highway 746 and State Road 649, along the north side of State Road 649. Some vermiculite occurs along the contact of a small pegmatite thar is cutting hprnblende gneiss. The vermiculite occurs in a veryy narrow zone, less than 6 inches in width. The deposit does not offer any commercial possibilities. Exfoliation tests show that the vermiculite in this deposit is concentrated in the -10/30 and -30/60 mesh with some expansion in both sizes.

~~Halifax County Number 1.~~ Number

Halifax County Deposit Number 1. Halifax County deposit number 1 is located about ½ miles south of the junction of State Highways 746 and State Road 616 on State Highway 746. In the deposit some very small flakes are found scattered throughout a very deeply weathered material that ia cut by pegmatites. There is some hornblende gneiss in the vicinity but it could not be determined whether or not the vermiculite occurs in hornblende gneiss because of the deeply weathered character of the material. Exfoliation tests indicate little or no excansion except for a veey limited amount on the -30/60 mesh size, The deposit definitely has no commercial possibilities.

Halifax County Deposit Number 2. Halifax County Deposit number 2 is located about 1 and ½ miles northwest of the junction of Satate Roads 623 and 624 on Sate Road 624. In the deposit some very small flakes are found scattered throughout a deeply weathered hornblende gneiss that is cut by small pegmaties and quartz veins. Exfoliation tests and screens anaylsis indicate that most of the vermiculite occurs in the -10/30 and -30/60 mesh sizes. However, expansion was very limited and the deposit is definitely not comercial.

Halifax County Deposit Number 3. Halifax County deposit number 3 is found about 1 mile east of Paces on State Road 658, on the eastern side of the Dan River. In this deposit vermiculite is found scatered throughout a hornblende gneiss that has been intrudded by small pegmatites. Exfoliation and screen anaylsis indicate that the vermiculite occurs from ~~1~~ -4 mesh to -60 mesh with most of the accunluation in the 10/30 and - 30/60 mesh sizes. The vermiculite shows good expansion qualities but the size of the deposit issmall and the tonnage available is very limited.

Halifax County Deposit Number 5. Halifax County De osit number 5 occurs about $\frac{1}{2}$ mile southeast of the junction of State Roads 674 and 672 on State Road 672. The vermiculite occurs as small pockets in a granitic gneiss. in a zone about 3 feet wide. It oc urs as small and irregular and pockets in the gneiss. Some muscovite and biotite are found in the gneiss. Screen anaylsis shows that the unexpaneed ore- material occurs is size from minus 4 mesh through minus 60 mesh. Exfoliation tests indicate that the vermiculite expahds very well but the size of the deposit is too small to permit commercial production.

Halifax County Deposit Number 6. Deposit number six in Halifax County is located about $\frac{1}{2}$ mile north of the intersection of Sate Roads 671 and 659 on 671. Here vermiculite is found scattered throughout a hornblende gneiss. that is cut by several small pagmatites. The flake size is very small and the deposit is very limited in extent. Screen analysis inficates that all of the expanded vermocilite is smaller than 10 mesh. However, exfloiation tests show that the vermiculite from this deposit expands very well.

Halifax County Deposit Number 7. Deposit number seven in Halifax County is located about 1 and $\frac{1}{2}$ miles north of the intersection of State Highway 813 and State Road 642 on State Road 642. The vermiculite occurs ~~in~~ as a lens or pod shaped deposit in a very deeply weathered felspathic material. The pods

ar lensee are very small the- and the deposit is definite y not commercial. There is some hornblende gneiss in the area. Screen analysis show that most of the expaned material from this deposit will pass through a 10 mesh screen. Eexfloistion tests indicate that the material expands very well.

Halifax Coubty Deposit Number 8. Deposit number 8 in Halifax County is located about 1 and $\frac{1}{2}$ miles north of the intersection of State Roads 641 and U.S.Highway 501. The main part of the deposit is the lens or pod-shpaed depositwhich is completely mineralized, except for some wqartz in the deposit. The Couhtry rock is a deeply weathered hornblende gneiss that has some vermiculite scattered throughout it but in very minor amounts. There are several pods in the road cut. (Picture later). Exf- Screen analysis indicate that all of the expanded material from this cut- deposit will pass through a 4 mesh screen. Exfoliationtests indicate that the material expands very good. However, from the size of the deposit is does not seem to offer commercial possibilities.

Halifax County Deposit Number 9. Deposit number 9 in Halifax County is located about 1 and $\frac{1}{2}$ miles southwest of the intersection of State Roads 683 and 659 along State Road 659 just north of Birch Creek. The deposit comsists of several narrow zones of vermiculite scattered throughout-a hornblende gneiss that occurs in the area. Screen analysis shows that most of the expanded material will pass through a 10-mesh screen with a very small per centage being caught on a 4-mesh screen. Exfoliation tests show that the material expands very weell. However, the deposit is small and does not seem to offer commercial possibilities.

Future Possibilities for Charlotte-Halifax Counties District:
The possibility of comercial deposits occuring in this district seem very slim.

Studies to date indicate that most of the deposits are very small and flakes size is also quite small. Results of exfoliation studies indicate that the best grade of vermiculire is this district occurs in the southern part of the district in Halifax County. ~~So any attempt to locate~~ Also, this part of the district seems to be underlain with considerale hornblende gneiss so any attempt to locate comercial deposits in the area should be concentrated in this part of the district.

Bedford-Franklin Counties District: The Bedford-Franklin Counties District extends from near Forest and Goode in Bedford County southwesteward to the vicinity of Taylors Store in Franklin County. The district covers an area about 25 miles long and 9 miles wide; however most of the deposits are found in a nuch smaller area about 15 miles long and 3 to 4 miles wide that is centered near Moneta in Bedford County. The district is traversed by State Highways 43, 122, and 297 and numerous secondary roads. The Roanoke River runs through the southern part of the district, ~~along to~~ separating Bedford and Franklin counties.

Most of the Bedford-Franklin Counties district is underlain by the Moneta gneiss. The Moneta gneiss is a hornblende gneiss and biotite gneiss, the two occurring as sep arate lithologic unites but being so intimatelely associated that thry cannot be msppped seaparately. They occur in parallel, alternating bands with one or the other predominating in places. The Monetas gneiss has been intrudded by numerous pegmatite, some of them quite large that are worked for feldspar in the district.

The good looking vermiculite prospects in Bedford-Franklin counties district are founf in the hornblende gneuss facies of the Moneta gneiss. Some of the deposits seem to be quite large and offer possibilities for comercial development. Such deposits are usually of the disseminated type. Vermiculite is also found in the biotite gneiss facies but such

deposits do not seem to be of high grade material. Vermiculite also occurs as pods and lensee and is found in the pegmatites in the area.

Bedford Coubty Deposit Number 2. Bedford County deposit number 2 is located about 3/4 mile east of intersection of State Highways 24 and 122. The vermiculite is in the Mometa Gneiss whicg is a hornblende gneiss and biotite gneiss.There are five zones of mineralization, the largest of which is aboyt 25 feet in width. This ;arge pocket is highly mieralized. In between the mineralized zones the biotite gneiss and hornblende gneuss is partly mineralized although the mineral content is very low. Several quartz veins are cutting the country rock. Several small inclusion of vermiculite, from six to eight inches long and four to five inches wide were noted occurring in the biotite gneiss. The whole width of mineralization as exposed in the road cut on State Highway 24. Screen analysis of the expaneed material from this deposit indicate that all of the expaned material will pass through a 4-mesh screen with the largest percent being caugth on a 30 mesh or of the size -10/30 mesh. Exfoliation tests indicate that the vermiculite expands very well.

Abo t 3000 feet to the west of deposit number 2 is a partly altered basic dike that is partly mineralized. 2-A. The zone of mineralization is about 3 feet in width and on either sode is biotite gneiss.

Screen analysis of this deposit indicates that all of the material will pass a $\frac{1}{2}$ mesh screen, with about the largest perecntage accumulation on the in the $-\frac{1}{2}/4$ mesh size. Exfoliation tests indicate good exoansion for the material from this deposit.

Bedford County Deposit Number 14. Deposit number 14 in Bedford county is located just north of Roanoke River on State Highway 122. Here small pockets of vermiculite are found scatered through out the Monetat gneiss as exposed in the road cut. At this locality the Moneta gneiss is an

alternatin hornblende and biotire gnaiss . The width of the zone in which mineralization occurs is about 75 feet. Several quartz veins are found cutting the country rock.

Screen analysis shows that the expanded material will pass through a 4 mesh screen with about equal distrobution on the ~~14~~ on all four screen sizes used. Exfoliation tests indicate fair expansion of the material

Beford County Deposit Number 4. Deposit number 4 in Bedford County is located about 1 and $\frac{1}{2}$ miles southeast of the junction os State Highway 122 and State Road 608 on State Road 608. In this deposit, which occurs in the Moneta gneiss, hornblende gneiss is partly altered to vermiculite. The zone of mineralization occur on the east side of the road and the entire zone is about 400 feet wide. The entire zone is not mineralized but there are several zones within the zone that are from 1 to 2 feet in width. The vermiculite is associated with quartz veins.

Screen analysis indicates that the expaned vermiculite from this deposit will pass through a 4-mesh screen. However, exfoliation tests indicate that the vermiculite does not expand too well.

Bedford County Deposit Number 5. Deposit number 5 in Bedford county is located about 1 and $\frac{1}{2}$ miles northwest of the jundtion of State Roads 608 and 654 on State Road 608. The deposit is best seen to the west of a small crreek and on the eastern side of the road.

The vermiculite occur in a deeply weathered Moneta gneiss. It is impossible to tell whteher the vermiculite occur in the hornblende or biotite facies of the formation. The zone of mineralization, as exposed in theroad cut, is about 2000 feet in width. The zones contains seven smaller zones of mineralization, the widest of which is approximately two feet.

Screen analysis shows that all of the expanded material will pass through a 4-mesh screen with the greatest accumulation on the ± -10/30 size. Exfoliation tests indicate that the vermiculite from this deposit does not expand well enough to be considered a commercial possibility.

Bedford County Deposit Number 1. Bedford County Deposit number 1 is located about ¼ miles west of the intersection of State Highway 122 and State Road 750 along State Road 750. The deposit ap arent;y is associated with previously discussed deposit number 14 as the two are about ¼ mile from each other in an east-west direction.

Mineralization is inhornblende gneiss facies of the Moneta gneiss. although there is some biotite gneiss in the area. The zone of mineralization as exposed in the road cut, is 100 feet, plus or minus, in width.

Screen analysis shows that all of the expaned material will pass through a 4-mesh screen, with the greatest accumulation on the -10/30 size. Exfoliation tests show that the vermiculite expands rea ily and the deposit seems to offer commercial pos ibilities.

Bedford County Deposit Number 15 is located along State Highway 122 junst north of the crissing of the above hoghway with Goos Creek, where vermiculite is exposed in the east road cut.

The vermiculite is found in the hornblende gneiss pahse of the Moneta gneiss. The depo it is rather small, however.

Screen analysis shows that the expanded material will pass through a 4-mesh screen, with the greatest accumulation of material on the -10/30 screen. Exfoliation tests indicate that the material expands only moderately well.

Bedford County Deposit Number 9. Deposit number 9 in Bedford County is located about 1 mile north of the intersection of State Roads 715 and 714 along State Road ~~1~~ 715, or just to the west of State Road ~~17~~ 715.

The ore occur along or within a pegmatite that is intrudding the Moneta gneiss. Pockets of Monenta gneiss remain in the pegmatite as xenoliths. and some of the pockets are almost completelt mineralized whereas others are only partly so. Moneta gneiss here appears to be of the biotite gneiss facies. The north wall of the pegmatite contains pockets of vermiculite that are surrounded by the biotite gneiss. The pegmatite has been mined for its feldspar content. The pegmatite also contain muscovite and some large flakes of vermiculite disseminated throughout it.

Screen analysis of the expaned ore from this deposit ~~idicuate~~ indicates that all all of the expanded ore will pass througha 4 mesh screen with the greatest accumulation on the 10 and 30 mesh screens. Exfoliation tests shpw that the vermiculite expands very well.

Bedford County Deposit Number 12. Deposit number 12 in Bedford county is located on State Road 725 about 1 and $\frac{1}{2}$ miles east of the intersection of State Highway 43 and State Road 725.

Here sveral pockets of vermiculite are found occurring in a deeply weathered material, probably some phase of the Moneta gneiss. The sone of mineralization is about 70 feet wide, with six zones cutting through the area. The widest zone is about three feet in width, with the others being smaller. The vermiculite seems to be of low grade. One rather large quartz vein cuts the zone of mineralization. About two hundred yards to west in north bank of road anorther zone with minor showing of vermiculite is found.

Screen analysis shows that the expaned ore will pass through a 4 mesh screen, with the greatest acculuhation on the 1- in the -10/30 size. Exfolia' ion tests show that the ore expands very well.

Bedford County Deposit Number 10. Deposit number 10 in Bedford County is located about $\frac{1}{4}$ mile north of the intersection of State Roads 725 and 722 on State Road 722.

The deposit is in the Moneta gneiss and occurs as a pocket about 2 feet in width. The depsit is very low grade and is not considered to be of commercial possibilities.

Screen analysis shows that the expanded material will pass through a 4-mesh screen, with only a verysmall percentage ac umulatiing on the -4/10 screen. Exfoliayion tests show that only a- the material expands very little, about 1.5 times.

Bedford County Deposit Number 11. Deposit number 11 in Bedford County is located on State Highway 43 about $\frac{1}{2}$ mile north of the intersection of State Highway 43 and State Road 724.

Here a zone of mineralization about 1000 feet wide is exposed on the northeast side of the highway. The vermiculire deposit occurs in the Moneta gneiss, of which s me of the biotite facies is exposed at the northwestern limits of the deposit. The vermiculite is concentrated at the two ends of the mineralized zone with numerous small lenses in between. Several quartz veins are cutting through the deposit at the southeastern edge with a concentration of the vermiculite along the edges.

Screen analysis shows that all of the expaned material will pass through a 4-mesh screen with only a small perce tage accumulating of this -4-/ 10 screen. The greatest accumulation is on the -10/30 screen. Exfoliation tests show the the vermiculite expands only moderately well.

Bedford County Deposit Number 6 on 732. Deposit number 6 on 732 is loca'ed is located about ½ mile south of the intersection of State Roads 732 and 73[illegible] on State Road 732.

The vermiculite deposit is in a hornblende gneiss and biotite gneiss, apparently the Moneta gneiss. Zone of mineralization as exposed in the road cut is about 600 feet in width. Theere are six small zones, varying from 1 to 2 feet in width. Near the northwestern end of msjor zone there is a z ne about 50 feet wide that is more or less compltely mineralized. Several of the zones occur along the contact with pegmatites, onw sch zone of which is about 18 inches in width. This zone occurs on the northeast side of the road. Quite a bit of hard rocks occurs in the deposit. The road cut is well covered with vegatation so there may be others zones ~~that~~ in the deposit that are covered.

Screen analysis shows that all of the expaned material from this deposit will pass through a 4-mesg screen, with the greatest percentage accunulating on the -10/30 mesh screen. Exfoliation tests shows that the vermiculite expands to about twice the orginal volumn.

Bedford County Deposit Number 7. Deposit number 7 in Bedford County is located one State Road 732 about 1 mile south of the intersection of State Roads 732 and 771.

The deposit is in the Moneta gneiss, apparently and occurs about 1 miles north of deposit number 6, so perhaps the two deposits are related. The deposit is about 20 feet in width as exposed in the road cut and occurs on the west side of the road. The zone seems to ge more or less completely mineralized. No pegmatites or quartz vrins were seen in the deposit.

Screen analysis shows that all of the expanded material will pass through at 4-mesh screen with the greatest percentage accunulating of the [illegible] -10/30 mesh screen. Exfoliation tests show that material from the deposits expands very poorly.

Bedford County Deposit Number 1 on 297. Deposit number 1 on 297 is located about ½ miles east of the intersection of State Highway 297 and tate Road 777 on State Highway 297.

A deposit of vermiculite about 200 feet occurs in a deeply weatherd host rock. Near the western edge of the deposit a zone about ~~200~~ 20 feet wide that has approximately 50 per cent vermiculite, There are eight other zones in the deposit, varying from a few inches to several feet in width. Some of the vermiculite is associated with quartz veins.

Screen analysis shows that all of the expaned material from this deposit will pass through a 4 mesh screen, with about equal accumulations on the -4/10 and -10/30 mesh screens. The bulk of the material is caught on these two screens. Exfoliayions tests indicate th volumn will increase to about double the original size.

Deposit Number 2 on
Bedford County Deposit Number 2 on 297. Deposit number 2 on 297 in Bedford County is located near intersection of ~~State Highway~~ State Highway 297 and Big Otter River.

The deposit is in a deeply weathered Moneta gneiss, which at this locality is a hornblende and biotite gneiss. The deposit is about 30 feet wide, as exposed in the road cut. There are eight zones of mineraiization of which the widest is about 1 foot.

Screen analysis shows that expanded material from this deposit will pass through a 10 mesh screen, with the bulk of the material accumulating on the -10/30 and -30/60 mesh screens, with the greatests accumulation on the -30/60 mesh screen. Exfoliayion tests indicate an increase in voumn of about 2 for material from this deposit.

About ½000 fet to west on State Highway 297 is another zone of mineralization about 40 feet wide in which there are three separate zones of mineralization.

Screen analysis shows that all.of the expaned material from this deposit will pass through a 4 mesh screen, with only a very small percentage accumulating on the -4/10 mesh screen. About 75 percebta of the material will accumulate on the 1 -10/30 and -30/60 mesh with about equal percebtages on each. Exfoliation tests indicate fair to good expansion for material from this deposit.

Deposit Number 3 on 297
Bedford County Deposit Number 3 on 297. Deposit number 3 on 297 in Bedford County is located just to the east of the intersection of State Highway 297 and State Road 715.

The depo it is in a very de ply weathered material apparently the biotite gneiss facies of the Moneta gneiss. The ae- deposit is about 100 feet wide and near the base of the road cut is a zone about 30 feet wide in which vermiculite appears to run very high but the flakes are verty small. There are a series of pockets and lenses throughout the entire zone.

Screen analysis shows that the unexpaned material will all pass through a 4-mesh screen with the grea est accumulations on -10/30 and -30/ 60 mesh screens. Exfoliaylons tess indicate very little if any expansion so the material is either a very low grade vermiculite or is some associated mica.

Deposit Number 4
Bedford County Deposit Number 4 on 297. Deposit number 4 on 297 in Bedford County is located about ½ miles west of the inersection of State highway 297 and State Road 715 just to the east a a small creek that is crosses by State Highway 297.

The deposit hear is about 3000 feet wide in a deeply weathered phase of the Moneta gneiss. The deposits consists of a series of pockets and- in which

vermiculite flakes are larger than in the material in between. The entire zone has some vermiculite in it.

Screen analysis shows that the expanded material will pass through a 10 mesh screen with the greatest accumulation on the -30/60 screen size. exfoliation tests show that the vermiculite expands only a little, with an increae in volumn of only about land ½ times.

Bedford County Number 5 on 297. Bedford County deposit number 5 on 297 is located about 3/4 of a mile west of deposit number 4 on State Highway 297.

In this deposit mineralization is found in a zone about 20 feet wide in a deeply weathered material, probably the biotite gneiss facies of the Moneta gneiss. The vermiculite seems to be in very small flakes, however.

Screen analysis shows thay expaned material from this deposit will pass through a 10-mesh screem. Exfoliation tests indicate very little expansion of the material.

Bedford County Deposir Number 6 on 297. Bedford County deposit number 6 on 297 is located along State Highway 297 about 1 mile east of the intersection of State Highway 297 and State Road 777.

This deposit of vermiculite occurs in deeply weathered Moneta gneiss, apparently the biotite facies, The deposit is about 150 feet in width as indicated by exposures along the highway. The zone appears to be about 50 per cent kineralized. The vermiculite occurs in a vein-tupe deposit, not in pockets. Sveral ~~large~~- quartz veins cut the deposit, with very large flakes of vermiculite occurring along the contact with the quartz veins.

Screen ana ysis indicates that the expaned material will pass through a 4-mesh screen but with very little material accumulating on the -4/10 size. The greatest accumulations are on the ~~1-10~~/30 and -30/60 mesh sizes.

Exfoliayoon tests indicate only moderate to poor expansion for the vermiculite from this deposit.

Bedford County Deposit Number 7 on 297. Deposit number 7 on 297 in Bedford County is located on ~~Highway~~* State Highway 297 about $\frac{1}{2}$ mile east of the intersection of State Highway 297 and State Road 777.

The deposite is in a deeply weathered biotite gneiss facies of the Moneta gneiss. Two zones of mineralization are exposed in the road cut. The main zone is about 100 feet in width that is more or less mineralized throughout its width. About 100 feet to the east a another zone about 1 foot in width as a lens or pod.

Franklin County Deposit Numberl. Deposit Number 1 in Franklin County is located aloong State Highway 122 about $\frac{1}{4}$ miles southof the point at which State Highway 122 cross the Roanoke River at the Bedford-Franklin counties line.

This deposit is in both the hornblende gneuss and biotite gneiss phase of the Moneta gneiss, with mineralization in both gneisses. The entite zone of mineralization is about 1600 feet in width, as indicated by exposures in the road cut. The deposits consists of several stringers from 1 to 5 inches in width that are all vermiculite and several wider zones, the widest of which is about 20 feet wide. This zone occurs mostly as a pocket and is in the hornblende gneiss. No pegmatites or quartz veins were noted in the deposit.

This deposit apparently is connected with deposits numbers 1 and 14 which occur just to the north side of the Roanoke River in Bedford County.

Screen analysis of vermiculite from the biotite gneiss shows the expanded material will all pass through a 10 mesh screen, with greatest accumulation on the -30/60 mesh screen. Exfoliation tests indicate very little expansion for this material.

Screen analysis of vermiculite associated with the hornblende gneiss shows that the expanded material will all pass through a 4 mesh screen with the greatest accumulstion on the -10/30 mesh size. Exfoliation tests shows that

vermiculite from the hornblende gneiss expands very well.

Screen analysis of unexpanded material from the zones that are all vermiculite show that the material will pass through a 4-mesh screen. No expanded material was found in this soze however, and all of the expanded material will pass through a 10 mesh screen. Exfoliation tests indicate that this material will expand poorly t o moderate.

Franklin County Depodit Number 2. Deposit number 2 in Franklin County is located along State Highway 122 about $\frac{1}{4}$ mile northeast of the intersection of State Highway 122 and State Road 616.

The deposit is found in the hornblende gneiss and biotite gneiss facies of the Moneta gneiss. The zone of mineralization is about 20 feet wide, as shown by the exposure in the road cut.

Screen analysis shows that the expanded material will pass through a 10 mesh screen , with the greatest accumulation of expanded material in the size -10/30. Exfoliation tests show that the vermiculite from this deposit expands poorly.

Franklin County Deposit Number 2-A. Deposit number 2-A in Franklin County is located just west of the intersection of State Highway 122 and State Road 636 along State Highway 122.

The deposit is in a deeply weathered bioti e gneiss, probably the Mometa gneiss. The deposit is about 125 to 150 feet in width with a series of vermiculite strigers, some of which are almost 100 percent vermiculite, occurring scattered throughout the zone. Most of the stringers or veins are about 1 foot in width with the widest one being 4 feet. Numerpus quartz veins cut through the deposit. About 100 feet south of this deposit there is a similar zone about 75 feet in width.

Screen analysis on the exparede material from this deposit was not made as exfoliation tests indicate that the ore e oands only slightly or very little.

Pittsylvania-Franklin Counties District: The Pittsylvania-Franklin Counties District extends from near Toshes in Pittsylvania County westward and southwestward to include most of the western and southern part of Franklin County. According to the Geologic Map of Virginia (1928) the eastern ~~of-of-the-~~ part of the district in Pittstylvania County and southeastern Franklin County is underlain by the Wissihicken formation and the western part of the district is underlain by rocks of the"Lynchburg"formation. However, most of the rocks in the Lynchburg formayion appear to be a soutyweatward extension of the Moneta gneiss in that the hornblende and biotite gneisses of the Moneta gneiss appear to extend southweatdward. However, the pegmatites that are numerous in the Bedford-Franklin Counties Distrdct are absebt here.

The depodits in this district are widely scattered throughout the distriict, with the only area showing any concentration around ~~the-~~ Toshes in Pittsylvania. Throughout the remainder of the district the depodits are very scattered with a deposit occurring only here and there.

Pittsylvania County Depodit Number 5. Deposit number 5 in Pittsylvania County is located along State Road 794 about 1 mile north of the intersection of States Roads 789 and 794 and jusy south of a small creek that flows across State Road 794.

The deposit is in a biotite gneiss with a zone of mineralization about 80 feet wide. In the mabor zone there are two smaller zones, one about 20 feet in width and the other about 30 feet wide. In between these two zones the biotite gneiss contains some vermiculite. No quartz veins are found in the deposit.

Screen analysis shows that all of the expanded materiall will pass through a 10 mesh screen. Exfoliation tests i dicate very good expansion but very small expanded material.

Deposit Number 7

Pittsylvania County Deposit Number 7. Deposit number 7 in Pittsylvania County is located along State Road 772 about 3/4 mile northeast of the intersection of State Roads 772 and 773.

This deppsit occurs in a very de ply weathered material that looks and looks like a combination of vermiculite and sericite. The zone of mineralization is about 15 fe t in width. It occurs near one of the old barite mines in the area and is exposed only on the north side of the road.

Screen ana;ysis shows that the expanded material will pass through a 10 mesh svreen., with the greatest percentage qccumul sting on the 1--10/30 screen size. Exfoliation tests indigate that the voulun will increas to about double the unexpanded material

Pittsylvania County Deposit Number 8. Deposut number 8 in Pittsylvania County is located along State Road 605 just to the north of the intersection of State Road 605 and State Highway 40.

The deposit occurs in a biotite gneiss with possibly some hornblende gneiss in area. The main zone of mineralization, as exposed in the road cut, is about loo feet in width; however, there is some mineralization to the southeast of the main zone. There are sveral zones of mineralization within the main zones with these apnes varying in width from 1 to five feet. Several quartz veins cut the orebody, with large flakes of vermiculite occurring along the quartz veins.

Screen analysis of the expanded material indicate that all will pass

a 4-mesh screen, but with very little ac umulation on the -4/10 mesh size. Exfoliation tests indicate an increase in voulmn of about double the original volumn.

Pittsylvania County Deposit Number 9. Deposit number 9 in Pittsylvania County is located at the intersection of State Highway 40 and State Road 688.

The deposit apparehtly occurs in a biotite gneiss and the deposit is about 100 feet in width as indicated by the exposure in the road cut. The entire zone is mineralized with some sections richer than others. The veemiculite in this deposit has numver minute drag folds or crenulations. No quartz veins or pegmatites are found cut ing the orebody.

Screen analysis indicates that the expahded material from this deposit will pass through a 4 mesh screen but with very little accumulation on the 14/10 size. The greatest accumulation is on the -10/30 screen.

Pittsylvania County Deposit Number 12. Deposit number 12 in Pittsylvania County is located along State Road 800 about 3/4 mile west of the intersection of State Roads 750 and 800.

This deposit is in a veey de ply weathered material, probably a biotite gneiss. The deposit consists of a series of horizontal stringers of vermiculite from 2 to 3 inches in width. No quartz veins are seen in the deposit. Tonnages avaliable in this deposit would be very small.

Screen analysis of expanded material from this deposit indicate that it will pass through a 4-mesh screen, with very littel accumulation in the -4/10 size. The greatest percebt is in the-10/30 size. Exfoliation tests indicate only moderate expansion.

Pittsylvania County Deposit Number 13. Deposit number 13 in Pitsylvania County is located along State Road 800 about ½ mile west of deposit number

12 and about 3/4 mile east of the intersection of State Roads 800 and 805.

The deposit consists of a zone about 5 feet in width that is completely mineralized. with several quartz veins cutting through the zone. Several narrow zones occur to the east of the main zone and also to the east the country rocks is a biotite gneiss.

Screen analysis indicates that all of the expanded material will pass through a 4-mesh screen but with only a small percebtage being caught on a 10 mesh screen. The greatest percentage is caught on the 30 mesh screen. Exgoliation trsts indicate very good expansion of the material from this deposit.

Pittsylvaniq County Deposit Number 15. Deposit Number 15 in Pittsylvania County is located along State Road 644 about $\frac{1}{4}$ mile west of the intersection of State Roads 644 and 783.

The deposit is in a biotite gneiss(check samples) that is cut by at least one quartz vein. The zone of mineralization is about 5o feet wide with a series of pickets in the zone. The largest pocket is about three feet wide.

Screen analysis indicates that expanded material from this de osit will pass through a 4 mesh screen but with very little being caught on the 10 mesh screen. The largest accumulation is on the 30 mesh screen. Exfoliation tests indicate good exfoliation of material from this deposit.

Pittsylvania County Deposit Number 3. Deposit number 3 in Pittsylvania County is located on State Road 605 about $\frac{1}{2}$ mile north of the intersection of State Highway 40 and State Road 605.

In this deposit there are a few poclets of vermiculire in a hornglende gneiss. The gneiss is cut by several small pegmaties but there is very little mineralozation along the pegmatites.

Screen analysis of the expanded material from this deposit indicates that all of the expanded materiall will pass al4-mesh screen, with about equal amounts being caught on the 30 mesh and 60 mesh screens. Exfoliations tests indicate that the material from this deposit offers possibilities of producing some good grade vermiculite.

Deposit numbe
Pittsylvania County Deposit Number 16. Deposit num er 16 is located about ½ mile west of the intersection of State Highway 40 and Sate Road 605 along State Highway 40.

The deposit is in a deeply weathered material and is a zone from 8 to 12 inches wide occurring along a quartz vein.

Pittsylvalina County Deposit Number 17. Deposit number 17 in Pittsylvania County is located near just east of the eastern intersection of State Highway 40 and State Road 668.

This deposit is in a de oly weathered material that is locally feldspathic. The deposits consists of a series of zones exposed in Road cuts on State Highway 40. The western zone consists consusts of 5 zones of which the widest is about 6 feet. The zones are of the stringer types and are parallel to the schistosity. About 100 feet to the easte there are two more stringers, one about 2 feet and the other 3 feet in width.

Exfolision tests indicate very little expansion of the material from this deposit so it is possible it is a very low grade vermiculite or some associated material.

Pittsylvabia County Deposit Number 18. Deposit number 18 in Pittsylvania County is located near the intersection of State Highway 40 and State Road 774 on State Highway 40.

The deposits consists of one zo e about 4 feet wide in a very deeply weathered material, with several smaller stringers to east and weat.

Screen anaylsis shows that the ~~material~~ expanded materiall will pass through a 10 mesh screen, with the greatest accumulation on the 30 mesh screen. Exfoliation tests indicate very little expansion, only about 1.5 times.

Franklin County Deposit Number 11. Deposit number 11 in Franklin County is located along Stste Highway 40 just northeast of the intersection of Stste Highway 40 and State Road 793.

The depodit occurs in a hornblende gneiss that is possibly related to the Moneta gneiss. The deposit, as exposed along the highway, is about 125 feet in width. Most of the deposit has some mineralization but most of the vermiculite is concentrated in two zone near the western end. One of these zones is about 3 feet and is almost all vermiculite. The other zones occurs to the west of this one and is perhaps 15 to 20 feet in width with a series of pockets of mineralization.

Screen analysis of the expanded material from this deposit indicates that all of the expanded material will pass through a 10 mesh screen, with the largest percent being caught on the 60 mesh screen but with a good percentage being caught on the 30 mesh screen. Exfoli tion tests indicate only moderate expansion.

Franklin County Deposit Number 12. Deposit number 12 din Franklin County is located on State Road 785 about 1 mile east of the intersection of State Road 785 and State Road 622.

The deposit consists of a few very narrow strinfers of vermiculite in a deeply weathered schist. Because of the apparent very low grade of the deposit, no screen anaylsis or exfoliation tests were run on vermiculite from this deposit.

~~Dep~~ Franklin County Deposit Number 13. Depodit number 13 in Franklin County

is located along State Road 622 about ½ mile north of the ibtersection of State Roads 622 and 785.

The deposit consists of a mineralized zone about 6 inches wide along a quarts vein in a deeply weathered schist. Several feet to east of the main zone is a kittle very loow grade veemiculite.

Screen analysis shows that allof the expanded material from this deppsit will pass throug a 4-mesh screen with the greates accumulation on the 30 mesh screen. Exfoliation trsts indicate that the material will about double volumn upon ~~heating~~ expansion.

Franklin County Deposit Number 14. Deposit number 14 in Franklin County is located along State Highway 40 just west of the intersection of State Highway 40 and State Road 670.

The deposit is in a hornblende gneiss and biotite gneiss complex, probably the Moneta gneiss. There are several small stringers of verniculite less than 6 inches in width.

Screen analysis shows that all of the expanded materiall will pass through a 10 mesh screen and exfoliayion tests indicate that the expanding qualities of the material are very poor, with an increase in voulmn of only about 1 and ½ times.

Deposit Frahklin County Deposit Number 10. Deposit number 10 in Franklin County is located on State Road 674 about ½ mile east of the intersection of State Roads 674 and 705.

The depodit occurs in a biotite gneiss and consists of a zone or stringer of almost pure vermiculite about 2 feet in width with a quartz lens in the center.

Screen analysis shows that all of the expanded material will pass through a 4 mesh screen with greatest accumulation of the 30 mesh screen.

Exfoliation tests indicate that the material has fair to good expsnsion qualities.

De- Franklin Coutnt Deposit Number b. Deposit B in Franklin County is located Along State Road 640 about ½ mile west of the intersection of State Roads 640 and 756.

The deposit is about 1009 feet in width, as exposed in the road cut, with some veemiculite scattered through the aone. The deposit is in a mica schist.

Screen analysis shows that all of the expanded material woll pass through a 10 mesh screen with the greatest accumulation on the 30 mesh screen. Exfoliation tests indicate veey liitel expansion.

Franklin County Deposit Number 16. Deposit number 16 in Franklin County is located along Stste Road 969 about ¼ miles southeast pf the intersection of State Roads 969 and 629.

The mineralizatio in this deposite appears to be in a pyroxenite but the percentage of vermiculite is very low. The zone of mineralization is about 40 feet in width.

Franklib County Deposit Number 17. Depodit number 17 in Franklin County is located along State Road 629 about 1000 feet south of the intersection of State Roads 629 and 858.

This deposit occurs in a deeply weathered mica schist, probably a biotite gneiss. The zone of mineralization is about 15 feet wide woth mineralization throughout the zone. (examine mica).

Screen analysis indicates that the expanded material from this deposit will all pass through a 10 mesh screen with the greatest amount being caught on the 60 mesh screen. Exfoliation trsts indicate that the

matetial has possibilities of producing some very good, expanded vermiculite.

Franklin County Deposit Number 8. Deposit number 8 in Franklin County is located along State Highway 890 just across the Henry-Franklin County line in Henry County. This deposit is

The deposit occurs as a zone about 10 feet wide that is almost completely mineralized. The country rock on either side of the deposit is a biotite gneiss.

Screen analysis of the expanded material indicates that all of the expanded material will pass through a 4 mesh screen but with only a very small percebtage being caught on the 10 mesh screen. The largest amount is caught on the 30 mesh screen. Exfoliation tests indicate that that the deposit will yield some material with good expahsion qualities.

Franklin County Deposit Number 9. Deposit number 9 in Franklin County is located along State Hoghway 800 about ½ miles north of the Hehry-Franklin County line. The proximity of deposits 8 and 9 suggests that these two deposit may be the exposed portions of a fairly large deposit in this area.

The mineralization in this deposit is in a basic formation, probably a hornblende gneiss. (Ghech samples). The zone of mineralozation is about 40 feet in width with only partiall mineralization. Some very large flakes in the deposit are found in associayion with a quartz vein.

Screen analysis of the expanded material from this deposit shows that all of the material will pass through a 10 m- 4 mesh screen, with a fair accumulation on the 10 mesh scren. The grwatest accumulations are on the 30 and 60 mesh screens. Exfoliation tests indicate that the depodit may yield some good quality vermiculite.

Henry County District: The Henry County District extends from near Leatherwood to include the area southweastward to the southwestern and southern parts of the county near Riadgway. The deposits in this district are concentrated in an area about 8 miles long and 4 to 5 miles wide concentrated near Ridgeway in southern Henry County. There are a few scattering deposits throughout the rest of the district.

According to the State Geologic Map the area is underlain by the Leatherwood granite and the Wissihickon formation. Most of the veemiculite occurs in hornblende gneiss, biotite gneiss, and several basici intrusives, probably pyroxenites, with some large vermiculite flakes in the pegmatites. The gneisses and granites around Ridgeway have been intruded by numerous pegmatites that have been worked for their mica content.

Henry County Deposit Number3. Depodit number 3 in Henry County is located along State Road 641 about 2 miles east of the intersection of Stste Road 641 and U.S.Highway 220.

The deposit is a naoorw stringer along a quartz veins of some very large flakes. The country rocks is indeterminable.

Henry County Deposit Number 12. Deposit number 12 in Henry County is located along State Road 641 about 1 mile spith of deposit number 3 and 3 miles south of the intersection of State Road 641 and ~~State Highway~~ U.S. Highway 220.

Most of the deposit is located in a hoenblende gneiss but some is in a gneiss that is locally garnetiferous. (Examine samples for true identification). The gneiss is cut local y by quartz veins and pegmatites(small). One zone of mineralization is about 150 feet wide in which there are several zones of mineralization. This zone is exposed along the road. About 200 feet to the northwest along a private road, a bulldozer path has exposed a- two stringers that are completely vermiculitized. These are in a hornblende gneiss.

As exfoliation tests on this material indicate very little expansion, screen analysis wwre not run on this material.

Henry County Deposit "umber 10. Deposit number 10 in Henry County is located along U.SlHighway 220 just north of the intersection of U.S. Highway 220 and State Road 734.

The deposit is a zone about 400 feet in width in a deeply weathered material, probably a biotite and hornblende gneiss. Several small pegmatites cut thruugh the zone. Minera ization is dissemnated throughout the zone.

Exfoliation tests indicate very little if any expansion of material from this deposit, so screen anaylsis of expanded material were hot made.

Henry County Deposit Number 4. Henry County Deposit number 4 occurs along State Road 641 about $\frac{1}{2}$ mile south of the intersection of State Road 641 and State Road 640.

The deposit consists of a zone about 1 foot wide that occurs along the contact between a pegmatite and a hornblende gneiss. Mineralization decreases away from the pegmatite and finally ceases entirely about 1 foot away. Seems to be in support of hyrdothermal alterartion theory.

Exfoliation tests indicate veey little expansuon for the vermiculite from this deposut, however. So no scre n analysis were run.

Table VII, 7. Powder diffraction data for hydrobiotite

1		2		3		4	
d	I	d	I	d	I	d	I
11.4	10			11.75	10		
		10.0	10			9.7	10
4.55	2	4.55	2	4.55	2	4.55	2
		4.25	1	4.15	0.5		
3.40	8			3.41	1		
3.33	2	3.30	8 b				
				3.11	1	3.20	6
2.61	8	2.61	8	2.61	4	2.61	4
2.42	4	2.43	4	2.45	2	2.45	2 d
2.28	1 d	2.27	1	2.30	0.5 d		
2.17	1 d	2.16	2	2.19		2.18	0.5 d
				2.11	0.5		
1.992	1	1.98	1	1.99	0.5		
		1.89	1				
		1.81	0.5				
1.727	0.5	1.730	0.5				
1.675	1 d	1.655	2			1.685	1
1.530	6	1.525	6	1.531	4	1.529	4
		1.505	2				
1.320	1	1.317	1	1.320	1	1.320	1
1.296	0.5	1.293	0.5	1.298	0.5	1.296	0.5
1.266	0.5	1.265	0.5	1.271	0.5	1.270	0.5

FeK radiation ; d in kX ; I, relative intensity estimated visually.

1. Hydrobiotite, Mpwapwa, Morogoro, Tanganyika
2. As 1, heated at 700° C for 24 hours.
3. Hydrobiotite, Sao Paulo, Brazil.
4. As 3, heated at 700° C for 24 hours.

Table VII, 3. Diffraction data on vermiculite from West Chester, Pa.

1		2		3		4		5	
d	I	d	I	d	I	d	I	d	I
14.2	10	14.0	10	14.1	4 d				
				9.2	6 d	9.23	8	9.26	8
7.1	2 d								
4.75	0.5								
4.58	5	4.56	4	4.56	6	4.50	2	4.53	6 b
4.38	3							4.41	
3.75								3.83	2 b
3.51	6	3.50	4						
3.42	5	3.44	6						
				3.00	10	3.02	10	3.09	10
2.81	4	2.86	2			2.86	4		
2.74	1	2.75	2						
2.63	5	2.61	4	2.63	8	2.61	8	2.613	2 b
2.53	3			2.59	2			2.578	
2.49	0.5	2.47	2	2.46	10	2.46	10	2.447	10
2.373	4 b	2.38	2						
2.291	0.5	2.29	2						
2.187	0.5			2.18	2	2.18	4	2.178	4
2.084	0.5	2.09	2	2.08	2	2.08	4	2.089	2
2.006	1								
1.963	0.5	1.96	0.5						
				1 895	1	1.89	2	1.897	1
1.736	1	1.73	1	1.73	1	1.74	1		
		1.67	0.5					1.663	6 b
1.649	0.5			1.65	1	1.64	1 d	1.647	4 b
1.530	6	1.528	6	1.528	8	1.523	6	1.517	8
1.501	0.5							1.499	2
								1.453	2
1.438	0.5	1.439	2					1.440	1
1.406	0.5								
				1.360	2 d	1.366	2	1.384	8 b
1.325	2	1.321	4	1.319	1				
1.311	2							1.307	2
				1.285	1			1.289	4 b
1.270	0.5	1.269	0.5	1.273	0.5				

FeK radiation ; d in kX ; I, relative intensity estimated visually ; d=diffuse ; b=broad.

1. Vermiculite, Brinton's quarry, West Chester, Pa.
2. Vermiculite heated at 200° C for 2 hours.
3. Vermiculite heated at 500° C for 24 hours.
4. Vermiculite heated at 700° C for 24 hours.
5. Talc (Gruner 1934).

X-RAY POWDER FILM DATA
DEPARTMENT OF GEOLOGY
UNIVERSITY OF VIRGINIA

Date
Investigator
Film number 724
Radiation and filter Fe
Source of material
~~Loudoun County~~ #13

Center = 14.805

Line no.	Measurements	I	2θ	θ	$\sin^2\theta$	d_{hkl}	n	h k l
B 1	15.86	B	10.05			11.0506		
2	17.20		23.95			~~4~~4.6653	L	
C 3	18.08	C	31.75			3.5387		
-2	12.41							
-3	11.55							
-4	10.55							
A 4	19.05	A	42.15			2.6738		
5	19.40		45.95			2.4899		
6	20.00		51.95			2.2101		
7	20.47		56.65			2.0402		
9	22.49		76.85			1.5575		
8	21.77		69.65			1.6950		
1								

d values for 3 most intense lines, A)_____, B)_____, C)_____

Crystal system_____ a_o_____, b_o_____, c_o_____
Bravais lattice_____ V_____, G_____, M_____
Space group_____ Z_____. c/a_____
Symmetry class_____

Name of substance_____

Similar To L166Y, Mt. Material.

X-RAY POWDER FILM DATA
DEPARTMENT OF GEOLOGY
UNIVERSITY OF VIRGINIA

Date
Investigator
Film number 720
Radiation and filter
Source of material
Louisa Co. #1

Center = 15.375°

Line no.	Measurements	I	2θ	θ	$\sin^2\theta$	d_{hkl}	n	h k l
1	16.14	A	7.85°			14.512	L	
2	16.51		11.35°			9.7987		
3	16.65°		12.90			8.6169		
4	17.77	B	23.95			4.6653	L	
5	18.40		30.25°			3.7129		
6	18.90	C	35.25°			3.1990		
7	19.21		38.35°			2.9475		
8	14.80							
6	11.83							
7	11.51							
8	19.67		42.95°			2.6640	L	
9	20.60		46.25°			2.4154	L	
10.	23.00		76.25°			1.5856	L	

d values for 3 most intense lines, A)_____, B)_____, C)_____

Crystal system_____ a_o_____, b_o_____, c_o_____
Bravais lattice_____ V_____, G_____, M_____
Space group_____ Z_____. c/a_____
Symmetry class_____

Name of substance_____

X-RAY POWDER FILM DATA
DEPARTMENT OF GEOLOGY
UNIVERSITY OF VIRGINIA

Edmonds VER 2 cell.

VER.

Date
Investigator
Film number 788
Radiation and filter
Source of material
Bird. Ca. #2-A

Center = 16.36

Line no.	Measurements	I	2θ	θ	$\sin^2\theta$	d_{hkl}	n	h k l
1	16.99	A	6.3			14.029	L	
2	17.07		7.1			12.45		
3	18.27		19.1			4.64	L	
~~3~~	14.47		~~24.6~~			~~3.59~~		
4	18.85		24.9			3.57	L	
5	19.43		30.7			2.91		
6	19.71	C	33.5			2.67	L	
~~6~~	13.02							
7	20.02		36			2.45	L	
8	21.54		51.8			1.76	L	
9	21.74		53.8			1.70	L	
10	22.28	B	59.2			1.56	L	
~~10~~	10.44							

d values for 3 most intense lines, A)_____, B)_____, C)_____

Crystal system_____ a_o_____, b_o_____, c_o_____
Bravais lattice_____ V_____, G_____, M_____
Space group_____ Z_____. c/a_____
Symmetry class_____

Name of substance -VER-

Expands very well

X-RAY POWDER FILM DATA
DEPARTMENT OF GEOLOGY
UNIVERSITY OF VIRGINIA

Date
Investigator
Film number 791
Radiation and filter
Source of material
Bird-Sind Co. #12

Center = 14.10

Line no.	Measurements	I	2θ	θ	$\sin^2\theta$	d_{hkl}	n	h k l
1	14.96		8.6			10.281		
2	15.32		12.2			7.2545		
3	16.05		19.5			4.3521		
4	16.21		21.1			4.2104		
5	16.58		24.8			3.5900		
6	16.74	B	26.4			3.3759		
6	11.46							
7	17.52	A	34.2			2.6217		
7	10.67							
8	17.81		37.1			2.4232		
9	18.26		41.6			2.1709		
10	18.63		45.3			2.0018		
11	19.59		54.9			1.6723		
12	20.13	C	60.3			1.5348		
12	8.08							

d values for 3 most intense lines, A)_____, B)_____, C)_____

Crystal system_____ a_o_____, b_o_____, c_o_____
Bravais lattice_____ V_____, G_____, M_____
Space group_____ Z_____. c/a_____
Symmetry class_____

Name of substance hydrob.

X-RAY POWDER FILM DATA
DEPARTMENT OF GEOLOGY
UNIVERSITY OF VIRGINIA

Edwards

Date
Investigator
Film number 787
Radiation and filter
Source of material
F.C. #13

Center = 13.375

Line no.	Measurements	I	2θ	θ	$\sin^2\theta$	d_{hkl}	n	h k l
1	12.55		8.25			10.717		
2	15.28		19.05			4.6586		
3	15.96	A	25.85			3.414		
~~3~~	10.79							
4	16.15		27.75			3.21		
5	16.38		30.05			2.97		
6	16.73	B	33.55			2.67		
6	10.01							
7	17.01		36.35			2.47		
8	17.28		39.05			2.30		
9	17.46		40.85			2.20		
10	17.88		44.25			2.041		
11	18.78		52.05			1.69		
~~11~~	7.98							
12	19.30	C	59.25			1.55		

d values for 3 most intense lines, A)_____, B)_____, C)_____

Crystal system_____ a_o_____, b_o_____, c_o_____
Bravais lattice_____ V_____, G_____, M_____
Space group_____ Z_____. c/a_____
Symmetry class_____

Name of substance Pb(OH)Br

X-RAY POWDER FILM DATA
DEPARTMENT OF GEOLOGY
UNIVERSITY OF VIRGINIA

EXPANDED VERY WELL

Date
Investigator
Film number 721
Radiation and filter
Source of material FRANKLIN CO. N 8

Center = 17.187

Line no.	Measurements	I	2θ	θ	$\sin^2\theta$	d_{hkl}	n	h k l
1	18.80	B	11.13			9.9813		
2	19.56		23.73			4.7080	L	
3	20.45	A	32.63			3.4458	L	
4	21.44	C	42.53			2.6690	L	
5	21.58		43.93			2.5879	L	
6	21.80		46.13			2.4709	L	
-1	16.17							
-2	14.80							
-3	13.94							
-4	12.94							
7	22.34		51.53			2.2269	L	
8	24.15		69.63			1.6954	L	
9	24.88		76.93			1.5361	L	

d values for 3 most intense lines, A)_____, B)_____, C)_____

Crystal system_____ a_o_____, b_o_____, c_o_____
Bravais lattice_____ V_____, G_____, M_____
Space group_____ Z_____. c/s_____
Symmetry class_____

Name of substance_____

BEDFORD COUNTY VERMICULITE

No. 2- On route 24 about 3/4 mile east of intersection of routes 24 and 122. Exposed in both sides of road. In moneta gneiss which is a biotite and hornblende gneiss. Five different mineralized zones. ~~widest about five feet.~~ One pocket exposed about 25 feet wide. This pocket is highly mineralized. In between the mineralized zones biotitite gneisss and hornblende gneiss thar is partly mineralized. Several quartz veins are cutting the country rock. Several small inclusions of vermiculite, 6 to 8 inches long and 4 to 5 inches wide were noted occurring within the biotite gneiss. The whole width of mineralization is about 25 feet. Samples 2 and 2-A from this exposure.

About 3000 feet west of main zone of mineralization there is a parlty altered hornblende gneiss(dike) Zone about 3 feet wide. Biotite gneiss on either side of mineralized zone.

No. 14 There ~~is a very minor occurrence~~ are several minor occurrences of vermiculite along 122 between the junction of 24 and 122 and 24 and 122. In these occurrences , which occur in deeply weathered gneisses, very small pockets of vermiculite occur associated with small quzrtz veins.

No. 4 Moneta gneiss locally aletered to vermiculite. Series of hornblende gneisses that are partially altered to vermiculite. Moneta gneiss is an alterating hornblende and biotite gneiss. locally contains vermiculite, especially where cut by quartz veins. Zone exposed on east side of road, aboit 4000 feet wide. Located on State Road 608 about 1 and 1/2 miles east of Moneta. Several zones that contain some vermiculite.

No. 5. Deeply weathered Moneta gneiss that contains 7 zones of vermiculite. Two of the widest are about 2 feet in width. The others are lesss than one foot. One deeply weathered basic intrusive in zone. Zone about 20000 feet wide.

No. 1 Bedford County. Along north side of State Road 750 about 1/2 mile west of 122. 100 fet, plus or minus, of mineralizations Mainly a hornblende gneiss that is partly altered to vermiculote. Some biotite gneiss in zone of mineralization.

NO. 14. Road cut on 122 just north of Roanoke River in Bedford county where 50 to 100 feet of horndb ede and iotite gneiss is exposed. Small pockets of vermiculite in hornblende gneiss. Several quartz veins cutting country rock.

No. 15- Moneta gneiss in which hornblende phase is partially altered to vermiculite. North of Goose Creek on 122. East road cut.

No.6 Bed. County on 732

In Hornblende and biotite gneiss. One vein next to small pegmatite. Sample from here. 18 inches wide. Northeast side of road. Zone of mineralization 600 feet wide. 6 zones of mineralization i to 2 feet wide. Near norrhwest end of of zone of mineralization a zone about 50 feet in width more or less mineralized completely. On zone in southeast end next to pegmatite . Quite a bit of hard rock in zone. Road cut well covered with vegatation so may be more zones.

No. 7 Bed. County. On 732 north of number 6. Zone 20 feet wide more or less e completely mineralized . West side of road. No pegmatites or quartz veins in zone/

No. 1 on 297 Bedeeun- County. Host material deeply weathered. Some vermiculite associated with quartz veins. Zone 200 feet wide. Near western end zone 20 feet wide with perhaps 50 per cent mineralized. E ght other zones, from a few inches to several feet wide.

No. 2 on 297 Bedford County. In deeply weathered Moneta gneiss, biotite and hornblende. 8 zones of mineralization in zone 30 feet wide. Widest zone 1 foot. About ~~1/4~~ 1/4 mile to west on 297 another zone about 40 feet wide with 3 zones of mineralization. Some mineralization in entire zone. Sample 2-A on 297.

No. 3 on 297. Zone aboit 100 feet wide in a very deeply weathered sap. Near base of road cut a zone about 30 feet wide in which vermiculite runs very high but small flakes. Series of pockets and lenses of vermiculite around main zone. If expands, good prospect for small flakes.

No. 4 on 297. Zone about 300 feet wide in which a series of pockets in which flakes are larger than flakes in material in between. Entire zone has some vermiculite/

No. 5 on 297. Similar to no. 4 Zone exposed in both banks of road. One zone about 20 feet wide with good mineralization as small flakes.

No. 6 on 297. 130 foot zone probably 50 per cent mineralized. Several quartz veins with large flakes next to quartz vein. Vermiculite in veins, not pockety.

No. 7 on 297. Two zone exposed in road cut. One zone about 100 feet east has one pod or lense that reaches a maximum of 1 foot. About 100 feet to west another zone more or less mineralized with small flakes. No mineralization in between two zone.

Vermiculite-Franklin County

Number 11. Zone about 125 feet. Most of zone contains some mineralization., but most mineralization two zones on northwest. One zone 3 feet, plus or minus, almost completely mineralized. To northwest another zone 15 to 20 feet wide with a series of pockets of mineralization. In Moneta gneiss ?

Number 12. A deeply weathered mica schist with a few very narrow zones of vermiculite.

Number 13. Mineralized zone about 6 inches wide with a quartz vein in zone. Several feet to east some mineralization, low grade.

Number 14. Several narrow stringers in a biotite gneiss and hornblende gneiss. Veins less than six inches wide.

Number 10. Zone of pure vermiculite about 2 feet wide. Quartz lens in center. Country rock biotite gneiss.

Number 1. Zone about 300 feer wide with mineralization. Biotite gneiss and and hornblende gneiss. Mineralization in both. One pocket in hornblende gneiss about 20 feet wide. Some stringers 1 to 5 inches wide with complete mineralization. Good prospect. Samples 1-A Biotite gneiss; 1-B complete; 1-C Hornblende gneiss. Mineralization extends to west along 122 for several hundred feet. Zone of mineralization about 1000 feet or more. No pegs seen or quartz veins.

Number 2. Zone of mineralization about 20 feet wide in a hornblende and biotite gneiss.

Number 2-a. Zone 125 to 150 feet wide in biotite gneiss with a series of almost pure vermiculite. Widest about 4 feet. Most run around 1 foot. Numerous quartz veins. About 100 feet down 122 to Rocky Mount another similar zone. This zone 75 feet in width.

B. Zone 100 feet wide with some mineralization. Small flakes. X-Ray.

Number 16. a pyroxenite. Percentage of vermiculite very low. Zone about 40 feet wide with mineralization.

Number 17. Zone about 15 feet wide with vermiculite throughout. Host rock probably a niotite gneiss. Material deeply weathered. Examine with mica.

Number 8. Zone about lo feet wide almost completely mineralized. Matetial on either side a biotite gneiss. Chemival Analysis.

Number 9. Basic formation. Mineralized zone 40 feet wide. only partially mineralized. Some large flakes associated with a quartz vein. 8 and 9 only looo feet apart.

Pittsylvania County

Number 5.- Country rocks is a biotite gneiss. Zone of mineralization about 80 feet wide. One zone about 20 feet and another zone about 30 feet. with high percentage of vermiculite. In between ~~bite~~ biotite gneiss contains some vermiculite. No quartz veins.

Number 7.- Unique occurrence. Looks like may be in shear zoneappearing body. About 15 feet wide. Looks like combination of vermiculite and sericite. Vermiculite intermixed with sericite. Exposed on north side of road only. ~~Near~~ Just west of old barite mines.

Number 8.- In biotite gneiss(Moneta gneiss?) Main zone of mineralization about 100 feet wide. Some mineralization to southeast of main zone. Several quzrtz veins in zone. Large flakes around quartz veins. Most zones of mineralization about one feet in width with widest perhaps five feet.

Number 9. Zone 100 feet wide almost completely mineralized. Host rock apparently a biotite gneiss. Richer in some zones than others. Good prospect if expands. Seeems to be in zone of drag foldings or crenulations.

Number 12. In deeply weathered, probably biotite gneiss. Series of horizontal layers 2 to 3 inches thick. Probably a very small tonnage available. No quartz veins.

Number 13. Zone about 5 feet wide almost completely mineralized. Several quartz veins in zone. (Chemical analysis of samples. several narrow zones to east. To east country rock biotite gneiss.

Number 14. Biotite gneiss(Check country rock in bag)/ Zone about 50 feet wide. with a series of pockets. One pocket about three feet wide. Quartz vein cuts pocket.

Number 2. Very low grade material.

Number 3. Few very small pockets of vermiculite in Moneta gneiss. Moneta gneiss cut by pegmatites but very little mineralization along pegs.

Number 16. Very good looking exposure along quartz vein. 8 to 12 inches wide.

About 1000feet east of Number 9 a zone about 50 feet wide with a series of ver miculite zones, about 6 to 12 inches in width. Small flakes.

Number 17. Western zone 25 feet wide with 4 or 5 zones widest of which is about 6 feet. Parellel to schistosity. Apparently not in pockets. About loo feet to east 2 more zones. One zone about 3 feet and another about 2 feet. Country rock deeply weathered and locally feldspathic. Sample from eastern zone.

Number 18. One vein about 4 feet looks good. several smaller zones to east and west. In a very deeply weathered material.

Lousia County no. 1.

In hornblende gneiss. Several pegs cut orebody. Several non-mineralized hornblende dikes or xenoliths. Orebody 75 feet wide.

Lousia County no. 2.

200 feet wide as exposed in road cut. Hornblende gneiss cut by small pegs. Check samples to see ~~whte-~~ whether from hornblende to biotite to vermiculite.

Charlotte County

No. 4. Some vermiculite in a hornblende gneiss. Very narrow zone, not commercial. Along small pegmatite.

No. 3. Pods or lens-shaoed zone of completely vermiculite in a hornblende gneiss. cut by pegs and quartz veins.

No. 2. Zone 25 to 30 fee t wide in a hornblende gneiss with some very fi small flakes of vermiculite. Qtz veins and pegs cut rock.

Halifax County

No. 7. Lens or pod type in a deeply weathered feldspatic material. None commer. very small pods. hornblende gneiss in area.

No. 5. Small pockets in a granite gneiss. Zone 3 feet wide with some. Occurs in very small pockets and irregular. in granite gneiss. Some muscovite and b otite present.

No. 6. Vermiculite scat ered through a hornblende gneiss. Exposure small. Peg. cut horndlende gneiss.

No. 9. Several zones of vermiculite in a hornblende gneiss.

No. 3 Some very scatering small amounts of vermiculite in a hornblende gneiss cut by pegs. Check for hornblende?

No. 10. A zone about 10 feet wide in a deeply weathered material. Biotite and hornblende gneiss in area. Hard to tell what parent rock was. Pegs cut rock. Mineralization disseminated throughout zone.

No. 1. Some very small flakes in a deeply weathered material. cut by small pegs. Quite a bit of hornblende gneiss in area. Not commercial.

No. 2. Some very small flakes in a deeply weathered hornblende gneiss. vut by small pegs and qtz veins. Not com ercial.

No. 8. Pod or lens-shaped deposit completely vermiculitized, escept for some qtz. ~~in a~~ Country rock a deeply weathered hornblende gneiss. with some fine-grained ver. Several pods in road cut. Picture.

Number 9. Bedford County. Pegmatite intrudding Moneta gneiss. Pockets of Moneta gneiss remsin in pegmatite, as xenoliths. Some pockets alomost completely vermiculitized. Others only parlty. Pegmatite to north contains some vermiculite flakes. Mineta gneiss here appears to have been almost completely a biotite gneiss. Pegmatite has been mined and is being mined today for feldspar by Mr. Nance of Bedford. Some biotite in pegmatite. North wall of pegmatite contains pockets ofvermiculite surrounded by deeply weathered biotite gneiss. Prospect not too good.

Number 12 on State Road 725. Several small pockets of vermiculite in a deeply weathered material. One rather large quartz vein cuts area. Vermiculite seems punky. Zone of mineralization 70 feet in width. Six zones of vermiculite in area. One about 3 feet in width, others less than one foot. Several hundred yards to west in north bank of road cut another zone with minor showinhs of vermiculite.

Number 10. A minor occurrence of some low grade ore. In Mineta gneiss. Vermiculite pocket about 2 feet in width.

Number 11. On Route 43. Over 1000 feet wide. In Moneta gneiss. Veemiculite seems concentrated at northwestern and southeastern limits. In between are numerous smalll lenses. The country roock seems to contain some vermiculite. Some unaltered biotite gneiss at northwestern limits. Several quartz veins are seen cutting southeastern edge. Concebtration of veemiculite along quartz veins.

Henry County

No. 3. Large flakes along quartz vein. Country rock indeterminable.

No. 12. Zone 150 feet wide with several zones of mineralization. Cut by pegs and quartz veins. Lovally garnetiferous . Examine samples for identification. About 200 feet to northwest along privaye road a bulldozed has uncovered two veins of completely mineralized material in nornblende gneiss.
Sample 12-A has ~~tura-~~ touramaline crystals from zone about 1 foot wide, completely mineralized.

No. 4 Zone about 1 foot wide against a peg. Mineralization decreases away from peg. Mineralization in Hornblende gneiss. Good example of hydrothermal alteration.

No. 10. Zone as exposed 40 feet wide in a deeply weathered mate ial, probably biotite and hornblende gneiss. Hoard to tell what parent rock was. Pegs cut rock. Mineralization disseminated throughout zone.

HRI, Sax Co. #1

Wyoming

SCREEN ANALYSIS AFTER EXPANSION

SIZE	WT.	VOL.	WT. CU. FT.	EXFOLIATION RATIO
- ½+4				
- 4+10				
- 10+30				1.11
- 30+60	47.9	71		1.07
- 60	94.9	120		

SCREEN ANALYSIS

Sample No. HALIFAX Co. #1

Before Expansion			After Expansion		
Size	Wt.	Vol.	Size	Wt.	Vol.
-½+4			½+4		
- 4+10	6.0	8.0	- 4+10	5.2	8.0
- 10+30	28.0	34.0	- 10+30	27.0	36.0
- 30+60	43.2	53.0	- 30+60	40.7	57.0
- 60	93.7	112.0	- 60	87.7	

Halifax Co. # 2

No good
Ver. cent. very coarse

SCREEN ANALYSIS AFTER EXPANSION

SIZE	WT.	VOL.	WT. CU. FT.	EXFOLIATION RATIO
- ½+4				
- 4+10	7.4	7		1.09
- 10+30	57.8	62		1.11
- 30+60	85.9	101		1.17
- 60	65.8	71		1.11

SCREEN ANALYSIS

Sample No. +1A1, -5n+ co. #2

Before Expansion			After Expansion		
Size	Wt.	Vol.	Size	Wt.	Vol.
-½+4			½+4		
- 4+10	31.5	30.0	- 4+10	30.9	32.0
- 10+30	72.7	67.0	- 10+30	70.8	77.0
- 30+60	62.3	58.0	- 30+60	61.4	68.0
- 60	58.4	54.0	- 60	55.7	60.0

HABSAX Co. #3

SCREEN ANALYSIS AFTER EXPANSION

SIZE	WT.		VOL.	WT. CU. FT.	EXFOLIATION RATIO
- ½+4					
- 4+10	~~38.7~~				2.69
- 10+30	21.6 / ~~38.7~~	31.2	125 .173 / 157	10.9	3.00
- 30+60	36.9	47.5	240		2.66
- 60	78.8	21.6	108		1.79

SCREEN ANALYSIS

Sample No. HALIFAX CO. #3

Before Expansion			After Expansion		
Size	Wt.	Vol.	Size	Wt.	Vol.
-½+4			½+4		
- 4+10	15.5	16.0	- 4+10	14.8	43.0
- 10+30	65.6	66.0	- 10+30	62.8	198.0
- 30+60	71.0	70.0	- 30+60	68.0	186.0
- 60	63.5	57.0	- 60	60.0	102.0

9\A1.f A+ coi+5

SCREEN ANALYSIS AFTER EXPANSION

SIZE	WT.		VOL.	WT. CU. FT.	EXFOLIATION RATIO
- ½+4					
- 4+10	1.6 / 12.1	13.9	8 / 10 .2	12.6	2.58
- 10+30	16.5 / 78.4	29.1	50 / 225 .206	13.0	2.15
- 30+60	72.1	30.2	141		1.62
- 60	63.1	17.7	83		1.05

SCREEN ANALYSIS

Sample No. Halifax Co. #5

Before Expansion			After Expansion		
Size	Wt.	Vol.	Size	Wt.	Vol.
-½+4			½+4		
- 4+10	52.8	60.0	- 4+10	51.2	155.0
- 10+30	61.9	73.0	- 10+30	59.9	157.0
- 30+60	59.9	72.0	- 30+60	58.4	117.0
- 60	58.7	69.0	60	56.5	73.0

HOUSAY CO. #6

SCREEN ANALYSIS AFTER EXPANSION

SIZE	WT.		VOL.	WT. CU. FT.	EXFOLIATION RATIO
- ½+4					
- 4+10					1.59
- 10+30	18.2 / 45.3	32.6	93 · 1.97 / 120	12.61	2.37
- 30+60	86.7	48.8	185		2.18
- 60	59.5	19.5	74		1.41

SCREEN ANALYSIS

Sample No.

Before Expansion HAL, SAN cut 6

After Expansion

Size	Wt.	Vol.	Size	Wt.	Vol.
-½+4			½+4		
- 4+10	47.4	47.0	- 4+10	45.9	75.0
- 10+30	31.0	32.0	- 10+30	29.5	76.0
- 30+60	84.9	91.0	- 30+60	82.8	191.0
- 60	51.8	52.0	- 60	49.5	73.0

tPLA1, fnr co#7

SCREEN ANALYSIS AFTER EXPANSION

SIZE	WT.		VOL.	WT. CU. FT.	EXFOLIATION RATIO
- ½+4					
- 4+10	2.4	1.1	5		1.90
- 10+30	15.2 / 51.2	24.7	43 / 188	22.2	1.65
- 30+60	99.6	49.2	215		1.39
- 60	65.5	25.7	110		1.12

SCREEN ANALYSIS

Sample No. Halifax Co. #7

Before Expansion			After Expansion		
Size	Wt.	Vol.	Size	Wt.	Vol.
-½+4			-½+4		
4+10	33.7	41.0	- 4+10	31.8	78.0
- 10+30	71.0	88.0	- 10+30	67.0	145.0
- 30+60	68.4	93.0	- 30+60	64.8	130.0
- 60	58.0	79.0	- 60	54.4	89.0

Holiday Cash

SCREEN ANALYSIS AFTER EXPANSION

SIZE	WT.	VOL.	WT. CU. FT.	EXFOLIATION RATIO
- ½+4				
- 4+10	6.8 / 16.8 / 9.7	35 / 49 .194	12.2	3.68
- 10+30	30.8 / 60.6 / 58.6	190 / 294 .162	10.2	2.95
- 30+60	32.5 / 25.6	128		2.29
- 60	14.8 / 6.0	30		1.37

X-RAY

SCREEN ANALYSIS

Sample No. HALIFAX CO. #2

Before Expansion			After Expansion		
Size	Wt.	Vol.	Size	Wt.	Vol.
-½+4			-½+4		
- 4+10	419.0	58.0	- 4+10	415.5	213.0
- 10+30	48.0	73.0	- 10+30	44.5	215.0
- 30+60	24.5	38.0	- 30+60	23.0	87.0
- 60	14.0	19.0	- 60	12.5	26.0

HALLSAT CO #9

SCREEN ANALYSIS AFTER EXPANSION

SIZE	WT.		VOL.	WT. CU. FT.	EXFOLIATION RATIO
- ½+4					
- 4+10	LITTLE EXP. MAT. HERE 2.7	2.2	12		1.85
- 10+30	26.7 / 90.9	41.3	142 : 187 / 238	11.8	2.19
- 30+60	100.2	39.4	220		2.52
- 60	69.8	17.0	95		1.5

SCREEN ANALYSIS

Sample No. HALIFAX CO. #9

Before Expansion			After Expansion		
Size	Wt.	Vol.	Size	Wt.	Vol.
-½+4			-½+4		
- 4+10	69.3	64.0	- 4+10	66.5	123.0
- 10+30	88.7	84.0	- 10+30	85.1	186.0
- 30+60	74.6	76.0	- 30+60	71.3	181.0
- 60	64.5	63.0	- 60	60.4	90.0

~~Halifax Co. #4~~
HENRY Co. II 4
No good

SCREEN ANALYSIS AFTER EXPANSION

SIZE	WT.	VOL.	WT. CU. FT.	EXFOLIATION RATIO
- ½+4				
- 4+10	14.2	16		
- 10+30	58.1	66		
- 30+60	66.3	80		
- 60	50.6	56		

SCREEN ANALYSIS

Sample No. HALIFAX Co. #4

Before Expansion			After Expansion		
Size	Wt.	Vol.	Size	Wt.	Vol.
-½+4			-½+4		
- 4+10	21.8	24.0	- 4+10	21.5	25.0
- 10+30	60.6	70.0	- 10+30	59.5	70.0
- 30+60	67.0	76.0	- 30+60	64.0	77.0
- 60	48.5	53.0	- 60	45.1	53.0

LOUISIANA Co. #2

SCREEN ANALYSIS AFTER EXPANSION

SIZE	WT.		VOL.	WT. CU. FT.	EXFOLIATION RATIO
- ½+4					
- 4+10	1.3 / 7.4	3.3%	9 / 75	9.14	2.01
- 10+30	18.6 / 91.9	42.8	107 / 196	11.0	2.34
- 30+60	95.5	34.1	178		1.88
- 60	54.9	16.8	77		1.37

SCREEN ANALYSIS

Sample No. LOUISIA CO. #2

Before Expansion			After Expansion		
Size	Wt.	Vol.	Size	Wt.	Vol.
-½+4			½+4		
- 4+10	61.7	54.0	- 4+10	59.2	109.0
- 10+30	76.5	72.0	- 10+30	73.4	168.0
- 30+60	80.0	80.0	- 30+60	76.5	150.0
- 60	43.6	43.0	- 60	40.6	59.0

HERB ~~MALINE~~ Co. #10

no good

SCREEN ANALYSIS AFTER EXPANSION

SIZE	WT.	VOL.	WT. CU. FT.	EXFOLIATION RATIO
- ½+4				
- 4+10				0
- 10+30	85,3	93		1,13
- 30+60	102,9	120		1,17
- 60	68,2	75		1,05 ~~1,00~~

SCREEN ANALYSIS

Sample No. HALIDAY #10

Before Expansion			After Expansion		
Size	Wt.	Vol.	Size	Wt.	Vol.
-½+4			-½+4		
- 4+10	75.6	72.0	- 4+10	74.1	73.0
- 10+30	74.6	75.0	- 10+30	73.6	86.0
- 30+60	77.5	80.0	- 30+60	76.6	90.0
- 60	52.7	57.0	- 60	50.9	60.0

[illegible] Co. [illegible]

SCREEN ANALYSIS AFTER EXPANSION

SIZE	WT.	VOL.	WT. CU. FT.	EXFOLIATION RATIO
- ½+4				
- 4+10	~~37.6~~	~~54~~		~~1.24~~
- 10+30	37.6	54		~~1.50~~
- 30+60	47.3	75		~~1.64~~
- 60	39.3	63		~~1.71~~

SCREEN ANALYSIS

Sample No. Halsey CH#12

Before Expansion			After Expansion		
Size	Wt.	Vol.	Size	Wt.	Vol.
-½+4			-½+4		
- 4+10	18.9	22.0	- 4+10	17.8	22.0
- 10+30	46.8	64.0	- 10+30	44.6	66.0
- 30+60	48.7	72.0	- 30+60	45.8	75.0
- 60	36.5	58.0	- 60	33.9	58.0

H ~~HFAX~~ HENRA Cei #12-A
no good

SCREEN ANALYSIS AFTER EXPANSION

SIZE	WT.	VOL.	WT. CU. FT.	EXFOLIATION RATIO
- ½+4				
- 4+10	65.5	59.		0
- 10+30	76.6	82		
- 30+60	39.6	52		
- 60	25.7	32		

SCREEN ANALYSIS

Sample No. HALIFAX C.#12-A

Before Expansion			After Expansion		
Size	Wt.	Vol.	Size	Wt.	Vol.
½+4			½+4		
- 4+10	78.3	78.0	- 4+10	76.7	70.0
- 10+30	72.6	78.0	- 10+30	71.8	78.0
- 30+60	35.7	46.0	- 30+60	35.2	46.0
- 60	25.5	34.0	- 60	24.2	34.0

Bed. Co. #1

SCREEN ANALYSIS AFTER EXPANSION

SIZE	WT		VOL	WT CU FT	EXFOLIATION RATIO
- ½ + 4					
- 4 + 10	4.2 / 8.7	7.8	38.0 .110 / 380	6.96	3.07
- 10 + 30	20.5 / 88.4	65.7	119 .172 / 320.0	10.8	3.72
- 30 + 60	42.2	17.3	84.0		2.43
60	41.6	9.3	45.0		1.18

SCREEN ANALYSIS

Sample No. Bed Co. #1

Before Expansion			After Expansion		
Size	Wt.	Vol	Size	Wt.	Vol.
-½+4			½+4		
4+10	28.2	26	- 4+10	28.0	80
- 10+30	93	86	- 10+30	89	320
- 30+60	36.8	35	- 30+60	35.4	85
- 60	32.5	28	60	31.2	33

Bad, C. #1 @ 297

SCREEN ANALYSIS AFTER EXPANSION

SIZE	WT.		VOL.	WT. CU. FT.	EXFOLIATION RATIO
- ½+4					
- 4+10	7.6 / 54.02	35.7	215 / 85 .169	10.6	1.72
- 10+30	7.2 / 54.4	35.3	42 / 84 .171	10.8	1.51
- 30+60	28.8	14.7	35		1.47
- 60	40.7	14.3	34		1.11

SCREEN ANALYSIS

Sample No. Bed. Coal #1 in 297

Before Expansion			After Expansion		
Size	Wt.	Vol.	Size	Wt.	Vol.
-½+4			½+4		
- 4+10	28.8	29.5	- 4+10	26.0	50.0
- 10+30	76.6	81.0	- 10+30	72.5	122.0
- 30+60	48.1	51.0	- 30+60	45.8	75.0
- 60	31.8	34.5	- 60	29.9	38.0

B2d. CB. #2m247

SCREEN ANALYSIS AFTER EXPANSION

SIZE	WT.		VOL.	WT. CU. FT.	EXFOLIATION RATIO
- ½+4					
- 4+10					1.79
- 10+30	24.6 / 54.3	35.8	56 / 110 .439	27.7	1.414
- 30+60	80.6	42.2	129		1.31
- 60	55.7	21.9	67		1.23

SCREEN ANALYSIS

Sample No. Bed Co. #2 m297

Before Expansion			After Expansion		
Size	Wt.	Vol.	Size	Wt.	Vol.
-½+4			½+4		
- 4+10	12.5	14.0	- 4+10	11.7	25.0
- 10+30	71.5	85.0	- 10+30	18.4	122.0
- 30+60	67.1	75.5	- 30+60	64.9	97.0
- 60	48.0	215.5	- 60	45.8	56.0

B Q1, CB. 2-A on 297

SCREEN ANALYSIS AFTER EXPANSION

SIZE	WT.	VOL.	WT. CU. FT.	EXFOLIATION RATIO
- ½+4				
- 4+10	.5 / .9 1.3	4 / 5 .125	7.87	2.78
- 10+30	14.8 / 58.9 35.1	76 / 135 19.5	12.3	2.20
- 30+60	98.8 42.1	162		1.83
- 60	66.8 21.5	83		1.53

SCREEN ANALYSIS

Sample No. BEL. CO. 2-AM287

Before Expansion			After Expansion		
Size	Wt.	Vol.	Size	Wt.	Vol.
-½+4			½+4		
- 4+10	8.4	9.0	- 4+10	7.6	25.0
- 10+30	76.8	72.0	- 10+30	73.6	158.0
- 30+60	92.4	84.8	- 30+60	89.0	154.0
- 60	61.5	55.0	- 60	58.1	84.0

Bed Co. # 2-A

SCREEN ANALYSIS AFTER EXPANSION

SIZE	WT		VOL	WT CU FT	EXFOLIATION RATIO
- 4 + 4	59.2 39.2	34.1%	168 168 .234	141.7	3.38
- 4 + 10	20.8 30.9	31.7%	111 156 .187	11.8	3.46
10 + 30	15.4 26.3	24.6	74 .280 121	13.1	3.41
30 + 60	10.4	6.5	32		2.00
60	8.2	3.2	16		1.09

SCREEN ANALYSIS

Sample No. Bd. Co. #7-A

Before Expansion			After Expansion		
Size	Wt.	Vol	Size	Wt.	Vol.
-½+4	57	69	½+4	49.1	233
-4+10	39	216	-4+10	34	159
-10+30	26	32	-10+30	22.8	109
-30+60	6.7	9	-30+60	8.6	18
-60	4.8	5.5	60	6.5	6

Bed. Co. 2-B

SCREEN ANALYSIS AFTER EXPANSION

SIZE	WT		VOL	WT CU FT	EXFOLIATION RATIO
- ½ + 4					
- 4 + 10	~~6.7~~ ~~26.9~~	15.9	~~42~~ ~~64.0~~ 159	10.1	2.13
- 10 + 30	~~13.8~~ ~~50.6~~	48.7	~~78~~ 196.0 177	11.2	2.29
- 30 + 60	52.3	22.0	89.0		1.78
60	49.1	13.1	53.0		1.18

SCREEN ANALYSIS

Sample No. Bed. c o. 2-B

Before Expansion			After Expansion		
Size	Wt.	Vol	Size	Wt.	Vol.
-½+4			½+4		
- 4+10	~~6.7~~ 39.4	~~42~~ 38	- 4+10	37.5	81
- 10+30	~~13.8~~ 83.6	~~28~~ 86	- 10+30	79.5	197
- 30+60	50.7	50	- 30+60	48.9	89
- 60	46.8	41.5	- 60		49.5

Blot. Co. #3497

no good

SCREEN ANALYSIS AFTER EXPANSION

SIZE	WT.	VOL.	WT. CU. FT.	EXFOLIATION RATIO
- ½+4				
- 4+10	32.4	36		
- 10+30	76.2	91		
- 30+60	80.0	92		
- 60	53.9	62		

SCREEN ANALYSIS

Sample No. Bed. Co. #3 on 297.

Before Expansion			After Expansion		
Size	Wt.	Vol.	Size	Wt.	Vol.
-½+4			-½+4		
- 4+10	424.0	49.0	- 4+10	42.0	49.0
- 10+30	82.7	97.0	- 10+30	78.4	95.0
- 30+60	77.0	85.0	- 30+60	73.8	82.0
- 60	52.4	60.0	- 60	49.5	57.0

SCREEN ANALYSIS AFTER EXPANSION

B.L.d. Co. #4 m 29

SIZE	WT.		VOL.	WT. CU. FT.	EXFOLIATION RATIO
- ½+4					
- 4+10					1.32
- 10+30	13.1 / 72.4	31.7	26. ~~50~~ / 93	31.7	1.38
- 30+60	98.7	416.9	138		1.37
- 60	49.6	21.4	63		1.17

SCREEN ANALYSIS

Sample No. Bed. Co #4 on 297

Before Expansion			After Expansion		
Size	Wt.	Vol.	Size	Wt.	Vol.
-½+4			½+4		
- 4+10	29.5	28.0	- 4+10	28.4	37.0
- 10+30	90.0	88.0	- 10+30	87.4	122.0
- 30+60	71.0	72.0	- 30+60	69.0	99.0
- 60	39.5	40.0	- 60	37.0	47.0

Std. Co. #4

SCREEN ANALYSIS AFTER EXPANSION

SIZE	WT		VOL.	WT CU FT.	EXFOLIATION RATIO
- ½ + 4					
- 4 + 10	1.0 / 17.3	9.3	5 / 22.0	12.6	1.24
- 10 + 30	7.8 / 60.3	34.8	17 / 82.0	28.9	1.18
- 30 + 60	56.0	33.5	79.0		1.11
60	441.0	22.4	53.0		1

SCREEN ANALYSIS

Sample No. Bid. co #4

Before Expansion			After Expansion		
Size	Wt.	Vol.	Size	Wt.	Vol.
-½+4			½+4		
4+10	~~10~~ 21.6	~~5~~ 21	- 4+10	20.6	26
- 10+30	~~7.8~~ 69.9	~~12~~ 74	- 10+30	63.2	87
- 30+60	59.1	71	- 30+60	55.7	79
- 60	43.5	49.5	- 60	39.6	46

Bod. co. #4 An 2957

SCREEN ANALYSIS AFTER EXPANSION

SIZE	WT.		VOL.	WT. CU. FT.	EXFOLIATION RATIO
- ½+4					
- 4+10					
- 10+30	1.0 22.9	16.2	2.5 25	25.1	
- 30+60	64.7	43.8	68		
- 60	54.1	40.0	62		

SCREEN ANALYSIS

Sample No. Bed. Co. #4 on 297 A

Before Expansion			After Expansion		
Size	Wt.	Vol.	Size	Wt.	Vol.
-½+4			-½+4		
- 4+10	41.7	5.0	- 4+10	41.0	5.0
- 10+30	27.5	29.5	- 10+30	26.5	29.0
- 30+60	63.9	66.0	- 30+60	61.5	64.0
- 60	54.0	60.0	- 60	50.5	59.5

Pilot Co. #5 in 297

SCREEN ANALYSIS AFTER EXPANSION

SIZE	WT.		VOL.	WT. CU. FT.	EXFOLIATION RATIO
- ½+4					
- 4+10	20.5	8.4	24 .854	53.7	
- 10+30	5.2 / 68.8	28.1	6 .867 / 80	54.6	
- 30+60	85.1	35.2	100		
- 60	61.0	28.1	80		

SCREEN ANALYSIS

Sample No. Bed co. -5 in 297

Before Expansion			After Expansion		
Size	Wt.	Vol.	Size	Wt.	Vol.
-½+4			-½+4		
- 4+10	26.4	29.0	- 4+10	25.5	30.0
- 10+30	69.7	75.0	- 10+30	68.0	75.0
- 30+60	85.6	96.0	- 30+60	83.0	95.0
- 60	67.0	82.0	- 60	64.4	79.0

Bod. Co. #5

SCREEN ANALYSIS AFTER EXPANSION

SIZE	WT		VOL.	WT. CU. FT.	EXFOLIATION RATIO
- ½ + 4					
- 4 + 10	1.7 / 8.1	8.9	7 / 16.0 ; 2 2/3	15.3	1.40
- 10 + 30	18.2 / 42.6	50.5	39 / 91.0 ; .466	29.41	1.39
- 30 + 60	23.7	17.8	50.0		1.30
- 60	14.2	12.8	23.0		1.02

SCREEN ANALYSIS

Sample No. Bed Co. #5

Before Expansion			After Expansion		
Size	Wt.	Vol.	Size	Wt.	Vol.
-½+4			½+4		
- 4+10	16.1	20	- 4+10	14.8	28
- 10+30	42.6	61	- 10+30	40	84.5
- 30+60	23.7	35	- 30+60	27.4	45.5
- 60	15.5	20	- 60	13.9	20.5

Bed. Co. #6

SCREEN ANALYSIS AFTER EXPANSION

SIZE	WT		VOL.	WT. CU. FT.	EXFOLIATION RATIO
- ½ + 4					
- 4 + 10	8.7 (16)	3.9	13.0 (2.5) .246	15.1	2.19
- 10 + 30	10.1 61.6	21/0.5	32.0 .315 136.0	19.9	1.72
- 30 + 60	54.8	36.0	121.0		1.62
60	43.4	19.9	67.0		1.26

SCREEN ANALYSIS

Sample No. Bed Cont 6-month.

Before Expansion			After Expansion		
Size	Wt.	Vol.	Size	Wt.	Vol.
-½+4			½+4		
- 4+10	32.9 .6	33.5 2.5	- 4+10	28.7	71
- 10+30	68.3 10.1	74 32	- 10+30	62	127
- 30+60	46.8	53.	- 30+60	43.1	86
- 60	40.1	42	- 60	36.8	53

B-4, Co. #6

SCREEN ANALYSIS AFTER EXPANSION

SIZE	WT		VOL.	WT. CU. FT.	EXFOLIATION RATIO
- ½ + 4					
- 4 + 10	1.0 / 77.2	8.2	10. / 22.0	6.30	2.20
- 10 + 30	6.0 / 118.6	52.0	38. / 140.0	9.95	1.41
- 30 + 60	59.2	27.9	75.0		1.61
60	30.0	11.8	32.0		1.08

SCREEN ANALYSIS

Sample No. Bed Co. #6 W. Hargleson

Before Expansion			After Expansion		
Size	Wt.	Vol.	Size	Wt.	Vol.
-½+4			½+4		
- 4+10	29.5	25	- 4+10	28.9	57
- 10+30	118.7	96	- 10+30	116.8	135
- 30+60	54.8	45	- 30+60	53.7	63
- 60	29.2	24	- 60	27.5	26.

Ed. Co. #6 on 297

SCREEN ANALYSIS AFTER EXPANSION

SIZE	WT.		VOL.	WT. CU. FT.	EXFOLIATION RATIO
- ½+4					
- 4+10	.5 / 6.1	4.5	2 .25 / 12	15.7	1.27
- 10+30	11.1 / 56.1	19.9	19 .1585 / 86	36.8	1.24
- 30+60	81.8	40.0	108		1.13
- 60	47.7	23.7	64		1.07

SCREEN ANALYSIS

Sample No B26.c0.#1a297

Before Expansion

Size	Wt	Vol
-½+4		
-4+10	17.8	22.0
-10+30	61.0	72.0
-30+60	74.5	84.0
-60	48.0	58.0

After Expansion

Size	Wt	Vol
-½+4		
-4+10	16.5	28.0
-10+30	58.2	89.0
-30+60	73.0	95.0
-60	45.3	62.0

Bed Co. #7

SCREEN ANALYSIS AFTER EXPANSION

SIZE	WT		VOL.	WT. CU. FT.	EXFOLIATION RATIO
- ½+4					
- 4+10	.4 / 11.9	4.2	4 / 13.0 1100	2.30	1.23
- 10+30	18.2 / 106.7	52.0	25 / 161 1729	415.9	1.42
- 30+60	59.1	29.4	91		1.46
- 60	38.8	14.2	44		1.01

SCREEN ANALYSIS

Sample No. Bed Co. #7

Before Expansion			After Expansion		
Size	Wt.	Vol.	Size	Wt.	Vol.
-½+4			-½+4		
- 4+10	37.2	38	- 4+10	35.7	47
- 10+30	104.7	108	- 10+30	101.5	153
- 30+60	50	52	- 30+60	48.8	76
- 60	34.9	35	- 60	32.9	35.5

SCREEN ANALYSIS AFTER EXPANSION

Ind. Co. #4

SIZE	WT.		VOL.	WT. CU. FT.	EXFOLIATION RATIO
- ½ +4					
- 4 +10	3.1 / 4.9	3.9	11 / 15 .281	17.8	2.50
- 10 +30	33.3 / 86.8	47.2	90 / 180.0 .370	23.3	1.69
- 30 +60	70.0	35.7	136.0		1.72
- 60	37.9	13.2	50.0		1.08

Bed Co. #9

34.8	33
83.41	84
58.0	64
34.1	37

33.4	83
80.6	142
55.4	110
32.2	40

Ed Co. #10

SCREEN ANALYSIS AFTER EXPANSION

SIZE	WT.		VOL.	WT. CU. FT.	EXFOLIATION RATIO
- ½+4					
- 4+10	.9 / 13.4	10.3	4 .225 / 15.	12.1	1.11
- 10+30	3.6 / 39.6	38.6	10 .360 / 56	22.7	1.25
- 30+60	26.1	27.6	40		1.25
60	31.2	33.4	34		1.03

SCREEN ANALYSIS

Sample No. B.d.c.#10

Before Expansion			After Expansion		
Size	Wt.	Vol.	Size	Wt.	Vol.
-½+4		19	½+4		
- 4+10	20	19	- 4+10	19.9	21
- 10+30	39.6	10.5	- 10+30	37.3	50.5
- 30+60	28.0	32.9	- 30+60	26.0	41.0
- 60	32.9	30.0	- 60	32.0	31.0

Bed. Co. # 11

SCREEN ANALYSIS AFTER EXPANSION

SIZE	WT.		VOL.	WT. CU. FT.	EXFOLIATION RATIO
- ½+4					
- 4+10	1.9 / 3.9	21.6	6 .318 / 9	20.0	1.69
- 10+30	27.1 / 47.5	53.6	65 .217 / 105	26.3	1.65
- 30+60	30.0	26.5	52		1.27
60	24.1	15.3	30		1.02

SCREEN ANALYSIS

Sample No. Bulk Sample #11

Before Expansion			After Expansion		
Size	Wt.	Vol.	Size	Wt.	Vol.
-½+4			-½+4		
- 4+10	13.9	16.5	- 4+10	13.0	28.0
- 10+30	49.0	60.0	- 10+30	45.5	99.0
- 30+60	28.5	35.5	- 30+60	27.0	45.0
- 60	24.3	27.5	- 60	23.9	28.0

B.C. Co. #12 on 725

SCREEN ANALYSIS AFTER EXPANSION

SIZE	WT.		VOL.	WT. CU. FT.	EXFOLIATION RATIO
- ½+4					
- 4+10	4.3 / 9.8	9.8	12 / 25	22.6	2.01
- 10+30	26 / 58.9	59.6	67 / 150	24.5	1.78
- 30+60	27.4	22.2	56		1.51
- 60	12.2	8.3	21		1.11

SCREEN ANALYSIS

Sample No. Bed coal 12 ~725

Before Expansion			After Expansion		
Size	Wt.	Vol.	Size	Wt.	Vol.
-½+4			½+4		
- 4+10	29.2	35.0	- 4+10	28.4	71.0
- 10+30	50.5	68.0	- 10+30	48.2	121.0
- 30+60	23.5	31.0	- 30+60	23.0	47.0
- 60	13.0	17.0	- 60	11.7	19.0

OSED Co. #14

SCREEN ANALYSIS AFTER EXPANSION

SIZE	WT.		VOL.	WT. CU. FT.	EXFOLIATION RATIO
- ½+4					
- 4+10	6 / 21.7	24.8	35 .1711 / 50	10.8	2.40
- 10+30	10 / 33.4	36.1	46 .217 / 73	13.7	2.35
- 30+60	25.6	19.8	40		1.60
- 60	35.2	19.3	39		1.14

SCREEN ANALYSIS

Sample No. Bed. coal 14

Before Expansion			After Expansion		
Size	Wt.	Vol.	Size	Wt.	Vol.
-½+4			½+4		
- 4+10	29.0	25.0	- 4+10	26.8	60.0
- 10+30	33.4	32.5	- 10+30	32.0	74.0
- 30+60	25.1	25.0	- 30+60	24.5	40.0
- 60	37.0	35.0	- 60	35.6	40.0

Bldg. Co. #15

SCREEN ANALYSIS AFTER EXPANSION

SIZE	WT.		VOL.	WT. CU. FT.	EXFOLIATION RATIO
- ½+4					
- 4+10	.4 / 7.7	4.7	4 .10 / 12	6.3	1.94
- 10+30	14.5 / 80.2	51.1	35 .414 / 145	26.4	1.87
- 30+60	52.4	29.5	84		1.46
- 60	34.0	15.2	43		1.07

SCREEN ANALYSIS

Sample No. Bed Co. #15

Before Expansion			After Expansion		
Size	Wt.	Vol.	Size	Wt.	Vol.
-½+4			-½+4		
- 4+10	64.1	49.0	- 4+10	62.5	95.0
- 10+30	54.0	47.0	- 10+30	52.8	88.0
- 30+60	27.7	24.0	- 30+60	27.0	35.0
- 60	39.8	31.0	- 60	38.0	33.5

F-8 Awlk. Co. 1-A
~~Bgn~~

SCREEN ANALYSIS AFTER EXPANSION

SIZE	WT.		VOL.	WT. CU. FT.	EXFOLIATION RATIO
- ½+4					
- 4+10					1.03
- 10+30	6 / 81.2	29.6	11 / 94 ~~+.83~~ .545	34.3	1.15
- 30+60	133.7	43.7	139		1.05
- 60	90.8	26.7	85		1.0

SCREEN ANALYSIS

Sample No. FRANK. C6-1-A. BGN

Before Expansion			After Expansion		
Size	Wt.	Vol.	Size	Wt.	Vol.
-½+4			-½+4		
- 4+10	30.0	29.0	- 4+10	29.3	30.0
- 10+30	100.2	97.0	- 10+30	99.3	111.0
- 30+60	166.2	100.0	- 30+60	105.2	105.0
- 60	74.0	67.0	- 60	72.9	67.0

BAWK. Co. 1-

SCREEN ANALYSIS AFTER EXPANSION

SIZE	WT.	VOL.	WT. CU. FT.	EXFOLIATION RATIO
- ½+4				
- 4+10	NO EXPANSION 29.6 8.2	23		1.29
- 10+30	6.8 85.6 37.8	29 12.34 106	13.7 4	1.75
- 30+60	68.4 29.1	82		1.38
- 60	84.3 34.9	70		1.08

SCREEN ANALYSIS

Sample No. FRANK. CO. 1-C

Before Expansion			After Expansion		
Size	Wt.	Vol.	Size	Wt.	Vol.
-½+4			-½+4		
- 4+10	66.7	51.0	- 4+10	66.0	66.0
- 10+30	73.9	58.0	- 10+30	72.7	101.0
- 30+60	59.5	50.0	- 30+60	58.7	69.0
- 60	74.5	58.0	- 60	73.2	63.0

FRANK. CO. 1-B

SCREEN ANALYSIS AFTER EXPANSION

SIZE	WT.		VOL.	WT. CU. FT.	EXFOLIATION RATIO
- ½+4					
- 4+10	7.8 / 12.3	10.4	32 / 215 .241	15.5	2.43
- 10+30	25.7 / 96.0	59.4	92 / 240 .280	17.6	2.04
- 30+60	52.6	23.8	102		1.77
- 60	36.8	10.6	216		1.21

SCREEN ANALYSIS

Sample No. FRANKLINITE I-A. completely thin.

Before Expansion			After Expansion		
Size	Wt.	Vol.	Size	Wt.	Vol.
-½+4			-½+4		
- 4+10	42.8	46.0	- 4+10	41.0	112.0
- 10+30	86.4	100.0	- 10+30	84.0	204.0
- 30+60	44.8	51.0	- 30+60	43.4	91.0
- 60	33.3	34.0	- 60	31.7	41.0

F-BAR Co. #1-R

Hyw

SCREEN ANALYSIS AFTER EXPANSION

SIZE	WT.		VOL. wt/cc=	WT. CU. FT.	EXFOLIATION RATIO
- ½+4					
- 4+10	2.8 / 33.7	11.0	18 / 44 .350	22.6	1.95
- 10+30	15 / 94.6	50.0	88 / 200 .153	9.64	2.75
- 30+60	67.7	25.2	101		1.09
- 60	64.3	13.9	56		1.06

SCREEN ANALYSIS

Sample No. FRANK. Co. 1-C

Before Expansion			After Expansion		
Size	Wt.	Vol.	Size	Wt.	Vol.
-½+4			-½+4		
- 4+10	72.2	54.0	- 4+10	70.7	105.0
- 10+30	83.5	68.0	- 10+30	82.1	187.0
- 30+60	51.0	43.0	- 30+60	59.6	90.0
- 60	55.7	42.0	- 60	54.6	52.0

FRANK CO. #2 (?)

SCREEN ANALYSIS AFTER EXPANSION

SIZE	WT.		VOL.		WT. CU. FT.	EXFOLIATION RATIO
- ½+4						
- 4+10	NO EXPANK ~~85.5~~	8.1	30			1.14
- 10+30	8.5 ~~123.9~~	41.2	40 160	4.7 .212	13.4	1.64
- 30+60	58.5	32.4	120			2.16
- 60	53.8	16.4	61			1.21

SCREEN ANALYSIS

Sample No. FRANK Co. #2 (?)

Before Expansion			After Expansion		
Size	Wt.	Vol.	Size	Wt.	Vol.
-½+4			-½+4		
- 4+10	97.8	83.0	- 4+10	92.9	95.0
- 10+30	93.3	83.0	- 10+30	90.5	136.0
- 30+60	43.7	45.0	- 30+60	41.9	97.0
- 60	219.0	45.0	- 60	47.1	57.0

FBAR H. Co. #8

SCREEN ANALYSIS AFTER EXPANSION

SIZE	WT.		VOL.	WT. CU. FT.	EXFOLIATION RATIO
- ½+4					
- 4+10	1.7 / 4.2	2.6	9 / 11	11.9	2.73
- 10+30	26.4 / 103.1	52.8	71 / 220	23.4	1.94
- 30+60	80.8	32.6	136		1.71
- 60	213.0	12.0	50		1.18

SCREEN ANALYSIS

Sample No. Formula, Lot #8

Before Expansion			After Expansion		
Size	Wt.	Vol.	Size	Wt.	Vol.
-½+4			-½+4		
- 4+10	52.5	44.0	- 4+10	50.3	120.0
- 10+30	101.8	96.0	- 10+30	99.1	186.0
- 30+60	57.1	58.0	- 30+60	55.2	99.0
- 60	28.1	27.0	- 60	26.9	32.0

Bulk Co. #9

SCREEN ANALYSIS AFTER EXPANSION

SIZE	WT.		VOL.	WT. CU. FT.	EXFOLIATION RATIO
- ½+4					
- 4+10	5.4 / 16.2	11.1	30 / 46	11.3	1.83
- 10+30	12.1 / 61.3	31.7	52 / 130	121.7	1.69
- 30+60	71.1	37.6	153		1.72
- 60	59.2	20.3	84		1.27

SCREEN ANALYSIS

Sample No. FRANK. Co. #9

Before Expansion			After Expansion		
Size	Wt.	Vol.	Size	Wt.	Vol.
-½+4			-½+4		
- 4+10	49.8	58.0	- 4+10	43.9	106.0
- 10+30	68.5	83.0	- 10+30	62.4	140.0
- 30+60	57.6	70.0	- 30+60	52.4	120.0
- 60	52.5	55.0	- 60	48.3	70.0

F-BANK. Co. #10

SCREEN ANALYSIS AFTER EXPANSION

SIZE	WT.	VOL.	WT. CU. FT.	EXFOLIATION RATIO
- ½+4				
- 4+10	3.9 / 19.6 9.0	9 .4341 / 32	27.1	1.42
- 10+30	21.6 / 55.5 34.7	56 .386 / 123	26.2	1.39
- 30+60	53.2 33.9	120		1.29
- 60	48.6 22.3	79		1.07

SCREEN ANALYSIS

Sample No. FRANKLIN CO. #10

Before Expansion			After Expansion		
Size	Wt.	Vol.	Size	Wt.	Vol.
-½+4			-½+4		
- 4+10	43.0	55.0	- 4+10	40.0	78.0
- 10+30	61.0	88.0	- 10+30	57.2	122.0
- 30+60	39.8	62.0	- 30+60	37.4	79.0
- 60	47.3	67.0	- 60	44.0	72.0

FRANK. CO. #11

SCREEN ANALYSIS AFTER EXPANSION

SIZE	WT.		VOL.	WT. CU. FT.	EXFOLIATION RATIO
- ½+4					
- 4+10					1,56
- 10+30	5.5 / 61.0	39	16 / 103	20.6	1.48
- 30+60	87.4	39.4	140		1,46
- 60	103.2	31.5	172		1,24

SCREEN ANALYSIS

Sample No. FRANK. CO. #11

Before Expansion			After Expansion		
Size	Wt.	Vol.	Size	Wt.	Vol.
-½+4			-½+4		
4+10	49.5	53.0	- 4+10	47.6	83.0
- 10+30	65.8	71.0	- 10+30	63.4	105.0
- 30+60	66.9	69.0	- 30+60	65.4	101.0
- 60	80.4	73.0	- 60	77.6	90.0

BAM'R Co. #12

SCREEN ANALYSIS AFTER EXPANSION

SIZE	WT.		VOL.	WT. CU. FT.	EXFOLIATION RATIO
- ½+4					
- 4+10	20.9	8.5	27		1.21
- 10+30	14.7 / 97.7	43.7	28 / 138 ; 52.5	33.0	1.18
- 30+60	57.7	27.5	87		1.22
- 60	50.9	20.2	64		1.01
			316		

SCREEN ANALYSIS

Sample No. FRANKS. CO #2

Before Expansion			After Expansion		
Size	Wt.	Vol.	Size	Wt.	Vol.
-½+4			-½+4		
- 4+10	410.5	48.0	- 4+10	39.3	58.0
- 10+30	92.0	110.0	- 10+30	99.1	130.0
- 30+60	52.0	64.0	- 30+60	49.9	78.0
- 60	49.2	57.0	- 60	46.8	58.0

9

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FOB AK 19, Co. - B

SCREEN ANALYSIS AFTER EXPANSION

SIZE	WT.	VOL.	WT. CU. FT.	EXFOLIATION RATIO
- ½+4				
- 4+10	24.4 / 12.0	31		1.11
- 10+30	8.9 / 73.6 / 35.2	13 / 91 / 61.8	43.0	1.04
- 30+60	53.9 / 25.6	66		1.00
- 60	60.5 / 27.1	70		1.00

SCREEN ANALYSIS

Sample No. FRANKLIN Co. B

Before Expansion			After Expansion		
Size	Wt.	Vol.	Size	Wt.	Vol.
-½+4			-½+4		
- 4+10	42.9	45.0	- 4+10	41.5	50.0
- 10+30	71.2	78.0	- 10+30	69.0	83.0
- 30+60	48.3	56.0	- 30+60	46.7	56.0
- 60	60.0	69.0	- 60	57.5	69.0

FRANK. CO. #17 #13

SCREEN ANALYSIS AFTER EXPANSION

SIZE	WT.		VOL.	WT. CU. FT.	EXFOLIATION RATIO
- ½+4					
- 4+10	VERY LITTLE IN 30, OVER. 14.1	5.4	14		1.21
- 10+30	13.5 / 69.6	33.9	20 / 97	28.3	1.23
- 30+60	14.9	36.8	105		1.28
- 60	56.7	24.5	70		1.06

SCREEN ANALYSIS

Sample No. FRANK CO. 17a13?

Before Expansion			After Expansion		
Size	Wt.	Vol.	Size	Wt.	Vol.
-½+4			-½+4		
- 4+10	39.0	39.0	- 4+10	38.1	47.0
- 10+30	57.6	61.0	- 10+30	56.0	75.0
- 30+60	75.9	82.0	- 30+60	73.2	105.0
- 60	52.4	62.0	- 60	49.5	62.0

F-HAWK, Co. #13

SCREEN ANALYSIS AFTER EXPANSION

SIZE	WT.		VOL.		WT. CU. FT.	EXFOLIATION RATIO
- ½+4						
- 4+10	3.3 / 23.5	12.7	5 / 33	.660	41.5	1.35
- 10+30	16.7 / 57.4	30.9	30 / 96	.547	34.2	1.25
- 30+60	48.6	29.6	77			1.03
- 60	40.7	20.8	54			1.02

SCREEN ANALYSIS

Sample No. F BANK Co. # 13

Before Expansion			After Expansion		
Size	Wt.	Vol.	Size	Wt.	Vol.
-½+4			-½+4		
- 4+10	44.9	52.0	- 4+10	43.4	70.0
- 10+30	58.4	75.0	- 10+30	55.5	94.0
- 30+60	42.6	60.0	- 30+60	40.8	62.0
- 60	34.1	44.0	- 60	30.8	44.0

FRANK. CO. #14

SCREEN ANALYSIS AFTER EXPANSION

SIZE	WT.		VOL.		WT. CU. FT.	EXFOLIATION RATIO
- ½ + 4						
- 4 + 10	29.2	12.5	35			
- 10 + 30	17.0 63.3	28.9	9 81	1778	419.0	
- 30 + 60	75.5	34.0	95			
- 60	62.4	24.7	69			

SCREEN ANALYSIS

Sample No. Franks Co. #14

Before Expansion			After Expansion		
Size	Wt.	Vol.	Size	Wt.	Vol.
-½+4			-½+4		
- 4+10	47.9	52.0	- 4+10	46.1	52.0
- 10+30	67.1	80.0	- 10+30	64.7	80.0
- 30+60	78.8	99.0	- 30+60	76.4	99.0
- 60	46.5	52.0	- 60	44.1	52.0

BAM 13. CO. #17

SCREEN ANALYSIS AFTER EXPANSION

SIZE	WT.	VOL.	WT. CU. FT.	EXFOLIATION RATIO
- ½+4				
- 4+10				1.76
- 10+30	16.2 / 54.7 / 29.0	76 .213 / 134	13.4	2.49
- 30+60	96.7 47.0	217		1.92
- 60	71.2 23.9	110		1.38

SCREEN ANALYSIS

Sample No. FRANK. Co. #17

Before Expansion			After Expansion		
Size	Wt.	Vol.	Size	Wt.	Vol.
-½+4			½+4		
- 4+10	81.4	81.0	- 4+10	76.6	142.0
- 10+30	64.6	68.0	- 10+30	59.9	169.0
- 30+60	62.9	73.0	- 30+60	57.8	140.0
- 60	52.3	58.0	- 60	49.1	80.0

Fed. Ca #2

SCREEN ANALYSIS AFTER EXPANSION

SIZE	WT %	VOL %	VOL	WT CU FT	EXFOLIATION RATIO
- ½ + 4					
- 4 + 10	7.9 10.9	12.5	31. 43.0	12.1	3.50
- 10 + 30	20.5 91.2	66.6	77. 285.0	16.8	3.07
- 30 + 60	41.6	17.7	76.0		2.22
60	23.8	4.9	21.0		1.27

SCREEN ANALYSIS

Sample No. Bird . Co. #2

Before Expansion			After Expansion		
Size	Wt.	Vol	Size	Wt.	Vol.
-½+4			½+4		
4+10	22.217	24cc	- 4+10	23.5	84
- 10+30	103.12	101cc	- 10+30	98.3	310
- 30+60	35.7	36cc	- 30+60	34.5	80
- 60	16.5	12.5	60	15.9	21

H2A no good

SCREEN ANALYSIS AFTER EXPANSION

SIZE	WT.	VOL.	WT. CU. FT.	EXFOLIATION RATIO
- ½+4				
- 4+10	58.5	70		1.14
- 10+30	79.4	93		1.08
- 30+60	56.1	70		1.05
- 60	57.5	64		1.08

SCREEN ANALYSIS

Sample No. #2-A

Before Expansion			After Expansion		
Size	Wt.	Vol.	Size	Wt.	Vol.
-½+4			½+4		
- 4+10	80.5	81.0	- 4+10	76.6	92.0
- 10+30	73.6	80.0	- 10+30	71.8	85.0
- 30+60	50.0	60.0	- 30+60	48.6	63.0
- 60	58.8	62.0	- 60	54.8	62.0

SCREEN ANALYSIS

Sample No. CHAR. COAL

Before Expansion No good

After Expansion

Size	Wt.	Vol.	Size	Wt.	Vol.
-½+4			-½+4		
- 4+10	66.4	51.0	- 4+10	15.2	53.0
- 10+30	101.2	82.0	- 10+30	99.0	83.0
- 30+60	51.8	55.0	- 30+60	49.0	62.0
- 60	47.6	52.0	- 60	43.8	52.0

CHARLOTTE Co. #2

SCREEN ANALYSIS AFTER EXPANSION

SIZE	WT.	VOL.	WT. CU. FT.	EXFOLIATION RATIO
- ½+4				
- 4+10	58.8	45		
- 10+30	99.4	81		
- 30+60	50.8	62		
- 60	46.8	54		

SCREEN ANALYSIS

Sample No. CHARLOTTE COUNTY #3

Before Expansion			After Expansion		
Size	Wt.	Vol.	Size	Wt.	Vol.
-½+4			½+4		
- 4+10	45.0 / MW Good 42.0		- 4+10	43.5	42.0
- 10+30	55.7	53.0	- 10+30	54.4	56.0
- 30+60	46.1	48.0	- 30+60	46.5	48.0
- 60	51.3	53.0	- 60	51.0	53.0

CHARLOTTE CO. #3

SCREEN ANALYSIS AFTER EXPANSION

SIZE	WT.	VOL.	WT. CU. FT.	EXFOLIATION RATIO
- ½+4				
- 4+10	40.0	39		
- 10+30	54.7	57		
- 30+60	44.2	50		
- 60	49.5	51		

CHARLOTTE Co. #4

SCREEN ANALYSIS AFTER EXPANSION

SIZE	WT.		VOL.	WT. CU. FT.	EXFOLIATION RATIO
- ½+4					
- 4+10					1.06
- 10+30	~~42.6~~ 8.3	19.6	25/59 1331	20.9	~~1.47~~
- 30+60	54.1	43.9	87		1.55
- 60	~~39.7~~	26.1	52		1.25

SCREEN ANALYSIS

Sample No. CHARLOTTE CLAY

Before Expansion			After Expansion		
Size	Wt.	Vol.	Size	Wt.	Vol.
½+4			½+4		
- 4+10	19.0	17.0	- 4+10	18.5	18.0
- 10+30	49.5	47.0	- 10+30	48.5	69.0
- 30+60	48.6	49.0	- 30+60	47.0	76.0
- 60	38.4	39.0	- 60	35.7	49.0
	155.5				

SCREEN ANALYSIS AFTER EXPANSION

P, T.T.S. Co. #3

SIZE	WT.		VOL.	WT. CU. FT.	EXFOLIATION RATIO
- ½+4					
- 4+10					2.43
- 10+30	13.7 / 56.5	41.0	53. / 165	16.3	3.08
- 30+60	85.9	40.2	162		1.67
- 60	61.1	18.9	76		1.16

SCREEN ANALYSIS

Sample No. PITTS. CO. #3

Before Expansion			After Expansion		
Size	Wt.	Vol.	Size	Wt.	Vol.
-½+4			-½+4		
- 4+10	20.0	23.0	- 4+10	19.6	56.0
- 10+30	74.0	85.0	- 10+30	69.7	176.0
- 30+60	69.4	72.0	- 30+60	66.8	120.0
- 60	53.5	53.0	- 60	50.6	61.5

PITTS. CO. #5

SCREEN ANALYSIS AFTER EXPANSION

SIZE	WT.		VOL.	WT. CU. FT.	EXFOLIATION RATIO
- ½+4					
- 4+10	~~31.3~~		~~32~~		1.00
- 10+30	2.6 12. ~~81.1~~	16.4	8 16 .325 ~~80~~	20.5	1.09
- 30+60	~~53.2~~	54.1	53 ~~6~~		1.12
- 60	VERY LITTLE ~~29.5~~	29.6	29		1.00

SCREEN ANALYSIS

Sample No. PITTS. Co. #3

Before Expansion			After Expansion		
Size	Wt.	Vol.	Size	Wt.	Vol.
-½+4			-½+4		
- 4+10	48.2	47.0	- 4+10	47.0	47.0
- 10+30	79.1	75.0	- 10+30	76.7	82.0
- 30+60	55.5	52.0	- 30+60	53.7	58.0
- 60	49.5	47.0	- 60	47.0	46.0

Pitts. Co. #7

SCREEN ANALYSIS AFTER EXPANSION

SIZE	WT.		VOL.	WT. CU. FT.	EXFOLIATION RATIO
- ½+4					1.67
- 4+10	4.6 / 12.5	8.2	11,418 / 25	26.4	1.60
- 10+30	19.2 / 74.8	48.9	47 / 149 (4691)	25.8	1.45
- 30+60	49.9	30.8	94		1.49
- 60	22.5	12.1	37		1.36

SCREEN ANALYSIS

Sample No. PITTS. CO. #57

Before Expansion			After Expansion		
Size	Wt.	Vol.	Size	Wt.	Vol.
-½+4	10.2	12.0	-½+4	16.0	20.0
- 4+10	34.1	40.0	- 4+10	33.3	64.0
- 10+30	67.8	85.0	- 10+30	66.0	123.0
- 30+60	37.0	45.0	- 30+60	36.0	67.0
- 60	19.0	22.0	- 60	17.8	30.0

Pitts. Co. #8

SCREEN ANALYSIS AFTER EXPANSION

SIZE	WT.		VOL.	WT. CU. FT.	EXFOLIATION RATIO
- ½+4					
- 4+10	3.2	2.3	6 +		1.92
- 10+30	13.0 / 58.8	46.2	49, 265 / 120	16.7	2.00
- 30+60	36.9	32.6	85		1.94
- 60	35.6	18.8	49		1.21

SCREEN ANALYSIS

Sample No RTTS. Co. #8

Before Expansion			After Expansion		
Size	Wt	Vol	Size	Wt	Vol.
-½+4			½+4		
4+10	23.2	24.0	- 4+10	21.8	46.0
- 10+30	64.3	66.0	- 10+30	61.0	132.0
- 30+60	20.6	30.0	- 30+60	25.2	58.0
- 60	25.7	27.0	60	24.3	32.5

BTS. CO. #9

SCREEN ANALYSIS AFTER EXPANSION

93
78

SIZE	WT.	VOL.	WT. CU. FT.	EXFOLIATION RATIO
- ½+4				
- 4+10	1.3 / 3.4 33	7 / 11 186	11.7	3.07
- 10+30	15.7 / 59.8 51.4	67 / 170 2.35	141.8	2.11
- 30+60	41.4 29.8	96		1.36
- 60	38.1 16.3	54		1.24

SCREEN ANALYSIS

Sample No. Pitts. Co. #9

Before Expansion			After Expansion		
Size	Wt.	Vol	Size	Wt.	Vol.
-½+4			½+4		
- 4+10	29.0	29.0	- 4+10	27.1	89.0
- 10+30	64.1	70.0	- 10+30	60.3	148.0
- 30+60	30.2	36.0	- 30+60	29.0	49.0
- 60	32.7	33.0	- 60	29.8	41.0

Potts. Co. #12

SCREEN ANALYSIS AFTER EXPANSION

SIZE	WT.		VOL.	WT. CU. FT.	EXFOLIATION RATIO
- ½+4					
- 4+10	.8 / 11	6.3	3 .267 / 16	16.8	1.37
- 10+30	14.2 / 59.1	38.4	27 .540 / 98	33.0	1.29
- 30+60	49.2	31.8	81		1.23
- 60	44.9	23.5	60		1.02

SCREEN ANALYSIS

Sample No. PITTS. CO #12

Before Expansion			After Expansion		
Size	Wt.	Vol.	Size	Wt.	Vol.
-½+4			-½+4		
- 4+10	410.0	413.0	- 4+10	385	590
- 10+30	60.0	72.0	- 10+30	58.0	93.0
- 30+60	37.5	40.0	- 30+60	35.9	59.0
- 60	35.5	45.0	- 60	35.0	46.0

TTS. Co. #13

SCREEN ANALYSIS AFTER EXPANSION

SIZE	WT.	VOL.	WT. CU. FT.	EXFOLIATION RATIO
- ½+4				
- 4+10	5.2 / 6.3 — 5.5	28 / 32 — 1859	11.7	3.66
- 10+30	53.5 / 71.9 — 71.7	297 / 419 — 1180	11.4	3.49
- 30+60	24.5 — 19.2	112		3.53
- 60	8.1 — 3.4	20		2.67

SCREEN ANALYSIS

Sample No. Pitts. Co. #13

Before Expansion			After Expansion		
Size	Wt.	Vol.	Size	Wt.	Vol.
-½+4			-½+4		
-4+10	30.0	414.0	-4+10	28.1	161.0
-10+30	61.0	99.0	-10+30	57.1	345.0
-30+60	21.8	28.0	-30+60	20.0	99.0
-60	17.0	9.0	-60	6.0	19.0

Pitts. Co. #15

SCREEN ANALYSIS AFTER EXPANSION

SIZE	WT.		VOL.	WT. CU. FT.	EXFOLIATION RATIO
- ½+4					
- 4+10	1.1 / 1.3	1.19	6 / 6 (158 lb)	11.5	4.30
- 10+30	37.9 / 67.8	54.7	201 / 320 (183 lb)	11.5	3.33
- 30+60	54.1	32.0	187		3.26
- 60	49.8	12.3	72		1.43

SCREEN ANALYSIS

Sample No. Pitts. Co. # 15

Before Expansion			After Expansion		
Size	Wt.	Vol.	Size	Wt.	Vol.
-½+4			-½+4		
- 4+10	30.0	33.0	- 4+10	28.0	142
- 10+30	73.0	82.0	- 10+30	78.4	273
- 30+60	43.0	50.0	- 30+60	39.7	163.0
- 60	40.0	42.0	- 60	37.4	60.0

Pitts. Co. #17

No. Book

SCREEN ANALYSIS AFTER EXPANSION

SIZE	WT.	VOL.	WT. CU. FT.	EXFOLIATION RATIO
- ½+4				
- 4+10	48.5	49		
- 10+30	72.9	82		
- 30+60	45.9	59		
- 60	82.6	94		

SCREEN ANALYSIS

Sample No. PITTS. COAL #17

Before Expansion			After Expansion		
Size	Wt.	Vol.	Size	Wt.	Vol.
-½+4			-½+4		
- 4+10	59.2	57.0	- 4+10	56.7	57.0
- 10+30	79.2	87.0	- 10+30	75.7	87.0
- 30+60	46.5	57.0	- 30+60	44.8	57.0
- 60	79.7	90.0	- 60	75.7	90.0

PITT. CO. #18

SCREEN ANALYSIS AFTER EXPANSION

SIZE	WT.		VOL.	WT. CU. FT.	EXFOLIATION RATIO
- ½+4					
- 4+10	~~40.9~~ 53.4	27.4	63		1.17
- 10+30	10.9 85.8	48.7	~~20~~ 112 (54.5)	341.4	1.12
- 30+60	24.2	16.1	37		1.07
- 60	13.3	7.8	18		1.00

SCREEN ANALYSIS

Sample No. PITTS. CO. #18

Before Expansion			After Expansion		
Size	Wt.	Vol.	Size	Wt.	Vol.
-½+4			-½+4		
- 4+10	71.0	71.0	- 4+10	68.2	83.0
- 10+30	90.8	94.0	- 10+30	78.6	105.0
- 30+60	20.2	29.0	- 30+60	20.0	31.0
- 60	12.5	15.0	- 60	10.9	15.0

PITTSYLVANIA-FRANKLIN COUNTIES DISTRICT

Rocky Mount

Penhook

Toshes

Henry

US 220

VA 40

VA 890

EXPLANATION

U.S. Highway — US 220

Virginia Primary Highway — VA 40

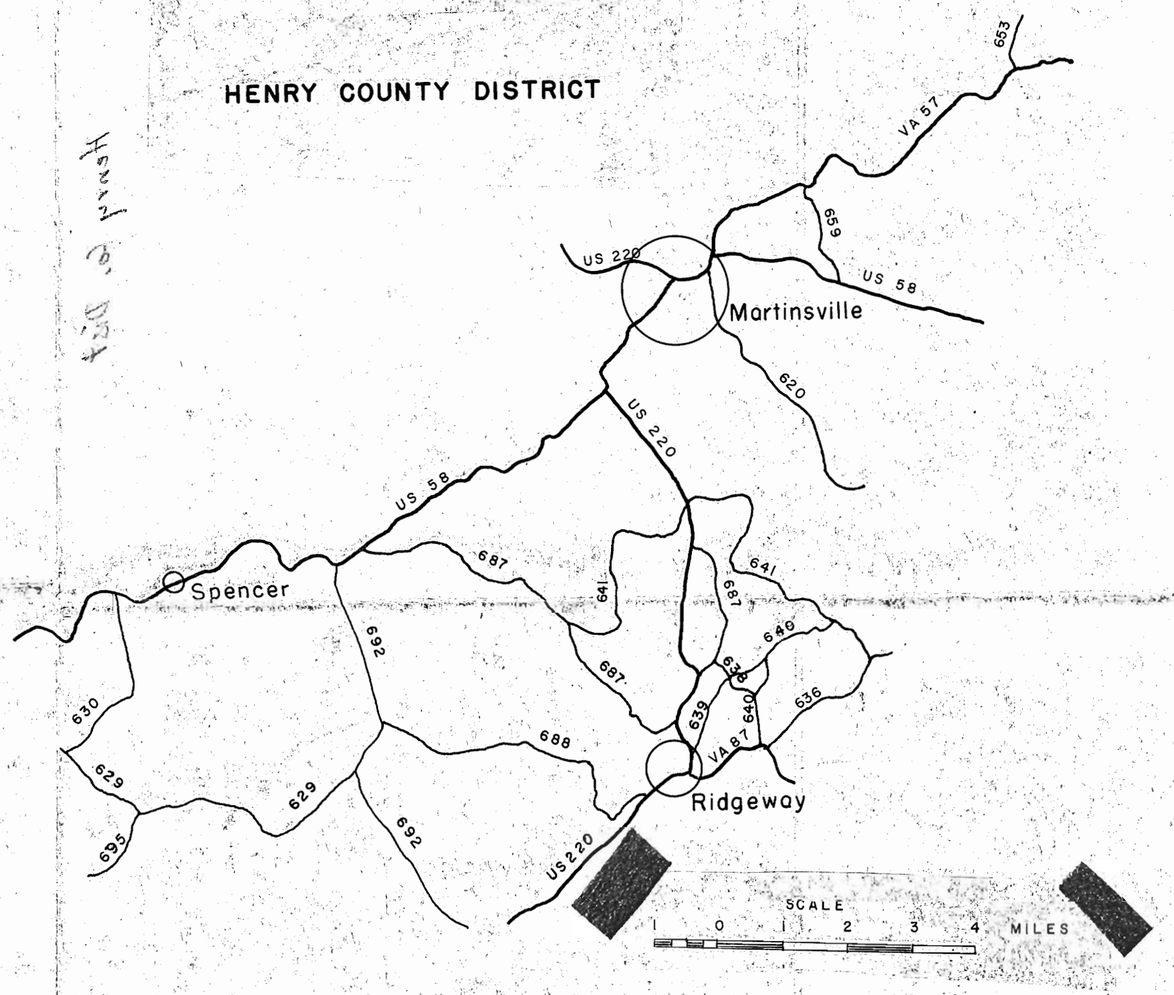
Virginia Secondary Highway — 619

Vermiculite Prospect — ▲

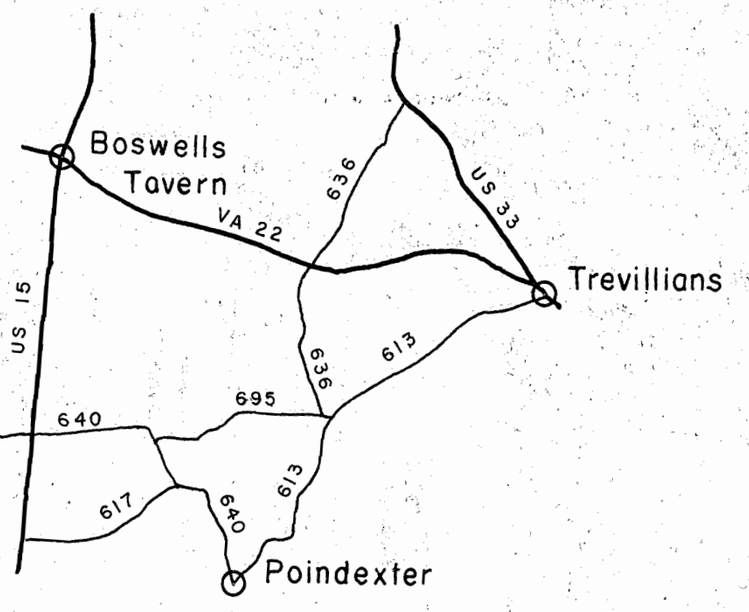
EXPLANATION

U.S. Highway — US 58
Virginia Primary Highway — VA 87
Virginia Secondary Highway — 688
Vermiculite Prospect — ▲

HENRY COUNTY DISTRICT



LOUSIA COUNTY DISTRICT



EXPLANATION

U.S Highway
Virginia Primary Highway
Virginia Secondary Highway
Vermiculite Prospect

US 6
VA 22
640
▲

SCALE
1 0 1 2 3 4 MILES

1
ROCKY MOUNT AREA
FOUR TIMES MAP SCALE

4
FERRUM AREA
FOUR TIMES MAP SCALE

5
HENRY AREA
FOUR TIMES MAP SCALE

6
PENHOOK AREA
FOUR TIMES MAP SCALE

VA. PRIMARY HIGHWAY
VA. SECONDARY HIGHWAY

IN USE		NOT IN USE	
▪	FARM UNIT	▫	
▪	DWELLING OTHER THAN FARM	▫	
▪	GROUPS OF DWELLINGS CLOSELY SPACED	▫	
▪	SCHOOL (WHITE)	▫	
▪	SCHOOL (COLORED)	▫	
▪	LARGE SCHOOL OR COLLEGE	▫	
▪	CHURCH (WHITE)	▫	
▪	CHURCH (COLORED)	▫	
▪	CHURCH WITH CEMETERY ADJACENT	▫	
▪	CEMETERY	▫	
▪	POST OFFICE	▫	
▪	FILLING STATION	▫	
▪	STORE OR SMALL BUSINESS ESTABLISHMENT	▫	
▪	BUSINESS ESTABLISHMENT AND FILLING STATION	▫	
▪	FACTORY OR INDUSTRIAL PLANT	▫	
▪	TOURIST CAMP	▫	
▪	SEASONAL DWELLING	▫	
▪	WAREHOUSE, GENERAL	▫	
▪	POWER PLANT	▫	
▪	SAWMILL	▫	
▪	GRAVEL PIT	▫	
▪	QUARRY	▫	
▪	SWIMMING POOL	▫	
▪	HALL - COMMUNITY, TOWN OR GRANGE	▫	
▪	SEASONAL INDUSTRY	▫	
▪	PLAYGROUND, BALL FIELD, ETC.	▫	
▪	MINE	▫	
▪	BULK TANKS	▫	
RFD	RURAL MAIL ROUTE		
SB	SCHOOL BUS ROUTE		

DISTANCE ON PRIMARY ROADS BETWEEN PRIMARY INTERSECTIONS AND / OR COUNTY LINE

NOTE:
ROADS DISTANCE SHOWN ON SECONDARY ROADS BETWEEN SECONDARY INTERSECTIONS, SECONDARY AND PRIMARY INTERSECTIONS OR SECONDARY INTERSECTIONS AND COUNTY LINES.

FRANKLIN CO.

FORMED IN 1785 FROM HENRY AND BEDFORD AND ADDED TO FROM PATRICK. NAMED FOR BENJAMIN FRANKLIN. GENERAL JUBAL A. EARLY LIVED IN THIS COUNTY.

VA. DEPT. OF CONS. & DEVELOPMENT

INDEX TO COUNTY LOCATION

RURAL or MUNICIPALITY	1940 CENSUS POPULATION	SQ. MILES
RURAL	24,121	718.48
BOONES MILL	377	1.82
ROCKY MOUNT	1,366	0.70
TOTAL	25,864	721.00

FRANKLIN COUNTY
VIRGINIA
SHOWING
PRIMARY AND SECONDARY HIGHWAYS

SCALE OF MILES
0 1 2 3 4

COUNTY SEAT- ROCKY MOUNT

PREPARED BY THE
DEPARTMENT OF HIGHWAYS
RICHMOND, VIRGINIA
JAN. 1, 1951

BASE MAP PREPARED BY THE DEPARTMENT OF HIGHWAYS IN COOPERATION WITH THE FEDERAL WORKS AGENCY, PUBLIC ROADS ADMINISTRATION, ASSISTED BY THE STATE PLANNING BOARD AND THE WORKS PROGRESS ADMINISTRATION

REQUESTS FOR INFORMATION AND REPORTS ON CONDITION OF ROADS SHOWN ON THIS MAP SHOULD BE ADDRESSED TO DISTRICT ENGINEER, DEPARTMENT OF HIGHWAYS SALEM, VIRGINIA.

SECONDARY MILEAGE TABULATION				
DATE	1-1-50	1-1-51		
HARD SURFACE	180.03	186.43		
ALL-WEATHER SURFACE	411.15	406.65		
LIGHT SURFACE	203.61	200.71		
UNSURFACED	141.96	144.46		
TOTAL MILEAGE	936.75	938.25		

TOTAL PRIMARY MILEAGE IN THE COUNTY AS OF JAN. 1, 1951 — 119.15 MI.

SECONDARY MILEAGE TABULATION								
TYPE	7-1-32	7-1-34	5-1-39	7-1-41	7-1-42	7-1-43	7-1-44	7-1-45
UNIMPROVED	——	546.84	357.92	274.95	248.75	210.76	204.12	204.12
GRADED & DRAINED	——	106.33	123.69	114.23	99.44	138.16	136.46	136.46
GRAVEL, SOIL, ETC	——	221.44	360.51	455.50	510.81	504.05	512.39	503.49
BIT. SURF. PAVED	——	19.61	69.63	87.31	81.03	72.76	72.76	91.66
TOTAL MILEAGE	——	894.22	911.75	921.99	940.03	925.73	925.73	925.73

PITTSYLVANIA COUNTY
VIRGINIA

SHOWING

PRIMARY AND SECONDARY HIGHWAYS

SCALE OF MILES 0 1 2 3 4

COUNTY SEAT – CHATHAM

PREPARED BY THE
DEPARTMENT OF HIGHWAYS
RICHMOND, VIRGINIA
JULY 1, 1945

BASE MAP PREPARED BY THE DEPARTMENT OF HIGHWAYS IN COOPERATION WITH THE FEDERAL WORKS AGENCY, PUBLIC ROADS ADMINISTRATION, ASSISTED BY THE STATE PLANNING BOARD AND THE WORKS PROGRESS ADMINISTRATION

N

LEGEND

- CORPORATE LIMITS, POPULATION IN THOUSANDS AND HIGHWAYS THROUGH TOWNS
- COUNTY SEAT
- SMALL TOWN OR VILLAGE
- STATE LINE
- COUNTY LINE
- MAGISTERIAL DISTRICT LINE
- PARK, MONUMENT OR RESERVATION
- STEAM RAILROAD, SINGLE TRACK
- STEAM RAILROAD, TWO OR MORE TRACKS
- RAILROAD STATION
- RAILROAD GRADE CROSSING
- RAILROAD ABOVE ROAD
- RAILROAD BELOW ROAD
- RAILROAD BRIDGE
- HIGHWAY BRIDGE 20 FEET OR OVER
- FORD
- TRANSMISSION LINE
- PRIVATE ROAD HAVING PUBLIC USE
- UNIMPROVED ROAD
- GRADED AND DRAINED ROAD
- SOIL, GRAVEL OR STONE ROAD
- BITUMINOUS SURFACED & PAVED ROADS
- U.S. HIGHWAY
- VIRGINIA PRIMARY HIGHWAY
- VIRGINIA SECONDARY HIGHWAY

NOTES: ROAD BAND WIDTHS: PRIMARY + 0.08
SECONDARY AND OTHER ROADS + 0.05

MAGISTERIAL DISTRICT BOUNDARY LINES WHICH ARE SHOWN PARALLEL TO FEATURES SUCH AS ROADS, STREAMS ETC., ARE ON CENTERLINE OF SUCH FEATURES UNLESS SPECIFICALLY NOTED OTHERWISE ON MAP.

DISTANCE ON PRIMARY ROADS ESTABLISHED PRIMARY INTERSECTIONS AND OR COUNTY LINE

IN USE	NOT IN USE
FARM UNIT	0
DWELLING (Other) THAN FARM	0
GROUPS OF DWELLINGS CLOSELY SPACED	0
SCHOOL (WHITE)	0
SCHOOL (COLORED)	0
LARGE SCHOOL OR COLLEGE	0
CHURCH (WHITE)	0
CHURCH (COLORED)	0
CHURCH WITH CEMETERY ADJACENT	
CEMETERY	
POSTOFFICE	
FILLING STATION	0
STORE OR SMALL BUSINESS ESTABLISHMENT	
BUSINESS ESTABLISHMENT AND FILLING STATION	
FACTORY OR INDUSTRIAL PLANT	
TOURIST CAMP	
WAREHOUSE, GENERAL	
SAWMILL	
SEASONAL DWELLING	
SEASONAL INDUSTRY	
HIGHWAY GARAGE	
WATER TANK	
KILN OR OVEN	
MINE	
TOWNHALL, GRANGE OR COMMUNITY HALL	
PLAYGROUND, BALLFIELD ETC.	
GOLF COURSE	
NURSERY	
C.C.C. CAMP	
RFD MAIL ROUTES	
SB SCHOOL BUS ROUTES	
STAR MAIL ROUTES	

REQUESTS FOR INFORMATION AND REPORTS ON CONDITION OF ROADS SHOWN ON THIS MAP SHOULD BE ADDRESSED TO DISTRICT ENGINEER, DEPARTMENT OF HIGHWAYS LYNCHBURG, VIRGINIA

SECONDARY MILEAGE TABULATION

TYPE	7-1-32	7-1-34	7-1-39	7-1-41	7-1-42	7-1-43	7-1-44	7-1-45
UNIMPROVED	———	158.50	135.22	72.10	72.25	60.34	59.79	61.24
GRADED & DRAINED	———	649.25	500.52	380.89	316.69	318.97	324.17	320.07
GRAVEL, SOIL ETC.	———	833.10	537.77	664.90	708.50	670.89	663.57	662.55
BIT. SURF. PAVED	———	89.51	254.57	309.08	328.78	384.55	323.79	323.79
TOTAL MILEAGE	1434.36	1430.36	1428.08	1427.07	1426.22	1374.80	1371.32	1367.65

INDEX TO COUNTY LOCATION

RURAL or MUNICIPALITY	1940 CENSUS POPULATION	SQ. MILES
RURAL	59,648	1020.43
CHATHAM	1,530	1.10
GRETNA	819	0.27
TOTAL	61,697	1022.50
DANVILLE	32,749	9.70

6-1-32	7-1-38	7-1-44
7-1-33	7-1-39	7-1-45
7-1-34	7-1-40	
7-1-35	7-1-41	
7-1-36	7-1-42	
7-1-37	3-5-43	

SEE SUPPLEMENTAL SHEET 72A FOR ENLARGED AREAS

CHARLOTTE COUNTY
VIRGINIA

SHOWING

PRIMARY AND SECONDARY HIGHWAYS

SCALE OF MILES 0 1 2 3 4

COUNTY SEAT – CHARLOTTE

PREPARED BY THE

DEPARTMENT OF HIGHWAYS

RICHMOND, VIRGINIA

JULY 1, 1945

BASE MAP PREPARED BY THE DEPARTMENT OF HIGHWAYS IN COOPERATION WITH THE FEDERAL WORKS AGENCY, PUBLIC ROADS ADMINISTRATION, ASSISTED BY THE STATE PLANNING BOARD AND THE WORKS PROGRESS ADMINISTRATION

REQUESTS FOR INFORMATION AND REPORTS ON CONDITION OF ROADS SHOWN ON THIS MAP SHOULD BE ADDRESSED TO DISTRICT ENGINEER, DEPARTMENT OF HIGHWAYS LYNCHBURG, VIRGINIA

LEGEND

- CORPORATE LIMITS, POPULATION IN THOUSANDS AND HIGHWAYS THROUGH TOWNS.
- COUNTY SEAT
- SMALL TOWN OR VILLAGE
- COUNTY LINE
- MAGISTERIAL DISTRICT LINE
- STEAM RAILROAD, SINGLE TRACK
- STEAM RAILROAD, TWO OR MORE TRACKS
- RAILROAD STATION
- RAILROAD GRADE CROSSING
- RAILROAD ABOVE ROAD
- RAILROAD BELOW ROAD
- TRANSMISSION LINE
- HIGHWAY BRIDGE 20 FEET OR OVER
- FORD
- GATE
- RFD RURAL OR STAR MAIL ROUTE
- UNIMPROVED ROAD
- GRADED AND DRAINED ROAD
- SOIL, GRAVEL OR STONE ROAD
- BITUMINOUS SURFACED OR PAVED ROAD
- U.S. HIGHWAY
- VIRGINIA PRIMARY HIGHWAY
- VIRGINIA SECONDARY HIGHWAY
- SB SCHOOL BUS ROUTE
- DISTANCE ON PRIMARY ROADS BETWEEN PRIMARY INTERSECTIONS AND/OR COUNTY LINES

NOTES:

DISTANCE SHOWN ON SECONDARY ROADS BETWEEN SECONDARY INTERSECTIONS, SECONDARY AND PRIMARY INTERSECTIONS OR SECONDARY INTERSECTIONS AND COUNTY LINES

MAGISTERIAL DISTRICT BOUNDARY LINES WHICH ARE SHOWN PARALLEL TO FEATURES SUCH AS ROADS, STREAMS, ETC., ARE ON THE CENTERLINE OF SUCH FEATURES UNLESS SPECIFICALLY NOTED OTHERWISE

ROAD BAND WIDTHS: PRIMARY = 0.08" SECONDARY AND OTHER ROADS = 0.05"

IN USE		NOT IN USE
▪	FARM UNIT	▫
▪	DWELLING OTHER THAN FARM	▫
◣	SEASONAL DWELLING	◺
▪	GROUPS OF DWELLINGS CLOSELY SPACED	▫
✝	SCHOOL (WHITE)	✝
✝	SCHOOL (COLORED)	✝
✝	CHURCH (WHITE)	✝
✝	CHURCH (COLORED)	✝
✝	CHURCH WITH CEMETERY ADJACENT	✝
✝	CEMETERY	✝
▪	POST OFFICE	▫
▟	STORE OR SMALL BUSINESS ESTABLISHMENT	▫
⛽	FILLING STATION	⛽
▟	BUSINESS ESTABLISHMENT AND FILLING STATION	▫
▙	FACTORY OR INDUSTRIAL PLANT	▫
▪	WAREHOUSE, GENERAL	▫
▲	SAWMILL	△
▪	HIGHWAY GARAGE	
⛳	GOLF GROUND OR COUNTRY CLUB	
▲	PLAYGROUND, BALL FIELD, ETC.	
▲	PICNIC GROUND	
✱	OBSERVATION OR LOOKOUT TOWER	
✱	AIRWAY BEACON LIGHT	

1 DRAKES BRANCH AREA
THREE TIMES MAP SCALE

2 CHARLOTTE AREA
FOUR TIMES MAP SCALE

3 KEYSVILLE AREA
FOUR TIMES MAP SCALE

4 PHENIX AREA
FOUR TIMES MAP SCALE

INDEX TO COUNTY LOCATION

SECONDARY MILEAGE TABULATION								
TYPE	7-1-32	7-1-34	7-1-39	7-1-41	7-1-42	7-1-43	7-1-44	7-1-45
UNIMPROVED	——	18.90	17.80	18.16	34.39	31.74	34.24	34.62
GRADED & DRAINED	——	46.15	37.15	36.15	114.05	111.95	93.98	95.28
GRAVEL, SOIL, ETC.	——	307.53	288.95	274.71	171.59	181.49	199.65	196.35
BIT. SURF. PAVED	——	4.98	52.70	76.27	84.17	80.42	80.43	82.43
TOTAL MILEAGE	368.15	377.56	396.60	405.29	404.20	405.20	408.30	408.68

RURAL or MUNICIPALITY	1940 CENSUS POPULATION	SQ. MILES
RURAL	14,077	462.06
CHARLOTTE C.H.	399	3.14
DRAKES BRANCH	438	3.24
KEYSVILLE	607	1.32
PHENIX	340	1.24
TOTAL	15,861	471.00

REVISED		
6-1-32	7-1-38	7-1-43
7-1-33	7-1-39	7-1-44
7-1-34	7-1-40	7-1-45
7-1-35	7-1-41	
7-1-36	6-11-42	
7-1-37	7-1-42	

MAP CHARLOTTE COUNTY VIRGINIA

20

LEGEND

- CORPORATE LIMITS, POPULATION IN THOUSAND
- AND HIGHWAYS THROUGH TOWNS
- COUNTY SEAT
- SMALL TOWN OR VILLAGE
- STATE LINE
- COUNTY LINE
- MAGISTERIAL DISTRICT LINE
- PARK MONUMENT OR RESERVATION
- STEAM RAILROAD, SINGLE TRACK
- STEAM RAILROAD, TWO OR MORE TRACKS
- RAILROAD STATION
- RAILROAD GRADE CROSSING
- RAILROAD ABOVE ROAD
- RAILROAD BELOW ROAD
- TRANSMISSION LINE
- UNIMPROVED ROAD
- GRADED AND DRAINED ROAD
- SOIL, GRAVEL OR STONE ROAD
- BITUMINOUS SURFACED ROAD OR PAVED ROAD
- BLUE RIDGE PARKWAY-PROPOSED
- HIGHWAY BRIDGE 20 FEET OR OVER
- FORD
- U. S. HIGHWAY
- VIRGINIA PRIMARY HIGHWAY
- VIRGINIA SECONDARY HIGHWAY

NOTES: ROAD BAND WIDTHS: PRIMARY ROADS = 0.08
SECONDARY AND OTHER ROADS = 0.05

- DISTANCE ON PRIMARY ROADS BETWEEN PRIMARY INTERSECTIONS AND/OR COUNTY LINES
- RFD RURAL MAIL ROUTE
- SB SCHOOL BUS ROUTE
- APPROVED FOREST HIGHWAY

DISTANCE ON SECONDARY ROADS BETWEEN SECONDARY INTERSECTIONS, SECONDARY AND PRIMARY INTERSECTIONS OR SECONDARY INTERSECTION AND COUNTY LINES.

MAGISTERIAL DISTRICT BOUNDARY LINES WHICH ARE SHOWN PARALLEL TO FEATURES SUCH AS ROADS, STREAMS, ETC., ARE ON THE CENTERLINE OF SUCH FEATURES UNLESS SPECIFICALLY NOTED OTHERWISE.

IN USE
- FARM UNIT
- DWELLING OTHER THAN FARM
- GROUPS OF DWELLINGS CLOSELY SPACED
- SCHOOL (WHITE)
- SCHOOL (COLORED)
- CHURCH (WHITE)
- CHURCH (COLORED)
- CHURCH WITH CEMETERY ADJACENT
- CEMETERY
- POSTOFFICE
- FILLING STATION
- STORE OR SMALL BUSINESS ESTABLISHMENT
- BUSINESS ESTABLISHMENT AND FILLING STATION
- TOURIST CAMP
- FACTORY OR INDUSTRIAL PLANT
- SEASONAL INDUSTRY
- SAWMILL
- QUARRY
- POWER SUBSTATION
- WAREHOUSE-GENERAL
- STATE HIGHWAY GARAGE
- HOTEL, INN
- SEASONAL DWELLING
- ALMSHOUSE
- C.C.C. CAMP
- OBSERVATION OR LOOKOUT TOWER
- PROMINENT PEAKE AND LOOKOUT TOWER
- HALL-COMMUNITY TOWN OR GRANGE
- BULK TANK

NOT IN USE

7
BIG ISLAND AREA
FOUR TIMES MAP SCALE

8
PEAKLAND AREA
FOUR TIMES MAP SCALE

9
AREA EAST OF BEDFORD
SIX TIMES MAP SCALE

1
MONTVALE AREA
FOUR TIMES MAP SCALE

2
THAXTON AREA
FOUR TIMES MAP SCALE

3
STEWARTSVILLE AREA
FOUR TIMES MAP SCALE

4
MONETA AREA
FOUR TIMES MAP SCALE

5
GOODE AREA
FOUR TIMES MAP SCALE

6
FOREST AREA
FOUR TIMES MAP SCALE

SECONDARY MILEAGE TABULATION									
TYPE	7-1-32	7-1-34	7-1-39	7-1-41	7-1-42	7-1-43	7-1-44	7-1-45
UNIMPROVED	——	391.45	238.55	185.00	172.10	161.18	153.68	151.43
GRADED&DRAINED	——	229.25	186.05	120.77	104.92	96.17	95.77	92.97
GRAVEL,SOIL, ETC.	——	199.20	380.55	481.10	495.22	523.85	522.28	523.98
BIT.SURF.PAVED	——	30.45	48.26	74.21	94.26	94.34	87.21	76.51
TOTAL MILEAGE	875.35	841.35	853.41	861.08	866.50	875.54	858.94	844.89

REQUESTS FOR INFORMATION AND REPORTS ON CONDITION OF ROADS SHOWN ON THIS MAP SHOULD BE ADDRESSED TO DISTRICT ENGINEER, DEPARTMENT OF HIGHWAYS SALEM, VIRGINIA.

RURAL or MUNICIPALITY	1940 CENSUS POPULATION	SQ. MILES
RURAL	25,714	779.80
BEDFORD	3,973	2.20
TOTAL	29,687	781.00

INDEX TO COUNTY LOCATION

BEDFORD COUNTY
VIRGINIA
SHOWING
PRIMARY AND SECONDARY HIGHWAYS

SCALE OF MILES
0 1 2 4

COUNTY SEAT- BEDFORD

PREPARED BY THE
DEPARTMENT OF HIGHWAYS
RICHMOND, VIRGINIA
JULY 1, 1945

BASE MAP PREPARED BY THE DEPARTMENT OF HIGHWAYS IN COOPERATION WITH THE FEDERAL WORKS AGENCY, PUBLIC ROADS ADMINISTRATION, ASSISTED BY THE STATE PLANNING BOARD AND THE WORKS PROGRESS ADMINISTRATION

REVISED		
6-1-32	7-1-38	7-1-44
7-1-33	7-1-39	7-1-45
7-1-34	7-1-40	
7-1-35	7-1-41	
7-1-36	11-9-42	
7-1-37	7-1-43	

MAP BEDFORD COUNTY VIRGINIA 10

BEDFORD-FRANKLIN COUNTIES DISTRICT

EXPLANATION

- U.S. Highway
- Virginia Primary Highway
- Virginia Secondary Highway
- Vermiculite Prospect

US 460
VA 122
731
▲

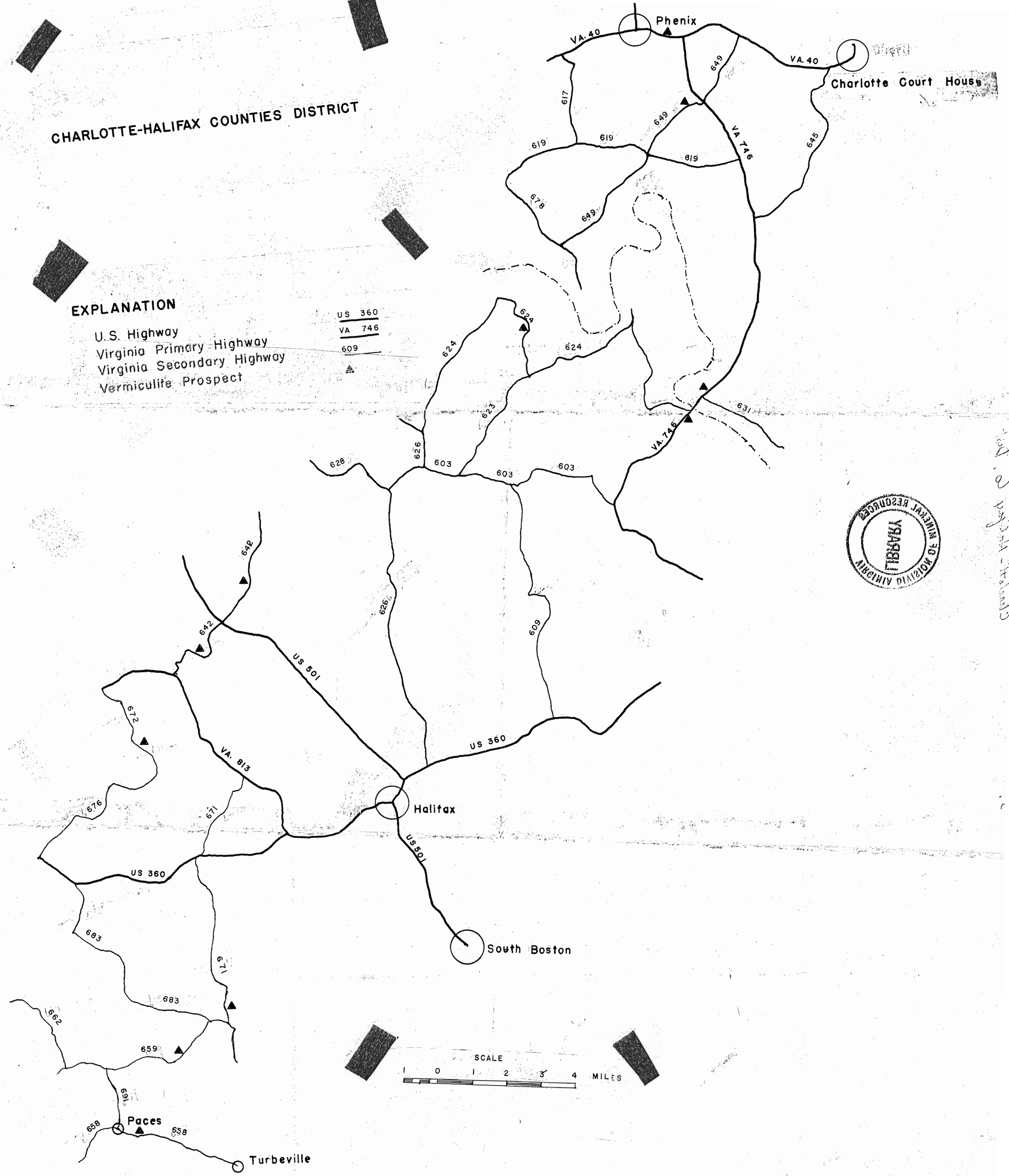
Goode
Bedford
Moneta
Taylors Store
ROANOKE RIVER
US 460
VA 24
VA 122
VA 43
689
688
715
707
706
777
VA 297
415
714
724
722
725
731
732
737
654
608
749
655
750
678
636
616
666
667
634
672

SCALE
1 0 1 2 3 4 MILES

CHARLOTTE-HALIFAX COUNTIES DISTRICT

EXPLANATION

U.S. Highway — US 360
Virginia Primary Highway — VA 746
Virginia Secondary Highway — 609
Vermiculite Prospect — ▲



BUCKINGHAM COUNTY DISTRICT

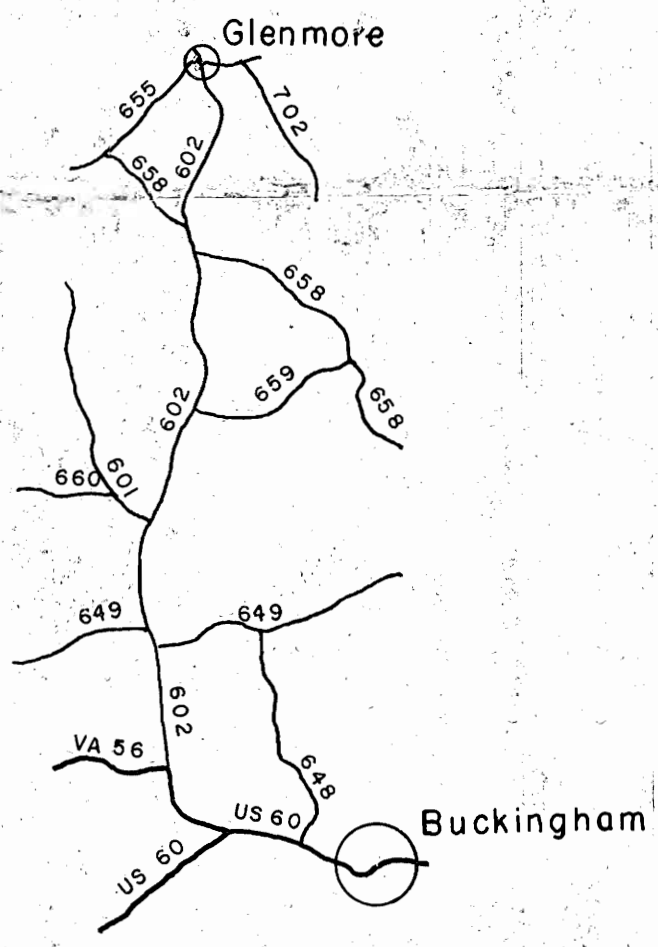
EXPLANATION

U.S. Highway — US 60

Virginia Primary Highway — VA 56

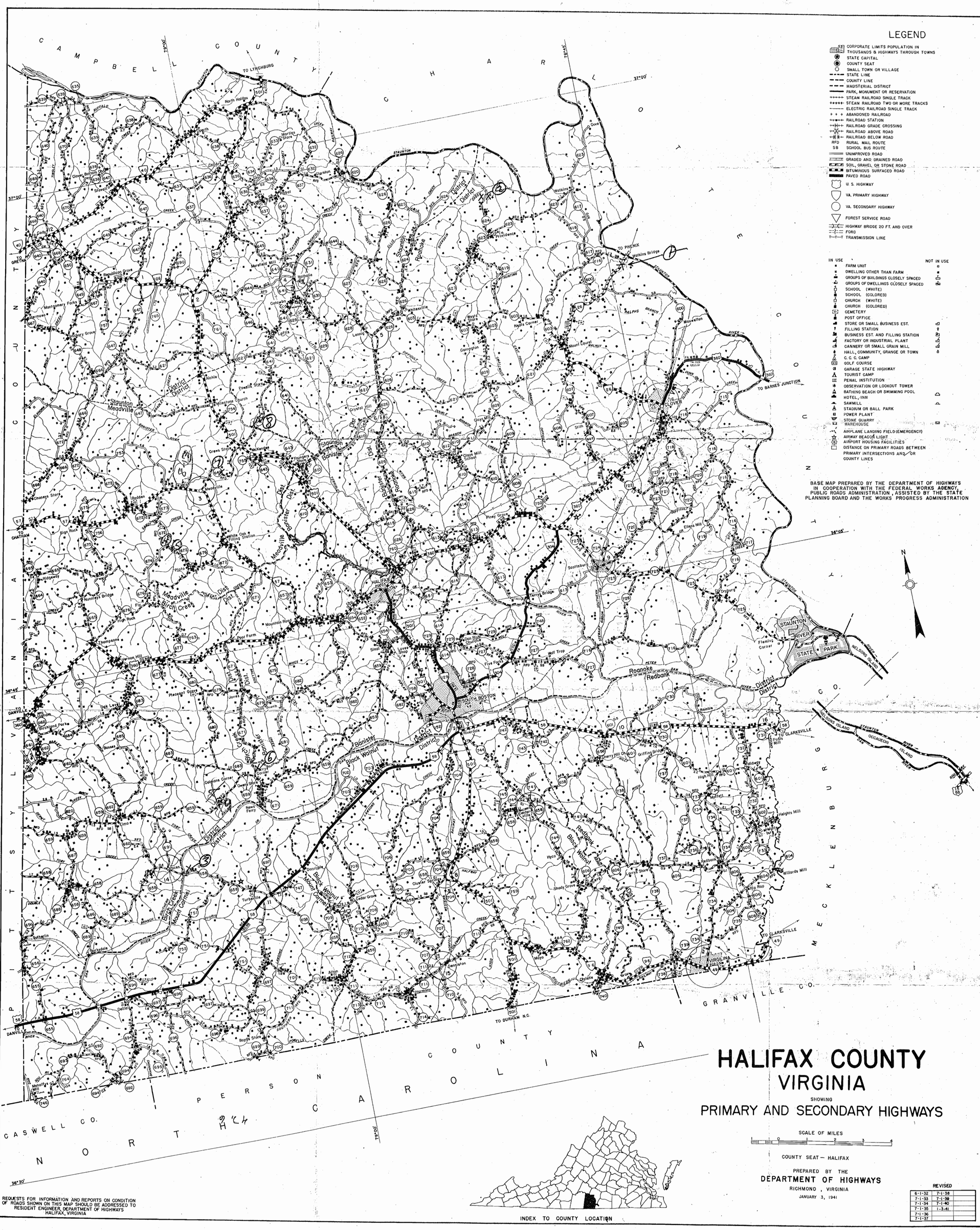
Virginia Secondary Highway — 602

Vermiculite Prospect — ▲



SCALE

1 0 1 2 3 4 MILES



LEGEND

- CORPORATE LIMITS POPULATION IN THOUSANDS & HIGHWAYS THROUGH TOWNS
- STATE CAPITAL
- COUNTY SEAT
- SMALL TOWN OR VILLAGE
- STATE LINE
- COUNTY LINE
- MAGISTERIAL DISTRICT
- PARK, MONUMENT OR RESERVATION
- STEAM RAILROAD SINGLE TRACK
- STEAM RAILROAD TWO OR MORE TRACKS
- ELECTRIC RAILROAD SINGLE TRACK
- ABANDONED RAILROAD
- RAILROAD STATION
- RAILROAD GRADE CROSSING
- RAILROAD ABOVE ROAD
- RAILROAD BELOW ROAD
- RFD RURAL MAIL ROUTE
- SB SCHOOL BUS ROUTE
- UNIMPROVED ROAD
- GRADED AND DRAINED ROAD
- SOIL, GRAVEL OR STONE ROAD
- BITUMINOUS SURFACED ROAD
- PAVED ROAD
- U. S. HIGHWAY
- VA. PRIMARY HIGHWAY
- VA. SECONDARY HIGHWAY
- FOREST SERVICE ROAD
- HIGHWAY BRIDGE 20 FT. AND OVER
- FORD
- TRANSMISSION LINE

IN USE		NOT IN USE
▪	FARM UNIT	▫
▪	DWELLING OTHER THAN FARM	▫
▪	GROUPS OF BUILDINGS CLOSELY SPACED	▫
▪	GROUPS OF DWELLINGS CLOSELY SPACED	▫
▫	SCHOOL (WHITE)	
▪	SCHOOL (COLORED)	
▫	CHURCH (WHITE)	
▪	CHURCH (COLORED)	
	CEMETERY	
▪	POST OFFICE	
▪	STORE OR SMALL BUSINESS EST.	▫
▪	FILLING STATION	▫
▪	BUSINESS EST. AND FILLING STATION	▫
▪	FACTORY OR INDUSTRIAL PLANT	▫
▪	CANNERY OR SMALL GRAIN MILL	▫
▪	HALL, COMMUNITY, GRANGE OR TOWN	▫
	G. C. C. CAMP	
	GOLF COURSE	
▪	GARAGE STATE HIGHWAY	
▪	TOURIST CAMP	
▪	PENAL INSTITUTION	
▪	OBSERVATION OR LOOKOUT TOWER	
▪	BATHING BEACH OR SWIMMING POOL	
▪	HOTEL, INN	
▪	SAWMILL	▫
▪	STADIUM OR BALL PARK	
▪	POWER PLANT	
▪	STONE QUARRY	
▪	WAREHOUSE	▫
	AIRPLANE LANDING FIELD (EMERGENCY)	
	AIRWAY BEACON LIGHT	
	AIRPORT HOUSING FACILITIES	
	DISTANCE ON PRIMARY ROADS BETWEEN PRIMARY INTERSECTIONS AND/OR COUNTY LINES	

BASE MAP PREPARED BY THE DEPARTMENT OF HIGHWAYS IN COOPERATION WITH THE FEDERAL WORKS AGENCY, PUBLIC ROADS ADMINISTRATION, ASSISTED BY THE STATE PLANNING BOARD AND THE WORKS PROGRESS ADMINISTRATION

REQUESTS FOR INFORMATION AND REPORTS ON CONDITION OF ROADS SHOWN ON THIS MAP SHOULD BE ADDRESSED TO RESIDENT ENGINEER, DEPARTMENT OF HIGHWAYS HALIFAX, VIRGINIA

INDEX TO COUNTY LOCATION

HALIFAX COUNTY
VIRGINIA
SHOWING
PRIMARY AND SECONDARY HIGHWAYS

SCALE OF MILES 0 1 2 3 4

COUNTY SEAT — HALIFAX

PREPARED BY THE
DEPARTMENT OF HIGHWAYS
RICHMOND, VIRGINIA
JANUARY 3, 1941

REVISED

6-1-32	7-1-38	
7-1-33	7-1-39	
7-1-34	7-1-40	
7-1-35	1-3-41	
7-1-36		
7-1-37		