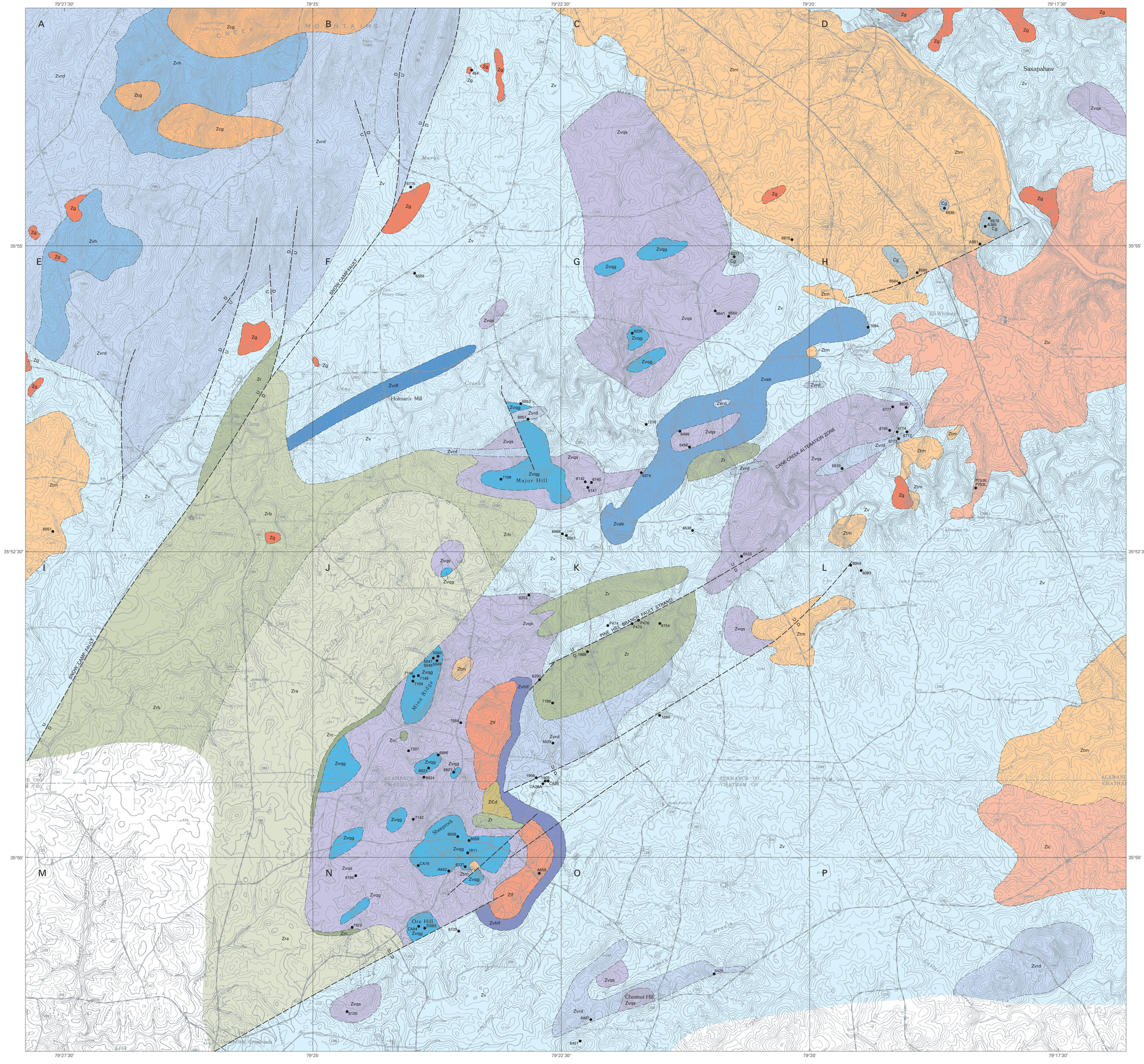


SCALE 1:24 000

1 1/2 0 1 MILE

1 .5 0 1 KILOMETER

CONTOUR INTERVAL 10 FEET

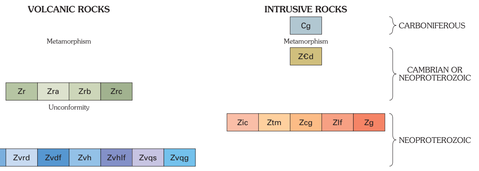
EXPLANATION

— — — **Contact**—Position inferred from scattered outcrops or soil types

– – – **Fault**—Position inferred from topographic features, juxtaposition of unrelated rock types, observed shear zones, lineaments noted on Landsat and side-looking radar images, and boundaries of mapped soils. U, upthrown side; D, downthrown side

6886● **Location of composite rock chip sample collected for analysis**—Analytical results given in tables 8–10

CORRELATION OF MAP UNITS



DESCRIPTION OF MAP UNITS

VOLCANIC ROCKS

Zr **Reedy Branch Tuff (Neoproterozoic)**—Rhyodacitic and dacitic tuff containing abundant euhedral to subhedral plagioclase crystals and lesser quartz phenocrysts in a very fine grained matrix of muscovite, biotite, chlorite, epidote, calcite, ilmenite, and anatase; commonly contains small inclusions of dark, fine-grained rock, most of which are smaller than 0.4 in (1 cm); a few may be as much as 6 in (15 cm) long; some are angular and some are rounded

Zra Reedy Branch Tuff that is slightly to moderately altered to quartz-sericite

Zrb Reedy Branch Tuff that is strongly altered to quartz-sericite and, locally, is strongly sheared

Zrc A discontinuous subunit up to a few feet (meters) thick at the base of the Reedy Branch Tuff that contains abundant rounded clasts of a variety of volcanic rocks in a crystal-rich matrix; interpreted to be a debris flow unconformably overlying the older strata. Locally consists of two or more clast-rich layers separated by layers of crystal-rich tuff

Intermediate to felsic volcanic complex (Neoproterozoic)—Mixed basaltic to rhyolitic tuff and coarse pyroclastic rocks, in part fragment rich; contains a few flows and volcaniclastic rocks. The entire assemblage is assumed to be older than the Reedy Branch Tuff. The regional correlation by Offield with the Aaron(?) Formation and the Hyco Formation of Harris (1982) is tentative

Zv Tuffs, coarse pyroclastic rocks, and lesser flows and volcaniclastic rocks—Mixed lithic types and outcrop spacing precluded further subdivision in mapping. Where possible, individual rock types were mapped separately, but no internal stratigraphic sequence was recognized

Zvab Andesitic or basaltic rocks—Few outcrops observed but a long narrow area of mafic rock is suggested by Tirzah- and Efland-type soils (Kaster, 1960)

Zvrd Siliceous, partly flow-banded rhyolites and dacites—Probably constitute most of the volcanic rocks in the Cane Creek Mountains; elsewhere linear outcrop areas no more than 3 mi (5 km) long. These isolated areas are interpreted to be underlain by flows, domes, or stubby lenses. Flow banding is present in about half of the outcrops examined. These rocks include crystal-rich lapilli tuffs that contain some lithic fragments, tuff that contains compacted and deformed shards, and lapilli tuffs in which fine devitrified glass has preserved patches of flow layering, some layers contain microspherulites

Zvdf Probable debris flows east of Snow Camp community—Several thin beds of coarse conglomerate, perhaps lahars, contain diverse volcanic cobbles, separated by layers of dacitic and andesitic tuff

Zvh Siliceous hornfels—Aureoles in felsic volcanic rocks in the Cane Creek Mountains. Fine-grained, aplite-like rocks associated with granitoid intrusions

Zvhlf Hornfels adjacent to the Lindley Farms Quartz Monzonite in sectors J and N

Zvqs Quartz-sericite-paragonite rock—Light-gray to grayish-green, altered intermediate to felsic volcanic complex. Original lithic textures generally remain recognizable. Commonly contains a trace to several percent pyrite. Also includes potassically altered rocks and epidote-rich altered rocks within and near plutons. Outer edges grade into volcanic rocks without hydrothermal alteration; inner contacts with siliceous core zone generally abrupt

Zvqg Siliceous core-zone rocks—Generally gray to white intermediate to felsic rocks that are intensely altered to very siliceous quartz granofels and associated pods of pyrophyllite-andalusite-pyrite rock. Accessory minerals include chloritoid, topaz, magnetite, hematite, tourmaline, and, less commonly, lazulite. Quartz-healed breccias common; original lithic textures generally faint or totally obliterated

INTRUSIVE ROCKS

Cg **Unmetamorphosed granitoid rock (Carboniferous)**—Small areas of granite, dacite, and rhyodacite, quartz-rich and potassium-poor, light-colored and medium-grained, and molybdenum-bearing greisenlike muscovite quartz-epidote-sulfide rock. Some areas are strongly deuterically or hydrothermally altered. Rounded and partly embayed quartz phenocrysts are common; traces of potassium feldspar occur as replacements on microfractures. Propylitic alteration was incomplete and parts of the plagioclase phenocrysts retain their delicate oscillatory zones. Unmapped apophyses of unmetamorphosed granitoid rocks have intruded metamorphosed plutonic rocks in sectors C and D, and the northern halves of sectors G and H, such as at sites 6258, 6571, 6682, and 6707 (fig. 2, sectors D and H). The unmetamorphosed porphyritic hornblende quartz monzonite at site 6610H (fig. 2, sector J) was identified largely on the basis of float fragments ranging in size from cobbles to large boulders

ZCd **Metamorphosed porphyritic dacite stock (Cambrian? or Neoproterozoic)**—Rock commonly contains plagioclase phenocrysts in a matrix of plagioclase and lesser quartz; no potassium feldspar was recognized. Epidote-rich rock is a locally abundant alteration phase. No outcrops were found; distribution was inferred from common float cobbles and a local area of quartz-rich soil. Probably associated epidote-rich veins cut nearby Reedy Branch Tuff suggesting that these rocks are probably younger than that unit

Zic **Quartz-diorite-hornfels-volcanic rock injection complexes (Neoproterozoic)**—Volcanic rock hornfels cut by multiple apophyses of fine-grained plutonic rock and variously textured porphyry; intrusive component may equal or exceed hornfels and volcanic rock. Excellent exposures of fine-grained quartz diorite in small bodies that have injected roof rock hornfels and masses, separated by hornfels screens, are present for 1.25 mi (2 km) along the banks of Cane Creek in sector H

Ztm **Intrusive rocks, medium-grained, hypidiomorphic granular to porphyritic (Neoproterozoic)**—Generally silicified granite, rhyolite, dacite, rhyodacite, trachyte, quartz monzonite, quartz monzodiorite, quartz monzogabbro, granodiorite, and quartz diorite. In addition to primary quartz, plagioclase, and potassium feldspar, metamorphic minerals include epidote, biotite, muscovite, and chlorite; graphic and myrmekitic aggregates of quartz and feldspar are common in some bodies. A few small stocks underwent intense quartz-sericite and local potassic alteration; the latter is indicated by hydrothermal biotite. Hornblende developed locally during metamorphism at one site. Abundant wall-rock inclusions and variations in composition indicate that the rocks were modified by assimilation of andesitic material from the walls. Some mapped contacts were inferred from the extent of Appling, Cecil, and Helena soils (Kaster, 1960) with which these rocks correlate well

Zcg **Granite intrusions in the Cane Creek Mountains (Neoproterozoic?)**—Three areas of light-pink to light-gray, medium-fine-grained to porphyritic, plagioclase-rich granophyric granite that probably merge at depth into a shallow plutonic body; their margins grade into porphyries having aplitic groundmasses. Feldspar, predominantly sodic plagioclase, is dominant; potassium feldspar is mostly incorporated in the common myrmekite, perthite, and irregular granophyric and graphic intergrowths. Epidote and complexly metamorphosed biotite are present. We think that these granitoid inclusions are older than the Reedy Branch Tuff

Zlf **Lindley Farms Quartz Monzonite (Neoproterozoic)**—Medium- to coarse-grained rock consists of light-gray quartz and feldspar and about 20 percent dark minerals in grain-sized aggregates that appear black in hand specimen, granophyric textures common; widely contaminated by the assimilation of mafic wall rocks. Also includes granite porphyry and quartz monzogabbro. Thoroughly saussuritized; the greenschist- to amphibolite-facies transition is indicated by green amphibole in newly formed mafic mineral aggregates. Limits of areas underlain by this rock cannot be inferred from the soil type

Zg **Gabbroic stocks (Neoproterozoic)**—Small bodies of gabbro, quartz monzogabbro, hornblende quartz monzogabbro, diorite, and hornblende gneiss, having chilled margins and zones of assimilated wall rocks. Metamorphic hornblende, biotite, and newly formed potassium feldspar are common; metamorphism here was in amphibolite facies. Cuneiform quartz and myrmekite are present. Outcrop data were collected from areas near Foust Mine and other bodies close to the Snow Camp fault; and the further distribution of the rock was inferred from the presence of characteristic Davidson, Iredell, and Mecklenburg soils (Kaster, 1960)

Figure 3.— Geologic map showing locations of composite rock chip samples analyzed by emission spectroscopy or X-ray fluorescence and, of part of the samples, gold analyses by fire assay.