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GEOLOGY AND LAND USE

HALIFAX COUNTY

by

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1981

A geologic map is the basic foundation upon which many land use and land management decisions should be made. Geologic knowledge as a basic tool for land use planning has always been a necessity; many times, an overlooked necessity. The rapid increase in population and the transition of our structure from one of a predominantly agrarian society to one of complex interrelationships of manufacturing and technical services has overtaxed our resource evaluation and planning capacity to keep abreast with our growth. We find, therefore, that we have become the victims of virtually unplanned developments. Many times, the wants of a few have taken precedence over the needs of many.

It is now becoming apparent, that in order to just supply the ever increasing demand on our non-renewable mineral resources, all future planning must include basic geologic data and must insure the protection of our active and potential mineral resource sites for our present and future generations.

Because of the accelerated growth, much planning is done after development rather than during the conceptual planning and development period. Consequently, the hasty development of many urban communities has left us in the unfavorable situation of trying to provide the needed resources these expanding areas demand while unplanned growth patterns have seriously abused our land and have not made the fullest and most productive use of our natural and mineral resources.

In addition to providing the planners with the distribution of the geologic rock types and the locations of inactive, active, and potential mineral resource sites, many solutions to land use planning and engineering problems which arise with urbanization can be solved through careful study of the information present on the geologic map. The following lists the types of information that may be assimilated from a geologic map:

A. Bedrock geology describing rock types and their distribution

B. Active, inactive and potential mineral resource sites

C. Topography of the area showing unique topographic features

D. Drainage systems and basins

E. Floodplains

F. Flood prone areas

G. Terraces - alluvial and marine

H. Areas susceptible to extreme erosion

I. Landslide prone areas

J. Slope design for highway and industrial sites

K. Cut and fill sites

L. Surface and subsurface data on the design and construction of public and private industrial projects

M. Dam site locations

N. Fault and shear zones which may be of significance in the location of dams, industrial sites, etc.

O. Location of solid and liquid waste disposal sites

P. Water well location sites to supply ground water to areas without municipal facilities

Q. Green belt locations

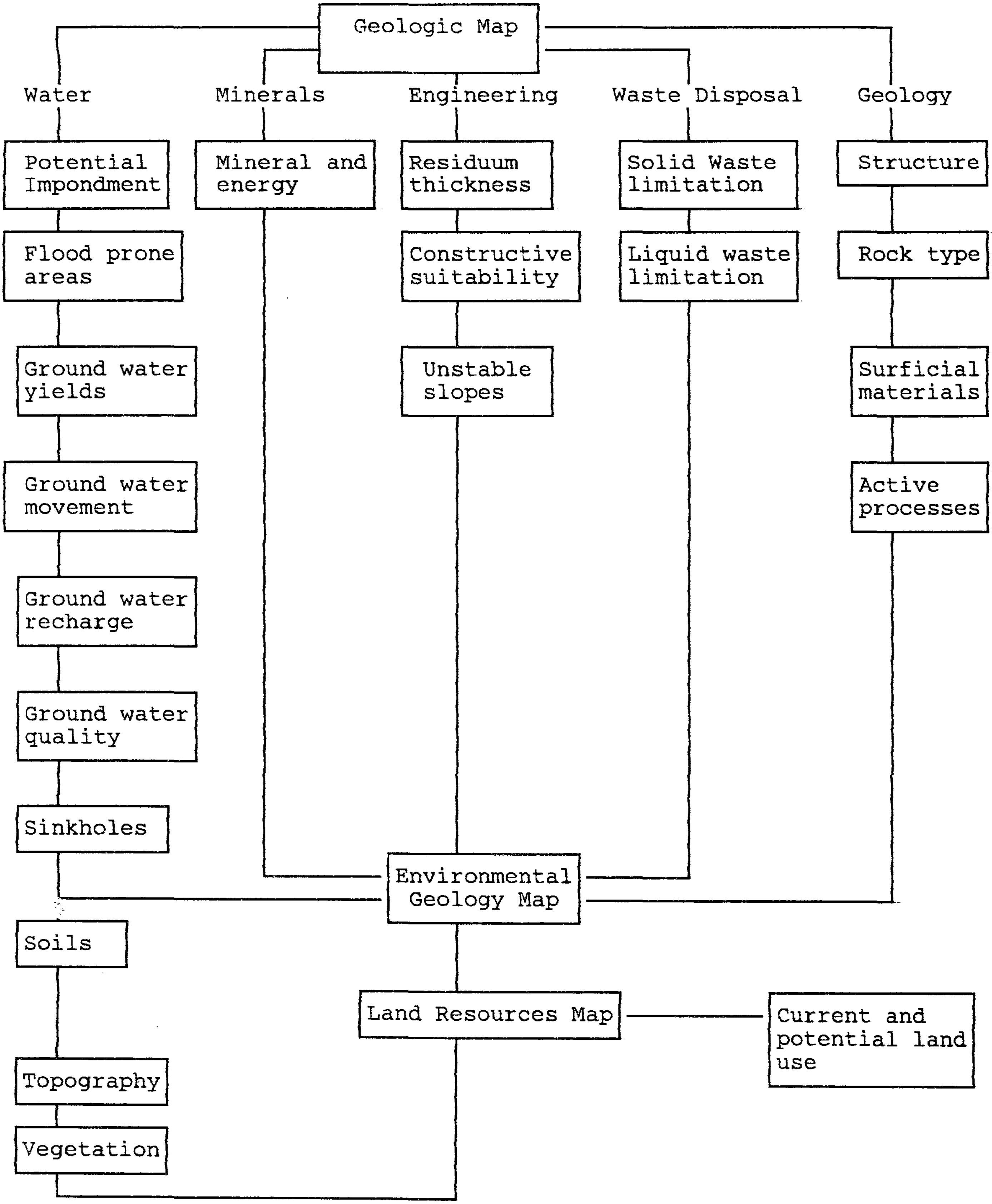
R. Recreational sites (parks, etc.)

S. Future location sites for bicycle and other trails

This information will save valuable time and money as new areas are planned for and incorporation into the evergrowing urban framework.

The urban area that does not project its long-ranged planning program for its existing and its potential mineral resource sites will have to bear the consequences of either added financial burden of higher transportation costs from distant source areas or higher cost substitutes which may be in limited supply. So, it is imperative that city and county land use planners should, for present and future use, acquire from the geologists all available geological and mineral resource information on their area. This information is essential in order to make the most advantageous use possible of the strategically located supplies and deposits of raw rock and mineral resources within an area.

TABLE 8: DERIVATIVE GEOLOGIC MAP POSSIBILITIES



GEOLOGIC MAP UNITS, CORRELATED WITH THEIR GENERAL ROCK TYPES, TOPOGRAPHY AND USES

GEOLOGIC UNIT	ROCK UNIT	TOPOGRAPHY	USES
Floodplain Alluvium	Unconsolidated sands and clays	Narrow to broad low-lands	Construction sand; brick clay (selected locations) ceramic clay (selected locations)
River terrace and Coastal Plain deposits	Unconsolidated clays, silt, sands and some gravels, often interlayered	Flat to moderately sloping divides; gentle to moderate slopes	Construction sand; decorative gravel (landscaping, etc.)
Triassic sediments	Red shales with interbedded sandstones, siltstones, and claystones Red to white consolidated gravel (conglomerate)	Low rolling hills, undulating Gentle to steeply sloping hills and ridges	Brick and tile clay; ceramic clays (selected locations) lightweight aggregate (selected locations)
Triassic dikes, sills and mafic igneous complexes	Dark colored massive crystalline rocks	Rounded hills; slightly to steeply sloping to broad low lands	Construction - crushed stone (highway base aggregate)
Felsic igneous complexes	Light colored massive and granitic texture	Rolling dissected hills; slight to moderate slopes	Construction - crushed stone (highway base aggregate); concrete products
Flows, graywackes, lithic and crystal tuffs and conglomerates	Hard metamorphic rocks	Steep hills and rough stoney ground	Construction - crushed stone (highway base aggregate)
Argillite, tuffs, phyllites	Soft metamorphic rocks - exhibits laminations and banding	Rolling hills and lowlands	Construction - lightweight aggregate
Schists and schistose gneiss	Mica bearing metamorphic rocks - exhibits laminations and banding	Rolling dissected hills	Construction - crushed stone (highway base aggregate)

CONCLUSION

For intelligent resource management and land use planning, as much useful information as possible on the area should be obtained before any decisions are made and any plans or programs initiated. The assimilation of data in this text is provided for these very reasons. Without the basic geologic and mineral resource knowledge and understanding of an area, sound resource management and land use planning cannot and will not be implemented.

In order to plan properly, the basic information provided in this text should be used as a supplement to other information acquired for these purposes. Without wise and careful use of all the knowledge available, we become the victims of unplanned growth and of shortages of critical mineral resources, rather than the residents of well-planned communities.

Planned growth patterns primarily depend on the availability of suitable useable land and the mineral and natural resources for its development and continued support. Present and future land use planning and mineral resource evaluation and development depends upon our ability to work in close cooperation with one another and to use our combined knowledge to its wisest advantage. These facts are becoming more critical to use daily as we realize that we have the knowledge to plan land use but are beginning to lack many of the critical nonrenewable mineral resources needed to sustain our progress. This very fact places the burden of responsibility upon us to help insure the wise conservation and expanded exploration of mineral and energy resources.

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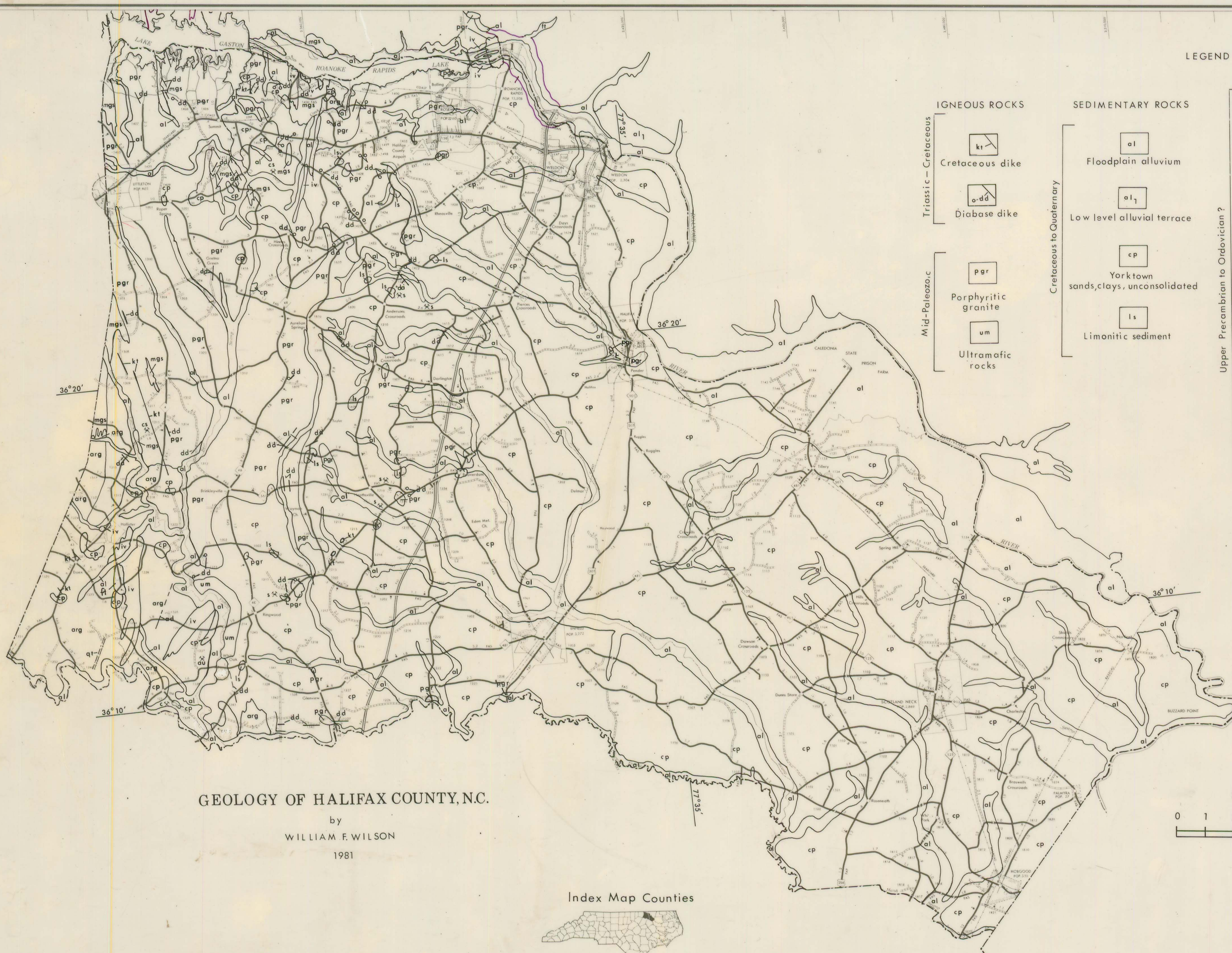

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LEGEND

IGNEOUS ROCKS

Triassic – Cretaceous

- kt — Cretaceous dike
- dd — Diabase dike

Mid-Paleozoic

- pgr — Porphyritic granite
- um — Ultramafic rocks

SEDIMENTARY ROCKS

Cretaceous to Quaternary

- al — Floodplain alluvium
- al_1 — Low level alluvial terrace
- cp — Yorktown sands, clays, unconsolidated
- ls — Limonitic sediment

METASEDIMENTARY AND METAVOLCANIC ROCKS

Upper Precambrian to Ordovician ?

- arg — Argillite includes conglomerate interbeds
- qt — Quartzite
- ft — Felsic tuff
- iv — intermediate volcanic rocks

METAMORPHIC ROCKS

- mgs — Mica gneisses and schists

SYMBOLS

Contact dashed where concealed

MINES AND QUARRIES

abandoned · active

cs — crushed stone

s — sand

au — gold

N

SCALE

0 1 2 3 4 5 miles

Index Map Counties

N.C. GEOLOGICAL SURVEY