North Carolina Department of Environmental Quality
Energy Group
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North Carolina Geological Survey
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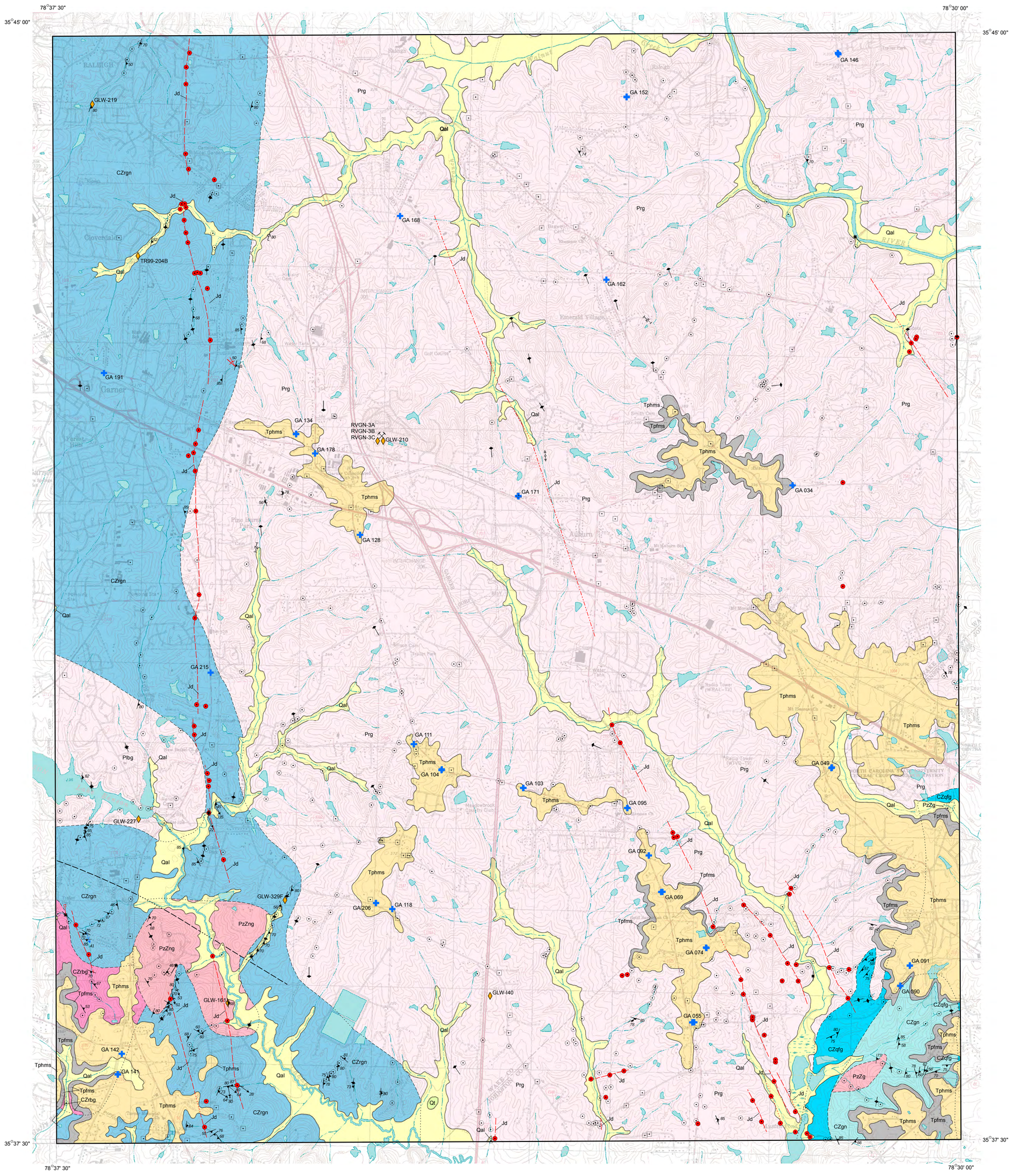

UNIT DESCRIPTIONS

Qal - Alluvium: Unconsolidated, tan to light gray, stream deposits of sand and gravel, with occasional clay and silt; poorly to well sorted, poorly stratified. Foliation measurements and station locations represent outcrops of crystalline basement inliers surrounded by alluvium too small to map separately.

Qt - Terrace alluvium: Unconsolidated, tan to light gray, stream terrace deposits of sand and gravel, with occasional clay and silt; poorly to well sorted, poorly stratified. Interpreted to be present in one area along Swift Creek near the Wake/Johnson County line.

Coastal Plain Units

Tphms – Heavy mineral bearing sand: Sand, silty and clayey, reddish brown, yellow, and pink; fine to very coarse grained; typically fines upward; moderately well to moderately poorly sorted; subangular to rounded. Contains rare to trace heavy minerals, (dominantly dravite and rutile) rare to trace mica; rare to trace rose quartz; and rare to trace amethyst. Massively bedded with upper 5-feet typically having a strong pedogenic overprint which obscures sedimentary structures. Very coarse-grained and medium sand fraction is typically well-rounded and frosted. Lower contact has a sharp erosional contact. Basal portion contains pieces of reworked silicified limestone and lithified sandstone with common fossil impressions; these are presumed to be middle Eocene in age. Thickness ranges up to about 20-feet.

Tpfms – Fine micaceous sand: Unit only recognized in cores. Sand, clayey and silty, yellow, light gray and pink to reddish pink. Contains two distinct lithofacies. The upper lithofacies is typically fine-grained sand, but contains coarse silt as well; moderately well to well-sorted; grains are subangular to subrounded. Contains rare to trace heavy minerals often in distinct laminations, trace to minor mica, and rare to trace white feldspar. Sedimentary structures include laminations, flaser bedding, and burrows. The lower lithofacies consists of coarse- to very coarse-grained quartz sand with distinct beds of coarse-grained silt; poorly to moderately sorted; grains are angular to subangular. Contains rare to trace heavy minerals, trace to minor coarse mica, rare to trace white feldspar, and rare rose quartz. Massively bedded, silt beds are laminated and contain lenticular beds. Contact between the upper and lower lithofacies is gradational.

Intrusive Rocks

Jd – diabase: fine to medium-grained, equigranular to locally plagioclase porphyritic diabase, typically olivine-bearing. Commonly weathers to black to tan-gray, spheroidal boulders and cobbles. Occurs in vertical to steeply dipping dikes. The traces of some of the dikes on the Garner quadrangle are inferred on the basis of linear magnetic highs. Other dike locations are inferred from the location of float. Refer to explanation for details.

Plbg- Lake Benson Pluton: medium-grained, locally porphyritic biotite granite. May contain white mica, epidote, allanite, and zircon.

Rolesville Batholith

Prg - Rolesville main granite: medium- to coarse-grained biotite + muscovite monzogranite with a color index of 2-10 named by Farrar (1985). The Rolesville main granite varies in appearance, with a range in color index and grain size, development of a foliation, as well as the presence or absence of subhedral alkali feldspar megacrysts. This variation may result from a number of still unrecognized granitoid facies. It is notable for its friable nature. This granitoid is ubiquitous in the Rolesville pluton, and occupies the largest surface area at the present level of erosion. (Description from Speer, 1994)

The southern portion of the Garner quadrangle may have local occurrence of the Archers Lodge phase of the Rolesville Batholith.
Archers Lodge granitoid: a coarse-grained biotite monzogranite with alkali feldspar megacrysts up 3 cm long. (Description from Speer, 1994)

Raleigh Terrane

PzZng - Nottingham granitoid orthogneiss: streaky to weakly banded, generally moderately well foliated, locally porphyritic, tan, light brown, or brownish-orange biotite granitic orthogneiss. Contains local biotite-rich enclaves which may be xenoliths; epidote, titanite, and white mica are interpreted as products of metamorphic and/or low-temperature alteration.

CZrgn – Raleigh gneiss: mixed unit consisting mainly of fine- to coarse-grained, well foliated, compositionally layered, and locally lineated biotite granitoid gneiss, and lesser amounts of biotite + hornblende gneiss, biotite schist, white mica +/- sillimanite schist, metagabbro, and amphibolite. The unit is locally intruded by dikes of pink to gray granitic pegmatite and white to gray graphic granite.

CZrbg - Biotite granitic orthogneiss: medium-grained, weakly banded, weakly porphyritic, well foliated granitic gneiss. Phenocrysts are alkali feldspar; also contains white mica, epidote, and titanite.

Rocks of Uncertain Affinity

PzZg – granitoid: medium- to coarse-grained, light gray to pale pink, massive to slightly foliated granitoid composed of quartz, plagioclase, k-feldspar, muscovite, biotite, epidote, chlorite, and garnet. Locally, contains clusters of biotite and muscovite.

CZqfg - quartzofeldspathic gneiss and schist: fine- to coarse-grained, white to light gray, well foliated, quartzofeldspathic gneiss. Contains interlayers of light gray to pale pink felsic gneiss, white to gray, fine-grained muscovite schist, quartz-muscovite schist, biotite schist, and greenish-black to black amphibolite.

CZgn - felsic gneiss: pinkish-gray to tan-white, fine- to medium-grained poorly to well foliated, weakly banded microcline-plagioclase-quartz-white mica gneiss and leucogneiss, locally with magnetite.

REFERENCES:

Clark, T.W., Blake, D.E., Stoddard, E.F., Carpenter, P.A., III, and Carpenter, R.H., 2004, Preliminary bedrock geologic map of the Raleigh 30' x 60' quadrangle, North Carolina: North Carolina Geological Survey Open-file Report 2004-02, scale 1:100,000, in color.

Farrar, S.S., 1985, Stratigraphy of the northeastern North Carolina Piedmont: Southeastern Geology, v. 25, p. 159-183.

Speer, J.A., 1994, Nature of the Rolesville Batholith, North Carolina, in Stoddard, E.F. and Blake, D.E., eds., Geology and Field Trip Guide, Western Flank of the Raleigh Metamorphic Belt, North Carolina, Carolina Geological Society Guidebook for 1994 Annual Meeting, p. 57-62.

EXPLANATION OF MAP SYMBOLS

CONTACTS, FAULTS, AND OTHER FEATURES

- contact - location inferred
- contact - location concealed
- brittle fault - location inferred
- brittle fault - location concealed
- diabase dike - location inferred
- diabase dike - location concealed
- diabase - inferred from aeromagnetic data or stream patterns

- Strike and dip of inclined regional foliation
- Strike of inclined regional foliation, dip unknown
- Strike of vertical regional foliation
- Strike and dip of cleavage
- Strike and dip of biotite foliation
- Strike of vertical biotite foliation
- Strike of biotite foliation, dip unknown
- Strike and dip of inclined joint surface
- Strike of vertical joint surface
- Strike and dip of schlieren
- Strike of schlieren, dip unknown
- Strike of vertical pegmatite dike
- Strike and dip of quartz vein
- Strike of vertical quartz vein
- Trend and plunge of lineation
- Trend of oriented inclusion, dip unknown
- Trend and plunge of fold hinge
- Trend and plunge of crenulation lineation

- Coastal Plain mapping station location
- Diabase station location
- Bedrock mapping station location
- GA 191 — Coastal Plain hand auger location and number
  - Locations with multiple symbols (present as elongate or wider-than normal symbol clusters) indicate collection of hand auger data from multiple depths.
  - Hand auger sampling outside of Coastal Plain unit performed to confirm or deny the presence of Coastal Plain material.
- Crushed stone quarry - active
- GLW-219 — Geochemical station location

MN GN
6 1/2 MILS | 1° 27' 26 MILS
UTM GRID AND 1981 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET

SCALE 1:24 000
1 0.5 0 1 Miles
1,000 500 0 1,000 2,000 3,000 4,000 5,000 6,000 7,000 Feet
1 0.5 0 1 Kilometers
CONTOUR INTERVAL 10 FEET


MAP LOCATION

ADJOINING 7.5' QUADRANGLES

Raleigh West	Raleigh East	Knightdale
Lake Wheeler	**Garner**	Clayton
Angier	Edmondson	Powhatan

Base topographic map is digital raster graphic image of the Garner 7.5 minute USGS quadrangle (1993).

Rolesville Batholith geology mapped 1992 - 1994.
Supported by the U.S. Geological Survey under assistance award #1434-93-A-1165 through the North Carolina Geological Survey.

Geologic units in the Raleigh terrane portion of the quadrangle from Clark and others (2004).

Area west of Rolesville Batholith
1994 - 1995 by Edward F. Stoddard.

Johnston County portion mapped
1993 – 1994 by Edward F. Stoddard.

Coastal Plain mapped by John G. Nickerson and Norman K. Gay in 2000 – 2001 with partial support from USGS Statemap program award #00HQG148 (2000).

Data entry of A. Speer field notes by Anna Katerina Pascht

					OXIDES IN PERCENT												SELECTED ELEMENTS IN PPM																
SAMPLE ID	Geologist	Rock Type	Rock Type Detail	Map Unit	SiO2	TiO2	Al2O3	Fe2O3	MnO	MgO	CaO	Na2O	K2O	P2O5	Cr2O3	LOI	+H2O	-H2O	TOTAL	Ag	As	Au	Ba	Ce	Co	Nd	Ni	Sc	Sr	Ta	U	V	Y	Zn	Zr
GLW-219	Stoddard	mafic gneiss	biotite amphibolite	CZrgn	55.5	0.82	17.2	8.57	0.19	3.49	6.28	3.92	1.68	0.15		0.65			98.2	<0.1	<1	<2	310	17	49	11	4	19.7	274	3.9	1.4	189	29	108	112
GLW-329F	Stoddard	mafic gneiss	clinopyroxene amphibolite	CZrgn	44.3	0.83	18.2	11.40	0.21	5.30	14.70	0.99	0.77	0.10		1.00			97.9	<0.1	<1	<2	97	20	57	11	47	43.0	381	2.8	0.4	286	22	66.2	57
GLW-161	Stoddard	Nottingham granitoid orthogneiss	biotite-garnet-magnetite leucogranitic gneiss	PzZng	76.8	0.14	11.9	1.50	0.05	0.31	1.45	3.64	2.59	0.02	<0.01	0.30			98.8	0.5	<1	<2	595	31	27	11	4	4.0	106	3.7	3.0	3	38	47.4	124
TR99-204B	Stoddard	felsic gneiss	biotite leucogranitic gneiss	CZrgn	76.6	0.13	12.4	1.92	0.06	0.02	0.70	4.01	3.31	<0.01		0.30			99.5	0.5	<1	<2	515	71	<0.5	20	1	6.0	68	<0.5	3.9	3	48	76.3	260
GLW-210	Stoddard	Rolesville granite	medium biotite granite	Prg	71.5	0.23	14.1	1.68	0.03	0.42	1.61	3.70	4.32	0.07	<0.01	0.45			98.3	5.0	<1	<2	630	52	37	20	4	3.2	253	5.0	6.2	20	18	50.4	142
GLW-227	Stoddard	Lake Benson granite	medium biotite granite	Plbg	69.1	0.40	15.1	2.79	0.03	0.82	2.14	3.20	4.78	0.13	<0.01	0.40			99.2	2.9	<1	<2	1440	146	37	48	14	3.6	407	5.3	3.4	34	22	97.2	264
GLW-140	Stoddard	Rolesville granite	medium biotite granite	Prg	69.6	0.36	14.9	2.27	0.03	0.73	1.90	3.82	4.27	0.10	<0.01	0.50			98.7	6.1	<1	<2	1020	92	67	28	6	3.8	445	6.0	2.8	33	12	60.3	202
RVGN-3A	Speer	Rolesville granite	medium biotite granite	Prg	70.06	0.36	15.11	2.38	0.03	0.71	1.91	4.41	3.59	0.11	0.01	0.47	0.34	0.08	99.15				1130	84	2			4.5	358	<2	3.2	32	14	68	222
RVGN-3B	Speer	Rolesville granite	megacrystic biotite granite	Prg	71.25	0.29	14.32	2.09	0.02	0.66	1.74	4.06	4.02	0.09	0.01	0.47	0.29	0.01	99.02				840	74	3			4.5	218	<2	4.4	36	16	58	192
RVGN-3C	Speer	Rolesville granite	mafic (fine, gneissic biotite-rich enclave)	Prg	56.74	1.40	16.87	6.93	0.10	2.75	4.47	4.91	3.53	0.81	0.01	1.19	0.72	0.14	99.71				1135	262	14			11.0	1230	<2	3.2	161	22	141	519

Version 10/25/2016

Samples collected by Stoddard analyzed by XRAL, Toronto, Canada
Samples collected by Speer analyzed at ALS Chemex Labs in Sparks, NV.
NA = No sample analysis
PPM = parts per million
LOI = loss on ignition

Compiled Geologic Map of the Garner 7.5-minute Quadrangle, Wake and Johnston Counties, North Carolina

Geology by
Edward F. Stoddard (area west of the Rolesville Batholith and Johnston County portion of map area)
J. Alexander Speer (Rolesville Batholith portion)
John G. Nickerson and Norman K. Gay (Coastal Plain)

Digital representation by Michael A. Medina, Philip J. Bradley and Heather D. Hanna

2016
(Version 12/12/2016)

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