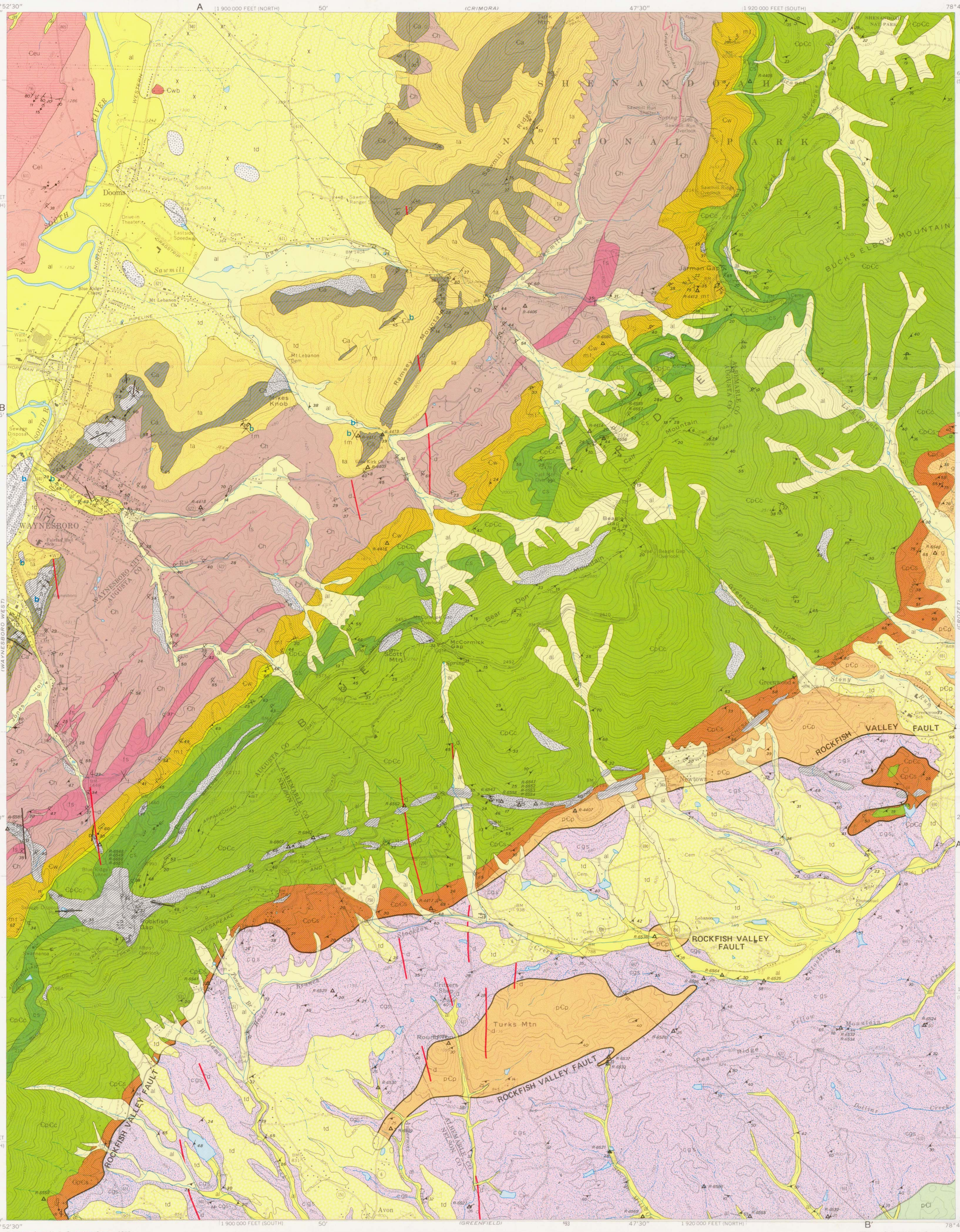
COMMONWEALTH OF VIRGINIA
DEPARTMENT OF CONSERVATION AND ECONOMIC DEVELOPMENT
DIVISION OF MINERAL RESOURCES
James L. Calver
Commissioner of Mineral Resources and State Geologist



Base map from U. S. Geological Survey, 1973
Waynesboro East Quadrangle, 7½-minute series

Williams & Heintz Map Corporation
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GEOLOGIC MAP OF THE WAYNESBORO EAST QUADRANGLE, VIRGINIA

Geology by Thomas M. Gathright II, William S. Henika and John L. Sullivan III

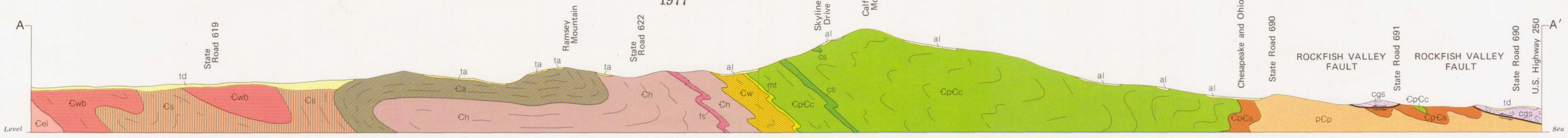
UTM GRID AND 1973 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET

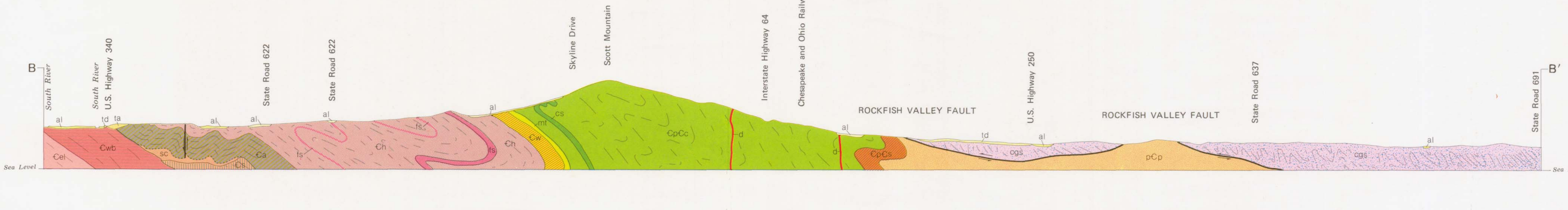
SCALE 1:24 000

CONTOUR INTERVAL 40 FEET
DATUM IS MEAN SEA LEVEL

1977

QUADRANGLE LOCATION





EXPLANATION

	Unit	ROCK CHARACTERISTICS	GEOLOGIC AND ECONOMIC FACTORS AFFECTING LAND MODIFICATION
QUATERNARY	al	Alluvium: *Flood-plain and low level terrace deposits of sand and silt overlying silty clay and gravel; large cobbles present.*	Alluvium periodically flooded; cuts and excavations subject to sliding and sloughing; flooding restricts nonfarm uses. (Unit 14 in text.)
	al	Alluvium: *Sand, cobbles, rounded boulders, and angular blocks along upland streams.*	Block fields and debris-filled valleys on the Blue Ridge subject to creep, slides, and local rockfalls. Droughtiness, steep slopes, and mass movement limit agricultural and nonfarm uses. (Unit 13 in text.)
	ta	Talus deposits: *Cobbles, boulders, and angular blocks in a sand matrix.*	
	td	Terrace and alluvial-fan deposits: *High-level terrace and alluvial-fan deposits of gravel and sand in a red clay matrix.*	Older, upland sediments of variable permeability; artificial cuts subject to creep and sloughing. Characteristics of underlying bedrock may greatly influence environmental response of terrace deposits to man-induced stress. (Unit 12 in text.)
	sc	Sandy clay: *Sand, clay, and coarse quartzite debris. (in cross-section B-B' only.)*	Suspected to occur locally beneath unit 7.
TRIASSIC	d	Diabase dikes: *Dark greenish-gray to black diabase.*	Weathers into large, rough-surfaced, round boulders and bright-red clay. Difficult to excavate. (Unit 11 in text.)
CAMBRIAN	Ceu, Cel	Elbrook Formation: Ceu, upper member, *characteristically orangish-yellow weathering, gray to dark-gray crystalline dolomite with phyllitic and slaty interbeds; some thin interbeds of dark-gray algal limestone.*	Moderately deep, well-drained soils, somewhat shaly. Small sinkholes are common. (Unit 8 in text.)
		Cel, lower member, *laminated to thin-bedded, pale-green phyllite and slaty dolomite; interbeds of laminated, fine-grained, buff to light-gray weathering, light- to dark-gray dolomite. Laminated red phyllite occurs locally.*	Shallow, shaly, clay soils with moderate permeability and moderately high shrink-swell potential. Extensive karst areas. (Unit 8 in text.)
	Cwb	Waynesboro Formation: *Gray, brown, green, and red argillite and phyllite with interbeds of laminated to thin-bedded, light- to dark-gray dolomite and limestone, and tan, fine-grained, thin- to thick-bedded sandstone.*	Extreme variation in depth to bedrock where terrace deposits are present. Sinkholes common, particularly in overlying terraces. Soil thicknesses highly variable. (Unit 8 in text.)
	Cs	Shady Formation: *(In cross sections only.)*	Suspected zone of solution and collapse at the west foot of the Blue Ridge. (Unit 8 in text.)
	Ca, q	Antietam Formation: *Thin-bedded, tan to white, metamorphosed, feldspathic sandstone, interlayered with green and pink, laminated phyllite and argillite (upper part). Massive, fine-grained, white to light-gray, Skolithos-bearing vitreous quartzite (lower part).* q, *thick prominent quartzite ledge.*	Mountain land with shallow, stony, and sandy soils that grade upslope into rock fields and outcrop. High permeability and low to moderate shrink-swell potential. Creep and slides. (Unit 7 in text.)
	Ch, q, fs	Harpers Formation: *Green to bluish-gray, quartz-chlorite-sericite phyllite, with thin to massive interbeds of grayish-green to bluish-gray metamorphosed sandstone.* q, *light-tan, prominent quartzite.* fs, *zone of metamorphosed, ferruginous sandstones.*	Mountain land with thin, excessively drained soils; rippable bedrock near surface. Low to moderate permeability and low shrink-swell potential. Artificial cuts are susceptible to erosion and sloughing. (Unit 6 in text.)
	Cw	Weverton Formation: *Light-brown weathering, green quartzose phyllite; thick, coarse-grained, reddish-purple, metamorphosed, ferruginous sandstone and light-gray, pebble quartzite. Laminated green or dark purplish-gray phyllite locally at base.*	Shallow, excessively drained, rocky soil. Moderate permeability and low to moderate shrink-swell potential. Creep and sloughing are common on steep slopes. (Unit 5 in text.)
	mt, cs, CpCc	Catoctin Formation: *Fine-grained, dark greenish gray chlorite-epidote-albite schist and actinolite-chlorite-albite schist; amygdaloidal metabasalt, epidosite, epidote-quartz breccia, and greenish-gray metatuff.* mt, *mottled, greenish-purple, phyllitic metatuff.* cs, *light-green medium- to coarse-grained, metamorphosed, lithic sandstone and phyllite.*	Mountain land, with well-drained, rocky, red clay soils. Moderate permeability and low shrink-swell potential. Pervasive joints and cleavage throughout. (Unit 4 in text.)
	CpCs	Swift Run Formation: *Medium- to coarse-grained, light- to greenish-gray, tan-weathering quartz-sericite schist and quartz-sericite-chlorite schist; some schistose, metamorphosed, lithic sandstone.*	Mountain land with well-drained micaceous-clay soils of variable depth. Steep slopes, especially those parallel to cleavage, are subject to creep and slides. (Unit 3 in text.)
PRECAMBRIAN	pCp, g	Pedlar Formation: *Dark bluish- to greenish-gray, coarse-grained, massive to sheared, granodiorite gneiss.* g, *light-gray, greenish-gray, or pink, very coarse grained, porphyritic, massive to sheared, granite gneiss.*	Mountain land, characterized by steep slopes, scattered massive ledges, and shallow, stony, well-drained soils. Severe restrictions on most construction, solid-waste disposal, and septic-tank drainfield sites. (Unit 2 in text.)
	pCl	Lovingston Formation: *Dark-gray, medium-grained, massive to foliated granitic gneiss and mylonitic biotite gneiss.*	Uplands, characterized by low, linear, parallel ridges, moderate to gentle slopes, and locally thick clay soils. Moderate restrictions on construction, solid-waste disposal, and septic-tank drainfield sites in areas of thin soils. (Unit 1 in text.)
	cgs	Cataclastic rocks, altered from precambrian rocks in Paleozoic time: *Dark to light-gray, medium- to coarse-grained suite of protomylonite, mylonite, phylonite, blastomylonite and mylonite gneiss derived from the Lovingston Formation.*	

OTHER LAND–MODIFICATION FACTORS

Modified land: *Extensive cut and fill due to grading.*

Rockfalls: *Areas of actual or potential rockfalls or slides not included in talus deposits.*

Karst land: *Areas of known or potential sinkhole development, subsidence, and cave openings.*

x Sinkhole.

CONTACTS

Exposed or approximate

Indefinite contact along collapse breccia zone (in cross section B-B' only)

FOLDS

Direction and angle of plunge of minor anticline

Direction and angle of plunge of minor syncline

Direction and angle of plunge of minor fold showing strike and dip of axial plane

Direction and angle of plunge of minor fold showing strike and dip of axial plane and symmetry of fold

FAULTS

Black line where exposed or approximate; gray line where covered or inferred; U, upthrown side, D, downthrown side, T, upper sheet; arrows indicate direction of relative movement

BRECCIA

b Collapse breccia

ATTITUDE OF ROCKS

Strike and dip of beds

Strike and dip of overturned beds

Strike of vertical beds

FOLIATION

Strike and dip of schistosity

Horizontal schistosity

Strike of vertical schistosity

LINEATION

Direction and angle of plunge of rodding, boudinage, and crinkle folds

Direction, angle of plunge, and symmetry of crenulation

Direction and angle of plunge of mineral lineation, streaks, and grooves

MINE, QUARRY, AND PROSPECTS

Abandoned mine or quarry

Crushed stone (quartzite) quarry

fm Iron and manganese mine

X Prospect

f Iron

m Manganese

fm Iron-manganese

SAMPLE LOCATIONS

R-4414 R, repository number of sample

CROSS SECTION DESIGN:

1. No vertical exaggeration.
2. Subsurface structure interpreted from surface measurements.
3. Thickness of terrace deposits, colluvium, and alluvium diagrammatic.