

EXPLANATION OF UNITS

INTRUSIVE ROCKS

Devonian(?)



Daf

Pegmatite. Two small bodies in the northwest part of the quadrangle, of white, foliated, muscovite \pm garnet pegmatite and coarse-grained granite. Other isolated outcrops of pegmatite are indicated by "+" symbols on the map.

Alaskite, weakly foliated.

Alaskite, weakly foliated.

WALDOBORO PLUTON



Granite. White to light gray, medium-grained biotite-muscovite granite. Massive to weakly foliated. A high precision U-Pb zircon age of 368 ± 2 Ma was obtained for this granite from the Waldoboro West quadrangle (Tucker and others, 2001).



Heterogeneous granite. Medium-grained to pegmatitic biotite-muscovite \pm garnet granite, commonly with foliation or schlieren.

Silurian (?)



Gabbro and amphibolite. Includes dark gray, coarse-grained pyroxene gabbro; black, medium-grained to coarse-grained porphyritic hornblende gabbro; and dark greenish gray hornblende amphibolite.

METAMORPHOSED INTRUSIVE ROCKS

Devonian



Haskell Hill Granite Gneiss (of Tucker and others, 2001). White to light gray, medium-grained to fine-grained biotite granite gneiss. Strongly foliated, even in dikes. Cuts across and includes xenoliths of Lincoln Sill. Isotopic age of 408+5/-4 Ma from Haskell Hill by Tucker and others (2001).

Devonian-Silurian



Foliated porphyritic syenite of the Lincoln Sill (of Trefethen, 1937). Medium to dark gray biotite-feldspar \pm amphibole syenite with subhedral to euhedral phenocrysts of distinctive purplish-gray K-feldspar. Phenocrysts range from $\frac{1}{4}$ " to 2" in length, and commonly exhibit Carlsbad twins. The matrix is well foliated, and in some places is a biotite schist. This rock comprises a broad pluton to the northeast, much of which is undeformed, but in the Jefferson quadrangle it occurs mainly as blocks or xenoliths in the Haskell Hill granite gneiss, and is foliated. A sample of the igneous rock from the town of Liberty has been dated at 418 ± 1 Ma by high-precision U-Pb method on zircon (Tucker and others, 2001).

Devonian-Ordovician (?)



Gneiss. Medium to light gray, fine-grained quartz-feldspar-biotite gneiss. Generally massive but locally with darker gray streaks or folia.

STRATIFIED ROCKS

Ordovician



Cape Elizabeth Formation. Thinly interbedded schist and granofels. Schist is medium to light gray, medium-grained and contains quartz, muscovite, and biotite. The granofels is light gray to milky white and dominated by quartz with lesser feldspar and biotite. Bedding thickness is typically ½" to 2", but locally up to 8", with sharp bedding contacts.



Amphibolite. Medium green to greenish gray to black, medium-grained to fine-grained amphibolite and amphibole-biotite-plagioclase schist. Locally has sating sheen

-----relationship uncertain -----

Silurian-Ordovician (?)



Bucksport Formation. Gray-weathering to dull brown-weathering, thin-bedded to medium-bedded, fine-grained to medium-grained granofels. Natural outcrops exhibit a flaggy or slabby break along the layering. Includes light gray to medium gray to purplish-gray quartz-feldspar-biotite granofels, and light green to medium greenish-gray quartz-plagioclase-diopside ± biotite ± actinolite ± garnet cale-silicate granofels. While cale-silicate rock is commonly present in subordinate amounts, its percentage in outcrop ranges from 0 to 100. The compositional layering is interpreted as bedding in many places, as indicated by symbols on the map. In other places, especially where cross-cutting cale-silicate veins are present, it is not certain whether the compositional layering represents bedding or a metamorphic layering. Where the gray granofels locally has higher biotite concentrations and rarely also muscovite, the rock has a schistose texture. Finer-grained varieties dominated by quartz and feldspar are massive and hard to break,



Mica schist. Coarse-grained, silvery-gray, fissile muscovite-biotite-quartz schist. In bed of Davis Stream east of Jefferson village.

------ thrust fault -----

Cambrian



Clarry Hill formation (new name). Medium to coarse-grained, medium gray quartz-rich sillimanite-mica schist with andalusite or andalusite pseudomorphs and abundant tiny pink to salmon-colored garnets. Migmatite is abundant, as cross-cutting, intersecting veins in a complexly swirled and disharmonic structure. Contains thin, discontinuous garnet coticule layers. Probably correlates, in part, with the Megunticook Formation. Named for Clarry Hill, in the Union quadrangle to the east.

MIXED ROCKS

Devonian-Ordovician (?)



Burkettville Complex (of West, 2006). Leucocratic biotite granite to foliated granite to gneissic granite, coarse-grained to pegmatitic. Outcrops commonly include thin to medium bedded quartz-feldspar-biotite granofels like that of the Bucksport Formation, interpreted to be xenoliths or country rock to the granite.

REFERENCES

Gerber, Robert G., and Rand, John R., 1982, Town of Waldoboro Landfill Expansion Study, Waldoboro, Maine, Figure 1.

Trefethen, Joseph M., 1937, The Lincoln sill: Journal of Geology, v. 45, no. 4, p. 353-380.

Tucker, R. D., Osberg, P. H., and Berry, H. N., IV., 2001, The geology of a part of Acadia and the nature of the Acadian orogeny across central and eastern Maine: American Journal of Science, v. 301, no. 3, p. 205-260

West, David P., Jr., 2006, Bedrock geology of the Washington quadrangle, Maine: Maine Geological Survey, Open-File Map 06-79, scale 1:24000.

Geologic Age		Absolute Age
Cenozoic Era		0-65
Mesozoic Era	Cretaceous Period	65-145
	Jurassic Period	145-200
	Triassic Period	200-253
Paleozoic Era	Permian Period	253-300
	Carboniferous Period	300-360
	Devonian Period	360-418
	Silurian Period	418-443
	Ordovician Period	443-489
	Cambrian Period	489-544
Precambrian time (Older than 544

Échelle des temps géologiques, 2002: Commission géologique du Canada, Dossier Public 3040 (Série nationale des sciences de la Terre, Atlas géologique) - RÉVISION.)

Bedrock Geology of the Jefferson Quadrangle, Maine

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SCALE 1: 24,000

1 0

1000 0 1000 2000 3000 4000 5000 6000 7000 FEET

1 0 1 KILOMETER

CONTOUR INTERVAL 20 FEET

SOURCES OF INFORMATION

P. H. Osberg field work in 1977, 1980-1981. H. N. Berry IV field work in 2007. R.G. Gerber and J. R. Rand, 1982, Figure 1.

1:24,000 using standard U.S. Geological Survey topographic map symbols.

The use of industry, firm, or local government names on this map is for location purposes only and does not impute responsibility for any present or potential effects on the natural resources.

Topographic base from U.S. Geological Survey Jefferson quadrangle, scale

EXPLANATION OF SYMBOLS

- Outcrop of mapped unit.
- + Outcrop of pegmatite.
- Δ Outcrop containing porphyritic syenite.
- # Outcrop containing pseudotachylyte.
- Float or possible outcrop presumed to represent underlying bedrock.

Strike and dip of planar features

Dike or vein (Inclined, Vertical): a = aplite, d = diorite or granodiorite, f = foliated felsic rock, p = pegmatite, vn = quartz vein.

 \nearrow_{20} \times Bedding, tops unknown. (Inclined, Vertical)

 $\overset{\sim}{\sim}_{20}$ Contorted or folded bedding. (Inclined)

20 × Compositional layering in metamorphic rock. (Inclined, Vertical)

Contact between rock units. (Inclined, Vertical)

Foliation or schistosity. (Inclined, Vertical)

Foliation in syenite. (Inclined, Vertical)

✓ Cleavage. (Inclined, Vertical)

 \mathcal{A}_{45} % Axial plane of open fold. (Inclined, Vertical)

/20 / Joint. (Inclined, Vertical)

Trend and plunge of linear features

Hinge of fold (Plunging). (Dextral, Symmetrical, Sinestral, Asymmetry unknown)

Hinge of syncline (Plunging).

Hinge of fold in pegmatite (Plunging).

Lineation (Plunging): a = amphibole elongation, sl = slickensides.

Intersection lineation (Plunging).

EXPLANATION OF LINES

Contact between map units.

Thrust fault, interpreted from stratigraphic relationships and map pattern.