

DESCRIPTION OF MAP UNITS

Pattern indicates area of insufficient outcrop to determine bedrock formation. Clay, silt, gravel, boulders or thick saprolite. Does not necessarily denote Quaternary deposits.

SEDIMENTARY ROCKS

- Sb** Bloomsburg Rebeds (Upper and Middle Silurian) - Gray-red, thin to thick-bedded siltstone, sandstone, and local quartz-pebble conglomerate, poorly to moderately sorted, massive, with local planar to rough cross-bedded laminations. Conglomerate consists of matrix-supported quartz pebbles in grayish-red, fine-grained sandstone. Rock near the base is greenish-gray to light-gray, locally grayish-orange quartz sandstone to siltstone with subrounded grains; massive, planar-tabular to trough cross-bedded. Thickness is approximately 1500 feet. Lower contact is abrupt, at last occurrence of red sandstone.
- Sd** Marcellus Shale (Middle Devonian) - Dark-gray to black shale, locally arenaceous, weathers medium-gray; beds, predominantly thin-bedded, locally thick-bedded and massive, iron-stained, fossiliferous. Upper contact with the Mahanaga Formation not exposed but regionally is gradational, spanning several feet and marked by a fairly abrupt change from lighter colored, harder, siltstone to darker colored, softer, silty shale (Alvord and Drake, 1971; Hepner, 1951). Thickness is approximately 900 feet. Lower contact covered but probably an abrupt change from black shale to silty limestone (Alvord and Drake, 1971; Epstein, 1973). To the northeast in Pennsylvania, drill core suggests a lower contact gradational over a 40-foot interval from a black shale downwards through a limy shale into the silty limestone of the Buttermilk Falls Limestone (Fletcher and Woodrow, 1970).
- Dd** Buttermilk Falls Limestone (Middle Devonian) - Medium to dark gray, clayey to silty limestone; locally contains bedded and nodular black chert. Limestone weathers light to medium-light gray and is thin to medium-bedded, fluggy, and fossiliferous. Thickness is approximately 270 feet. Lower contact is gradational through several feet from silty limestone into the interbedded limestone and calcareous siltstone of the Schoharie Formation.
- Sa** Schoharie Formation (Lower Devonian) - Medium to thick bedded, silty to shaly, locally dolomitic limestone containing local thin ribs or pods of black chert; weathers medium gray to locally pale-olive. Grades downward into medium to dark-gray calcareous siltstone at base. Dolomitic (Tremadoc). Thickness approximately 175 feet. Gradational lower contact is at the first massive siltstone (Alvord and Drake, 1971).
- Os** Esopus Formation (Lower Devonian) - Medium to dark-gray, shaly to finely arenaceous siltstone, minor calcareous siltstone near top. Laminated to medium-bedded with local massive thick-bedded layers. Weathers medium-gray with iron-staining in places. Scouraged (Tremadoc). Cleavage is developed in the southwest part of outcrop belt but not in the northeast. Thickness approximately 300 feet. Lower contact is sharp and unconformable where the formation is underlain by coarse sandstone of the Ripely (Epstein 1984). Where the clastics are absent, the lower contact is reported by Spink (1965) to be conformable and gradational through an interval of several feet in which arenaceous and calcareous siltstones become interbedded with, then replaced by, silt limestones.
- Dc** Oriskany Group (Lower Devonian), undivided
 - Ridgely Sandstone** - Medium-gray, medium- to thick-bedded quartz-pebble conglomerate and coarse quartz sandstone. Sand grains are moderately well sorted and angular. Rock has a carbonate cement and contains abundant brachiopods. Unit first occurs west of Paters Valley, thickens to the southwest. Thickness ranges from 0 to 32 feet.
 - Shriver Chert** - Black to dark-gray siltstone and shale containing interbedded mottled, black and white chert and medium-gray, thin-bedded, medium-crystalline limestone. Lower contact is gradational. Unit only found in the southwestern part of the map area. Thickness ranges from 0 to 28 feet.
 - Glenier Formation** - Medium to dark-gray, fossiliferous, thin to medium-bedded, cherty, fine-grained silty limestone. Unit is thin in the southwest and thickens to the northeast where it constitutes most of the Oriskany Group. Lower contact is gradational. Formation thickness ranges from 55 to 170 feet. Total thickness of Oriskany Group is approximately 170 feet.
- Dp** Helderberg Group, undivided Port Ewen Shale, Minisk Limestone, New Scotland Formation and Coeymans Formation. Only on cross sections.
- Dn** Port Ewen Shale (Lower Devonian) - Upper section is dark to medium-dark-gray, calcareous siltstone and shale, fossiliferous. Lower section is medium-dark-gray, calcareous silty shale, irregularly bedded, nonfossiliferous. Thickness is approximately 150 feet. Lower contact is abrupt and marked by the first occurrence of limestone (Epstein and others, 1967).
- Dm** Minisk Limestone and New Scotland Formation, undivided
 - Minisk Limestone** (Lower Devonian) - Medium-gray, fine-grained argillaceous limestone, medium-bedded, some nodules and lenses of a more calcium-rich limestone. Maintains a uniform thickness of 23 feet (Epstein and others 1967). Lower contact covered but gradational elsewhere in the region (Epstein and others, 1967).
 - New Scotland Formation** (Lower Devonian) - Upper section dark-gray, siliceous, laminated shale containing medium-dark-gray, very fine-grained limestone pods, also scattered beds and lenses of medium-gray, very fine-grained argillaceous, fossiliferous limestone. Limestone contains small, dark-gray chert nodules. Lower section is medium-dark-gray, siliceous, calcareous, fossiliferous shale containing beds and lenses of medium-gray, fine-grained, argillaceous, very fossiliferous limestone. Contains nodules, lenses and local irregular beds of dark-gray chert. Total thickness of formation is approximately 75 feet. Lower contact is abrupt, at the top of a calcareous quartz sandstone.
- Dc** Coeymans Formation (Lower Devonian) - Stormont Member - a medium-light to medium-gray, fine to coarse-grained calcareous sandstone containing lenses of arenaceous limestone. Lower contact marked by scoured surface. Northeast of Wallpack Center, the Stormont member is replaced by the Kalkberg Limestone, a medium-bedded, medium-gray, medium-grained silty limestone with lenses and nodules of black chert. Southwest of Wallpack Center the Kalkberg Limestone grades into the Shawnee Island Member, a medium-gray, medium-bedded to coarse-grained limestone, medium-bedded, fluggy to massive, with local bichromes. Throughout the map area the basal Dupue Limestone Member consists of medium-dark-gray, very fine to fine-grained limestone, thin to medium-bedded, massive to fluggy. Total thickness of unit is approximately 90 feet. All units are fossiliferous. The lower contact of each member is gradational unless otherwise stated. Lower contact of formation is abrupt and marked by first occurrence of argillaceous limestone (Epstein and others, 1967).
- Rd** Rondout and Decker Formations, undivided
 - Rondout Formation** (Lower Devonian and Upper Silurian) - Upper part of formation is medium-dark-gray, very fine to fine-grained, medium-bedded, argillaceous limestone. The middle part is medium-gray argillaceous dolomite, medium-bedded, massive to laminated, locally forms deep desiccation columns, weathers grayish-orange. Basal beds consist of medium to dark-gray, very fine to medium-grained limestone, medium-bedded. Total thickness approximately 40 feet. Silurian-Devonian boundary is within the middle part of the unit (Dunkler and Harris 1988). Lower contact is abrupt, marked by first occurrence of quartz sandstone.
 - Decker Formation** (Upper Silurian) - Unit is light to medium-gray, calcareous quartz siltstone and sandstone, locally fine-pebble conglomerate. Locally interbedded with medium-gray, medium to coarse-grained, thin to medium-bedded limestone and very fine-grained dolomite. Total thickness approximately 72 feet. Lower contact is gradational (Epstein and others, 1967).
- Sv** Bossarsville Limestone (Upper Silurian) - Medium-gray to medium-dark-gray, very fine-grained, argillaceous limestone and limestone weathers medium bluish gray. Thin-bedded, laminated to ribbon-textured. Desiccation columns and cracks occur in southwestern part of map area. Total thickness is approximately 100 feet. Lower contact is gradational and placed at top of uppermost dolomite.
- Su** Pocono Island Formation (Upper Silurian) - Greenish-gray, finely crystalline to aphanitic dolomite containing discontinuous lenses with disseminated, rounded quartz grains; local quartz sandstone beds and argillaceous dolomite. Unit is thin to medium-bedded, and fluggy. Thickness unknown but thought to be approximately 500 feet, based on well data south of map area. Lower contact thought to be gradational (Spink, 1967; Alvord and Drake, 1971; Epstein, 1973). Exposed only near Hainesville and along Little Flat Brook between Layton and Hainesville. Unit delineated by drill data (table 1).

MAP SYMBOLS

- Contact - solid where known; dashed where approximate; dotted where concealed; queried where uncertain.
- Thrust faults - solid where known; dashed where approximate; dotted where concealed; queried where uncertain; sawtooth on overthrust plate.
- FOLDS
 - Syncline, showing trace of trough line and direction of plunge
 - Anticline, showing trace of crest line and direction of plunge
 - Anticline, gently inclined to recumbent - showing trace of crest line, direction of dip of limbs, direction of plunge
 - Syncline, gently inclined to recumbent - showing trace of trough line, direction of dip of limbs, direction of plunge
 - Cleavage trough, showing trough line and direction of plunge
- MINOR FOLDS
 - Minor syncline - showing trough line and plunge
 - Minor asymmetric fold - showing bearing of plunge of "L", indicates fold viewed down plunge.

PLANAR FEATURES

- Strike and dip of beds: ball indicates top known from sedimentary structures
- Inclined
- Overturned
- Strike and dip of slaty or spaced cleavage
- Bearing and plunge of intersection of bedding and slaty cleavage
- Bearing and plunge of extension lineation
- Bearing and plunge of small fold seen in outcrop
- Mine, quarry or open pit - r, road metal
- Domestic well showing rock unit - see table 1

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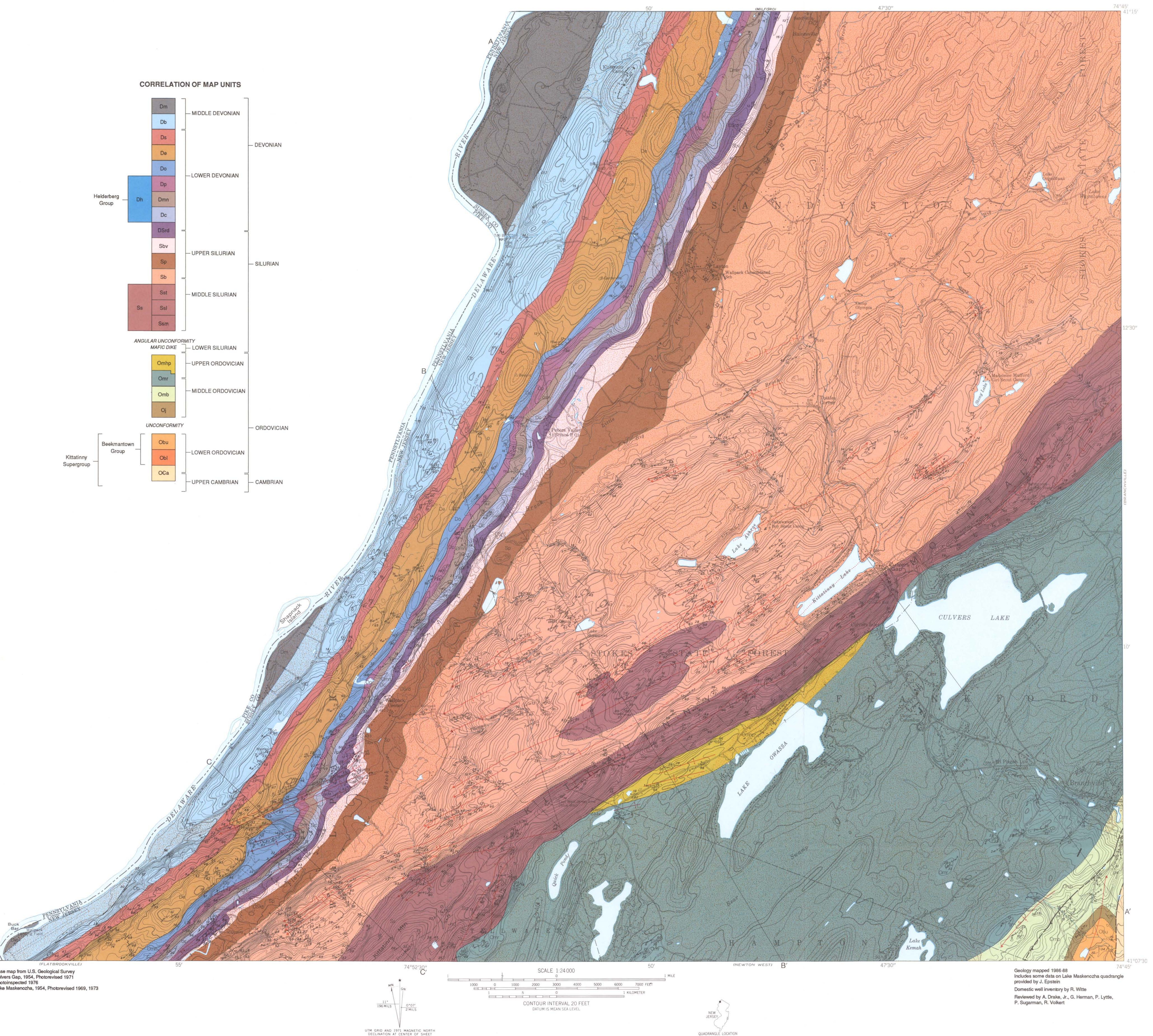
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Table 1. Well records used to outline Bloomsburg Bed Belts and Pocono Island Formation contact, Culvers Gap quadrangle.

Well No.	N.J. Permit No.	Depth	Driller's Log	Unit	Correlation
1	21-6,643	0-60	gravel and sand shale and limestone	Sp	
2	21-5,828	0-75	clay and gravel	Sp	
3	21-4,914	10-10	clay and boulders	Sp	
4	21-6,298	0-52	sand, clay, gravel	Sp	
5	21-6,154	0-75	gravel and sand limestone	Sp	
6	21-5,564	0-81	sand and red rock	Sb	
7	21-6,323	0-59	sand and gravel	Sp	
8	21-5,976	0-40	overturned	Sb	
9	21-5,653	0-30	boulder and red rock	Sb	
10	21-5,152	0-58	overturned with big boulders	Sb	
11	21-5,258	0-15	overturned	Sb	
12	21-5,113	0-50	overturned with clay, gravel and red rock	Sp	
13	21-5,168	0-55	overturned with boulders and red rock	Sb	
14	21-4,344	0-50	overturned	Sp	
15	21-4,932	0-35	clay and gravel	Sp	
16	21-5,569	0-20	overturned	Sb	
17	21-1,864	77-84	overturned	Sp	
18	21-5,975	0-23	overturned	Sb	
19	21-7,215	0-5	gravel containing thin bedded quartzite and weathered limestone	Sp	

1. In absence of drill's log noting overturn thickness, depth of quartz has been estimated.



BEDROCK GEOLOGIC MAP OF THE SUSSEX COUNTY, NEW JERSEY PORTIONS
OF THE CULVERS GAP AND LAKE MASKENOZHA QUADRANGLES

by
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1992

