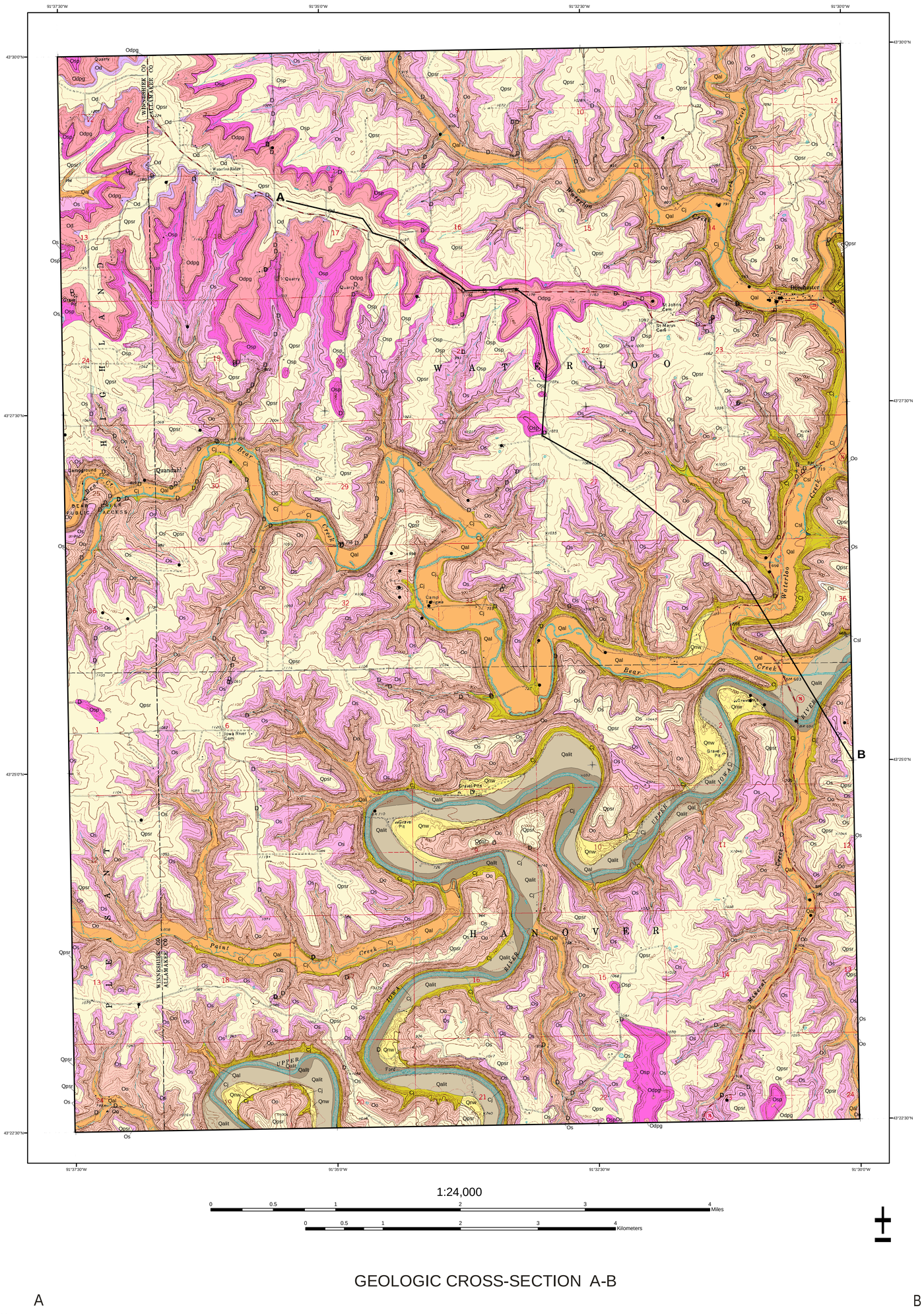
Surficial Geology of the Dorchester (Iowa) 7.5' Quadrangle

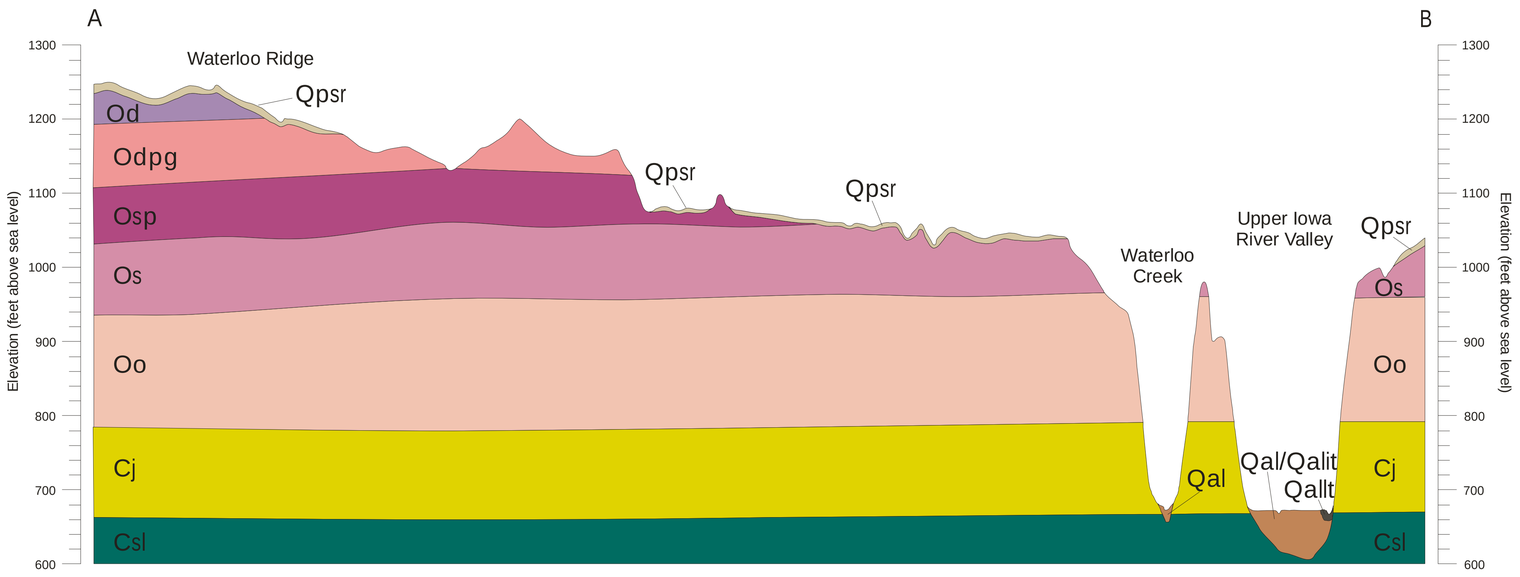


1:24,000

0 0.5 1 2 3 4 Miles

0 0.5 1 2 3 4 Kilometers

GEOLOGIC CROSS-SECTION A-B



LEGEND

CENOZOIC

QUATERNARY SYSTEM

HUDSON EPISODE

Qal - Alluvium (De Forest Formation-Undifferentiated) One to four meters (3 – 13 ft) of massive to weakly stratified, grayish brown to brown loam, silt loam, clay loam, or loamy sand overlying less than three meters (10 ft) of poorly to moderately well sorted, massive to moderately well stratified, coarse to fine feldspathic quartz sand, pebbly sand, and gravel and more than three meters (10 ft) of pre-Wisconsin or late Wisconsin Noah Creek Formation sand and gravel. Also includes colluvium derived from adjacent map units in stream valleys, on hillslopes, and in closed depressions. Seasonal high water table occurs in this map unit.

Qallt - Upper Iowa River Valley - Low Terrace/Modern Channel Belt (DeForest Formation-Camp Creek Member and Roberts Creek Member) Variable thickness of less than 1 m to 5 m (3 – 16 ft) of very dark gray to brown, noncalcareous, stratified silty clay loam, loam, or clay loam, associated with the modern channel belt of the Upper Iowa River valley. Ox-bow lakes and meander scars are common features associated with this terrace level. Post-settlement alluvium thickness varies from 0.5 m (1.5 ft) in higher areas to 2 m (6.5 ft) along the river course and in lower lying areas. Seasonal high water table and frequent flooding potential.

Qalit - Upper Iowa River Valley - Intermediate Terrace (DeForest Formation-Camp Creek Member, Roberts Member and Gunder Member) Variable thickness of less than 1 m to 5 m (3 – 16 ft) of very dark gray to brown, noncalcareous, stratified silty clay loam to loam that overlies calcareous, medium- to coarse-grained sand and gravel of Wisconsinan (Noah Creek Formation) and/or pre-Wisconsinan age. Occupies low terrace position. Seasonal high water table and frequent flooding potential.

HUDSON AND WISCONSIN EPISODE

Qnw- Sand and Gravel (Noah Creek Formation) More than ten meters (33 feet) of yellowish brown to gray, poorly to well sorted, massive to well stratified, coarse to fine feldspathic quartz sand, pebbly sand and gravel. In places mantled with one to three meters of fine to medium, well sorted sand derived from wind reworking of the alluvium. This unit encompasses deposits that accumulated in stream valleys during the Wisconsin Episode.

WISCONSIN EPISODE

Qpsr - Loess over bedrock (Peoria Formation—silt facies) Generally 2 to 8 m (6 – 27 ft) of yellowish to grayish brown, massive, jointed noncalcareous grading downward to calcareous silt loam to silty clay loam. Overlies bedrock units or colluvium. This mapping unit encompasses upland divides, ridge-tops and convex side-slopes. Well to somewhat poorly drained landscape.

PALEOZOIC

ORDOVICIAN SYSTEM

Od - Limestone (Dunleith Formation) Limestone with minor thin interbedded shale. This is the lower of two successive major cavern and karst-forming bedrock map units of the Galena Group. The formation consists of fossiliferous limestone and argillaceous limestone with common chert nodules; only the lower 15 m (50 ft) of this formation occurs in the northwest portion of the map. Springs may occur near the base and sinkholes and karst features may be present.

Odpg - Shale, Limestone, and Dolomite (Decorah, and underlying Platteville, and Glenwood formations) A unit of green-grey shales, dense limestones, argillaceous limestones, and dolostone with average thickness of 25 to 26 m (80 to 85 ft). The upper division, the Decorah Formation, consists of 12 to 14 m (39 to 46 ft) of interbedded fossiliferous green-grey shale and limestone. The middle division, the Platteville Formation, consists of 7.5 m (25 ft) of limestone, argillaceous limestone, and dolostone; it serves as a source of quarried aggregate; along with the underlying St. Peter it forms distinctive elongate ridges in upland landscape positions. The lower division, the Glenwood Formation, consists of 2 to 3 m (7 to 9 ft) of green-grey shale with minor siltstone to fine sandstone. This map unit, especially the Decorah and Glenwood subdivisions, is rarely exposed except in man-made excavations or cuts.

Osp - Sandstone (St. Peter Sandstone Formation) A moderately resistant unit forming distinctive elongate ridges in upland landscape positions, especially where capped by Platteville Formation limestone of map unit Odpg. It generally ranges from 18 to 23 m (60 to 75 ft) in thickness, but may attain thicker sections where it overlies paleotopographic low areas on the high-relief surface of unconformity with underlying units. A white to tan, and occasionally red to orange-stained, pure quartz sandstone, it ranges from hard cemented at the top to friable. Locally, may serves as a source of fill sand.

Os - Dolomite and Sandstone (Shakopee Formation) A variably resistant slope to ledge-forming unit ranging in thickness from 17 to 30 m (55 to 100 ft). Composed of interbedded dolomite, sandy dolomite and sandstone with a prominent 8 to 10 m (26 to 33 ft) thick horizontally stratified sandstone (New Richmond Sandstone Member) occupying its lower part. Contains some chert nodules, and has distinctive oolitic and stromatolitic facies. Small springs locally occur near its base and it may host karst caverns.

Oo - Dolomite (Oneota Formation) A highly resistant ledge and cliff-forming unit of up to 60 m (200 ft) of dolomite that has chert nodules, small calcite crystal filled cavities, and stromatolite facies. May host karst cavities, caverns, and springs. Interbeds of fine-grained sandstone occur in the lower 8 m (25 ft). Serves as a source of high quality aggregate.

CAMBRIAN SYSTEM

Cj – Sandstone (Jordan Sandstone Formation) A friable to weakly cemented quartzose and feldspathic, fine- to coarse-grained sandstone, that typically displays well-developed cross-stratification. Thickness varies between 28 to 34 m (90 to 110 ft).

Csl – Siltstone and Dolomite (St. Lawrence Formation) A unit of thin-bedded dolomitic siltstone and silty dolomite with variable glauconite pellet content. Thickness averages 20 m (65 ft). Not known to be exposed, but present at the bedrock surface beneath alluvium of major drainages in the eastern portion of the map area.

Drill Holes

Outcrops

Adjacent 7.5' Quadrangles

SPRING_GROVE	WILMINGTON	EITZEN
HIGHLANDVILLE	DORCHESTER	WAUKON_NW
FREEPORT	HANOVER	WAUKON

Quadrangle Location

Base map from USGS Dorchester 7.5' Digital Raster Graphic (IGS GIS file DRGB42.TIF) which was scanned from the Dorchester 7.5' Topographic Quadrangle map, published by US Geological Survey in 1981
Topographic contours and land features based on 1975 aerial photography, field checked in 1977
Land elevation contours (20' interval) based on NGVD 1929.

Iowa Geological Survey digital cartographic file Dorchester08quad_bedrock.mxd, version 8/18/08 (ArcGIS 9.2)
Map projection and coordinate system based on Universal Transverse Mercator (UTM) Zone 15, datum NAD83.

The map and cross section are based on interpretations of the best available information at the time of mapping. Map interpretations are not a substitute for detailed site specific studies.

GEOLOGIC MAPPING OF THE UPPER IOWA RIVER WATERSHED: PHASE 4: Dorchester 7.5' Quadrangle

Iowa Geological Survey
Open File Map OFM-08-6
August 2008

prepared by

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