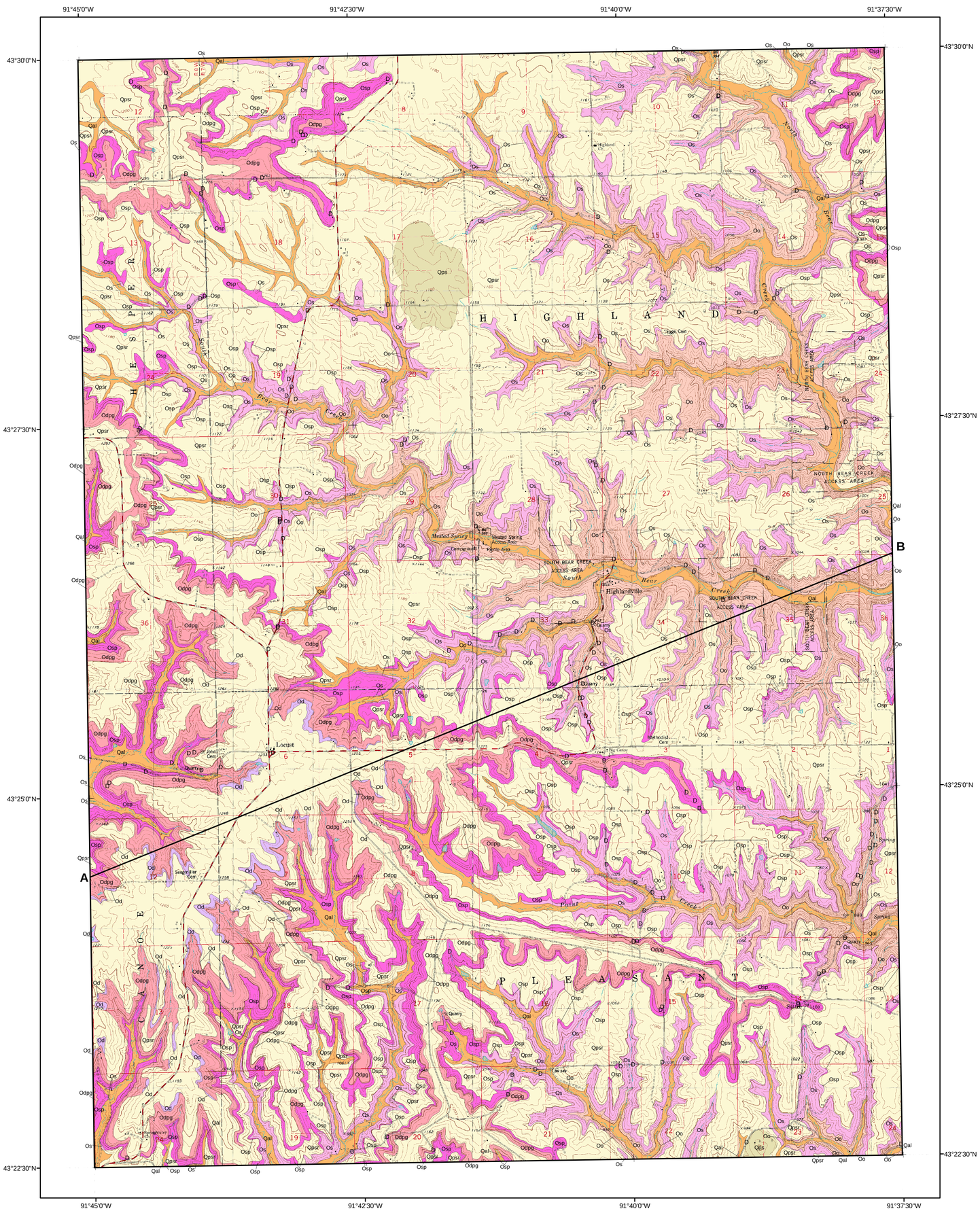
Surficial Geology of the Highlandville (Iowa) 7.5' Quadrangle



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 to 13 feet) of massive to weakly stratified, grayish brown to brown loam, silt loam, clay loam, or loamy sand overlying less than three meters 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 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.

WISCONSIN EPISODE

Qps

Qps - Loess (Peoria Formation—silt facies) Generally 2 to 6 meters (6 to 19 feet) of yellowish to grayish brown, massive, jointed noncalcareous grading downward to calcareous silt loam to silty clay loam. Overlies massive, fractured, loamy glacial till of the Pre-Illinoian Wolf Creek or Alburnett formations with or without intervening clayey Farmdale/Sangamon Geosol. In most areas the Pre-Illinoian till is 1 to 5 m (3 to 16 ft) thick, but may be up to 8 m (27 ft) thick locally. This mapping unit encompasses upland divides, ridge-tops and convex-side slopes. Well to somewhat poorly drained landscape.

Qpsr

Qpsr - Loess over bedrock (Peoria Formation—silt facies) Generally 2 to 6 m (6 to 19 ft) of yellowish to grayish brown, massive, jointed noncalcareous grading downward to calcareous silt loam to silty clay loam. Overlies Ordovician 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

Od - Limestone (Dunleith Formation) A prominent ledge and cliff-forming unit of up to 42 m (137 ft) of 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; it is commonly quarried for aggregate. Major springs occur near the base and sinkholes and karst features are common. Along valley wall positions it is frequently mantled by 0 to 2 m (0 to 6 ft) of loess-derived and weathered bedrock-derived colluvium.

Odpg

Odpg - Shale, Limestone, and Dolomite (Decorah, and underlying Platteville, and Glenwood formations) A nonresistant slope-forming unit of green-grey shales, dense limestones, argillaceous limestones, and dolostone with average thickness of 26 to 27 m (85 to 90 ft). Along steep valley wall slopes large detached slump-blocks of overlying Dunleith Formation limestone often rest on the upper surface of this unit. Forms a regional confining unit that serves as the basal boundary of the karst system in the overlying Dunleith, Wise Lake and Dubuque formations of the Galena Group. 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. 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 and is commonly mantled by 0 to 2 m (0 to 6 ft) of loess-derived and weathered bedrock-derived colluvium.

Osp

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. Grey shale and conglomerate occurs locally in the lower part, particularly in thicker sections. Locally serves as a source of fill sand. Forms a local bedrock aquifer where confined by overlying bedrock. Commonly mantled by 0 to 2 m (0 to 6 ft) of loess-derived and weathered bedrock-derived colluvium.

Os

Os - Dolomite and Sandstone (Shakopee Formation) A variably resistant slope to ledge-forming unit ranging in thickness from 0 to 30 m (0 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. May locally be thin or absent where truncated beneath the unconformity at the base of the overlying St. Peter Formation. Small springs locally occur near its base and it may host karst caverns. Mostly mantled by 0 to 2 m (0 to 6 ft) of loess-derived and weathered bedrock-derived colluvium.

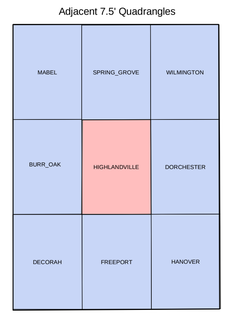
Oo

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 limited karstic cavities, caverns, and springs. Forms a bedrock aquifer throughout much of the map area. May be mantled by 0 to 2 m (0 to 6 ft) of loess-derived and weathered bedrock-derived colluvium.

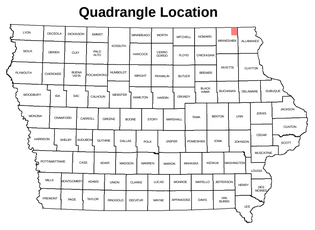
• **Well Points**

D **Outcrops**

Adjacent 7.5' Quadrangles



Quadrangle Location



Base map from USGS Highlandville 7.5' Digital Raster Graphic (IGS GIS file DRGB41.TIF) which was scanned from the Freeport 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 Highlandvillequad07.mxd, version 7/30/07 (ArcGIS 9.1)
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 3: Highlandville 7.5' Quadrangle

Iowa Geological Survey
Open File Map OFM-07-2
July 2007

prepared by

Robert M. McKay[1], Huaibao Liu[1], Jean Young[2], and Stephanie Tassier-Surine[1]

[1]Iowa Geological Survey, Iowa City, Iowa
[2]Luther College, Decorah, Iowa

Iowa Department of Natural Resources, Richard A. Leopold, Director
Iowa Geological Survey, Robert D. Libra, State Geologist

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Special Acknowledgment and Map Dedication

We note with great sadness that during the final preparation of this map, our co-author, Jean Young passed away on June 28, 2007 after a brief illness following surgery. Jean was the curator of the geologic and paleontologic collections at Luther College, the author of Fossils and Rocks of Eastern Iowa, a longtime student and investigator of the geology of northeast Iowa, and a talented artist. Additionally, in 2004, she participated in the discovery of a new Ordovician *Lagerstätte* fossil site in Winneshiek County, and in 2006 co-authored a Geological Society of America scientific paper with H. Liu and R. McKay about that new and rare fossil fauna. Jean resided along Echo Valley Road near the center of the Highlandville Quad for 25+ years, and had intimate knowledge of the geology of the quadrangle and the surrounding area. Despite her deteriorating health and mobility Jean participated in field work for this map at every opportunity; her knowledge of key outcrops, wells and landowners were invaluable. This map is dedicated to Jean and the memories of Iowa geology and fieldwork that we and other Survey geologists have shared with Jean over our careers. Jean's spirit, goodwill, knowledge and enthusiasm will be missed by us and many others.