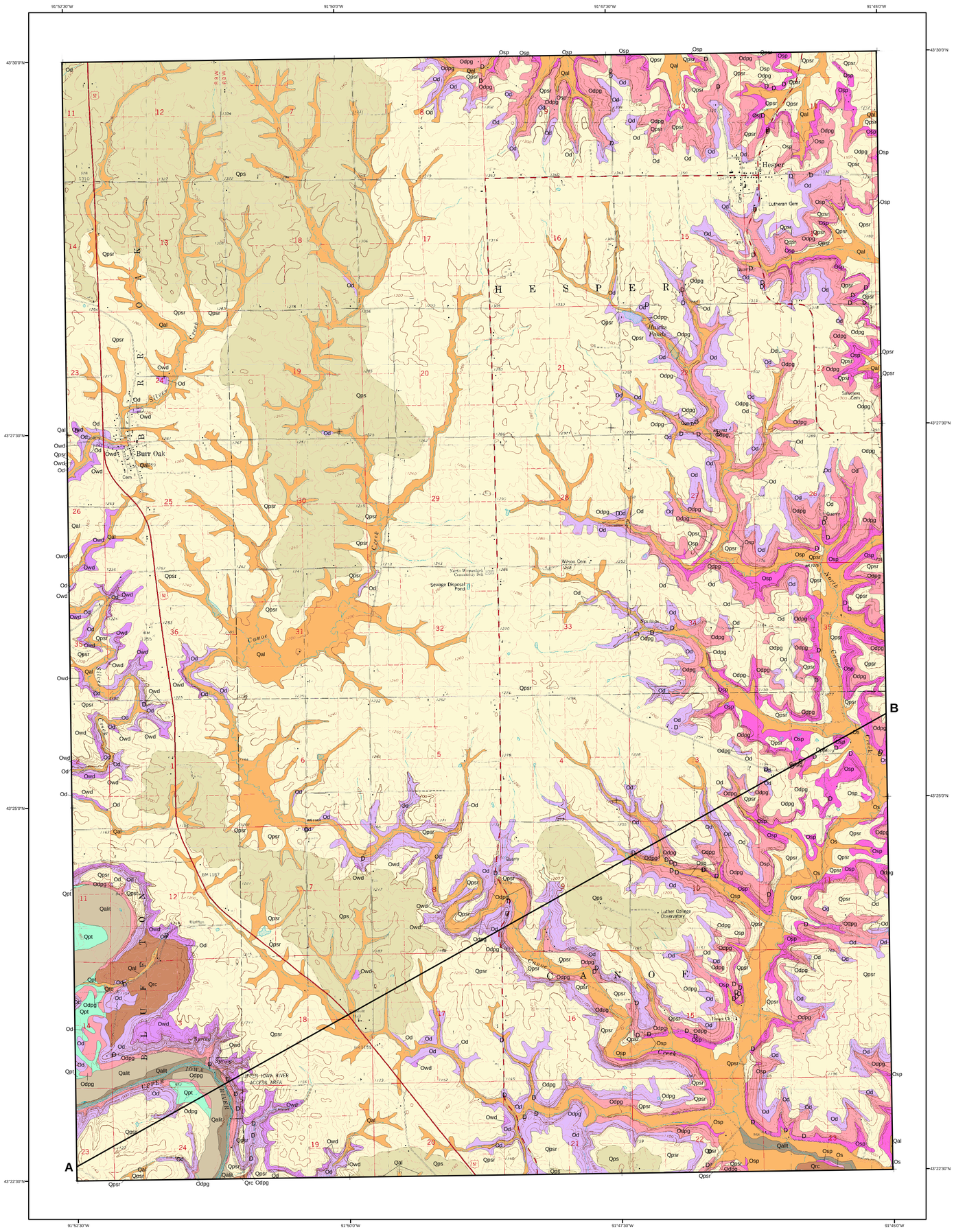
Surficial Geology of the Burr Oak (Iowa) 7.5' Quadrangle



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 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.

Qallt

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

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

WISCONSIN EPISODE

Qpt

Qpt - High Terrace - either Late Phase or Early Phase (Peoria Formation – silt and/or sand facies) Two to seven meters of yellowish brown to gray, massive, jointed, calcareous or noncalcareous, silt loam and intercalated fine to medium, well sorted sand. May grade downward to poorly to moderately well sorted, moderately to well stratified, coarse to fine feldspathic quartz sand, pebbly sand, loam, or silt loam alluvium (Late Phase) or may overlie a Farmdale Geosol developed in Roxanna Silt which in turn overlies a well-expressed Sangamon Geosol developed in poorly to moderately well sorted, moderately to well stratified, coarse to fine sand, loam, or silt loam alluvium (Early Phase).

Qps

Qps - Loess (Peoria Formation—silt facies) Generally 2 m 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 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 m to 5 m (3 – 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 8 m (6 – 27 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.

PLEISTOCENE UNDIFFERENTIATED

Qrc

Qrc - Rock Core Meanders/Structural Benches Includes rock core meanders associated with Pre-Wisconsin river development and terrace deposits overlying bedrock benches. Some areas occupy positions as much as 10m (33 ft) above the modern floodplain. Consists of undifferentiated alluvial and colluvial fill of unknown age and thickness. May be mantled by 1 to 3 m (3-10 ft) of Peoria Formation- silt facies (loess).

Paleozoic
Ordovician System

Owd

Owd - Limestone and minor Shale (Wise Lake Formation and overlying Dubuque Formation) A prominent ledge and cliff-forming unit of up to 31 m (102 ft) of limestone with notable thin interbedded shale in the upper 6 m. This map unit is the upper of two successive major cavern and karst-forming bedrock units in the area. The Wise Lake Formation consists of 21 m (67 ft) of medium to thick-bedded relatively chert-free limestone, portions of which exhibit a distinctive bioturbated fabric; serves as a quarried aggregate source The Dubuque Formation consists of 10 m (34 ft) of crinoidal limestones and thin interbedded shale. Sinkholes are common to abundant within this map unit. Often mantled by 0 m to 2 m (0 –6 ft) of loess-derived and weathered bedrock-derived colluvium.

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 units in the area. 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. Frequently mantled by 0 m to 2 m (0 – 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 m to 27 m (85 –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. The upper division, the Decorah Formation, consists of 12 m to 14 m (39 – 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 m to 3 m (7 – 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 m to 2 m (0 – 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 m to 23 m (60 – 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, quartz-rich 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. Forms a local bedrock aquifer where confined by overlying bedrock. Commonly mantled by 0 m to 2 m (0 – 6 ft) of loess-derived and weathered bedrock-derived colluvium.

Os

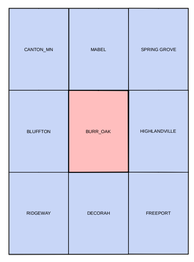
Os - Dolomite and Sandstone (Shakopee Formation) A variably resistant slope to ledge-forming unit ranging in thickness from 0 m – 30 m (0 – 100 ft). Composed of interbedded dolomite, sandy dolomite and sandstone with a prominent 8 m – 10 m sandstone (New Richmond Sandstone Member) occupying its lower 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 m to 2 m (0 – 6 ft) of loess-derived and weathered bedrock-derived colluvium.

Water Features

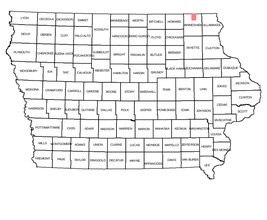
Drill Holes

D **Outcrops**

Adjacent 7.5' Quadrangles



Quadrangle Location

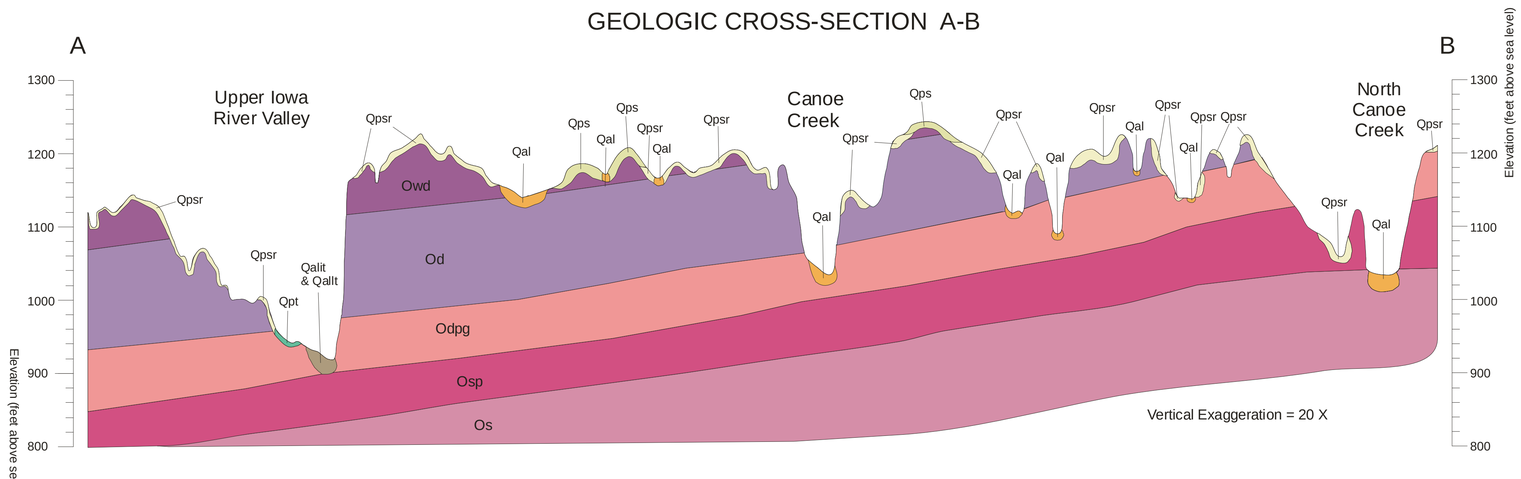


Base map from USGS Burr Oak 7.5' Digital Raster Graphic (IGS GIS file DRGB40.TIF) which was scanned from the Burr Oak 7.5' Topographic Quadrangle map, published by US Geological Survey in 1981
Topographic contours and land features based on 1975 aerial photography, field checked in 1977
Land elevation contours (20' interval) based on NGVD 1929.

Iowa Geological Survey digital cartographic file BurrOakquad07.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 CROSS-SECTION A-B



GEOLOGIC MAPPING OF THE UPPER IOWA RIVER WATERSHED: PHASE 3: Burr Oak 7.5' Quadrangle

Iowa Geological Survey
Open File Map OFM-07-1
July 2007

prepared by

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Special Acknowledgment

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, and a longtime student and investigator of the geology of northeast Iowa. Her spirit, goodwill, knowledge and enthusiasm will be missed by us and many others.