OKLAHOMA GEOLOGICAL SURVEY
Charles J. Mankin, *Director*

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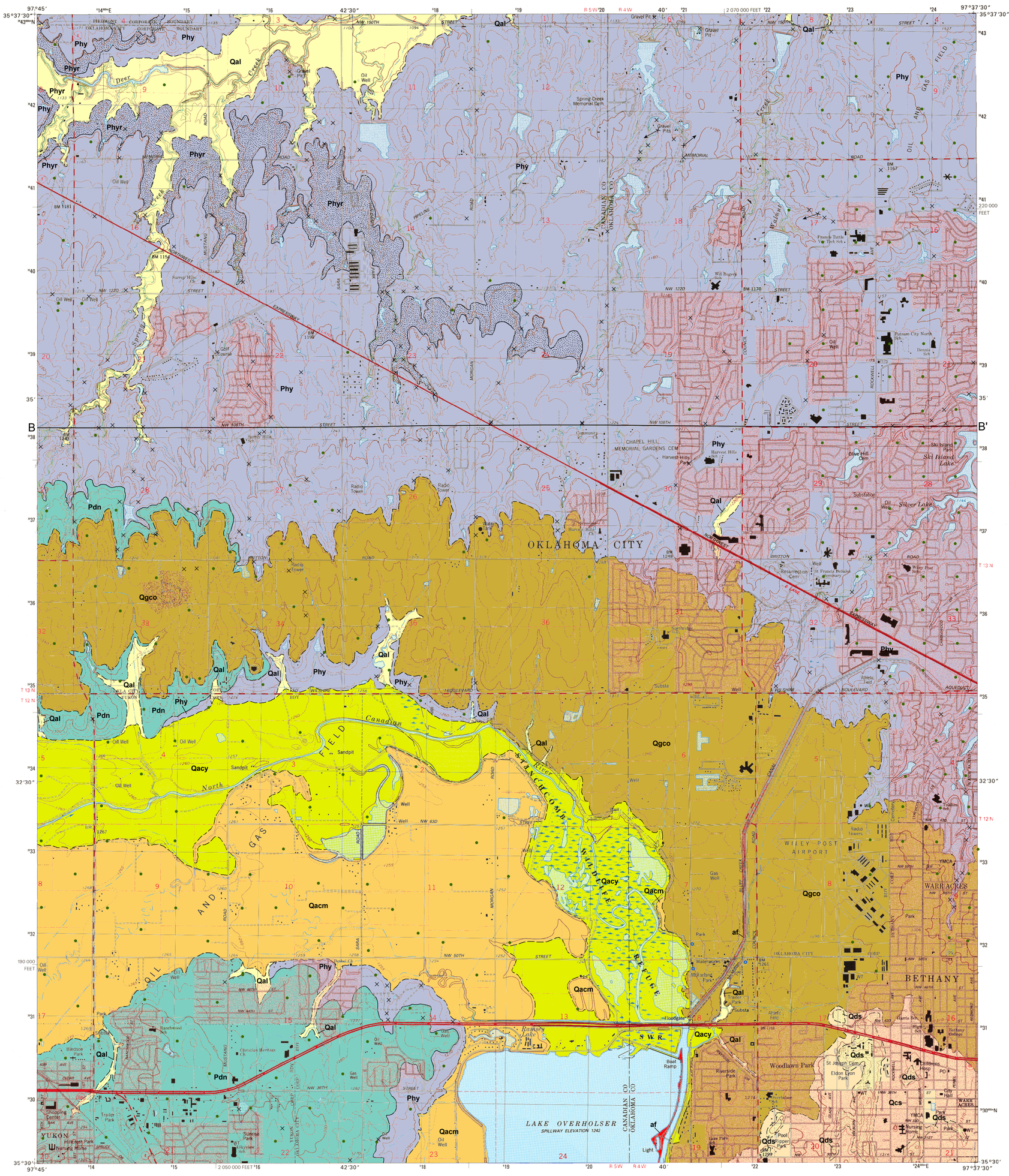


Base Map Credits

The base map was compiled by the U.S. Geological Survey. Topography compiled 1984. Planimetry derived from imagery taken 1995 and other sources. Universal Transverse Mercator (UTM) projection. 1983 North American Datum. 10,000-foot grid ticks based on Oklahoma coordinate system, north and south zones. 1,000-meter UTM grid, zone 14.

Geologic Map Credits

Geology by Neil H. Suneson, Thomas M. Stanley, and Jonathan D. Price, 1998-1999. Research supported by the U.S. Geological Survey, National Cooperative Geologic Mapping Program, under Assistance Award Number 98HQAG2060. The views and conclusions contained in this document are those of the authors and should not be interpreted as necessarily representing the official policies, either expressed or implied, of the U.S. Government. Published originally as Open-File Report 2-99 as an author-prepared, black-and-white paper map. Digitally reproduced in color as Open-File Report OF4-2004. Map revised and published as OGQ-48. Cartography and layout prepared by G. Russell Standridge, 2002.

SCALE 1:24000

1 .5 0 1 MILE

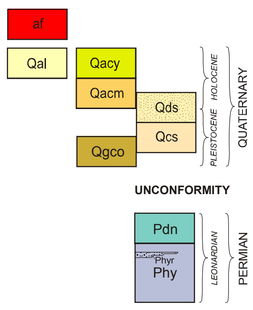
1000 0 1000 2000 3000 4000 5000 6000 7000 FEET

1 .5 0 1 KILOMETER

CONTOUR INTERVAL 10 FEET

TRUE NORTH
MAGNETIC NORTH
8°
APPROXIMATE MEAN DECLINATION

CORRELATION OF MAP UNITS



SYMBOLS

- Unit contact; dashed where approximate
- Outcrop, geologic observation
- Outcrop, bearing of paleocurrent direction
- Petroleum well. Includes oil, gas, oil and gas, dry, service (water supply or injection), junked and abandoned, unknown. Modified from Natural Resources Information System database
- Municipal water well

DESCRIPTION OF UNITS

af ARTIFICIAL FILL–Natural or artificial slumps, cavings, or talus covering formerly exposed areas. Most deposits of this type found around man-made earthen dams and large-scale land-fills. Thickness variable

Qal ALLUVIUM (Holocene)–Clay, silt, sand, and gravel in channels and on flood plains of modern streams. Thickness: 0 to about 25 ft

Qacy ALLUVIUM OF NORTH CANADIAN RIVER (Holocene)–Clay, silt, sand, and gravel in channels and on flood plain of North Canadian River. Area probably subject to frequent flooding. Thickness: generally 0 to 40 ft; rarely more than 40 ft

Qacm ALLUVIUM OF NORTH CANADIAN RIVER (Holocene)–Clay, silt, sand, and gravel on Recent flood plain of North Canadian River about 5 to 10 ft above Qacy. Area rarely subject to flooding. Thickness: unknown, possibly as much as 50 ft

Qds DUNE SAND (Holocene and Pleistocene?)–Fine- to coarse-grained, moderately to poorly sorted sand. Consists mainly of rounded to subrounded quartz grains, with some silt and clay-size material. Probably represents eolian reworking of Pleistocene terrace deposit Qgco. Dunes best seen east of Lake Overholser in secs. 17, 20, and 21, T. 2 N., R. 4 W. Thickness: 0 to 50 ft

Qcs COVER SAND (Holocene and Pleistocene?)–Unconsolidated, very fine-grained sand to coarse-grained silt and clay, moderately to poorly sorted. Consists mainly of rounded to subrounded quartz grains, with abundant silt- and clay-size material. Forms extensive nearly flat topographic surfaces as much as 80 ft above modern alluvial valleys. Probably represents aeolian reworking of Pleistocene and younger fluvial terrace deposits. Thickness: from a thin veneer to as much as 30 ft, averages closer to 5 ft thick.

Qgco REMNANTS OF OLDER TERRACE DEPOSITS (Pleistocene)–Clay, silt, sand, and gravel adjacent to the flood plain of the North Canadian River. Sand commonly is medium- to coarse-grained and very light colored; gravel locally consists of concentrations of distally derived pebbles and cobbles, mostly subrounded quartz and quartzite. Base of unit varies from 0 to 45 ft above the modern flood plain of the North Canadian River and ranges in elevation to about 1260 to 1315 ft above sea level. The top of the unit is as much as 70 ft above the modern flood plain and is as high as 1340 ft above sea level. Present only on north and east side of the North Canadian River. Thickness: 0 to 60 ft

Pdn DUNCAN FORMATION (Permian)–Sandstone, fine- to very fine grained, and minor siltstone and shale. Lower 10 to 16 ft poorly indurated and poorly exposed; reddish orange (10R6/6) to light brown (5YR6/4), thin- to medium-bedded, fine-grained arkosic to subarkosic sandstone that locally fines upward to moderate reddish brown (10YR5/4) to moderate reddish orange (10R6/6) very fine grained sandstone and siltstone. Trough cross-laminations common and well-developed. Locally, this lower part consists of moderate reddish orange (10R6/6) to pale brown (5YR5/2), fine- to medium-grained, poorly sorted, thin- to medium-bedded quartzwackes interbedded with moderate reddish brown (10YR5/4) to pale olive (10Y6/2) well-laminated to fissile clayshale and moderately indurated, thin-bedded (beds 2 to 5 in. thick) to laminated siltstone to very fine-grained quartzwacke. Shale intervals as thick as 3 ft appear to grade laterally into siltstone and very fine-grained sandstone intervals. The Duncan Formation weathers to light brown or brownish-orange color compared to the underlying Hennessey Formation. Thickness: 60 ft, top not exposed

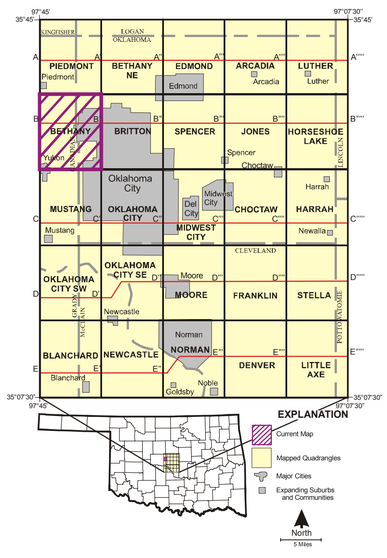
Phy HENNESSEY FORMATION (Permian)–Mostly a silty claystone or clayshale depending on whether bedding is laminated (<=1cm thick: clayshale), or thin (>1cm thick: claystone), with local intervals of fine- to very fine-grained sandstone and coarse siltstone. The Reeding Sandstone is the only mappable bed that can be traced with any certainty in the Hennessey Formation.

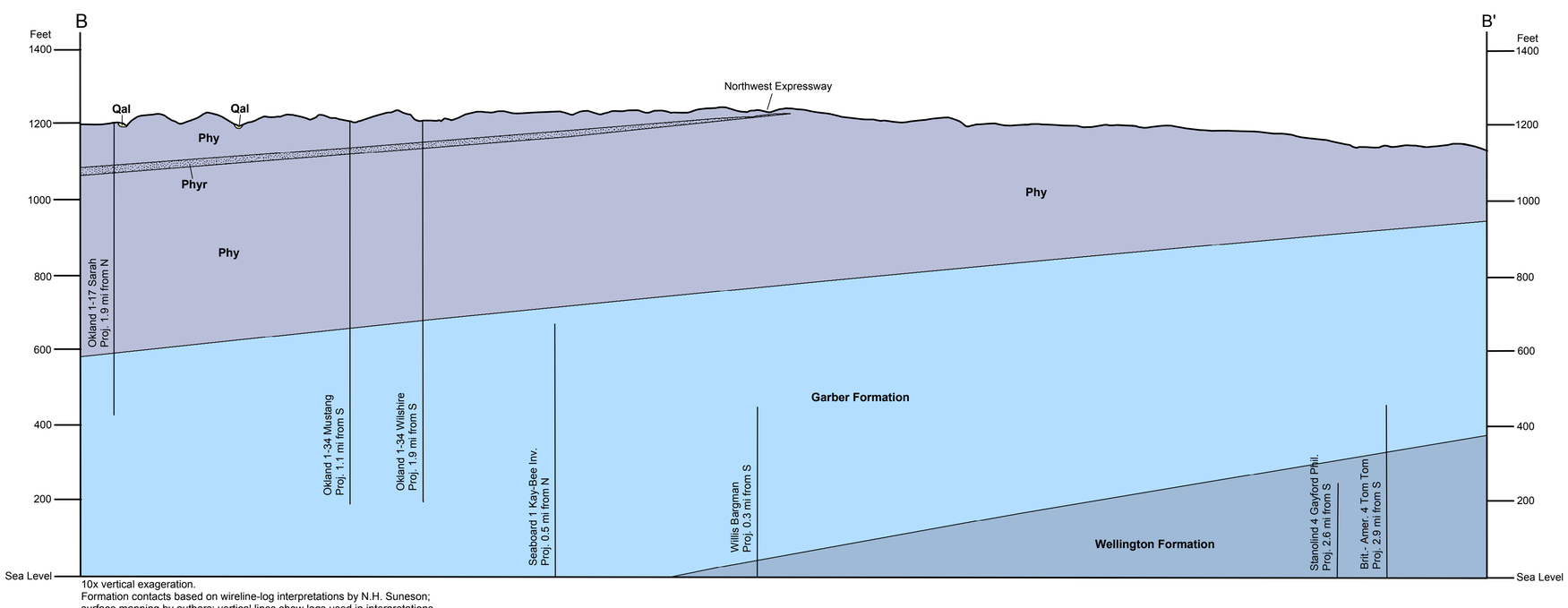
Shale, silty, moderate reddish brown (10R4/6) to dark reddish brown (10R3/4); minor siltstone, sandy, moderate reddish brown (10R4/6) to dark reddish brown (10R3/4), also banded with yellowish gray (5Y7/2) beds; and minor sandstone, very fine grained to rarely fine- to medium-fine-grained (near base), typically moderate reddish brown (10R4/6) to light brown (5YR5/6) to moderate reddish orange (10R6/6), rarely yellowish gray (5Y8/1). Silty shale mostly poorly stratified, weathers to small, angular fragments and more rarely to flakes. Contains common iron-reduction spots, light greenish gray (5GY6/1 to 5GY8/1), as large as 2 in. in diameter. Channelform deposits rare. Commonly weathers to bare, rounded outcrops and/or "badlands"-type topography. Sandy siltstone generally stratified, less commonly unstratified, and contains rare trace fossils, cross bedding, ripple marks, and shale rip-up clasts. Beds commonly about 1 to 4 in. thick. Circular iron-reduction spots as large as 4 in. in diameter common, locally concentrated parallel to bedding planes. Siltstone commonly weathers to small chips, rarely spheroidal or angular blocks, in places has a "hackly" appearance. Calcite veinlets and vugs common. Interbedded siltstone and shale weather to "badlands"-type or bench-and-slope topography. Sandstone beds typically cross-bedded and contain ripple marks. Lenticular- and wavy-bedding, burrows, trace fossils, mudcracks, shale rip-up clasts, and soft-sediment deformation features uncommon. Some beds show evidence for scour and channelform bases. Circular yellowish gray (5Y8/1) iron-reduction spots as large as 4 in. in diameter and thin, greenish gray beds common. Sandstone friable, weathers platy to flaggy. Thickness: about 500 ft based on cross section, base of formation not exposed

Reeding Sandstone Bed (Phyr): Sandstone, very fine grained, light brown (5YR5/6) to moderate reddish brown (10R4/6) to moderate reddish orange (10R6/6); and minor siltstone, moderate brown (10R4/6) and moderate reddish orange (10R6/6) and shale, dark reddish brown (10R3/4). Contains conspicuous light greenish gray (5GY8/1) to greenish gray (5GY6/1) circular iron-reduction spots that vary in size from very small to 5 in. in diameter and are locally concentrated in bands parallel to bedding planes. Generally well-stratified at base to unstratified at top; locally with low-angle cross-bedding. In places contains gray layers and streaks that my be diagenetic. Rare vertical burrows (?). Basal contact sharp and apparently conformable with underlying Hennessey Formation. Weathers to angular blocks. Thickness: about 2 to 35 ft

References

Bingham, R.C.; and Moore, R.L., 1975, Reconnaissance of the water resources of the Oklahoma City quadrangle, central Oklahoma: Oklahoma Geological Survey Hydrologic Atlas 4, 4 sheets, scale 1:250,000.





10x vertical exageration.
Formation contacts based on wireline-log interpretations by N.H. Suneson; surface mapping by authors; vertical lines show logs used in interpretations.

GEOLOGIC MAP OF THE BETHANY 7.5′ QUADRANGLE, CANADIAN AND OKLAHOMA COUNTIES, OKLAHOMA

Neil H. Suneson, Thomas M. Stanley, and Jonathan D. Price

1999