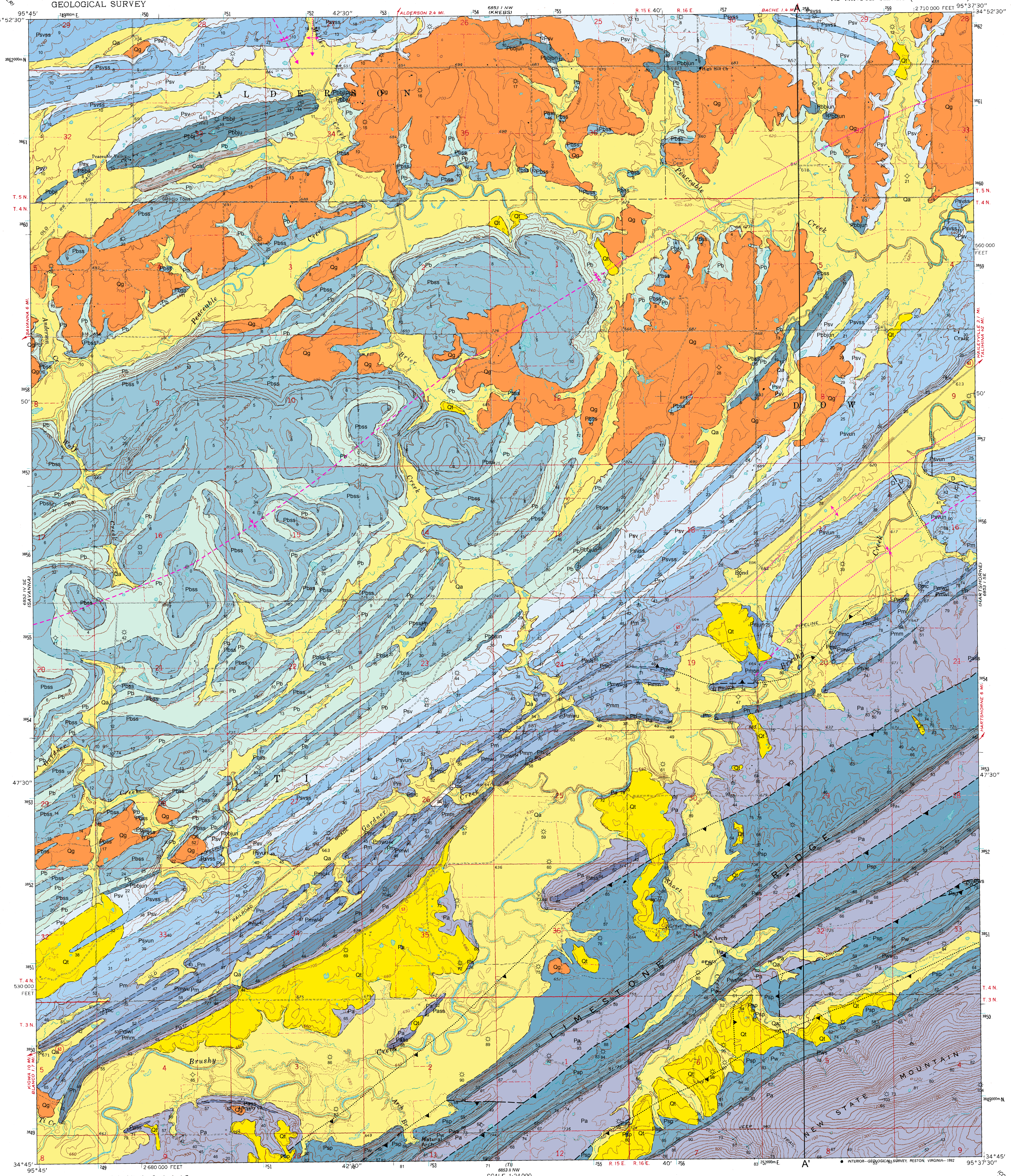
OKLAHOMA GEOLOGICAL SURVEY
Charles J. Mankin, *Director*

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

STATE OF OKLAHOMA

HARTSHORNE SW QUADRANGLE
OKLAHOMA—PITTSBURG CO.
7.5 MINUTE SERIES (TOPOGRAPHIC)



Mapped, edited, and published by the Geological Survey in cooperation with the Oklahoma Highway Department, Oklahoma Water Resources Board, and Oklahoma State Soil Conservation Board

Control by USGS and USC&GS

Topography by photogrammetric methods from aerial photographs taken 1966. Field checked 1967

Polyconic projection. 1927 North American datum
10,000-foot grid based on Oklahoma coordinate system, south zone
1000-meter Universal Transverse Mercator grid ticks, zone 15, shown in blue

Areas covered by dashed light-blue pattern are subject to controlled inundation to 597 feet by Eufaula Reservoir

Fine red dashed lines indicate selected fence and field lines where generally visible on aerial photographs. This information is unchecked

UTM GRID AND 1967 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET
1°32' 27 MILS
8° 142 MILS

Map photoinspected 1977
No major culture or drainage changes observed

SCALE 1:24 000

CONTOUR INTERVAL 20 FEET
DOTTED LINES REPRESENT 10-FOOT CONTOURS
NATIONAL GEODETIC VERTICAL DATUM OF 1929

THIS MAP COMPLIES WITH NATIONAL MAP ACCURACY STANDARDS
FOR SALE BY U.S. GEOLOGICAL SURVEY, DENVER, COLORADO 80225, OR RESTON, VIRGINIA 22092
AND OKLAHOMA GEOLOGICAL SURVEY, NORMAN, OKLAHOMA 73069
A FOLDER DESCRIBING TOPOGRAPHIC MAPS AND SYMBOLS IS AVAILABLE ON REQUEST

QUADRANGLE LOCATION

The difference between 1927 North American Datum and North American Datum of 1983 (NAD 83) for 7.5-minute intersections is given in USGS Bulletin 1875. The NAD 83 is shown by dashed corner ticks

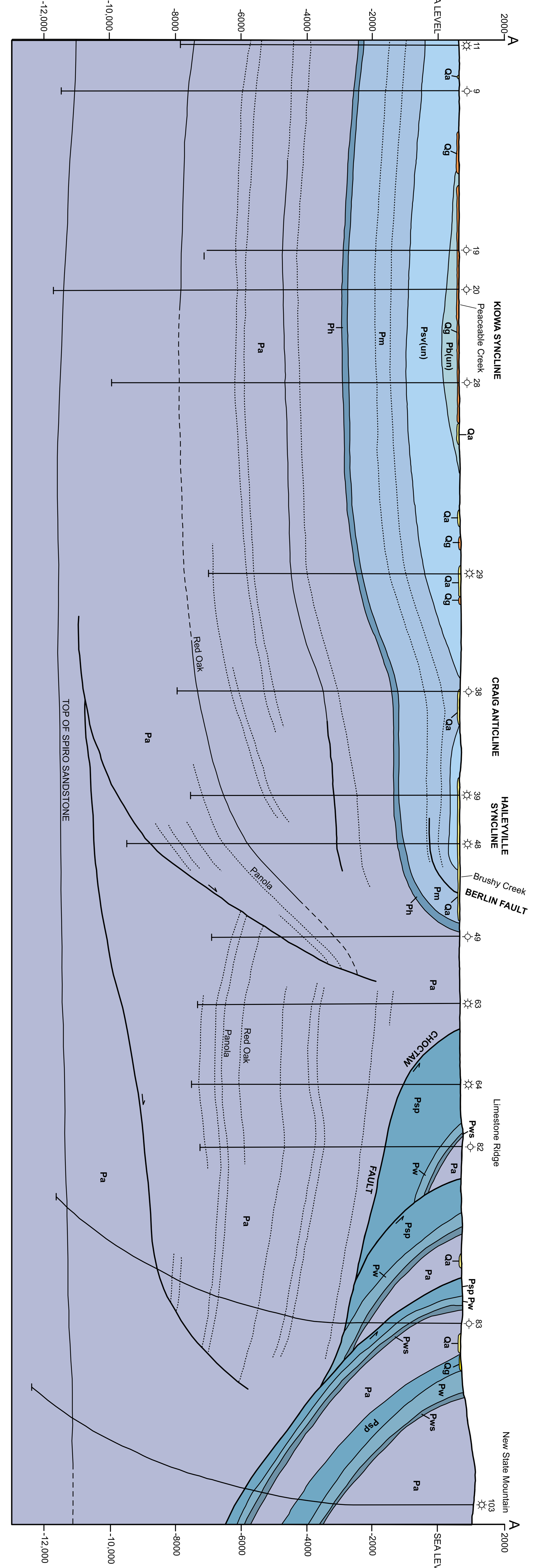
ROAD CLASSIFICATION
Light-duty
Unimproved dirt
State Route

Geology mapped in 1996

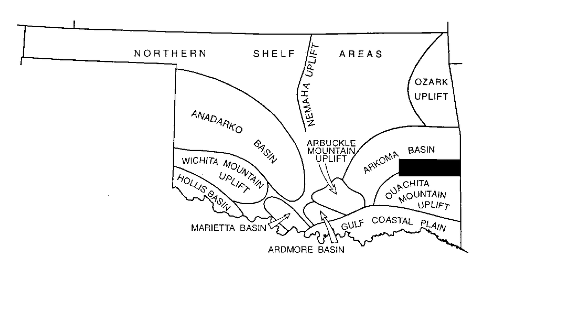
HARTSHORNE SW, OKLA.
34095-G6-OM-024
1967
PHOTOINSPECTED 1977
DMA 6853 I SW—SERIES V883

GEOLOGIC MAP OF THE HARTSHORNE SW 7.5' QUADRANGLE, PITTSBURG COUNTY, OKLAHOMA

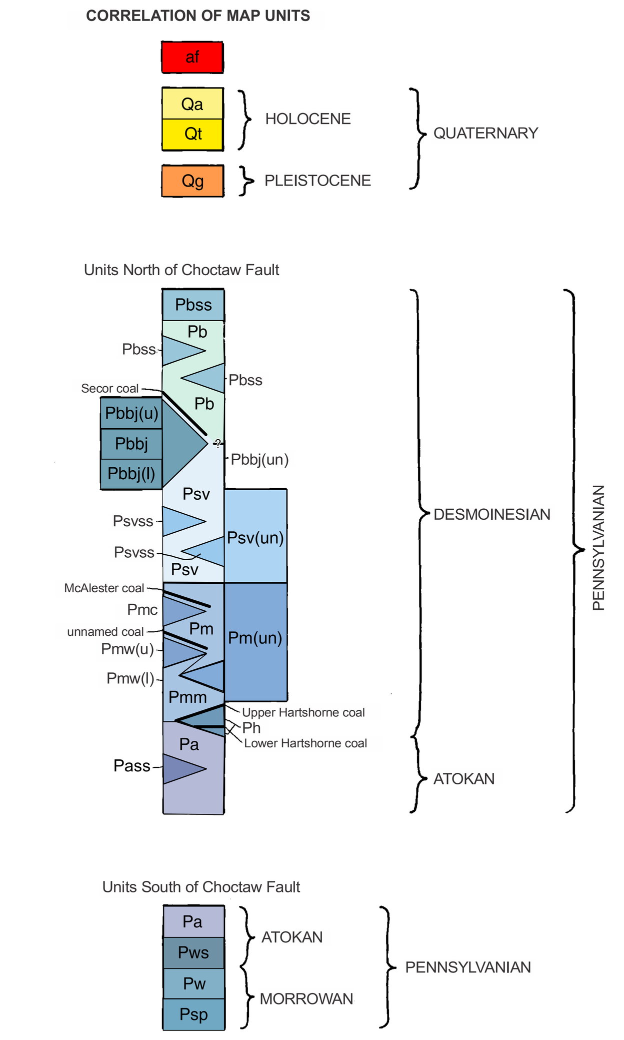
By
N. H. Suneson and L. A. Hemish
1996



Prepared in cooperation with the U.S. Geological Survey, National Geologic Mapping Program. Partial funding from USGS STATEMAP Program, Assistance Award No. G13AC00239.



CORRELATION OF MAP UNITS



DESCRIPTION OF UNITS

af — ARTIFICIAL FILL - Material used for dams.

Qa — ALLUVIUM (QUATERNARY) - Gravel, sand, silt, and clay on flood plains of present-day streams. Thickness: variable, but generally less than 20 ft where observed.

Qt — TERRACE DEPOSITS (QUATERNARY) - Subangular to subrounded cobbles, gravel, sand, and silt forming a veneer on the surfaces of terraces that stand about 15-20 ft above the beds of present-day streams. Thickness: variable, but generally less than 20 ft.

Qg — GERTY SAND (QUATERNARY) - Unconsolidated gravel, sand, silt, and clay in abandoned river channel found at elevations well above modern flood plains. Main constituents of the gravel are rounded cobbles and pebbles of quartz, quartzite, chert, flint, jasper, and silicified wood. Thickness: varies from a thin veneer to an estimated maximum of 50 ft.

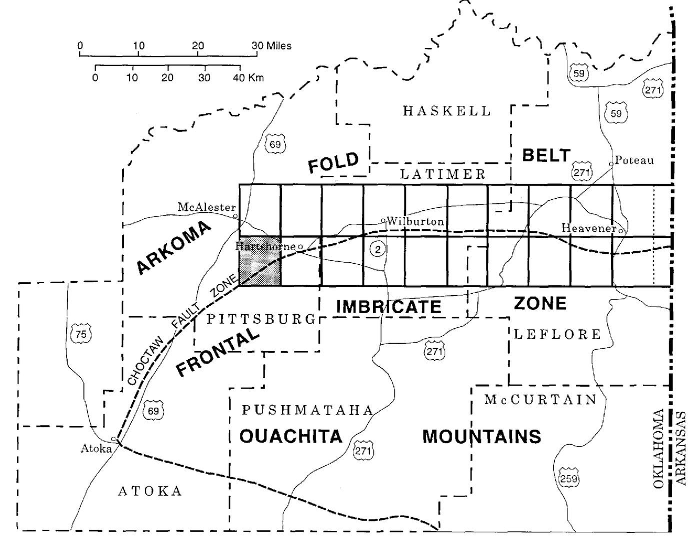
Pb — BOGGY FORMATION (PENNSYLVANIAN) - Predominantly sandy, silty grayish black (N2) to olive gray (5Y4/1) to dark yellowish brown (1OYR4/2) shales and siltstones (Pb) with several mappable, scarp-forming, fine- to very fine grained sandstones (Pbbj, Pbss). At the base is the Bluejacket Sandstone Member (Pbbj), mostly moderate yellowish brown (10YR5/4), about 20-200 ft thick. In the northwestern part of the map area the Bluejacket contains a lower, very fine grained, silty, shaly, thin-bedded, parallel-bedded, ripple-marked, bioturbated sandstone unit 25-50 ft thick labelled Pbbj(l); and an upper silty shale unit (generally covered), about 50-100ft thick labeled Pbbj(u), containing large-scale trough cross-bedding, abundant soft-sediment-deformation features, and stacked-channel sequences. Pbbj thins eastward and southward and is only a single undivided unit labelled Pbbj(un) represented by about 20-40 ft of thin- to medium-bedded, slabby sandstone in the eastern and central part of the map area. In the southwestern part of the map area the Bluejacket is unexposed or possibly absent; where partially exposed, it was observed to be only inches to a few ft thick. On the map the contact between the Savanna and Boggy Formations is marked locally by a dashed and queried line projected between outcrops of the Bluejacket Sandstone. Units represented as Pbss are predominantly dark yellowish brown (1OYR4/2) to grayish orange (1OYR?/4) to light brown (5YR5/2), very fine grained, noncalcareous sandstones with abundant sedimentary structures such as ripples, cross-stratification, sole marks, and soft sediment deformation features. The Secor coal occurs in the shale interval just above Pbbj. It is locally of minable thickness in the northwestern part of the quadrangle where it is >2 ft thick. Top of formation eroded. Maximum remaining thickness: about 2000 ft.

Psv — SAVANNA FORMATION (PENNSYLVANIAN) - Predominantly pale yellowish brown (1OYR6/2) to olive gray (5Y3/2) to medium dark gray (N4) shales (Psv) with several mappable moderate brown (5YR4/4) to grayish orange (1OYR?/4) to moderate reddish brown (1OR4/6), fine- to very fine grained, noncalcareous sandstone units (Psvss). The sandstones are massive to thin-bedded and shaly. They commonly are cross bedded and ripple marked and in places contain abundant soft-sediment deformation features. Sole marks (trace fossils; brush and prod marks; flute, groove, and load casts) at the base of some sandstone beds are locally common. Most shales in the Savanna include thin, unmappable sandstone units. Coal beds may be present locally, but none were observed in outcrop. In the vicinity of the Craig anticline and in the southwestern part of the map area, where beds dip more steeply, sandstone and shale units are undifferentiated and labelled Psv(un). Thickness: 1250- 1450 ft.

Pm — McALESTER FORMATION (PENNSYLVANIAN)- Consists of 3 named members including (oldest to youngest): McCurtain Shale (Pmm), Warner Sandstone (divided into lower (Pmw(l)) and upper (Pmw(u)) units), and Cameron Sandstone (Pmc). Unnamed shale labelled Pm separates the named sandstones above the lower Warner Sandstone Member where it is present. Where the lower Warner Sandstone Member is absent, the McCurtain Shale Member extends to the base of the upper Warner Sandstone Member. Near the intersection of the axis of the Haileyville syncline and the Berlin fault, individual members of the McAlester Formation could not be determined and the unit is mapped as Pm(un).

The McCurtain Shale Member (Pmm) is predominantly poorly exposed olive gray (5Y3/2 to 5Y4/1), laminated, spheroidally weathering, silty shale. Ironstone concretions and trace fossils are present but uncommon. Carbonized plant material locally occurs on bedding planes. Includes very minor siltstone and sandstone beds. Thickness: where lower Warner Sandstone is absent, 300 ft in eastern part of quadrangle, thickens to west to about 900 ft in SW1/4 sec. 19, T. 4 N., R. 16 E. About 300ft thick in western part of quadrangle where lower Warner Sandstone is present.

The Warner Sandstone Member (Pmw(l), Pmw(u)) is predominantly a relatively well exposed grayish orange (10YR7/4) to yellowish gray (5Y7/2), fine to very fine grained, noncalcareous silty sandstone. Beds typically weather to slabs or flagstones and less commonly equidimensional blocks. Individual sandstone beds vary from less than 1 to over 3 ft thick and occur as isolated beds separated from others by covered intervals that are probably shale and siltstone. Ripple marks, cross-stratification, and wavy or swaley bedding characterize most beds; some beds are unstratified, show plane-parallel stratification, and/or soft-sediment deformation features. Sole marks are rare. Small amounts of mica, feldspar, and carbonized plant debris are present. Sandstone beds locally appear to grade into flaser-bedded siltstone/sandstone sequences as thick as several tens of ft. As much as 50 ft of sandstone and covered intervals separating sandstone beds is exposed, but the unit is probably thicker and is shown that way on the map. The upper Warner is fossiliferous in the SW1/4 sec. 26, T. 4 N., R. 15 E., and includes marine fauna consisting predominantly of brachiopods. Although mapped as a single unit, the Warner Sandstone Member (Pmw(l), Pmw(u)) consists of several moderately continuous to discontinuous sandstone beds separated by covered intervals. The upper Warner Sandstone Member (Pmw(u)) is nearly continuous across the quadrangle; the lower Warner Sandstone Member (Pmw(l)) is present only in the western half of the quadrangle. Thickness: Pmw(l) - about 200 ft in west, thins to 0 to northeast in sec. 24, T. 4 N., R. 15 E.; Pmw(u)- maxiumum 250ft, locally thins to 0 ft; entire Warner Sandstone Member interval including shale (Pm) between upper and lower units - maximum 575 ft in southwest corner of quadrangle.



The Cameron Sandstone Member (Pmc) is a relatively well exposed, yellowish gray (5Y7/2) to dusky yellow (5Y6/4), very fine grained noncalcareous silty sandstone that typically weathers to flagstones that are npple marked. Individual outcrops vary from isolated 1- to 2-ft-thick sandstone beds to stacked sandstones 30 It thick. Although mapped as a single unit, the Cameron Sandstone Member includes covered intervals that separate sandstone beds and are probably shale and siltstone. Locally, the Cameron Sandstone Member weathers to blocks or slabs. Common sedimentary structures, in addition to ripple marks, include cross-stratification and wavy beds; lenticular bedding (pinch and swell) and soft-sediment deformation features are rare. The sandstone locally appears to grade both up- and down-dip and along strike into !laser bedded siltstone/sandstonl:l sequences. Outcrop thickness does not exceed 50 ft; map shows Cameron as thick as about 125 ft based on topographic expression, though this may be too thick. Thins to 0 It in eastern part of quadrangle.

Shale in the McAlester Formation (Pm) is predominantly olive gray (5Y3/2 to 5Y4/1), olive black (5Y2/1), to grayish black (N2) silty shale that contains rare thin siltstone beds. The shale typically weathers to thin flakes or chips and locally contains iron-oxide stained concretions and carbonized plant debris. In places, the shale is spheroidally weathered and/or tectonically sheared to the extent that bedding planes are impossible to recognize. In two large cutbanks of Brushy Creek in NE1/4 sec. 20, T. 4 N., R. 16 E., the McAlester Shale consists of unstratified shale containing angular to subrounded shale, siltstone, and sandstone pebbles, cobbles, and boulders as much as 5 It in diameter. A fossiliferous layer containing unbroken brachiopods occurs in SW1/4 NE1/4 sec. 20, T. 4 N., R. 16 E. A 1.5-ft-thick fossiliferous limestone crops out within the formation in the east-central part of sec. 24, T. 4 N., R. 15 E. The shale in the McAlester Formation contains two coal beds. An unnamed coal about 8 in. thick about 100ft above the top of the upper Warner Sandstone Member is present in the eastern part of the quadrangle. The youngest coal in the McAlester Formation is the McAlester _coal It occurs about 50 It above the Cameron Sandstone Member. The coal has been locally mined and small spoils piles occur in the NW1/4 sec. 24, T. 4 N., R. 15 E.

Thickness of McAlester Formation: About 1600 ft along the eastern edge of the quadrangle, and about 2000 ft in the southwestern part.

Ph — HARTSHORNE FORMATION (PENNSYLVANIAN) - Predominantly grayish orange (10YR7/4) to dark yellowish orange {10YR6/6) to yellowish gray {5Y7/2), fine-grained, silty, ripple-marked, mostly thin-bedded (1 in. to 6 in.), relatively well exposed, noncalcareous sandstone interbedded with poorly exposed, platy weathering, !laser- to lenticular-bedded siltstone and shale. Outcrops form 1/2- to 2-ft-thick tombstone topography, ledges 2 to 10 It high, and more rarely cliffs as high as 40 ft. The formation is characterized by sandstone outcrops separated by covered intervals that probably overlie shale and siltstone. Ridges underlain by the Hartshorne Formation are typically littered with slabs and flagstones. Some sandstone beds are continuous for hundreds of It; others show pronounced lenticularity and thickening and thinning. Channelform structures are rare. Common sedimentary structures include ripple marks, wavy bedding, trace fossils, and large- (1 to 4 It) and small- (inches) scale cross-stratification. Cross stratification is typically unidirectional and generally east to west; locally, herringbone cross-stratification shows two opposing current directions. The sandstone is quartzose and typically contains rare mica. Iron oxide generally coats individual grains. Carbonized plant debris locally occurs on bedding planes. The Hartshorne Formation contains two named coal beds - the Lower and Upper Hartshorne coals. The Upper(?) Hartshorne coal is present in the eastern half of the quadrangle. The Lower Hartshorne coal was mined in the center E1/2 sec. 34, T. 4 N., R. 15 E. The base of the Hartshorne Formation appears to be a disconformity. Thickness: individual outcrops rarely more than 50 It thick, but Maximum thickness of formation about 500 ft, thins to 0 in the eastern part of the quadrangle.

Pa — ATOKA FORMATION (PENNSYLVANIAN) - North of Choctaw fault, predominantly very poorly exposed, grayish black (N2) to olive gray (5Y3/2), slightly to very silty, fissile to platy, noncalcareous shale. Locally weathers spheroidally and contains sparse concretions and layers. In places, ellipsoidal concretions as much as 1 ft in diameter consist of a mass of closely spaced tubular trace fossils. Contains rare thin (about 1 in.) siltstone beds and much less common sandstone beds; the thicker, mappable sandstone beds are labelled Pass. Sandstone beds in the Atoka Formation north of the Choctaw fault locally are well-exposed, medium light gray (N6) to light olive gray (5Y6/1) to dusky yellow (5Y6/4) and interbedded with siltstone and shale. They are uniformly fine-grained but contain a wide variety of weathering characteristics and sedimentary structures. Outcrops weather to blocks, slabs, and flagstones; individual beds vary from unstratified to parallel- to cross-stratified; large- and small-scale cross-stratification is present locally, as are soft-sediment deformation features and dish-and-pillar structures. Ripple marks, trace fossils, and flute and groove casts are present locally. The sandstones are generally quartzose and contain mica; carbonized plant debris is present on some bedding planes. The Atoka Formation exposed north of the Choctaw fault represents the upper part of the formation. Maximum thickness exposed north of Choctaw fault: about 5000 It, but difficult to determine due to complicated and poorly exposed structure.

South of Choctaw fault, predominantly very poorly exposed grayish black (N2), olive black (5Y2/1), to olive gray (5Y3/2) noncalcareous, fissile to platy, laminated slightly sility shale with thin (mostly less than 1 in. thick) sandstone and siltstone beds. Shale locally contains ironstone concretions. Sandstone and siltstone beds typically represent Bouma Ted or Td sequences. Shale characterizes extreme lower part of Atoka Formation immediately over the Spiro sandstone and underlies the northwestern sides of the valleys between the Spiro - Wapanucka ridges. In the southeastern corner of the quadrangle, the Atoka Formation probably consists of 80% shale. Most outcrops of Atoka Formation are poorly exposed, moderate yellowish brown (1OYR5/4) to grayish orange (1OYR7/4) to dusky yellow (5Y6/4), noncalcareous sandstone beds that represent partial, repeated, and truncated Bouma sequences similar to those deposited from turbidity currents as well as unstratified sandstones similar to those deposited by mass-flow processes. Sandstone outcrops vary from walls to ledges to tombstone topography to dipslope outcrops. Outcrops typically weather to slabs and flagstones. Strata occur as individual beds overlain and underlain by shale or separated by covered intervals or as stacked, amalgamated beds as thick as 30 ft. Sedimentary structures include parallel-, cross-, and wavy-stratification, dish-and-pillar structures, convolute stratification caused by soft-sediment deformation, and ripple marks. Sole marks such as trace fossils, load coasts, and flute and groove casts are common. The sandstones are silty, fine-grained, and quartzose with sparse feldspar and mica; color variation is caused by differences in the amount of iron oxide coating on sand grains. Carbonized plant debris locally occurs on bedding planes. The Atoka Formation south of the Choctaw fault represents the lower and middle parts of the formation. Maximum thickness exposed south of Choctaw fault: about 6000 ft.

Pws — SPIRO SANDSTONE (PENNSYLVANIAN) - Predominantly dark yellowish orange (1 OYR6/6) to grayish orange (10YR7/4), well-exposed, fine-grained, quartzose sandstone. Locally, the sandstone is coarse- to medium-grained and/or bioclastic. The upper part of the unit also includes common spiculitic siltstone and spiculite. Limestone similar to that in the Wapanucka is also present near the top of the Spiro in all but the northern outcrop belt. Spiculite and limestone are more rarely is interbedded in the sandstone Limestone locally is at the base of the Spiro sandstone. Exposures vary from slopes covered with slabs and flagstones to long, low, tombstone-like outcrops separated by covered intervals (probably shale) to low ledges to near-vertical walls as high as 30 ft. Spiro sandstone outcrops vary from 1 to several tens of ft thick and vary from hard and brittle to soft and vuggy. Sedimentary structures vary from laminated to parallel-stratified to cross- and wavy-stratified to large-scale tabular- and trough crossbedded. Locally, beds pinch and swell; ripple marks, load casts, and trace fossils are rare. Channelform deposits are uncommon. In general, the sandstone beds consist mostly of moderately well-rounded quartz grains coated with varying amounts of iron oxide. Fossils (especially crinoids) and fossil molds are uncommon. In general, the sandstone is noncalcareous; rarely, however, calcite cement is present. Porosity is generally moderate. Hand specimens of spiculitic siltstone and spiculite are well-stratified ("wispy") and weather to a "spongy" appearance. Spiro outcrops are rarely more tha 150 It thick and more typically about 50 ft thick (including covered intervals), but the entire unit is undoubtedly thicker and is shown that way on the map. The Spiro sandstone is generally separated from the underlying Wapanucka Limestone by a rarely exposed shale interval as thick as 250 ft, but typically 50 It to 100 ft. Where possible, the contact between the Spiro sandstone and Wapanucka Limestone is drawn on the highest Wapanucka Limestone outcrop. Thickness of Spiro sandstone: generally 150 to 200 It; appears to pinch out on the ridge about 1/2 mi west of Natural Arch.

Pw — WAPANUCKA LIMESTONE (PENNSYLVANIAN)- Predominantly medium gray {N5) to dark gray (N3) to pale yellowish brown (1OYR6/2), moderately well exposed, irregularly bedded limestone. Most common type of limestone is finely crystalline micrite; bioclastic limestone is less common; coarsely crystalline, sandy, and spiculitic varieties of limestone are rare. Very rare rock types that are mapped as part of the Wapanucka Limestone include shale, spiculite (common at base), and sandstone similar to that in the Spiro sandstone. Irregularly shaped masses of chert are common in the micrite. Outcrops of Wapanucka Limestone weather to flagstones, blocks, and boulders and locally form tombstone topography, ledges, and cliffs several tens of It high. Covered intervals are common and probably overlie shale. Individual beds vary from unstratified to medium-bedded (inches) to rarely finely laminated. Wavy beds, cross beds, and pinch-and-swell structures are rare. Crinoids, locally replaced by sparry calcite, range from absent or uncommon in some micrites to abundant in the bioclastic limestones. Some of the limestone has a slightly petroliferous odor. Fractures typically are filled with calcite. Limestone is less common than spiculite and spiculitic sandstone in the southeasternmost outcrop belt at the southern edge of the quadrangle. Individual outcrops of Wapanucka Limestone are rarely more than 200 ft thick, but the entire unit is considerably thicker and is shown that way on the map. The Wapanucka Limestone is separated from the overlying Spiro sandstone by a very poorly exposed shale that is of variable thickness, but generally tens of It thick. Where possible, the contact between the Wapanucka Limestone and Spiro sandstone is drawn at the top of the limestone. The Wapanucka appears to grade into the underlying "Springer" Formation; limestone beds very similar to those in the Wapanucka occur in the "Springer" and limey shale (or muddy limestone) similar to that in the "Springer" probably is present in the lower part of the Wapanucka, but is covered. The contact between the Wapanucka Limestone and the "Springer" Formation is drawn between the lowest thick outcrop of limestone or spiculite and the highest thick outcrop of calcareous shale. Thickness of Wapanucka Limestone: about 200 It to 700 It; thickest in southeastern outcrop belt.

Psp — "SPRINGER" FORMATION (PENNSYLVANIAN) - Predominantly very poorly exposed olive gray (5Y3/2 - 5Y4/1) to olive black (5Y2/1) to grayish black (N2), silty, very to slightly calcareous to noncalcareous fissile shale. Unit includes uncommon, but relatively well-exposed calcareous sandstone and limestone beds. Shale generally weathers spheroidally or to small chips or flakes. Locally contains ironstone concretions and layers. Shale interbedded with thin siltstone beds that locally are calcareous, pinch and swell, and locally form concretions. Uncommon sandstone beds are medium gray (N5), quartzose, up to about 1 ft thick, cross-stratified, calcareous, and contain conspicuous grains of glauconite. Limestone beds in the "Springer" Formation are about 1 to 3 It thick, weather to slabs and flagstones, and are medium dark gray (N4) to medium gray (N5). The texture varies from coarsely crystalline to bioclastic. Crinoid fragments are the most common fossils. An unusual facies of the "Springer" in the E1/2 SE1/4 sec. 30, T. 4 N., R. 16 E., and Wl/2 NEt/4, sec. 31, T. 4 N., R. 16 E., contains calcareous shale concretions as large as 3 It in diameter; this may have been mistaken for the Mississippian Caney Shale by previous workers. Maximum thickness: 3300 ft, although may be repeated by unrecognized faulting and/or folding.

Oklahoma Geologic Quadrangle **OGQ-20**
Geologic Map of the Hartshorne SW 7.5' Quadrangle
(previously Open-File Report OF8-96)
Text

SYMBOLS

CONTACT - Dashed where approximately located; queried where uncertain

THRUST FAULT - Sawteeth on upper plate; dashed where approximately located; dotted where concealed; queried where uncertain

FAULT - Arrows show relative horizontal movement; dashed where approximately located; dotted where concealed

FAULT - Dashed where inferred; dotted where concealed; U = upthrown side, D = downthrown side

ANTICLINE - Showing crestline; arrow show direction of plunge; dotted where concealed

SYNCLINE - Showing troughline; arrow shows direction of plunge; dashed where approximately located; dotted where concealed

STRIKE AND DIP OF BEDS

Strike and dip of beds, upright

Strike and dip of beds, overturned

Strike and dip of beds, facing direction unknown, except on flanks of Kiowa syncline, where all beds are upright.

Strike and dip of beds, approximate

Vertical beds, facing direction unknown

Undulatory beds

Horizontal beds

OIL AND GAS WELLS

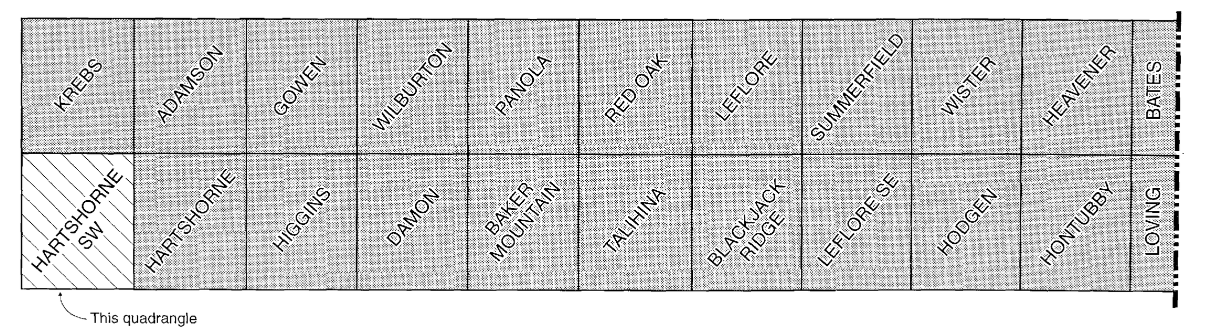
Dry hole, abandoned

Gas well

15 — Number on map corresponds to list of wells

LIST OF WELLS SPUDDED BEFORE DECEMBER 1, 1996 (OPERATOR, NUMBER, FARM NAME, SPUD DATE, TOTAL DEPTH)

1.	Mustang 1-28 Mollett	4/31/73	3175'
2.	Fortuna 1-30 Anderson	1/24/83	12,528'
3.	Fortuna 1-27 Goodson	9/9/85	8596'
4.	Mustang 1-26 Fuggitt	4/15/75	8590'
5.	Mustang 1-26 Fields	11/22/87	8810'
6.	Fortuna 2-25 Segelquist	8/31/87	8612'
7.	Fortuna 1 Segelquist	12115/82	11,900'
8.	Fortuna 1-30 Smith	2/15/83	11,900'
9.	Mustang 2-30 McLean	11/18/80	14,124'
10.	Texinia 2-30 Smith	9/26/87	8476'
11.	Fortuna 1-29 McLean-Choate	2/7/84	8550'
12.	Mustang 1-29 Berry	8/6/78	8558'
13.	Apache 1 German	6/12/65	11,578'
14.	MEG 1-34 Hurricane	4/4/85	11,950'
15.	Spectra 1 Rogers	4/24/82	11,865'
16.	Spectra 1 Melvin	2/10/83	12,150'
17.	TXO 1 Melvin A	4/2/85	9300'
18.	Mustang 1-32 Goodson	4/27/79	8773'
19.	Sunset 1 Henry	6/14/69	8866'
20.	Headington 1 Kemp	12/30/73	12,350'
21.	Texaco 32-1 Camp B	11/11/88	12,000'
22.	Leben 1-5 Henry	5/20/69	9000'
23.	Mustang 1-4 Stipe	5112/73	4140'
24.	Mustang 1-3 Turney	9/4/72	4300'
25.	Apache 1 Barringer	8/18/66	11,392'
26.	Mustang 1-9 McFadden	4/6/82	10,900'
27.	Mustang 1-11 Barringer	6/19/79	11,000'
28.	Skelly 1 James	5/25/68	10,600'
29.	Gose 1 Cope	6/4/67	7600'
30.	Public Service 3 Choc-Chick Nations	8/11/43	1313'
31.	Whitmar 1-17 Roden	3/14/94	9600'
32.	Whitmar 1-17 Agee	3/6/84	10,500'
33.	Seneca 1-16 Browne	4/16/82	10,500'
34.	Mustang 1-15 Browne	6/4/83	10,500'
35.	Tenneco 1-15 Crowl	12/6/78	11,000'
36.	Hadson 1-18 Thornton	7/17/81	9500'
37.	Concorde 1-18 Thornton-Collins	3/5/91	9000'
38.	Oxley 1 Cope	10/13/76	8642'
39.	Wheeler 1-17 Shann	11/25/90	8168'
40.	Sinclair 1 Sensibaugh	5/18/62	11,775'
41.	Seneca 1-20 Rollings	11/29/82	11,733'
42.	Seneca 1-21 Hackler	10/31/82	12,545'
43.	Oxley 2 Stevens	6/15/90	10,100'
44.	Oxley 1 Stevens	8/15/75	10,500'
45.	TXO 1 Brazil	7/23/84	9601'
46.	Oxley 1 Schiller	11/7/78	9376'
47.	Oxley 2 Schiller	9/2/85	8500'
48.	Hamilton Brothers 1-20 Thornton-Ralley	12/19179	13,060'
49.	Arkla 2-20 Thornton-Railey	4/21/89	7500'
50.	Samson 1 Travis	8/21/84	8250'
51.	Hamilton Brothers 1-21 Shann	12/16/80	7828'
52.	Oxley 1-28 Crowl	11/15/84	7861'
53.	Pan American 1 West	6/24/68	10,318'
54.	TXO 1 Crowl	5/2/84	9838'
55.	TXO 2 Stevens	12/23/85	10,426'
56.	TXO 1 Stevens	8/28/83	9255'
57.	Barrett 3 Stevens	1/25/93	9722'
58.	Oxley 1 Whiting	1217/74	13,275'
59.	Oxley 2 Whiting	7/16/91	9579'
60.	Oxley 3 Whiting	3/16/93	9465'
61.	Arkla 1-30 Loveless	3/26/80	14,800'
62.	TXO 1 Penfield	10/7/82	7900'
63.	Hamilton Brothers 1-29 Strange	6/28/81	8005'
64.	Seagull Mid-South 2-29 Strange	9/12/94	8200'
65.	TXO 1 Ellison	1/20/83	13,000'
66.	TXO 1 Fugitt	6/30/81	9534'
67.	TXO 1 Ruyana	12/6/84	10,311'
68.	TXO 1 Scherer B	3/9/86	10,283'
69.	Arco 2 Scherer B	4/2/91	10,000'
70.	Samson 1 Van Dyke	6/30/85	10,100'
71.	Samson 3-35 Van Dyke	1/9/92	B230'
72.	Samson 2-35 Van Dyke	12/30/89	7593'
73.	Amoco 3 Scott	5/29/93	8031'
74.	Amoco 1 Scott	7/11/89	6662'
75.	Amoco 5 Scott	9/1/95	4430'
76.	Amoco 2 Scott	11/5/91	7960'
77.	TXO 1G. Scott	4/15/83	8300'
78.	Area 2 M. Scott	6/18/90	8000'
79.	TXO 1 M. Scott	7/8/84	8000'
80.	Barrett 3 Collins	1/29/94	6902'
81.	Texaco 31-3 M. Scott	4/19/94	12,740'
82.	Hamilton Brothers 1-32 Spahn	3/1/85	8000'
83.	Texaco 32-1 Dromgold B	5/11/90	12,430'
84.	Texaco 33-1 Dromgold C	6/17/90	6432'
85.	WiiHams 1-4 Coker	9/7/90	6800'
86.	Petroleum Dev. Co. 1-3 Luker	6/21/94	3800'
87.	Texaco 3-1 Stafford	6/2/90	6438'
88.	Samson 4-2 Carl Goddard	4/23/92	3408'
89.	Samson 3-2 Goddard	1/30/91	6733'
90.	Texaco 2-2 Carl Goddard	10/5/89	7260'
91.	Texaco 2-1 Carl Goddard	8/4/88	12,132'
92.	Texaco 1-1 J.A. Goddard	11/3/88	7485'
93.	Texaco 1-4 J.A. Goddard	3/23/95	6820'
94.	Texaco 1-2 J.A. Goddard	1/20/91	6689'
95.	Texaco 1-3 J.A. Goddard	2/20/94	11,500'
96.	Texaco 6-3 J.A. Collins	4/27/92	10,860'
97.	Texaco 6-4 J.A. Collins	2/21/95	7620'
98.	Texaco 6-2 J.A. Collins	12/3/89	8690'
99.	Texaco 1-6 J.A. Collins	1/6/89	11,670'
100.	Barrett 3 Rosso	6/18/95	6780'
101.	Barrett 2 Rosso	9/15/93	7680'
102.	Barrett 32-2 Dromgold	5/12/93	12,260'
103.	Amoco 1 Rosso	6/22/88	14,050'
104.	Texaco 4-2 Dromgold	4/3/93	14,047'



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