RANGES EAST OF CIMARRON MERIDIAN

RANGES WEST OF INDIAN MERIDIAN

TOWNSHIPS NORTH

CIMARRON MERIDIAN

INDIAN MERIDIAN

Upper and lower Morrow sandstones generally absent in this area

KEYES DOME

CIMARRON ARCH

RICE NE FIELD

POSTLE FIELD

Upper Morrow sandstones generally absent in this area

Upper Morrow fluvial subarkosic channel fill and FDD deposits

CAMRICK DISTRICT

SOUTH BALKO FIELD

COMO FIELD

NO FDD

FDD

Boise City

Guymon

Beaver

C

C′

C″

LOWER MORROW SANDSTONE AREA, MOCANE-LAVERNE GAS AREA: Interspersed sandstone, shale, and limestone. Sandstone bodies are generally shallow marine to very nearshore in origin. In certain areas, sand bodies appear channel-like in their log signatures and areal distributions. However, glauconite and trace fossils in samples indicate that the sand bodies were deposited in a marine or semimarine environment such as estuaries or tidally influenced shorelines. Since sand bodies have highly variable log signatures and are highly irregular in thickness and areal extent, their depositional environments are interpreted to be highly dynamic and may include nearshore bars, tidal flats and ridges, tidal mouth bars, and estuarine point bars. This interpretation is contrary to the opinion of many geologists who believe that the depositional environment of all lower Morrow sandstones consists of barrier islands or detached offshore bars. No FDD sediments are recognized in this area.

FLUVIAL CHANEL FILL: Some upper Morrow sandstone is interpreted to occur within paleo-drainage systems incised upon older marine shale or alluvial deposits. Principal deltaic indicators such as delta-front sandstone and interdistributary deposits are generally absent in these areas. This indicates that the depositional environment was mainly fluvial within a coastal (flood) plain with little or no delta formation. Channel fill fluvial sediments may have been reworked during eustatic sea-level rise during upper Morrowan time.

MORROW TYPE LOG
RICE NE AREA
Bracken Exploration 1–23 Gaither
NE NE 23, 3N–10E, CM

KB 3602′

GR Res. Cond.

Thirteen Finger lime
Top Morrow Fm.
Upper Morrow Purdy sand zone
"Squaw Belly"
Lower Morrow Keyes sands
Chester ls.

TD 6000′

MORROW TYPE LOG
CANTON & EASTERN DEWEY CO. AREA
Woods Petroleum Corp. 31–1 Irving
S½ S½ NW 31, 17N–14W

KB 1799′

GR Res. Cond.

Top Inola ls.
Thirteen Finger lime
Top Morrow Fm.
Top Springer?
Top upper Chester
Top Chester "solid"

TD 10,450′

STRATIGRAPHIC CHART FOR THE MORROWAN SERIES IN THE PANHANDLE AND NORTHWEST OKLAHOMA

SYSTEM	SERIES	GROUP	FORMAL SURFACE NAMES (FORMATION)	INFORMAL SUBSURFACE NAMES
PENNSYLVANIAN	Atokan	Atoka	Atoka (surface name where exposed in eastern Oklahoma)	Thirteen Finger lime
	Morrowan	Morrowan (Lower Dornick Hills)	Morrow (surface name where exposed in Arkansas)	(The following names are sometimes used interchangeably and are not necessarily in any stratigraphic order)
			Kearny Formation (subsurface name used in Kansas)	Upper Morrow: Purdy sand, Sturgis sand (Keyes and Sturgis field area); Bowles sand (Camrick field); Kelly sand (Eva NW field); Lips sand (Camp creek, Camrick, and Keyes fields); A, B, C, D, etc, sand; Puryear (deep Anadarko basin)
				Lower Morrow: "Squaw Belly" (limy sediments and limestone, sometimes called middle Morrow); Mocane - Laverne sand; Keyes or Basal sand; Jefferson sand (Arkoma basin)
			Cromwell Sandstone; of the Union Valley Formation in the Arkoma basin	
MISSISSIPPIAN	Chesterian	Mayes	Pitkin Limestone (surface names when exposed in eastern Oklahoma); Fayetteville Shale; Hindsville Limestone	Chester (Manning, Mississippi)

EXPLANATION

- Principal sandstone areas including fluvial and/or FDD deposits as shown
- General distribution of Morrow chert conglomerate
- Principal transport direction
- Approximate oil/gas boundary
- Approximate limit of significant Morrow fluvial and/or FDD sediments
- A———A′ Regional cross section
- Type log

Structural boundaries

- Major faults, exposed at, or interpreted to occur at the surface. Overthrust faults identified with solid barbs on hanging wall block. Normal faults identified by relative movement of blocks, U, upthrown side; D, downthrown side. Arrows indicate relative horizontal movement
- Major subsurface faults. Overthrust faults identified with open barbs on hanging wall block
- Plunge of subsurface structure

Stratigraphic/Structural boundaries

- Surface contact between rock units. May be approximated or locally generalized
- Buried contact, structural contour, or structural trend
- Change in rate of thickening of strata or generalized structural

Basement outcrop and subcrop

- Pre-Pennsylvanian strata missing

ALFALFA GRANT WOODS

ANADARKO SHELF

APPROXIMATE EROSIONAL/DEPOSITIONAL LIMIT OF MORROW FORMATION

Woodward "trench"

Woodward

WOODWARD MAJOR ELLIS DEWEY BLAINE ROGER MILLS CUSTER

CANTON AREA

Lower Morrow coastal plain deposits

Mostly shallow marine sandstone

Lower Morrow delta plain deposits

Mostly upper and lower Morrow marine shale and shelf sandstone

Old Woman "channel"

Watonga

Oil Gas

ANADARKO BASIN

Cheyenne

Clinton

Weatherford

Elk City

WASHITA CANADIAN OKLAHOMA

(Morrow-Springer high pressure gas trend)

WATONGA-CHICKASHA TREND

OKLAHOMA CITY

CLEVELAND

Norman

APPROXIMATE MORROW DEPOCENTER

BECKHAM MOUNTAIN VIEW FAULT

WICHITA DU

FRONTAL FAULT

BLUE CREEK CANYON FAULT ZONE

CADDO

Chickasha

MCCLAIN

GRADY

CEMENT FAULT ZONE

CYRIL BASIN

CHICKASHA FAULT

CENTRAL OKLAHOMA FAULT ZONE

GREER KIOWA

WICHITA UPLIFT

D MEERS FAULT

HARMON

BURCH FAULT

ALTUS

U NORTH FORK FAULT

HOLLIS BASIN

JACKSON

COMANCHE

Lawton

Duncan

STEPHENS

ARBUCKLE MOUNTAINS

INDIAN MERIDIAN

TILLMAN

COTTON

WAURIKA-MUENSTER FAULT

WAURIKA-MUENSTER UPLIFT

MARIETTA BASIN

CRINER UPLIFT

JEFFERSON

TOWNSHIPS SOUTH

FLUVIAL-DOMINATED DELTAIC (FDD) OIL RESERVOIRS IN OKLAHOMA: THE MORROW PLAY

MAP OF THE MORROW SANDSTONE PLAY AREAS

By
R. D. Andrews

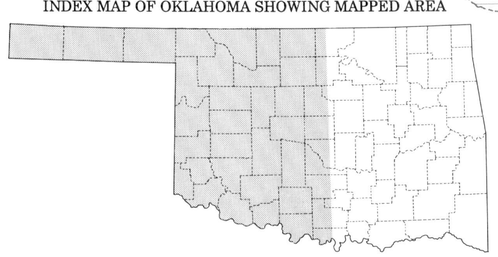
Morrow Play Workshop
June 1, 1995

SCALE 1:1 000 000

25 0 25 50 75 100 MILES

25 0 25 50 75 100 KILOMETERS

INDEX MAP OF OKLAHOMA SHOWING MAPPED AREA



Base from U.S. Geological Survey