R. 5 W. R. 4 W. R. 3 W.

T. 28 N. T. 27 N. T. 26 N.

FAULT ZONE

PENDROY FAULT

PROBABLE FAULT BEDS OF BLOCK UNKNOWN ATTITUDE

PONDERA COULEE DOME

PONDERA TETON FIELD

LEDERER POOL

COUNTY COUNTY

TETON PONDERA

Discovery Well June 1927

Deep Test

To Great Falls

To Conrad 27 Mi.

To Conrad 15 Mi.

To Dupuyer

To Anaconda

BASE COMPILED FROM G.L.O TOWNSHIP PLATS AND AUTHORS' FIELD SHEETS

STRUCTURE CONTOURS BY C.E. ERDMANN AND K.H. HOLMES

EXPLANATION

STRUCTURE CONTOUR AND STRUCTURAL SYMBOLS

- CONTROL FROM OIL WELL DATA
- CONTOUR INTERPOLATED FROM OIL WELL DATA
- FAULT ZONE OR FAULT BLOCK, APPROX. LOCATED (U, UPTHROWN SIDE; D, DOWNTHROWN SIDE)

WELL SYMBOLS

- OIL WELL
- OIL WELL, ABANDONED
- SHOW OF OIL, ABANDONED
- SHOW OF OIL AND GAS, ABANDONED
- OIL WELL, SHOW OF GAS
- GAS WELL, SHOW OF OIL
- GAS WELL, SHOW OF OIL, ABANDONED
- GAS WELL, ABANDONED
- DRY HOLE, ABANDONED
- LOCATION OR DRILLING WELL

PIPE LINE SYMBOLS

- 1 MONTANA POWER CO. 20" GAS LINE (CUT BANK - ANACONDA)
- 2 MONTANA-DAKOTA UTILITIES 4" GAS LINE (CONRAD - CHOTEAU)
- 3 PHILLIPS PET. CO. 5" OIL LINE (CUT BANK - GREAT FALLS)
- 4 PHILLIPS PET. CO. 4" OIL LINE (PONDERA OIL FIELD - CONRAD PUMPING STATION ON OIL LINE NO. 3)
- 5 PHILLIPS PET. CO. 3" OIL FEEDER LINE

MISCELLANEOUS SYMBOLS

- GRADED GRAVEL ROAD
- UNIMPROVED ROAD OR TRAIL
- BM ×3965 BENCH MARK WITH ELEVATION
- 4074 FOUND CORNER WITH ELEVATION
- (36) SECTION NUMBER

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

PONDERA OIL FIELD

PONDERA AND TETON COUNTIES, MONTANA

SHOWING CONTOURS ON ERODED SURFACE OF MISSISSIPPIAN LIMESTONE AND WELLS REACHING TO IT

1 0 1 2 MILES

5,000 0 5,000 10,000 FEET

CONTOUR INTERVAL 10 FEET. DATUM MEAN SEA LEVEL
CONTOURS BASED ON WELL DATA AS OF JANUARY 1, 1952

FEBRUARY 1952

COMPOSITE LOG SECTION FOR PONDERA OIL FIELD

SYSTEM	SERIES	GROUP	FORMATION	MEMBER	APPROXIMATE PAUNAL ZONE	THICKNESS (FT.)	GRAPHIC LOG
QUATERNARY	PLEISTOCENE					50	
CRETACEOUS	UPPER CRETACEOUS	COLORADO SHALE		UNDIFFER-ENTIATED	NO-BRARA	170	
CRETACEOUS	LOWER CRETACEOUS	COLORADO SHALE		BLACKLEAF SANDY MEMBER	MOWRY	400	
CRETACEOUS	LOWER CRETACEOUS	KOOTENAI		UNDIFFERENTIATED		510	
JURASSIC	UPPER JUR.	ELLIS	MORRISON FORMATION			450	
MISSISSIPPIAN	UPPER MISS.	SUNBURST	REREDON SHALE			80	
MISSISSIPPIAN	UPPER MISS.	SUNBURST	REREDON SHALE			169	
MISSISSIPPIAN	UPPER MISS.	SUNBURST	MISSION CANYON LS.			80	
MISSISSIPPIAN	LOWER MISS.	MADISON	MISSION CANYON LS.			492	
MISSISSIPPIAN	LOWER MISS.	MADISON	LODGEPOLE	WOODHURST LS.		323	
MISSISSIPPIAN	LOWER MISS.	MADISON	LODGEPOLE	PAINE SH.		249	
DEVONIAN	UPPER DEVONIAN	THREE FORKS	ANHYDRITE			816	
DEVONIAN	UPPER DEVONIAN	JEFFERSON				255	
DEVONIAN	UPPER DEVONIAN	MAY-WOOD				110	
CAMBRIAN	UPPER CAMBRIAN	DRY CR.				95	
CAMBRIAN	UPPER CAMBRIAN	PILG-RIM*				100	
CAMBRIAN	MIDDLE CAMBRIAN	UNDIFFERENTIATED				545	
CAMBRIAN	MIDDLE CAMBRIAN	FLATHEAD				40	
ARCHEAN							

DESCRIPTION AND REMARKS

0 100 200 300 400 500 600 700 800 900 1000 FEET
VERTICAL SCALE

Glacial drift and silts — UNCONFORMITY

Shale, gray to dark gray, soft, micaceous. Siltstone, dark gray to black, hard. Limestone, white to brown. Occasional thin bentonites.

Shale, gray to dark gray, micaceous, pyritic. Siltstone, dark gray, micaceous, hard.

Shale, dark gray, micaceous, of varying hardness. Sandstone, light gray, calcareous. Shale, dark brownish-gray, calcareous, contains fish scales and foraminifera. Some interbedded brown to gray limestone and gray shale.

Shale, gray, micaceous, non-calcareous, hard. Limestone, dark grayish-brown. Trace quartzite pebbles and creamy bentonite

Shale and siltstone, gray, finely pyritic. Sandstone, very fine-grained, gray, glauconitic, calcareous in part. Shale, grayish-brown, bentonitic.

"Red speck zone." Secondary zeolites (heulandite and chabazite) derived from alteration of bentonite in gray, bentonitic mudstone.

Sandstone, fine to medium-grained, light gray, glauconitic, micaceous, cherty. Shale, light gray, bentonitic. Shale, gray, silty, non-calcareous. Bentonite, creamy-gray.

Limestone, brown to brownish-gray, sandy.

Sandstone, fine to medium-grained, gray to dark greenish-gray, glauconitic. Shale, dark gray, silty to sandy. Occasional thin, creamy bentonite.

Sandstone, fine to medium-grained, gray to dark greenish-gray, glauconitic. Shale, dark gray, fissile, soft. Siltstone, dark gray.

Sandstone, fine-grained, light gray to gray. Shale, dark gray, silty to sandy.

Shale, green and red-maroon.

Mudstone and siltstone, variegated, predominantly red-maroon and green. Sandstone, fine-grained, greenish-gray.

"Sunburst Sand" zone. Sandstone, fine to medium-grained, light gray, sub-angular to well rounded quartz grains. — DISCONFORMITY

Mudstone, predominantly gray, some maroon and lavender, yellow weathering conspicuous. Green to greenish-gray siltstone at base.

Sandstone, fine to medium-grained, light gray to gray, glauconitic, contains thin laminae of dark gray finely micaceous siltstone and shale.
Siltstone, dark gray, finely micaceous, contains thin partings of fine-grained, light gray, glauconitic sandstone. Lower half pyritic. — DISCONFORMITY

Limestone, light gray to gray, dense and shale, gray, calcareous; both finely pyritic. — DISCONFORMITY

PRODUCTIVE ZONE PONDERA AREA
Limestone, dolomitic, white to buff-brown, sparsely cherty. — CONTOURED HORIZON
Dolomite, buff, dense to saccharoidal.

Dolomite, light buff, dense to saccharoidal, pyritic. Chert at top.

Samples missing.

Limestone, white to buff and light brown, massive, fragmental, some saccharoidal. Several thin beds of gray, fragmental limestone and occasional zones of milky and buff chert.

Limestone, buff to brown, dense to fragmental, pyritic in part. Milky chert conspicuous, some buff chert.

Limestone, brown to black, dense, argillaceous, interbedded with brownish-gray to black calcareous shales. Gray and black chert in lower part. Limestone, gray, dense, sandy at base.

Shale, grayish-green and gray, finely pyritic, micaceous in lower part. Limestone, buff to light brown, dolomitic at base. Post-evaporite unit.

Anhydrite, massive, interbedded with buff to brown dense to saccharoidal dolomite. Occasional thin beds of grayish-green shale.

Show of oil and gas.

Limestone, brown, dense; brownish-gray to gray and slightly argillaceous toward base. Occasional thin beds of anhydrite and brown saccharoidal dolomite.

Dolomite and limestone, gray to brown, argillaceous, interbedded with predominantly green to gray-green dolomitic shale; some gray and red shale. — DISCONFORMITY (?)

Shale, predominantly maroon and green, micaceous, non-calcareous.

Limestone, buff to brown, dense, sparsely conglomeratic toward top.

Shale, predominantly maroon and grayish-green, micaceous, non-calcareous, with occasional thin beds of light gray, light brown and greenish-gray limestone; glauconitic toward base.

Sandstone, quartz, fine-grained, calcareous at top, quartzitic toward base. — NONCONFORMITY

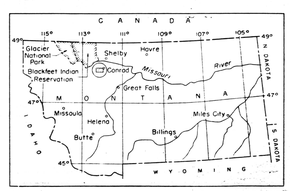
Granite, fine-grained.
T.D. A.B. Cobb-Hirshberg No. 1, 5232 Feet.

ELLIOTT ET AL - JONES NO. 1 — A.B. COBB AND CO. - HIRSHBERG NO. 1

POROSITY SYMBOLS: (V) = VUGULAR, (I) = INTERGRANULAR, (F) = FRACTURE

NOTE: LOG COMPILED AS INDICATED FROM CABLE TOOL SAMPLES OF ELLIOTT ET AL - JONES WELL NO. 1, SE NW SEC. 17, T. 27 N., R. 4 W., (DRILLED 1928) AND ROTARY TOOL SAMPLES OF A.B. COBB AND CO. - HIRSHBERG WELL NO. 1, NE NE SW SEC. 23, T. 27 N., R. 4 W., (DRILLED 1943-1944) * SAMPLES EXAMINED BY V.K. KOSKINEN

* PROPOSED NEW FORMATION NAME



INDEX MAP
SHOWING LOCATION OF STRUCTURE CONTOUR MAP (CIRCLED)

Montana (Pondera oil field) - Structure - 1:24000. 1952.
cop. 1

This map is listed as Open file in KGS Index 263

JMS