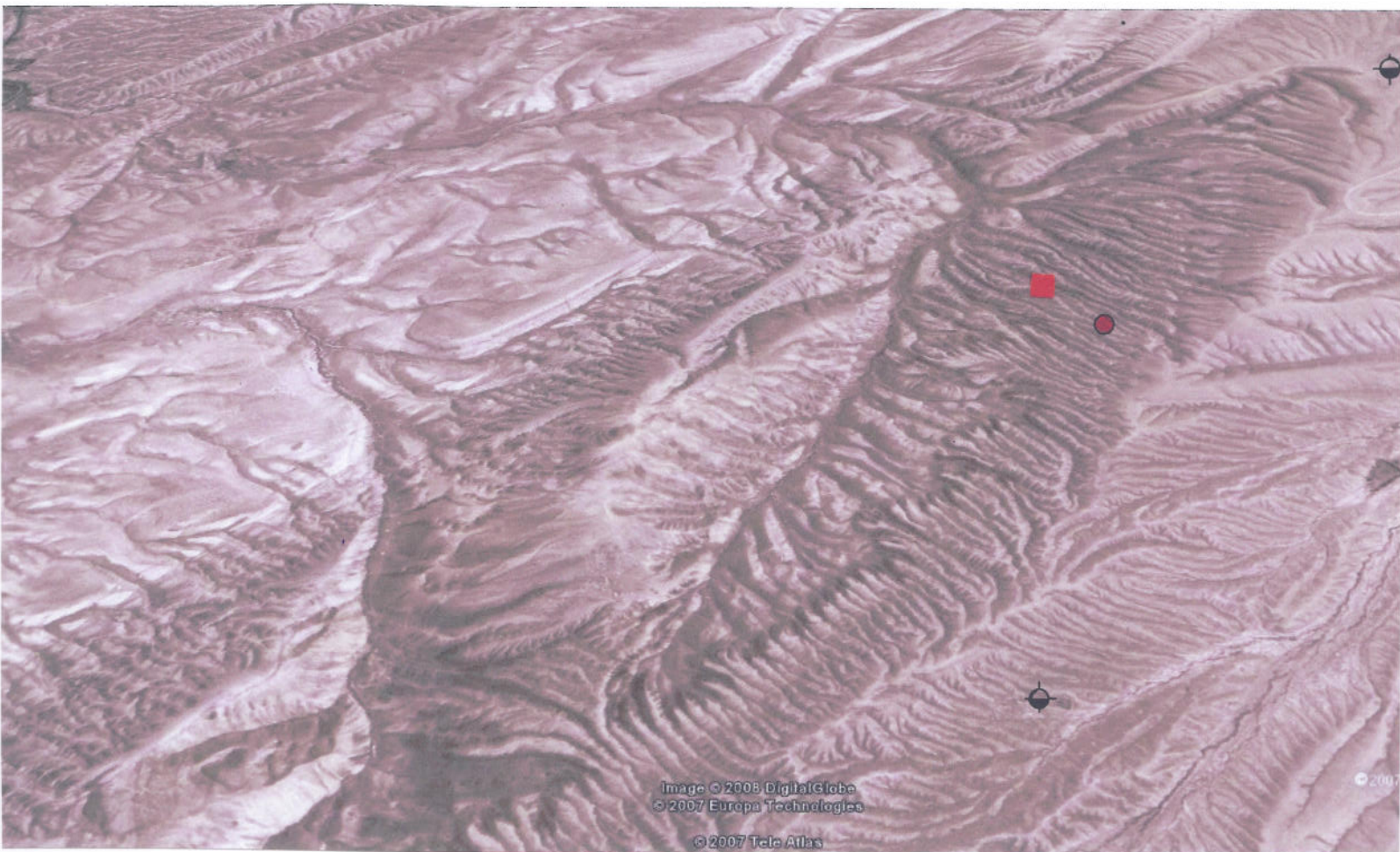


WILD HORSE ANTICLINE PROSPECT

Big Horn County, Wyoming

Executive Summary



**Google Earth Image of Wild Horse Anticline Viewed Toward the East
Previous Test Wells, Apex and Proposed Wildcat Location Indicated**

WILD HORSE ANTICLINE PROSPECT

T51&52N-R92W

Big Horn County, Wyoming



**Apex of Wild Horse Anticline Is Visible In Middle-Background
Indicated By Horizontal Strata of the Cody Shale**

Prepared by:

Daniel C. Wychgram

**Daniel C. Wychgram
Exploration Geologist**

Introduction

The Wild Horse Anticline is located in the prolific Bighorn Basin of Wyoming about 5 miles northeast of the town of Basin. This structure demonstrates excellent four-way closure encompassing an area of more than 1900 acres. Only four oil test wells have been drilled and these have been located far down dip on the flanks of the structure. The untested area of closure above these wells is approximately 1140 acres.

The potential for high rates of production and large reserves is excellent. Torchlight Oil Field, 4 miles to the southwest, has produced 17 million barrels of oil. A Madison Limestone well drilled there in 1968 penetrated a cavern and came in flowing 4,400 BOPD. This well produced 858,000 barrels of oil in the first 16 months of production ².

Four primary producing zones exist in the Wild Horse Anticlinal structure. The Frontier Formation offers the possibility of sweet green oil and gas at shallow depths. Sandstone strata, including the Peay Sand member of this formation, have produced over one million barrels of oil at nearby Greybull Oil Field. The Paleozoic Phosphoria Formation, Tensleep Sandstone and Madison Limestone are deeper targets that are reliable and prolific producers throughout the Bighorn Basin on similar structures.

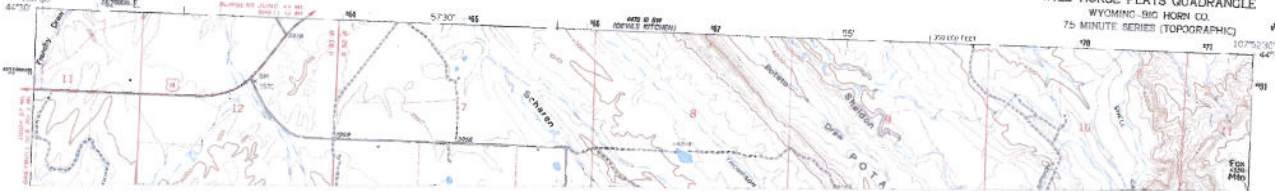
Geology

Data from satellite imagery, high-altitude color-infrared photography viewed in stereo, the Wild Horse Flats Quadrangle and field observations were used to compile the map of the surface geology. Previously drilled wells in the area, although helpful in planning a wildcat test, are too sparsely spaced to allow meaningful sub-surface mapping.

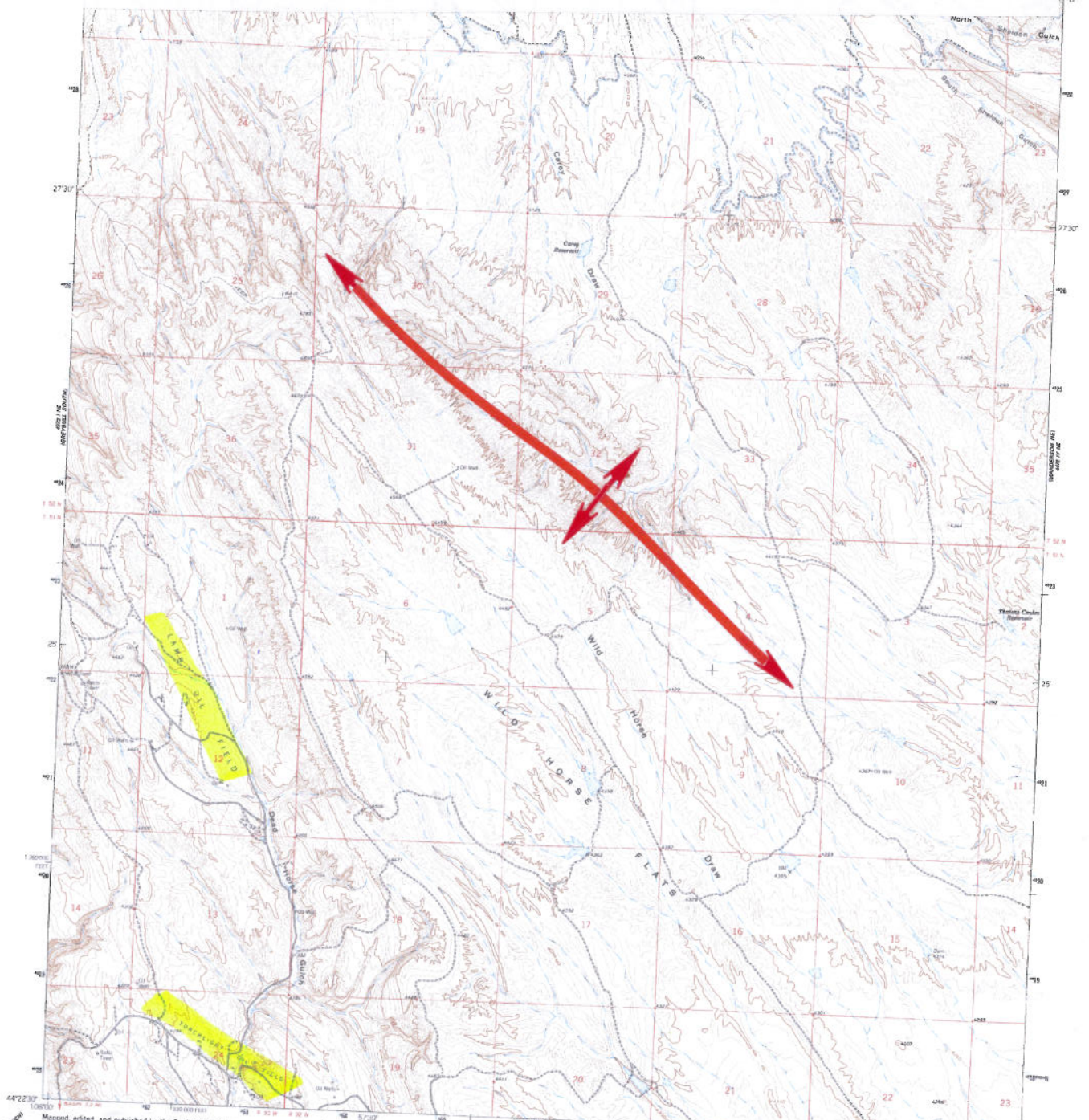
Detailed geologic mapping has revealed a primary and a secondary apex within the overall area of closure of the Wild Horse Anticline. The surface geology is dominated by only one formation--the Cody Shale. It was decided to map the Quaternary stream deposits since some of the stream segments are controlled by geologic structure. In this area, the Cody Shale contains several strata of varying competence. This erosional contrast is expressed in the topography and aids in mapping the geology. Several key beds were mapped but they follow the topographic contours so closely that it was decided not to place them on the topo-based map.

A technique referred to as form-line analysis was used to create a structural contouring of the surface structure. The form-lines are controlled by strike, relative dip, key beds and outcrop pattern. Although this is a qualitative analysis, it is an accurate representation of the shape of the surface structure. It can be seen that the northeast limb of the anticline is considerably steeper than the southwest limb. As a consequence of this asymmetry, the axial plane is inclined to the southwest. Therefore, as the surface structure is projected to a subsurface formation, it must be migrated to the southwest proportionate to the depth of the projection.

A proposed test well location was staked in the field as shown in the following photograph. It was selected to be near the primary surface apex but on the southwest side of the axis to compensate for migration of the apex at the Paleozoic oil zones. An important additional consideration is the locally rough terrain which sets practical limits as to where a location can be built and a drilling rig transported. An access road exists near the location which is not indicated on the 1960-vintage quadrangle map.



Wild Horse Flats Quadrangle showing close proximity of major production at Torchlight Oil Field (4 miles SW) and Lamb Oil Field (2.5 miles SW). A Madison Limestone well drilled in 1968 at Torchlight hit a cavern and flowed 4,400 BOPD.



Map prepared, edited, and published by the Geological Survey as part of the Department of the Interior program for the development of the Missouri River Basin. Control by USGS and USC&GS. Topography by photogrammetric methods from aerial photographs taken 1967-1968. Field checked 1960. Publication projection: 1927 North American datum, 10,000-foot grid based on Wyoming coordinate system, east central zone. 1:000 meter Universal Transverse Mercator grid ticks, zone 13, shown in blue. Fine red dashed lines indicate selected fence and field lines where generally visible on aerial photographs. This information is unclassified.



SCALE 1:24,000
CONTOUR INTERVAL 20 FEET
NATIONAL GEODESIC VERTICAL DATUM OF 1929

ROAD CLASSIFICATION
Medium-duty Light-duty
Unimproved dirt
U.S. Route

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

QUADRANGLE LOCATION
Map photos updated 1978
No major culture or drainage changes observed

WILD HORSE FLATS, WYO.
N44275-W10752N/7.5
1960
PHOTOINTERPRETED 1978
DMA 6472 IV NW-BENTON WORK



Proposed location staked on flat-lying strata near apex of the Wild Horse Anticline

Wildcat Test Well and Previously Drilled Wells

The well records for each well drilled in the mapped area were examined in detail. The elevation of the Phosphoria Formation top was calculated and placed on the map next to the well symbol. One well, the Ward Alfred & Son, was not drilled deep enough to penetrate the Paleozoics. The well data reinforce the form-line analysis when the analysis is migrated to the southwest a few hundred feet to compensate for the anticline's asymmetry. The Sierra Trading Corporation well is an exception. This well calculates as being the second highest well in the mapped area despite its location being further down the flank of the anticline. No explanation for this anomaly could be found.

A formation thickness matrix was prepared and a weighted average thickness for each interval was determined. Based on these thicknesses, and the assumption that the wildcat well would top the Frontier Formation at approximately 120 feet drilling depth, the following depth projections are calculated for the wildcat test well:

<u>Formation</u>	<u>Depth</u>	<u>Elevation</u>	<u>Comments</u>
Cody Shale	Surface	+4,420	May need to be placed behind surface casing to prevent caving
Frontier Fm.	120	+4,300	Moderate oil & gas potential
Mowry Shale	637	+3783	
Thermopolis Shale	1080	+3340	Muddy sandstone member has minor oil & gas potential
Cloverly Fm.	1642	+2778	Minor oil & gas potential
Morrison Fm.	1894	+2526	Minor oil potential
Sundance Fm.	2204	+2216	Minor oil potential
Gypsum Springs Fm.	2514	+1906	
Chugwater Group	2689	+1731	
Dinwoody Fm.	3399	+1021	
Phosphoria Fm.	3445	+ 975	Excellent oil potential
Tensleep Sandstone	3711	+ 709	Excellent oil potential
Amsden Fm.	3822	+ 598	
Madison Limestone	3982	+ 438	Excellent oil potential
TD	4282	+ 138	Evaluate upper 300 feet

Economics

As with any wildcat prospect, economic expectations are speculative. In the following calculation for potential oil in place, the area used is the closed area above the highest dry hole, the Cominco American #2. This area is 1140 acres = the variable **A**. The reservoir parameters of thickness (**h**) and porosity (**Φ**) are taken from published data. Reservoir data from the Greybull Oil Field (five miles northwest) is used for the Frontier Formation and data from the Torchlight Oil Field (four miles to the southwest) is used for the Paleozoic formations. The variable oil saturation (**So**) is not given and assumed to be greater than 50% in order to be productive. Therefore, **So** = 50% is used throughout the calculations.

Frontier Formation Potential

The reservoir parameters at Greybull Oil Field are for the Peay sandstone member of the Frontier Formation. The pay thickness is given as 100-110 feet but the field-observed 35 feet is used here. The average porosity is given as 30%. The barrels of oil in place calculate:

BO (in place) = VAhΦSo where V (volume constant) = 7,758 bbls/ac. Ft

BO (in place) = (7,758)(1140 acres)(35 feet)(30%)(50%) = 46,431,630 BO

Phosphoria Formation Potential

The reservoir parameters at Torchlight Oil Field are used for the Phosphoria Formation. The pay thickness is given as 30 feet and the average porosity as 12%. The barrels of oil in place calculate:

BO (in place) = (7,758)(1140)(30)(12%)(50%) = 15,919,416 BO

Tensleep Sandstone Potential

The reservoir parameters at Torchlight Oil Field are used for the Tensleep Sandstone. The pay thickness is given as 35 feet and the average porosity as 14%. The barrels of oil in place calculate:

BO (in place) = (7758)(1140)(35)(14%)(50%) = 21,668,094 BO

Madison Limestone Potential

The reservoir parameters at Torchlight Oil Field are used for the Madison Limestone. The pay thickness is given as 70 feet and the average porosity is given as 16%. The barrels of oil in place calculate:

BO (in place) = (7758)(1140)(70)(16%)(50%) = 49,527,072 BO

Lease WYW173230

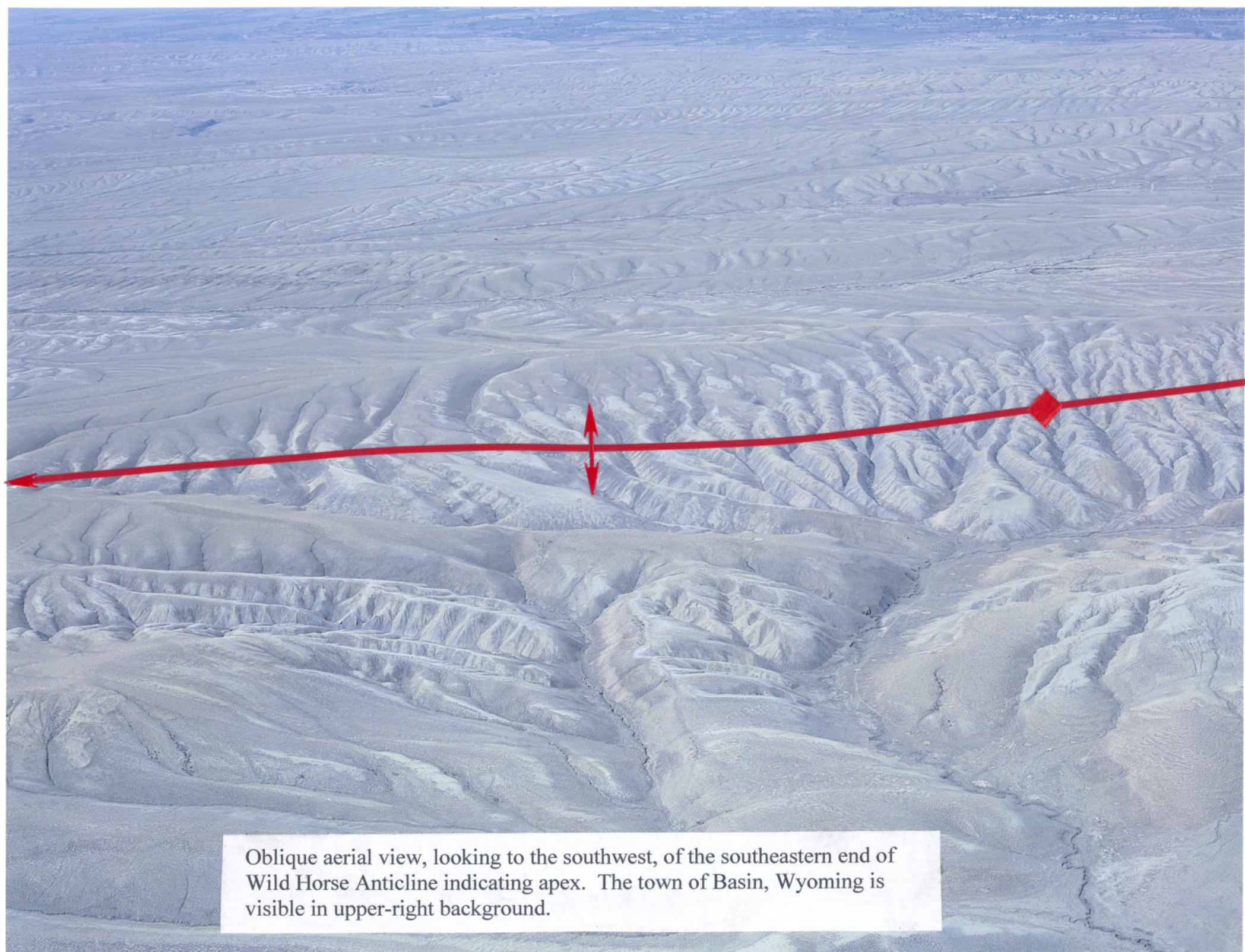
This lease is a 10-year term federal/BLM lease with an effective date of October 1, 2006. The lease includes 1,777 acres and covers the entire prospective area above the highest dry hole. There are no restrictive stipulations and the only notices are those that “applies to all parcels”. Of these, only the stipulation limiting development on slopes in excess of 25 percent would apply. One producing well located anywhere on the lease from any zone will HBP the entire oil field.

References (included in map pocket)

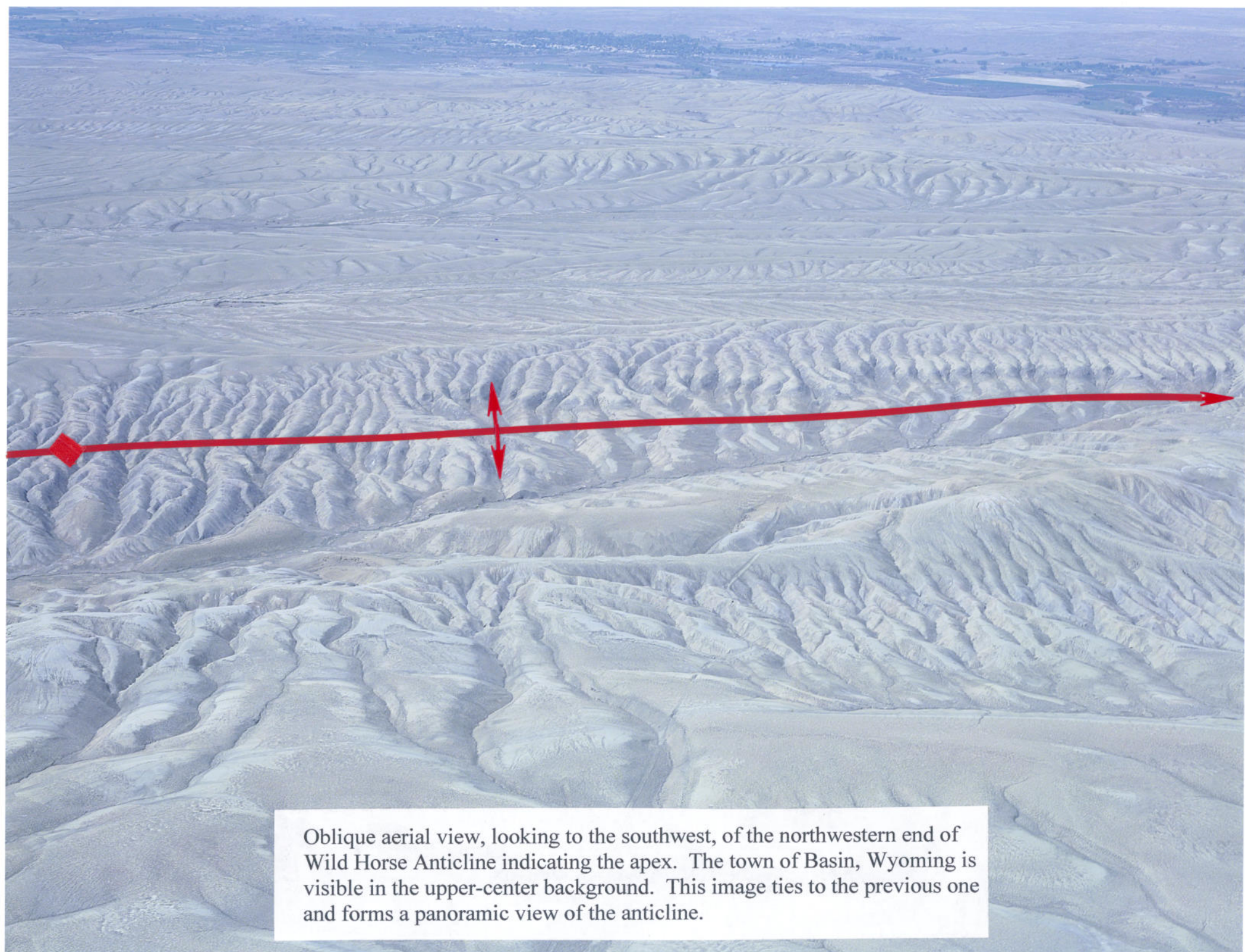
1. Anonymous, 1989, Torchlight, in Wyoming Geological Association Symposium on Wyoming Oil and Gas Fields, Bighorn and Wind River Basins, P. 509-510.
2. Dougan, Paul M., 2001, Equity Oil Company Annual Report 2001, P. 7.
3. Mohl, Keith L., 1989, Greybull, in Wyoming Geological Association Symposium on Wyoming Oil and Gas Fields, Bighorn and Wind River Basins, P. 209-210.

Steeply-northeast-dipping strata of the Cody Formation on northwest flank of the Wild Horse Anticline. View is to southeast.






Oblique aerial view, looking to the southwest, of the southeastern end of Wild Horse Anticline indicating apex. The town of Basin, Wyoming is visible in upper-right background.



Oblique aerial view, looking to the southwest, of the northwestern end of Wild Horse Anticline indicating the apex. The town of Basin, Wyoming is visible in the upper-center background. This image ties to the previous one and forms a panoramic view of the anticline.

A wide-angle photograph of a mountainous landscape. The terrain is characterized by numerous off-highway vehicle tracks etched into the slopes of the hills. A river flows through a valley in the center of the image. The sky is clear and blue. In the foreground, there is some sparse, green vegetation. A white text box is overlaid in the upper right corner of the image.

Breached interior of Wild Horse Anticline showing roll-over at axis in left middle background. This area is used as an off-highway-vehicle recreation area.



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• Certified Petroleum Geologist •

References

Anonymous
Anonymous
Casper, Wyoming
August, 1989

Map: Gene George
Clark and George
Oil and Gas Prop.

DISCOVERY WELL

Name: Unknown
Location: Approximate center 24-51N-93W
Date of Completion: 1913
Initial Potential: 30 BOPD Mowry - Lower Cretaceous
Total Depth: 300± feet Mowry
Elevation: 4200 Gr estimated
Casing: Unknown
Perforations: Open hole
Treatment: None, natural
Pressures: Unknown

GENERAL FIELD DATA

Regional Setting: East Flank, Bighorn Basin
Other Formations with Shows: None reported
Exploration Method Leading to Discovery:
 Surface mapping
Trap Type: Structural, anticline
Surface Formations: Frontier - Upper Cretaceous
Oldest Formation Penetrated: Precambrian
Well: Pan American Pet., 10 Orchard Unit, NWSESE 24-51N-93W
Spacing Order: None, unit excluded from Rule 302
Logging Practice: Past; EL, M1CL, GRN, Recent; LATL, SNP, SONL
Completion Practice: Pre 1948; open hole, Recent; set casing through pay, selectively perforate, acidize
Productive Area: 840 acres Madison
Number of Producing Wells: 19
Number of Abandoned producers: 147+ (145+ Mowry, 1 Phosphoria, 1 Tensleep)
Number of Dry Holes: 31+
Number of Shut-in Wells: 38 (6 Mowry, 6 Phosphoria, 6 Tensleep, 20 Madison)
Number of Disposal Wells: 2 Tensleep
Number Pressure Maintenance Injection Wells: 8
Market for Production: Marathon Pipeline
Major Operators: Amoco Production Co.

RESERVOIR DATA

Formation: Mowry "Kimball" and "Oeth Louie" - Cretaceous
Lithology: Sandstone
Discovery Date: 1913
Porosity: Unknown
Permeability: Unknown
Average Pay Thickness: 30 feet - "Kimball"; 25 feet - "Oeth Louie"
Oil Column: 300± feet
Oil/Water Contact: +3550± feet
Gas Oil Ratio: Unknown
Initial Pressure: Unknown

TORCHLIGHT

T51N R92-93W
Big Horn County, Wyoming
Mowry "Kimball" and "Oeth Louie", Phosphoria, Tensleep, Madison, Bighorn

Present Pressure: Depleted
Drive Mechanism: Solution gas
Rw and/or Salinity: 0.58 @ 68° F.
Bottom hole Temperature: Unknown
Character of oil or gas: Gravity - 46.3° API; Sweet; Paraffin base; Color - dark green
Continuity of Reservoir: Over entire structure with variable porosity and permeability
Cumulative Production: 203,745 + BO, 1/1/89
Primary Recovery: 199,244 BO
Secondary: 4461 + BO
Estimated Ultimate Recovery: 203,745 BO

DISCUSSION

The total number of wells drilled between 1913 and 1932 is not certain and primary production ceased in 1932. A limited waterflood has been conducted with unknown results.

RESERVOIR DATA

Formation: Phosphoria - Permian
Lithology: Dolomite, anhydritic, cherty
Discovery Date: October 31, 1947
Location: Stanolind, 1 Unit, SWSENE 24-51N-93W
Initial Potential: F 1500 MCFGPD on DST
Perforations: 2830 - 2860 DST; Tensleep discovery, did not produce from the Phosphoria
Treatment: None
Porosity: 12% average; 5.4% average, Core, Range 2.5 - 10.5% (NWSE 14 and NESE 25-51N-93W, 29 samples, nonproductive)
Permeability: 1.4 md average, Core, Range 0-15 md; highly variable due to fracturing
Average Pay Thickness: 30 feet
Oil/Gas Column: Gas - 150 feet; Oil - 200 feet
Gas/Oil/Water Contact: Gas/Oil + 1140 feet; Oil/Water + 940 feet
Gas Oil Ratio: Variable, 0 to 219,000:1; only gas at the present time
Initial Pressure: 1450 psi SIP DST
Present Pressure: Unknown
Drive Mechanism: Solution gas, limited water
Rw and/or Salinity: 0.22 @ 68° F. DST
Bottom hole Temperature: 100° F. Log (SESW 24-51N-93W)
Character of oil or gas: Oil: Gravity - 31.3° API; Pour point <5° F.; Sulfur - 1.99%; Viscosity - 42 sec @ 100° F.; Specific gravity - 0.869; Nitrogen - 0.08%; Color - greenish black; Gas: BTU - 1144; Methane - 80.1%; Ethane - 10.86%; Propane - 2.12%; Butane - 1.24%; Pentanes + - .81%; N₂ - 3.21%; He - 0.01%; H₂S - 1.66%

Continuity of Reservoir: Covers entire structure, variable porosity and permeability

Cumulative Production: 3,394,226 MCFG, 1/1/89, oil included with Tensleep production

Primary Recovery STBO or MCF/AC FT: Unknown

Secondary: Unknown

Estimated Ultimate Recovery: 5+ BCFG; oil undetermined

Decline Curve: Appendix

RESERVOIR DATA

Formation: Tensleep - Pennsylvanian

Lithology: Sandstone

Discovery Date: October 31, 1947

Location: Stanolind, 1 Unit, SWSENE 24-51N-93W

Initial Potential: F 1632 BOPD

Perforations: 3038 - 3140 open hole

Treatment: None, natural

Porosity: 14% average Log

Permeability: Not reported

Average Pay Thickness: 35 feet

Oil Column: 200 feet

Oil/Water Contact: +940 feet

Gas Oil Ratio: Variable, 0 to 8113:1

Initial Pressure: 1600 psi Rock pressure

Present Pressure: Unknown

Drive Mechanism: Water

Rw and/or Salinity: 3.3 @ 68° F. produced water

Bottom hole Temperature: 100° F. Log (SENWSE 24-51N-93W)

Character of oil or gas: Gravity - 35° API; Pour point - <5° F.; Viscosity - 39 sec @ 100° F.; Sulfur - 1.83%; Specific gravity - 0.850; Nitrogen - 0.055

Continuity of Reservoir: Continuous and widespread

Cumulative Production: 3,753,272 BO, 11,989,698 BW, 1/1/89, includes Phosphoria

Primary Recovery STBO or MCF/AC FT: Unknown

Secondary: Unknown, water injection began in 1987

Estimated Ultimate Recovery: 3,800,000 BO

Decline Curve: Appendix

RESERVOIR DATA

Formation: Madison - Mississippian

Lithology: Dolomite and limestone

Discovery Date: April 11, 1948

Location: Stanolind, 2 Orchard Unit, SWNESE 24-51N-93W

Initial Potential: P 450 BOPD

Perforations: 3363 - 3635 open hole

Treatment: Acidized w/3000 gal

Porosity: 16% average, Core, Range 5-27.5% (limited data)

Permeability: 25 md average, Core, Range 0.2 - 269 md; lower zone is irregularly cavernous

Average Pay Thickness: 70 feet

Oil Column: 380 feet

Oil/Water Contact: +425 feet

Gas Oil Ratio: Unknown, very low gas

Initial Pressure: 1500 psi DST

Present Pressure: Unknown

Drive Mechanism: Water

Rw and/or Salinity: 9.5 @ 100° F. produced

Bottom hole Temperature: 110° F. Log (SENWSE 24-51N-93W)

Character of oil or gas: Gravity - 20.5° API; Pour point - <5° F.; Viscosity - 400 sec @ 100° F.; Sulfur - 2.72%; Specific gravity - 0.931; Nitrogen 0.22; Color - brownish-black

Continuity of Reservoir: Widespread, highly variable porosity and permeability

Cumulative Production: 12,212,973 BO, 581,137 MCFG, 295,932,277 BW, 1/1/89, includes 6 wells commingled w/Tensleep; 38 wells

Primary Recovery STBO or MCF/AC FT: Unknown

Secondary: Unknown, gas injection started in 1964

Estimated Ultimate Recovery: 14,000,000 BO

Decline Curve: Appendix

RESERVOIR DATA

Formation: Bighorn - Ordovician

Lithology: Dolomite

Discovery Date: March 12, 1962

Location: Pan American Pet., 10 Orchard Unit NWNESE 24-51N-93W

Initial Potential: P 51 BO, 371 BWPD

Perforations: 4119 - 4133

Treatment: None

Porosity: 14% average Log

Permeability: Unknown

Average Pay Thickness: 16 feet

Oil Column: 40± feet

Oil/Water Contact: Unknown

Gas Oil Ratio: 0

Initial Pressure: 1904 psi DST

Present Pressure: Depleted

Drive Mechanism: Water

Rw and/or Salinity: 2.2 @ 68° F.

Bottom hole Temperature: 116° F. DST @ 4130 feet (NESE 24-51N-93W)

Character of oil or gas: Gravity - 24° API

Continuity of Reservoir: Unknown, 1 well

Cumulative Production: 5519 BO, 1/1/89

Primary Recovery: 5519 BO

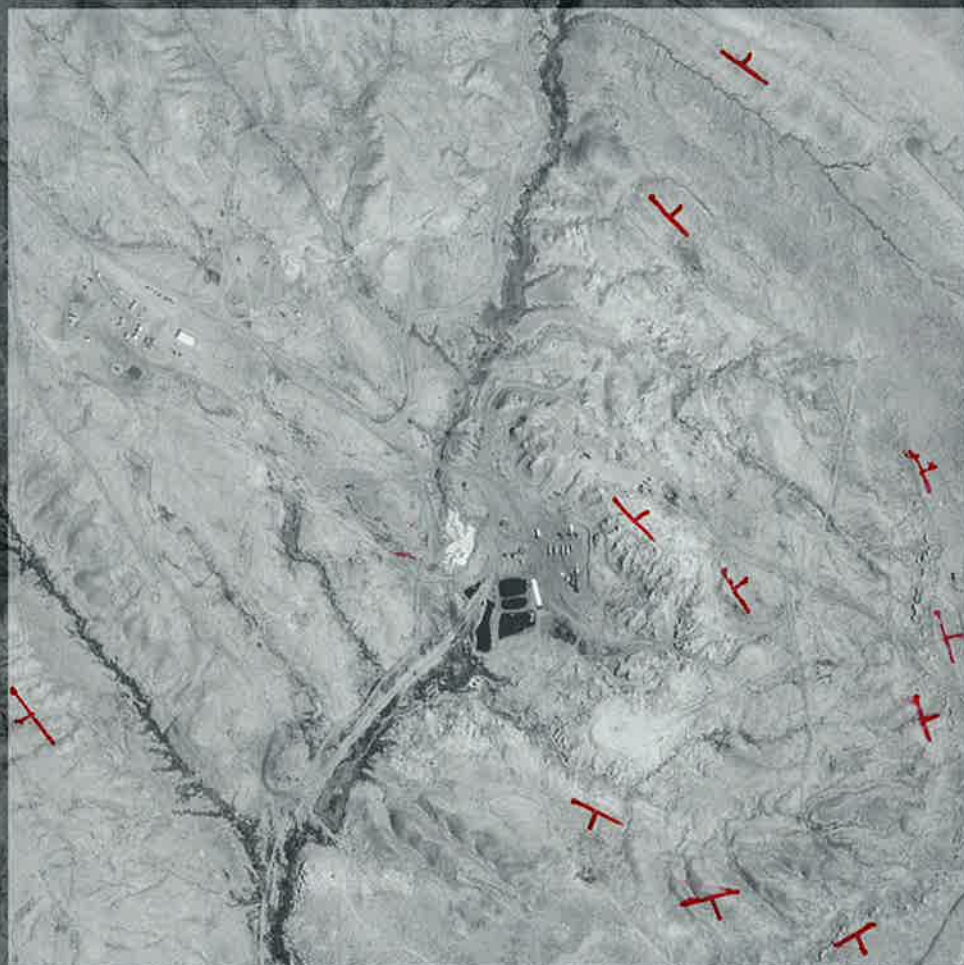
Secondary: None

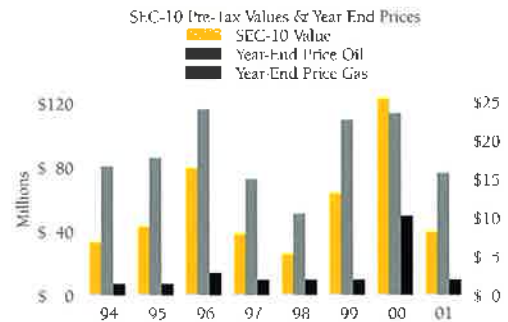
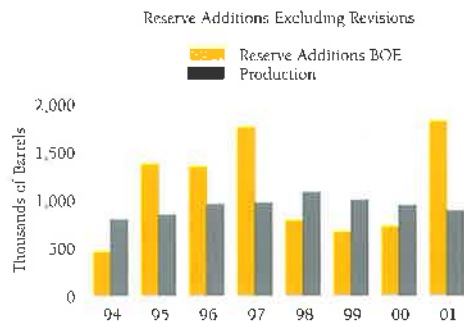
Estimated Ultimate Recovery: 5519 BO

REFERENCES

- Biggs, Paul and R.H. Espach, 1960, Torchlight Field: Petroleum and Gas Fields of Wyoming, Bureau of Mines Bulletin 582, p. 270-273.
- Wyoming Geological Association, 1957, Torchlight Field: Symposium, Wyoming Oil and Gas Fields.
- Wyoming Oil and Gas Commission, 1988, Production data; well files.

EQUITY OIL COMPANY ANNUAL REPORT 2001





The second source of improved oil production performance is a result of 2001 fourth quarter drilling in the Torchlight field which was a direct result of the 3-D survey of the field the Company conducted in early 2001. One of the purposes of the survey was to attempt to locate a drilling location in the field that would replicate the type of reserves and production rate associated with the Torchlight #37 well which was drilled in 1968. That well produced a total of 858,000 barrels in the first 16 months of its productive life at rates as high as 4,400 barrels per day. The Torchlight #59, which was drilled in December 2001 and completed in January 2002, may have encountered a zone with properties similar to the Torchlight #37 since it tested at an initial rate of 300 barrels per day flowing 100% oil with a flowing tubing pressure of 350 psig. It is presently producing at a rate of 200 barrels per day due to the limitations of the surface equipment in the field. Assuming that the present flowing characteristics are sustained, additional equipment will be installed early in the third quarter of 2002 so that the full productive potential of the well can be determined. A second extension well, the #1-19 MCP Federal, was also drilled in December 2001 and has recently been completed as a more typical Torchlight well producing 50 barrels of oil and 1,050 barrels of water per day. Since both the Torchlight #59 and the #1-19 MCP Federal were completed subsequent to year-end 2001, no reserves associated with the wells were recorded in 2001.

The major thrust of our exploration activity in 2001 was the continuation of the development of our Beaver Creek prospect. This prospect is the result of the prolific Nisku discovery, the #24-15 Beaver Creek well drilled in 1998. Through year-end 2001 that well has produced a total of 1 million barrels of oil and 594 MMCF of gas at rates as high as 2,200 barrels of oil per day. During 2000 and 2001, Equity conducted a total of 35 square miles in two 3-D geophysical surveys in the Beaver Creek area to attempt to identify additional Nisku drilling targets. The surveys have identified multiple prospective drilling locations, the first of which is planned to be drilled beginning in March of 2002. Drilling in the Beaver Creek prospect area has been hampered by a protracted period of negotiations with the United States Forest Service to obtain the required drilling and surface occupancy permits. It is hoped that the initial test, the BTA #1-B Equity Redtail, will validate the effectiveness of the 3-D work that we have done in the area.

Keith L. Mohl
Consulting Geologist
Billings, Montana
April, 1989

DISCOVERY WELL

Name: Gas: Peay Hill Oil, 1 Minor-Sherard
Oil: Bighorn Oil & Gas Co., 1 George Alford
Location: Gas: Lot 1 NWNW 21-52N-93W
Oil: SESE 17-52N-93W
Date of Completion: Gas: July, 1907
Oil: October, 1908
Initial Potential: Gas: Initially a 70 foot flare decreasing to a steady 50 foot flare that burned out of control for 18-24 months at an estimated rate of 6-10 MMCFGPD Cloverly "Greybull" - Cretaceous
Oil: Unknown Cloverly "Greybull"
Total Depth: Gas: 827 Cloverly
Oil: 910 Cloverly
Elevation: Gas: 3794 Gr
Oil: 3801 Gr
Casing: Gas: 500 feet, size unknown
Oil: Unknown
Perforations: Gas: 801-821 open hole
Oil: Unknown
Treatment: Gas: Natural
Oil: Natural
Pressures: Gas: BHP estimated at over 600 psi in September 1907
Oil: Unknown

GENERAL FIELD DATA

Regional Setting: East Flank, Bighorn Basin
Other Formations with Shows: Muddy-Cretaceous, Amsden-Pennsylvanian, Phosphoria-Permian, Madison-Mississippian
Exploration Method Leading to Discovery: Surface geology
Trap Type: Oil accumulation is confined to the north plunge and west flank. The trap for the oil is attributed primarily to the pinchout of sand on the north and south, and to a lesser degree to probable faulting. The gas zone is primarily related to structural closure.
Surface Formations: Lower Frontier, Upper Mowry - Cretaceous
Oldest Formation Penetrated: Undifferentiated Cambrian
Well: J. W. Osborn 1 Kreuger, NWNWNW 20-52N-93W
Spacing Order: Apparently little regard was given to well spacing or pattern with wells being 100-450 feet apart.
Logging Practice: Early wells: no logs. Recent past: ES, ML, GRN. Present: IES, FDGR, GRN.
Completion Practice: It appears most wells completed open hole.
Productive Area: Gas: Estimated 500 acres
Oil: Estimated 900 acres

GREYBULL

T52N R93W
Big Horn, Wyoming
Frontier, Cloverly

Number of Producing Wells: 22 (21 Frontier "Peay", 1 Cloverly)
Number of Abandoned producers: 81 Cloverly "Greybull"; unknown - Frontier
Number of Dry Holes: Unknown
Number of Shut-in Wells: 15 Frontier
Number of Disposal Wells: 0 (?)
Number Pressure Maintenance Injection Wells: 3 active, 14 inactive - all Frontier
Market for Production: Gas: Unknown. No sales since 1915.
Oil: Until late 1915 transported by railroad. In late 1915 Midwest Refinery at Greybull. In the mid-1940s Gordons Refinery, a small topping plant, refined the oil. Current production is moved by trucks to Marathon.
Major Operators: Hughes Oil Corp., West Oil, National Treasure Mines

RESERVOIR DATA

Formation: Cloverly "Greybull"-Cretaceous
Lithology: Sandstone
Discovery Date: Gas: July, 1907
Oil: October, 1908
Porosity: 15% average estimated, 1 core shows Range 13-21%. Several modern logs show Range 10-16%.
Permeability: 1 core shows a 4 foot zone with 1.6-2.7 darcys
Average Pay Thickness: 20 feet (estimated), some modern logs show 10-15 foot zone.
Oil/Gas Column: 800+ feet
Gas/Oil/Water Contact: Unknown
Gas Oil Ratio: Unknown
Initial Pressure: 600+ psi estimated
Present Pressure: Depleted
Drive Mechanism: Gas expansion, gravity, and very limited water drive.
Rw and/or Salinity: 1.53 @ 68° F produced (NENE 17-52N-93W)
Bottom hole Temperature: 89° F Engineering Field Study
Character of oil or gas: Oil: Gravity - 49.9 API; Pour point - 20° F; Sulphur - .07%; Paraffin base; sweet green.
Gas: BTU-1140; Methane - 81.7%; Ethane - 17.4%; CO₂ - .2%; Nitrogen - .7%.
Continuity of Reservoir: Good continuity, trapping by pinchout and faulting.
Cumulative Production: 1,025,206 BO, gas volumes unknown (all formations combined) Production from the Wyoming Oil and Gas Statistics 1987. However there is no record of early production. Biggs and Espach show cumulative gas through

1956 as 298,000,000 CF. There has essentially been no gas production since 1915 except on a local basis.

Primary Recovery STBO: 1,100,000 BO

Secondary: Several operators have conducted field studies and pilot floods. There has been only minor response.

Estimated Ultimate Recovery: 1,100,000 BO (all formations combined)

Decline Curve: Appendix

RESERVOIR DATA

Formation: Frontier "Peay"-Cretaceous

Lithology: Sandstone, argillaceous

Discovery Date: June, 1955 (?), 32 Frontier "Peay" wells were drilled 1955-1959

Location: NWNWNE 17-52N-93W

Initial Potential: P 6 BOPD

Perforations: 343-420 open hole

Treatment: Natural

Porosity: 30% average, Range 21-34% 3 cores, 24% average, Density Logs, Range 23-25% 5

Permeability: 333 md average, 3-Cores, Range 2-1270 md

Average Pay Thickness: Logs show "Peay Sand" 100-110 feet thick. Upper 60 feet less argillaceous.

Oil/Gas Column: Unknown

Oil/Water Contact: +3400 feet estimated

Gas Oil Ratio: Unknown

Initial Pressure: Unknown

Present Pressure: Depleted

Drive Mechanism: Gas expansion

Rw and/or Salinity: 1.80 @ 68° F produced water - Well 16 Lot 53 8-52N-93W

Bottom hole Temperature: 65°-70° Logs

Character of oil or gas: Gravity - 36° API

Continuity of Reservoir: Massive continuous sandstone

Cumulative Production: 1,025,206 BO, gas volumes unknown (all formations combined)

Primary Recovery STBO or MCF/AC FT: Unknown

Secondary: Extensive studies and several secondary recovery projects attempted with no effective response.

Estimated Ultimate Recovery: 1,100,000 BO (all formations combined)

Decline Curve: Appendix

DISCUSSION

The Greybull Anticline, formally known as Peay Hill, is an asymmetrical anticlinal closure on the east side of the Bighorn Basin. The structural trend is northwest-southeast, and exhibits 200 feet of closure. Faults trending southwest-northeast are present in outcrops of the Frontier Formation. Displacement along the faults are reported to exhibit 10-70 feet of surface displacement. A fault on the north plunge of the structure is postulated to explain this shallow Peay Sand producing area. Information on these wells is

very poor and few electric logs are available. These wells seem to be the principle producing area, at the present time, on the Greybull structure.

Interpretation of "old well data" suggests Greybull "channel" trends in a northeast-southwest direction across the north end of the anticline. The maximum thickness reported in the field is 35 feet. On outcrop (five miles northeast of the Greybull Field) the sand is 22 feet thick and cross bedding indicates a stream flow from east to west.

The structure map is based on electric log control. Thus, it is limited to widely spaced control points. It was decided not to attempt putting any faults on the map, other than the fault on the north plunge of the structure to explain the Peay production.

Two marginal gas wells were completed in the Muddy Sandstone. There is no recorded production.

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