



00788382

Slope Tests

| | |
|------|------------------|
| 458 | $1/2^{\circ}$ |
| 548 | $3/4^{\circ}$ |
| 639 | $3/4^{\circ}$ |
| 700 | $1/4^{\circ}$ |
| 820 | $1/4^{\circ}$ |
| 918 | $1/4^{\circ}$ |
| 999 | $1/2^{\circ}$ |
| 1120 | $1/4^{\circ}$ |
| 1240 | $1/2^{\circ}$ |
| 1331 | $1/2^{\circ}$ |
| 1450 | $3/4^{\circ}$ |
| 1540 | $3/4^{\circ}$ |
| 1661 | $3/4^{\circ}$ |
| 1750 | $3/4^{\circ}$ |
| 1840 | 1° |
| 1933 | $1\ 1/4^{\circ}$ |
| 2022 | $1\ 3/4^{\circ}$ |
| 2112 | $1\ 3/4^{\circ}$ |
| 2294 | $2\ 1/4^{\circ}$ |
| 2385 | $2\ 1/4^{\circ}$ |
| 2476 | $2\ 3/4^{\circ}$ |
| 2566 | 3° |
| 2654 | $3\ 1/2^{\circ}$ |
| 2745 | $3\ 1/2^{\circ}$ |
| 2834 | $3\ 1/4^{\circ}$ |
| 2925 | $2\ 1/4^{\circ}$ |
| 2985 | $2\ 1/4^{\circ}$ |
| 3076 | $2\ 3/4^{\circ}$ |
| 3166 | $2\ 1/4^{\circ}$ |
| 3287 | $2\ 1/4^{\circ}$ |
| 3409 | $2\ 3/4^{\circ}$ |
| 3497 | 3° |
| 3587 | 3° |
| 3681 | $3\ 3/4^{\circ}$ |
| 3773 | 4° |
| 3863 | $4\ 1/2^{\circ}$ |
| 3940 | $4\ 3/4^{\circ}$ |
| 4042 | 5° |
| 4270 | $5\ 1/2^{\circ}$ |
| 4372 | $6\ 3/4^{\circ}$ |
| 4492 | 6° |
| 4575 | 6° |
| 4673 | 5° |
| 4750 | $6\ 1/4^{\circ}$ |
| 4822 | $6\ 1/4^{\circ}$ |
| 4900 | $6\ 1/4^{\circ}$ |
| 5066 | $5\ 1/4^{\circ}$ |
| 5158 | $4\ 3/4^{\circ}$ |
| 5280 | $6\ 3/4^{\circ}$ |
| 5360 | 7° |
| 5464 | $7\ 1/4^{\circ}$ |
| 5515 | $7\ 1/4^{\circ}$ |
| 5575 | $7\ 3/4^{\circ}$ |
| 5645 | $7\ 3/4^{\circ}$ |
| 5770 | 7° |
| 5859 | $6\ 1/2^{\circ}$ |

Victor R. Gallagher #3 Government Heye

Location: C NE SW, Section 17, T. 9 N., R. 78 W., Jackson County, Colorado

Elevation: 8193 Kelly bushing

Spud date: 8-27-59

Completion date: 10-6-59

Total Depth: 5965 (driller)
5962 (Schlumberger)

Formation Tops: (Schlumberger)

| | |
|-------------|---------|
| Pierre | Surface |
| Niobrara | 4398 |
| Frontier | 5075 |
| Mowry | 5474 |
| Muddy | 5606 |
| Thermopolis | 5696 |
| Dakota | 5720 |
| Fuson | 5775 |
| Lakota | 5848 |
| Morrison | 5986 ? |

Casing: 10 3/4" @ 367' w/200 sacks
7" @ 5960' w/500 sacks

Perforations: 4 jets per foot through the following intervals:
5934 - 5852
5788 - 5758
5738 - 5724
5720 - 5718
5698 - 5622
5620 - 5610

Well History

| | | |
|---------|--|---------|
| 8/27/59 | Spud in 8:00 p.m. | |
| 8/28/59 | Drilling surface hole | |
| 8/29/59 | Set 354' of 10 3/4" @ 367 with 200 sacks | |
| 8/30/59 | WOC - Nipple up | |
| 8/31/59 | 373 - 696 | |
| 9/1/59 | 696 - 1312 | |
| 9/2/59 | 1312 - 1849 | |
| 9/3/59 | 1849 - 2209 | |
| 9/4/59 | 2209 - 2402 | |
| 9/5/59 | 2402 - 2576 | |
| 9/6/59 | 2576 - 2814 | |
| 9/7/59 | 2814 - 3089 | |
| 9/8/59 | 3089 - 3464 | |
| 9/9/59 | 3464 - 3770 | |
| 9/10/59 | 3770 - 3944 | |
| 9/11/59 | 3944 - 4107 | |
| 9/12/59 | 4107 - 4273 | |
| 9/13/59 | 4273 - 4413 | |
| 9/14/59 | 4413 - 4555 | |
| 9/15/59 | 4555 - 4746 | |
| 9/16/59 | 4746 - 4881 | |
| 9/17/59 | 4881 - 5001 | |
| 9/18/59 | 5009 - 5194 | |
| 9/19/59 | 5194 - 5368 | |
| 9/20/59 | 5368 - 5496 | |
| 9/21/59 | 5496 - 5581 | |
| 9/22/59 | 5581 - 5605 | |
| 9/23/59 | 5605 - 5662 | |
| 9/24/59 | 5662 - 5708 | Core #1 |
| 9/25/59 | 5708 - 5747 | Core #2 |
| 9/26/59 | 5747 - 5784 | Core #2 |
| 9/27/59 | 5784 - 5827 | |
| 9/28/59 | 5827 - 5902 | |
| 9/29/59 | 5902 - 5965 | |
| | 5965 TD | |
| 9/30/59 | logging | |
| 10/1/59 | Drill Stem Test #1 | |
| 10/2/59 | Running casing - set 7" @ 5960' w/500 sacks | |
| 10/3/59 | WOC | |
| 10/4/59 | Perforating | |
| 10/5/59 | Running tubing, rigging up for swabbing unit | |
| 10/6/59 | Swabbing down, testing | |

| | |
|------------|---|
| 500-510 | Shale - lt. gray, Calc. plus some shaley line |
| 510-520 | Siltstone, sdy, Calc. cementation, lt. gray |
| 520-580 | Siltstone, lt. gray, occasional calcite |
| 580-590 | Sand 20%, very fine, slight limonite stain |
| 590-620 | Siltstone, lt. gray, sl. trace lm. |
| 620-640 | Shale, silty, trace calcite |
| 640-670 | Shale and siltstone |
| 670-680 | Shale and sandy siltstone |
| 680-780 | Shale and siltstone - trace loose sand grains in samples |
| 780-940 | Shale, med. dk. gray, siltstone streaks, bentonite common |
| 940-1050 | Sand - silty to med. gr., scattered black grains, carb at base, bent. |
| 1050-1100 | Shale and siltstone, med. gray, some sandy |
| *1100-1400 | Siltstone, gray, sandy streaks |
| 1400-1610 | Shale and siltstone - lt. med. gray |
| 1610-1630 | Siltstone - lt. gray |
| 1630-1730 | Sandy siltstone - lt. gray |
| 1730-1740 | Sandy siltstone, as above; trace sand |
| 1740-1750 | Sand 50%, med. gray/green and black grains, tightly cemented |
| 1750-1760 | Sand 40%, as above |
| 1760-1770 | Sand 90% as above |
| 1770-1780 | Siltstone med. gray, sand 10% as above |
| 1780-1830 | Siltstone as above with trace of sand |
| 1830-1870 | Siltstone - slightly more sandy than above |
| 1870-1890 | Siltstone - less sandy |
| 1890-1900 | Shale - med. gray, silty |
| 1900-1990 | Shale and siltstone as above |
| 1990-2100 | Siltstone |
| 2100-2110 | Shale - med. gray |
| 2110-2180 | Shale and siltstone |
| 2180-2200 | Shale and siltstone - more sandy |
| 2200-2320 | Shale and siltstone, with trace fine sand, scattered black grains |
| 2320-2380 | Shale and siltstone, as above |
| 2380-2400 | Shale and siltstone, as above - more sandy |
| 2400-2530 | Siltstone - some sandy streaks |
| 2530-2540 | Siltstone as above; trace calcite |
| 2540-2750 | Siltstone as above - sandy streaks |
| 2750-2760 | Shale med. gray - light gray bentonite |
| 2760-2770 | Shale as above - trace sand |
| 2770-2780 | Shale as above - trace calcite |
| 2780-2940 | Shale as above - silty streaks |
| 2940-2990 | Shale - appears to be darker gray than above |
| 2990-3000 | Shale; 10% silty sandstone |
| 3000-3120 | Shale, as above, occasional trace of sand |
| 3120-3130 | Shale, as above; bentonite |
| 3130-3260 | Shale, as above |
| 3260-3270 | Shale, as above; bentonite |
| 3270-3500 | Shale as above |
| 3500-3630 | Shale, med. gray silty |
| 3630-3670 | Shale, lighter gray?, more silty than above |
| 3670-3710 | Shale as above, trace sand, glauc. |
| 3710-3720 | Shale as above, trace glauc. sand - calcite |
| 3720-3730 | Shale as above, trace sand as above. |
| 3730-3760 | Shale as above - 10% sand, med. grain, glauc. |
| 3760-3770 | Shale as above - trace sand |
| 3770-3790 | Shale as above - 10% white bentonite |
| 3790-3800 | Shale as above - decrease in bentonite |
| 3800-3810 | Shale as above - 10% white bentonite |
| 3810-3860 | Shale as above |
| 3860-3880 | Shale as above - 10% sand, glauc., Calc. cementation |
| 3880-3890 | Shale as above - trace sand |
| 3890-3920 | Shale and siltstone - med. to light gray |
| 3920-3930 | Shale and siltstone - trace sand, speckled |
| 3930-3940 | Shale and siltstone - 10% sand as above |
| 3940-3950 | Shale and siltstone - trace sand as above |
| 3950-4400 | Shale - silty - light to med. gray, occasional trace calcite |
| 4400-4600 | Shale, med. gray w/tan Calc. specks |
| 4600-4650 | Shale as above - less speckled shale, increase in lt. gray |

VICTOR R. GALLAGHER #3 Gov't Hoya - Sample Description (Continued)

- 5560-5570 Shale, med. gray, Silic., very hard - trace sand, gray vfg.
 5570-5580 Shale, as above
 5580-5590 Shale, as above - some gray silty sand - tr. gray, tan qtzic sd.
 5590-5595 trip - cavings!
 5595-5600 Shale, as above - trace tan sand, vfg tightly cemented, some qtzitic, no fluor or cut.
 5600-5605 (trip 5603) Cavings - trace tan hd sand as above
 5605-5610 Trace sand as above
 5610-5615 Sand 10% tan vfg. fairly friable, pass low par., sl fluor?
 5615-5620 Sand 15% as above
 5620-5625 Sand 10% as above
 5625-5630 Sand 5% - as above - some very hard
 5630-5635 Sand 5% - some larger grain size, with sl fluor - fair par?
 5635-5640* Sand 5-10% - med. gr. sub ang., pass stain?, sl. fluor, fair par.
 5640-5645* Sand - 5% - 10% as above
 5645-5650* Sand - 5% as above
 5650-5655* Shale - med. gray - sand scarce
 5655-5660* Shale - med. gray, some silty, no sand
 5645-5650 Shale - med. dk. gray - trace sand
 5650-5655 Shale - med. dk. gray - 5% sd, mfg, buff, friable, sl fluor.; bentonite pyrite
 5655-5660 Shale, as above - 5% sd. as above
 5660-5665 Shale, gray, tr. siltstone - trace sand, as above
 5665-5670 Shale gray, silty to sandy - trace - 5% sand as above - bentonite
 5670-5675 Shale, as above - trace sand as above - bentonite
 5675-5680 Shale, as above; 20% lt. gray silty sd. - trace sand as above
 5680-5685 Shale, gray silty -
 5685-5690 Shale and Siltstone - trace sand as above - bentonite
 5690-5695 Sand 10% - gray tan, tightly cemented
 5695-5700 Siltstone and shale, same sandy - trace sand, tan, tightly cemented - 15 min arc sand 10%, tan, sl. fluor.
 5700-5708 Core #1
 5710-5715 Shale and Siltstone, med - light gray, trace hard gray sand
 5715-5720 Shale and siltstone, as above becoming more sandy
 5720-5725 Shale and Siltstone, as above, increase in sand
 5725-5730 Sand 30% - tan - gray, vfg, u tite, interstitial clay, fluor
 5730-5756 Core #2
 5756-5760 Cavings
 5760-5765 Sand 10% - tite, pass - low par - 90% dk shale
 5765-5770 Sand 10% as above, some qtzitic - 90% shale
 5770-5775 Shale, med. dk. gray, trace sand as above
 5775-5780 Sand 15% - pass fair par - 85% shale as above
 5780-5785 Sand 10% - 90% shale - bentonite
 5785-5790 Sand 30% - bentonite
 5790-5795 Sand 30% - bentonite
 5795-5800 Sand 5% - blue green, bentonite (anhydrite)
 5800-5805 Shale med. dk, trace sand - blue green bentonite or anhydrite
 5805-5810 Shale, trace sand, blue green bent. 10%
 5810-5815 Shale, sl. trace sand, trace blue green bent.
 5815-5820 Shale & Siltstone, lt. gray - trace sand - reddish to buff
 5820-5825 Shale, trace redd shale - 10% green anhydrite
 5825-5830 Shale and Siltstone, trace red shale, trace sand
 5830-5835 Shale and Siltstone, as above
 5835-5840 Shale and Siltstone, as above
 5840-5845 Shale and Siltstone, as above
 5845 (Kelly Correction) Shale as above/trace red shale
 5845-5850 Shale - trace red, trace green anh., trace sand
 5850-5855 Shale and Siltstone, light med. gray - trace red, trace green anh.
 5855-5860 Shale and Siltstone, as above, white bentonite, tr. sand
 5860-5865 Shale, as above, increase in red and green anh.
 5865-5870 Shale - red and green prominent
 5870-5875 Shale - trace red and green, trace sand
 5875-5880 Shale, as above
 5880-5885 Shale, very little red and green, trace sand
 5885-5890 Sand 10% - med. grain, sub ang, sl. stain
 5890-5895 Shale, trace sand, as above; Chert pebbles
 5895-5900 Shale; trace sand as above, some v. titely cemented
 5900-5905 Sand 60%, slight fluor, pass stain, fair par

4650-4690 Shale - becoming lighter gray - slickensides
4690-4760 Shale - silty - med. to light gray
4760-4770 Shale as above - pyrite
4770-4780 Shale as above
4780-4800 Shale and siltstone - pyritic
4800-4810 Shale and siltstone - decrease in siltstone
4810-4830 Shale and siltstone - (30% speck shale, cavings?)
4830-4870 Shale, silty med. gray - pyritic, slickensides
4870-4880 Shale, silty Carb. specks - trace sand, green and black specks
4880-4890 Shale as above - no sand
4890-4980 Shale, med. to light gray - pyritic
4980-4990 Shale as above - 10% silty sand, glauc., Carb. specks
4990-5000 Shale as above - trace sand, as above
5000-5010 Shale as above - 5% sand, as above
5010-5020 Shale as above - trace sand as above
5020-5030 Shale - little more silty - trace sand - trace calcite
5030-5070 Shale, silty as above
5070-5080 Siltstone, sandy, Carb. specks and streaks
5080-5100 Siltstone and shale - med. light gray
5100-5110 Sand, 60%, silty, glauc., Carb.
5110-5120 Siltstone, sandy, light gray
5120-5130 Sand 50% light gray, tite, glauc.
5130-5140 Sand 30% as above
5140-5150 Sand 30% as above
5150-5160 Sand 10% as above; shale, 90% med. gray
5160-5170 Sand 10% as above; shale 90% as above
5170-5180 Shale and siltstone - med. gray, trace sand
5180-5190 Shale and siltstone, as above
5190-5200 Shale and siltstone, as above
5200-5210 Shale and siltstone, as above
5210-5220 Shale and siltstone, as above - trace sand
5220-5230 Shale and siltstone as above
5230-5240 Shale and siltstone - trace Calcite - slickensides
5240-5250 Shale and siltstone - 20% silty sand
5250-5260 Shale and siltstone
5260-5270 Shale and siltstone - trace Calcite
5270-5280 Shale and siltstone
5280-5290 Shale and siltstone
5290-5300 Shale, med. gray silty - siltstone, light gray
5300-5310 Shale and siltstone as above - 20% sand, tite, glauc.
5310-5320 Shale and siltstone - 10% sand as above
5320-5330 Shale and siltstone - trace sand as above
5330-5340 Shale and siltstone - 10% sand
5340-5350 Shale and siltstone - trace sand
5350-5360 Shale and siltstone
5360-5370 Shale and siltstone - becoming more silty
5370-5380 Shale - darker gray, more brittle
5380-5390 Shale - 50% darker as above; 50% light gray
5390-5400 Shale, med. light gray, silty
5400-5410 Shale, darker gray, sil. (60%); 40% light gray silty
5410-5420 Shale - 40% dark, sil. ; 60% light gray, silty
5420-5430 Shale - 40% dk. - 60% light
5430-5440 Shale as above
5440-5450 Shale - as above
5450-5460 Shale - increase in darker shale
5460-5470 Shale - med. dk. gray, brittle, sl. Calc. - trace sd, salt & pepper
5470-5480 Shale as above
5480-5490 Shale as above
5490-5500 Shale as above
5500-5510 Shale as above - trace Calcite - trace ten lime
5510-5520 Shale as above
5520-5530 Shale as above - 10% sand, tannish gray, glauc.
5530-5540 Shale as above - 10% sand as above
5540-5550 Shale - dk. gray to brownish gray - more silty - 10% sand aa
5550-5560 Trip - Cavings!

CORES

Core #1 5700-5708 (barrel jammed)
Recovered 8' Shale and Siltstone, light gray, very hard.
No saturation. Dips of 50°-60° indicated.

Core #2 5731-5756 Recovered 25'
3 1/2' tite sand, very hard, fractured, slight odor, fluorescence.
9 1/2' sand, very clayey, hard, no visible laminations,
no fractures.
2' sand, very clayey, as above. fractured, slight odor and
fluorescence.
5' sand, clayey as above, no fractures, no visible porosity.
5' sand as above, slight fluorescence, possibly little more porous
than above.

| <u>Depth</u> | <u>Permeability</u> | <u>Porosity</u> | <u>Oil saturation</u> | <u>Total water</u> | <u>Coring time</u> |
|--------------|---------------------|-----------------|-----------------------|--------------------|--------------------|
| 5731-5732 | less than .01 | 6.0 | 11.7 | 10.0 | 40 Min. |
| 32-33 | 14.0 | 15.4 | 9.7 | 29.2 | 16 " |
| 33- 34 | .36 | 7.1 | 12.7 | 22.6 | 17 " |
| 34- 35 | .56 | 5.7 | 24.6 | 21.0 | 17 " |
| 35- 36 | less than .01 | 4.3 | 0.0 | 93.0 | 15 " |
| 36- 37 | 0.0 | 3.9 | 0.0 | 84.5 | 11 " |
| 37- 38 | 0.0 | 4.3 | 0.0 | 83.7 | 12 " |
| 38- 39 | 0.0 | 2.8 | 0.0 | 92.8 | 14 " |
| 39- 40 | 0.0 | 4.0 | 5.0 | 77.5 | 12 " |
| 40- 41 | 0.0 | 2.8 | 0.0 | 89.3 | 14 " |
| 41- 42 | 0.0 | 4.0 | 0.0 | 82.5 | 16 " |
| 42- 43 | 0.0 | 2.7 | 0.0 | 92.5 | 16 " |
| 43- 44 | 0.0 | 6.7 | 22.4 | 32.8 | 16 " |
| 44- 45 | 0.0 | 3.6 | 0.0 | 91.6 | 13 " |
| 45- 46 | 0.0 | 4.6 | 0.0 | 80.5 | 14 " |
| 46- 47 | 0.0 | 4.3 | 4.7 | 88.4 | 13 " |
| 47- 48 | 0.0 | 4.5 | 4.4 | 93.3 | 15 " |
| 48- 49 | 0.0 | 5.3 | 3.8 | 86.7 | 16 " |
| 49- 50 | 0.0 | 4.5 | 4.4 | 84.5 | 14 " |
| 50- 51 | 0.0 | 4.0 | 5.0 | 67.5 | 14 " |
| 51- 52 | 0.0 | 3.3 | 6.1 | 69.7 | 12 " |
| 52- 53 | 0.0 | 3.2 | 6.3 | 59.4 | 11 " |
| 53- 54 | 0.0 | 3.3 | 0.0 | 78.8 | 11 " |
| 54- 55 | 0.0 | 4.9 | 0.0 | 77.5 | 9 " |
| 55- 56 | 0.0 | 4.7 | 0.0 | 66.0 | 8 " |

DRILL STEM TESTS

DST #1

5851 - 5963

Open 3 1/2 hrs.

CO2 to surface immediately mud 10 min.

Rec. 95' fresh water in drill cellars

Pressures recorded by test tool:

| | |
|---------------|----------|
| IHP | 3142 PSI |
| IFP | 1195 PSI |
| 1" Orifice | 1303 PSI |
| 3/4" Orifice | 1485 PSI |
| 1/2" Orifice | 1780 PSI |
| SIP (Surface) | 2072 PSI |
| FFP | 3070 PSI |

Pressures recorded at surface:

| | | Separator | Orifice |
|------------|--------------|------------|------------|
| 9:45 A.M. | 1" orifice | | 480# @ 60° |
| 9:50 | | 480# @ 63° | 435# @ 60° |
| 10:05 | | 470# @ 63° | 435# @ 60° |
| 10:15 | | 470# @ 62° | 420# @ 58° |
| 10:30 | | 470# @ 60° | 420# @ 58° |
| 10:45 | | 460# @ 56° | 410# @ 54° |
| 11:00 | | 460# @ 54° | 400# @ 44° |
| 11:15 | | 460# @ 54° | 400# @ 43° |
| 11:20 | 3/4" orifice | 640# @ 60° | 610# @ 60° |
| 11:30 | | 650# @ 62° | 630# @ 60° |
| 11:45 | | 665# @ 60° | 645# @ 52° |
| 11:50 | | 660# @ 59° | |
| 12:00 | 1/2" orifice | 780# @ 64° | 770# @ 61° |
| 12:15 P.M. | | 790# @ 65° | 780# @ 60° |
| 12:30 | | 800# @ 65° | 790# @ 60° |

| | | |
|------------------------|---------|----------------|
| tst 65 gal. distillate | 30 min. | (3/4" orifice) |
| tst 65 gal. distillate | 23 min. | (1/2" orifice) |

Oil 52° gravity at 66°

VICTOR R. GALLAGHER #3 Gov't Hoya - Sample Description (Continued)

5905-5910 Sand 15% as above
5910-5915 Sand 30% as above, Chert
5915-5920 Sand 50%, better porosity, Chert. abundant
5920-5925 Sand, trace, Chert, bentonite
5925-5930 Sand, trace as above, Chert, bentonite
5930-5935 Sand, trace as above, Chert abundant (Cong?)
5935-5940 Sand 10%, poorly sorted, some very tightly cemented
5940-5945 Shale and Siltstone, gray, sil., tr. sand, trace green anh
5945-5950 Shale and Siltstone, gray
5950-5955 Shale and Siltstone, gray
5955-5960 Shale and Siltstone, gray
5960-5965 Shale and Siltstone, gray

5965 TD

*Geolegraph wrong - Correction 5660 = 5645