Geological Report

Hopkins #11-1-16-24
357 FWL, 2010 FSL (N 38° 41.084′, W 94° 42.719′)
Section 1-T16S-R24E
Miami, Co. Kansas
API #15-121-27676
Elevation: 998 GL (est. from Topo. Map)
Drilling Contractor: Glaze Drilling Co., (Lic. #5885)
Spud: 5/18/2003
Surface: 11 1/4" bore hole, set 20' of 8 5/8" csg. cmt'd with 6 sx
Production bore hole: 7 7/8"
Rotary Total Depth: 660'on 5/19/03
Drilling fluid: Air
E-Log Total Depth: No Open Hole Run
Production Csg.: Used 5 ½" 15.50#/ft., set at 504' (packer rubber)

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Formation	Driller Log Tops	Datum
Stark Shale	233	765
Hushpuckney Shale	262	736
Base Kansas City	280	718
"Middle" Knobtown Sand	310	688
Carbonaceous Zone in Tacket Fm.	No call	----
"Big Lake" Sand	397	601
South Mound Zone	437	561
Hepler (Wayside) Sand	445	553
"Upper" Mulberry Zone	No call	----
Mulberry Zone	No call	----
Weiser Sand	484	514
Myrick Station	502	496
Anna Shale (Lexington Coal Zone)	506	492
Peru Sand	Not developed	----
Summit Shale Zone	546	452
Mulky Coal/Shale Zone	568	430
Squirrel Sand	581	417
Bevier Coal Zone	No call	----
Rotary Total Depth	660	338

Major Zones of Interest (Depths based on Driller's Log measurements)

Stark Shale Zone, 233-237. Shale, black, mixed cuttings, mostly gritty textured, pyritic in part, no shows of free gas.

** Gas test at 240', no open flow and no water.

Hushpuckney Shale Zone, 262-266. Shale, black, platy to blocky, trace angular cuttings, gritty textured in part, trace pyritic, very-very weak scattered show of free gas.

** Gas test at 280', "puff" open flow and no water, estimated .50 MCF.

"Middle" Knobtown Sand, 310-317. Sandstone, very light gray with green tint, very fine-to-fine grain, angular, poorly sorted, well consolidated, firm, poor trace fair intergranular porosity, silty, shaly, carbonaceous and micaceous fragments found along bedding planes, no show.

** Gas test at 320', no increase.

Carbonaceous Zone found in the Tacket Formation, no call. Sample bag 380-390 contained a trace of coal (few "floaters"), pyritic in part, and exhibited to fair show of free gas. Trace gray-brown, carbonaceous, slightly silty shale, but had no show.

"Big Lake" Sand, 397-400. Silt/sandstone, somewhat of a dull pale green, silt size to fine grain, poor to moderately sorted, well consolidated, firm, trace micaceous and pyritic, scattered siderite material in some clusters, contained no shows.

** Gas test at 400', no increase.

South Mound Zone, 437-440. Shale, black, very to very-very dark gray, trace very dark chocolate brown, blocky to angular cuttings, all were mostly gritty textured, "peppered" with micro pyrite crystals, trace secondary crystallization, no noticeable show of free gas.

** Gas test at 440', open flowed 10 MCF, a 9.5 increase. Driller noted a "little" water.

Hepler Sand, 445-450. Sandstone, tan, light gray-tan, light gray, fine to not quite coarse grain, sub-rounded to very angular, poorly sorted, well to very well consolidated, mostly very firm, poor porosity, silty-shaly-calcareous, very weak to questionable odor, very-very dull fluorescence, weak to fair stain, very weak speckled to spotty show of free oil and hydrocarbon residue. Most of the sand clusters looked to be made of "re-worked" sand and calcareous material.

450-455. Siltstone, pale green, laminated in part with sandstone, that is light to medium tan, fine to medium grain, poor to moderately sorted, sub-angular to very angular, well consolidated, poor to fair porosity, weak odor, fair stain, "sheen" show of free oil.

Note: Sample bag 440-450, besides the sandstone, also contained a fair percent of coal, of this coal, an abundant amount were "floaters", questionable show of free gas due to the light coating of oil from the Hepler Sand which tends to hinder shows of free gas from coals and carbonaceous shale. This coal may be the "Stray" that we have found in other wells in the area.

** Gas test at 460', no increase

Weiser Sand, 484-487. Sandstone, light tan to tan, all with a light green tint, fine grain, angular, poorly sorted, well consolidated, firm, poor trace fair porosity, silty to shaly in part, micaceous, dull fluorescence, fair odor, fair show of free dark brown oil. Does not merit further testing at this time.

** Gas test at 500', no increase, still 10 MCF.

Myrick Station Limestone, 502-506. Limestone, mottled medium to dark browns, fine to coarse crystalline, trace dolomitic, poor to very poor crystalline porosity, trace argillaceous and fossiliferous in part, no odor, no fluorescence, scattered staining.

Anna Shale (Lexington Coal Zone), 506-507+. Shale, black, platy to blocky cuttings, gritty textured in part, trace pyritic, coal and "coaly shale, 10-15 percent of coal in sample were "floaters", pyritic in part, all three had no to questionable shows of free gas. Zone is closer to 3.0 feet thick.

** Gas test at 520', open flowing 98 MCF, or an increase of 88 MCF. Driller noted a slight increase in water, but after another 20 feet drilled, commented that the Lexington was giving up a "fair" amount of water, volume not available.

Peru Sand. Not developed.

Summit Shale Zone, 546-549. Shale, black, mostly angular cuttings, gritty textured, trace pyritic, no show of free gas. Zone is 3 to possibly 4 feet thick.

** Gas test at 560', open flowing 85 MCF or a decrease of 13 MCF, Decrease possible due to water from Lexington Zone.

Mulky Shale/Coal Zone, 568-572+. Shale, black, mostly angular trace blocky cuttings, mostly gritty textured, trace pyritic, no show of free gas. "Coaly shale" and coal, at lease 20% were "floaters", pyritic, trace fractured, but instead of gypsum and/or calcite crystals, fractures contained pyrite, very-very weak scattered shows of free gas. Believe zone to be at least 5 feet thick.

** Gas test at 580', open flowed 110 MCF. Based on the 85 MCF from the last test, this is an increase of 25 MCF, but "if" water did effect the previous test, then only an increase of 12 MCF. Driller noted another increase in water.

Squirrel Sand. Driller noted "sandstone" from 581-630. Note the sand from the following sample bags:

- 580-590. Sandstone, very light tans, fine to medium grain, angular to very angular, poorly sorted, well consolidated, mostly semi-firm, trace friable, poor to fair porosity, no odor, very dull fluorescence, very light staining, no show of free oil, few specks of hydrocarbon residue.
- 590-600. Silt/sandstone, very light grays, silt size to fine grain, laminated in part by sandstone as above, no show.

** Gas test at 600', no increase in gas, still 110 MCF, slight increase in water.

- 600-610. Sandstone, tan with grayish tint, fine to medium grain, angular to very angular, trace sub-rounded grains, poorly sorted, well to very well consolidated, semi-firm to firm, micaceous, trace sand clusters with carbonaceous fragments, light oil sheen on most sand clusters.
- 610-620. Sandstone as above, little more grayish and carbonaceous, light oil scum in side of sample bag, no show of free oil, still a sheen, very weak odor

** Gas test at 620', no increase in gas, large increase in water.

- 620-630. Sandstone, light gray with tan tint, mostly medium grain, angular to very angular, poor to moderately well sorted, well consolidated, mostly friable, trace semi-firm, good to very good porosity, very carbonaceous in part, no fluorescence, fair "pungent" odor, weak scattered stain and brown to black hydrocarbon residue. No show of free oil or gas.
- 630-640. Sandstone as above with same type of show.
- 640-650. Sandstone as above. Sandstone, white, fine to medium grain, angular, moderately sorted, well consolidated, very friable to friable, good to excellent porosity, no fluorescence, very weak "pungent" odor, spotty show of brown to very dark brown free oil.

Note: Squirrel Sand makes an abundance of water. Vacuum truck required to haul off excess water.

Bevier Coal Zone. No top called. Sample bag 650-660 contained, (along with Squirrel Sand above and pale green shale) coal, abundant "floaters", exhibited questionable shows of free gas due to oil sheen covering cuttings from the Squirrel Sand which hinders gas shows. Coal might be 8 to12 inches thick.

** Gas test at 660, no increase in open flow gas, still 110 MCF, but large increase in water as noted above.

Brief Summary

Stark	No open flow
Hushpuckney	.50 (estimated)
"Big Lake" Sand	No increase
South Mound	9.5 MCF (little water)
Hepler Sand	No increase
Weiser Sand	No increase
Lexington	88 MCF ("fair amount of water")
Summit	No increase (decrease, see report)
Mulky	25(?) MCF (increase water)
Squirrel Sand(s)	No increase (abundant water)
Total	110 to 123 MCF open flow

** Structural comparison of the subject well using the Top of the Lexington Zone:

Hopkins 11-1	Hopkins 4-1	Hopkins 1-1	Rofail 12-36	Kallevig 1-1	Sears 10-2
506	481	488	478	503	529

End Report
Rex R. Ashlock