

**GEOLOGICAL REPORT**

**Mullendore # MP-5**  
 1815' FSL, 2475' FWL  
 Section 3, T30S-R9E  
 Elk Co., Kansas

**Operator:** Perkins Oil Enterprises Inc., Box 707, 204 S. Cedar, Howard, Kansas 67349

**Drilling Contractor:** L & S Well Service, Bart Lorenz, driller  
 Ingersoll Rand air rotary drill rig with auxiliary air compressor and booster

**Wellsite Geologist:** Michael L. Ebers – On location from 661' to T.D.

**Dates Drilled:** Set surface on 2/15/06  
 Drilled from 43' to 1337' on 2/16/06.  
 Drilled from 1337' to T.D. on 2/17/06.

**Size Hole:** 7 7/8" **Total Depth:** 1715' (driller)

**Elevation:** 1168' (surveyed) **GPS Location:** N 37° 27.994', W 96° 24.499'

**Drilling Fluid:** Compressed air with injected water

**Surface Casing:** 43.3' of 8 5/8" surface casing cemented to the surface with 12 sacks cement.

**Electric Logs Run:** Gamma ray and neutron logs

**Formation Tops:** Formation tops were picked from the gamma ray and neutron logs

**Rock Color Descr:** GSA Rock Color Chart (dry cuttings)

**Status:** **Water Injection Well**

**Gas Shows:** Did not conduct any gas orifice tests due to well making significant water.

**Oil Shows:**

<b>Douglas Sandstone</b>	<b>1035-1048'</b>	<b>Excellent oil show</b>
<b>Lansing Limestone</b>	<b>1136-1162'</b>	<b>Trace oil show</b>
<b>Hertha Limestone</b>	<b>1640-1664'</b>	<b>Light oil show</b>

**Water Encountered:** Encountered 5 to 10 gpm water @ ~650'. Picked up additional water throughout well.

**Canister Tests:** See separate report for the results of the canister desorption tests.

**Notes:** Well cuttings were examined at the drill rig and discarded. Select samples of coal and zones of interest were saved and examined in the laboratory with a binocular microscope and blacklight

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**FIELD and LABORATORY SAMPLE EXAMINATION**

- 0-661' Samples not examined
- 661-706' Shale, medium dark gray
- 706-718' Limestone, olive gray and dark olive gray, fine grained, no visible porosity, no petroliferous odor or show
- 718-736' Shale, medium dark gray and maroon, maroon colored return water
- 736-761' Shale, maroon, maroon colored return water
- 761-770' Shale, maroon with sandstone streaks
- 770-786' Sandstone, tan and light gray, fine grained, friable, no petroliferous odor or show
- 786-794' Limestone, tan and olive gray, fine grained
- 794-810' Sandstone, light gray, fine grained, thinly laminated with siltstone, no petroliferous odor or show
- 810-836' Shale, medium dark gray, thinly laminated with shale maroon and siltstone, light gray and limestone, tan
- 836-861' Shale, medium dark gray, locally maroon; limestone @ 846-850'
- 861-902' Shale, medium dark gray

**Top of the Stalnaker Sandstone at 902' (+266')**

- 902-924' Sandstone, very fine grained, light gray, tight, very hard, very poor porosity, no petroliferous odor or show
- 924-937' Shale, medium dark gray
- 937-946' Shale, medium dark gray and maroon
- 946-964' Sandstone, light gray, very fine grained, hard, tight, no petroliferous odor or show
- 964-996' Shale, medium dark gray, trace maroon shale

**Top of the Iatan Limestone at 996' (+172')**

- 996-1000' Limestone, medium brown and olive gray, massive, no visible porosity, no petroliferous odor or show
- 1000-1010' Shale, medium dark gray
- 1010-1035' Siltstone, medium dark gray, thinly laminated with sandstone, very fine grained, light gray, tight, no petroliferous odor or show

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Top of the Douglas Sandstone at 1035' (+133')

- 1035-1048' Douglas Sandstone, tan, fine grained, subrounded, well sorted, little silt, 20 to 24% porosity, few chips very silty and well cemented, uniform bright whitish yellow fluorescence, excellent petroliferous odor, excellent show of medium light brown oil on pit, no visible oil in cuttings (washed out during drilling)
- 1048-1054' Shale, medium dark gray
- 1054-1074' Limestone, tan and light olive gray, very fine grained, dense, no visible porosity, no petroliferous show or odor
- 1074-1102' Shale, medium dark gray
- 1102-1114' Limestone, tan, fine and medium grained, massive to granular, scattered pinpoint vugs, estimate 2 to 3% pinhead vuggy and intergranular porosity, irregular medium dull mottled yellow fluorescence, faint petroliferous odor, no visible oil
- 1114-1134' Shale, medium dark gray

Top of the Lansing Group at 1134' (+34')

- 1134-1162' Limestone, tan, fine grained, few scattered pinpoint vugs, 10% granular limestone with light brown oil staining, trace fossils, fossiliferous, overall 3 to 4% vuggy and intergranular porosity, trace petroliferous odor (probably from sand @ 1035'), 25% mottled bright yellow fluorescence
- 1162-1187' Limestone, light olive gray, fine grained, locally medium grained, scattered fossils-corals etc., <1% porosity, massive, no fluorescence
- 1187-1293' Limestone, light olive gray and medium light gray, fine grained, massive, no visible porosity, no fluorescence

Base of the Lansing Group at 1293' (-125')

- 1293-1402' Shale, medium dark gray
- 1402-1419' Limestone, light olive gray, fine grained, dense
- 1419-1438' Shale, medium dark gray, fine silty
- 1438-1452' Siltstone, very thinly laminated with shale
- 1452-1457' Shale, dark gray

Top of the Kansas City Group at 1457' (-289')

- 1457-1476' Limestone, tan and light olive gray, fine grained, no visible porosity, dense
- 1476-1486' Shale, medium dark gray
- 1486-1503' Limestone, light olive gray, fine grained

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