API #15-153-21080

Saman Sharifaie
Petroleum Geologist

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GEOLOGIST'S REPORT
DRILLING TIME AND SAMPLE LOG

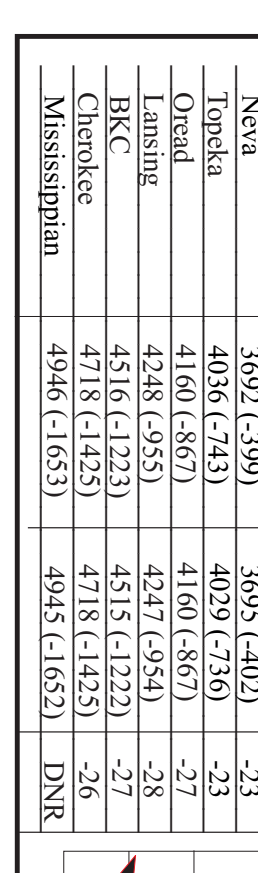
COMPANY Murfin Drilling Co., Inc.
LEASE Kacirek Trust #1-SWD
FIELD Brumm Northeast
LOCATION 330' FSL & 1250' FWL
SEC 5 TWSP 2S RGE 36W
COUNTY Rawlins STATE Kansas
CONTRACTOR Murfin Drilling #2
SPUD 11/20/14 COMP 11/28/14
RTD 5300' LTD 5302'
MUD UP 3285' TYPE MUD Chemical
SAMPLES SAVED FROM 3580' TO RTD
DRILLING TIME KEPT FROM 3580' TO RTD
SAMPLES EXAMINED FROM 3580' TO RTD
GEOLOGICAL SUPERVISION FROM 3080'
REFERENCE WELL MDCI - Kacirek Trust #2-5

ELEVATIONS
KB 3293'
DF
GL 3282'
Measurements Are All From Kelly Bushing

CASING
CONDUCTOR
SURFACE 8-5/8" at 308'
PRODUCTION 5-1/2" at 5297'

ELECTRICAL SURVEYS
CND; DIL; MEL; Sonic
Pioneer Wireline

Formation	Sample Tops	E-log Tops	Struct Pos.
Anhydrite	3205 (+88)	3201 (+92)	-14
Base Anhydrite	3240 (+53)	3236 (+57)	-15
Neva	3692 (-399)	3695 (-402)	-23
Topeka	4036 (-743)	4029 (-736)	-23
Oread	4160 (-867)	4160 (-867)	-27
Lansing	4248 (-955)	4247 (-954)	-28
BKC	4516 (-1223)	4515 (-1222)	-27
Cherokee	4718 (-1425)	4718 (-1425)	-26
Mississippian	4946 (-1653)	4945 (-1652)	DNR



REMARKS Due to poor shows of oil, low relative structural position, and negative DST results, it is recommended and agreed upon by all parties that production casing be set to use this well for salt-water disposal as intended.

Respectfully Submitted,

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*Note: Formation tops have been adjusted to match electric logs

Geological Descriptions	Engineering Data
Anhydrite 3201 (+92)	
Base 3236 (+57)	

Geological Descriptions	Engineering Data
DAILY PENETRATION @ 7:00 AM **11/20/14 - Spudded at 3:00 PM** **11/21/14 - Drilling at 541'** **11/22/14 - Drilling at 3569'** **11/23/14 - Drilling at 3900'** **11/24/14 - Testing at 4200'** **11/25/14 - Testing at 4270'** **11/26/14 - Drilling at 4565'** **11/27/14 - Drilling at 5220'**	**Morgan Mud @ 3569'** **Wt: 8.6** **Vis: 98** **Wl: 5.2** **Chl: 700** **LCM: 8#** Pipe Strap @ 3569': 1.74 Short to Board
Sh., brn/dk orng/crm, slty to sndy, fri to sft, Tr gmy	
Sst., lt gry/crm, vf-fn gr, pr intgran por, sli fri to brit, calc, rexlzd, shly, Tr tan Ls w/ NVP, n/s	
Sltst., brn/tan, fn gr, srtd, pr-fr intgran por, fri, incr sndy w/ dpth, Tr pyr, scat gry/gn Sh, n/s	
Sh., brn/dk orng, slty, sft, abund lt gry Sst a.a	
Sh., gry/gn/orng, sli sft, pred Sst & Sltst a.a	
Sh., brn/dk orng, gmy to sft	
Sh., brn/gry/gn, slty to sndy	
Sltst., brn/dk orng, fn-med gr, srtd, fr intgran por, sli calc, sub-rndd, fri, Tr gry Sh, Tr pyr, n/s	
Sltst., brn/orng, vf-fn gr, srtd, fri to sft/gmy IP, pr intgran por, rndd, calc IP, scat gry/gn Sh, n/s	
Sh., brn/dk orng, sft to gmy, incr Chk w/ dpth	
Neva 3695 (-402)	
Ls., crm/tan, fn xln, Oolc/foss, pr vis por, calc cmt, dns, pred hd to sli fri, sbang, chky IP, no odr, n/s	
Ls., a.a, incr chky, sbang to blky	
Sh., gry/brn/dk orng/gn, slty IP, fri to sli sft	
Sh., brn/gry/gn, pred slty to sndy, fiss IP, pyrc IP	
Sst., lt gry/lt gn, vf gr, srtd, pr intgran por, consl, calc cmt, sli fri to brit, sub-rndd, pred slty brn Sh, n/s	
Sh., varic, sft to gmy	
Red Eagle 3756 (-463)	
Dol., crm/tan, fn xln, sli foss, pr vis por, pt dns to chky, sli calc, blky, scat lt gry Ls, Tr orng Cht, n/s	
Ls., crm/lt gry, fn xln, sli foss, pr vis por, calc, dolc IP, pt dns to sub-chky, fri, chty, Tr pyr, n/s	
Sh., varic, slty to gmy	
Sh., brn/gry, slty	
Sh., brn, sft to gmy	
Sh., gry/gn, fiss, brit	
Foraker 3806 (-513)	
Ls., crm/lt gry, fn-med xln, foss IP, pr vis por, dolc IP, pt dns to sub-chky, calc IP, Tr Cht, shly, n/s	
Ls., a.a, gry/tan IP, mott IP, sli gran/slty, scat gry Sh	
Sh., gry/gn, slty, fri to sli brit	
Ls., gry/crm/brn, sing, fn xln, foss IP, pr por, ti, dns, calc IP, hd to chky, shly, n/s	
Sh., gry/orng/gn, pyrc IP, sli slty, sft to fri	
Ls., crm/gry, fn xln, foss IP, Tr pr intxln por, pt dns to chky, sli dolc IP, pyrc IP, blky to sbang, shly, n/s	
Sh., gry/brn/orng/gn, slty to gmy IP, Tr Cht	
Ls., crm/lt gry, fn xln, Tr foss, pr vis por, dns to chky, sli fri, calc IP, sbang to blky, dolc IP, scat Cht & pyr, n/s	
Sh., gry/brn/orng/gn, gmy to brit, abund Chk	
Sh., gry/brn/gn, slty IP, gmy to brit	
Ls., crm/lt gry, sli mott, fn xln, Oolc IP, Tr pr intfoss por, dns, calc IP, dolc IP, shly, n/s	
Sh., brn/dk orng, slty, rndd, fri to sft	
Sh., gry, intbdd foss, fiss IP, fri to sli sft	
Ls., crm/gry/varic, sli mott, fn xln, foss IP, no-pr vis por, Tr calc, pt dns to chky, n/s	
Sh., blk carb	
Sh., brn/gry/orng, slty to sndy IP, fri	
Sh., gry/brn/gn, slty IP	
Stotler 3958 (-665)	
Ls., tan/crm/lt gry, sli mott, fn xln, foss/Oolc, pr vis por, pt dns, calc, shly, n/s	
Sh., gry/brn/dk orng, slty to sndy IP, fri to brit, pyrc IP	**Morgan Mud @ 3982'** **Wt: 9.3** **Vis: 71** **Wl: 7.6** **Chl: 800** **LCM: 10#**
Ls., crm/tan/lt gry, vf-fn xln, foss, no-pr vis por, dns to chky, calc cmt, sbang to blky, scat pyr, n/s	
Sh., dk orng/gry, sft	
Ls., crm/gry/tan, sli mott, fn xln, foss IP, no-pr por, dns, calc cmt, hd to chky, sbang, Tr pyrc Sd, n/s	
Ls., crm/tan, fn xln, foss, pr pp intfoss por, pt dns, ti, sli fri to sub-chky, calc IP, sbang, scat blk spkld stn, lt sat, rr pp FO, Tr irid, dl yel fluor, no odr, VSSFO	
Ls., crm/lt gry, fn xln, sli foss, no-pr vis por, pt dns to sub-chky, Tr calc, scat dd blk stn, spkld IP, sub-sat, gils, no fluor, no odr, NSLO	
Sh., gry/dk orng/gn, fiss IP, slty to gmy, Tr pyr	
Topeka 4029 (-736)	
Ls., crm/tan, mott IP, fn xln, Oolc, pr vis por, dns to sub-chky, calc cmt, sbang, intbdd w/ rd Sh, n/s	
Ls., a.a, abund gry Sh, chty	
Ls., wht/crm, sing, vf-fn xln, Tr pr intOolc por, pred NVP, dns to sub-chky, calc cmt, sbang to blky, n/s	
Sh., brn/dk orng/gry, sft to gmy, slty IP	
Sltst., brn/dk orng, fn gr, srtd, fri to mdy IP, fr intgran por, sub-rndd, consl, shly, n/s	**DST #1** **(Oread)** **4116'-4200'**
Sh., brn/gry/gn, slty to sndy IP, Tr pyr, sft to fri	**30-60-30-60** **IF: BOB in 3½ mins** **ISI: No return** **FF: BOB in 4 mins** **FSI: No return** **Rec: 1500' Total Fluid,** **196' M w/ oil spots (100%M),** **126' MCW (85%W, 15%M),** **1115' MCW (95%W, 5%M),** **63' WCM (50%W, 50%M)**
LeCompton 4107 (-814)	
Ls., wht/crm/lt gry, fn xln, Tr foss, no-pr vis por, dns, calc IP, blky, hd to sub-chky, Tr pyr, n/s	
Sh., purp/gry, slty, sli blky, fri, pyrc	
Sh., gry/lt gry/brn, slty IP, sli calc, pyrc IP, fri to gmy	**IFP: 94 - 362** **FFP: 366 - 564** **ISIP: 1194** **FSIP: 1186** **IHP: 2198** **FHP: 1920** **BHT: 145º** **RW: .316 @ 50ºF** **Chl: 31,000 PPM**
Sh., lt gry, gmy	
Sh., gry/blk carb, calc IP, brit, pyrc IP	
Oread 4160 (-867)	
Ls., crm/wht, fn xln, foss, Oolc IP, fr pp intfoss & xln por, dns to chky, calc IP, sli fri, sbang, fr amt dk brn sptd stn, sub-mod sat, irid OCW, rr G Bubls, scat pp FO, bri fluor, fnt odr, FSFO	
Ls., crm/tan, sing, vf-fn xln, Tr pr intxln por, pred dns w/ NVP, chky IP, hd, blky, calc IP, n/s	**Morgan Mud @ 4200'** **Wt: 9.3** **Vis: 55** **Wl: 7.2** **Chl: 900** **LCM: 8#** Deviation Survey @ 4200': ¼º
Ls., tan/brn, sing, vf xln, NVP, v dns, hd, decr Chk abund, sbang to blky, n/s	
Sh., dk gry/dk brn/blk, sli carb, fri to brit, pyrc	
Ls., tan/crm/brn, sing, vf-fn xln, Tr foss, no-pr vis por, dns to chky, blky, hd, Tr pyr, n/s	
Sst., crm/lt gry/lt gn, vf gr, srtd, pr intgran por, consl, rndd, fri to brit, sli calc, rexlzd, glauc IP, pyrc, n/s	
Sh., brn/gry/orng/gn, slty to sli sndy, fri to brit, pyrc	
Sh., brn/dk orng/gry, slty to sft/gmy, pyrc IP	
Lansing 4247 (-954)	
Ls., tan/crm/wht, fn xln, fr-gd intfoss & Oolc por, Tr vug por, dns to sub-chky, calc IP, fr amt dk brn/blk stn, sub-sat, sptd IP, abund pp FO, Tr G Bubls, irid OCW, bri gn fluor, fnt odr, F-GSFO	
Ls., tan, sing, vf xln, NVP, v dns, hd to sub-chky, sbang to blky, n/s	
Sst., gry/lt gn, vf gr, srtd, pr por, consl, rndd, fri, slty IP, Tr glauc, pyrc IP, shly, n/s	
Sh., gry/brn/orng/gn, slty IP, fri to brit, fiss IP	**Morgan Mud @ 4285'** **Wt: 9.3** **Vis: 54** **Wl: 8.0** **Chl: 1,100** **LCM: 8#**
Ls., crm/tan, fn xln, pr pp intfoss & xln por, pt dns, fri to sub-chky, scat try blk sptd stn, sub-lt sat, gils IP, Tr dl fluor, no odr, NSFO	
Sh., gry/gn, sli slty, pyrc	
Ls., crm/wht, fn xln, foss, pr-fr intOolc & xln por, sli ti, pt dns, sli fri to sub-chky, pyrc, scat dk brn/blk sptd stn, lt sat, Tr slw bld FO, dl yl fluor, pr cut, Tr irid, fnt odr, SSFO	**DST #2** **(LKC A)** **4190'-4270'**
Sh., blk carb/gry/gn, sli slty, pyrc, fiss IP, brit	**30-60-60-90** **IF: Built to 5½"** **ISI: No return** **FF: Built to 4"** **FSI: No return** **Rec: 116' MCW (70%W, 30%M),** **58' MCW (80%W, 20M),** **56' M (100%M)**
Ls., wht/crm/tan, fn xln, pr intfoss por, pt dns, sli fri to sub-chky, dolc IP, Tr pyr, rr blk sptd stn, lt sub-sat, gils, Tr irid, Tr dl gn fluor, no odr, NSFO	
Sh., gry/brn/gn, fiss IP, pyrc IP, brit to sli sft	
Sh., brn, sli slty, blky, fri	
Sh., brn/dk orng/gry, pred slty, gmy IP	**IFP: 24 - 73** **FFP: 78 - 117** **ISIP: 896** **FSIP: 758** **IHP: 2227** **FHP: 2016** **BHT: 136º** **RW: .867 @ 22ºF** **Chl: 25,500 PPM**
Ls., wht/crm/lt gry, fn xln, foss/Oolc, pr vis por, pt dns, calc cmt, hd to brit, chky IP, sbang, rr (5 pcs) blk sptd stn, sub-sat, gils, no odr, NSFO	
Ls., a.a, incr dns/calc, v chky, n/s	
Sh., dk gry/dk brn/blk, carb, pyrc, fiss IP	
Sh., brn/gry/gn, pyrc, sli slty, brit to gmy	
Sh., gry/gn, fiss, brit	
Ls., crm/tan/dk brn, vf-fn xln, pr intxln & pp intfoss por, dns to chky, pred calc, blky, ti, Tr brn spkld stn, v lt sub-sat, Tr irid pp FO, gn min fluor, no odr, VSSFO	
Sh., dk gry/gn/dk brn/blk carb, pyrc	
Sh., gry/gn, fiss, brit to sft, sli pyrc, Lmy	
Sh., brn/dk orng, slty, fri, rndd	
Ls., crm/wht, fn xln, Tr pr pp intpart & xln por, dns, ti, calc, blky, hd to sub-chky, scat med brn/blk spkld stn, sub-lt sat, sli gils/try IP, Tr FO bld on brk, Tr gn min fluor, no odr, VSSFO	
Stark 4466 (-1173)	
Sh., gry/blk carb, brit, abund brn slts	
Sh., brn/gry/gn, slty to sndy IP, pred fri to brit, sft IP	
Ls., crm/wht/lt gry, fn xln, sli foss, Tr pr pp intpart & xln por, pred NVP, dns, hd to sli brit, sbang to blky, sub-chky IP, rr (2-3 pcs) lt brn spkld stn, sub-sat, Tr gn min fluor, no odr, NSFO	
Sh., gry/brn/gn, slty IP, brit to sft	
Ls., crm/tan, fn xln, Tr foss, frac, NVP, dns, calc IP, ang to blky, chky IP, n/s	
BKC 4515 (-1222)	
Ls., crm/tan/lt gry, sing, fn xln, Tr foss, no-pr vis por, pred dns to pt dns IP, calc cmt, blky, chky IP, n/s	
Sh., brn/gn/orng, pred slty, gmy IP	
Ls., crm/tan/lt gry, fn xln, foss IP, no-pr vis por, dns, calc cmt, blky, hd to chky, pyrc IP, scat lt gn Sst, n/s	
Sh., gry/gn, fiss, slty IP, pyrc, brit	
Sh., brn, gmy	
Marmaton 4557 (-1264)	
Ls., tan/crm, fn xln, foss, no-pr vis por, dns, calc cmt, sbang to blky, hd to sub-chky IP, shly, n/s	
Sh., gry/purp/gn, sli slty, calc, fiss IP	
Sh., brn/dk orng, slty to sli sndy, fri	
Ls., crm/tan, mott, fn xln, foss IP, Tr fr intpart por, calc IP, fri to chky, rndd to dns/blky, intbdd Sh, scat lt gry Sd, n/s	
Sh., brn, slty, fri, & Sh., gry/gn, fiss, brit	**Morgan Mud @ 4611'** **Wt: 9.3** **Vis: 72** **Wl: 6.8** **Chl: 1,000** **LCM: 10#**
Ls., tan/crm/gry, mott, fn xln, Tr foss, pr por, dns to chky, calc IP, sbang, shly in frac, scat lt gry Sd, n/s	
Sltst., lt gry, fn gr, srtd, pr intgran por, consl, sbu-rndd, fri, sli calc, shly IP, n/s	
Sh., gry/blk carb, fiss IP, sli pyrc	
Pawnee 4644 (-1351)	
Ls., crm/wht/brn, fn xln, foss/Oolc, no-pr vis por, dns, calc cmt, hd to sli brit, sub-chky IP, blky, n/s	
Ls., wht/lt gry/crm, vf-fn xln, NVP, dns, calc, hd to chky, ang to blky, sli slty IP, n/s	
Sh., gry/brn/blk carb	
Ls., crm/tan, sing, vf xln, Tr foss, no-pr vis por, dns, calc cmt, ang to blky, sub-chky IP, sli pyrc, Tr Cht, n/s	
Ls., crm/tan/brn, sing, fn xln, gran IP, Tr pr intgran por, pt dns to sub-chky, hd/blky to sli fri, Tr Cht, n/s	
Sh., gry, sli slty, pyrc	
Sh., blk carb, pyrc	
Ft Scott 4702 (-1409)	
Ls., crm/tan/brn, fn xln, Oolc, pr-fr intfoss por, pt dns to dns, calc cmt, sbang to blky, sli fri to sub-chky, sli pyrc, n/s	
Cherokee 4718 (-1425)	
Ls., crm/lt brn, vf-fn xln, Oolc IP, Tr fr intfoss por, pred no-pr por, calc IP, pt dns to sub-chky, sli fri to brit, pyrc IP, sbang to blky, scat gry/blk Sh, n/s	
Sst., wht/clr, fn-med gr, mod srtd, pr por, consl/ti, calc, sli fri, n/s	Deviation Survey @ 4740': ½º
Ls., tan/lt brn, vf-fn xln, Tr foss, NVP, dns, hd, calc IP, blky to sbang, sub-chky IP, n/s	
Sh., gry/gn/brn, sli slty, fiss IP, fri to brit	
Ls., crm/tan/lt gry, fn xln, foss IP, no-pr por, calc, pt dns to sub-chky, sli brit IP, sbang to blky, shly, n/s	
Sh., brn/gry/gn, slty to sndy IP, Tr varic, 30% Ls a.a	
Sst., crm/gry/varic, mott, fn-med gr, mod srtd, pr intgran por, consl, calc, rexlzd, sli fri, shly, n/s	
Sh., brn/orng/gry/varic, fiss to blky IP, slty to sndy IP	
Sst. & Sh., a.a	
Sh., brn/gry/purp/varic, slty IP, fri to brit IP, Tr fiss pcs	
Sst., varic, mott, med-crs gr, pr-mod srtd, pr intgran por, consl, calc, sli fri, sub-rndd to sbang, rexlzd, Tr Cht, pred brn slty Sh a.a, n/s	
Sh., brn/gry/varic, fri to brit, pred slty to sndy	
Sst., wht/brn/varic, mott, fn-crs gr, pr-mod srtd, pr intgran por, consl, calc, sli fri, sub-rndd to sbang, rexlzd, shly, n/s	
Sh., gry/brn/varic, sli pyrc, slty to sndy IP	
Sst., a.a, mod srtd, incr dns	
Sh., brn/gry/blk/varic, carb IP, sli pyrc, slty to sndy IP	
Mississippian 4945 (-1652)	
Ls., crm, vf-fn xln, foss IP, no-pr vis por, dns to sub-chky, calc IP, blky, pred slty Sh & Sst a.a, n/s	
Ls., tan/crm/lt gry, fn xln, Tr foss, no-pr vis por, pt dns to sub-chky, dolc IP, sndy, pyrc IP, n/s	
Cht., wht/clr/varic, mott, pred frs to sli wthd, foss/trip IP, no-pr intfoss por, transl to transp IP, dns, hd to sli brit, abund Chk, pred Ls a.a, Tr Sd, n/s	
Dol., crm/tan, sing, fn xln, pr intxln por, sli dns to fri, sub-rndd, suc, sbang, Tr glauc, scat Chk, n/s	
Sst., lt gry/wht, fn gr, srtd, pr por, consl/ti, fri, rndd, glauc, shly, Tr dol, n/s	
Ls., tan/crm, sing, vf xln, NVP, dns, calc IP, blky, hd to chky IP, sndy, dolc IP, n/s	
Ls., lt brn/tan/crm, sing, vf-fn xln, foss, no-pr vis por, dns to chky, fri, calc IP, sbang, Tr Sd, n/s	
Ls., tan/crm, fn xln, foss/Oolc, Tr pr por, dns, calc cmt, sbang, fri to chky, Tr Cht, sndy, n/s	
Arbuckle 5080 (-1787)	
Dol., crm/pnk, fn-lg xln, pr-fr intxln por, dns, calc, hd to sli fri, sbang, glauc, n/s	
Dol., crm/tan/gry, fn-med xln, pr intxln por, pt dns, calc, hd to sli fri, sbang, glauc IP, n/s	
Dol., pnk/crm/lt gn, fn-med xln, pr vis por, pt dns, sli fri, calc, sbang, glauc, n/s	
Dol., a.a, gry IP, Tr glauc Sst	
Dol., crm/pnk, sing, fn xln, pr vis por, fri, sbang, calc, glauc, incr shly, n/s	
Sh., brn/gry/varic, blky, mica IP, sft to brit	
Sh., gry/brn/varic, slty to sndy IP, pyrc, fri to brit	
Dol., crm/wht, fn-lg xln, fr intxln por, hd to sli fri IP, suc, abund cong Sst, shly, n/s	**Morgan Mud @ 5300'** **Wt: 9.4** **Vis: 74** **Wl: 6.4** **Chl: 800** **LCM: 15#** Deviation Survey @ 5300': ¾º
RTD 5300 (-2007)	