

GRAND MESA

OPERATING COMPANY

(316) 265-3000
FAX: (316) 265-3455

1700 N. WATERFRONT PARKWAY
BLDG. 600
WICHITA, KANSAS 67206-5514

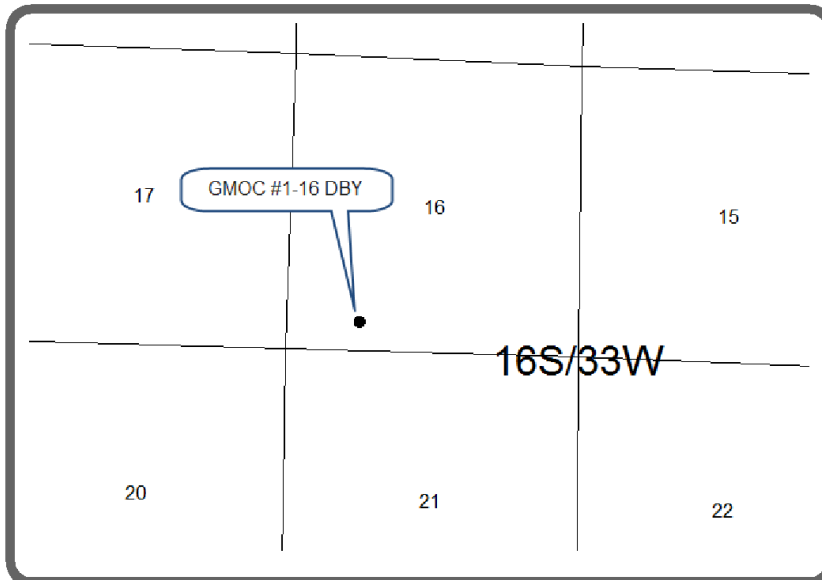
Scale 1:240 (5"=100') Imperial
Measured Depth Log

Well Name: #1-16 DBY
Location: 524'FSL, 1307'FWL, 16-16s-33w, Scott County, Kansas
License Number: API: 15-171-20822 Region: Wildcat
Spud Date: 7-22-2011 Drilling Completed: 8/7/2011
Surface Coordinates: Lat: 38.657562 734346
Long: -100.976284 1292929
Bottom Hole Vertical hole
Coordinates:
Ground Elevation (ft): 3075' K.B. Elevation (ft): 3086'
Logged Interval (ft): 3600' To: RTD Total Depth (ft): 4900
Formation: Mississippian at RTD
Type of Drilling Fluid: Chemical

Printed by MUD.LOG from WellSight Systems 1-800-447-1534 www.WellSight.com

GEOLOGIST

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Company: Grand Mesa Operating Company
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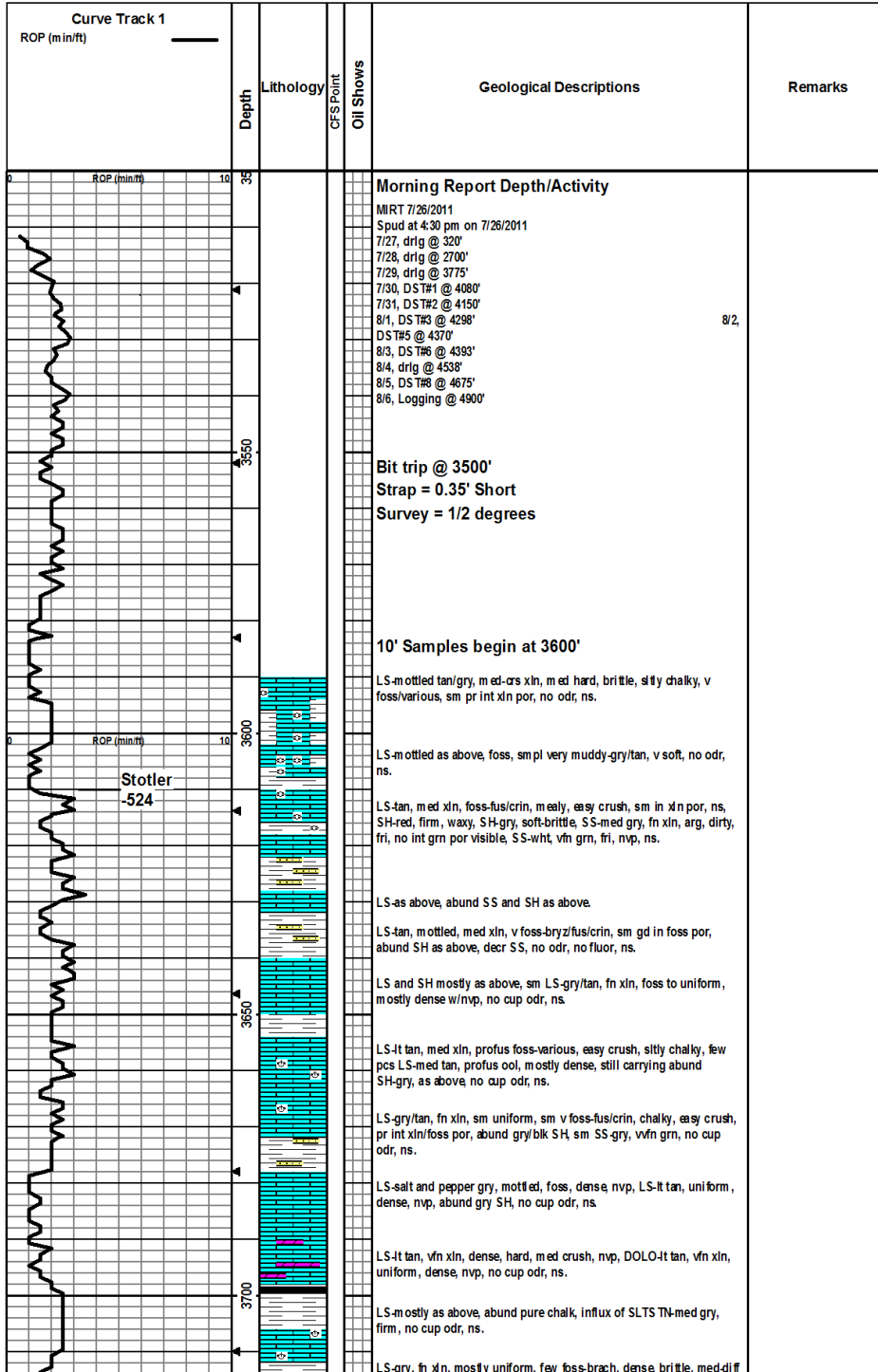
COMMENTS

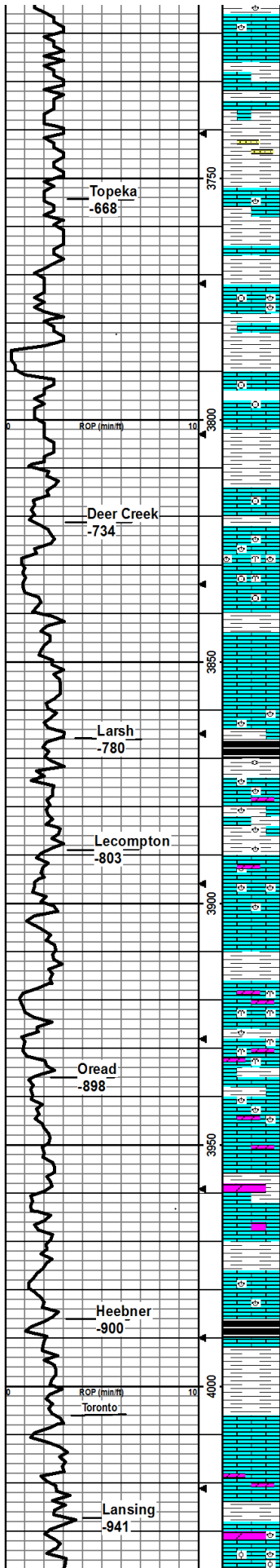
Contractor: Murfin Drilling Company Rig #22
Pusher: Kelly Wilson
Surface Casing: 8 5/8" set at 226'
Production Casing: 5 1/2" set at 4896', to further test the Swope, Hertha, Johnson, Atoka.
Mud by: MudCo
DST's by: Tribite Testing
Logs by: Weatherford (DIL, CN-CD, ML, SON, IMAGE)
RTD=4900'
LTD=4902'

FORMATION TOPS

FORMATION	SAMPLE TOPS		LOG TOPS	
	Depth	Datum	Depth	Datum
Stone Corral	2439'	+647	2439'	+647
B/Stone Corral	2457'	+629	2458'	+628
Heebner Shale	3986'	-900	3988'	-902
Lansing	4027'	-941	4030'	-944
Muncie Creek Shale	4200'	-1114	4198'	-1112

Stark Shale	4291'	-1205	4292'	-1206
Hushpuckney Shale	4334'	-1248	4334'	-1248
Marmaton	4404'	-1318	4409'	-1323
Little Osage Shale	4540'	-1454	4541'	-1445
Morrow	4696'	-1610	4698'	-1612
Mississippian	4743'	-1657	4743'	-1657
RTD	4900'	-1814		
LTD			4902'	-1816





crush, nvp, decr chalk, sm LS-med tan, med xln, foss, scat in foss por, no cup odr, ns.

LS-drk-med gry, vfn xln, v dense hard, nvp, sm LS-mottled/foss, as above, abund gry SH, no cup odr, ns.

LS and SH as above, no change.

LS-med-drk gry, vfn xln, foss-brach, v dense hard, brittle sm LS-tan, med xln, foss, abund drk gry SH, no cup odr, ns.

LS-gry, fn xln, foss-brach, mottled, dense, hard, nvp, ns. sm LS-tan, foss, as above, no cup odr, ns.

LS-mostly crm/lt tan, vfn xln, chalky, easy crush, abund gry blk SH, nvp, ns.

LS-drk-med gry, vfn xln, mostly uniform, rare foss-brach, rare pls, sm LS-lt tan, fn xln, v foss-fus/brach/crin, nvp, no cup odr, ns.

LS-med gry, fn xln, mostly hard/dense/uniform, sm foss-brach/bryz-fen, abund pure chalk, nvp, no cup odr, ns.

LS-crm-lt tan, fn xln, mostly dense, med crush, mostly uniform, few v foss-crin/brach, rare stylo w/drk stn along frac faces, cuts blu/gry, no cup odr, nsfo.

LS-gry/tan, fn xln, mostly dense/hard/uniform, few pcs foss, nvp, no cup odr, ns.

LS-mostly as above, sm LS-tan, fn-med xln, v foss-brach/crin, easy-med crush, sm pr int foss por, few pcs CHERT-drk tan, transl, no cup odr, no fluor, ns.

LS-crm-tan, fn xln, mostly dense/uniform, few pcs foss-various, sm LS-tan, med-crs xln, profus foss, pr-fr int xln/foss por, abund chalk, few pcs CHERT, abund drk gry SH, no cup odr, sm m in fluor, ns.

LS-mostly as above, incr LS-lt tan, crs xln, foss/mealy, fr int xln por, SH-drk gry, few pcs blk carb, no cup odr, ns.

LS-gry/tan, fn xln, dense/brittle, uniform, med-diff crush, sm DOLO-lt tan, fn xln, gd vug por, med crush, no cup odr, no fluor, ns.

LS-lt tan, fn-med xln, dense, diff crush, sm foss-brach, nvp, sm CHERT-gry, op-transl, foss, abund SH-blk/brn/red/grn, sm silty, no cup odr, ns.

LS-mostly as above, sm v foss/mealy w/fr int foss por, sm DOLO-lt tan, fn xln, dense w/nvp, SH's as above, no cup odr, ns.

LS-med-lt tan, med-crs xln, mostly profus foss-various, mealy, sm pr int foss por, brittle sm dolomitic, easy crush, abund pure chalk, abund SH-gry, silty, no cup odr, ns.

LS-lt tan/crm, med xln, v foss-brach/spic, mealy, grainy/silty, sm dolomitic, med crush, rare pr int foss por, decr chalk, sm CHERT-gry, transl, nvp, no cup odr, no fluor, ns.

SH-predom red, sm gry/blk, sm silty.

SH-red/brn, sandy, silty, sm anhy/gyp.

LS-crm/tan, med xln, sm v foss/ool-bryz/fus/crin, in foss/ool por filled w/calcite, sm DOLO-tan, pr vug por, abund SH-gry, silty, no cup odr, no fluor, ns.

LS-crm, fn xln, mostly dense, sm foss-various, med crush, abund DOLO-gry/tan, fn xln, dense/uniform, nvp, no cup odr, ns.

LS and DOLO as above, sm profus foss-bryz/crin/spic, mostly dense, sm por vug por, scat drk gry min stn along faces, no cup odr, nsfo.

LS-crm, med xln, foss-various, easy crush, grainy text, scat pr vug por, ns, DOLO-tan, fn xln, mostly dense rare pr vug por, sm chalk, abund red/brn SH's as above, abund SLTSTN-wht/gry w/sm anhy/gyp xls, no cup odr, ns.

LS-gry/crm, fn xln, sm foss as above, abund chalk, influx of LS-gry, mostly dense/uniform, void of foss, hard, brittle, abund SH's gry/red/brn, sm silty/grainy, no cup odr, scat chalky min fluor, ns.

LS and DOLO as above, scat pr int foss por, no cup odr, ns

smpl predom SH's, gry/drk gry/red/orn/brn, silty, some gyp xls, abund pyrite, sm LS-lt tan, med xln, foss, sm pr vug por, no cup odr, ns.

SH-blk, carb, fissile, waxy, abund in 4000 sm pl.

SH-predom gry, sm blk-not carb, abund red/orn, silty, no cup odr, ns.

LS-lt gry, fn xln, mostly dense/hard, med crush, sm chalky w/ easy crush, few pcs per tray w/vsfo, no cup odr.

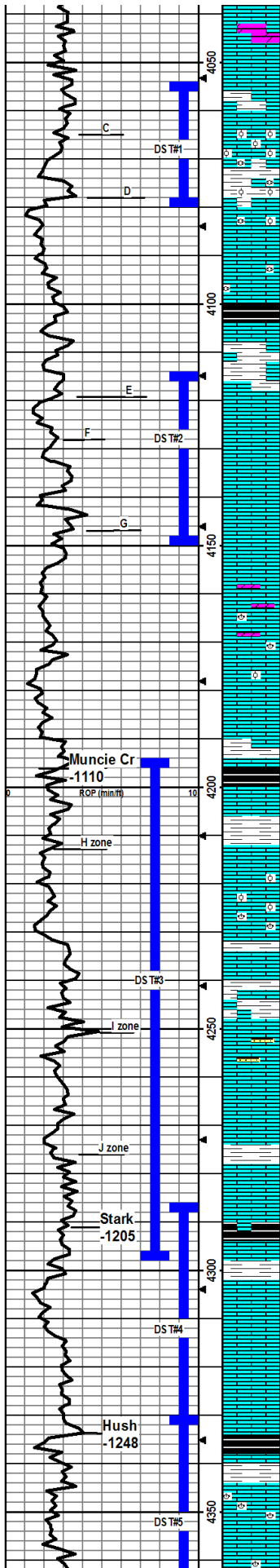
LS-lt gry, fn xln, mostly dense, chalky, 2-4 pcs per tray w/pr int xln por, vsfo, diff to break out of por, 1 pc w/pr pp/vug por w/vsfo, rare spotty stn, no fluor, no cup odr.

DOLO-predom gry, sm tan, fn xln, mostly dense/hard, diff crush, rare pr pp/vug por, sm CHERT-gry, opaque, sm LS-chalky, as above, nvp, no cup odr, no fluor, ns.

LS-crm, med-crs xln, foss, mealy, sm fr-gd int foss por, ns, abund DOLO-lt tan, med xln, sm dense/uniform, sm w/pr int xln por/gd vug por, abund CHERT-gry, sharp/fresh, opaque, no cup odr, ns.

Mudco: 3870'
 WT: 9.2
 VIS: 55
 pH: 9.0
 CHI: 5k
 LCM: 3#

Samples poor, a lot of SH sluff, red/gry.



LS/DOLO as above, incr CHERT-predom wht fresh, opaque, foss, no cup odr, ns.

LS-ft crm, fn xln, mostly dense, brittle, med crush, uniform, slty chaly, 2-4 pcs per tray w/spotfy fr vug por, rare large calcite rhomb bs w/trace in por, no cup odr, scat dul min fluor.

LS-crm, vfn xln, dense/brittle, sm chaly, rare foss-brach, ooc stylo frags w/drck min stn, does not cut, scat dul yet fluor, abund SH-gry/blk, no cup odr, ns

LS-crm, fn xln, profus ool/foss-fus, brittle, easy-med crush, fr-gd int foss/ool por, gd sho med brn fo in al por, gd sat in many pcs per tray, wvk to no bleed on break, dull gold fluor, streaming pale cut, gd cup odr, wk odr on break, no gas bub, base of zone is LS-wht crm, fn xln, uniform, dense, nvp, gd cup odr.

SH-gry/grn, silty, flecks drk min.

LS-wht crm, fn xln, dense, brittle, uniform, abund pure chalk, rare pr pp/vug por, no cup odr, scat min (chalk) fluor, ns. LS-as above, decr chalk, rare foss-fus, one pc tan ool LS w/pr int ool por and vss drk fo-probably from C zone above. LS-as above, rare foss-fus, vchaly, no cup odr, ns.

SH-gry/brn. LS-crm, fn xln, rare foss-fus, mostly dense, uniform, rare pr pp/vug por, rare int xln por, rare trc drk fo will not break out of por, no cup odr.

LS-crm/wht, micro-fn xln, rare foss-fus, chaly, rare fr-gd pp/vug por-all barren, rare (2-3 pcs per tray) pr int xln por, rare trace of drk fo, abund SH-drk gry/brn/pur, sm silty, no cup odr.

LS-crm/wht, fn xln as above, mostly dense/uniform, chaly, few pcs per tray w/pr int xln por w/vsfo, will not break out. 2-3 pcs per tray w/pr-fr pp/int xln por w/vsfo, bleed on break, no odr, scat dul fluor, abund SH-gry/grn/pur/brn/orn, some silty.

LS-wht crm, micro-fn xln, dense, v chaly, rare foss-fus, few pcs per tray w/pr pp por w/vsfo, sm barren por, few stylo w/trc of fo in frags, abund pyrite, no cup odr, wk gold fluor in several pcs per tray, abund SH-gry/grn sm silty, rare congl.

LS-crm/lt gry, micro-fn xln, brittle sparry, dense, foss-brach/fus, chaly, rare pr int xln por, CHERT-gry, sharp, foss, opaque few pcs DOLO-t tan, fn xln, dense, hard, nvp, abund SH-gry/red/brn, sm congl, no cup odr, ns.

LS-gry, micro xln, foss, sm slty ool, sparry, dense, hard, brittle, nvp, no cup odr, ns. SH's as above, sm congl.

LS-mostly as above, few pcs crs xln, sparry, no cup odr, no fluor, ns.

LS-gry/crm, fn xln, sm crs xln, sparry, dense/hard, nvp, ns, smpl is predom SH-drk-med gry/brn/red, silty, few pos blk carb, abund pyrite, no cup odr.

LS and SH as above, smpl retruns poor, running in a tank of mud while drilling ahead.

sample returns are poor, mixing mud.

LS-wht crm, fn xln, mostly dense/uniform, sm chalk, sm sparry, rare pr int xln por, v rare fr-gd pp/vug por, vssfo, difficult to break out, gd sat even brn stn in drys, sm calcite filled frags, few pcs ool/foss-brach/fus, all int ool por filled w/calcite, nvp, ns.

LS-med tan, med xln, grainy, sm ool, sm chalk, rare pr fr int ool por as above w/vsfo, no cup odr, sm pl is predom gry SH.

Mix of SH's, gry/brn/red, sm silty, few SS clusters, rare pcs LS-crm, fn xln, ool w/pr-fr int ool, ss dark fo, no cup odr, no fluor.

smpls still poor, mixing mud, sm pl nearly all SH's-variuous, few pcs LS-crm, fn xln, mostly uniform, rare pcs LS-crm, ool as above w/pr-fr int ool por, sfo, no cup odr.

60smpl same as above, no pcs w/sho.

LS-crm/lt gry, fn xln, dense/brittle, mostly uniform, nvp, no cup odr, ns, smpls remain poor, predom SH's as above.

LS and SH as above, 4298 60min smpl-influx of abund SH-blk, carb, blocky, waxy.

LS-ft tan/gry, micro-fn xln, sm med xln/sparry, silty chaly, hard/brittle-soft/chaly, abund fr int xln por, sm pr-fr pp-vug por, average 50% sat, fr sho drk fo in many pcs per tray, patchy (50-75%) med brn stn in drys, gd cup odr, vdul gold fluor, streaming cut.

LS-gry/tan, fn xln, mostly dense, uniform, decr chalk, rare foss-spic, decr por and sfo as above, fr cup odr.

SH-blk, carb, abund in 4350 sample.

LS-tan-ft tan, sm crm, mostly fn xln, dense, hard, foss-brach, pr-fr int xln por, fr pp por, fr sfo in por, sm LS-brn, crs xln, sparry, fr-gd int xln por, fr sho drk fo in many pcs/sample, v strng cup odr (ptr and sulf), v strng sample odr under heat of microscope, dul gold fluor, immed pale blu/wht streaming cut, patchy med brn stn in drys.

LS-dr. fn xln, uniform, rare foss-brach/spic, dense nvp, decr sholith.

DST#1
C zone
 4055'-4080'
 30-45-45-60
 Rec:
 240' WCM
 180' MCW
 IFFP: 27-66#
 FFP: 74-124#
 SIP: 1086-1078#

Mudco: 4080'
 WT: 9.4
 VIS: 60
 pH: 10
 Chl: 6k
 LCM: 4

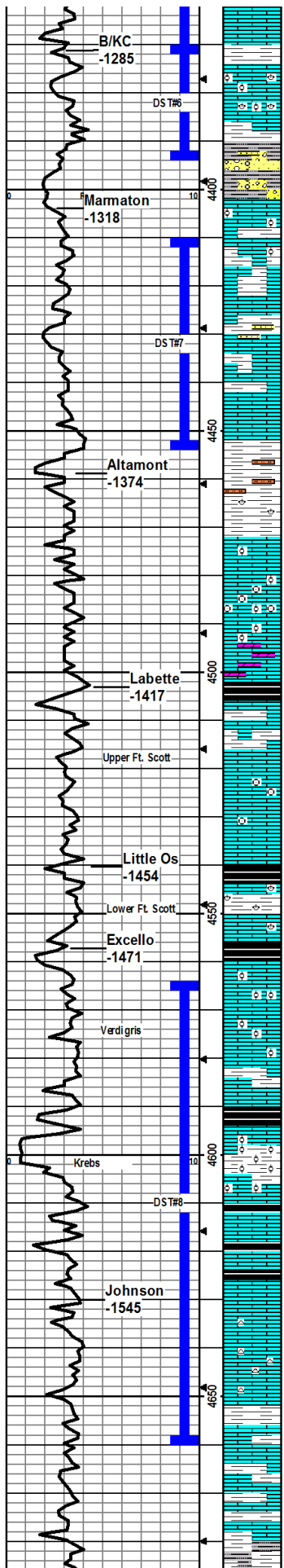
DST#2
E-F zone
 4115'-4150'
 30-45-45-60
 Rec:
 665' MCW
 IFFP: 42-186#
 FFP: 202-314#
 SIP: 1075-1050#

Mudco: 4170'
 WT: 9.4
 VIS: 60
 pH: 9.5
 Chl: 7.5k
 LCM: 3

Mudco: 4298'
 WT: 9.2
 VIS: 63
 pH: 11
 Chl: 5k
 LCM: 3

DST#4
Swope
 4286'-4330'
 30-45-30-60
 Rec:
 1550' TF
 496' MCW
 279' WCM
 775' Wtr
 IFFP: 175-700#
 FFP: 730-947#
 SIP: 1124-1130#

DST#5
Hertha
 4330'-4370'
 30-45-60-90
 Rec:
 1395' TF
 403' GIP
 310' MCW
 310' OCMW



strng cup odr, scat dul gold fluor.

LS-gry/tan, fn xln, rare foss, dense/hard, nvp, few pcs CHERT-gry, fresh, still carrying very strong cup odr, decr sho.

LS-crm/tan, mostly fn xln, dense, uniform, sm foss/ps/ool, sm LS-gry, crs xln w/fr-gd int xln por, few pcs per tray w/gd int foss/ool por w/med brn stn in por, sfo in several pcs per tray, gd cup odr, dul gold fluor in several pcs/tray, brt blu/wht streaming cut, decr por and sho in base, few pcs DOLO-t tan, fn xln, hard, mostly dense/uniform, sm w/fr vug por, ns.

SS-It blu/gry, vfn grn, arg, nvp, ns, abund SH-predom gry, sm red, no cup odr.

LS-It brn, fn xln, ool/foss, dense, nvp, sm LS-tan, micro xln, dense, uniform, nvp, sm LS-It gry w/drkr gry inclus (foss?) stly chalky, rare int xln por, ns, few pcs w/patchy drk stn, does not cut, no cup odr, scat min fluor, ns.

SH-gry/blk, silty, sm red, waxy, no cup odr, ns.

SH-gry/drkr gry, sm brt orn, silty, mica, striated, silty, SS-It blu/gry, vfn grn, arg, nvp, no cup odr, ns.

SH-as above, gry/brn/orn, silty, sm SS-fn grn, dirty gry, arg, nvp, two small pcs LS-tan, fn xln, ool w/fr int ool por, vsfo, no cup odr, no fluor.

LS-crm/tan, micro-fn xln, ool in part, w/fr int ool por, ss drk fo, sm dense, stly foss, med crush, w/fr pp/vug por, sho med-drk fo in all por, breaks out of por, no cup odr, still carrying abund SH as above.

LS-gry, fn xln, dense, hard, uniform, nvp, no cup odr, ns.

SH-med-drkr gry, sm silty.

LS-tan, fn xln, mostly uniform, sm stly foss-brach, dense, brittle, nvp, no cup odr, ns.

LS-gry/tan, fn xln, mostly uniform, sm foss-brach, few chalky, one small pc ool w/pr int ool por, vsfo, no cup odr, no fluor.

LS-med-It tan, micro-fn xln, mostly uniform, hard, brittle, sm foss-vfoss/ool, sm chalky, few (3-4) pcs per tray w/pr int xln/foss por, vsfo-will not break out, 2-3 pcs per tray w/rare pr vug por and vsfo, wk bleed on break, scat v dull gold fluor, no cup odr, carrying much SH-gry/red/orn.

DOLO-t tan, fn xln, uniform, dense, vpr int xln, por, no cup odr, ns, LS-crm/tan, fn xln, foss, dense, nvp, ns.

SH-mostly drkr gry-med gry, abund blk/carb in 4530 sm pl, grainy, soft, flakey.

LS-gry, mostly fn xln, few micro xln, few crs xln, mostly uniform, sm foss, dense, nvp, no cup odr, ns.

LS-gry/orm, fn xln, as above, sm LS-gry, crs xln, flakey/mealy, chalky, sm pr int xln (chalky) por, one pc in two trays w/pr vug por vsfo, will not break out, no cup odr, sm dul min fluor.

LS-mostly as above, few pcs LS-gry, crs xln, w/gry or noidal inclus, stly chalky, vpr int xln por, no odr, sm min (calcite) fluor, ns.

SH-blk, carb.

LS-gry/lt tan, micro-fn xln, vfoss-crin/brach, dense, hard, sm chalk, 1-2pcs w/pr int xln por, vsfo, rare spot sat, no cup odr, no fluor, ns.

SH-blk, carb.

LS-mottled tan/brn/gry, med xln, vfoss-crin/brach, vhard, dense, grainy, sm LS-It tan, micro xln, ool, nvp, abund CHERT-gry/dr, transi-transp, fresh, no cup odr, no fluor, ns.

LS-mostly as above, influx of LS-It gry, fn xln, ool/foss, pr int xln por, rare int foss por, sft sho drkr brn fo in several pcs/tray, no cup odr, scat dul fluor, streaming blu/wht cut, CHERT-as above, foss-fus.

SH-gry/brn/red, waxy, soft, sm silty, sm blk, carb.

Mostly SH-red/brn, v soft.

LS-gry, fn xln, uniform, dense, hard, nvp, no fluor, ns, LS-med tan, micro xln, profus ool, dense, nvp, dul min fluor, no cup odr, ns.

SH-blk, carb.

SH-blk, carb.

LS-It tan, vfn xln, vdense, hard, brittle, spotty pp/vug por, ss med brn fo, no cup odr, spotty dul fluor.

SH-gry.

LS-It tan, vfn xln, mostly uniform, scat pr vug por, rare frags, patchy stn, no cup odr, blu/wht streaming cut, vsfo in few pcs per tray, difficult to break out of por.

LS-It tan, vfn-fn xln, dense, mostly uniform, rare foss, scat pr pp por, rare fr vug por, ssfo, patchy med brn stn in dry, abund CHERT-gry/tan, transi, fresh, quest cup odr.

Predom SH-med-drkr gry, sandy/silty, sm congl, mostly hard/brittle, waxy, sm LS-drkr tan, fn xln, ool/foss, dense, rare int xln por, rare int foss/ool por, one pc w/vsfo (maybe from above), no cup odr, scat dul fluor.

SH-gry's.

Mix of SH's and LS's mostly as above, influx of LS-mottled tan, micro xln, profus ool w/scat pr-fr int ool por, ssfo in all por, few tiny gas bub on break, fnt odr on break, vfrt cup odr, no fluor.

240 GOCMV
186' GOCMV
341' MWCGO
IFP: 82-343#
FFP: 358-582#
SIP: 1173-1184#

DST#6
Pleasanton
4370'-4393'
30-45-30-90
Rec:
1096' GIP
2004' GO
124' MCW
IFP: 172-620#
FFP: 652-873#
SIP: 1235-1247#

DST#7
Lenapah
4410'-4453'
30-30-10-Out
Rec:
3' Mud
IFP: 34-26#
FFP: 28-26#
SIP: 41-N/A#

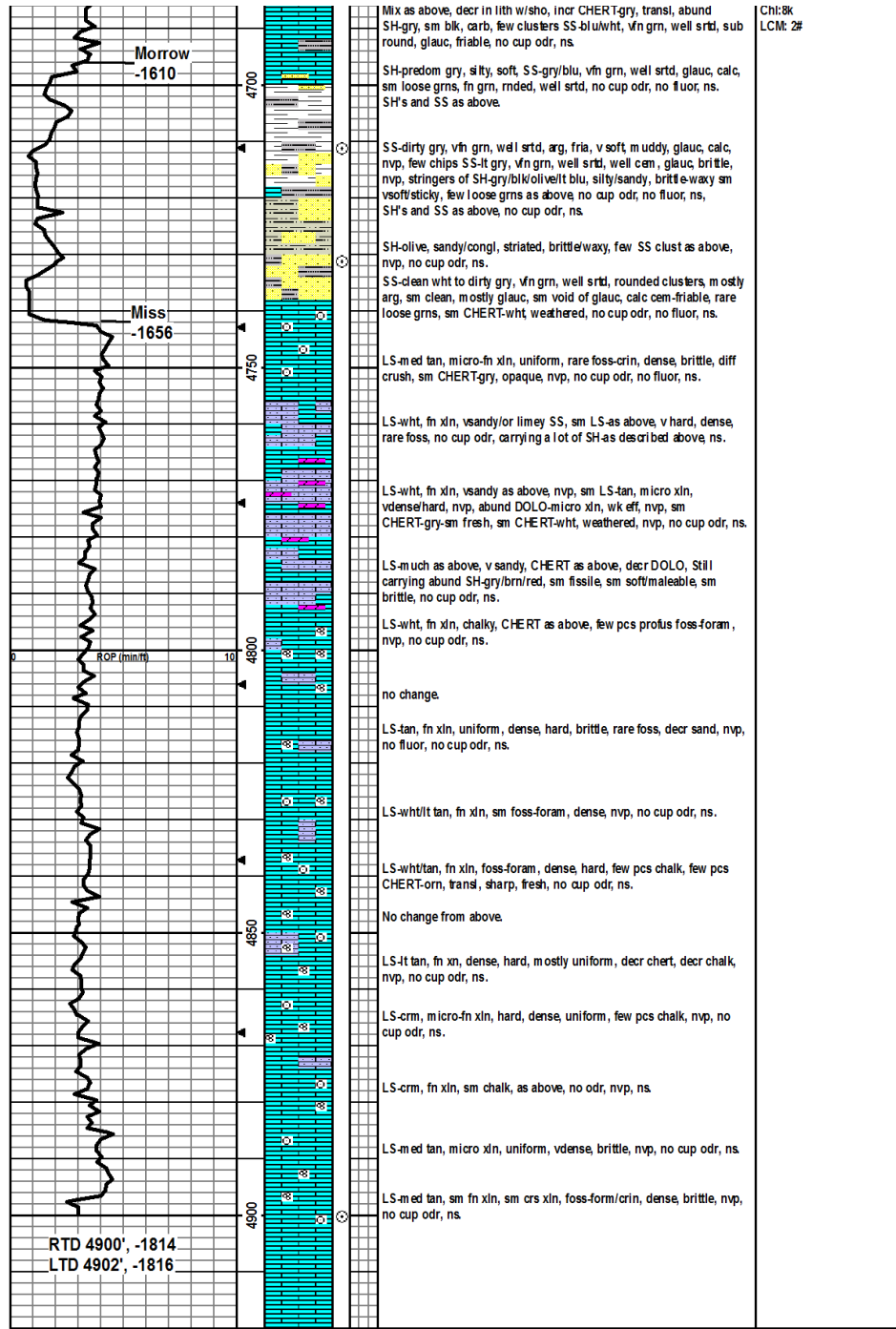
Mudco: 4370'
WT: 9.2
VIS: 60
pH: 10
Chl: 7.5k
LCM: 3

Mudco: 4398'
WT: 9.2
VIS: 68
pH: 9
Chl: 9.8k
LCM: 2

Mudco: 4576'
WT: 9.3
VIS: 64
pH: 11
Chl: 7.7k
LCM: 2

DST#8
Johnson
4565'-4660'
30-45-60-90
Rec:
992' GIP
50' GOCM
310' MCGO
IFP: 46-111#
FFP: 110-160#
SIP: 1130-1109#

Mudco: 4684'
WT: 9.1
VIS: 40
pH: 10



Mix as above, decr in lith w/sho, incr CHERT-gry, transi, abund SH-gry, sm blk, carb, few clusters SS-blw/wh, vfn grn, well srt'd, sub round, glauc, friable, no cup odr, ns.

SH-predom gry, silty, soft, SS-gry/blu, vfn grn, well srt'd, glauc, calc, sm loose grns, fn grn, rnded, well srt'd, no cup odr, no fluor, ns. SH's and SS as above.

SS-dirty gry, vfn grn, well srt'd, arg, fria, v soft, m uddy, glauc, calc, nvp, few chips SS-ft gry, vfn grn, well srt'd, well cem, glauc, brittle, nvp, stringers of SH-gry/blk/olive/t blu, silty/sandy, brittle-waxy sm vssoft/sticky, few loose grns as above, no cup odr, no fluor, ns, SH's and SS as above, no cup odr, ns.

SH-olive, sandy/congl, striated, brittle/waxy, few SS clust as above, nvp, no cup odr, ns.

SS-clean wht to dirty gry, vfn grn, well srt'd, rounded clusters, m ostly arg, sm clean, mostly glauc, sm void of glauc, calc cem-friable, rare loose grns, sm CHERT-wht weathered, no cup odr, no fluor, ns.

LS-med tan, micro-fn xln, uniform, rare foss-crin, dense, brittle, diff crush, sm CHERT-gry, opaque, nvp, no cup odr, no fluor, ns.

LS-wht, fn xln, vsandy/or limy SS, sm LS-as above, v hard, dense, rare foss, no cup odr, carrying a lot of SH-as described above, ns.

LS-wht, fn xln, vsandy as above, nvp, sm LS-tan, micro xln, vdense/hard, nvp, abund DOLO-micro xln, wk eff, nvp, sm CHERT-gry-sm fresh, sm CHERT-wht, weathered, nvp, no cup odr, ns.

LS-much as above, v sandy, CHERT as above, decr DOLO, still carrying abund SH-gry/brn/red, sm fissile, sm soft/maleable, sm brittle, no cup odr, ns.

LS-wht, fn xln, chalky, CHERT as above, few pcs profus foss-foram, nvp, no cup odr, ns.

no change.

LS-tan, fn xln, uniform, dense, hard, brittle, rare foss, decr sand, nvp, no fluor, no cup odr, ns.

LS-wht/t tan, fn xln, sm foss-foram, dense, nvp, no cup odr, ns.

LS-wht/tan, fn xln, foss-foram, dense, hard, few pcs chalk, few pcs CHERT-orn, transi, sharp, fresh, no cup odr, ns.

No change from above.

LS-ft tan, fn xln, dense, hard, mostly uniform, decr chert, decr chalk, nvp, no cup odr, ns.

LS-crm, micro-fn xln, hard, dense, uniform, few pcs chalk, nvp, no cup odr, ns.

LS-crm, fn xln, sm chalk, as above, no odr, nvp, ns.

LS-med tan, micro xln, uniform, vdense, brittle, nvp, no cup odr, ns.

LS-med tan, sm fn xln, sm crs xln, foss-form/crin, dense, brittle, nvp, no cup odr, ns.