

# 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: 1-22 BSB Unit  
Location: 1140' FSL 110' FEL Sec 22-19s-23w  
License Number: 15-135-25820  
Spud Date: 11/28/2014  
Surface Coordinates: 38.381261 -99.843138  
Region: NESS County, KS  
Drilling Completed: 12/5/2014

Bottom Hole Vertical  
Coordinates:  
Ground Elevation (ft): 2269  
Logged Interval (ft): 3460 To: 4561  
Formation: Mississippian  
Type of Drilling Fluid: Mud-Co Chemical  
K.B. Elevation (ft): 2278  
Total Depth (ft): 4561

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

## OPERATOR

Company: Grand Mesa Operating Company  
Address: 1700 N. Waterfront Pkwy, Bldg 600  
Wichita Kansas, 67206

## Comments

Contractor: DUKE RIG #4

Mud: Mud-Co  
Testing: Diamond testing  
Logging: Weatherford

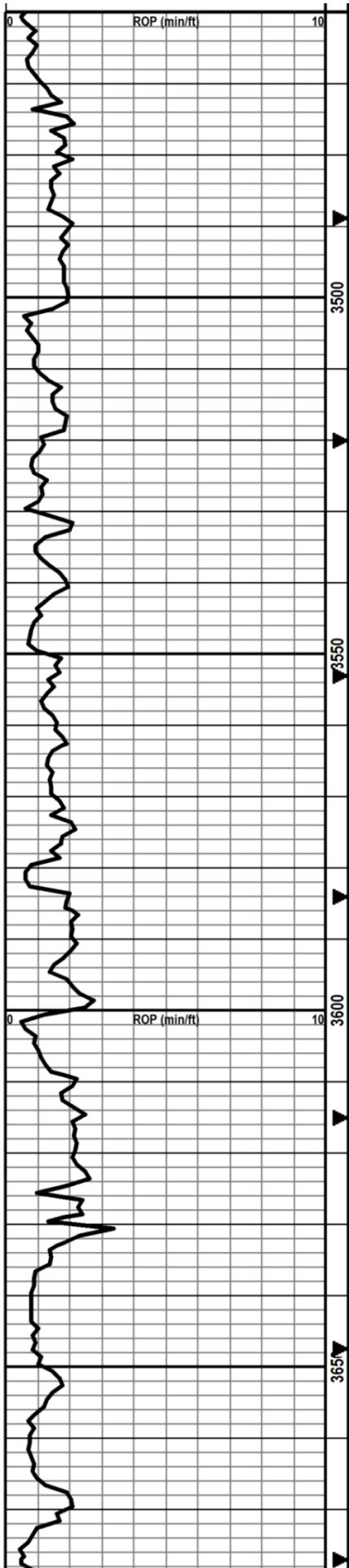
LTD - 4558ft  
RTD - 4561ft

Operator ran 5 1/2 inch casing to further test the Ft. Scott, Krebs, and Cherokee sand.

## Geologist

Steve Carl  
Grand Mesa Op. Co.

Curve Track 1 ROP (min/ft)	Depth	DST Interval	Lithology	Oil/Gas Show	Geological Descriptions	Other info.
—						



20 ft Samples start at 3500

Mostly LS-lt gry, grainy in part, chalky, soft, ns.

MUDSTN-lt gry, calc, grainy, v soft, no cup odr, ns.

LS-lt gry, chalky, grainy, soft, muddy, SH-med gry, silty, soft, ns.

LS-med gry/tan, fn xln, grainy in part, some hard/brittle, foss-various, sm soft, chalky, sm int xln por, no odr, ns.

LS-tan/gry, crs xln, profus foss-spic/fus, mealy, chalky in part, dense, hard, brittle, nvp, some CHERT-gry, foss, no cup odr, ns.

LS-much as above, influx of LS-wht, v chalky, soft, decr CHERT, no cup odr, ns.

LS-med tan, crs xln, foss-crin/various, dense/hard, LS-lt gry, fn xln, uniform to foss-crin, dense/hard, brittle, decr chalk, nvp, no cup odr, ns.

LS-tan, med-crs xln, foss-crin/various, dense, brittle, hard, some LS-gry, micro xln, uniform, dense, brittle, some chalk, nvp, no cup odr, ns.

LS-lt tan, med-crs xln, v foss-crin/fus/brach, mostly dense/hard, some chalky, med crush, some chalk as above, scat fr int foss por, few LS-crm, micro xln, dense, brittle, uniform, nvp, no cup odr, ns.

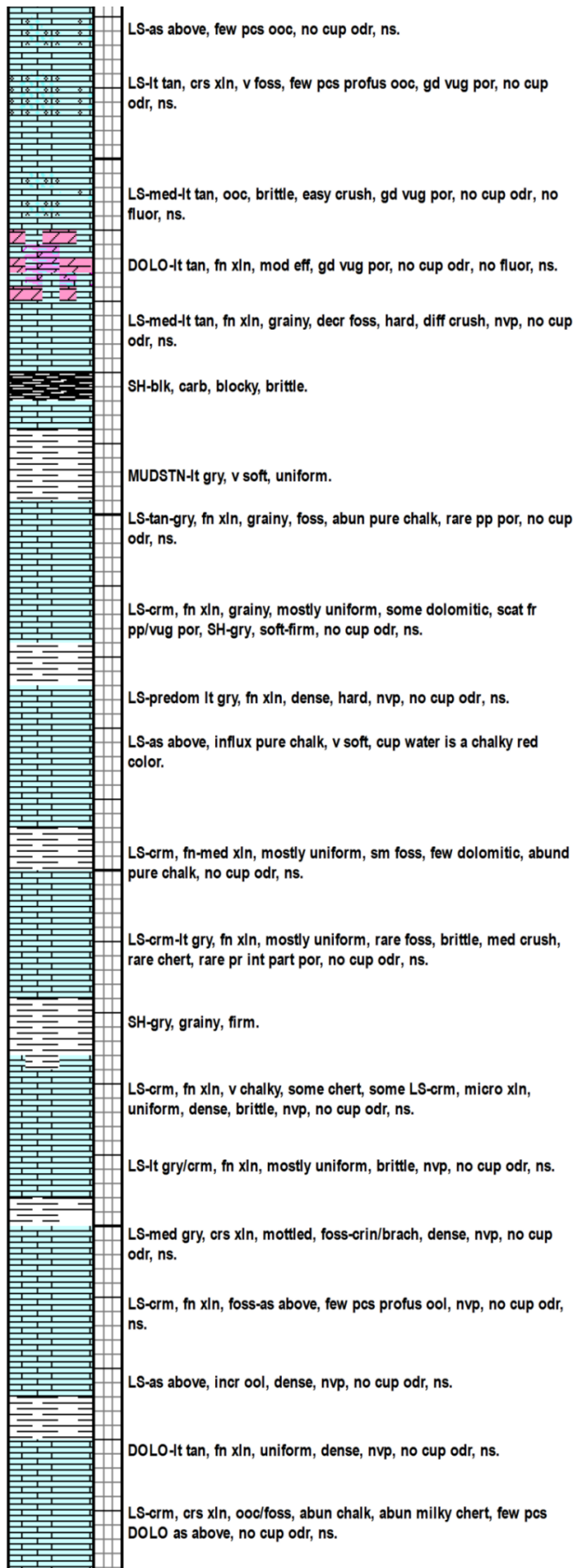
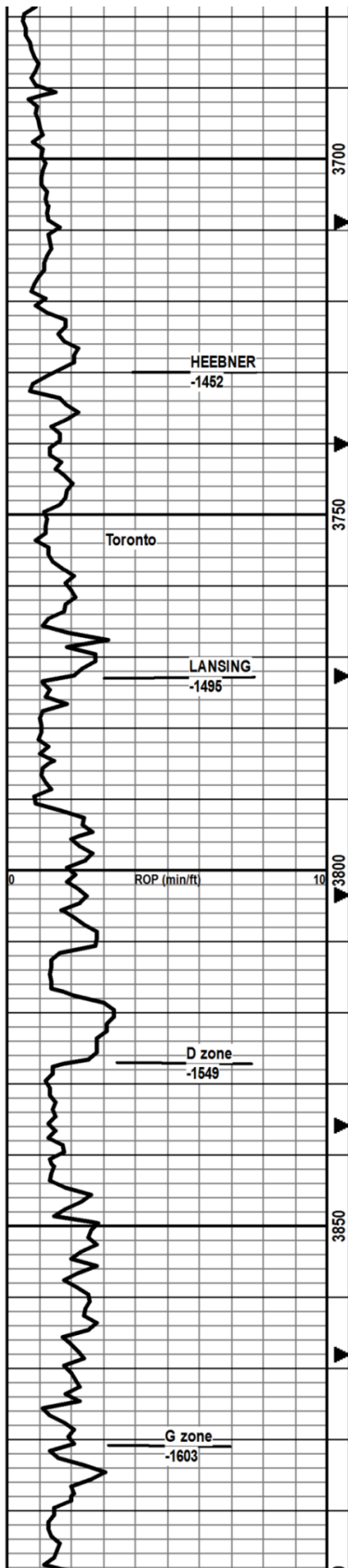
several LS's-predom lt tan, crs xln, v foss-various, grainy, mealy, easy crush, scat int part por, sm LS-crm, fn-med xln, foss, med crush, scat int part por, sm LS-crm, fn xln, dense, hard, diff crush, foss, nvp, no cup odr, ns.

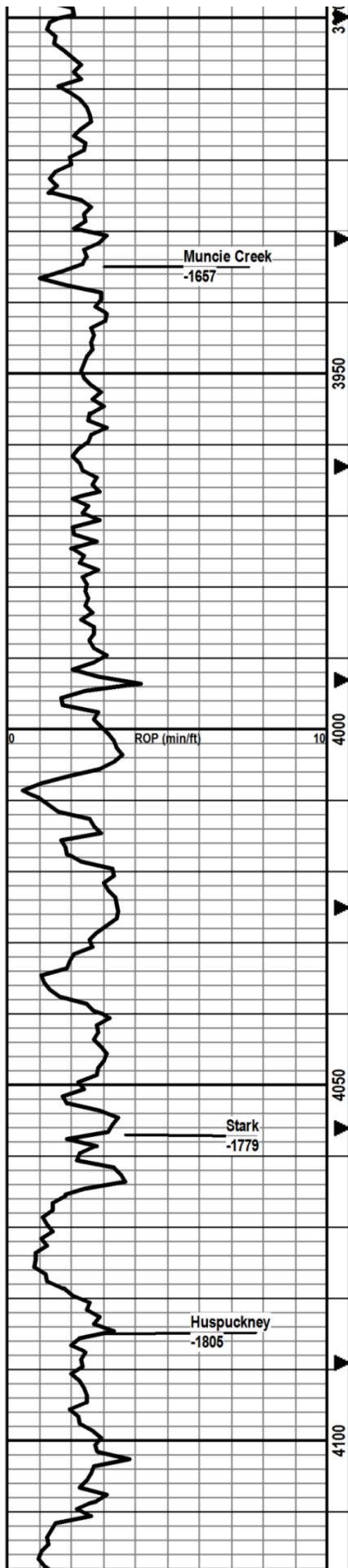
LS-mostly med tan, crs xln, foss, mealy, easy crush, scat in part por, no cup odr, ns.

LS-crm-med tan, crs xln, v foss-fus/brach, mealy in part, brittle, easy crush, scat fr int part por, no cup odr, ns.

LS-mostly lt gry, crs xln, foss as above, brittle, easy crush, decr mealy, some chalk, few pcs chert, scat fr int part por, no cup odr, ns.

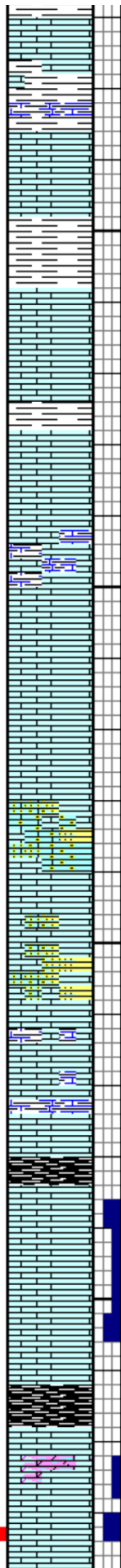
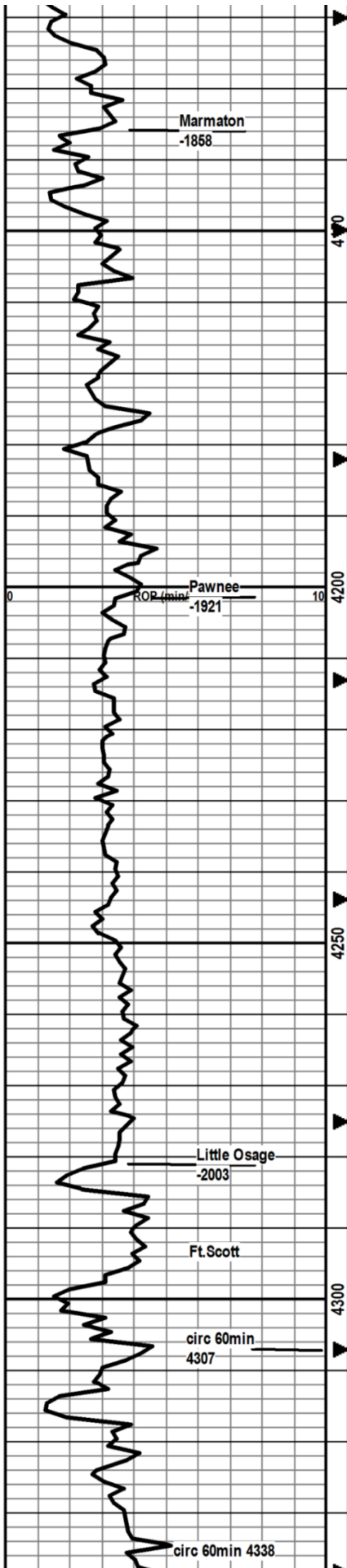
LS-mostly as above, mottled, incr chalk, influx of LS-drk gry, v dense, hard, nvp, no cup odr, ns.





	LS-as above, influx, DOLO-It tan, fn xln, dense, nvp, no cup odr, ns.
	LS- predeom It tan/gry, vfn xln, uniform, dense, hard, rare foss-various, rare pp/vug por, no cup odr, ns.
	LS-It tan, fn xln, mostly uniform, dense, hard, sm chalk, sm chert, SH-drk gry, silty, no cup odr, ns.
	SH-gry/grn, soft/muddy to firm/brittle, silty, few pcs SH-blk, carb, LS-as above, no cup odr, ns.
	LS-It tan/crm, fn xln, mostly uniform, some foss, abund milky sharp chert, some chalk, no cup odr, ns.
	LS-no change. abund sharp chert.
	LS-med-It tan, fn xln, mostly uniform, dense, hard, sm foss/ool, sm sharp milky foss chert, few pcs chalk, nvp, no cup odr, ns.
	LS-no change, SH-gry.
	LS-crm, fn-med xln, dense, brittle, nvp, sm LS-crm, ool, sparry, dense, brittle, nvp, abund chalk, decr chert, no cup odr, ns.
	LS-as above, SH-med gry, silty, no cup odr, ns.
	LS-gry/crm, fn xln, densly pkd ool, w/calcite filled int ool por, sm profus ooc, w vgd vug por, no cup odr, even yel mineral fluor, ns.
	SH-gray/red/brn/maroon, silty, blocky, waxy.
	LS-It gry, fn-med xln, foss, ool, chalky, sm ooc, w gd vug por, sm LS-brn, micro xln, hard, brittle, sparry, foss, nvp, no cup odr, ns.
	LS-crm, vfn xln, sm uniform, sm ool/foss, sparry, calcite filled int foss por, dense, brittle, nvp, no cup odr, ns.
	SH-blk carb, few pcs in 4070smpl.
	LS-brn, fn xln, dense, hard, uniform, nvp, no cup odr, no fluor, ns.
	LS-crm/gry, med xln, foss in part, v chalky, easy crush, nvp, abund chert-gry, transl, foss, sm DOLO-It tan, fn xln, dense, nvp, no cup odr, ns.
	SH-blk, carb, present in 4100smpl. blocky.
	LS-brn, micro xln, v dense, hard, brittle, rare foss, nvp, ns. SH-gry, waxy to silty.
	LS-mostly crm, vfn xln, dense, sparry, foss-various, nvp, sm DOLO-It tan/crm, fn xln, dense, nvp, no cup odr, ns.
	MUDSTN-blu/gry, muddy, v soft, sm SH-gry, silty, fiss, no cup odr, ns.

Mud-Co  
4031'  
12/02/2014  
wt: 8.9  
vis: 51  
Chlor: 3800  
LCM: 1



LS-lt tan, crs xln, foss, mealy, med crush, scat int part por, no cup odr, ns.

SH-gry, silty, some red, blocky, no cup odr, ns.

LS-lt tan, vfn xln, mostly uniform, sm ool/foss, sparry, dense, hard, nvp, no cup odr, ns.

SH-med-drk gry, silty, some sandy, no cup odr, ns.

LS-crm, micro xln, sparry, ool/foss-crin/fus, dense, brittle, nvp, no cup odr, ns.

LS-crm, fn-med xln, mostly uniform, sm chalk, few pcs chert-milky, ool, nvp, no cup odr, ns.

LS-crm as above, no change, decr chalk, decr chert, SH-gry/red, silty/sandy in part. no cup odr, ns.

LS-med gry, fn-med xln, grainy in part, mostly uniform, dense, hard, tough, nvp, LS-crm as above, mostly uniform, sm foss-small brach/fus, rare chalk, nvp, no cup odr, ns.

LS-drk-med tan, fn xln, grainy, uniform, shaley, nvp, no cup odr, ns.

LS-crm, vfn xln, mostly uniform, dense, sm chalk, few DOLO, nvp, no cup odr, ns.

LS-crm, fn xln, sm grainy, mostly uniform, sparry, dense, brittle, sm chalky, rare foss, nvp, no cup odr, ns.

No change

LS-mostly as above, influx of LS-med tan, fn xln, sandy, dense, hard, nvp, no cup odr, ns.

LS-crm, vfn xln, sparry in part, sm sandy, dense, hard, nvp, no cup odr, ns.

LS-as above, darker tan, incr sandy, nvp, no cup odr, ns.

LS-drk gry/blk, fn xln, vig eff in acid, silty, grainy, shaley, med crush, nvp, SH-various, gry/brn/red, silty, sandy in part, mostly brittle and blocky, no cup odr, ns.

SH-blk, carb, flood in 4290 sample, no cup odr, ns.

LS-tan, predom fn xln, sparry, dense, brittle, patchy pr int xln por, drk oil locked in por, sm LS-crm, crs xln, w abund fr int xln/pp por, fr sho v lt brn free oil in all por, bleed o&g on break, brt yel fluor, pale blu streaming cut, patchy lt brn stn in drys, fr cup odr.

30 min: much as above, decr sho, influx of chalk, sm milky chert, fr cup odr.  
60min: as above, incr sho, many pcs per tray, brt yel fluor, good cup odr.

SH-blk, carb. LS-lt tan/crm, mostly fn xln, dense, brittle, few pcs/tray LS-crm, crs xln, fr in xln por, fr sfo, faint cup odr.

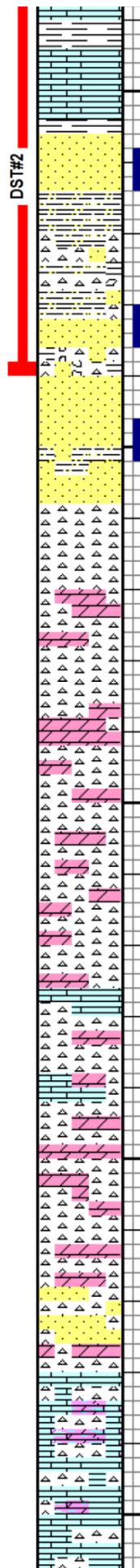
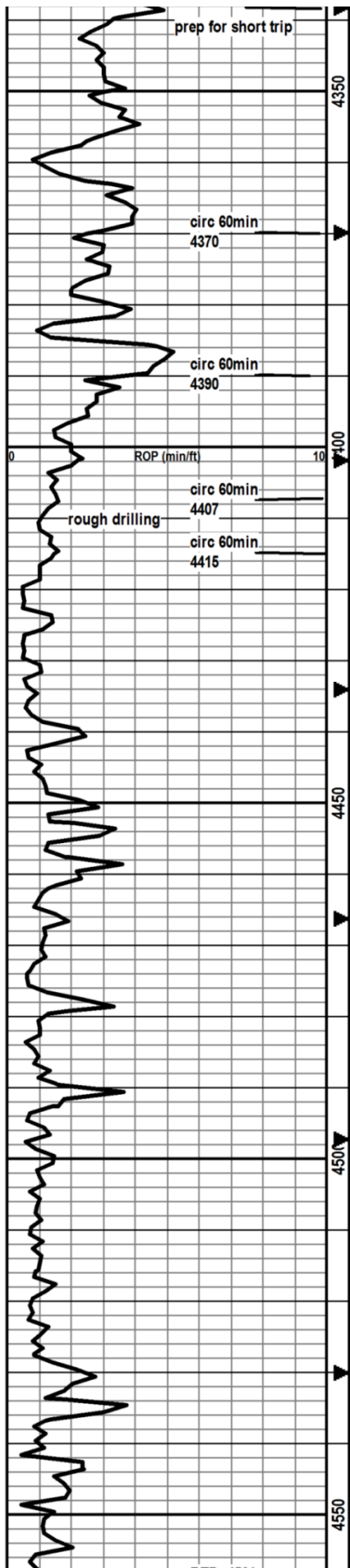
LS-lt tan, vfn xln, mosity uniform, few pcs foss, scat pr int foss/int part por w/ssfo. ques cup odr.

LS-mostly as above, ~10pcs/tray LS-micro xln, vdense, vhard, fr vug por, fsfo, oil is darker brown than the show above. brt yel fluor, good cup odr.

Mud-Co  
4390'  
12/4/2014  
wt: 9.45  
vis: 56  
Chlor: 4600  
LCM: 1

DST#1  
4331'-4370'  
Cher SS  
30-45-60-80  
Rec:  
TF: 490'  
270' GIP  
175' GO  
API: 35deg  
315' GSMCO  
IFP: 10-77#  
BOB 15mins  
ISIP: 1297#  
FFP: 82-186#  
BOB 14mins  
FSIP: 1287#  
BHT: 122deg

Short trin at



SH's-mostly gry, sm red/maroon, blocky, sm silty/sandy, faint cup odr, ssfo in LS-as above.

LS-med tan/brn, micro xln, dense, brittle, hard, nvp, vnt cup odr, ns.

SS-med tan, fn grn, w srted, sub round, abund clust, mod well cemented, fr int grn por, good sat med brn free oil in por, influx brt orange chert, fnt cup odr.

SS-fn grn in above, clusters well cemented, hard, brittle, fr in grn por, gsfo on break, fnt cup odr.

SH-mostly gry, fissile in part, silty, sandy, firm, waxy, no cup odr, ns.

CHERT-wht, weathered, foss, mealy, no eff in acid, gd vug por, sfo in all por, abund ss clusters as above, gd cup odr, vwv gold fluor.

4400 sample mostly shale - trip trash

4407 stop smpl is mostly SH's, many w/rndd edges, few clus ss w/show aa, few weath chert w/vug por and show aa. 30min-flood of ss clusters, fn grn, well srted, well cem, hard, brittle, abund glauc, sat w fo, gd cup odr, immed pale blu wking cut.

30min smpl: influx CHERT-predom wht, 30%milky, mostly sharp/fresh, rare trip with fr por, blk stn in por, trace fo, still carrying ss clusters, gd cup odr.

CHERT-mostly wht-opaque, 20% milky, mostly sharp/fresh, few pcs weathered, no cup odr, ns.

CHERT as above, influx DOLO-wht, fn xln, suc, vwv eff, gd int xln por, no cup odr, no fluor, ns.

CHERT/DOLO as above, no cup odr, no fluor, ns.

CHERT as above, increase in weathered chert, wht, opaque, no cup odr, ns.

CHERT wht/milky, as above, mostly opaque, about 50% weathered chert 50% fresh/sharp, abund DOLO-ft tan, fn xln, suc, no cup odr, ns.

Same, no change.

CHERT and DOLO as above, no change, no cup odr, no fluor, ns.

No change.

CHERT and DOLO, about 50-50 mix, as above, few ss clusters, fn grn, well srted, no cup odr, ns

Influx, LS-wht/grn tint, present in 4550 smpl, fn xln, uniform, med crush, nvp, no cup odr, no fluor, ns.

4560smpl mostly CHERT and DOLO as above, incr in LS as above, no cup odr, no fluor, ns.

30min sample, as above, influx pure chalk, no cup odr, ns.

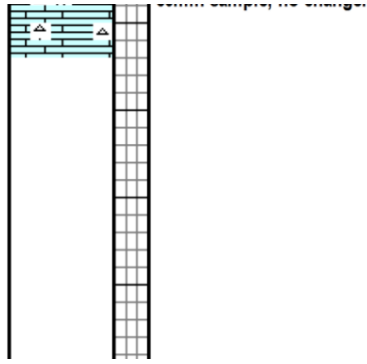
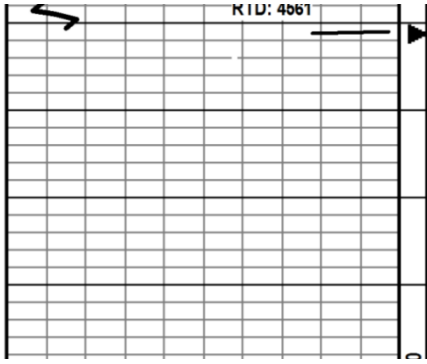
60min sample. no change.

4338'

DST#2  
4332'-4390'  
Cher SS/Chert  
30-45-60-90  
Rec:  
TF: 695'  
440' GIP  
315' GO  
API: 37deg  
255' GSMCO  
125'GHMCO  
IFP: 12-116#  
BOB 9 1/2mins  
ISIP: 1294#  
FFP: 126-262#  
BOB 11mins  
FSIP: 1285#  
BHT: 121

DST#3  
4388'-4415'  
Cher SS  
30-45-60-90  
Rec:  
TF: 1142'  
2' CO  
250' SOHMCW 4% Oil  
760' SOMCW 4% Oil  
65' Water  
60' SMCW  
IFP: 16-210#  
BOB 8mins  
ISIP: 1361#  
FFP: 216-523#  
BOB 9mins  
FSIP: 1363#  
CHLOR: 23kppm

Mud-Co  
4453  
12/05/2014  
wt: 9.2  
vis: 51  
Chlor: 7300  
LCM: 1



TD reached at 12:50pm  
Dec 5 2014