



# Empirica

Scale: 5" / 100'  
Measured Depth Log

**Well Name** Winder South 7

**Location** Sec. 9-T6N-R67W

**State** Colorado

**Country** USA

**County** Weld

**Rig Number** Patterson 346

**API Number** 05-123-43401-00

**Field** Wattenberg

**Geographic Region** DJ Basin

**Drilling Completed** 9/29/2016

**Spud Date** 9/26/2016

**Surface Coordinates** SHL: 2306'FNL, 408' FEL, Sec. 9 T6N R67W

Lat: 40.502673 / 40° 30' 9.6228"

Long: -104.890339 / -104° 53' 25.2198"

**Bottom Hole Coordinates** PBHL: 1376'FSL, 460' FWL, Sec. 8 T6N R67W

**Ground Elevation** 4,856'

**K.B. Elevation** 4,880.5'

**Logged Interval** 6,920' To 17,155'

**Total Depth** 17,155'

**Formation** Niobrara C Chalk

**Type of Drilling Fluid** Oil Based Mud

## Operator

**Company** Extraction Oil & Gas

**Address** 1888 Sherman St., Suite 200  
Denver, CO 80203

## Geologist

**Name** Jared Rouse

**Company** Extraction Oil & Gas

**Address** 1888 Sherman St., Suite 200  
Denver, CO 80203



## Other

**Equipment** ML-589

**Comments** Start: 9-26-16  
TD: 9-29-16

**Services Provided** 2-man Logging  
On Site Geosteering

**Logger Names** Dominic Pitre/ Nicholas V

**Address** ALS Empirica  
6510 Guhn Road  
Houston, Texas 77040

Zone Color Coding

Oil

Note

Error

Condensate

Core

Water

Gas

Pressure

Seal

Rock Types

UNKNOWN

ANHYDRITE

GYPSUM

SALT

CHALK

LIMESTONE

DOLOMITE

CHERT

COAL

MARLSTONE

CLAYSTONE

SHALE

SHALE GRAY

SHALE COLORED

SILTSTONE

SANDSTONE

CONGLOMERATE

BRECCIA

TILL

BENTONITE

TUFF

IGNEOUS

METAMORPHIC

CEMENT

Accessories

**Fossils**

F FOSSIL

GASTROPOD

ALGAE

AMPHIPORA

BELEMNITE

BIOCLASTIC

BRACHIOPOD

BRYOZOA

CEPHALOPOD

CORAL

CRINOID

ECHINOID

FISH

FORAMINIFERA

ARGILLACEOUS

ARGILLITE GRAIN

BENTONITE

BITUMENOUS SUBSTANCE

BRECCIA FRAGMENTS

CALCAREOUS

CARBONACEOUS FLAKES

PLANT REMAINS

PELLET

PISOLUTE

PLANT SPORES

SCAPHOPOD

STROMATOPOROID

GLAUCONITE

GYPSIFEROUS

HEAVY MINERAL

KAOLIN

MARLSTONE

MINERAL CRYSTALS

NODULES

PHOSPHATE PELLETS

PYRITE

SALT CAST

SANDY

DOLOMITIC

FELDSPAR

FERRUGINOUS PELLET

FERRUGINOUS

**Stringer**

ANHYDRITE STRINGER

BENTONITE STRINGER

COAL STRINGER

DOLOMITE STRINGER

GYPSUM STRINGER

LIMESTONE STRINGER

MARLSTONE (CALC) STRG

MARLSTONE (DOL) STRG

SANDSTONE STRINGER

SHALE STRINGER

SILTSTONE STRINGER

Other Syn

ORGANIC

PINPOINT

DEAD

EVEN

QUESTIONABLE

SPOTTED STAINING

FORM

GAS SHOW

VUGGY

NORMAL F

OIL SHOW

OVERTURN

Engineering

BIT

CASING

REVERSE

OVERTURE

SLIDE

SIDEWALL

Porosity

E EARTHY

FENESTRAL

F FRACTURE

INTERCRYSTALLINE

INTEROOLITIC

MOLDIC

CONNECTION (RIGHT)

CONNECTION (LEFT)

CONNECTION GAS

CORE - LOST

CORE - RECOVERED

DST INTERVAL

SURVEY

TRIP GAS

WIRELINE

WIRELINE

atkins

# mbols

ATION TOP L LITHOGRAPHIC

## Rounding

**MX** MICROXLN

**A** ANGULAR **MS** MUDSTONE

**R** ROUNDED **PS** PACKSTONE

**S** SUBANG **WS** WAKESTONE

**F** SUBRND

## Sorting

FAULT

## Textures

**M** MODERATE

CORE (LEFT) **B** BOUNDSTONE **P** POOR

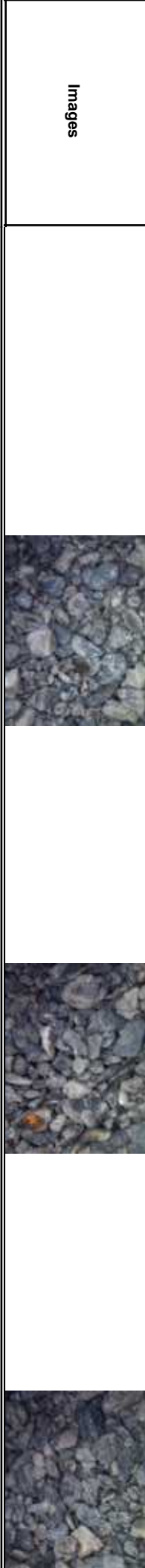
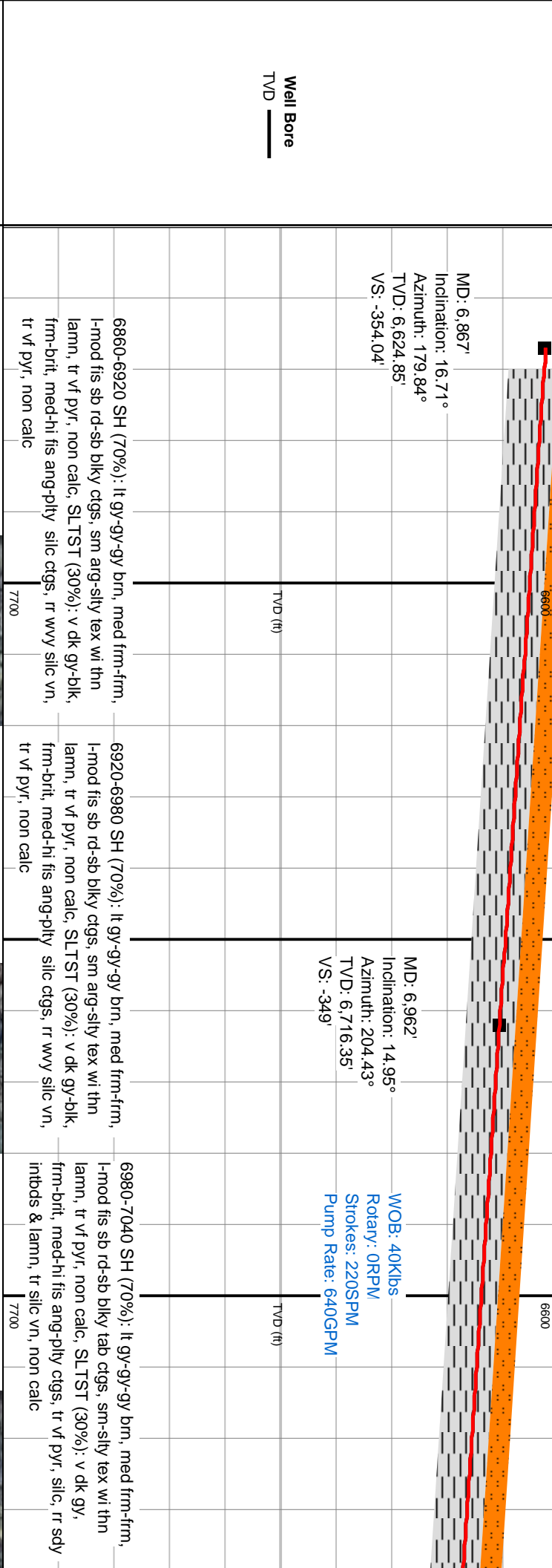
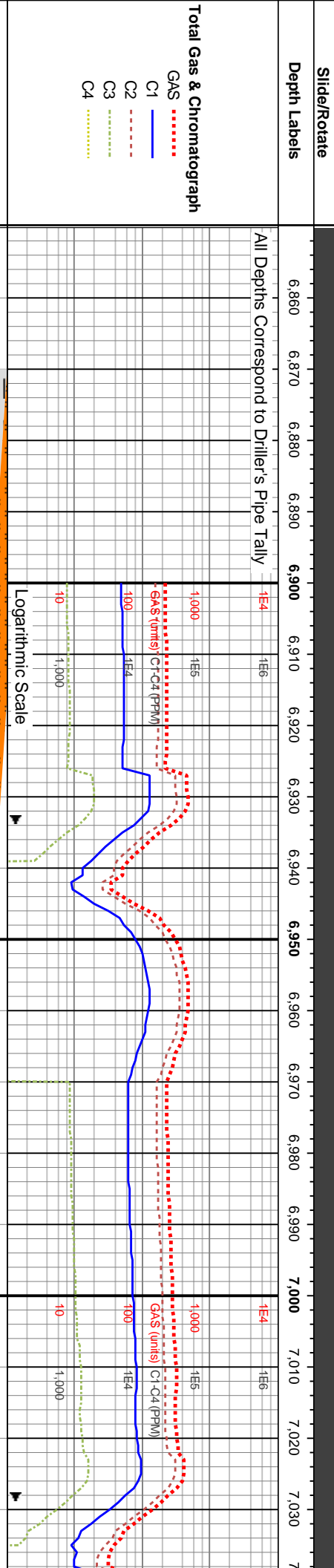
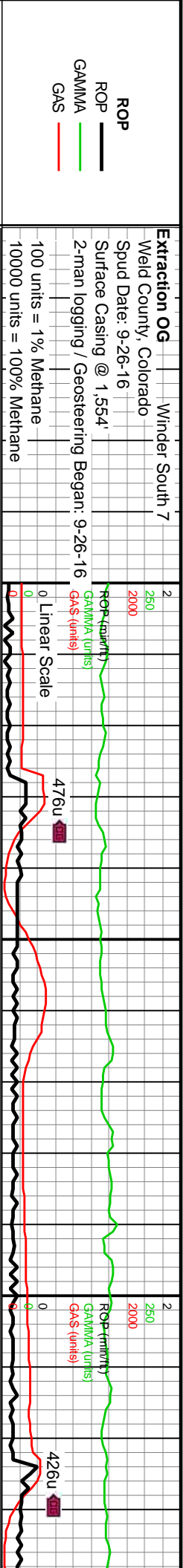
**C** CHALKY **W** WELL

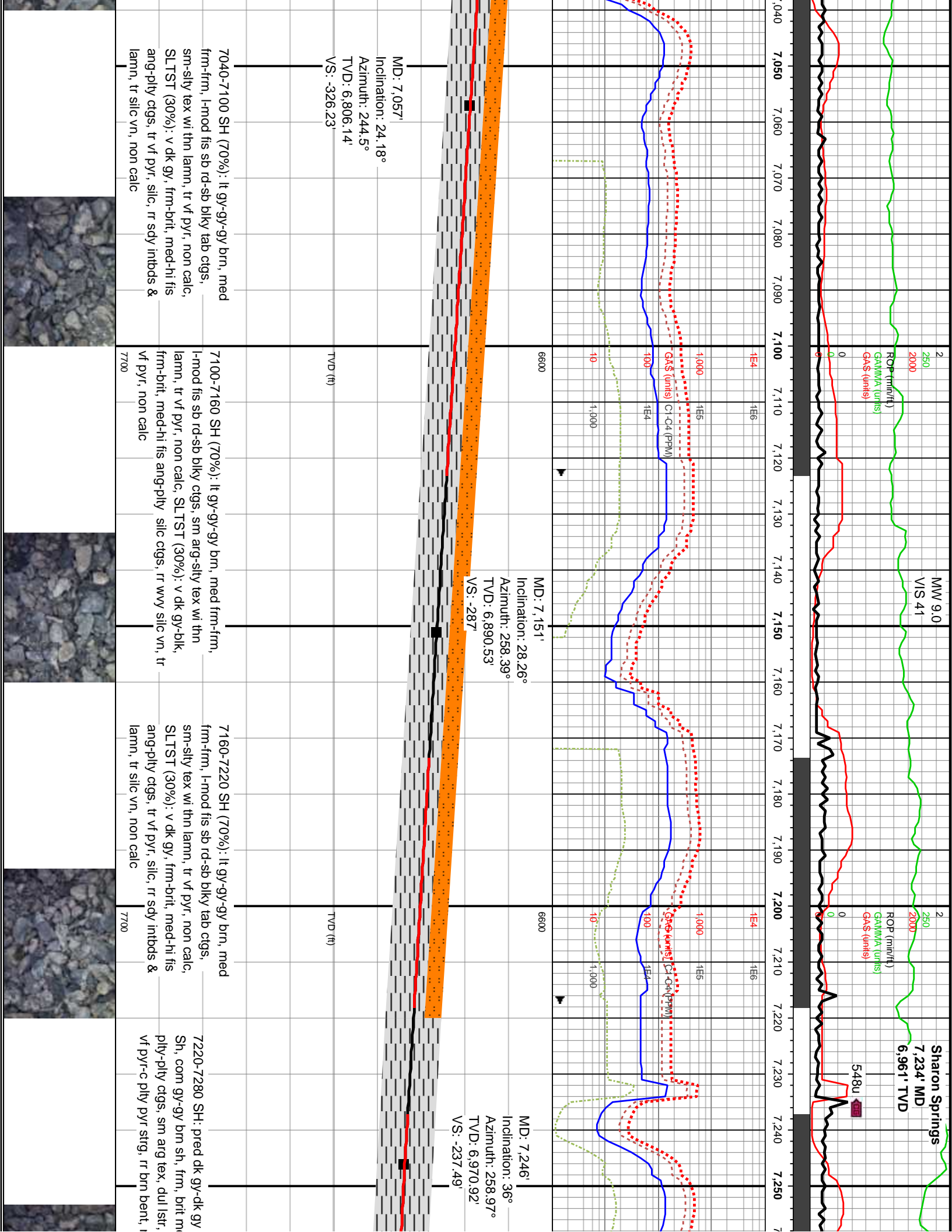
**CX** CRYPTOXLN

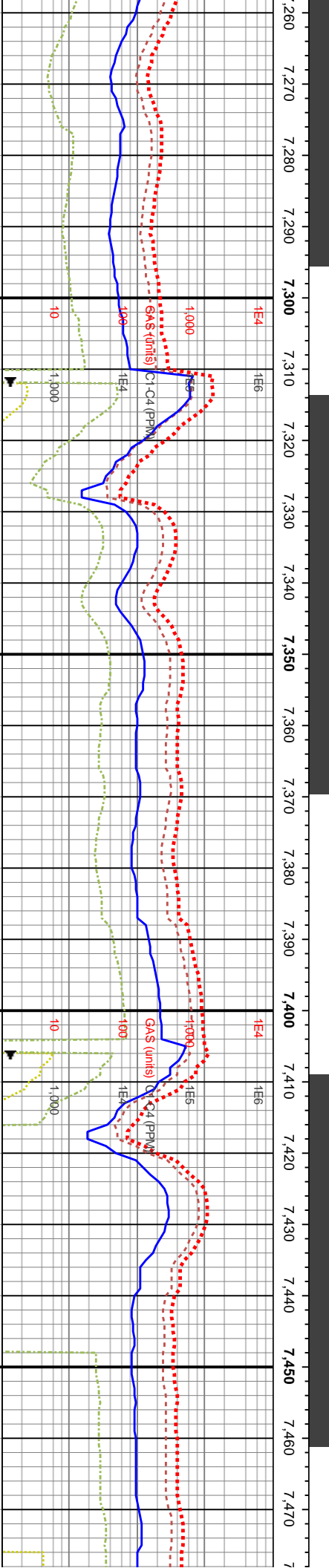
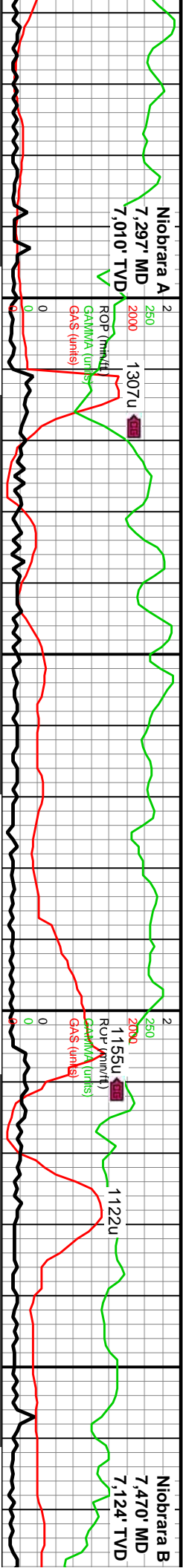
**E** EARTHY

TESTED - LEFT **FX** FINELYXLN

TESTED - RT **GS** GRAINSTONE

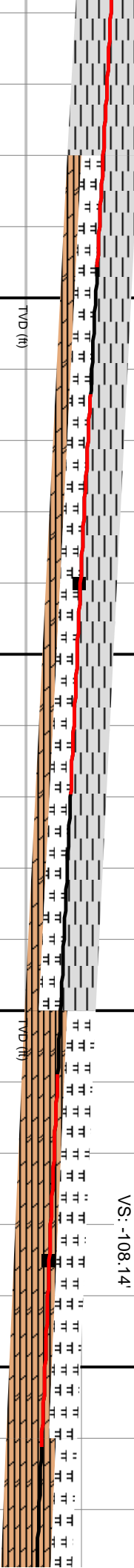






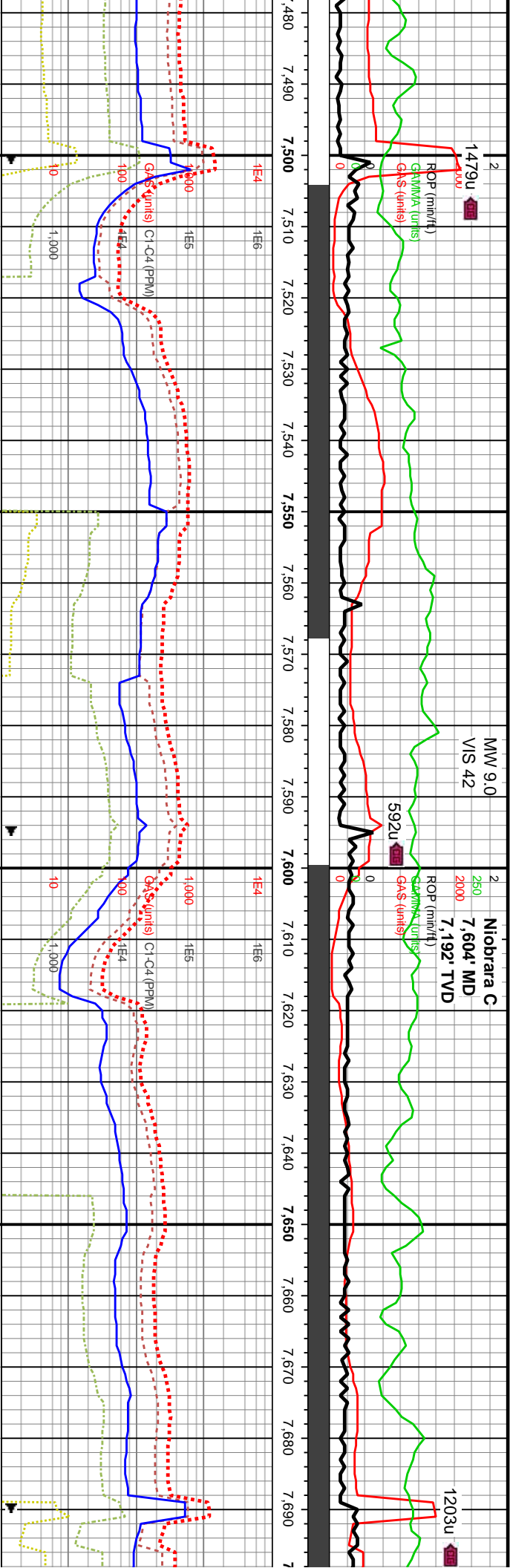
MD: 7,340'  
Inclination: 45.53°  
Azimuth: 254.22°  
TVD: 7,042.05'  
VS: -177.95'

MD: 7,435'  
Inclination: 53.06°  
Azimuth: 257.61°  
TVD: 7,103.97'  
VS: -108.14'



Sharon Spg ed-hi fis blkly-sb slic vn ip, occ-r non calc	7280-7400 SH (50%): pred dk gy-dk gy bl Sharon Spg Sh, com gy-gy brn sh, frm, bri med-hi fis blkly-sb pily-pily cigs, sm arg tex, dul lstr, slic vn ip, occ-r vf pyr-c pily pyr stgy, rr brn bent, non calc, MRLST (30%): gy-dk gy, frm-brit, mod fis sb blkly cigs, sm-sl rgh tex ip wi wh dk brn mntly incl, dul rthy-wxy lstr, tr vf pyr, tr c pyr stgy, tr chk inltd, mod calc wi brn mntly resdl, CHK (20%): lt gy-lt gy brn-gy, occ vf-u f chky incl & rr brn mntly incl ip, pred mod fis sb blkly-blky cigs wi sm-sl silty tex, tr c free chk, tr vf pyr, hi calc, wi incr mntly incl grdg to MRLST	7400-7460 CHK (60%): pred gy-gy brn-dk gy, occ lt gy, v arg LS wi occ vf-f chky incl & occ thn chky lamn, frm-brit mod fis sb ang-sb blkly-occ pily, sm-sily tex, tr c free chk, tr bent, tr vf pyr, hi calc, grdg to MRLST (40%): gy-gy brn-dk gy, med fis sb blkly-blky cigs, rr brn mntly incl, sm-sl silty tex, tr vf pyr, l-mod calc wi brn mntly resdl	7460-7520 CHK arg LS wi occ v frm-brit mod fis tex, rr c free ch brn-dk gy, mot v incl, med fis sb l-mod calc wi br
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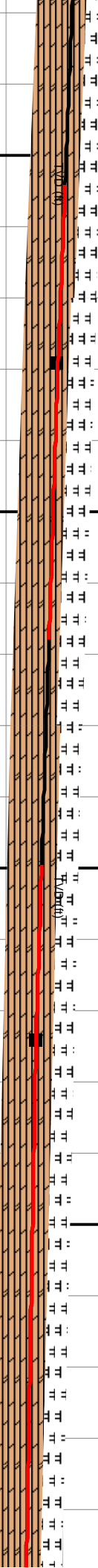


WOB: 33Klbs  
Rotary: 20RPM  
Strokes: 220SPM  
Pump Rate: 640GPM

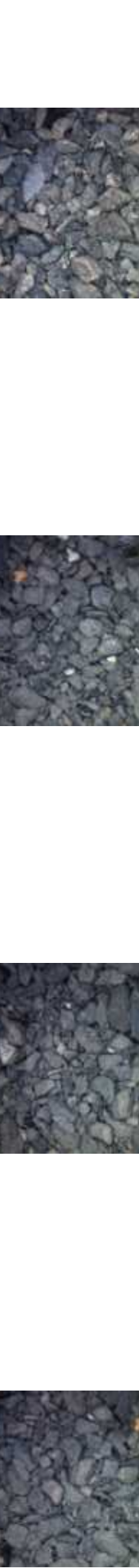
MD: 7,529'  
Inclination: 57.89°  
Azimuth: 260.8°  
TVD: 7,157.24'  
VS: -32.09'

6600

MD: 7,624'  
Inclination: 67.11°  
Azimuth: 260.69°  
TVD: 7,201.06'  
VS: 50.99'

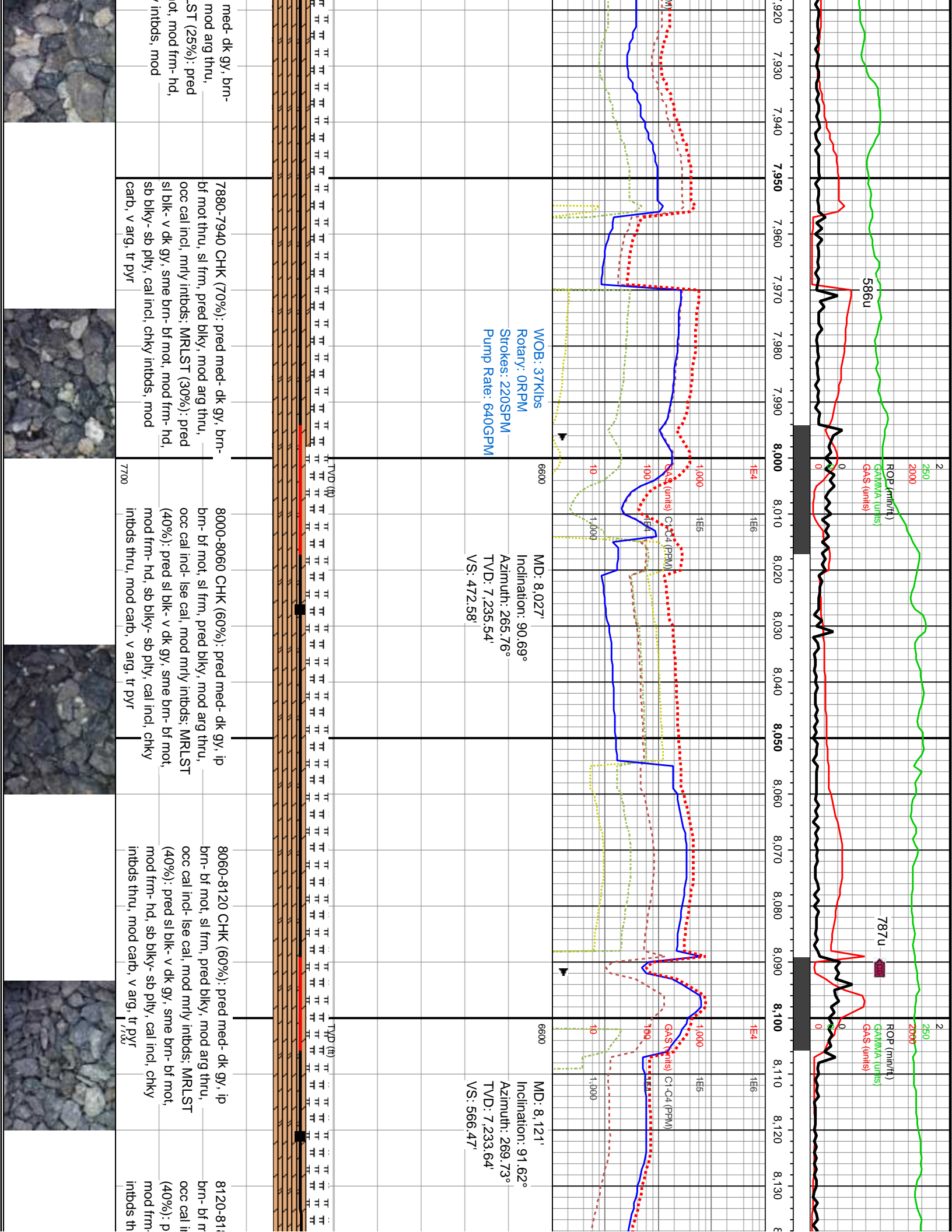


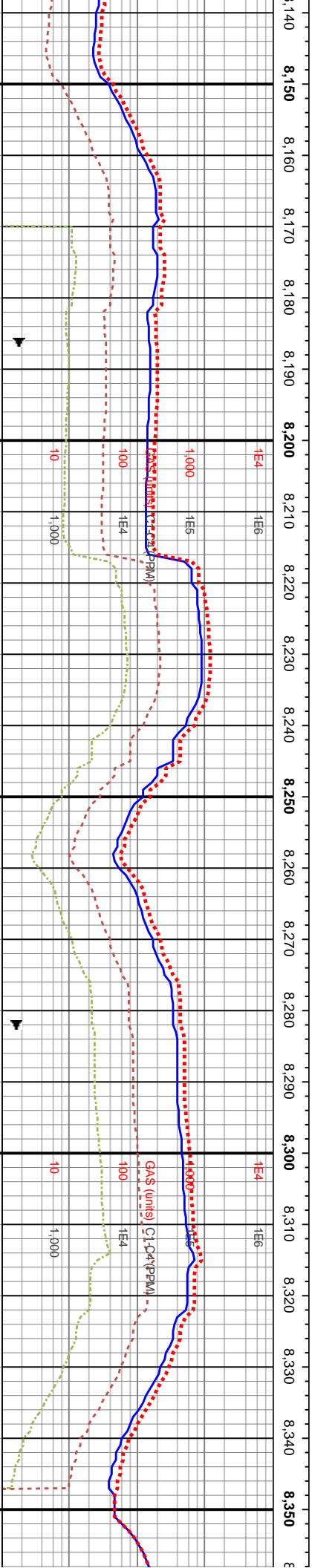
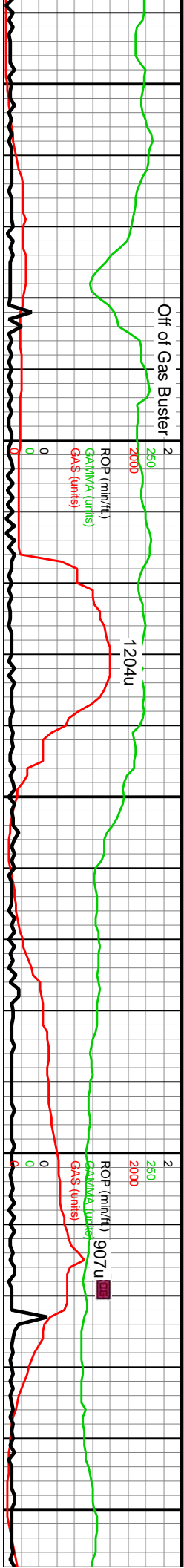
7520-7580 CHK (65%): pred gy-dk gy wi, occ lt gy, v arg LS wi occ vf-f chky incl & occ thn chky lamm, frm-brit mod fis sb ang-sb biky-occ ply, sm-sily tr-occ c free chk, tr vf pyr, hi calc, grddy to MRLST (35%): pred dk gy, occ gy, med fis sb biky-biky ctgs, rr brn mrlly incl, sm-sl sily tex, tr vf pyr, l-mod calc wi brn mrlly resd	7700
7580-7640 CHK (70%): pred gy-gy brn-dk gy, occ lt gy, v arg LS wi occ vf-f chky incl & occ thn chky lamm, frm-brit mod fis sb ang-sb biky-occ ply, sm-sily tex, tr c free chk, tr bent, tr vf pyr, hi calc, grddy to MRLST (30%): gy-gy brn-dk gy, med fis sb biky-biky ctgs, rr brn mrlly incl, sm-sl sily tex, tr vf pyr, l-mod calc wi brn mrlly resd	7700
7640-7700 CHK (70%): gy-gy brn-dk gy, occ lt gy, v arg LS wi occ vf-f chky incl & occ thn chky lamm, frm-brit mod fis sb ang-sb biky-occ ply ctgs, sm-sily tex, rr c free chk, tr vf pyr, hi calc, MRLST (30%): gy-gy brn-dk gy, mot wi rr dk brn mrlly incl & tr vf-f wh chky incl, med fis sb biky-biky ctgs, sm-sl sily tex, tr vf pyr, l-mod calc wi brn mrlly resd	7700







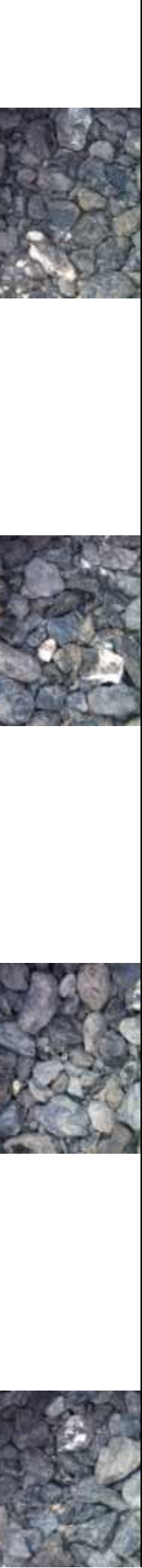


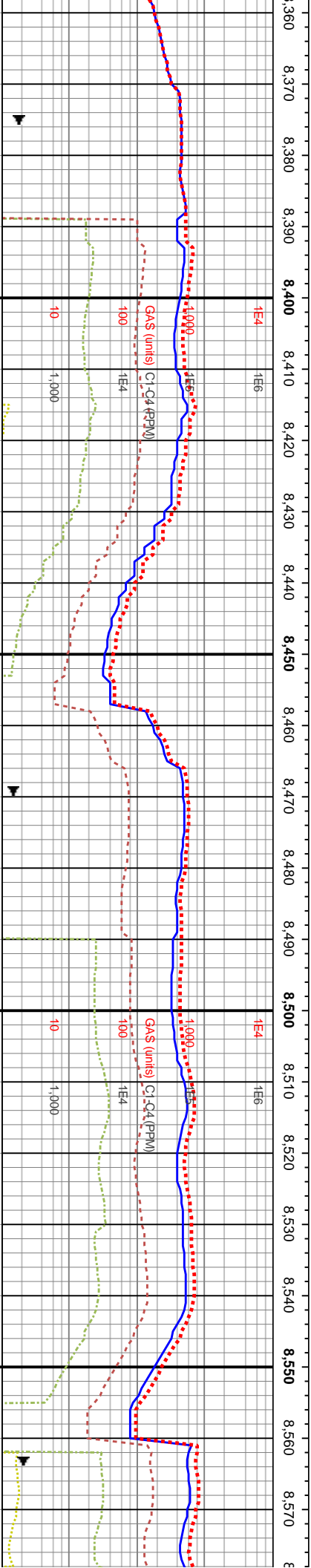
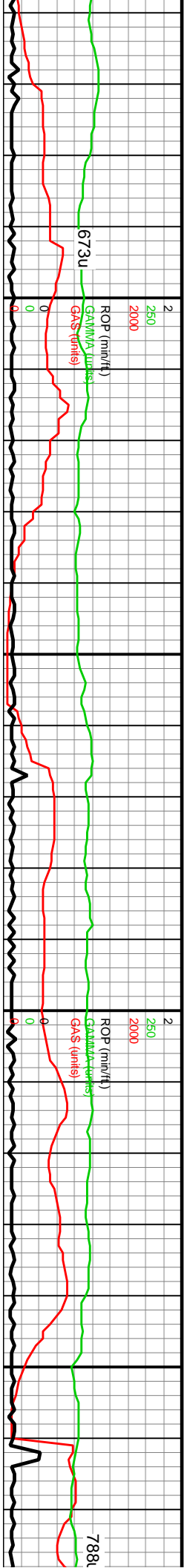


MD: 8,216'  
Inclination: 92.06°  
Azimuth: 269.97°  
TVD: 7,230.59'  
VS: 661.42'



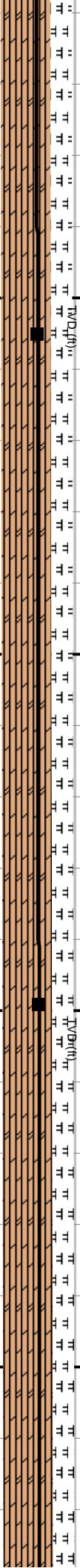
8180-8240 CHK (70%): pred med- dk gy, ip brn- tn- bf mot, sl frm, pred blk, sl- mod arg thru, mod calc incl, tr lse cal, mod mrlly intbds, tr pyr: MRLST (30%): pred sl blk- med gy, sme brn- bf mot, mod frm- hd, sb blk- sb pily, calc incl, chky intbds thru, mod carb, v arg	8240-8300 CHK (70%): pred med- dk gy, ip brn- tn- bf mot, sl frm, pred blk, sl- mod arg thru, mod calc incl, tr lse cal, mod mrlly intbds, tr pyr: MRLST (30%): pred sl blk- med gy, sme brn- bf mot, mod frm- hd, sb blk- sb pily, calc incl, chky intbds thru, mod carb, v arg	8300-8360 CHK (70%): pred med- dk gy, ip brn- tn- bf mot, sl frm, pred blk, sl- mod arg thru, mod calc incl, tr lse cal, mod mrlly intbds, tr pyr: MRLST (30%): pred sl blk- med gy, sme brn- bf mot, mod frm- hd, sb blk- sb pily, calc incl, chky intbds thru, mod carb, v arg
7700	7700	7700





MD: 8,405'  
Inclination: 91.56°  
Azimuth: 269.49°  
TVD: 7,224.3'  
VS: 850.31'

WOB: 39K  
MD: 8,499' 6600  
Rotary: 65f  
Inclination: 91.62°  
Strokes: 22  
Azimuth: 269.68°  
Pump Rate  
TVD: 7,221.69'  
VS: 944.27'



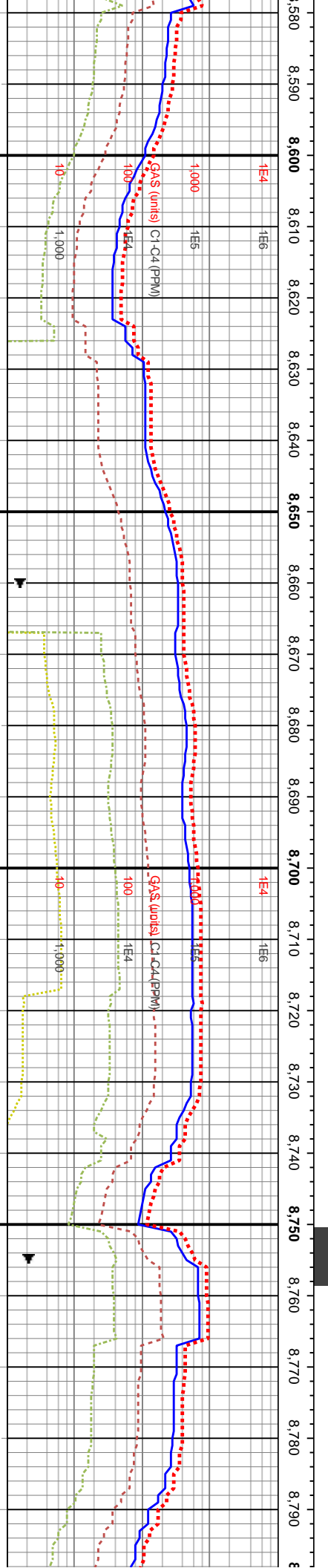
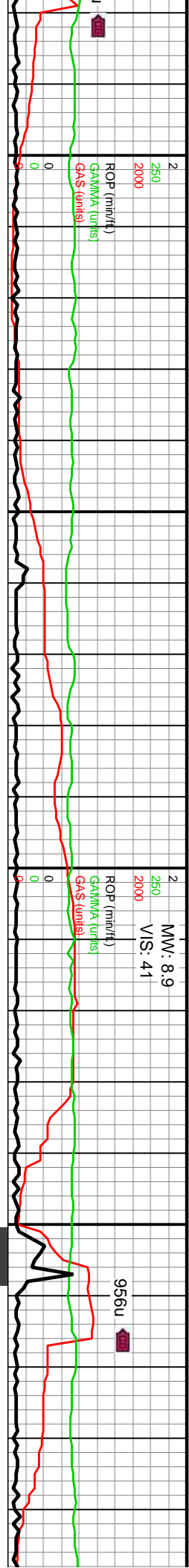
8360-8420 CHK (70%): pred med- gy, ip brn-tn- bf mot, sl frm, pred blk, sl- mod arg thru, mod calc incl, tr lse cal, mod mrlly intbds, tr pyr; MRLST (30%): pred v dk- med gy, sme brn- bf mot, mod frm- hd, sb blk- sb ply, calc incl, chky intbds thru, mod carb, v arg

8420-8480 CHK (70%): pred med- gy, ip brn-tn- bf mot, sl frm, pred blk, sl- mod arg thru, mod calc incl, tr lse cal, mod mrlly intbds, tr pyr; MRLST (30%): pred v dk- med gy, sme brn- bf mot, mod frm- hd, sb blk- sb ply, calc incl, chky intbds thru, mod carb, v arg

8480-8540 CHK (70%): pred med- gy, ip brn-tn- bf mot, sl frm, pred blk, sl- mod arg thru, mod calc incl, tr lse cal, mod mrlly intbds, tr pyr; MRLST (30%): pred v dk- med gy, sme brn- bf mot, mod frm- hd, sb blk- sb ply, calc incl, chky intbds thru, mod carb, v arg

8540-8600 CHK (65%): pred med- gy, ip brn-tn- bf mot, sl frm, pred blk, sl- mod arg thru, mod calc incl, tr lse cal, mod mrlly intbds, tr pyr; MRLST (35%): pred v dk- med gy, sme brn- bf mot, mod frm- hd, sb blk- sb ply, calc incl, chky intbds thru, mod carb, v arg



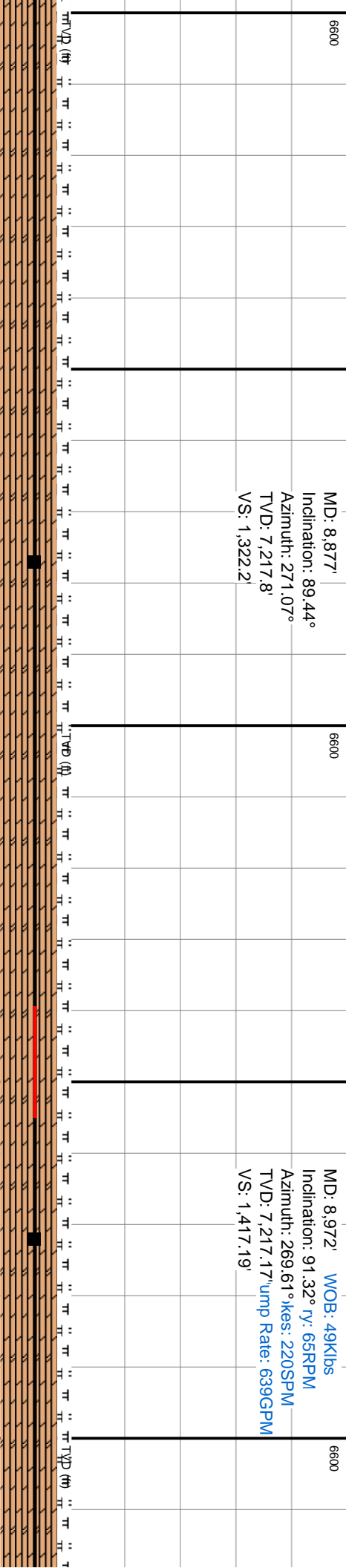
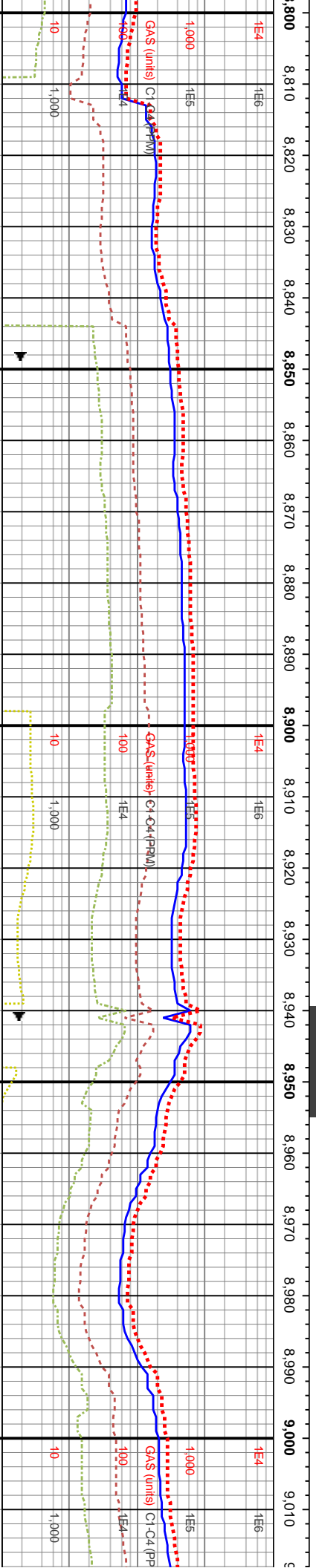
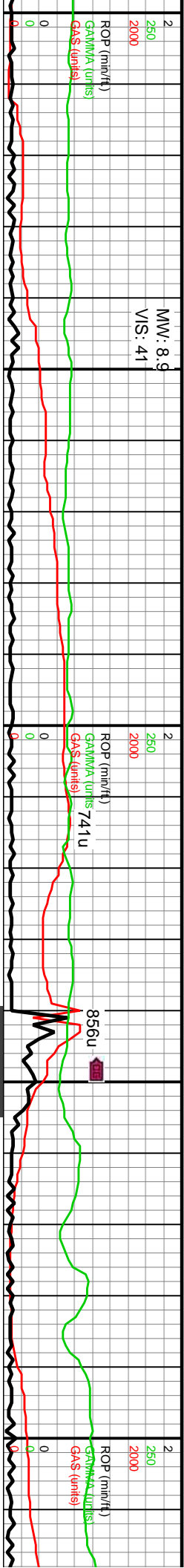


MD: 8,594'	6600	MD: 8,688'	6600	MD: 8,783'
Inclination: 91.05°		Inclination: 90.43°		Inclination: 90.34°
Azimuth: 268.98°		Azimuth: 269.18°		Azimuth: 270.05°
TVD: 7,219.47'		TVD: 7,218.26'		TVD: 7,217.62'
VS: 1,039.24'		VS: 1,133.22'		VS: 1,228.21'

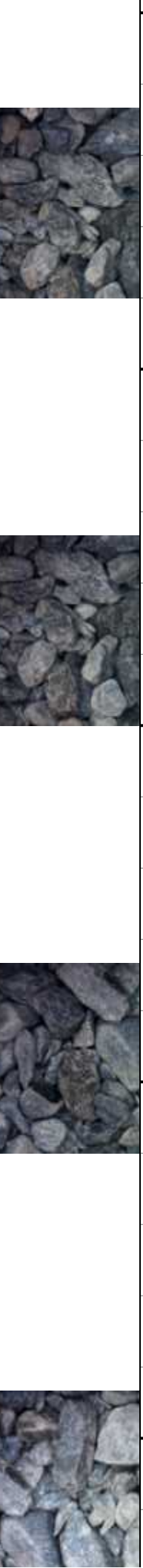
d med- gy, ip brn- sl- mod arg thru, mod mly intbds, tr dk- med gy, sme bdkly- sb pily, calc carb, v arg	7700	8600-8660 CHK (65%): pred med- gy, ip brn- tn- bf mot, sl frm, pred biky, sl- mod arg thru, mod calc incl, tr lse cal, mod mly intbds, tr pyr; MRLST (35%): pred v dk- med gy, sme brn- bf mot, mod frm- hd, sb biky- sb pily, calc incl, chky intbds thru, mod carb, v arg	8660-8720 CHK (70%): pred med- gy, ip brn- tn- bf mot, sl frm, pred biky, sl- mod arg thru, mod calc incl, tr lse cal, mod mly intbds, tr pyr; MRLST (30%): pred v dk- med gy, sme brn- bf mot, mod frm- hd, sb biky- sb pily, calc incl, chky intbds thru, mod carb, v arg	8720-8780 CHK (80%): pred gy- med, sme lt brn, ip brn- tn- bf mot, sl frm, pred biky, ip sl arg, occ calc incl, sme lse cal, occ mly intbds, tr pyr; MRLST (20%): pred dk- med gy, sme brn- bf mot, mod frm- hd, sb biky- sb pily, calc incl, chky intbds thru, mod carb, arg	8780-8840 brn, ip brn- arg, occ c intbds, tr sme brn- calc incl,
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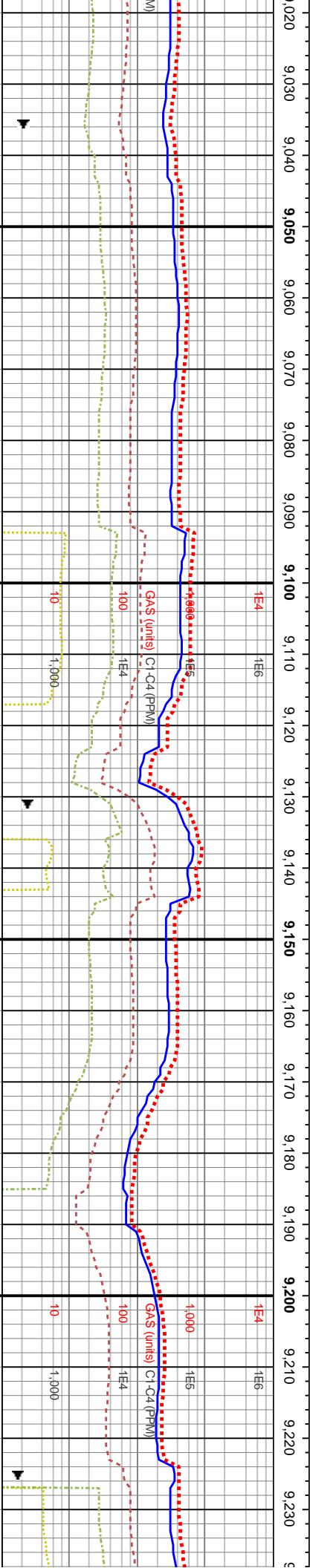
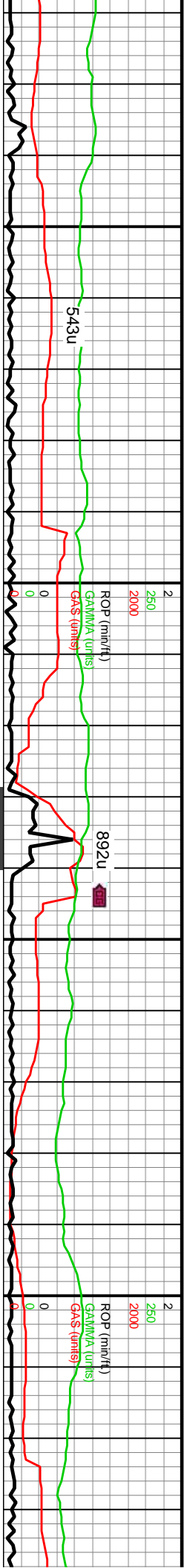




0 CHK (80%): pred gy- med, sme lt - tn- bf mot, sl frm, pred blk, ip sl alc incl, sme lse cal, occ mrlly pyr; MRLST (20%): pred dk- med gy, bf mot, mod frm- hd, sb blk- sb ply, chky intbds thru, mod carb, arg	8840-8900 CHK (80%): pred gy- med, sme lt brn, ip brn- tn- bf mot, sl frm, pred blk, ip sl arg, occ calc incl, sme lse cal, occ mrlly intbds, tr pyr; MRLST (20%): pred dk- med gy, sme brn- bf mot, mod frm- hd, sb blk- sb ply, calc incl, chky intbds thru, mod carb, arg	8900-8960 CHK (80%): pred gy- med, sme lt brn, ip brn- tn- bf mot, sl frm, pred blk, ip sl arg, occ calc incl, sme lse cal, occ mrlly intbds, tr pyr; MRLST (20%): pred dk- med gy, sme brn- bf mot, mod frm- hd, sb blk- sb ply, calc incl, chky intbds thru, mod carb, arg	8960-9020 CHK (80%): pred gy- med, sme lt brn, ip brn- tn- bf mot, sl frm, pred blk, ip sl arg, occ calc incl, sme lse cal, occ mrlly intbds, tr pyr; MRLST (20%): pred dk- med gy, sme brn- bf mot, mod frm- hd, sb blk- sb ply, calc incl, chky intbds thru, mod carb, arg
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MD: 9,066'  
Inclination: 90.76°  
Azimuth: 269.25°  
TVD: 7,215.47'  
VS: 1,511.17'

6600

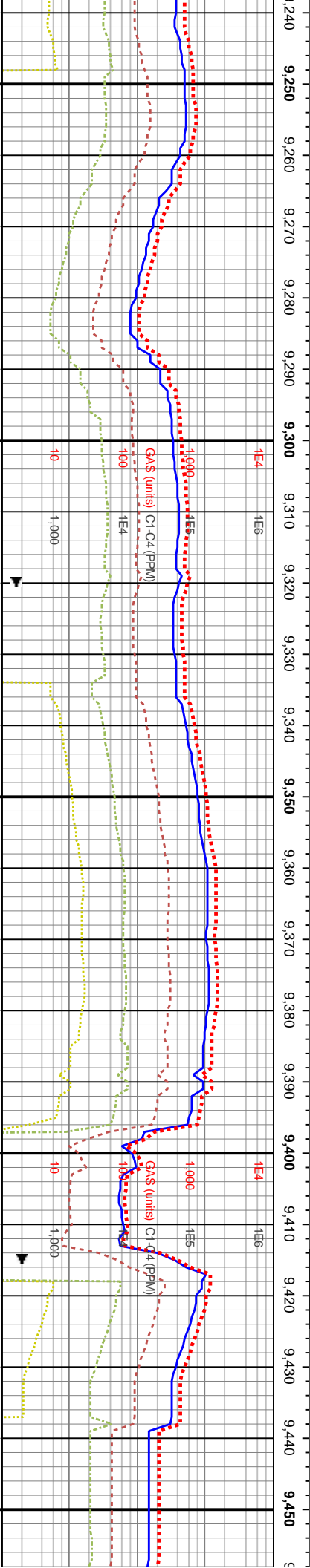
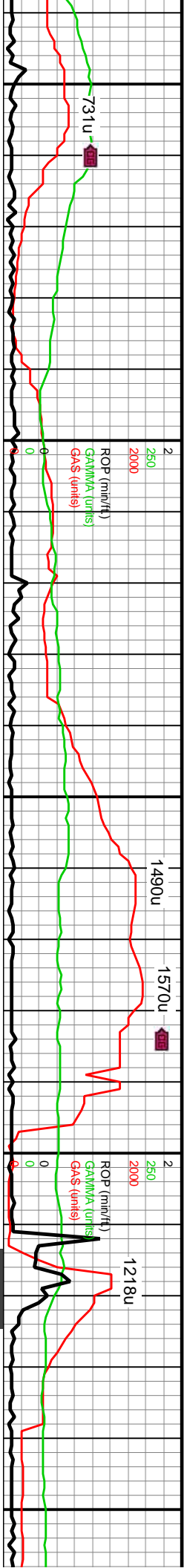
MD: 9,161'  
Inclination: 92.15°  
Azimuth: 270.27°  
TVD: 7,213.05'  
VS: 1,606.14'

6600

9020-9080 CHK (80%): pred gy- med, sme lt brn, ip brn- tn- bf mot, sl frm, pred blk, ip sl arg, occ calc incl, sme lse cal, occ mrlly intbds, tr pyr; MRLST (20%): pred dk- med gy, sme brn- bf mot, mod frm- hd, sb blk- sb ply, calc incl, chky intbds thru, mod carb, arg	9080-9140 CHK (80%): pred gy- med, sme lt brn, ip brn- tn- bf mot, sl frm, pred blk, ip sl arg, occ calc incl, sme lse cal, occ mrlly intbds, tr pyr; MRLST (20%): pred dk- med gy, sme brn- bf mot, mod frm- hd, sb blk- sb ply, calc incl, chky intbds thru, mod carb, arg	9140-9200 CHK (85%): pred gy, ip med gy, sme lt brn, brn- tn- bf mot, sl frm, pred blk, ip sl arg, occ calc incl, sme lse cal- frac fl cal, occ mrlly intbds, occ pyr; MRLST (15%): pred dk- med gy, sme brn- bf- gy mot, pred hd- frm, sb blk- sb ply, calc incl, chky intbds thru, mod carb, arg	9200-9260 CHK (85%): pred gy, ip med gy, sme lt brn, brn- tn- bf mot, sl frm, pred blk, ip sl arg, occ calc incl, sme lse cal- frac fl cal, occ mrlly intbds, occ pyr; MRLST (15%): pred dk- med gy, sme brn- bf- gy mot, pred hd- frm, sb blk- sb ply, calc incl, chky intbds thru, mod carb, arg
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7700





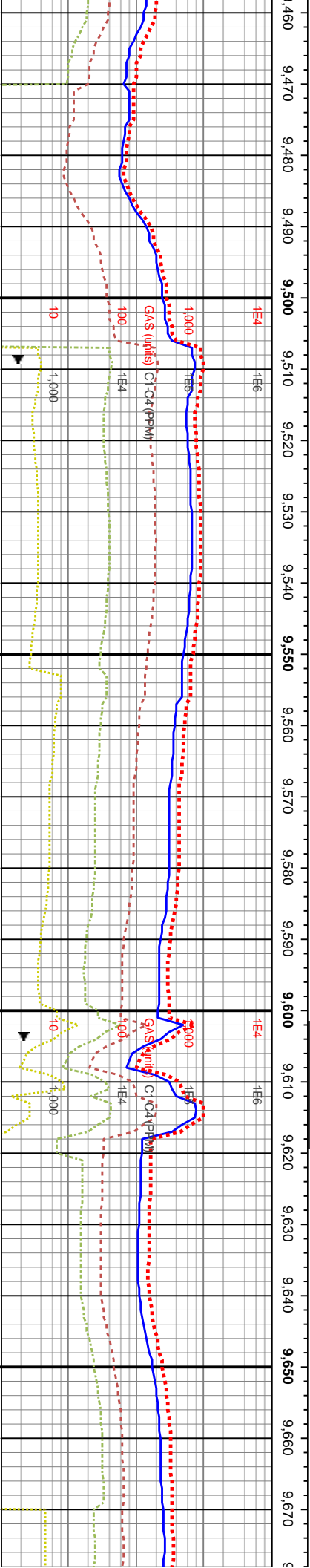
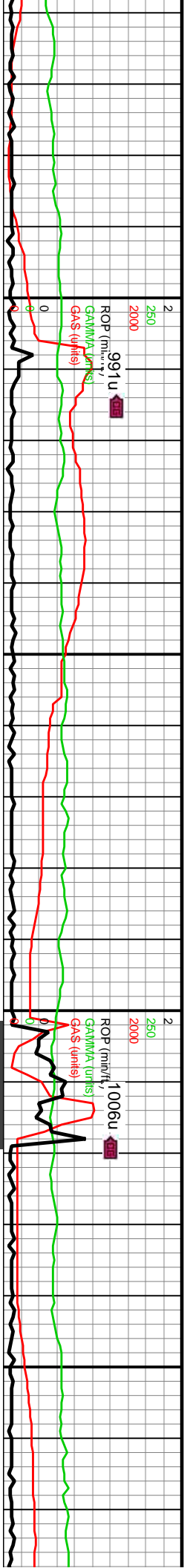
MD: 9,255'  
Inclination: 92.51°  
Azimuth: 270.85°  
TVD: 7,209.23'  
VS: 1,700.06'

MD: 9,350'  
Inclination: 92.76°  
Azimuth: 270.84°  
TVD: 7,204.86'  
VS: 1,794.94'

MD: 9,444'  
Inclination: 91.65°  
Azimuth: 271.57°  
TVD: 7,201.25'  
VS: 1,888.85'

pred gy, ip med gy, sl frm, pred blkly, ip cal-frac fl cal, MRLST (15%): pred /mot, pred hd-frm, blkly intbds thru,	9260-9320 CHK (85%): pred gy, ip med gy, sme lt brn, brn-tn-bf mot, sl frm, pred blkly, ip sl arg, occ calc incl, sme lse cal-frac fl cal, occ mltly intbds, occ pyr; MRLST (15%): pred dk-med gy, sme brn-bf-gy mot, pred hd-frm, sb blkly-sb pily, calc incl, chky intbds thru, mod carb, arg	9320-9380 CHK (85%): pred gy, sme med gy, sme lt brn, brn-tn-bf mot, sl frm, pred blkly, ip sl arg, occ calc incl, sme lse cal-frac fl cal, occ mltly intbds, occ pyr; MRLST (15%): pred dk-med gy, sme brn-bf-gy mot, pred hd-frm, sb blkly-sb pily, calc incl, chky intbds thru, mod carb, arg	9380-9440 CHK (90%): pred gy, sme med gy, sme lt brn, brn-tn-bf mot, sl frm, pred blkly, ip sl arg, occ calc incl, sme lse cal-frac fl cal, occ mltly intbds, occ pyr; MRLST (10%): pred dk-med gy, sme brn-bf-gy mot, pred hd-frm, sb blkly-sb pily, calc incl, chky intbds thru, mod carb, arg	9440-9500 sme lt brn, arg, occ cal mltly intbds, med gy, str blkly-sb pily carb, arg
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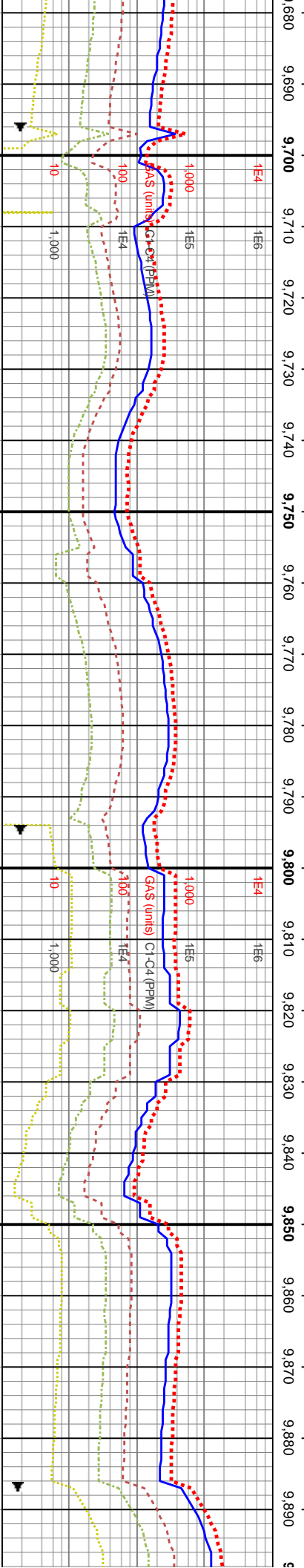
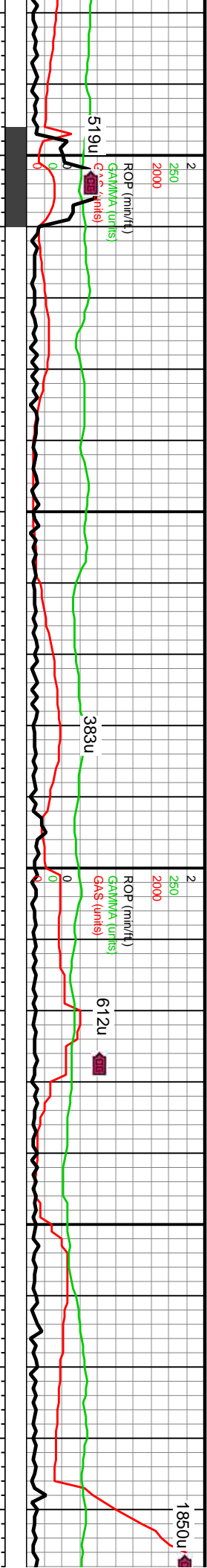


WOB: 48Klbs  
Rotary: 65RPM  
Strokes: 220SPM  
Pump Rate: 639GPM

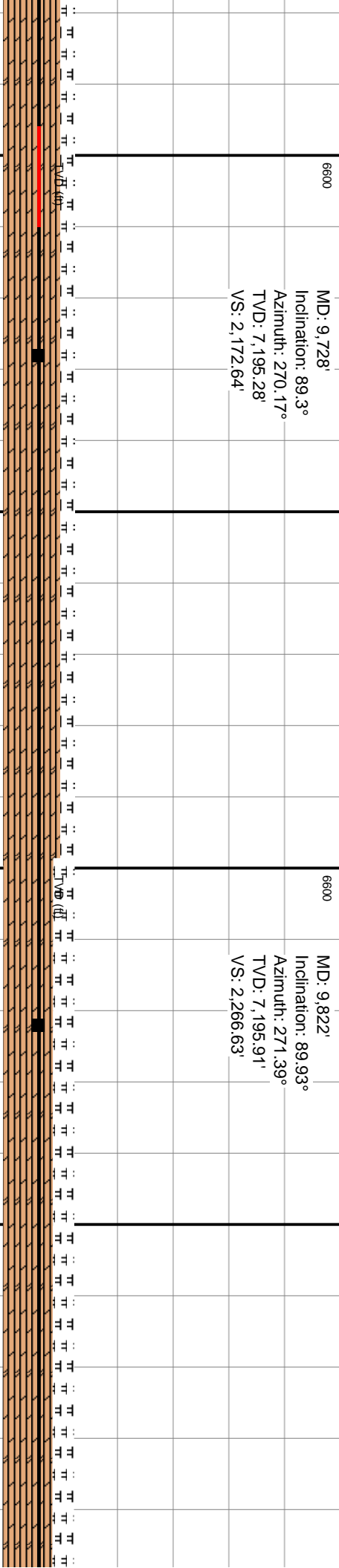
MD: 9,539'  
Inclination: 92.21°  
Azimuth: 272.11°  
TVD: 7,198.05'  
VS: 1,983.75'

CHK (90%): pred gy, sme med gy, brn-tn-bf mot, sl frm, pred blk, ip sl c incl, sme lse cal, tr frac fl cal, occ occ pyr; MRLST (10%): pred dk-brn-bf-gy mot, pred hd-frm, sb /, calc incl, chky intbds thru, mod	9500-9560 CHK (80%): pred gy, sme med gy, sme lt brn, brn-tn-bf mot, sl frm, pred blk, ip sl arg, occ calc incl, sme lse - euhed cal, occ mrlly intbds, occ pyr; MRLST (20%): pred dk-med gy, sme brn-bf-gy mot, pred hd-frm, sb blk- sb ply, calc incl, chky intbds thru, mod carb, arg	9560-9620 CHK (80%): pred gy, sme med gy-tn, brn-tn-bf mot, sl frm, pred blk, ip sl arg, occ calc incl, sme lse - euhed cal, occ mrlly intbds, occ pyr; MRLST (20%): pred dk-med gy, sme brn-bf-gy mot, pred hd-frm, sb blk- sb ply, calc incl, chky intbds thru, mod carb, arg	9620-9680 CHK (80%): pred gy, sme med gy-tn, brn-tn-bf mot, sl frm, pred blk, ip sl arg, calc incl, sme lse - euhed cal, occ mrlly intbds, occ pyr; MRLST (20%): pred dk-med gy, sme brn-bf-gy mot, pred hd-frm, sb blk- sb ply, calc incl, chky intbds thru, mod carb, arg
7700	7700	7700	

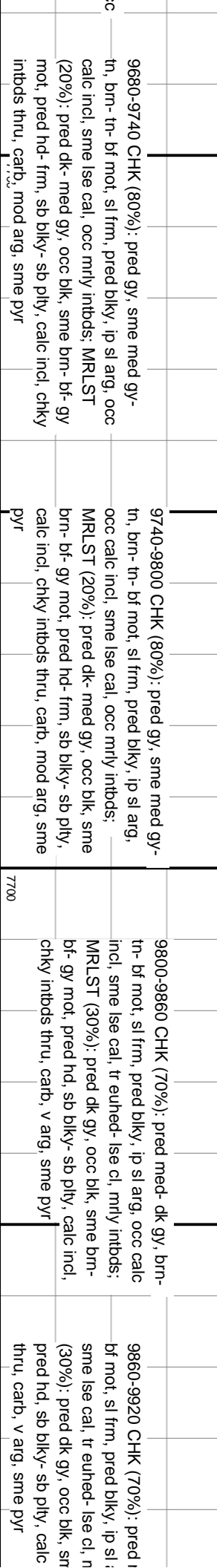




MD: 9,728'  
Inclination: 89.3°  
Azimuth: 270.17°  
TVD: 7,195.28'  
VS: 2,172.64'



MD: 9,822'  
Inclination: 89.93°  
Azimuth: 271.39°  
TVD: 7,195.91'  
VS: 2,266.63'

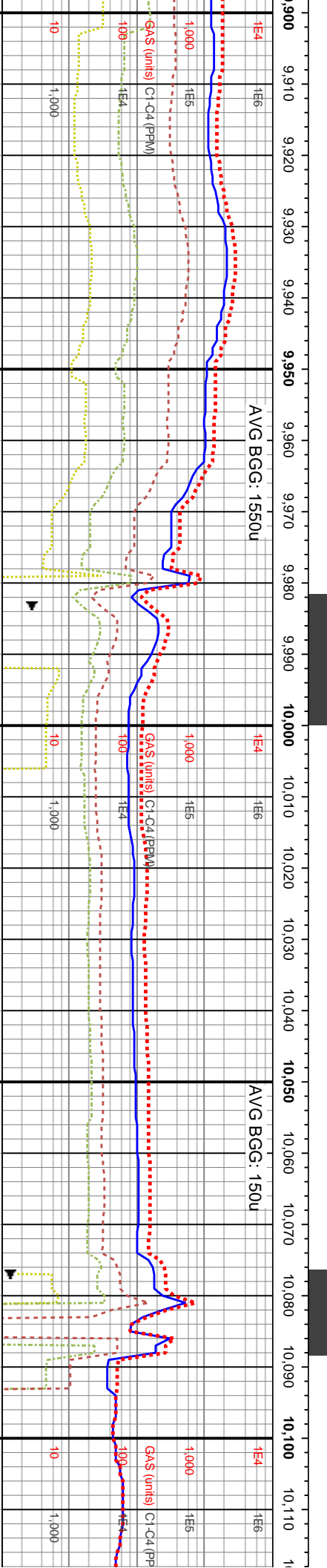
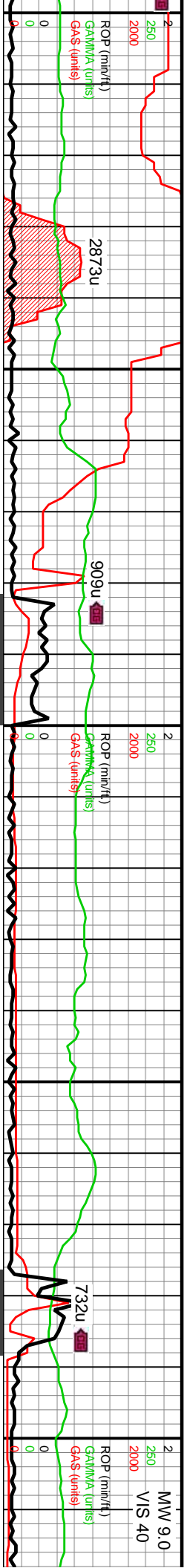


MD: 9,882'  
Inclination: 89.93°  
Azimuth: 271.39°  
TVD: 7,195.91'  
VS: 2,266.63'



MD: 9,942'  
Inclination: 89.93°  
Azimuth: 271.39°  
TVD: 7,195.91'  
VS: 2,266.63'



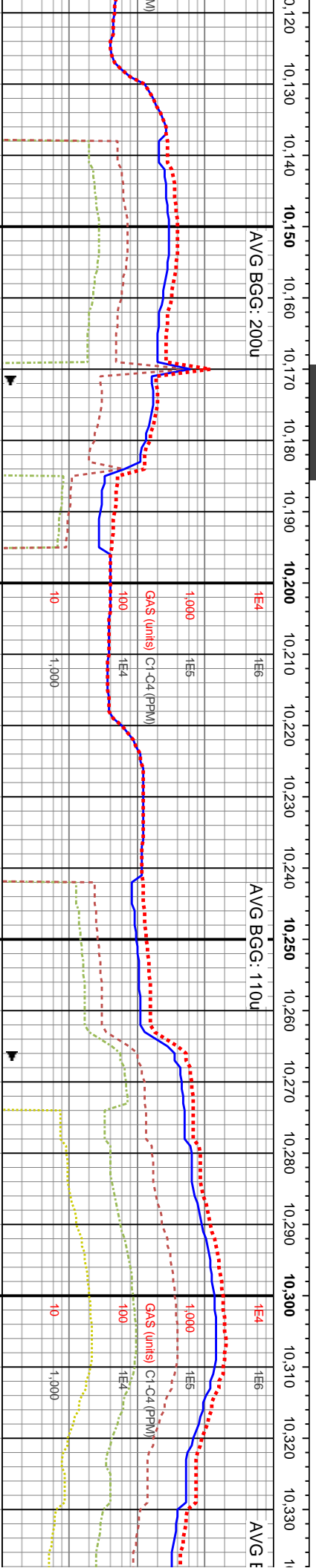
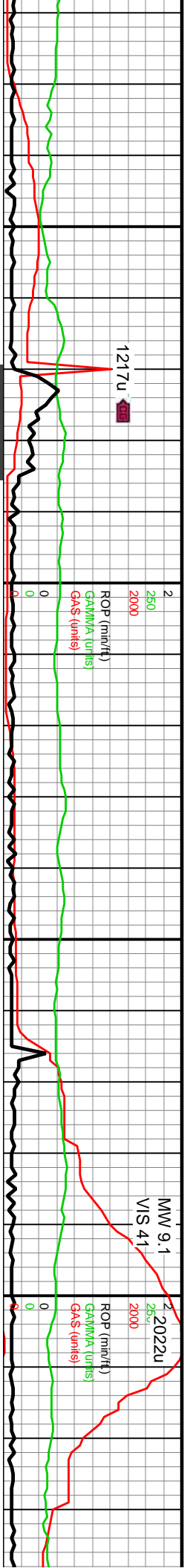


6600	MD: 9,917' Inclination: 89.83° Azimuth: 271.55° TVD: 7,196.11' VS: 2,361.6'	WOB: 36Klbs Rotary: 65RPM Strokes: 220SPM Pump Rate: 639GPM	MD: 10,011' Inclination: 89.34° Azimuth: 270.28° TVD: 7,196.79' VS: 2,455.58'	MD: 10,106' Inclination: 89.61° Azimuth: 270.33° TVD: 7,197.68' VS: 2,813.34'
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med- dk gy, brn- tn- arg, occ calc incl, only intbds: MRLST e brn- bf- gy mot, incl, chky intbds	9920-9980 CHK (70%): pred med- dk gy, brn- tn- bf mot, sl frm, pred blk, ip sl arg, occ calc incl, sme lse cal, tr euhed- lse cl, mrlly intbds: MRLST (30%): pred dk gy, occ blk, sme brn- bf- gy mot, pred hd, sb blk- sb plty, calc incl, chky intbds thru, carb, v arg, sme pyr	9980-10040 CHK (60%): pred med- dk gy, brn- tn- bf mot, sl frm, pred blk, ip sl arg, occ calc incl, sme lse cal, tr euhed- lse cl, mrlly intbds: MRLST (40%): pred dk gy, occ blk, sme brn- bf- gy mot, pred hd, sb blk- sb plty, calc incl, chky intbds thru, carb, v arg, sme pyr	10040-10100 CHK (60%): lt gy- pred gy, occ dk gy wi intbdd chky & mrlly incl, l- mod fis brit- frm sb rd- rd ctgs, occ sb blk- blk, hi calc wi cin hel rxn, v chky lt gy ctgs- dk gy mrlly wi occ chky incl, grdg to MRLST: pred dk gy, occ dk gy brn, mot wi tr occ vf- f chky incl, tr vf pyr, mod calc wi brn resdl, tr vf pyr	10100-10160 C intbdd chky & r sb rd- rd ctgs, oc grdg to mod cal mot wi tr occ vf-
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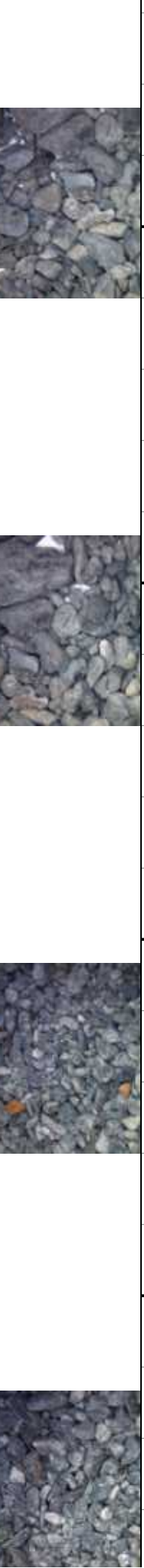


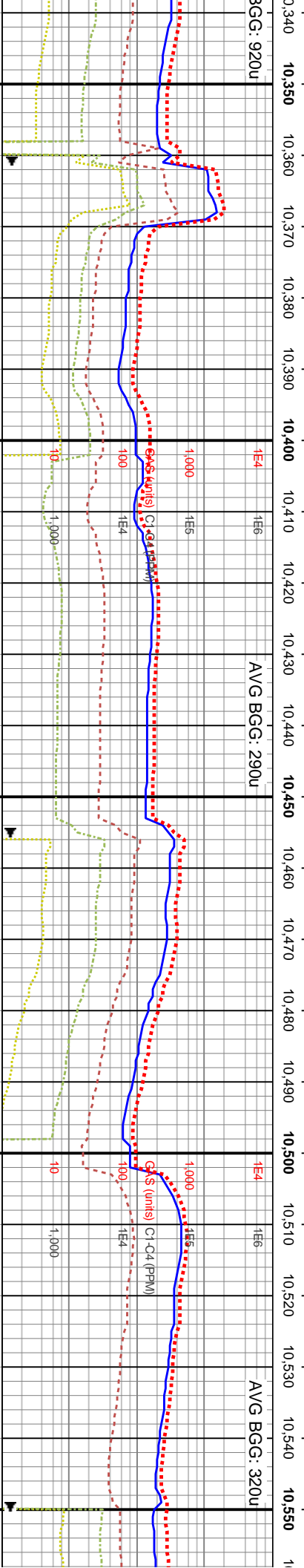
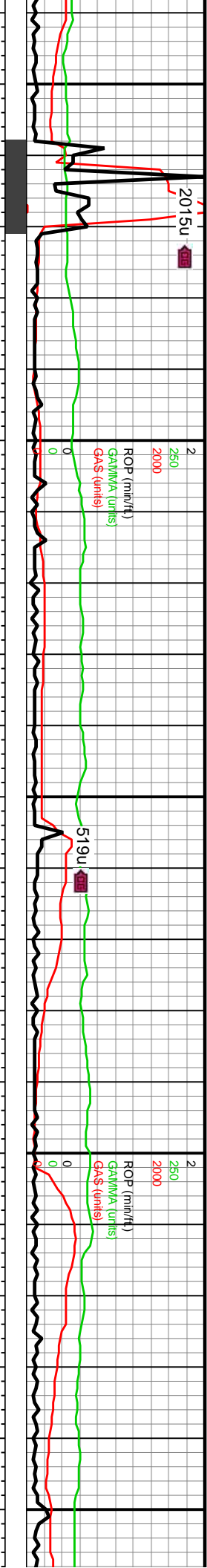


MD: 10,200'  
Inclination: 90.9°  
Azimuth: 268.35°  
TVD: 7,197.26'  
VS: 2,905.92'

MD: 10,295'  
Inclination: 91.01°  
Azimuth: 268.2°  
TVD: 7,195.68'  
VS: 2,999.78'

10160-10220 CHK (65%): lt gy-pred gy, v arg LS wi occ dk gy wi intbdd chky & mnty incl, l-mod fis brit-frm sb rd-rd ctgs, occ sb blkly-blky, hi calc wi cin hcl rxn, v chky lt gy ctgs-dk gy mnty wi occ chky incl, tr c free wh chk, grdg to 35% MRLST: pred dk gy, occ dk gy brn, mot wi tr occ vf-f chky incl, tr vf pyr, mod calc wi brn resdl, tr vf pyr	7700
10220-10280 CHK (75%): lt gy-gy-dk gy wi occ vf-f wh chky incl & occ thn lamm wi occ intbdd mnty incl, frm-brit v arg LS, l-mod fis sb rd-rd ctgs, occ sb blkly-blky, hi calc wi cin hcl fiz, MRLST (25%): pred dk gy, occ dk gy brn, mot wi tr occ vf-f chky incl, tr vf pyr, tr vf pyr, mod calc wi straw brn mnty resdl	7700
10280-10340 CHK (75%): lt gy-gy-dk gy v arg LS wi occ vf-f wh chky incl, frm-brit, l-mod fis sb rd-rd ctgs, occ sb blkly-blky, hi calc wi cin hcl fiz, wi incr brn mnty mod grdg to MRLST (25%): pred dk gy, occ dk gy brn, mot wi u f-med brn mnty incl, tr occ vf-f chky incl, tr vf pyr, tr vf pyr, mod calc wi lt straw brn mnty resdl	7700





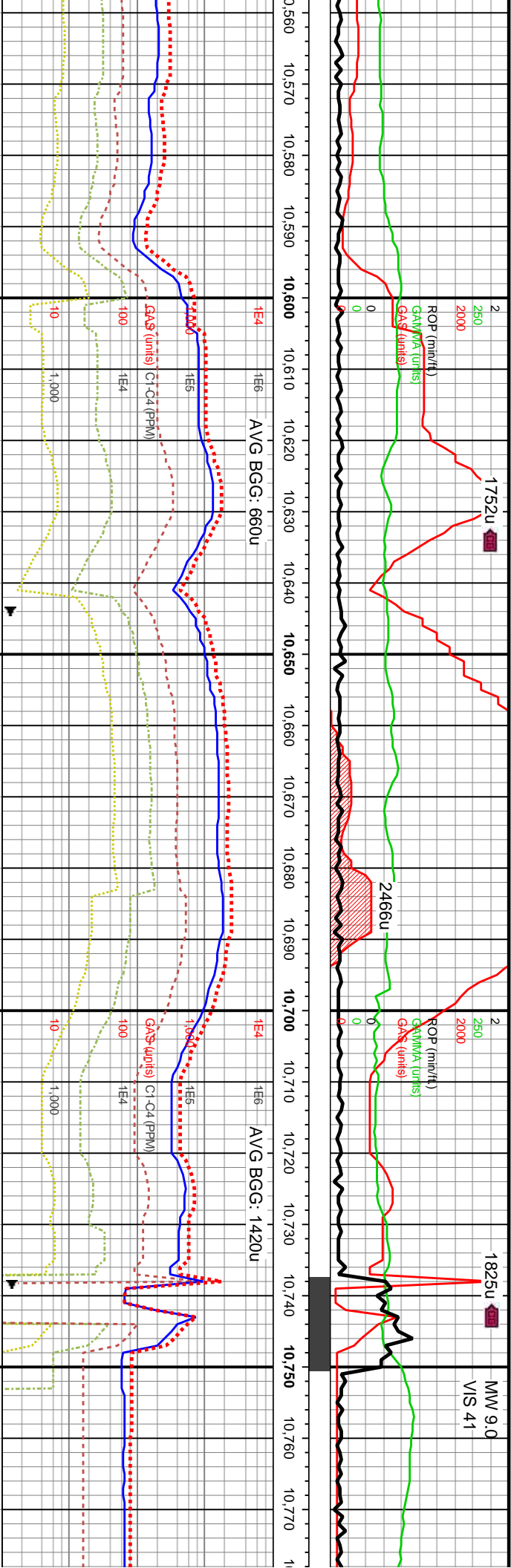
MD: 10,389'  
Inclination: 91.9°  
Azimuth: 270.93°  
TVD: 7,193.29'  
VS: 3,092.27'

MD: 10,484'  
Inclination: 91.77°  
Azimuth: 270.71°  
TVD: 7,190.25'  
VS: 3,185.35'

WOB: 47Klbs  
Rotary: 65RPM  
Strokes: 220SPM  
Pump Rate: 639GPM

10340-10400 CHK (75%): lt gy-gy-occ dk gy wi intbdd chky & mrlly incl, l-mod fis brit-frn sb rd-rd ctgs, occ sb blkly-blky, hi calc wi cin hcl rxn, gridg to 25% MRLST: pred dk gy, occ dk gy brn, mot wi rr occ vf-f chky incl, tr vf pyr, mod calc wi lt straw brn resdl	10400-10460 CHK (70%): lt gy-gy-dk gy wi occ vf-f wh chky incl & occ thn lamn wi occ intbdd mrlly incl, frn-brit v arg LS, l-mod fis sb rd-rd ctgs, occ sb blkly-blky, hi calc wi cin hcl fiz, MRLST (30%): pred dk gy, occ dk gy brn, mot wi rr occ vf-f chky incl, tr vf pyr, tr vf pyr, mod calc wi brn mrlly resdl	10460-10540 CHK (70%): lt gy-gy-dk gy wi occ vf-f wh chky incl & occ thn lamn wi occ intbdd mrlly incl, frn-brit v arg LS, l-mod fis sb rd-rd ctgs, occ sb blkly-blky, hi calc wi cin hcl fiz, MRLST (30%): pred dk gy, occ dk gy brn, mot wi rr occ vf-f chky incl, tr vf pyr, tr vf pyr, mod calc wi brn mrlly resdl	10520-10580 CHK (70%): lt gy-gy- occ vf-f wh chky incl, frn-brit, l-mod occ sb blkly-blky, hi calc wi cin hcl f mod gridg to MRLST (30%): pred d brn, mot wi u f-med brn mrlly incl, r tr vf pyr, tr vf pyr, mod calc wi lt brr
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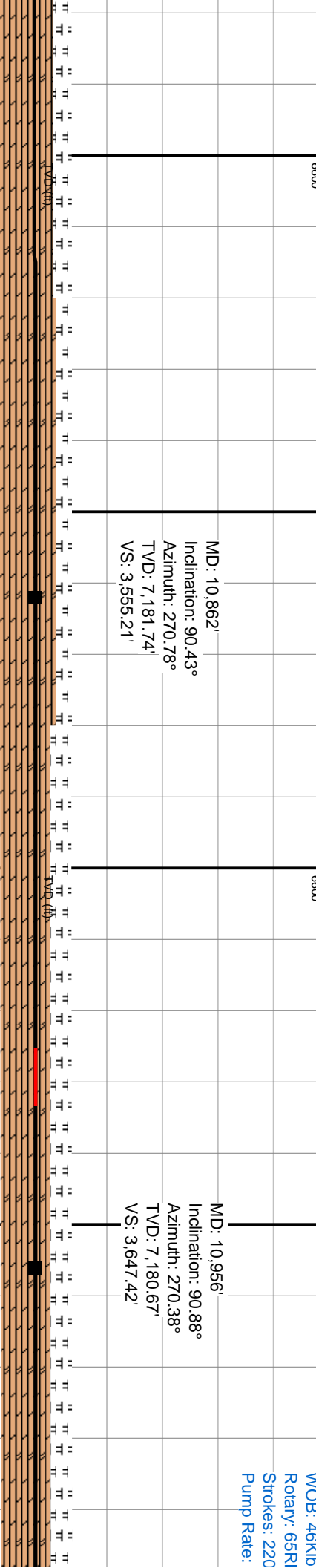
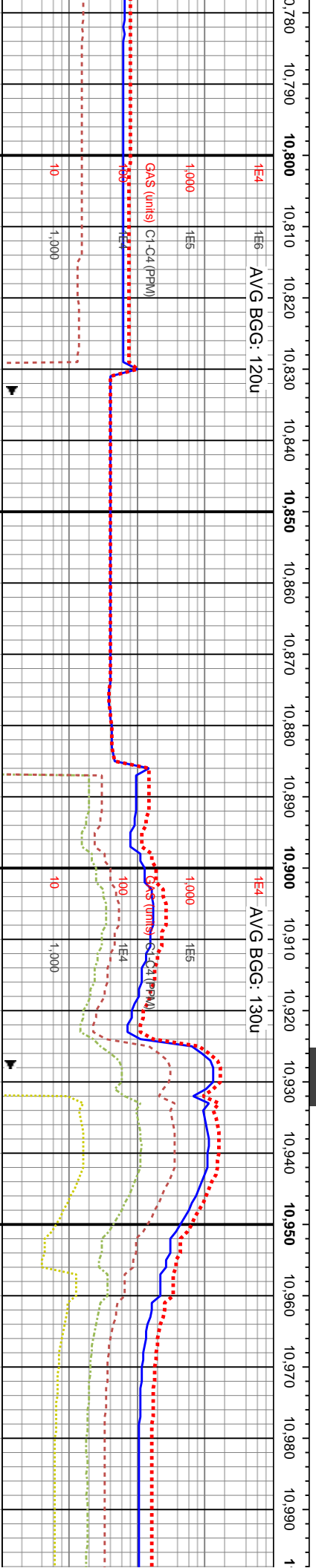
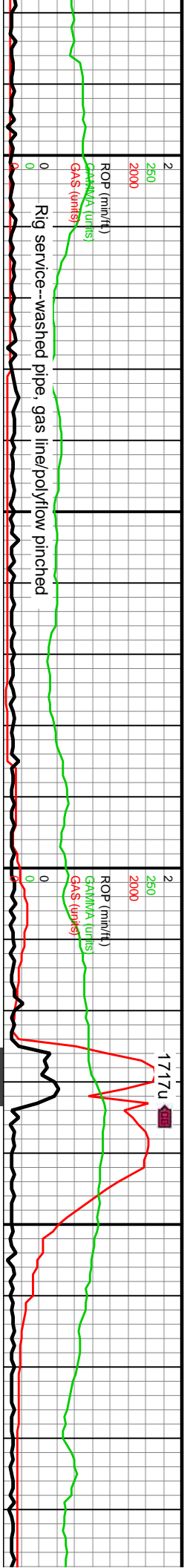
MD: 10,578'  
Inclination: 91.77°  
Azimuth: 271.42°  
TVD: 7,187.35'  
VS: 3,277.38'

MD: 10,672'  
Inclination: 91.05°  
Azimuth: 272.29°  
TVD: 7,185.04'  
VS: 3,369.15'

MD: 10,767'  
Inclination: 91.25°  
Azimuth: 270.59°  
TVD: 7,183.13'  
VS: 3,462.04'

dk gy v arg LS wi d fis sb rd-rd ctgs, iz, wi incr brn mrlly k gy, occ dk gy occ vf-f chky incl, mrlly resdl	10580-10640 CHK (70%): It gy-gy-occ dk gy wi intbdd chky & mrlly incl, l-mod fis brit-frn sb rd-rd ctgs, occ sb blkly-blky, hi calc wi cin hcl rxn, grdg to 30% MRLST: pred dk gy, occ dk gy brn, mot wi tr occ vf-f chky incl, tr vf pyr, mod calc wi lt brn resdl	10640-10700 CHK (70%): It gy-gy-dk gy wi occ vf-f wh chky incl & occ thn lamm wi occ intbdd mrlly incl, frm-brit v arg LS, l-mod fis sb rd-rd ctgs, occ sb blkly-blky, tr c pyr strg-euhed pyr, tr cal fos, hi calc wi cin hcl fiz, MRLST (30%): pred dk gy, occ dk gy brn, mot wi tr occ vf-f chky incl, tr vf pyr, tr vf pyr, mod calc wi brn mrlly resdl	10700-10760 CHK (75%): It gy-gy-occ dk gy wi intbdd chky & mrlly incl, l-mod fis brit-frn sb rd-rd ctgs, occ sb blkly-blky, hi calc wi cin hcl rxn, grdg to 25% MRLST: pred dk gy, occ dk gy brn, mot wi tr occ vf-f chky incl, tr vf pyr, mod calc wi lt straw brn resdl	10760-10820 C occ vf-f wh chky occ sb blkly-blky mod grdg to MF brn, mot wi u f-f tr vf pyr, tr vf py
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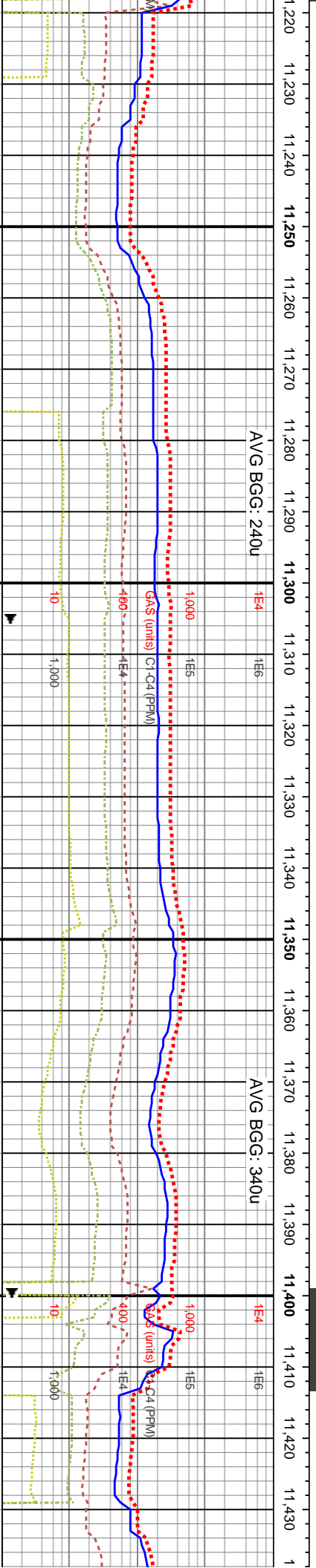
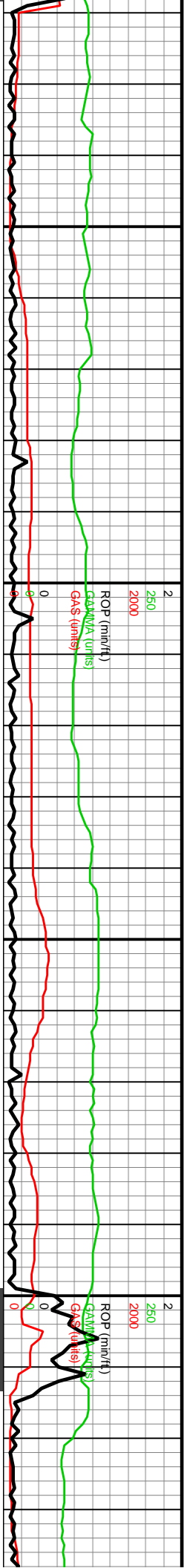
HK (75%): lt gy-gy-dk gy v arg LS wi incl, frm-brit, l-mod fis sb rd-rd ctgs, , hi calc wi clin hcl fiz, wi incr brn mrly	10820-10880 CHK (80%): lt gy-gy-dk gy wi occ vf-f wh chky incl & occ thn lamm wi occ intbdd mrly incl, frm-brit v arg LS, l-mod fis sb rd-rd ctgs, occ sb biky-biky, hi calc wi clin hcl fiz, MRLST (20%): pred dk gy, occ dk gy brn, mot wi tr occ vf-f chky incl, tr vf pyr, mod calc wi straw brn mrly resd	10880-10940 CHK (70%): lt gy-gy-dk gy wi occ vf-f wh chky incl & occ thn lamm wi occ intbdd mrly incl, frm-brit v arg LS, l-mod fis sb rd-rd ctgs, occ sb biky-biky, tr vf pyr, hi calc wi clin hcl fiz, MRLST (30%): pred dk gy, occ dk gy brn, mot wi tr occ vf-f chky incl, tr vf pyr, mod calc wi brn mrly resd	10940-11000 CHK (70%): pred gy-dk gy, occ lt gy, frm-brit v arg LS wi tr-occ vf-f wh chky incl, l-mod fis sb rd-sb biky-occ ply ctgs, tr vf pyr, tr pyr strg, tr cal fil fos frags, hi calc wi clin hcl rxn, MRLST (30%): pred dk gy, occ dk gy brn, mot wi tr occ vf-f chky incl, tr vf pyr, tr vf pyr, mod calc wi brn mrly resd
7700	7700	7700	7700

WOB: 46Klb  
Rotary: 65R  
Strokes: 220  
Pump Rate:









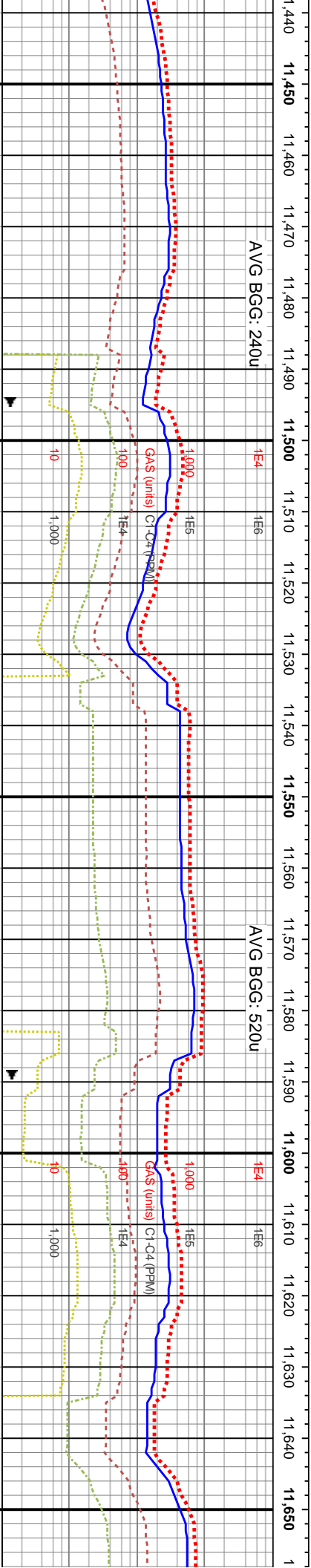
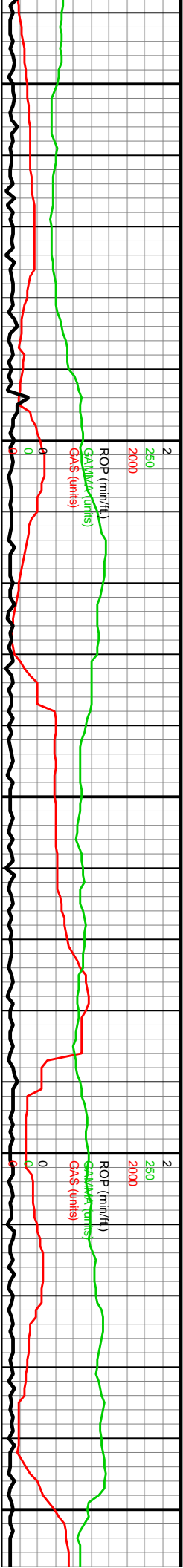
MD: 11,239'  
Inclination: 91.17°  
Azimuth: 269.52°  
TVD: 7,176.11'  
VS: 3.925.89'

MD: 11,334'  
Inclination: 90.24°  
Azimuth: 270.52°  
TVD: 7,174.94'  
VS: 4,019.26'

MD: 11,428'  
Inclination: 92.37°  
Azimuth: 270.45°  
TVD: 7,172.8'  
VS: 4,111.49'

11240-11300 CHK (60%): gy-dk gy, occ off wh-it gy v-f wh chky incl, s, tr vf pyr, tr pyr cln hcl rxn, mod calc wi com dk	11300-11360 CHK (60%): pred gy-dk gy, occ rr wh c free chk, frm-brit v arg LS wi rr-occ vf-f wh chky incl, l-mod fis sb rd-sb blk-occ ply ctgs, rr vf pyr strg, tr fos frags wi cal fil, hi calc wi cln hcl rxn, MRLST (40%): pred dk gy, occ dk gy brn, mot wi rr occ vf-f chky incl, tr vf pyr, tr vf pyr, mod calc wi com dk brn mntly resdl	11360-11420 CHK (60%): gy-dk gy, occ off wh-it gy rr c free chk thrh, frm-brit v arg LS wi rr-occ vf-f wh chky incl, l-mod fis sb rd-sb blk-occ ply ctgs, rr vf pyr & vf-f pyr strg, tr fos frags wi cal fil, hi calc wi cln hcl flzz, MRLST (40%): pred dk gy, occ dk gy brn, mot wi rr occ vf-f chky incl, tr vf pyr, tr vf pyr, mod calc wi dk brn mntly resdl	11420-11540 CH l-mod fis sb rd-sl (40%): pred dk g resdl
11240-11300 CHK (60%): gy-dk gy, occ off wh-it gy v-f wh chky incl, s, tr vf pyr, tr pyr cln hcl rxn, mod calc wi com dk	11300-11360 CHK (60%): pred gy-dk gy, occ rr wh c free chk, frm-brit v arg LS wi rr-occ vf-f wh chky incl, l-mod fis sb rd-sb blk-occ ply ctgs, rr vf pyr strg, tr fos frags wi cal fil, hi calc wi cln hcl rxn, MRLST (40%): pred dk gy, occ dk gy brn, mot wi rr occ vf-f chky incl, tr vf pyr, tr vf pyr, mod calc wi com dk brn mntly resdl	11360-11420 CHK (60%): gy-dk gy, occ off wh-it gy rr c free chk thrh, frm-brit v arg LS wi rr-occ vf-f wh chky incl, l-mod fis sb rd-sb blk-occ ply ctgs, rr vf pyr & vf-f pyr strg, tr fos frags wi cal fil, hi calc wi cln hcl flzz, MRLST (40%): pred dk gy, occ dk gy brn, mot wi rr occ vf-f chky incl, tr vf pyr, tr vf pyr, mod calc wi dk brn mntly resdl	11420-11540 CH l-mod fis sb rd-sl (40%): pred dk g resdl





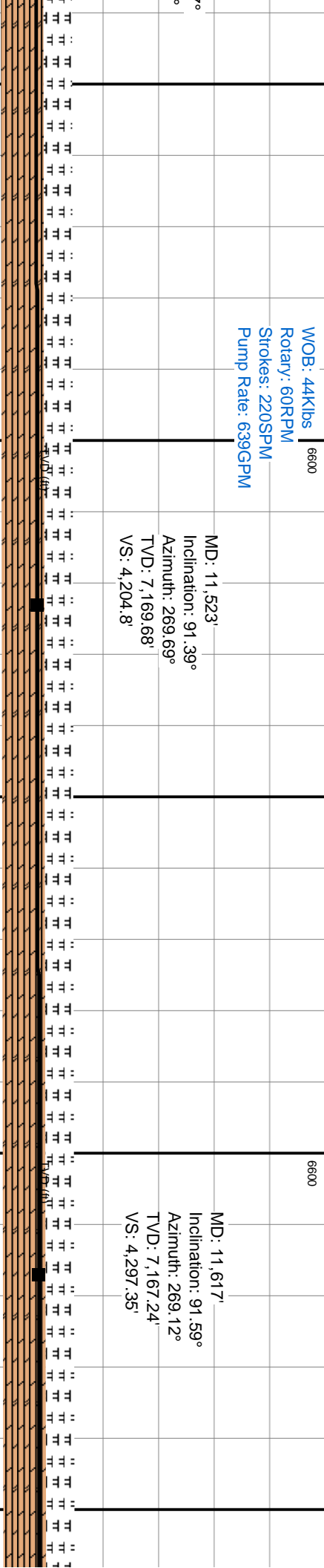
WOB: 44Klbs

Rotary: 60RPM

Strokes: 220SPM

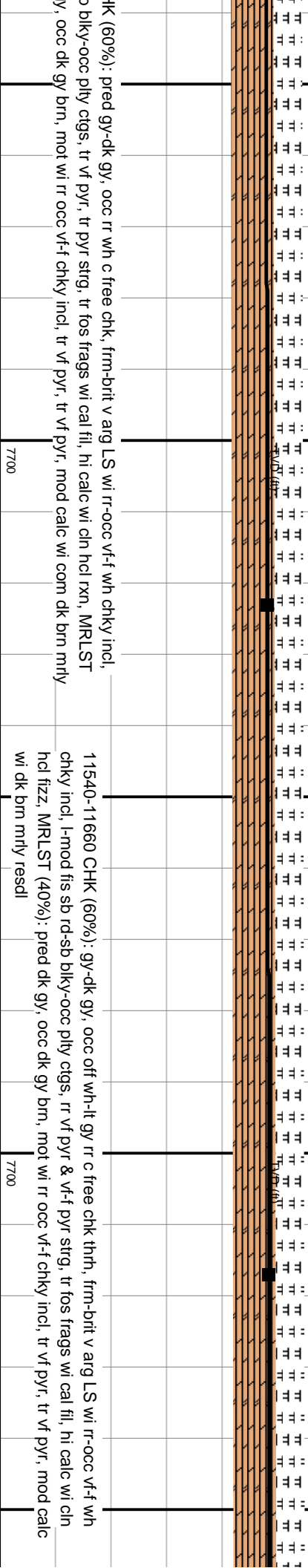
Pump Rate: 639GPM

MD: 11,523'  
Inclination: 91.39°  
Azimuth: 269.69°  
TVD: 7,169.68'  
VS: 4,204.8'



6600

MD: 11,617'  
Inclination: 91.59°  
Azimuth: 269.12°  
TVD: 7,167.24'  
VS: 4,297.35'



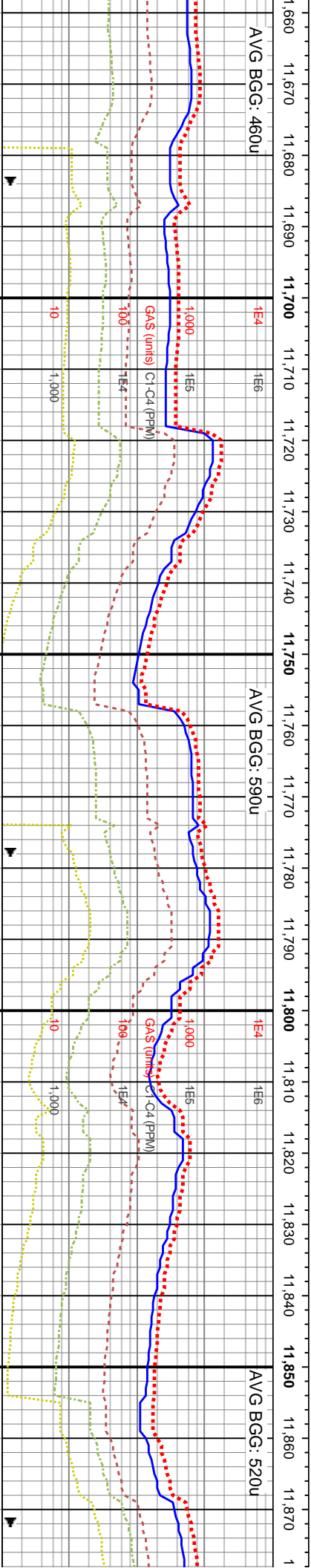
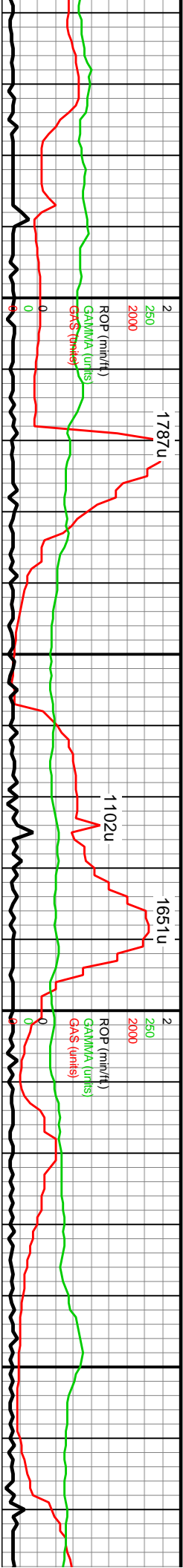
7700

7700

CHK (60%): pred gy-dk gy, occ rr wh c free chk, frm-brit v arg LS wi rr-occ vf-f wh chky incl, b biky-occ ply cigs, tr vf pyr, tr pyr strg, tr fos frags wi cal fil, hi calc wi cin hcl rxn, MRLST y, occ dk gy brn, mot wi rr occ vf-f chky incl, tr vf pyr, tr vf pyr, mod calc wi com dk brn mrlly

11540-11660 CHK (60%): gy-dk gy, occ off wh-lt gy rr c free chk thn, frm-brit v arg LS wi rr-occ vf-f wh chky incl, l-mod fis sb rd-sb biky-occ ply cigs, rr vf pyr & vf-f pyr strg, tr fos frags wi cal fil, hi calc wi cin hcl fizz, MRLST (40%): pred dk gy, occ dk gy brn, mot wi rr occ vf-f chky incl, tr vf pyr, tr vf pyr, mod calc wi dk brn mrlly resd



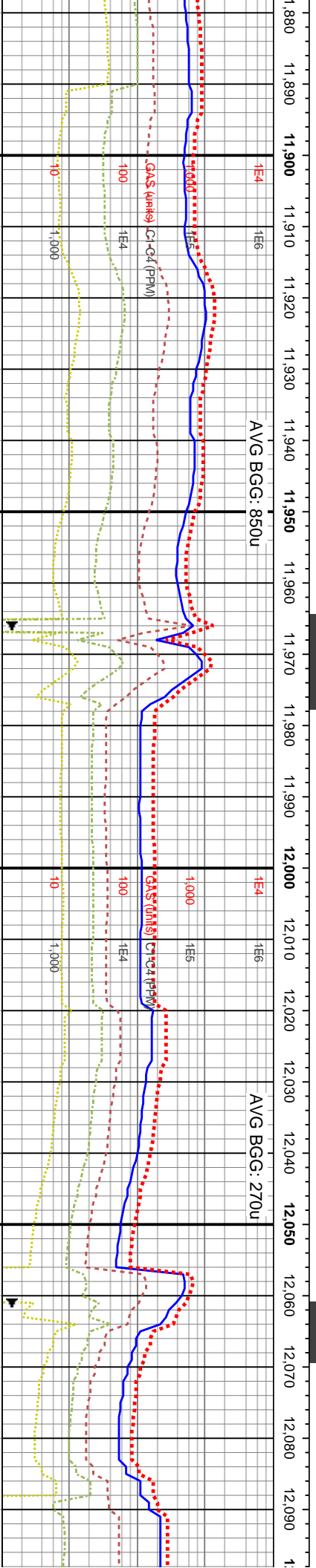
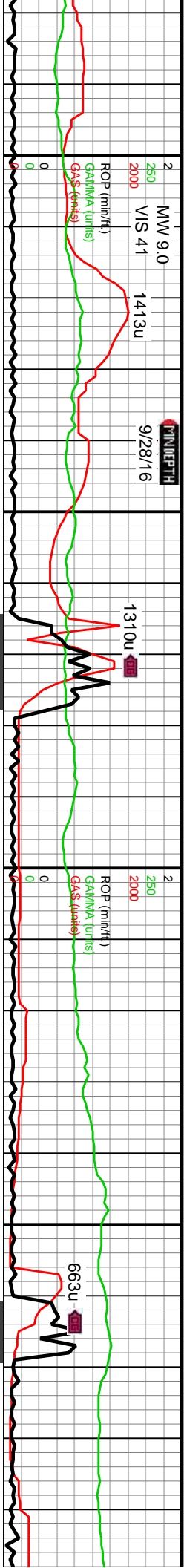


MD: 11,712'  
Inclination: 90.81°  
Azimuth: 268.28°  
TVD: 7,165.25'  
VS: 4,391.09'

MD: 11,806'  
Inclination: 91.26°  
Azimuth: 268.27°  
TVD: 7,163.55'  
VS: 4,483.95'

11660-11720 CHK (70%): lt gy-gy-occ dk gy wi inbadd chky & mrlly incl, l-mod fis brit-frm sb rd-rd ctgs, occ sb blkly-blky, hi calc wi cin hcl rxn, grdg to 30% MRLST: pred dk gy, occ dk gy brn, mot wi rr occ vf-f chky incl, tr vf pyr, mod calc wi lt brn resdl	11720-11780 CHK (70%): lt gy-gy-dk gy v arg LS wi occ-abnt vf-f wh chky incl, frm-brit, pred mod fis blkly-blky ctgs, hi calc wi cin hcl fiz, wi incr brn mrlly mod grdg to MRLST (30%): pred dk gy, occ dk gy brn, mot wi u f-med brn mrlly incl, rr occ vf-f chky incl, tr vf pyr, tr vf pyr, mod calc wi lt brn mrlly resdl	11780-11840 CHK (75%): lt gy-gy-dk gy v arg LS wi occ-abnt vf-f wh chky incl, frm-brit, pred mod fis blkly-blky ctgs, hi calc wi cin hcl fiz, wi incr brn mrlly mod grdg to MRLST (25%): pred dk gy, occ dk gy brn, mot wi u f-med brn mrlly incl, rr occ vf-f chky incl, tr vf pyr, tr vf pyr, mod calc wi lt brn mrlly resdl	11840-11900 CHK (75%): lt gy-gy-c chky & mrlly incl, l-mod fis brit-frm s sb blkly-blky, hi calc wi cin hcl rxn, g MRLST: pred dk gy, occ dk gy brn, chky incl, tr vf pyr, tr vf pyr, mod ca
7700	7700	7700	7700





MD: 11,900'  
Inclination: 91.74°  
Azimuth: 267.62°  
TVD: 7,161.09'  
VS: 4,576.88'

WOB: 48Klbs  
Rotary: 65RPM  
Strokes: 220SPM  
Pump Rate: 639GPM

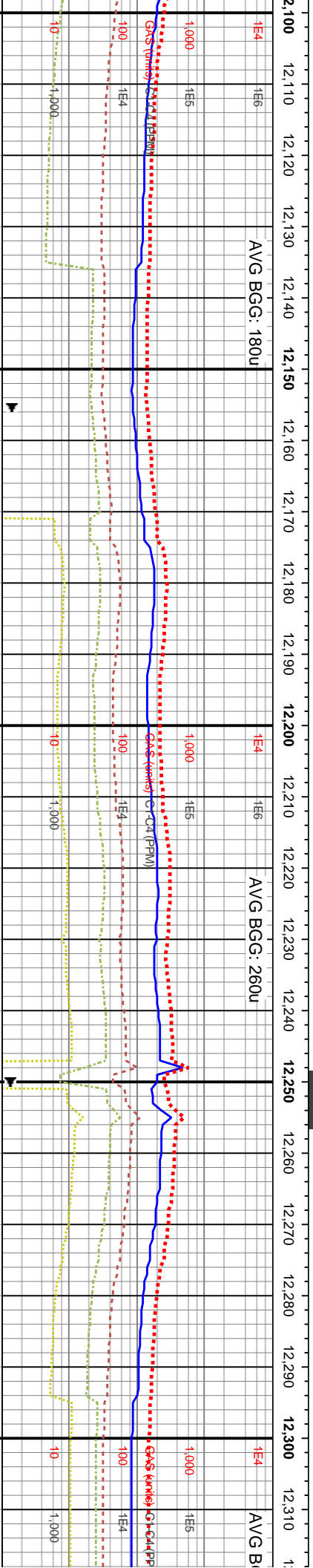
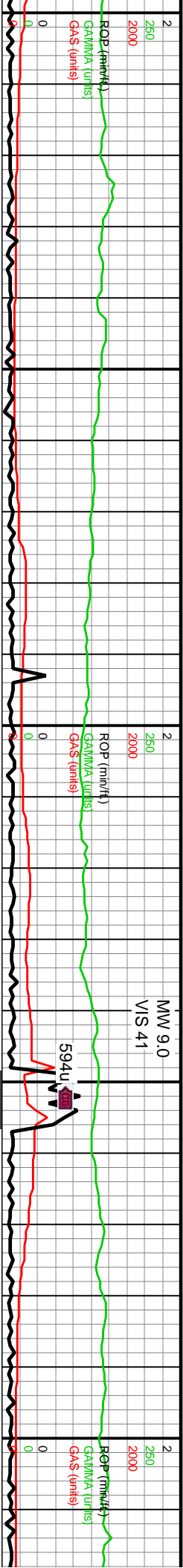
MD: 11,995'  
Inclination: 90.92°  
Azimuth: 269.38°  
TVD: 7,158.88'  
VS: 4,670.67'

MD: 12,090'  
Inclination: 90°  
Azimuth: 269.62°  
TVD: 7,158.12°  
VS: 4,764.2'

11900-11960 CHK (75%): pred gy-dk gy, com lt gy, v arg LS wi occ-com vf-f wh chkly incl, frm-brit, mod fis sb blkly-blky ctgs, hi calc wi cin hcl RXN, wi decr chkly incl grdg to MRLST (25%): pred dk gy, occ dk gy brn, mot wi u f-med brn mrlly incl, rr occ vf-f chkly incl, tr vf pyr, tr vf pyr, mod calc wi brn mrlly resdl	7700
11960-12020 CHK (75%): pred gy-dk gy, com lt gy, v arg LS wi occ-com vf-f wh chkly incl, frm-brit, mod fis sb blkly-blky ctgs, hi calc wi cin hcl RXN, wi decr chkly incl grdg to MRLST (25%): pred dk gy, occ dk gy brn, mot wi u f-med brn mrlly incl, rr occ vf-f chkly incl, tr vf pyr, tr vf pyr, mod calc wi brn mrlly resdl	7700
12020-12080 CHK (75%): lt gy-gy-occ dk gy wi intbdd chkly & mrlly incl, frm-brit mod fis sb blkly-blky ctgs, rr c free wh chk, hi calc wi cin hcl rxn, grdg to 25% MRLST: pred dk gy, occ dk gy brn, mot wi rr occ vf-f chkly incl, tr vf pyr, tr vf pyr, mod calc wi lt brn	7700
12080-12140 CHK (75%): intbdd chkly & mrlly incl, frm-brit mod fis sb blkly-blky ctgs, rr c free wh chk, hi calc wi cin hcl rxn, grdg to 25% MRLST: pred dk gy, occ dk gy brn, mot wi rr occ vf-f chkly incl, tr vf pyr, tr vf pyr, mod calc wi lt brn	7700



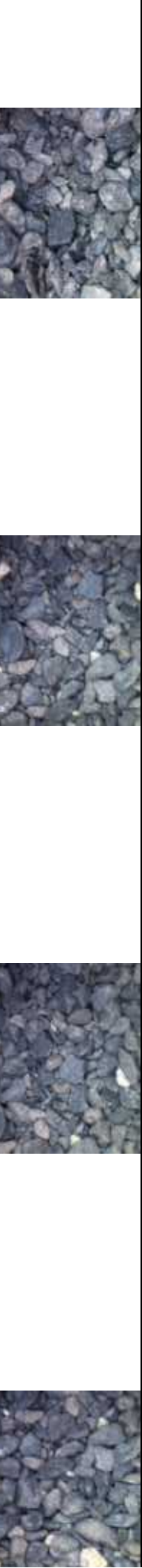


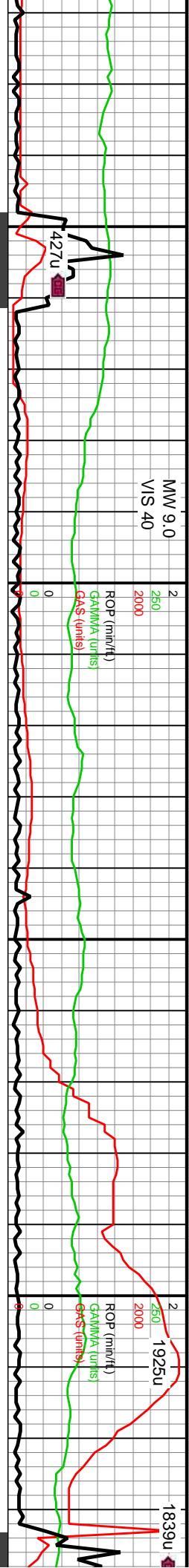


MD: 12,184'  
Inclination: 90.43°  
Azimuth: 269.14°  
TVD: 7,157.77'  
VS: 4,856.78'

MD: 12,278'  
Inclination: 91.11°  
Azimuth: 271.6°  
TVD: 7,156.51'  
VS: 4,949.06'

12,140-12,200 CHK (65%): gy-dk gy v arg LS wi occ f	12,200-12,320 CHK (60%): pred gy-dk gy, occ lt gy, v arg LS wi occ-com vf-f wh chky incl, frm-bit, mod fis
wh chky incl & mot wi rr brn mrlly incl, frm-brit mod fis	sb blkly-blky ctgs, rr c free wh chk, rr columnar cal fos,
sb blkly-blky ctgs, rr c free wh chk, rr columnar cal fos,	tr vf pyr, hi calc wi cin hcl rxn, MRLST (35%): pred dk
tr vf pyr, hi calc wi cin hcl rxn, MRLST (35%): pred dk	gy, occ dk gy brn, mot wi rr occ vf-f chky incl, tr vf pyr,
gy, occ dk gy brn, mot wi rr occ vf-f chky incl, tr vf pyr,	mod calc wi brn mrlly resdl
mod calc wi brn mrlly resdl	





MW 9.0  
VIS 40

ROP (min/ft)  
2500  
2000  
0

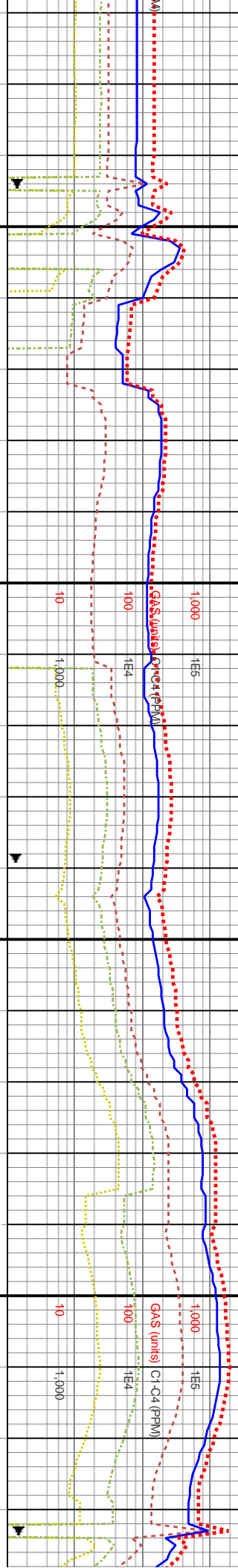
ROP (min/ft)  
2500  
2000  
0

1839u

GG: 210u

AVG BGG: 180u

AVG BGG: 950u



ROP (min/ft)  
2500  
2000  
0

ROP (min/ft)  
2500  
2000  
0

1839u

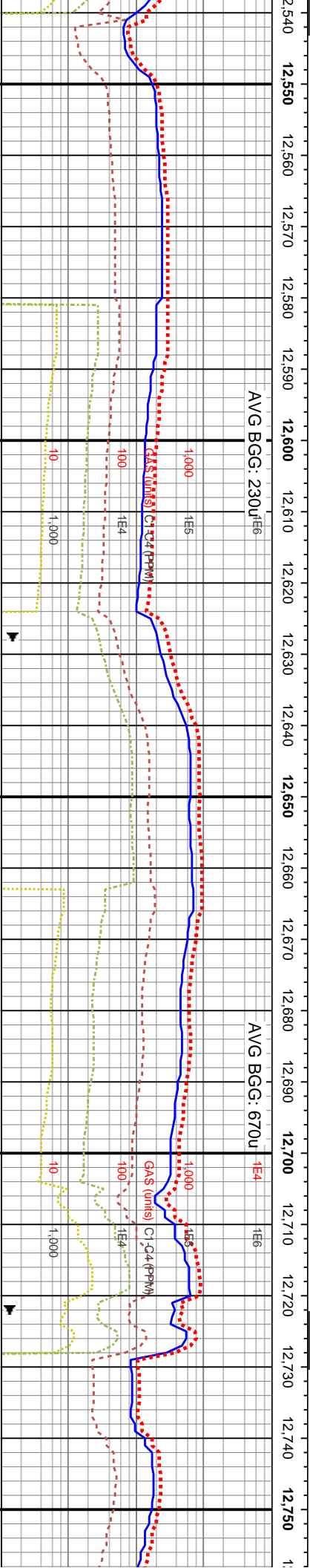
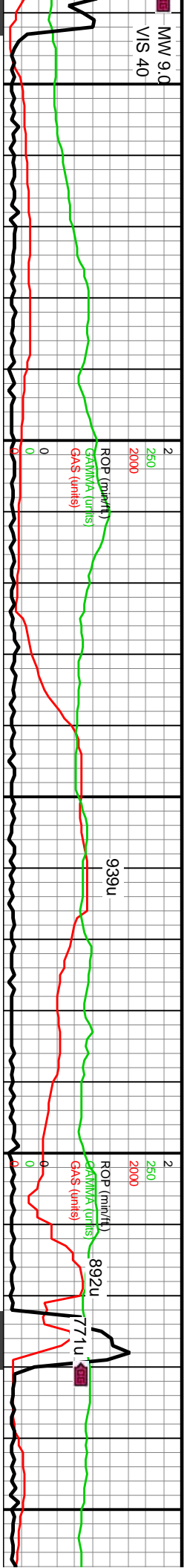
MD: 12,373'  
Inclination: 89.35°  
Azimuth: 271.06°  
TVD: 7,156.13'  
VS: 5,042.01'

MD: 12,467'  
Inclination: 88.99°  
Azimuth: 271.04°  
TVD: 7,157.49'  
VS: 5,134.07'

WOB: 48Klbs  
Rotary: 60RPM  
Strokes: 220SPM  
Pump Rate: 639GPM

12320-12380 CHK (65%): gy-dk gy v arg LS wi occ f wh chky incl & mot wi rr brn mrlly incl, frm-brit mod fis sb blkly-blky ctgs, rr c free wh chk, mict cal vn, tr c pyr strg, hi calc wi chn hcl rxn, MRLST (35%): pred dk gy, occ dk gy brn, mot wi rr occ vf-f chky incl, tr vf pyr, mod calc wi brn mrlly resdl	12380-12440 CHK (65%): gy-dk gy v arg LS wi occ f wh chky incl & mot wi rr brn mrlly incl, frm-brit mod fis sb blkly-blky ctgs, rr c free wh chk, mict cal vn, tr c pyr strg, hi calc wi chn hcl rxn, MRLST (35%): pred dk gy, occ dk gy brn, mot wi rr occ vf-f chky incl, tr vf pyr, mod calc wi brn mrlly resdl	12440-12500 CHK (70%): lt gy-gy-dk gy wi occ vf-f wh chky incl & occ thn lamn wi occ intbdd mrlly incl, frm-brit v arg LS, mod fis sb blkly-blky ctgs, tr c pyr strg-euhed pyr, hi calc wi chn hcl fiz, MRLST (30%): pred dk gy, occ dk gy brn, mot wi rr occ vf-f chky incl, tr vf pyr, mod calc wi brn mrlly resdl	12500-12560 CHK (80%): pred l occ-com vf-f wh chky incl & com chky vn, frm-brit mod fis sb blkly chk, rr c pyr strg, hi calc wi chn hcl rxn, MRLST (20%): pred dk gy, occ dk gy brn, mot wi rr incl & rr f chky incl, tr vf brn mrlly resdl
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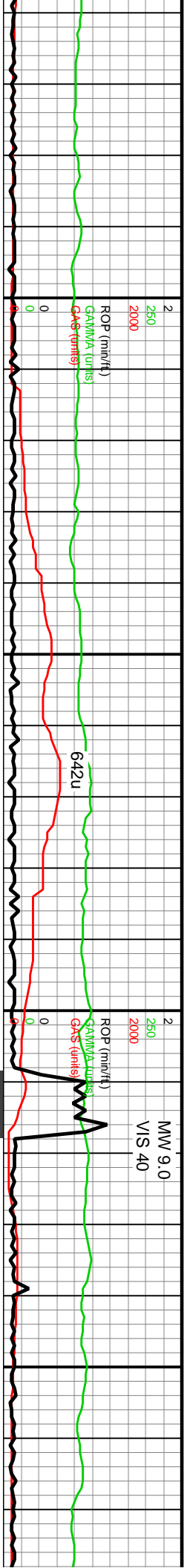


MD: 12,562'  
Inclination: 90.29°  
Azimuth: 269.81°  
TVD: 7,158.09'  
VS: 5,227.32'

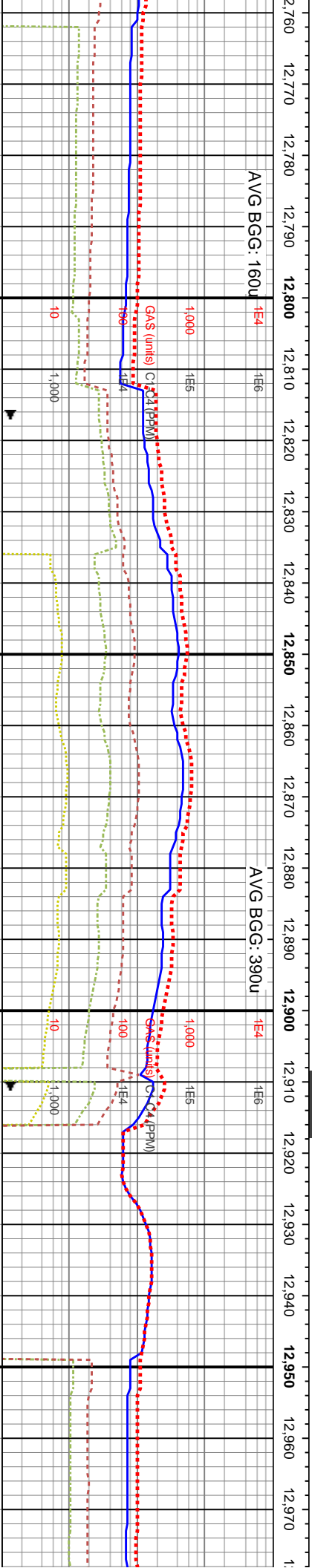
MD: 12,656'  
Inclination: 89.77°  
Azimuth: 269.28°  
TVD: 7,158.04'  
VS: 5,319.86'

MD: 12,750'  
Inclination: 91.02°  
Azimuth: 269.67°  
TVD: 7,157.39'  
VS: 5,412.42'

gy-gy v arg LS wi thin chky lamn wi c biky ctgs, tr c free si rxn, MRLST , mot wi occ dk gy pyr, mod calc wi	12560-12680 CHK (75%): lt gy-gy-dk gy wi occ vf-f wh chky incl & occ thin lamn wi occ intbdd mly incl, frm-brit v arg LS, mod fis sb biky-biky ctgs, tr c pyr strg-euhed pyr, hi calc wi cin hcl fiz, MRLST (25%): pred dk gy, occ dk gy brn, mot wi tr occ vf-f chky incl, tr vf pyr, mod calc wi brn mly resdl	12680-12740 CHK (60%): pred gy-dk gy, occ lt gy, frm-brit v arg LS wi occ vf-f wh chky incl, occ v chky intbds, mod fis sb biky-biky ctgs, tr c pyr strg, hi calc, wi decr chky incl grdg to MRLST (40%): pred dk gy, occ dk gy brn, mot wi u f-med brn mly incl, tr occ vf-f chky incl, tr vf pyr, mod calc wi brn mly resdl	12740-12800 C wh chky incl & r sb biky-biky ctgs wi cin hcl rxn, M brn, mot wi tr oc brn mly resdl
7700	7700	7700	7700

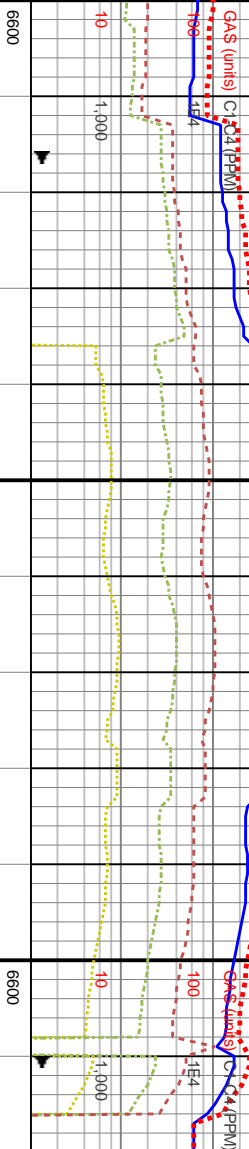


MW 9.0  
VIS 40



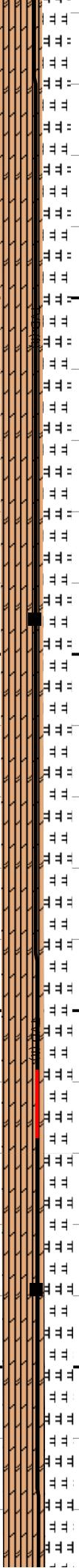
AVG BGG: 160U

AVG BGG: 390U



MD: 12,845'  
Inclination: 90.95°  
Azimuth: 269.7°  
TVD: 7,155.76'  
VS: 5,505.88'

MD: 12,939'  
Inclination: 92.75°  
Azimuth: 270.08°  
TVD: 7,152.73'  
VS: 5,598.26'



HK (60%): gy-dk gy v arg LS wi occ f  
mot wi rr brn mly incl, frm-brit mod fis  
s, tr c free wh chk, tr c pyr strg, hi calc  
RLST (40%): pred dk gy, occ dk gy  
cc vf-f chky incl, tr vf pyr, mod calc wi

12800-12860 CHK (60%): gy-dk gy v arg LS wi occ f  
wh chky incl & mot wi rr brn mly incl, frm-brit mod fis  
sb blkly-blky ctgs, tr c free wh chk, tr c pyr strg, hi calc  
wi chn hcl rxn, MRLST (40%): pred dk gy, occ dk gy  
brn, mot wi rr occ vf-f chky incl, tr vf pyr, mod calc wi  
brn mly resdl

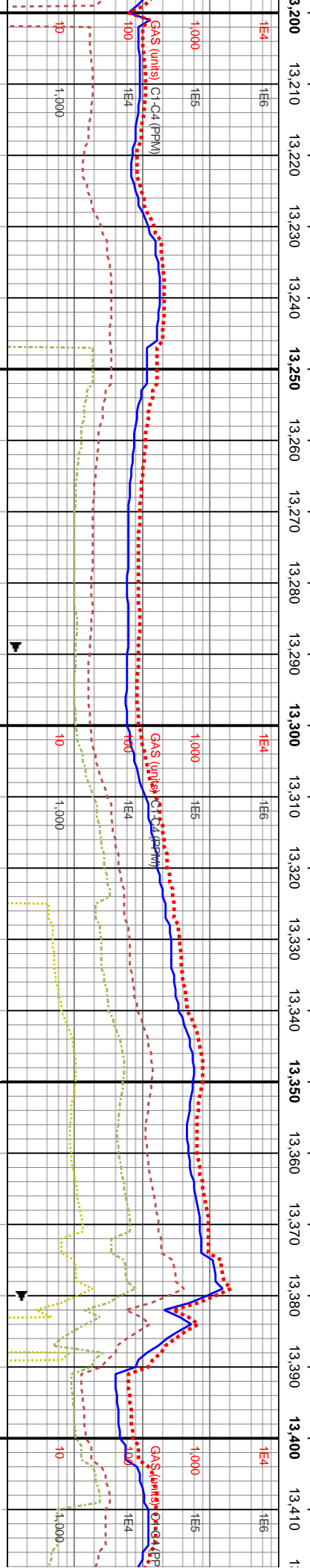
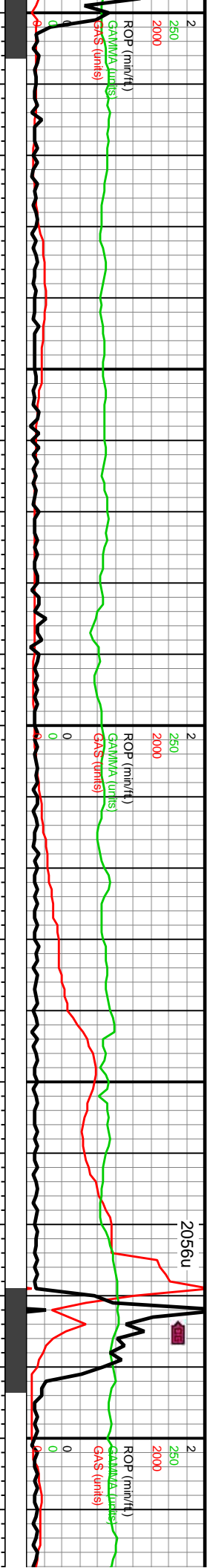
12860-12920 CHK (60%): pred gy-dk gy, occ lt gy,  
frm-brit v arg LS wi occ vf-f wh chky incl, occ v chky  
intbds, mod fis sb blkly-blky ctgs, tr c pyr strg, hi calc,  
wi decr chky incl grdg to MRLST (40%): pred dk gy,  
occ dk gy brn, mot wi u f-med brn mly incl, rr occ vf-f  
chky incl, tr vf pyr, mod calc wi brn mly resdl

12920-12980 CHK (60%): lt gy-gy-occ dk gy v arg LS  
wi occ f wh chky incl, frm-brit mod fis sb blkly-blky  
ctgs, rr c free wh chk, tr vf pyr, rr c free chk, MRLST  
(40%): pred dk gy, occ dk gy brn, mot wi rr occ vf-f  
chky incl ip, tr vf pyr, mod calc wi brn mly resdl









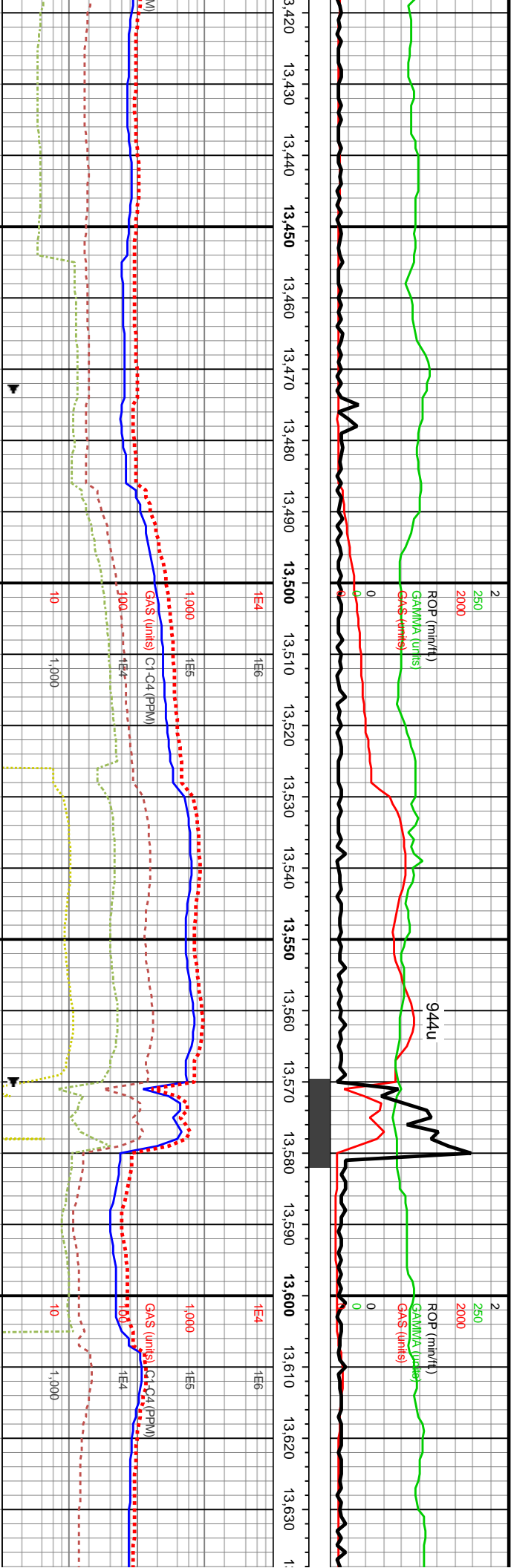
MD: 13,223'  
Inclination: 92.24°  
Azimuth: 270.5°  
TVD: 7,139.54'  
VS: 5,877.52'

MD: 13,317'  
Inclination: 92.68°  
Azimuth: 270.99°  
TVD: 7,135.51'  
VS: 5,969.61'

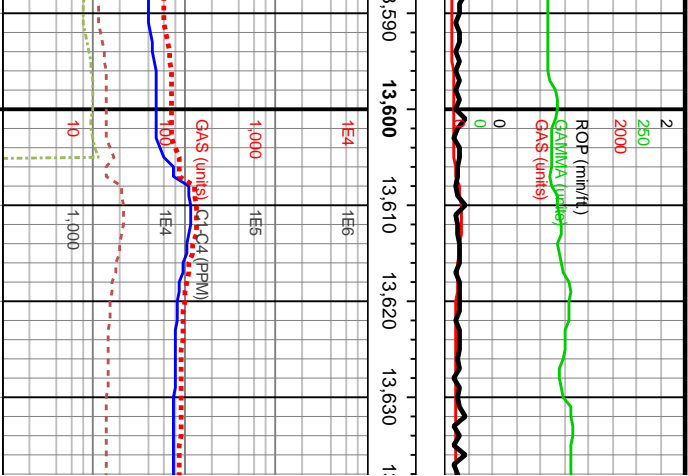
MD: 13,412'  
Inclination: 90.0°  
Azimuth: 270.4°  
TVD: 7,132.64'  
VS: 5,855.08'

13220-13280 CHK (55%): lt gy- gy-occ dk gy v l, frm-brit mod fis sh chk, tr vf pyr, rr c dk gy, occ dk gy incl ip, tr vf pyr, mod	13280-13340 CHK (80%): pred gy, sme med gy- brn, brn- tn- bf mot, sl frm, pred blky- sb blky, sl arg thru, mod calc incl, lse- frac fl cal, occ mrly intbds, tr pyr, rr bent; MRLST (20%): pred v dk- med gy, sme brn- gy mot, mod frm- hd, sb blky- sb pily, calc incl, chky intbds thru, mod carb, v arg	13340-13400 CHK (80%): pred gy, sme med gy- brn, brn- tn- bf mot, sl frm, pred blky- sb blky, sl arg thru, mod calc incl, lse- frac fl cal, occ mrly intbds, tr pyr, rr bent; MRLST (20%): pred v dk- med gy, sme brn- gy mot, mod frm- hd, sb blky- sb pily, calc incl, chky intbds thru, mod carb, v arg	13400-134 gy- brn, br sl arg thru, mrly intbds gy, sme br pily, calc tr

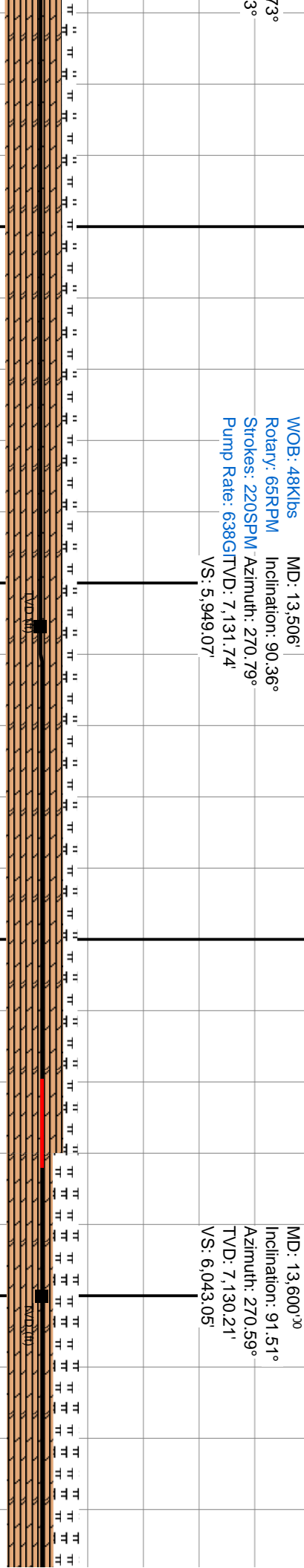




WOB: 48Klbs  
Rotary: 65RPM  
Strokes: 220SPM  
Pump Rate: 638G/TV  
MD: 13,506'  
Inclination: 90.36°  
Azimuth: 270.79°  
TVD: 7,131.74'  
VS: 5,949.07'



MD: 13,600'  
Inclination: 91.51°  
Azimuth: 270.59°  
TVD: 7,130.21'  
VS: 6,043.05'



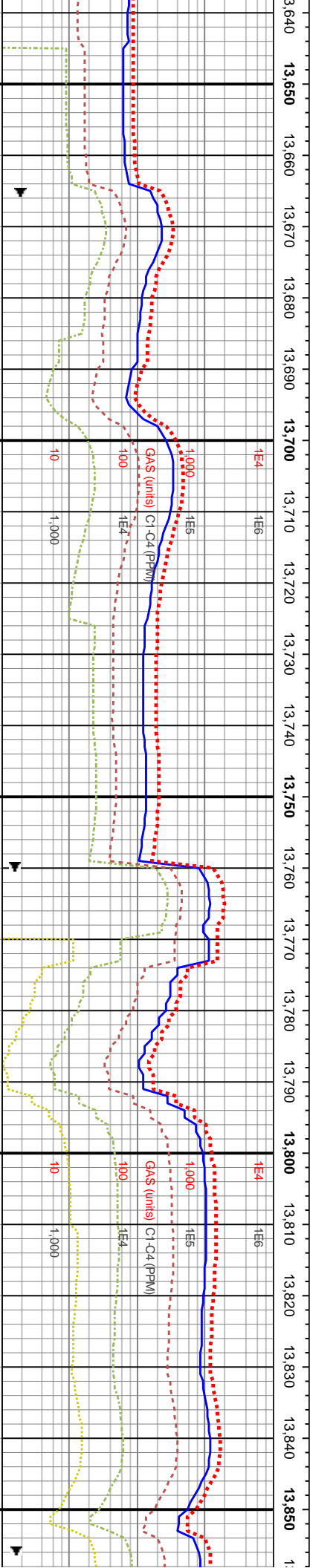
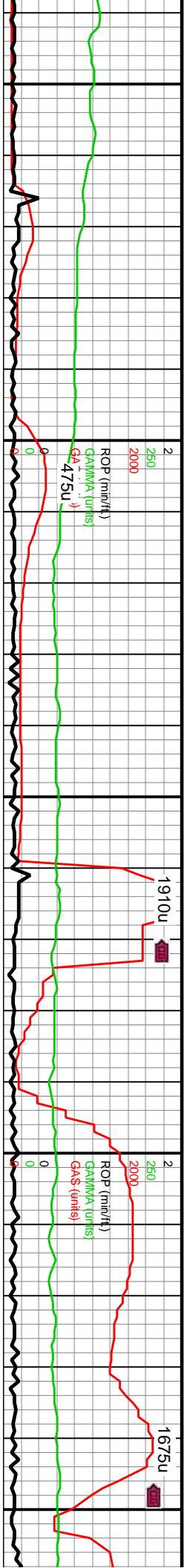
60 CHK (80%): pred gy- tn, sme med  
n- tn- bf mot, sl frm, pred blk- sb blk-  
mod calc incl, lse- euhed cal, occ  
, tr pyr; MRLST (20%): pred v dk- med  
gy mot, mod frm- hd, sb blk- sb  
calc, chky intbds thru, mod carb, v arg

13460-13520 CHK (80%): pred gy- tn, sme  
med gy- brn, brn- tn- bf mot, sl frm, pred blk-  
sb blk- sl arg thru, mod calc incl, lse- euhed  
cal, occ mrlly intbds, tr pyr; MRLST (20%): pred  
med- dk gy, sme brn- gy mot, mod frm- hd, sb  
blk- sb plty, calc incl, chky intbds thru, mod  
carb, v arg

13520-13580 CHK (80%): pred gy- tn, sme med gy-  
brn, brn- tn- bf mot, sl frm, pred blk- sb blk- sl arg  
thru, mod calc incl, lse- euhed cal, sme sl mrlly  
intbds, tr pyr; MRLST (20%): pred med- dk gy, sme  
brn- gy mot, mod frm- hd, sb blk- sb plty, calc incl,  
chky intbds thru, mod carb, v arg

13580-13640 CHK (65%): pred gy- med gy, sme  
med gy- lt brn, brn- tn- bf mot, sl frm, pred blk- sb  
blk- sl arg thru, mod calc incl, lse- euhed cal, sme  
sl mrlly intbds, tr pyr; MRLST (35%): pred med- dk  
gy, sme brn- gy mot, mod frm- hd, sb blk- sb plty,  
calc incl, chky intbds thru, mod carb, v arg





MD: 13,695'  
Inclination: 91.87°  
Azimuth: 270.64°  
TVD: 7,127.41'  
VS: 6,138'

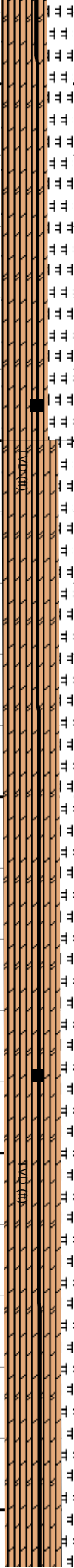
MD: 13,789'  
Inclination: 91.88°  
Azimuth: 271.13°  
TVD: 7,124.33'  
VS: 6,231.94'

13640-13700 CHK (65%): pred gy- med gy, sme med gy- lt brn, brn- tn- bf mot, sl frm, pred blkly- sb blkly, sl arg thru, mod calc incl, lse- euhed cal, sme sl mrlly intbds, tr pyr; MRLST (35%): pred med- dk gy, sme brn- gy mot, mod frm- hd, sb blkly- sb plty, calc incl, chky intbds thru, mod carb, v arg

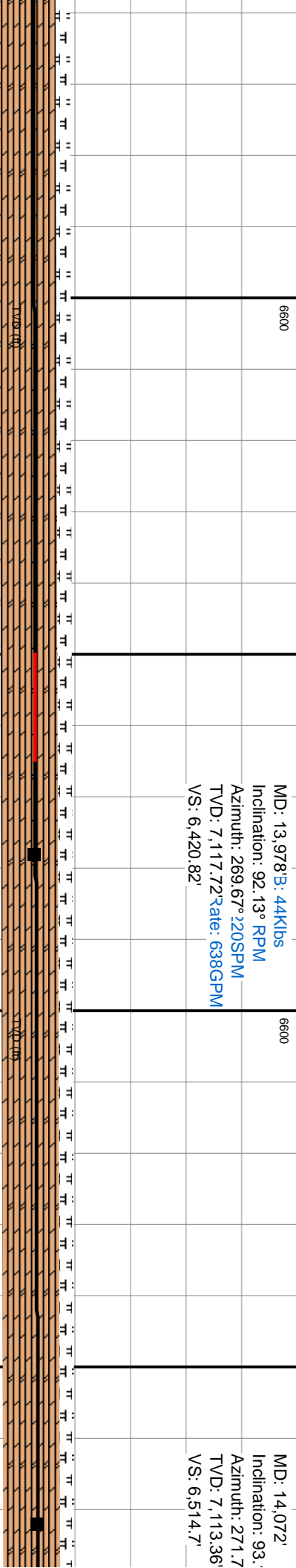
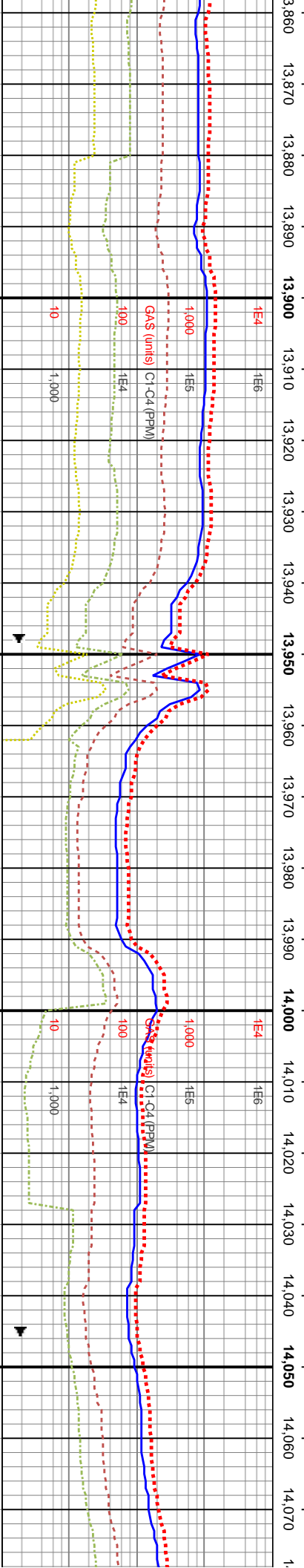
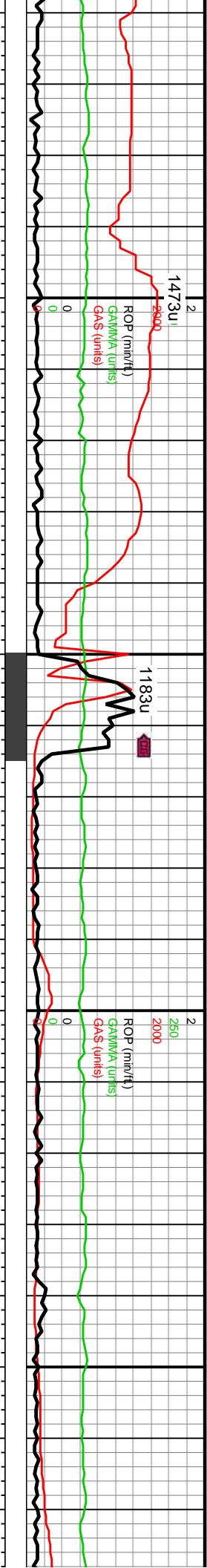
13700-13760 CHK (80%): pred gy- med gy, sme lt brn, brn- tn- bf mot, sl frm, pred blkly- sb blkly, sl arg thru, mod calc incl, lse- frac fl cal, sme sl mrlly intbds, sme pyr; MRLST (20%): pred med- dk gy, sme brn- gy mot, mod frm- hd, sb blkly- sb plty, calc incl, chky intbds thru, mod carb, arg

13760-13820 CHK (80%): pred gy- med gy, sme lt brn, brn- tn- bf mot, sl frm, pred blkly- sb blkly, sl arg thru, mod calc incl, lse- frac fl cal, sme sl mrlly intbds, sme pyr; MRLST (20%): pred med- dk gy, sme brn- gy mot, mod frm- hd, sb blkly- sb plty, calc incl, chky intbds thru, mod carb, arg

13820-13880 CHK (80%): pred i brn, brn- tn- bf mot, sl frm, pred thru, mod calc incl, lse- frac fl ca intbds, sme pyr; MRLST (20%): sme brn- gy mot, mod frm- hd, s incl, chky intbds thru, mod carb,

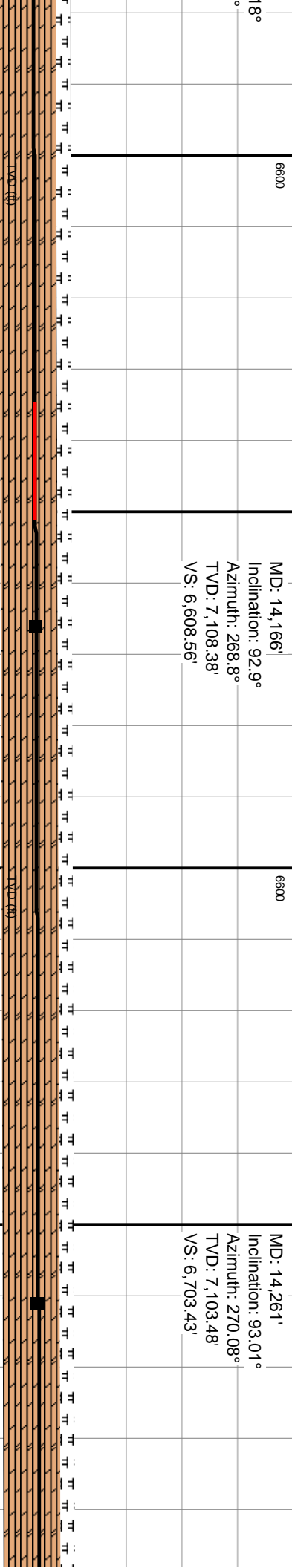
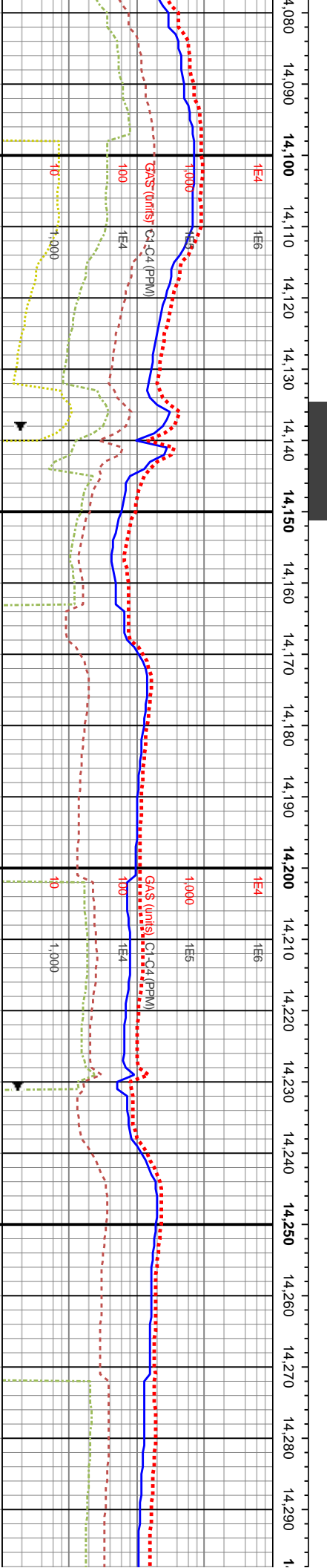
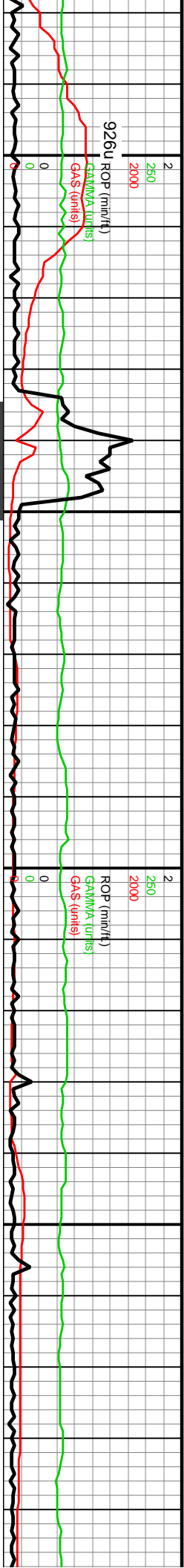






gy- med gy, sme lt bly- sb bly, sl arg l, sme sl mly pred med- dk gy, b bly- sb ply, calc arg	13880-13940 CHK (85%): pred gy- med gy, sme lt brn, brn- tn- bf mot, sl frm, pred bly- sb bly, sl arg thru, mod calc incl, lse- frac fl cal, sme sl mly intbds, sme pyr; MRLST (15%): pred med- dk gy, sme brn- gy mot, mod frm- hd, sb bly- sb ply, calc incl, chky intbds thru, mod carb, arg,so	13940-14000 CHK (85%): pred gy, sme lt brn, brn- tn- bf mot, sl frm, pred bly- sb bly, sl arg thru, mod calc incl, lse- frac fl cal, sme sl mly intbds, sme pyr; MRLST (15%): pred med- dk gy, sme brn- gy mot, mod frm- hd, sb bly- sb ply, calc incl, chky intbds thru, mod carb, arg	14000-14060 CHK (80%): pred gy, sme lt brn, brn- tn- bf mot, sl frm, pred bly- sb bly, mod arg thru, mod calc incl, occ lse cal, tr frac fl cal, mod sl mly intbds, sme pyr; MRLST (20%): pred med- dk gy, sme brn- gy mot, mod frm- hd, sb bly- sb ply, calc incl, chky intbds thru, mod carb, arg	14060-14120 (15%): pred med- dk gy, sme brn- gy m tn- bf mot, sl fr mod calc incl, intbds, sme py sme brn- gy m incl, chky intb
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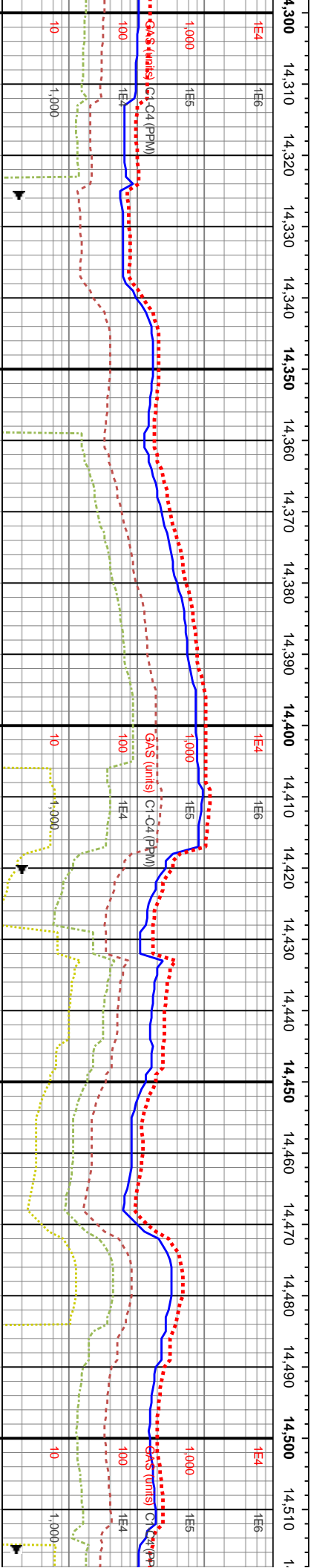
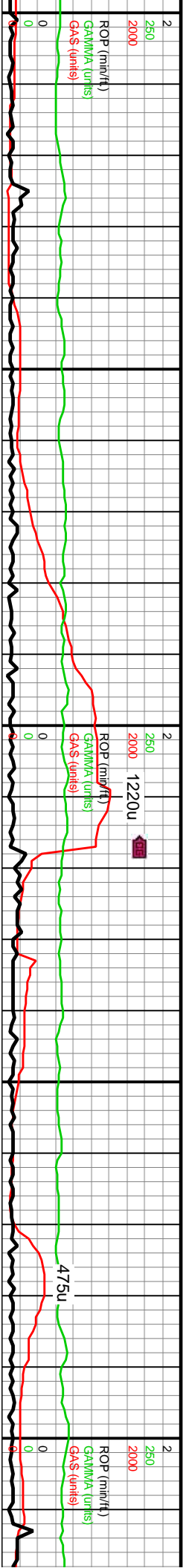




CHK (80%): pred gy, sme lt brn, brn- m, pred blkly- sb blkly, mod arg thru, occ lse cal, tr frac fl cal, mod sl mrlly tr; MRLST (20%): pred med- dk gy, mod, mod frm- hd, sb blkly- sb plty, calc is thru, mod carb, arg	14120-14180 CHK (80%): pred med gy, sme gy- lt brn, sme brn- tn- bf mot, sl frm, pred blkly- sb blkly, mod arg thru, mod calc incl, occ lse cal, tr frac fl cal, mod mrlly intbds, sme pyr; MRLST (20%): pred med- dk gy, sme brn- gy mot, mod frm- hd, sb blkly- sb plty, calc incl, chky intbds thru, mod carb, v arg	14180-14240 CHK (80%): pred med gy, sme gy- lt brn, sme brn- tn- bf mot, sl frm, pred blkly- sb blkly, mod arg thru, mod calc incl, occ lse cal, tr frac fl cal, mod mrlly intbds, sme pyr; MRLST (20%): pred med- dk gy, sme brn- gy mot, mod frm- hd, sb blkly- sb plty, calc incl, chky intbds thru, mod carb, v arg	14240-14300 CHK (80%): pred med gy, sme gy- lt brn, sme brn- tn- bf mot, sl frm, pred blkly- sb blkly, mod arg thru, mod calc incl, occ lse cal, tr frac fl cal, mod mrlly intbds, sme pyr; MRLST (20%): pred med dk gy, sme brn- gy mot, mod frm- hd, sb blkly- sb plty calc incl, chky intbds thru, mod carb, v arg
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MD: 14,166'  
Inclination: 92.9°  
Azimuth: 268.8°  
TVD: 7,108.38'  
VS: 6,608.56'

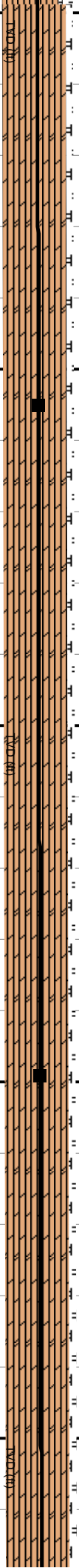
MD: 14,261'  
Inclination: 93.01°  
Azimuth: 270.08°  
TVD: 7,103.48'  
VS: 6,703.43'



MD: 14,355'  
Inclination: 91.67°  
Azimuth: 269.21°  
TVD: 7,099.64'  
VS: 6,797.34'

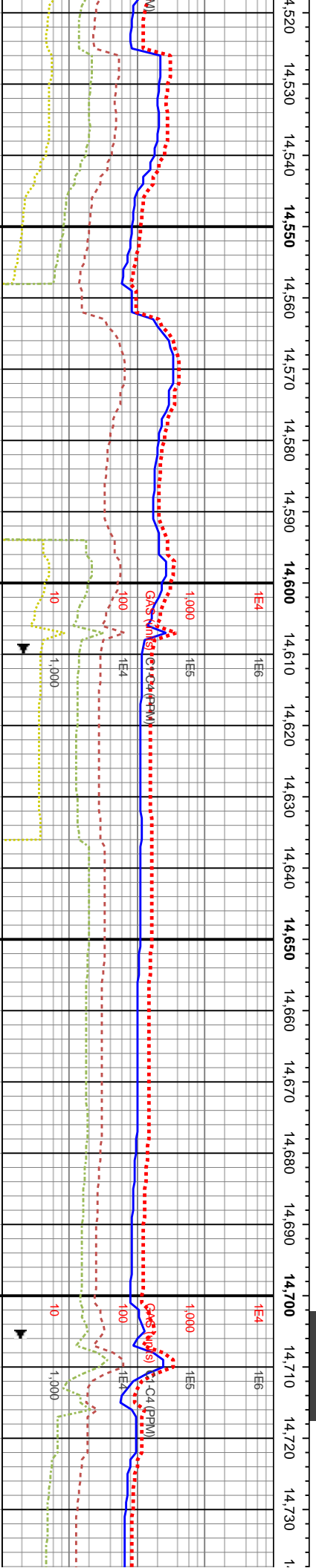
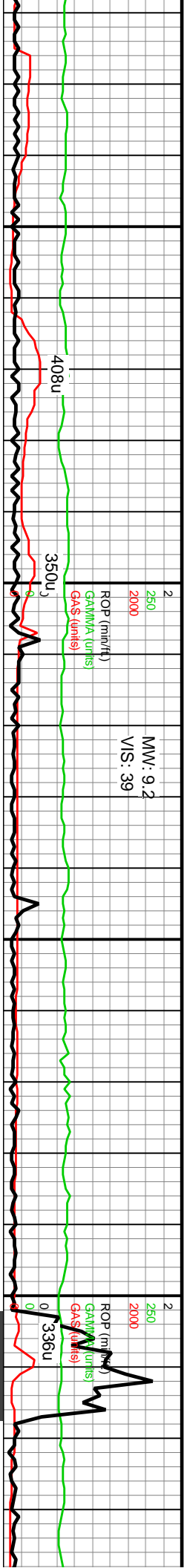
MD: 14,449'  
Inclination: 91.74°  
Azimuth: 269.52°  
TVD: 7,096.85'  
VS: 6,891.29'

WOB: 43Klbs  
Rotary: 65RPM  
Strokes: 209SPM  
Pump Rate: 609GPM



Depth Interval	Description
14300-14360 CHK (90%):	pred med gy, sme gy- lt brn, sme brn- tn- bf mot, sl frm, pred blk- sb blk, mod arg thru, mod calc incl, occ lse cal, tr frac fl cal, mod mrlv intbds, sme pyr: MRLST (10%): pred med- dk gy, sme brn- gy mot, mod frm- hd, sb blk- ply, calc incl, chky intbds thru, mod carb, v arg
14360-14420 CHK (90%):	pred gy, sme med gy- lt brn- offwht, sme brn- tn- bf mot, sl frm, pred blk- sb blk, ip sl arg thru, mod calc incl, sme lse cal, occ dk mrlv intbds, sme pyr: MRLST (10%): pred med- dk gy, sme brn- gy mot, mod frm- hd, sb blk- sb ply, calc incl, chky intbds thru, mod carb, arg
14420-14480 CHK (90%):	pred gy, sme med gy- lt brn- offwht, sme brn- tn- bf mot, sl frm, pred blk- sb blk, ip sl arg thru, mod calc incl, sme lse cal, occ dk mrlv intbds, sme pyr: MRLST (10%): pred med- dk gy, sme brn- gy mot, mod frm- hd, sb blk- sb ply, calc incl, chky intbds thru, mod carb, arg
14480-14540 CHK (90%):	pred gy, sme med gy- lt brn- offwht, sme brn- tn- bf mot, sl frm, pred blk- sb blk, ip sl arg thru, mod calc incl, dk mrlv intbds, sme pyr: MRLST (10%): pred med- dk gy, sme brn- gy mot, mod frm- ply, calc incl, chky intbds thru, m

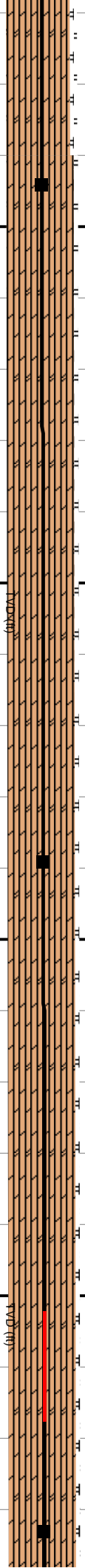




MD: 14,544'  
Inclination: 92.3°  
Azimuth: 270.58°  
TVD: 7,093.5'  
VS: 6,986.23'

MD: 14,639'  
Inclination: 92.03°  
Azimuth: 271.85°  
TVD: 7,089.91'  
VS: 7,081.14'

MD: 14,733'  
Inclination: 91°  
Azimuth: 269°  
TVD: 7,087.33'  
VS: 7,175.09'



14540-14600 CHK: pred gy, sme med gy- lt  
brn- ofwrt, sme brn- tn- bf mot, sl frm, pred  
biky- sb biky, ip sl arg thru, mod calc incl, sme  
lse- euhed cal, sme dk mrly intbds, sme pyr

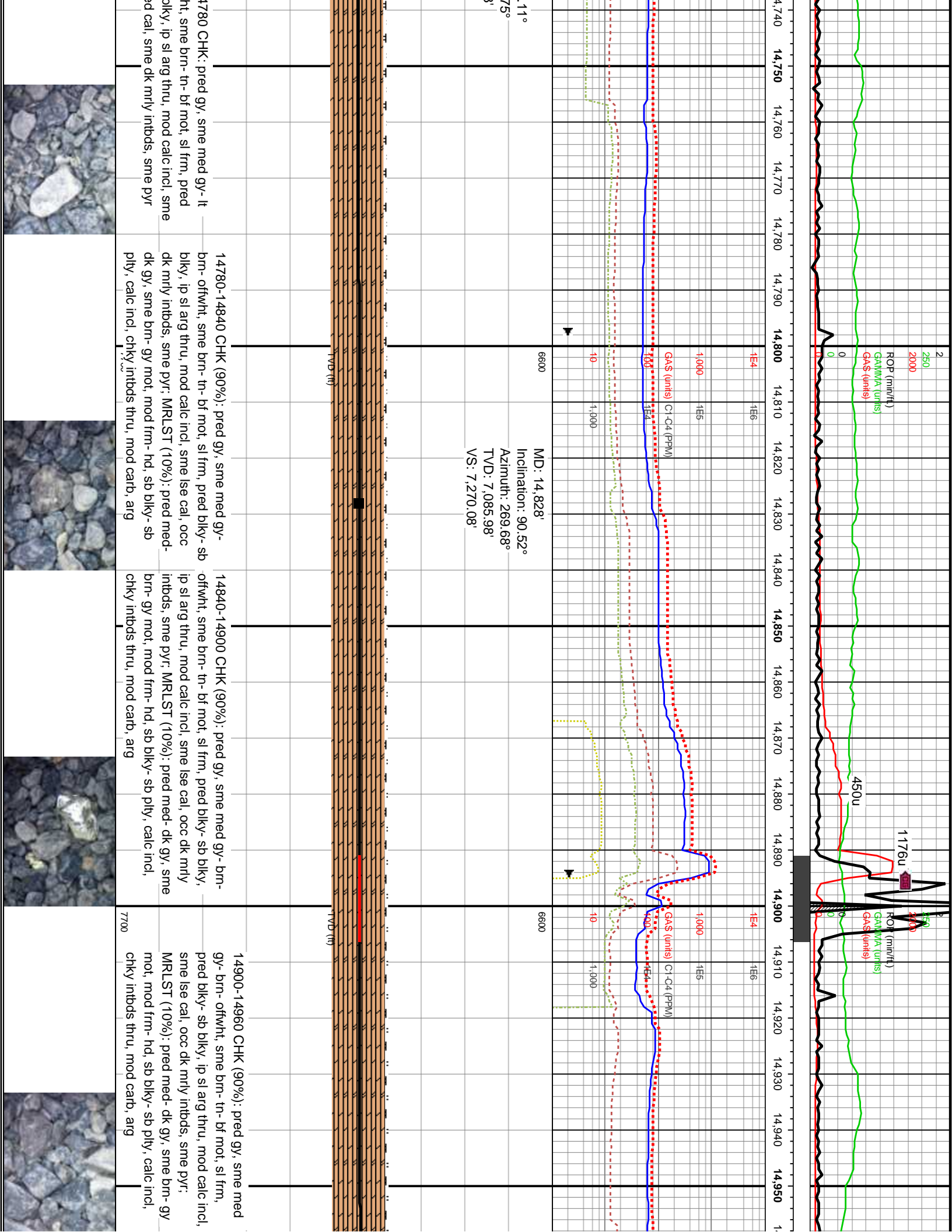
14600-14660 CHK: pred gy, sme med gy- lt brn-  
ofwrt, sme brn- tn- bf mot, sl frm, pred biky- sb  
biky, ip sl arg thru, mod calc incl, sme lse-  
euhed cal, sme dk mrly intbds, sme pyr

14660-14720 CHK: pred gy, sme med gy- lt brn-  
ofwrt, sme brn- tn- bf mot, sl frm, pred biky- sb biky,  
ip sl arg thru, mod calc incl, sme lse- euhed cal,  
sme dk mrly intbds, sme pyr

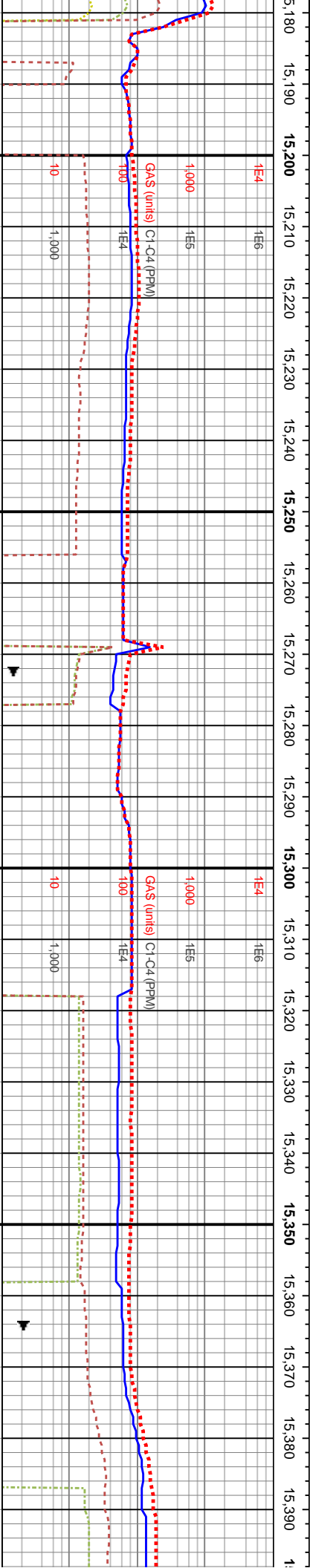
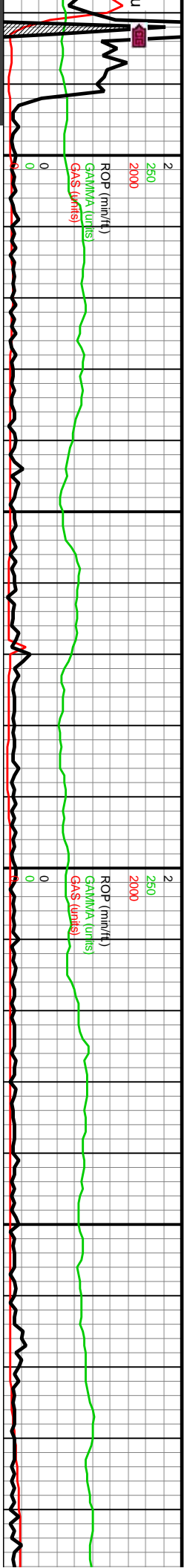
14720-14730 CHK: pred gy, sme med gy- lt brn-  
ofwrt, sme brn- tn- bf mot, sl frm, pred biky- sb biky,  
ip sl arg thru, mod calc incl, sme lse- euhed cal,  
sme dk mrly intbds, sme pyr







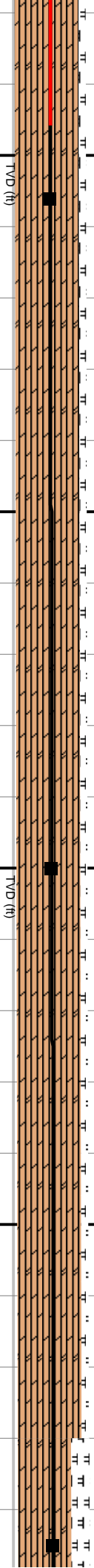




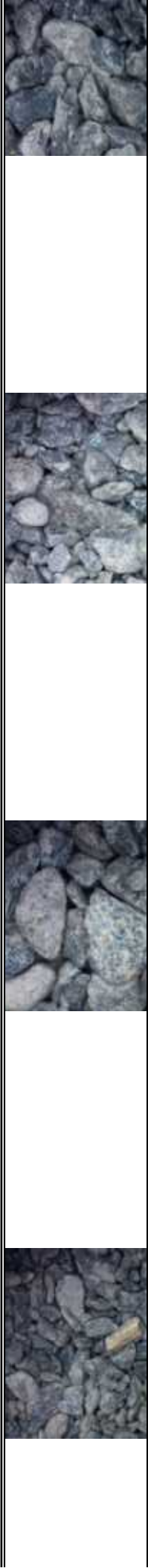
MD: 15,206'  
Inclination: 92.73°  
Azimuth: 269.79°  
TVD: 7,077.06'  
VS: 7,647.95'

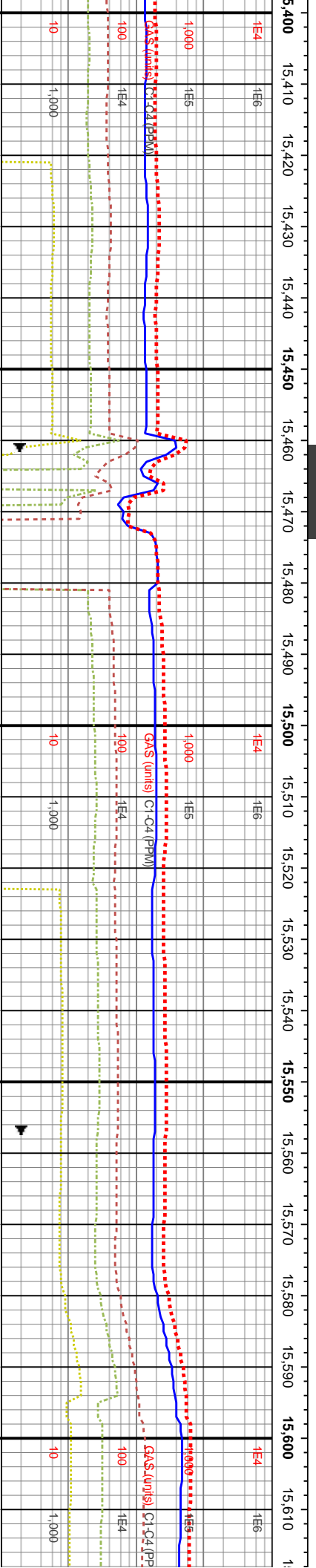
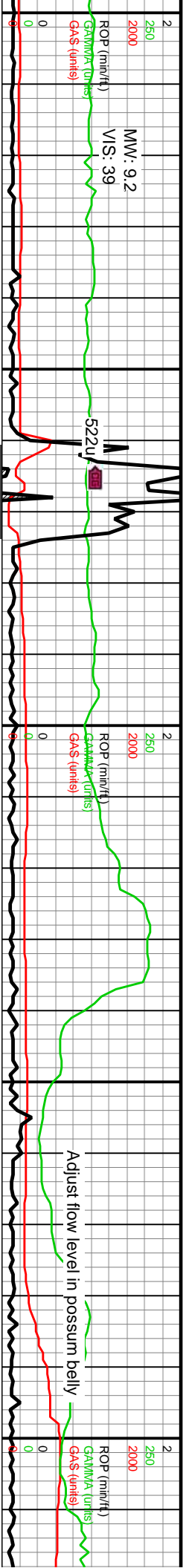
MD: 15,300'  
Inclination: 92.01°  
Azimuth: 270.46°  
TVD: 7,073.18'  
VS: 7,741.87'

MD: 15,395'  
Inclination:  
Azimuth: 27  
TVD: 7,070  
VS: 7,836.8

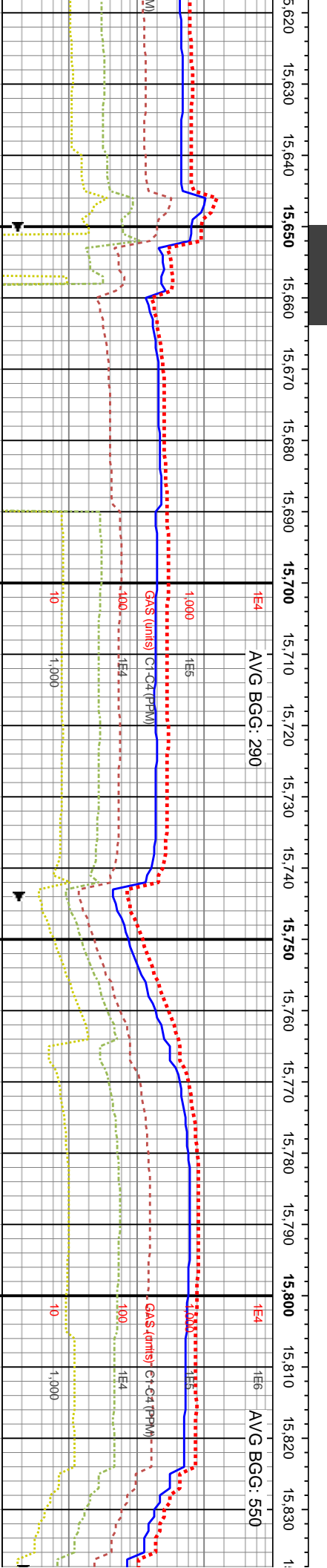
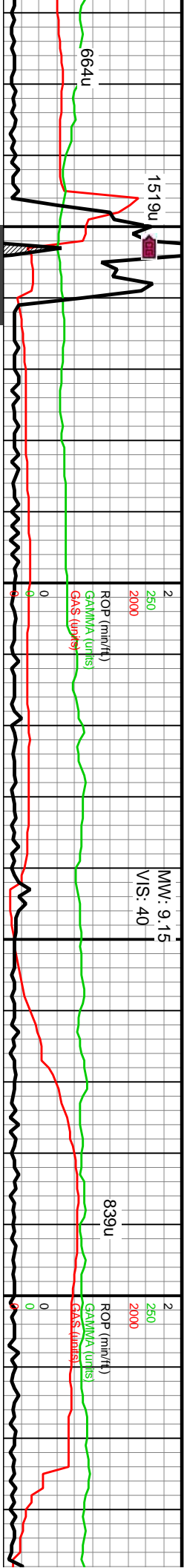


occ med gy- brn- biky- sb biky, ip sl rr frac fl cl, occ dk pred med- dk gy, biky- sb pily, calc	15200-15260 CHK (85%): pred gy, ip med gy- brn, lt brn- tn- bf mot, sl frm, pred biky- sb biky, ip sl arg thru, mod calc incl, sme ise cal, dk mnty intbds, sme pyr; MRLST (15%): pred med- dk gy, sme brn- gy mot, mod frm- hd, sb biky- sb pily, calc incl, chky intbds thru, mod carb, arg	15260-15320 CHK (85%): pred gy, ip med gy- brn, lt brn- tn- bf mot, sl frm, pred biky- sb biky, ip sl arg thru, mod calc incl, sme ise cal, dk mnty intbds, sme pyr; MRLST (15%): pred med- dk gy, sme brn- gy mot, mod frm- hd, sb biky- sb pily, calc incl, chky intbds thru, mod carb, arg	15320-15380 CHK (80%): pred gy, ip med gy- brn, lt brn- tn- bf mot, sl frm, pred biky- sb biky, ip sl arg thru, mod calc incl, sme ise cal, rr euhed cal, dk mnty intbds, sme pyr; MRLST (20%): pred med- dk gy, sme brn- gy mot, mod frm- hd, sb biky- sb pily, calc incl, chky intbds thru, mod carb, arg	15380-154
7700	7700	7700		



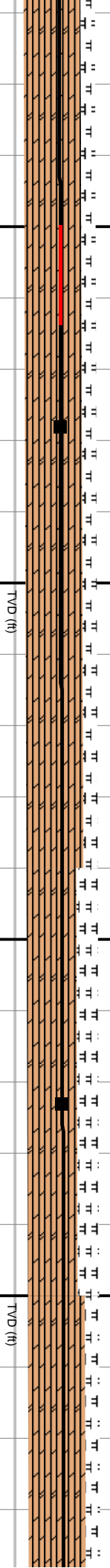






MD: 15,678'  
Inclination: 92.4°  
Azimuth: 270.4°  
TVD: 7,059.98'  
VS: 8,119.63'

MD: 15,773'  
Inclination: 92.79°  
Azimuth: 270.35°  
TVD: 7,055.68'  
VS: 8,214.53'



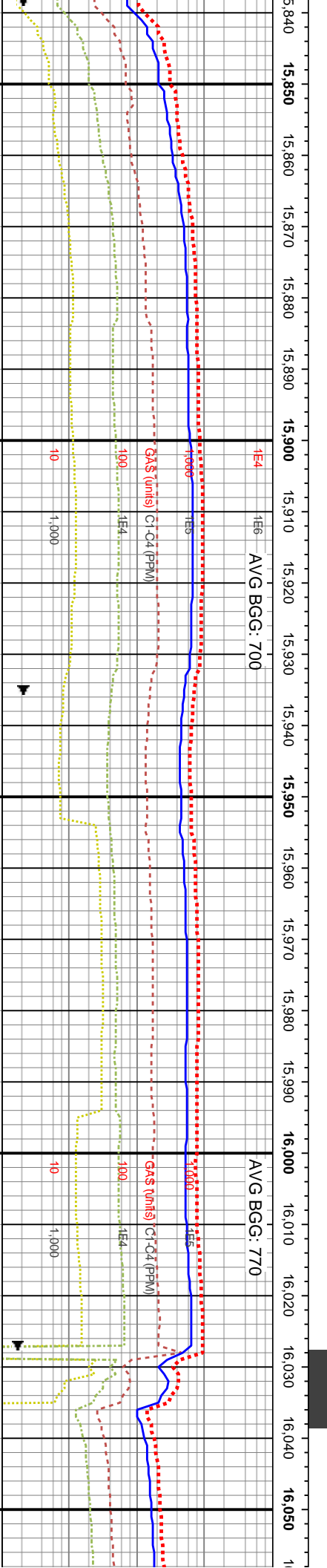
15620-15680 CHK (80%): pred med gy- gy, ip lt gy- brn, lt brn- tn- bf mot, sl frm, pred blk- sb blk, sl arg thru, mod calc incl, sme lse cal, tr euhed cal, dk mrlly intbds, sme pyr, tr gn bent; MRLST (20%): pred med- dk gy, sme brn- gy mot, mod frm- hd, sb blk- sb ply, calc incl, chky intbds thru, mod carb, arg

15680-15740 CHK (80%): pred med gy- gy, ip lt gy- brn, lt brn- tn- bf mot, sl frm, pred blk- sb blk, sl arg thru, mod calc incl, sme lse cal, tr euhed cal, dk mrlly intbds, sme pyr, tr gn bent; MRLST (20%): pred med- dk gy, sme brn- gy mot, mod frm- hd, sb blk- sb ply, calc incl, chky intbds thru, mod carb, arg

15740-15800 CHK (70%): lt gy- gy, com dk gy wi intbdd f wh chky incl & u f- med brn mrlly incl ip grdg to mrlst, frm- brit l- mod fis sb rd- sb blk- tab v arg LS ctgs, pred sm tex, sl slty ip, tr vf pyr, hi calc wi cin hcl RXN, wi incr mrlly incl grdg to MRLST: gy- dk gy- gy brn, med hi fis blk- sb ply ctgs, sm tex, mod calc wi brn mrlly resdl

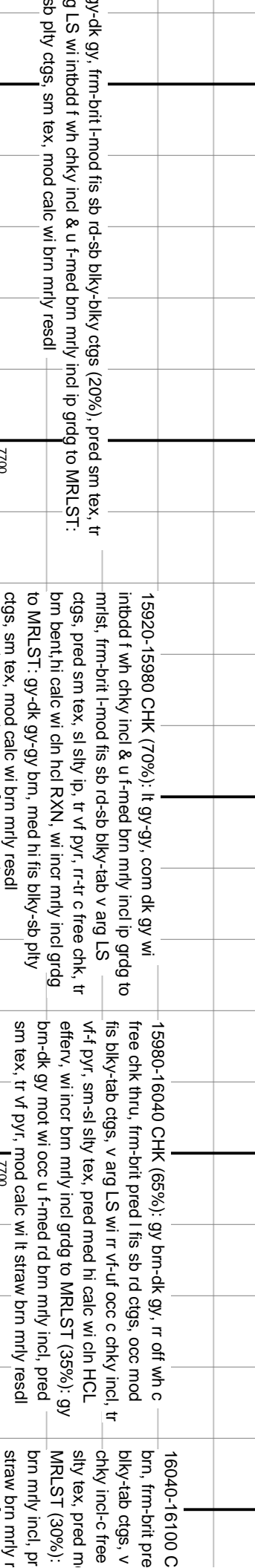
15800-15920 CHK (80%): lt gy- gy, com dk gy wi intbdd f wh chky incl & u f- med brn mrlly incl ip grdg to mrlst, frm- brit l- mod fis sb rd- sb blk- tab v arg LS ctgs, pred sm tex, sl slty ip, tr vf pyr, hi calc wi cin hcl RXN, wi incr mrlly incl grdg to MRLST: gy- dk gy- gy brn, med hi fis blk- sb ply ctgs, sm tex, mod calc wi brn mrlly resdl





MD: 15,868'  
Inclination: 92.27°  
Azimuth: 269.85°  
TVD: 7,051.55'  
VS: 8,473.7'

6600  
TVD (ft)



MD: 15,962'  
Inclination: 91.53°  
Azimuth: 269.84°  
TVD: 7,048.43'  
VS: 8,566.1'

6600  
TVD (ft)

15920-15980 CHK (70%): lt gy-gy, com dk gy wi  
intbdd f wh chk incl & u f-med brn mrly incl ip grdg to  
mr1st, frm-brit l-mod fis sb rd-sb blkylab v arg LS  
ctgs, pred sm tex, sl slty ip, tr vf pyr, rr-tr c free chk, tr  
brn bent, hi calc wi cin hcl RXN, wi incr mrly incl grdg  
to MRLST: gy-dk gy-gy brn, med hi fis blkylab slty  
ctgs, sm tex, mod calc wi brn mrly resdl

15980-16040 CHK (65%): gy brn-dk gy, rr off wh c  
free chk thru, frm-brit pred l fis sb rd ctgs, occ mod  
fis blkylab ctgs, v arg LS wi rr vf-uf occ c chk incl, tr  
vf-f pyr, sm-sl slty tex, pred med hi calc wi cin HCL  
efferv, wi incr brn mrly incl grdg to MRLST (35%): gy  
brn-dk gy mot wi occ u f-med rd brn mrly incl, pred  
sm tex, tr vf pyr, mod calc wi lt straw brn mrly resdl

16040-16100 C  
brn, frm-brit pre  
blkylab ctgs, v  
chkylab incl-c free  
slty tex, pred m  
MRLST (30%):  
brn mrly incl, pr  
straw brn mrly r

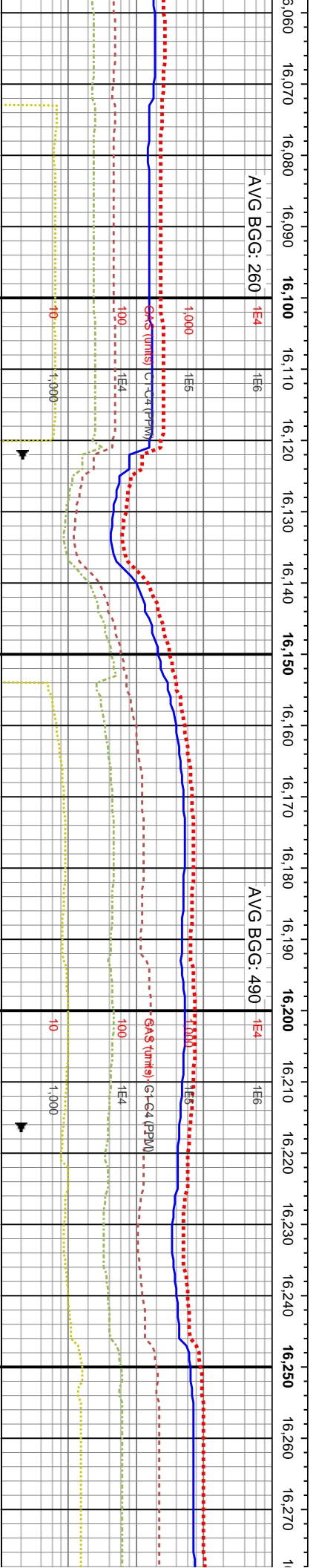
6600  
TVD (ft)

7700

7700

7700

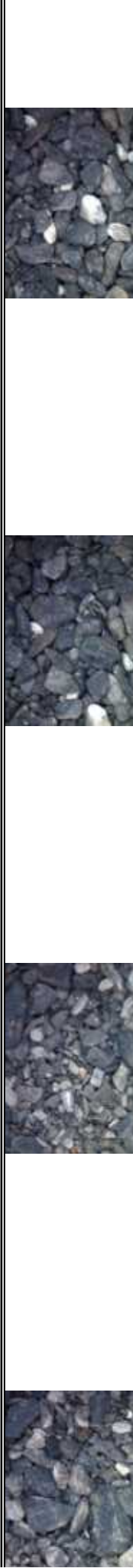


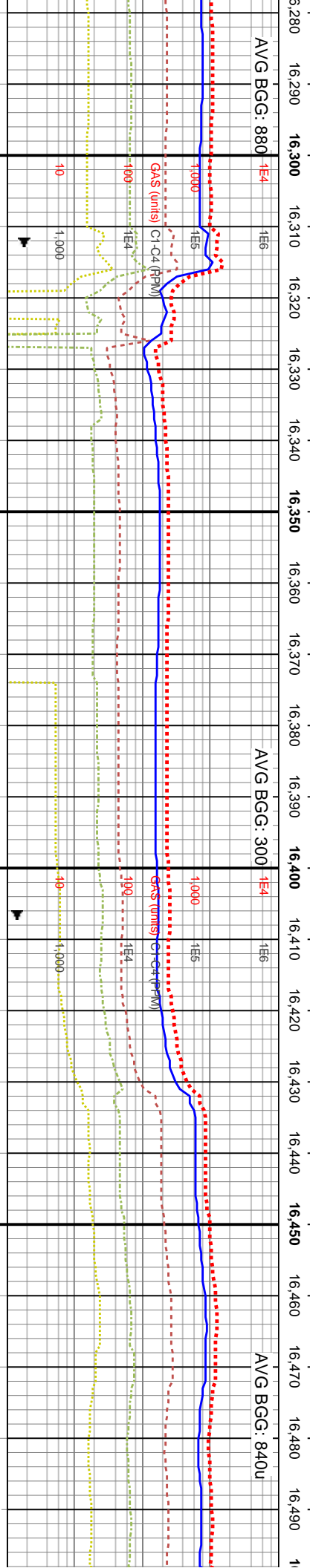
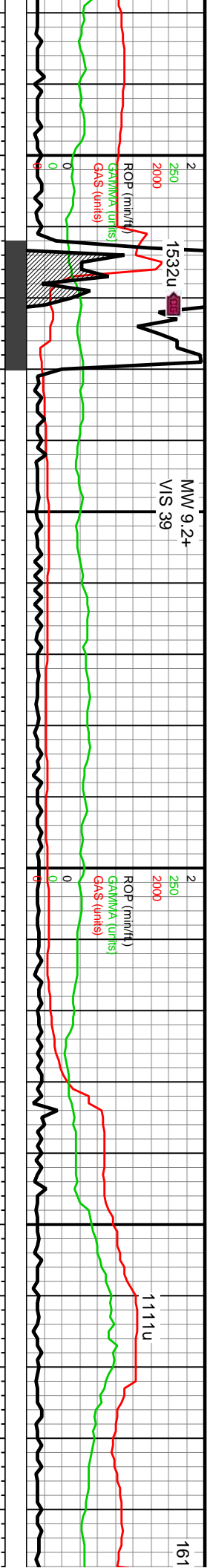


MD: 16,152'  
Inclination: 91.64°  
Azimuth: 270.96°  
TVD: 7,042.09'  
VS: 8,752.47'

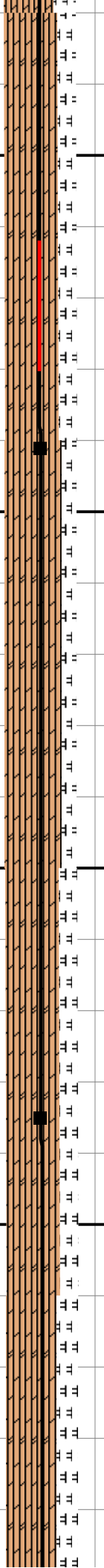
MD: 16,246'  
Inclination: 90.37°  
Azimuth: 271.61°  
TVD: 7,040.44'  
VS: 8,844.45'

HK (70%): gy brn-dk gy, occ v lt gy d l fis sb rd ctgs, occ mod fis arg LS wi rr vf-uf chky incl, occ c wh chk, tr vf-u-feuhed pyr strg, sm-sl med hi calc wi cln HCL rxn, grdg to brn-dk gy mot wi occ u f-med rd sm tex, tr vf pyr, mod calc wi lt resd	16100-16160 CHK (80%): gy brn-dk gy, occ v lt gy brn, frm-brit pred l fis sb rd ctgs, occ mod fis blk-y-tab ctgs, v arg LS wi rr vf-uf chky incl, occ c wh chky incl-c free chk, tr vf-u-feuhed pyr strg, sm-sl silty tex, pred med hi calc wi cln HCL rxn, grdg to MRLST (20%): gy brn-dk gy mot wi occ u f-med rd brn mrlly incl, pred sm tex, tr vf pyr, mod calc wi lt straw brn mrlly resd	16160-16220 CHK (65%): lt gy-gy-dk gy, v arg LS wi rr wh chky incl & com thn chky lamm, frm-brit pred l fis sb rd ctgs, occ mod fis blk-y-tab ctgs, sm-sl silty tex, rr c free chk, tr vf pyr, pred med hi calc wi cln HCL rxn, grdg to MRLST (35%): gy brn-dk gy med-hi fis blk-y-sb ply ctgs, mot wi occ u f-med rd brn mrlly incl, pred sm tex, tr vf pyr, mod calc wi brn mrlly resd	16220-16280 CHK (70%): lt gy-gy-dk gy, frm-brit l-mod fis sb rd-blky ctgs, sm-sl silty tex, v arg LS wi rr wh chky incl & com thn chky lamm, rr c free chk, rr pyr strg, tr vf pyr incl, pred med hi calc wi cln HCL efferv, MRLST (30%): gy brn-dk gy med-hi fis blk-y-sb ply ctgs, mot wi occ u f-med rd brn mrlly incl, pred sm tex, tr vf pyr, mod calc wi brn mrlly resd
7700	7700	7700	7700





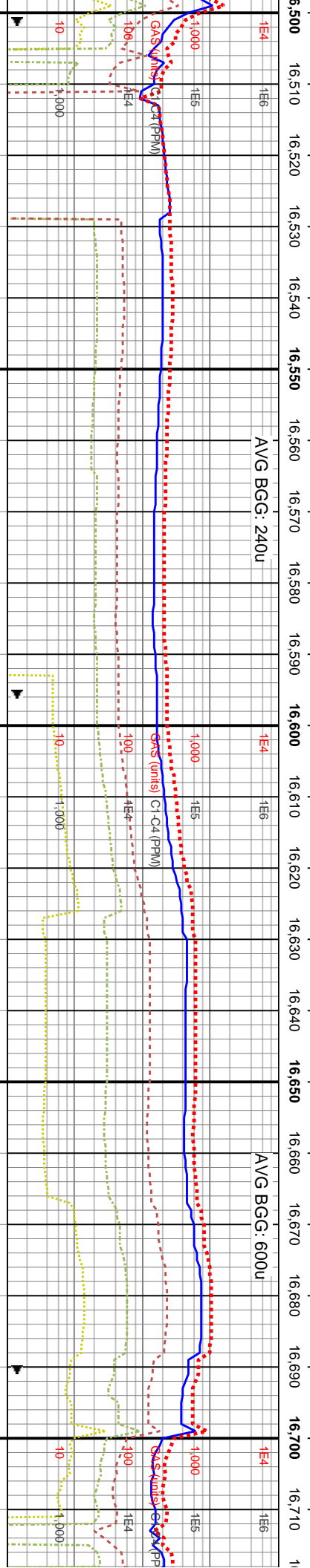
16280-16340 CHK (75%): lt gy-gy-dk gy, v arg LS wi rr	16340-16400 CHK (80%): lt gy-gy-dk gy, frm-brit	16400-16460 CHK (75%): lt gy-gy-dk gy, frm-brit	16460-16520 CHK (70%): lt gy-gy-dk gy, frm-brit
wh chky incl & com thn chky lamm, frm-brit pred l fis sb	l-mod fis sb rd-biky ctgs, sm-sl stly tex, v arg LS wi rr	med-hi fis sb biky-tab ctgs, v arg LS wi rr-abnt wh	free chk, frm-brit med-hi fis sb biky-tab ctgs, v arg LS wi rr-abnt wh
rd ctgs, occ mod fis biky-tab ctgs, sm-sl stly tex, rr c	wh chky incl & com thn chky lamm, rr c free chk, rr pyr	chky incl thn chky lamm, sm-chky, occ c free chk, rr	tr vf pyr, med-hi calc wi cin HCL rxn, MRLST
free chk, tr vf pyr, pred med hi calc wi cin HCL rxn,	stg, tr vf pyr incl, pred med hi calc wi cin HCL rxn,	cal, tr vf pyr, med-hi calc wi cin HCL rxn, MRLST	incl grdg to MRLST (30%): pred gy
grdg to MRLST (25%): gy brn-dk gy med-hi fis biky-sb	MRLST (20%): gy brn-dk gy med-hi fis biky-sb ply	(25%): gy brn-dk gy, med-hi fis biky-sb ply ctgs, mot	med-hi fis biky-sb ply ctgs mot wi c
ply ctgs, mot wi occ u f-med rd brn mrlly incl, pred sm	ctgs, mot wi occ u f-med rd brn mrlly incl, pred sm	wi occ u f-med rd brn mrlly incl, pred sm tex, tr vf pyr,	mrlly incl & rr wh chky incl, pred sm
tex, tr vf pyr, mod calc wi brn mrlly resdl	tex, tr vf pyr, mod calc wi brn mrlly resdl	mod calc wi brn mrlly resdl	calc wi brn mrlly resdl
7700	7700	7700	



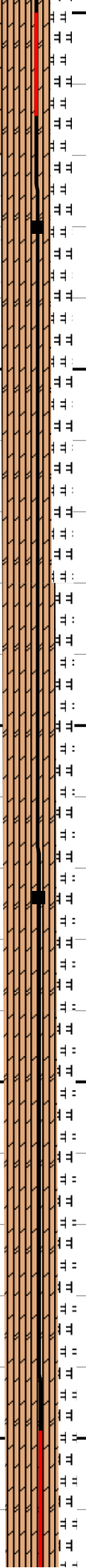
16280-16340 CHK (75%): lt gy-gy-dk gy, v arg LS wi rr	16340-16400 CHK (80%): lt gy-gy-dk gy, frm-brit	16400-16460 CHK (75%): lt gy-gy-dk gy, frm-brit	16460-16520 CHK (70%): lt gy-gy-dk gy, frm-brit
wh chky incl & com thn chky lamm, frm-brit pred l fis sb	l-mod fis sb rd-biky ctgs, sm-sl stly tex, v arg LS wi rr	med-hi fis sb biky-tab ctgs, v arg LS wi rr-abnt wh	free chk, frm-brit med-hi fis sb biky-tab ctgs, v arg LS wi rr-abnt wh
rd ctgs, occ mod fis biky-tab ctgs, sm-sl stly tex, rr c	wh chky incl & com thn chky lamm, rr c free chk, rr pyr	chky incl thn chky lamm, sm-chky, occ c free chk, rr	tr vf pyr, med-hi calc wi cin HCL rxn, MRLST
free chk, tr vf pyr, pred med hi calc wi cin HCL rxn,	stg, tr vf pyr incl, pred med hi calc wi cin HCL rxn,	cal, tr vf pyr, med-hi calc wi cin HCL rxn, MRLST	incl grdg to MRLST (30%): pred gy
grdg to MRLST (25%): gy brn-dk gy med-hi fis biky-sb	MRLST (20%): gy brn-dk gy med-hi fis biky-sb ply	(25%): gy brn-dk gy, med-hi fis biky-sb ply ctgs, mot	med-hi fis biky-sb ply ctgs mot wi c
ply ctgs, mot wi occ u f-med rd brn mrlly incl, pred sm	ctgs, mot wi occ u f-med rd brn mrlly incl, pred sm	wi occ u f-med rd brn mrlly incl, pred sm tex, tr vf pyr,	mrlly incl & rr wh chky incl, pred sm
tex, tr vf pyr, mod calc wi brn mrlly resdl	tex, tr vf pyr, mod calc wi brn mrlly resdl	mod calc wi brn mrlly resdl	calc wi brn mrlly resdl
7700	7700	7700	





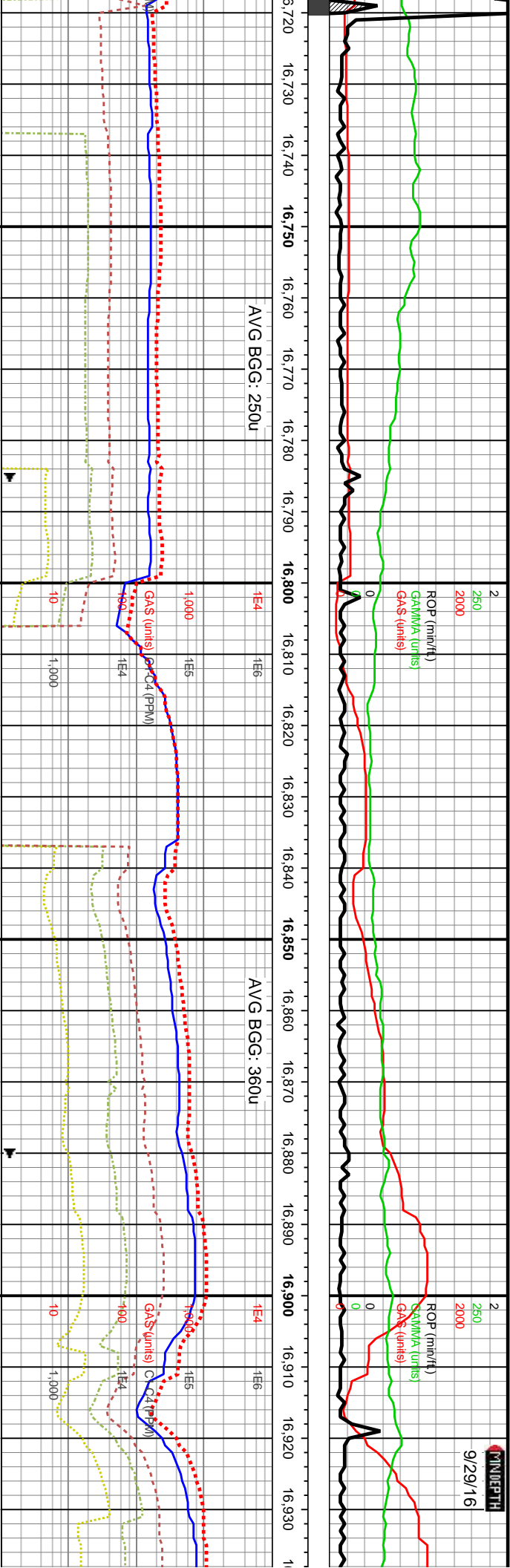


MD: 16,  
Inclination:  
Azimuth:  
TVD: 7,1  
VS: 9,30

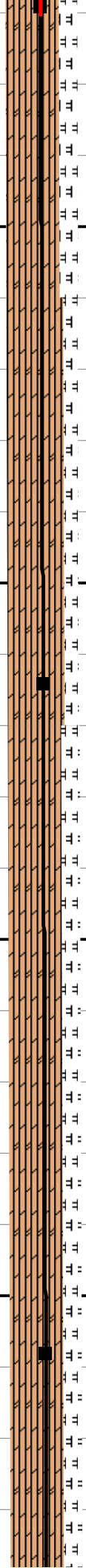


16640:-16700 CHK (75%): pred it gy-gy, occ dk gy  
wi occ vf-u f-c ip chky incl & intbds, frm-brit med-hi  
fis sb biky-tab v arg LS, sm-chky tex, occ c free chk,  
rr c pyr stng thru, tr vf pyr incl, med-hi calc wi cin  
HCL rxn, MRLST (25%): gy brn-dk gy, med-hi fis  
biky-sb ply cigs, mot wi occ u f-med rd brn mrlly  
incl, pied sm tex, tr vf pyr, mod calc wi brn mrlly  
rescl





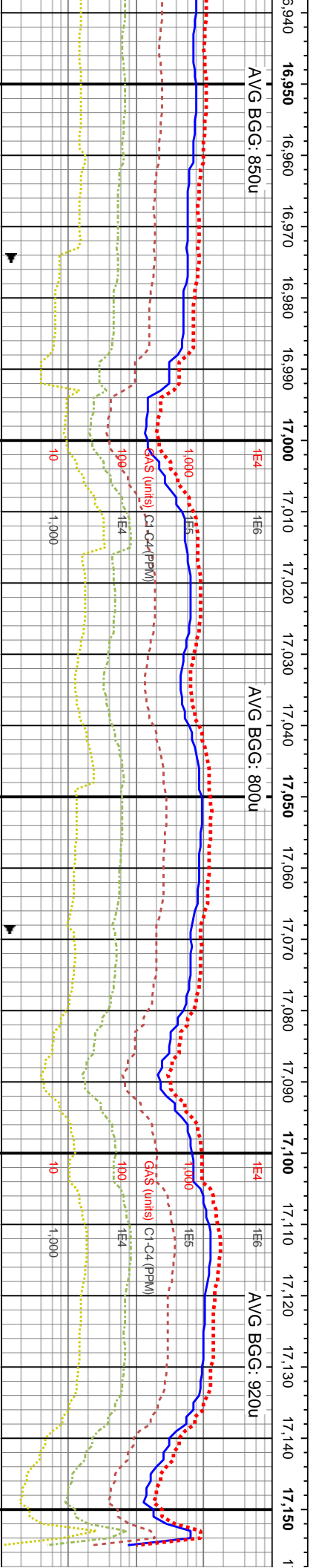
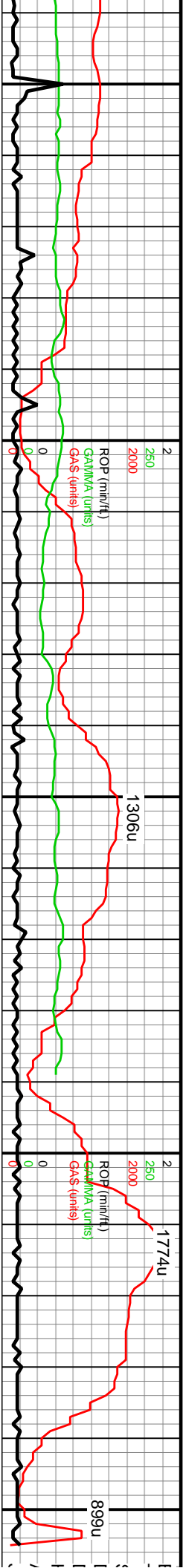
MD: 16,814'  
Inclination: 93.18°  
Azimuth: 269.43°  
TVD: 7,020.77'  
VS: 9,402.33'



MD: 16,908'  
Inclination: 93.19°  
Azimuth: 268.99°  
TVD: 7,015.55'  
VS: 9,494.83'

HK (75%): pred lt gy-gy, occ dk gy wi blkly incl & mot wi occ brn mrlly incl, arg LS wi rr-abnt wh chky incl thn chky lamn, sm-chky tex, r r vf pyr incl, med-hi calc wi cin HCL rxn, mrl grdg to MRLST (25%): gy brn-dk ky-sb ply ctgs, mot wi occ u f-med rd sm tex, tr vf pyr, mod calc wi brn mrlly resdl	16760-16820 CHK (80%): pred lt gy-gy, occ dk gy grdg to mrlst, frm-brit med-hi fis sb blkly-tab ctgs, v arg LS wi rr-abnt wh chky incl thn chky lamn, sm-chky tex, occ c free chk, tr vf pyr & r c-euhed pyr strg, med-hi calc wi cin HCL rxn, MRLST (20%): gy brn-dk gy, med-hi fis blkly-sb ply ctgs, mot wi occ u f-med rd brn mrlly incl, pred sm tex, tr vf pyr, mod calc wi brn mrlly resdl	16820-16880 CHK (75%): pred lt gy-gy, occ dk gy wi occ vf-u f-c ip chky incl & intbds, frm-brit med-hi fis sb blkly-tab v arg LS, sm-chky tex, occ c free chk, r r c pyr strg thru, tr vf pyr incl, med-hi calc wi cin HCL rxn, MRLST (25%): gy brn-dk gy, med-hi fis blkly-sb ply ctgs, mot wi occ u f-med rd brn mrlly incl, pred sm tex, tr vf pyr, mod calc wi brn mrlly resdl	16880-16940 CHK (75%): pred lt gy v arg LS wi abnt thn chky lamn & vf-f chky incl, com gy-dk gy wi occ vf-f-c ip chky incl & mot wi occ brn mrlly incl ip, frm-brit med-hi fis sb blkly-tab ctgs, sm-chky tex, r r c pyr strg thru, tr vf pyr incl, med-hi calc wi cin HCL rxn, mot wi incr brn mrl grdg to MRLST (25%): dk gy-v dk gy-gy brn, med-hi fis blkly-sb ply ctgs, sm-sltly tex, tr vf pyr, mod calc wi brn mrlly resdl
	7700	7700	7700



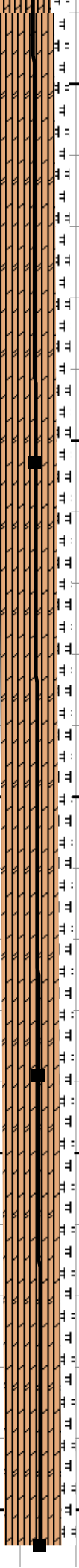


WOB: 35Klbs  
Rotary: 65RPM  
Strokes: 204SPM  
Pump Rate: 593GPM

MD: 17,003'  
Inclination: 93.88°  
Azimuth: 269.28°  
TVD: 7,009.69'  
VS: 9,588.29'

MD: 17,089'  
Inclination: 94°  
Azimuth: 268.26°  
TVD: 7,003.78'  
VS: 9,672.95'

\*Projection 1  
MD: 17,150'  
Inclination: 93.88°  
Azimuth: 2  
TVD: 6,998.29'



TVD (ft)

TVD (ft)

Reach TD on s

16940-17000 CHK (80%): pred lt gy-gy, occ dk gy  
grdg to mrlst, v arg LS wi rr-abnt wh chky incl thn  
chky lamn, frm-brit med-hi fis sb blk-y-tab ctgs,  
sm-chky tex, occ c free chk, tr vf pyr & rr-c-ehed pyr  
strg, med-hi calc wi cin HCL efferv. MRLST (20%): gy  
brn-dk gy, med-hi fis blk-y-sb ply ctgs, mot wi occ u  
f-med rd brn mrlly incl, pred sm tex, tr vf pyr, mod calc  
wi brn mrlly resdl

17000-17060 CHK (80%): pred lt gy-gy, occ dk gy wi  
occ vf-u f-c chky incl & inbds, frm-brit med-hi fis sb  
blk-y-tab v arg LS, sm-chky tex, occ c free chk, rr c pyr  
stg thru, tr vf pyr incl, med-hi calc wi cin HCL rxn, wi  
incr brn mrlly incl & lamn grdg to MRLST (20%): gy  
brn-dk gy, med-hi fis blk-y-sb ply ctgs, mot wi occ u  
f-med rd brn mrlly incl, pred sm tex, tr vf pyr, mod  
calc wi brn mrlly resdl

17060-17155 CHK (80%): pred lt gy v arg LS wi abnt thn chky lamn & vf-f chky incl,  
com gy-dk gy wi occ vf-u f-c ip chky incl & mot wi occ brn mrlly incl ip, frm-brit med-hi  
fis sb blk-y-tab ctgs, sm-chky tex, rr c pyr strg thru, tr vf pyr incl, med-hi calc wi cin  
HCL rxn, mot wi incr brn mrl grdg to MRLST (20%): dk gy-v dk gy-gy brn mot wi occ  
brn mrlly lamn & f-u f dk brn mrlly incl, rr wh chky incl, med-hi fis blk-y-sb ply ctgs,  
sm-sltly tex, tr vf pyr, mod calc wi brn mrlly resdl

7700

7700



Bit #: 1

Type: SK516-K2-Z

Size: 7 7/8"

Depth In: 1,561'

Depth Out: 17,155'

Hours: 36.5 hrs

Avg Ft/Hr: 427 'h'

Jets: 7X13

17,160	17,170	17,180	17,190	17,200
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no bit\*

5	
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94°

68.26°

3.114

10/29/2016