DRAFT 10/31/15

SUBSURFACE, INC

Geological Consulting
FID Gas Detection
Wildcat and Lateral Expertise

' THE EYES OF THE BIT '

975 Grant St., Denver, CO 80203 (303) 813-9305
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WEBSITE: www.subsurf.net

COMPANY:	GRMR Oil & Gas, LLc.
WELL:	Hamill 19-16 "D" (D) api 05-081-07820-00
LOCATION:	SESE Sec 19, T5N,R90W Lat 40.364225,Long -107.529442
	SL= 152 fsl , 247 fel , BHL:= 366 S, 111 W of wellhead
STATE/COUNTY:	Colorado , Moffat County
DEPTH LOGGED FROM:	1000 TO: 6980
DATE LOGGED FROM:	10/18/15 TO: 10/ 25/15
GEOLOGIST:	William" Bill"Eucker III
DRILLING FLUID:	4% INHIBIDRILL/Poly
DRILLING CONTRACTOR:	Precision Drlling # 706
SPUD DATE:	10/18/15
TD DATE:	10/25/15
ELEVATION: GL:	6455 KB: 6478

STATUS: P&A'd

Dir. Section Plane 191.41°

P-RATE Min. / ft. 5ft avg | % LITHOLOGY | DEPTH | POROSITY | INTERPRETED LITHOLOGY | SIZE | GEOLOGICAL COMMENTS | GAS (TOTAL, C1, C2, C3, C4s)

Data from Pason

Drlg w/ NB#2, 7-7/8 Ulterra 516S in @ 815 MD

Drlg w/ 1.83° MM (.17rpg)

Calib: 1%CH4=100u THA =10,000 ppm = 1550 div c1

250 ft/hr ROT
150 ft/hr SLIDE

MUD GAS %

Subsurface, Inc. 8x32ft FID Lab w/ Baseline 1015 THA and 1030A GC

KB 6477

set 9-5/8" surf csg @ 810MD

0-1000 not eval.

install wellsite geological services @ 1000 10/19/15

drill out 8AM 10/20/15

SS-lt gry fgr wl srtd sl s&p rr Glauc drty slty rr microcarb deb frm fri tr wh tr mgry no show microlam w/ SH & Sltstn v sl calc & dolo

SH-m brngry microlam w/ lt gry fgr ss
SLTST- nm brngry microcarb micromic (bio) sm bent mtrx sl dolo grainy

SS-lt gry semi trnsl vf-fgr tr off wh fgr tt s&p wl srtd sptty blu yel F w/ strmy bri Cut max 6-8% opt por

SS-v lt gry-m gry vf-fgr slty microlam pred tt tr microcarb sl-v frm tr mhd brit rr s&p tr varic sl dolo tr scatt sptty blu yel F slow bri blu yel strmy cut wl srtd subang sm cly pore fill max 6-8% opt por comm microlam w/ SH

SLTST-lt-m brngry sdy rr glauc frm sl dolo
SS-v lt gry rr v lt honey o stn fri frm microcarb fgr wl srtd sl s&p rr varic (aqua & orng) rr tr qtz ovgths (2) frags w/ even bri F v slow bri cut gd mlky C w/ time sl calc & Dolo

type marine Mancos

SS-lt gry vf-fgr tt microlam NS

SH-m (dkr) brngry subblky blky micromic sl slty v frm sl brit sl bent mtrx sl dolo

massive shale facies

SH-m-dk brngry frm bent non calc v sl dolo micromic microcarb
SLTST-m brngry tr aqua grs micromic & carb grainy txt frm
SS-lt gry vf-fgr rr Glauc tt com cly pore fill NF rr microcarb deb (marginal marine)

noted a few oily stnd SH frags poss contam w/ F

SH-m gry sm dkr brngry tr shl frags v bent frm sl dolo rr brn tint w/ tan foram (streak)
SLTST-m brngry grainy frm aa
SS-lt gry vf-fgr tt NS microlam in SH tr glauc mic (bio) sl s&p sl dolo

10% Tray F

SS-wh lt gry vf-fgr microlam in sh,sl s&p tr Glauc wl srtd rr microcarb com cly pore fill drty slty rr varic sl calc sl dolo 10% bri blu yel gold F slow strmy bri Cut tr halo tr 8-9% opt por rr qtz ovgths tr high surf tension (tr acid bounce)
SLTST-m brngry rthy microcarb bent rr tr Glauc
SS-lt gry hly microlam w/ SH tr wh vf-fgr tr Glauc sptty blu yel F vf-fgr (up) tr varic sl s&p v sl dolo v frm brit (5% TrayF)

v slty Lw E marine lith

SH-m brngry frm bent sl dolo tab ip
SLTST-m brngry sdy microcarb rthy bent micromic sl-v frm
SS-lt gry vf-fgr tt wl srtd drty microlam in slty SH rr tr tan chlky (irr) incls rr tr m-crse fargs s&p tr pyr (tr High E)

SH-dkr m brngry frm v sl calc & dolo v bent mtrx rr scatt tr tan orng forams sm lt bent gry

SS-lt-m gry vf-fgr tt microcarb drty NS microlam

no tray F dcrng E

BENT-lt-m gry wxy v arg NF tr wh w/ pale blu F
SH-dk brngry frm sl dolo rr Pyr bent mtrx slty
SLTST-m-dk brngry sdy mic(mus) frm sl dolo w/tr SS-lt gry vf-fgr wl srtd tt NS

SH-m-dk char brngry tr rr fine forams bent mtrx sm ltr sftr microcarb slty
SLTST-m-dk char gry frm sdy microcarb rr aqua microlam w/ ss micromic (mus) sl dolo rr glauc tr ss
TR BENT-wh tan wxy sft sm lt gry

DOLO- dul khaki tan dnse mhd v sl dolo poss siderite
BENT-v lt brn v sft v arg
SH-dk char brngry frm plty bent mtrx sl dolo
SLTST-tr Glauc sdy tr aqua frm sl dolo

v slty Lw E marine lith

DOLO-dul v lt-m khaki tan mhd dnse tr pyr smooth rr tr wackstn lmy sl dolo concretionary rr tr pyr (patterned)

SH-m-dk char brngry sctt rr orng foram frm bent sl dolo v sl calc

BENT- tr v lt gry sft NF
SH-m-dk char brngry sctt rr orng forams frm bent sl dolo v sl calc
SLTST-m-dk brngry frm bent micromic (bio) microcarb sl dolo

DOLO-trace,khaki dnse lmy ip
SH-m-dk char brngry sft-frm v bent cntctd w/ ltr sftr v bent shale (arg bent)
SLTST-m dk char gry grainy frm sl dolo occ sdy microlam

DOLO-tr khaki lt dul dnse lmy pos siderite
SH-dk char gry frm scatt dul orng fine forams slty sl dolo

SLTST-m-dk char gry rr microlam w/ tr ss micromic (mus) rr micropyr frm

Mancos Type Lith

SH-dk char gry frm blky tab v sl dolo v bent mtrx slty ip rr microcarb & micromic

no tray F *tr mass pyr frag*

DOL-khaki tan dnse sl dolo pos FeCO3
SH-dk char gry frm sl dolo microcarb spks bent mtrx tr pyr fnly micromic
SLTST-m-dk gry sft-frm bent mtrx sl dolo microcarb & mic

SH-dk brngry rr scatt dul fine orng forams frm sl dolo bent mtrx

BENT-rr wh wxy w/ pale F

SLTST-m-dk gry sm brngry bent grainy rr glauc micromic microcarb sl dolo sft-v frm

SH-dk char gry sn sftr ltr v bent cntcts gummy ip solu ip sl-v frm bent mtrx sl dolo slty micromic mus

gummy sft solu raw

DOLO-dul lt khaki dnse crypto rr shl incl rr pry sl dolo tr orng brn lmy concretionary
SH-m-dk brngry frm v sft & bent rr Inoc frag plty sl calc & dolo
SLTST- m-dk char gry sft frm v bent sl dolo rr glauc & grainy

DOLO-dul lt-m khaki vsl dolo microxln ip tr orng tinted LS concretionary
SH-m-dk brngry sl slty bent rr dul orng forams micromic (bio) & mus, frm sl dolo sl-v frm v bent aa
SLTST-m-dk char brngry sft-v frm grainy v bent microcarb & mic sl dolo

pred v slty Low E marine

SLTST-m-v dk char gry frm grainy tr Glauc rr wh tan chlky incls (not foram) micromic (bio) microcarb sl dolo, v sl calc

SH-v dk char gry slty sl-v dolo v sl calc scatt rr dul orng brn forams frm tr DOL frags microcarb bent mtrx sm ltr brngry v sft v bent (arg Bent) cntcts

BENT-trnsl wh lt blu gry wxy pale blu yel F cln sm m brn gry wxy sl arg sm scatt Tray F (bent)

BENT-wh v lt gry wxy trnsl rr yel gold F
SLTST-m brngry sdy tr glauc sctt orng forams sl calc v dolo rthy frm
SS-off wh lt gry vf-fgr cly choked tr glauc v calc cmt tr carb rr wh irr incl

SLTST-dk char gry tr glauc sl-v frm sl calc v dolo tr scatt tt ss

BENT- rr wh lt blu gry lt brngry trnsl lt gry tr F

SHL-wl dev Inoc

Influx (Kn) type lith incr dul orng foran w/ tr fecal est Hot Mancos Mkr.

SH-m-dk char gry sl brn tint v slty sl-v frm non-mod spkld w/ dul tan orng forams sl-v frm bent mtrx rr aqua tr glauc grs rr hckly gd mod eff com tr wl dev Inoc micromic bio rr carb fos deb.

less spkld sl-tr mod eff
no sig Tray F incr depo E

SH-m-dk char brngry non-mod spkld w/ dul tan orng forams (sm lg) (dcrng) slty sooty bent sft-frm v bent microcarb trpyr
SLTST-m-dk gry grainy tr sdy tr glauc w/ scatt dul tan orng forams tr v lt gry ss.

sl-tr mod eff (bulk) pest prox to Kn

SH-dk char brngry non-ltly w/ dul tan orng calcsphrs i.e forams mic (bio) bent mtrx sft-sl frm tr wl dev Inoc
SLTST-m-dk brngry rthy microcarb sft-frm
SS-off wh lt gry v frm vf-fgr com tr glauc sl calc cmt tt NS

sig dcrng Depo E Incr E

dkr, solu gummy sft w/ fnt odor in raw wet cut

Top Niobrara Fm. 2834MD / 2822TVD

SH-nrly blk macro v dk char gry v sooty dul lust v sft frm Rapid eff v solu com lt-mod w/ wh tan wl dev (sm lg) forams tr fecal pellets tr ss & Sltst aa

fnt odor

SH-v dk char gry v sooty sl-v frm brit bent mtrx ltly spkld w/ lt tan wh calcsphrs (forams) tr mod spkld gd mod-sl rapid eff non bench

dcrng eff & forams

BENT-lt gry trnsl wxy sm m gry v pyr
SH-m-v dk brngry ltly spkld w/ tan orng (fine) forams rr fecal pels v bent mtrx sft frm rr mod spkld sl-tr mod eff (in 10% HCl)

SLTST-m-dk gry brn arg frm com foram bent rr aqua grs micromic rr microcarb spks

non bench /Interbench sl-mod eff

SH-m-dk charcoal gry w/ sl brn tint v bent mtrx sft-v frm non-lty spkld w/ tan foram

BENT- lt gry trnsl wxy v frm brit

interbench type

SH-m gry dk brngry non-ltly spkld w/ tan forams sft-v frm v bent mtrx mod eff

Tow Creek Bench E-Log 3150 MD)

More Competent/ Incr tan orng (lgr) Forams Bench type

BENT-tan wxy tr blu gry tr F
SH-v dk char brngry mod w/ tan Forams tr choc brn hly spkld mrly frags rr multicolored fos debris (bri blu pealy) Rapid Eff

CAL-clr wh bladed (assoc w/ Bent)
SH-m-v dk brngry marly ltly-hly spkld w/ tan orng forams sm lg rr multi colored fos deb tr hckly frm mhd brit microcarb bent ip mod-Rapid eff

less spkld Bench type /Dk Bench

SH-dk char gry w/ sm brn tint lt-mod spkld tr marly sm fine fecal pels & dk dul orng brn calcsphrs v frm brit gd mod to Rapid eff sm ltr sftr v bent cntct
SLTST-m-dk brngry sooty v calc sft-v frm sooty micromic

Dk bench type Lith

SH-v dk char brngry vfm brit tab non-ltly spkld w/ fine orng forams sm fecal pels Rapid eff micromic tr bent mtrx sl slty ip

WMB smpl top (E-Log 3406MD)

BENT-lt blugry tr Inoc frags
SH-m-v dk char brngry marly ltly spkld tr mod spkld w/ tan orng forams Rapid eff mhd brit

TR SHL- scatt wh tan Inoc frags

SH-v dk char brngry com ltr tan orng forams sm hly spkld fargs Marly ip sl-v frm brit V Rapid eff (incr)

(bench type)

est "oysterbed zone" via smpls

SHL-Inoc tr pearly cln
BENT-wh wxy trnsl rr F
SH-v dk char brn gry tr choc brn & hly spkld comm tan orng (tr wh) Forams sm lg wl dev, Marly & Chlky ip brit mhd tr hckly txt V Rapid eff
SHL-comm Inoc frags

SH-m-v dk char brngry ltly spkld w/ dul orng brn marly brit snm ltr v bent cntcts micromic microcarb rthy v bent slty v frm brit V rapid eff bench type

BENT-crm wxy shardy
SHL-sft chlky altered (oxidized?)
SH-m-dk char brngry rr scatt xln wh incls comm fecal lt-mod spkld w/ dkr forams rthy microcarb v bent tr micropyr Rapid eff Bench type rk

WMB base E-Log 3664MD

SH-m-dk char gry sm brn tint comm tr fecal, gd mod w/ sl Rapid Eff frm brit pred non spkld

BENT-crm v lt gry wh mic

dcrng eff pred Interbench

BENT-wh sft w/ abdt mic
SH-v dk char gry ltly-non spkld gd mod effsm ltr sftr v bent sl-v frm tr micropyr

SH-v dk char gry sl brn tint tr dul orng forams & fecal pred non spkld scatt plty v bent mtrx mod-sl Rapid eff sl-v frm brit.

tr shl bits rr xln calc (sec)
tr Rhomb habit tr arg stn

SH-dk char gry plty fis pred non spkld v frm v bent mod-sl rapid eff Interbench..

SHL- sm pearly crm wh cln wl dev Inoc
SH-m-v dk char gry sm brn tint tab sm ltr & sft (v bent) comm fine fecal mod-sl rapid

Interbench type

MRLSTN- trace arg lmy dnse
BENT-lt gry wxy trnsl
SH-dk char gry nrly blk macro sl brn tint subblky blky ip vfrm brit mod-sl Rapid eff

SH-dk char gry sm brn tint sm sftr & ltr v bent cntcts v frm brit v Rapid eff (bulk test) slty

LS-lt-m gry sm m brngry dnse marly brit vfrm-mhd

3rd Bench Top Ft Hays Equiv.

LS-m-dk brngry dnse arg tr lt-m khaki cryptoxln mhd brit tr wackestn rr welded forams in tt lmy mtrx Rapid eff

Carlile Fm. E-Log 4104 MD (4084 TVD)

BENT-v lt gry w/ tr lt-deep grngrn incls tr glauc*
SH-m-dk char gry tr pyr sl -mod eff (sig dcrng) v bent mtrx tr shl frags (inoc)

stopped drlg 6hrs swap out DP

BENT-trnsl tan lt gry w/ briyel blu gold F
SH-v dk char gry brit non spkld sl-mod eff sl Rapid frm-mhd brit ip * rr lg lt grn incls, (1) frag xln Calc w/ bri blu yel F wh tan mas cln

Type Carlie no tray F

SH-v dk char gry blk macro v frm brit subblky sl calc (bulk test) sm bent mtrx

incr depo Energy

SLTST-m-dk gry v calc grainy sdy frm drty
SS-v lt gry off wh vf-fgr frm fri wl srtd v calc cmt rr tr Glauc NS

BENT-off wh lt tan wxy mic shardy w/ bri Fluor
SLTST-m-dk gry vvsdy frm v calc drty

658u positive w/ gd sweet HC gas Odor @ shkrs , sl oil sheen while rinsing smpl
noted: sig influx SS w/ 40% bri blu yel Tray F
noted: gd HC odor in wet cut smpl

SS-cln wh clr f-crse (pred fgr) rr sptty lt-m brn o stn sm wh cly pore fill v fri s&p w/ lt-dk gry smokey tr blk cht grs, rr tr glauc tr qtz ovgths subrnd-subang sptty bri blu yel gold F, fair to gd mlky cut w/ Halo tr max 12-16% opt por pred tt.

gd sweet HC odor @ Shkr & in wet cut w/ 30% Bri Blu Yel Tray Fluor

SS-lt-m gry fgr cly choked (lt gry dry) sm aqua drty tt frm wl srtd non-sl dolo v sl calc sm trnsl tr cln clr & wh s&p tr bri F comm pale Fslow strmy Cut

scatt fnt-bri Tray Fluor approx 10%

BENT-wh cln wxy w/ bri blu yel F
SH-blk macro v dk char grys pyr slty micromic (bio) sl-v frm brit non calc
SLTST-m-v dk char gry v grainy rthy Organic comm aqua grains incl frm rr Glauc non calc

CAL-wh crm tan trnsl mass habit (sec late stage) tr pale mnrl Fluor, tr scatt mass Pyr frags
BENT-wh lt blu gry trnsl wxy w/ bri F
SH-blk macro frm non calc Organic sm m-dk brngry v bent mtrx
SLTST-m-v dk char gry rthy sdy comm aqua grs rr tr Glauc v frm sl dolo non cal tr ss cvgs
BENT-off wh tan wxy bri F tr euhedral (cubic) Pyr incls

SH-nrly blk v dk char gry frm non calc sm bent mtrx microcarb tr blk vit fos deb (organic source rk)

SH-blk macro frm mhd brit non calc com tr pyr

BENT-off wh trnsl wxy sft splntry bri blu yel F

SH-blk macro sootty v dk char gry smooth v fis non calc sm degassing frags sl solu while rinsing

BENT-wh crm v lt gry tint wxy trnsl w/ bri yel blu F
SH-blk macro vdk choc brn w/ sl gry tint non calc sil rr wh hairline tt calc microvn blky smooth rr tr pyr

E-Log Shell Ck 4769 MD

10% TRAY FLUOR (pred SS)

SS-wh cln sl crm tint f-gr tr crse welded qtz Mtrx i.e. sm" Quartzite" vrit v hd rr smokey gry/brn grains ang incls (cht) pred tt barren re scatt bri blu yel fluor (even ip) lt oil stn frags fnt blky blu yel Cut

noted 20% Tray Fluor

SH-sl varic; m gry (v bent) , blk hd v carb sft dul wxy m brngry *tr carb shale* (paludal environ)
SS-lt-m brngry cntctd w/ carb tt hd drty non calc, clr cln Quartzite tr crm, lt honey stn, fgr wl srtd tr carb w/ bri (even) fluor v slow strmy blu yel cut sm cly pore fill tt rk

v gd (30%) Tray Fluor

SS-cln wh sl crm tan tint prly srtd f-crse tr pyr incl sm wl rnd w/ v gd opt por mgry cht grs, lse crse grains (unconsol) gd qtz ovgths subrnd-subang pred 8-9% tr 16% gd bri blu yel (even) Fluor slow strmy cut fair-gd mlky w/ time.

Lakota type (influx cherty wh & aqua SS)

SS-wh crm lt-m pastel grn tr lt purp f-crse abdt lse varic Chert ang hd (orng wh smokey gry) abdt unconsol rnd crse barren non calc tr scatt ss w/ Fluor (cvgs

CHT-varic ang hd mixed w/ ss crypto
SS-wh cln prlysrtd unconsol ip NS

Jurassic Morrison E-Log 4932MD

SH-tr deep rust red (regolithic paleosol) cntctd w/ lt-m pastel grn , gry blu grn lt purp mott sdy non calc subwxy ip com m gry & blk sl frm-mhd brit ip

SH-pastel aqua & m gry sl sdy subwxy sl dolo mhd-hd v brit sil

LS-wh lt tan brngry dnse chlky crypto hd

86u.CG — carbide Lag 16 min BU

BENT-scatt wxy wh sl olive tint splntry w/ bri Fluor
LS-lt tan trnsl gry crypto dnse mhd
SH-pastel lt blu aqua lt trnsl brngry mott sm dk rthy brn m gry crypto v sil cherty ip hd

SALT WASH MBR E-Log 5041-84 MD

LS-tan dnse crypto trnsl ip mott w/ lt grn grainy chlky frm-hd dolo ip
SH-varic lt blu grn m gry sm brn rr purp tint sm dk orng brns v sil cherty incls frm-hd sl dolo & calc
SS-wh cln sm lt pastel grn, vf-f up pred wl srtd rr varic grains (orng & grn rr pyr sl dolo sm calc cmt tt NFSC v frm brit tr cht incls-ang trnsl brn
CHT-varic crypto ang hd mixed w/ ss

SLTST-dul lt-m red sdy sm m brn cntctd w/ lt wxy grns frm v calc grainy (paleosol)

213u. CG

BENT-off wh sft rr bri orng incls wxy tr F
LS-lt tan dnse chlky aa
SH-lt-m pastel aqua tr gry mott maroon subwxy sft sdy v frm non calc tr rr lmy looks bent

SH-maroon pastel lt gry ,lt aqua blu grn subwxy mott ,sm m brngry w/ sltst & sdy incls

SS-wh cln v lt grn vf-fgr tr mgr NS sm grn sm orng
LS-wh tan trnsl crypto tr wackestn

171u.CG

SS-wh lt grngry tint fgr wl srtd rr lt-dk grn & red grain incls (tr glauc ?) v frm brit calc & dolo cmt tt NSFC rr blk carb /ss cntct tr microcarb prtngs

BENT-off wh wxy w/ yel gold F

SH-varic lt aqua rust m rthy brn tr purp sdy sm rust ang ripup clasts ,tr deep red (paleosol)
SS-wh fgr comm varic incls rust aqua sm blk carb spks rr lmy incls sl-v frm nom-sl cal;c NFSC
BENT-v lt gry trnsl wh tan wxy scatt yel Gold Fluor pale ip nrly 5%

133u. CG

SS-wh cln lt gry rr spkld w/ bri orng & lt grn grains sm lt pastel grn & gry pred fgr tr prly srtd (vf-fgr(up) sl calc & dolo sm aqua SH incls NFSC

sig Influx Marine SS

Sundance Fm. Type Remnant

LS-m brn wh chlky mott w/ sm rnd lmy pelletal incls
SH-lt-m gry sl brn tint fis smooth sl frm velvity lust (Beaver stockade type) rr sdy & glauc incls
SLTST-m gry sdy v Glauc frm lmy
SS-lt gry lt brngry fgr comm glauc rr mgr cly & calc cmt frm drty tt NFSC

153u. CG

ROP 1 2 3 4 min/ft 5ft avg

MUD GAS % 0 .1 .2 .5 1.0 % 5 10

end page 1

ENTRADA SS MBR E-LOG 5438 MD
tt w/ 29K overpull
50+/- ft 18% DENPOR w/X-O
140ft Gross SS
Top Triassic CHINLE E-Log 5578 MD
10/23
28k updrag
Bit#2 4803ft 53hrs gd
NB#3 7-7/8" U616s
SLIDE
SLIDE
10/24
SHINARUMP MBR E-Log 5956 MD
MOENKOPI MBR E-Log 6126 MD
SLIDE
SLIDE
last SLIDE
PERMIAN Top E-Log 6523
Base Permian E-Log 6716
10ft/6% DENPOR
WEBER SS MBR E-LOG 6730
EAGLE VALLEY E-LOG 6770 MD
10/25
Bit#3 7-7/8" U616s, 1362 ft, 41 hrs
Pason DATA
P-RATE
min/ft. 5ft avg.

v bent lt khaki gummy paste macro

ENTRADA SS MBR 5438 MD E-Log

SS-wh crm fgr (tr vf-mgr) wl srtd sft cly filled cln tr ool incl scatt tr glauc & lt orng & lt grn grains frm fri sl calc V dolo

SS-wh crm fgr wl srtd cln sft v fri sft-frm sm gd opt por scatt lt orng grains tr hly spkld w/ brn ool frags in lmy mtrx v calc cmt tr f(up) & m gr tr glauc (marine type) barren NS

Stopped Circ & Cond. 1hr

BENT-wh lt tan trnsl tr olive tint tr lt gry wxy pale -bri yel gold Fluor rr shardy

SS-wh crm vf-fgr sl-v frm brit rr orng grain incls cln non calc non dolo NS rr tr ool & glauc frags (cvgs)

Macro Raw; v lt khaki gummy

SS-wh cln fri vf-fgr non calc barren

Base Jurrasic/Top Triassic Redbeds

SH-tr deep red frm (paleosol surf)

SLTST- m-dk brick red grainy(sdy) sl-v calc v dolo sft-frm solu

TFB

SLTST-bri-deep brick red sdy sm microbnded (purp pnk & wh) sl-v frm v sl dolo

SS-wh clr tr lt purp tt vf-fgr lmy sl dolo NS

SLTST- bri orng brick red sm dul redbrn frm sl-v calc rr bnded w/ wh pnk v sdy spkld w/ rr wh clr incls (bent, calc)

SLTST-m brnick orng red grainy txt frm sl-v calc sl dolo spkld w/ wh incls v lmy v sdy

Macro: v solu while rinsing poss Marine streak

LS-wh pink purp sft-frm dnse chlky mott & laced w/ red arg shale

BENT-v lt gry wh wxy v lt blu gry w/ Fluor

LS-wh chlky sm purp mott sft-frm semi trnsl incl w/sltstn (not anhy)

SLTST-m-dk bri rust orng red v grainy txt sm pink & purp stn v sdy sm circ lt grn & wh incls spkld & mott w/ sm wh sft gummy incls frm v calc v dolo rr tr wh cln ss NS

BENT-wh v lt gry rr shardy rr blu gry tint wxy trnsl pale-bri yel Gold Fluor prob in place

SLTST-bri rust orng sm lt pink & purp grainy frm v lmy mod eff in 10% HCl

SH-m-deep dul red frm sft solu sl dolo v calc

Influx Shale facies (dcrg Energy)
Color Change more dul m purp red

SH-dul m purp reds brit frm smooth txt rr lmy incls mott v dolo

SH-brick red orng v sl purp tint sm bri orng v sft gummy & solu, sl-v frm sl-v calc rr laced & incl w/ LS & BENT (not anhy)

SLTST-bri rust orng red frm v calc

SH-deep red (prob paleosol) tr purp sft v solu orng v sft spkld w/ cln wh incls sm purp brn v sdy rr crse qtz incls non-sl calc

SS-trnsl wh clr cln lt pnk tint f-crse subang-ang brit fri prly srtd qtz pred tt non calc tr fnt sptty dk hvy oil interstial stn w/ yel gold Fluor rr tr even F, slow bri strmy cut pred hd tt w/ tr sm gd opt por tr well defined qtz ovgths

Bleached Zone

SH-v lt purp tr deep purpbrn bri rust -deep red tr bri yel white sm v lt gry v bent tr hematic stn com crse ang qtz gr incls (rnd & mgr mott spkld & laced bnded v bent non calc

SH-varic hd lt-dk purp deep red tr yel slty sdy non calc spkld & mott w/ tr Hematic stn

SLTST- lt-dk rust orng sdy non calc sft-v frm

SS-wh cln f-mgr quartzite ip wh proe fill fri sl frm-v hd sm varic cly mtrx barren

"bleached zone" prob paleosol surf

SH-varic mott lt-m purp m-dul red deep dk red bri rust white non calc sft-hd brit tr hematite stn grainy spkld solu sil ip lt gry crse qtz

Fnt HC Odor in wet cut Noted 20% Tray Fluor

SS-clr cln f-v crse rr lt orng tr m-dk pnk & red tr degassing frags ang -rnd rr hematic stn tr sptty hvy blk interstial oil stn abdt unconsol tr 8-10% opt por tr qtz ovgths com conchoidal frac v gd blu yel F (incl lse grains) bri yel blu gold cut w/Halo

Influx dul brick rust orng brn Redbeds

SLTST-brick red orng v calc sl dolo frm sm wh lmy incls

SLTST-bri brick orng frm v calc -sl dolo v grainy(sdy

SH-dul brick redbrns smooth vfrm-mhd brit sl dolo tr cntctd w/ lt grn subwxy SH

SLTST-bri rust orng v grainy sl-v frm sl dolo (dcrng) Bulk

SH-bri red orng smooth v frm brit rr tr Anhy

SLTST-bri rust orng grainy txt frm non calc v sl dolo v rr clr wh xln anhy incls

SH-tr deep dk red (paleosol) mhd brit non calc

SLTST-bri rust orng bnded w/ lt grn wh mott w/ purp & deep red sl dolo v frm brit NS

BENT-trnsl lt olive tint wxy sm lt blu grn shardy mic w/ sm Fluor

drlg massive Triassic redbeds

SH-bri rust orng red smooth tr anhy incls non calc v sl dolo sl frm-hd ip

SLTST- lt-m bri rust orng sft-frm v sl dolo

SH-bri rust orng red solu rr wh cln anhy incls

SLTST- brick red orng tr anhyic sl dolo sl-v frm brit

SLTST-bri rust orng v Anhyic sl-v frm sl dolo

ANHY-wh cln v sft gummy tr pnk arg stn

ANHY-wh gummy sft cntctd w/ Dolo

DOLO-wh trnsl lt gry & pnk tint V Anhyic mhd brit dnse mott w/ purp SH tr pale blu (mnrl) F

SLTST-bri rust orng sm deep reds solu sl-v frm brit grainy (sdy) txt v Anhyic

SH-bri rust orng sft-hd anhyic solu

SLTST- bri rust orng sft-v frm anhyic comm anhy mtrx & incls non calc v sl dolo (bulk test)

incr depo Energy

SLTST-bri rust orng v sdy anhyic mtrx & incls f-mgr sdy incls sm lse qtz grains in mtrx rr tr SS-wh tt anhy mtrx sft non -sl calc v dolo

ANHY-wh lt orng stn gummy v solu amorph v sft solu tr xln (gyp) mott w/ SH & SS

SH-varic blk purp dk gry lt aqua redbrns rust rr yel tr dk bio in orng sh sm m-crse qtz grain incls in purp brn shale

SLTST-varic rust orng deep red frm sl dolo rr clr orng mgr rnd qtz grains in pnk & red mtrx

SS-wh, lt smokey gry tr pnk & purp tint f-crse sm wh cln fgr wl srtd pred prly srtd comm f-mgr orng pnk comm lse v crs sm rnd & frstd grains v sl calc & dolo no show

SS-wh cln f-gr mod wl srtd nrly qtzite sil lt gry & orng tr dk hematite stnd qtz grain sm prly srtd NS

hc Prob Eagle Valley (Penn) Evap

SH-dul bri brick red sm bri red solu non-v sl calc v sl dolo sft-sl frm v anhyic prob paleosol

DOLO-LT-M BRNGRY DNSE MICRO-CRYPROXLN mhd anhyic rr dul rose tint sl lmy BENT-wh wxy scatt pale-bri yel gold F

Sebkha type lithology

SH-varic purp brn blk grn dul m red bri rust rust & reds

DOLO-lt-m gry brit mhd dnse crypto-microxln anhyic sl lmy sm grainy txt & incls

ANHY- wh gummy sft amorph tr xln granular tr bladed (gyp)

DOLO-lt-m brngry dnse m gry chlky anhyic crypto-microxln

SH-varic blk v brit mhd sil dul purp rust reds aa

BENT-wh wxy lt gry tr olive tint w. scatt pale-bri Fluor

ANHY-wh gummy solu sm orng stn

DOLO-lt-m brngry dnse lt khaki anhyic

SH-varic splntry blk red lt grn bri orng v anhyic

SLTST-varic aa

SS-lt blu grn wh lt-m red wl srtd pred fgr tt NS rr rnd mgr incls.

SH-blk red lt grn & gry rust brit non calc subwxy ip frm-mhd non-sl dolo rr sdy incls brit

ANHY-wh gummy sft solu

TD Drlr 6980MD 4:40AM 10/25/15

proj 6980MD 1.9° Inc, 272 Az 380 VS
6959 TVD, 366 S, 111 W (Wellhead)

see final report for detailed Lith

Wt 8.5# Vis 35
67u. CG
3u.
5u.
c1 .42,c2 .06% c3 .07,c4 .04%
92u. CG
c1 3.8,c2 .2% c3 .08,c4 .03%
TRIP GAS 492u.
Wt 8.4# Vis 35
72u. CG
8 bbl/Hr Mud Seep
60+/- BBl LCZ
120u CG
109u. DTG
Wt 8.5# Vis 35
52u. CG
Wt 8.5# Vis 35
c1 .65%
113u. CG
8-10 bbl/hr Mud Seep
34u.
8u.
c1 .26,c2 .06% c3 .08,c4 .03%
162u. Fm
c1 .31,c2 .07% c3 .08,c4 .068%
149u.Fm
41u.
Wt 8.4# Vis 35
6u.
c1 .26,c2 .03% c3 .05,c4 .01%
75u CG
56u.CG
MUD GAS %
44u.CG
c1 .18%
42u.CG
Wt 8.6# Vis 36
30 bbl/Hr Mud Seep
34u.CG
38u.CG
Wt 8.7# Vis 37
18 bbl/hr Mud Seep
Wt 8.7 Vis 37
24u.CG
Wt 8.8# Vis 38
LCZ 30 bbls seep 10 bbls/hr
c1 .24% tr hvys
62u.CG
SHTG 434u.
0 .1 .2 .5 1.0 % 5 10
MUD GAS %

end