LITHOLOGY STRIP LOG
WellSight Systems
Scale 1:240 (5"=100') Imperial
Measured Depth Log

Well Name: Basin No.1
Location: NE SE Sec.9-T40N-R5E, Rio Grande Co., CO
License Number: API No. 05-105-06019
Region: Del Norte Field
Spud Date: 2/28/13
Drilling Completed: 3/23/13
Surface Coordinates: 1900'FSL 660'FEL
Latitude 37.726122/ Longitude -106.425207
Bottom Hole Coordinates:
Ground Elevation (ft): 8176
K.B. Elevation (ft): 8193
Logged Interval (ft): 74 To: 9270
Total Depth (ft): 9270
Formation: Mancos Shale [Sills]; Dakota, Entrada
Type of Drilling Fluid: KCL/Polymer

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

OPERATOR

Company: First Liberty Energy, Inc.
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GEOLOGIST

Name: Randy Say
Company: RSay Enterprises
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Arvada, CO 80004
303-940-8751

Casing/ Data

Conductor Pipe: 16.0" set @ 74'
Surface Casing 9.625" 36# J-55 set @ 1220'
Intermediate Casing 7.00" J-55 LT&C set @ 4798'
Production Casing 4.50" set @ TD[9270]
Plugged and abandoned 5/25/13

ROCK TYPES

- Anhy
- Bent
- Brec
- Cht
- Clyst
- Coal
- Congl
- Dol
- Gyp
- Igne
- Lmst
- Meta
- Mrlst
- Salt
- Shale
- Shcol
- Shgy
- Sltst
- Ss
- Till

ACCESSORIES

FOSSIL
- Algae
- Amph
- Belm
- Bioclst
- Brach
- Bryozoa
- Cephal
- Coral
- Crin
- Echin
- Fish
- Foram
- Fossil
- Gastro
- Oolite
- Ostra
- Pelec
- Pellet
- Pisolite
- Plant
- Strom

MINERAL
- Anhy
- Arggrn
- Arg
- Bent
- Bit
- Brecfrag
- Calc
- Carb
- Chtdk
- Chtlt
- Dol
- Feldspar
- Ferrpel
- Ferr
- Glau
- Gyp
- Hvymin
- Kaol
- Marl
- Minxl
- Nodule
- Phos
- Pyr
- Salt
- Sandy
- Silt
- Sil
- Sulphur
- Tuff

STRINGER
- Anhy
- Arg
- Bent
- Coal
- Dol
- Gyp
- Ls
- Mrst
- Sltstrg
- Ssstrg

TEXTURE
- Boundst
- Chalky
- Cryxln
- Earthy
- Finexln
- Grainst
- Lithogr
- Microxln
- Mudst
- Packst
- Wackest

ROP/ENG DATA
ROP (Min/FT)
Gamma (API)
Depth
Porosity Type
Porosity
Lithology
Grain Size
Oil Show
Sorting
Rounding
Geological Descriptions
Total Gas (TG)
Total Gas(TG) (Units)
C1 (Units)
C2 (Units)
C3 (units)
C4 (units)
C5 (units)
0 ROP (Min/FT) 2
0 Gamma (API) 150
0 Total Gas(TG) (Units) 100
16.0" Conductor Pipe set at 74'
2/28/13
Pason ROP not working, drilling time from Rig Geolograph; 74-636
NB1 12.250" in @ 74; HTC HC D5062X
Pason Total Gas Readings Begin @ 720; No Chromatograph 720-1243
W 8.9 V 48 WL NC pH 11.0 cK CL 500 Ca 80 LCM
WOB 8 RPM 60/65 PP 500 SPM 130
DS= 0.75 -163
3/1/13
DS= 0.75 - 435
WOB 8 RPM 60/65 PP 500 SPM 130
Pason ROP operational @ 636
DS= 0.75 - 680
WOB 8/12 RPM 60/65 PP 500/800 SPM 130
DS= 1.0 - 988
WOB 12 RPM 50 PP 1130 SPM 130
3/2/13
DS= 1.0 - 1173
WOB 12 RPM 50 PP 1130 SPM 130
3/3/13
NB1 12.250" in @ 74; BHI HC D5062X; out 1243; 1169' in 29.5hrs; 39.62'/hr
Circ hole to run Elogs, No flow @ pits
3/4/13
Surface Casing 9.625" 36# J-55 set @ 1220
NB2 8.750" BHI Q506FX in @ 1243
No Trip Gas
W 8.8 V 40 WL 10.0 pH 8.0 cK 2 CL 500 Ca 80 LCM
W 8.8 V 40 WL 10.0 pH 8.0 cK 2 CL 500 Ca 80 LCM
Added 40 bbls to mud system
W 8.7 V 41 WL 11.0 pH 9.6 cK 1 CL 700 Ca 40 LCM
3/5/13
DS= 0.75 - 2628
W 8.7 V 41 WL 7.2 pH 11.0 cK 1 CL 750 Ca 50 LCM

Conejos Formation at Surface

SH m-dkgy firm-sft blky w/abnt cly mgy vsft-gummy; nsfoc

SH aa w/intbd ltgy slty fg ss; nsfoc

No shows of oil in mud, or smpl cut/flor

SS m-ltgy fg-slty slmica

SH m-ltgy firm-sft blky slty w/incr in intbd SS aa; nsfoc

CLYSTN mgy vvsft/gummy

SH aa w/decr amt gummy clystn

SS ltgy m-fg w/occ vcg ang qtz clasts mica w/volcanic clasts inclusions; nsfoc

No shows of oil in mud, or smpl cut/flor

SH decr amt m-dkgy grdg to mudstn

SS/CONG wh-ltgy vcg/cong-occ mg ang-sbrd qtz grs w/abnt volcanic clast inclusions; occ mica; nsfoc

SH mgy firm blky decr amt in smpl

occ tr feld incl & volcanic tuff

SS/CONG aa incr ang vcg cong qtz grs w/bk/dkgy volcanic inclusions; tr felds grs; nsfoc

tr SH aa

SS/CONG aa wh-mgy vcg/cong incr in ang qtz grs w/abnt volcanic inclusions; occ bk mica grs; nsfoc

tr mgy SH blky slty

occ tr ltgy sft volcanic ash/tuff

SS/CONG wh-mgy vcg/cong ang qtz grs w/abnt volcanic inclusions; occ bk mica grs; nsfoc

incr amt breccia frags

No shows of oil in mud, or smpl cut/flor

SS/CONG m-ltgy cong/vcg vanf qtz grs w/abnt volcanic clasts; bk mica grs; occ tr breccia; nsfoc

incr amt volcanic ash/tuff ltgy sft mica

SS/CONG mgy vcg/cong ang qtz grs w/mtrx volcanic clasts; bk mica w/incr amt breccia; nsfoc

Breccia gy-wh qtz grs w/mtrx ash, mica, & volcanic inclusions

incr amt tuff/ash vsft ltgy mica

SS/CONG w/incr amt breccia; cong/vcg ang qtz grs w/mtrx volcanic clasts, mica & breccia; nsfoc

SS/CONG lt-mgy cong/vcg incr mg ang qtz grs in mtrx volcanic tuff/clasts; mica; nsfoc

incr amt felds grs in cong mtrx

Ash/tuff ltgy sft mica

No shows of oil in mud, or smpl cut/flor

SS/CONG m-ltgy sft-firm decr cong/vcg incr mg ang qtz grs w/incr felds & mica; volcanic clasts; nsfoc

Breccia mgy sft qtz grs/volcanic clasts/felds w/mtrx of tuff

incr amt tuff/ash ltgy sft mica as mtrx for cong qtz/fedls grs

CONG decr amt qtz grs vcg-mg ang w/incr in felds grs; volcanic clasts/mins & mica; imbedded in mtrx of tuff/ash ltgy sft; nsfoc

Breccia aa mica felds

tuff/ash ltgy vsft mica w/incl volcanic mins

No shows of oil in mud, or smpl cut/flor

CONG m-incr dkgy firm-occ sft decr amt qtz grs in mtrx w/incr amt volcanic mins/clasts; mica & incr in felds inclusions; nsfoc

tuff/ash ltgy vsft-mushy w/mica & volcanic inclusions

CONG m-dkgy firm-sft in mtrx of ash w/mixture of mg ang qtz grs/felds grs/ & volcanic clasts; occ mica; nsfoc

Breccia dkgy volcanic mins & felds grs

CONG aa w/mtrx ash & mixture of qtz & felds grs; volcanic clasts & mica; nsfoc

No shows of oil in mud, or smpl cut/flor 74 to 1243

Breccia w/felds inclusions

CONG/SS m-dkgy w/ltgy ss text firm-sft in mtrx of ash w/mixture of mg ang qtz grs/felds grs/ & volcanic clasts; occ mica; nsfoc

Breccia

ash ltgy vsft-mushy w/mica & volcanic inclusions

CLYSTN mgy gummy/vsft slty

No shows of oil in mud, or smpl cut/flor

CONG/SS ltgy-gn w/ltgy/gn ss text firm-sft in mtrx of fg ang qtz grs/felds grs & volcanic clasts; occ mica; nsfoc

incr in amt of CLYSTN mgy vsft/gummy vslty/sdy

tr felds grs in mtrx

CLYSTN w/dkgy sft SH slty blky slty intbd w/CONG/SS; nsfoc

CONG grdg to cg SS ltgy-ltgn firm-hd w/cly mtrx & inclusions; nsfoc

No shows of oil in mud, or smpl cut/flor

CLYSTN m-dkgy vsft/gummy w/intbd sltst w/embedded volcanic inculsions

scat volcanic grains in smpl

CONG/SS vcg-mgy-ltgn (chlorite) ang qtz grs in cly mtrx w/mica & felds grs; nsfoc

CLYSTN lt-mgy vsft-firm w/dkgy blky sh intbd & SS/CONG aa intbd; nsfoc

SS/CONG mgy-ltgn cg-mg qtz grs in ltgy ash mtrx w/felds grs & volcanic inclusions; nsfoc

SH/CLYSTN mgy sft blky gummy w/embedded volcanic fragments

SS/CONG m-dkgy-gn (gn chlorite grains) hd dns-firm w/ang qtz grs & volcanic minerals embedded in welded ash mtrx; nsfoc

tr felds minerals in mtrx

SS/CONG aa w/incr amt dkgy/brn volcanic minerals & chlorite embedded w/in mtrx; nsfoc

CLYSTN m-dkgy vsft slty cly

No shows of oil in mud, or smpl cut/flor

CONG m-dkgy w/occ gn grs(chlorite) hd-firm in mtrx of ltgy ash/tuff w/embedded qtz grs & tr felds; nsfoc

CONG aa w/incr in felds in mtrx; nsfoc

occ tr Breccia

CONG m-dkgy w/occ gn grs(chlorite) hd-firm in mtrx of ltgy ash/tuff w/embedded qtz grs, felds & volcanic mins; nsfoc

CLYSTN mgy gummy

No shows of oil in mud, or smpl cut/flor

CONG m-dkgy w/occ gn grs(chlorite) hd-firm in mtrx of ltgy ash/tuff w/embedded qtz grs, felds & volcanic mins; nsfoc

CLYSTN aa

CONG m-dkgy w/occ gn grs(chlorite) hd-firm in mtrx of ltgy ash/tuff w/embedded qtz grs, felds & volcanic mins; nsfoc

No shows of oil in mud, or smpl cut/flor

CLYSTN mgy sft-gummy

CONG ltgy-dkgy w/occ gn grs(chlorite) sft-firm in mtrx of ltgy ash/tuff w/embedded qtz grs, felds & volcanic mins; nsfoc

incr tr embedded volcanic minerals & felds

CLYSTN aa

CONG ltgy-dkgy w/occ gn grs(chlorite) sft-firm in mtrx of ltgy ash/tuff w/embedded qtz grs, felds & volcanic mins; nsfoc

No shows of oil in mud, or smpl cut/flor

CONG ltgy-dkgy decr amt gn grs(chlorite) sft-hd in mtrx of ltgy ash/tuff w/embedded qtz grs, felds & volcanic mins; nsfoc

CONG aa incr amt felds in mtrx; nsfoc

tr CLYSTN sft ltgy

CONG ltgy-dkgy tr gn grs(chlorite) sft-hd in mtrx of ltgy ash w/embedded qtz grs, felds & volcanic mins; nsfoc

No shows of oil in mud, or smpl cut/flor

CLYSTN vsft/gummy ltgy

CONG mgy-dkgy firm-hd in mtrx of ltgy ash w/embedded qtz grs, tr gn chlorite grs, incr amt felds & volcanic mins; nsfoc

occ tr Breccia

CONG m-dkgy-incr pink/orng (incr in felds in mtrx) w/incr in embedded qtz grs; ash/tuff mtrx; nsfoc

CLYSTN mgy vsft slty

tr Breccia w/in mtrx of CONG

CONG m-dkgy-pink/orng (abnt felds) w/embedded qtz grs& volcanic minerals in ash/tuff mtrx; nsfoc

CONG aa incr dkgy-gybrn-orng/red (fedls) hd dns welded tuff mtrx; nsfoc

No shows of oil in mud, or smpl cut/flor

occ tr Breccia

CONG m-dkgy-pink/orng (abnt felds) w/embedded qtz grs & volcanic minerals in ash/tuff mtrx; nsfoc

incr amt felds in mtrx

CLYSTN grdg to gummy dkgy cly

CONG m-dkgy-pink/orng (abnt felds) w/embedded qtz grs & volcanic minerals in ash/tuff mtrx; nsfoc

No shows of oil in mud, or smpl cut/flor

CLYSTN vvsft slty text

No shows of oil in mud, or smpl cut/flor

CONG m-dkgy-decr pink/orng (felds) w/scat qtz grs & volcanic minerals in ash/tuff mtrx; nsfoc

CONG aa incr sft text occ mica; nsfoc

CLYSTN grdg to gummy cly

CONG mgy-dkgy-ltred/pink sft-firm sft ash mtrx w/qtz grs, felds, occ mica; nsfoc

CLYSTN aa

CONG mgy-dkgy-ltred/pink sft-firm ash mtrx w/qtz grs, felds, occ mica; nsfoc

No shows of oil in mud, or smpl cut/flor

CLYSTN mgy vsft w/embedded qtz grs

CONG mgy-dkgy-ltred/pink sft-firm ash mtrx w/qtz grs, felds, volcanic mins; nsfoc

CLYSTN/CLY sft ltgy w/qtz grs

CONG mgy-dkgy-ltred/pink sft-firm ash mtrx w/qtz grs, felds, volcanic mins; nsfoc

CONG m-dkgy vsft in mtrx of vsft ltgy volcanic ash w/qtz/felds grs & volcanic min inlcusions; nsfoc

No shows of oil in mud, or smpl cut/flor

incr amy CLYSTN & vsft bk sh

CONG m-dkgy vsft-mushy; mtrx of vsft ltgy volcanic ash w/qtz grs/decr amt felds grs & volcanic min inlcusions; nsfoc

Breccia ltgy w/mixture volcanic min grs

CLYSTN/SH vsft-mushy dkgy w/min grs mixed w/dk-mgy CONG aa; nsfoc

incr amt felds in mtrx

CONG m-dkgy-occ ltgy/wh sft-fri in mtrx of vsft-mushy gy volcanic ash w/incr in felds min & scat qtz grs; nsfoc

CLYSTN/SH dkgy sft-firm blky w/embedded grs

Breccia aa

CONG m-dkgy-occ ltgy/wh sft-fri in mtrx of vsft-mushy gy volcanic ash w/incr in felds min & scat qtz grs; nsfoc

CLYSTN aa

No shows of oil in mud, or smpl cut/flor

Breccia dkgy/tan fri w/larger volcanic min grs

SH mgy sft slty

CONG m-dkgy-occ ltgy/wh sft-fri in mtrx of vsft-mushy gy volcanic ash w/incr in felds min & scat qtz grs; nsfoc

Breccia aa w/volcanic mins

CLYSTN/SH mgy-red vsft blky felds

CONG m-dkgy-occ ltgy/wh incr vfri-uncon grs of qtz in mtrx of vsft gy volcanic ash w/felds & qtz grs; nsfoc

No shows of oil in mud, or smpl cut/flor

CONG m-dkgy-occ ltgy/wh incr vfri-uncon grs of qtz in mtrx of vsft gy volcanic ash/tuff w/felds & qtz grs; nsfoc

Breccia dkgy firm volcanic min inclusions

CLYSTN/SH mgy sft

CONG m-dkgy-occ ltgy/wh incr vfri-uncon grs of qtz in mtrx of vsft gy volcanic ash/tuff w/felds & qtz grs; nsfoc

No shows of oil in mud, or smpl cut/flor

tr loose felds grs

Breccia mgy firm w/frags of vf qtz grs & pumice

CONG m-dkgy-occ ltgy/wh incr vfri-uncon grs of qtz in mtrx of vsft gy volcanic ash/tuff w/felds & qtz grs; nsfoc

CONG aa incr fri w/mtrx ash/tuff & inclusions qtz/felds/volcanic; nsfoc

No shows of oil in mud, or smpl cut/flor

Tuff vltgy-wh-plgn vsft-occ firm; mtrx of ltgy ash that is altered to a soft cly texture vslcalc; w/inclusions of qtz grs & volcanic mins

No shows of oil in mud, or smpl cut/flor

Tuff vltgy-wh-plgn vsft; mtrx of ltgy ash that is altered to a soft cly texture vslcalc; w/inclusions of qtz grs & volcanic mins

Tuff aa grdg back to intbd CONG mgy fri qtz grs & volcanic min; nsfoc

Tuff wh-ltgy-gygn vsft ash mtrx w/qtz grs w/incr incr CONG mgy fri qtz grs & volcanic min; nsfoc

occ tr Breccia

No shows of oil in mud, or smpl cut/flor

CONG mgy-clr-wh vfri-uncon grs of qtz in mtrx of vsft gy volcanic ash/tuff w/dkgy volcanic mins; nsfoc

CLYSTN dkgy vsft

tr pink felds grs & abnt uncon qtz grs

CONG mgy-clr-wh vfri-uncon grs of qtz in mtrx of vsft gy volcanic ash/tuff w/dkgy volcanic mins; nsfoc

No shows of oil in mud, or smpl cut/flor

CLYSTN/SH dkgy vsft blky

CONG mgy-red/orng-dkgy firm-uncon grs of qtz & incr amt felds grs in mtrx of sft gy volcanic ash/tuff w/dkgy volcanic mins; nsfoc

CLYSTN sft w/qtz grs

CONG mgy-red/orng-dkgy firm-uncon grs of qtz & felds grs in mtrx of sft gy volcanic ash/tuff w/dkgy volcanic mins; nsfoc

incr amt uncon qtz & felds grs

No shows of oil in mud, or smpl cut/flor

CONG mgy-red/orng-dkgy firm-uncon grs of qtz & incr amt felds grs in mtrx of sft gy volcanic ash/tuff w/dkgy volcanic mins; nsfoc

occ tr Breccia

CONG mgy-red/orng-dkgy firm-uncon grs of qtz & incr amt felds grs in mtrx of sft gy volcanic ash/tuff w/dkgy volcanic mins; nsfoc

No shows of oil in mud, or smpl cut/flor

CLYSTN/SH dkgy sft

CONG m-ltgy fri-incr abnt uncon grs pred qtz & felds grs in mtrx of sft gy volcanic ash/tuff & volcanic mins; nsfoc

No shows of oil in mud, or smpl cut/flor

CLYSTN aa

tr Breccia

CONG m-ltgy fri-incr abnt uncon grs pred qtz & felds grs in mtrx of sft gy volcanic ash/tuff & volcanic mins; nsfoc

No shows of oil in mud, or smpl cut/flor

CONG aa incr clr qtz grs f-mg; m-ltgy fri-incr abnt uncon grs pred qtz & felds grs in mtrx of sft gy volcanic ash/tuff & volcanic mins; nsfoc

CLYSTN ltgy sft

CONG clr-ltgy f-mg; fri-uncon grs qtz & felds grs in mtrx of gy volcanic ash w/ volcanic mins; nsfoc

Tuff (welded tuff) mgy-gybrn hd-fri; mtrx of ash cmted w/inclusion qtz, felds, chlorite, & volcanic mins; nsfoc

Breccia fri volcanic mins

No shows of oil in mud, or smpl cut/flor

Tuff (welded tuff) mgy-gybrn hd-fri; mtrx of ash loosley cmted w/inclusion qtz, felds, chlorite, & volcanic mins; nsfoc

CONG clr-ltgy f-mg; fri-uncon grs qtz & felds grs in mtrx of gy volcanic ash; nsfoc

Base of Conejos/ Top of Blanco Basin 4560 (3633)

base of Tuff aa incr fri & incr amt chlorite & vang qtz grs; grdg into clystn/tuff; nsfoc

CLYSTN ltgy vsft slty w/CONG aa; nsfoc

decr amt Breccia

CONG mgy-wh/clr incr as arkosic SS vc-mg vang occ calc cmted w/felds & occ tr pyr & bent cly mtrx; nsfoc

CLYSTN mgy-brn vsft bent w/ss aa & embedded qtz/felds

SH bk-redbrn sft blky bent

SS/CONG wh-clr-pink vcg/cong-mg vang arkosic (felds) w/cly mtrx & occ calc cmt tr pyr & occ sltst; nsfoc

CLYSTN/SH vsft-mushy bent redbrn-gybrn w/intbd SLTST mgy bent & CONG SS vcg arkosic (felds); nsfoc

tr pyr

No shows of oil in mud, or smpl cut/flor

SS/CONG aa wh-clr-pink vcg/cong-mg vang arkosic (felds); becoming a complex of bent clystn/SH/SLTST; tr pyr; nsfoc

CLYSTN redbrn-brn vsft slty bent

No sample shows associated with gas increase at 4718

SS uncon qtz grs loose & embedded in cly; nsfoc

SS wh-pink vcg/cong-mg vang arkosic (felds); intbd w/bent clystn/SH/SLTST; tr pyr; nsfoc

SH brn-dkgy firm-sft plty-blky vbent occ slpyr w/intbd SLTST & vsft redbrn cly; nsfoc

SS wh-pink-gy vcg-mg arkosic (felds) vang occ pyr & occ bent clystn; w/intbd complex of sltst/ vsft redbrn cly/ & SH dkgy blky-plty slcalc; nsfoc

No shows of oil in mud, or smpl cut/flor; 1200-4812

CLYSTN ltgy vsft slty

CONG mgy-wh-ltgn sft wintbd Tuff & SS aa; nsfoc

NOTE: Transition Zone in top section of Blanco Basin Formation

CONG wh-clr-ltgy m-cg qtz grs occ felds grs embedded within ltgy Tuff vsft qtzitic w/dead asphaltic inclusions; nsfoc

CLYSTN mgy vsft-mushy

SLTST ltgy fri decr to a trace

No shows of oil in mud, or smpl cut/flor

CONG wh-clr-ltgy m-vcg qtz grs tr felds grs embedded within ltgy Tuff vsft qtzitic w/dead asphaltic inclusions; nsfoc

CONG aa grsdg to f-vfg SS w/tr pyr & incr ash/tuff; nsfoc

CLYSTN sft-mushy slty

SH dkgy sft plty bent

SS (first devloped SS bed) wh-clr vf-mg uncon-vfri sbang msrt; pred uncon loose grs; occ slfelds; tr pyr; w/thin intbd SH strgs aa; por-g; oilstn-none; nsfoc

SS aa wh-clr vf-mg uncon-vfri sbang msrt; uncon loose grs; occ slfelds (ltyel grs); tr pyr; w/intbd SH dkgy plty bentonitic; por-g; oilstn-none; nsfoc

No shows of oil in mud, or smpl cut/flor

SH strgs m-dkgy sft plty carb bent

SS wh-clr vf-mg uncon-vfri sbang msrt; uncon loose grs; occ slfelds (ltyel grs); tr pyr; w/intbd SH dkgy plty bentonitic; por-g; oilstn-none; nsfoc

SS aa w/sh strgs felds grs & pyr; por-g-fr nsfoc

SH dkgy blky carb bent

SS wh-ltgy-occ pale yel (frlds) vf-mg uncon-vfri sbang-ang msrt; uncon loose grs; slpyr; w/intbd SH dkgy plty bent; por-g-fr; oilstn-none; nsfoc

SH strgs aa occ lam

No shows of oil in mud, or smpl cut/flor

SS wh-ltgy-ltyel uncon-fri f-mg sbang-ang msrt; occ bent & shly w/intbd SH strgs; por-g-occ ex; nsfoc

SH m-dkgy sft blky bent

SS aa incr uncon w/sh strgs; nsfoc

SS wh-ltgy-ltyel uncon-fri (vfri clus) f-mg sbang-ang msrt; trpyr; bent & shly w/intbd SH bent & mgy strgs; por-g-occ ex (vlcn uncon ss grs); nsfoc

SH strgs mgy blky vcarb bent

SS wh-ltgy-ltyel uncon-fri f-mg sbang-ang msrt; occ bent & shly w/intbd SH strgs; por-g-occ ex; nsfoc

SH m-dkgy blky firm slty bent

SS wh-ltgy-decr ltyel/felds uncon-fri f-mg sbang msrt; w/tr bent & intbd SH strgs; por-g-occ fr; nsfoc

No shows of oil in mud, or smpl cut/flor

SH m-dkgy blky carb bent slpyr

SS wh-clr-ltgy uncon-fri clus; vf-mg ;sbang msrt; occ tr pyr intbd w/sft bent clystn; SS por-fr; nsfoc

SS aa f-mg sbang msrt; vfpyr w/intbd sft SH/CLYSTN bent; SS por-fr-p; nsfoc

SH m-dkgy sft blky bent vcarb

SS wh-clr-ltgy f-vfg pred uncon-occ fri clus; sbang msrt; tr pyr; por-fr-g; nsfoc

SH aa occ vsft bent

SS wh-clr-ltgy f-vfg pred uncon-occ fri clus; sbang msrt; tr pyr; sl felds (ltyel grs); intbd w/SH strgs aa; por-fr-g; nsfoc

tr pyr incr

Animas Formation 5520 (2673)

SH m-dkgy sft blky vcarb bent occ slpyr

SS wh-clr-transl f-mg uncon-fri clus; sbang msrt; slpyr; tr felds (ltyel grs); intbd w/SH mgy bent strgs aa; por-fr; nsfoc

SH strgs aa occ ltgn vbent

SS wh-clr-transl f-mg uncon-fri clus; sbang msrt; slpyr; tr felds (ltyel grs); intbd w/SH mgy bent strgs aa; por-fr-g; oilstn-none; flor-10% ltyel; cut-10% very weak slow mlky cut; res-none; residual show, no live oil in cuttings or mud

SH incr incr amts mgy-gygn sft vbent slcalc

SS ltgy-wh f-mg uncon-mfri occ clus; sbang msrt; occ tr calc cmt; occ bent cly mtrx; slpyr; por-fr; oilstn-none; flor-10% pale yel; cut-10% of clus have very weak slow mlky cut; res-none; residual show, no live oil in cuttings or mud

SS aa; shows aa very weak mlky residual show

SH strgs mgy-gn sft blky bent slpyr

SS ltgy-wh-mlky vfg-mg uncon-fri clus; sbang msrt; occ calc cmt; bent cly mtrx; slpyr; por-fr; oilstn-none; flor-20% ltyel; cut-20% weak slow mlky cut only on vfri clus; res-none; residual show, no live oil in cuttings or mud

SS aa incr cly mtrx felds & slpyr w/SH strgs intbd; por-fr; residual shows aa

SS aa no shows w/incr in amt intbd dkgy carb sh strgs

SS wh/mlky-ltgy f-mg uncon-fri clus; sbang msrt; incr calc cmt & tr pyr w/intbd SH strgs aa; por-fr; oilstn-none; flor-tr pale yel; cut-tr weak mlky residual cut; res-none

SS aa w/incr in calc cmted clus & cly in mtrx; w/intbd sh strgs; residual shows aa

SS aa no smpl shows occ grdg to ltgy sltst w/sh strgs

SS wh-mlky-clr f-m-occ cg uncon-incr in calc cmted clus; sbang-ang msrt; calc cmt w/incr in cly in mtrx; vfpyr w/intbd mgy sltst & dk-mgy SH carb slty; por-fr-g; oilstn-none; flor-20% ltyel; cut-20% slow weak mlky residual cut; res-none

SS w/intbd SH strgs aa incr tr pyr

SS wh-clr-occ pale yel (felds) f-cg uncon-fri clus; sbang-ang msrt; calc cmt clus w/cly in mtrx; vfpyr w/intbd sltst & carb slty SH; por-fr-g; oilstn-none; flor-10% ltyel; cut-10% slow weak mlky residual cut; res-none; residual show, no live oil in cuttings or mud

SS aa por-p-fr occ slty; nsfoc w/incr in intbd SH dkgy carb strgs

SS wh-clr-pale yel (felds); f-mg uncon-fri clus; sbang-ang msrt; calc cmt w/cly in mtrx; vfpyr w/intbd sltst & SH; por-fr-; oilstn-none; flor-10% ltyel; cut-10% slow weak mlky residual cut; res-none; residual show, no live oil in cuttings or mud

SS wh-ltgy-clr f-mg uncon-fri clus sbang msrt; calc cmt; abnt cly in mtrx; occ felds; por-fr; nsfoc

SH gybrn-mgy firm-sft blky-plty carb vbent slty w/intbd sltst strgs & SS strgs aa; nsfoic

SS aa incr fg-vfg grdg to sltst w/intbd SH/SLTST strgs; por-p-fr; nsfoc

SH dkgy-gybrn sft blky vslty carb slpyr w/intbd mgy SLTST pyr carb; nsfoc

SH aa incr gybrn sft plty occ slty vvcarb pyr w/decr amt intbd SLTST mgy fri & intbd SS strgs ltgy-tan vf=fg slty carb cly mtrx shly por-p nsfoc

tr pyr

SS mgy-wh fg fri-uncon calc cmted clus abnt cly mtrx decr to intbd strgs sltst; por-p-fr; nsfoc

SH gybrn-dkgy vsft-firm blky-plty occ fis vcarb vslty w/intbd SLTST strgs; nsfoc

SH gybrn-brn incr vsft-sft blky-plty occ fis vvcarb slty trpyr; w/intbd sltst & vfg ss strgs; nsfoc

SH aa incr vsft slty & pyr vvcarb w/intbd thin strgs dkgy sltst grdg to vfg ss; nsfoc

tr pyr

SH gybrn-brn vsft-sft blky-plty fis vvcarb slty trpyr; w/intbd sltst & vfg ss strgs; nsfoc

SLTST mgy fri carb

tr pyr

V 42
WL 4.2
pH 9.0
cK 1
CL 760
Ca 140
LCM

SH aa incr sftr brn/gybrn vcarb tr vfpyr w/intbd mgy sltst strgs; nsfoc

SLTST strgs aa

SH gybrn-brn/dkgy sft-firm blky-plty fis occ bent slcalc; w/sltst strgs intbd; nsfoic

tr pyr

SLTST m-dkgy fri arg slcalc

Scale Change

NOTE: Gas Scale Change at 6200

SH brn-gybrn-dkgy vsft-firm incr plty-blky occ fis vcarb slty w/intbd SLTST strgs; nsfoc

SLTST m-ltgy fri vcarb arg w/tr calc & pyr w/in SH aa

Total Gas 1024 Units

Volcanic (igneous) siliceous Sill wh-ltgy sft-firm; ltgy mtrx siliceous (microxtline qtz) w/occ tr mica; por-fr-g, probable fractured; oilstn-80% of smpl has scat inclusions of bk asphaltic oil pieces, no visible live oil; flor-80% myel; cut-80% slow myel strm cut; res-ltbrn oil ring in dish

Mancos Sill Zone - Top 6236 (1957)

SH aa brn-gybrn sft plty vcarb pyr; flor-none; cut slow mlky residual cut

Total Gas 9136 Units

Volcanic Sill aa ltgy siliceous mtrx (microxtline qtz) w/fracture por; oilstn-50% bk asphaltic inclusions; flor-50% myel; cut-50% slow myel strm cut; res-ltbrn oil ring in dish

Upper Sill Zone - Top 6236 (1957)

SLTST wh-crm fri-firm gran occ slpyr chky mtrx calc; w/intbd SH gybrn vsft vvcarb; por-p; oilstn-none; nsfoc

Total Gas 2348 Units

Total Gas 8371 Units

DS= 5.50 - 6295

Volcanic Sills w/intbd brn carb sh; ltgy-wh sfr-firm siliceous mtrx (microxtline qtz) w/tr mica & pyr; por-g-fr w/fractured por; oilstn-20% bk-dkbrn asphaltic inclusion, no live oil; flor-50% myel; cut-50% slow myel strm cut; res-ltbrn oil ring in dish

tr pyr & calc

Total Gas 8034 Units

no visible oil in mud

Upper Sill Zone - Base 6318 (1875)

SH gybrn-dkgy sft-firm plty-blky vcarb incr slty slcalc w/dkgy sltst strgs; occ tr calc in smpls indicating possble fractures; flor-none; cut-very weak slow mlky residual cut

W 8.8
V 37
WL 6.0
pH 9.5
cK 1
CL 800
Ca 160
LCM

tr pyr & calc

Total Gas 8231 Units

Volcanic Sills [intbd w/in brn sft SH]; ltgy-wh fri-sft siliceous microxtline texture; tr mica; intbd within SH aa; thinner & less well developed than the sill @ 6250; por-fr-g probable fractured; oilstn-no live oil, no trace of asphaltic inclusions as in 6250 sill; flor-10% myel; cut-10% slow mlky cut; res-none in dish

Total Gas 6022 Units

DS= 5.25 - 6388

SH gybrn-brn vsft plty-blky vcarb occ vfpyr slcalc; nsfoc w/intbd SLTST mgy fri vcarb slpyr arg

SLTST ltgy fri arg slcalc pyr w/tr calc in smpls

Connection Gas 2265

SH ltbrn-dkgy-gybrn vsft-firm plty occ fis vcarb slpyr & occ tr calc in smpl slcalc; nsfoc w/intbd ltgy SLTST strgs aa

Connection Gas 3150

tr pyr & mlky/wh cal cin smpl

SH aa vsft grdg to ltgy CLYSTN vvsft-mushy

Connection Gas 3267

SLTST mgy-gybrn vfri arg vvcarb slcalc

Connection Gas 917

DS= 5.0 -6515

SH gybrn-ltbrn-dkgy vsft-firm plty-blky vcarb slty occ vfpyr slcalc; flor-none; cut-sh starting to have a weak mlky residual cut

Connection Gas 575

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SH aa w/intbd sltst strgs; flor-none; cut-slow mlky residual sh cut

W 9.1
V 42
WL 6.0
pH 9.5
cK 2
CL 800
Ca 140
LCM

Connection Gas 1396

SH gybrn-ltbrn-dkgy vsft-firm plty-blky vcarb slty occ vfpyr slcalc; flor-none; cut-slow mlky residual sh cut

SLTST m-dkgy vfri vvcarb arg

Lower Sill Zone - Top 6568 (1625)

SH dkgybrn-dkgy-brn sft-incr mushy plty-blky occ fis vvcarb occ bent & incr slty w/intbd gy sltst strgs; slcalc; flor-none; cut-slow mlky residual sh cut

Connection Gas 1129

SH dkgybrn-dkgy-brn sft-incr mushy plty-blky occ fis vvcarb occ bent & incr slty w/intbd gy sltst strgs; slcalc; flor-none; cut-slow mlky residual sh cut

Intrusive Sill Top Zone 6622-6638 (16)

CONG [Quartz Latite, Volcanic Intrusive Sill] wh-clr vf-mg qtz grs; ang-sbrd; psrt; pitted grs w/wh cly coating; embedded in mtrx of brn-dkgy mushy-sft sh/clystn [altered sh from volcanic intrusion heat]; trpyr, mica, & volcanic minerals; por-g-fr(porosity from qtz grs similar to a sandstone type porosity); oilstn-tr oilstn on a few qtz grs, no visible live oil on qtz grs; live oil show in mud as a sheen on surface of mud & when cut with solution, live lttan oil visible under the scope

Total Gas 551 Units

Lower Sill Zone - Base 6622 (1571)

Oil sheen & trace of light tan live oil in mud when mud sample is cut with solution

Intrusive Sill Lower Zone 6654-6690 (36)

CONG [Quartz Latite, Volcanic Intrusive Sill] decr amt wh-clr vf-mg qtz grs; ang-sbrd; psrt; pitted grs w/wh cly coating; embedded in mtrx of brn-dkgy mushy-sft sh/clystn [altered sh from volcanic intrusion heat]; trpyr, mica, & volcanic minerals; por-g-fr(porosity from qtz grs similar to a sandstone type porosity); oilstn-tr oilstn on a few qtz grs, no visible live oil on qtz grs; live oil show aa; Lower zone incr intbd w/SH brn-dkgy mushy vcarb; SH cuts mlky diffuse cut

Total Gas 516 Units

Oil sheen & trace of light tan live oil in mud when mud sample is cut with solution

Total Gas 817 Units

SH mot gybrn-brn–dkgy mushy-sft plty-blky vcarb scat carb mat in mtrx slslty w/tr pyr & calc; w/embedded CONG qtz grs aa; shows aa

Oil sheen & trace of light tan live oil in mud when mud sample is cut with solution

SH aa incr sft-mushy dkgy vvcarb slty pyr; SH has a slow mlky residual cut; w/decr amt of CONG qtz latite decr to strgs w/in SH; CONG show trace of lsow weak mlky cut; no live oil show in smpl, mud show decr to sheen

Total Gas 514 Units

Mud show decr to trace of sheen in mud, no live oil

Trace of oil sheen in mud, no trace of live oil in sample check

Volcanic Sill Zone - Base 6755 (1438)

CONG/Qtz Latite mlkky-wh fg qtz grs decr to strgs intbd w/in sft SH; no smpl shows on qtz grs; SH yeilds a slow weak mlky residual cut, no live oil show

SH brn-gybrn sft plty-blky vcarb slpyr occ slty mcalc w/intbd ltgy fri sltst strgs; vweak slow mlky residual cut

DS= 2.50 - 6791

SLTST incr amt strgs m-ltgy fri arg carb slcalc

W 9.3
V 42
WL 6.4
pH 9.0
cK 1
CL 820
Ca 180
LCM

SH brn-gybrn sft plty-blky vcarb slpyr occ slty mcalc w/intbd ltgy fri sltst strgs; vweak slow mlky residual cut

thin vfg SS strgs mgy fri grdg to sltst w/in SH aa nsfoc

SH brn-gybrn-occ gygn sft plty-blky vcarb vfpyr slty mcalc w/intbd sltst strgs; nsfoc

incr tr pyr

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SH m-dkgy-incr gygn sft-firm plty-blky occ slfis carb slty w/intbd sltst & ss strgs; nsfoc

SS ltgy-gygn firm-fri vfg arg carb slcalc; por-p nsfoc

SH m-dkgy-gygn sft-firm fis plty-blky slcarb incr slty w/intbd sltst & ss strgs; nsfoc

incr tr pyr

SH aa incr slty/sdy carb vfpyr; nsfoc

SH m-dkgy-gygn sft-firm fis plty-blky slcarb incr slty w/intbd sltst & ss strgs; nsfoc

W 9.1
V 44
WL 6.0
pH 9.0
cK 1
CL 880
Ca 180
LCM

SLTST ltgy fri carb w/SH aa nsfoc

SH brn-mgy-dkgy sft plty-blky vcarb arg slty w/intbd sltst strgs; nsfoc

SLTST dkgy vsft arg carb slcalc

Niobrara Formation 7156 (1037)

SH brn-gybrn/mgy vsft plty-blky occ fis vcarb incr mcalc & slbent; nsfoc

Trace of faint oil sheen in mud, no live oil

SH aa w/incr amt MRLST mot gybrn/m-ltgy sft-firm plty-blky vcarb incr slchky mcalc; no oilstn, or live oil; flor-none; cut-vweak slow mlky residual cut

Total Gas 1530 Units

tr pyr & incr tr bent

MRLST mot gybrn-crm/ltgy sft plty fis slchky carb slbent intbd w/in SH aa incr pyr; no oilstn, or live oil; flor-none; cut-vweak slow mlky residual cut

Trace of faint oil sheen in mud, no live oil

SH dkgy-gybrn sft plty grdg to MRLST aa; shows aa

W 9.2
V 43
WL 5.4
pH 9.0
cK 1
CL 860
Ca 180
LCM

MRLST mot gybrn-crm/ltgy sft plty fis slchky carb slbent intbd w/in SH aa incr pyr; no oilstn, or live oil; flor-none; cut-vweak slow mlky residual cut

Total Gas 851 Units

incr tr bent sft ltgy; tr pyr

Trace of faint oil sheen in mud, no live oil

MRLST aa mot gybrn-crm/ltgy sft plty fis chky vcarb bent intbd w/in SH gybrn sft plty pyr; no oilstn, or live oil; flor-none; cut-vweak slow mlky residual cut

Total Gas 944 Units

Total Gas 851 Units

SH dkgy-gybrn sft plty vcarb slty vcalc w/in MRLST aa

MRLST aa mot gybrn-crm/ltgy sft plty fis chky vcarb bent intbd w/in SH gybrn sft plty pyr; no oilstn, or live oil; flor-none; cut-vweak slow mlky residual cut

Total Gas 803 Units

incr amt LS wh fri-sft vchky slty

MRLST aa w/incr amt intbd LS; shows aa

Total Gas 804 Units

occ tr calc

MRLST aa mot gybrn-crm/ltgy sft plty fis chky vcarb bent intbd w/in SH gybrn sft plty pyr; no oilstn, or live oil; flor-none; cut-vweak slow mlky residual cut

Trace of faint oil sheen in mud, no live oil

SH dkgy-gybrn sft-firm plty fis vcarb pyr w/intbd MRLST/SLTST & thin LS strgs ss; shows aa

tr pyr & bent

MRLST mot gybrn-crm/mgy sft plty fis vchky vcarb bent intbd w/SH aa ; no oilstn, or live oil; flor-none; cut-vweak slow mlky residual cut

Greenhorn Limestone 7558 (635)

tr pyr, calc & bent

Total Gas 725 Units

LS ltgy-wh sft-fri vchky slty

MRLST aa w/intbd strgs SLTST/LS & SH aa; shows aa

Total Gas 8451

MRLST mot gybrn-crm/mgy-incr dkgy vsft plty fis vchky vcarb bent intbd w/SH aa ; no oilstn, or live oil; flor-none; cut-vweak slow mlky residual cut, no change in smpl cut from above; no visible live oil in smpl; possible fracture at 7600-7610

Trace of faint oil sheen in mud, no live oil

LS wh-tan-ltgy fri-firm arg chky slpyr w/calc in mtrx w/intbd strgs MRLST/SH; nsfoc

SH gybrn-dkgy sft plty vcarb slslty pyr w/in LS ss; nsfoc

W 9.2
V 43
WL 6.0
pH 9.0
cK
CL 880
Ca 180
LCM

LS wh-crm/ltgy fri-firm xfxl-gran slty occ slpyr vvchky mtrx por-p-occ fr; nsfoc w/intbd SH sgtrgs dkgy blky vcarb slcalc

LS strgs incr ltgy xgxcl firm slty w/tr pyr & calc; nsfoc

SS ltgy-wh vf-fg uncon-fri sang msrt; mtrx-bent & cly filled; calc cmt; w/intbd SH/LS strgs; SS por-fr-occ g; oilstn-none; flor--none; cut-none

Graneros Shale 7696 (497)

SS incr f-mg very dirty mtrx kao cly; calc cmt; w/intbd ltg slty LS strgs; por-fr-p; nsfoc

LS tan-ltgy xfxl-gran fri-firm slty pyr intbd w/SS aa; por-p; nsfoc

SS ltgy vfg-fg uncon-vfri sbang msrt calc cmted kao cly mtrc shly w/tr pyr & intbd dkgy sh strgs; por-p; nsfoc

W 9.4
V 44
WL 8.0
pH 8.0
cK 2
CL 860
Ca 180
LCM TR

tr pyr & bent

SH m-dkgy sft plty-blky occ fis vcarb vfpyr w/thin intbd LS/SLTST/SS strgs; nsfoc

tr pyr & calc

SH aa incr fis bent w/intbd strgs LS/SS aa; nsfoc

SH bk-dkgybrn vsft-firm plty-blky fis incr carb bent mcalc w/intbd strgs aa; nsfoc

tr pyr & bent & occ calc

SH dkgy-gynbrn firm-sft fis incr vcarb w/fracture filling calc vfpyr w/decr amt intbd LS/SS strgs; oilstn-none; flor-none; cut-weak mlky diffuse sh cut

tr pyr & bent w/occ fracture filling calc

SH dkgy-bk sft-firm plty-blky fis vcarb occ bent vsft slcalc w/decr intbd strgs of LS/SLTST; oilstn-none; flor-none; cut-slow weak mlky diffuse cut

SH aa shows aa w/intbd ltgy fri sltst; incr tr calc & pyr

SH dkgy-bkv sft-firm plty-blky fis vcarb bent w/decr amt of intbd strgs of LS/SLTST; oilstn-none; flor-none; cut-slow weak mlky diffuse cut; res-no residual oil ring after cut

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Scale Change

SS/SLTST ltgy-wh vfg-slty text ss grdg to sltst fri-sft arg mtrx carb slpyr; por-p; nsfoc

tr pyr & bent

SH dkgy-bk vsft-frim plty fis vcarb vslpyr mcalc vvslty w/intbd ltgy SLTST/vfg SS strgs vfg fri incr in incr amt; SS por-p; nsfoc

SS wh-clr uncon-fri clus vf-fg sbrd wsrt; calc cmt; abnt carb inclusions in mtrx; cly mtrx w/intbd dkgy SH strgs carb slpyr; por-p-occ g; nsfoc

Dakota Sand Zone - Top 8082 (111)

Dakota Sand Upper Bench - Top 8082 (111)

SH dk-mgy sft plty vcarb slcalc intbd w/in SS aa nsfoc

Dakota Sand Upper Bench - Base 8130 (63)

SS wh-clr-ltgy f-vfg fri-uncon sbrd wsrt; incr amt kao cly mtrx also as coatings on grs; ss grs occ pitted; tr pyr & carb mat in mtrx w/intbd thin strgs dkgy carb SH strgs; por-fr-incr g; oilstn-none; nsfoc

No oil sheen or trace of oil in mud

Dakota Sand Lower Bench - Top 8130 (63)

SH decr amt SH in smpl dk-mgy carb slcalc pyr w/in SS aa nsfoc

W 9.2
V 45
WL 6.5
pH 9.0
cK 2
CL 860
Ca 180
LCM TR

tr pyr

Dakota Sand Lower Bench - Base 8190 (3)

SS wh-ltgy-clr vf-incr mg uncon-fri/firm cmted clus; sbrd msrt; occ calc cmt; abnt kao cly in mtrx; w/intbd thin strgs dkgy SH aa; por-fr-g; oilstn-none; flor-very pale yel; cut-very weak slow mlky cut; res-none

No oil sheen or trace of oil in mud

Morrison Formation 8190 (3)

NOTE: Change Gas Scale

SS ltgy-clr-wh vf-mg pre uncon-fri clus sbrd mwsrt; calc cmt; mtrx-kao cly & carn mat w/intbd thin dk SH strgs; por-ex-fr; oilstn-none; flor-tr pale yel; cut-20% slow myel-mlky cut; res-no live oil in dish

No oil sheen or trace of oil in mud

LS crm-ltgy microxl-litho hd-firm slty/sdy LS por-tt; nsfoc w/SS aa por-fr-g; no oilstn; flor-pale yel; cut-slow mlky diffuse cut; res-none

tr pyr & cht

SS wh-clr f-vf-occ mg uncon-firm cmtd clus; sbrd mwsrt; calc cmt w/occ cht; tr pyr & carb mat in mtrx; kao; w/intbd dkgy SH strgs & incr amt LS aa; SS por-g=fr; oilstn-none; flor-ltyel; cut-slow weak mlky residual cut; res-none

LS wh-crm xfxl-litho firm-hd chty & siliceous; tr pyr w/intbd SH strgs & decr amt SS aa as intbd strgs w/in LS; SS por-p-fr; oilstn-none; flor-none; cut-tr vweak slow mlky cut; res-none

No oil sheen or trace of oil in mud

LS ltgy-wh xfxl firm-hd xfxl-gran slty & chty w/intbd SS strgs ltgy-wh fg fri-uncon sbrd msrt por-p; nsfoc

LS aa incr ltgy microxl hd dns chty slpyr por-tt nsfoc w/incr in intbd redbrn-gy SH blky arg slty slcalc pyr

LS wh-ltgy xfxl-gran hd-fri vchty & siliceous tr pyr w/intbd SS ltgy vfg & incr in SH varicolored [red/ltgy.gn] firm blky sil; LS por-p; nsfoc

incr tr mlky cht & pyr

W 9.3
V 46
WL 6.2
pH 9.0
cK 2
CL 880
Ca 200
LCM TR

LS ltgy-wh microxl-litho vhd dns-fri sil vchty slpyr w/intbd ltgy SS strgs & varicol SH aa; nsfoc

tr pyr & cht

LS aa w/incr amt SS strgs ltgy vfg abnt cly mtrx; SS por-p nsfoc;

LS wh-ltgy xfxl-microxl hd-firm sil & vchty por-tt nsfoc w/incr in SS aa & intbd w/SH varicol gy-pink-red firm blky sil & pyr

No oil sheen or trace of oil in mud

tr pyr & cht

SS wh-clr-ltgy f-vfg uncon-firm calc cmted clus; cly mtrx SS por-p-fr; nsfoc w/intbd LS aa nsfoc

Junction Creek Sand 8462 (-269)

SS clr-ltgy vf-fg pred uncon-occ fri calc cmted clus; sbrd-wrd; wsrt; calc cmt; cly mtrx w/intbd dkgy-gn sh strgs & wh xfxl LS strgs; SS por-g; nsfoc

LS wh xfxl firm slpyr chty

SS clr-ltgy f-vfg uncon-occ fri clus; wrd wsrt; calc cmt; cly mtrx w/intb d Sh/Ls strgs aa; SS por-g-ex; nsfoc

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Total Gas 167 Units

tr pyr & cht

SS ltgy-clr-wh uncon-occ fri clus; wrd wsrt; calc cmt; kao cly mtrx; occ tr pyr; w/intbd mgy-gn blky SH strgs & LS strgs; SS por-g-ex; nsfoc

tr pyr & decr amt cht

SS aa incr clr uncon fg w/incr i strgs SH mgy-gn blky slty slcalc; SS por-g-ex; nsfoc

SS clr-wh f-vfg uncon-fri clus sbrd wsrt; calc cmt; abnt cly mtrx occ tr cht w/intbd LS ltgy xfxl hd sil pyr; SS por-fr-g; nsfoc

No oil sheen or trace of oil in mud

Todilto Member 8598 (-405)

Scale Change

SH redbrn-m-dkgy-gn firm blky slty calc w/intbd SS ss & ltgy-tan LS; nsfoc

GYP wh sft-firm plty

W 9.3
V 46
WL 6.0
pH 9.0
cK 2
CL 880
Ca 200
LCM TR

Entrada Sand Member 8640 (-447)

SH redbrn-dkgy-gygn firm blky arg w/intbd vfg SS uncon; & incr amt GYP wh firm plty as strgs w/in SH & LS

SH bk-dkgy hd-firm blky carb slcalc pyr w/intbd LS & SS strgs; nsfoc w/incr amt GYP wh firm plty

LS ltgy-wh xfxf firm slty pyr sil w/SH & SS aa; nsfoc & wh plty GYP

GYP wh-crm firm plty as strgs w/in LS/SH aa

Dewey Bridge Member 8680 (-487)

LS aa w/incr amt intbd strgs GYP/SH/ & thin SS strgs; por-p-tt nsfoc

No oil sheen or trace of oil in mud

LS ltgy-tan xfxl-gran firm pyr occ chky w/intbd strgs dkgy SH/ GYP / & vfg SS; nsfoc

SH dkgy-redbrn firm blky slty

W 9.3
V 46
WL 6.8
pH 9.0
cK 1
CL 840
Ca 160
LCM TR

tr pyr

SS ltgy vf-fg firm-uncon sbrd wsrt inbtbd w/in SH & LS aa; nsfoc

GYP wh-crm firm plty intbd w/in LS mgy-wh xfxl firm occ slty/sdy; LS por-p-tt nsfoc

LS ltgy-wh xfxf firm slty pyr sil; por-p; nsfoc

SS ltgy vf-fg firm-uncon sbrd wsrt inbtbd w/in SH & LS aa; nsfoc

GYP wh-crm firm plty

LS ltgy-wh xfxl fri-firm w/intbd GYP/SS/gybrn SH strgs; LS por-p nsfoc

SS

tr pyr & calc

3/18/13

LS aa w/decr asmt GYP wh plty w/intbd SS strgs clr-lttan f-vfg fri clus-uncon sbrd msrt; sil cmt; slpyr; por-p-fr; nsfoc

W 9.3
V 44
WL 6.0
pH 9.0
cK 1
CL 860
Ca 160
LCM TR

Dewey Bridge Sand - Top 8844 (-651)

SH strgs redbrn-dkgy firm blky w/in LS aa; nsfoc

DS= 6.50 - 8850

SLTST mot dkgy/wh fri vcarb cly mtrx grdg to vfg; por-p nsfoc

SS ltgy-clr-tan f-vfg firm-fri clus-uncon grs; sbang-ang msrt; calc cmt cly mtrx-occ cln; w/vthin intbd dkgy SH strgs; por-fr-g; oilstn-none; flor-none; cut-none

No oil sheen or trace of oil in mud

Dewey Bridge Sand - Base 8860 (-667)

W 9.3
V 43
WL 6.4
pH 9.0
cK 1
CL 860
Ca 180
LCM TR

Carmel 8880 (-687)

SS aa por-p nsfoc w/intbd SH/Ls strgs aa

tr GYP wh plty

LS ltgy-wh xfxf firm slty pyr sil; por-p; nsfoc

SS wh-lttan vf-fg uncon-vfri sbang msrt cly mtrx slpyr w/tr gyp; SS por-p-tt nsfoc

NB4 6.125" in @ 6081; BHI Q406FX in @ 6081; out 8930; 2849 in 149.50hrs; 19.05'/hr

SH m-dkgy sft blky carb w/LS strgs aa; nsfoc

No oil sheen or trace of oil in mud

Trip Gas 532 Units

SS f-vfg uncon-fri sbang msrt cly mtrx calc cmted clus w/intbd SH strgs; por-p-fr nsfoc

NB5 6.125" in @ 8930; BHI DP505X

LS tan-ltgy xfxf firm slty pyr sil; por-p; nsfoc

3/19/13

SS clr-lttan f-vfg-occ mg uncon-fri clus; sbrd msrt; cly mtrx w/intbd dk blky sh strgs & decr amt LS strgs; por-fr-occ g; oilstn-none; flor-none; cut-slow weak mlky residual cut; res-no oilstn in dish

W 9.3
V 47
WL 6.0
pH 9.0
cK 1
CL 860
Ca 180
LCM TR

SH m-dkgy blky slty carb slcalc w/decr tr gy slty LS strgs; tr pyr

No oil sheen or trace of oil in mud

3/2013

SS arkosic lttan-pink-clr f-vf-occ mg uncon-fri clus; sbrd wsrt; occ dolo cmt; tr kao cly mtrx w/occ carb mat & thin strgs dkgy SH; por-g-ex; oilstn-none; flor-none; cut-slow weak mlky residual cut; res-none

Navajo Sand 9016 (-823)

SS aa arkosic incr lttan fg w/intbd SH strgs aa; por-g; shows aa, residual cut, no oilstn; intbd SLTST mot wh-dkgy fri carb dolo mtrx

SLTST mot dkgy/wh firm-fri w/dolo cmt slpyr carb grdg to vfg dkgy SS strgs arkosic; oilstn-none; flor-none; cut-slow weak residual mlky cut; res-none

Possible unconformity/fault plane occ tr slickensides on dkgy-bk SH vit plty; and incr in pink/mlky felds in qtz mtrx

SLTST mot dkgy-wh in decr amt, incr amt bk-dkgy-dkredbrn hd blky SH w/slickensides & curved surfaces(fault plane?) w/incr in SS arkosic clr-pink/mlky f-vfg uncon-fri clus sbang msrt; dolo cmt; por-fr-g; nsfoc; occ wh plty gyp

No oil sheen or trace of oil in mud

SLTST/SH strgs aa intbd w/in SS

SS arkosic wh-clr-pink uncon-fri clus; sbang wsrt; dolo cmt; cly mtrx; slpyr;vthin wh plty gyp strgs; w/thin intbd SH dkgybrn blky carb, no slickensides or fault plane indicators; SS por-fr-g; oilstn-none; nsfoc

W 9.1
V 42
WL 6.8
pH 9.0
cK 1
CL 860
Ca 180
LCM TR

tr pyr & gyp

SS arkosic wh-pink-clr vf-occ mg; uncon-fri clus; dolo cmt; occ cly mtrx w/carb material; w/thin intbd ltgy SLTST strgs & dkgy blky SH strgs; SS por-g; oilstn-none; flor-none; cut-none

3/21/13

SLTST strgs mgy fri csarb

SS arkosic aa incr pink/wh-clr f-vfg uncon-fri clus; dolo cmt w/cly mtrx carb/shly intbd strgs & sltst strgs; por-g-fr; oilstn-none; nsfoc

Decr Mud W from 9.3 to 9.0 @ 9175

No samples from 9190-TD [9270] due to loss of circulation and no returns

No more gas readings 9190 to TD [9270'] due to loss of circulation

3/22/13

Lost Retrurns @ 9213; Built up Mud & LCM, got temporary returns from uphole [Not from downhole @ 9213; Got a 4,239 Unit Trip Gas from uphole section

Lost 450 BBLs @ 9213

W 8.8
V 38
WL 8.8
pH 10.0
cK 1
CL 700
Ca 80
LCM TR

3/23/13

NB5 6.125" in @ 8930; BHI DP505X; out 9270; 340' in 25.0hrs; 13.60'/hr

Total Depth (Driller) 9270'(-1077')

Lost Returns; No samples or gas 9190-9270

Lost Returns; No samples or gas 9190-9270

Production Casing 4.50" set @ TD[9270]