Lplot VH

Pason Systems USA Corp.
(720) 880-2000

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OPERATOR:	**NOBLE ENERGY**
WELL:	**THUNDERHEAD USX AB25-99HZ**
LOCATION:	**SEC. 25, T7 , 64W**
COUNTY:	**WELD**
STATE:	**COLORADO**
SPOT:	**244 FNL 587 FWL**
ELEVATION:	**4786' GRD 4799 KB**
FIELD:	**WATTENBURG**
SPUD DATE:	**DECEMBER 11, 2009**
TD DATE:	**DECEMBER 25, 2009**
DATES LOGGED:	**DECEMBER 11, 2009 - DECEMBER 25, 2009**
DEPTHS LOGGED:	**750' - 6500'**
LOGGERS:	**JOHN WITNER / ANDREW ALTEPETER**
DRILLING FLUID:	**H2O, POLY, GEL, KCL FINISH**
DRILLING RIG:	**ENSIGN 136**
API:	**05-123-30695**
LOG TYPE:	**Vertical**
SCALE:	**1:240 (5 inches per 100 feet)**
REMARKS:	

LITHOLOGY DESCRIPTION

UNMANNED LOGGING WITH T-GAS BEGAN 12/10/09
2-PERSON LOGGING WITH HIGH-SPEED GAS CHROMATOGRAPH BEGAN ON 12/11/09

STOP PASON T-GAS START CHROMATOGRAPH

SHLYSS: clr-ltgy,lt tn, trnsl-offwh, f dom m gr, ang-sbang, sme sbrnd, p-m srt,mod lse, occ tgtclus,mtx;cly-slt grdg to aren shslt, calc-slcalc

CHANGE SCALE

SHLYSS: clr-ltgy,lt tn, trnsl-offwh, f dom m gr, ang-sbang, sme sbrnd, p-m srt,mod lse, occ tgtclus,mtx;cly-slt grdg to aren shslt, calc-slcalc

SHLYSS: clr-ltgy,lt tn, trnsl-offwh, f dom m gr, ang-sbang, sme sbrnd, p-m srt,mod lse, occ tgtclus,mtx;cly-slt grdg to aren shslt, calc-slcalc

MUCH OF THE VERY CLAY RICH FRACTION IS LOST IN CLEANING AND SAMPLE PREP

SHLYSS: clr-ltgy,lt tn, trnsl-offwh, f dom m gr, ang-sbang, sme sbrnd, p-m srt,mod lse, occ tgtclus,mtx;cly-slt grdg to aren shslt, calc-slcalc

SHLYSS: clr-ltgy,lt tn, trnsl-offwh, f dom m gr, ang-sbang, sme sbrnd, p-m srt,mod lse, occ tgtclus,mtx;cly-slt grdg to aren shslt, calc-slcalc

SHLYSLTST: lt gy, gy, pl gy -offwht, sme gybrn, sbplty,sme sbblky, firm , gt -rthy, mtx ; arg -slty, sl calc

SHLYSS: clr-ltgy,lt tn, trnsl-offwh, f dom m gr, ang-sbang, sme sbrnd, p-m srt,mod lse, occ tgtclus,mtx;cly-slt grdg to aren shslt, calc-slcalc

SS: clr, wht, lt gy, trnsl, f- m gr, sbrnd - sbang, m srt ,fri, tr lse,cly ck, irreg clus, mtx ; calc/arg cmt glau w/ wht cly - lt brn grdg to shlyss

SHLYSS: clr-ltgy,lt tn, trnsl-offwh, f dom m gr, ang-sbang, sme sbrnd, p-m srt,mod lse, occ tgtclus,mtx;cly-slt grdg to aren shslt, calc-slcalc

SCALE CHANGE

SS: clr, wht, lt gy, trnsl, f- m gr, sbrnd - sbang, m srt ,fri, tr lse,cly ck, irreg clus, mtx ; calc/arg cmt glau w/ wht cly - lt brn grdg to shlyss

SHLYSS: clr, wht, lt gy, drty -cln fol, trnsl, vf - f gr, sb rnd - sbang, p-m srt , tgt irreg - blky clus, mtx ; calc/arg cmt w/ wht cly

SHLYSLTST: gybrn -dkgy,occ ltgy - brn, occ sbfis - sbplty, firm -v sft, occ mot , rthy - gt, mtx ; arg -slty, aren, sl -m calc, occ-n carb grdg or intbd w/ shlyss

SHLYSS: clr, wht, lt gy, drty -cln fol, trnsl, vf - f gr, sb rnd - sbang, p-m srt , tgt irreg - blky clus, mtx ; calc/arg cmt w/ wht cly

SLTY SH: gy, ltgy, occ gybrn, occ sbfis - sbplty, firm -sb firm, occ mot , rthy - gt, tr sbwxy, mtx ; arg -slty, sl -m calc, occ-n carb, sme v aren

SHLYSS: clr, wht, lt gy, drty -cln fol, trnsl, vf - f gr, sb rnd - sbang, p-m srt , tgt irreg - blky clus, mtx ; calc/arg cmt w/ wht cly

SLTY SH: gy, ltgy, occ gybrn, occ sbfis - sbplty, firm -sb firm, occ mot , rthy - gt, tr sbwxy, mtx ; arg -slty, sl -m calc, occ-n carb, sme v aren

SHLYSS: clr, wht, lt gy, drty -cln fol, trnsl, vf - f gr, sb rnd - sbang, p-m srt , tgt irreg - blky clus, mtx ; calc/arg cmt w/ wht cly

SHLYSS: lt gybrn - offwht, ltgy, trnsl - clr, dirty s&p, cf -fm gr, sbrnd - sbang, fri-brit tt clus, p -m srt, mtx ; sl -m calc, arg- cly -wht cly, grdg to sltsh

SLTY SH: gy, ltgy, occ gybrn, occ sbfis - sbplty, firm -sb firm, occ mot , rthy - gt, tr sbwxy, mtx ; arg -slty, sl -m calc, occ-n carb, sme v aren

SHLYSS: clr, wht, lt gy, drty -cln fol, trnsl, vf - f gr, sb rnd - sbang, p-m srt , tt irreg - blky clus, mtx ; calc/arg cmt w/ wht cly

SLTY SH: lt gy, gy, pl gy -offwht, trgybrn, occ sbplty,sme sbblky, firm , gt - rthy mtx ; arg -slty, sl-m calc , grdg or intbd w/ shlyss

SS: clr, wht, lt gy, trnsl, f- vf gr, sbrnd - sbang, m - psrt ,fri, sme lse,cly ck, irreg clus, mtx ; calc/arg cmt w/ wht cly - lt brn grdg to shlyss

SLTY SH: lt gy, gy, pl gy -offwht, trgybrn, occ sbplty,sme sbblky, firm , gt - rthy mtx ; arg -slty, sl-m calc , grdg or intbd w/ shlyss

SLTY SH: lt gy, gy, pl gy -offwht, trgybrn, occ sbplty,sme sbblky, firm , gt - rthy mtx ; arg -slty, sl-m calc , grdg or intbd w/ shlyss

SHLYSS: clr, wht, lt gy, drty -cln fol, trnsl, vf - f gr, sb rnd - sbang, p-m srt , tt irreg - blky clus, mtx ; calc/arg cmt w/ wht cly

SLTY SH: gy, ltgy, occ gybrn, occ sbfis - sbplty, firm -sb firm, occ mot , rthy - gt, tr sbwxy, mtx ; arg -slty, sl -m calc, occ-n carb, sme v aren

SHLYSS: clr, wht, lt gy, drty -cln fol, trnsl, vf - f gr, sb rnd - sbang, p-m srt , tt irreg - blky clus, mtx ; calc/arg cmt w/ wht cly

LOST POWER READING SAME GAS POWER ON GAS SAME OR SLIGHTLY HIGHER

SLTY SH: gy, ltgy, occ gybrn, occ sbfis - sbplty, firm -sb firm, occ mot , rthy - gt, tr sbwxy, mtx ; arg -slty, sl -m calc, occ-n carb, sme v aren

SCALE CHANGE

SS: clr, wht, lt gy, trnsl, f- m gr, sbrnd - sbang, m srt ,fri, sme lse,cly ck, irreg clus, mtx ; calc/arg cmt w/ wht cly - lt brn grdg to shlyss

PROG PIERRE
MD 2898' TVD 2898'

SHLYSS: clr, wht, lt gy, drty -cln fol, trnsl, vf - f gr, sb rnd - sbang, p-m srt , tgt irreg - blky clus, mtx ; calc/arg cmt w/ wht cly

SHLYSS: lt-m gy, vf - f gr, sb rnd-sbang, mod srt, tgt irreg-sbblky clus, calc/arg cmt w/ scat wht cly, grdg to sl drty ss

SHLYSS: lt-m gy, vf - f gr, sb rnd-sbang, mod srt, tgt irreg-sbblky clus, calc/arg cmt w/ scat wht cly, grdg to sl drty ss

SLTY SH: gyblk-dkgy,occ ltgy, occ sbfis - sbplty, spntry, firm -v firm, occ mot , rthy-grty, mtx ; arg -slty, sl -m calc, occ-n carb grdg or intbd w/ shlyss

SHLYSS: lt-m gy, vf - f gr, sb rnd-sbang, mod srt, tgt irreg-sbblky clus, calc/arg cmt w/ scat wht cly, grdg to sl drty ss

SS: clr, wht, lt gy, trnsl, f- m gr, sbrnd - sbang, m srt ,fri, sme lse,cly ck, irreg clus, mtx ; calc/arg cmt w/ wht cly - lt brn grdg to shlyss

TRAP MOTOR BLEW OUT REPLACING TRAP

SHLYSS: m gy, vf - f gr, sb rnd - sbang, mod srt, irreg - sbblky clus, slty - arg cmt, grdg to drty ss, v sl calc

SLTYSH: m gy - lt gy brn, occ lt gy, sbblky - sbplty, tr splty, mod firm - firm, occ mot, gty, mtx; arg - slty, v sl calc, occ f lam, sme carb flk & frag

TRAP MOTOR BLEW OUT REPLACING TRAP

SLTYSH: m gy - lt gy brn, occ lt gy, sbblky - sbplty, tr splty, mod firm - firm, occ mot, gty, mtx; arg - slty, v sl calc, occ f lam, sme carb flk & frag

NEW TRAP INSTALLED

SLTYSH: pred m gy, occ m gy brn, sbblky - blky, occ sbplty, sft - mod firm, occ mot, gty, mtx; arg - slty, non calc, tr f lam, sme carb flk & frag

SLTYSH: m - dk gy - dk gy brn - occ gy blk, sbblky - blky, occ sbplty, sft - mod firm, gty, occ grdg - SH, mtx; arg, non calc, carb flk, org

PROG PARKMAN MD 3662' TVD 3662'

SS: clr - occ fros - occ lt - m gy, pred f gr, occ m gr, sbang - sbrndd, mod - w srt, pred gr supt, fri - brit, mod - g consol, non - v sl calc, sme glau frag

SS: clr - occ fros - occ lt - m gy, pred f gr, occ m gr, sbang - sbrndd, mod - w srt, pred gr supt, v fri - fri, p - mod consol, non - v sl calc, sme glau frag

SS: clr - fros - s&p, pred f gr, occ m gr, ang - sbang, mod - w srt, pred gr supt, occ mtx supt, fri - brit, mod - g consol, non - v sl calc, sme glau & carb frag

SS: clr - fros - s&p, pred f gr, occ m gr, ang - sbang, mod - w srt, pred gr supt, occ mtx supt, fri - brit, mod - g consol, non - v sl calc, sme glau & carb frag

SS: lt - m gy - clr - fros, pred f gr, occ m gr, sbang, mod srt, gr - mtx supt, fri - brit, mod - g consol, non - v sl calc, sme carb frag

SS: pred lt - m gy, occ clr - fros, f - m gr, sbang, mod srt, gr - mtx supt, fri - brit, mod - g consol, non - v sl calc, sme carb frag

SHLYSS: m gy, vf gr, occ f gr, sb rnd - sbang, mod srt, irreg - sbblky clus, slty - arg cmt, grdg to drty ss, non calc, carb flk & frag

SHLYSS: m gy, vf gr, occ f gr, sb rndd - sbang, mod srt, irreg - sbblky clus, slty - arg cmt, grdg to drty ss, non calc, occ carb flk & frag

SLTYSH: m gy - occ dk gy, sbblky - blky, mod firm - firm, gty - rthy, mtx; arg - slty, non calc, carb flk, org, occ fos frag

SHLYSS: m gy, vf gr, occ f gr, sb rndd - sbang, mod srt, irreg - sbblky clus, slty - arg cmt, grdg to drty ss, non calc, occ carb flk & frag, occ fos frag, tr galu gr clus

PROG SUSSEX MD 4430' TVD 4430'

SLTYSH: m gy - m gy brn, sbblky - blky, sft - mod firm, gty - rthy, mtx; arg - slty, non calc, occ carb flk, occ fos frag

SHLYSS: m gy, vf gr, occ f gr, sb rndd - sbang, mod srt, irreg - sbblky clus, slty - arg cmt, grdg to drty ss, non calc, occ carb flk & frag, occ fos frag

SHLYSS: lt - m gy, vf gr, occ f gr, sb rndd - sbang, mod srt, irreg - sbblky clus, slty - arg cmt, brit - occ hd, grdg to drty ss, non calc, carb flk & frag

SLTYSH: m gy - lt - m gy brn, sbblky - blky, mod firm - firm - occ brit, gty - rthy, mtx; arg - slty, non calc, occ carb flk, occ fos frag

SHLYSS: pred m gy, lt gy, vf - f gr, sb rndd - sbang, mod srt, sbblky clus, slty - arg cmt, mod firm - brit, grdg to drty ss, non - sl calc, carb flk

SLTYSH: m gy - m gy brn, sbblky - blky, mod firm - firm - occ brit, gty - rthy, mtx; arg - slty, non - sl calc, occ carb flk, occ fos frag, tr lt gy - tan shale

SLTYSH: m gy - m gy brn, sbblky - blky, mod firm - firm - occ brit, gty - rthy, mtx; arg - slty, non - sl calc, occ carb flk, occ fos frag, tr lt gy - tan shale

SLTYSH: m gy - m gy brn, sbblky - blky, mod firm - firm - occ brit, gty - rthy, mtx; arg - slty, non - sl calc, occ carb flk, occ fos frag, tr lt gy - tan shale

PROG SHANNON MD 5063' TVD 5063'

SHLYSS: lt-m gy, vf-mf gr, sbrnd-sbang, mod srt, tt irreg-sbblky clus, sl - m calc, grdg to sltysh

SS: clr, wht, trnsl, sl-abnt s&p,sme sl drty, f-cf gr, sb rd - sb ang, brit, tt clus, m - sme w srt, mtx ; calc, abnt arg- cly

SLTY SH: lbrn, ltgybrn, ltbrn, sbfis - sbplty, sbblky, v firm, hom , rthy-gt, mtx ; arg -slty, sl-m calc

SLTY SH: lbrn, ltgybrn, ltbrn, sbfis - sbplty, sbblky, v firm, hom , rthy-gt, mtx ; arg -slty, sl-m calc

SH: gyblk,dkgy, gybrn, sbplty -sb fis, occ , blky - sbblky, firm - v firm, grny - rthy, sme sbbnd, mtx ; sme abnt aren, arg -slty, calc, grdg to sltysh

SLTY SH: lbrn, ltgybrn, ltbrn, sbfis - sbplty, sbblky, v firm, hom , rthy-gt, mtx ; arg -slty, sl-m calc

SLTY SH: lbrn, ltgybrn, ltbrn, sbfis - sbplty, sbblky, v firm, hom , rthy-gt, mtx ; arg -slty, sl-m calc

SH: gybrn,dkgy, tan, sbplty -sb fis, sme sbblky, firm , grny - rthy, sme sbbnd, mtx ; sme aren, arg -slty, calc, grdg to sltysh

SLTY SH: lbrn, ltgybrn, ltbrn, sbfis - sbplty, sbblky, v firm, hom , rthy-gt, mtx ; arg -slty, sl-m calc

SLTY SH: lbrn, ltgybrn, ltbrn, sbfis - sbplty, sbblky, v firm, hom , rthy-gt, mtx ; arg -slty, sl-m calc

SH: gyblk,dkgy, gybrn, sbplty -sb fis, occ , blky - sbblky, firm - v firm, grny - rthy, sme sbbnd, mtx ; sme abnt aren, arg -slty, calc, grdg to sltysh

SH: brn, gybrn, sme dkgybrn, sbfis - sbplty, occ sbblky, firm -v firm, hom - mot, rthy -gt, mtx ; arg -slty, sme sl aren, sl -m calc

TRIP OUT FOR HORIZONTAL ASSEMBLY

PROG TEEPEE BUTTES MD 5982' TVD 5982"

SH: brn, gybrn, sme dkgybrn, sbfis - sbplty, occ sbblky, firm -v firm, hom - mot, rthy -gt, mtx ; arg -slty, sme sl aren, sl -m calc

SLTY SH: lbrn, ltgybrn, ltbrn, sbfis - sbplty, sbblky, v firm, hom , rthy-gt, mtx ; arg -slty, sl-m calc

SLTY SH: lbrn, ltgybrn, ltbrn, sbfis - sbplty, sbblky, v firm, hom , rthy-gt, mtx ; arg -slty, sl-m calc

SLTY SH: lbrn, ltgybrn, ltbrn, sbfis - sbplty, sbblky, v firm, hom , rthy-gt, mtx ; arg -slty, sl-m calc

SH: m gy brn, sme dkgybrn, sbfis - sbplty, occ sbblky, mod firm - firm, hom - mot, rthy -gt, mtx ; arg -slty, sme sl aren, sl - m calc

SH: m gy brn, sme dkgybrn, sbfis - sbplty, occ sbblky, mod firm - firm, hom - mot, rthy -gt, mtx ; arg -slty, sme sl aren, non calc

SLTY SH: lt - m gy brn, sbfis - sbplty, occ sbblky, firm - v firm, hom, rthy - gt, mtx; arg - slty, non calc

SLTY SH: lt - m gy brn, sbplty, occ sbblky, firm - v firm, hom, rthy - gt, mtx; arg - slty, non calc

SLTY SH: lt - m gy brn, sbplty, occ sbblky, firm - v firm, hom, rthy - gt, mtx; arg - slty, non calc

SLTY SH: lt - m gy brn, sbplty, occ sbblky, firm - v firm, hom - occ mot, rthy - gt, mtx; arg - slty, non calc

LOG CONTINUES ON HORIZONTAL LPLOT LOG THUNDERHEAD USX AB25-99HZ