**PASON SYSTEMS USA CORP.**
16080 Table Mountain Parkway
Suite 500
Golden, CO 80403 U.S.A.
(720) 880-2000

LOG created using LPLOT for Win32 Beta 1.47, Mar 17, 2000, Copyright (C) 1999-2000 Pason Systems USA Corp

OPERATOR: **NW NATURAL**
WELL: **I/W 24C-23-65**
LOCATION: **SW SEC 23, T6N, R5W**
COUNTY: **COLUMBIA**
STATE: **OREGON**
SPOT: **976.5'NL, 1256.3'EL**
ELEVATION: **GL 905.0', KB 922.5'**
FIELD: **REICHHOLD POOL DEVELOPMENT**

SPUD DATE: **APRIL 20,2000**
TD DATE: **MAY 6,2000**
DATES LOGGED: **APRIL 20, 2000 to MAY 6, 2000**
DEPTHS LOGGED: **33' - 2591'**
LOGGERS: **ED PERRY, SCOTT WAGGONER**
DRILLING FLUID: **LSND**
DRILLING RIG: **TAYLOR RIG #4**

**LOG TYPE: MUD LOG**

**SCALE: 1:240 (5.0 INCH/100 FT)**

**REMARKS:**

## LITHOLOGIES

| | | | | |
|---|---|---|---|---|
| SANDSTONE | SILTSTONE | SHALE | COAL | BENTONITE |
| LIMESTONE | DOLOMITE | ANHYDRITE | CHERT | SALT |
| CONGLOMERATE | TUFF | ALLUVIUM | METAMORPHIC | GLACIAL TILL |
| DARK CHERT | WELDED TUFF | ARGILLACEOUS LIMESTONE | LIME MUDSTONE | CRYSTALLINE LIMESTONE |
| LIME BOUNDSTONE | LIME GRAINSTONE | LIME PACKSTONE | LIME WACKESTONE | DOLOMITIC LIMESTONE |
| CALCAREOUS DOLOMITE | ARGILLACEOUS DOLOMITE | DOLOMITIC MUDSTONE | CRYSTALLINE DOLOMITE | DOLOMITIC BOUNDSTONE |
| DOLOMITIC GRAINSTONE | DOLOMITIC PACKSTONE | DOLOMITIC WACKESTONE | SHALY SANDSTONE | CLAYSTONE |
| GRAY CLAYSTONE | COLORED CLAYSTONE | VOLCANICS | BRIGHT COAL | INTERMEDIATE COAL |
| DULL COAL | COALY SHALE | NON COAL | GRANITE | BRECCIA |
| MARL | DOLOMITIC MARL | CARBONACEOUS SHALE | CHALK | GYPSUM |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| ⁘ | UNABLE TO INTERPRET | ☒ | NO SAMPLE | ▤ | BLACK SHALE | ▤ | COLORED SHALE | ▨ | GRAY SHALE |
| ▤ | SILTY SHALE | | SHALY SILTSTONE | ☐ | NOTHING | | | | |

## MODIFIERS

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| ɪɪɪ | AHYDRITE STRINGERS | ▲ | ALGAE, LAMINATED | ▲ | ALGAE, NON-DESCRIPT | ▲ | ALGAE OOTOID | ▲ | ALGAE SKELETAL | ⌶ | AMPHIPORA |
| // | ANHYDRITIC | - | ARGILLACEOUS | / | ARGILLITE GRAIN | ⊳ | BELEMNITE | B | BENTONITE | ^ | BIOCLAST/ FRAGMENTAL |
| ◊ | BRACHIOPOD | ☋ | BRECCIA | ⊤ | BRYOZOA | ⊥ | CALCAREOUS | ■ | CARBONACEOUS FLAKES | ◣ | CEMENTING BITUMENOUS |
| ∘ | CEPHALOPOD | ▲ | CHERT, DARK | △ | CHERT, LIGHT | ⊠ | CHERT, TRIPOLITIC | ▬ | COAL | ⌐ | CORAL |
| ⊙ | CRINOID | ✳ | CRYSTALS | π | DOLOMITE STRINGERS | ∠ | DOLOMITIC | ♡ | ECHINOID | + | FELDSPAR |
| ⅄ | FERRUGINOUS | ● | FERRUGINOUS GRAINS | Ⅱ | FERRUGINOUS STRINGERS | ⟜ | FISH REMAINS | ❦ | FORAMINIFERA | F | FOSSILS |
| ⌘ | FRACTURES | △ | GASTROPOD | ~ | GLAUCONITE | \\ | GYPSIFEROUS | Ш | GYPSUM STRINGERS | ◖ | HEAVY/DARK MINERALS |
| Y | INTRACLASTS | K | KAOLIN | Ⅱ | LIMESTONE STRINGERS | L | LIMONITE | π | MARLSTONE, CALCAREOUS | π | MARLSTONE, DOLOMITIC |
| ⌣ | MICACEOUS | ⊕ | NODULES | ◊ | OOLITES | ⊕ | OSTRACOD | ∞ | PEBBLES | ▽ | PELECYPOD |
| ø | PELLETS | ● | PHOSPHATE PELLETS | ⊙ | PISOLITE | ◊ | PLANT REMAINS | P | PYRITE | ⊞ | SALT CAST/INFILL |
| ∘ | SAND GRAINS | ⊡ | SANDSTONE STRINGERS | ⁚ | SANDY | θ | SCAPHOPOD | — | SHALE LAMINAE | ^ | SILICEOUS |
| ⊡ | SILTSTONE STRINGERS | ▬ | SILTY | ⫴ | SLICKENSLIDE | S | SPORES | Ш | STROMATOPOROID | ⊓ | STYLOLITE |
| V | TUFFACEOUS | | | | | | | | | | |

## POROSITY/SORTING/ROUNDNESS SYMBOLS

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| X | INTERCRYSTALLINE INTERGRANULAR | V | VUGGY | F | FRACTURE | ϕ | INTEROOLITIC | P | PINPOINT | ʃ | ORGANIC |
| O | MOLDIC | e | EARTHY | ☐ | FENESTRAL | | | | | | |
| A | ANGULAR | a | SUBANGULAR | R | ROUNDED | r | SUBROUNDED | | | | |
| W | WELL | M | MEDIUM | P | POOR | | | | | | |

## ENGINEERING SYMBOLS

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| ♠ | BIT CHANGE | ^ | LOST CIRCULATION | ◢ | CASING | ◣ | CASING | ◀ | SIDEWALL CORE | ▶ | SIDEWALL CORE |
| ▷ | WIRELINE TEST | ◁ | WIRELINE TEST | ↥ | GAS TO SURFACE | ↥ | OIL TO SURFACE | ↥ | WATER TO SURFACE | ● | EVEN STAINING |
| ◑ | SPOTTED STAINING | D | DEAD OIL | ○ | QUESTIONABLE | • | OIL SHOW | ☼ | GAS SHOW | ✷ | OIL AND GAS SHOW |
| Ⓒ | CONNECTION GAS | Ⓣ | TRIP GAS | ▨ | MIDNIGHT DEPTH | ▨ | MIDNIGHT DEPTH | ▭ | CONNECTION | — | OFF BOTTOM |
| // | NORMAL FAULT | // | REVERSE FAULT | ⅃ | OVERTURNED STRATA | | | | | | |

## BAR SYMBOLS

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| ▨ | CORE RECOVERED | ☐ | CORE LOST | ☐ | DST INTERVAL | ▨ | ROTATING | ☐ | SLIDING | ▦ | CANISTER |

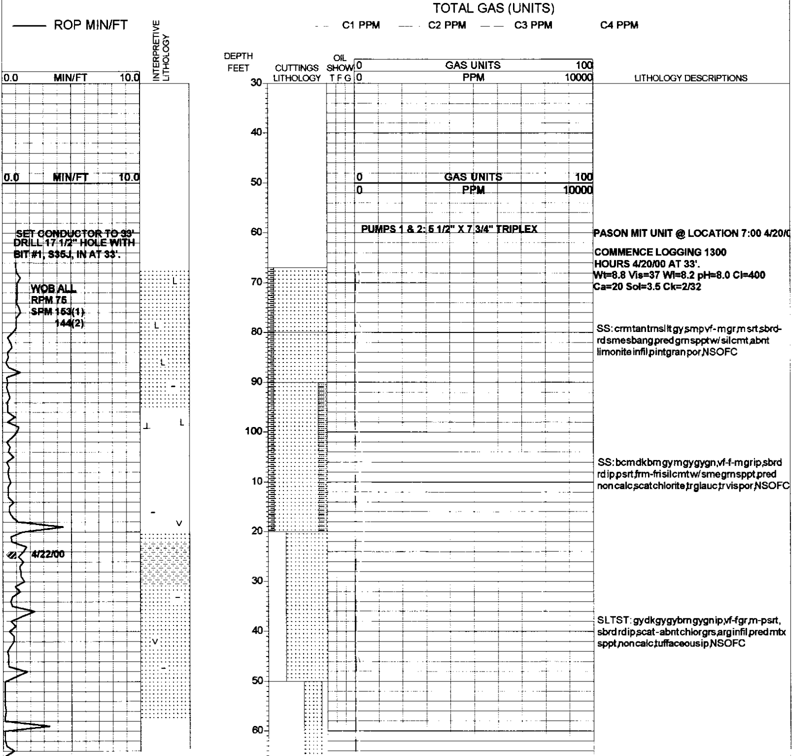
## ABBREVIATIONS

CB - CORE BIT
CG - CONNECTION GAS
CO - CIRCULATE OUT
SPM - STROKES/MIN

DST - DRILL STEM TEST
DTG - DOWNTIME GAS
LAT - LOGGED AFTER TRIP
TG - TRIP GAS

NR - NO RETURNS
NS - NO SAMPLE
PP - PUMP PRESSURE
WOB - WEIGHT ON BIT

RPM - REVOLUTIONS/MIN
RR - RE-RUN
SLM - STEEL LINE MEASURE



SET CONDUCTOR TO 33'
DRILL 17 1/2" HOLE WITH
BIT #1, S35J, IN AT 33'.

**WOB ALL**
RPM 75
SPM 153(1)
144(2)

4/22/00

PUMPS 1 & 2: 5 1/2" X 7 3/4" TRIPLEX

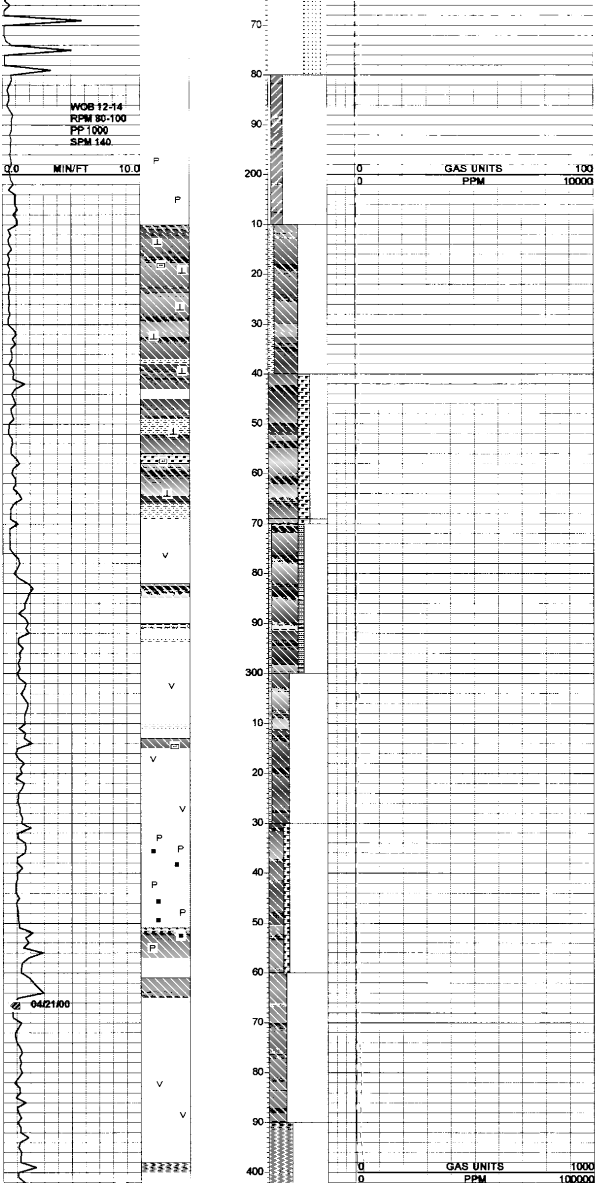
PASON MIT UNIT @ LOCATION 7:00 4/20/0

COMMENCE LOGGING 1300
HOURS 4/20/00 AT 33'.
Wt=8.8 Vis=37 Wl=8.2 pH=8.0 Cl=400
Ca=20 Sol=3.5 Ck=2/32

SS: crmtantmsltgy,smpvf-mgr,msrt,sbrd-rd,smesbang,predgrnsppt,w/silcmt,abnt limonite infil,pintgranpor,NSOFC

SS: bcmdkbmgymgygygn,vf-f-mgrip,sbrd rdip,psrt,frm-fri,silcmt,w/smegrnsppt,pred noncalc,scatchlorite,trglauc,trvispor,NSOFC

SLTST: gydkgygybrngygnip,vf-fgr,m-psrt, sbrdrdip,scat-abntchlorgrs,arginfil,predmtx sppt,noncalc,tuffaceousip,NSOFC



SLTST: ltgy-dkgy-gybrn-crmgy-tr clor gn-tan, vf-f gr, sbrd-rd, slfrm-sft, no calc, sme brign clor incl-mat, grdg to SHLY SLTST

SHY SLTST: ltgy-dkgy-gytan-brngy, sft-slfrm, vf-f gr, no calc, rd-sbrd, abnt arg infl w/ sme tuff cly, grdg to tuff mudstone, tr dism pyr clust w/ sme limonite replacement

SHLY SLTST: ltgy-dkgy-gybrn-ltbrn-dkbrn-buff-tangy, vf-fgr, sbrd-rd, sft-modfrm, abnt brn-gy cly-lmy infl, sme mica & clor tgr, abnt carb lam-strgs w/ tr lse mat, vcalc

GYCLYST: dkbrn-ltgy-brn-mot buffgy-ltcrmgy, vfgr, grdg to SLTST w/ sme SS strgs, v sticky

CARBSH: dkbrn-ltbrn-dkgy, modfrm-slfrm, sbplty-plty-sbblky, grty-rthy, vcalc, abnt carb intlam-strgs w/ tr incl, grdg to SHLY SLTST

SHLY SLTST: ltgy-dkbrn-dkgy-medbrn-buff-crmtan, vf-fgr, rd-sbrd, tr-modcalc, psrt, abnt carb strgs-lam w/ sme lse mat, tr dism pyr w/ carb clustr

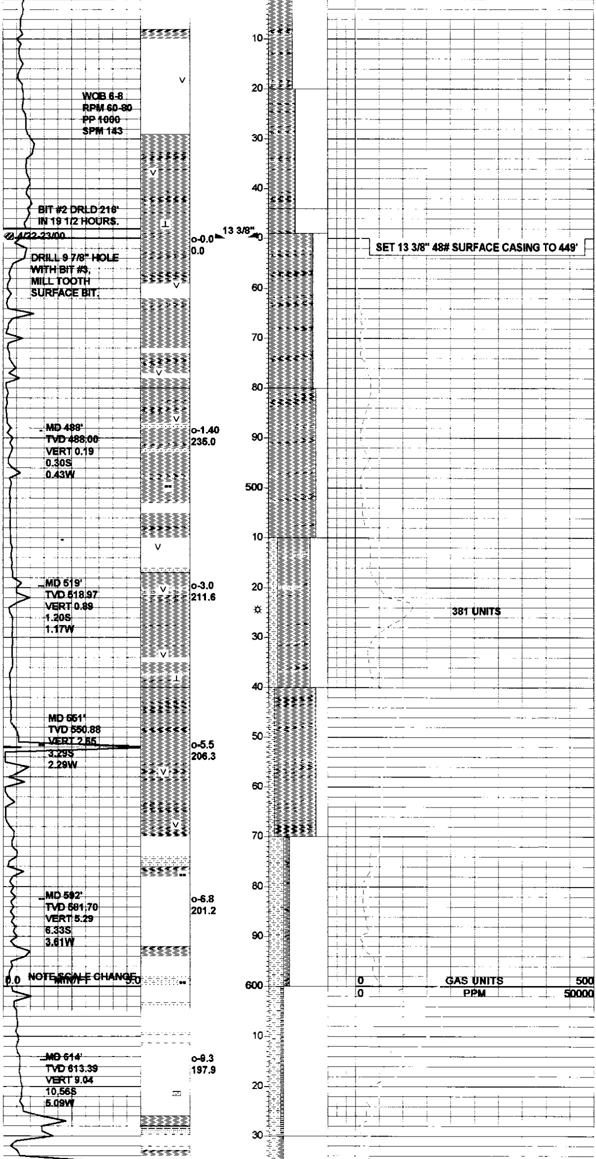
SME MICA LCM W/ SMPLE

SHLY SLTST: dkgy-ltbrn-dkbrn-crmtan-gytan-ltgy-mot buff, vf-fgr, occ mafic gr, sbrd-rd, psrt, tr calc, abnt carb strgs w/ occ lse mat, tr mic

SHLY SLTST: ltbrn-dkbrn-gybrn-dkgy-crmtan-mot buffgy-ltgy, vf-fgr, rd-sbrd, tr calc, abnt dism pyr clustr, abnt carb strgs-w/ sme lse mat, sme gy cly strgs-intlam

SME MICA LCM W/ SMPLE

SHLY SLTST: crm-ltgy-dkgy-gybrn-dkbrn-medchocbrn-ltmottgy, vf-fgr, rd-sbrd, tr-no calc psrt, slfrm-sft, sme lse dism pyr clustr, abnt carb incl-strgs w/ tr of lse mat, grdg to tuff SLTST



SHLYSLTST:crm-ltbrn-crmgy-ltgy-dkgy-medchocbrn,vf-fgr,sbrd-sbang-rd,modcalccmt,p-modsrt,sft-vsft,smelimonitegr,abnt carbmat-strgs,trdismpyr,grdgtotuffSLTST

SHLYSLTST:crm-tangy-dkgy-ltgy-mottan, vf-fgr,sbrd-rd-sbang,p-modsrt,modcalccmt, slfrm-vsft,abntcarbmat-incl,vunconslclyinfl

SHLYSLTST:ltbrn-crmgy-ltgy-dkgy-med brn,vf-fgr,sbrd-sbang-rd,calccmt,p-modsrt, sft-vsft,smelimonitegr

SLTST/MUDSTN:tanlt-dkbrnchocbrn mot/strk,vsft&cly-gummy,vfdismslty&occ qtzgrs,scat-fdismdkcarb/orgmat,smevcol-ambr-gngytuffmat&trfrags,sl-prednoncalc

MUDSTN:tanlt-dkbrnchocbrnmot/strk,vsft &cly-gummy,vfdismslty&occqtzgrs,scat-fdismdkcarb/orgmat,smevcoltuffmat&tr frags,slcalcip

sltymudstn:crm-tangy-dkgy-ltgy-mottan,vf-fgr,sbrd-rd-sbang,p-modsrt,modcalccmt,sl frm-vsft,abntcarbmat-incl,vunconslclyinfl&v stky-gmy

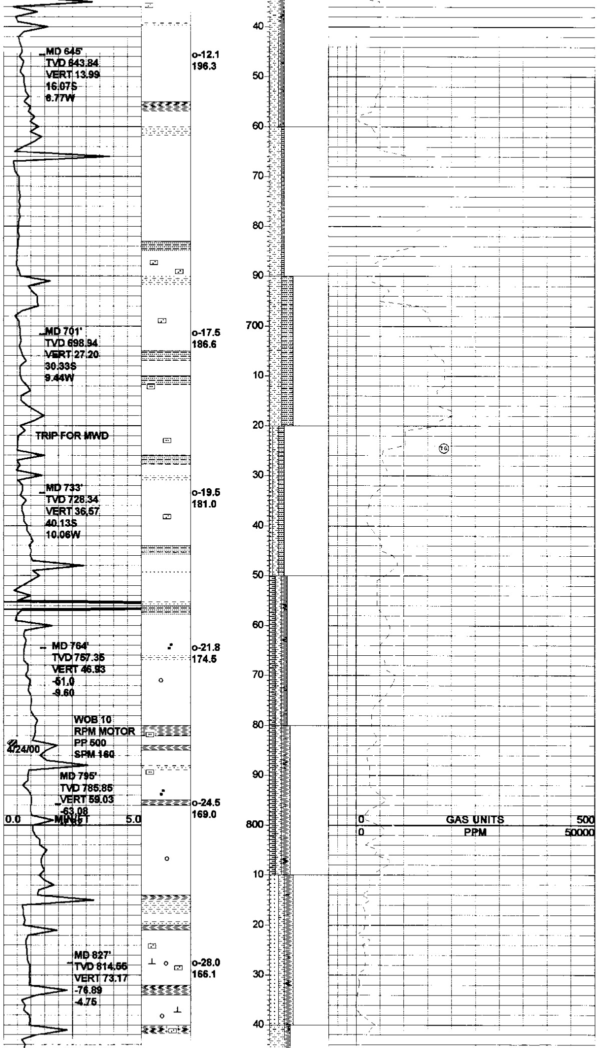
CLYST:brnmotgydkbrn,predvclymtxclayey abundantmatwashedfromsamp,scatvfsdy resd,scatdkcarb&orgmat-thnlylamflksin mtx,tuffmat,trvfdismpyr

SHLYSLTST:ltgy-dkgy-ltgybrn-crmgy,sl S&P,vf-fgr,sbrd-rd,modfrm-slsft,trcalccmt, modsrt,occcarbinclw/trlsemat,grdgtoSHLY SS

LOG TOP KEASEY FM @ 592'

SHLYSS:ltgy-crmbrn-offwhgy-motbuff,S&P vf-fgr,modfrm-slfri,sbrd-rd-sbang,mod-psrt, mtxsuptw/abntcalccmt,smecarbinclw/trlse matw/smple,trglauc,no-pvisintgranpor, NSFOC

SHLYSLTST:ltgy-dkgy-ltgybrn-crmgy,sl S&P,vf-fgr,sbrd-rd,modfrm-slsft,trcalccmt, modsrt,trgluac,occcarbinclw/trlsemat,grdg toSHLYSS,smegrdgtoSLTYSHw/sbpltystr



SHLYSLTST: ltgy-dkgy-ltgybrn-crmgy,sl S&P,vf-fgr,sbrd-rd,modfrm-slsft,trcalccmt, modsrt,trgluac,occcarbinclw/trlsemat,grdg toSHLYSS

SHLYSLTST: ltgy-dkgy-ltgybrn-crmgy,sl S&P,vf-fgr,sbrd-rd,modfrm-slsft,trcalccmt, modsrt,trgluac,occcarbinclw/trlsemat,grdg toSHLYSS

SHLTSLTST: dkgy-ltgy-gybrn,vf-fgr,sbrd-rd, slcalccmt,slty-grty ip,mod-psrt,abntcarbincl-flecks,grdgtoSLTYSS

SHLYSS: ltgy-crmbrn-offwhgy-mot buff,S&P vf-fgr,modfrm-slfri,sbrd-rd-sbang,mod-psrt, mtxsuptw/abntcalccmt,smecarbinclw/trlsematw/smple,trglauc,no-pvisintgranpor, NSFOC

**Wt=8.7 Vis=35 Wl=7.0 pH=9.5 Cl=400 Ca=40 Sol=3.0 Ck=2/32**

SHLTSLTST: dkgy-ltgy-gybrn,vf-fgr,sbrd-rd, slcalccmt,slty-grty ip,mod-psrt,abntcarbincl-flecks,grdgtoSLTYSS

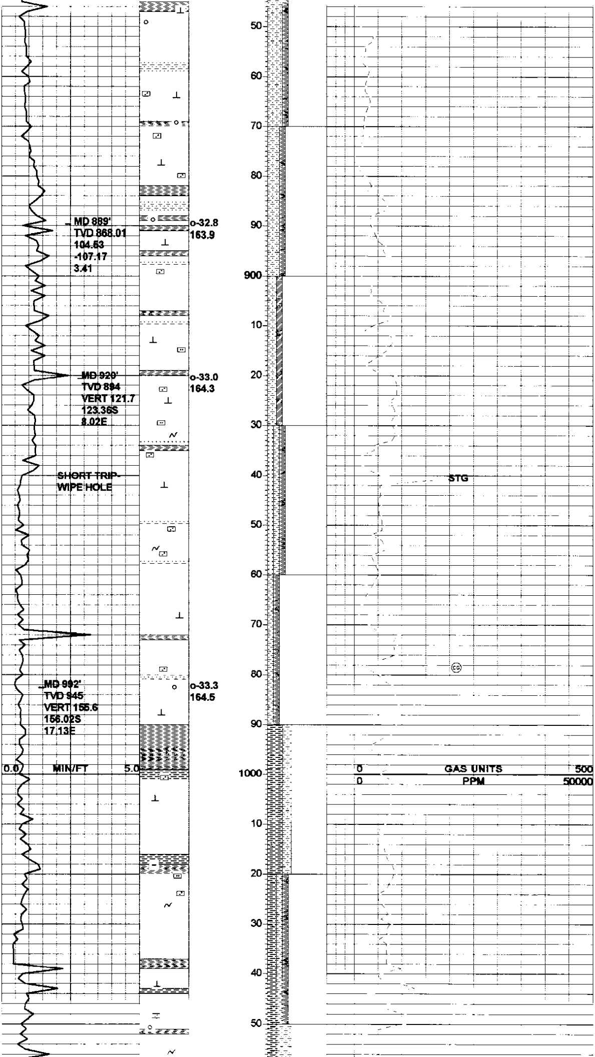
SS: clr-trnsl-fros-offwh,vf-mgr,sbrd-rd,fri-mod frm,grsuptw/silcmt,abntcarbincl-strgs,tr gluac,modintgranpor,NSFOC

SHLYSS: ltgy-crmbrnbuff,S&P,vf-fgr,mod frm-slfri,sbrd-rd-sbang,mod-psrt,mtxsuptw/ trcalccmt,smecarbinclw/trlsematw/smple, trglauc,nopor

SHYSS/SLTST: mgydkgygybrnip,vfsdy& qtzsltstgrsingybrnclystnmtx,scatgn-glauc, mod-vsft,noncalc,smecarbflks/grs-thnlylam inslt,lsevfsbrdssgrs

CLYST: ltgy-dkgy-ltgybrn-crmgy,slS&P,vf-f gr,sbrd-rd,modfrm-slsft,trcalccmt,modsrt,tr gluac,occcarbinclw/trlsemat

SS: bcmpredop&wh,vfgrwsrt,sbang-ang,vfri calccmt,minorarginfill,predthnbddinclyst,p visporscatglaucgrs NSOFC



SHSLTST: mgygybrndkgyip,incrvfsdyqtzslt smefffltggrs,clystmtx&cmtw/smecalccont, dkgn-ptglaucgrs,grdgtovfdrtyss,sme tuffaceous mat

SHYSS/SLTST: mgydkgygybrnip,vfsdy& qtzsltstgrsingybrnclystnmtx,scatgn-glauc, mod-vsft,noncalc,smecarbflks/grs-thnlylam insit,lsevf-fsbrdssgrs,tt,NSOFC

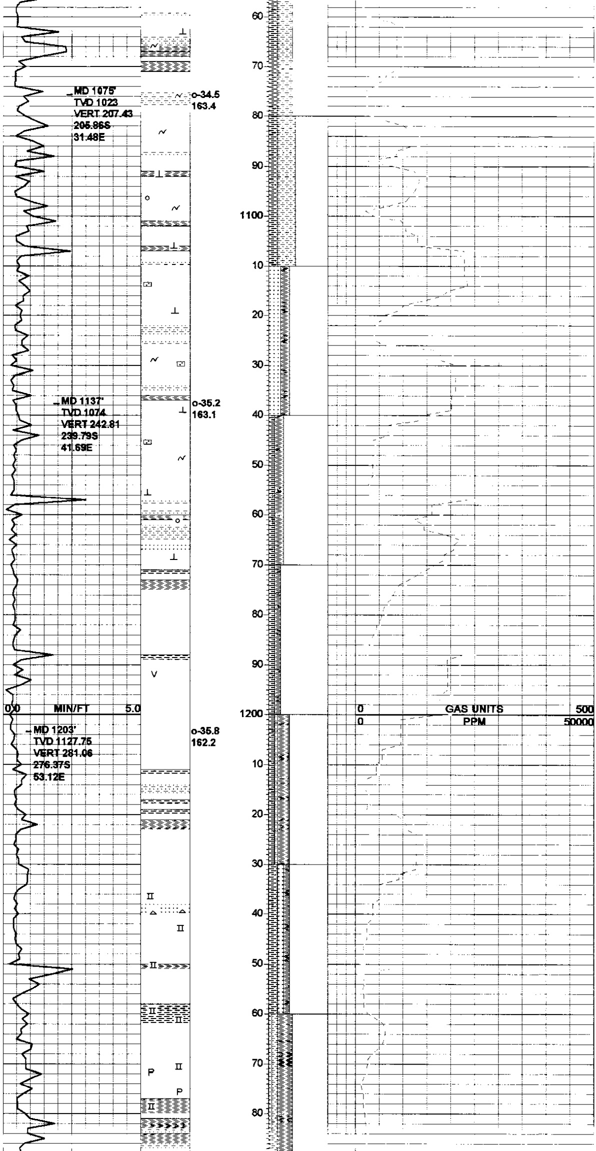
SHSLTST: mgygybrndkgy,vfsdyqtzslt,smef fltggrs,clystmtx&cmtw/smecalccont,dkgn-ptglaucgrs,grdgtovfdrtyss,smetuffaceous

SHSLTST: lt-mgygybrnmbrn,vsft-fri,predvf sdt/sltyqtzgrsw/abntcly/arginfil&mtc,sme calc,fltgssgrsip,smegrnyclyst,smecarb frags/flks&incl,smegn/glaucgrs

SHYSS/SLTST: mgydkgygybrn,vfsdy&qtz sltgrsingybrnclystn,scatgn-glauc,mod-vsft, non-slcalc,smecarbflks/grs-thnlylaminslt, lsevf-fsbrdssgrs,novispor

gr,sbrd-rd,modfrm-slsft,trcalccmt,modsrt,tr gluac,occcarbincl,ptm-vslty/sdy

SHLYSS: ltgy-crmbrnbuff,S&P,vf-fgr,mod frm-slfri,sbrd-rd-sbang,mod-psrt,mtxsuptw/ trcalccmt,smecarbinclw/trlsematw/smple, trglauc,novispor



SHYSLTST: m-dk-occltgy gybrn,predfri-sft, slty/sdy grsincalc&clymtx,fltgss grsabntgn glauc/chlor,incrsdy,incrcalcip,ltgyclysyip

SLTYSS: bfgyoffwhgn,vf-fgr,predangsbang ip,psrt,m-vfriw/wkcalc&argcmt/mtx,abnt glauc/chlorgrs/stn,drtytt,NSOFC

SLTYSS: bfoffwhgn,vf-fgr,predangsbangip,p srt,m-vfriw/wkcalc&argcmt/mtx,abnt glauc/chlorgrs/stn,drty

SHLYSS: ltgy-crmbrnbuff,S&P,vf-fgr,mod frm-slfri,sbrd-rd-sbang,mod-psrt,mtxsuptw/ trcalccmt,smecarbinclw/trlsematw/smple, glauc/chlorip

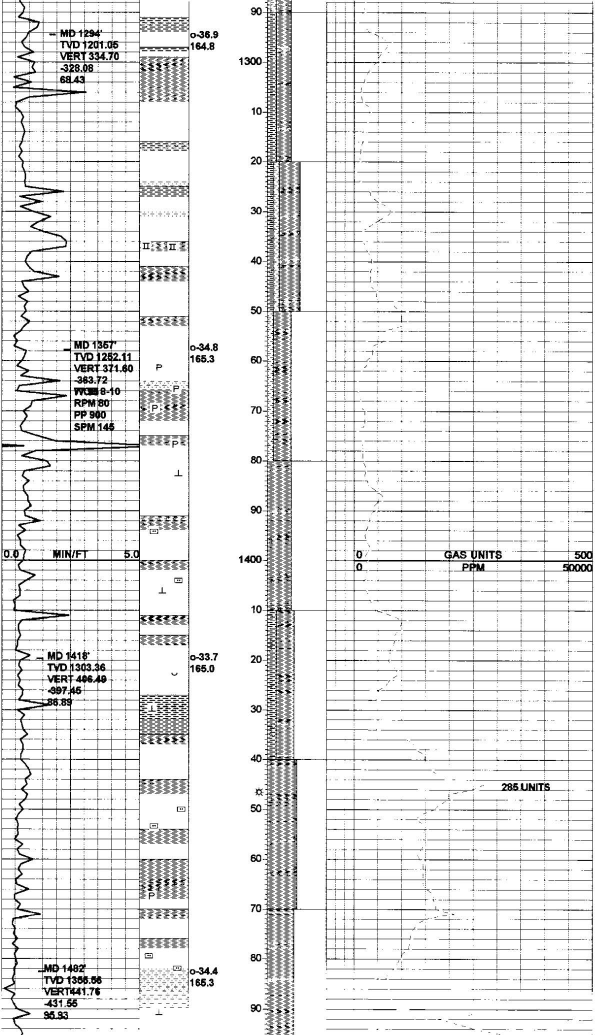
SLTYSS: bfoffwhgn,vf-fgr,predangsbangip,p srt,m-vfriw/wkcalc&argcmt/mtx,abnt glauc/chlorgrs/stn,drty

SS: opltbrnoffwhipdkgnmot,vf-fgr,msrt,pred sbang,frm-fricalccmt,abntchlorite,minorarg resd,novispor,NSOFC

SHLYSLTST: ltgy-dkgy-gybrn-tangy-crmbrn vf-fgr,mod-psrt,modfrm-sft,sbrd-sbang,tr-modcalccmt,grty-vsltyip,smecarbincl-flecks, trchlor,smeLSstrgsw/smple,trdismpyrclust

SHLYSS: offwh-trnsl-clr-fros-ltgy,slS&P,vf-f grw/occmgr,sbrd-rd-sbang,modfrm-fri,mod srt,predmtxsuptw/smegrsupt,occoffwh-crm-gyclyinfl,tr-modcalccmt,abntcarbincl-w/ smelsemat,p-modintgranpor,NSFOC

SHLYSLTST: ltgy-dkgy-gybrn-tangy-crmbrn vf-fgr,mod-psrt,modfrm-sft,sbang-sbrd-ang, tr-modcalccmt,grty-vsltyip,smecarbincl-flecks,trchlor,smeLSstrgsw/smple



SHLYSLTST: ltgy-dkgy-gybrn-ltcrmgy-offwhgy,vf-fgr,sbrd-sbang-ang,p-modsrt,modfrm-sft,tr-modcalccmt,smecrmbrnclyinfl,occcarbincl,trmicmica,grdgtoSLTYSH

**Wt=8.8 Vis=48 Wl=4.8 pH=9.5 Cl=900**
**Ca=40 Sol=3.5 Ck=2/32**

SHLYSLTST: ltgy-dkgy-gybrn-ltcrmgy-offwhgy,vf-fgr,sbrd-sbang-ang,p-modsrt,modfrm-sft,tr-modcalccmt,smecrmbrnclyinfl,occcarbincl,trmicmica,grdgtoSLTYSH

SHLYSS: offwh-fros-ltgy-trnsl-clr,S&P,vf-mgr,modfrm-fri,sbrd-rd-sbang,modsrt,trcalccmt,predgrsuptw/smemtxsupt,smeoffwh-crmclyinfl,abntcarbincl,occchlor,mod-pintgranpor,abntdismpyrstrgs-lseclustr, NSFOC

SHLYSLTST: ltgy-dkgy-gybrn-ltcrmgy-offwhgy,vf-fgr,sbrd-sbang-ang,p-modsrt,modfrm-sft,tr-modcalccmt,smecrmbrnclyinfl,occcarbincl,trmicmica,grdgtoSLTYSH

CLYST: ltgy-dkgy-gybrn,vsft-slsft,trsbplty-plty,rthy-sltyip,trSLTSTstrgs,smecarbincl-lsemat,trlmyinfl

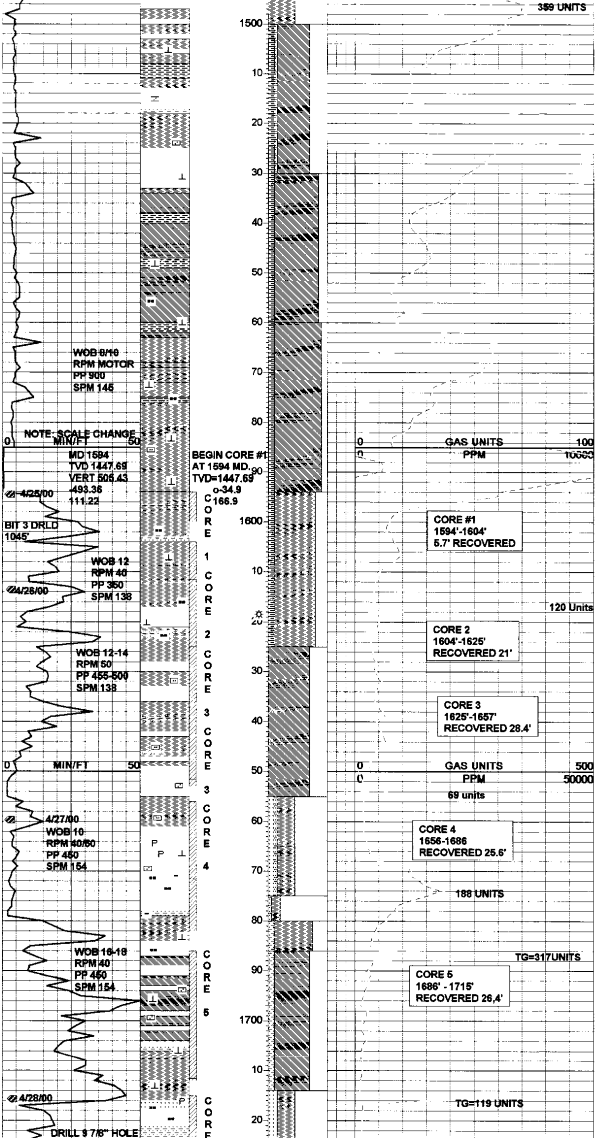
**LOG TOP COWLITZ FM. @ 1404'**

SHLYSLTST: ltgy-dkgy-gybrn-ltcrmgy-offwhgy,vf-fgr,sbrd-sbang-ang,p-modsrt,modfrm-sft,tr-modcalccmt,smecrmbrnclyinfl,occcarbincl,trmicmica,grdgtoSLTYSH

SHLYSLTST: ltgy-dkgy-brngy-crmtan-offbrn vf-fgr,sbang-rd-sbrd,modfrm-sft,tr-modcalccmt,smecarbincl-flecks,trdismpyr,smechort

GRCLYST: ltgy-dkgy-gybrn,vsft-slsft,trsbplty-plty,rthy-sltyip,trSLTSTstrgs,smecarbincl-lsemat,trlmyinfl

SHLYSLTST: ltgy-dkgy-brngy-crmtan-offbrn vf-fgr,sbang-rd-sbrd,modfrm-sft,tr-modcalccmt,smecarbincl-flecks,trdismpyr,smechort



GRCLYST: ltgy-dkgy-gybrn-trcrmbrn,vsft-sl sft,rthy-vgrtyip,trcalccmt,grdgtoSHLY SLTST,smelsecarbmat-flecks,occlsedism pyrclustr,sbrd-rdSS-SLTSTgr

SH/CLYST: ltgy-dkgy-brngy-brn,vf-fgr,sbang rd-sbrd,slfrm-sft,tr-modcalccmt,smecarbincl decr-nonslty

SH: lt-mgygybrn,sftgummyblkydns,rthytext ip,smevcalc,vsl-nonslty

**Wt=9.0 Vis=47 Wl=4.4 pH=9.5 Cl=900**
**Ca=40 Sol=5.0 Ck=2/32**

MUDSTN/SH: medgysmegybrn,vsft,cly-gummy,rthyslsbwxyip,m-vcalc,slsltytextip smooth-dns,scatcalcnods&mnrlcalcitefrags

GRCLYST/MUDSTN: ltgy-dkgy-gybrn-tr crmbrn,vsft-slsft,rthy-vgrtyip,trcalccmt,grdg toSHLYSLTST,smelsecarbmat-flecks,occ lsedismpyrclustr

**GEL/DMA**
**Wt 9.0 Vis 44 pH 9.5 Wl 4.8 Cl 900**
**Ca 40 Sol 5.0 Ck 2/32**

GYCLYST: dkgy-ltgy-gybrn,sft-modfrm,tr calccmt,rthy-grtyip,smeSLTSTburrowincl, occ-abntmicmica,sbblky-sbplty

SHLYSSLTST: ltgy-dkgy-trnsl-clr-fros-gybrn offwhgy,vf-fgr,sbrd-rd,modsrt,trcalccmt, sbplty-pltyip,abntclyinfl,abntcarbinclw/tr strgs&smelsemat,abntmicmicaw/trbio

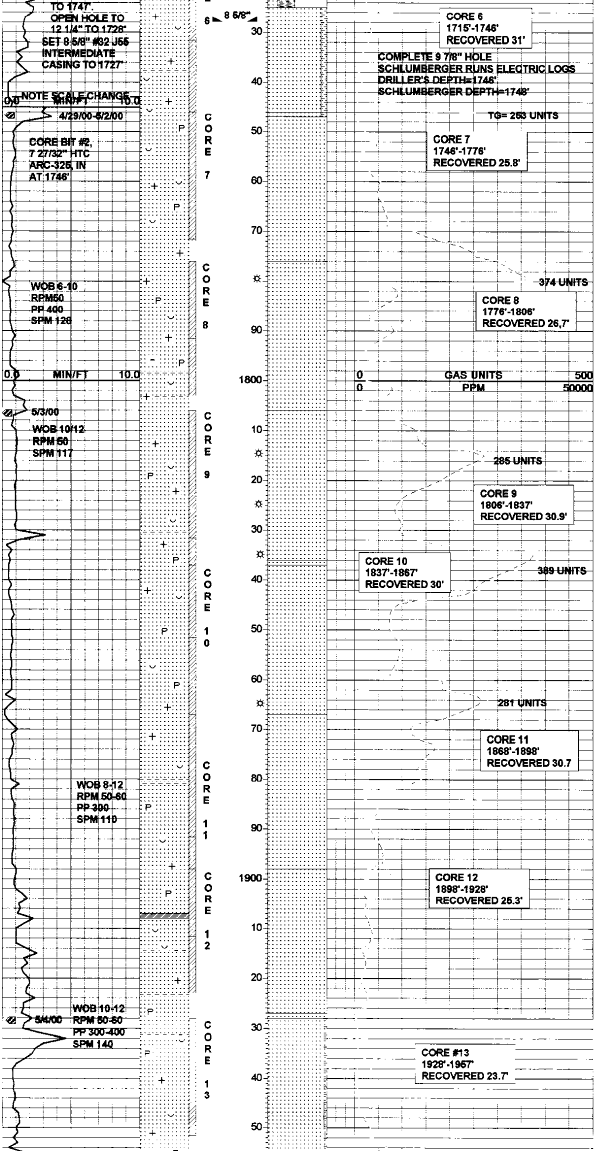
SHYSS/SS: predopwh vfgrsbang-ang,wsrt,v friw/minorarginfill,trs&pcarb/orgmat,pred thnbddinslt/sh,abntpyrmnrlcalcip,NSOFC

SLTY/MUDSTN: tanltbrns&p,blky,vsft-sft, rthyipsltytextip,smecarb&orgincl,scatdkgn chlornods,slcalc,scatpyrclstrs

**MUD@1686: Wt=8.9 Vis=39 Wl=4.6 pH=9.0**
**Cl=900 Ca=40 Sol=4% Ck=2/32**

GYCLYST: ltgy-dkgy-gybrn-crmgy,trsbplty, rthy-grty,sltyip,trcalccmt,smeSHLYSLTST strgs,occcarbincl-flecksw/trlsemat

SLTY/MUDSTN: tanltbrns&p,blky,vsft-sft, rthyipsltytextip,smecarb&orgincl,scatdkgn



TO 1747'.
OPEN HOLE TO
12 1/4" TO 1728'
SET 8 5/8" #32 J55
INTERMEDIATE
CASING TO 1727'

NOTE SCALE CHANGE

4/29/00-5/2/00

CORE BIT #2,
7 27/32" HTC
ARC-325, IN
AT 1746'

CORE 6
1715'-1746'
RECOVERED 31'

COMPLETE 9 7/8" HOLE
SCHLUMBERGER RUNS ELECTRIC LOGS
DRILLER'S DEPTH=1746'
SCHLUMBERGER DEPTH=1748'

TG= 253 UNITS

CORE 7
1746'-1776'
RECOVERED 25.8'

WOB 6-10
RPM50
PP 400
SPM 128

CORE 8
1776'-1806'
RECOVERED 26,7'

5/3/00

WOB 10/12
RPM 50
SPM 117

CORE 9
1806'-1837'
RECOVERED 30.9'

CORE 10
1837'-1867'
RECOVERED 30'

CORE 11
1868'-1898'
RECOVERED 30.7

WOB 8-12
RPM 50-60
PP 300
SPM 110

CORE 12
1898'-1928'
RECOVERED 25.3'

WOB 10-12
5/4/00
RPM 50-60
PP 300-400
SPM 140

CORE #13
1928'-1957'
RECOVERED 23.7'

chlornods,slcalc,scatpyrclstrs,trclrlsevf-fSs grs

**LOG TOP C&W SAND @ 1726'**

SS: ltgy-clr-fros-trnsl,S&P,vf-fgr,sbrd-rd,fri-sft unconsl clustr,mod-wsrt,tr-modcalccmt,gr suptw/smesilcmt,abntcarbincl,occmicmica,gintgranpor,NSFOC

**Wt. 9.0 Vis 39 pH 9.0 WL 4.8 Cl 900**
**Ca 40 CK 2/32 Sol 5%**

SS: clr-fros-trnsl-ltgy,abntS&P,vf-fgr,fri-slfrm sbrd-sbang-ang,trcalccmt,grsuptw/silcmt,tr offwhclyinfl,abntmicmicaw/trchlor&biot,occ m-lggnpkfeld,intgranpor,NSFOC

**DMA**
**Wt 8.8 Vis 38 pH 12.0 WL 8.8 CL 1000**
**Ca 40 Sol 3.5% CK 2/32**

SS: op&ltgysmeclr-trnslrrglasy,predLfgrvf ip,wsrt,sbang-angscatsbrd,abntmica/biot smechlorits,qtzw/abntarkosicgrs,smepyr& intgranmicropyr,occdkgrs&postuffaceous mat,dkorganicbandingtovflaminCore8,pred lsegrs-smevisporinsmlclstrs,tracetominor argcontent

SS: op&ltgysmeclr-trnslrrglasy,Lf-Lmgr,w srt,sbang-angscatsbrd,abntmica/biotsme chlorits,qtzw/abntarkosicgrs,smepyr& intgranmicropyr,occdkgrs,dkorganic bandinginCore8,predlsegrs,visporinsml clstrs,predcln

SS: gylt-mgyopclrglasy,bcmUf-Umgy, sbang-angw/scatsbrd,abnt-predlaegrs,sme vfrismlclstrs,abntpyrclstrs,mica/pyrflks& occbooks,tr-scatchlorgrs,abntfeldgrs,sme vispor,smedkcarbmat

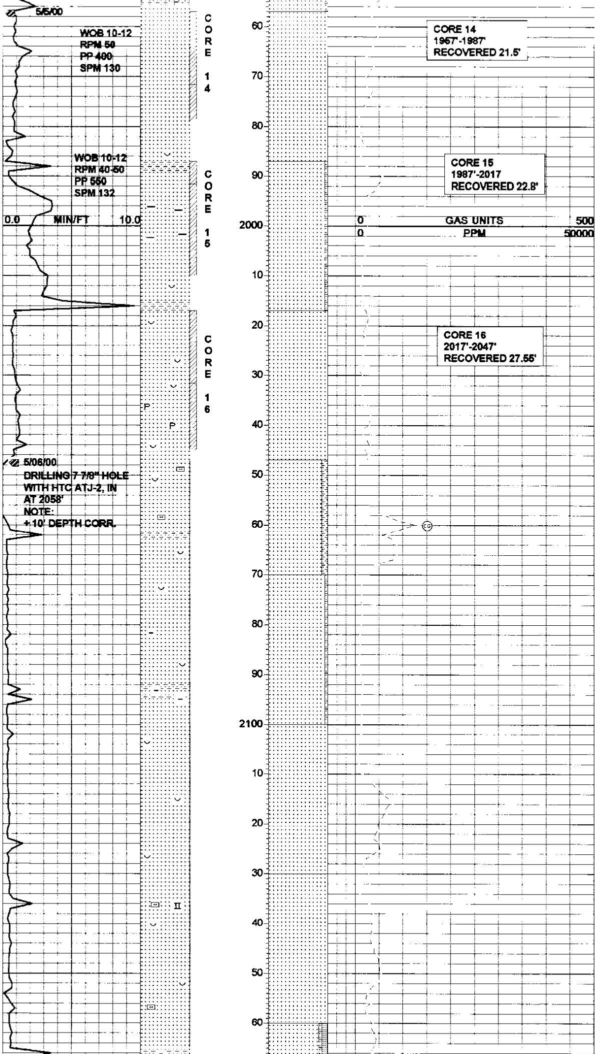
**DMA**
**Wt 8.8 Vis 37 pH 11.5 WL 8.0 CL 1200**
**Ca 40 Sol 3.5% Ck 2/32**

SS: clr-fros-trnsl-op-ltgy-gy,S&P,vf-fgrw/trm gr,sbang-angw/smelsesbrd-rd,fri-unconsl,gr suptw/silcmt,trarg-lmyinfl,smelsemgrpk feldspar,abntcarbincl,abntmicmicaw/trbio& chlor,gintgranpor,NSFOC

SS: glasyopclrltgyip,predf-Umgrsmevfgrin clstrs,angsbangip,m-wsrt,predlsegrs,abnt mica/biot,abntfeldgrs,scat-abntpyr,minorarg infil,scatdkcarbmat,scatBasfrags&trvcol Clyst

**DMA**
**Wt 8.9 Vis 39 pH 11.5 WL 7.0 CL 1300**
**Ca 40 Sol 4.0% Ck 2/32**

SS: ltgyglasyopipclr-trnsl,predUf-Lmgr&w srt,bcmangthru,uncons&lsethruw/rrvfri clstrs,abntmica&pyr,abntfeldgrs,scatvcol tuffaceousgrs-predred-pk-gn,gvisporip,trdk-blkorgmat



**DMA**
**Wt 8.8 Vis 37 pH 11.0 WL 7.0 CL 1300**
**Ca 40 Sol 3.5% CK 2/32**

SS: trnsl-op-clr-fros-gygl-ltgy-gy,slS&P,vf-fgr,wsrt,sbang-angw/smelsesbrd-rdgr,predlseunconsthruw/rrvfriclus,grsuptw/silcmt,trlmy-argincl,abntmic micaw/smebiot&chlor, occlsecarbmat,gintgranpor,NSFOC

SS: trnsl-clr-fros-op-gygl-ltgy-gytroffwh,sl S&P,vf-fgr,sbrang-ang-sbrd,predlseuncons thruw/rrfriclus,grsuptw/silcmt,trlmy-argincl, abntmicmicaw/trchlor,smelsecarbmat, SHLYSS-SLTYSHintlamw/coresmple,gintgranpor,NSFOC

SS: op-clr-fros-trnsl-ltgy-gygl,vf-fgr,sbang-sbrd-ang,wsrt,predlseunconsthruw/trvfri SHLYSSclus,grsuptw/silcmt,trcalcincl,abnt micmicaw/smechlor&biot,smelsecarbmat, trlsedismpyrclus,gintgranpor,NSFOC

SS: trnsl-clr-fros-op-gygl-gy-troffwhcrmbrn, vf-fgr,sbrd-rd-sbang,wsrt,predlseunconsthru w/rrvfriclus,grsuptw/silcmt,trarg-lmyinclw/ SHLYSS,abntlsecarbmat-flecks,occmica micaw/trbiot,gintgranpor,NSFOC

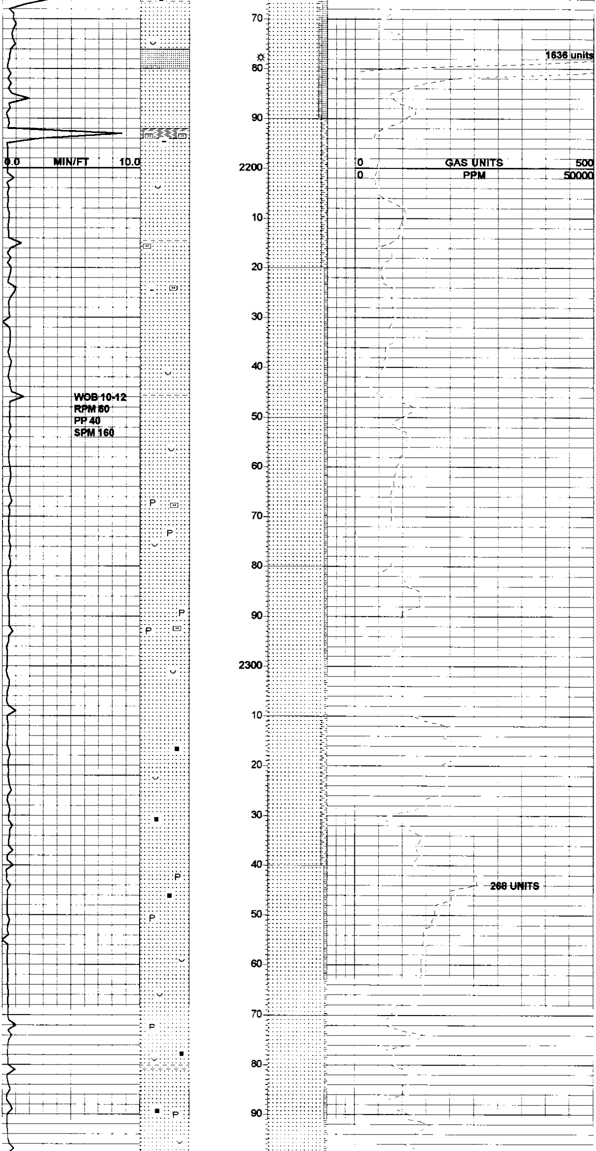
SS: trnsl-clr-fros-op-gygl-gy-troffwhcrmbrn, vf-fgr,sbrd-rd-sbang,wsrt,predlseunconsthru w/rrvfriclus,grsuptw/silcmt,trarg-lmyinclw/ SHLYSS,abntlsecarbmat-flecks,occmica micaw/trbiot,gintgranpor,NSFOC

SS: clr-trnsl-fros-gl-glgy-ltgy,vf-fgr,wsrt,sbrd-rd-sbangw/trang,predlseunconsthruw/rrfri clust,grsuptw/silcmt,occlsecarbmat,sme micmicaw/trbiot,gintgranpor,NSFOC

SS: trnsl-op-clr-fros-glgy-troffwh-crmbrn-gluagn,vf-fgr,sbrd-rd-sbang-ang,wsrt,predlse unconsthruw/rrvffriclus,grsuptw/silcmt&tr ofmtxsupt,troffwh-crmbrnarg-lmyincl,trof SHLYSS-SLTSTw/smple,abntmic micaw/ occbiot,smecarbincl,gintgranpor,NSFOC

**DMA**
**Wt 8.8 Vis 38 pH 10.5 WL 6.6 Cl 1400**
**Ca 40 Sol 3.5% CK 2/32**

SS: clr-fros-trnsl-op-gygl,vf-fgr,sbrd-rd-



sbang,wsrt,predlseunconsthruw/rrfriclus,grsuptw/smesilcmt,abntcarbincl,smemicmica,trdismpyr,trdullcoal,gintgranpor, NSFOC

DULLCOAL: blk-gyblk-dkblk,sbblky-blky, modfrm-brit,sm-rthy,smeconchfrac,visgasin smplelrgcuttings

SS: trnsl-fros-clr-op-gl-ltgy,vf-fgr,sbrd-rd-sbang,w-modsrt,predlseunconsthruw/rrfriclus,grsuptw/trmtxsupt,trltgy-gybrn SHLYSS-SLST,abntmicmicaw/smebiot&rr trchlor,smelsecarbmat-flecks,gintgranpor, NSFOC

SS: trnsl-fros-clr-op-gl-ltgy,vf-fgr,sbrd-rd-sbang,w-modsrt,predlseunconsthruw/rrfriclus,grsuptw/trmtxsupt,trltgy-gybrn SHLYSS-SLST,abntmicmicaw/smebiot&rr trchlor,smelsecarbmat-flecks,gintgranpor, NSFOC

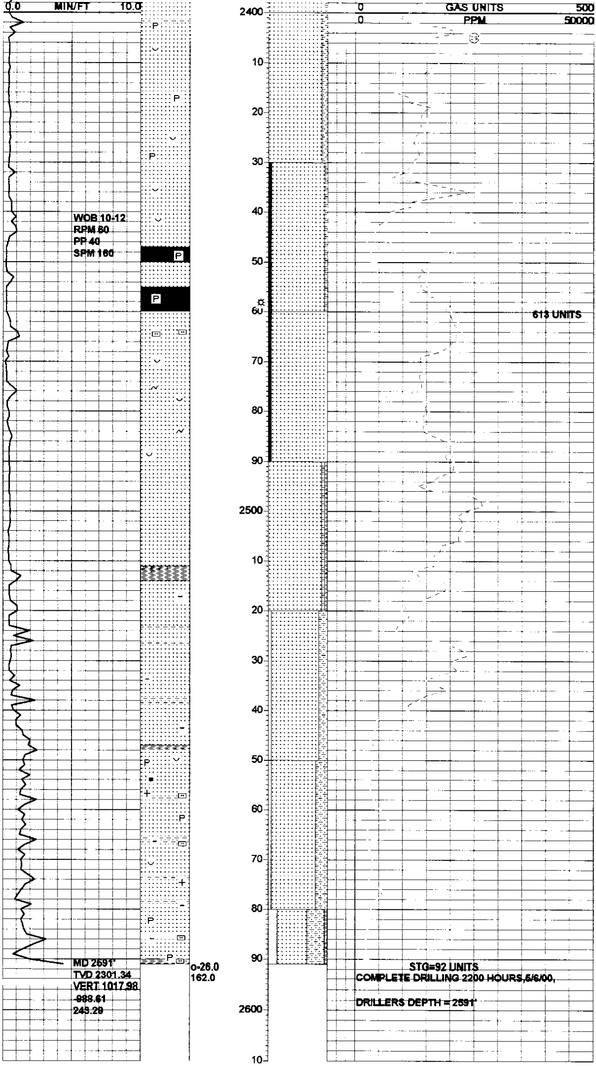
SS: clr-fros-trnsl-op-glgy-ltgy-troffwh,vf-fgr, sbrd-sbang-rd,wsrt,predlseunconsthruw/occfriclus,grsuptw/silcmt,troffwh-crmbrn cly-lmyincl,trSHLYSS-SLTST,abntmicmica w/smebiot,trlsecarbmatw/smedismpyrclus,gintgranpor,NSFOC

SS: clr-fros-trnsl-op-glgy-ltgy-troffwh,vf-fgr, sbrd-sbang-rd,wsrt,predlseunconsthruw/occfriclus,grsuptw/silcmt,troffwh-crmbrn cly-lmyincl,trSHLYSS-SLTST,abntmicmica w/smebiot,trlsecarbmatw/smedismpyrclus,gintgranpor,NSFOC

SS: trnsl-fros-clr-op-gl-ltgy,vf-fgr,sbrd-rd-sbang,w-modsrt,predlseunconsthruw/rrfriclus,grsuptw/trmtxsupt,trltgy-gybrn SHLYSS-SLST,abntmicmicaw/smebiot&rr trchlor,smelsecarbmat-flecks,gintgranpor, NSFOC

SS: trnsl-fros-clr-op-gl-ltgy,vf-fgr,sbrd-rd-sbang,w-modsrt,predlseunconsthruw/rrfriclus,grsuptw/trmtxsupt,trltgg-offwh SHLYSS,abntmicmicaw/smebiot&rrtrchlor trdismpyrclus,smelsecarbmat-flecks,gintgranpor,NSFOC

SS: trnsl-fros-clr-op-gl-ltgy,vf-fgr,sbrd-rd-sbang,w-modsrt,predlseunconsthruw/rrfriclus,grsuptw/trmtxsupt,trltgg-offwh SHLYSS,abntmicmicaw/smebiot&rrtrchlor trdismpyrclus,smelsecarbmat-flecks,gintgranpor,NSFOC



COMPLETE DRILLING 2200 HOURS,5/6/00,

DRILLERS DEPTH = 2591'

SS: trnsl-fros-clr-op-gl-ltgy,vf-fgr,sbrd-rd-sbang,w-modsrt,predlse uncons thru w/ rrfri clus,gr supt w/ tr mtx supt,tr offwh-crmbrn SHLYSS,abnt mic mica w/ sme biot & rr tr chlor tr dism pyr clus,sme lse carb mat-flecks,g intgran por,NSFOC

SS: trnsl-fros-clr-op-gl-ltgy,vf-fgr,sbrd-rd-sbang,w-modsrt,predlse uncons thru w/ rrfri clus,gr supt w/ tr mtx supt,tr ltgg-offwh SHLYSS,abnt mic mica w/ sme biot & rr tr chlor tr dism pyr clus,sme lse carb mat-flecks,g intgran por,NSFOC

COAL: blk-gyblk-dkblk,sbblky-blky,frm-bri, sme conc frac,occ dism pyr clus

SS: trnsl-fros-clr-op-gl-ltgy,vf-fgr,sbrd-rd-sbang,w-modsrt,predlse uncons thru w/ rrfri clus,gr supt w/ tr mtx supt,tr ltgg-offwh SHLYSS,abnt mic mica w/ sme biot & rr tr chlor tr glua,sme lse carb mat-strgs w/ SHLYSS,tr coal,g intgran por,NSFOC

SS: clr-fros-trnsl-op-glgy-ltgy,vf-fgr w/ occ m gr,sbrd-rd-sbang,vw-wsrt,predlse uncons thru w/ occ sft-fri SHLYSS clus,gr supt w/ sil cmt,tr offwh-crmbrn arg-lmy incl,abnt carb mat w/ tr strgs in SHLYSS,abnt mic mica w/ sme biot,g intgran por,NSFOC

SS: trnsl-fros-clr-op-gl-ltgy,vf-fgr,sbrd-rd-sbang,w-modsrt,predlse uncons thru w/ rrfri clus,gr supt w/ tr mtx supt,tr ltgg-offwh SHLYSS,abnt mic mica w/ sme biot & rr tr chlor tr dism pyr clus,sme lse carb mat-flecks,g intgran por,NSFOC

SS: ltgy-clr-fros-trnsl-gybrn-crmgy-gl gy-tr offwh,vf-fgr,mod-wsrt,sbrd-rd-sbang,gr supt w/ sme mtx supt,sme arg-lmy incl w/ SHLYSS-SLTST,abnt mic mica & biot grdg to SHLYSS-SLTYSH,sme lse carb mat,occ dism pyr clus,g-mod intgran por,NSFOC

TUFF/SS: AA,pt gy ltgy vcol ip,tuff frags & scat dk vcol clasts,pt qtz abnt feld grs,coaly frags & incl