



COMPENSATED Z-DENS LOG<sup>SM</sup>  
COMPENSATED NEUTRON LOG  
GAMMA RAY LOG  
CALIPER LOG

FILE NO:  
OH083650  
API NO:  
05017077820000

COMPANY  
WELL  
FIELD  
COUNTY

PRONGHORN OPERATING, LLC  
PEPPER #1  
CHEYENNE WELLS  
CHEYENNE STATE COLORADO

Ver. 3.87

LOCATION:

SHL: 1691' FNL & 2034' FEL

SEC 5 TWP 14S RGE 44W

OTHER SERVICES

SL  
DAUGR  
HDLZDUCNGR  
HDLUGR

PERMANENT DATUM  
LOG MEASURED FROM  
DRILL. MEAS. FROM

GL  
KB  
ELEVATION  
17 FT  
ABOVE P.D.  
KELLY BUSHING

ELEVATIONS:  
KB 4281 FT  
DF 4280 FT  
GL 4264 FT

DATE	22 MAR 2014
RUN	2
TRIP	1
SERVICE ORDER	617654
DEPTH DRILLER	5465 FT
DEPTH LOGGER	4698 FT
BOTTOM LOGGED INTERVAL	4695 FT
TOP LOGGED INTERVAL	4000 FT
CASING DRILLER	13.375 IN @ 438 FT
CASING LOGGER	438 FT
BIT SIZE	7.875 IN
TYPE OF FLUID IN HOLE	WBM
DENSITY	8.8 LB/G
VISCOSITY	50 S
PH	11
FLUID LOSS	8 CC
SOURCE OF SAMPLE	MUD TANK
RM AT MEAS. TEMP.	1.43 OHMM @ 52.3 DEGF
RM AT MEAS. TEMP.	1.06 OHMM @ 51.5 DEGF
RM AT MEAS. TEMP.	1.74 OHMM @ 50.2 DEGF
SOURCE OF RMF	MEASURED
RM AT BHT	0.73 OHMM @ 109 DEGF
TIME SINCE CIRCULATION	5.5 HOURS
MAX. RECORDED TEMP.	109 DEGF
EQUIP. NO.	HL 6690
LOCATION	CASPER
RECORDED BY	J. OSTLER
WITNESSED BY	FRANK RABBITO

IN MAKING INTERPRETATIONS OF LOGS OUR EMPLOYEES WILL GIVE THE CUSTOMER THE BENEFIT OF THEIR BEST JUDGEMENT. BUT SINCE ALL INTERPRETATIONS ARE OPINIONS BASED ON INFERENCES FROM ELECTRICAL OR OTHER MEASUREMENTS, WE CANNOT, AND WE DO NOT GUARANTEE THE ACCURACY OR CORRECTNESS OF ANY INTERPRETATION. WE SHALL NOT BE LIABLE OR RESPONSIBLE FOR ANY LOSS, COST, DAMAGES, OR EXPENSES WHATSOEVER INCURRED OR SUSTAINED BY THE CUSTOMER RESULTING FROM ANY INTERPRETATION MADE BY ANY OF OUR EMPLOYEES.

#### BOREHOLE RECORD

BIT SIZE	FROM	TO
12.25 IN	0 FT	1500 FT
7.875 IN	1500 FT	5465 FT

#### CASING RECORD

SIZE	WEIGHT	GRADE	FROM	TO
13.375 IN	48 LB/F	NA	0 FT	438 FT

#### REMARKS

RUN 2 TRIP 1: RUN 2: ZDL/CN/GR

CVOL COMPUTED USING FUTURE 5.5" CASING  
BVOL & CVOL UNITS ARE IN CUBIC FEET  
CALIPER WAS VERIFIED IN CASING

TOOL STRING RAN WITH NEUTRON BOWSPRING DECENTRALIZER

THANK YOU FOR CHOOSING BAKER HUGHES WIRELINE!  
CREW: NATHAN OSTLER, ANTHONY FERRIS  
RIG: WILDCAT RIG #1

EQUIPMENT DATA					
RUN	TRIP	TOOL	SERIES NO.	SERIAL NO.	POSITION
2	1	TTRM	3981XB	10217216	FREE
2	1	COMR	3514XB	10184847	FREE
2	1	GR	1329XA	370718	DECENTRALIZED
2	1	CN	2446XA	10400611	DECENTRALIZED
2	1	ZDL	2234XA	120009	PAD DEVICE

**MAIN LOG 5"/100FT SCALE (LIMESTONE MATRIX 2.71 G/CC)**

ECLIPS 6.2i ECLIPS General Release Rel 6.2i Wed Jun 12 12:21:40 CDT 2013

**Patches: 5**

Plotted: Sat Mar 22 06:36:16 2014

## PARAMETER AND FILTER SUMMARY REPORT

```
FILE: /data617654/MSLAM_DAL~04.prm
LOGGING MODE: DEPTH DIRECTION: UP
TOP DEPTH: 337.750 ft BOTTOM DEPTH: 4705.500 ft
```

## SYMMETRIC FILTER

MEASUREMENT TYPE	PARAMETER	VALUE	UNITS	INTERVAL (ft)
TENSION	FILTER ( )	medium (1)		TOP
GR	FILTER ( )	medium (1)		BOTTOM

## BOREHOLE & CEMENT

MEASUREMENT TYPE	PARAMETER	VALUE	UNITS	INTERVAL (ft)	
CASING - BOREHOLE & CEMENT VOLUME	CASING O.D.	5.500	in	TOP	BOTTOM
BIT SIZE	BIT SIZE	7.875	in	"	"

## PARAMETER AND FILTER SUMMARY REPORT

```
FILE: /data617654/MSLAM_DAL~10.prm
LOGGING MODE: DEPTH DIRECTION: UP
TOP DEPTH: 3989.000 ft BOTTOM DEPTH: 4649.000 ft
```

## SYMMETRIC FILTER

MEASUREMENT TYPE	PARAMETER	VALUE	UNITS	INTERVAL (ft)	
Y AXIS CALIPER	FILTER (j)	medium (1)		TOP	BOTTOM
	FILTER (j)	medium (1)		"	"
	FILTER (j)	medium (1)		"	"
	FILTER (j)	medium (1)		"	"
	FILTER (j)	medium (1)		"	"
CALIPER	FILTER (.h)	medium (1)		"	"
	FILTER (.i)	medium (1)		"	"
ZDL MED RES	FILTER (hrd1*)	medium		"	"
	FILTER (hrd1s*)	medium		"	"
	FILTER (hrd2*)	medium		"	"
	FILTER (hrd2s*)	medium		"	"
	FILTER (soft*)	medium		"	"
ZDL HIGH RES	FILTER (hrd1*)	light		"	"
	FILTER (hrd1s*)	light		"	"
	FILTER (hrd2*)	light		"	"
	FILTER (hrd2s*)	light		"	"

## BOREHOLE & CEMENT

MEASUREMENT TYPE	PARAMETER	VALUE	UNITS	INTERVAL (ft)
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CASING - BOREHOLE & CEMENT VOLUME	CASING O.D.	5.500	in	TOP	BOTTOM
	CASING THICKNESS	0.000	in	"	"
BIT SIZE	BIT SIZE	7.875	in	"	"
BOREHOLE CORR DIAMETER SOURCE	CALIPER/FIXED DIA. (cnbh*)	USE CALIPER		"	"
	CALIPER/FIXED DIA. (zdbh*)	USE CALIPER		"	"
BOREHOLE CORR DIAMETER	FIXED DIAMETER (cnbh*)	7.875	in	"	"

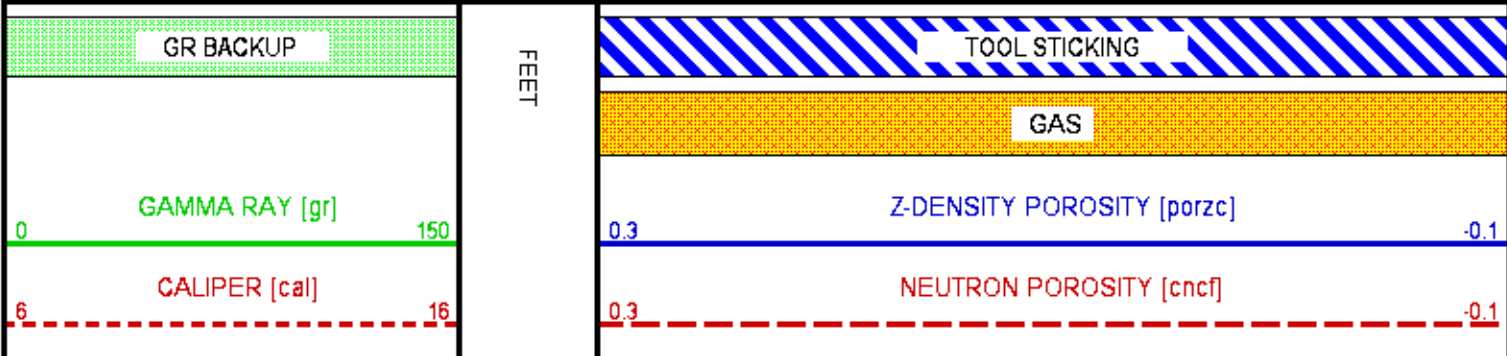
CN PROCESSING					
MEASUREMENT TYPE	PARAMETER	VALUE	UNITS	INTERVAL (ft)	
2446 CN MATRIX	2446 MATRIX	LIMESTONE		TOP	BOTTOM
CN SALINITY CORRECTION	SALINITY	0	ppm	"	"
CN TOOL STANDOFF	ENABLE STANDOFF CORR	OFF		"	"
	STANDOFF AMOUNT	0.00	in	"	"
CN CASING & CEMENT CORRECTION	CORRECTION	OFF		"	"
	BIT SIZE BEHIND CSNG	7.875	in	"	"

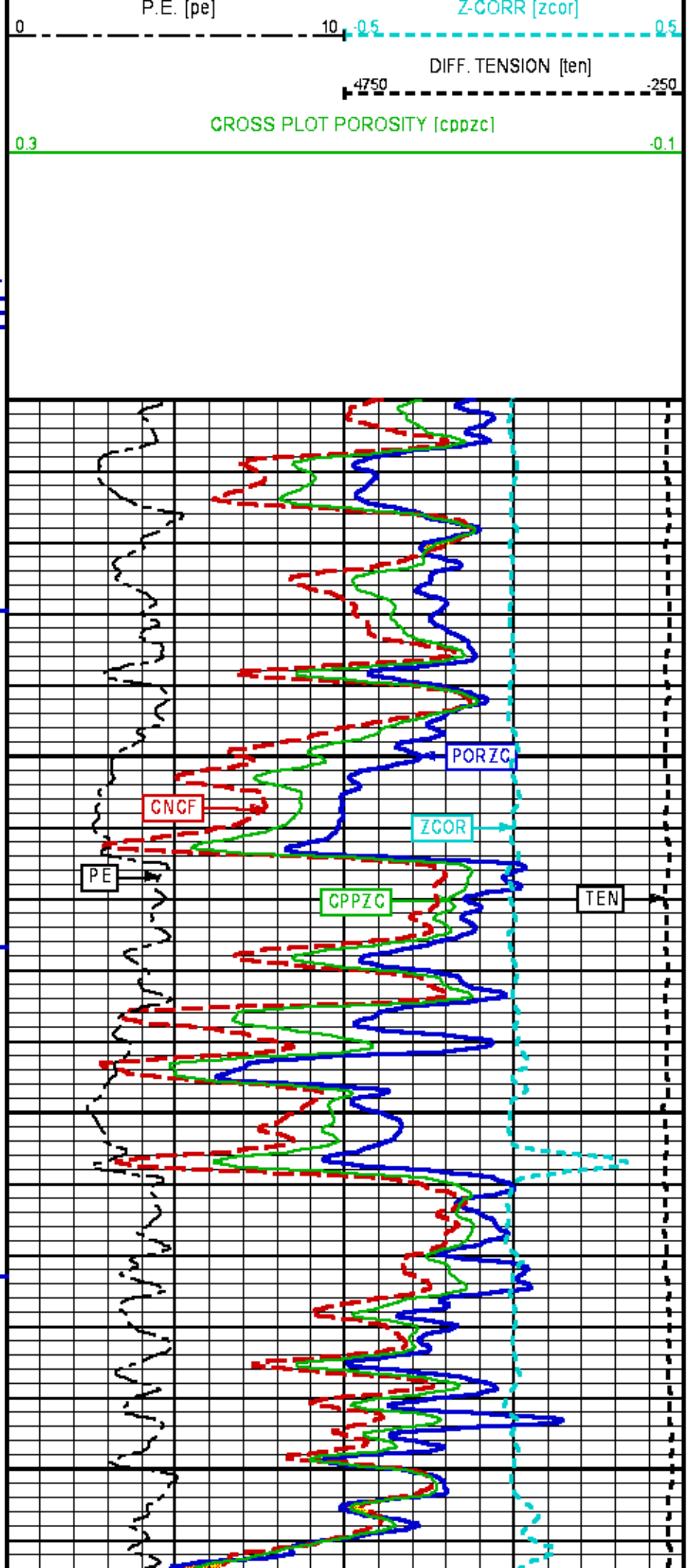
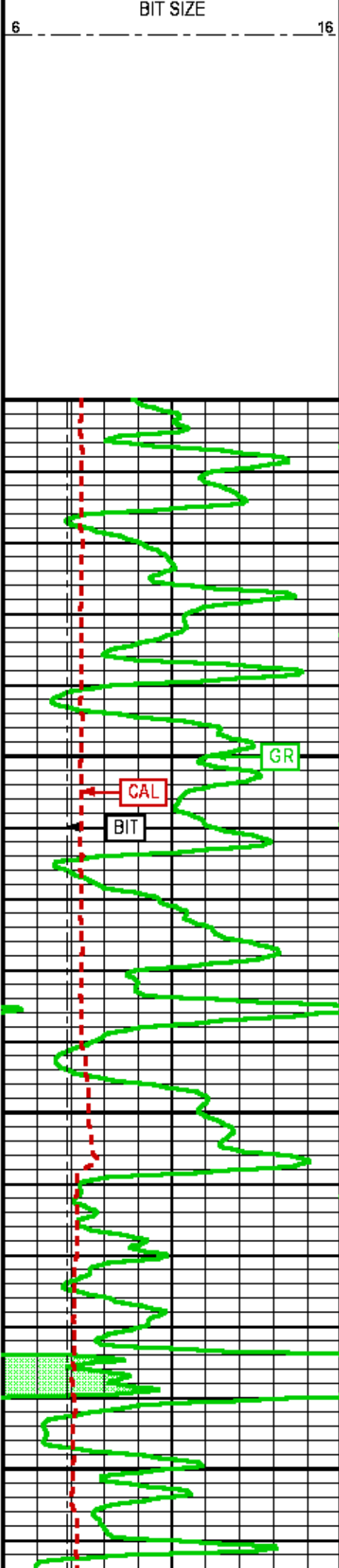
ZDL PROCESSING					
MEASUREMENT TYPE	PARAMETER	VALUE	UNITS	INTERVAL (ft)	
MUD DENSITY	MUD DENSITY	8.80	lbm/gal	TOP	BOTTOM
DENSITY POROSITY	RHOmatrix	2.710	g/cm3	"	"
	RHOfluid	1.000	g/cm3	"	"
ZDL	DENX TRACKING	ON		"	"

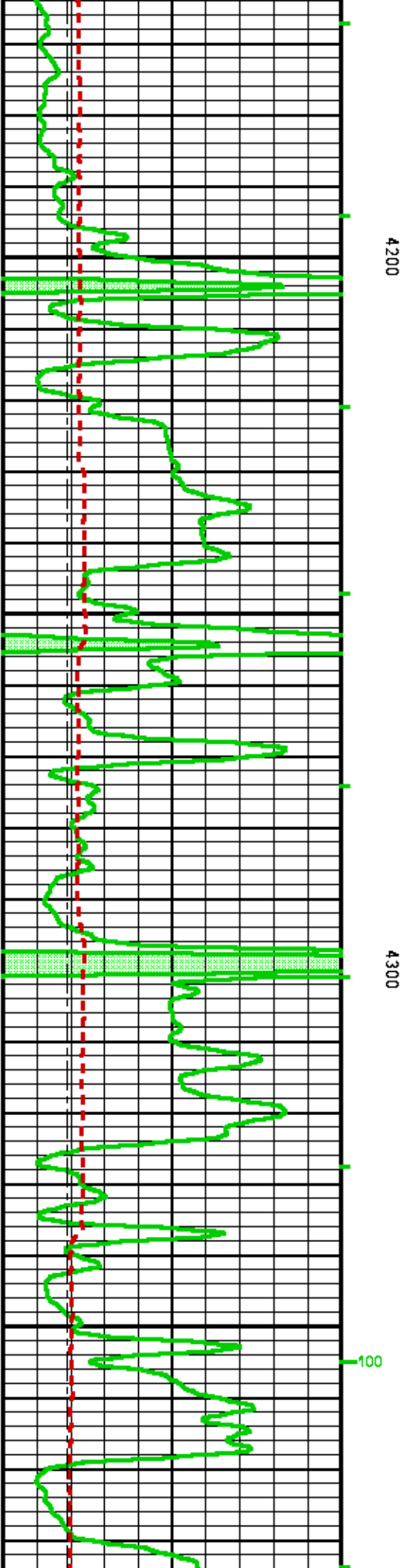
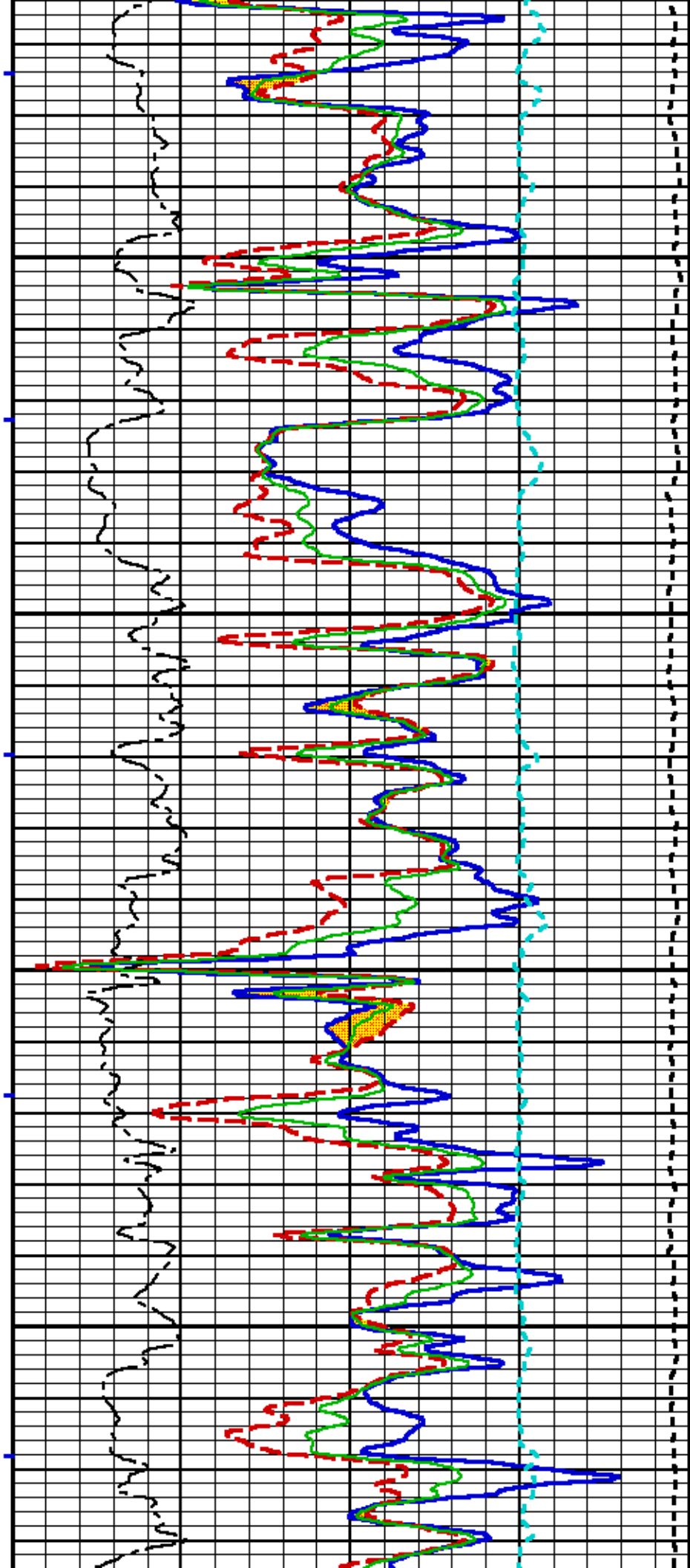
CURVE DESCRIPTION REPORT		
CURVE NAME	CREATION DATE	CURVE DESCRIPTION
F1:BIT	Mar 22 04:04:14 2014	BIT SIZE
F1:BVOL	Mar 22 04:04:14 2014	BOREHOLE VOLUME
F1:CAL	Mar 22 04:04:14 2014	CALIPER
F1:CNCF	Mar 22 04:04:14 2014	FIELD NORMALIZED COMPENSATED NEUTRON POROSITY
F1:CPPZC	Mar 22 04:04:14 2014	CROSSPLOT POROSITY FROM ZDEN
F1:CVOL	Mar 22 04:04:14 2014	CEMENT VOLUME
F1:GR	Mar 22 04:04:14 2014	GAMMA RAY
F1:PE	Mar 22 04:04:14 2014	PHOTO ELECTRIC CROSS-SECTION
F1:PORZC	Mar 22 04:04:14 2014	CORRECTED POROSITY
F1:TEN	Mar 22 04:04:14 2014	DIFFERENTIAL TENSION
F1:ZCOR	Mar 22 04:04:14 2014	DENSITY CORRECTION

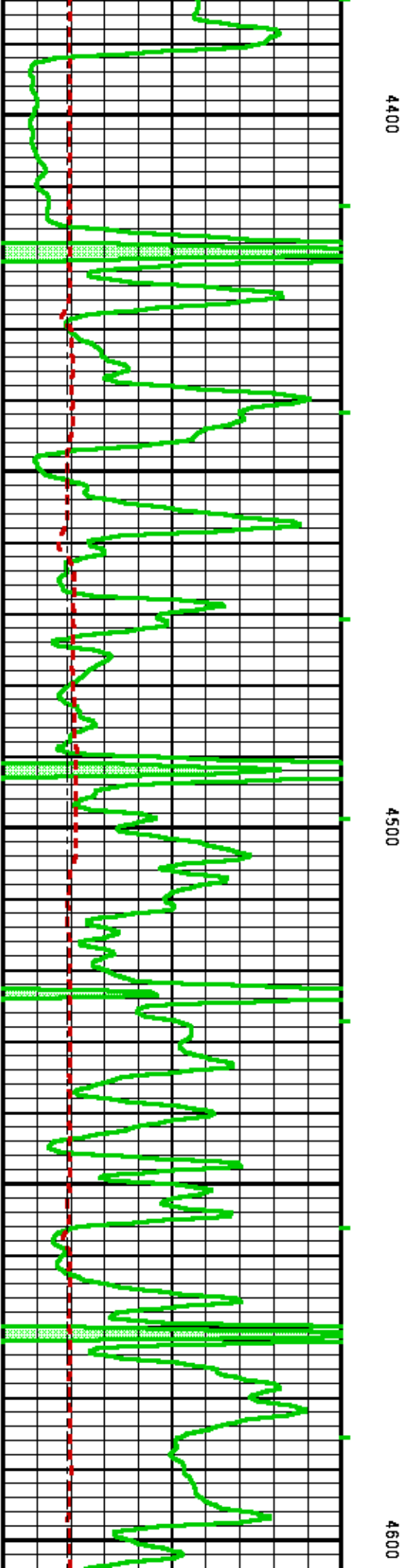
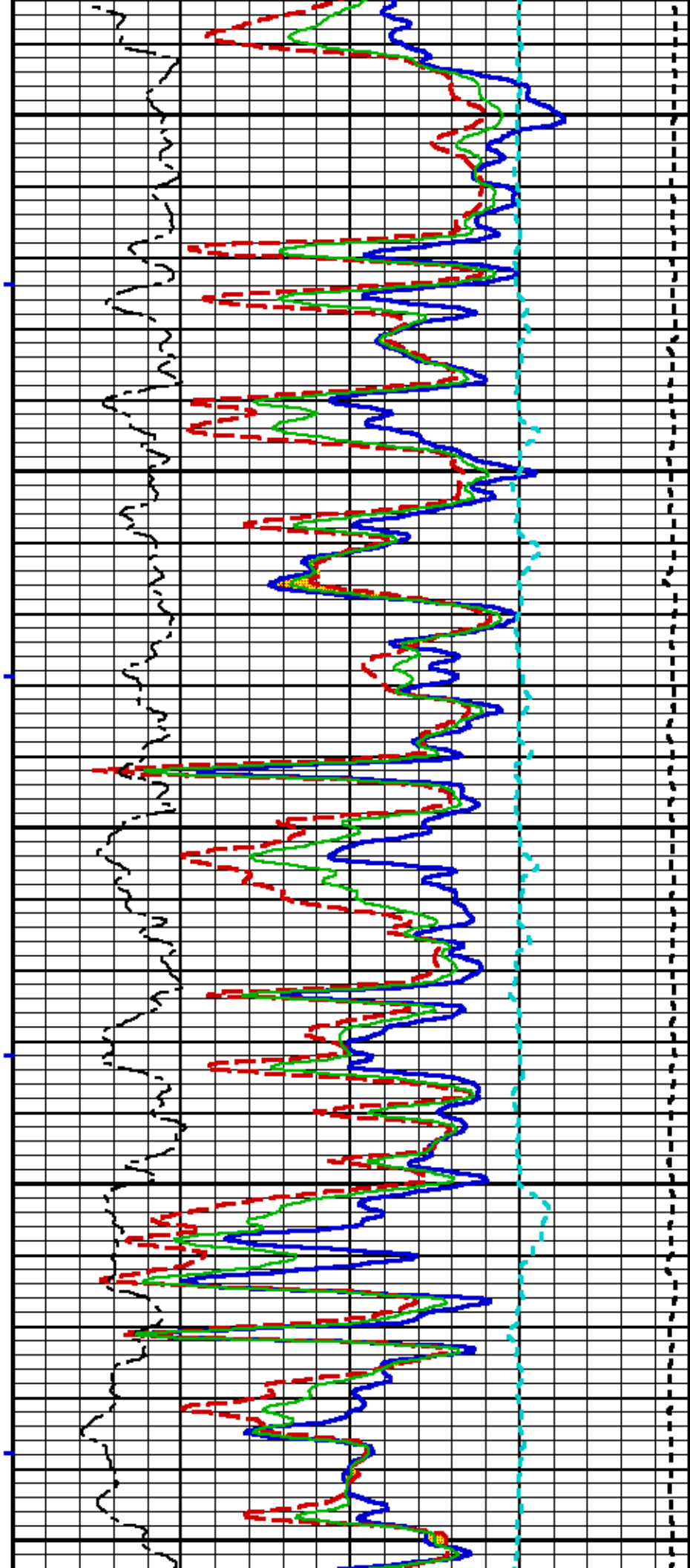
CURVE MEASURE POINT OFFSET							
CURVE	OFFSET (ft)	CURVE	OFFSET (ft)	CURVE	OFFSET (ft)	CURVE	OFFSET (ft)
BIT	0.00	CPPZC	2.50	PORZC	2.50		
CAL	3.00	GR	20.38	TEN	0.00		
CNCF	13.50	PE	2.50	ZCOR	2.50		

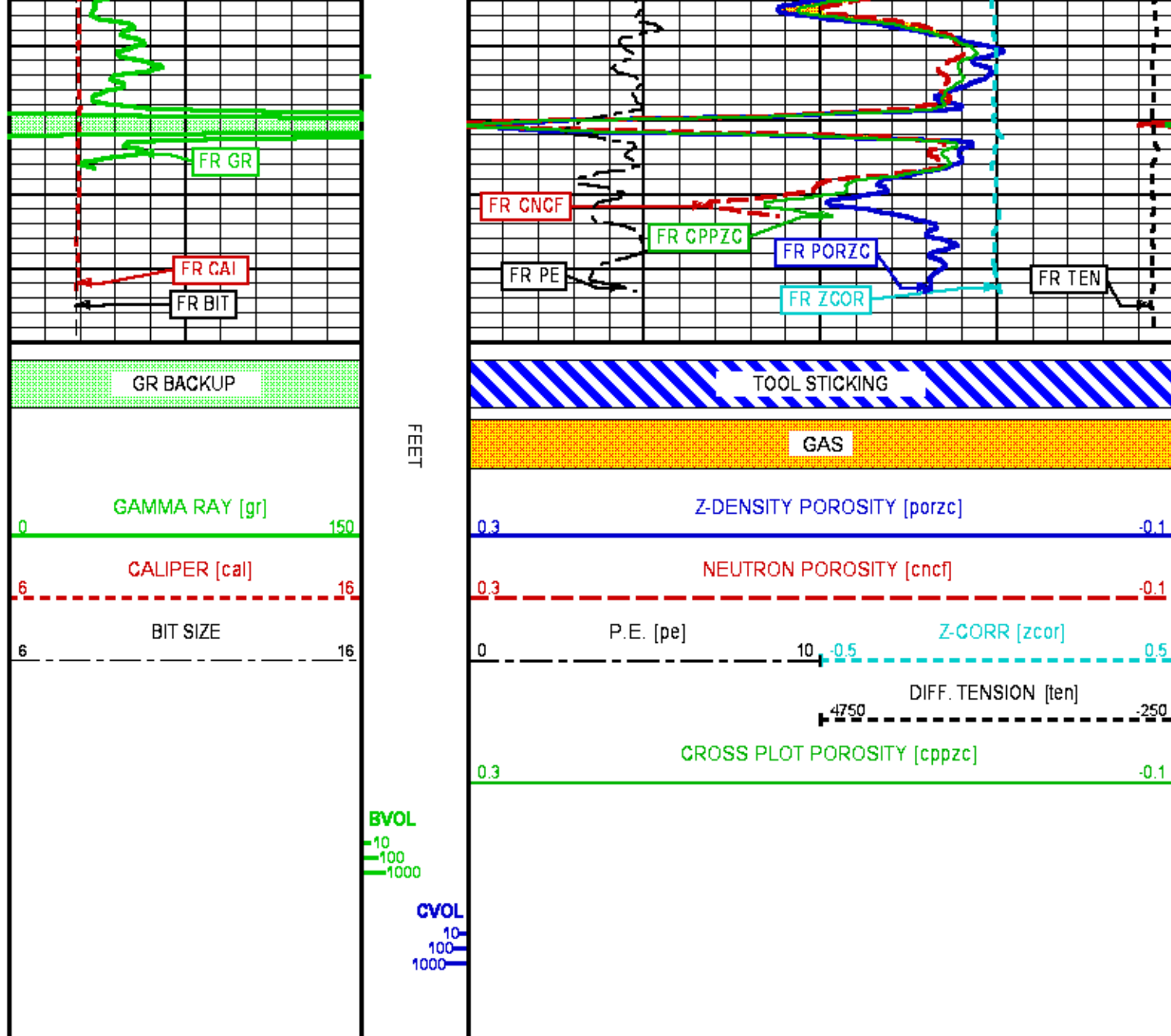
<b>Presentation</b>	: cpu6690:/dat1a/617654/zdl-cn_MAINLS.fvpdf [5"/100' Scale]
<b>Plot Interval</b>	: 4000 - 4649 Feet
<b>Data File 1</b>	: F1: cpu6690:/dat1a/617654/main_zdln.xtf
<b>Created On</b>	: Mar 21 23:52:28 2014
<b>Company</b>	: PRONGHORN OPERATING, LLC
<b>Well</b>	: PEPPER #1
<b>Field</b>	: CHEYENNE WELLS
<b>File Interval</b>	: 3955.25 - 4649 Feet
<b>OCT</b>	: MSLAM_DA











REPEAT LOG 5"/100FT SCALE (LIMESTONE MATRIX 2.71 G/CC)

ECLIPS 6.2i ECLIPS General Release Rel 6.2i Wed Jun 12 12:21:40 CDT 2013

Patches: 5

Plotted: Sat Mar 22 06:41:46 2014

### PARAMETER AND FILTER SUMMARY REPORT

FILE: /dat1a/617654/MSLAM\_DAL~05.prm  
 LOGGING MODE: DEPTH DIRECTION: UP  
 TOP DEPTH: 3992.750 ft BOTTOM DEPTH: 4299.500 ft

### SYMMETRIC FILTER

MEASUREMENT TYPE	PARAMETER	VALUE	UNITS	INTERVAL (ft)
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TENSION	FILTER Ø	medium (1)	TOP	BOTTOM
GR	FILTER Ø	medium (1)	"	"
BOREHOLE & CEMENT				
MEASUREMENT TYPE	PARAMETER	VALUE	UNITS	INTERVAL (ft)
CASING - BOREHOLE & CEMENT VOLUME	CASING O.D.	5.500	in	TOP BOTTOM
BIT SIZE	BIT SIZE	7.875	in	" "

PARAMETER AND FILTER SUMMARY REPORT				
FILE: /data/617654/MSLAM_DAL~09.prm LOGGING MODE: DEPTH      DIRECTION: UP TOP DEPTH: 4006.000 ft      BOTTOM DEPTH: 4704.750 ft				
SYMMETRIC FILTER				
MEASUREMENT TYPE	PARAMETER	VALUE	UNITS	INTERVAL (ft)
Y AXIS CALIPER	FILTER Ø	medium (1)		TOP BOTTOM
TENSION	FILTER Ø	medium (1)		" "
GR	FILTER Ø	medium (1)		" "
CN	FILTER Ø	medium (1)		" "
CALIPER	FILTER Ø	medium (1)		" "
	FILTER (.h)	medium (1)		" "
	FILTER (.i)	medium (1)		" "
ZDL MED RES	FILTER (hrd1*)	medium		" "
	FILTER (hrd1s*)	medium		" "
	FILTER (hrd2*)	medium		" "
	FILTER (hrd2s*)	medium		" "
	FILTER (soft*)	medium		" "
ZDL HIGH RES	FILTER (hrd1*)	light		" "
	FILTER (hrd1s*)	light		" "
	FILTER (hrd2*)	light		" "
	FILTER (hrd2s*)	light		" "

BOREHOLE & CEMENT				
MEASUREMENT TYPE	PARAMETER	VALUE	UNITS	INTERVAL (ft)
CASING - BOREHOLE & CEMENT VOLUME	CASING O.D.	5.500	in	TOP BOTTOM
	CASING THICKNESS	0.000	in	" "
BIT SIZE	BIT SIZE	7.875	in	" "
BOREHOLE CORR DIAMETER SOURCE	CALIPER/FIXED DIA. (cnbh*)	USE CALIPER		" "
	CALIPER/FIXED DIA. (zdbh*)	USE CALIPER		" "
BOREHOLE CORR DIAMETER	FIXED DIAMETER (cnbh*)	7.875	in	" "

CN PROCESSING				
MEASUREMENT TYPE	PARAMETER	VALUE	UNITS	INTERVAL (ft)
2446 CN MATRIX	2446 MATRIX	LIMESTONE		TOP BOTTOM
CN SALINITY CORRECTION	SALINITY	0	ppm	" "
CN TOOL STANDOFF	ENABLE STANDOFF CORR	OFF		" "
	STANDOFF AMOUNT	0.00	in	" "
CN CASING & CEMENT CORRECTION	CORRECTION	OFF		" "
	BIT SIZE BEHIND CSNG	7.875	in	" "

ZDL PROCESSING				
MEASUREMENT TYPE	PARAMETER	VALUE	UNITS	INTERVAL (ft)
MUD DENSITY	MUD DENSITY	8.80	lbm/gal	TOP BOTTOM
DENSITY POROSITY	RHOmatrix	2.710	g/cm3	" "
	RHOfluid	1.000	g/cm3	" "
ZDL	DENX TRACKING	ON		" "

CURVE DESCRIPTION REPORT		
CURVE NAME	CREATION DATE	CURVE DESCRIPTION
F1:BIT	Mar 22 03:35:11 2014	BIT SIZE
F1:BVOL	Mar 22 03:35:11 2014	BOREHOLE VOLUME
F1:CAL	Mar 22 03:35:11 2014	CALIPER
F1:CNCF	Mar 22 03:35:11 2014	FIELD NORMALIZED COMPENSATED NEUTRON POROSITY



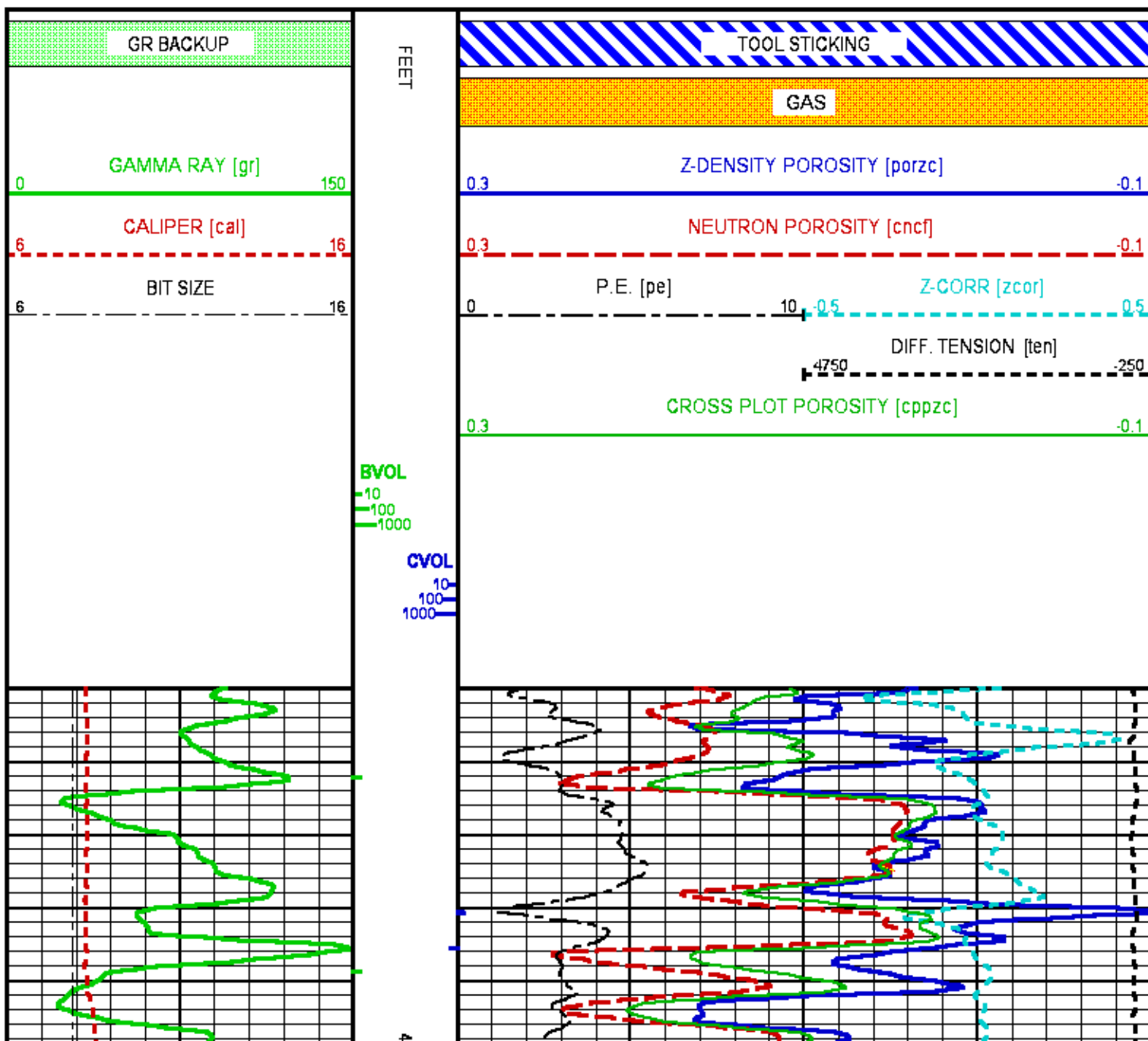
F1:CPPZC	Mar 22 03:35:11 2014	CROSSPLOT POROSITY FROM ZDEN
F1:CVOL	Mar 22 03:35:11 2014	CEMENT VOLUME
F1:GR	Mar 22 03:35:11 2014	GAMMA RAY
F1:PE	Mar 22 03:35:11 2014	PHOTO ELECTRIC CROSS-SECTION
F1:PORZC	Mar 22 03:35:11 2014	CORRECTED POROSITY
F1:TEN	Mar 22 03:35:11 2014	DIFFERENTIAL TENSION
F1:ZCOR	Mar 22 03:35:11 2014	DENSITY CORRECTION

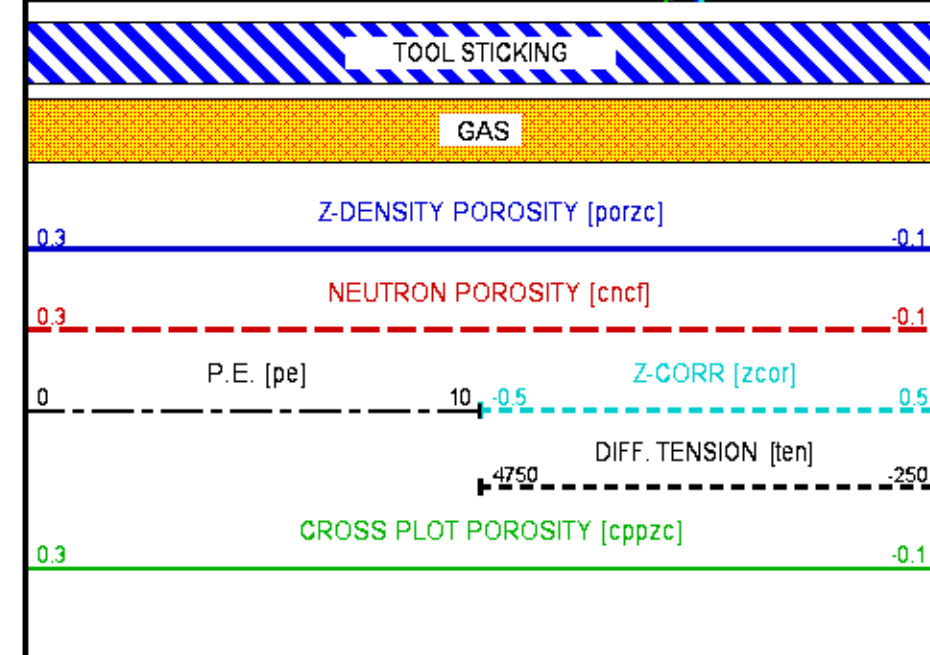
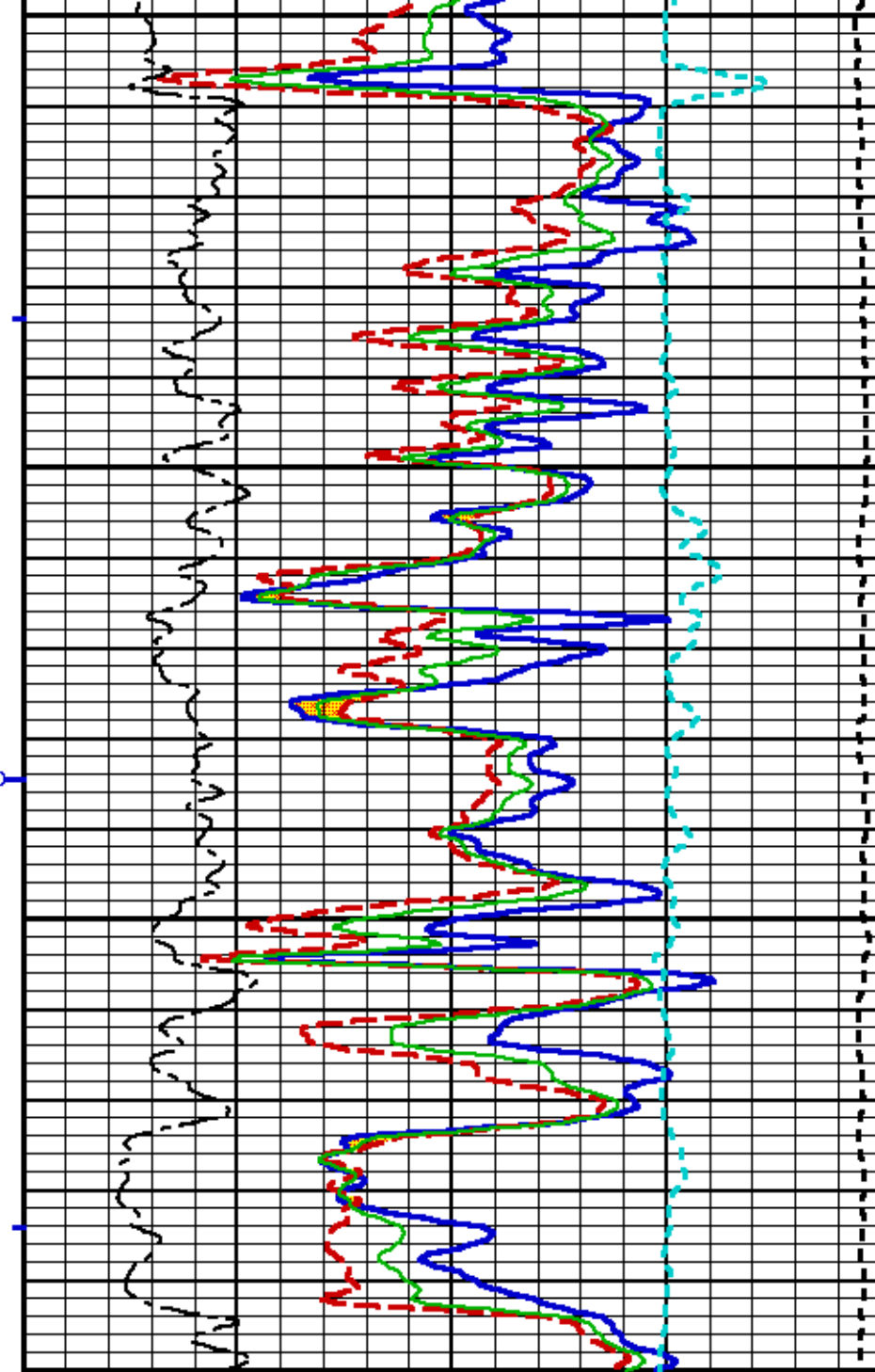
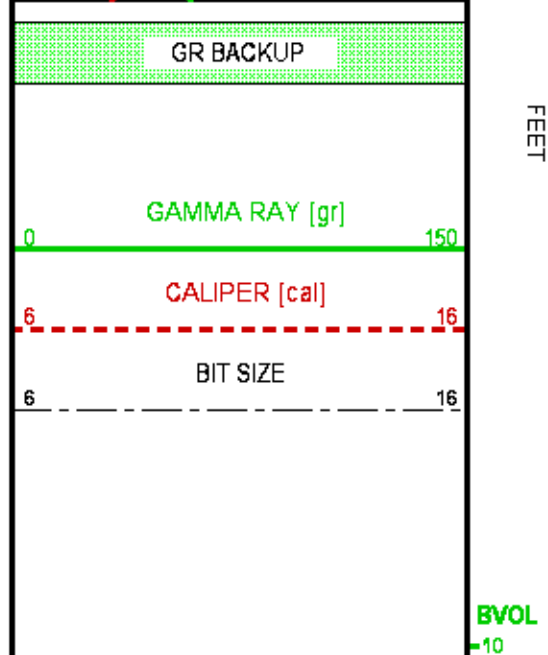
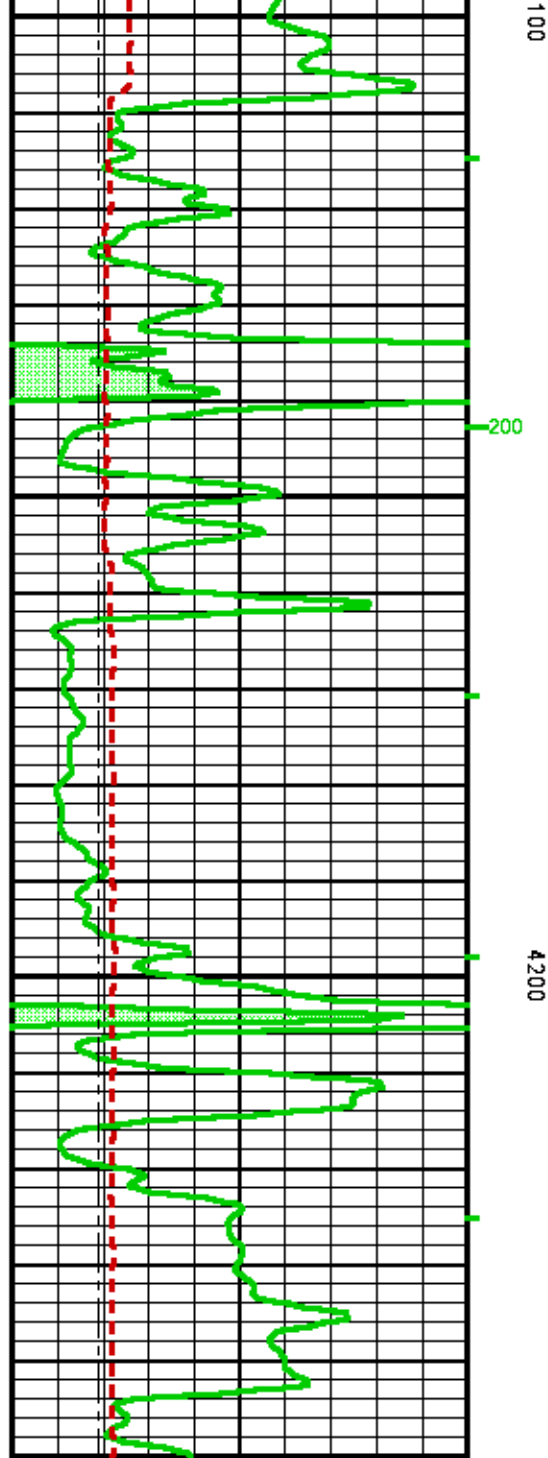
### CURVE MEASURE POINT OFFSET

CURVE	OFFSET (ft)	CURVE	OFFSET (ft)	CURVE	OFFSET (ft)	CURVE	OFFSET (ft)
BIT	0.00	CPPZC	2.50	PORZC	2.50		
CAL	3.00	GR	20.38	TEN	0.00		
CNCF	13.50	PE	2.50	ZCOR	2.50		

**Presentation** : cpu6690:/dat1a/617654/zdl-cn\_REPEATLS.fvpdf [5"/100' Scale]  
**Plot Interval** : 4050 - 4250 Feet

**Data File 1** : F1: cpu6690:/dat1a/617654/repeat\_zdlcn.xtf  
**Created On** : Mar 22 01:24:20 2014  
**Company** : PRONGHORN OPERATING, LLC  
**Well** : PEPPER #1  
**Field** : CHEYENNE WELLS  
**File Interval** : 3972 - 4704.75 Feet  
**OCT** : MSLAM\_DA





100  
1000  
CVOL  
10  
100  
1000

## MAIN LOG 5"/100FT SCALE (DOLOMITE MATRIX 2.85 G/CC)

ECLIPS 6.2i ECLIPS General Release Rel 6.2i Wed Jun 12 12:21:40 CDT 2013

Patches: 5

Plotted: Sat Mar 22 06:39:37 2014

### PARAMETER AND FILTER SUMMARY REPORT

FILE: /dat1a/617654/MSLAM\_DAL~04.prm  
LOGGING MODE: DEPTH DIRECTION: UP  
TOP DEPTH: 337.750 ft BOTTOM DEPTH: 4705.500 ft

#### SYMMETRIC FILTER

MEASUREMENT TYPE	PARAMETER	VALUE	UNITS	INTERVAL (ft)	
TENSION	FILTER Q	medium (1)		TOP	BOTTOM
GR	FILTER Q	medium (1)		"	"

#### BOREHOLE & CEMENT

MEASUREMENT TYPE	PARAMETER	VALUE	UNITS	INTERVAL (ft)	
CASING - BOREHOLE & CEMENT VOLUME	CASING O.D.	5.500	in	TOP	BOTTOM
BIT SIZE	BIT SIZE	7.875	in	"	"

### PARAMETER AND FILTER SUMMARY REPORT

FILE: /dat1a/617654/MSLAM\_DAL~10.prm  
LOGGING MODE: DEPTH DIRECTION: UP  
TOP DEPTH: 3989.000 ft BOTTOM DEPTH: 4649.000 ft

#### SYMMETRIC FILTER

MEASUREMENT TYPE	PARAMETER	VALUE	UNITS	INTERVAL (ft)	
Y AXIS CALIPER	FILTER Q	medium (1)		TOP	BOTTOM
TENSION	FILTER Q	medium (1)		"	"
GR	FILTER Q	medium (1)		"	"
CM	FILTER Q	medium (1)		"	"
CALIPER	FILTER Q	medium (1)		"	"
	FILTER (.h)	medium (1)		"	"
	FILTER (.i)	medium (1)		"	"
ZDL MED RES	FILTER (hrd1*)	medium		"	"
	FILTER (hrd1s*)	medium		"	"
	FILTER (hrd2*)	medium		"	"
	FILTER (hrd2s*)	medium		"	"
	FILTER (soft*)	medium		"	"
ZDL HIGH RES	FILTER (hrd1*)	light		"	"
	FILTER (hrd1s*)	light		"	"
	FILTER (hrd2*)	light		"	"
	FILTER (hrd2s*)	light		"	"

#### BOREHOLE & CEMENT

MEASUREMENT TYPE	PARAMETER	VALUE	UNITS	INTERVAL (ft)	
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MEASUREMENT TYPE	PARAMETER	VALUE	UNITS	INTERVAL (ft)	
CASING - BOREHOLE & CEMENT VOLUME	CASING O.D.	5.500	in	TOP	BOTTOM
	CASING THICKNESS	0.000	in	"	"
BIT SIZE	BIT SIZE	7.875	in	"	"
BOREHOLE CORR DIAMETER SOURCE	CALIPER/FIXED DIA. (cnbh*)	USE CALIPER		"	"
	CALIPER/FIXED DIA. (zdbh*)	USE CALIPER		"	"
BOREHOLE CORR DIAMETER	FIXED DIAMETER (cnbh*)	7.875	in	"	"

### CN PROCESSING

MEASUREMENT TYPE	PARAMETER	VALUE	UNITS	INTERVAL (ft)	
2446 CN MATRIX	2446 MATRIX	LIMESTONE		TOP	BOTTOM
CN SALINITY CORRECTION	SALINITY	0	ppm	"	"
CN TOOL STANDOFF	ENABLE STANDOFF CORR	OFF		"	"
	STANDOFF AMOUNT	0.00	in	"	"
CN CASING & CEMENT CORRECTION	CORRECTION	OFF		"	"
	BIT SIZE BEHIND CSNG	7.875	in	"	"

### ZDL PROCESSING

MEASUREMENT TYPE	PARAMETER	VALUE	UNITS	INTERVAL (ft)	
MUD DENSITY	MUD DENSITY	8.80	lbm/gal	TOP	BOTTOM
DENSITY POROSITY	RHOmatrix	2.710	g/cm3	"	"
	RHOfluid	1.000	g/cm3	"	"
	RHOmatrix (dolo)	2.860	g/cm3	"	"
ZDL	DENX TRACKING	ON		"	"

### CURVE DESCRIPTION REPORT

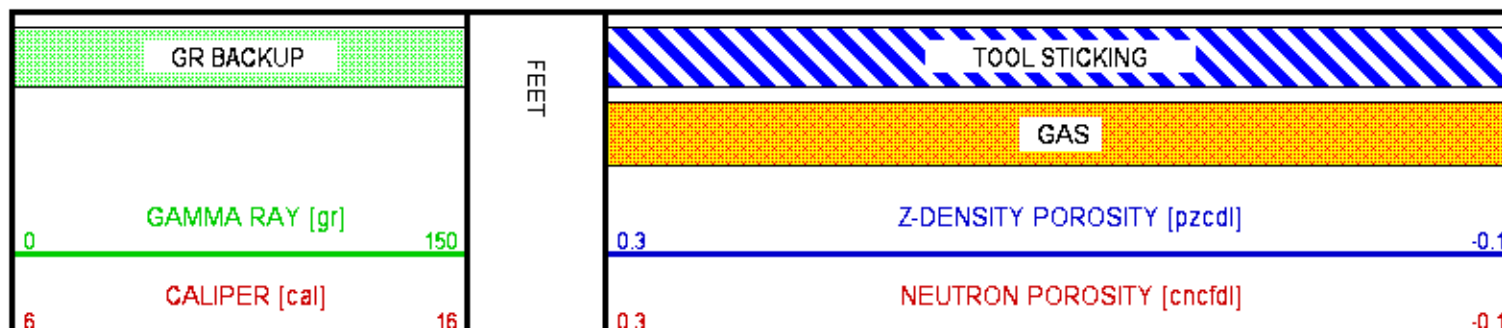
CURVE NAME	CREATION DATE	CURVE DESCRIPTION
F1:BIT	Mar 22 04:04:14 2014	BIT SIZE
F1:BVOL	Mar 22 04:04:14 2014	BOREHOLE VOLUME
F1:CAL	Mar 22 04:04:14 2014	CALIPER
F1:CNCFDL	Mar 22 04:04:14 2014	FIELD NORMALIZED DOLOMITE COMPENSATED NEUTRON POROSITY
F1:CPPZC	Mar 22 04:04:14 2014	CROSSPLOT POROSITY FROM ZDEN
F1:CVOL	Mar 22 04:04:14 2014	CEMENT VOLUME
F1:GR	Mar 22 04:04:14 2014	GAMMA RAY
F1:PE	Mar 22 04:04:14 2014	PHOTO ELECTRIC CROSS-SECTION
F1:PZCDL	Mar 22 04:04:14 2014	CORRECTED POROSITY FOR DOLOMITE MATRIX
F1:TEN	Mar 22 04:04:14 2014	DIFFERENTIAL TENSION
F1:ZCOR	Mar 22 04:04:14 2014	DENSITY CORRECTION

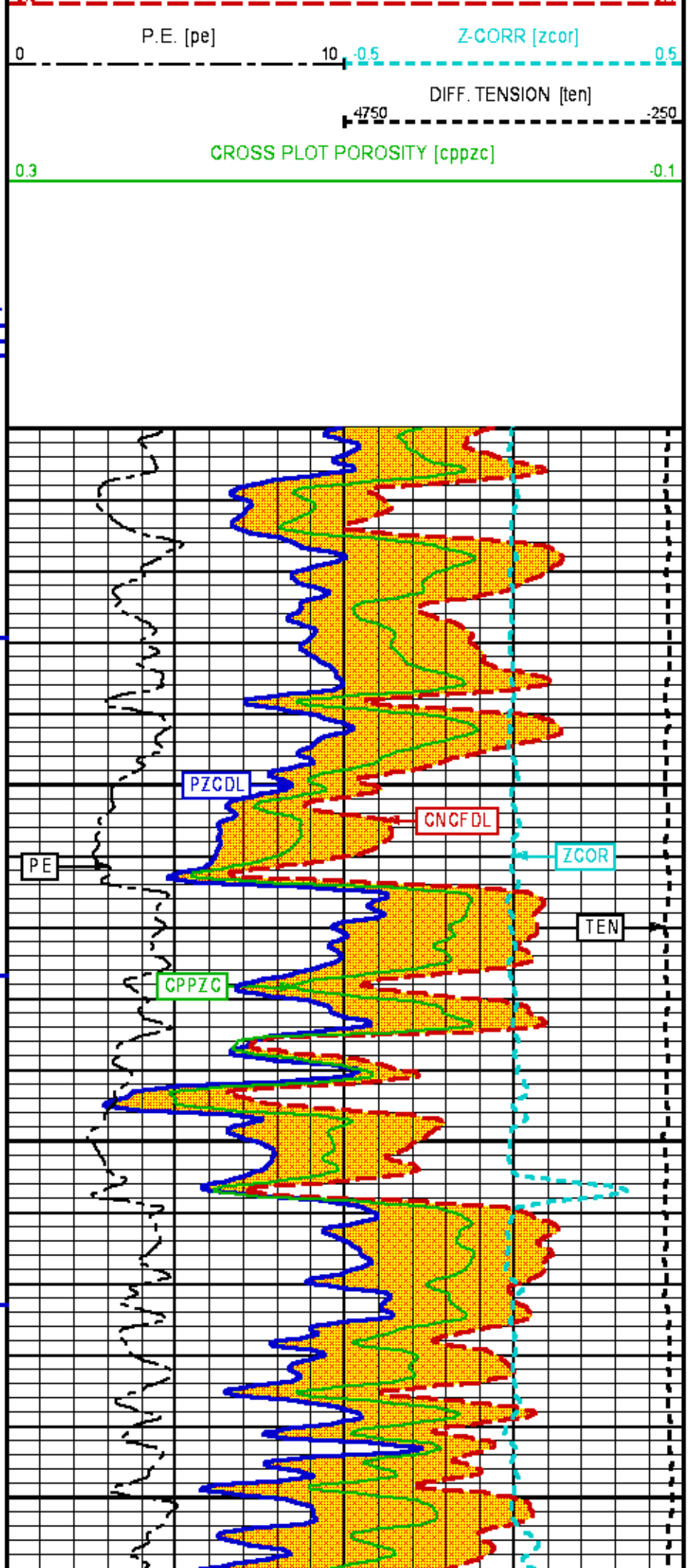
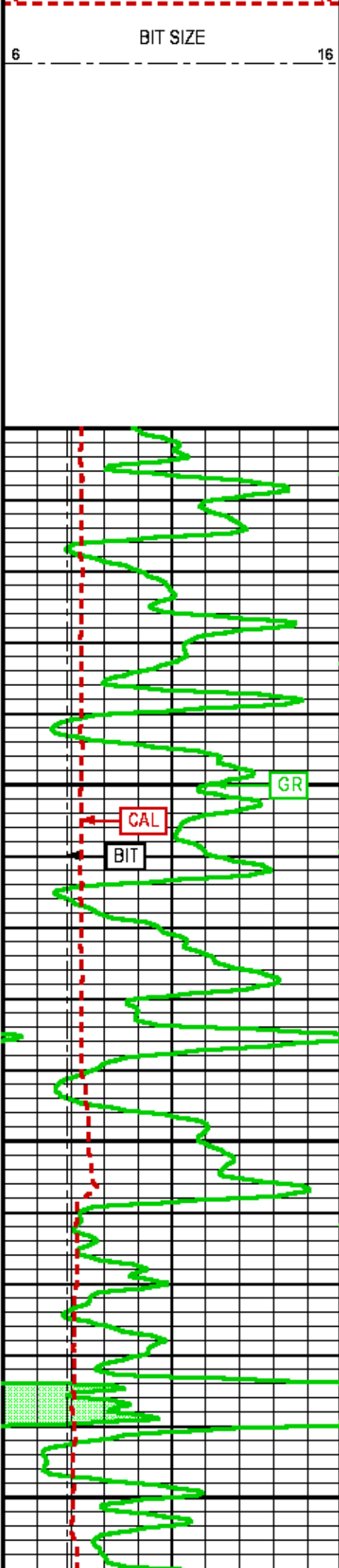
### CURVE MEASURE POINT OFFSET

CURVE	OFFSET (ft)	CURVE	OFFSET (ft)	CURVE	OFFSET (ft)	CURVE	OFFSET (ft)
BIT	0.00	CPPZC	2.50	PZCDL	2.50		
CAL	3.00	GR	20.38	TEN	0.00		
CNCFDL	13.50	PE	2.50	ZCOR	2.50		

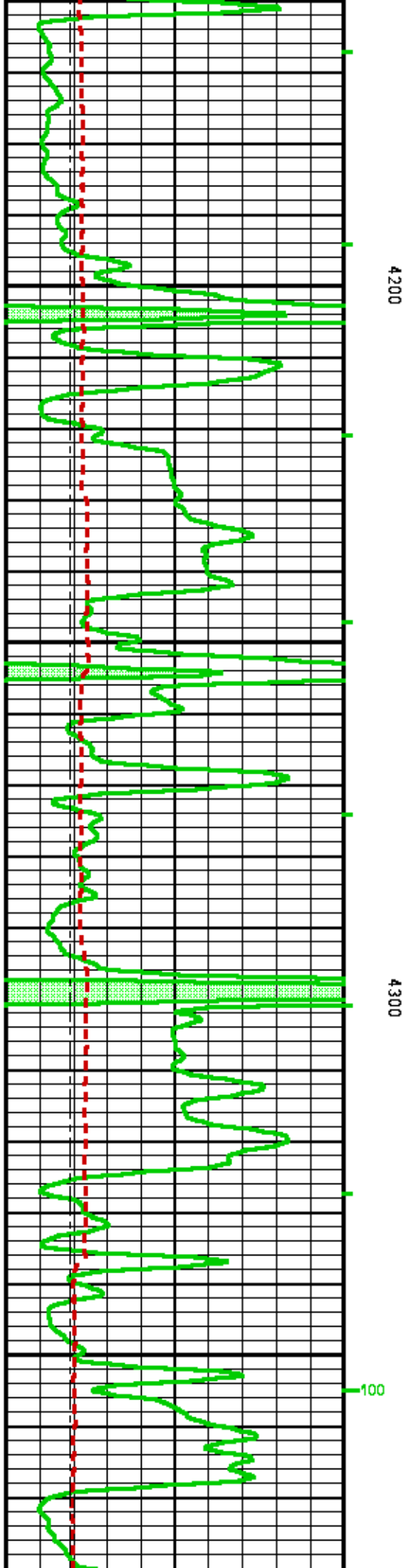
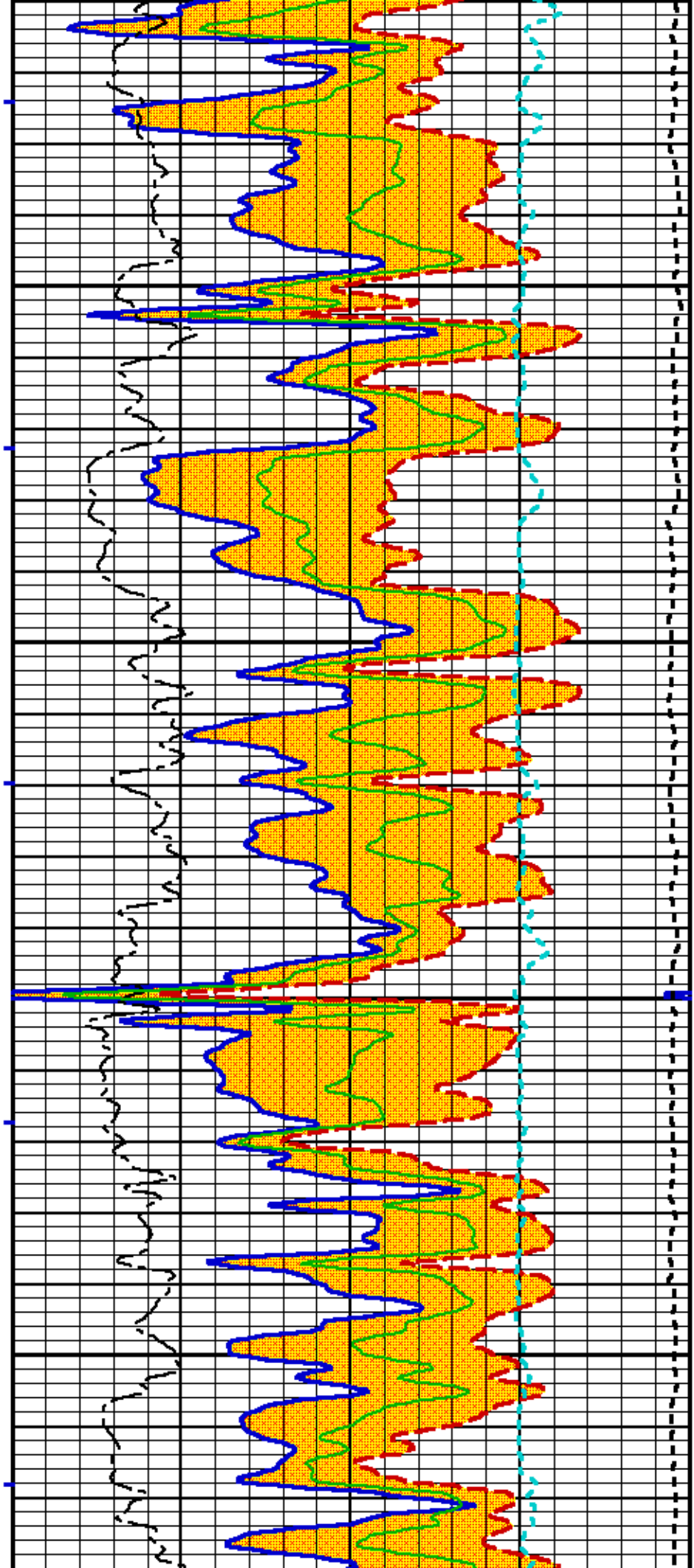
**Presentation** : cpu6690:/dat1a/617654/zdl-cn\_MAINDL.fvpdf [5"/100' Scale]  
**Plot Interval** : 4000 - 4649 Feet

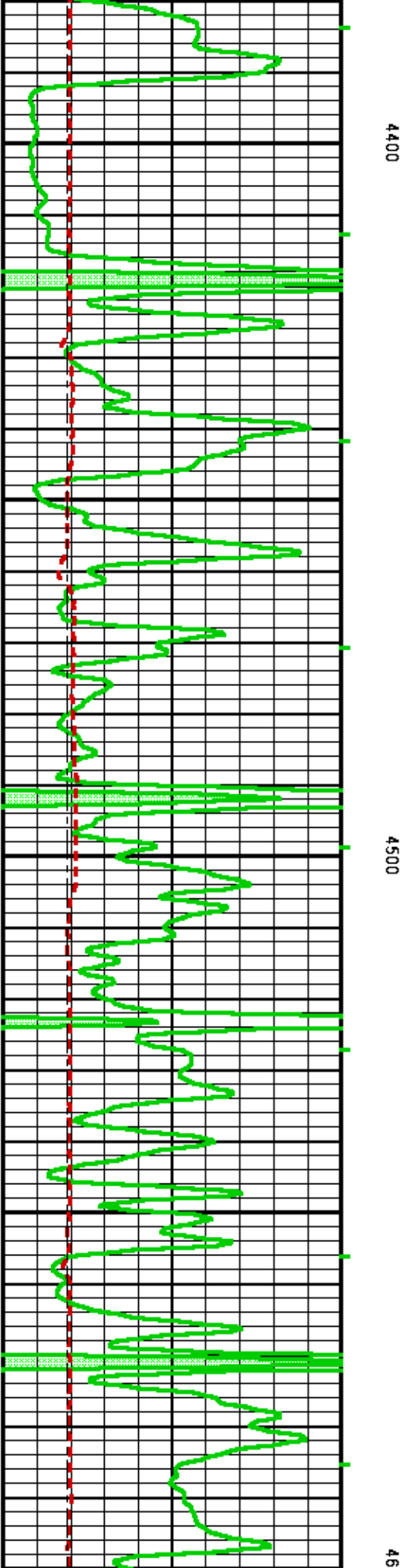
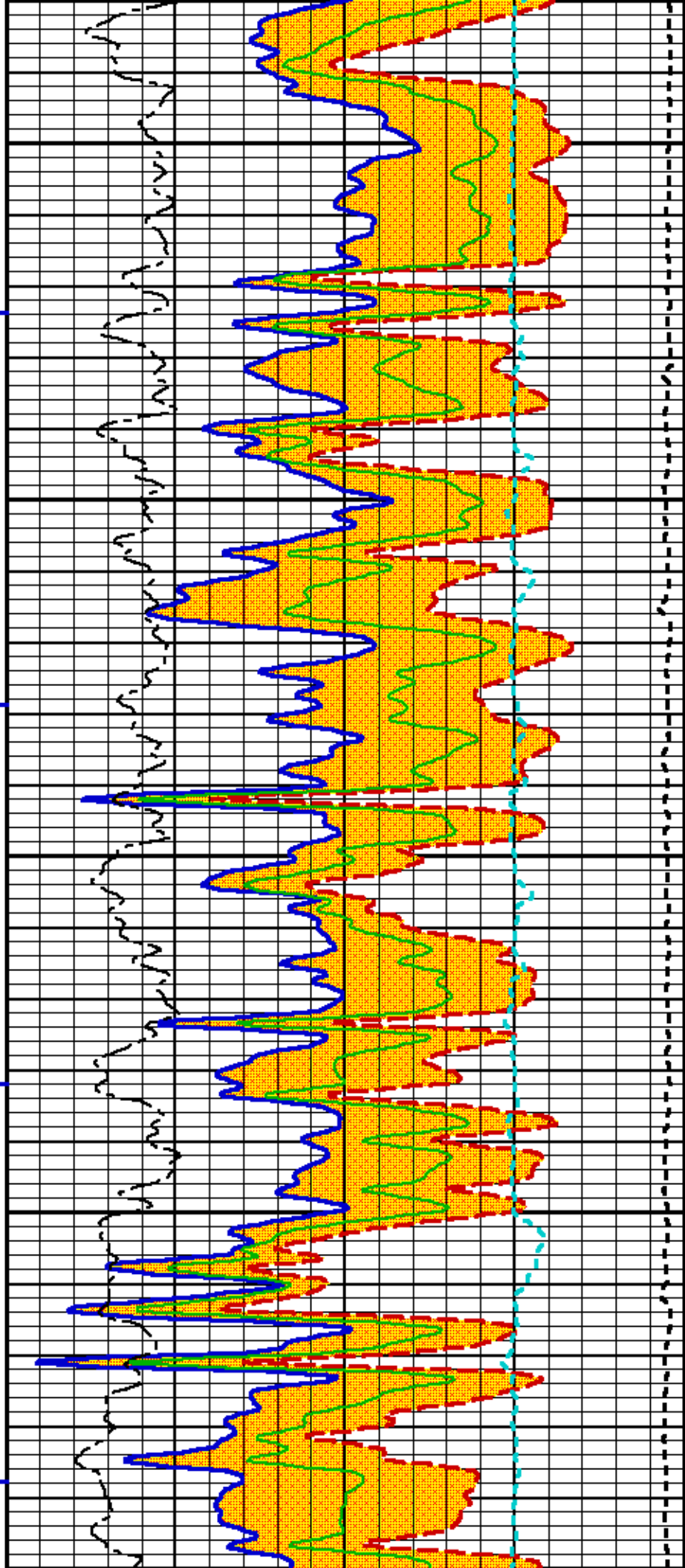
**Data File 1** : F1 : cpu6690:/dat1a/617654/main\_zdlen.xtf  
**Created On** : Mar 21 23:52:28 2014  
**Company** : PRONGHORN OPERATING, LLC  
**Well** : PEPPER #1  
**Field** : CHEYENNE WELLS  
**File Interval** : 3955.25 - 4649 Feet  
**OCT** : MSLAM\_DA



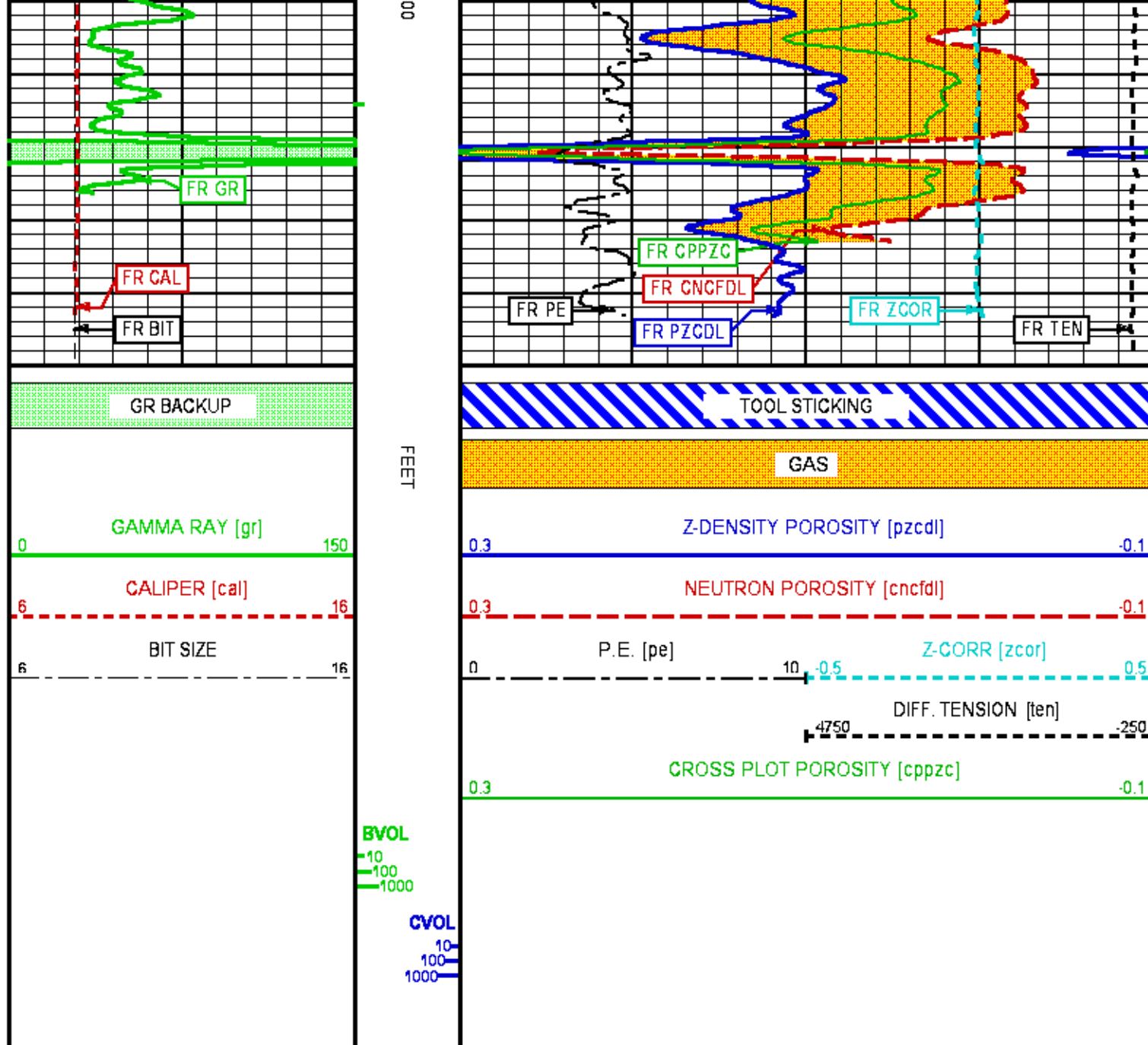












REPEAT LOG 5"/100FT SCALE (DOLOMITE MATRIX 2.85 G/CC)

ECLIPS 6.2i ECLIPS General Release Rel 6.2i Wed Jun 12 12:21:40 CDT 2013

Patches: 5

Plotted: Sat Mar 22 06:40:31 2014

## PARAMETER AND FILTER SUMMARY REPORT

FILE: /dat1a/617654/MSLAM\_DAL~05.prm  
 LOGGING MODE: DEPTH DIRECTION: UP  
 TOP DEPTH: 3992.750 ft BOTTOM DEPTH: 4299.500 ft

## SYMMETRIC FILTER

MEASUREMENT TYPE	PARAMETER	VALUE	UNITS	INTERVAL (%)
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MEASUREMENT TYPE	PARAMETER	VALUE	UNITS	INTERVAL (ft)	
TENSION	FILTER Q	medium (1)		TOP	BOTTOM
GR	FILTER Q	medium (1)		"	"
BOREHOLE & CEMENT					
MEASUREMENT TYPE	PARAMETER	VALUE	UNITS	INTERVAL (ft)	
CASING - BOREHOLE & CEMENT VOLUME	CASING O.D.	5.500	in	TOP	BOTTOM
BIT SIZE	BIT SIZE	7.875	in	"	"

PARAMETER AND FILTER SUMMARY REPORT					
FILE: /dat1a/617654/MSLAM_DAL~09.prm LOGGING MODE: DEPTH      DIRECTION: UP TOP DEPTH: 4006.000 ft      BOTTOM DEPTH: 4704.750 ft					

SYMMETRIC FILTER					
MEASUREMENT TYPE	PARAMETER	VALUE	UNITS	INTERVAL (ft)	
Y AXIS CALIPER	FILTER Q	medium (1)		TOP	BOTTOM
TENSION	FILTER Q	medium (1)		"	"
GR	FILTER Q	medium (1)		"	"
CN	FILTER Q	medium (1)		"	"
CALIPER	FILTER Q	medium (1)		"	"
	FILTER (.h)	medium (1)		"	"
	FILTER (.i)	medium (1)		"	"
ZDL MED RES	FILTER (hrd1*)	medium		"	"
	FILTER (hrd1*)	medium		"	"
	FILTER (hrd2*)	medium		"	"
	FILTER (hrd2*)	medium		"	"
	FILTER (soft*)	medium		"	"
ZDL HIGH RES	FILTER (hrd1*)	light		"	"
	FILTER (hrd1*)	light		"	"
	FILTER (hrd2*)	light		"	"
	FILTER (hrd2*)	light		"	"

BOREHOLE & CEMENT					
MEASUREMENT TYPE	PARAMETER	VALUE	UNITS	INTERVAL (ft)	
CASING - BOREHOLE & CEMENT VOLUME	CASING O.D.	5.500	in	TOP	BOTTOM
	CASING THICKNESS	0.000	in	"	"
BIT SIZE	BIT SIZE	7.875	in	"	"
BOREHOLE CORR DIAMETER SOURCE	CALIPER/FIXED DIA. (cnbh*)	USE CALIPER		"	"
	CALIPER/FIXED DIA. (zdbh*)	USE CALIPER		"	"
BOREHOLE CORR DIAMETER	FIXED DIAMETER (cnbh*)	7.875	in	"	"

CN PROCESSING					
MEASUREMENT TYPE	PARAMETER	VALUE	UNITS	INTERVAL (ft)	
2446 CN MATRIX	2446 MATRIX	LIMESTONE		TOP	BOTTOM
CN SALINITY CORRECTION	SALINITY	0	ppm	"	"
CN TOOL STANDOFF	ENABLE STANDOFF CORR	OFF		"	"
	STANDOFF AMOUNT	0.00	in	"	"
CN CASING & CEMENT CORRECTION	CORRECTION	OFF		"	"
	BIT SIZE BEHIND CSNG	7.875	in	"	"

ZDL PROCESSING					
MEASUREMENT TYPE	PARAMETER	VALUE	UNITS	INTERVAL (ft)	
MUD DENSITY	MUD DENSITY	8.80	lbm/gal	TOP	BOTTOM
DENSITY POROSITY	RHOmatrix	2.710	g/cm3	"	"
	RHOfluid	1.000	g/cm3	"	"
	RHOmatrix (dolo)	2.860	g/cm3	"	"
ZDL	DENX TRACKING	ON		"	"

CURVE DESCRIPTION REPORT		
CURVE NAME	CREATION DATE	CURVE DESCRIPTION
F1:BIT	Mar 22 03:35:11 2014	BIT SIZE
F1:BVOL	Mar 22 03:35:11 2014	BOREHOLE VOLUME

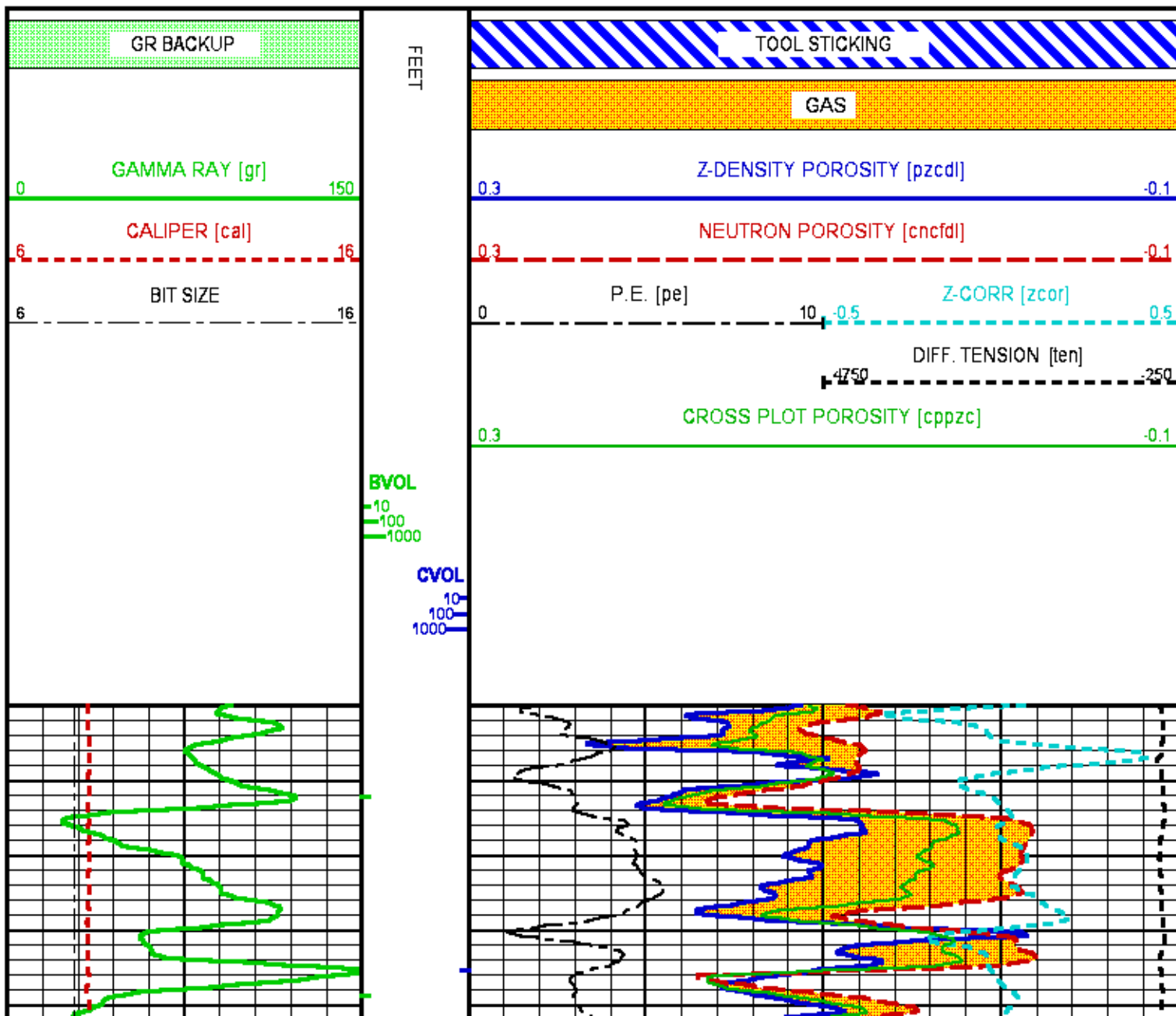
F1:CVOL	Mar 22 03:35:11 2014	BOREHOLE VOLUME
F1:CAL	Mar 22 03:35:11 2014	CALIPER
F1:CNCFDL	Mar 22 03:35:11 2014	FIELD NORMALIZED DOLOMITE COMPENSATED NEUTRON POROSITY
F1:CPPZC	Mar 22 03:35:11 2014	CROSSPLOT POROSITY FROM ZDEN
F1:CVOL	Mar 22 03:35:11 2014	CEMENT VOLUME
F1:GR	Mar 22 03:35:11 2014	GAMMA RAY
F1:PE	Mar 22 03:35:11 2014	PHOTO ELECTRIC CROSS-SECTION
F1:PZCDL	Mar 22 03:35:11 2014	CORRECTED POROSITY FOR DOLOMITE MATRIX
F1:TEN	Mar 22 03:35:11 2014	DIFFERENTIAL TENSION
F1:ZCOR	Mar 22 03:35:11 2014	DENSITY CORRECTION

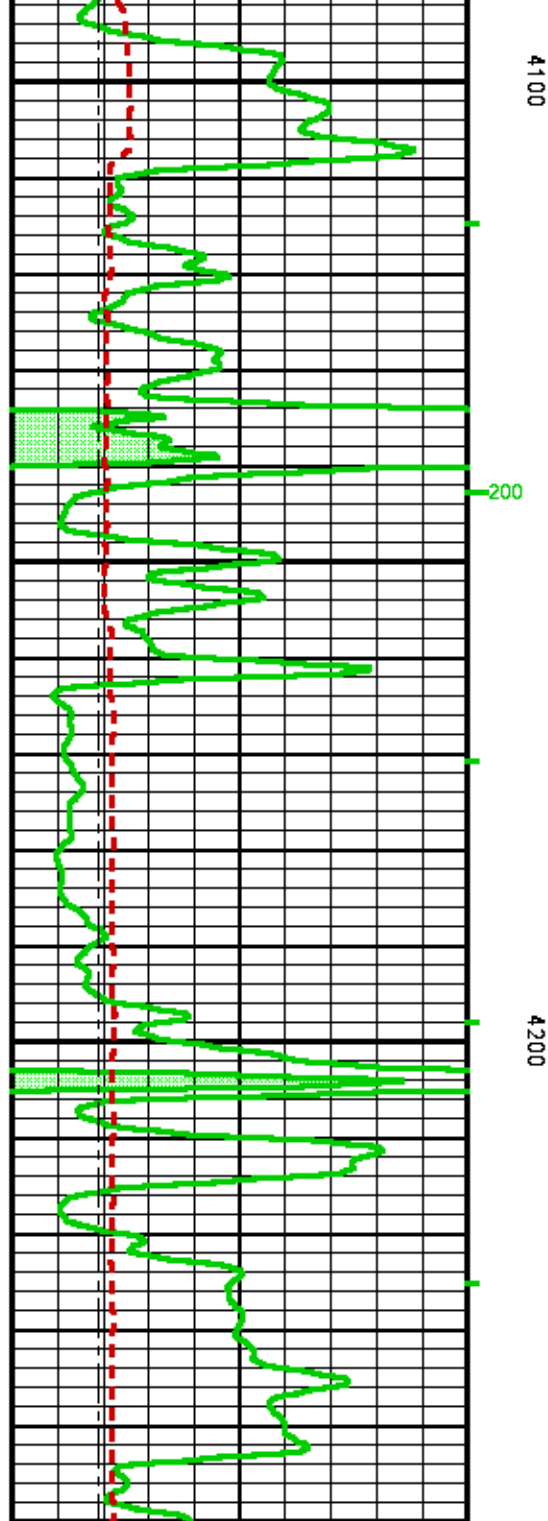
### CURVE MEASURE POINT OFFSET

CURVE	OFFSET (ft)	CURVE	OFFSET (ft)	CURVE	OFFSET (ft)	CURVE	OFFSET (ft)
BIT	0.00	CPPZC	2.50	PZCDL	2.50		
CAL	3.00	GR	20.38	TEN	0.00		
CNCFDL	13.50	PE	2.50	ZCOR	2.50		

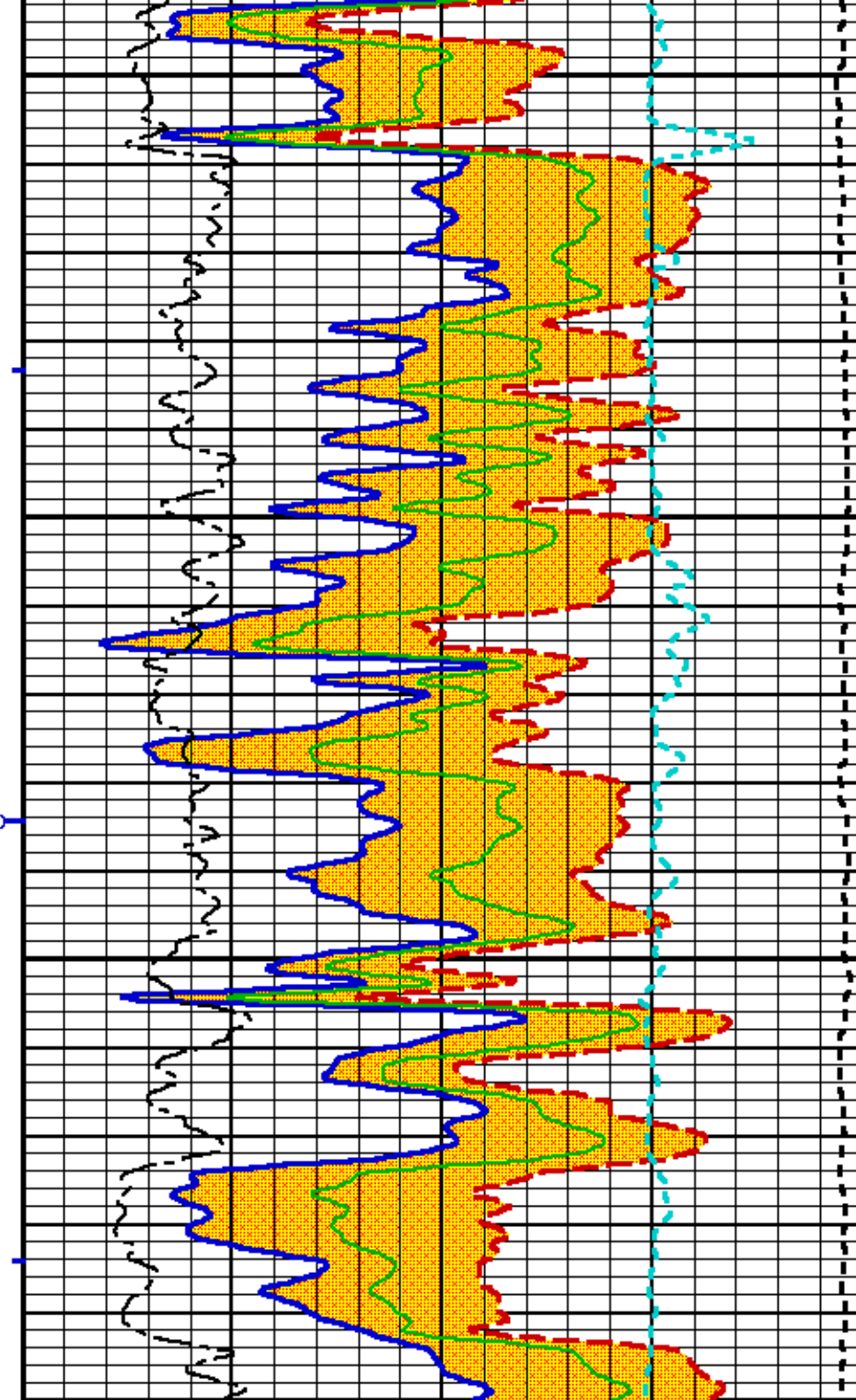
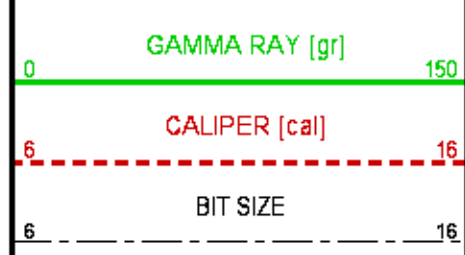
**Presentation** : cpu6690:/dat1a/617654/zdl-cn\_REPEATDL.fvpdf [5"/100' Scale]  
**Plot Interval** : 4050 - 4250 Feet

**Data File 1** : F1: cpu6690:/dat1a/617654/repeat\_zdln.xtf  
**Created On** : Mar 22 01:24:20 2014  
**Company** : PRONGHORN OPERATING, LLC  
**Well** : PEPPER #1  
**Field** : CHEYENNE WELLS  
**File Interval** : 3972 - 4704.75 Feet  
**OCT** : MSLAM\_DA



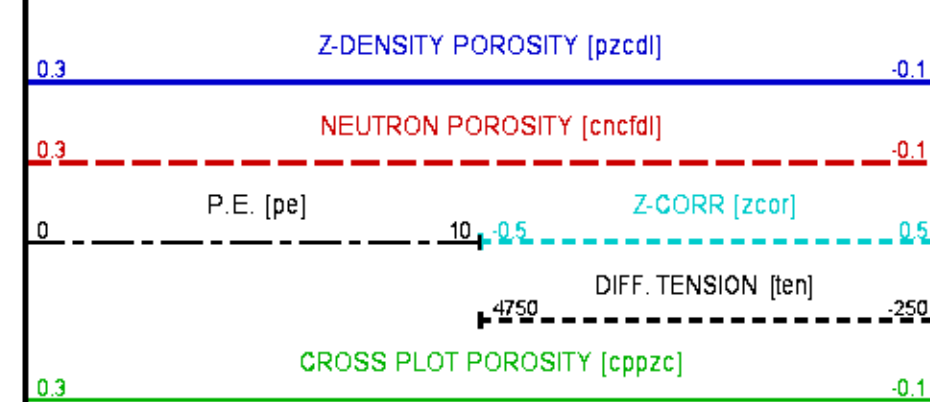


GR BACKUP



TOOL STICKING

GAS



BVOL

10

100

1000

CVOL

10

100

1000

## MAIN LOG 5"/100FT SCALE (BULK DENSITY)

ECLIPS 6.2i ECLIPS General Release Rel 6.2i Wed Jun 12 12:21:40 CDT 2013

Patches: 5

Plotted: Sat Mar 22 07:22:07 2014

### PARAMETER AND FILTER SUMMARY REPORT

FILE: /dat1a/617654/MSLAM\_DAL~04.prm  
 LOGGING MODE: DEPTH DIRECTION: UP  
 TOP DEPTH: 337.750 ft BOTTOM DEPTH: 4705.500 ft

#### SYMMETRIC FILTER

MEASUREMENT TYPE	PARAMETER	VALUE	UNITS	INTERVAL (ft)	
TENSION	FILTER Q	medium (1)		TOP	BOTTOM
GR	FILTER Q	medium (1)		"	"
	FILTER (.i)	medium (1)		"	"

#### BOREHOLE & CEMENT

MEASUREMENT TYPE	PARAMETER	VALUE	UNITS	INTERVAL (ft)	
CASING - BOREHOLE & CEMENT VOLUME	CASING O.D.	5.500	in	TOP	BOTTOM
BIT SIZE	BIT SIZE	7.875	in	"	"

### PARAMETER AND FILTER SUMMARY REPORT

FILE: /dat1a/617654/MSLAM\_DAL~10.prm  
 LOGGING MODE: DEPTH DIRECTION: UP  
 TOP DEPTH: 3989.000 ft BOTTOM DEPTH: 4649.000 ft

#### SYMMETRIC FILTER

MEASUREMENT TYPE	PARAMETER	VALUE	UNITS	INTERVAL (ft)	
Y AXIS CALIPER	FILTER Q	medium (1)		TOP	BOTTOM
TENSION	FILTER Q	medium (1)		"	"
GR	FILTER Q	medium (1)		"	"
	FILTER (.i)	medium (1)		"	"
CN	FILTER (.i)	medium (1)		"	"
CALIPER	FILTER Q	medium (1)		"	"
	FILTER (.h)	medium (1)		"	"
	FILTER (.i)	medium (1)		"	"
ZDL MED RES	FILTER (hrd1*)	medium		"	"
	FILTER (hrd1s*)	medium		"	"
	FILTER (hrd2*)	medium		"	"
	FILTER (hrd2s*)	medium		"	"
	FILTER (soft*)	medium		"	"

#### BOREHOLE & CEMENT

MEASUREMENT TYPE	PARAMETER	VALUE	UNITS	INTERVAL (ft)	
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MEASUREMENT TYPE	PARAMETER	VALUE	UNITS	INTERVAL (ft)	
CASING - BOREHOLE & CEMENT VOLUME	CASING O.D.	5.500	in	TOP	BOTTOM
	CASING THICKNESS	0.000	in	"	"
BIT SIZE	BIT SIZE	7.875	in	"	"
MUD DENSITY	MUD DENSITY	8.80	lbm/gal	"	"
BOREHOLE CORR DIAMETER SOURCE	CALIPER/FIXED DIA. (cnbh*)	USE CALIPER		"	"
	CALIPER/FIXED DIA. (zdbh*)	USE CALIPER		"	"
BOREHOLE CORR DIAMETER	FIXED DIAMETER (cnbh*)	7.875	in	"	"

### CN PROCESSING

MEASUREMENT TYPE	PARAMETER	VALUE	UNITS	INTERVAL (ft)	
2446 CN MATRIX	2446 MATRIX	LIMESTONE		TOP	BOTTOM
CN SALINITY CORRECTION	SALINITY	0	ppm	"	"
CN TOOL STANDOFF	ENABLE STANDOFF CORR	OFF		"	"
	STANDOFF AMOUNT	0.00	in	"	"
CN CASING & CEMENT CORRECTION	CORRECTION	OFF		"	"
	BIT SIZE BEHIND CSNG	7.875	in	"	"

### ZDL PROCESSING

MEASUREMENT TYPE	PARAMETER	VALUE	UNITS	INTERVAL (ft)	
MUD DENSITY	MUD DENSITY	8.80	lbm/gal	TOP	BOTTOM
DENSITY POROSITY	RHOmatrix	2.710	g/cm3	"	"
	RHOfluid	1.000	g/cm3	"	"
ZDL	DENX TRACKING	ON		"	"

### CURVE DESCRIPTION REPORT

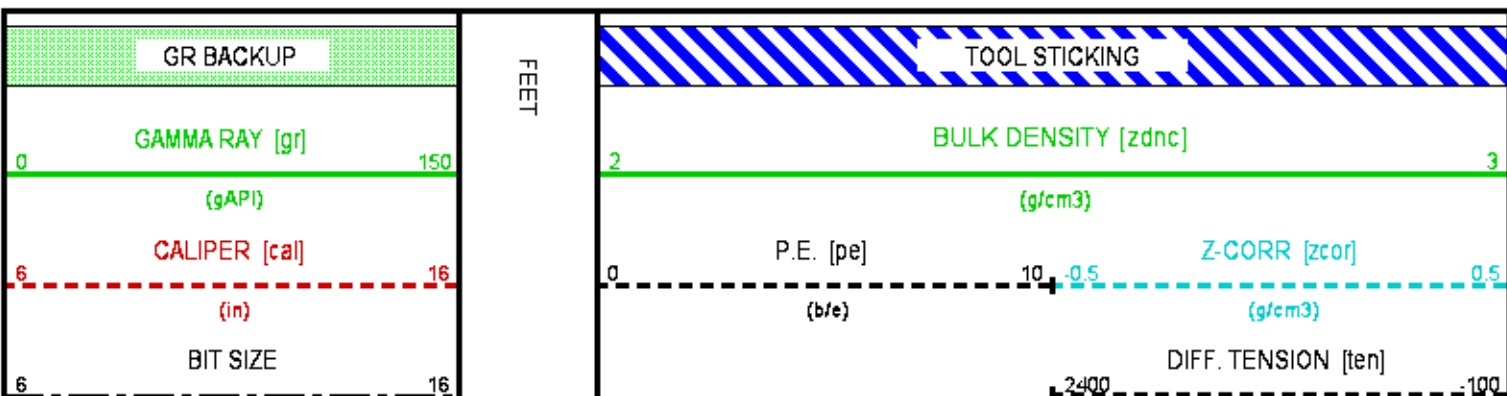
CURVE NAME	CREATION DATE	CURVE DESCRIPTION
F1:BIT	Mar 22 04:04:14 2014	BIT SIZE
F1:BVOL	Mar 22 04:04:14 2014	BOREHOLE VOLUME
F1:CAL	Mar 22 04:04:14 2014	CALIPER
F1:CVOL	Mar 22 04:04:14 2014	CEMENT VOLUME
F1:GR	Mar 22 04:04:14 2014	GAMMA RAY
F1:PE	Mar 22 04:04:14 2014	PHOTO ELECTRIC CROSS-SECTION
F1:TEN	Mar 22 04:04:14 2014	DIFFERENTIAL TENSION
F1:ZCOR	Mar 22 04:04:14 2014	DENSITY CORRECTION
F1:ZDNC	Mar 22 04:04:14 2014	BOREHOLE SIZE/MUD WEIGHT CORRECTED DENSITY

### CURVE MEASURE POINT OFFSET

CURVE	OFFSET (ft)	CURVE	OFFSET (ft)	CURVE	OFFSET (ft)	CURVE	OFFSET (ft)
BIT	0.00	GR	20.38	TEN	0.00	ZDNC	2.50
CAL	3.00	PE	2.50	ZCOR	2.50		

**Presentation** : cpu6690:/dat1a/617654/zdl-cn\_bulk.fvpdf [5"/100' Scale]  
**Plot Interval** : 4000 - 4649 Feet

**Data File 1** : F1: cpu6690:/dat1a/617654/main\_zdln.xtf  
**Created On** : Mar 21 23:52:28 2014  
**Company** : PRONGHORN OPERATING, LLC  
**Well** : PEPPER #1  
**Field** : CHEYENNE WELLS  
**File Interval** : 3955.25 - 4649 Feet  
**OCT** : MSLAM\_DA



(in)

(lbf)

BVOL

10  
100  
1000

CVOL

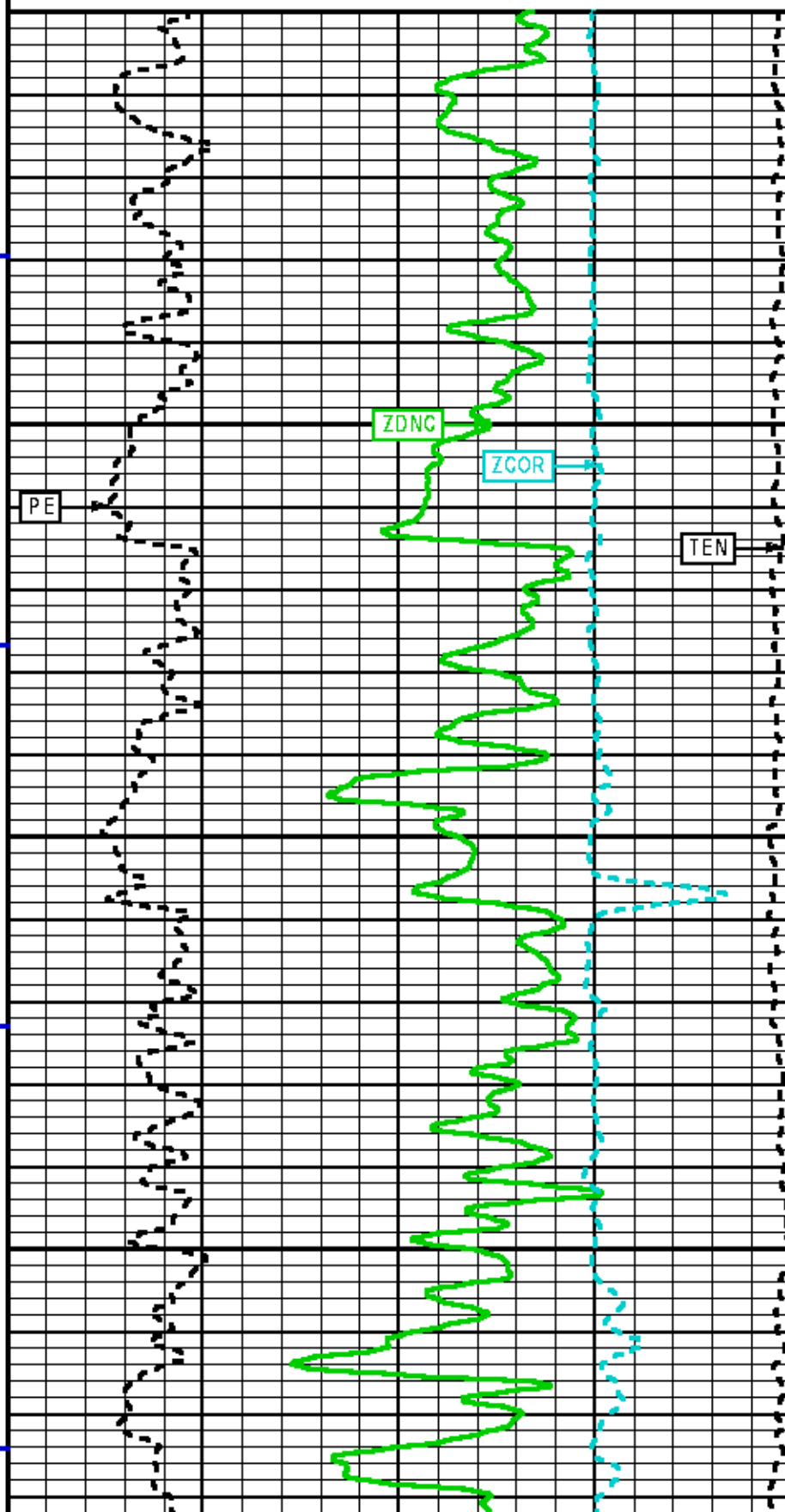
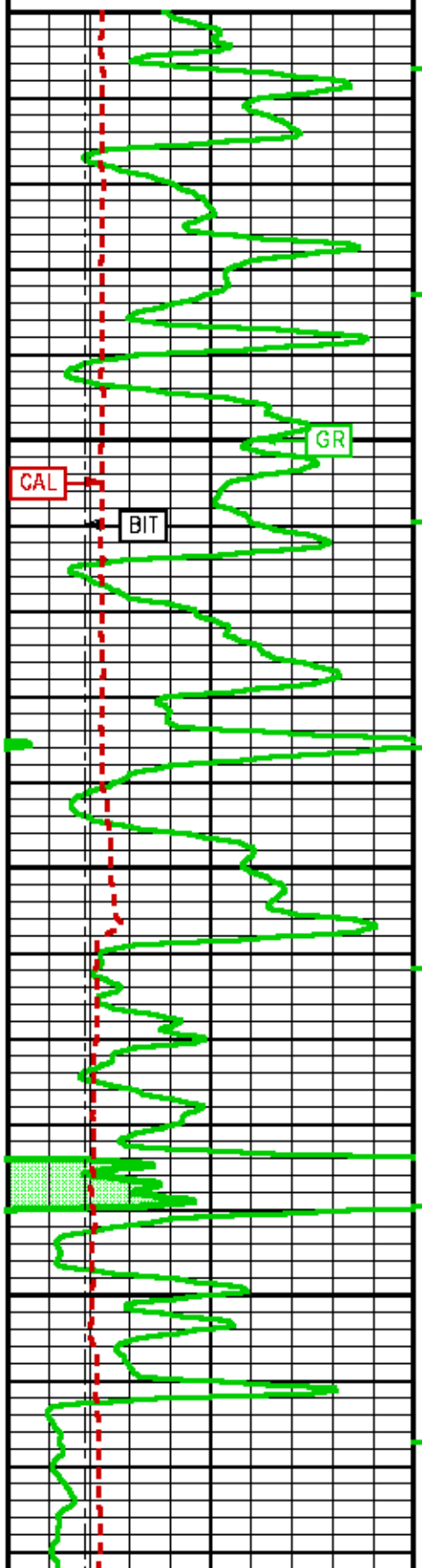
10  
100  
1000

4000

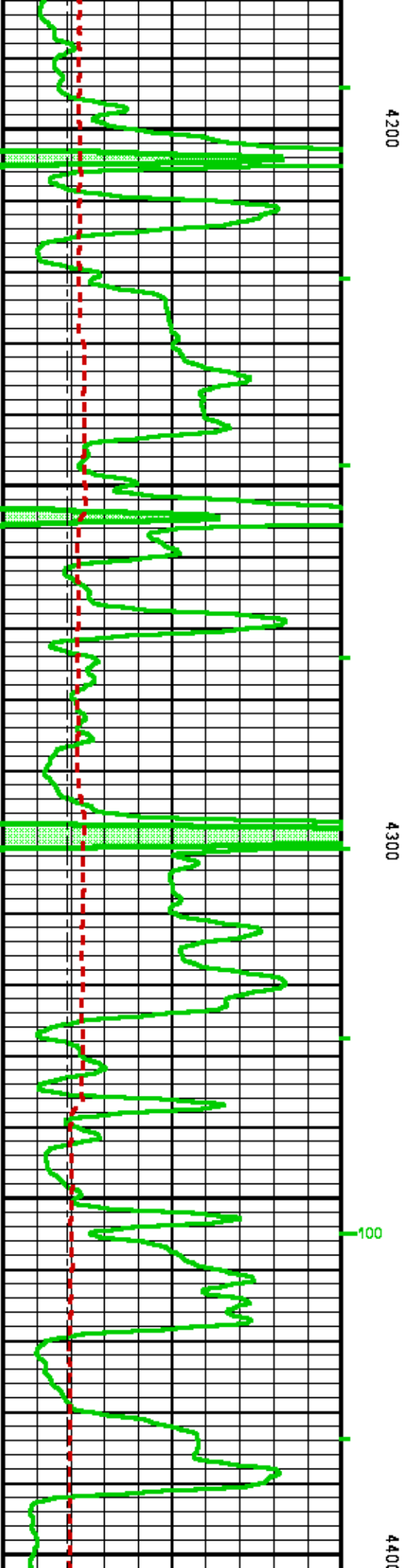
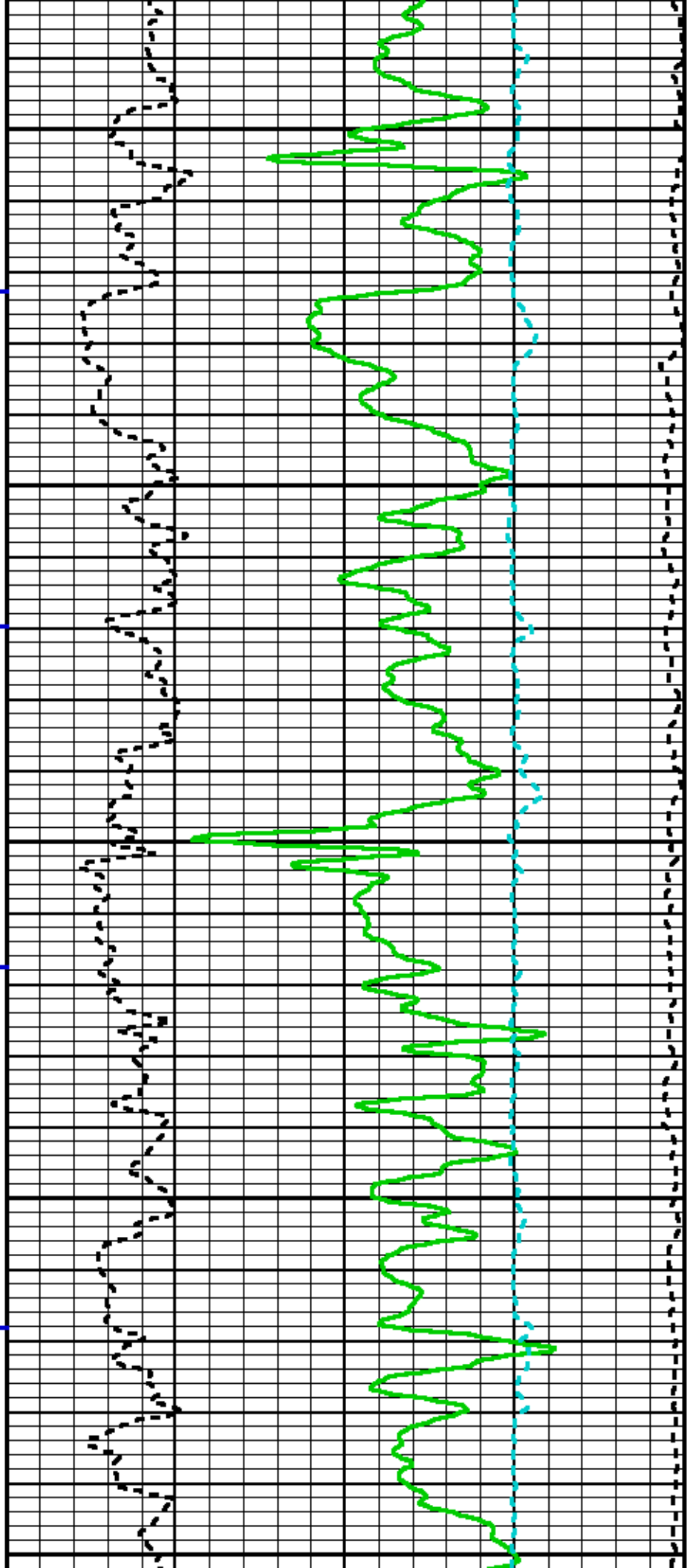
4100

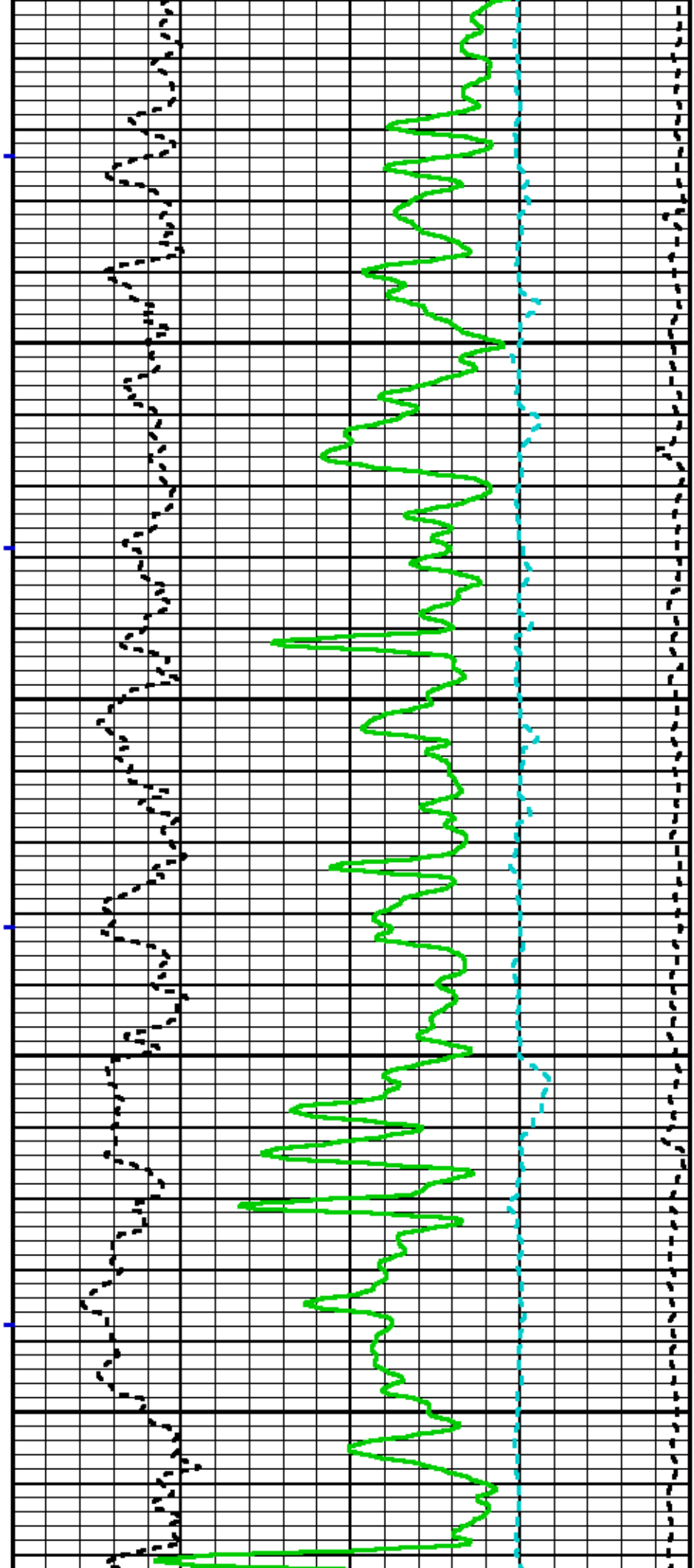
200

100



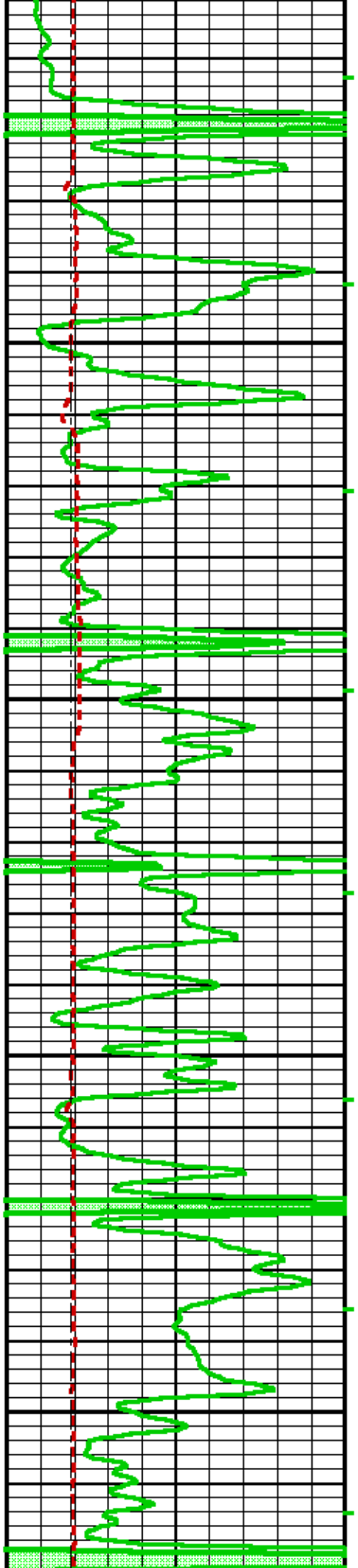


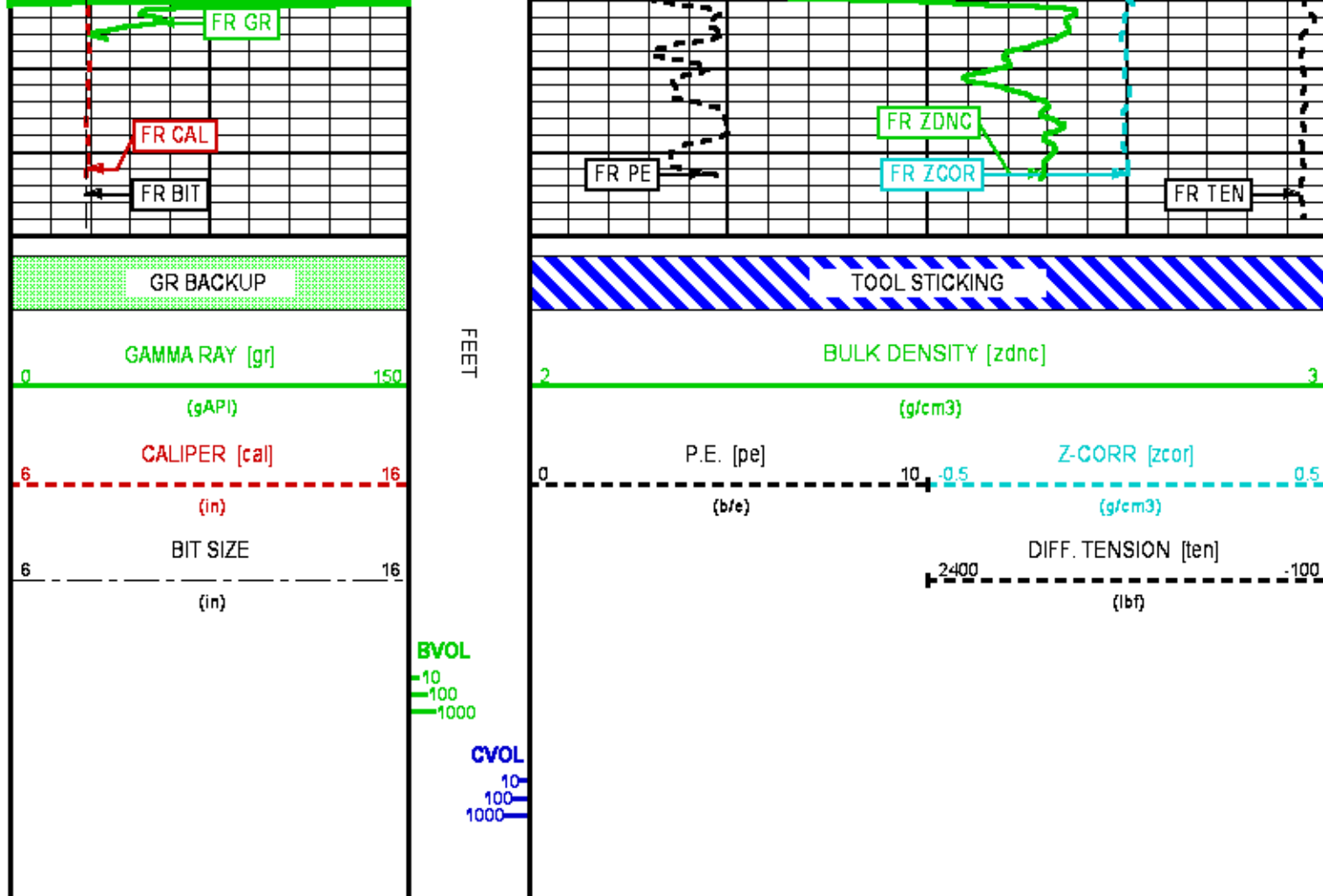




4500

4600





## CALIBRATION / VERIFICATION SUMMARY

Source File: /dat1a/617654/MSLAM.tp1

### GR PRIMARY CALIBRATION SUMMARY

TOOL #:	1329XA 370718			DATE/TIME PERFORMED:	Wed Mar 19 11:26:48 2014		
	UNIT #:	3882TD HL669D		CALB JIG #:	47D2NK BA-857		
	BACKGROUND (cts/s)	CALBRTR ON (cts/s)	CR DIFF (cts/s)	MULT	BACKGROUND (gAPI)	CALBRTR ON (gAPI)	CALBRTR (gAPI)
GR	183.33	1131.18	947.8	0.158	29.01	179.01	150

### GR PRIMARY VERIFICATION SUMMARY

TOOL #:	1329XA 370718	DATE/TIME PERFORMED:	Wed Mar 19 11:34:17 2014			
UNIT #:	3882TD HL669D	VERI JIG #:	47D2NK BA-857			
	BACKGROUND	CALBRTR ON	MULT	BACKGROUND	CALBRTR ON	DIFF.
	(cts/s)	(cts/s)		(gAPI)	(gAPI)	(gAPI)
GR	187.98	1132.84	0.158	29.75	179.28	149.53
						140.00 180.00

### GR BEFORE LOG VERIFICATION SUMMARY

TOOL #:	1329XA 370718	DATE/TIME PERFORMED:	Wed Mar 19 11:38:23 2014	DAYS SINCE CAL:	0
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UNIT #: 3882TD HL669D VER JIG #: 4702NK BA-857

	BACKGROUND (cts/s)	CALBRTR ON (cts/s)	MULT	BACKGROUND (gAPI)	CALBRTR ON (gAPI)	DIFF. (gAPI)
GR	186.80	1137.91	0.158	29.56	180.08	150.52
						129.53 159.53

## CN PRIMARY CALIBRATION SUMMARY

TOOL #: 2446XA 10400611 DATE/TIME PERFORMED: Wed Mar 5 13:27:39 2014

UNIT #: 3882TD HL669D CALIBRATOR #: 2437XB 12170130 SOURCE #: 4717XS N--943

	MEASURED CPS	DEADTM CORR CPS	DTC SSNLSN	NOMINAL SSNLSN	CORRECTION FACTOR	POROSITY (pu)
LSN	585.85	594.20				
SSN	1505.04	1551.75				
RATIO			2.61149	2.75100	1.05342	
					0.97000 1.07000	
CN						21.358

## CN PRIMARY VERIFICATION SUMMARY

TOOL #: 2446XA 10400611 DATE/TIME PERFORMED: Wed Mar 5 13:35:17 2014

UNIT #: 3882TD HL669D ICE BLOCK #: 4717ND VD-023

	MEASURED CPS	DEADTM CORR CPS	DTC SSNLSN	CORRECTION FACTOR	DTC CORR SSNLSN	POROSITY (pu)
LSN	1728.03	1802.84				
SSN	3991.72	4338.14				
RATIO			2.40628	1.05342	2.53597	
CN						18.346

## CAL PRIMARY CALIBRATION SUMMARY

TOOL #: 2234XA 120009 DATE/TIME PERFORMED: Wed Mar 5 11:08:22 2014

UNIT #: 3882TD HL669D

	SMALL RING	LARGE RING	MULT	ADD	SMALL RING (in)	LARGE RING (in)
CALIPER	1104.8	1836.0	0.00838	-1.37951	7.875	14.000

## ZDL PRIMARY CALIBRATION SUMMARY

TOOL: 2234XA 120009 DATE/TIME PERFORMED: Wed Mar 5 11:53:24 2014

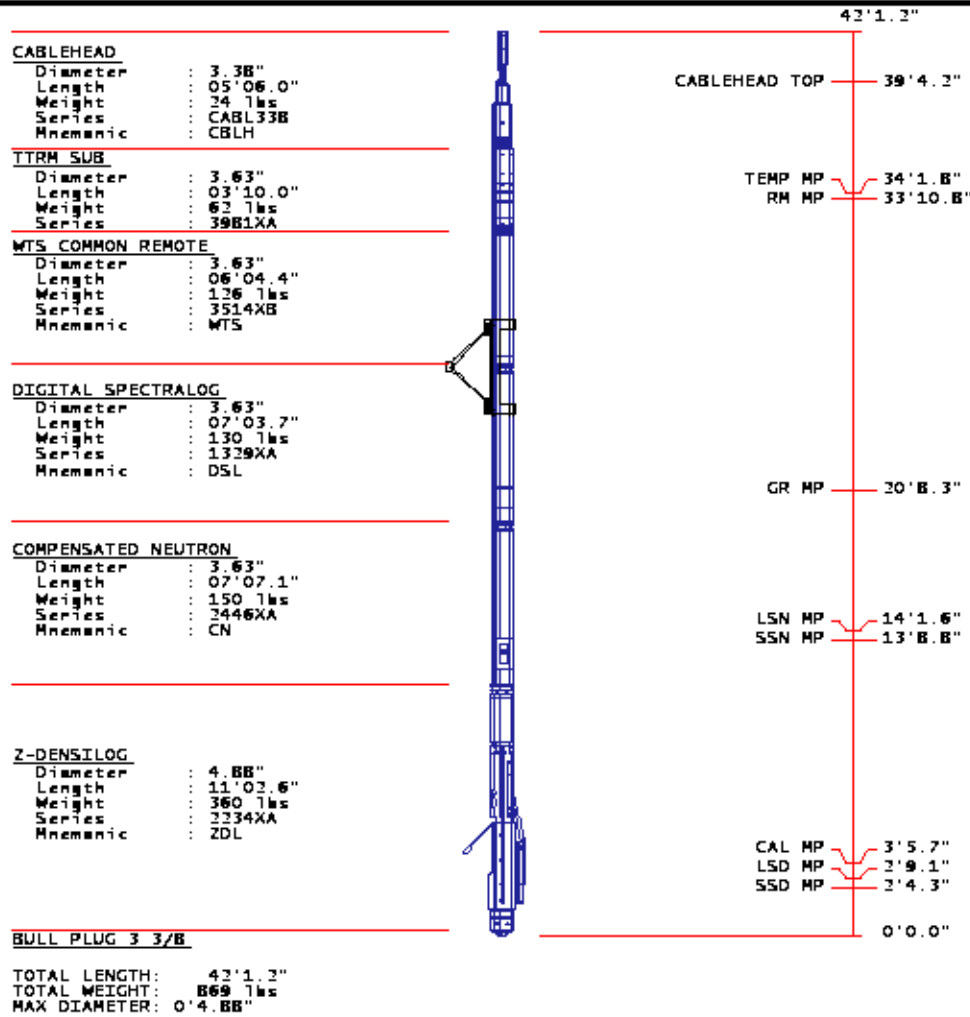
UNIT: 3882TD HL669D CALB BLKS: 2225XA 094299 CS SRC: 4703NT PP14058B

	SS CS PK (Channel)	LS CS PK (Channel)	SS_BKGD (cps)	LS BKGD (cps)	SS (cps)	LS (cps)	SHR	DEN (g/cm3)	CORR (g/cm3)	PE (b/e)
	224.6	226.7	1216.7	1559.9	22853.3	11675.8	0.646	1.699	0.003	2.150
	220.0 230.0	220.0 230.0					0.565 0.665			
MG (LO PE)										
AL	13311.7	1176.1						2.695	-0.009	

AL + SHIM	18153.7	2037.8	2.813	0.157
MG + SHIM (HI PE)	11189.2	5584.5	0.260	8.700
			0.210	0.270
RATIO AL + SHIM/AL	1.36	1.73		
	1.32	1.42	1.64	1.84
RATIO MG/AL	1.72	9.93		
	1.66	1.78	9.40	10.20

## INSTRUMENT CONFIGURATION

Source File: /dat1a/617654/MSLAM\_DAL/asm-tdg



COMPANY PRONGHORN OPERATING, LLC  
WELL PEPPER #1  
FIELD CHEYENNE WELLS  
COUNTY CHEYENNE STATE COLORADO

FILE NO: OH083650  
API NO: 05017077820000

LOCATION:  
SHL: 1691' FNL & 2034' FEL

ELEVATIONS:  
KB 4281 FT  
DF 4280 FT  
GL 4264 FT

SEC 5 TWP 14S RGE 44W

DATE 22 MAR 2014

