Schlumberger

GEOFRAME
PROCESSED
INTERPRETATION

FMIImage
8273'-6170'

Scale 5" - True Dip

*A Mark of Schlumberger

Using the following logs:

COMPANY: Carrizo Oil & Gas Inc
WELL: WEP 4-28-11-3-64
FIELD: Wildcat
County: Adams
State: Colorado
COUNTRY: USA
Date Logged: 2012/12/16 Date Processed: 16-Dec-2012
Well Location: Sec. 28, T3S, R64W
SHL: 369 FNL X 1164 FWL NWNW

Elevations: KB: DF: GL:

API Number: 05-001-09753-0000 Job Number:

FOLD HERE The well name, location and borehole reference data were furnished by the customer.

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Field Recording:	Location: Ft. Morgan, CO	Software Version: 20C0-999	Engineer: Allison Johnston
Office Recording:	ICS Center:	Baseline: GF 4.5	Log Analyst: M Yoshino

Mud and Borehole Measurements:

Rm @ Measured Temperature: 1.028ohm.m @ 58.6degF	BHT: 195.4degF	Bitsize: 8.75in
Rmf @ Measured Temperature: 0.8224ohm.m @ 58.6degF	Type Fluid in Hole:	Chemical Gel
Rmc @ Measured Temperature: 1.2336ohm.m @ 58.6degF	Mud Density: 9.3lbm/gal	

Remarks:

FMI was bulk shifted 1' downhole.
PEx data was depth adjusted to match FMI image.
Mud Resistivity (Rm) of 0.26 ohms (at Max Temp=195.4 deg F) was used for aperture computation.
Facies log generated by PEx Quicklook
NPOR and DPHZ were recomputed on limestone matrix (above 7766') and sandstone matrix (below 7766') on 12/18/2012.

MaxWell_2Dlis FMI .SCA [C4444
Horizontal Scale: 1 : 9.162
Orientation North

0 120 240 360

Resistive FMI Image Conductive

GR_FMI
0 (gAPI) 150

GR_PEX
0 (gAPI) 150

GR_PEX_wrap
150 (gAPI) 300

GR_FMI_wrap
150 (gAPI) 300

Tensile_Induced_Fracture

(Trace)

Reference : North

🟩

Tops

Breakout

(Trace)

Reference : North

Fault
(Trace)
Reference : North
Apertures
(10^N in)
-5 -4 -3 -2 -1 0 1

Open_PartHealed_Fracture
(Trace)
Reference : North
Apertures
(10^N in)
-5 -4 -3 -2 -1 0 1

Healed_Continuous_Fracture
(Sinusoid)
Orientation North

Fault
(Trace)
Reference : North
Apertures
(10^N in)
-5 -4 -3 -2 -1 0 1

Microfault
(Trace)
Reference : North
Apertures
(10^N in)
-5 -4 -3 -2 -1 0 1

Open_Lithbound_Fracture
(Trace)
Reference : North
Apertures
(10^N in)
-5 -4 -3 -2 -1 0 1

Healed_Lithbound_Fracture

(Trace)

Reference : North

Shear_Induced_Fracture

(Trace)

Reference : North

MD
1 : 240
ft

C1@MaxWel
6 (in) 12

C2@MaxWel
6 (in) 12

INCLINOME
Borehole drift
0 Deg 10

SRES@MaxWell
0.1 (ohm.m) 1000

AHT10.WELLED
0.1 (ohm.m) 1000

AHT20.WELLED
0.1 (ohm.m) 1000

AHT30.WELLED
0.1 (ohm.m) 1000

AHT60.WELLED
0.1 (ohm.m) 1000

AHT90.WELLED
0.1 (ohm.m) 1000

NetFracPoro
( )

Breakout
0 (1/ft) 10

Induced
10 (1/ft) 0

Breakout

Induced

Fault
Mean Aperture
0.0001 (in) 1

en_Lithbound_Fractu
Mean Aperture
0.0001 (in) 1

n_Continuous_Fract
Mean Aperture
0.0001 (in) 1

Microfault
Mean Aperture
0.0001 (in) 1

n_PartHealed_Fract
Mean Aperture
0.0001 (in) 1

Clay

PExL

DATA
0 ( ) 1

MD
1 : 240
ft

X Over

PEFZ PEFZ@Ma
0 ( ) 10

NPOR.WELLEDI
0.4 (ft3/ft3) -0.1

DPHZ.WELLEDI
0.4 (ft3/ft3) -0.1

NetOpenTL
( )

NetHealedTL
( )

N
W E
S

True Dip
Induced_Fractures_All

N
W E
S

True Dip
Healed_Fractures_All

N
W E
S

True Dip
Open_Fractures_All

N
W E
S

True Dip
Faults_and_Microfaults_All

Comments

Open Frac Tracelength
0 (1/ft) 5

Open Frac Tracelength

Healed_Tracelength
5 (1/ft) 0

Healed_Tracelength

Fracture Porosity
0 (ft3/ft3) 0.01

Fracture Porosity

Healed_Continuous_Fracture
True Dip
-5 (Deg) 95

Tensile_Induced_Fracture
True Dip
-5 (Deg) 95

Open_Lithbound_Fracture
True Dip
-5 (Deg) 95

Fault
True Dip
-5 (Deg) 95

Open_Continuous_Fracture
True Dip
-5 (Deg) 95

Microfault
True Dip
-5 (Deg) 95

Shear_Induced_Fracture
True Dip
-5 (Deg) 95

Open_PartHealed_Fracture
True Dip
-5 (Deg) 95

Bed_Boundary
True Dip
-5 (Deg) 95

Deformed_Bedding
True Dip
-5 (Deg) 95

Breakout
True Dip
-5 (Deg) 95

Sedimentary_Bedding
True Dip
-5 (Deg) 95

Healed_Lithbound_Fracture
True Dip
-5 (Deg) 95

#Open
( )

#Heal
( )

N
W E
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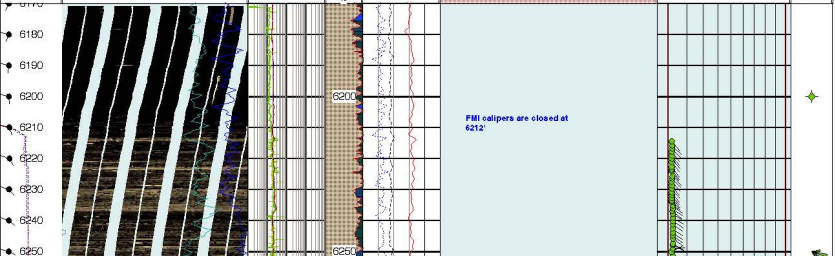
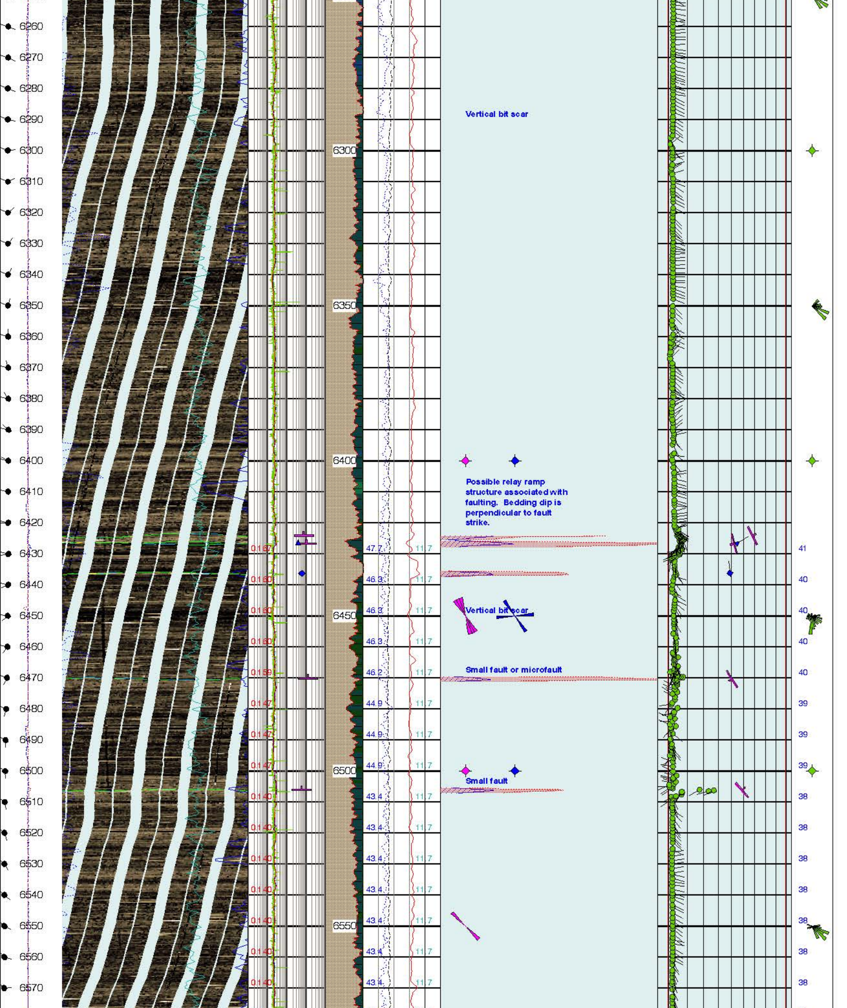
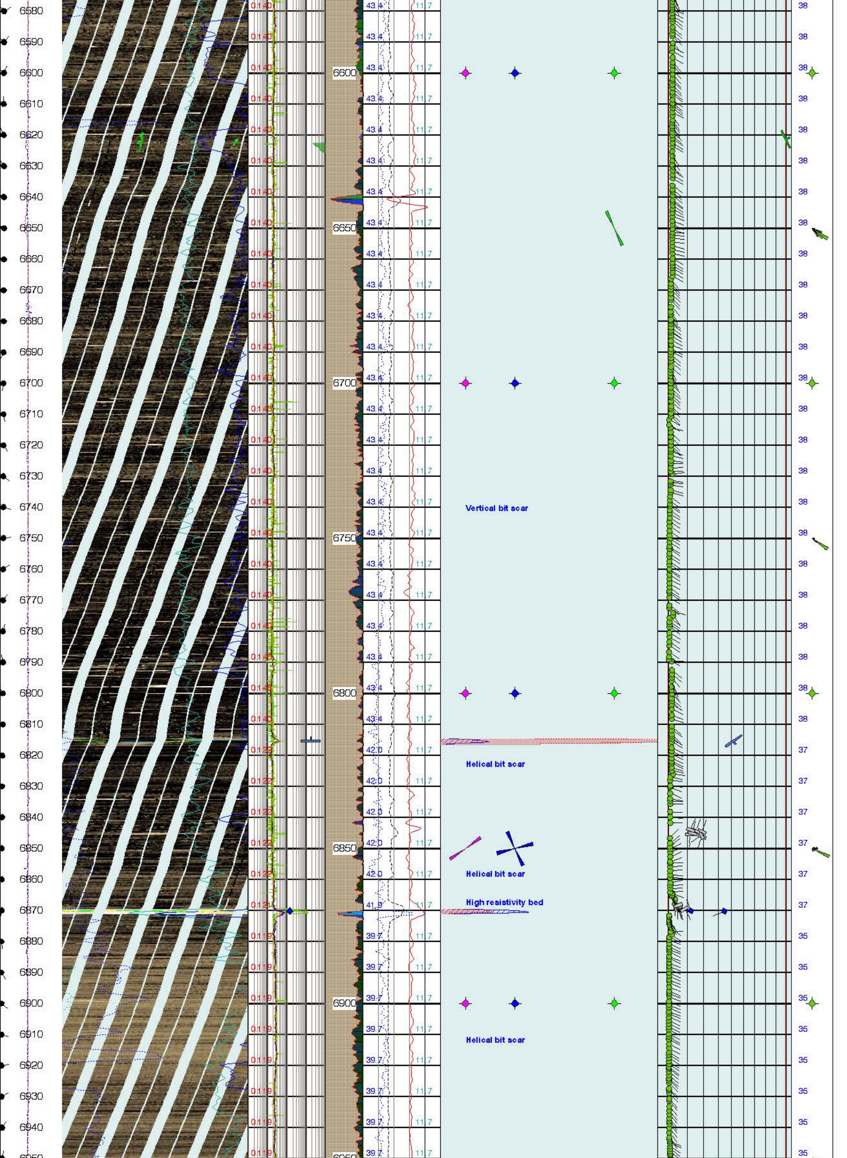
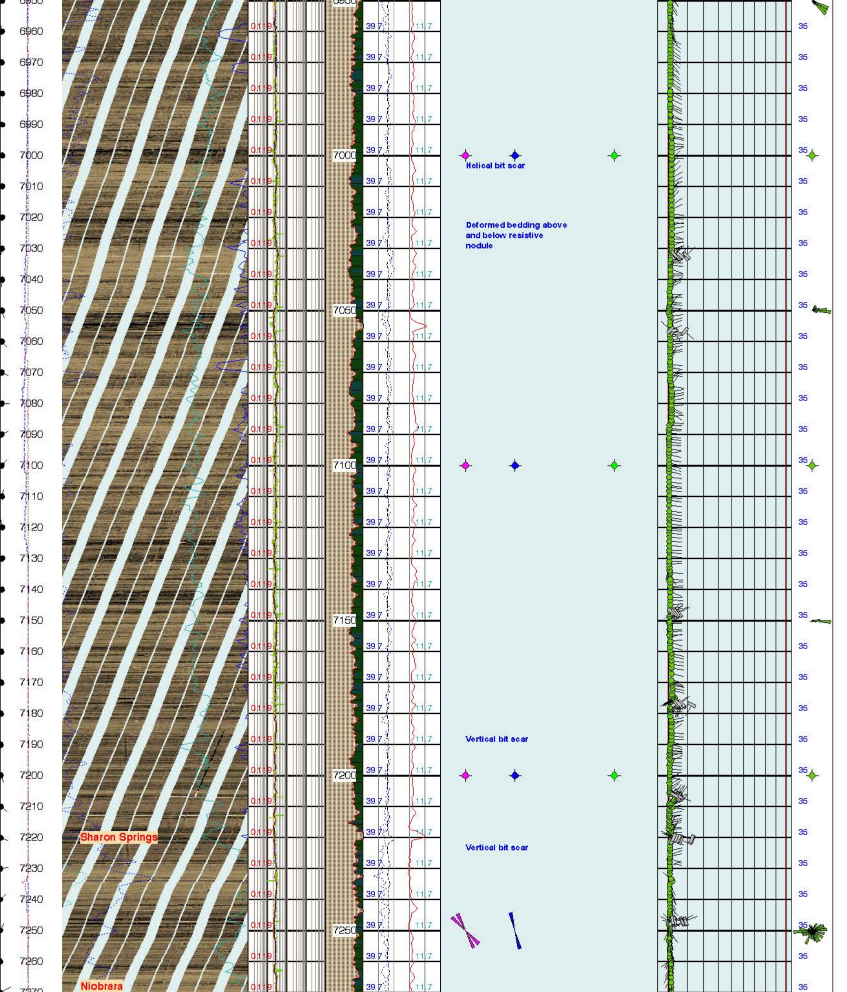
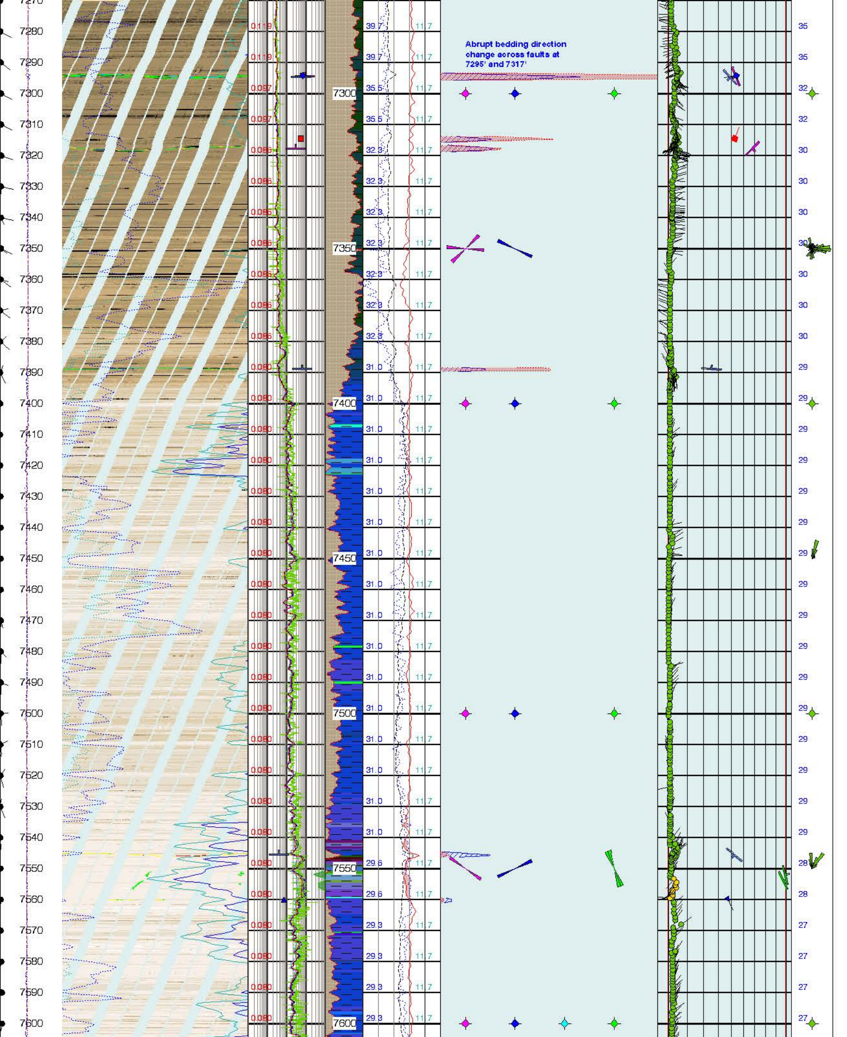
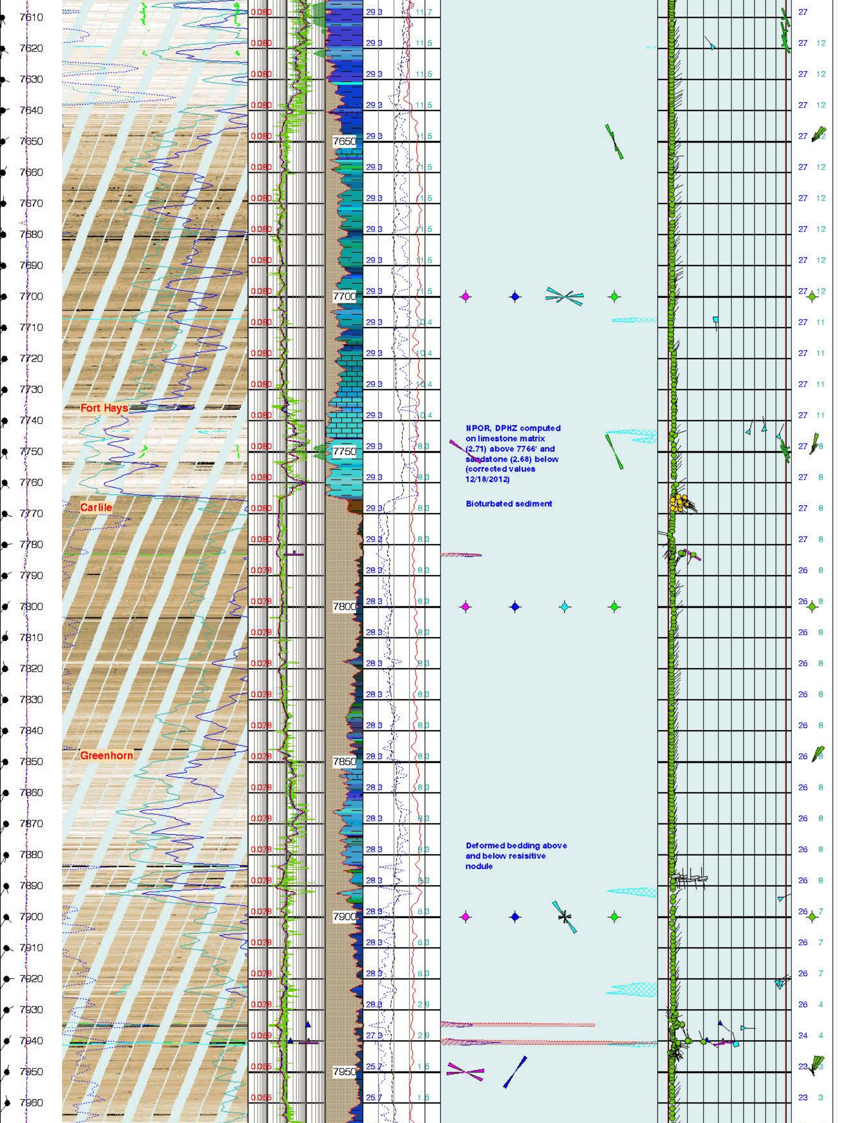








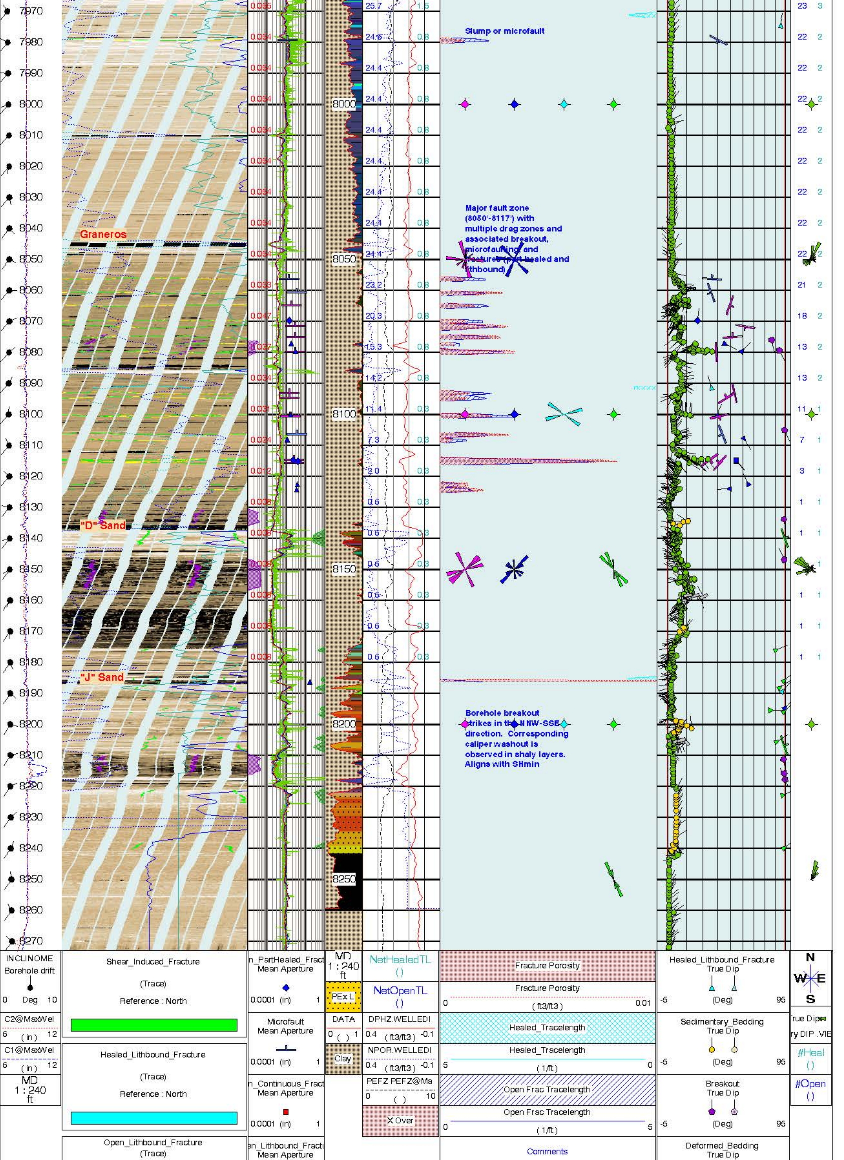

Abrupt bedding direction change across faults at 7295' and 7317'



NPOR, DPHZ computed on limestone matrix (2.71) above 7766' and sandstone (2.68) below (corrected values 12/18/2012)

Bioturbated sediment

Deformed bedding above and below resisitive nodule



Slump or microfault

Major fault zone (8050'-8117') with multiple drag zones and associated breakout, microfaulting, and fractures (part healed and lithbound)

Borehole breakout strikes in the NNW-SSE direction. Corresponding caliper washout is observed in shaly layers. Aligns with SHmin

Reference : North
Apertures
(10^N in)
-5 -4 -3 -2 -1 0 1
🟪🟥🟨🟩🟦🟦

Microfault
(Trace)
Reference : North
Apertures
(10^N in)
-5 -4 -3 -2 -1 0 1
🟪🟥🟨🟩🟦🟦

Fault
(Trace)
Reference : North
Apertures
(10^N in)
-5 -4 -3 -2 -1 0 1
🟪🟥🟨🟩🟦🟦

Healed_Continuous_Fracture
(Sinusoid)
Orientation North
🟦

Open_PartHealed_Fracture
(Trace)
Reference : North
Apertures
(10^N in)
-5 -4 -3 -2 -1 0 1
🟪🟥🟨🟩🟦🟦

Fault
(Trace)
Reference : North
Apertures
(10^N in)
-5 -4 -3 -2 -1 0 1
🟪🟥🟨🟩🟦🟦

Breakout
(Trace)
Reference : North
🟪

Tops

Tensile_Induced_Fracture
(Trace)
Reference : North
🟩

GR_FMI_wrap
150 (gAPI) 300

GR_PEX_wrap
150 (gAPI) 300

GR_PEX
0 (gAPI) 150

GR_FMI
0 (gAPI) 150

MaxWell_2Dlis FMI .SCA [C4444
Horizontal Scale: 1 : 9.162
Orientation North
0 120 240 360
Resistive FMI Image Conductive

▲
0.0001 (in) 1

Fault
Mean Aperture
0.0001 (in) 1

Induced

Breakout

Induced
10 (1/ft) 0

Breakout
0 (1/ft) 10

NetFracPoro
( )

AHT90.WELLED
0.1 (ohm.m) 1000

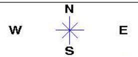
AHT60.WELLED
0.1 (ohm.m) 1000

AHT30.WELLED
0.1 (ohm.m) 1000

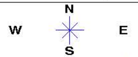
AHT20.WELLED
0.1 (ohm.m) 1000

AHT10.WELLED
0.1 (ohm.m) 1000

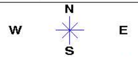
SRES@MaxWell
0.1 (ohm.m) 1000



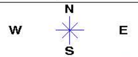
True Dip
Faults_and_Microfaults_All



True Dip
Open_Fractures_All



True Dip
Healed_Fractures_All



True Dip
Induced_Fractures_All

-5 (Deg) 95

Bed_Boundary
True Dip
-5 (Deg) 95

Open_PartHealed_Fracture
True Dip
-5 (Deg) 95

Shear_Induced_Fracture
True Dip
-5 (Deg) 95

Microfault
True Dip
-5 (Deg) 95

Open_Continuous_Fracture
True Dip
-5 (Deg) 95

Fault
True Dip
-5 (Deg) 95

Open_Lithbound_Fracture
True Dip
-5 (Deg) 95

Tensile_Induced_Fracture
True Dip
-5 (Deg) 95

Healed_Continuous_Fracture
True Dip
-5 (Deg) 95