LITHO DENSITY NEUTRON LOG

Company	Patterson Energy
Well	Zwillich #1
Field	Lorraine
County	Ellsworth
State	Kansas

Company Patterson Energy
Well Zwillich #1
Field Lorraine
County Ellsworth
State Kansas

Location: 660' FNL & 2310' FEL
API #: 15 053 21376
SEC 23 TWP 17S RGE 9W

Other Services
ML
DIL

			Elevation
Permanent Datum	Ground Level	Elevation 1775'	K.B. 1786'
Log Measured From	KB 11' AGL		D.F. 1785'
Drilling Measured From	KB		G.L. 1775'

Date	6/13/21	
Run Number	One	
Depth Driller	3270'	
Depth Logger	3269'	
Bottom Logged Interval	3247'	
Top Log Interval	2400'	
Casing Driller	8 5/8"@ 285'	
Casing Logger	285'	
Bit Size	7 7/8"	
Type Fluid in Hole	Chemical	Chlorides 9,000 PPM
Density / Viscosity	9.4/50	
pH / Fluid Loss	10.5/8.0	
Source of Sample	Pit	
Rm @ Meas. Temp	0.6@80degf	
Rmf @ Meas. Temp	0.5@80degf	
Rmc @ Meas. Temp	0.8@80degf	
Source of Rmf / Rmc	Calculated	
Rm @ BHT	0.4@114degf	
Time Circulation Stopped	9:00 p.m	
Time Logger on Bottom	11:05 p.m	
Maximum Recorded Temperature	114degf	
Equipment Number	T-605	
Location	Hays, KS.	
Recorded By	Casey Patterson	
Witnessed By	Mr. Austin Klaus	

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All interpretations are opinions based on inferences from electrical or other measurements and we cannot and do not guarantee the accuracy or correctness of any interpretation, and we shall not, except in the case of gross or willful negligence on our part, be liable or responsible for any loss, costs, damages, or expenses incurred or sustained by anyone resulting from any interpretation made by any of our officers, agents or employees. These interpretations are also subject to our general terms and conditions set out in our current Price Schedule.

Comments

Lorraine, KS Central Prairie Co-op
Ave V 2 mi. East, South into Location

LATITUDE/LONGITUDE
38.5635072, -98.2832565

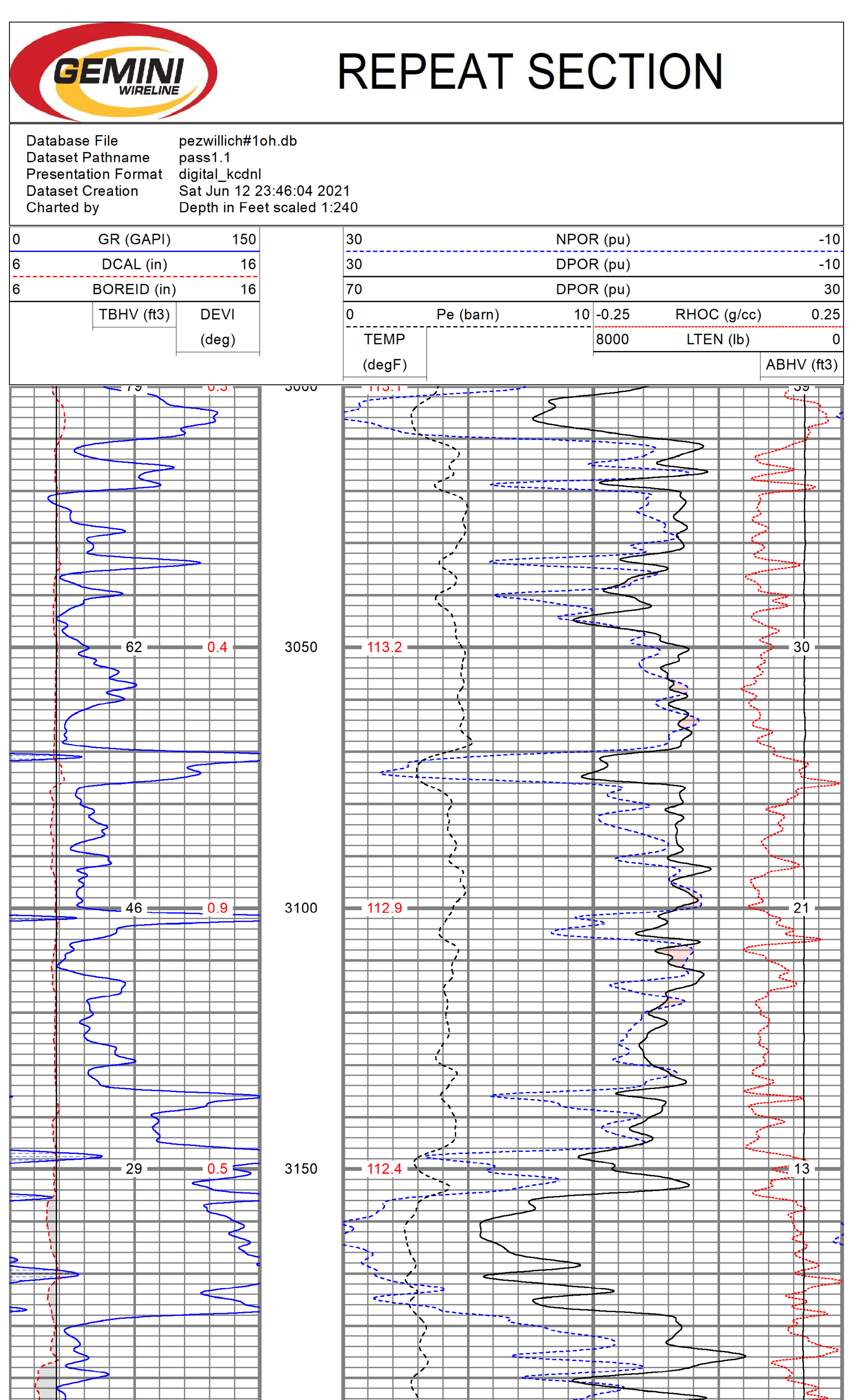
Thanks for using Gemini Wireline LLC
785-625-1182

MAIN PASS

Database File pezwillich#1oh.db
Dataset Pathname pass2
Presentation Format digital_kcdnl
Dataset Creation Sat Jun 12 23:32:59 2021
Charted by Depth in Feet scaled 1:240

REPEAT SECTION

Database File pezwillich#1oh.db
Dataset Pathname pass1.1
Presentation Format digital_kcdnl
Dataset Creation Sat Jun 12 23:46:04 2021
Charted by Depth in Feet scaled 1:240



Calibration Report

Database File pezwillich#1oh.db
Dataset Pathname pass2
Dataset Creation Sat Jun 12 23:32:59 2021

Dual Induction Calibration Report

Serial-Model: 1842-ADM
Surface Cal Performed: Sun Feb 18 09:36:23 2018
Downhole Cal Performed: Tue May 22 17:34:26 2018
After Survey Verification Performed: Sun Feb 18 09:36:52 2018

Surface Calibration

	Readings			References			Results	
Loop:	Air	Loop		Air	Loop		m	b
Deep	0.018	0.672	V	0.000	350.000	mmho/m	535.475	-9.896
Medium	0.003	0.769	V	0.000	400.000	mmho/m	522.607	-1.745
Internal:	Zero	Cal		Zero	Cal		m	b
Deep	0.018	0.672	V	0.000	350.000	mmho/m	535.240	-9.549
Medium	0.003	0.768	V	0.000	550.000	mmho/m	718.637	-2.088

Downhole Calibration

	Readings			References			Results	
Internal:	Zero	Cal		Zero	Cal		m	b
Deep	-0.219	349.905	mmho/m	-0.343	349.810	mmho/m	1.000	-3.124
Medium	-0.118	399.722	mmho/m	-0.226	399.745	mmho/m	1.000	-3.108
Shallow	2.536	0.025	V	500.000	2.000	Ohm-m	198.330	-2.504

After Survey Verification

	Readings			Targets			Results	
Internal:	Zero	Cal		Zero	Cal		m'	b'
Deep	0.000	0.000	mmho/m	-0.219	349.905	mmho/m	1.000	-3.124
Medium	0.000	0.000	mmho/m	-0.118	399.722	mmho/m	1.000	-3.108
Shallow	0.000	0.000	Ohm-m	500.000	2.000	Ohm-m	1.000	0.000

Neutron Calibration Report

Serial Number: AD5139
Tool Model: ADMY5139
Performed: (Not Performed)

Calibrator Value: 1 NAPI

Calibrator Reading: 1 cps

Sensitivity: 1 NAPI/cps

Temperature Calibration Report

Serial Number: WithMC
Tool Model: WMC
Performed: Fri Apr 19 12:15:04 2019

	Reference	Reading
Low Reference:	0.00 degF	0.00 degF
High Reference:	1.00 degF	1.00 degF

Gain: 1.00
Offset: 0.00
Delta Spacing 1

Inclinometer Calibration Report

Performed: Wed May 5 19:20:48 2021

	Low Read.	High Read.	Low Ref.	High Ref.	
X Accelerometer	205.00	1843.00	-1.00	1.00	gee
Y Accelerometer	205.00	1843.00	-1.00	1.00	gee
Z Accelerometer					gee

Gamma Ray Calibration Report

Serial Number: WithMC
Tool Model: WMC
Performed: Wed May 5 19:21:08 2021

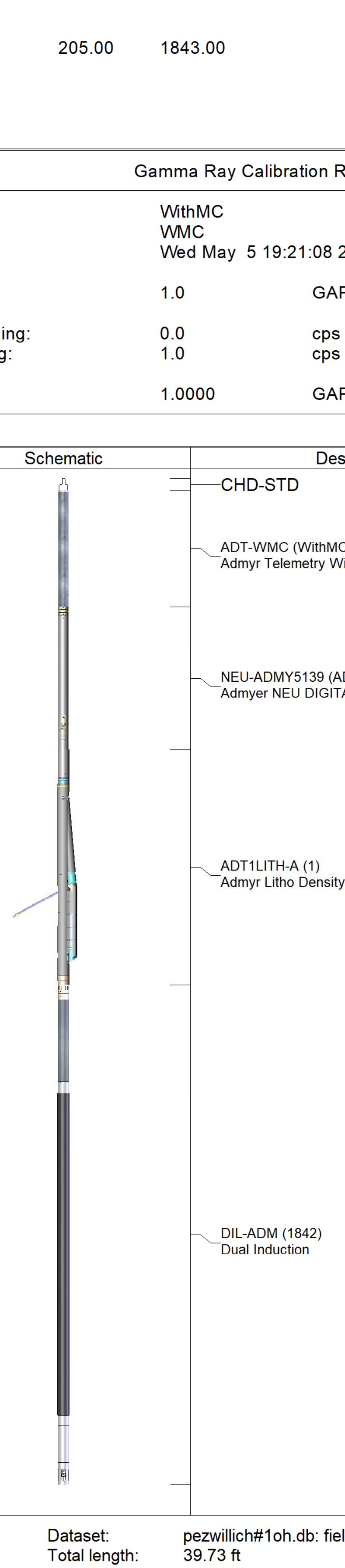
Calibrator Value: 1.0 GAPI

Background Reading: 0.0 cps
Calibrator Reading: 1.0 cps

Sensitivity: 1.0000 GAPI/cps

Sensor	Offset (ft)
GR	38.31
ACCY	37.15
ACCX	37.15
SSTAT	36.73
PSTAT	35.90
ASTAT	35.90
GRD	35.06
TEMP	35.06
NEU	31.00
LStat	22.54
LS8	21.88
LS7	21.88
LS6	21.88
LS5	21.88
LS4	21.88
LS3	21.88
LS2	21.88
LS1	21.88
LSV	21.88
LSD	21.86
SSV	21.67
SS8	21.67
SS7	21.67
SS6	21.67
SS5	21.67
SS4	21.67
SS3	21.67
SS2	21.67
SS1	21.67
DCAL	21.61
SSD	21.27
SP	10.60
CILD	10.60
CILM	6.89
RLL3	1.70
TR_Mon	0.00

Schematic



Description	Length (ft)	O.D. (in)	Weight (lb)
CHD-STD	0.50	1.69	1.00
ADT-WMC (WithMC) Admyr Telemetry With Mudcell	4.58	3.50	120.00
NEU-ADMY5139 (AD5139) Admyer NEU DIGITAL	5.65	3.50	50.00
ADT1LITH-A (1) Admyr Litho Density Tool	9.29	3.50	240.00
DIL-ADM (1842) Dual Induction	19.71	4.00	300.00

Dataset: pezwillich#1oh.db: field/well/run1/pass2
Total length: 39.73 ft
Total weight: 711.00 lb
O.D.: 4.00 in