



Scale 1:240 (5"=100') Metric
Measured Depth Log

Well Name: COPRC MIRROR LAKE P-20
Location: UWID: 300P206500126450 ; Surf. Loc: UNIT P-20 GRID 65-00 126-45
License Number: EL 470, ID# 2081
Spud Date: Jan 29, 2014 00:01hrs
Surface Coordinates: Lat / Long: N 64° 59' 57.98372", W 126° 47' 8.73410"
Grid N/E Y/X: N 7210027.780 m, E 604406.010 m
Bottom Hole Coordinates: 314.62m North 1198.96m West of Well Center
Grid N/E Y/X: N 7210300.15 m, E 603197.09 m
Ground Elevation (m): 284.15 K.B. Elevation (m): 289.35
Logged Interval (m): 2152 To: 3103 Total Depth (m): 3152
Formation: Lower Canol Fm
Type of Drilling Fluid: Gel Chem (Surface) Invert VersaClean C12 (Build; Lateral)
Region: Norman Wells
Drilling Completed: Feb 19, 2014 23:12hrs
Printed by HORIZONTAL.LOG from WellSight Systems 1-800-447-1534 www.WellSight.com

OPERATOR

Company: ConocoPhillips Canada
Address: 2100, 401- 9 Ave SW
Calgary, Alberta
T2P 2H7

GEOLOGIST

Name: Dave Lawrence; Gerald Pasveer
Company: Black Gold Geotechnical Services LTD.
Address: 2009 Colville Road
Route 9
New Haven PE

Comments

Samples from: 0m to 3152mMD (Build and Lateral), washed and viald for Operator and NEB & NWT at 5m intervals;

AFE#: 10351812

Drilling Rig: Beaver #2

Drilling Supervisor: Richard Turgeon; Dave Oper

Gas Detection: MD Totco Gas Analyzer

Geological Services: David Lawrence; Black Gold Geotechnical Services LTD.

Gerry Pasveer; Coromandel Resources LTD.

Directional Services: Sperry Drilling Services

MWD Services: Extreme Engineering Services

Wireline Logs: Schlumberger (Vertical into Build)

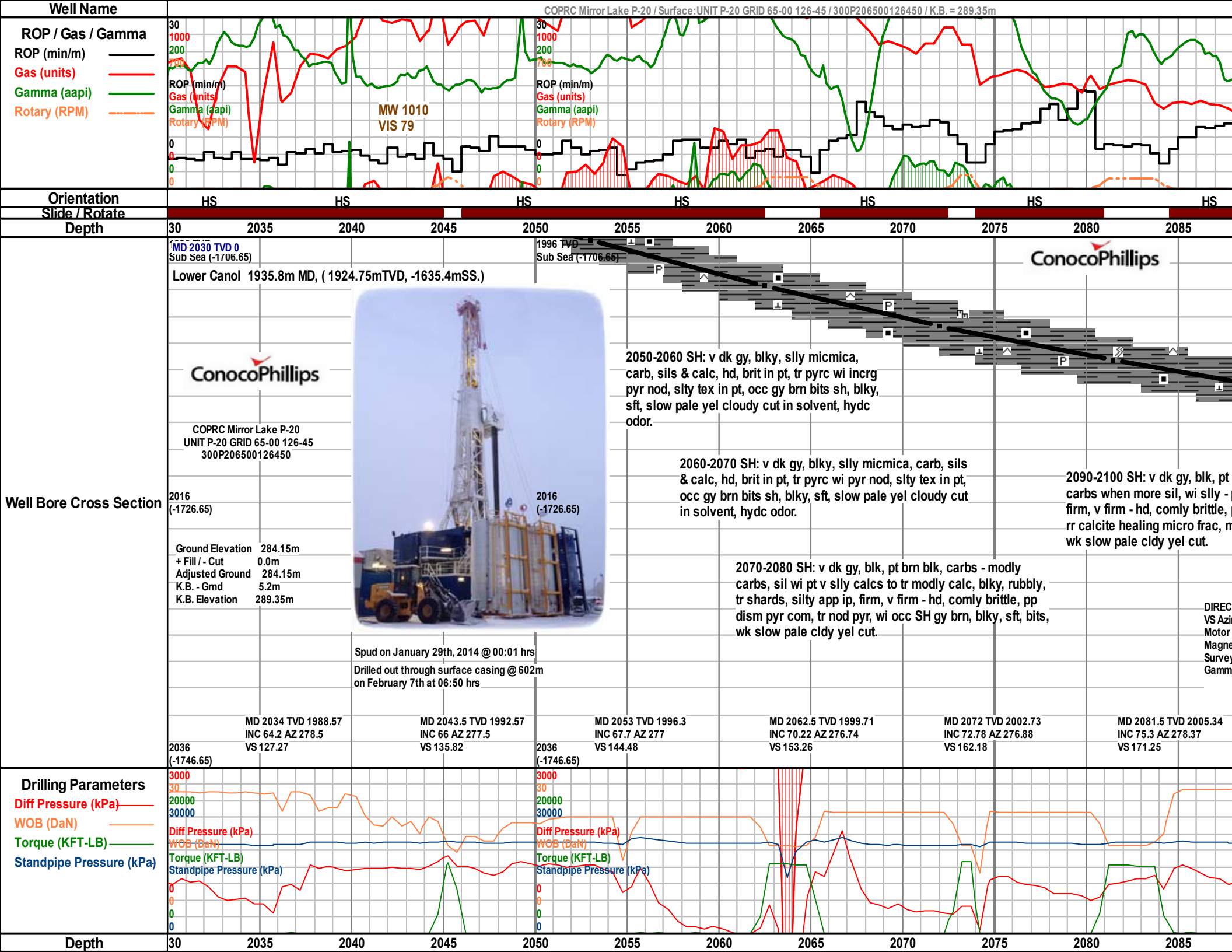
Gas Chromate / Isotubes: Continental Labs Rahil Kiani / Ukeme Dan.

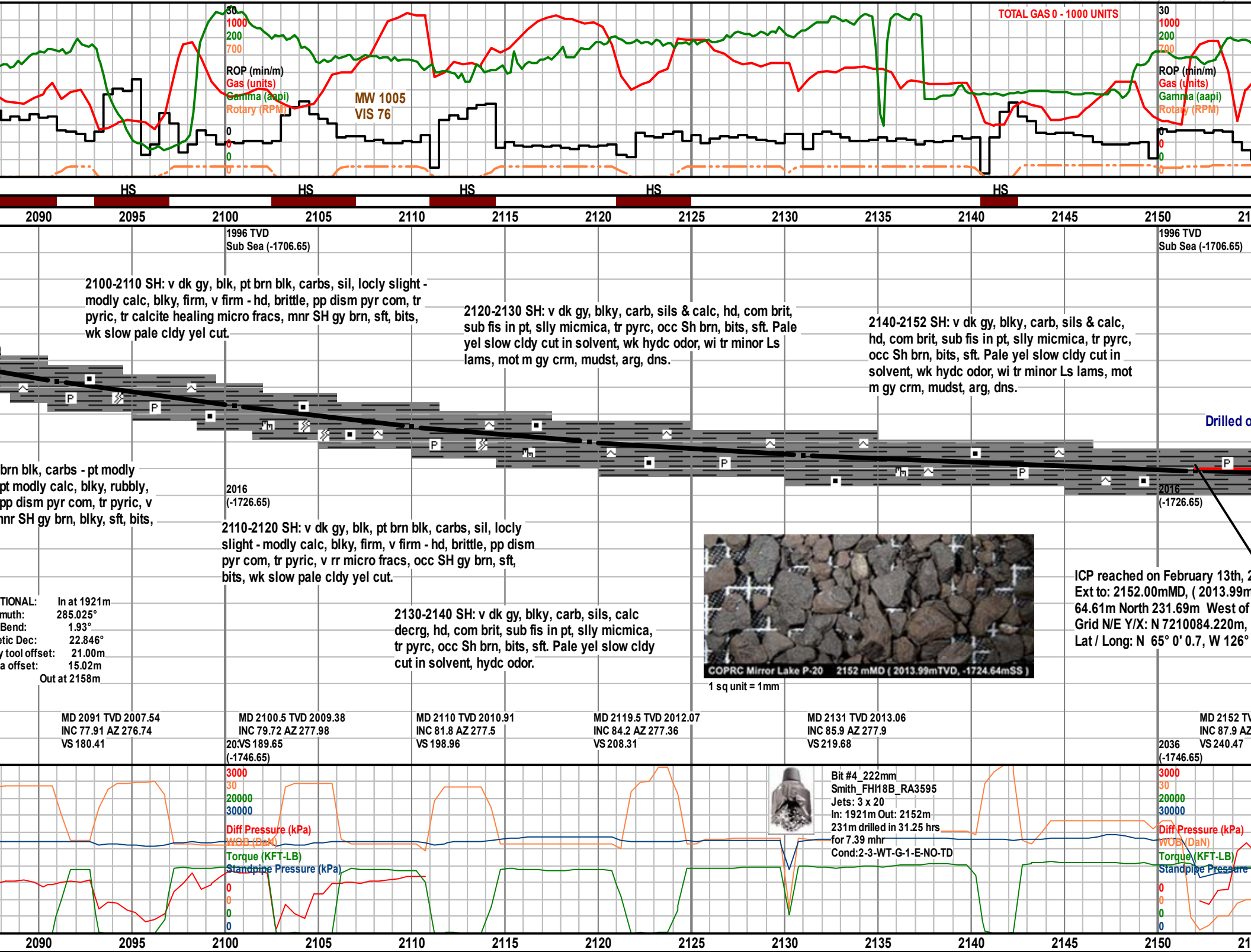
ROCK TYPES

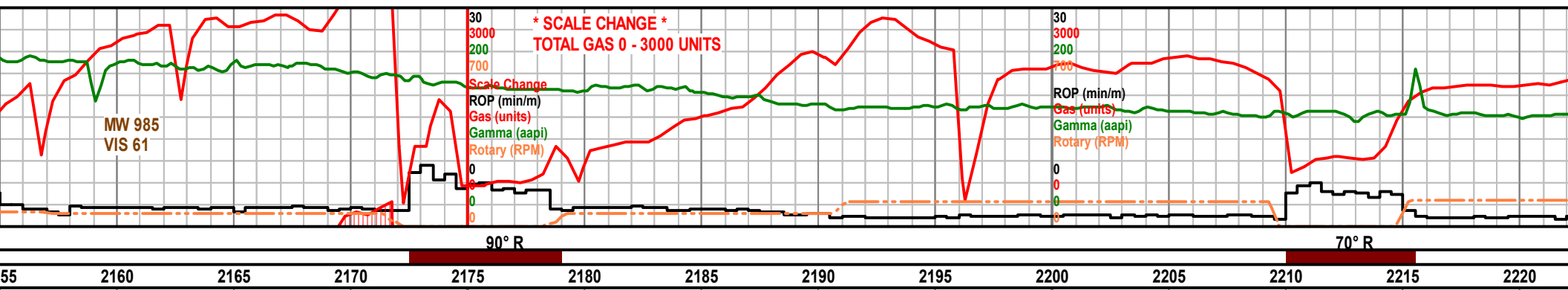
	Anhy		Coal		Lmst		Shale blk 2		Till
	Bent		Congl		Meta		Shcol		
	Brec		Dol		Mrst		Shgy		
	Cht		Gyp		Salt		Sltst		
	Clyst		Igne		Shale blk		Ss		

ACCESSORIES

FOSSIL		Ostra		Chtlt		Sandy		Sltstrg
	Algae		Pelec		Sideritic		Ssstrg	
	Amph		Pellet		Sil			
	Belm		Pisolite		Silt			
	Bioclst		Plant		Sulphur			
	Brach		Strom		Tuff			
	Bryozoa							
	Cephal							
	Coral							
	Crin							
	Echin							
	Fish							
	Foram							
	Fossil							
	Gastro							
	Oolite							
						</		







2152-2170 SH: v dk gy, grds to blk in pt, blk, carb, sils & calc, modly firm to occly hd, minor brit, sub fis in pt, silly micmica, tr pyrc, occ Sh brn, blk, bits, sft. Pale yel slow cldy cut in solvent, wk hydc odor.

2170-2190 SH: v dk gy, grds to blk in pt, blk, carb, sils & silly decrg calc, modly firm to occly hd, occly brit, sub fis in pt, silly micmica, tr pyrc, occ Sh brn, blk, bits, sft. Pale yel slow cldy cut in solvent, wk hydc odor.

2210-2230 SH: v dk gy - blk, blk, occly p
rubbly, carb, sft - modly firm - occly hd, o
calcs, micmica ip, tr dism pp pyr, tr nod p
v f pyric lams, occ brn blk SH, blk, bits,
pale cldy yel cut.

out intermediate casing Feb 16, 2014 @ 11:05 hrs

2014. 09:05hrs.
TVD, -1724.64mSS, 240.52m VS)
Well Center
E 604172.260m
47° 26.41

DIRECTIONAL: In at 2152m
VS Azimuth: 285.025°
Motor Bend: 1.36°
Magnetic Dec: 22.846°
Survey tool offset: 20.00m
Gamma offset: 13.93m
LWD_Array Ind: 25.60m
LWD_Gamma 23.56m

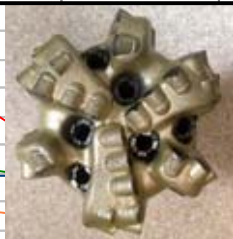
2190-2210 SH: v dk gy, grds to blk in pt, blk, carb, sils & silly calc, modly firm to occly hd, occly brit, sub fis in pt, tr micmica, pyrc wi occ pyr nod, wi occ Sh brn, blk, bits, sft. Pale yel slow cldy cut in solvent.

MD 2014.19
276.7

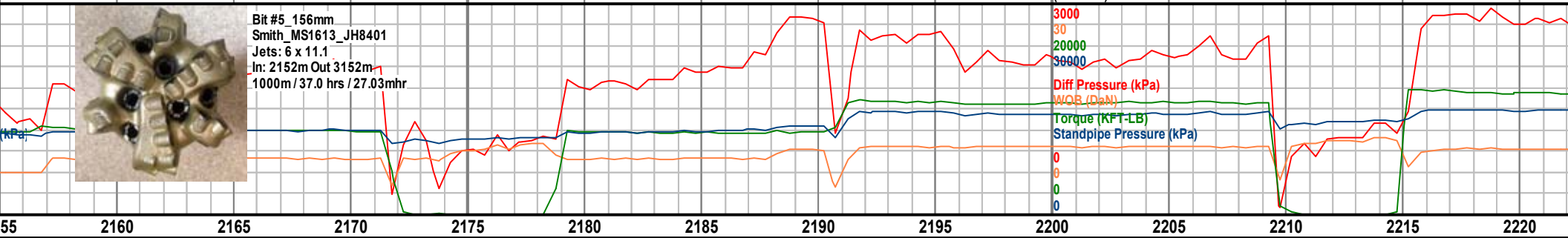
MD 2171 TVD 2014.87
INC 88 AZ 279.9
VS 259.33

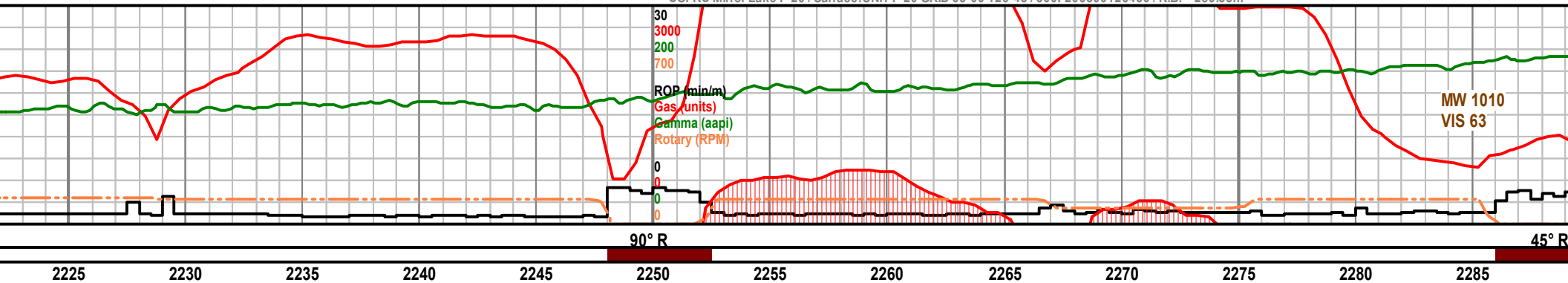
MD 2190 TVD 2015.54
INC 88 AZ 280.5
VS 278.26

MD 2209 TVD 2016.12
INC 88.5 AZ 281.1
VS 297.2



Bit #5 156mm
Smith_MS1613_JH8401
Jets: 6 x 11.1
In: 2152m Out 3152m
1000m / 37.0 hrs / 27.03mhr





1996 TVD
Sub Sea (-1706.65)

pt sb fis, pt
occlly sil / pt slly
pyr, v mnr loc v
sft; v wk slow

2230-2250 SH: v dk gy - blk, blk, occlly pt sb fis, pt
rubbly, carb, sft - modly firm - occlly hd, occlly sil / pt slly
calcs, micmica ip, tr dism pp pyr, tr nod pyr, v mnr loc v
v f pyric lams, occ brn blk SH, blk, bits, sft; v wk slow
pale cldy yel cut.

2260-2080 SH: v dk gy - blk, blk, tr pt sb fis - fis, pt rubbly,
carb, sft - firm - occlly hd, slight incr in occuring sil / more
comly slly - modly calcs, micmica ip, tr dism pp pyr, occ nod
pyr, tr v f pyric lams, occ brn blk SH, blk, bits, sft; com bit
generated tex, v wk slow pale cldy yel cut.

2080-2300 S
carb, sft - firm
comly slly -
pyr, tr v v f p
generated te



2250-2060 SH: v dk gy - blk, blk, occlly pt sb fis, carb, sft
- modly firm - occlly hd, occlly sil / tr pt calcs, micmica ip,
tr dism pp pyr, tr nod pyr, occ brn blk SH, blk, bits, sft; v
wk slow pale cldy yel cut.

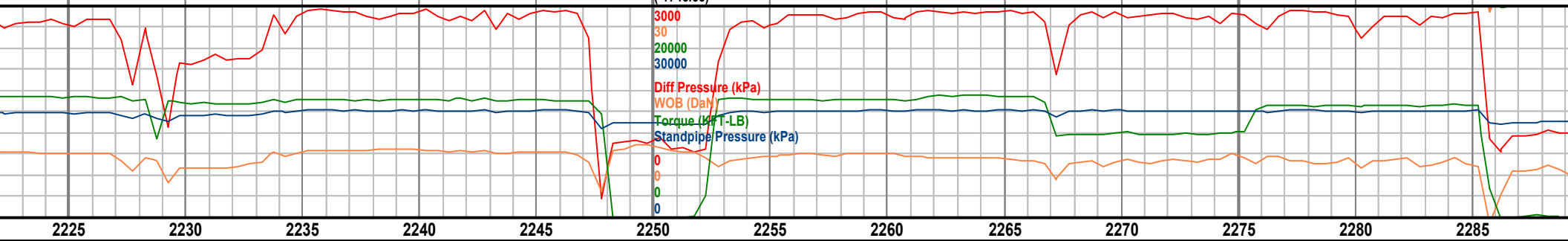


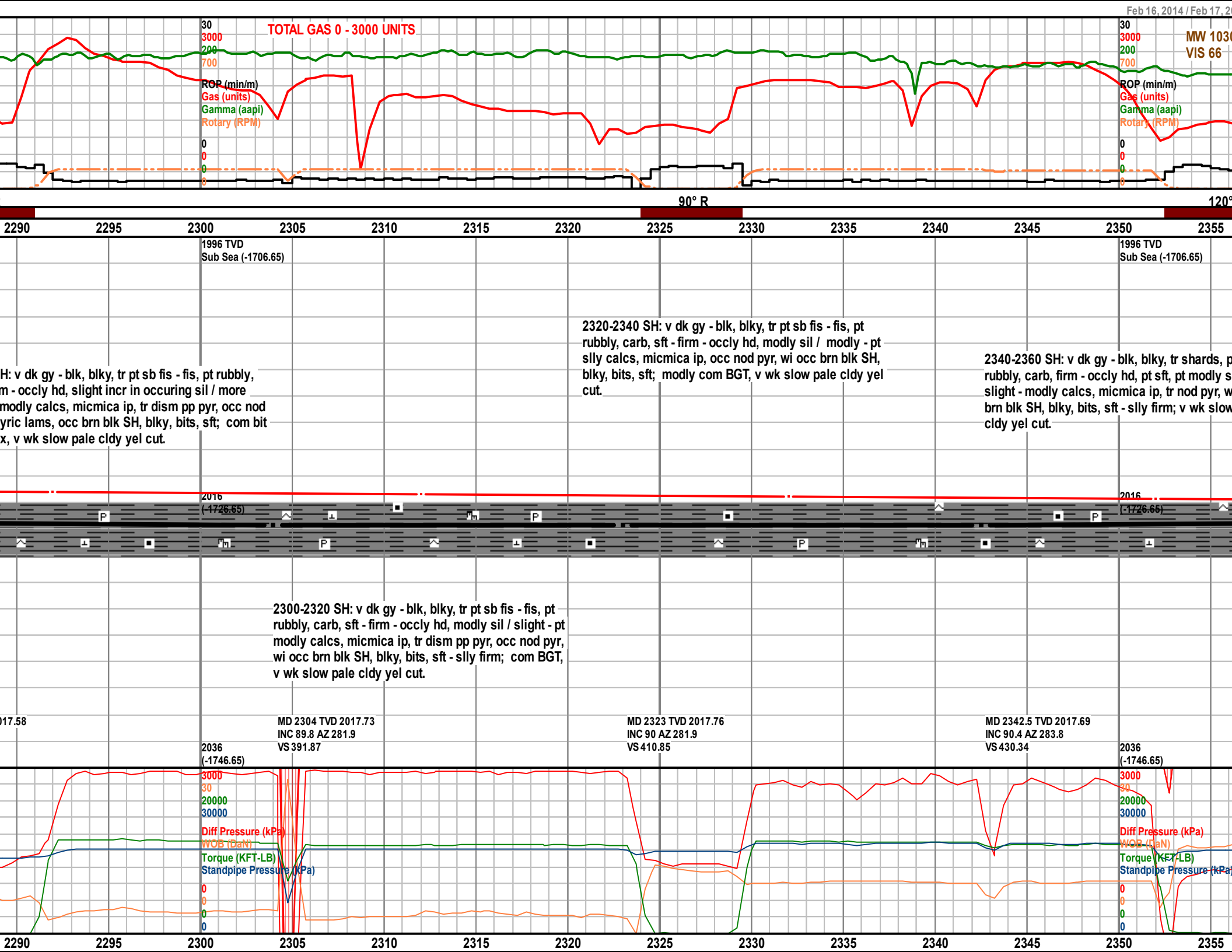
MD 2228 TVD 2016.5
INC 89.2 AZ 281.2
VS 316.16

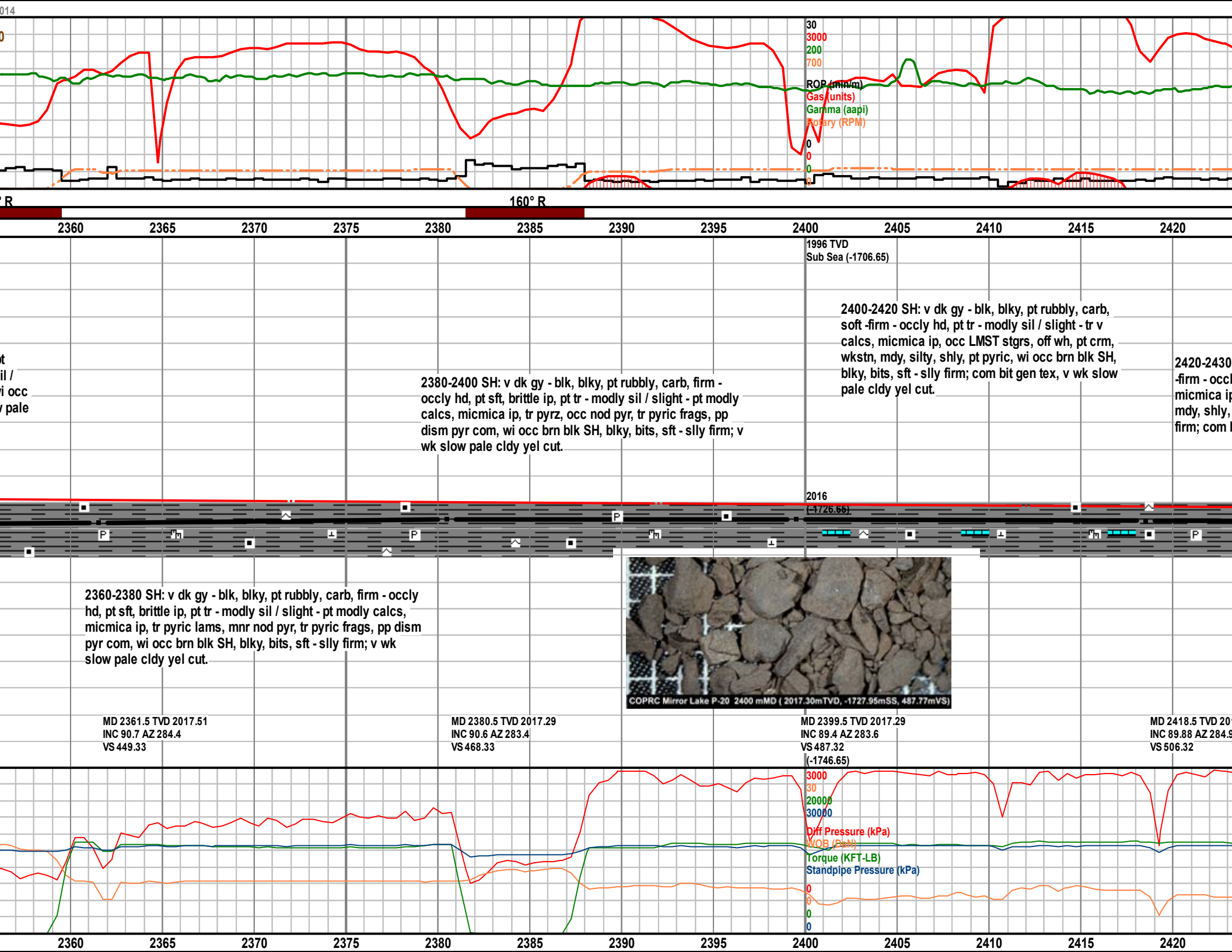
MD 2247 TVD 2016.75
INC 89.3 AZ 281.5
VS 335.13

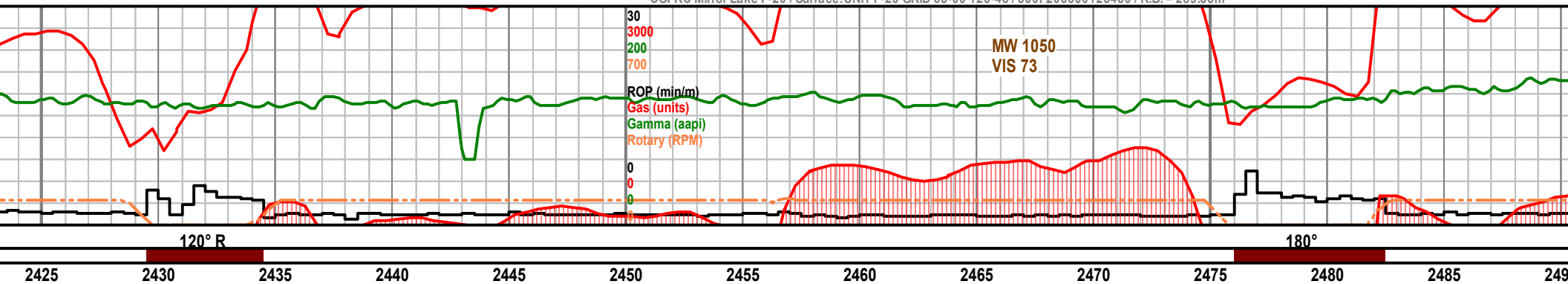
MD 2266 TVD 2017.16
INC 88.2 AZ 276.5
VS 354.02

MD 2285 TVD 2017.16
INC 89.3 AZ 281.5
VS 372.91









1996 TVD
Sub Sea (-1706.65)

SH: v dk gy - blk, blk, pt rubbly, carb, soft
ly hd, pt tr - modly sil / slight - tr v calcs,
o, occ LMST strgs, off wh, pt crm, wkstn, silty,
pt pyric, wi occ brn blk SH, blk, bits, sft - sily
bit gen tex, v wk slow pale cldy yel cut.

2450-2470 SH: v dk gy, grds to blk, blk, sb fis, carb,
com brit, firm, sils, sily calcs, tr pyrc, sily micmica, tr
pyr lams, pale yel slow cloudy cut / mnr LMST lams,
mot gy crm, mudst - wkest, arg, grds to mlrst in pt, tr
pyrc, no vis por.

2470-2490 SH: v dk gy, grds to blk, blk, sb fis,
carb, com brit, firm, sils, sily calcs, tr pyrc wi tr pyr
nod, sily micmica, tr pyr lams, pale yel slow cloudy
cut / mnr LMST lams as before.

2016
(-1725.55)

2430-2450 SH: v dk gy - blk, blk, pt rubbly, carb,
soft - firm - occly hd, pt tr - modly sil / slight - tr v
calcs, micmica ip, sily pyrc, show aa. LMST strgs
aa, but decrg.

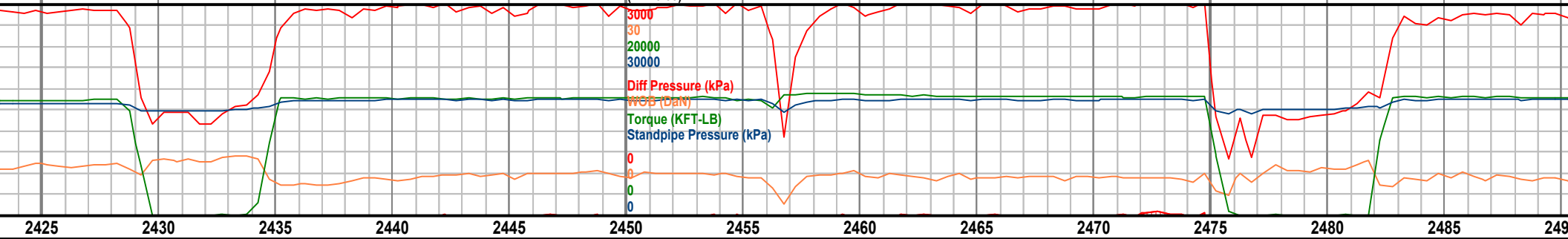
17.41
04

MD 2437.5 TVD 2017.5
INC 89.6 AZ 285.9
VS 525.32

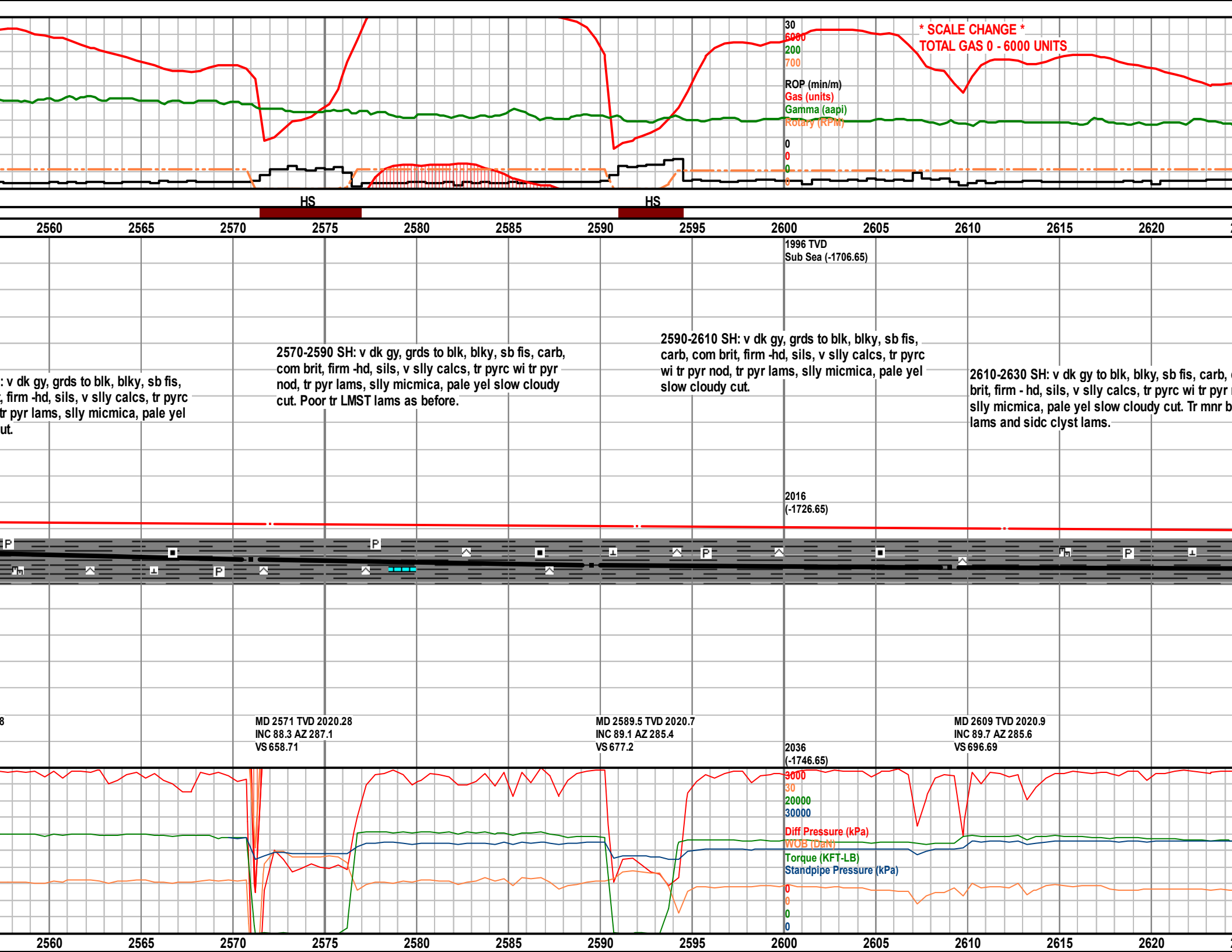
MD 2456.5 TVD 2017.56
INC 90 AZ 286.5
VS 544.32

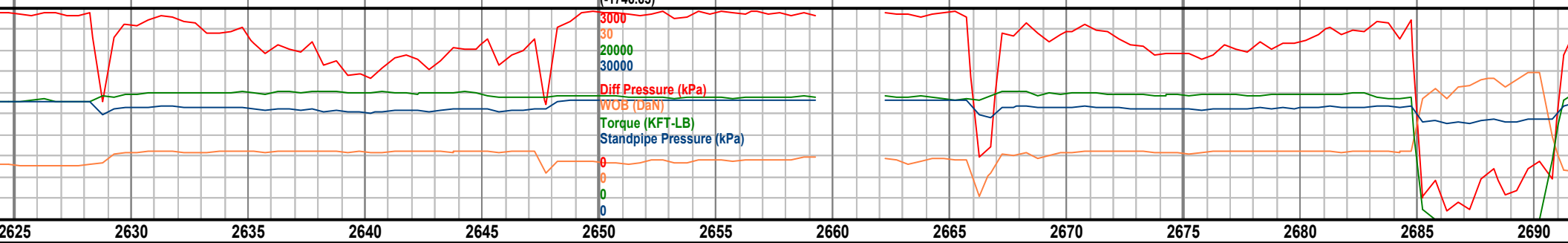
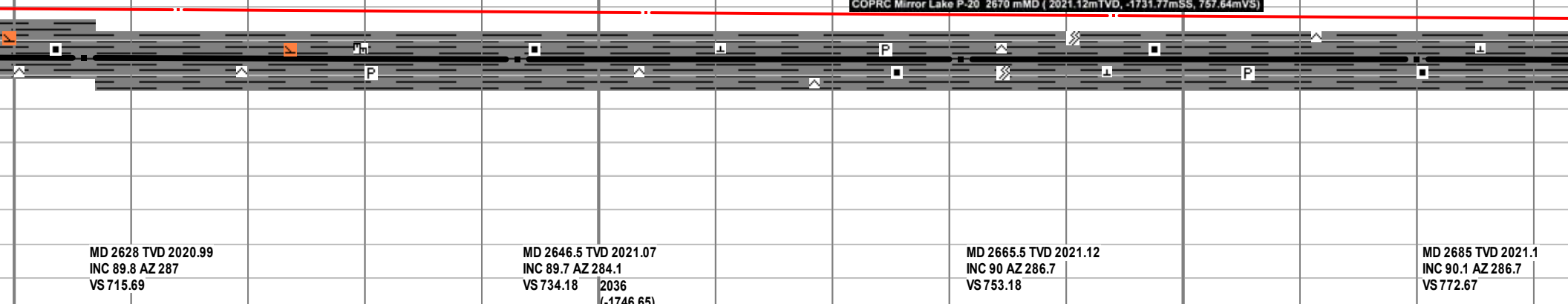
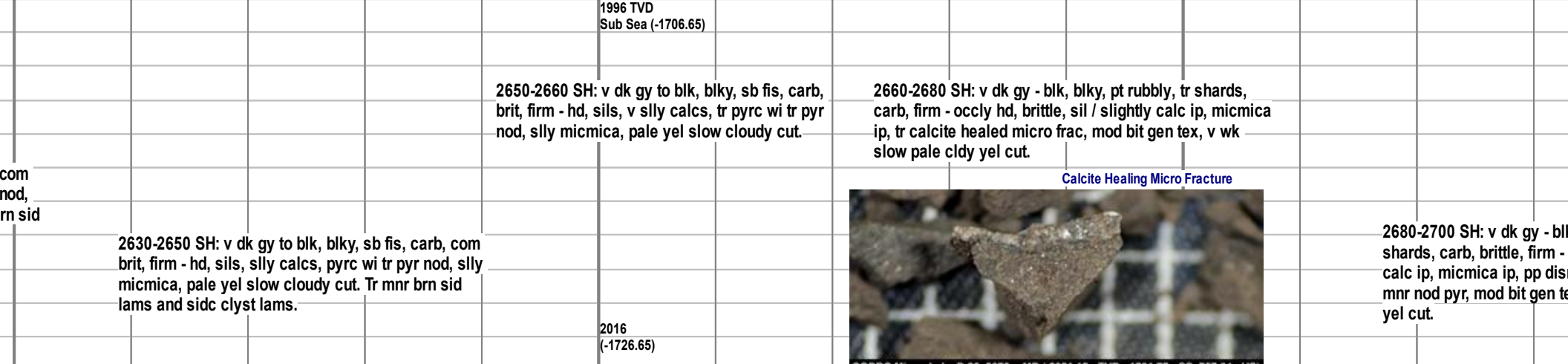
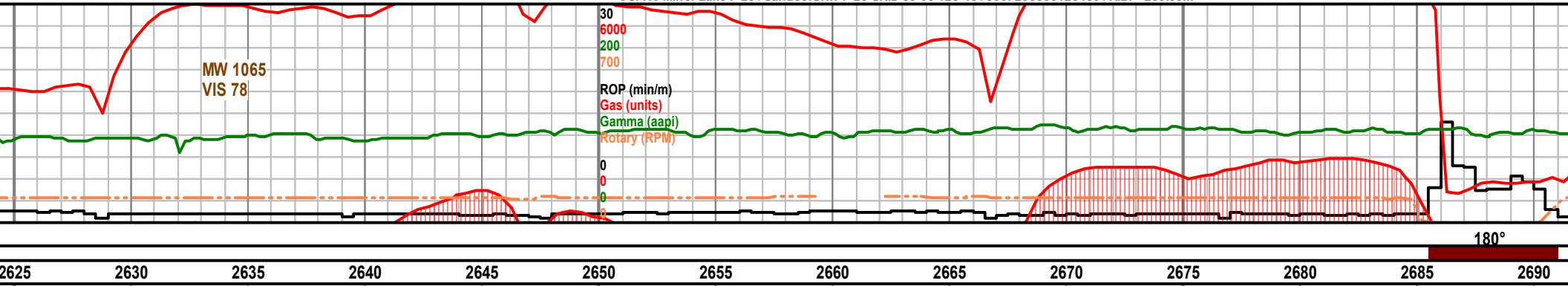
MD 2475.5 TVD 2017.56
INC 90 AZ 285.4
VS 563.31

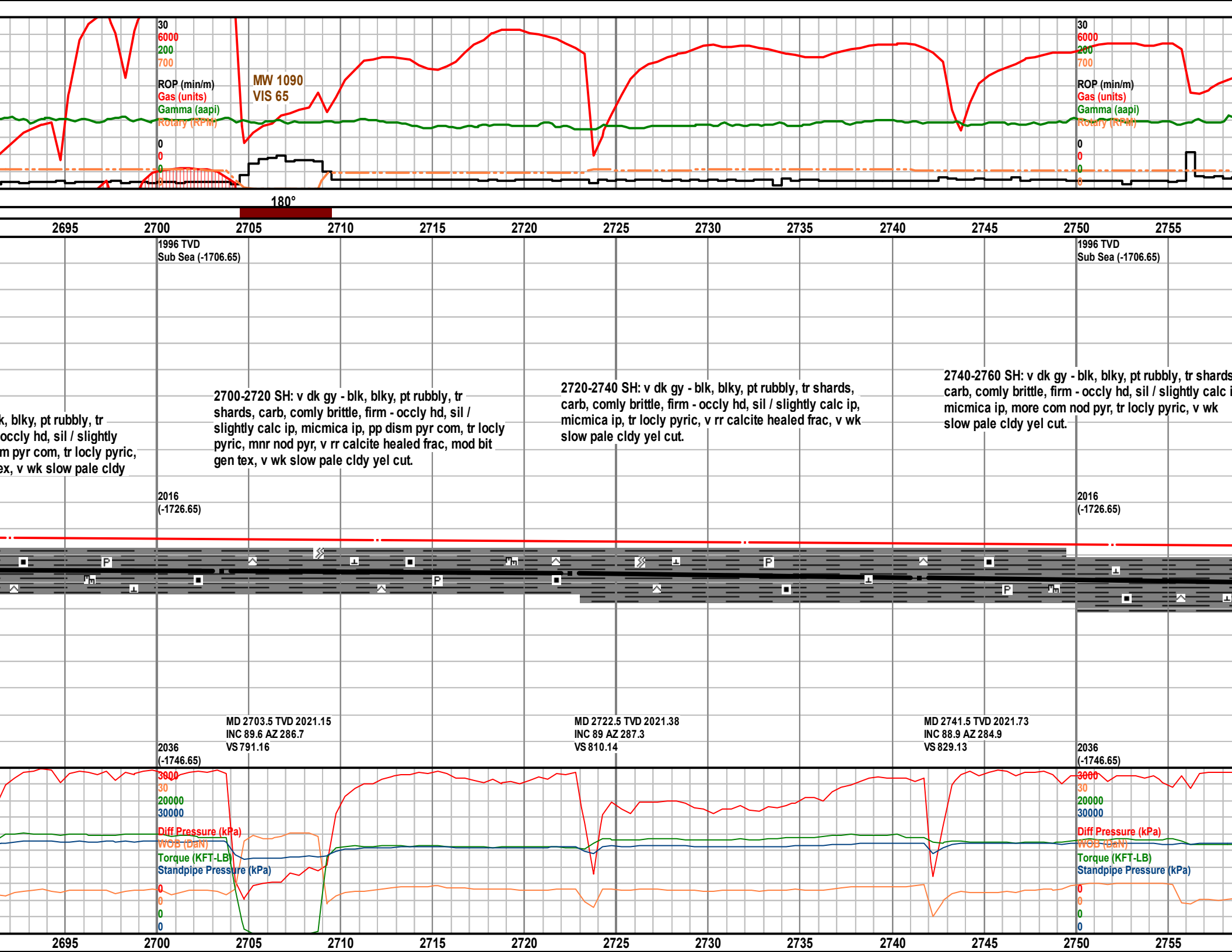
2036
(-1746.65)

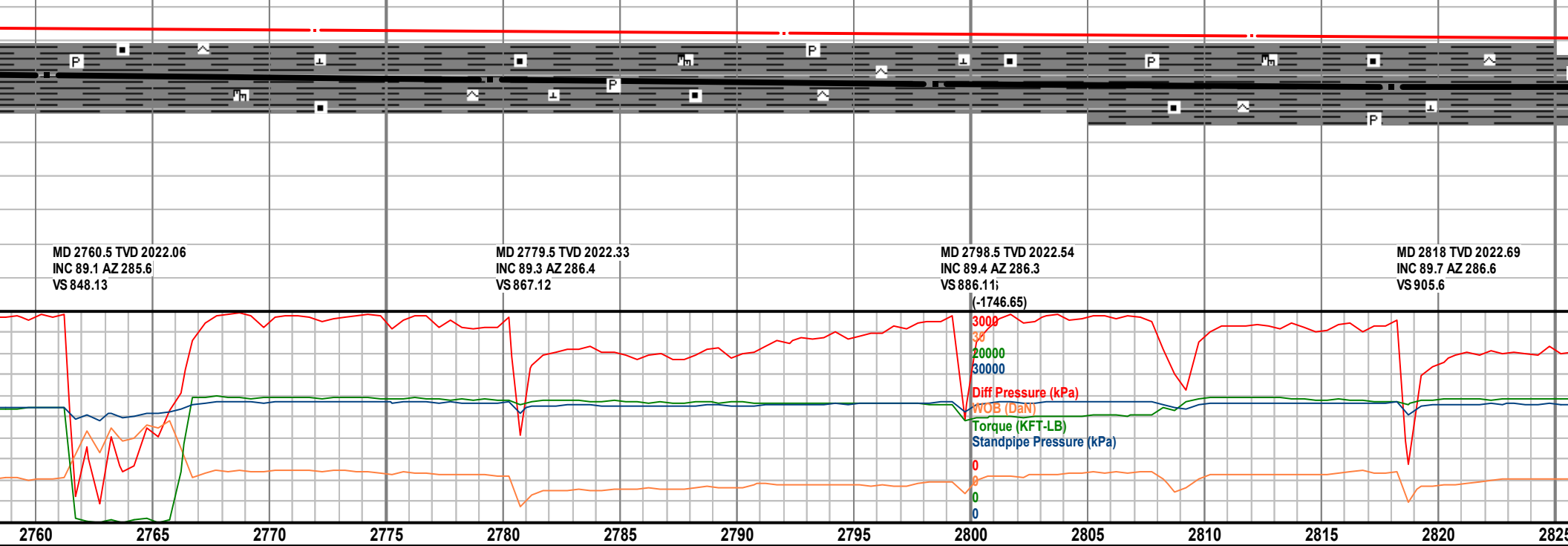
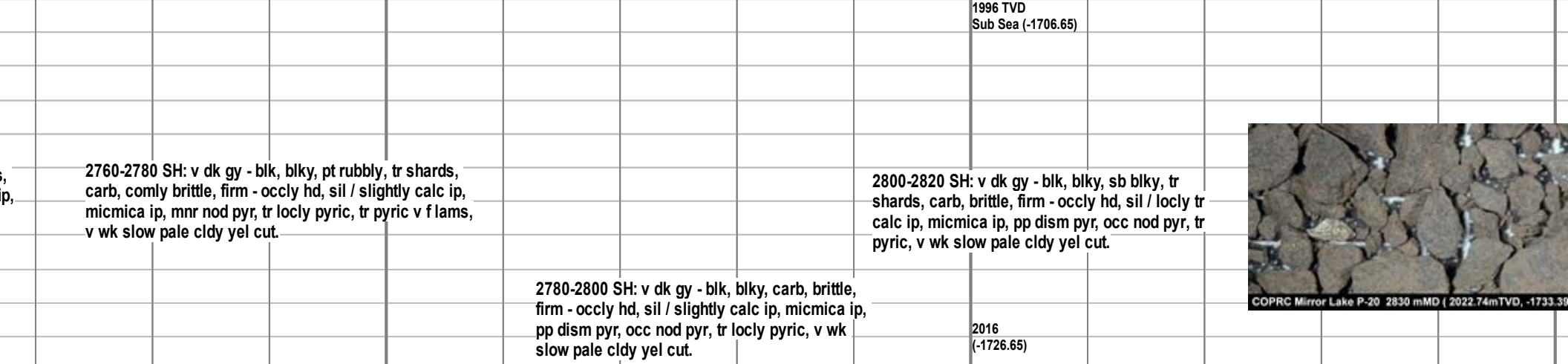
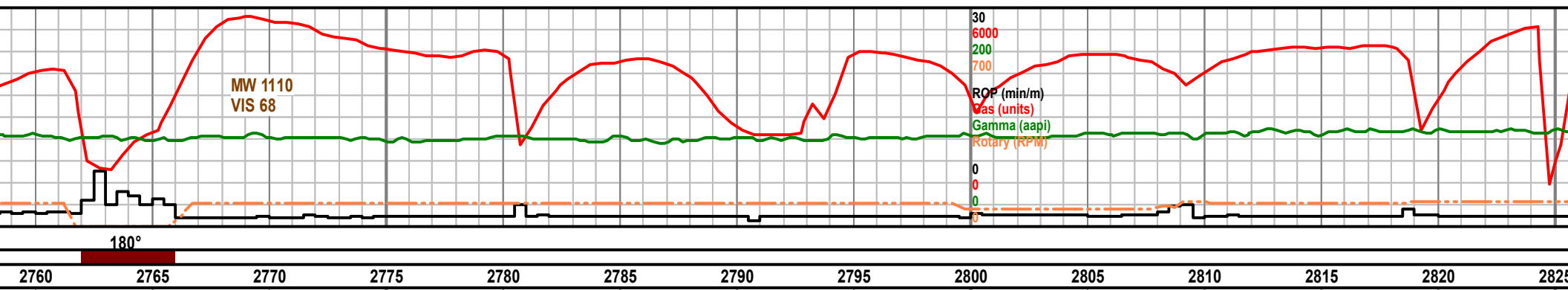






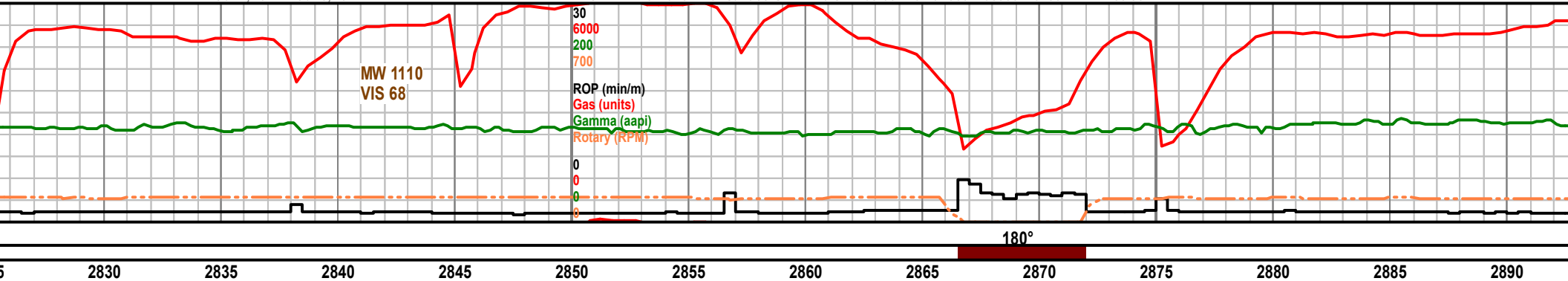






Feb 17, 2014 / Feb 18, 2014

COPRC Mirror Lake P-20 / Surface: UNIT P-20 GRID 65-00 126-45 / 300P206500126450 / K.B. = 289.35m

1996 TVD
Sub Sea (-1706.65)

m55, 917.53mVS)

2820-2840 SH: v dk gy - blk, blk, sb blk, tr shards, carb, brittle, firm - occly hd, sil / locly tr calc ip, micmica ip, pp dism pyr, occ nod pyr, tr pyric, v wk slow pale cldy yel cut.

2840-2860 SH: v dk gy - blk, blk, sb blk, carb, brittle, firm - occly hd, tr modly firm, sil / more comly slly calc, micmica ip, pp dism pyr, v rr nod pyr, v wk slow pale cldy yel cut.

2860-2880 SH: v dk gy - blk, blk, sb blk, tr shards, carb, brittle, firm - occly hd, tr modly firm, sil / more comly slly calc, micmica ip, pp dism pyr, v rr nod pyr, no vis fracs or pyric lams, v wk slow pale cldy yel cut.

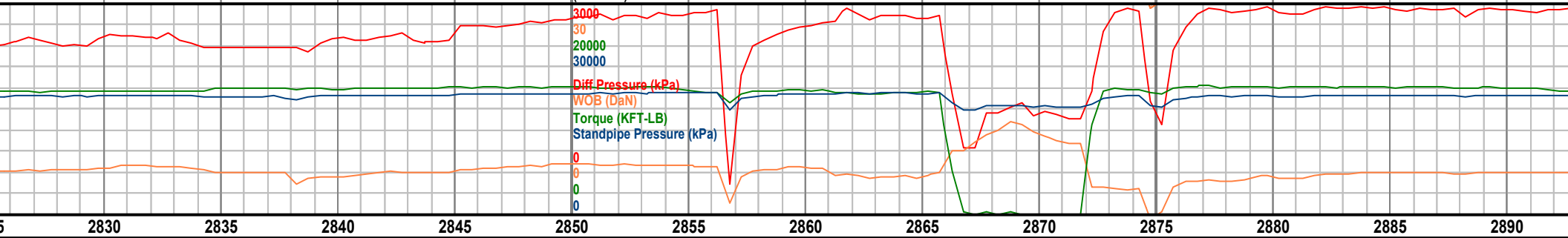
2880-2900 SH: v dk gy - blk, blk, sb blk, pt hd, tr modly firm, sil / more comly slly dism pyr, v rr nod pyr, no vis fracs or pyric lams, v wk slow pale cldy yel cut.

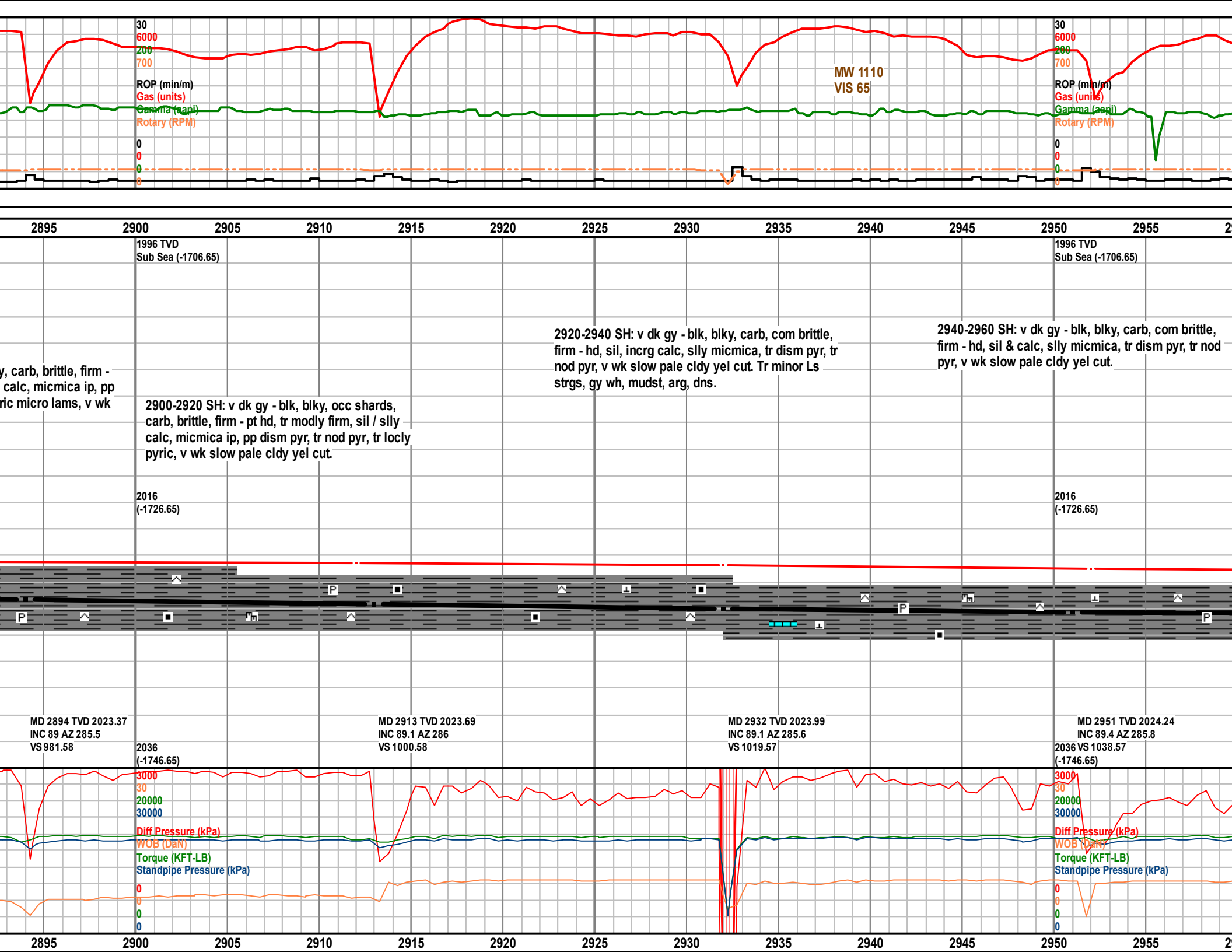
2016
(-1726.65)

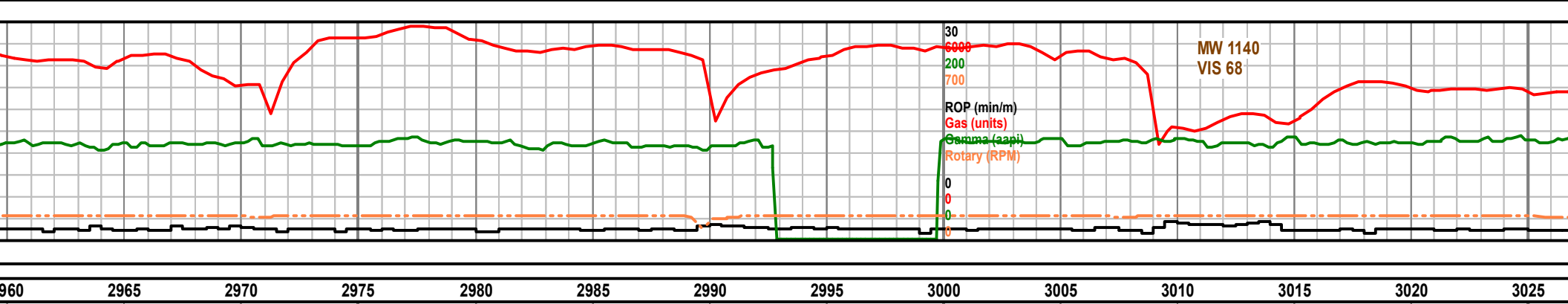
MD 2837 TVD 2022.76
INC 89.9 AZ 286.6
VS 924.59

MD 2856 TVD 2022.79
INC 89.9 AZ 284.7
VS 943.59

MD 2875 TVD 2023.01
INC 88.8 AZ 283.8
VS 962.59

2036
(-1746.65)





2960-2980 SH: v dk gy - blk, blk, carb, com brittle in pt, firm - hd, sil & calc, slly micmica, tr diss pyr, tr nod pyr, v wk slow pale cldy yel cut.

2980-3000 SH: v dk gy - blk, blk, carb, brittle, firm - hd, sil & slly calc, slly micmica, pyrc, incrg nod pyr, v wk slow pale cldy yel cut.

3000-3020 SH: v dk gy - blk, blk, carb, com brittle, firm - hd, sil & slly calc, slly micmica, pyrc wi occ nod pyr, v wk slow pale cldy yel cut.

3020-3040 SH: firm - hd, pyr, v wk

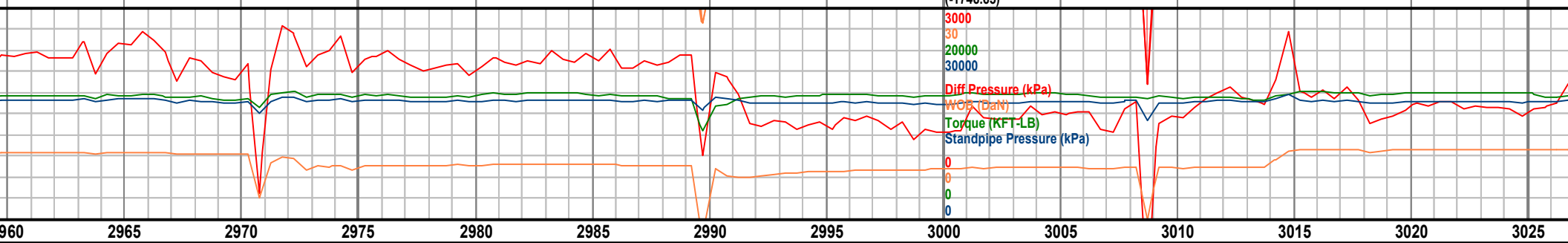
2016
(-1726.65)

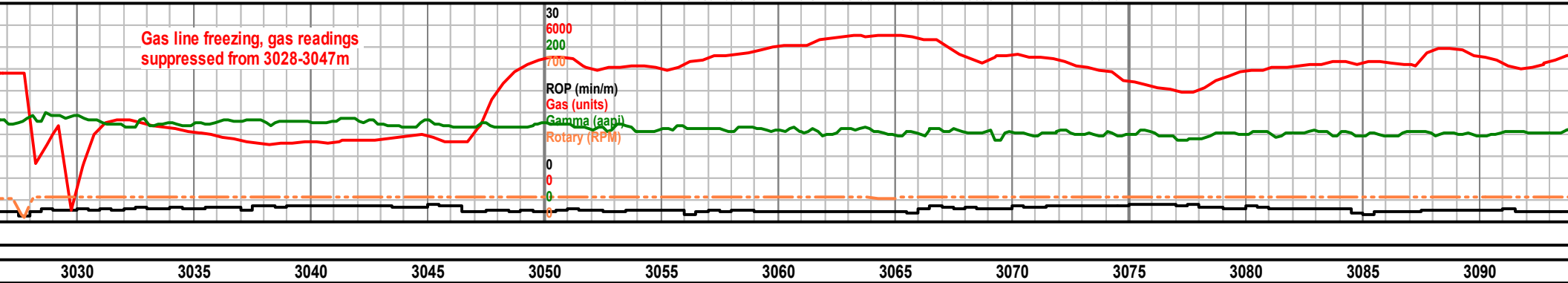
MD 2970 TVD 2024.44
INC 89.4 AZ 283.3
VS 1057.57

MD 2989 TVD 2024.55
INC 89.9 AZ 285.6
VS 1076.56

2036
(-1746.65)

MD 3008 TVD 2024.62
INC 89.7 AZ 284.5
VS 1095.56





1996 TVD
Sub Sea (-1706.65)

0 SH: v dk gy - blk, blk, carb, com brittle,
sil & sly calc, sly micmica, pyrc wi occ nod
slow pale cldy yel cut.

3040-3060 SH: v dk gy - blk, blk, carb, com brittle,
firm - hd, sil & sly calc, sly micmica, pyrc wi occ nod
pyr, v wk slow pale cldy yel cut.

3060-3080 SH: v dk gy - blk, blk, carb, com brittle,
firm - hd, sil & sly calc, sly micmica, pyrc wi occ nod
pyr, v wk slow pale cldy yel cut.

3080-3100 SH: v dk gy - blk, blk, carb, com brittle,
firm - hd, sil & sly calc, sly micmica, pyrc wi occ nod
pyr, v wk slow pale cldy yel cut.

2016
(-1726.65)

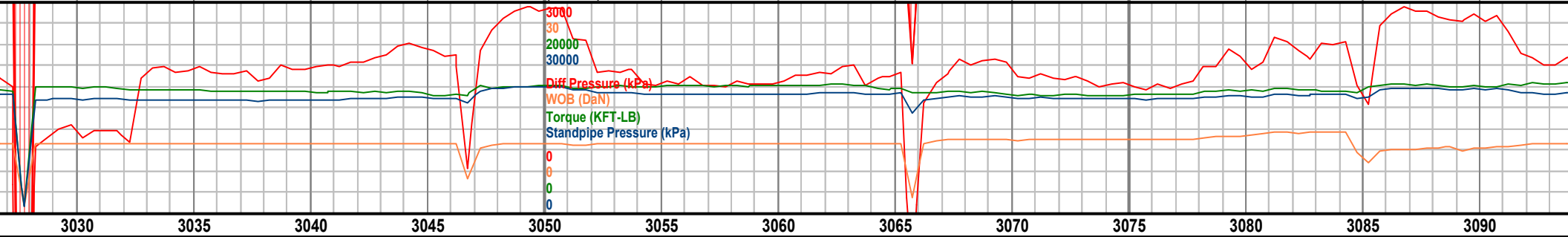
MD 3027 TVD 2024.68
INC 89.9 AZ 285.1
VS 1114.56

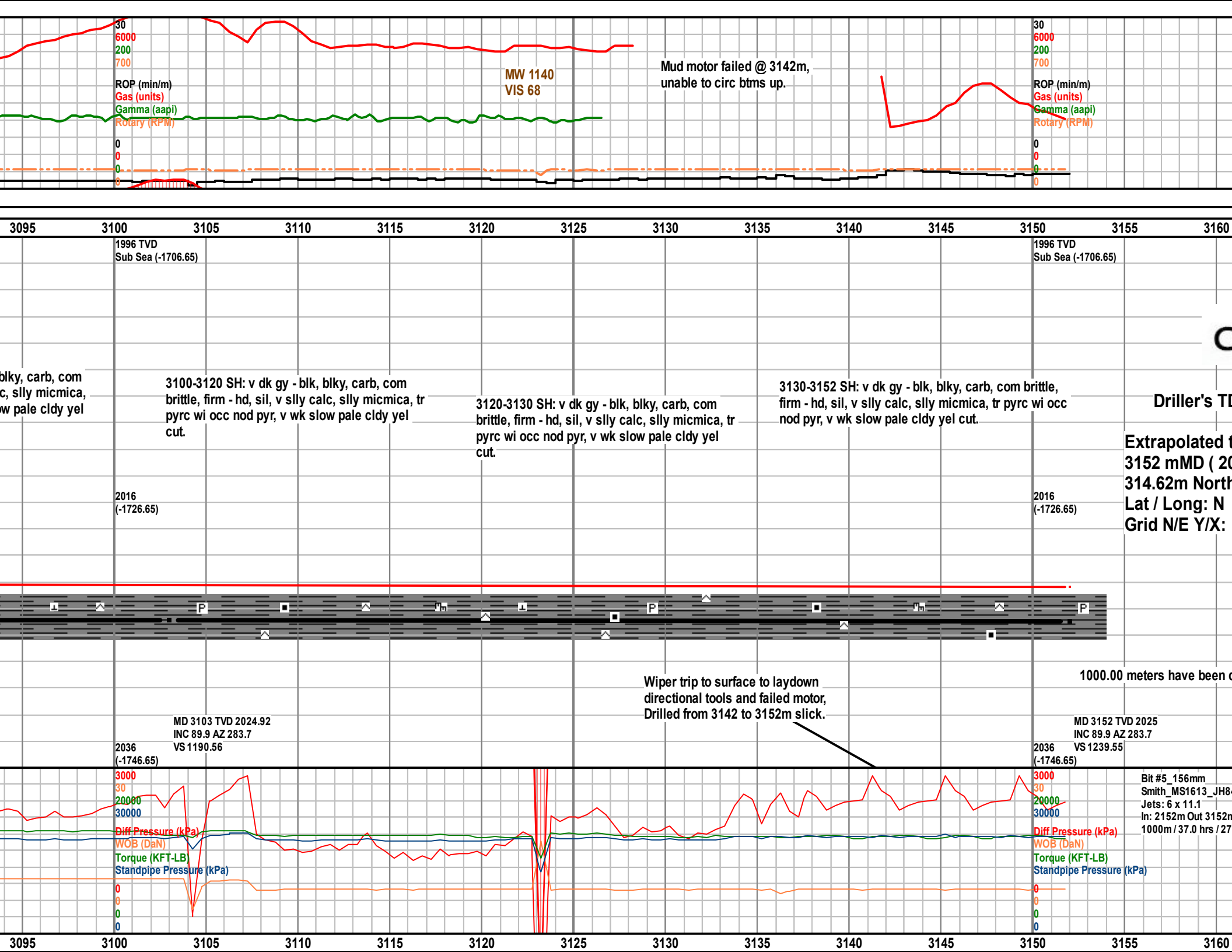
MD 3046 TVD 2024.75
INC 89.7 AZ 284.3
VS 1133.56

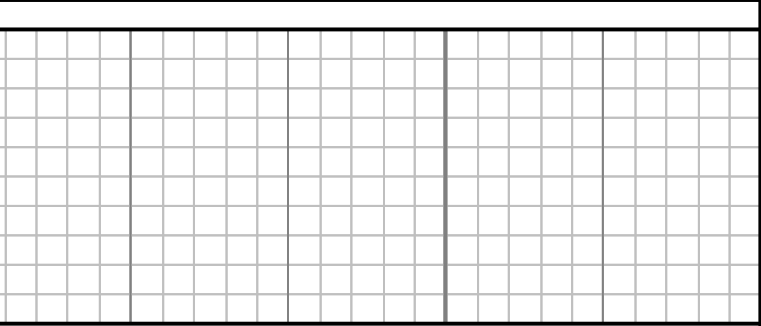
MD 3065 TVD 2024.83
INC 89.8 AZ 283.8
VS 1152.56

MD 3085 TVD 2024.89
INC 89.9 AZ 284.9
VS 1172.56

2036
(-1746.65)







3165 3170 3175 3180 31



D on February 19th, 2014 at 23:12hrs

to:

025.00mTVD, -1735.65mSS, 1239.53mVS)

n 1198.96m West of Well Center

65° 0' 8.13", W 126° 48' 40.23"

N 7210300.15 m, E 603197.09 m

drilled from the Heel at 2152.00m MD to TD at 3152.00m MD

Spud on January 29th, 2014 @ 00:01 hrs

Surface casing Drillout @ 602m on February 7th at 06:50 hrs

Intermediate casing Drillout @ 2152m on Feb 16, 2014 @ 11:05 hrs

401

n

.03mhr



DIRECTIONAL: In at 2152m
VS Azimuth: 285.025°
Motor Bend: 1.36°
Magnetic Dec: 22.846°
Survey tool offset: 20.00m
Gamma offset: 13.93m
LWD_Array Ind: 25.60m
LWD_Gamma 23.56m
Out at 3152m

3165 3170 3175 3180 31