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Houston, TX
(281) 784-5500
Bakersfield, CA
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(337) 364-2322
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(907) 561-2465

MUDLOG MD

COMPANY ExxonMobil Production
WELL PCU296-6A8
FIELD PICEANCE
REGION ROCKIES
COORDINATES 39.900102
108.212136
ELEVATION 7363.9
COUNTY, STATE RIO BLANCO, CO
API INDEX 05-103-11479-00
SPUD DATE 04/05/2010
CONTRACTOR HE
CO. REP. KEVIN GARDNER
RIG/TYPE 239 / FLEX 3
LOGGING UNIT 33
GEOLOGISTS NICK BAUER
JASON REISENBICHLER
ADD. PERSONS LAYNE GOOD
JASON REYNOLDS
CO. GEOLOGIST MELISSA SAURBORN

LOG INTERVAL

CASING DATA

DEPTHS: 148' TO 9717'
DATES: 04/05/2010 TO 04/19/2010
SCALE: 5"=100'

16" AT 147'
10.75" AT 4438'
AT
AT

MUD TYPES

HOLE SIZE

SPUD MUD TO 4454'
LSND TO 9717'
TO
TO

14.75" TO 4454'
9.875" TO 9717'
TO
TO

ABBREVIATIONS

<i>NB</i> NEWBIT	<i>PV</i> PLASTIC VISCOSITY	<i>LC</i> LOST CIRCULATION
<i>RRB</i> RERUN BIT	<i>YP</i> YIELD POINT	<i>CO</i> CIRCULATE OUT
<i>CB</i> CORE BIT	<i>FL</i> FLUID LOSS	<i>NR</i> NO RETURNS
<i>WOB</i> WEIGHT ON BIT	<i>CL</i> PPM CLORIDE ION	<i>TG</i> TRIP GAS
<i>RPM</i> ROTARY REV/MIN	<i>Rm</i> MUD RESISTIVITY	<i>SG</i> SURVEY GAS
<i>PP</i> PUMP PRESSURE	<i>Rmf</i> FILTRATE RESISTIVITY	<i>WG</i> WIPER GAS
<i>SPM</i> STROKES/MIN	<i>PR</i> POOR RETURNS	<i>CG</i> CONNECTION GAS
<i>MW</i> MUD WEIGHT	<i>LAT</i> LOGGED AFTER TRIP	
<i>VIS</i> FUNNEL VISCOSITY	<i>LAS</i> LOGGED AFTER SURVEY	

ALTERED ZONE	CHERT - GLASSY	FELSIC SILIC DIKE	MARL - CALC	SANDSTONE
ANDESITE	CHERT - PORCEL	FOSSIL	METAMORPHICS	SANDSTONE-TUFFACEOUS
ANHYDRITE	CHERT - TIGER STRIPE	GABBRO	MUDSTONE	SERICITIZATION
BASALT	CHERT - UNDIFF	GLASSY TUFF	OBSIDIAN	SERPENTINE
BENTONITE	CLAY	GRANITE	PALEOSOL	SHALE
BIOTITIZATION	CLAY-MUDSTONE	GRANITE WASH	PHOSPHATE	SHALE TUFFACEOUS
BRECCIA	CLYST-TUFFACEOUS	GRANODIORITE	PORCELANITE	SHELL FRAGMENTS
CALCARENITE	CHLORITIZATION	GYPSUM	PORCELANEOUS CLYST	SIDERITE
CALCAREOUS TUFF	COAL	HALITE	PYRITE	SILICIFICATION
CALCILUTITE	CONGLOMERATE	HORNBL-QTZ-DIO	PYROCLASTICS	SILTSTONE
CARBONATES	CONGL. SAND	IGNEOUS (ACIDIC)	QUARTZ DIORITE	SILTST-TUFFACEOUS
CARBONACEOUS MAT	CONGL. SANDSTONE	IGNEOUS (BASIC)	QUARTZ LATITE	TUFF
CARBONACEOUS SH	COQUINA	INTRUSIVES	QUARTZ MONZONITE	VOLCANICLASTICS SEDS
CEMENT CONTAM.	DACITE	KAOLINITIC	RECRYSTALLIZED CALCITE	VOLCANICS
CHALK	DIATOMITE	LIMESTONE	RHYOLITE	
CRYSTALLINE TUFF	DIORITE	LITHIC TUFF	SALT	
CHERT - ARGILL	DOLOSTONE	MARL - DOLO	SAND	

<200 ROP 0>
ft/hr

<50 Avg WOB 0>
kibs

<0 Gamma 100>
API Units

Depth

Lithology

MGS

<0 Ttl Gas 1K>
units

<0 CO2 10K>
ppm

<0 Flare Ht. 100>
ft

<10 Meth C-1 100K>
ppm

<10 Ethn C-2 100K>

<10 Prop C-3 100K>

<10 Butn C-4 100K>

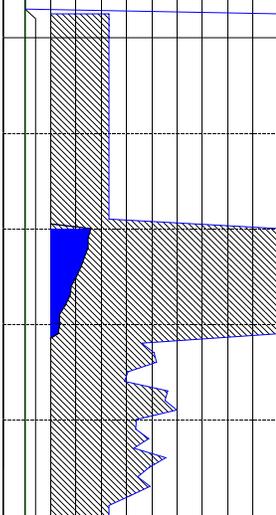
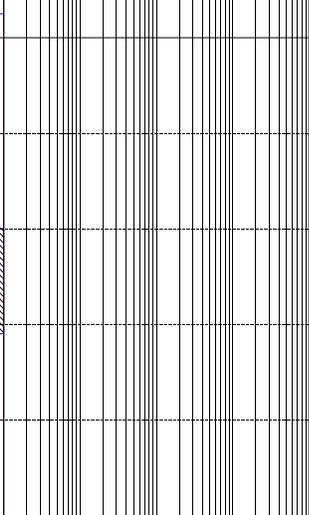
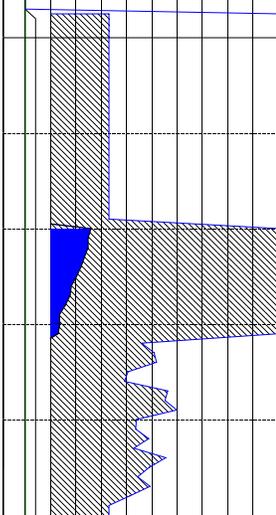
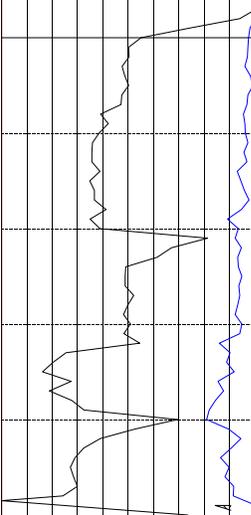
<10 Pent C-5 100K>

Interp. Lith

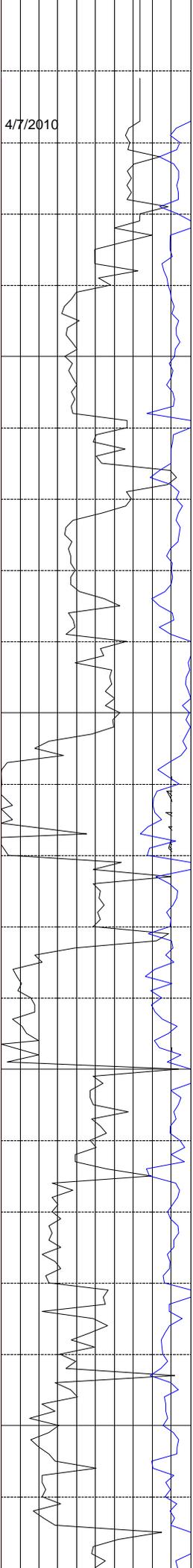
Remarks
Survey Data, Mud Reports, Other Info.

100

20

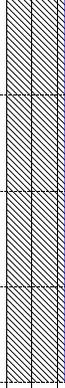
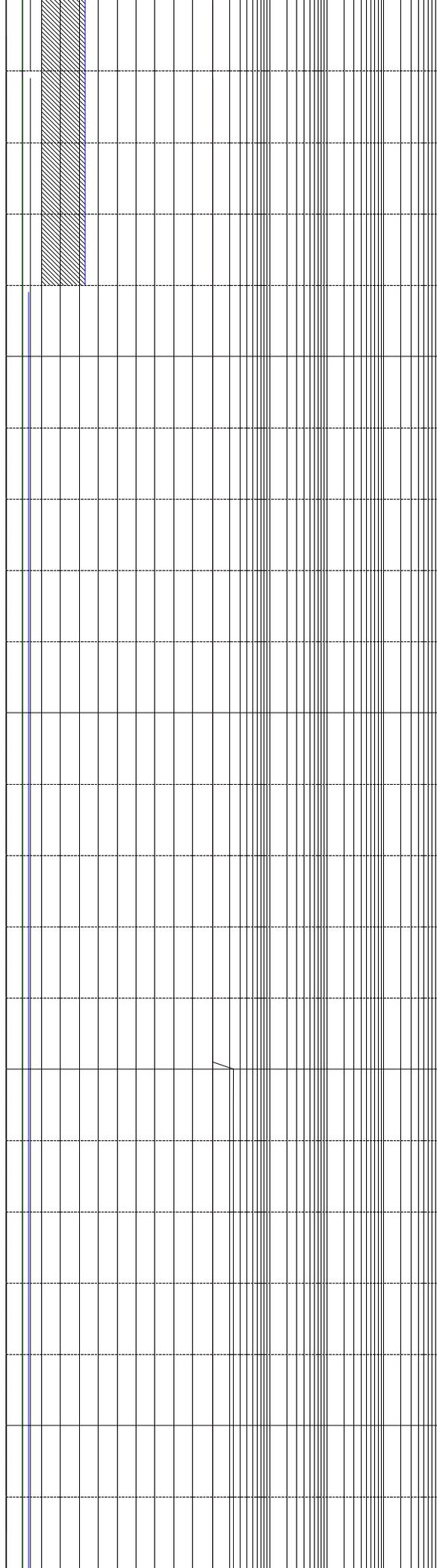


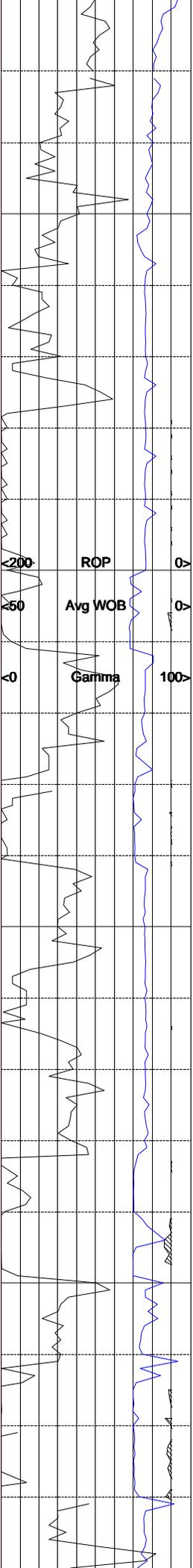
4/7/2010



300

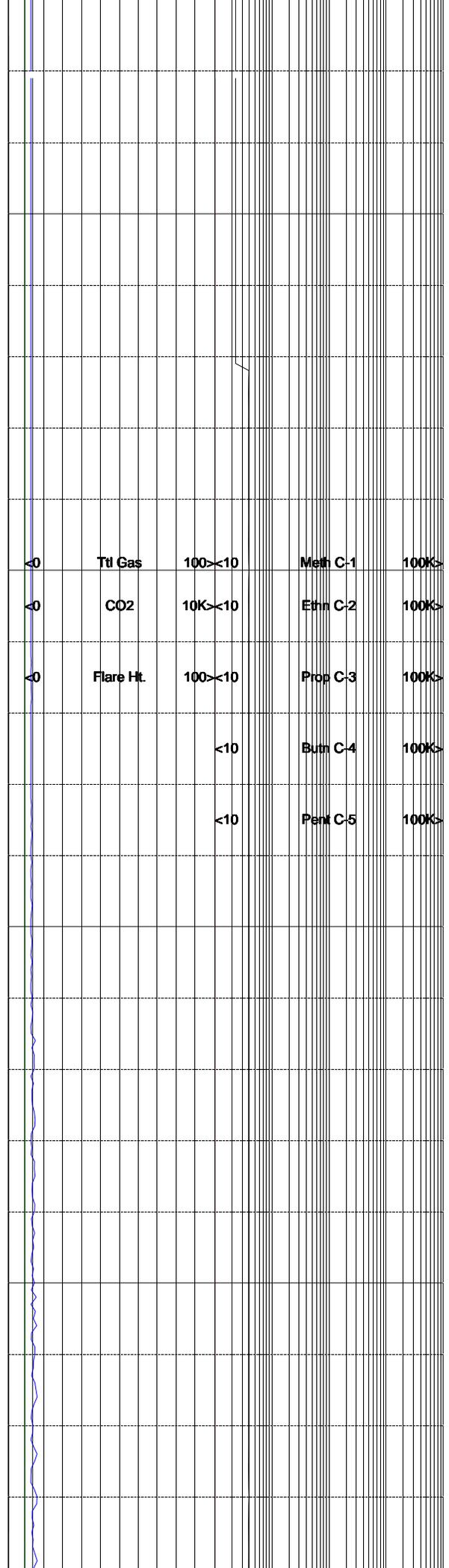
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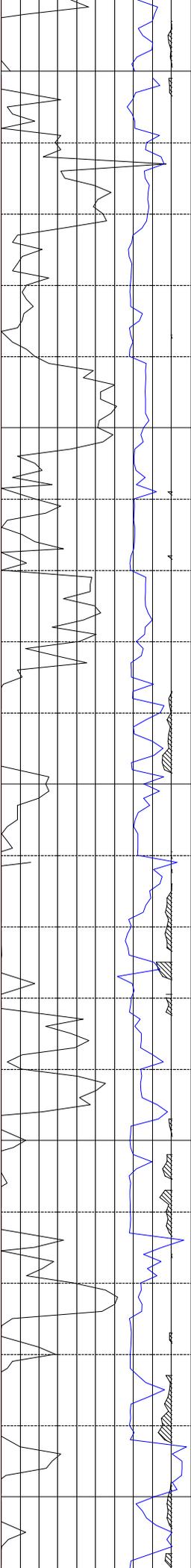


500

600

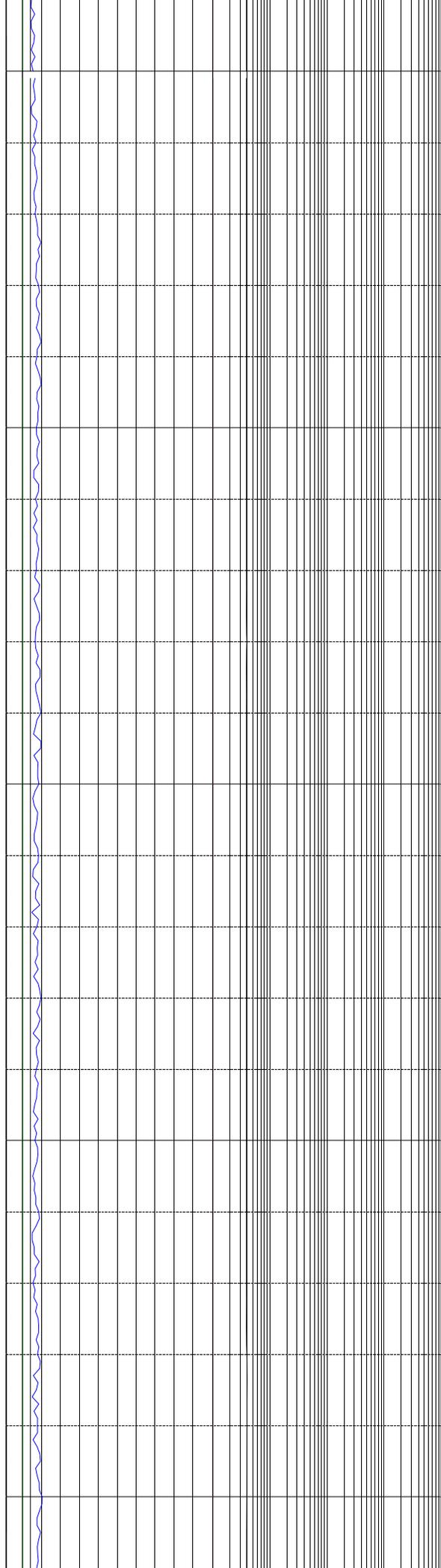


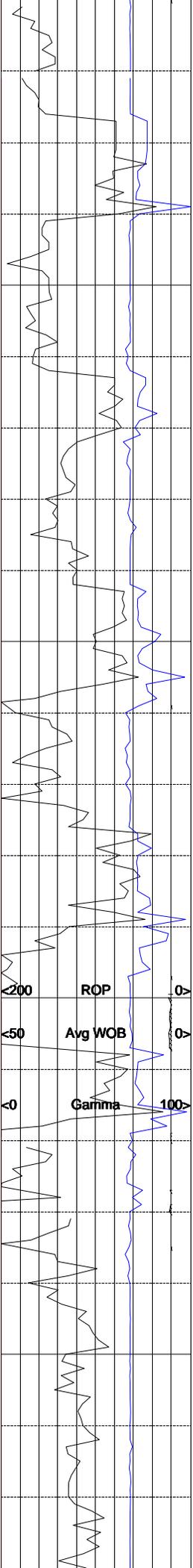
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		<10	Pent C-5	100K>



700

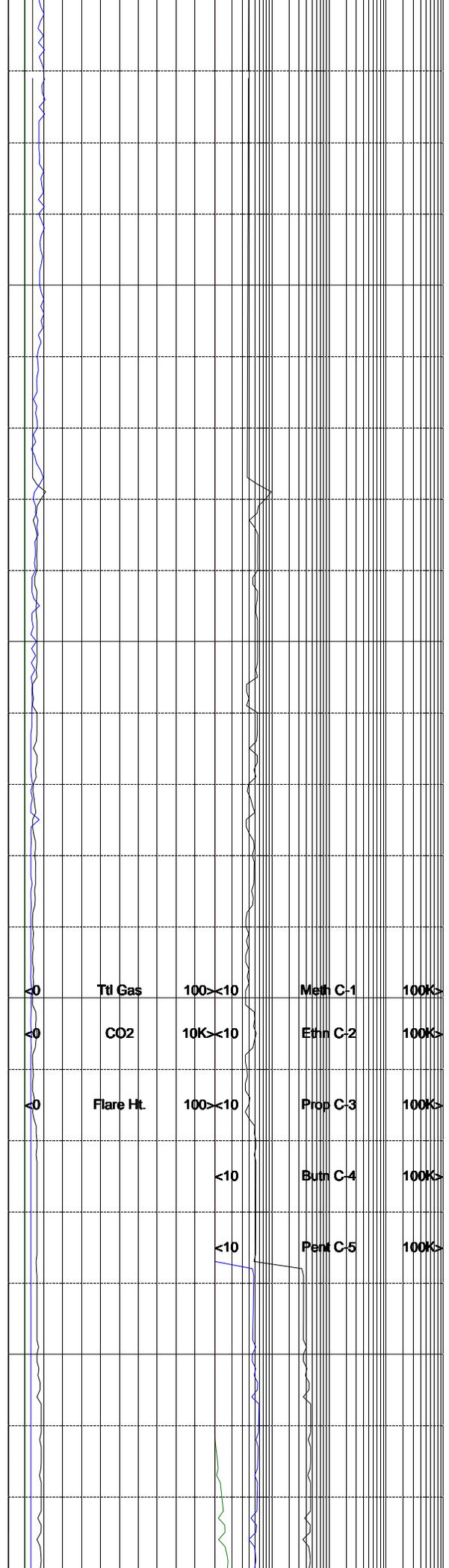
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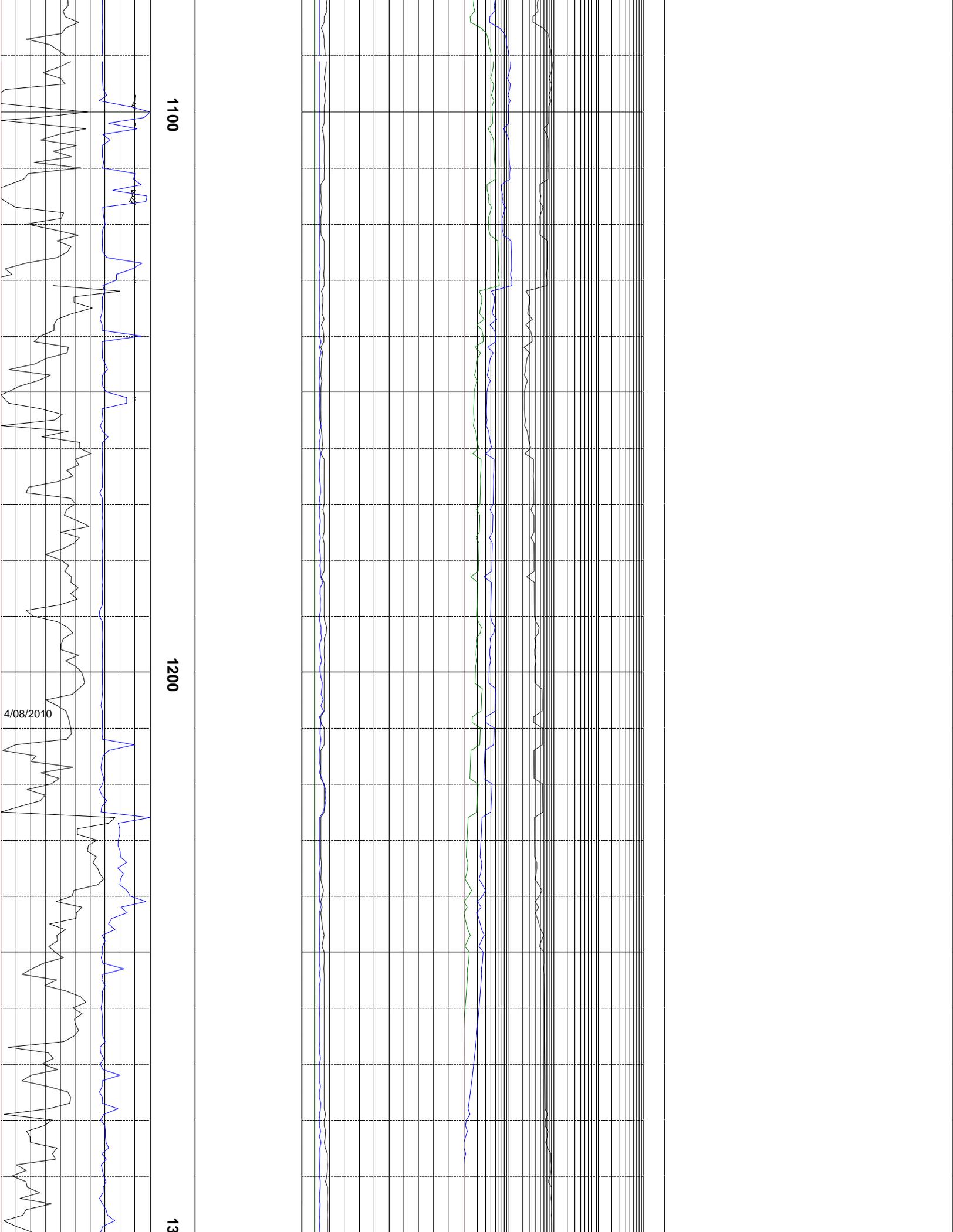


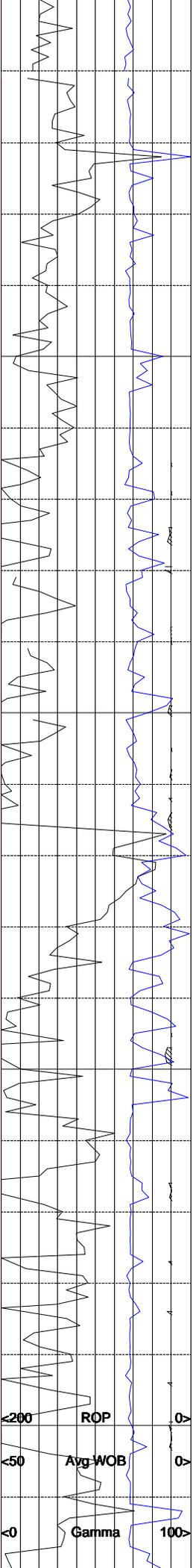
900

1000



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<0	CO2	10K><10	Ethn C-2	100K>
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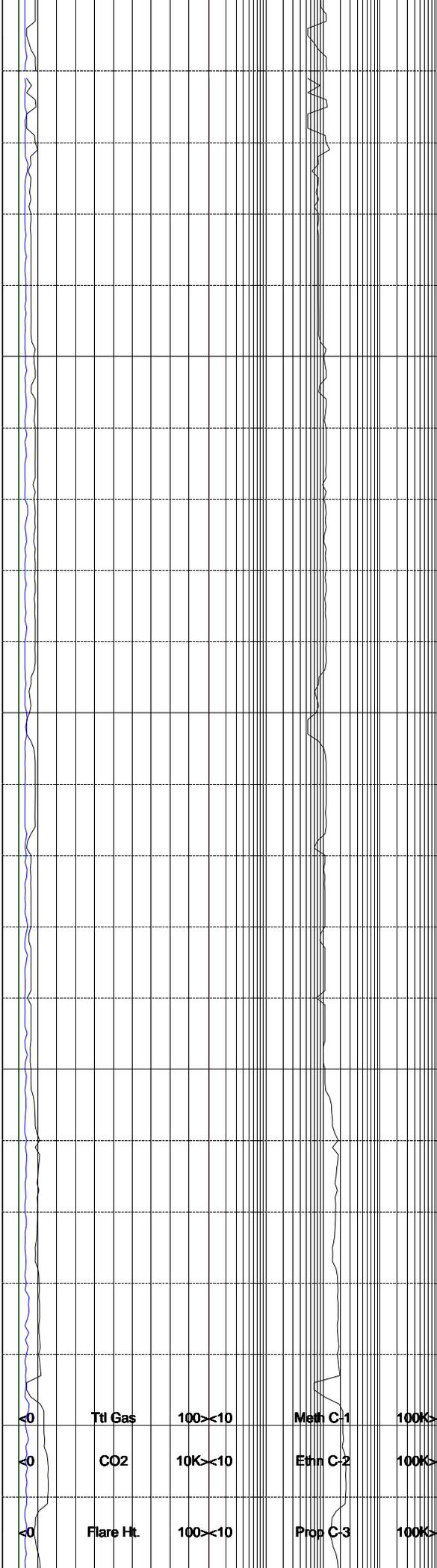




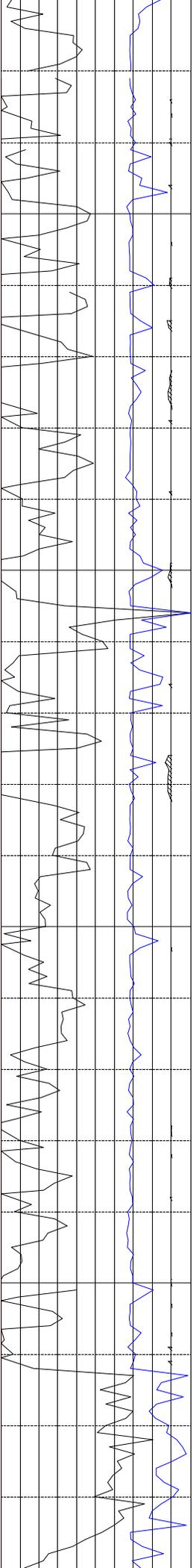
1400

1500

200 ROP
150 Avg WOB
0 Gamma 100

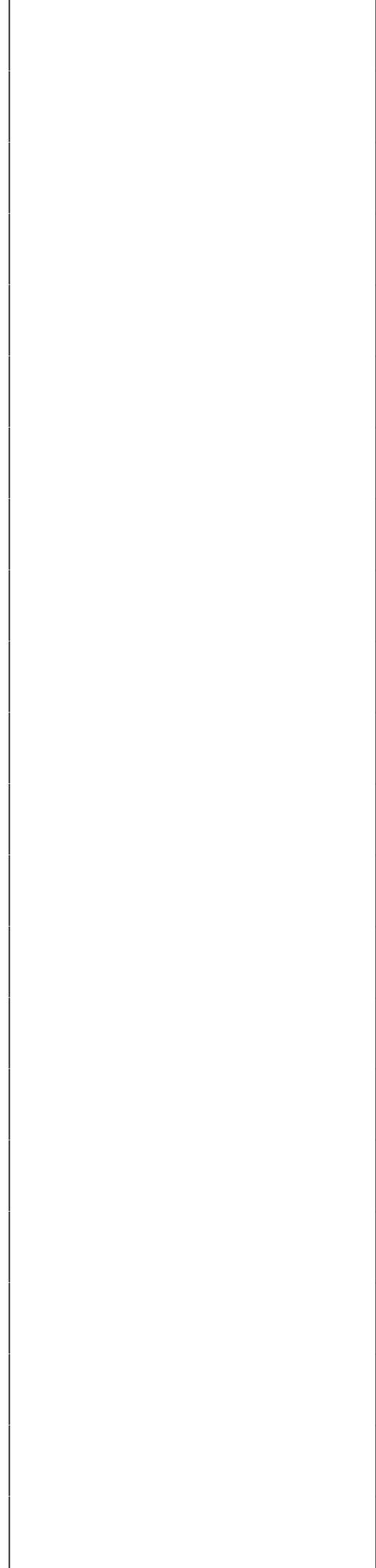
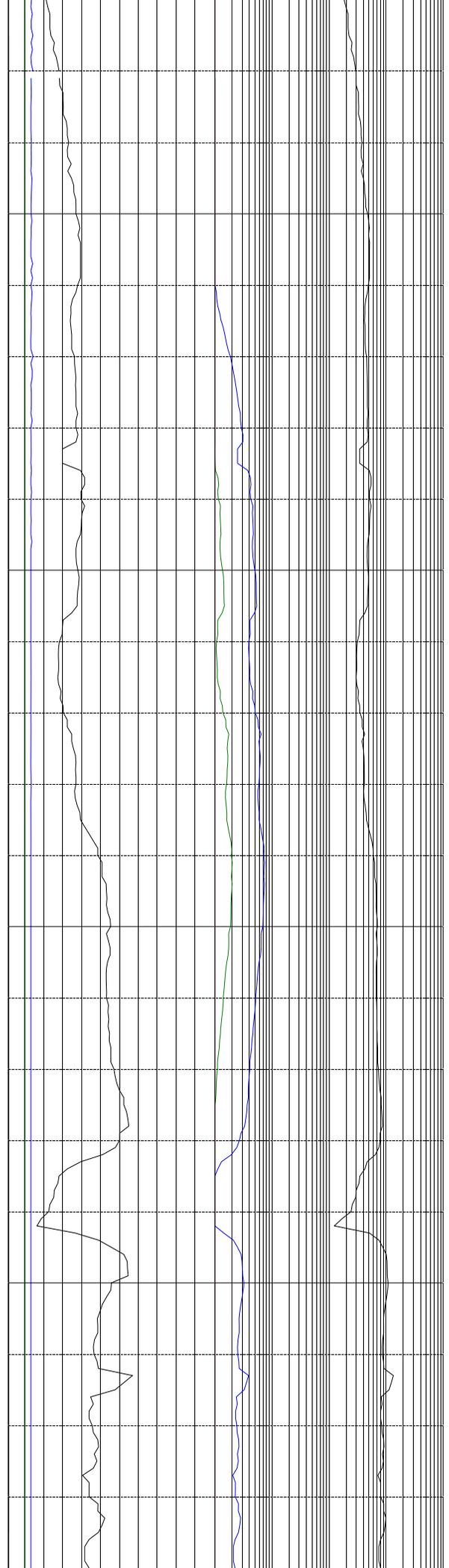


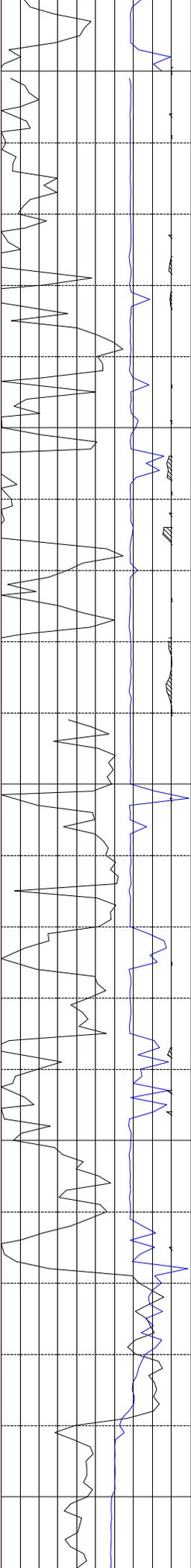
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0 CO2 10K<10 Ethn C-2 100K>
0 Flare Ht. 100K<10 Prop C-3 100K>



1600

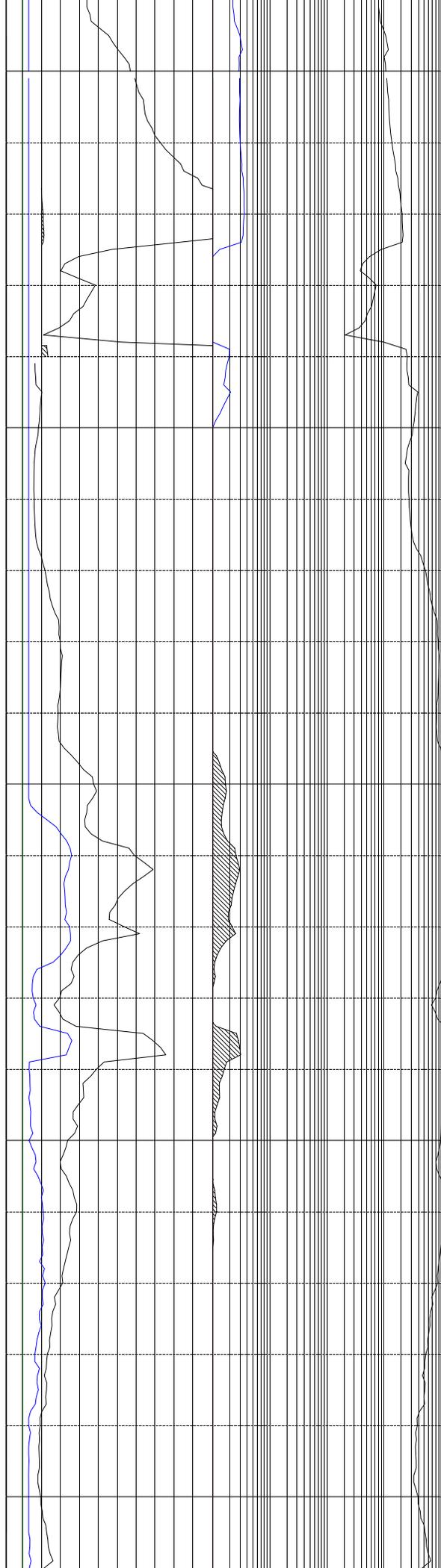
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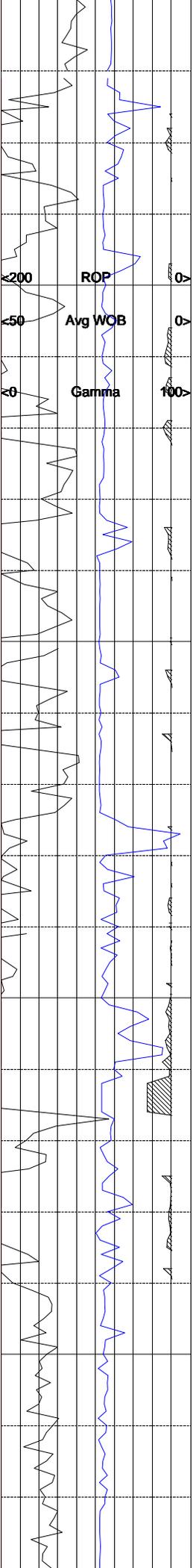




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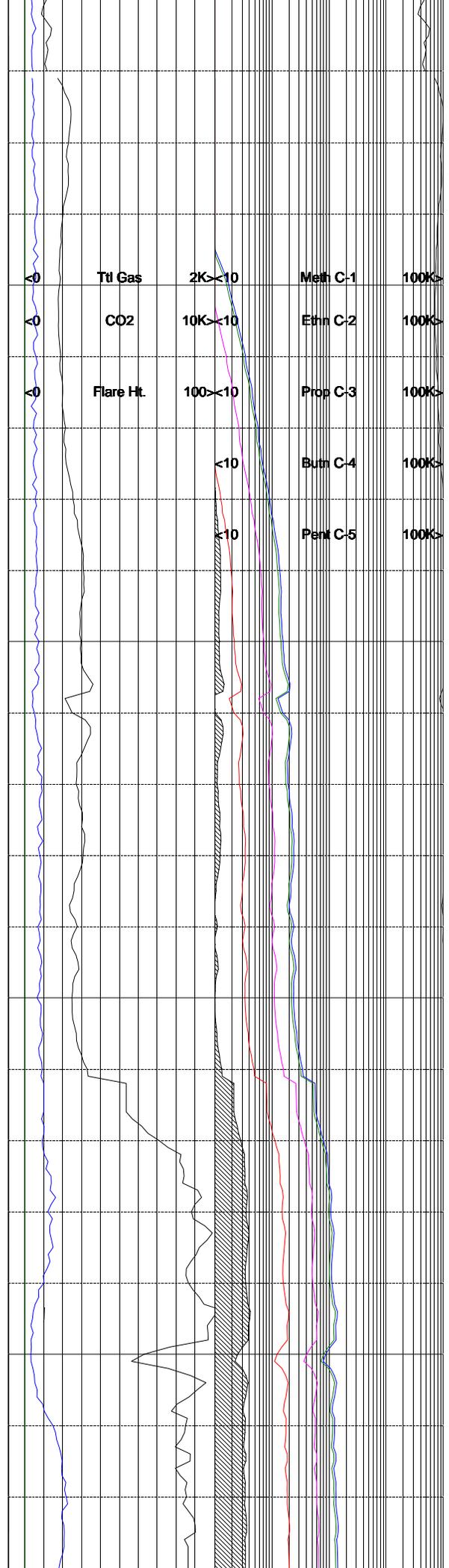
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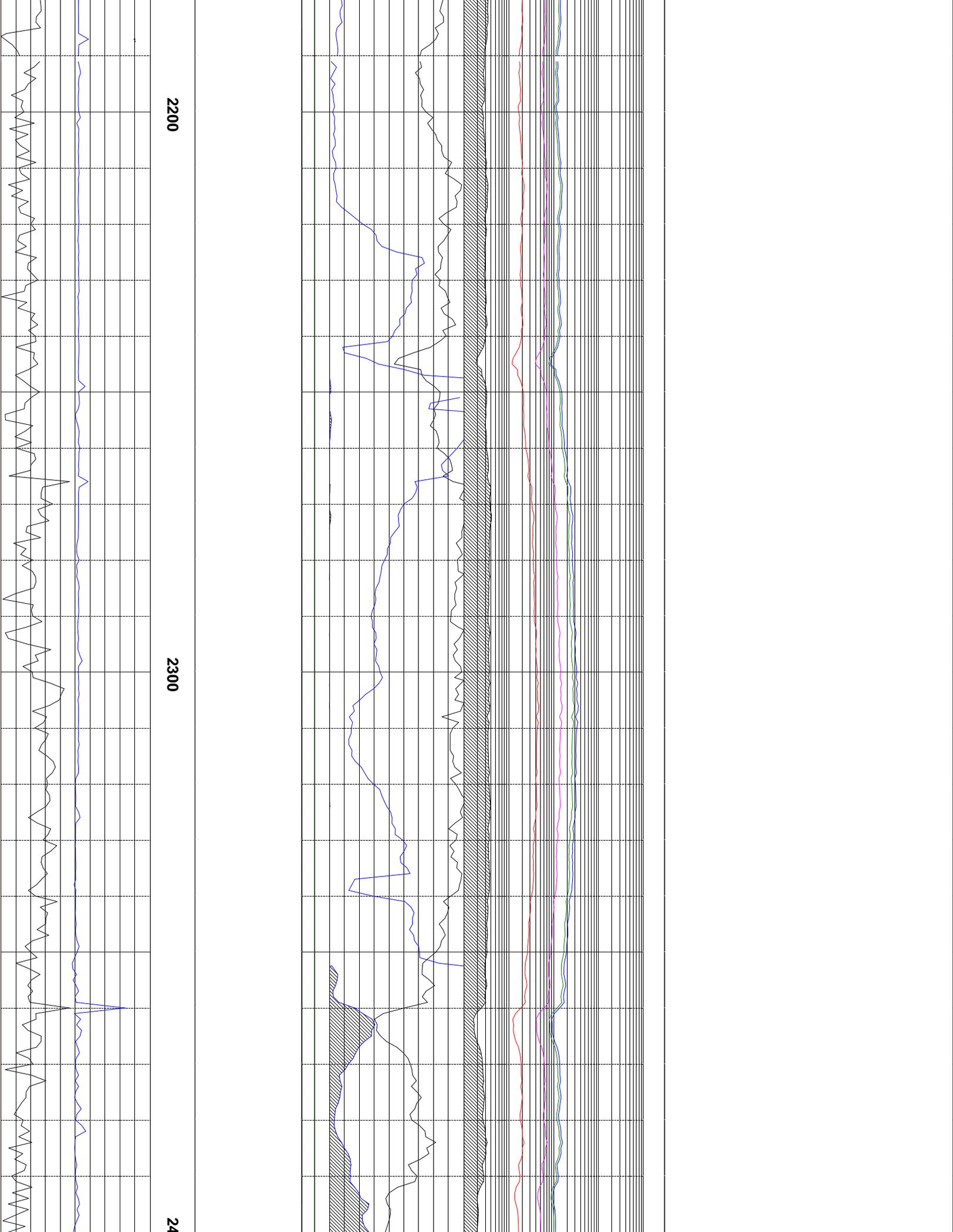


2000

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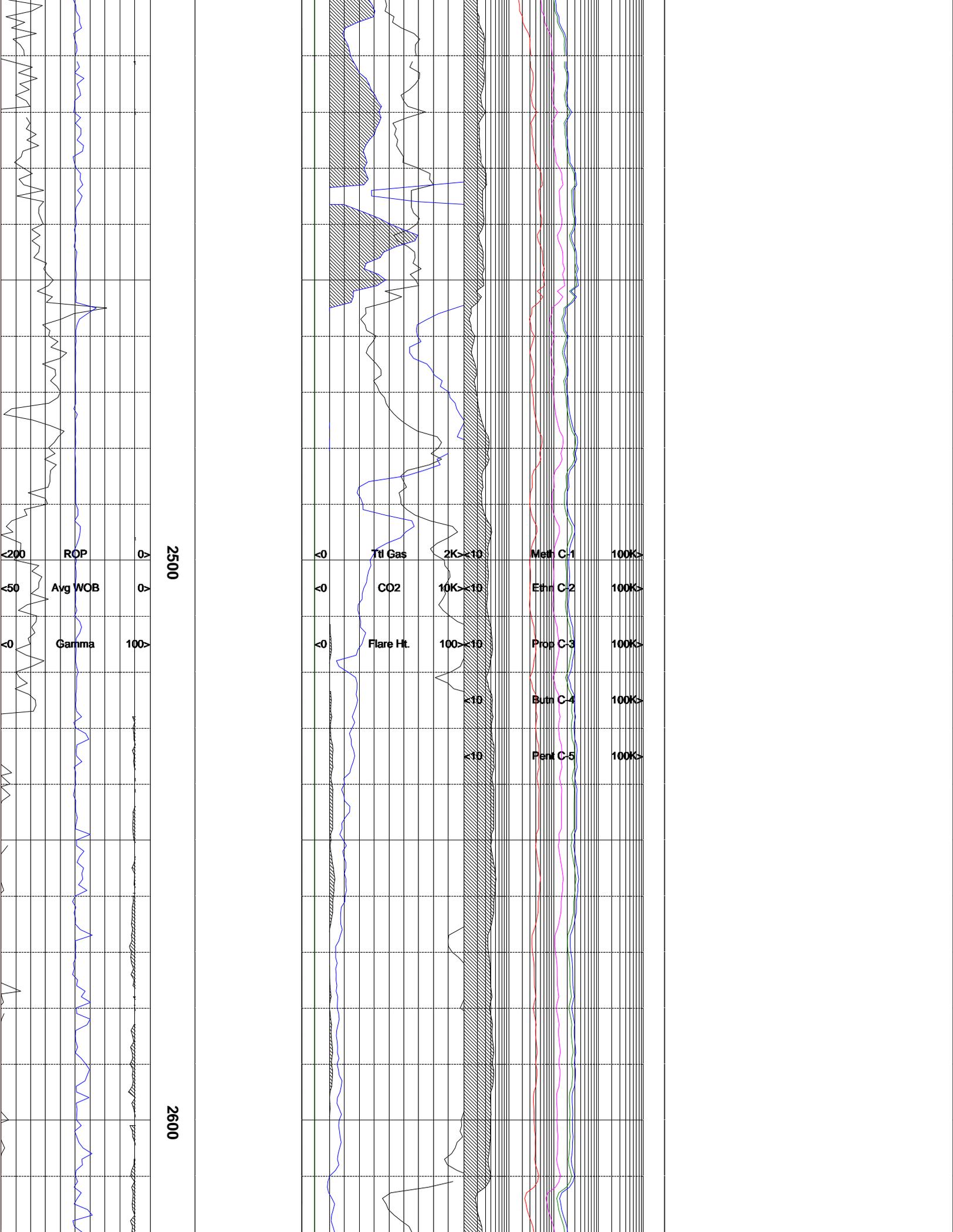
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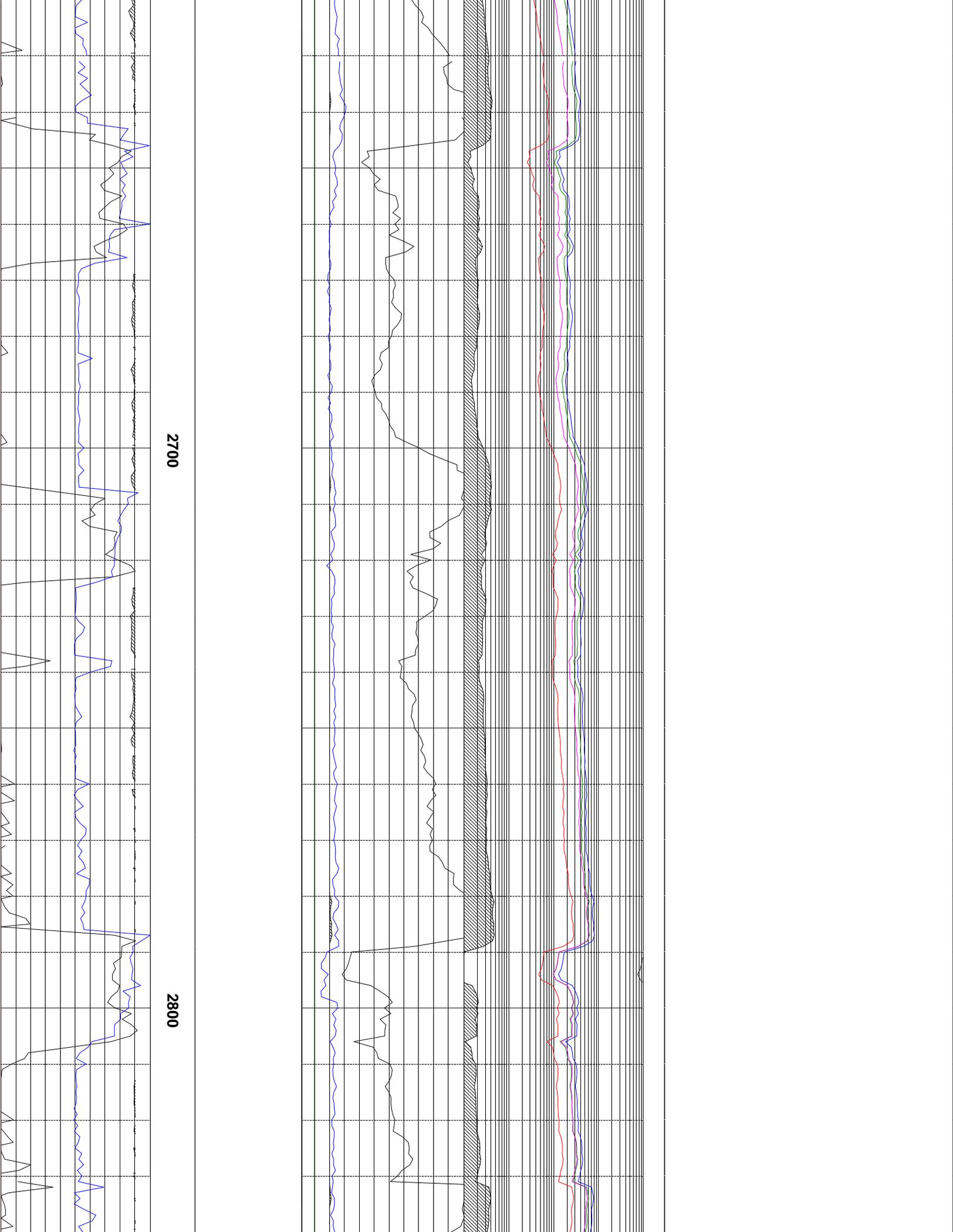


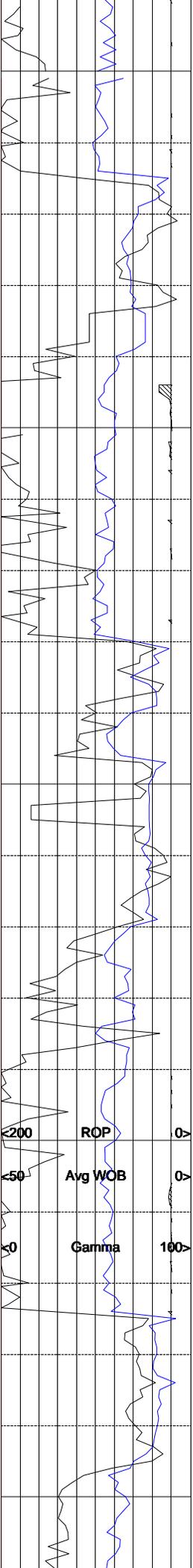
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2300

24

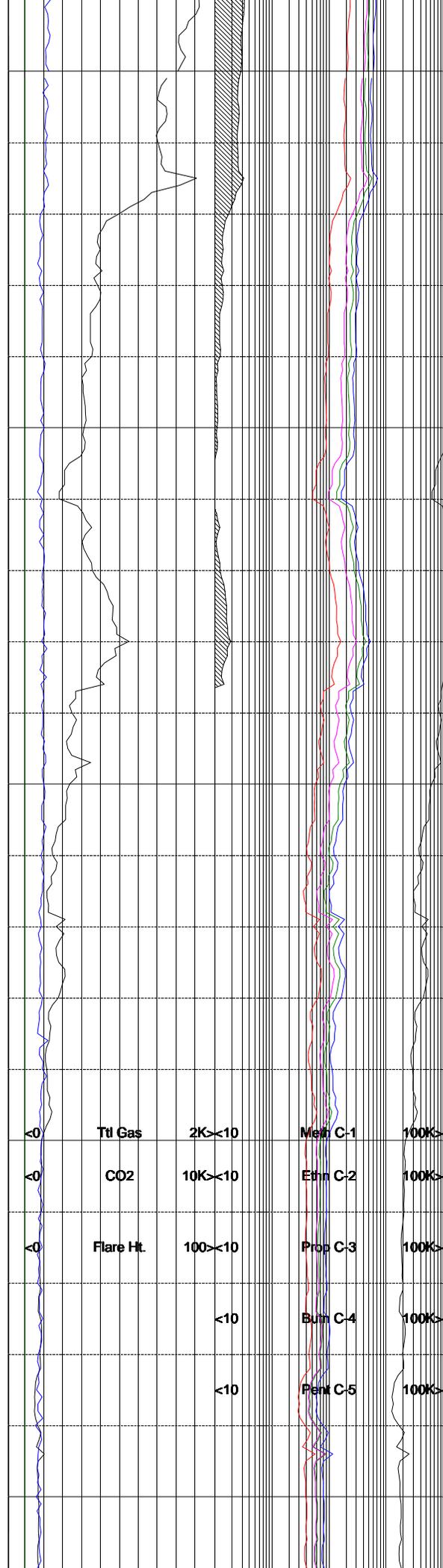




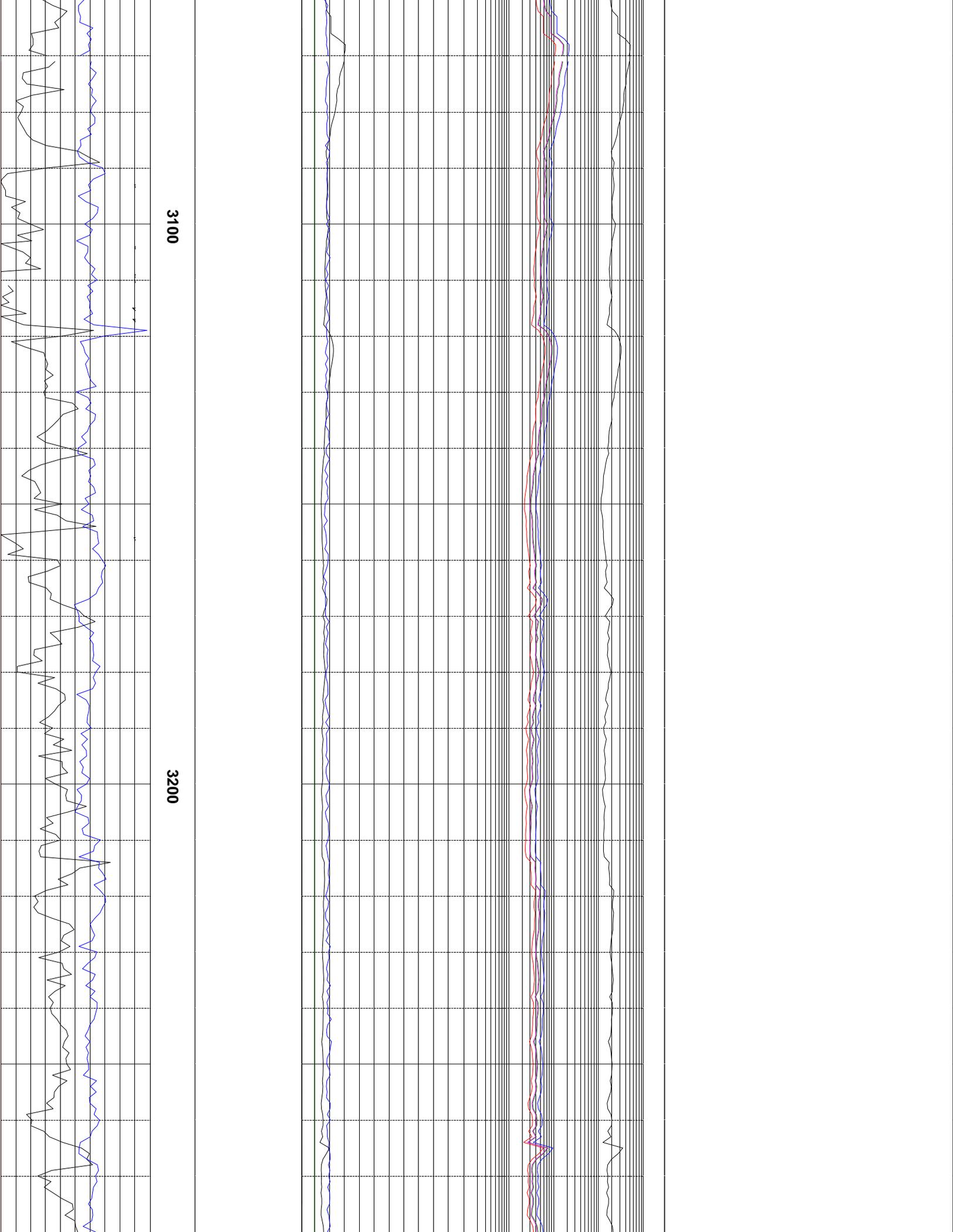


2900

3000

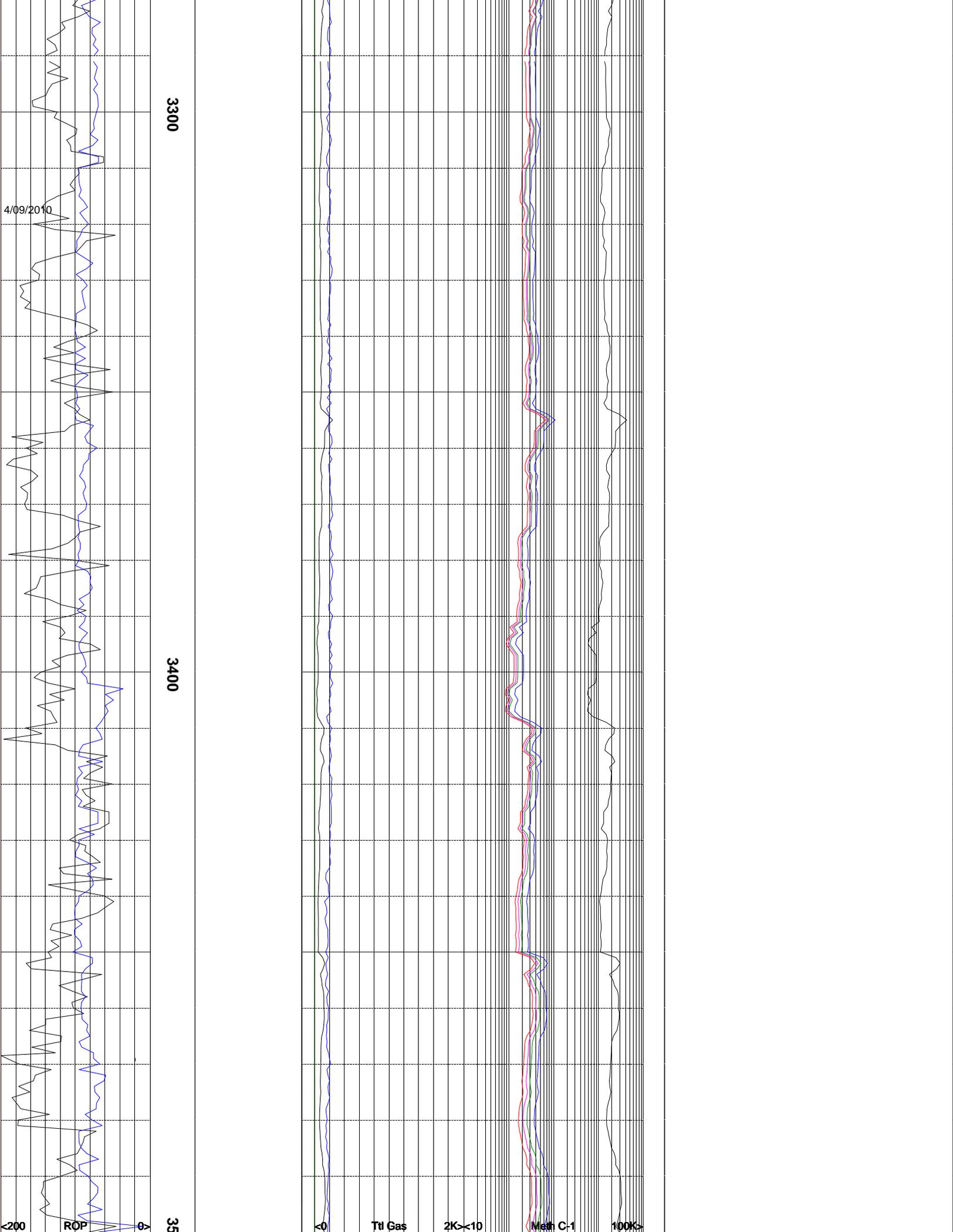


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<0	CO2	10K<10	Ethn C-2	100K>
<0	Flare Ht.	100<10	Prop C-3	100K>
		<10	Butn C-4	100K>
		<10	Pent C-5	100K>



3100

3200



3300

3400

3500

4/09/2010

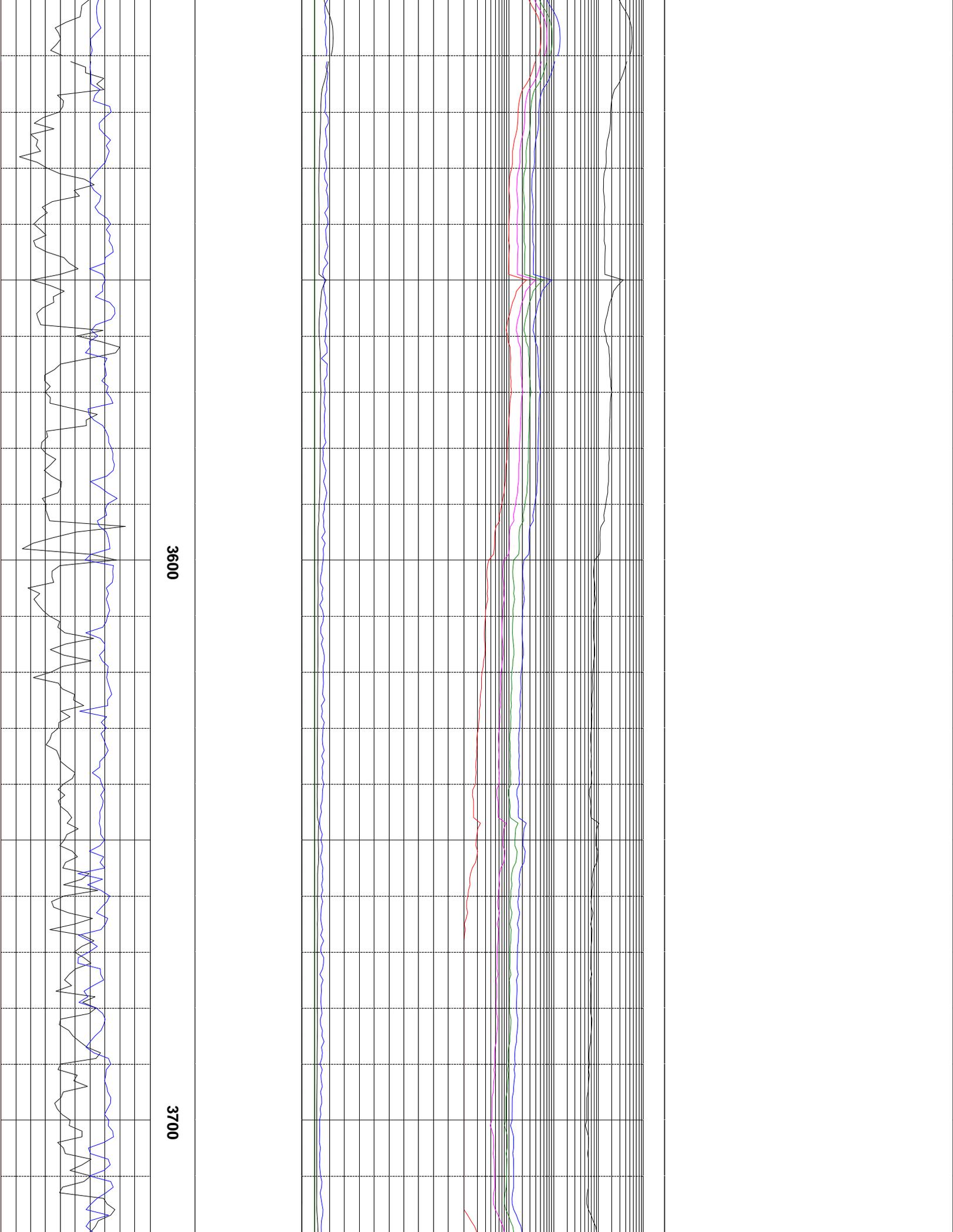
ROP

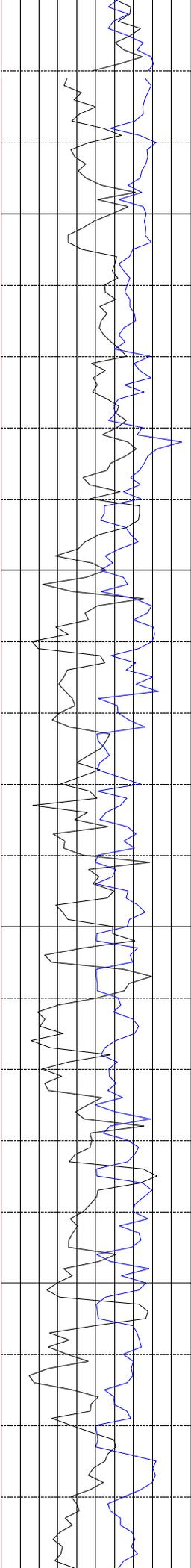
Ttl Gas

2Kx10

Meth C-1

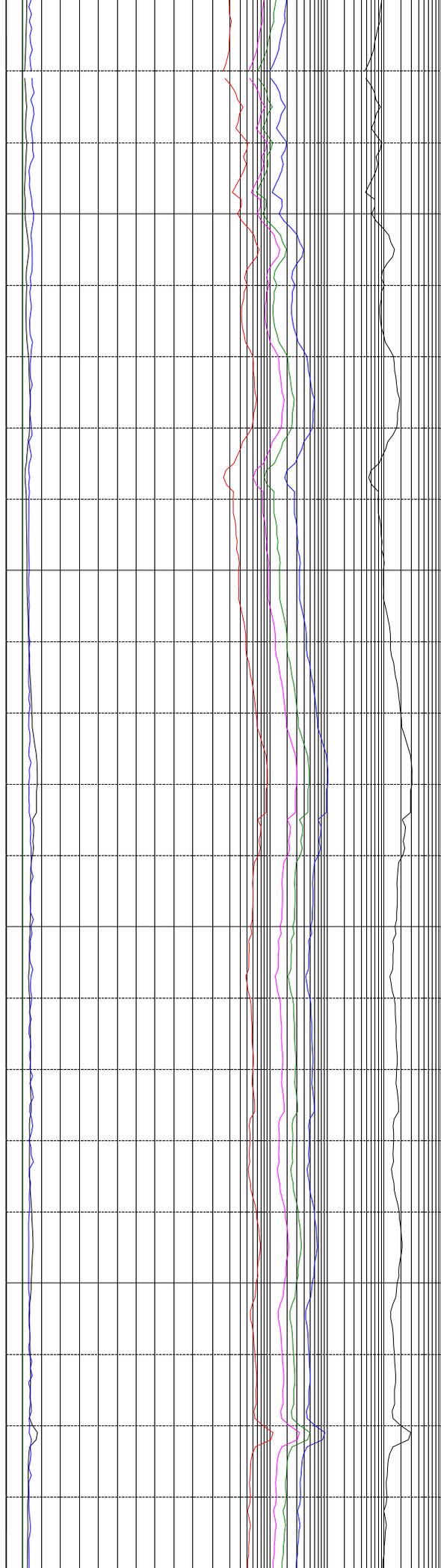
100Kx

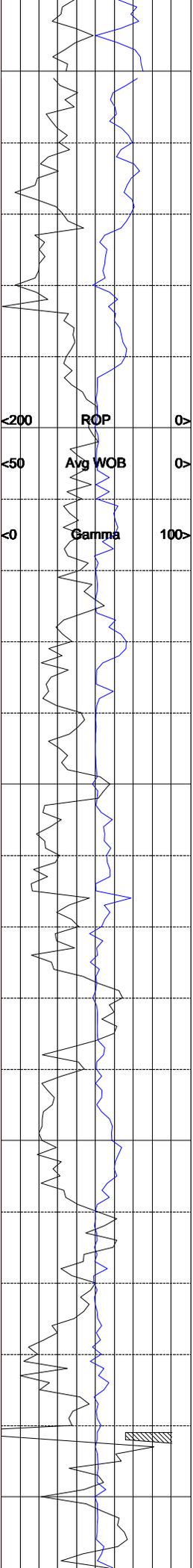




3800

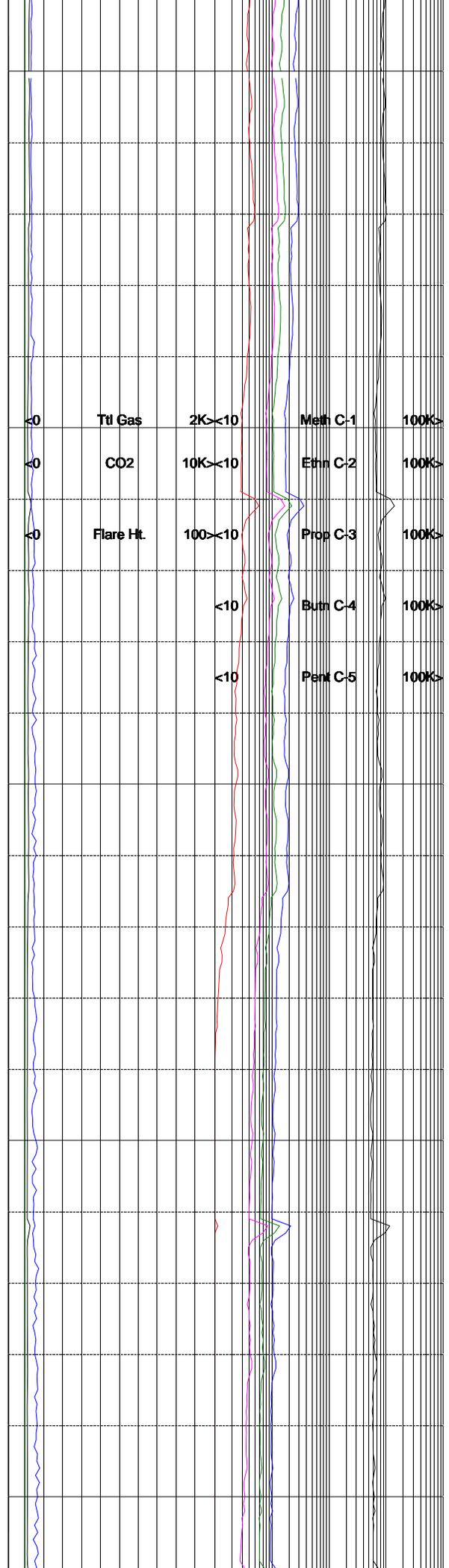
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4000

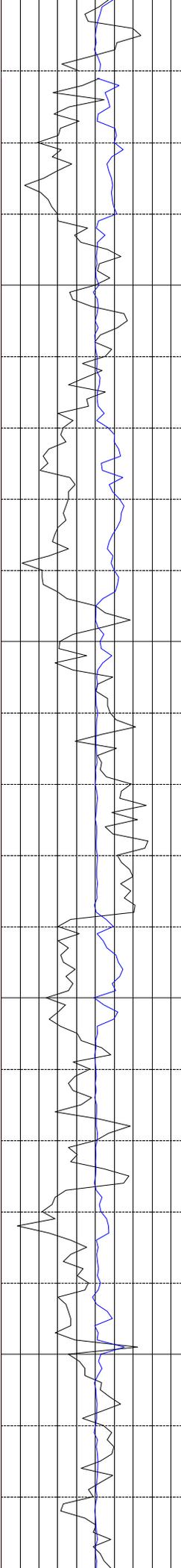
4100



ALL ROCK COLORS ARE REFERENCED TO THE
 GSA ROCK COLOR CHART. ROCK CONSTITUENTS
 ARE DESCRIBED WET AND LISTED IN ORDER
 OF MOST ABUNDANT TO LEAST ABUNDANT WITH
 RESPECT TO PERCENTAGE IN SAMPLE. DEPTH
 IS REFERENCED TO RKB.

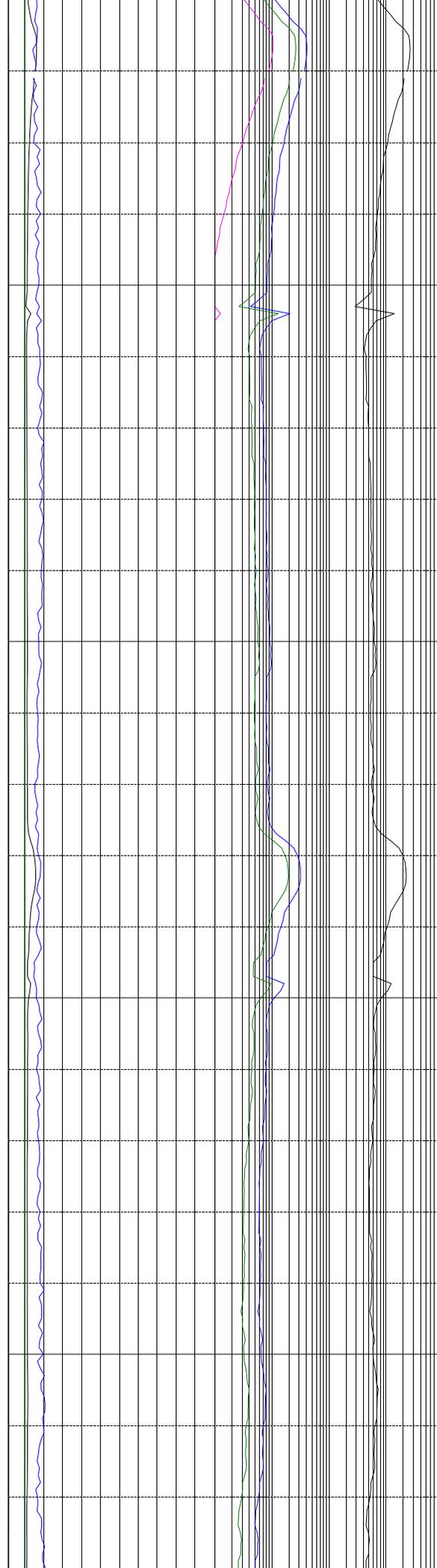
CONNECTION GASES AS WELL AS TRIP GASES
 AND DOWNTIME GASES ARE NOTED ON THE LOG

LARGE CONNECTION GASES WHICH APPEAR ON
 THE MUDLOG USUALLY REFLECT UPHOLE GAS
 INTERVALS BLEEDING INTO THE BORE HOLE
 DURING CONNECTIONS.

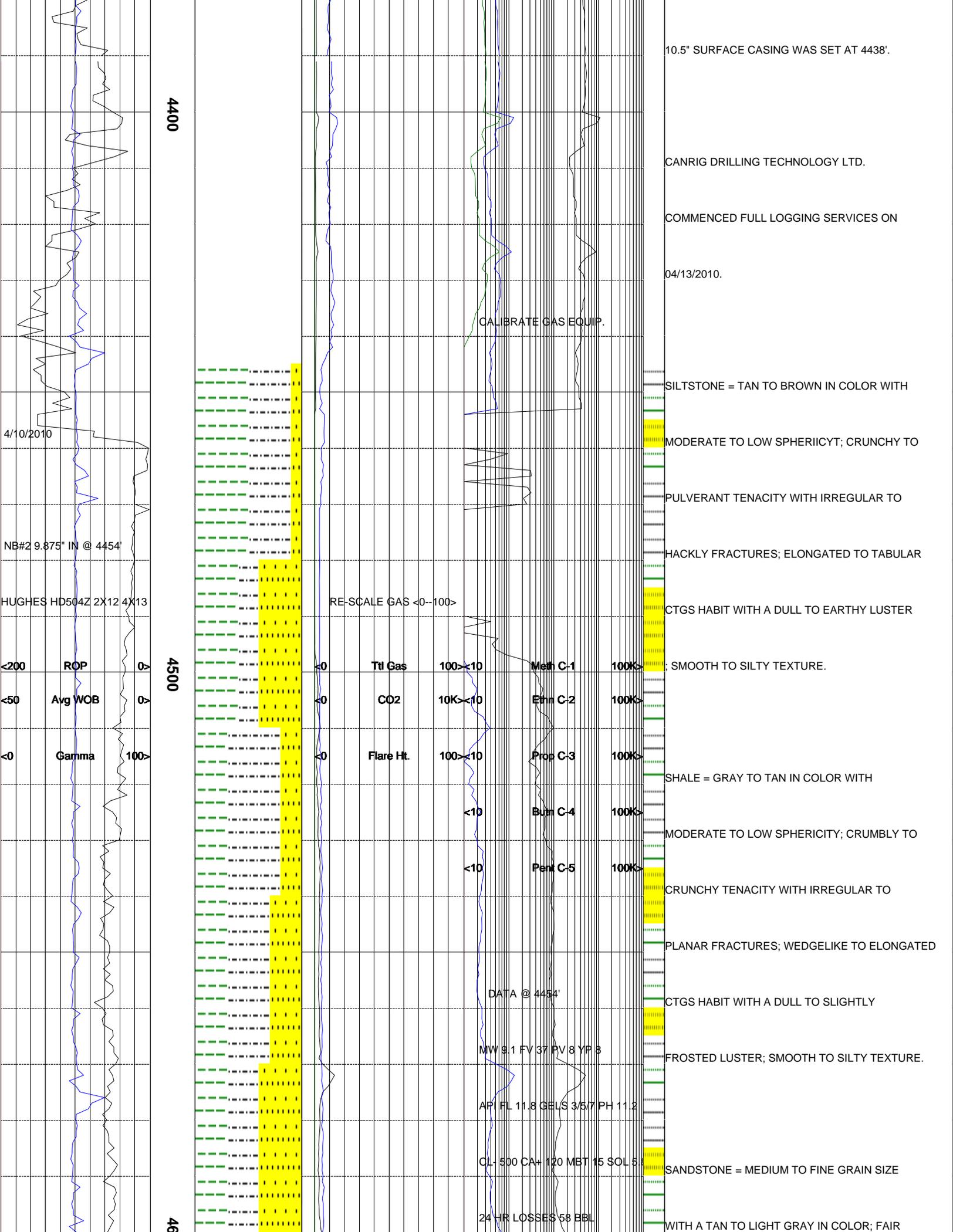


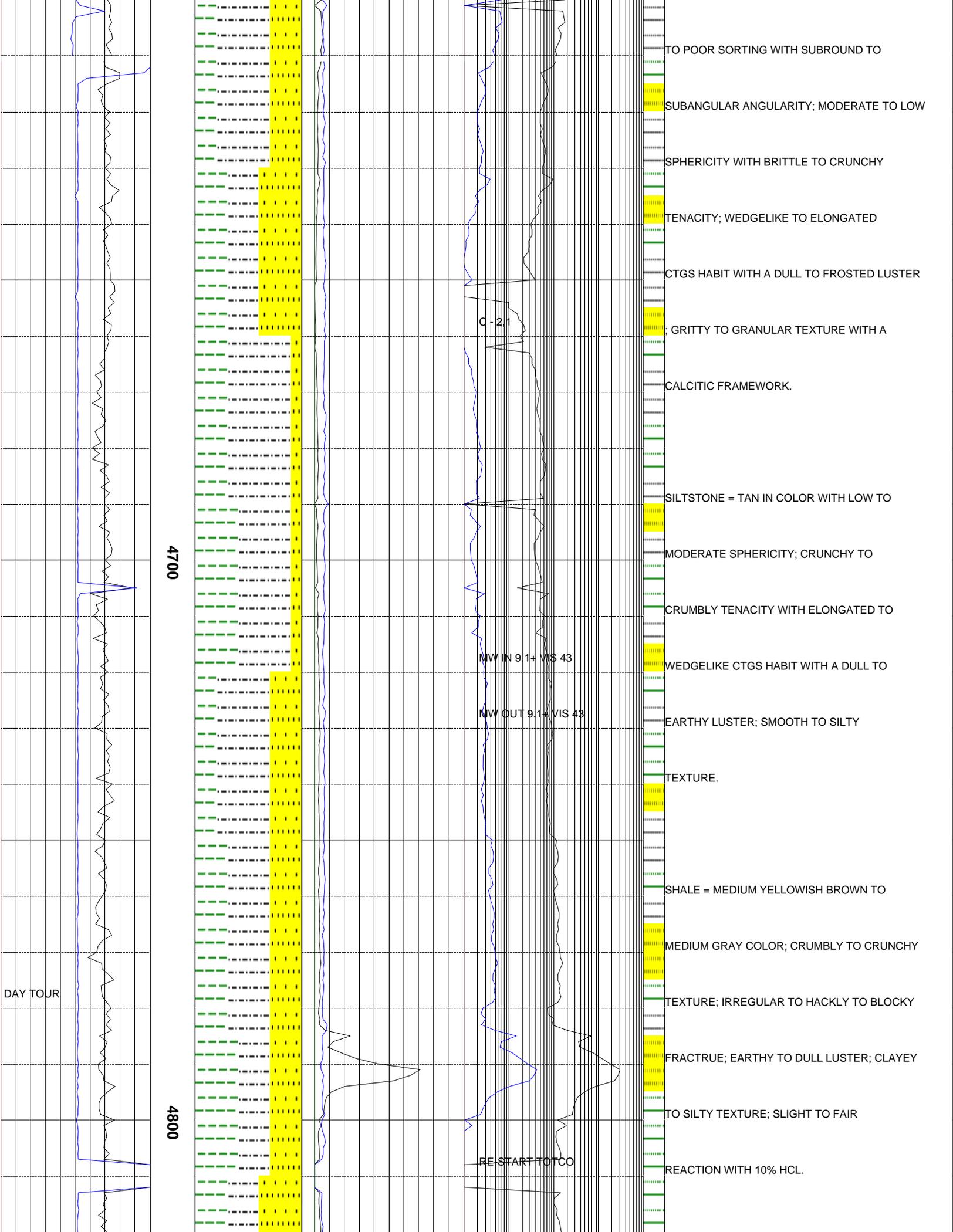
4200

4300



GAS CHROMATOGRAPHY EQUIPMENT IS
CALIBRATED TO A TEST GAS COMPOSED OF:
METHANE = 10000 PPM
ETHANE = 1000 PPM
PROPANE = 1000 PPM
I-BUTANE = 1000 PPM
N-BUTANE = 1000 PPM
I-PENTANE = 1000 PPM
N-PENTANE = 1000 PPM
WHEN THE MUD IS RUN THROUGH THE MGS (MUD
GAS SEPERATOR) THE INTERVAL IS MARKED ON
THE LOG IN THE SLIDE COLUMN AND NOTED ON
THE LOG.
ALL SANDSTONE INTERVALS ARE EXAMINED FOR
SAMPLE FLUORESCENCE IN THE UV SCOPE FOR
HYDROCARBON FLUORESCENCE AND MINOR
FLUORESCENCE FROM POSSIBLE FRACTURE
FILL. ALL FLUORESCENCE IS NOTED ON THE
MUDLOG.





4700

4800

DAY TOUR

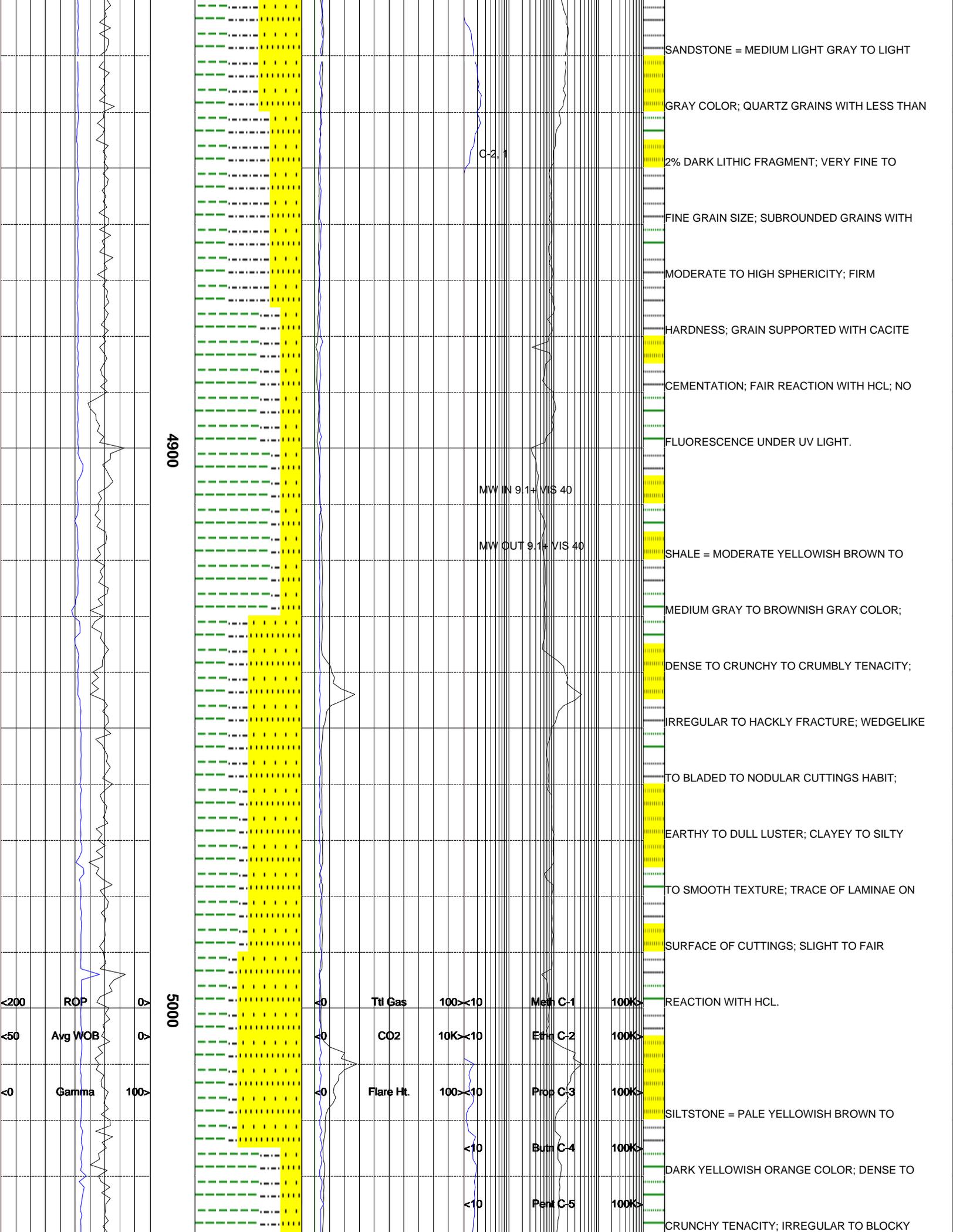
C-21

MW IN 9.1+ VIS 43

MW OUT 9.1+ VIS 43

RE-START TOTCO

TO POOR SORTING WITH SUBROUND TO
 SUBANGULAR ANGULARITY; MODERATE TO LOW
 SPHERICITY WITH BRITTLE TO CRUNCHY
 TENACITY; WEDGELIKE TO ELONGATED
 CTGS HABIT WITH A DULL TO FROSTED LUSTER
 GRITTY TO GRANULAR TEXTURE WITH A
 CALCITIC FRAMEWORK.
 SILTSTONE = TAN IN COLOR WITH LOW TO
 MODERATE SPHERICITY; CRUNCHY TO
 CRUMBLY TENACITY WITH ELONGATED TO
 WEDGELIKE CTGS HABIT WITH A DULL TO
 EARTHY LUSTER; SMOOTH TO SILTY
 TEXTURE.
 SHALE = MEDIUM YELLOWISH BROWN TO
 MEDIUM GRAY COLOR; CRUMBLY TO CRUNCHY
 TEXTURE; IRREGULAR TO HACKLY TO BLOCKY
 FRACTURE; EARTHY TO DULL LUSTER; CLAYEY
 TO SILTY TEXTURE; SLIGHT TO FAIR
 REACTION WITH 10% HCL.



4900

5000

SANDSTONE = MEDIUM LIGHT GRAY TO LIGHT GRAY COLOR; QUARTZ GRAINS WITH LESS THAN 2% DARK LITHIC FRAGMENT; VERY FINE TO FINE GRAIN SIZE; SUBROUNDED GRAINS WITH MODERATE TO HIGH SPHERICITY; FIRM HARDNESS; GRAIN SUPPORTED WITH CALCITE CEMENTATION; FAIR REACTION WITH HCL; NO FLUORESCENCE UNDER UV LIGHT.

SHALE = MODERATE YELLOWISH BROWN TO MEDIUM GRAY TO BROWNISH GRAY COLOR; DENSE TO CRUNCHY TO CRUMBLY TENACITY; IRREGULAR TO HACKLY FRACTURE; WEDGELIKE TO BLADED TO NODULAR CUTTINGS HABIT; EARTHY TO DULL LUSTER; CLAYEY TO SILTY TO SMOOTH TEXTURE; TRACE OF LAMINAE ON SURFACE OF CUTTINGS; SLIGHT TO FAIR REACTION WITH HCL.

SILTSTONE = PALE YELLOWISH BROWN TO DARK YELLOWISH ORANGE COLOR; DENSE TO CRUNCHY TENACITY; IRREGULAR TO BLOCKY

C-2, 1

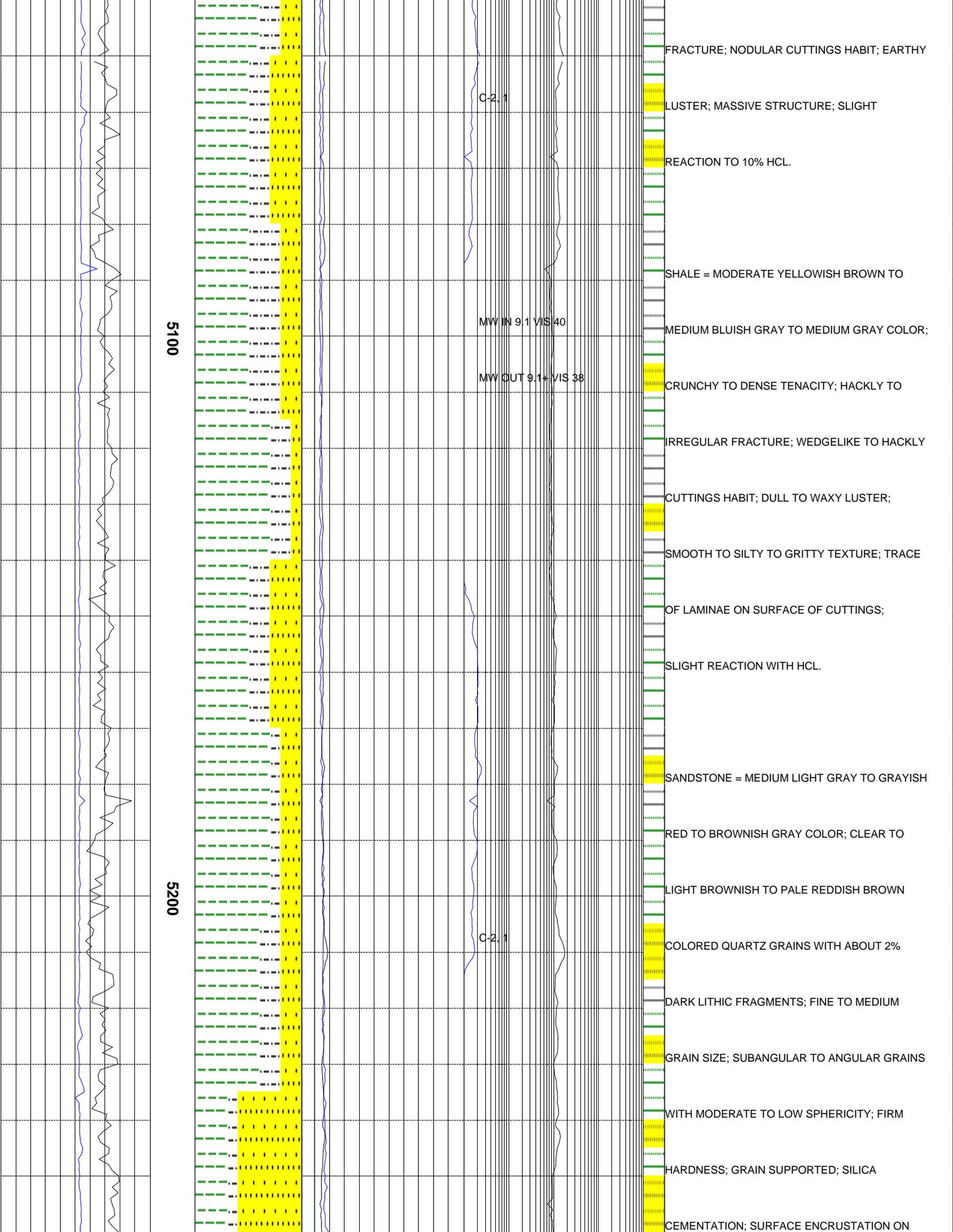
MW IN 9.1+ VIS 40

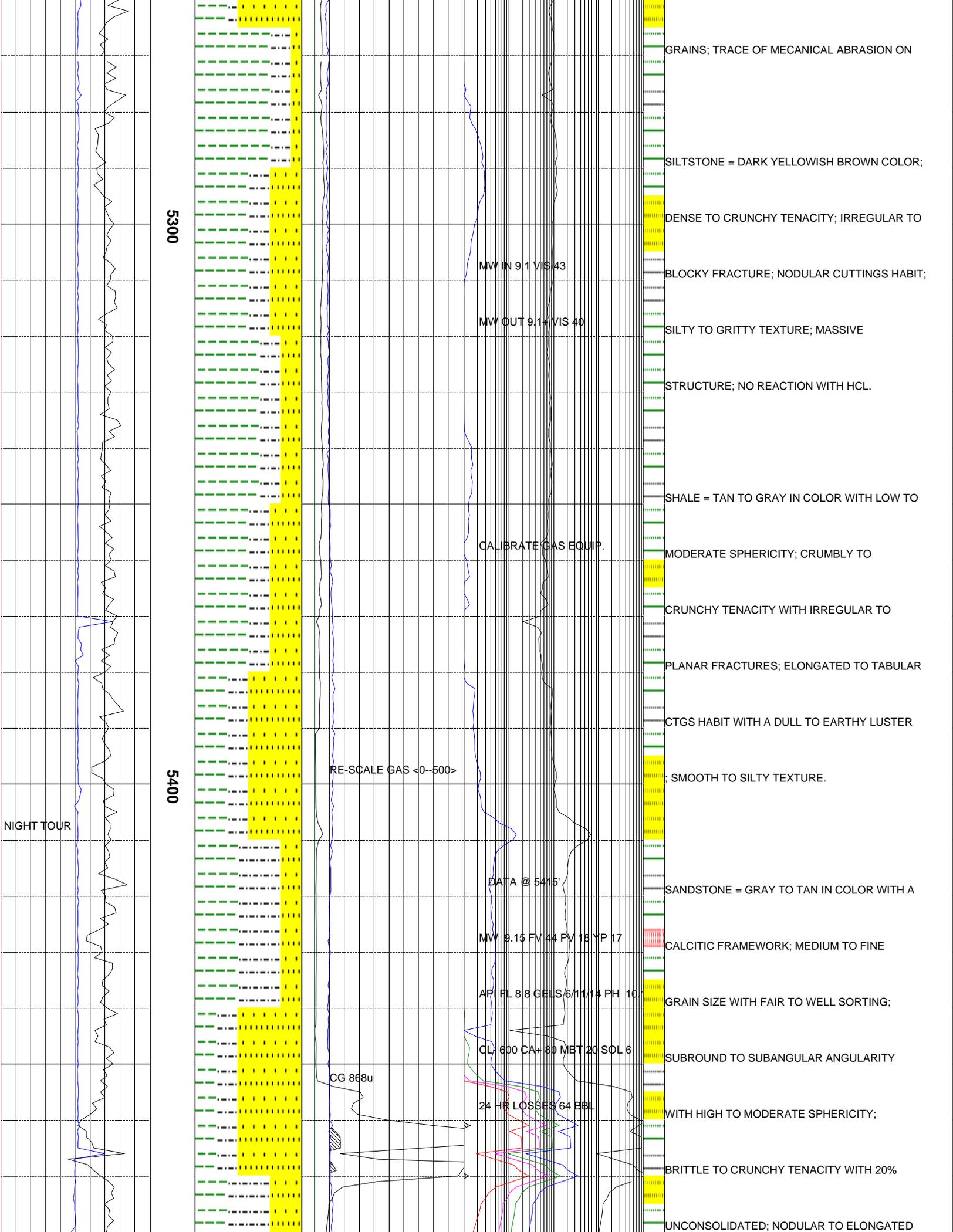
MW OUT 9.1+ VIS 40

ROP
Avg WOB
Gamma

Ttl Gas
CO2
Flare Ht.

Meth C-1
Ethn C-2
Prop C-3
Butn C-4
Pent C-5





5300

5400

NIGHT TOUR

MW IN 9.1 VIS 43

MW OUT 9.1+ VIS 40

CALIBRATE GAS EQUIP.

RE-SCALE GAS <0--500>

DATA @ 5415'

MW 9.15 FV 44 PV 18 YP 17

API FL 8.8 GELS 6/11/14 PH 10

CL: 600 CA+ 80 MBT 20 SOL 6

CG 868u

24 HR LOSSES 64 BBL

GRAINS; TRACE OF MECHANICAL ABRASION ON

SILTSTONE = DARK YELLOWISH BROWN COLOR;

DENSE TO CRUNCHY TENACITY; IRREGULAR TO

BLOCKY FRACTURE; NODULAR CUTTINGS HABIT;

SILTY TO GRITTY TEXTURE; MASSIVE

STRUCTURE; NO REACTION WITH HCL.

SHALE = TAN TO GRAY IN COLOR WITH LOW TO

MODERATE SPHERICITY; CRUMBLY TO

CRUNCHY TENACITY WITH IRREGULAR TO

PLANAR FRACTURES; ELONGATED TO TABULAR

CTGS HABIT WITH A DULL TO EARTHY LUSTER

; SMOOTH TO SILTY TEXTURE.

SANDSTONE = GRAY TO TAN IN COLOR WITH A

CALCITIC FRAMEWORK; MEDIUM TO FINE

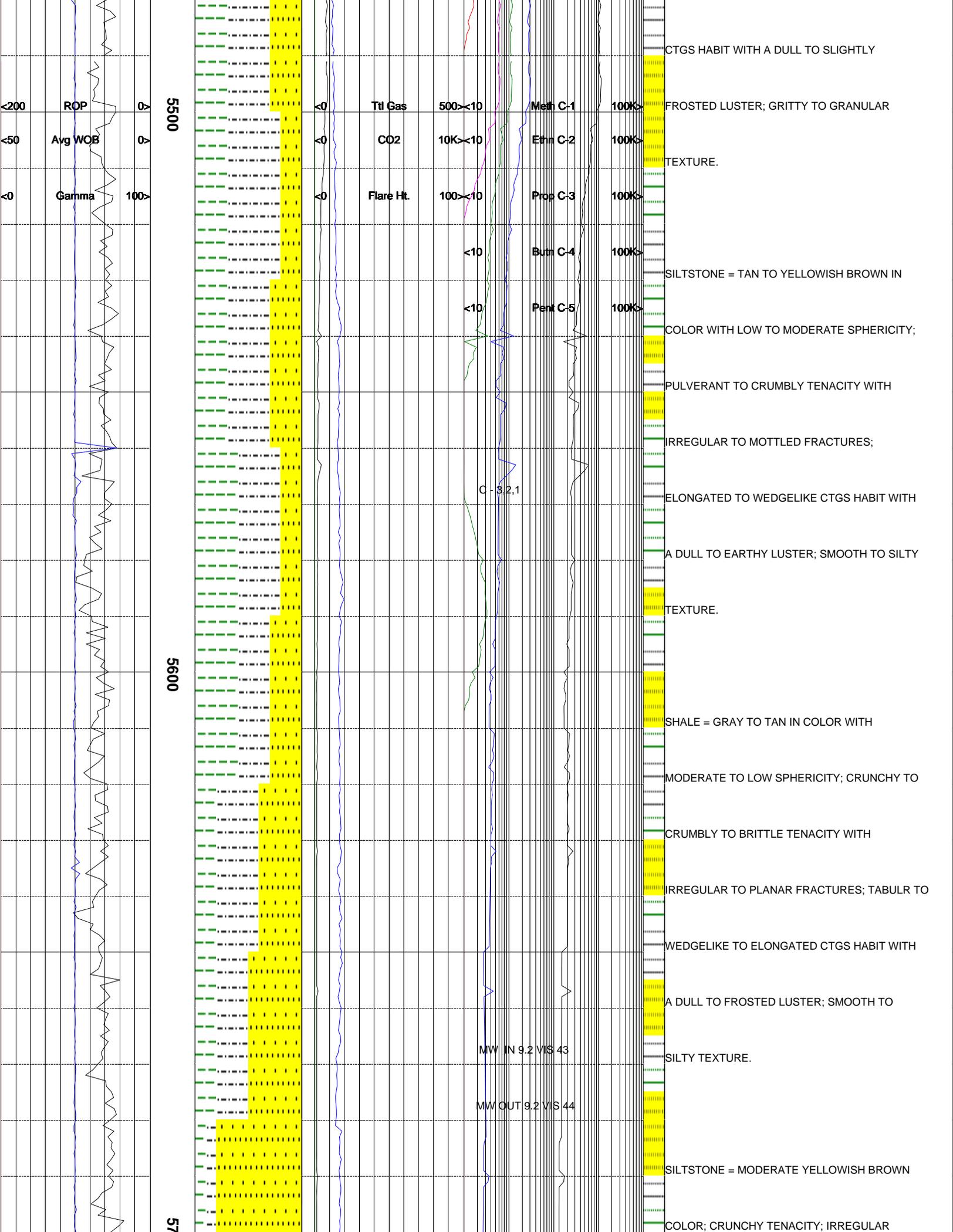
GRAIN SIZE WITH FAIR TO WELL SORTING;

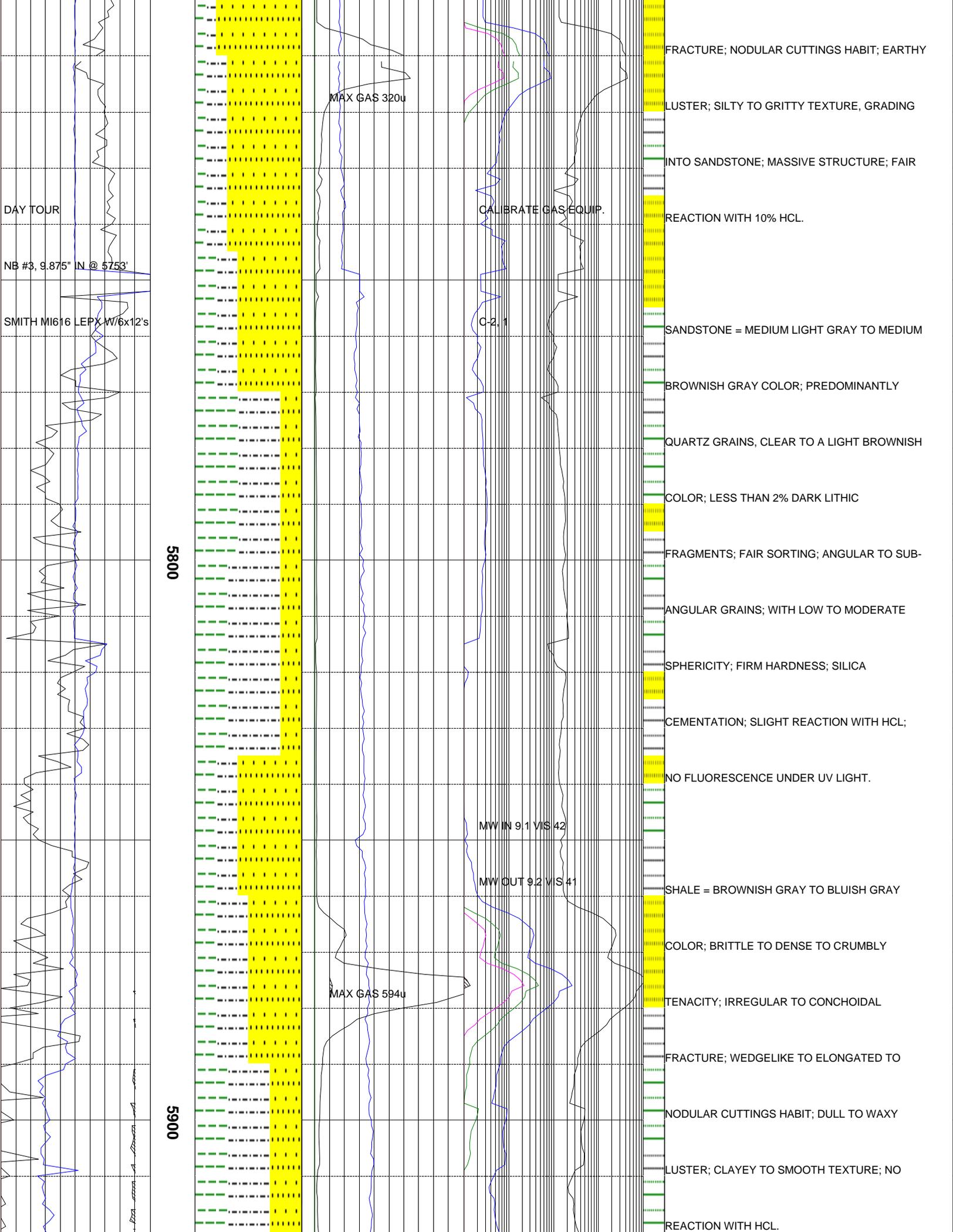
SUBROUND TO SUBANGULAR ANGULARITY

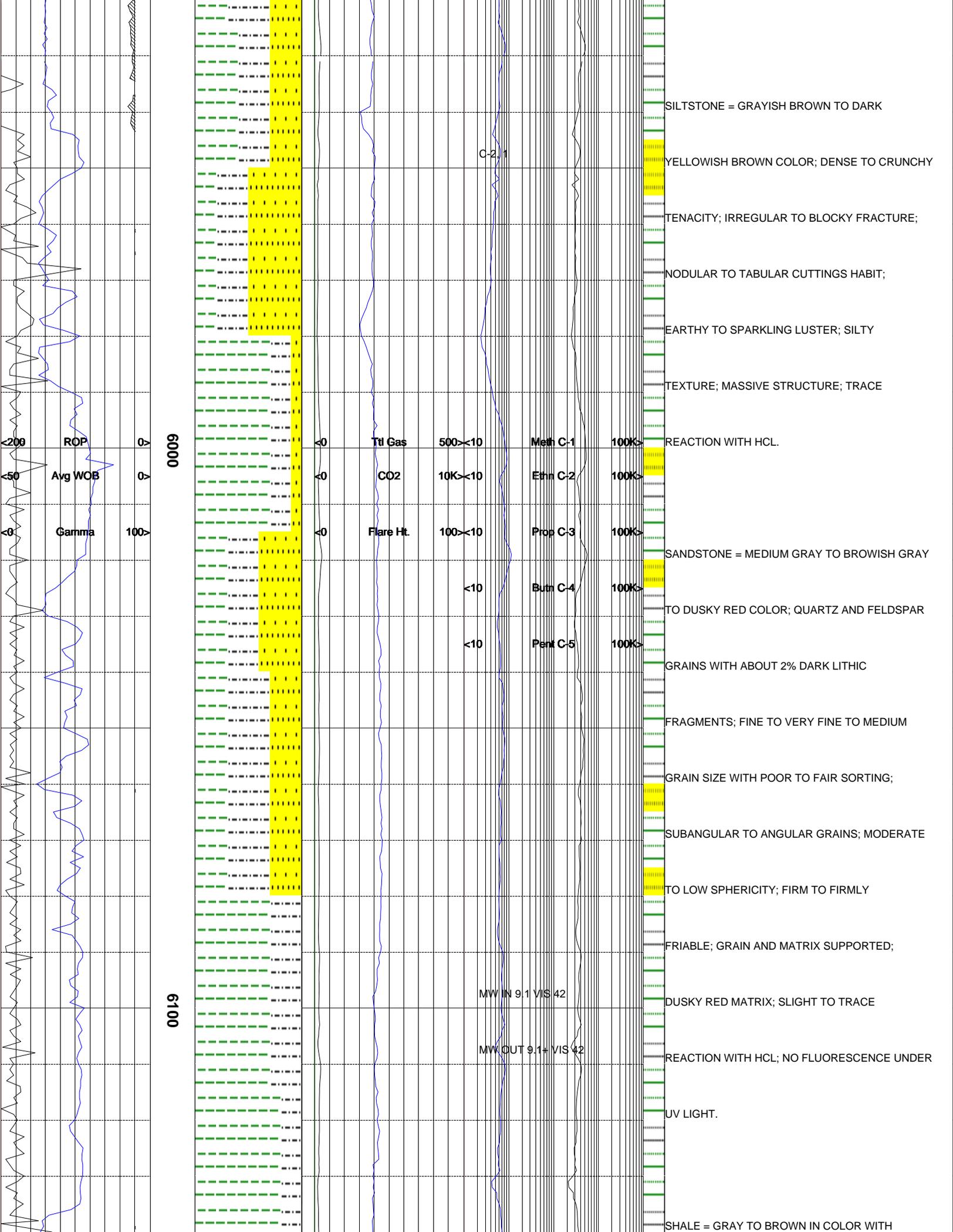
WITH HIGH TO MODERATE SPHERICITY;

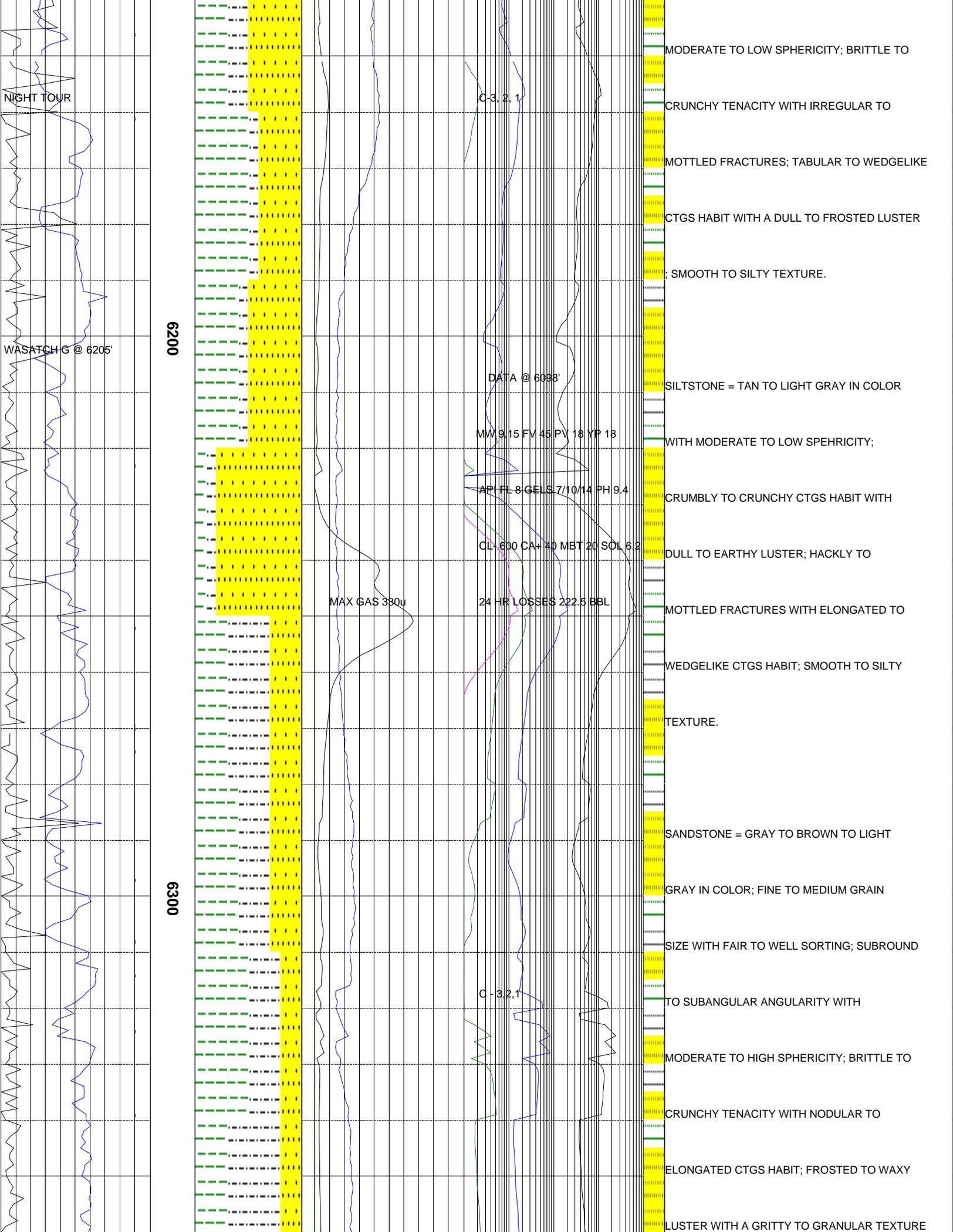
BRITTLE TO CRUNCHY TENACITY WITH 20%

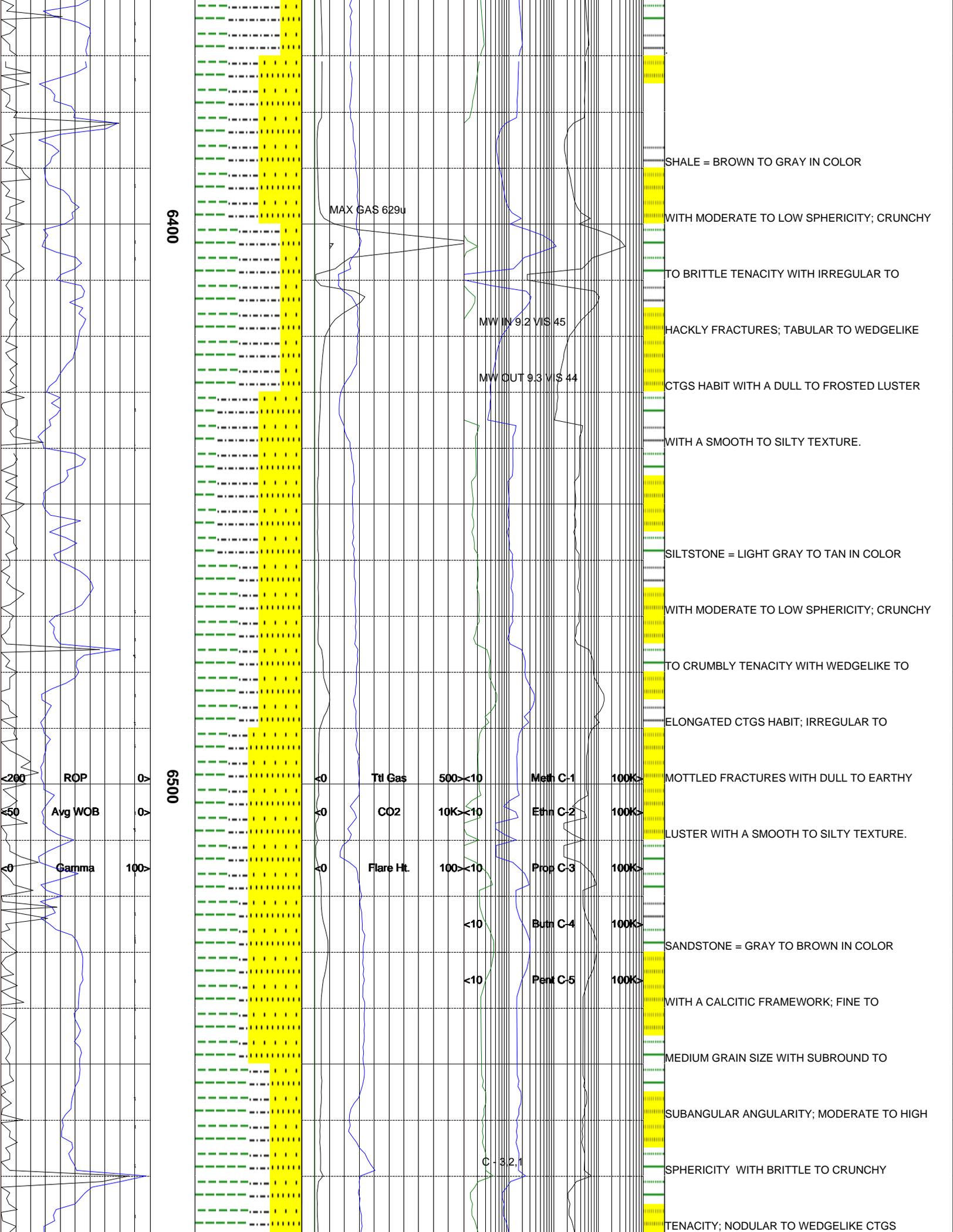
UNCONSOLIDATED; NODULAR TO ELONGATED











6400

6500

MAX GAS 629u

7

MW IN 9.2 VIS 45

MW OUT 9.3 VIS 44

<0	Ttl Gas	500<	<10	Meth C-1	100K>
<0	CO2	10K>	<10	Ethn C-2	100K>
<0	Flare Ht.	100>	<10	Prop C-3	100K>
			<10	Butn C-4	100K>
			<10	Pent C-5	100K>

SHALE = BROWN TO GRAY IN COLOR

WITH MODERATE TO LOW SPHERICITY; CRUNCHY

TO BRITTLE TENACITY WITH IRREGULAR TO

HACKLY FRACTURES; TABULAR TO WEDGELIKE

CTGS HABIT WITH A DULL TO FROSTED LUSTER

WITH A SMOOTH TO SILTY TEXTURE.

SILTSTONE = LIGHT GRAY TO TAN IN COLOR

WITH MODERATE TO LOW SPHERICITY; CRUNCHY

TO CRUMBLY TENACITY WITH WEDGELIKE TO

ELONGATED CTGS HABIT; IRREGULAR TO

MOTTLED FRACTURES WITH DULL TO EARTHY

LUSTER WITH A SMOOTH TO SILTY TEXTURE.

SANDSTONE = GRAY TO BROWN IN COLOR

WITH A CALCITIC FRAMEWORK; FINE TO

MEDIUM GRAIN SIZE WITH SUBROUND TO

SUBANGULAR ANGULARITY; MODERATE TO HIGH

SPHERICITY WITH BRITTLE TO CRUNCHY

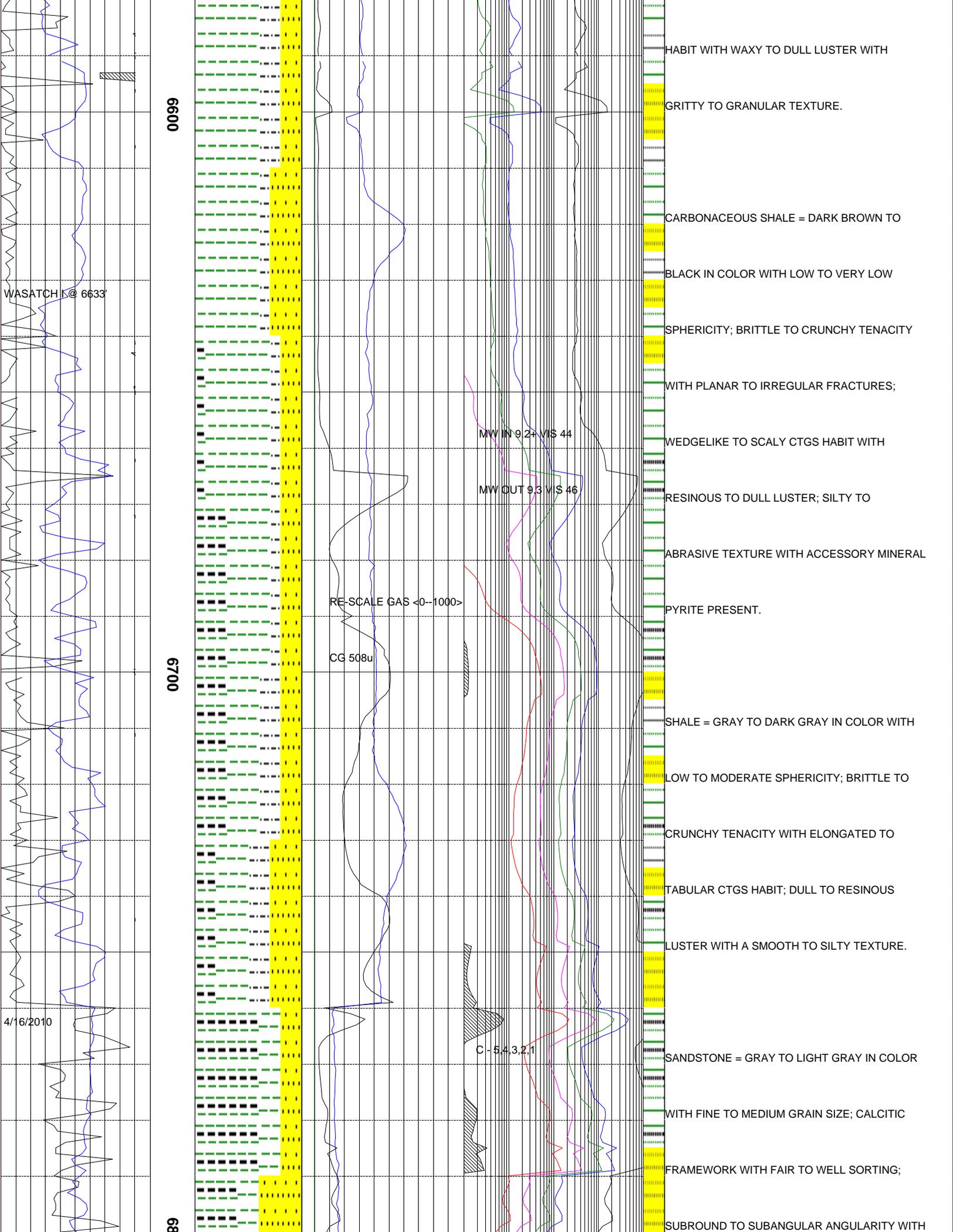
TENACITY; NODULAR TO WEDGELIKE CTGS

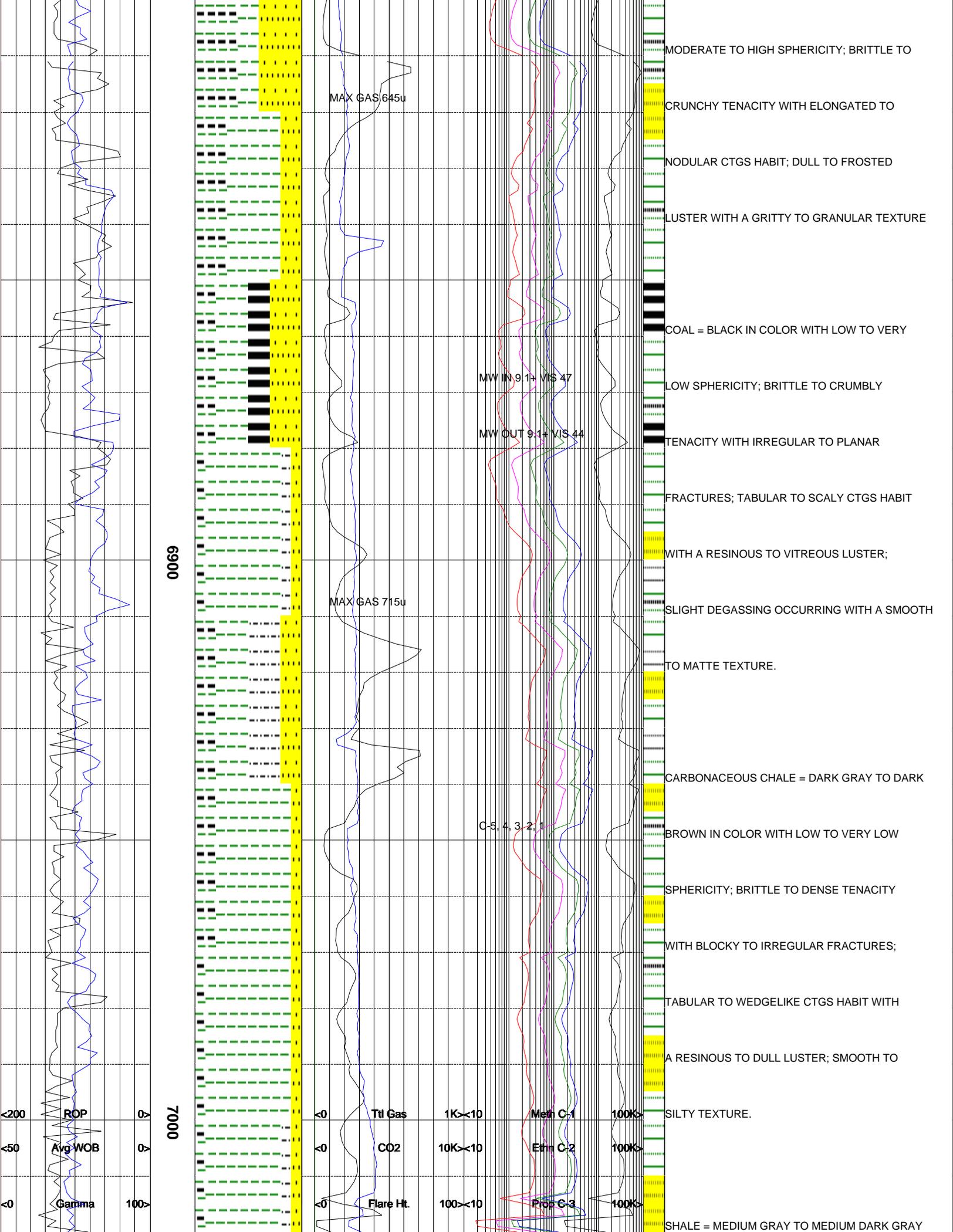
200 ROP

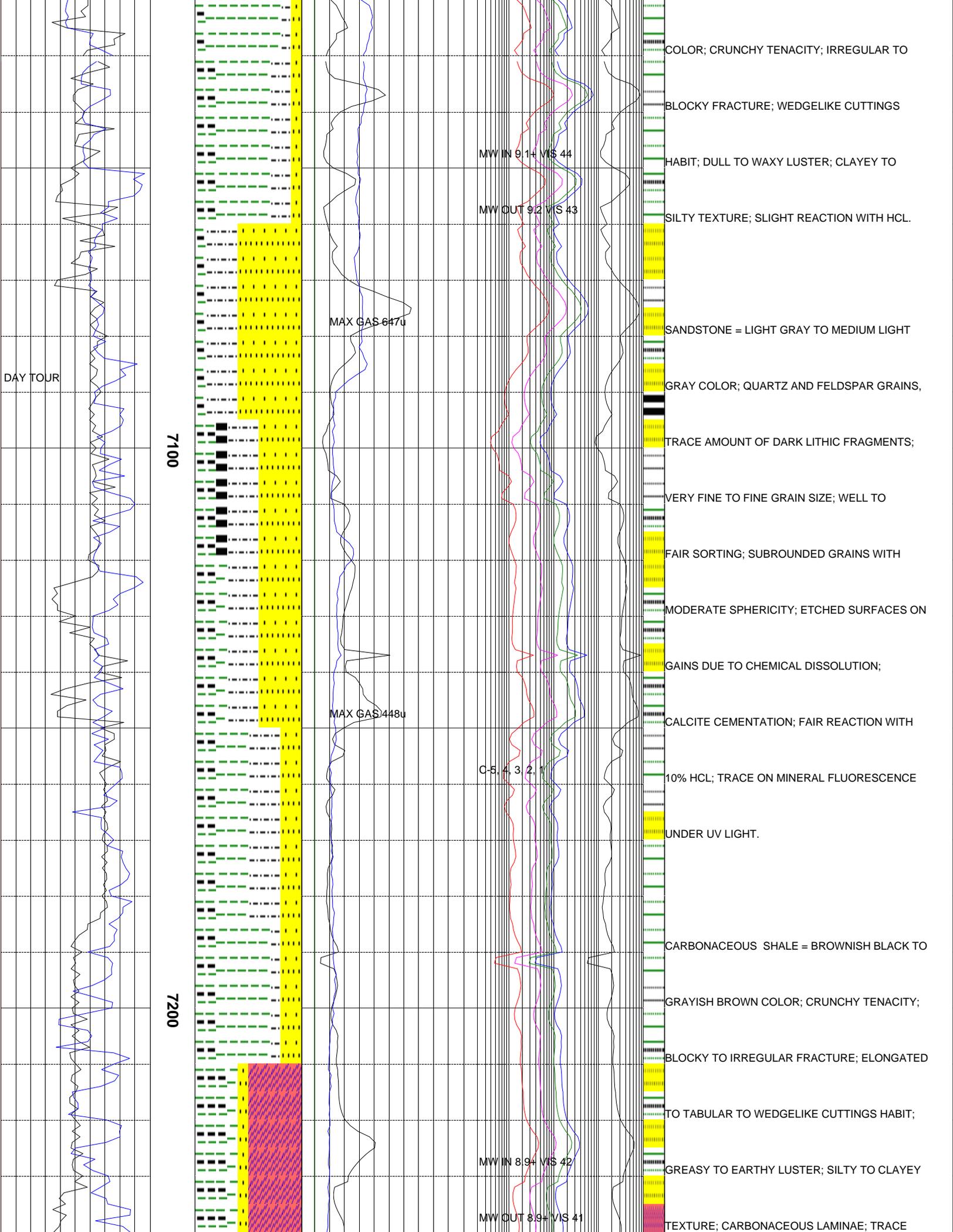
150 Avg WOB

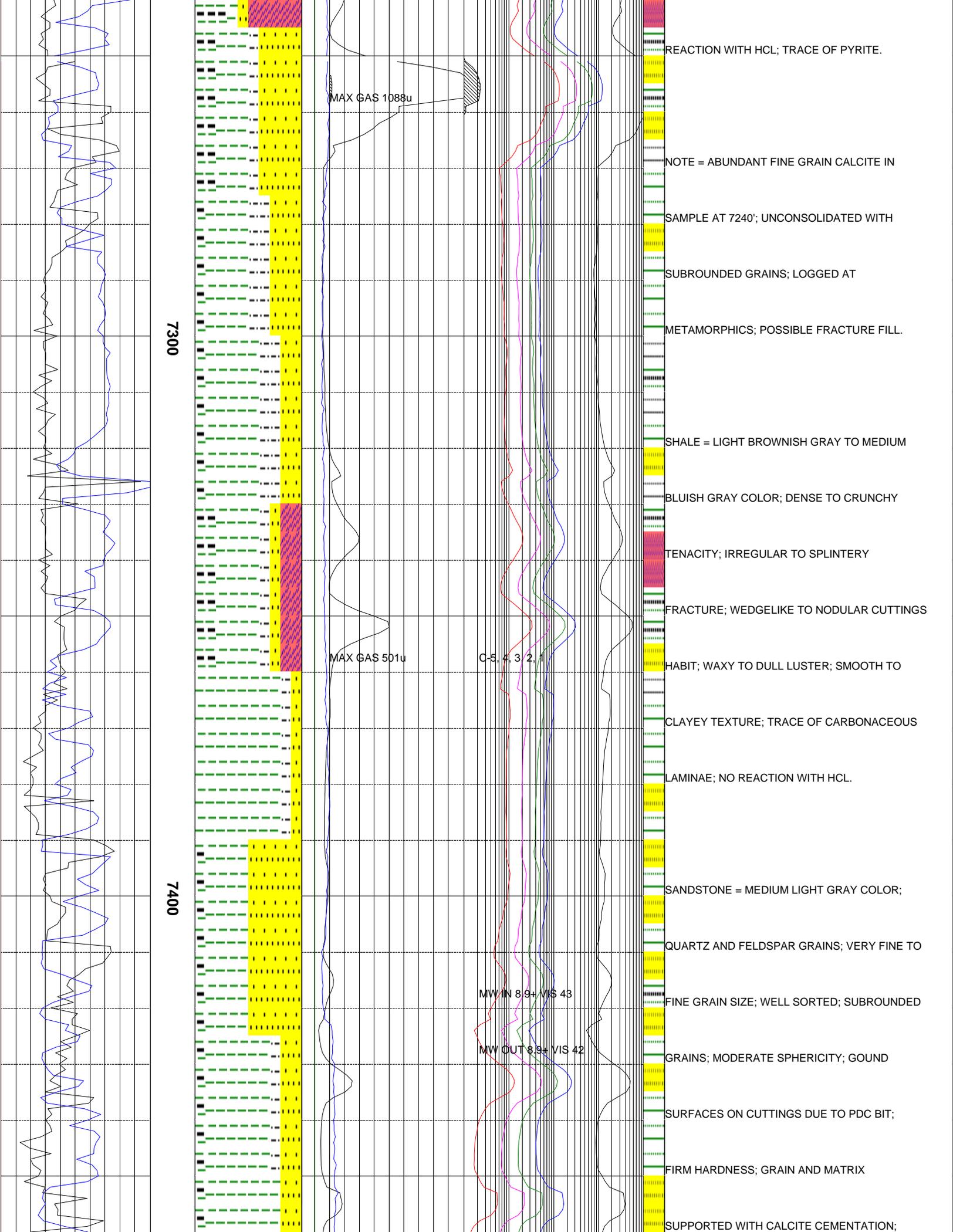
0 Gamma 100

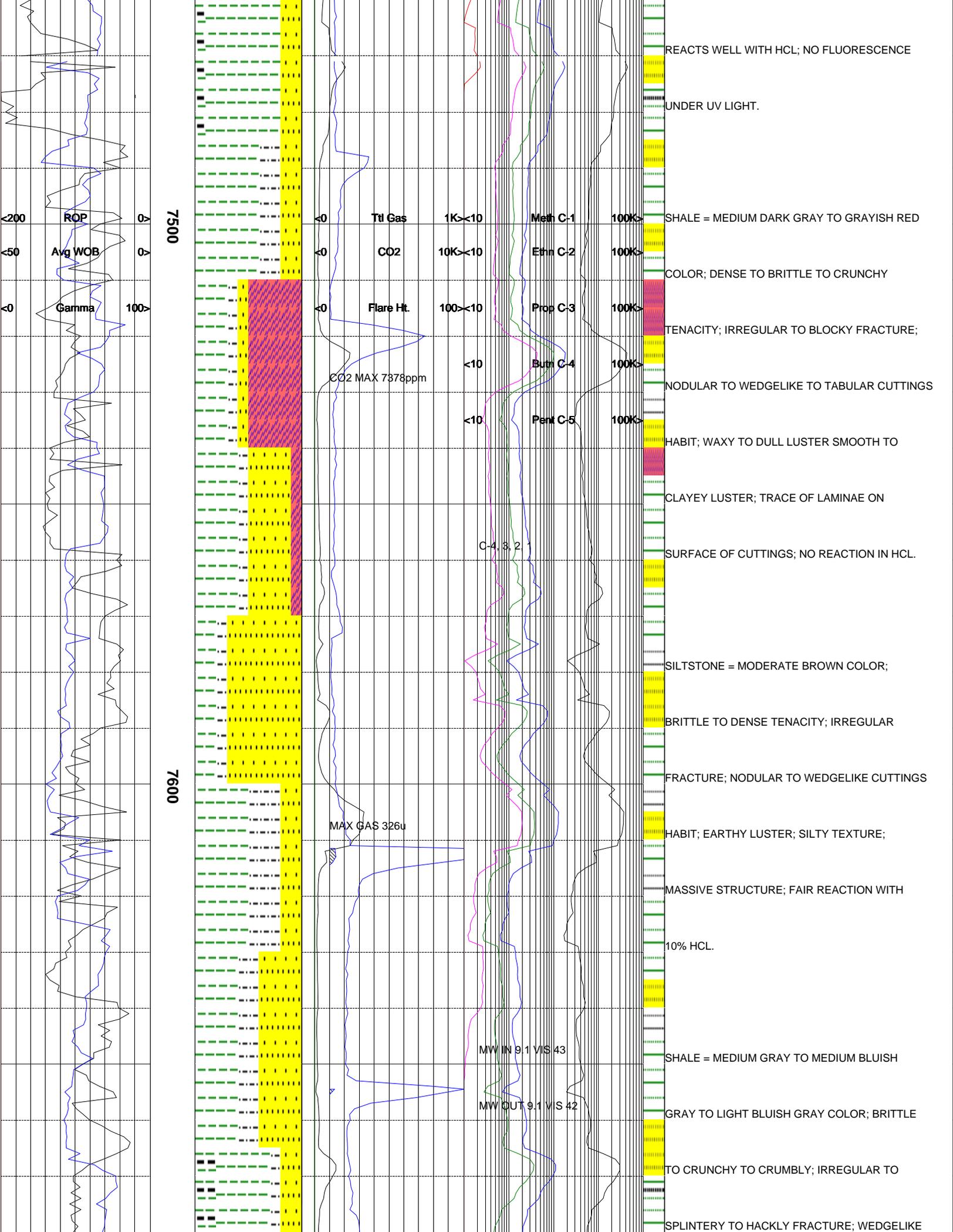
C - 32.1

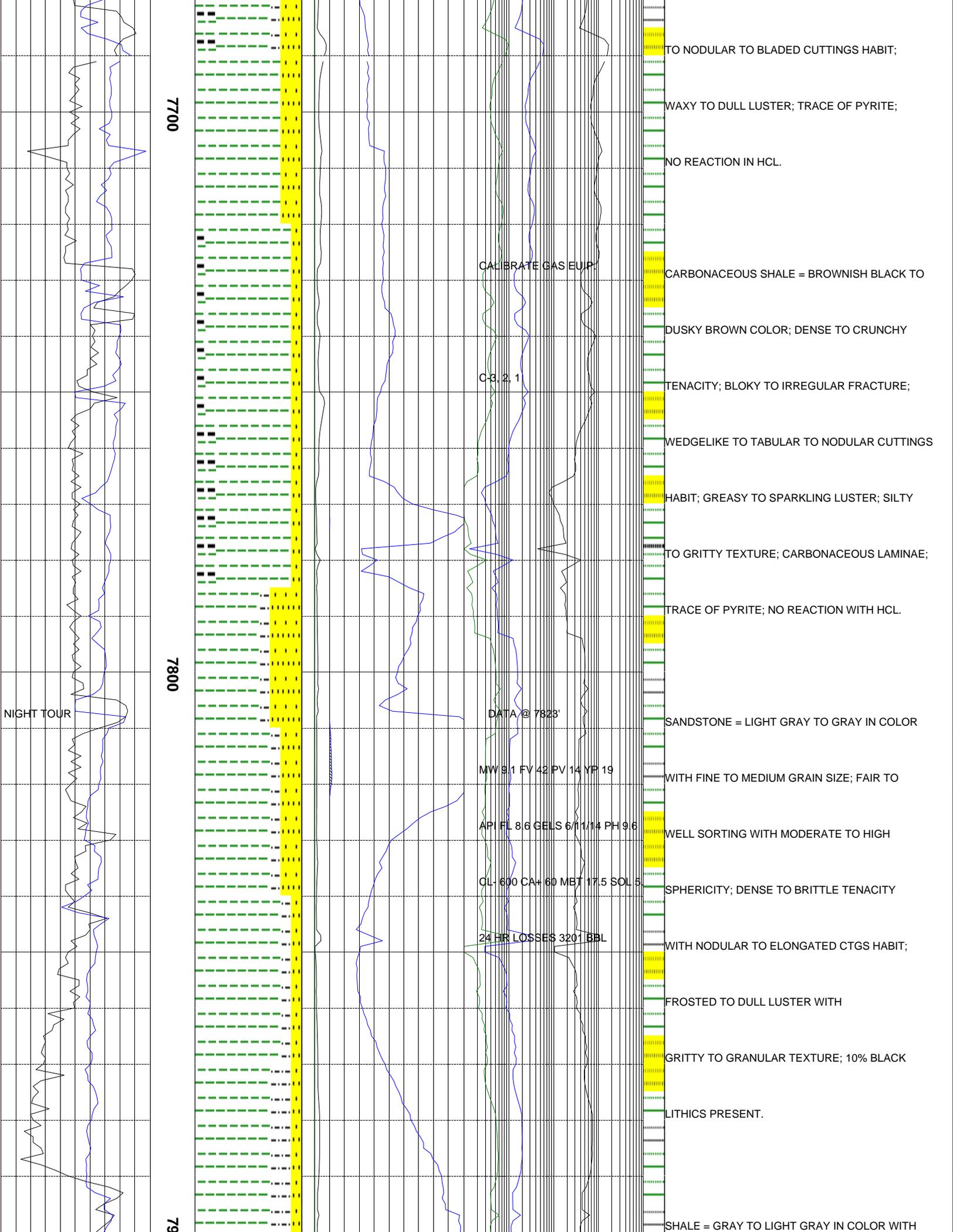


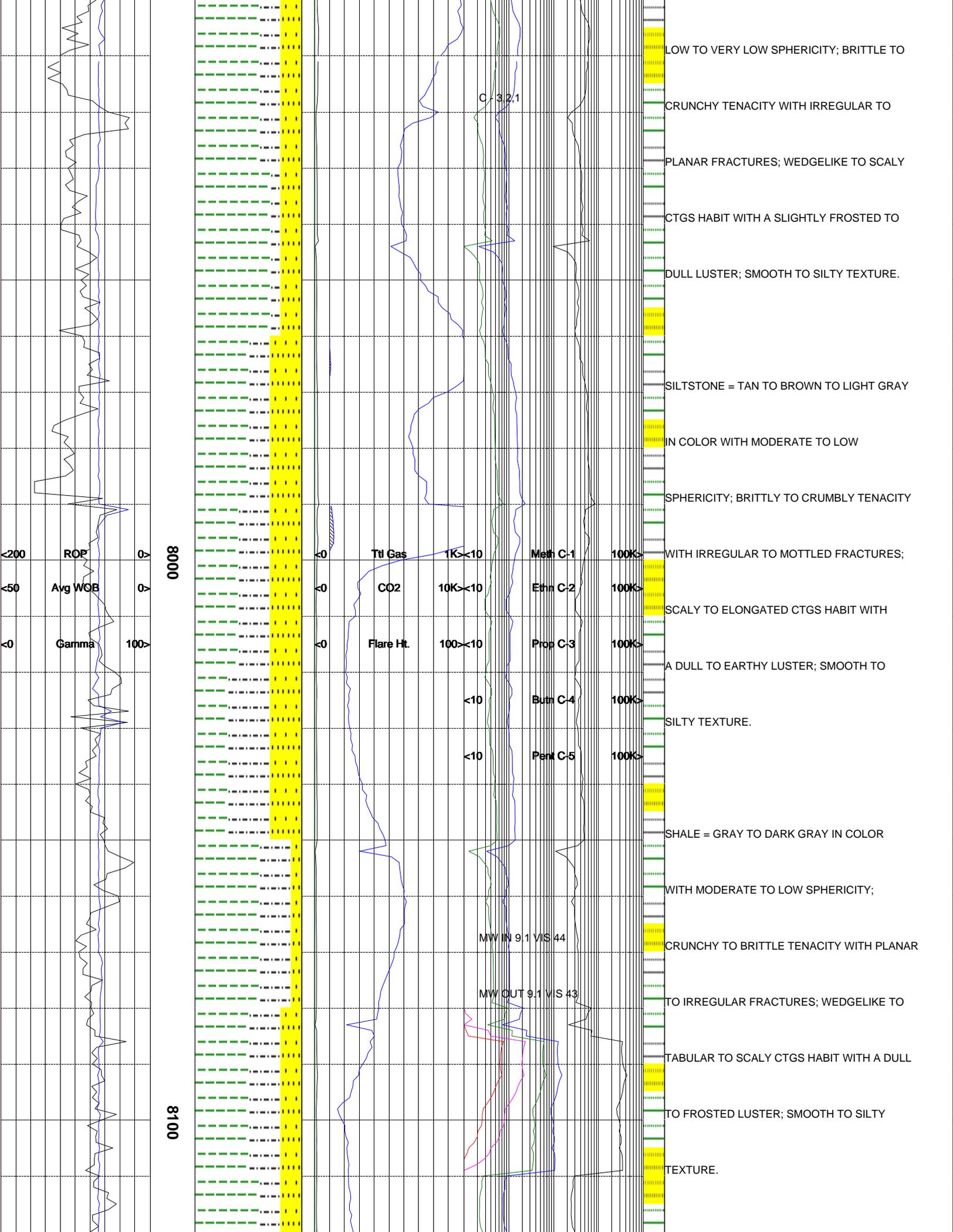












8000

8100

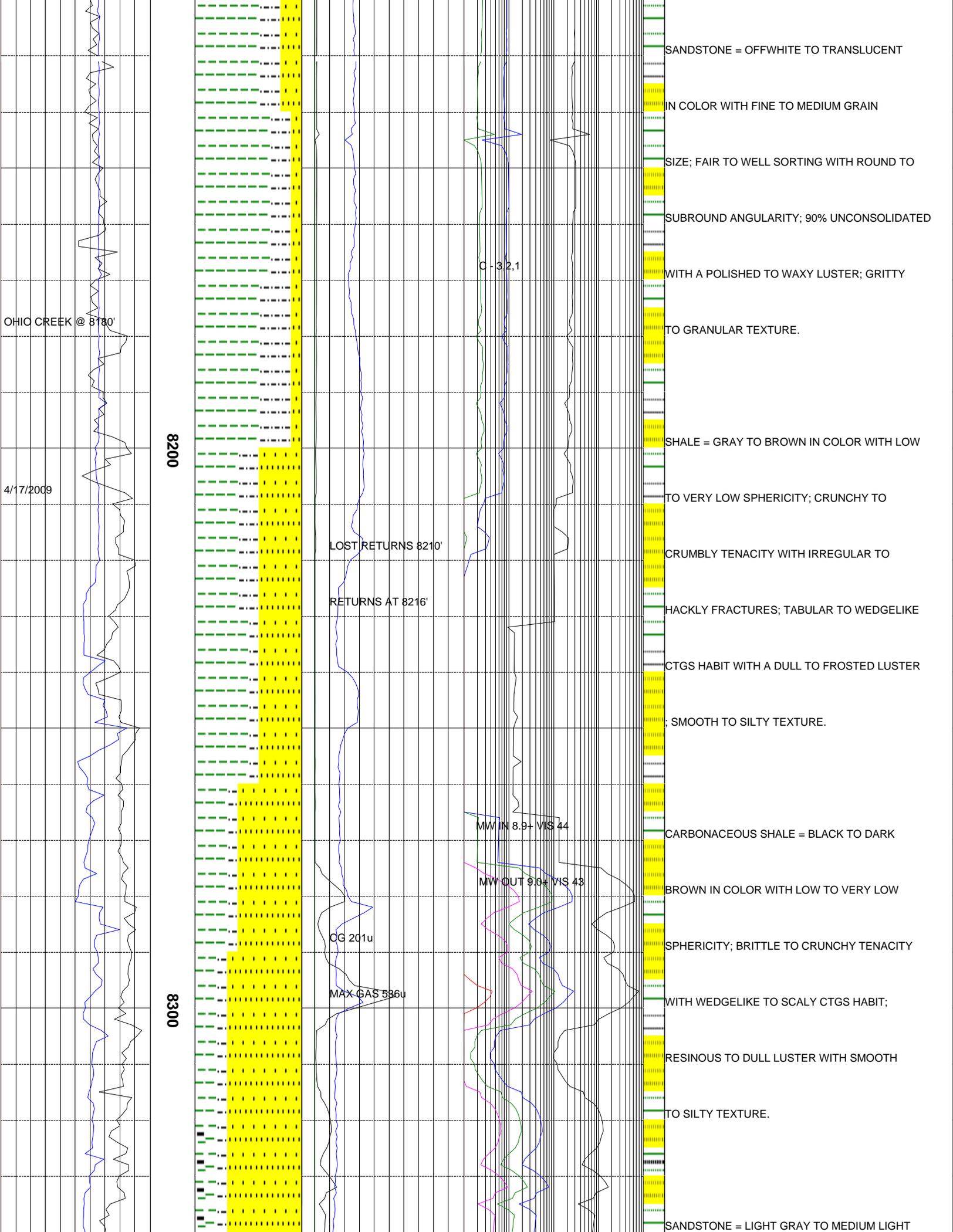
C-3,2,1

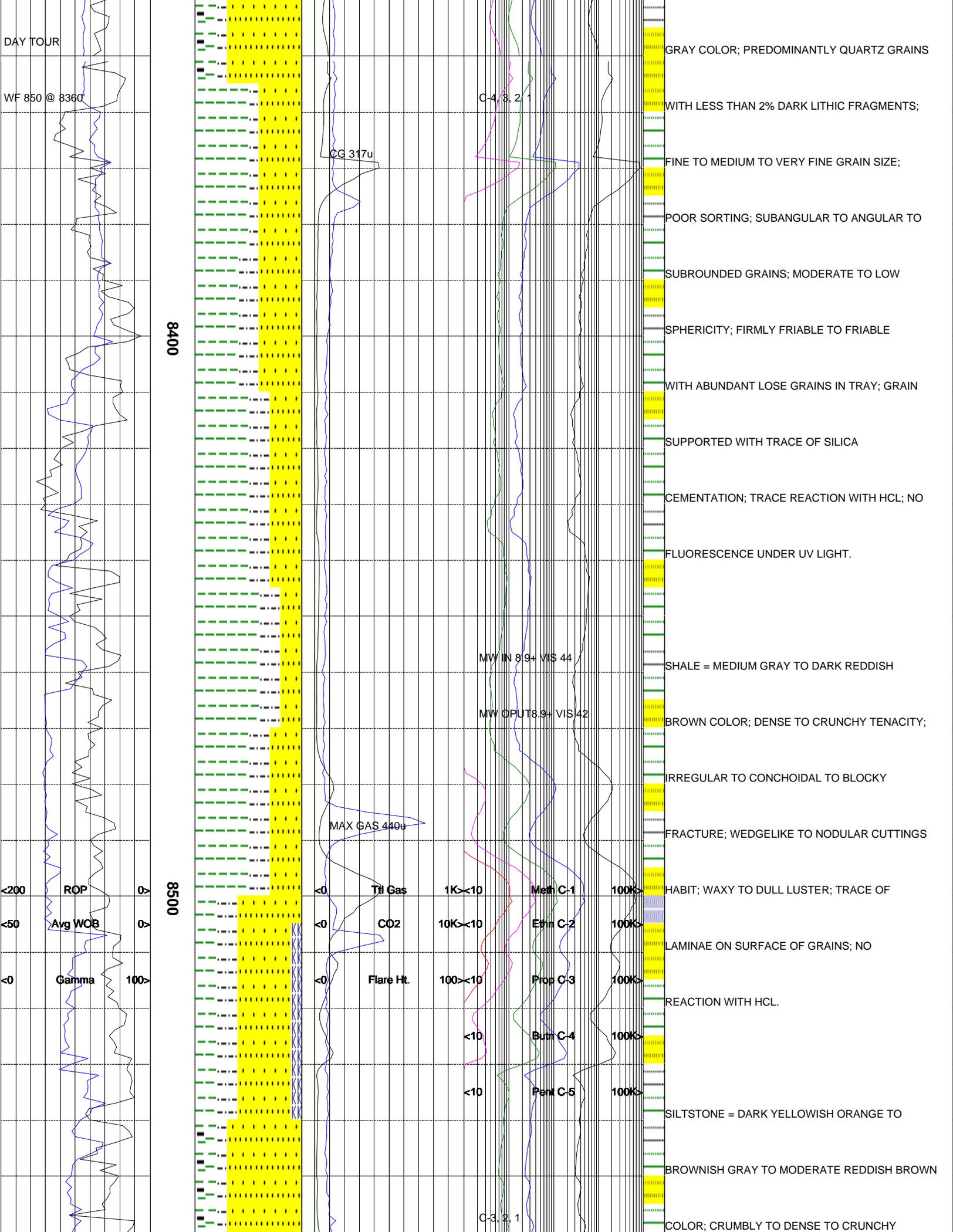
MW IN 9.1 VIS 44

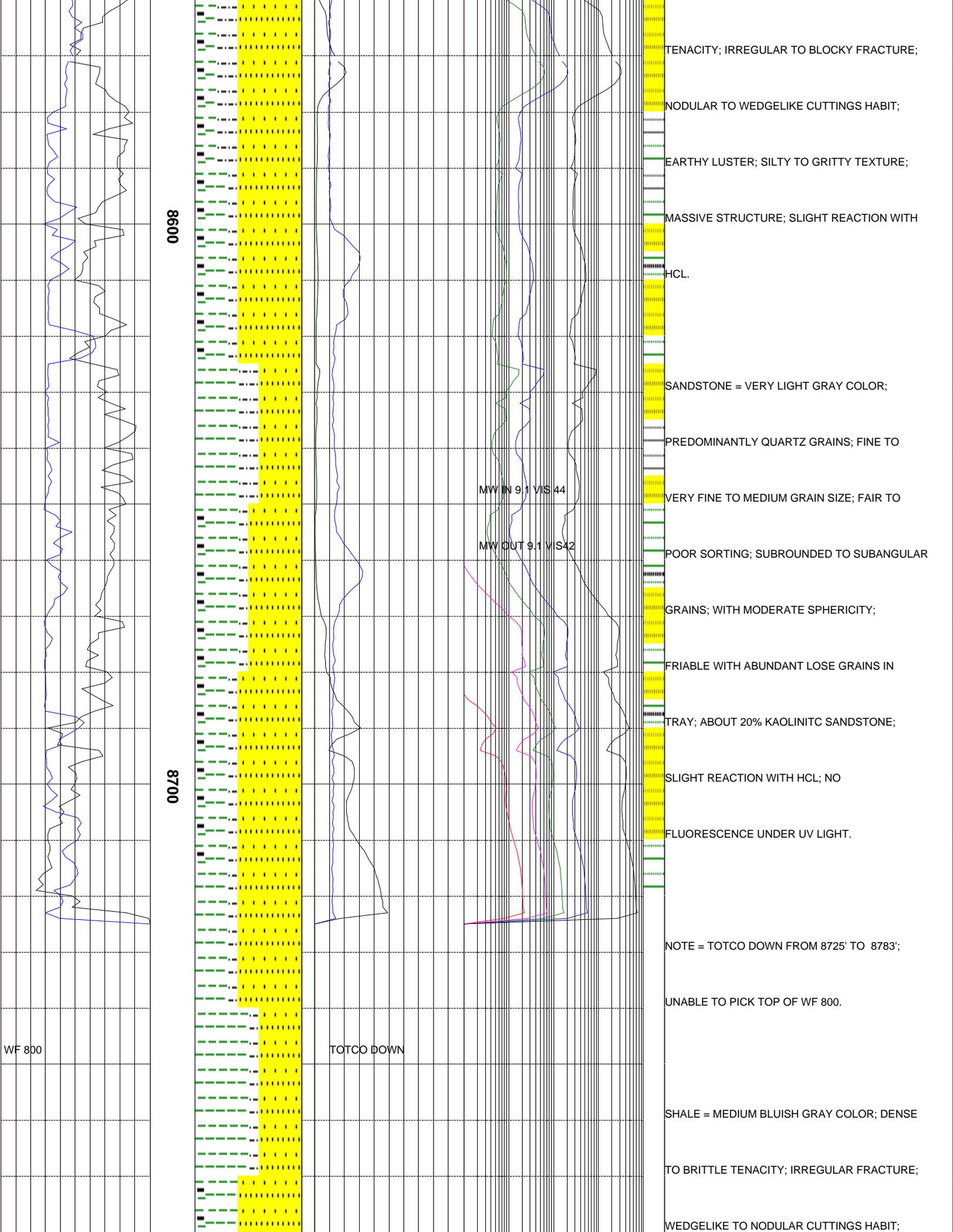
MW OUT 9.1 VIS 43

Ttl Gas	1K < 10	Meth C-1	100K >
CO2	10K < 10	Ethn C-2	100K >
Flare Ht.	100 < 10	Prop C-3	100K >
	< 10	Butn C-4	100K >
	< 10	Pent C-5	100K >

LOW TO VERY LOW SPHERICITY; BRITTLE TO
 CRUNCHY TENACITY WITH IRREGULAR TO
 PLANAR FRACTURES; WEDGELIKE TO SCALY
 CTGS HABIT WITH A SLIGHTLY FROSTED TO
 DULL LUSTER; SMOOTH TO SILTY TEXTURE.
 SILTSTONE = TAN TO BROWN TO LIGHT GRAY
 IN COLOR WITH MODERATE TO LOW
 SPHERICITY; BRITTLY TO CRUMBLY TENACITY
 WITH IRREGULAR TO MOTTLED FRACTURES;
 SCALY TO ELONGATED CTGS HABIT WITH
 A DULL TO EARTHY LUSTER; SMOOTH TO
 SILTY TEXTURE.
 SHALE = GRAY TO DARK GRAY IN COLOR
 WITH MODERATE TO LOW SPHERICITY;
 CRUNCHY TO BRITTLE TENACITY WITH PLANAR
 TO IRREGULAR FRACTURES; WEDGELIKE TO
 TABULAR TO SCALY CTGS HABIT WITH A DULL
 TO FROSTED LUSTER; SMOOTH TO SILTY
 TEXTURE.







8600

8700

TENACITY; IRREGULAR TO BLOCKY FRACTURE;
 NODULAR TO WEDGELIKE CUTTINGS HABIT;
 EARTHY LUSTER; SILTY TO GRITTY TEXTURE;
 MASSIVE STRUCTURE; SLIGHT REACTION WITH
 HCL.
 SANDSTONE = VERY LIGHT GRAY COLOR;
 PREDOMINANTLY QUARTZ GRAINS; FINE TO
 VERY FINE TO MEDIUM GRAIN SIZE; FAIR TO
 POOR SORTING; SUBROUNDED TO SUBANGULAR
 GRAINS; WITH MODERATE SPHERICITY;
 FRIABLE WITH ABUNDANT LOSE GRAINS IN
 TRAY; ABOUT 20% KAOLINITIC SANDSTONE;
 SLIGHT REACTION WITH HCL; NO
 FLUORESCENCE UNDER UV LIGHT.

MW IN 9.1 VIS 44

MW OUT 9.1 VIS 42

NOTE = TOTCO DOWN FROM 8725' TO 8783';

UNABLE TO PICK TOP OF WF 800.

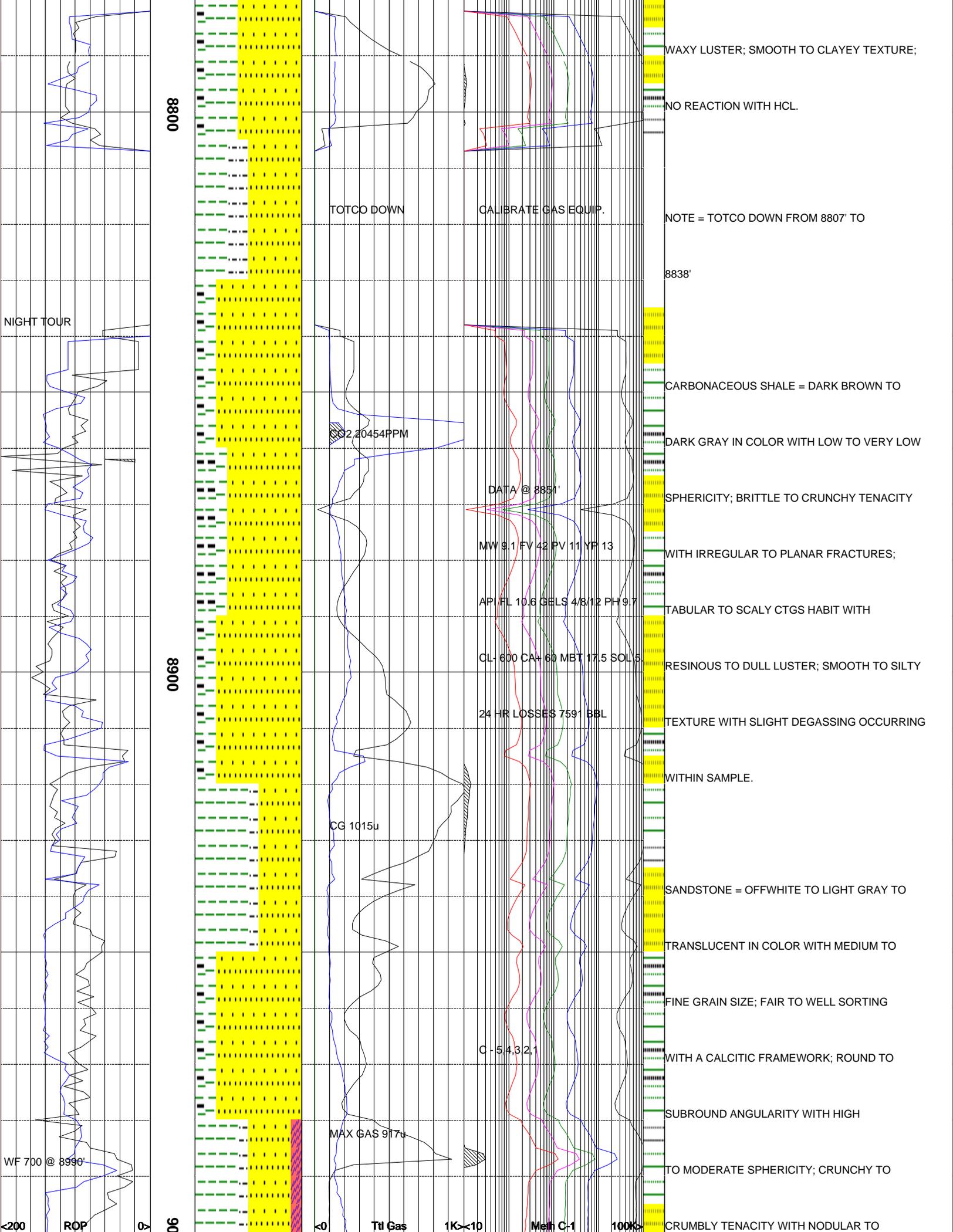
WF 800

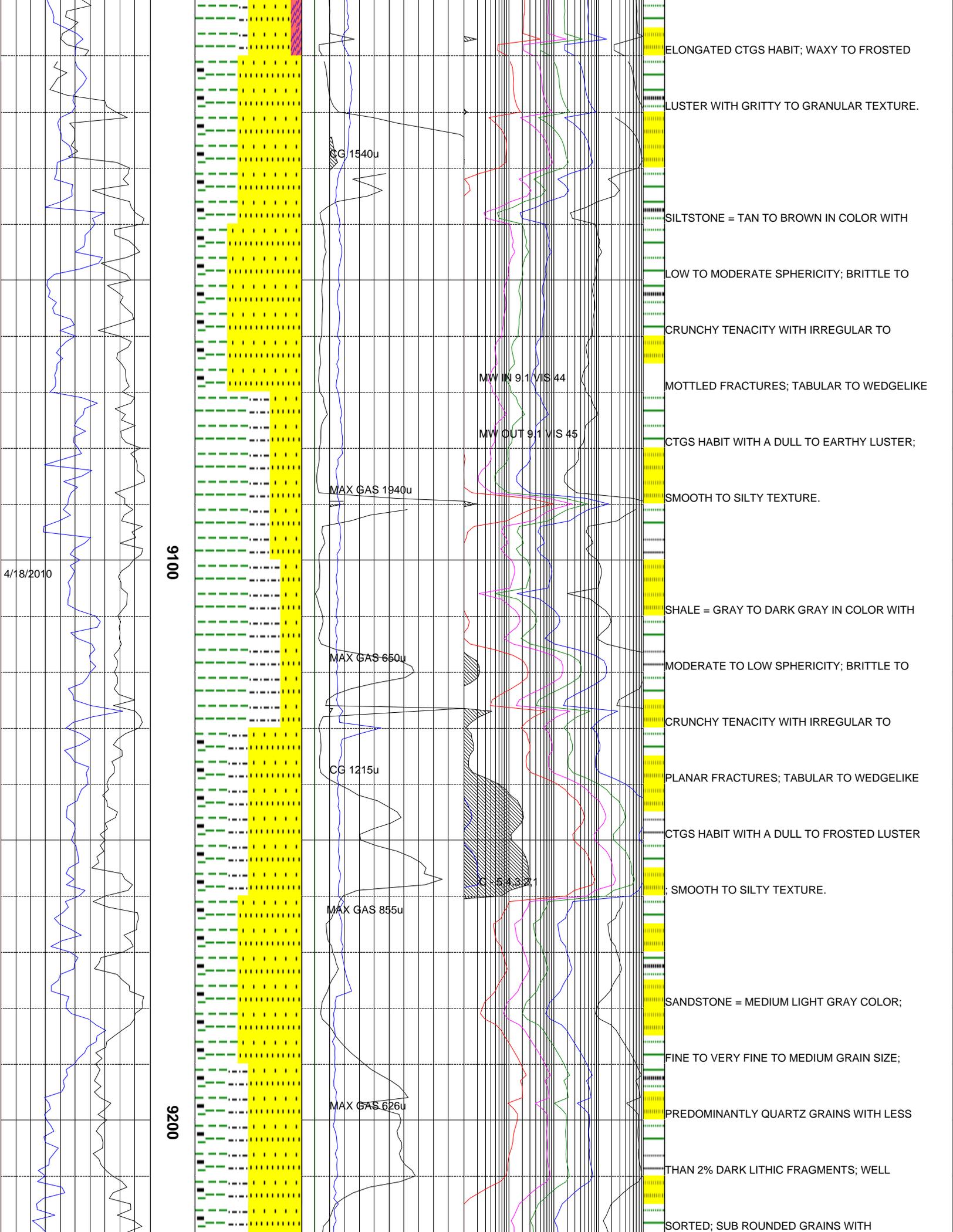
TOTCO DOWN

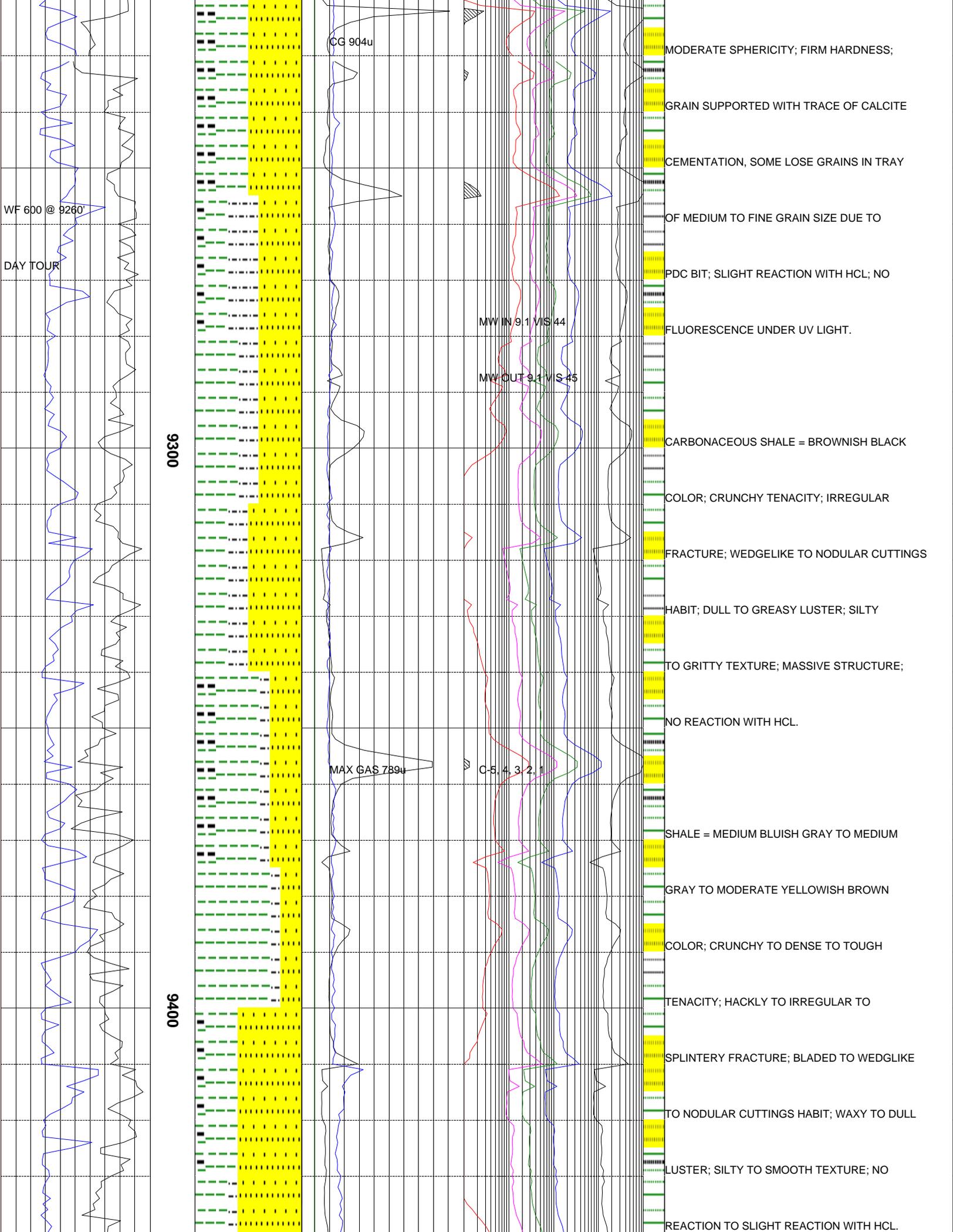
SHALE = MEDIUM BLUISH GRAY COLOR; DENSE

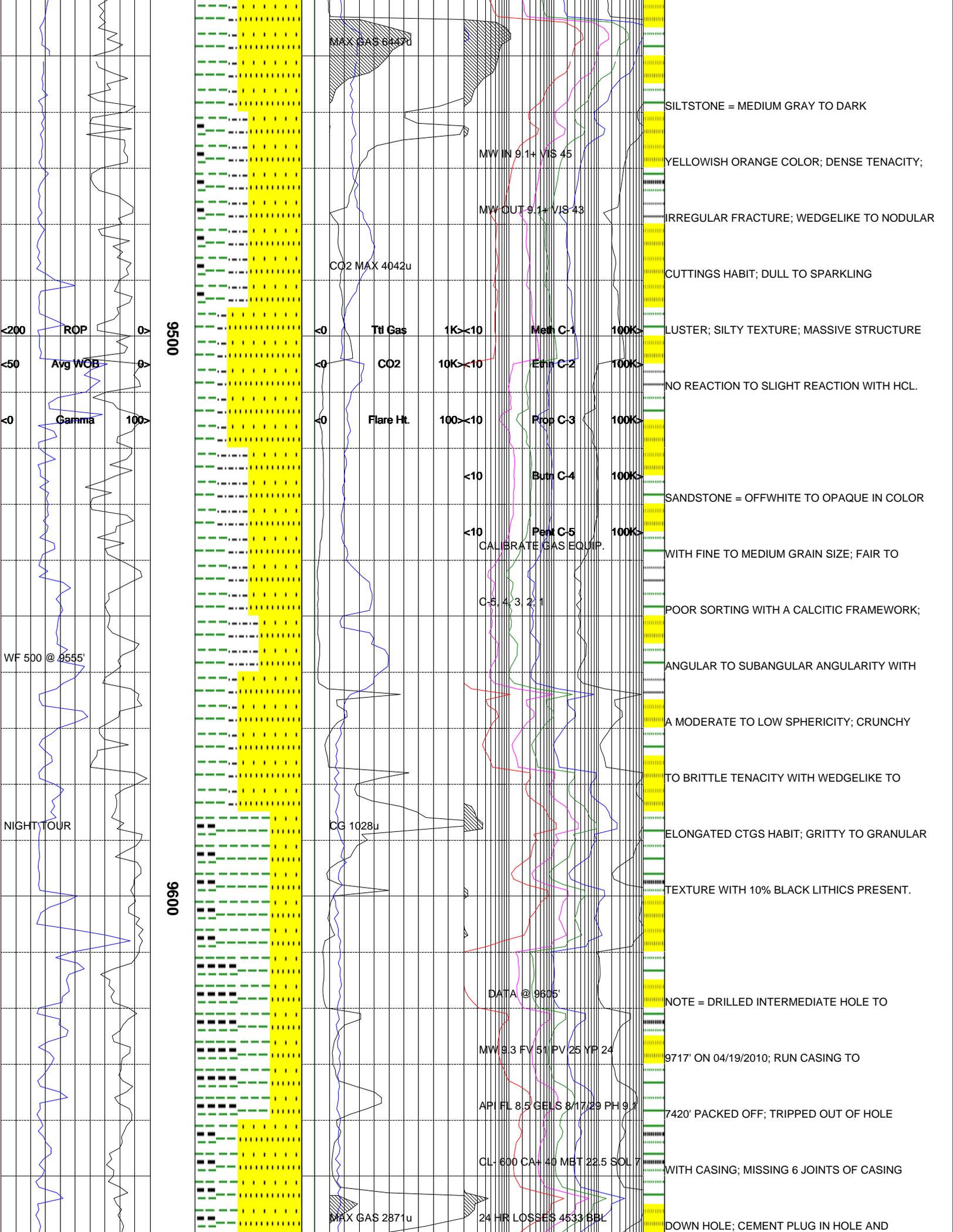
TO BRITTLE TENACITY; IRREGULAR FRACTURE;

WEDGELIKE TO NODULAR CUTTINGS HABIT;









9500

9600

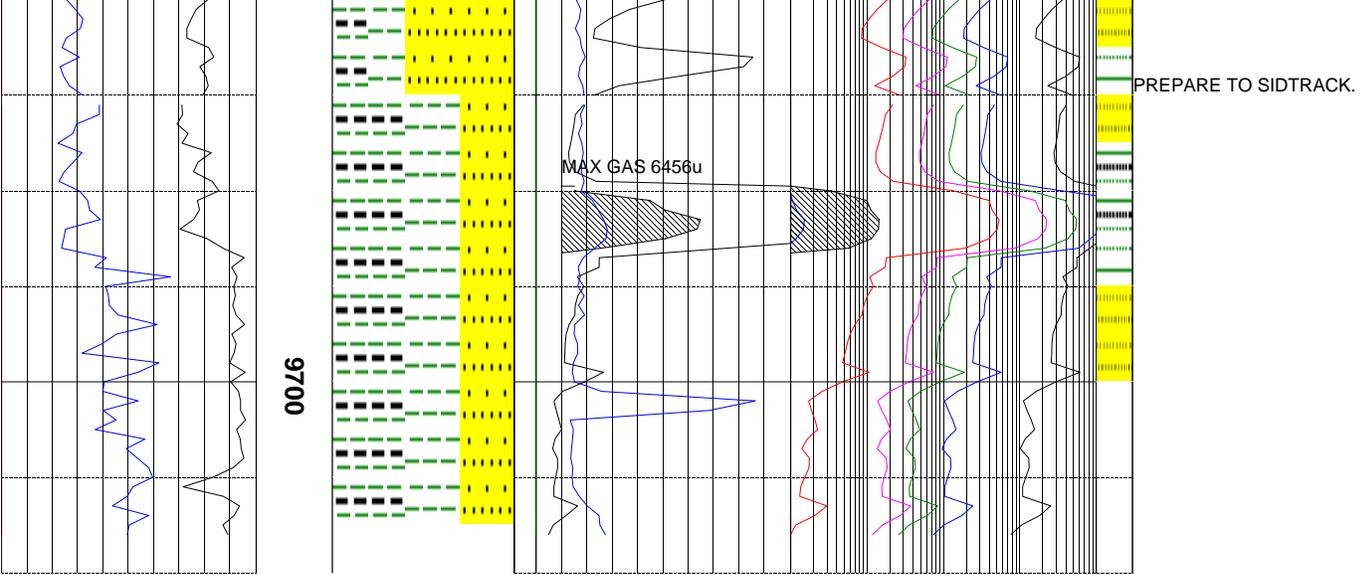
<200 ROP
 <50 Avg WOB
 <0 Gamma 100

MAX GAS 6447u
 MW IN 9.1+ VIS 45
 MW OUT 9.1+ VIS 43
 CO2 MAX 4042u
 Ttl Gas 1K<10 Meth C-1 100K>
 CO2 10K<10 Ethn C-2 100K>
 Flare Ht. 100><10 Prop C-3 100K>
 <10 Butn C-4 100K>
 <10 Pent C-5 100K>
 CALIBRATE GAS EQUIP.
 C-5, 4/3, 2, 1

SILTSTONE = MEDIUM GRAY TO DARK
 YELLOWISH ORANGE COLOR; DENSE TENACITY;
 IRREGULAR FRACTURE; WEDGELIKE TO NODULAR
 CUTTINGS HABIT; DULL TO SPARKLING
 LUSTER; SILTY TEXTURE; MASSIVE STRUCTURE
 NO REACTION TO SLIGHT REACTION WITH HCL.
 SANDSTONE = OFFWHITE TO OPAQUE IN COLOR
 WITH FINE TO MEDIUM GRAIN SIZE; FAIR TO
 POOR SORTING WITH A CALCITIC FRAMEWORK;
 ANGULAR TO SUBANGULAR ANGULARITY WITH
 A MODERATE TO LOW SPHERICITY; CRUNCHY
 TO BRITTLE TENACITY WITH WEDGELIKE TO
 ELONGATED CTGS HABIT; GRITTY TO GRANULAR
 TEXTURE WITH 10% BLACK LITHICS PRESENT.
 NOTE = DRILLED INTERMEDIATE HOLE TO
 9717' ON 04/19/2010; RUN CASING TO
 7420' PACKED OFF; TRIPPED OUT OF HOLE
 WITH CASING; MISSING 6 JOINTS OF CASING
 DOWN HOLE; CEMENT PLUG IN HOLE AND

WF 500 @ 8555'
 NIGHT TOUR

CG 1028u
 DATA @ 9605'
 MW 9.3 FV 51 PV 25 YF 24
 API FL 8.5 GELS 8/17/29 PH 9.7
 CL- 600 CA+ 40 MBT 22.5 SOL 7
 MAX GAS 2871u
 24 HR LOSSES 4533 BBL



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