Houston, TX
(281) 784-5500
Bakersfield, CA
(661) 328-1595
New Iberia, LA
(337) 364-2322
Anchorage, AK
(907) 561-2465

MUDLOG MD

COMPANY	ExxonMobil Production
WELL	PCU 197-34B7
FIELD	PICEANCE CREEK
REGION	ROCKY MOUNTAINS
COORDINATES	39.915669000
	108.261250000
ELEVATION	6647.9'
COUNTY, STATE	RIO BLANCO, CO
API INDEX	05-103-11086-00
SPUD DATE	9/16/2009
CONTRACTOR	H _P
CO. REP.	S. GUYOTE, W. GARNER
RIG/TYPE	# 320/FLEX 4S+
LOGGING UNIT	MLU 032
GEOLOGISTS	J. KEEVAN, C. RECORD
	C. PIERCE
ADD. PERSONS	M. PIPER, B. HICKS
	T. WALKER
CO. GEOLOGIST	CHRIS ALBA

LOG INTERVAL

DEPTHS:	4022'	**TO**	12990'
DATES:	9/15/2009	**TO**	12/13/2009
SCALE:		5"=100'	

MUD TYPES

LSND	**TO**	4022'
LIGCO	**TO**	12990'
	TO	
	TO	

CASING DATA

16"	**AT**	130'
10.75"	**AT**	3990'
7"	**AT**	9220'
	AT	

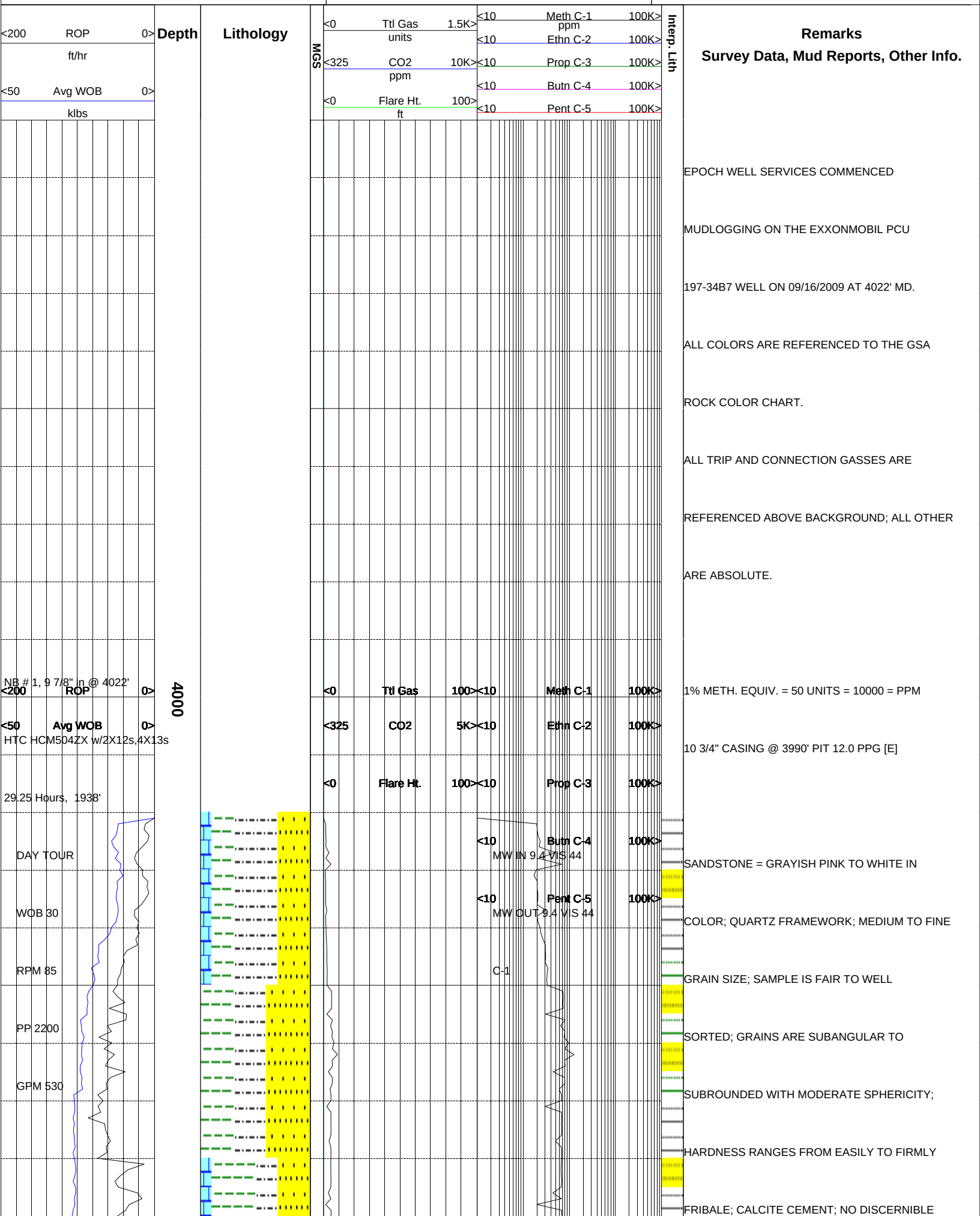
HOLE SIZE

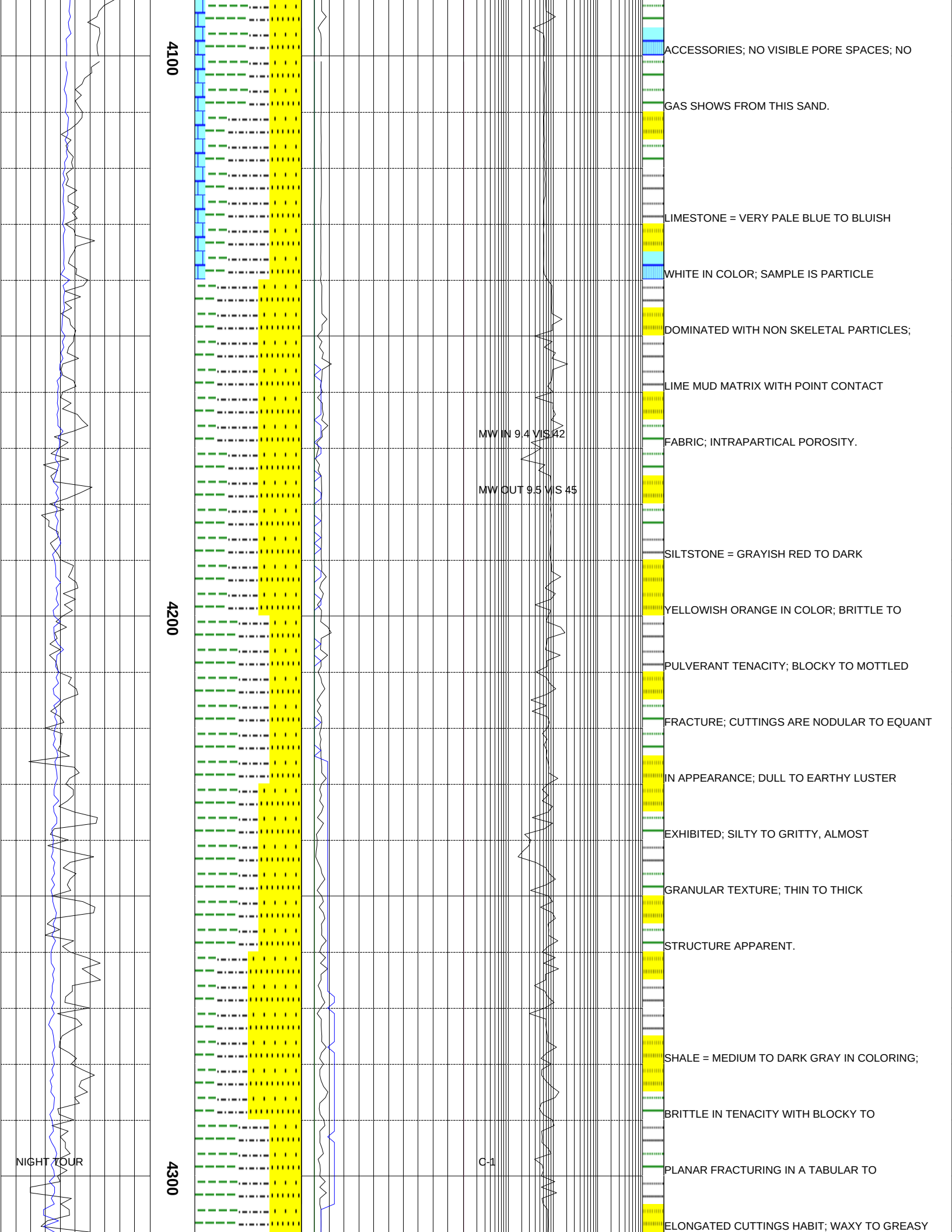
14.75"	**TO**	4022'
9.875"	**TO**	9100'
6.125"	**TO**	12990'
	TO	

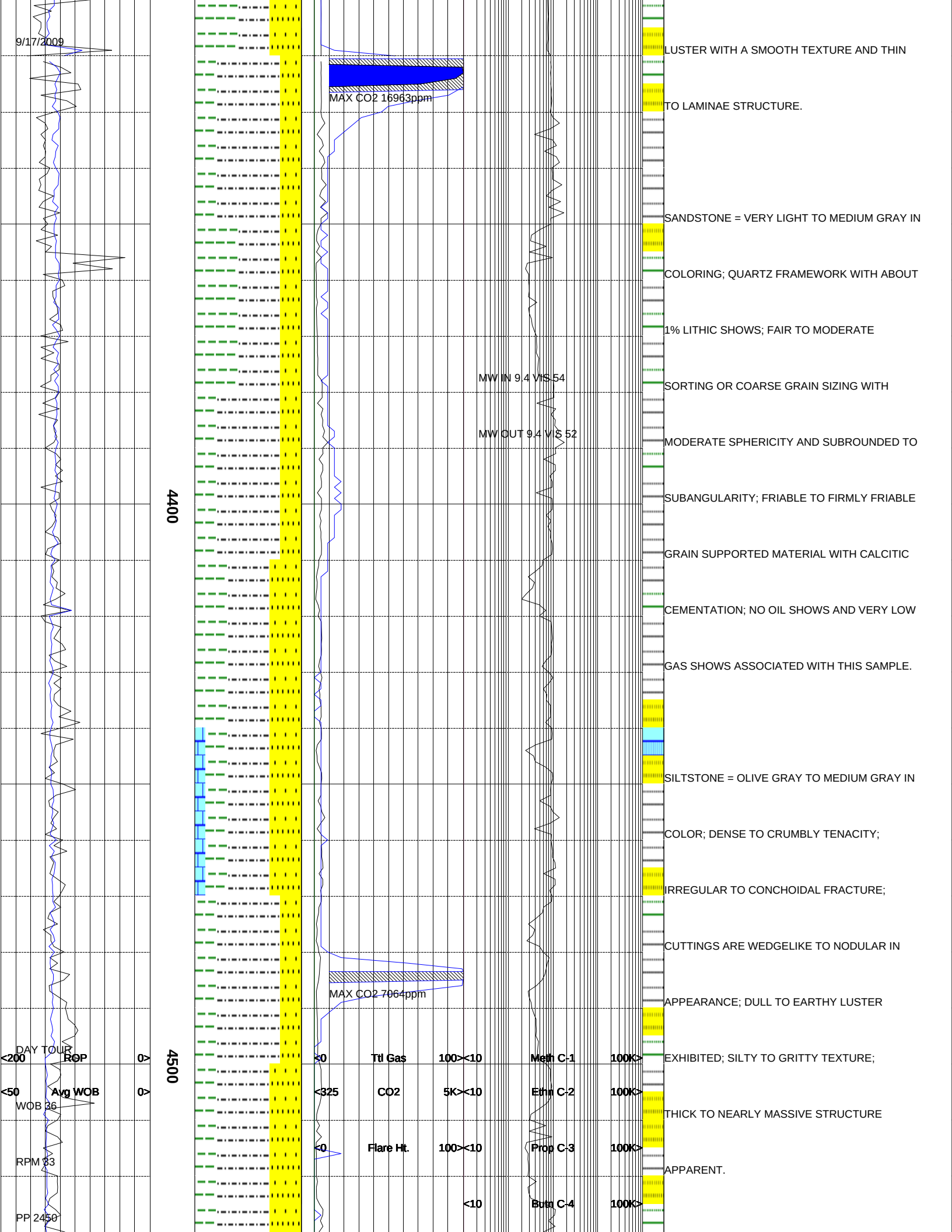
ABBREVIATIONS

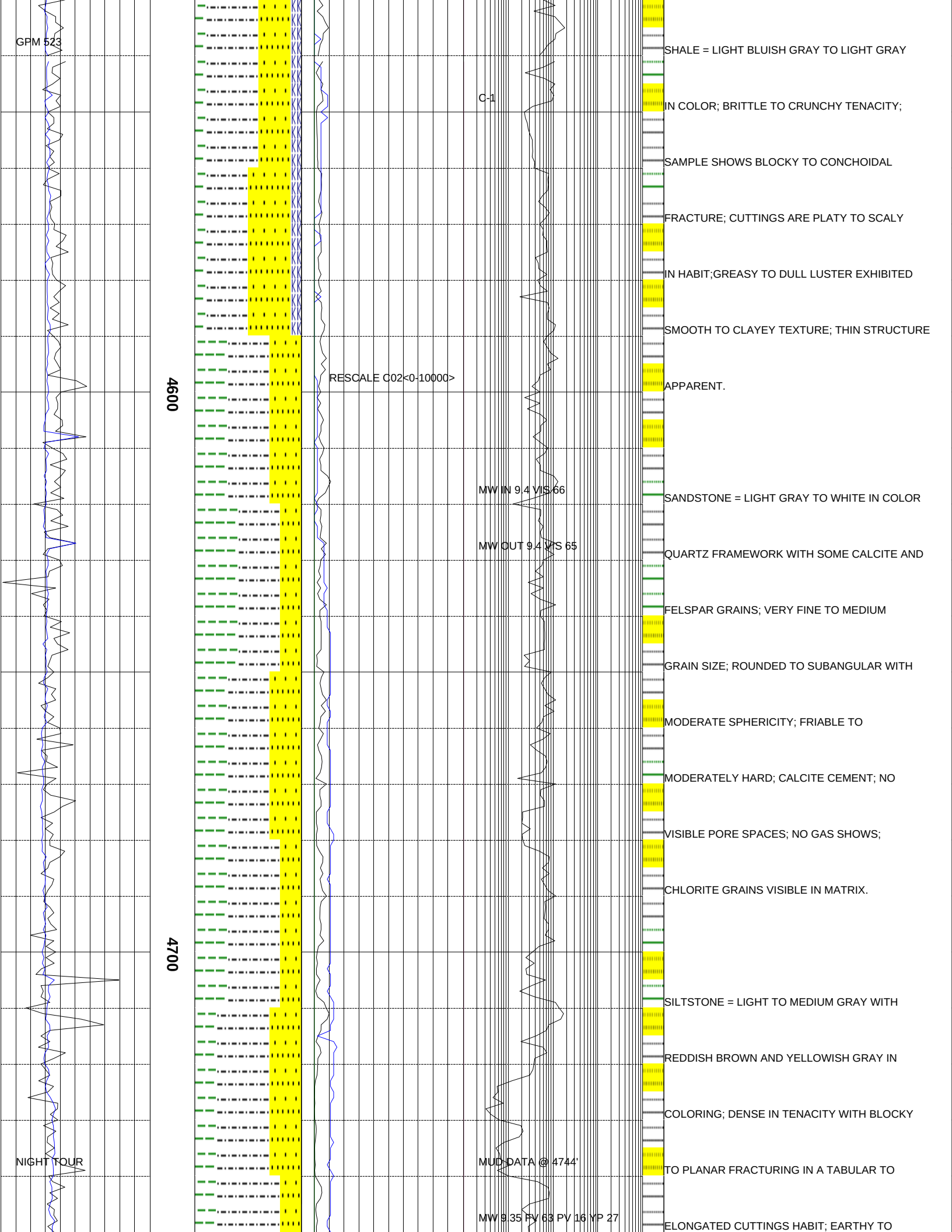
NB	NEWBIT	*PV*	PLASTIC VISCOSITY	*LC*	LOST CIRCULATION
RRB	RERUN BIT	*YP*	YIELD POINT	*CO*	CIRCULATE OUT
CB	CORE BIT	*FL*	FLUID LOSS	*NR*	NO RETURNS
WOB	WEIGHT ON BIT	*CL*	PPM CLORIDE ION	*TG*	TRIP GAS
RPM	ROTARY REV/MIN	*Rm*	MUD RESISTIVITY	*SG*	SURVEY GAS
PP	PUMP PRESSURE	*Rmf*	FILTRATE RESISTIVITY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

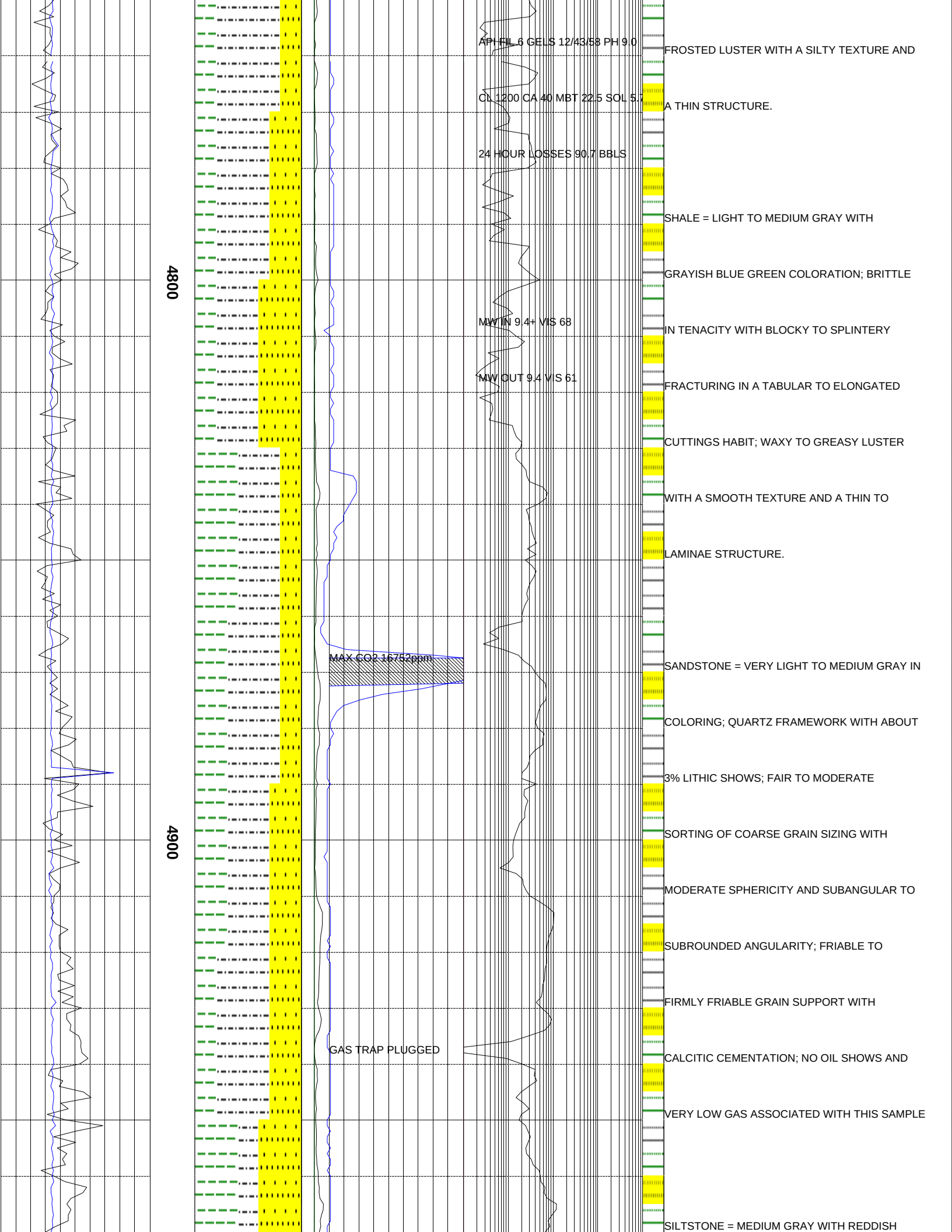
ALTERED ZONE
ANDESITE
ANHYDRITE
BASALT
BENTONITE
BIOTITIZATION
BRECCIA
CALCARENITE
CALCAREOUS TUFF
CALCILUTITE
CARBONATES
CARBONACEOUS MAT
CARBONACEOUS SH
CEMENT CONTAM.
CHALK
CRYSTALLINE TUFF
CHERT - ARGILL
CHERT - GLASSY
CHERT - PORCEL
CHERT - TIGER STRIPE
CHERT - UNDIFF
CLAY
CLAY-MUDSTONE
CLYST-TUFFACEOUS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

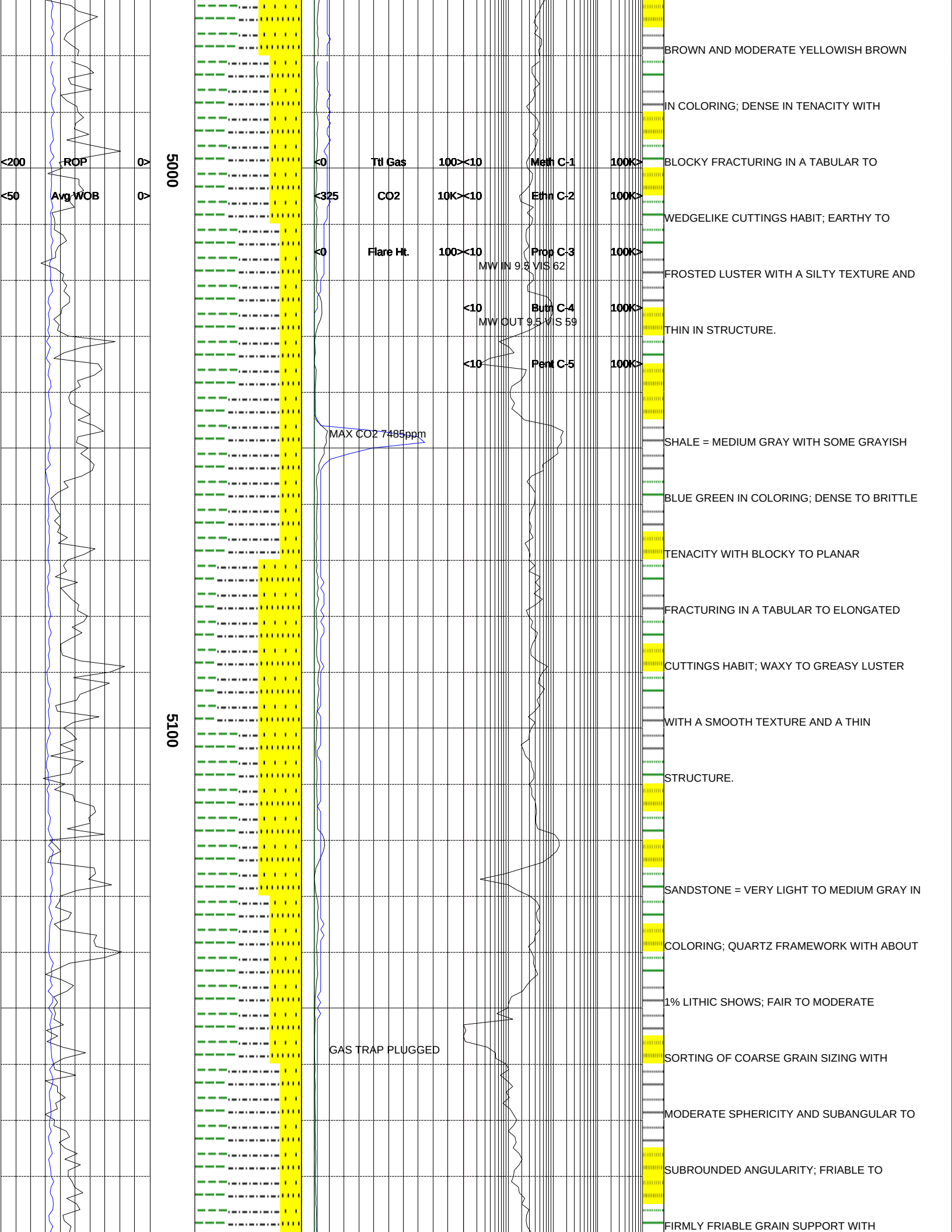

<200 ROP 0>
ft/hr
<50 Avg WOB 0>
klbs
Depth
Lithology
MGS
<0 Ttl Gas 1.5K>
units
<325 CO2 10K>
ppm
<0 Flare Ht. 100>
ft
<10 Meth C-1 100K>
ppm
<10 Ethn C-2 100K>
<10 Prop C-3 100K>
<10 Butn C-4 100K>
<10 Pent C-5 100K>
Interp. Lith
Remarks
Survey Data, Mud Reports, Other Info.
EPOCH WELL SERVICES COMMENCED
MUDLOGGING ON THE EXXONMOBIL PCU
197-34B7 WELL ON 09/16/2009 AT 4022' MD.
ALL COLORS ARE REFERENCED TO THE GSA
ROCK COLOR CHART.
ALL TRIP AND CONNECTION GASSES ARE
REFERENCED ABOVE BACKGROUND; ALL OTHER
ARE ABSOLUTE.
NB # 1, 9 7/8" in @ 4022'
HTC HCM504ZX w/2X12s,4X13s
29.25 Hours, 1938'
4000
1% METH. EQUIV. = 50 UNITS = 10000 = PPM
10 3/4" CASING @ 3990' PIT 12.0 PPG [E]
MW IN 9.4 VIS 44
MW OUT 9.4 VIS 44
C-1
DAY TOUR
WOB 30
RPM 85
PP 2200
GPM 530
SANDSTONE = GRAYISH PINK TO WHITE IN
COLOR; QUARTZ FRAMEWORK; MEDIUM TO FINE
GRAIN SIZE; SAMPLE IS FAIR TO WELL
SORTED; GRAINS ARE SUBANGULAR TO
SUBROUNDED WITH MODERATE SPHERICITY;
HARDNESS RANGES FROM EASILY TO FIRMLY
FRIBALE; CALCITE CEMENT; NO DISCERNIBLE

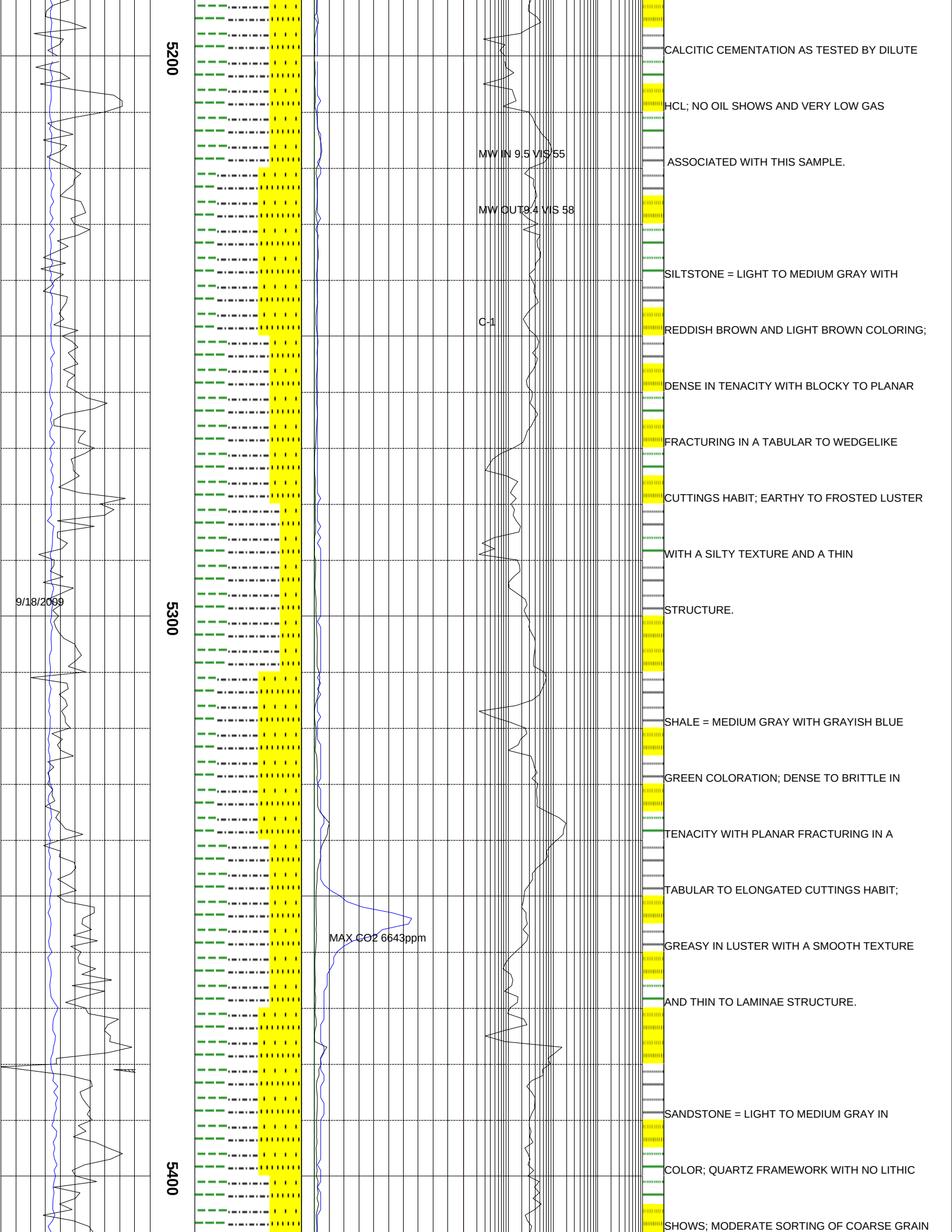

4100
4200
4300
ACCESSORIES; NO VISIBLE PORE SPACES; NO
GAS SHOWS FROM THIS SAND.
LIMESTONE = VERY PALE BLUE TO BLUISH
WHITE IN COLOR; SAMPLE IS PARTICLE
DOMINATED WITH NON SKELETAL PARTICLES;
LIME MUD MATRIX WITH POINT CONTACT
MW IN 9.4 VIS 42
FABRIC; INTRAPARTICAL POROSITY.
MW OUT 9.5 VIS 45
SILTSTONE = GRAYISH RED TO DARK
YELLOWISH ORANGE IN COLOR; BRITTLE TO
PULVERANT TENACITY; BLOCKY TO MOTTLED
FRACTURE; CUTTINGS ARE NODULAR TO EQUANT
IN APPEARANCE; DULL TO EARTHY LUSTER
EXHIBITED; SILTY TO GRITTY, ALMOST
GRANULAR TEXTURE; THIN TO THICK
STRUCTURE APPARENT.
SHALE = MEDIUM TO DARK GRAY IN COLORING;
BRITTLE IN TENACITY WITH BLOCKY TO
NIGHT TOUR
C-1
PLANAR FRACTURING IN A TABULAR TO
ELONGATED CUTTINGS HABIT; WAXY TO GREASY

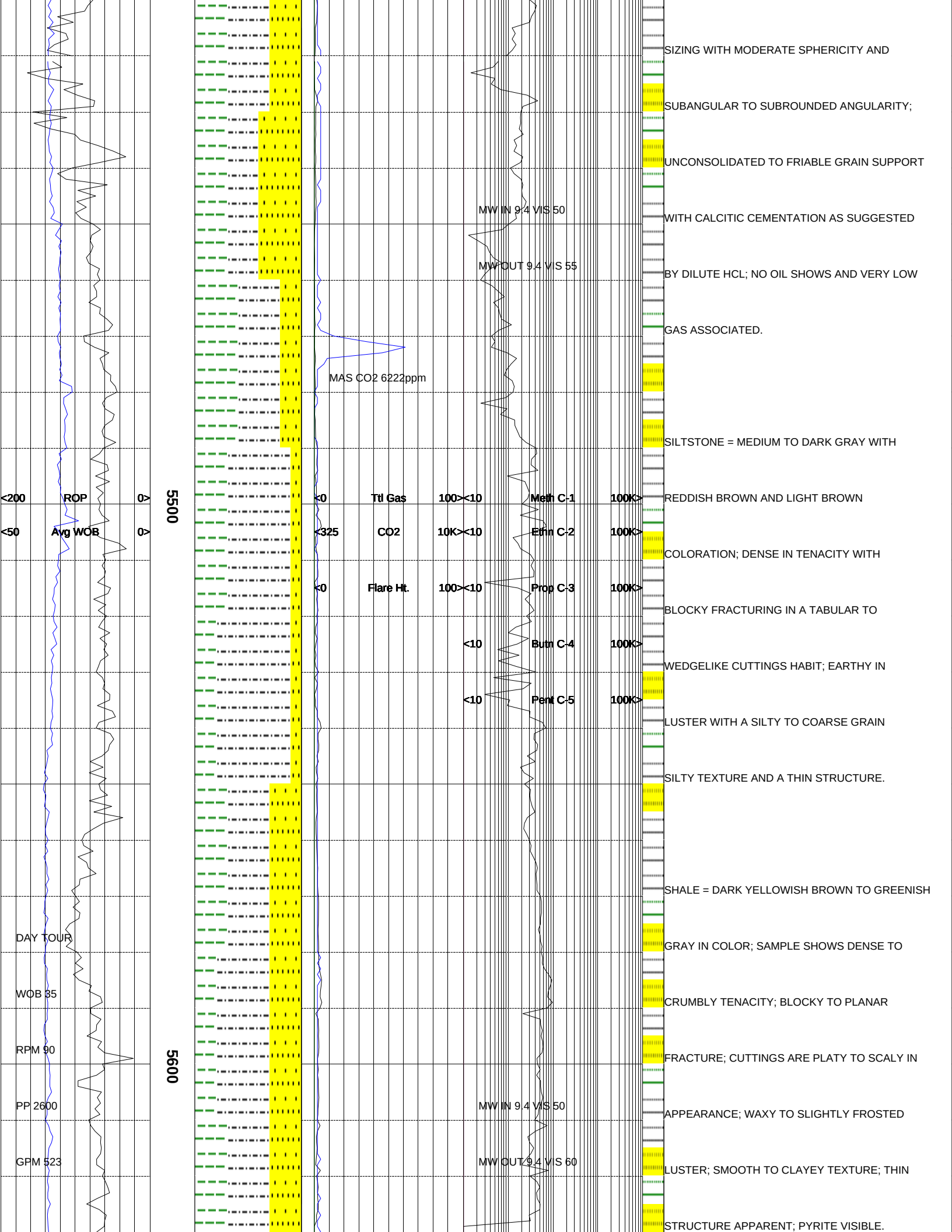

9/17/2009
MAX CO2 16963ppm
MW IN 9.4 VIS 54
MW OUT 9.4 VIS 52
4400
MAX CO2 7064ppm
4500
DAY TOUR
<200 ROP 0>
<50 Avg WOB 0>
WOB 36
RPM 33
PP 2450
<0 Ttl Gas 100><10 Meth C-1 100K>
<325 CO2 5K><10 Ethn C-2 100K>
<0 Flare Ht. 100><10 Prop C-3 100K>
<10 Buta C-4 100K>
LUSTER WITH A SMOOTH TEXTURE AND THIN
TO LAMINAE STRUCTURE.
SANDSTONE = VERY LIGHT TO MEDIUM GRAY IN
COLORING; QUARTZ FRAMEWORK WITH ABOUT
1% LITHIC SHOWS; FAIR TO MODERATE
SORTING OR COARSE GRAIN SIZING WITH
MODERATE SPHERICITY AND SUBROUNDED TO
SUBANGULARITY; FRIABLE TO FIRMLY FRIABLE
GRAIN SUPPORTED MATERIAL WITH CALCITIC
CEMENTATION; NO OIL SHOWS AND VERY LOW
GAS SHOWS ASSOCIATED WITH THIS SAMPLE.
SILTSTONE = OLIVE GRAY TO MEDIUM GRAY IN
COLOR; DENSE TO CRUMBLY TENACITY;
IRREGULAR TO CONCHOIDAL FRACTURE;
CUTTINGS ARE WEDGELIKE TO NODULAR IN
APPEARANCE; DULL TO EARTHY LUSTER
EXHIBITED; SILTY TO GRITTY TEXTURE;
THICK TO NEARLY MASSIVE STRUCTURE
APPARENT.

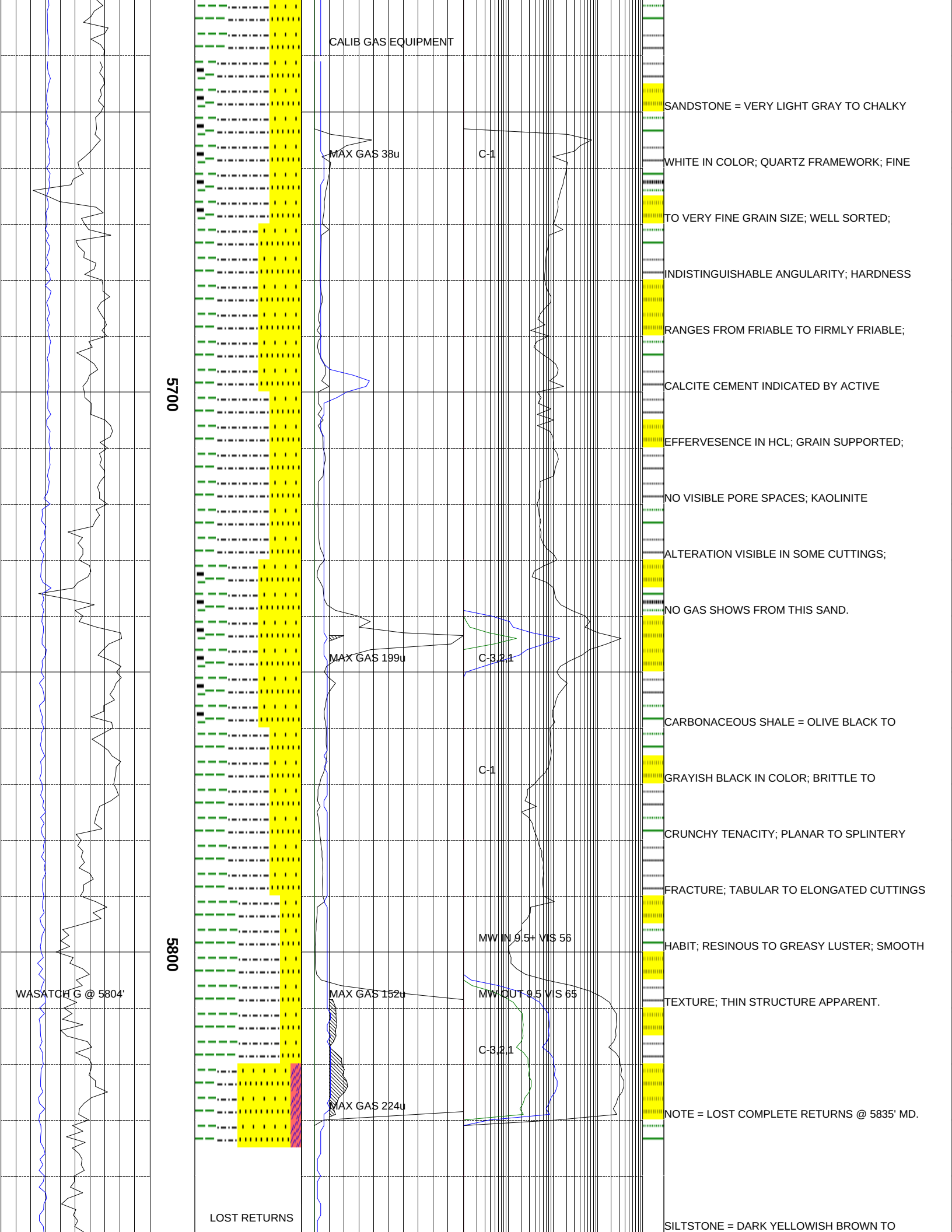

GPM 523
C-1
SHALE = LIGHT BLUISH GRAY TO LIGHT GRAY
IN COLOR; BRITTLE TO CRUNCHY TENACITY;
SAMPLE SHOWS BLOCKY TO CONCHOIDAL
FRACTURE; CUTTINGS ARE PLATY TO SCALY
IN HABIT;GREASY TO DULL LUSTER EXHIBITED
SMOOTH TO CLAYEY TEXTURE; THIN STRUCTURE
RESCALE C02<0-10000>
APPARENT.
4600
MW IN 9.4 VIS 66
SANDSTONE = LIGHT GRAY TO WHITE IN COLOR
MW OUT 9.4 VIS 65
QUARTZ FRAMEWORK WITH SOME CALCITE AND
FELSPAR GRAINS; VERY FINE TO MEDIUM
GRAIN SIZE; ROUNDED TO SUBANGULAR WITH
MODERATE SPHERICITY; FRIABLE TO
MODERATELY HARD; CALCITE CEMENT; NO
VISIBLE PORE SPACES; NO GAS SHOWS;
CHLORITE GRAINS VISIBLE IN MATRIX.
4700
SILTSTONE = LIGHT TO MEDIUM GRAY WITH
REDDISH BROWN AND YELLOWISH GRAY IN
COLORING; DENSE IN TENACITY WITH BLOCKY
NIGHT TOUR
MUD DATA @ 4744'
TO PLANAR FRACTURING IN A TABULAR TO
MW 9.35 FV 63 PV 16 YP 27
ELONGATED CUTTINGS HABIT; EARTHY TO

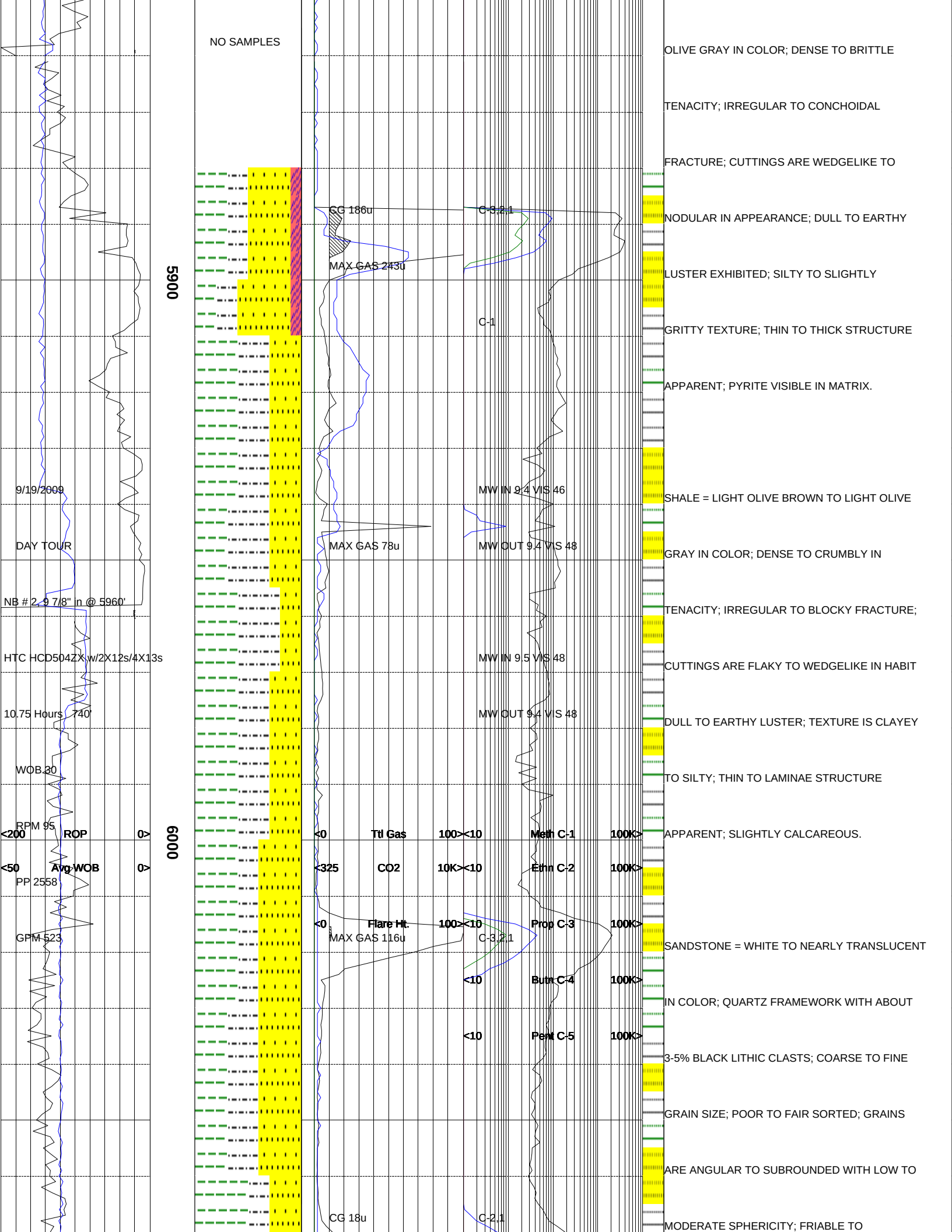

4800
4900
API FIL 6 GELS 12/43/58 PH 9.0
CL 1200 CA 40 MBT 22.5 SOL 5.7
24 HOUR LOSSES 90.7 BBLS
MW IN 9.4+ VIS 68
MW OUT 9.4 VIS 61
MAX CO2 16752ppm
GAS TRAP PLUGGED
FROSTED LUSTER WITH A SILTY TEXTURE AND
A THIN STRUCTURE.
SHALE = LIGHT TO MEDIUM GRAY WITH
GRAYISH BLUE GREEN COLORATION; BRITTLE
IN TENACITY WITH BLOCKY TO SPLINTERY
FRACTURING IN A TABULAR TO ELONGATED
CUTTINGS HABIT; WAXY TO GREASY LUSTER
WITH A SMOOTH TEXTURE AND A THIN TO
LAMINAE STRUCTURE.
SANDSTONE = VERY LIGHT TO MEDIUM GRAY IN
COLORING; QUARTZ FRAMEWORK WITH ABOUT
3% LITHIC SHOWS; FAIR TO MODERATE
SORTING OF COARSE GRAIN SIZING WITH
MODERATE SPHERICITY AND SUBANGULAR TO
SUBROUNDED ANGULARITY; FRIABLE TO
FIRMLY FRIABLE GRAIN SUPPORT WITH
CALCITIC CEMENTATION; NO OIL SHOWS AND
VERY LOW GAS ASSOCIATED WITH THIS SAMPLE
SILTSTONE = MEDIUM GRAY WITH REDDISH

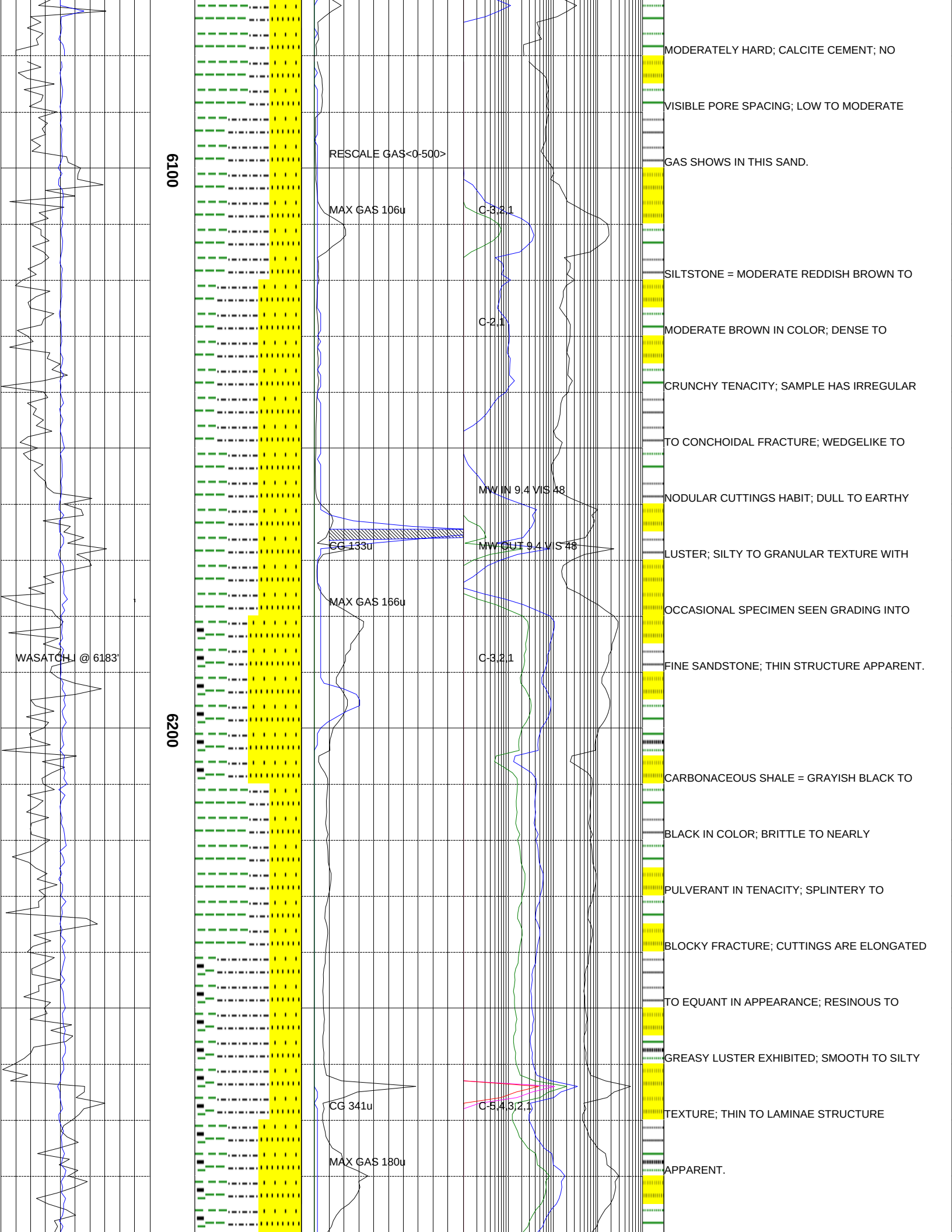

<200 ROP 0>
<50 Avg WOB 0>
5000
5100
<0 Ttl Gas 100><10 Meth C-1 100K>
<325 CO2 10K><10 Etha C-2 100K>
<0 Flare Ht. 100><10 Prop C-3 100K>
MW IN 9.5 VIS 62
<10 Butn C-4 100K>
MW OUT 9.5 VIS 59
<10 Pent C-5 100K>
MAX CO2 7485ppm
GAS TRAP PLUGGED
BROWN AND MODERATE YELLOWISH BROWN
IN COLORING; DENSE IN TENACITY WITH
BLOCKY FRACTURING IN A TABULAR TO
WEDGELIKE CUTTINGS HABIT; EARTHY TO
FROSTED LUSTER WITH A SILTY TEXTURE AND
THIN IN STRUCTURE.
SHALE = MEDIUM GRAY WITH SOME GRAYISH
BLUE GREEN IN COLORING; DENSE TO BRITTLE
TENACITY WITH BLOCKY TO PLANAR
FRACTURING IN A TABULAR TO ELONGATED
CUTTINGS HABIT; WAXY TO GREASY LUSTER
WITH A SMOOTH TEXTURE AND A THIN
STRUCTURE.
SANDSTONE = VERY LIGHT TO MEDIUM GRAY IN
COLORING; QUARTZ FRAMEWORK WITH ABOUT
1% LITHIC SHOWS; FAIR TO MODERATE
SORTING OF COARSE GRAIN SIZING WITH
MODERATE SPHERICITY AND SUBANGULAR TO
SUBROUNDED ANGULARITY; FRIABLE TO
FIRMLY FRIABLE GRAIN SUPPORT WITH

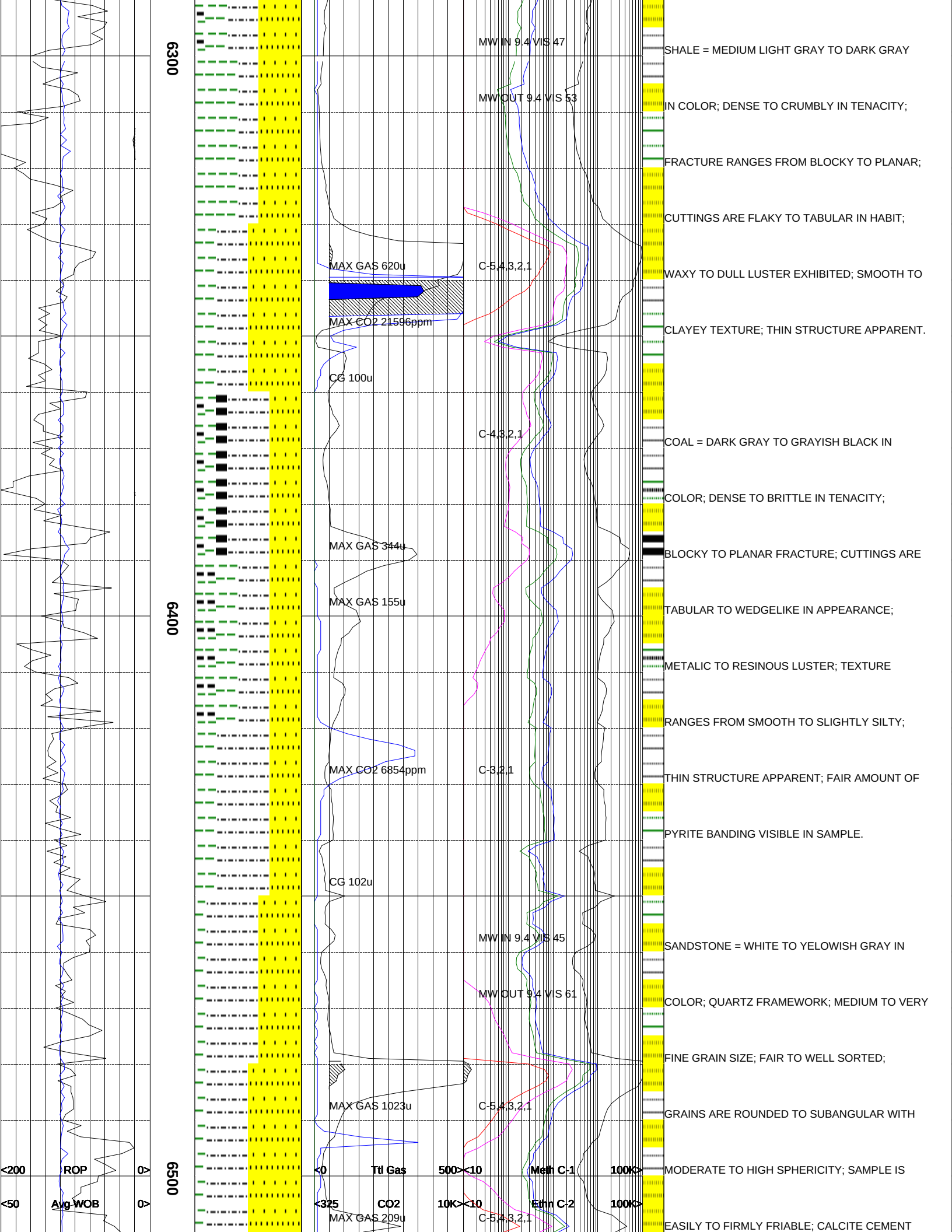

5200
5300
5400
9/18/2009
MW IN 9.5 VIS 55
MW OUT9.4 VIS 58
C-1
MAX CO2 6643ppm
CALCITIC CEMENTATION AS TESTED BY DILUTE
HCL; NO OIL SHOWS AND VERY LOW GAS
ASSOCIATED WITH THIS SAMPLE.
SILTSTONE = LIGHT TO MEDIUM GRAY WITH
REDDISH BROWN AND LIGHT BROWN COLORING;
DENSE IN TENACITY WITH BLOCKY TO PLANAR
FRACTURING IN A TABULAR TO WEDGELIKE
CUTTINGS HABIT; EARTHY TO FROSTED LUSTER
WITH A SILTY TEXTURE AND A THIN
STRUCTURE.
SHALE = MEDIUM GRAY WITH GRAYISH BLUE
GREEN COLORATION; DENSE TO BRITTLE IN
TENACITY WITH PLANAR FRACTURING IN A
TABULAR TO ELONGATED CUTTINGS HABIT;
GREASY IN LUSTER WITH A SMOOTH TEXTURE
AND THIN TO LAMINAE STRUCTURE.
SANDSTONE = LIGHT TO MEDIUM GRAY IN
COLOR; QUARTZ FRAMEWORK WITH NO LITHIC
SHOWS; MODERATE SORTING OF COARSE GRAIN

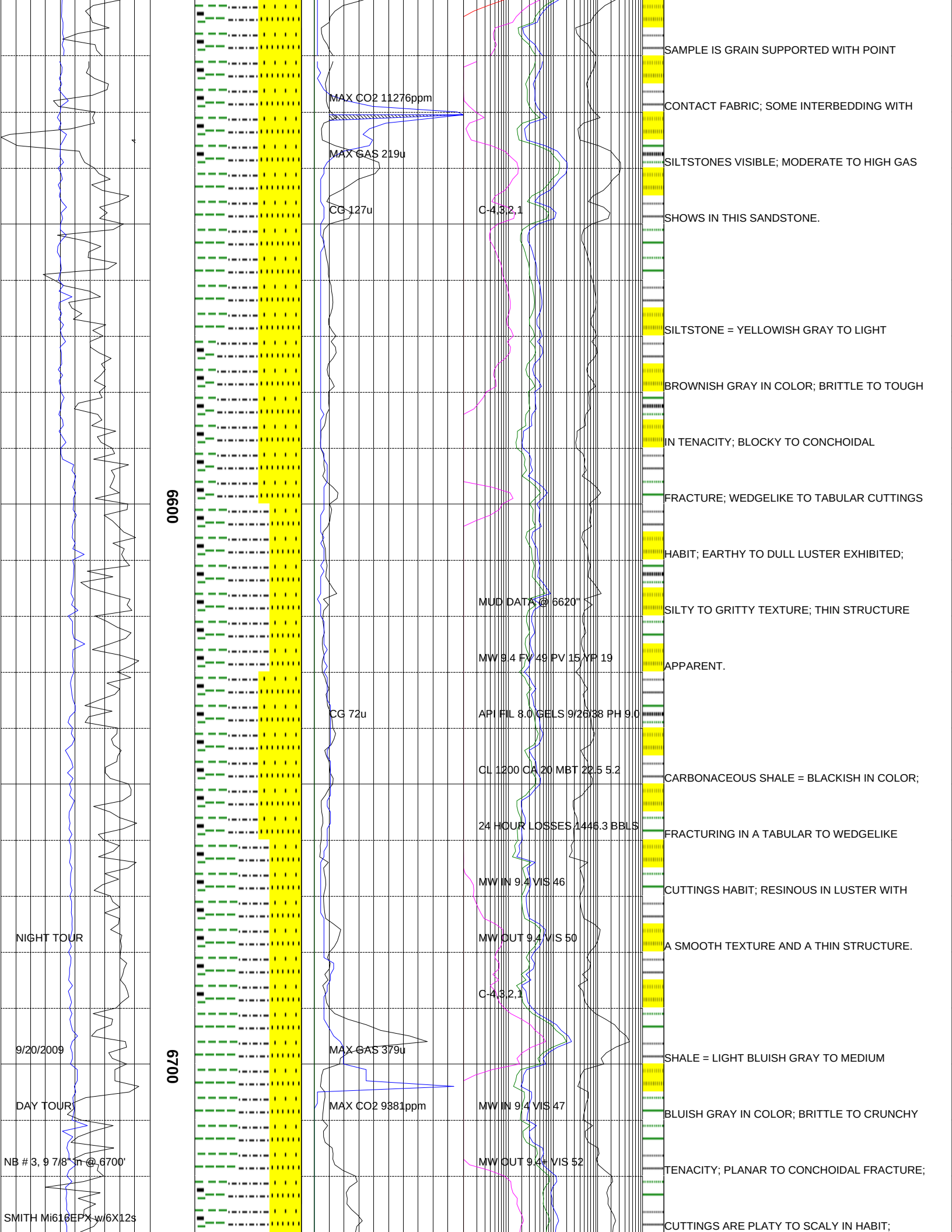

SIZING WITH MODERATE SPHERICITY AND
SUBANGULAR TO SUBROUNDED ANGULARITY;
UNCONSOLIDATED TO FRIABLE GRAIN SUPPORT
MW IN 9.4 VIS 50
WITH CALCITIC CEMENTATION AS SUGGESTED
MW OUT 9.4 VIS 55
BY DILUTE HCL; NO OIL SHOWS AND VERY LOW
GAS ASSOCIATED.
MAS CO2 6222ppm
SILTSTONE = MEDIUM TO DARK GRAY WITH
<200 ROP 0>
<0 Ttl Gas 100><10 Meth C-1 100K>
REDDISH BROWN AND LIGHT BROWN
5500
<50 Avg WOB 0>
<325 CO2 10K><10 Eth C-2 100K>
COLORATION; DENSE IN TENACITY WITH
<0 Flare Ht. 100><10 Prop C-3 100K>
BLOCKY FRACTURING IN A TABULAR TO
<10 Butn C-4 100K>
WEDGELIKE CUTTINGS HABIT; EARTHY IN
<10 Pent C-5 100K>
LUSTER WITH A SILTY TO COARSE GRAIN
SILTY TEXTURE AND A THIN STRUCTURE.
SHALE = DARK YELLOWISH BROWN TO GREENISH
DAY TOUR
GRAY IN COLOR; SAMPLE SHOWS DENSE TO
WOB 35
CRUMBLY TENACITY; BLOCKY TO PLANAR
RPM 90
FRACTURE; CUTTINGS ARE PLATY TO SCALY IN
5600
PP 2600
MW IN 9.4 VIS 50
APPEARANCE; WAXY TO SLIGHTLY FROSTED
GPM 523
MW OUT 9.4 VIS 60
LUSTER; SMOOTH TO CLAYEY TEXTURE; THIN
STRUCTURE APPARENT; PYRITE VISIBLE.

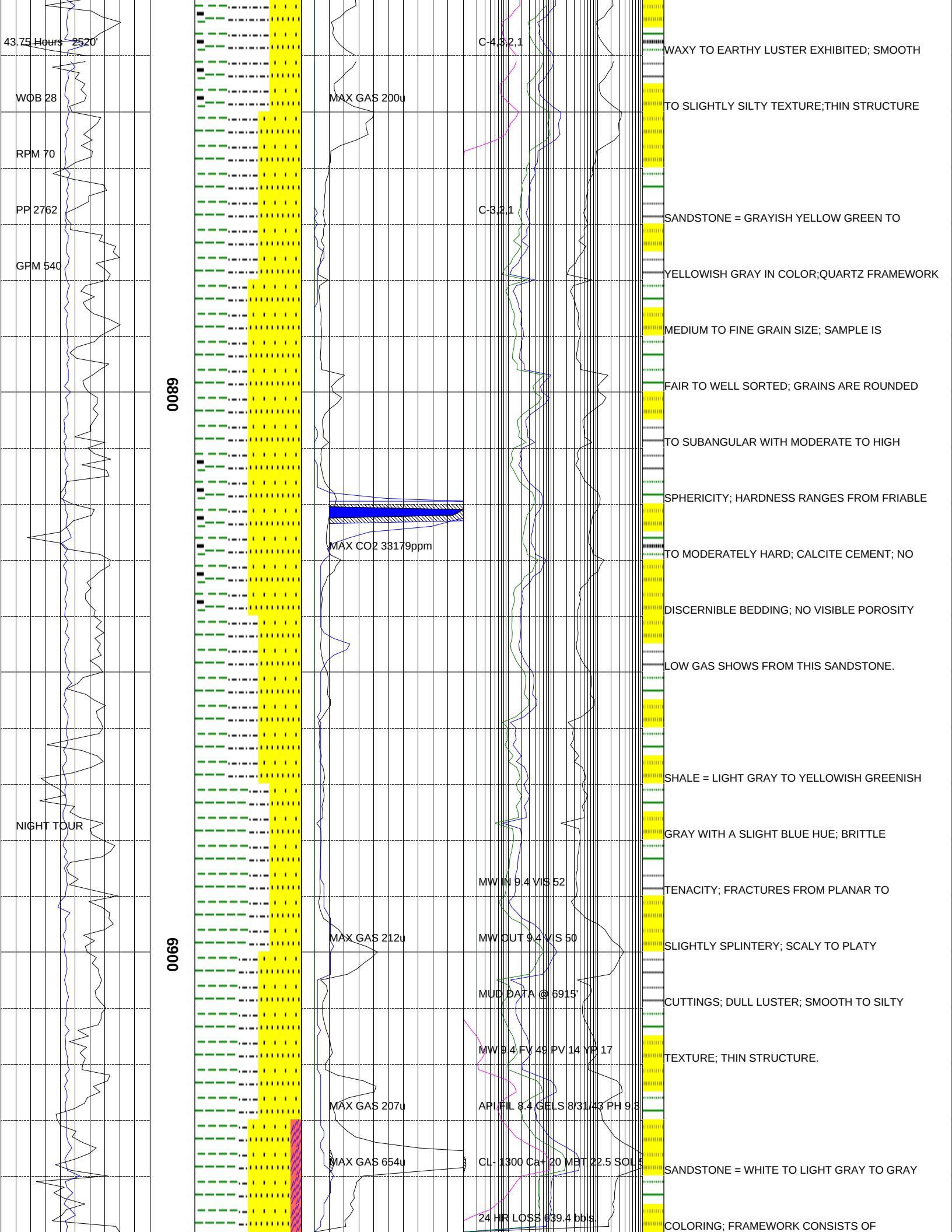

CALIB GAS EQUIPMENT
MAX GAS 38u
C-1
SANDSTONE = VERY LIGHT GRAY TO CHALKY
WHITE IN COLOR; QUARTZ FRAMEWORK; FINE
TO VERY FINE GRAIN SIZE; WELL SORTED;
INDISTINGUISHABLE ANGULARITY; HARDNESS
RANGES FROM FRIABLE TO FIRMLY FRIABLE;
CALCITE CEMENT INDICATED BY ACTIVE
EFFERVESENCE IN HCL; GRAIN SUPPORTED;
NO VISIBLE PORE SPACES; KAOLINITE
ALTERATION VISIBLE IN SOME CUTTINGS;
NO GAS SHOWS FROM THIS SAND.
5700
MAX GAS 199u
C-3,2,1
CARBONACEOUS SHALE = OLIVE BLACK TO
C-1
GRAYISH BLACK IN COLOR; BRITTLE TO
CRUNCHY TENACITY; PLANAR TO SPLINTERY
FRACTURE; TABULAR TO ELONGATED CUTTINGS
MW IN 9.5+ VIS 56
HABIT; RESINOUS TO GREASY LUSTER; SMOOTH
5800
WASATCH G @ 5804'
MAX GAS 152u
MW OUT 9.5 VIS 65
TEXTURE; THIN STRUCTURE APPARENT.
C-3,2,1
MAX GAS 224u
NOTE = LOST COMPLETE RETURNS @ 5835' MD.
LOST RETURNS
SILTSTONE = DARK YELLOWISH BROWN TO

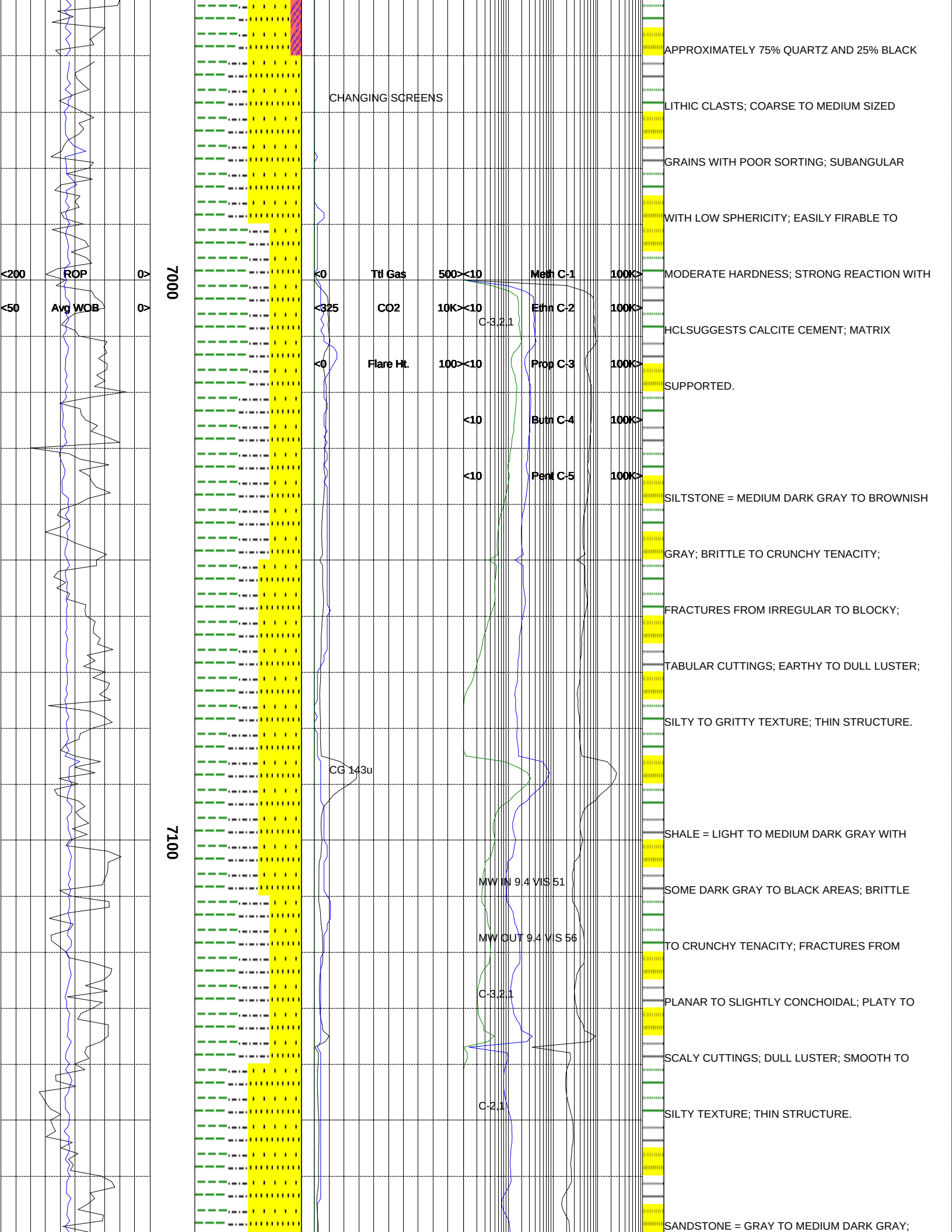

NO SAMPLES
OLIVE GRAY IN COLOR; DENSE TO BRITTLE
TENACITY; IRREGULAR TO CONCHOIDAL
FRACTURE; CUTTINGS ARE WEDGELIKE TO
NODULAR IN APPEARANCE; DULL TO EARTHY
LUSTER EXHIBITED; SILTY TO SLIGHTLY
GRITTY TEXTURE; THIN TO THICK STRUCTURE
APPARENT; PYRITE VISIBLE IN MATRIX.
SHALE = LIGHT OLIVE BROWN TO LIGHT OLIVE
GRAY IN COLOR; DENSE TO CRUMBLY IN
TENACITY; IRREGULAR TO BLOCKY FRACTURE;
CUTTINGS ARE FLAKY TO WEDGELIKE IN HABIT
DULL TO EARTHY LUSTER; TEXTURE IS CLAYEY
TO SILTY; THIN TO LAMINAE STRUCTURE
APPARENT; SLIGHTLY CALCAREOUS.
SANDSTONE = WHITE TO NEARLY TRANSLUCENT
IN COLOR; QUARTZ FRAMEWORK WITH ABOUT
3-5% BLACK LITHIC CLASTS; COARSE TO FINE
GRAIN SIZE; POOR TO FAIR SORTED; GRAINS
ARE ANGULAR TO SUBROUNDED WITH LOW TO
MODERATE SPHERICITY; FRIABLE TO
5900
6000
CG 186u
MAX GAS 243u
C-3,2,1
C-1
MW IN 9.4 VIS 46
MW OUT 9.4 VIS 48
MAX GAS 78u
MW IN 9.5 VIS 48
MW OUT 9.4 VIS 48
MAX GAS 116u
C-3,2,1
CG 18u
C-2,1
9/19/2009
DAY TOUR
NB # 2, 9 7/8" in @ 5960'
HTC HCD504ZX w/2X12s/4X13s
10.75 Hours, 740'
WOB 30
RPM 95
GPM 523
PP 2558
<200 ROP 0>
<50 Avg WOB 0>
<0 Ttl Gas 100>
<325 CO2 10K>
<0 Flare Ht. 100>
<10 Meth C-1 100K>
<10 Ethn C-2 100K>
<10 Prop C-3 100K>
<10 Butn C-4 100K>
<10 Pent C-5 100K>


6100
RESCALE GAS<0-500>
MAX GAS 106u
C-3,2,1
C-2,1
MW IN 9.4 VIS 48
CG 133u
MW OUT 9.4 VIS 48
MAX GAS 166u
WASATCH I @ 6183'
C-3,2,1
6200
CG 341u
C-5,4,3,2,1
MAX GAS 180u
MODERATELY HARD; CALCITE CEMENT; NO
VISIBLE PORE SPACING; LOW TO MODERATE
GAS SHOWS IN THIS SAND.
SILTSTONE = MODERATE REDDISH BROWN TO
MODERATE BROWN IN COLOR; DENSE TO
CRUNCHY TENACITY; SAMPLE HAS IRREGULAR
TO CONCHOIDAL FRACTURE; WEDGELIKE TO
NODULAR CUTTINGS HABIT; DULL TO EARTHY
LUSTER; SILTY TO GRANULAR TEXTURE WITH
OCCASIONAL SPECIMEN SEEN GRADING INTO
FINE SANDSTONE; THIN STRUCTURE APPARENT.
CARBONACEOUS SHALE = GRAYISH BLACK TO
BLACK IN COLOR; BRITTLE TO NEARLY
PULVERANT IN TENACITY; SPLINTERY TO
BLOCKY FRACTURE; CUTTINGS ARE ELONGATED
TO EQUANT IN APPEARANCE; RESINOUS TO
GREASY LUSTER EXHIBITED; SMOOTH TO SILTY
TEXTURE; THIN TO LAMINAE STRUCTURE
APPARENT.


6300
6400
6500
MW IN 9.4 VIS 47
MW OUT 9.4 VIS 53
MAX GAS 620u
C-5,4,3,2,1
MAX CO2 21596ppm
CG 100u
C-4,3,2,1
MAX GAS 344u
MAX GAS 155u
MAX CO2 6854ppm
C-3,2,1
CG 102u
MW IN 9.4 VIS 45
MW OUT 9.4 VIS 61
MAX GAS 1023u
C-5,4,3,2,1
MAX GAS 209u
C-5,4,3,2,1
SHALE = MEDIUM LIGHT GRAY TO DARK GRAY
IN COLOR; DENSE TO CRUMBLY IN TENACITY;
FRACTURE RANGES FROM BLOCKY TO PLANAR;
CUTTINGS ARE FLAKY TO TABULAR IN HABIT;
WAXY TO DULL LUSTER EXHIBITED; SMOOTH TO
CLAYEY TEXTURE; THIN STRUCTURE APPARENT.
COAL = DARK GRAY TO GRAYISH BLACK IN
COLOR; DENSE TO BRITTLE IN TENACITY;
BLOCKY TO PLANAR FRACTURE; CUTTINGS ARE
TABULAR TO WEDGELIKE IN APPEARANCE;
METALIC TO RESINOUS LUSTER; TEXTURE
RANGES FROM SMOOTH TO SLIGHTLY SILTY;
THIN STRUCTURE APPARENT; FAIR AMOUNT OF
PYRITE BANDING VISIBLE IN SAMPLE.
SANDSTONE = WHITE TO YELOWISH GRAY IN
COLOR; QUARTZ FRAMEWORK; MEDIUM TO VERY
FINE GRAIN SIZE; FAIR TO WELL SORTED;
GRAINS ARE ROUNDED TO SUBANGULAR WITH
MODERATE TO HIGH SPHERICITY; SAMPLE IS
EASILY TO FIRMLY FRIABLE; CALCITE CEMENT
<200 ROP 0>
<50 Avg WOB 0>
<0 Ttl Gas 500><10 Meth C-1 100K>
<325 CO2 10K><10 Ethn C-2 100K>


6600
6700
MAX CO2 11276ppm
MAX GAS 219u
CG 127u
C-4,3,2,1
CG 72u
MUD DATA @ 6620'
MW 9.4 FV 49 PV 15 YP 19
API FIL 8.0 GELS 9/26/38 PH 9.0
CL 1200 CA 20 MBT 22.5 5.2
24 HOUR LOSSES 1446.3 BBLS
MW IN 9.4 VIS 46
MW OUT 9.4 VIS 50
C-4,3,2,1
MAX GAS 379u
MAX CO2 9381ppm
MW IN 9.4 VIS 47
MW OUT 9.4 VIS 52
NIGHT TOUR
9/20/2009
DAY TOUR
NB # 3, 9 7/8" in @ 6700'
SMITH Mi616EPX w/6X12s
SAMPLE IS GRAIN SUPPORTED WITH POINT
CONTACT FABRIC; SOME INTERBEDDING WITH
SILTSTONES VISIBLE; MODERATE TO HIGH GAS
SHOWS IN THIS SANDSTONE.
SILTSTONE = YELLOWISH GRAY TO LIGHT
BROWNISH GRAY IN COLOR; BRITTLE TO TOUGH
IN TENACITY; BLOCKY TO CONCHOIDAL
FRACTURE; WEDGELIKE TO TABULAR CUTTINGS
HABIT; EARTHY TO DULL LUSTER EXHIBITED;
SILTY TO GRITTY TEXTURE; THIN STRUCTURE
APPARENT.
CARBONACEOUS SHALE = BLACKISH IN COLOR;
FRACTURING IN A TABULAR TO WEDGELIKE
CUTTINGS HABIT; RESINOUS IN LUSTER WITH
A SMOOTH TEXTURE AND A THIN STRUCTURE.
SHALE = LIGHT BLUISH GRAY TO MEDIUM
BLUISH GRAY IN COLOR; BRITTLE TO CRUNCHY
TENACITY; PLANAR TO CONCHOIDAL FRACTURE;
CUTTINGS ARE PLATY TO SCALY IN HABIT;


43.75 Hours 2520'
WOB 28
RPM 70
PP 2762
GPM 540
NIGHT TOUR
6800
6900
MAX GAS 200u
MAX CO2 33179ppm
MAX GAS 212u
MAX GAS 207u
MAX GAS 654u
C-4,3,2,1
C-3,2,1
MW IN 9.4 VIS 52
MW OUT 9.4 VIS 50
MUD DATA @ 6915'
MW 9.4 FV 49 PV 14 YP 17
API FIL 8.4 GELS 8/31/43 PH 9.3
CL- 1300 Ca+ 20 MBT 22.5 SOL 5
24 HR LOSS 639.4 bbls
WAXY TO EARTHY LUSTER EXHIBITED; SMOOTH
TO SLIGHTLY SILTY TEXTURE;THIN STRUCTURE
SANDSTONE = GRAYISH YELLOW GREEN TO
YELLOWISH GRAY IN COLOR;QUARTZ FRAMEWORK
MEDIUM TO FINE GRAIN SIZE; SAMPLE IS
FAIR TO WELL SORTED; GRAINS ARE ROUNDED
TO SUBANGULAR WITH MODERATE TO HIGH
SPHERICITY; HARDNESS RANGES FROM FRIABLE
TO MODERATELY HARD; CALCITE CEMENT; NO
DISCERNIBLE BEDDING; NO VISIBLE POROSITY
LOW GAS SHOWS FROM THIS SANDSTONE.
SHALE = LIGHT GRAY TO YELLOWISH GREENISH
GRAY WITH A SLIGHT BLUE HUE; BRITTLE
TENACITY; FRACTURES FROM PLANAR TO
SLIGHTLY SPLINTERY; SCALY TO PLATY
CUTTINGS; DULL LUSTER; SMOOTH TO SILTY
TEXTURE; THIN STRUCTURE.
SANDSTONE = WHITE TO LIGHT GRAY TO GRAY
COLORING; FRAMEWORK CONSISTS OF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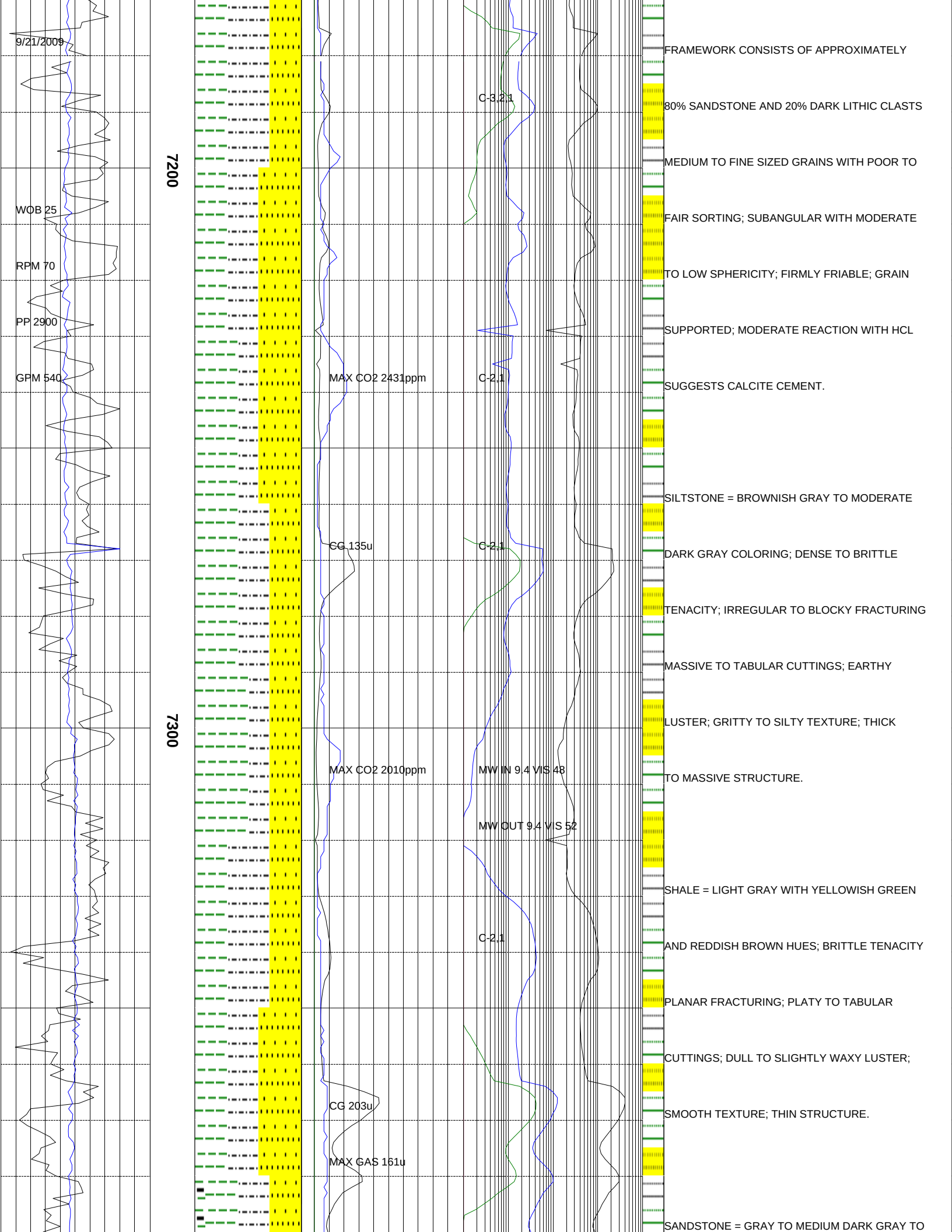
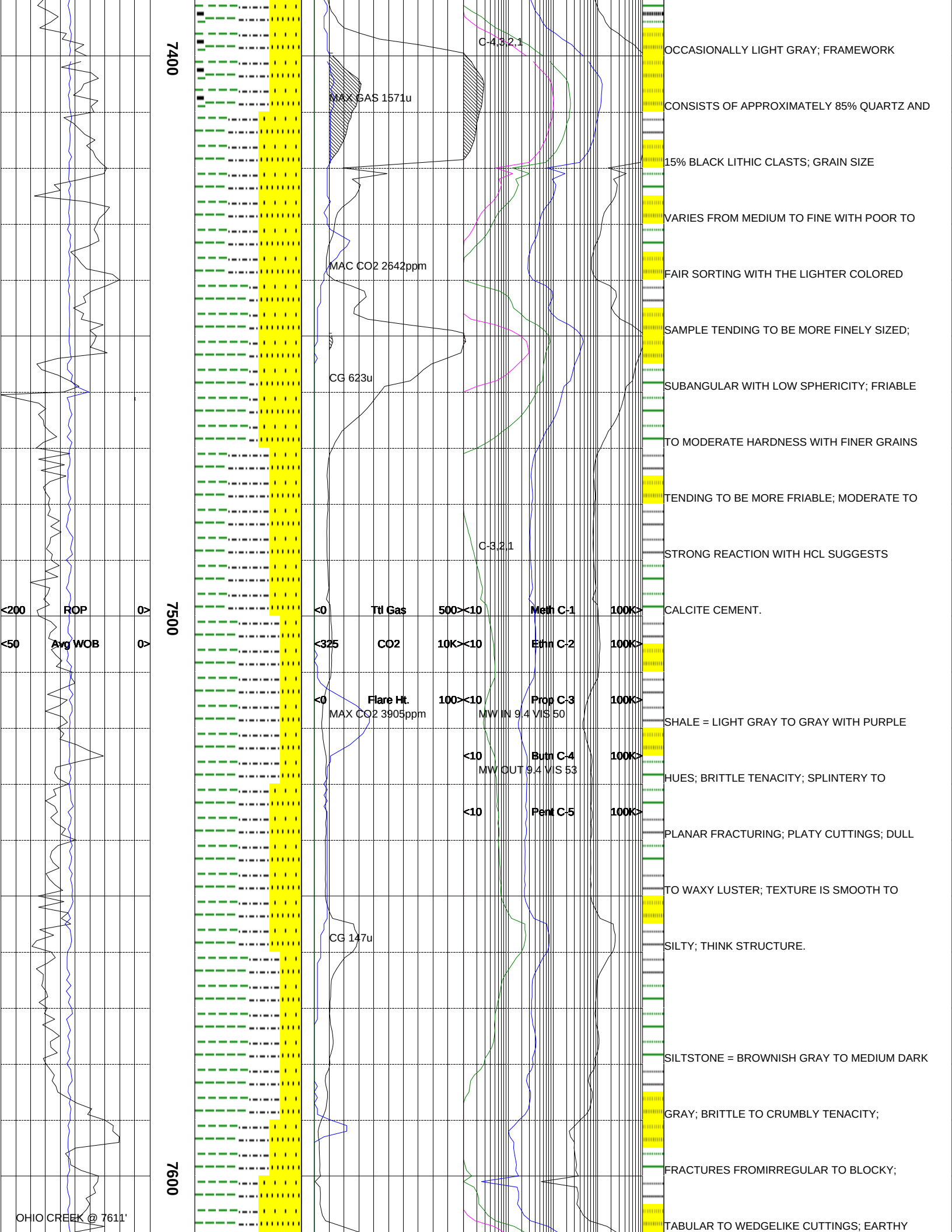
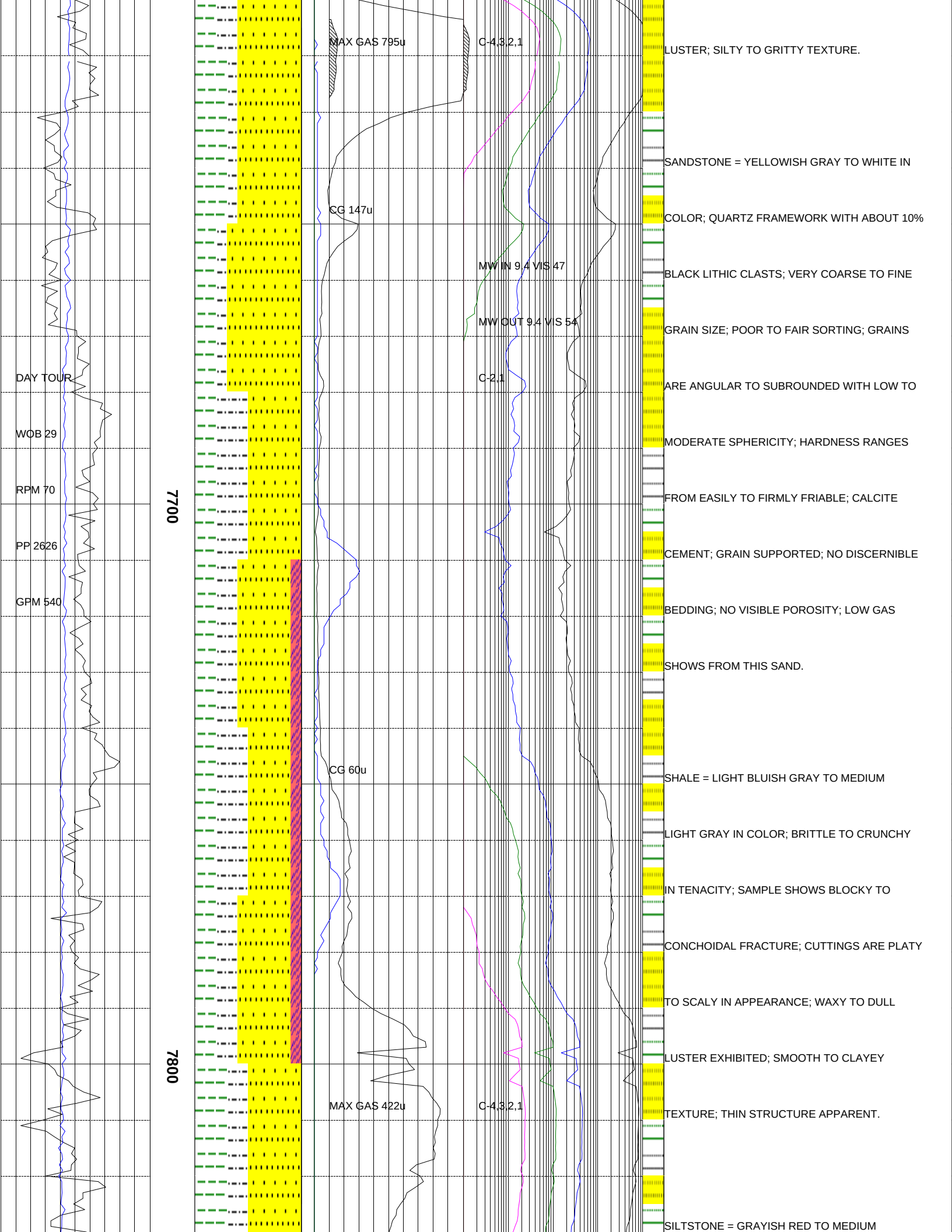
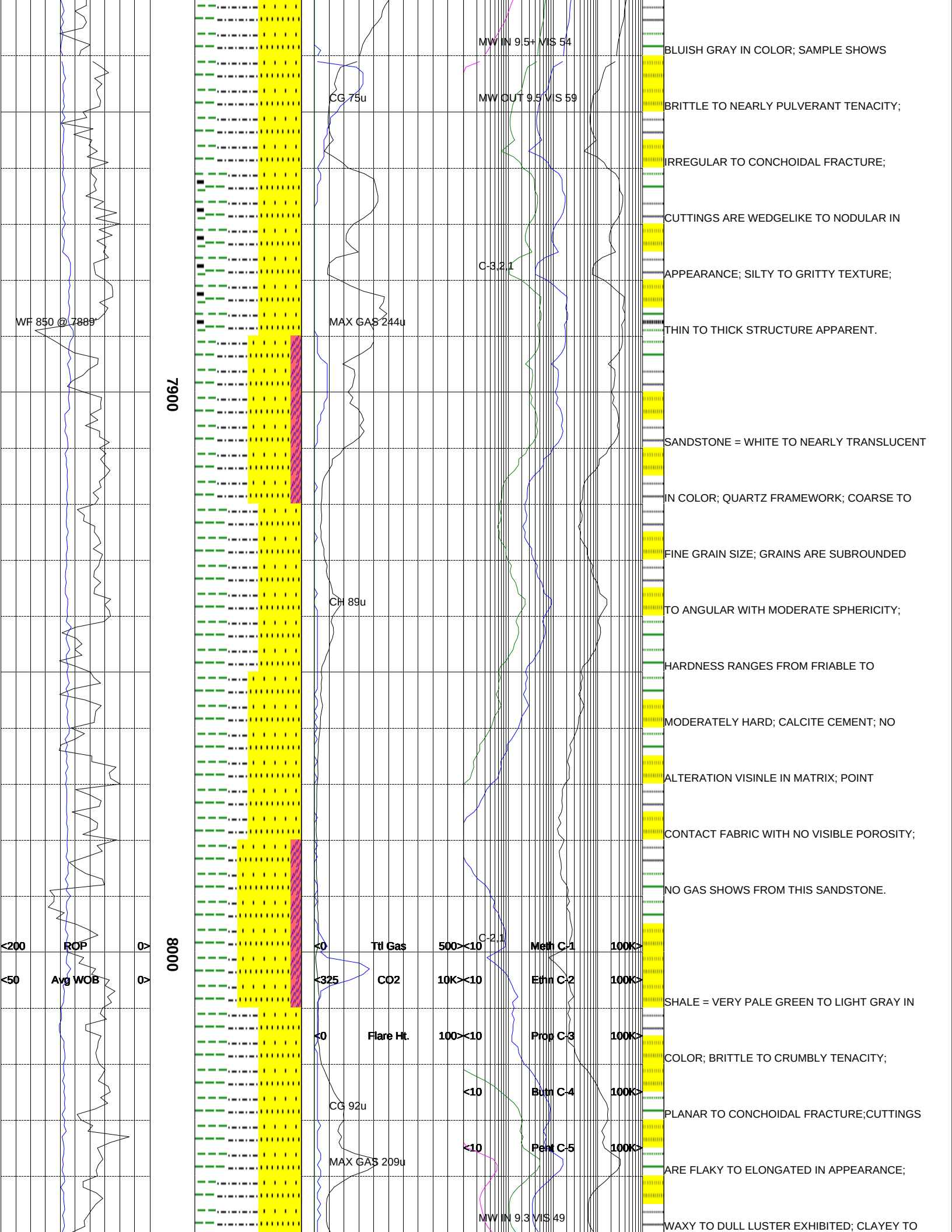
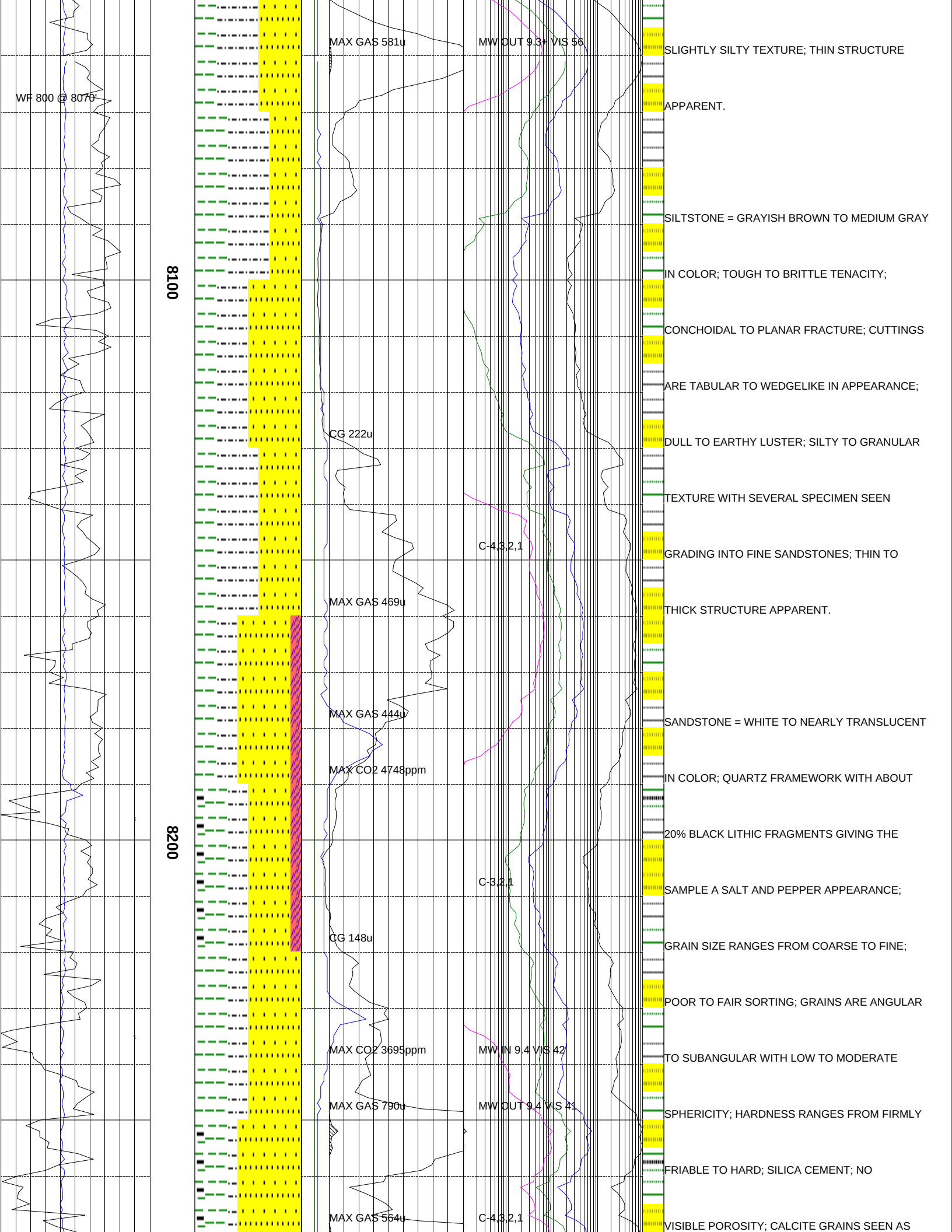
<50 Avg WOB 0>
7000
7100
<0 Ttl Gas 500>
<325 CO2 10K>
<0 Flare Hit. 100>
<10 Meth C-1 100K>
<10 Eth C-2 100K>
<10 Prop C-3 100K>
<10 Butn C-4 100K>
<10 Pent C-5 100K>
CHANGING SCREENS
C-3,2,1
CG 143u
MW IN 9.4 VIS 51
MW OUT 9.4 VIS 56
C-3,2,1
C-2,1
APPROXIMATELY 75% QUARTZ AND 25% BLACK
LITHIC CLASTS; COARSE TO MEDIUM SIZED
GRAINS WITH POOR SORTING; SUBANGULAR
WITH LOW SPHERICITY; EASILY FIRABLE TO
MODERATE HARDNESS; STRONG REACTION WITH
HCLSUGGESTS CALCITE CEMENT; MATRIX
SUPPORTED.
SILTSTONE = MEDIUM DARK GRAY TO BROWNISH
GRAY; BRITTLE TO CRUNCHY TENACITY;
FRACTURES FROM IRREGULAR TO BLOCKY;
TABULAR CUTTINGS; EARTHY TO DULL LUSTER;
SILTY TO GRITTY TEXTURE; THIN STRUCTURE.
SHALE = LIGHT TO MEDIUM DARK GRAY WITH
SOME DARK GRAY TO BLACK AREAS; BRITTLE
TO CRUNCHY TENACITY; FRACTURES FROM
PLANAR TO SLIGHTLY CONCHOIDAL; PLATY TO
SCALY CUTTINGS; DULL LUSTER; SMOOTH TO
SILTY TEXTURE; THIN STRUCTURE.
SANDSTONE = GRAY TO MEDIUM DARK GRAY;

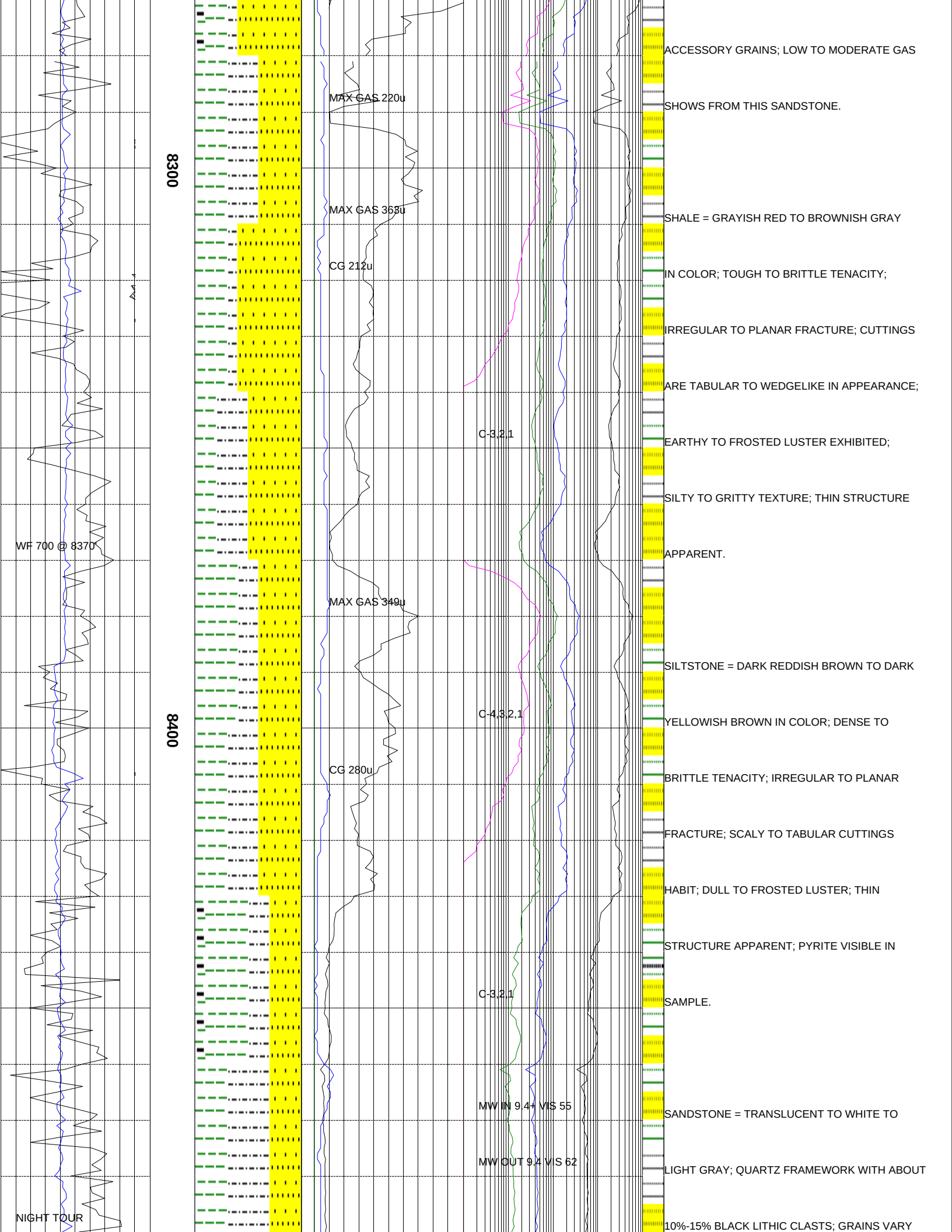

9/21/2009
WOB 25
RPM 70
PP 2900
GPM 540
7200
7300
MAX CO2 2431ppm
CG 135u
MAX CO2 2010ppm
CG 203u
MAX GAS 161u
C-3,2,1
C-2,1
C-2,1
MW IN 9.4 VIS 48
MW OUT 9.4 VIS 52
C-2,1
FRAMEWORK CONSISTS OF APPROXIMATELY
80% SANDSTONE AND 20% DARK LITHIC CLASTS
MEDIUM TO FINE SIZED GRAINS WITH POOR TO
FAIR SORTING; SUBANGULAR WITH MODERATE
TO LOW SPHERICITY; FIRMLY FRIABLE; GRAIN
SUPPORTED; MODERATE REACTION WITH HCL
SUGGESTS CALCITE CEMENT.
SILTSTONE = BROWNISH GRAY TO MODERATE
DARK GRAY COLORING; DENSE TO BRITTLE
TENACITY; IRREGULAR TO BLOCKY FRACTURING
MASSIVE TO TABULAR CUTTINGS; EARTHY
LUSTER; GRITTY TO SILTY TEXTURE; THICK
TO MASSIVE STRUCTURE.
SHALE = LIGHT GRAY WITH YELLOWISH GREEN
AND REDDISH BROWN HUES; BRITTLE TENACITY
PLANAR FRACTURING; PLATY TO TABULAR
CUTTINGS; DULL TO SLIGHTLY WAXY LUSTER;
SMOOTH TEXTURE; THIN STRUCTURE.
SANDSTONE = GRAY TO MEDIUM DARK GRAY TO

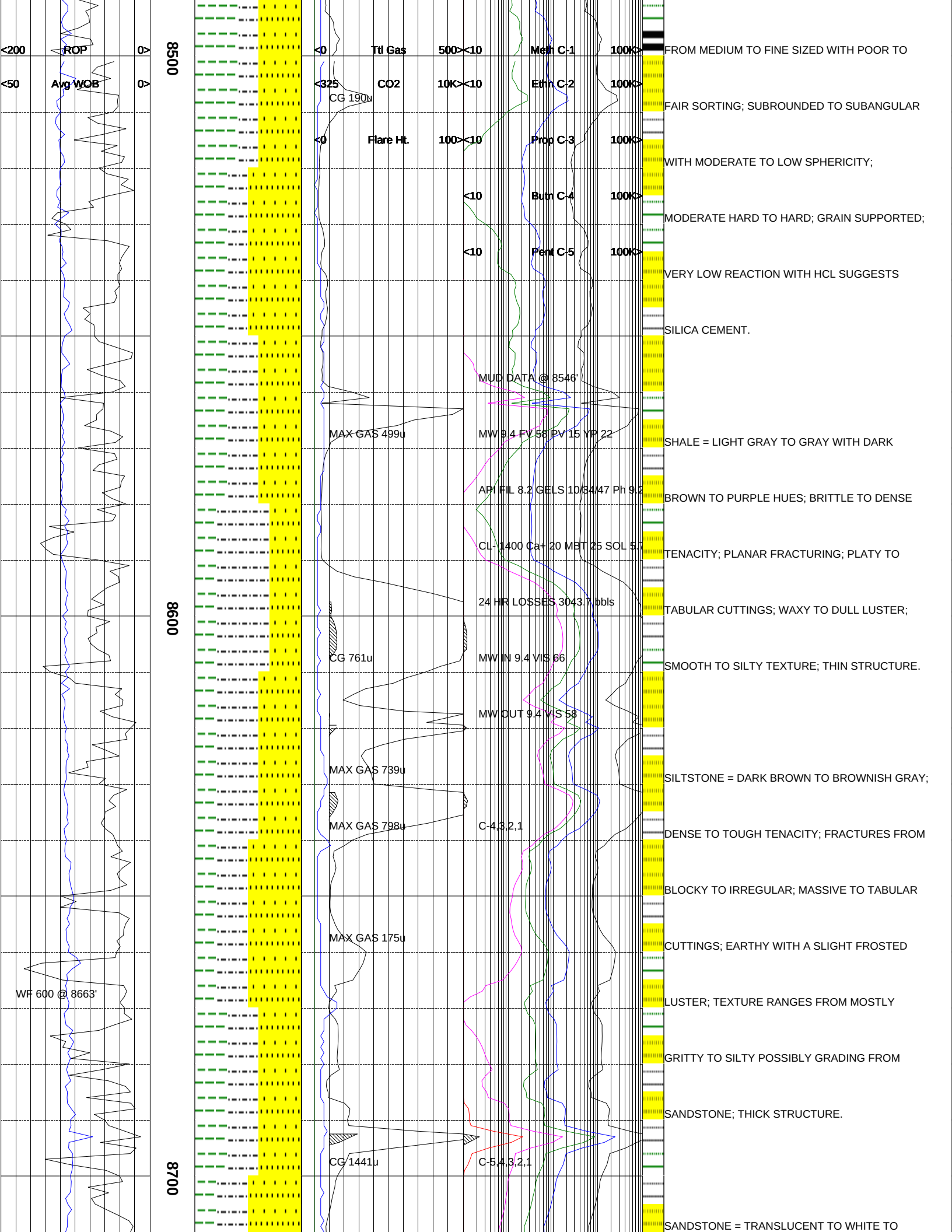

7400
7500
7600
<200 ROP 0>
<50 Avg WOB 0>
<0 Ttl Gas 500><10 Meth C-1 100K>
<325 CO2 10K><10 Ethn C-2 100K>
<0 Flare Ht. 100><10 Prop C-3 100K>
<10 Butn C-4 100K>
<10 Pent C-5 100K>
C-4,3,2,1
MAX GAS 1571u
MAC CO2 2642ppm
CG 623u
C-3,2,1
MAX CO2 3905ppm
MW IN 9.4 VIS 50
MW OUT 9.4 VIS 53
CG 147u
OCCASIONALLY LIGHT GRAY; FRAMEWORK
CONSISTS OF APPROXIMATELY 85% QUARTZ AND
15% BLACK LITHIC CLASTS; GRAIN SIZE
VARIES FROM MEDIUM TO FINE WITH POOR TO
FAIR SORTING WITH THE LIGHTER COLORED
SAMPLE TENDING TO BE MORE FINELY SIZED;
SUBANGULAR WITH LOW SPHERICITY; FRIABLE
TO MODERATE HARDNESS WITH FINER GRAINS
TENDING TO BE MORE FRIABLE; MODERATE TO
STRONG REACTION WITH HCL SUGGESTS
CALCITE CEMENT.
SHALE = LIGHT GRAY TO GRAY WITH PURPLE
HUES; BRITTLE TENACITY; SPLINTERY TO
PLANAR FRACTURING; PLATY CUTTINGS; DULL
TO WAXY LUSTER; TEXTURE IS SMOOTH TO
SILTY; THINK STRUCTURE.
SILTSTONE = BROWNISH GRAY TO MEDIUM DARK
GRAY; BRITTLE TO CRUMBLY TENACITY;
FRACTURES FROMIRREGULAR TO BLOCKY;
TABULAR TO WEDGELIKE CUTTINGS; EARTHY
OHIO CREEK @ 7611'


MAX GAS 795u
C-4,3,2,1
CG 147u
MW IN 9.4 VIS 47
MW OUT 9.4 VIS 54
C-2,1
DAY TOUR
WOB 29
RPM 70
PP 2626
GPM 540
7700
CG 60u
7800
MAX GAS 422u
C-4,3,2,1
LUSTER; SILTY TO GRITTY TEXTURE.
SANDSTONE = YELLOWISH GRAY TO WHITE IN
COLOR; QUARTZ FRAMEWORK WITH ABOUT 10%
BLACK LITHIC CLASTS; VERY COARSE TO FINE
GRAIN SIZE; POOR TO FAIR SORTING; GRAINS
ARE ANGULAR TO SUBROUNDED WITH LOW TO
MODERATE SPHERICITY; HARDNESS RANGES
FROM EASILY TO FIRMLY FRIABLE; CALCITE
CEMENT; GRAIN SUPPORTED; NO DISCERNIBLE
BEDDING; NO VISIBLE POROSITY; LOW GAS
SHOWS FROM THIS SAND.
SHALE = LIGHT BLUISH GRAY TO MEDIUM
LIGHT GRAY IN COLOR; BRITTLE TO CRUNCHY
IN TENACITY; SAMPLE SHOWS BLOCKY TO
CONCHOIDAL FRACTURE; CUTTINGS ARE PLATY
TO SCALY IN APPEARANCE; WAXY TO DULL
LUSTER EXHIBITED; SMOOTH TO CLAYEY
TEXTURE; THIN STRUCTURE APPARENT.
SILTSTONE = GRAYISH RED TO MEDIUM


MW IN 9.5+ VIS 54
CG 75u
MW OUT 9.5 VIS 59
C-3,2,1
WF 850 @ 7889'
MAX GAS 244u
7900
CH 89u
C-2,1
8000
<200 ROP 0>
<50 Avg WOB 0>
<0 Ttl Gas 500><10 Meth C-1 100K>
<325 CO2 10K><10 Ethn C-2 100K>
<0 Flare Ht. 100><10 Prop C-3 100K>
<10 Butn C-4 100K>
CG 92u
<10 Pent C-5 100K>
MAX GAS 209u
MW IN 9.3 VIS 49
BLUISH GRAY IN COLOR; SAMPLE SHOWS
BRITTLE TO NEARLY PULVERANT TENACITY;
IRREGULAR TO CONCHOIDAL FRACTURE;
CUTTINGS ARE WEDGELIKE TO NODULAR IN
APPEARANCE; SILTY TO GRITTY TEXTURE;
THIN TO THICK STRUCTURE APPARENT.
SANDSTONE = WHITE TO NEARLY TRANSLUCENT
IN COLOR; QUARTZ FRAMEWORK; COARSE TO
FINE GRAIN SIZE; GRAINS ARE SUBROUNDED
TO ANGULAR WITH MODERATE SPHERICITY;
HARDNESS RANGES FROM FRIABLE TO
MODERATELY HARD; CALCITE CEMENT; NO
ALTERATION VISINLE IN MATRIX; POINT
CONTACT FABRIC WITH NO VISIBLE POROSITY;
NO GAS SHOWS FROM THIS SANDSTONE.
SHALE = VERY PALE GREEN TO LIGHT GRAY IN
COLOR; BRITTLE TO CRUMBLY TENACITY;
PLANAR TO CONCHOIDAL FRACTURE;CUTTINGS
ARE FLAKY TO ELONGATED IN APPEARANCE;
WAXY TO DULL LUSTER EXHIBITED; CLAYEY TO


WF 800 @ 8070'
8100
8200
MAX GAS 581u
MW OUT 9.3+ VIS 56
CG 222u
C-4,3,2,1
MAX GAS 469u
MAX GAS 444u
MAX CO2 4748ppm
C-3,2,1
CG 148u
MAX CO2 3695ppm
MW IN 9.4 VIS 42
MAX GAS 790u
MW OUT 9.4 VIS 41
MAX GAS 564u
C-4,3,2,1
SLIGHTLY SILTY TEXTURE; THIN STRUCTURE
APPARENT.
SILTSTONE = GRAYISH BROWN TO MEDIUM GRAY
IN COLOR; TOUGH TO BRITTLE TENACITY;
CONCHOIDAL TO PLANAR FRACTURE; CUTTINGS
ARE TABULAR TO WEDGELIKE IN APPEARANCE;
DULL TO EARTHY LUSTER; SILTY TO GRANULAR
TEXTURE WITH SEVERAL SPECIMEN SEEN
GRADING INTO FINE SANDSTONES; THIN TO
THICK STRUCTURE APPARENT.
SANDSTONE = WHITE TO NEARLY TRANSLUCENT
IN COLOR; QUARTZ FRAMEWORK WITH ABOUT
20% BLACK LITHIC FRAGMENTS GIVING THE
SAMPLE A SALT AND PEPPER APPEARANCE;
GRAIN SIZE RANGES FROM COARSE TO FINE;
POOR TO FAIR SORTING; GRAINS ARE ANGULAR
TO SUBANGULAR WITH LOW TO MODERATE
SPHERICITY; HARDNESS RANGES FROM FIRMLY
FRIABLE TO HARD; SILICA CEMENT; NO
VISIBLE POROSITY; CALCITE GRAINS SEEN AS


8300
8400
MAX GAS 220u
MAX GAS 363u
CG 212u
C-3,2,1
MAX GAS 349u
CG 280u
C-4,3,2,1
C-3,2,1
MW IN 9.4+ VIS 55
MW OUT 9.4 VIS 62
WF 700 @ 8370
NIGHT TOUR
ACCESSORY GRAINS; LOW TO MODERATE GAS
SHOWS FROM THIS SANDSTONE.
SHALE = GRAYISH RED TO BROWNISH GRAY
IN COLOR; TOUGH TO BRITTLE TENACITY;
IRREGULAR TO PLANAR FRACTURE; CUTTINGS
ARE TABULAR TO WEDGELIKE IN APPEARANCE;
EARTHY TO FROSTED LUSTER EXHIBITED;
SILTY TO GRITTY TEXTURE; THIN STRUCTURE
APPARENT.
SILTSTONE = DARK REDDISH BROWN TO DARK
YELLOWISH BROWN IN COLOR; DENSE TO
BRITTLE TENACITY; IRREGULAR TO PLANAR
FRACTURE; SCALY TO TABULAR CUTTINGS
HABIT; DULL TO FROSTED LUSTER; THIN
STRUCTURE APPARENT; PYRITE VISIBLE IN
SAMPLE.
SANDSTONE = TRANSLUCENT TO WHITE TO
LIGHT GRAY; QUARTZ FRAMEWORK WITH ABOUT
10%-15% BLACK LITHIC CLASTS; GRAINS VARY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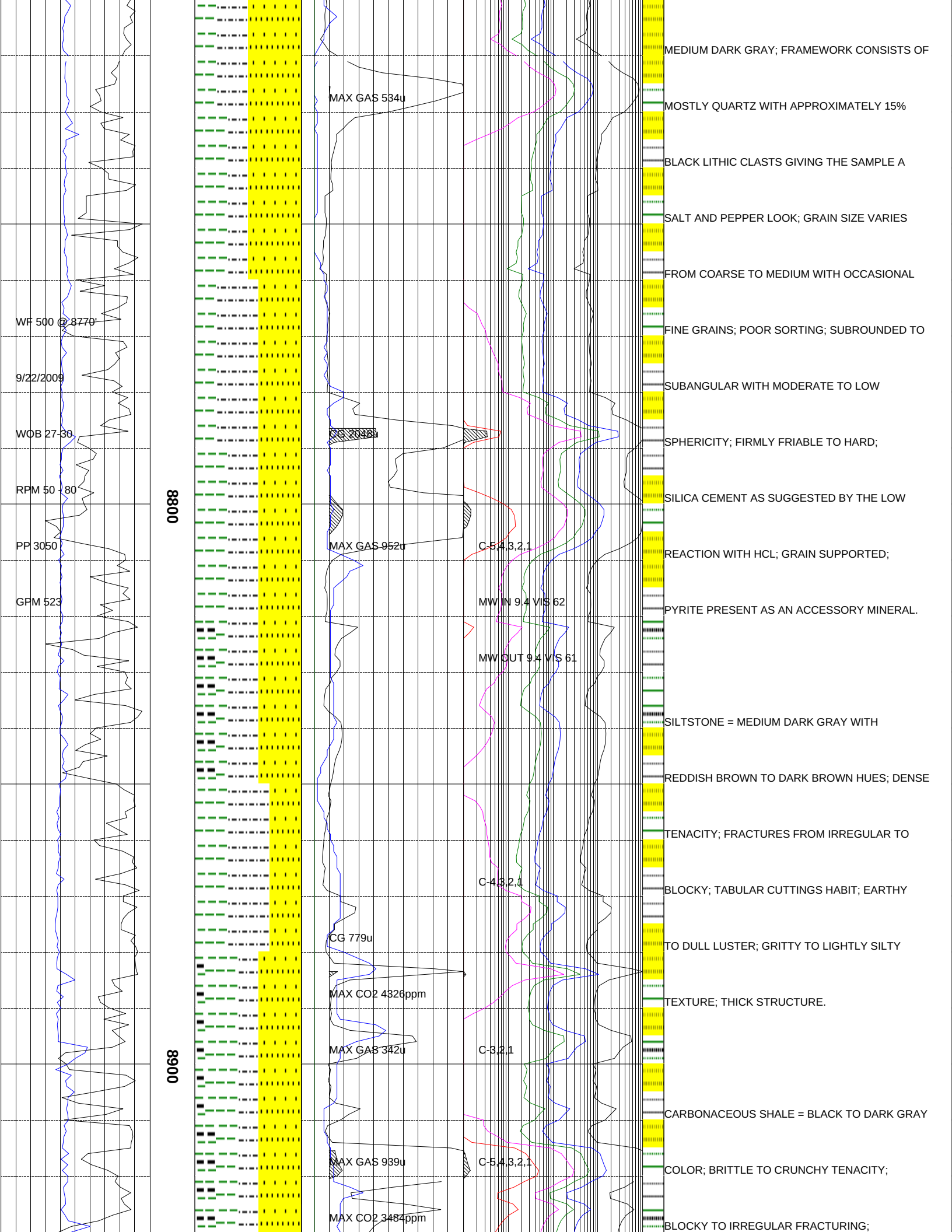
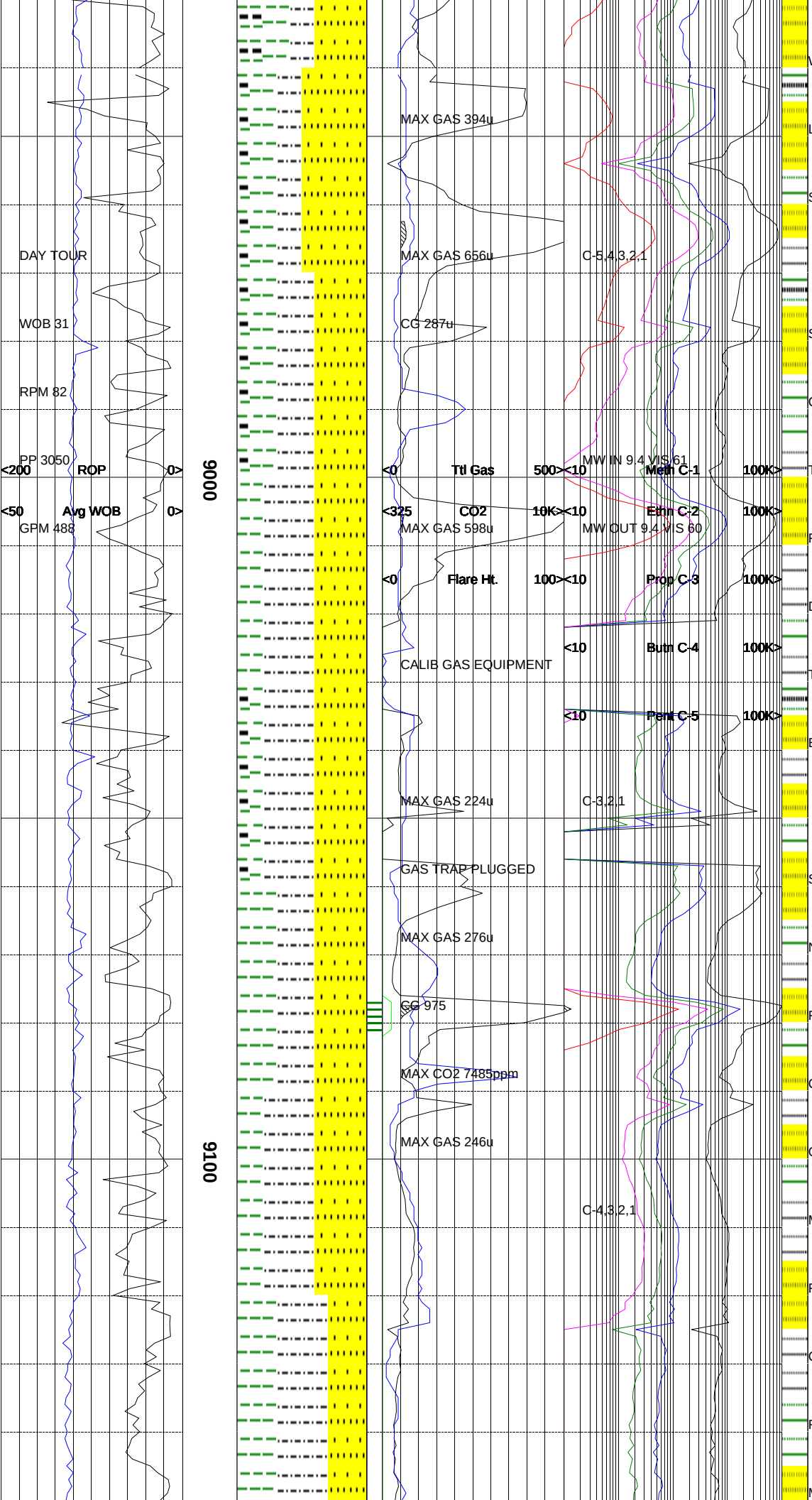
<50 Avg WOB 0>
8500
<0 Ttl Gas 500>
<325 CO2 10K>
CG 190u
<0 Flare Hit. 100>
<10 Meth C-1 100K>
<10 Eth C-2 100K>
<10 Prop C-3 100K>
<10 Butn C-4 100K>
<10 Pent C-5 100K>
MUD DATA @ 8546'
MAX GAS 499u
MW 9.4 FV 58 PV 15 YP 22
API FIL 8.2 GELS 10/34/47 Ph 9.2
CL- 1400 Ca+ 20 MBT 25 SOL 5.7
24 HR LOSSES 3043.7 bbls
8600
CG 761u
MW IN 9.4 VIS 66
MW OUT 9.4 VIS 58
MAX GAS 739u
MAX GAS 798u
C-4,3,2,1
MAX GAS 175u
WF 600 @ 8663'
8700
CG 1441u
C-5,4,3,2,1
FROM MEDIUM TO FINE SIZED WITH POOR TO
FAIR SORTING; SUBROUNDED TO SUBANGULAR
WITH MODERATE TO LOW SPHERICITY;
MODERATE HARD TO HARD; GRAIN SUPPORTED;
VERY LOW REACTION WITH HCL SUGGESTS
SILICA CEMENT.
SHALE = LIGHT GRAY TO GRAY WITH DARK
BROWN TO PURPLE HUES; BRITTLE TO DENSE
TENACITY; PLANAR FRACTURING; PLATY TO
TABULAR CUTTINGS; WAXY TO DULL LUSTER;
SMOOTH TO SILTY TEXTURE; THIN STRUCTURE.
SILTSTONE = DARK BROWN TO BROWNISH GRAY;
DENSE TO TOUGH TENACITY; FRACTURES FROM
BLOCKY TO IRREGULAR; MASSIVE TO TABULAR
CUTTINGS; EARTHY WITH A SLIGHT FROSTED
LUSTER; TEXTURE RANGES FROM MOSTLY
GRITTY TO SILTY POSSIBLY GRADING FROM
SANDSTONE; THICK STRUCTURE.
SANDSTONE = TRANSLUCENT TO WHITE TO

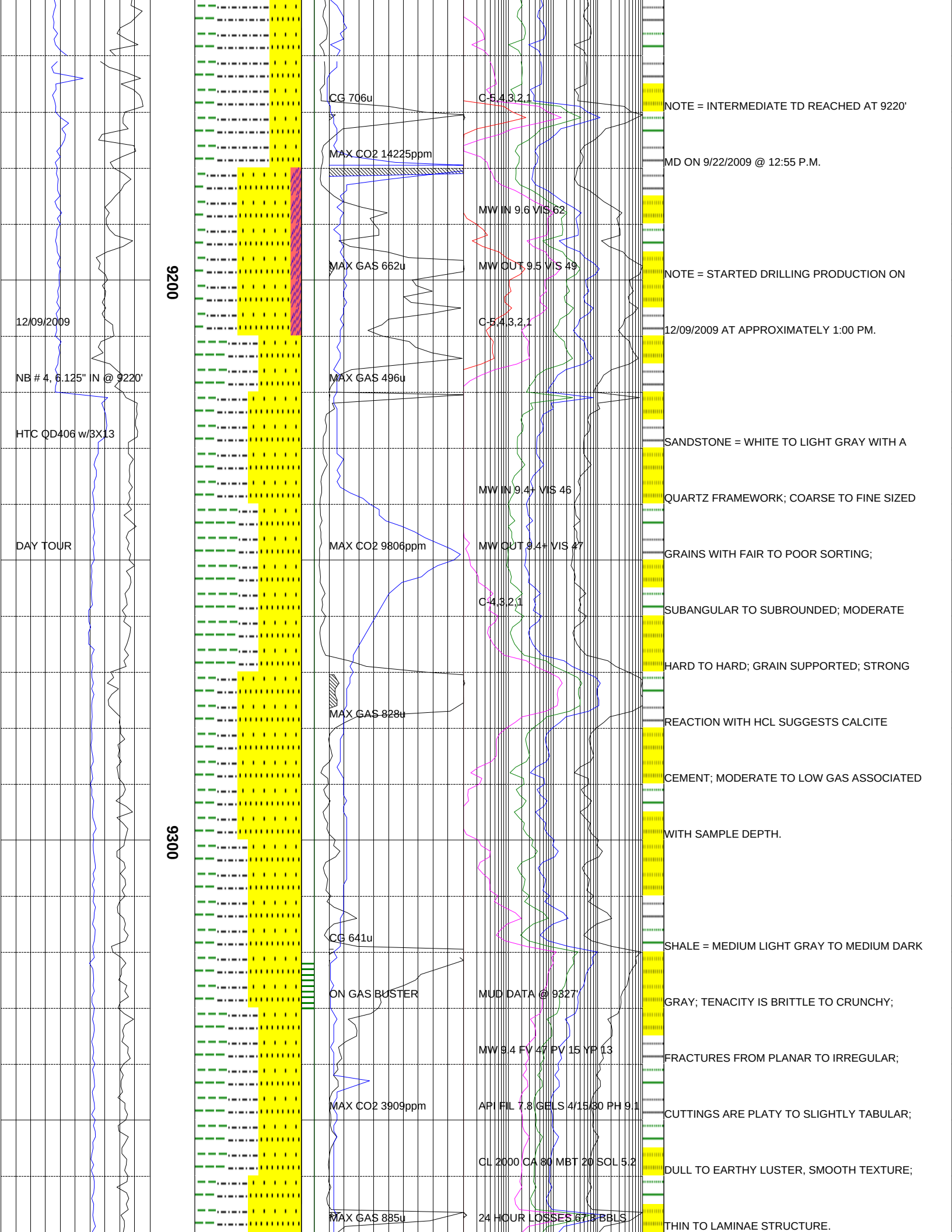

MEDIUM DARK GRAY; FRAMEWORK CONSISTS OF
MAX GAS 534u
MOSTLY QUARTZ WITH APPROXIMATELY 15%
BLACK LITHIC CLASTS GIVING THE SAMPLE A
SALT AND PEPPER LOOK; GRAIN SIZE VARIES
FROM COARSE TO MEDIUM WITH OCCASIONAL
WF 500 @ 8770'
FINE GRAINS; POOR SORTING; SUBROUNDED TO
9/22/2009
SUBANGULAR WITH MODERATE TO LOW
WOB 27-30
CG 2048u
SPHERICITY; FIRMLY FRIABLE TO HARD;
RPM 50 - 80
8800
SILICA CEMENT AS SUGGESTED BY THE LOW
PP 3050
MAX GAS 952u
C-5,4,3,2,1
REACTION WITH HCL; GRAIN SUPPORTED;
GPM 523
MW IN 9.4 VIS 62
PYRITE PRESENT AS AN ACCESSORY MINERAL.
MW OUT 9.4 VIS 61
SILTSTONE = MEDIUM DARK GRAY WITH
REDDISH BROWN TO DARK BROWN HUES; DENSE
TENACITY; FRACTURES FROM IRREGULAR TO
C-4,3,2,1
BLOCKY; TABULAR CUTTINGS HABIT; EARTHY
CG 779u
TO DULL LUSTER; GRITTY TO LIGHTLY SILTY
MAX CO2 4326ppm
TEXTURE; THICK STRUCTURE.
MAX GAS 342u
C-3,2,1
8900
CARBONACEOUS SHALE = BLACK TO DARK GRAY
MAX GAS 939u
C-5,4,3,2,1
COLOR; BRITTLE TO CRUNCHY TENACITY;
MAX CO2 3484ppm
BLOCKY TO IRREGULAR FRACTURING;

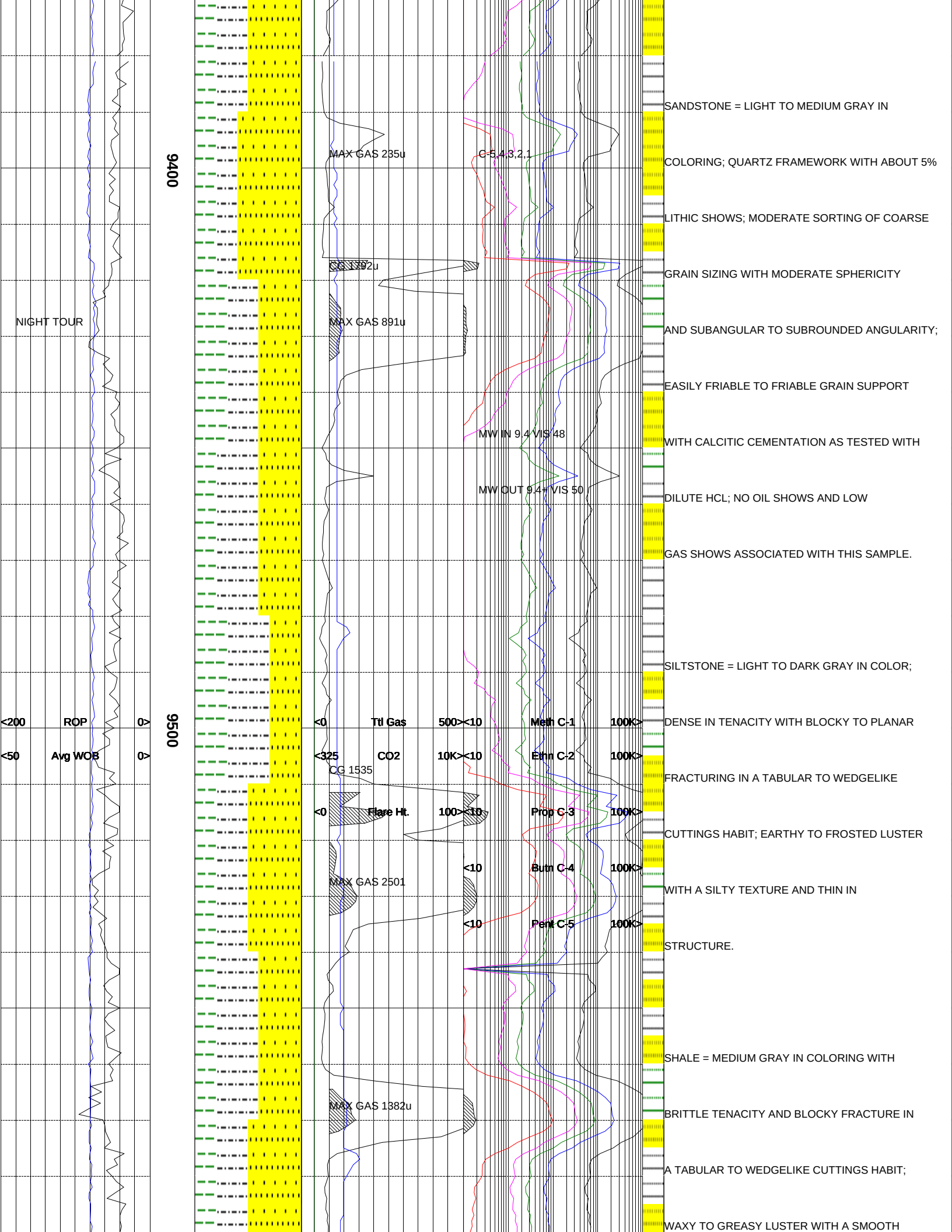


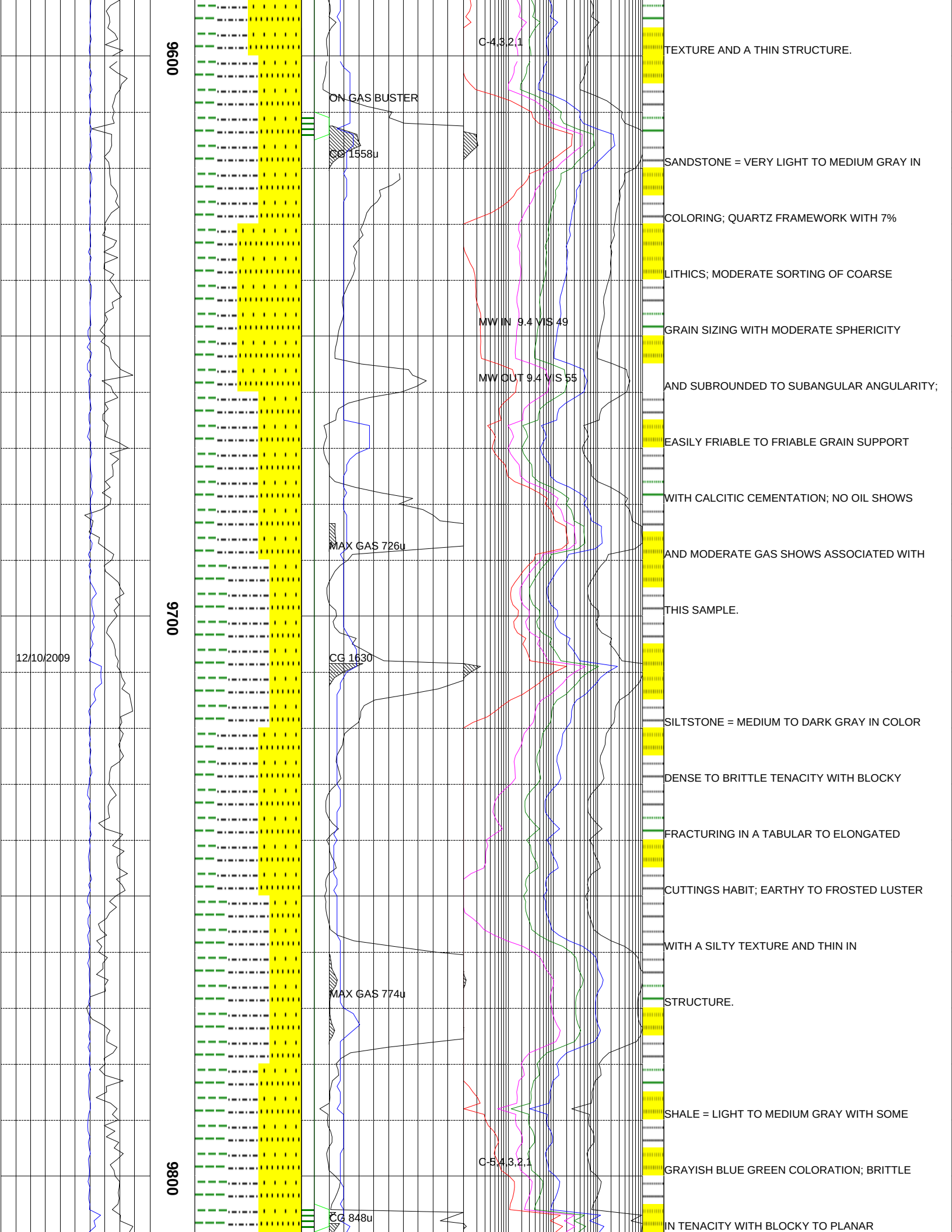
WEDGELIKE CUTTINGS; RESINOUS TO GREASY LUSTER; SMOOTH TEXTURE; THIN TO THICK STRUCTURE.

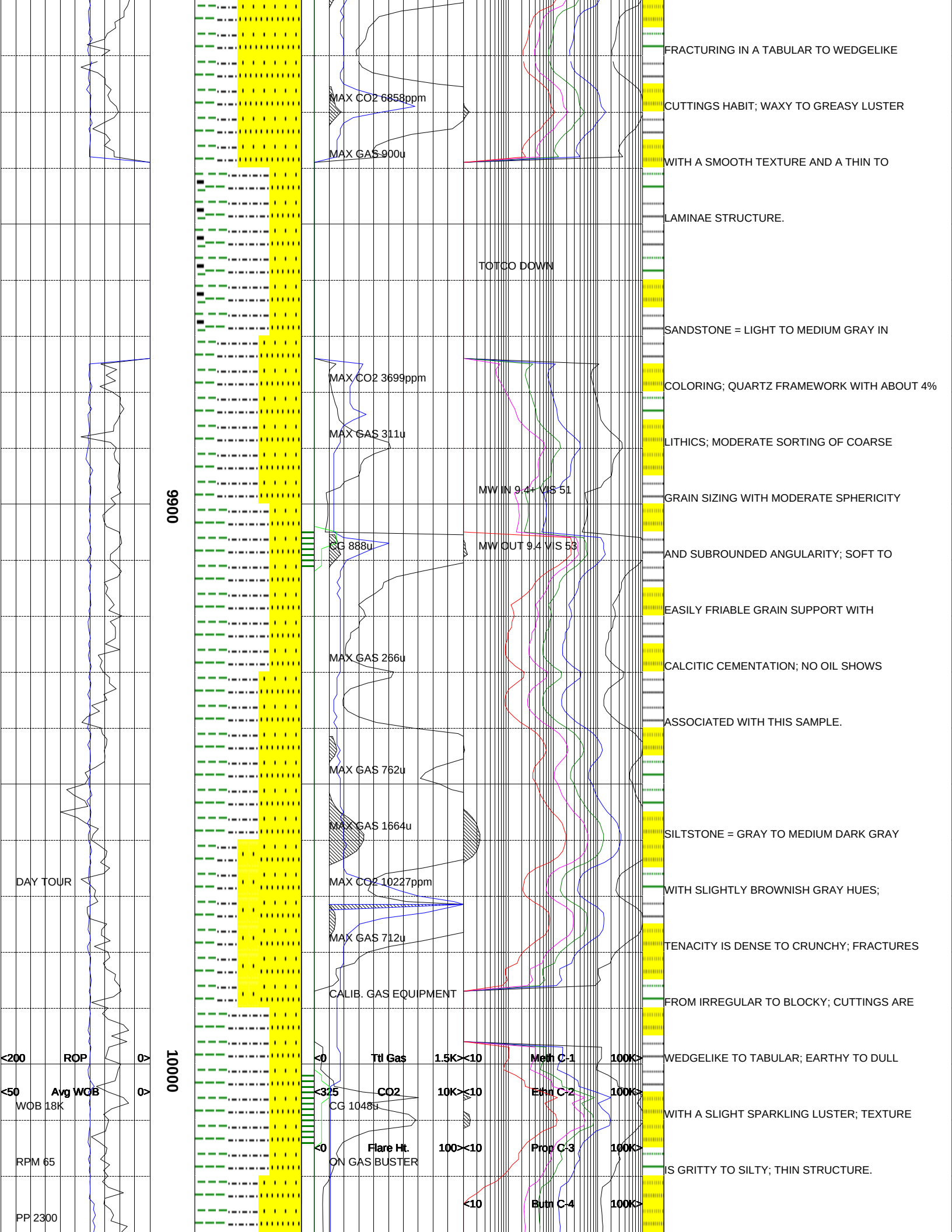
SHALE = LIGHT GRAY TO MEDIUM GRAY IN COLOR; SENSE TO CRUMBLY TENACITY; PLANAR TO BLOCKY FRACTURE; CUTTINGS RANGE FROM FLAKY TO BLADED IN APPEARANCE; WAXY TO DULL LUSTER EXHIBITED; CLAYEY TO SILTY TEXTURE; LAMINAE STRUCTURE THINLY BEDDED BETWEEN SILTSTONES APPARENT.

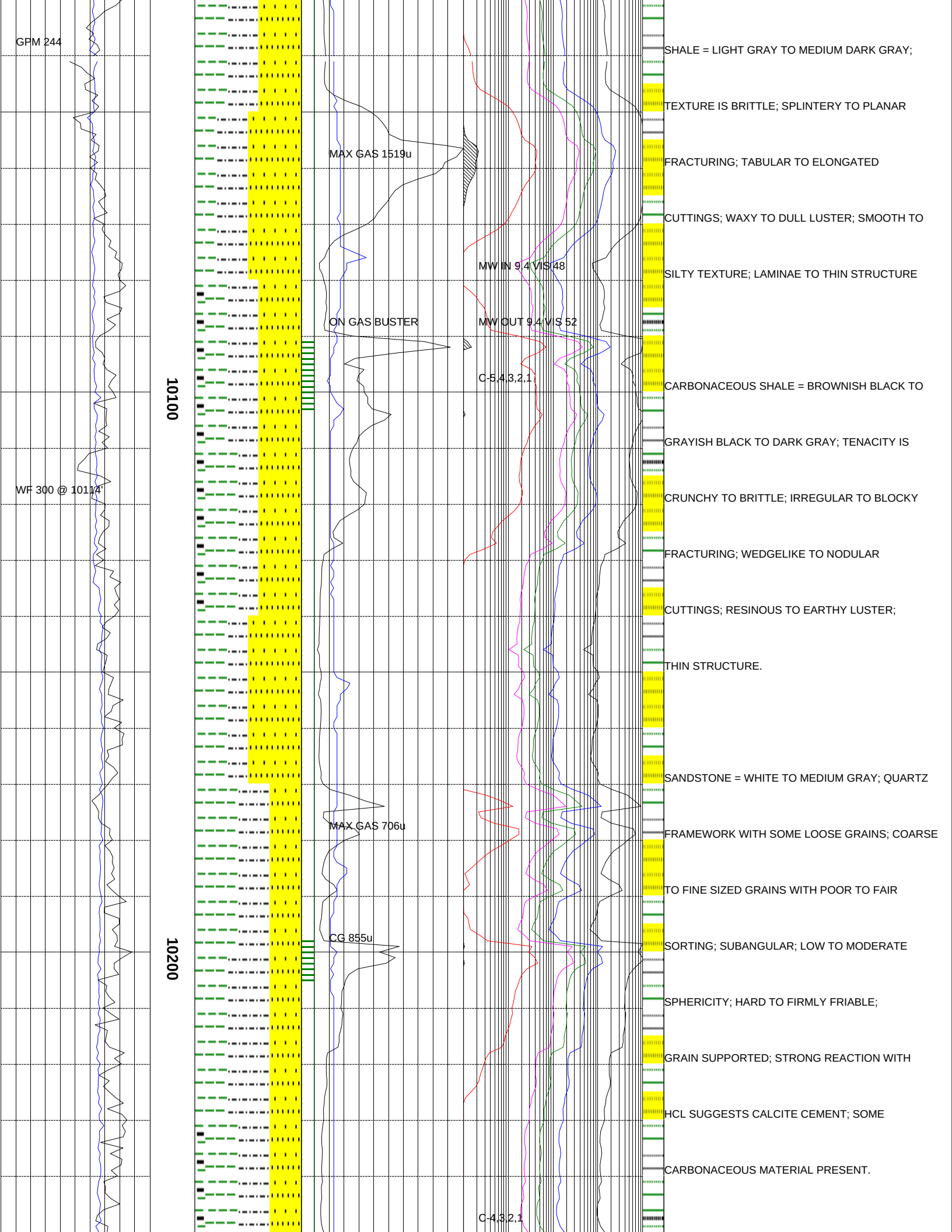
SANDSTONE = PINKISH GRAY TO WHITE TO NEARLY TRANSLUCENT IN COLOR; QUARTZ FRAMEWORK WITH SOME FELDSPAR GRAINS; COARSE TO FINE GRAIN SIZE; FAIR SORTING; GRAINS ARE ROUNDED TO SUBANGULAR WITH MODERATE TO HIGH SPHERICITY; SAMPLE IS FIRMLY FRIABLE TO MODERATELY HARD; CALCITE CEMENT SUGGESTED BY HIGH REACTION WITH HCL; NO VISIBLE POROSITY; MODERATE GAS SHOWS FROM THIS SANDSTONE.

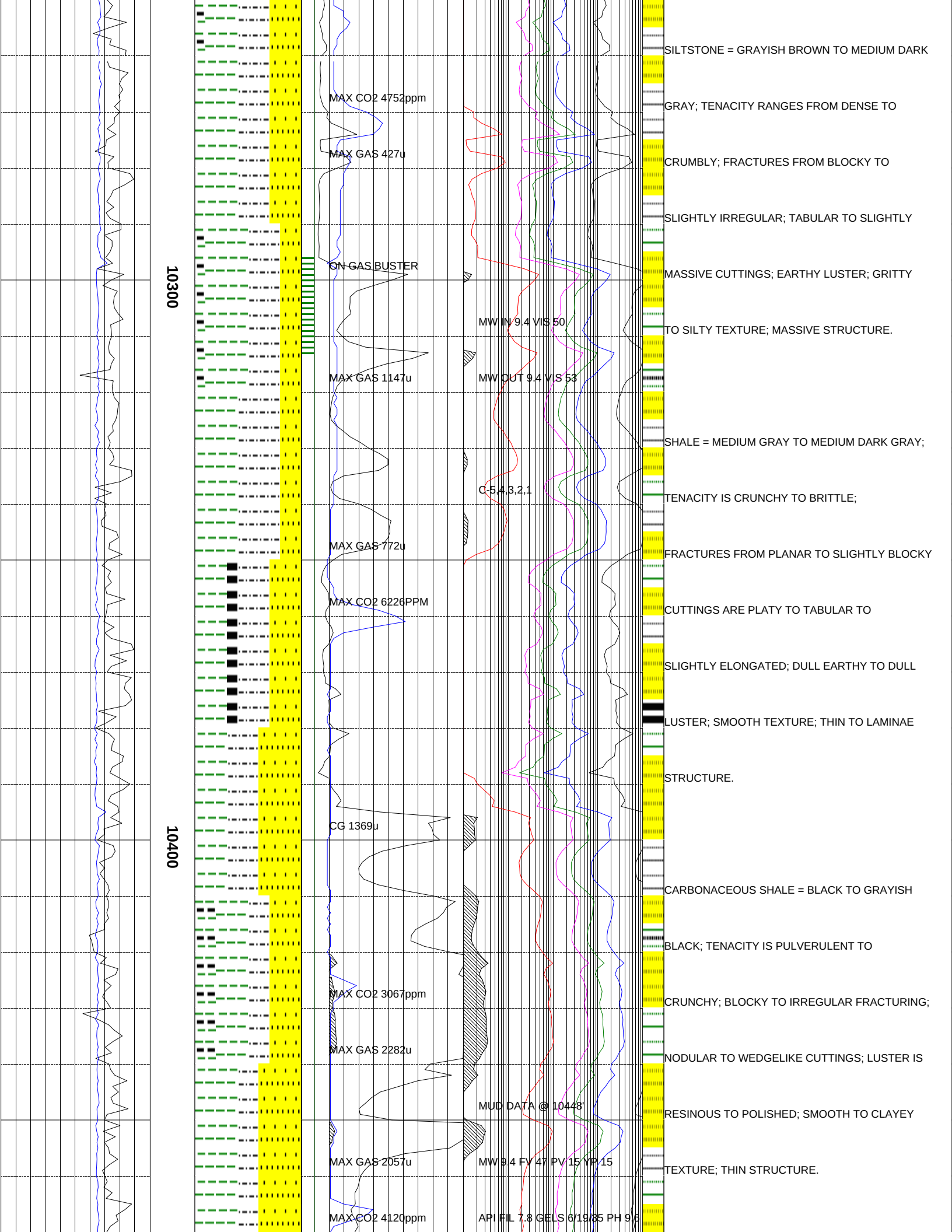

9200
9300
CG 706u
C-5,4,3,2,1
MAX CO2 14225ppm
MW IN 9.6 VIS 62
MAX GAS 662u
MW OUT 9.5 VIS 49
12/09/2009
C-5,4,3,2,1
NB # 4, 6.125" IN @ 9220'
MAX GAS 496u
HTC QD406 w/3X13
MW IN 9.4+ VIS 46
DAY TOUR
MAX CO2 9806ppm
MW OUT 9.4+ VIS 47
C-4,3,2,1
MAX GAS 828u
CG 641u
ON GAS BUSTER
MUD DATA @ 9327'
MW 9.4 FV 47 PV 15 YP 13
MAX CO2 3909ppm
API FIL 7.8 GELS 4/15/30 PH 9.1
CL 2000 CA 80 MBT 20 SOL 5.2
MAX GAS 885u
24 HOUR LOSSES 67.3 BBLS
NOTE = INTERMEDIATE TD REACHED AT 9220'
MD ON 9/22/2009 @ 12:55 P.M.
NOTE = STARTED DRILLING PRODUCTION ON
12/09/2009 AT APPROXIMATELY 1:00 PM.
SANDSTONE = WHITE TO LIGHT GRAY WITH A
QUARTZ FRAMEWORK; COARSE TO FINE SIZED
GRAINS WITH FAIR TO POOR SORTING;
SUBANGULAR TO SUBROUNDED; MODERATE
HARD TO HARD; GRAIN SUPPORTED; STRONG
REACTION WITH HCL SUGGESTS CALCITE
CEMENT; MODERATE TO LOW GAS ASSOCIATED
WITH SAMPLE DEPTH.
SHALE = MEDIUM LIGHT GRAY TO MEDIUM DARK
GRAY; TENACITY IS BRITTLE TO CRUNCHY;
FRACTURES FROM PLANAR TO IRREGULAR;
CUTTINGS ARE PLATY TO SLIGHTLY TABULAR;
DULL TO EARTHY LUSTER, SMOOTH TEXTURE;
THIN TO LAMINAE STRUCTURE.

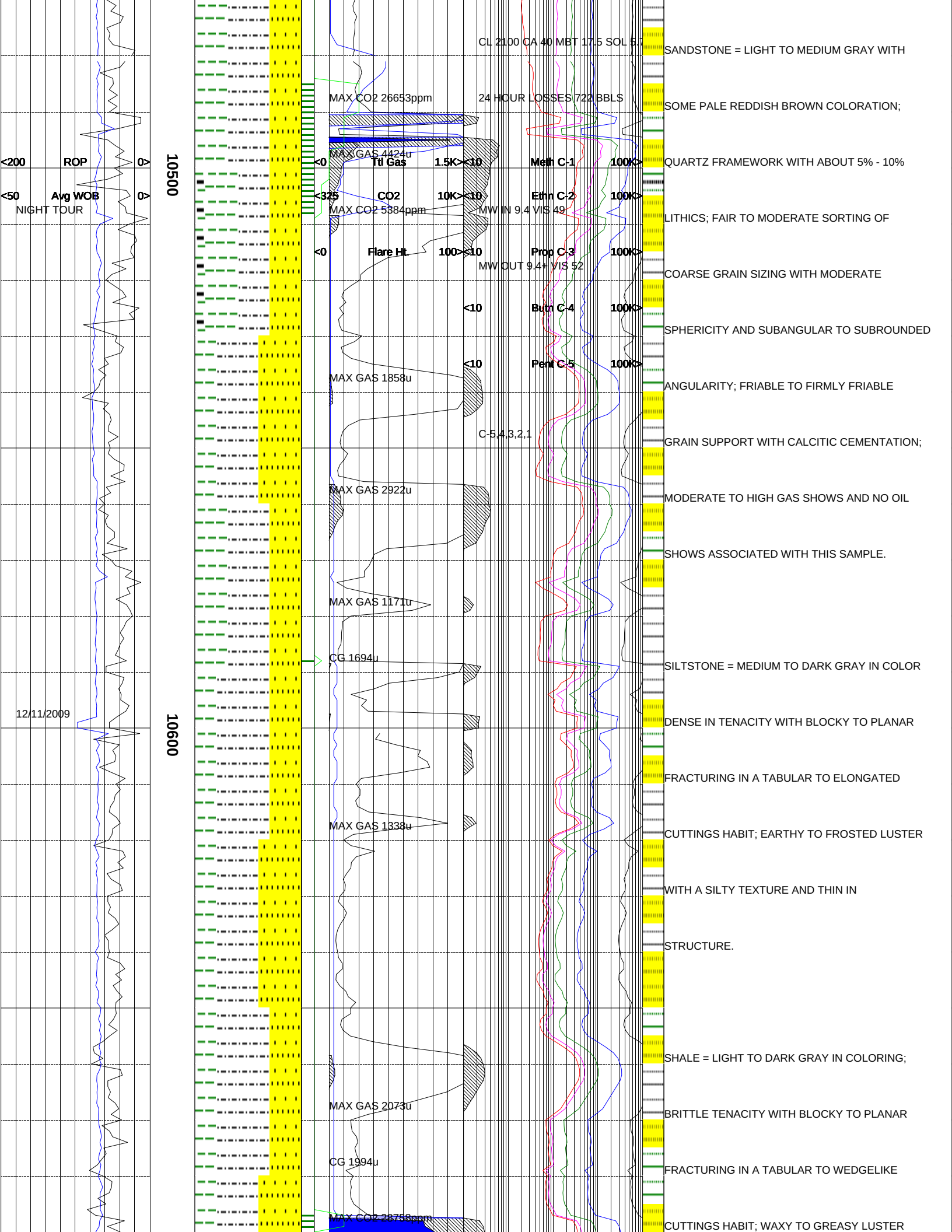

9400
9500
NIGHT TOUR
MAX GAS 235u
C-5,4,3,2,1
CG 1192u
MAX GAS 891u
MW IN 9.4 VIS 48
MW OUT 9.4+ VIS 50
<200 ROP 0>
<50 Avg WOB 0>
<0 Ttl Gas 500>
<325 CO2 10K>
CG 1535
<0 Flare Ht. 100>
MAX GAS 2501
MAX GAS 1382u
<10 Meth C-1 100K>
<10 Eth C-2 100K>
<10 Prop C-3 100K>
<10 Butn C-4 100K>
<10 Pent C-5 100K>
SANDSTONE = LIGHT TO MEDIUM GRAY IN
COLORING; QUARTZ FRAMEWORK WITH ABOUT 5%
LITHIC SHOWS; MODERATE SORTING OF COARSE
GRAIN SIZING WITH MODERATE SPHERICITY
AND SUBANGULAR TO SUBROUNDED ANGULARITY;
EASILY FRIABLE TO FRIABLE GRAIN SUPPORT
WITH CALCITIC CEMENTATION AS TESTED WITH
DILUTE HCL; NO OIL SHOWS AND LOW
GAS SHOWS ASSOCIATED WITH THIS SAMPLE.
SILTSTONE = LIGHT TO DARK GRAY IN COLOR;
DENSE IN TENACITY WITH BLOCKY TO PLANAR
FRACTURING IN A TABULAR TO WEDGELIKE
CUTTINGS HABIT; EARTHY TO FROSTED LUSTER
WITH A SILTY TEXTURE AND THIN IN
STRUCTURE.
SHALE = MEDIUM GRAY IN COLORING WITH
BRITTLE TENACITY AND BLOCKY FRACTURE IN
A TABULAR TO WEDGELIKE CUTTINGS HABIT;
WAXY TO GREASY LUSTER WITH A SMOOTH

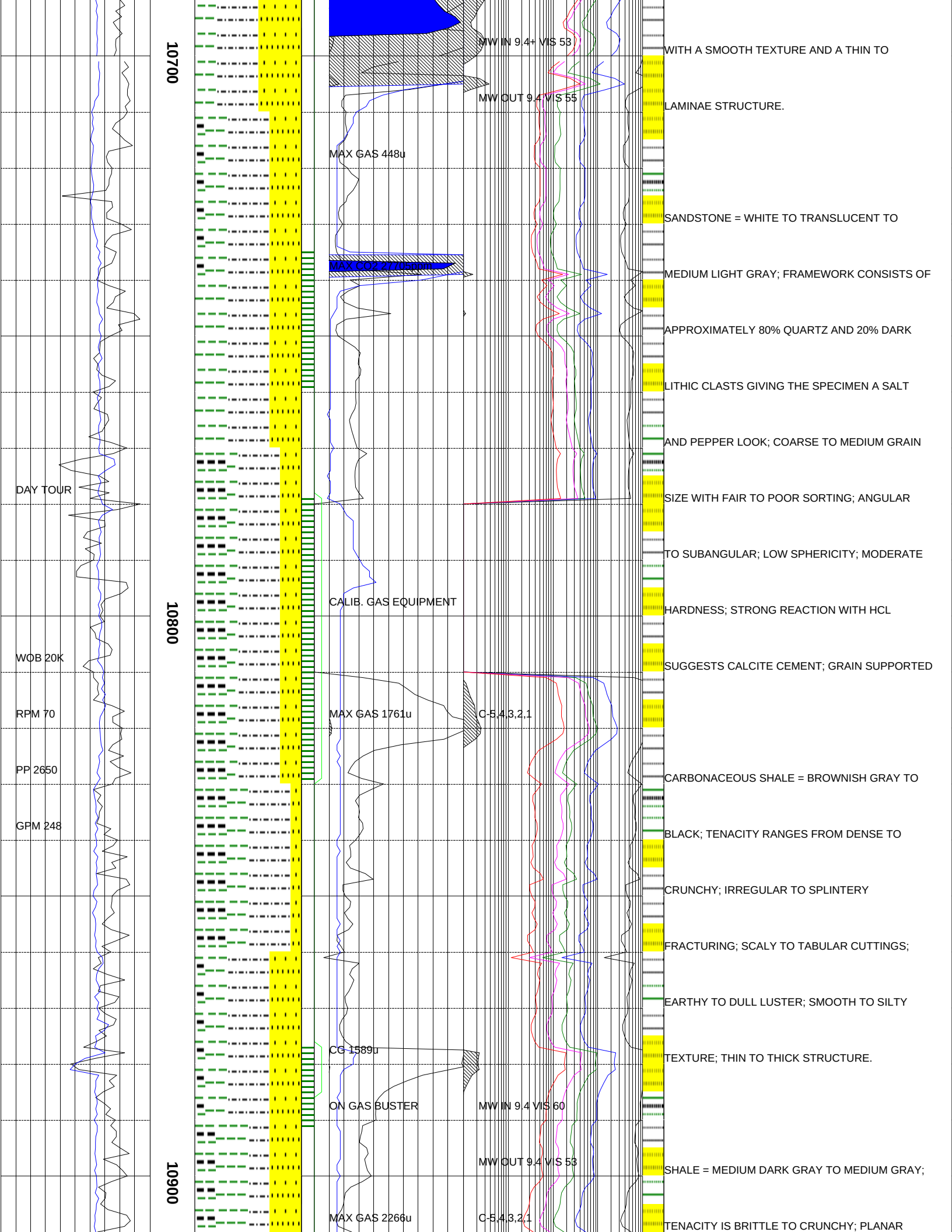

9600
9700
9800
12/10/2009
C-4,3,2,1
ON GAS BUSTER
CG 1558u
MW IN 9.4 VIS 49
MW OUT 9.4 VIS 55
MAX GAS 726u
CG 1630
MAX GAS 774u
C-5,4,3,2,1
CG 848u
TEXTURE AND A THIN STRUCTURE.
SANDSTONE = VERY LIGHT TO MEDIUM GRAY IN
COLORING; QUARTZ FRAMEWORK WITH 7%
LITHICS; MODERATE SORTING OF COARSE
GRAIN SIZING WITH MODERATE SPHERICITY
AND SUBROUNDED TO SUBANGULAR ANGULARITY;
EASILY FRIABLE TO FRIABLE GRAIN SUPPORT
WITH CALCITIC CEMENTATION; NO OIL SHOWS
AND MODERATE GAS SHOWS ASSOCIATED WITH
THIS SAMPLE.
SILTSTONE = MEDIUM TO DARK GRAY IN COLOR
DENSE TO BRITTLE TENACITY WITH BLOCKY
FRACTURING IN A TABULAR TO ELONGATED
CUTTINGS HABIT; EARTHY TO FROSTED LUSTER
WITH A SILTY TEXTURE AND THIN IN
STRUCTURE.
SHALE = LIGHT TO MEDIUM GRAY WITH SOME
GRAYISH BLUE GREEN COLORATION; BRITTLE
IN TENACITY WITH BLOCKY TO PLANAR

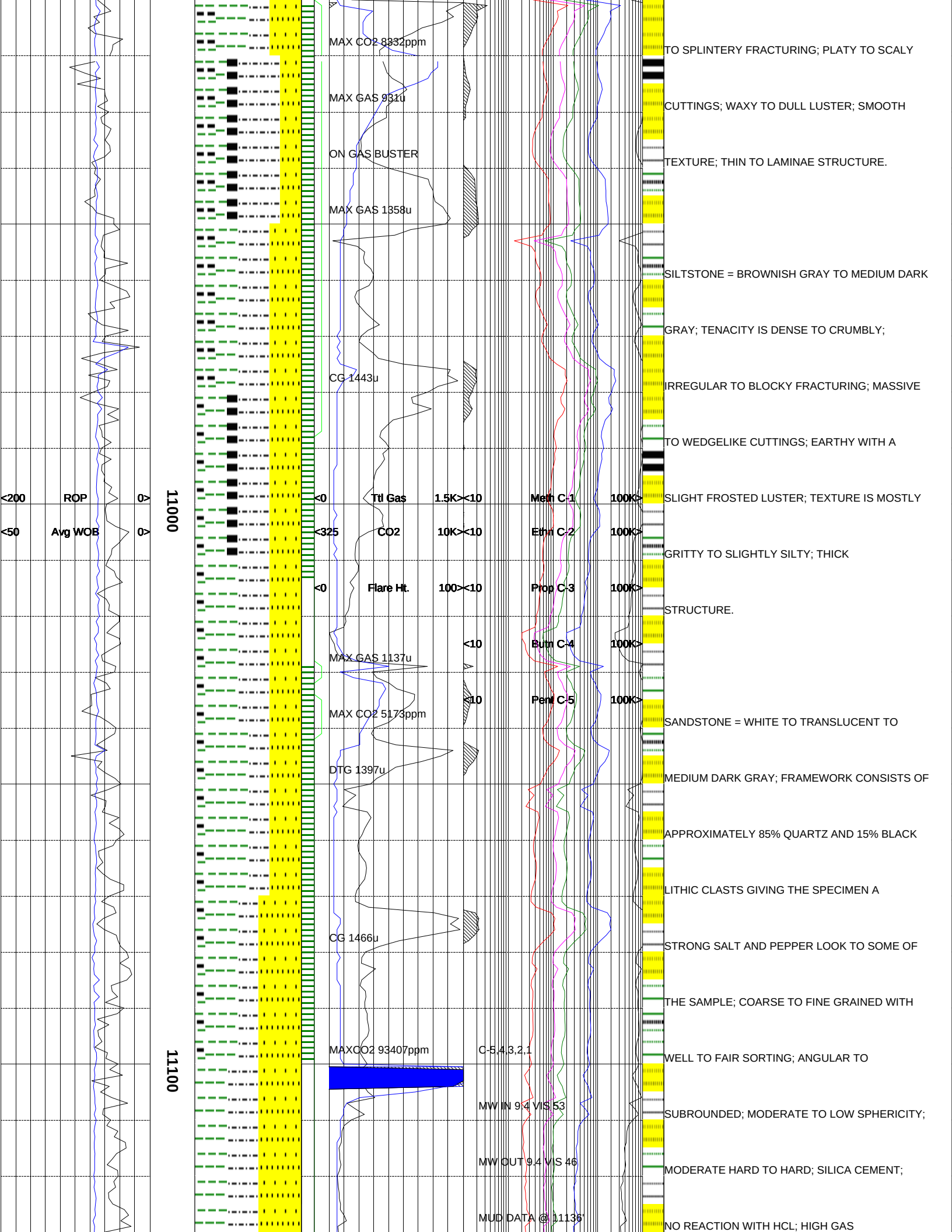

FRACTURING IN A TABULAR TO WEDGELIKE
CUTTINGS HABIT; WAXY TO GREASY LUSTER
WITH A SMOOTH TEXTURE AND A THIN TO
LAMINAE STRUCTURE.
MAX CO2 6858ppm
MAX GAS 900u
TOTCO DOWN
SANDSTONE = LIGHT TO MEDIUM GRAY IN
COLORING; QUARTZ FRAMEWORK WITH ABOUT 4%
LITHICS; MODERATE SORTING OF COARSE
GRAIN SIZING WITH MODERATE SPHERICITY
AND SUBROUNDED ANGULARITY; SOFT TO
EASILY FRIABLE GRAIN SUPPORT WITH
CALCITIC CEMENTATION; NO OIL SHOWS
ASSOCIATED WITH THIS SAMPLE.
MAX CO2 3699ppm
MAX GAS 311u
MW IN 9.4+ VIS 51
CG 888u
MW OUT 9.4 VIS 53
MAX GAS 266u
MAX GAS 762u
9900
SILTSTONE = GRAY TO MEDIUM DARK GRAY
WITH SLIGHTLY BROWNISH GRAY HUES;
TENACITY IS DENSE TO CRUNCHY; FRACTURES
FROM IRREGULAR TO BLOCKY; CUTTINGS ARE
WEDGELIKE TO TABULAR; EARTHY TO DULL
WITH A SLIGHT SPARKLING LUSTER; TEXTURE
IS GRITTY TO SILTY; THIN STRUCTURE.
MAX GAS 1664u
MAX CO2 10227ppm
MAX GAS 712u
CALIB. GAS EQUIPMENT
DAY TOUR
<200 ROP 0>
<50 Avg WOB 0>
WOB 18K
RPM 65
PP 2300
10000
<0 Ttl Gas 1.5K>
<325 CO2 10K>
CG 1048u
<0 Flare Ht. 100>
ON GAS BUSTER
<10 Meth C-1 100K>
<10 Eth C-2 100K>
<10 Prop C-3 100K>
<10 Butn C-4 100K>


GPM 244
MAX GAS 1519u
MW IN 9.4 VIS 48
ON GAS BUSTER
MW OUT 9.4 VIS 52
C-5,4,3,2,1
10100
WF 300 @ 10114'
MAX GAS 706u
CG 855u
10200
C-4,3,2,1
SHALE = LIGHT GRAY TO MEDIUM DARK GRAY;
TEXTURE IS BRITTLE; SPLINTERY TO PLANAR
FRACTURING; TABULAR TO ELONGATED
CUTTINGS; WAXY TO DULL LUSTER; SMOOTH TO
SILTY TEXTURE; LAMINAE TO THIN STRUCTURE
CARBONACEOUS SHALE = BROWNISH BLACK TO
GRAYISH BLACK TO DARK GRAY; TENACITY IS
CRUNCHY TO BRITTLE; IRREGULAR TO BLOCKY
FRACTURING; WEDGELIKE TO NODULAR
CUTTINGS; RESINOUS TO EARTHY LUSTER;
THIN STRUCTURE.
SANDSTONE = WHITE TO MEDIUM GRAY; QUARTZ
FRAMEWORK WITH SOME LOOSE GRAINS; COARSE
TO FINE SIZED GRAINS WITH POOR TO FAIR
SORTING; SUBANGULAR; LOW TO MODERATE
SPHERICITY; HARD TO FIRMLY FRIABLE;
GRAIN SUPPORTED; STRONG REACTION WITH
HCL SUGGESTS CALCITE CEMENT; SOME
CARBONACEOUS MATERIAL PRESENT.


10300
10400
MAX CO2 4752ppm
MAX GAS 427u
ON GAS BUSTER
MW IN 9.4 VIS 50
MAX GAS 1147u
MW OUT 9.4 VIS 53
C-5,4,3,2,1
MAX GAS 772u
MAX CO2 6226PPM
CG 1369u
MAX CO2 3067ppm
MAX GAS 2282u
MUD DATA @ 10448'
MAX GAS 2057u
MW 9.4 FV 47 PV 15 YP 15
MAX CO2 4120ppm
API FIL 7.8 GELS 6/19/35 PH 9.6
SILTSTONE = GRAYISH BROWN TO MEDIUM DARK
GRAY; TENACITY RANGES FROM DENSE TO
CRUMBLY; FRACTURES FROM BLOCKY TO
SLIGHTLY IRREGULAR; TABULAR TO SLIGHTLY
MASSIVE CUTTINGS; EARTHY LUSTER; GRITTY
TO SILTY TEXTURE; MASSIVE STRUCTURE.
SHALE = MEDIUM GRAY TO MEDIUM DARK GRAY;
TENACITY IS CRUNCHY TO BRITTLE;
FRACTURES FROM PLANAR TO SLIGHTLY BLOCKY
CUTTINGS ARE PLATY TO TABULAR TO
SLIGHTLY ELONGATED; DULL EARTHY TO DULL
LUSTER; SMOOTH TEXTURE; THIN TO LAMINAE
STRUCTURE.
CARBONACEOUS SHALE = BLACK TO GRAYISH
BLACK; TENACITY IS PULVERULENT TO
CRUNCHY; BLOCKY TO IRREGULAR FRACTURING;
NODULAR TO WEDGELIKE CUTTINGS; LUSTER IS
RESINOUS TO POLISHED; SMOOTH TO CLAYEY
TEXTURE; THIN STRUCTURE.


<200 ROP 0>
<50 Avg WOB 0>
NIGHT TOUR
10500
12/11/2009
10600
CL 2100 CA 40 MBT 17.5 SOL 5.7
MAX CO2 26653ppm
24 HOUR LOSSES 722 BBLS
MAX GAS 4424u
<0 Ttl Gas 1.5K>
<325 CO2 10K>
MAX CO2 5384ppm
MW IN 9.4 VIS 49
<0 Flare Ht. 100>
MW OUT 9.4+ VIS 52
<10 Meth C-1 100K>
<10 Eth C-2 100K>
<10 Prop C-3 100K>
<10 Butn C-4 100K>
<10 Pent C-5 100K>
MAX GAS 1858u
C-5,4,3,2,1
MAX GAS 2922u
MAX GAS 1171u
CG 1694u
MAX GAS 1338u
MAX GAS 2073u
CG 1994u
MAX CO2 28758ppm
SANDSTONE = LIGHT TO MEDIUM GRAY WITH
SOME PALE REDDISH BROWN COLORATION;
QUARTZ FRAMEWORK WITH ABOUT 5% - 10%
LITHICS; FAIR TO MODERATE SORTING OF
COARSE GRAIN SIZING WITH MODERATE
SPHERICITY AND SUBANGULAR TO SUBROUNDED
ANGULARITY; FRIABLE TO FIRMLY FRIABLE
GRAIN SUPPORT WITH CALCITIC CEMENTATION;
MODERATE TO HIGH GAS SHOWS AND NO OIL
SHOWS ASSOCIATED WITH THIS SAMPLE.
SILTSTONE = MEDIUM TO DARK GRAY IN COLOR
DENSE IN TENACITY WITH BLOCKY TO PLANAR
FRACTURING IN A TABULAR TO ELONGATED
CUTTINGS HABIT; EARTHY TO FROSTED LUSTER
WITH A SILTY TEXTURE AND THIN IN
STRUCTURE.
SHALE = LIGHT TO DARK GRAY IN COLORING;
BRITTLE TENACITY WITH BLOCKY TO PLANAR
FRACTURING IN A TABULAR TO WEDGELIKE
CUTTINGS HABIT; WAXY TO GREASY LUSTER


10700
10800
10900
DAY TOUR
WOB 20K
RPM 70
PP 2650
GPM 248
MW IN 9.4+ VIS 53
MW OUT 9.4 VIS 55
MAX GAS 448u
MAX CO2 2770ppm
CALIB. GAS EQUIPMENT
MAX GAS 1761u
C-5,4,3,2,1
CG 1589u
ON GAS BUSTER
MW IN 9.4 VIS 60
MW OUT 9.4 VIS 53
MAX GAS 2266u
C-5,4,3,2,1
WITH A SMOOTH TEXTURE AND A THIN TO
LAMINAE STRUCTURE.
SANDSTONE = WHITE TO TRANSLUCENT TO
MEDIUM LIGHT GRAY; FRAMEWORK CONSISTS OF
APPROXIMATELY 80% QUARTZ AND 20% DARK
LITHIC CLASTS GIVING THE SPECIMEN A SALT
AND PEPPER LOOK; COARSE TO MEDIUM GRAIN
SIZE WITH FAIR TO POOR SORTING; ANGULAR
TO SUBANGULAR; LOW SPHERICITY; MODERATE
HARDNESS; STRONG REACTION WITH HCL
SUGGESTS CALCITE CEMENT; GRAIN SUPPORTED
CARBONACEOUS SHALE = BROWNISH GRAY TO
BLACK; TENACITY RANGES FROM DENSE TO
CRUNCHY; IRREGULAR TO SPLINTERY
FRACTURING; SCALY TO TABULAR CUTTINGS;
EARTHY TO DULL LUSTER; SMOOTH TO SILTY
TEXTURE; THIN TO THICK STRUCTURE.
SHALE = MEDIUM DARK GRAY TO MEDIUM GRAY;
TENACITY IS BRITTLE TO CRUNCHY; PLANAR



TO SPLINTERY FRACTURING; PLATY TO SCALY

CUTTINGS; WAXY TO DULL LUSTER; SMOOTH

TEXTURE; THIN TO LAMINAE STRUCTURE.

SILTSTONE = BROWNISH GRAY TO MEDIUM DARK

GRAY; TENACITY IS DENSE TO CRUMBLY;

IRREGULAR TO BLOCKY FRACTURING; MASSIVE

TO WEDGELIKE CUTTINGS; EARTHY WITH A

SLIGHT FROSTED LUSTER; TEXTURE IS MOSTLY

GRITTY TO SLIGHTLY SILTY; THICK

STRUCTURE.

SANDSTONE = WHITE TO TRANSLUCENT TO

MEDIUM DARK GRAY; FRAMEWORK CONSISTS OF

APPROXIMATELY 85% QUARTZ AND 15% BLACK

LITHIC CLASTS GIVING THE SPECIMEN A

STRONG SALT AND PEPPER LOOK TO SOME OF

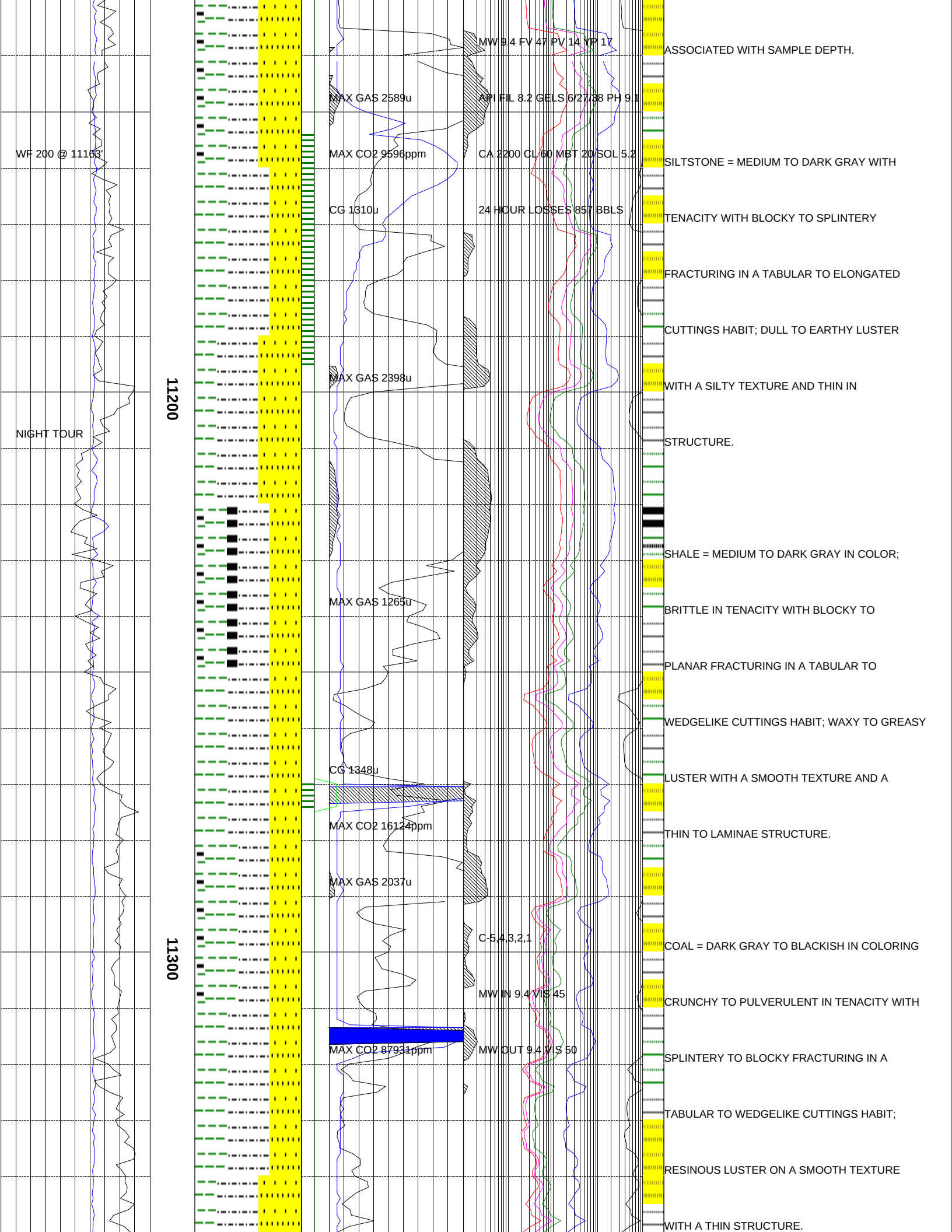
THE SAMPLE; COARSE TO FINE GRAINED WITH

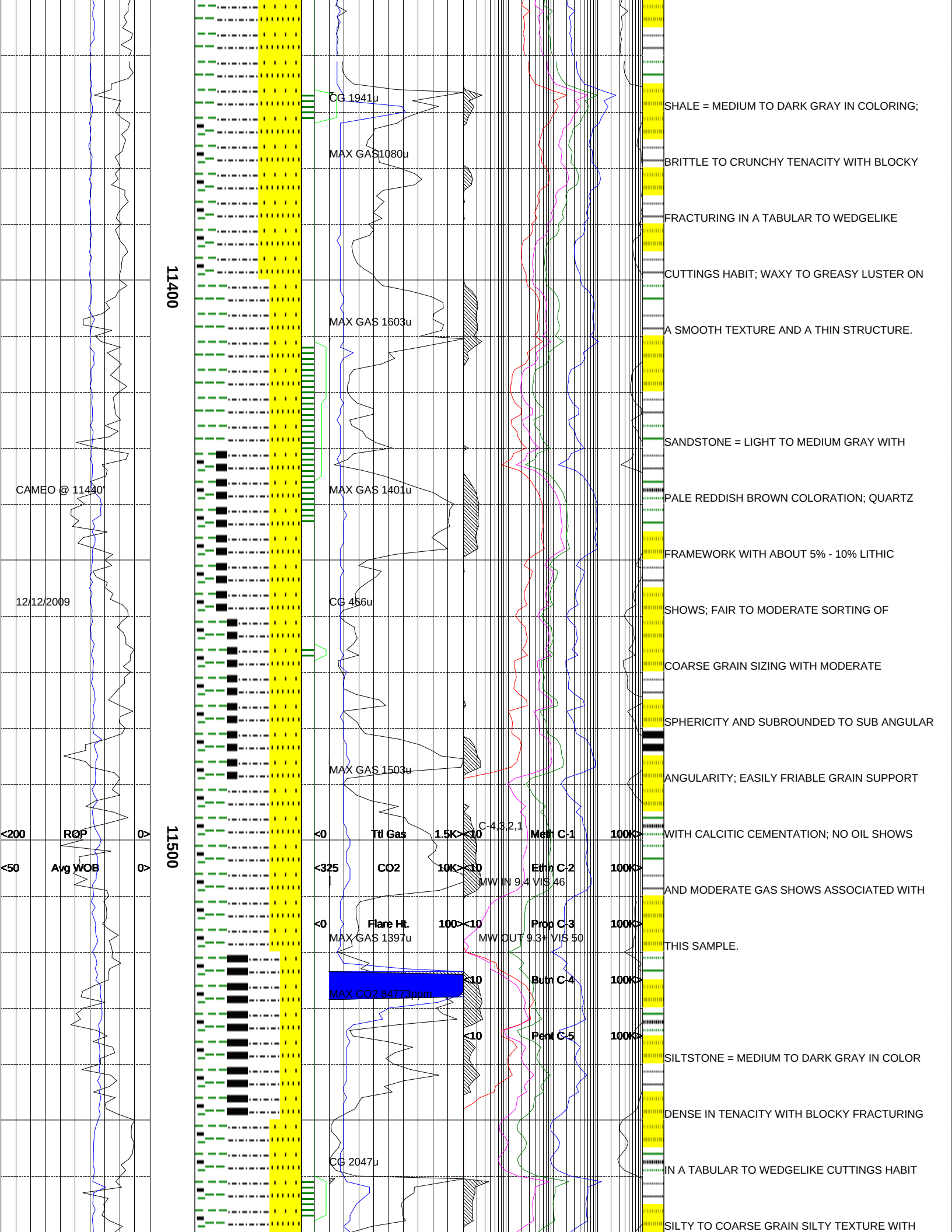
WELL TO FAIR SORTING; ANGULAR TO

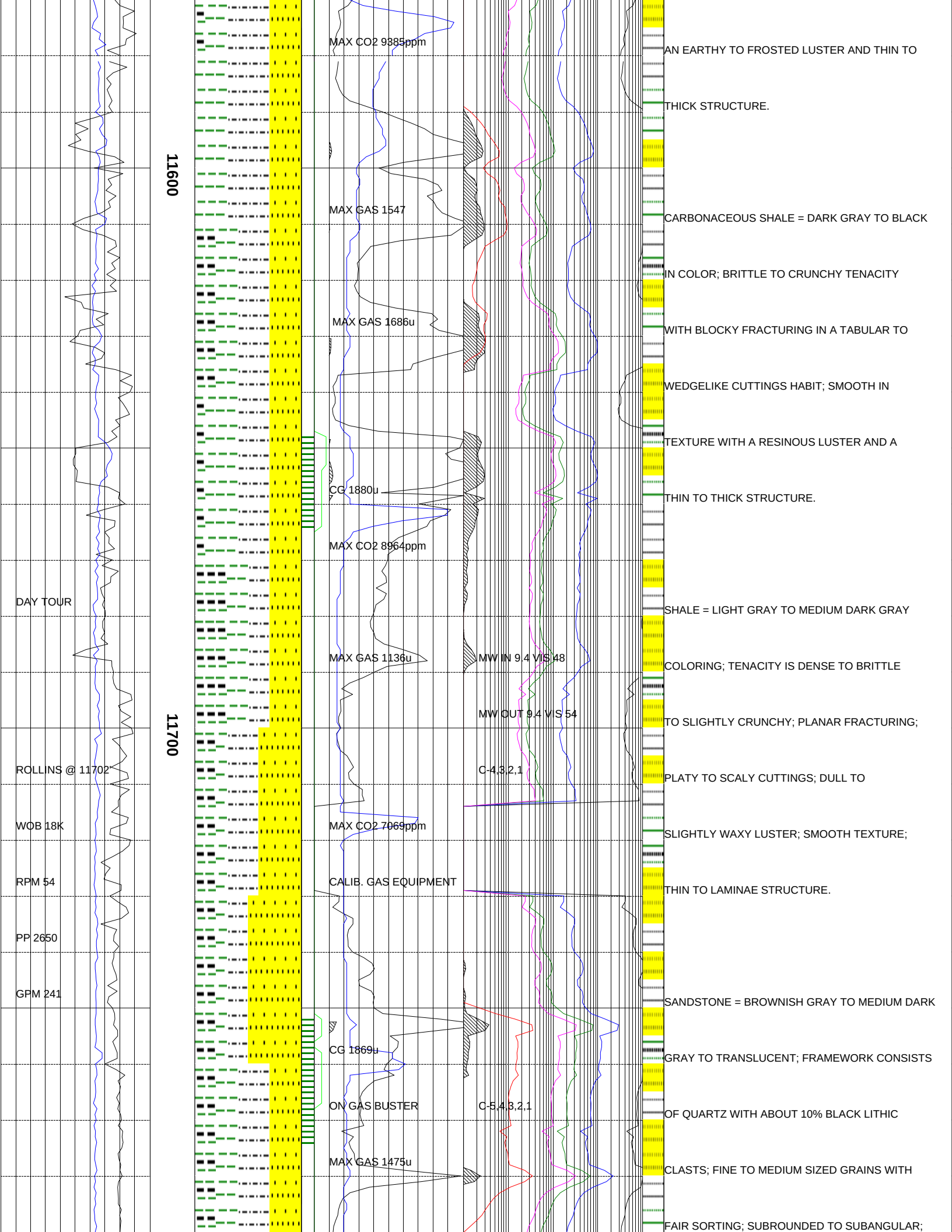
SUBROUNDED; MODERATE TO LOW SPHERICITY;

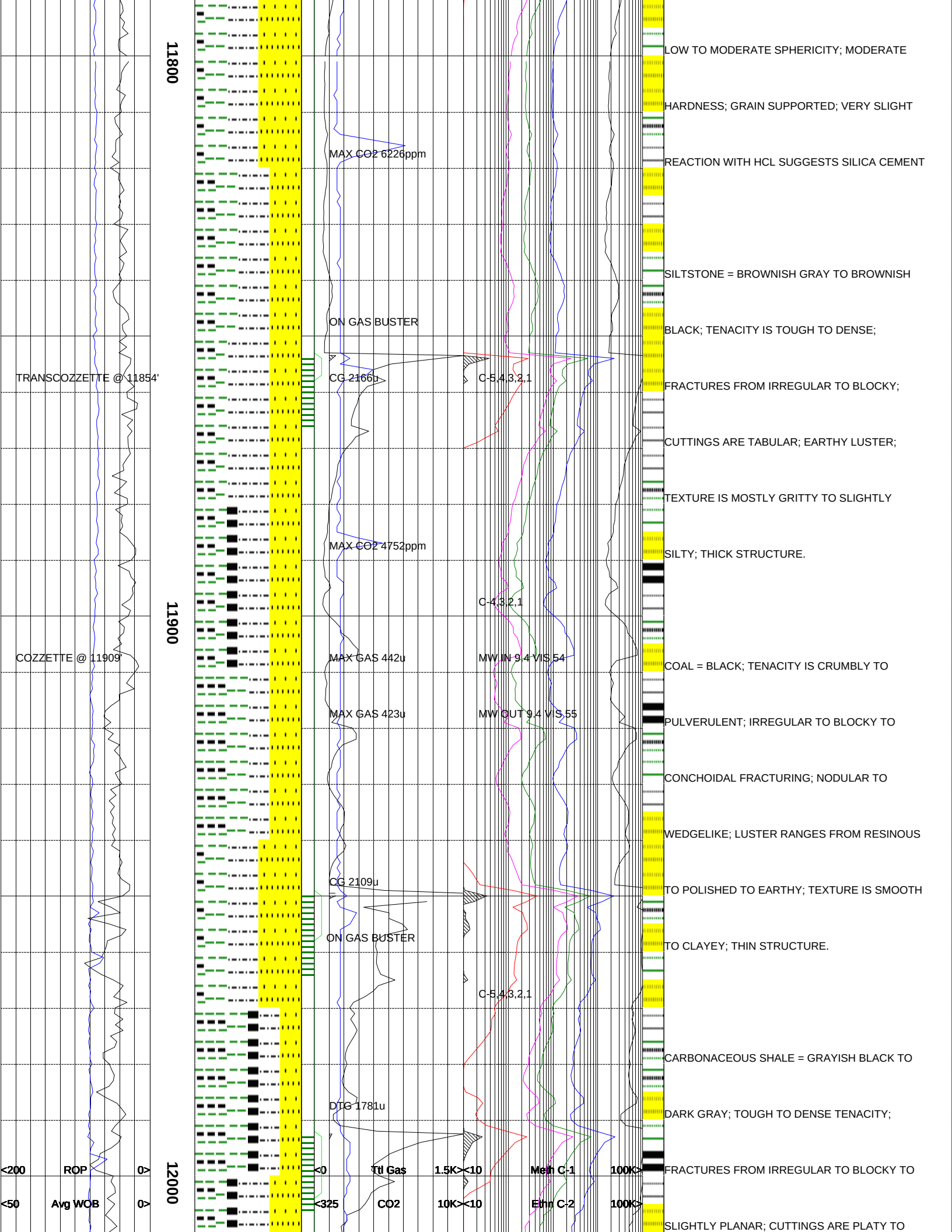
MODERATE HARD TO HARD; SILICA CEMENT;

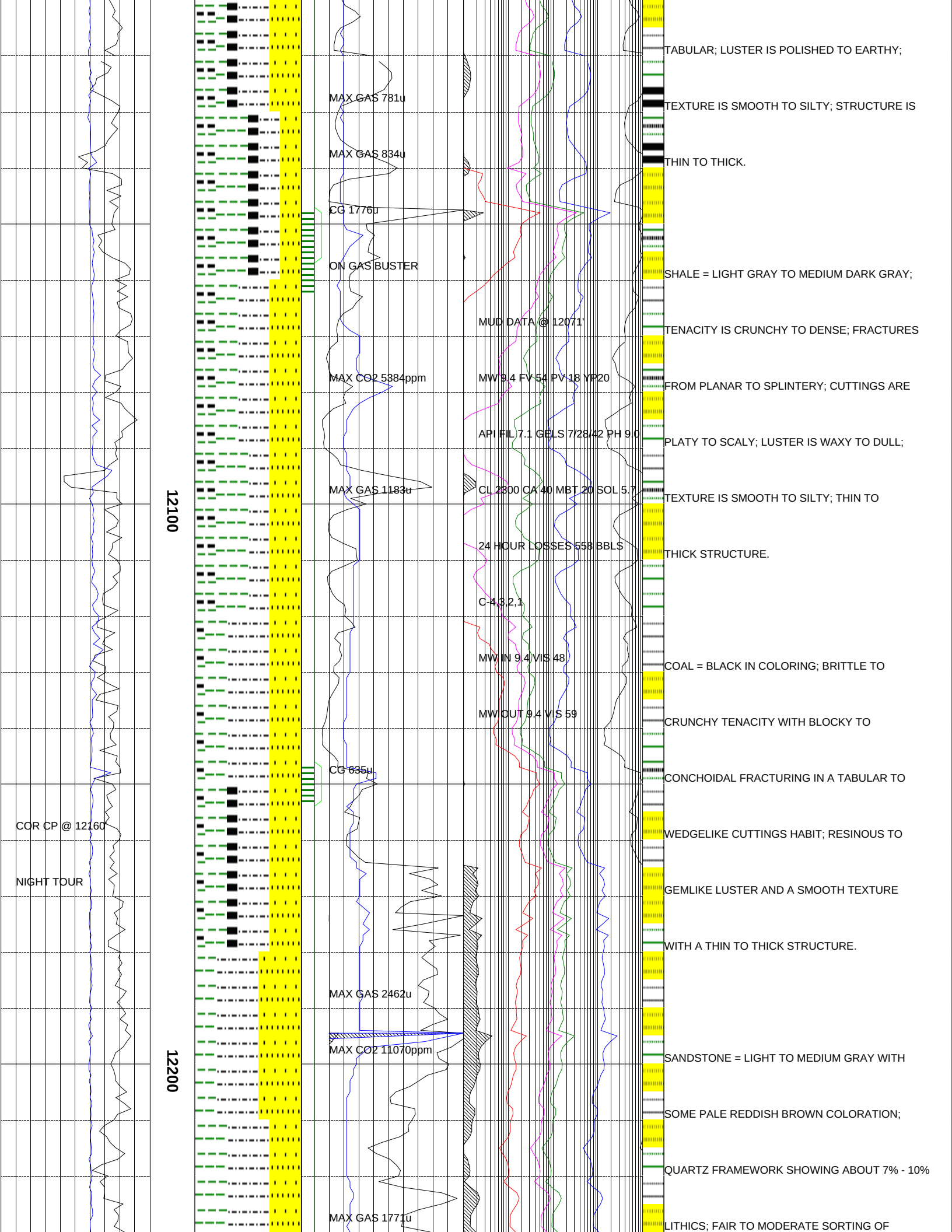
NO REACTION WITH HCL; HIGH GAS

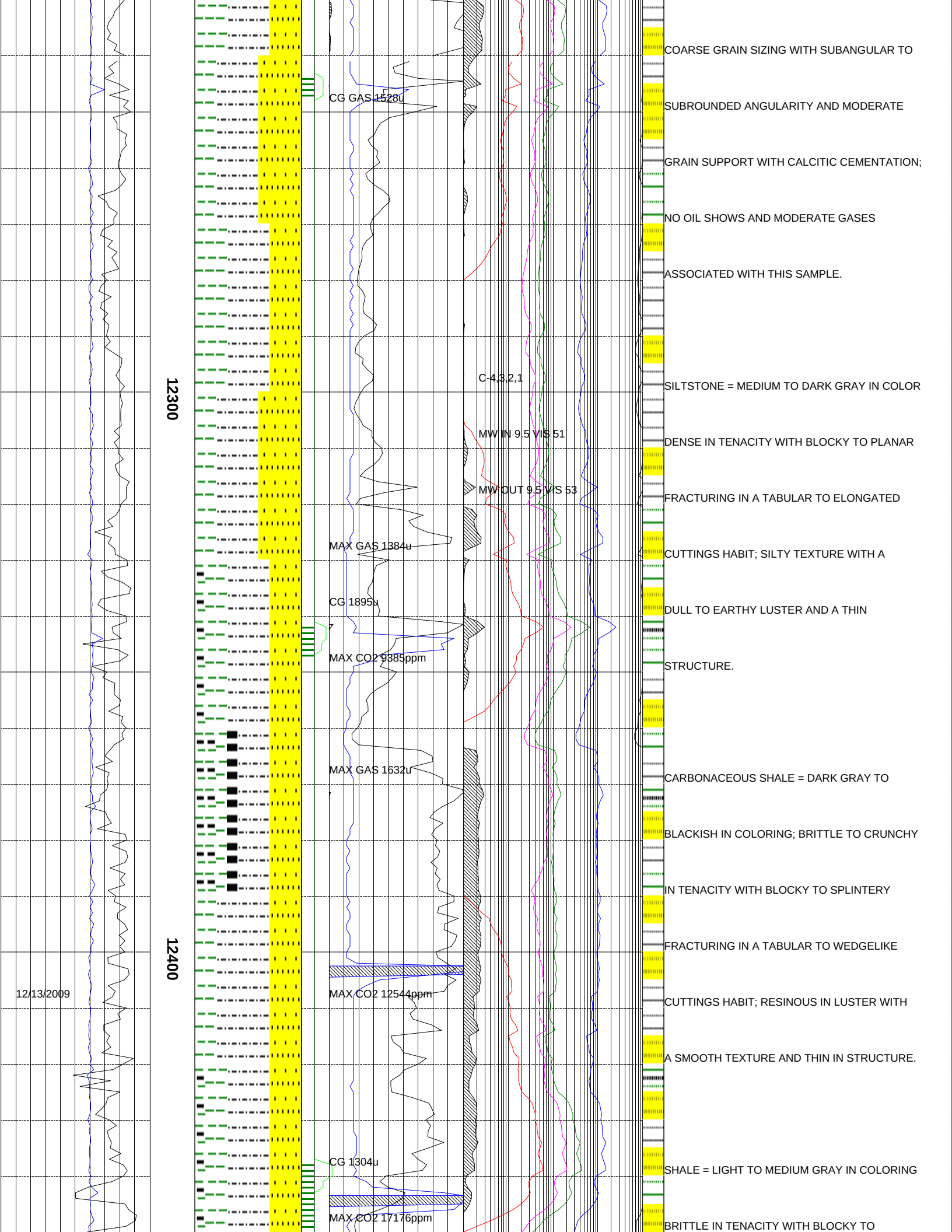

MW 9.4 FV 47 PV 14 YP 17
ASSOCIATED WITH SAMPLE DEPTH.
MAX GAS 2589u
API FIL 8.2 GELS 6/27/38 PH 9.1
WF 200 @ 11163'
MAX CO2 9596ppm
CA 2200 CL 60 MBT 20 SOL 5.2
SILTSTONE = MEDIUM TO DARK GRAY WITH
CG 1310u
24 HOUR LOSSES 857 BBLS
TENACITY WITH BLOCKY TO SPLINTERY
FRACTURING IN A TABULAR TO ELONGATED
CUTTINGS HABIT; DULL TO EARTHY LUSTER
MAX GAS 2398u
11200
WITH A SILTY TEXTURE AND THIN IN
NIGHT TOUR
STRUCTURE.
SHALE = MEDIUM TO DARK GRAY IN COLOR;
MAX GAS 1265u
BRITTLE IN TENACITY WITH BLOCKY TO
PLANAR FRACTURING IN A TABULAR TO
WEDGELIKE CUTTINGS HABIT; WAXY TO GREASY
CG 1348u
LUSTER WITH A SMOOTH TEXTURE AND A
MAX CO2 16124ppm
THIN TO LAMINAE STRUCTURE.
MAX GAS 2037u
C-5,4,3,2,1
COAL = DARK GRAY TO BLACKISH IN COLORING
11300
MW IN 9.4 VIS 45
CRUNCHY TO PULVERULENT IN TENACITY WITH
MAX CO2 87931ppm
MW OUT 9.4 VIS 50
SPLINTERY TO BLOCKY FRACTURING IN A
TABULAR TO WEDGELIKE CUTTINGS HABIT;
RESINOUS LUSTER ON A SMOOTH TEXTURE
WITH A THIN STRUCTURE.

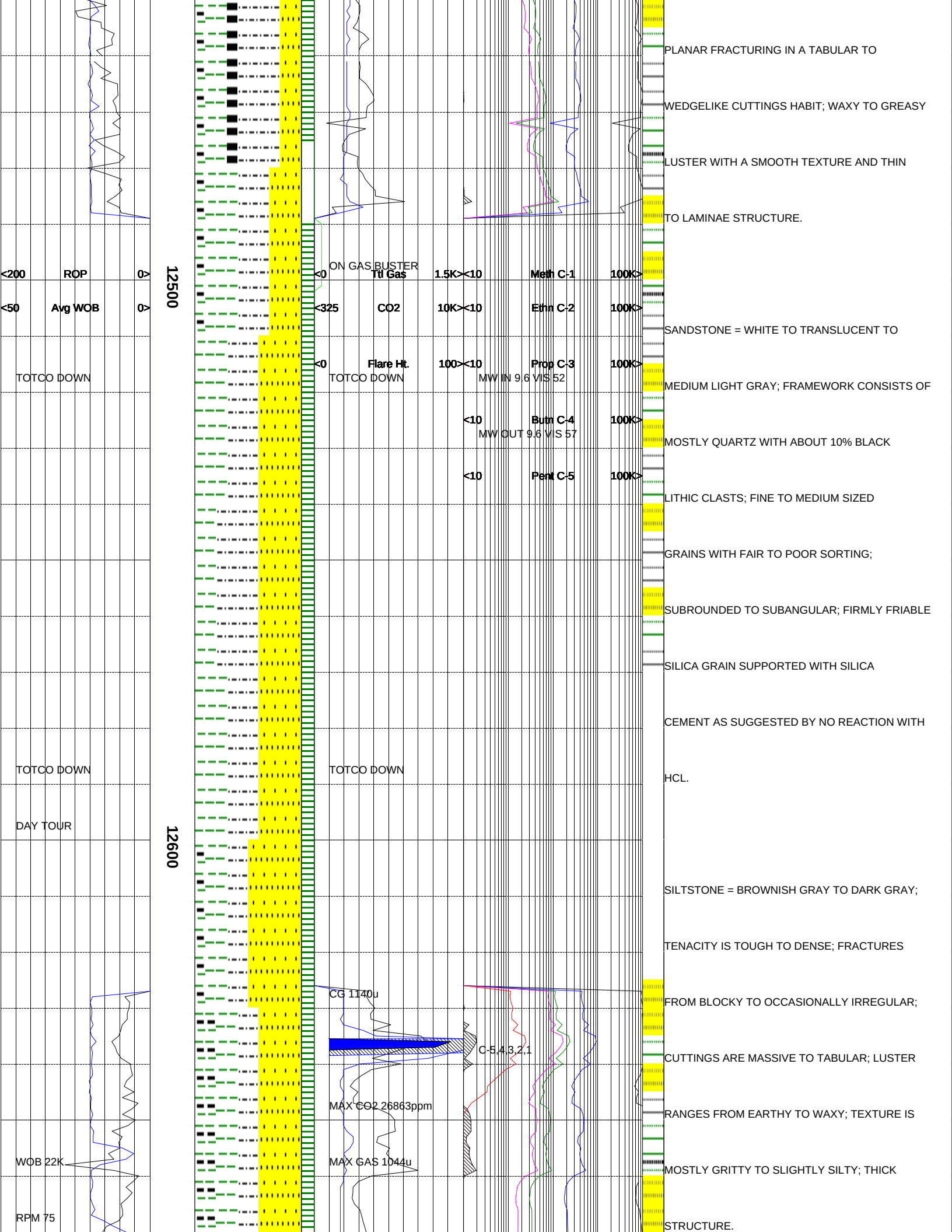

11400
11500
CG 1941u
MAX GAS1080u
MAX GAS 1603u
CAMEO @ 11440'
MAX GAS 1401u
12/12/2009
CG 466u
MAX GAS 1503u
<200 ROP 0>
<50 Avg WOB 0>
<0 Ttl Gas 1.5K>
<325 CO2 10K>
<0 Flare Ht. 100>
MAX GAS 1397u
MAX CO2 84773ppm
C-4,3,2,1
<10 Meth C-1 100K>
<10 Ethn C-2 100K>
MW IN 9.4 VIS 46
<10 Prop C-3 100K>
MW OUT 9.3+ VIS 50
<10 Butn C-4 100K>
<10 Pent C-5 100K>
CG 2047u
SHALE = MEDIUM TO DARK GRAY IN COLORING;
BRITTLE TO CRUNCHY TENACITY WITH BLOCKY
FRACTURING IN A TABULAR TO WEDGELIKE
CUTTINGS HABIT; WAXY TO GREASY LUSTER ON
A SMOOTH TEXTURE AND A THIN STRUCTURE.
SANDSTONE = LIGHT TO MEDIUM GRAY WITH
PALE REDDISH BROWN COLORATION; QUARTZ
FRAMEWORK WITH ABOUT 5% - 10% LITHIC
SHOWS; FAIR TO MODERATE SORTING OF
COARSE GRAIN SIZING WITH MODERATE
SPHERICITY AND SUBROUNDED TO SUB ANGULAR
ANGULARITY; EASILY FRIABLE GRAIN SUPPORT
WITH CALCITIC CEMENTATION; NO OIL SHOWS
AND MODERATE GAS SHOWS ASSOCIATED WITH
THIS SAMPLE.
SILTSTONE = MEDIUM TO DARK GRAY IN COLOR
DENSE IN TENACITY WITH BLOCKY FRACTURING
IN A TABULAR TO WEDGELIKE CUTTINGS HABIT
SILTY TO COARSE GRAIN SILTY TEXTURE WITH

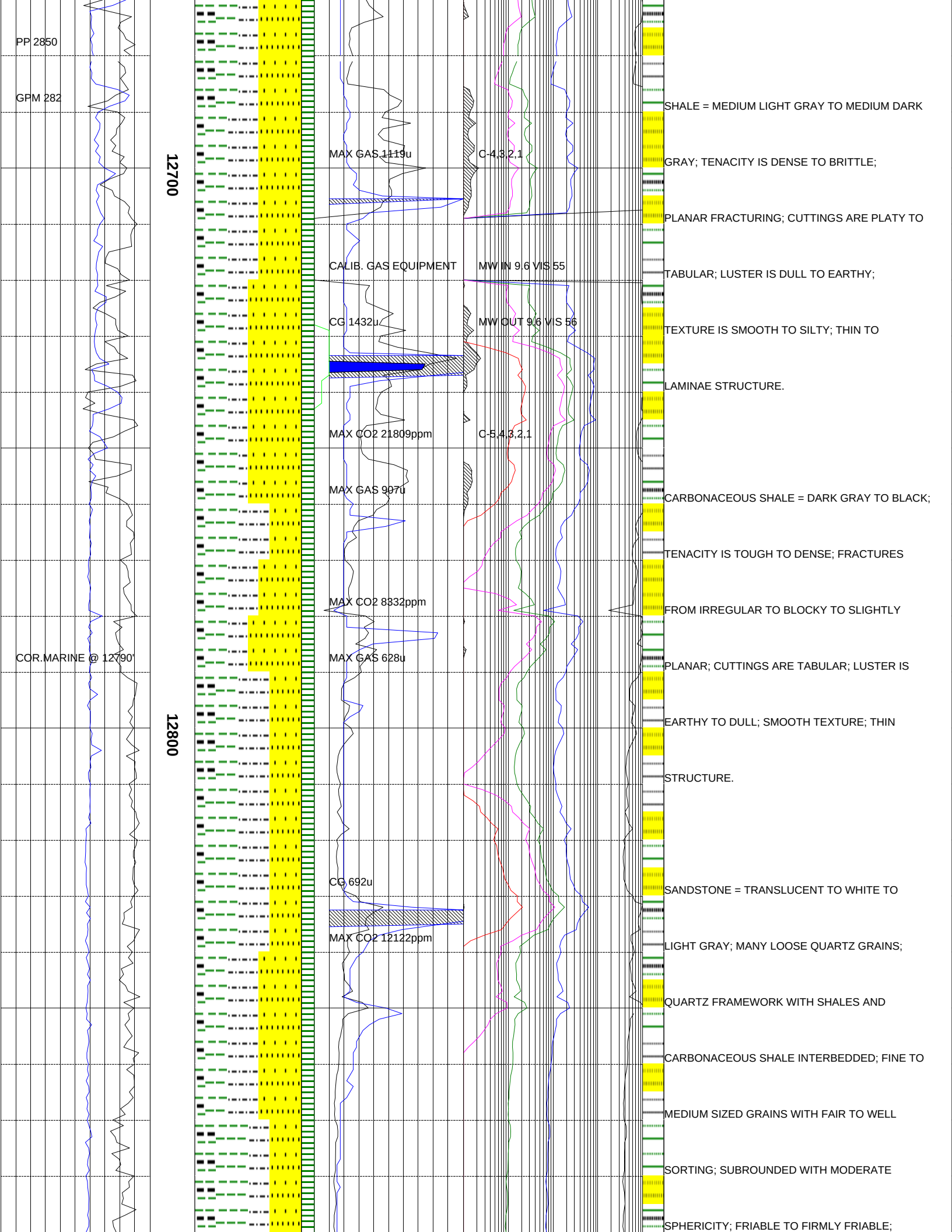

11600
11700
MAX CO2 9385ppm
MAX GAS 1547
MAX GAS 1686u
CG 1880u
MAX CO2 8964ppm
MAX GAS 1136u
MAX CO2 7069ppm
CALIB. GAS EQUIPMENT
CG 1869u
ON GAS BUSTER
MAX GAS 1475u
DAY TOUR
ROLLINS @ 11702'
WOB 18K
RPM 54
PP 2650
GPM 241
MW IN 9.4 VIS 48
MW OUT 9.4 VIS 54
C-4,3,2,1
C-5,4,3,2,1
AN EARTHY TO FROSTED LUSTER AND THIN TO
THICK STRUCTURE.
CARBONACEOUS SHALE = DARK GRAY TO BLACK
IN COLOR; BRITTLE TO CRUNCHY TENACITY
WITH BLOCKY FRACTURING IN A TABULAR TO
WEDGELIKE CUTTINGS HABIT; SMOOTH IN
TEXTURE WITH A RESINOUS LUSTER AND A
THIN TO THICK STRUCTURE.
SHALE = LIGHT GRAY TO MEDIUM DARK GRAY
COLORING; TENACITY IS DENSE TO BRITTLE
TO SLIGHTLY CRUNCHY; PLANAR FRACTURING;
PLATY TO SCALY CUTTINGS; DULL TO
SLIGHTLY WAXY LUSTER; SMOOTH TEXTURE;
THIN TO LAMINAE STRUCTURE.
SANDSTONE = BROWNISH GRAY TO MEDIUM DARK
GRAY TO TRANSLUCENT; FRAMEWORK CONSISTS
OF QUARTZ WITH ABOUT 10% BLACK LITHIC
CLASTS; FINE TO MEDIUM SIZED GRAINS WITH
FAIR SORTING; SUBROUNDED TO SUBANGULAR;


11800
11900
12000
TRANSCOZZETTE @ 11854'
COZZETTE @ 11909'
MAX CO2 6226ppm
ON GAS BUSTER
CG 2166u
C-5,4,3,2,1
MAX CO2 4752ppm
C-4,3,2,1
MAX GAS 442u
MW IN 9.4 VIS 54
MAX GAS 423u
MW OUT 9.4 VIS 55
CG 2109u
ON GAS BUSTER
C-5,4,3,2,1
DTG 1781u
LOW TO MODERATE SPHERICITY; MODERATE
HARDNESS; GRAIN SUPPORTED; VERY SLIGHT
REACTION WITH HCL SUGGESTS SILICA CEMENT
SILTSTONE = BROWNISH GRAY TO BROWNISH
BLACK; TENACITY IS TOUGH TO DENSE;
FRACTURES FROM IRREGULAR TO BLOCKY;
CUTTINGS ARE TABULAR; EARTHY LUSTER;
TEXTURE IS MOSTLY GRITTY TO SLIGHTLY
SILTY; THICK STRUCTURE.
COAL = BLACK; TENACITY IS CRUMBLY TO
PULVERULENT; IRREGULAR TO BLOCKY TO
CONCHOIDAL FRACTURING; NODULAR TO
WEDGELIKE; LUSTER RANGES FROM RESINOUS
TO POLISHED TO EARTHY; TEXTURE IS SMOOTH
TO CLAYEY; THIN STRUCTURE.
CARBONACEOUS SHALE = GRAYISH BLACK TO
DARK GRAY; TOUGH TO DENSE TENACITY;
FRACTURES FROM IRREGULAR TO BLOCKY TO
SLIGHTLY PLANAR; CUTTINGS ARE PLATY TO
<200 ROP 0>
<50 Avg WOB 0>
<0 Tl Gas 1.5K><10 Meth C-1 100K>
<325 CO2 10K><10 Ethn C-2 100K>


TABULAR; LUSTER IS POLISHED TO EARTHY;
MAX GAS 781u
TEXTURE IS SMOOTH TO SILTY; STRUCTURE IS
MAX GAS 834u
THIN TO THICK.
CG 1776u
ON GAS BUSTER
SHALE = LIGHT GRAY TO MEDIUM DARK GRAY;
MUD DATA @ 12071'
TENACITY IS CRUNCHY TO DENSE; FRACTURES
MAX CO2 5384ppm
MW 9.4 FV 54 PV 18 YP 20
FROM PLANAR TO SPLINTERY; CUTTINGS ARE
API FIL 7.1 GELS 7/28/42 PH 9.0
PLATY TO SCALY; LUSTER IS WAXY TO DULL;
MAX GAS 1183u
CL 2300 CA 40 MBT 20 SOL 5.7
TEXTURE IS SMOOTH TO SILTY; THIN TO
12100
24 HOUR LOSSES 558 BBLS
THICK STRUCTURE.
C-4,3,2,1
MW IN 9.4 VIS 48
COAL = BLACK IN COLORING; BRITTLE TO
MW OUT 9.4 VIS 59
CRUNCHY TENACITY WITH BLOCKY TO
CG 635u
CONCHOIDAL FRACTURING IN A TABULAR TO
COR CP @ 12160'
WEDGELIKE CUTTINGS HABIT; RESINOUS TO
NIGHT TOUR
GEMLIKE LUSTER AND A SMOOTH TEXTURE
WITH A THIN TO THICK STRUCTURE.
MAX GAS 2462u
MAX CO2 11070ppm
12200
SANDSTONE = LIGHT TO MEDIUM GRAY WITH
SOME PALE REDDISH BROWN COLORATION;
QUARTZ FRAMEWORK SHOWING ABOUT 7% - 10%
MAX GAS 1771u
LITHICS; FAIR TO MODERATE SORTING OF


CG GAS 1528u
12300
C-4,3,2,1
MW IN 9.5 VIS 51
MW OUT 9.5 VIS 53
MAX GAS 1384u
CG 1895u
MAX CO2 9385ppm
MAX GAS 1632u
12400
12/13/2009
MAX CO2 12544ppm
CG 1304u
MAX CO2 17176ppm
COARSE GRAIN SIZING WITH SUBANGULAR TO
SUBROUNDED ANGULARITY AND MODERATE
GRAIN SUPPORT WITH CALCITIC CEMENTATION;
NO OIL SHOWS AND MODERATE GASES
ASSOCIATED WITH THIS SAMPLE.
SILTSTONE = MEDIUM TO DARK GRAY IN COLOR
DENSE IN TENACITY WITH BLOCKY TO PLANAR
FRACTURING IN A TABULAR TO ELONGATED
CUTTINGS HABIT; SILTY TEXTURE WITH A
DULL TO EARTHY LUSTER AND A THIN
STRUCTURE.
CARBONACEOUS SHALE = DARK GRAY TO
BLACKISH IN COLORING; BRITTLE TO CRUNCHY
IN TENACITY WITH BLOCKY TO SPLINTERY
FRACTURING IN A TABULAR TO WEDGELIKE
CUTTINGS HABIT; RESINOUS IN LUSTER WITH
A SMOOTH TEXTURE AND THIN IN STRUCTURE.
SHALE = LIGHT TO MEDIUM GRAY IN COLORING
BRITTLE IN TENACITY WITH BLOCKY TO


<200 ROP 0>
<50 Avg WOB 0>
12500
TOTCO DOWN
ON GAS BUSTER
<0 Ttl Gas 1.5K>
<325 CO2 10K>
<0 Flare Ht. 100>
TOTCO DOWN
<10 Meth C-1 100K>
<10 Ethn C-2 100K>
<10 Prop C-3 100K>
MW IN 9.6 VIS 52
<10 Butn C-4 100K>
MW OUT 9.6 VIS 57
<10 Pent C-5 100K>
TOTCO DOWN
DAY TOUR
12600
TOTCO DOWN
CG 1140u
C-5,4,3,2,1
MAX CO2 26863ppm
WOB 22K
MAX GAS 1044u
RPM 75
PLANAR FRACTURING IN A TABULAR TO
WEDGELIKE CUTTINGS HABIT; WAXY TO GREASY
LUSTER WITH A SMOOTH TEXTURE AND THIN
TO LAMINAE STRUCTURE.
SANDSTONE = WHITE TO TRANSLUCENT TO
MEDIUM LIGHT GRAY; FRAMEWORK CONSISTS OF
MOSTLY QUARTZ WITH ABOUT 10% BLACK
LITHIC CLASTS; FINE TO MEDIUM SIZED
GRAINS WITH FAIR TO POOR SORTING;
SUBROUNDED TO SUBANGULAR; FIRMLY FRIABLE
SILICA GRAIN SUPPORTED WITH SILICA
CEMENT AS SUGGESTED BY NO REACTION WITH
HCL.
SILTSTONE = BROWNISH GRAY TO DARK GRAY;
TENACITY IS TOUGH TO DENSE; FRACTURES
FROM BLOCKY TO OCCASIONALLY IRREGULAR;
CUTTINGS ARE MASSIVE TO TABULAR; LUSTER
RANGES FROM EARTHY TO WAXY; TEXTURE IS
MOSTLY GRITTY TO SLIGHTLY SILTY; THICK
STRUCTURE.


PP 2850
GPM 282
12700
MAX GAS 1119u
C-4,3,2,1
CALIB. GAS EQUIPMENT
MW IN 9.6 VIS 55
CG 1432u
MW OUT 9.6 VIS 56
MAX CO2 21809ppm
C-5,4,3,2,1
MAX GAS 907u
MAX CO2 8332ppm
COR.MARINE @ 12790'
MAX GAS 628u
12800
CG 692u
MAX CO2 12122ppm
SHALE = MEDIUM LIGHT GRAY TO MEDIUM DARK
GRAY; TENACITY IS DENSE TO BRITTLE;
PLANAR FRACTURING; CUTTINGS ARE PLATY TO
TABULAR; LUSTER IS DULL TO EARTHY;
TEXTURE IS SMOOTH TO SILTY; THIN TO
LAMINAE STRUCTURE.
CARBONACEOUS SHALE = DARK GRAY TO BLACK;
TENACITY IS TOUGH TO DENSE; FRACTURES
FROM IRREGULAR TO BLOCKY TO SLIGHTLY
PLANAR; CUTTINGS ARE TABULAR; LUSTER IS
EARTHY TO DULL; SMOOTH TEXTURE; THIN
STRUCTURE.
SANDSTONE = TRANSLUCENT TO WHITE TO
LIGHT GRAY; MANY LOOSE QUARTZ GRAINS;
QUARTZ FRAMEWORK WITH SHALES AND
CARBONACEOUS SHALE INTERBEDDED; FINE TO
MEDIUM SIZED GRAINS WITH FAIR TO WELL
SORTING; SUBROUNDED WITH MODERATE
SPHERICITY; FRIABLE TO FIRMLY FRIABLE;