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Drilling Dynamics MD

COMPANY	ExxonMobil Production
WELL	FRU 197-33B6
FIELD	Piceance Creek
REGION	Rockies
COORDINATES	39.921441 108.282516
ELEVATION	6459'
COUNTY, STATE	Rio Blanco, CO
API INDEX	051031142400
SPUD DATE	03/30/2010
CONTRACTOR	HE
CO. REP.	W.GARNER/ C.CURTIS
RIG/TYPE	HP321
LOGGING UNIT	MLU#31
GEOLOGISTS	M.FRANCO/C.RECORD B.DELANEY
ADD. PERSONS	M.PIPER/ R.MCCANE
CO. GEOLOGIST	CHRIS ALBA

LOG INTERVAL

DEPTHS: 4045' **TO** 12776'
DATES: 07/05/2010 **TO** 07/17/2010
SCALE: 1" = 100'

CASING DATA

16" **AT** 149'
10.75" **AT** 4045'
4" **AT** 12776'
AT

HOLE SIZE

14.00" **TO** 4055'
10.00" **TO** 10343'
8.15" **TO** 12776'
TO

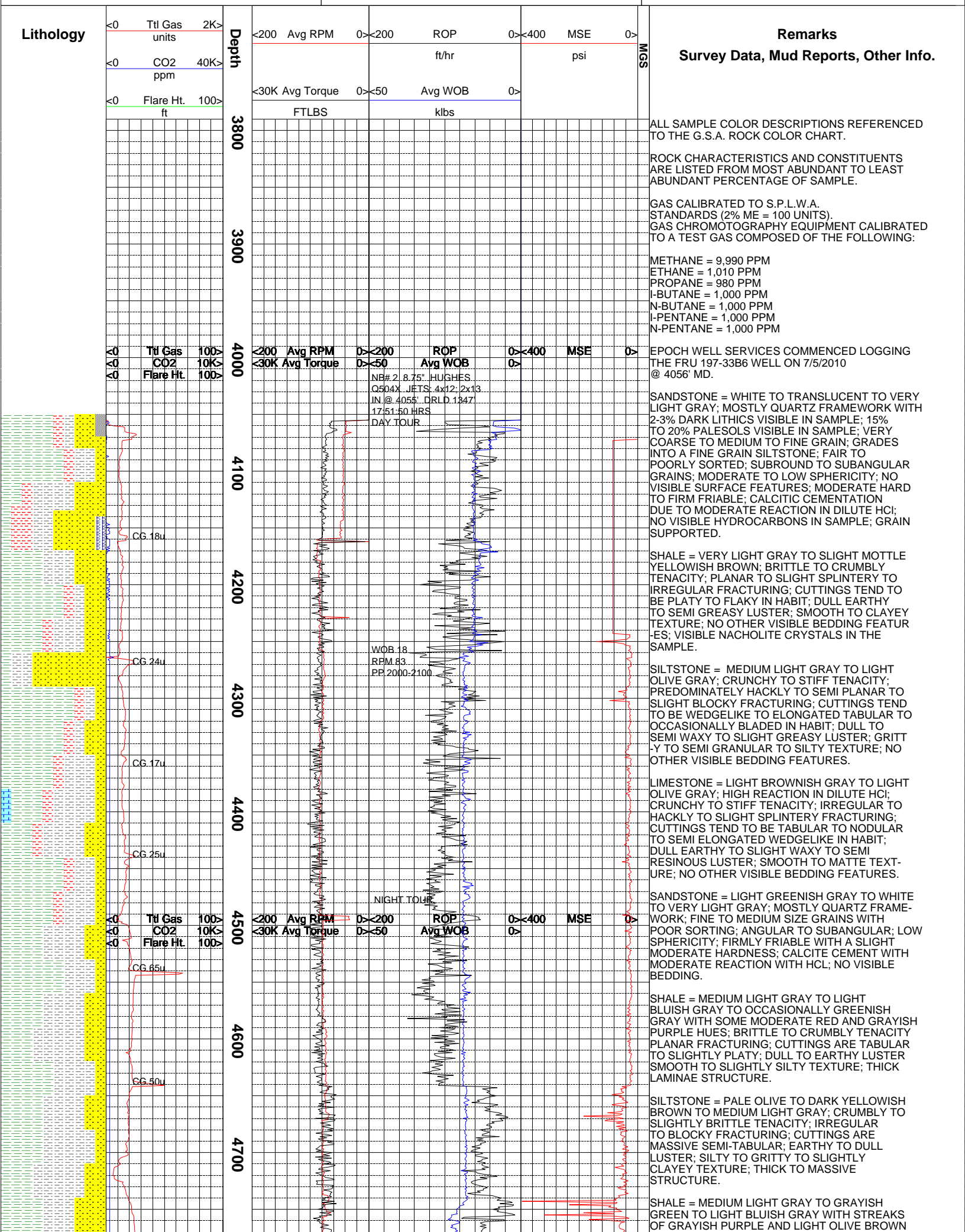
MUD TYPES

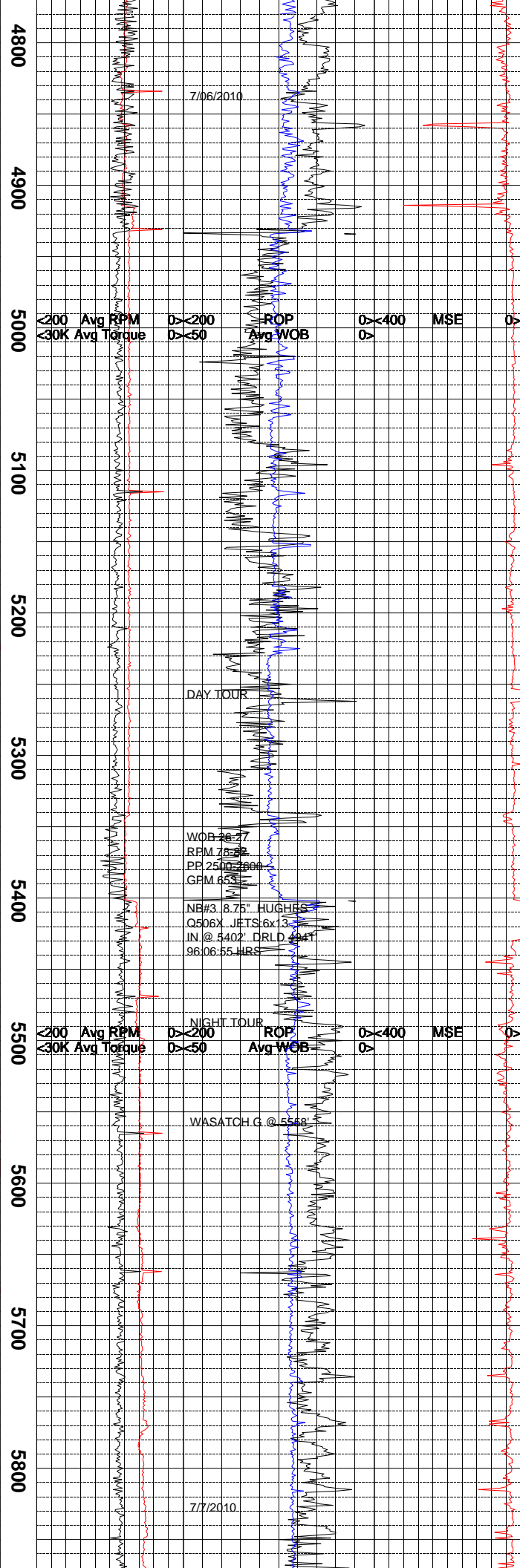
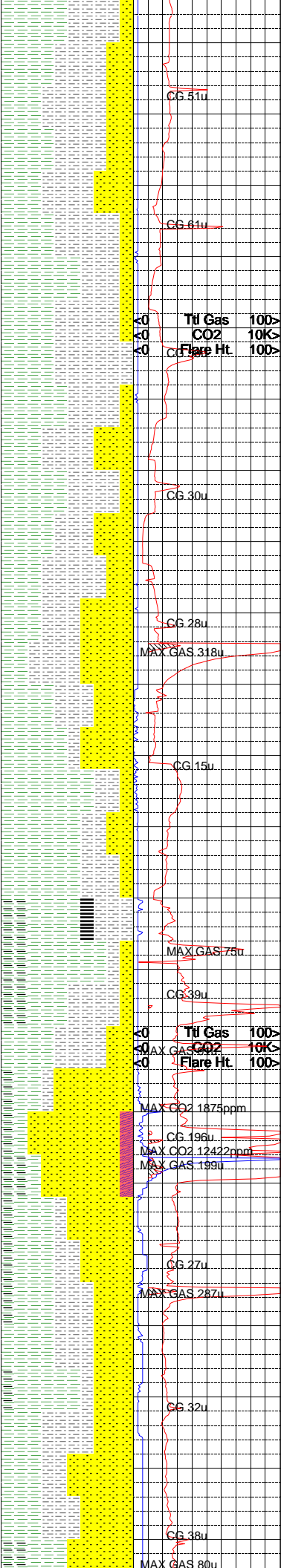
WATER-BASED **TO** 4055'
LSND **TO** 12776'
TO
TO

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	





AND DUSKY RED; CRUMBLY TO SLIGHTLY BRITTLE TENACITY; IRREGULAR TO BLOCKY TO SEMI-PLANAR FRACTURING; TABULAR TO PLATY CUTTINGS; DULL TO EARTHY TO WAXY LUSTER; SMOOTH TO CLAYEY TEXTURE; THICK STRUCTURE.

SANDSTONE = VERY LIGHT GRAY TO WHITE TO TRANSLUCENT; COMPOSED OF MOSTLY QUARTZ FRAMEWORK WITH APPROXIMATELY 5-10% BLACK LITHIC CLASTS; FINE GRAINED AND WELL SORTED; SUBANGULAR; LOW TO MODERATE SPHERICITY; MODERATE HARD TO FIRMLY FRIABLE; MODERATE TO WEAK REACTION SUGGESTS CALCITE CEMENT; SMALL AMOUNTS OF WHITE KAOLINITIC MATRIX; NO VISIBLE BEDDING; OCCASIONAL DARK YELLOWISH ORANGE HUES.

SILTSTONE = MEDIUM GRAY TO LIGHT BROWNISH GRAY TO MODERATE OLIVE BROWN TO MODERATE BROWN; TENACITY IS MOSTLY BRITTLE TO OFTEN CRUMBLY; IRREGULAR TO BLOCKY FRACTURING; CUTTINGS ARE SLIGHTLY MASSIVE TO TABULAR; EARTHY TO SLIGHTLY FROSTED LUSTER; GRITTY TO SILTY TEXTURE; GRADING FROM SANDSTONE; MASSIVE TO THICK STRUCTURE; LOW GAS ASSOCIATED WITH SAMPLE.

SANDSTONE = TRANSLUCENT TO GRAYISH ORANGE PINK TO LIGHT OLIVE GRAY; DOMINANT QUARTZ FRAMEWORK WITH TRACE AMOUNTS OF VERY FINE BLACK CLASTS; MOSTLY FINE GRAINED WITH OCCASIONAL MEDIUM GRAINS; WELL TO FAIR SORTED; SUBROUNDED TO SUBANGULAR WITH MODERATE TO LOW SPHERICITY; MODERATE HARD; SLIGHT TO MODERATE REACTION WITH HCL SUGGESTS SOME CALCITE CEMENT; GRAIN SUPPORTED WITH OCCASIONAL FRAGMENTS DISPLAYING A WHITE KAOLINITIC MATRIX; INCREASING AMOUNT OF LOOSE GRAINS IN SAMPLE.

SHALE = MEDIUM BLUSH GRAY TO GRAYISH GREEN TO MEDIUM GRAY WITH LIGHT OLIVE BROWN TO MEDIUM YELLOW STREAKS; BRITTLE TO SLIGHTLY CRUMBLY TENACITY; PLANAR TO SUB BLOCKY; TABULAR TO PLATY TO SLIGHTLY WEDGE LIKE IN HABIT; DULL EARTHY TO SEMI WAXY LUSTER; PREDOMINATELY SMOOTH TO CLAYEY TO SLIGHT MATTE IN TEXTURE; 2-5% PALEOSOLS VISIBLE IN SAMPLE; NO OTHER VISIBLE BEDDING FEATURES.

SILTSTONE = VERY LIGHT GRAY TO LIGHT BLUSH GRAY TO MEDIUM BLUSH GRAY; CRUMBLY TO CRUMBLY TENACITY; PLANAR TO SLIGHT HACKLY FRACTURING; CUTTINGS TEND TO BE PLATY TO SLIGHT WEDGE LIKE TO SEMI TABULAR IN HABIT; SLIGHT FROSTED TO SEMI TO SLIGHT GREASY LUSTER; GRITTY TO SILTY TEXTURE.

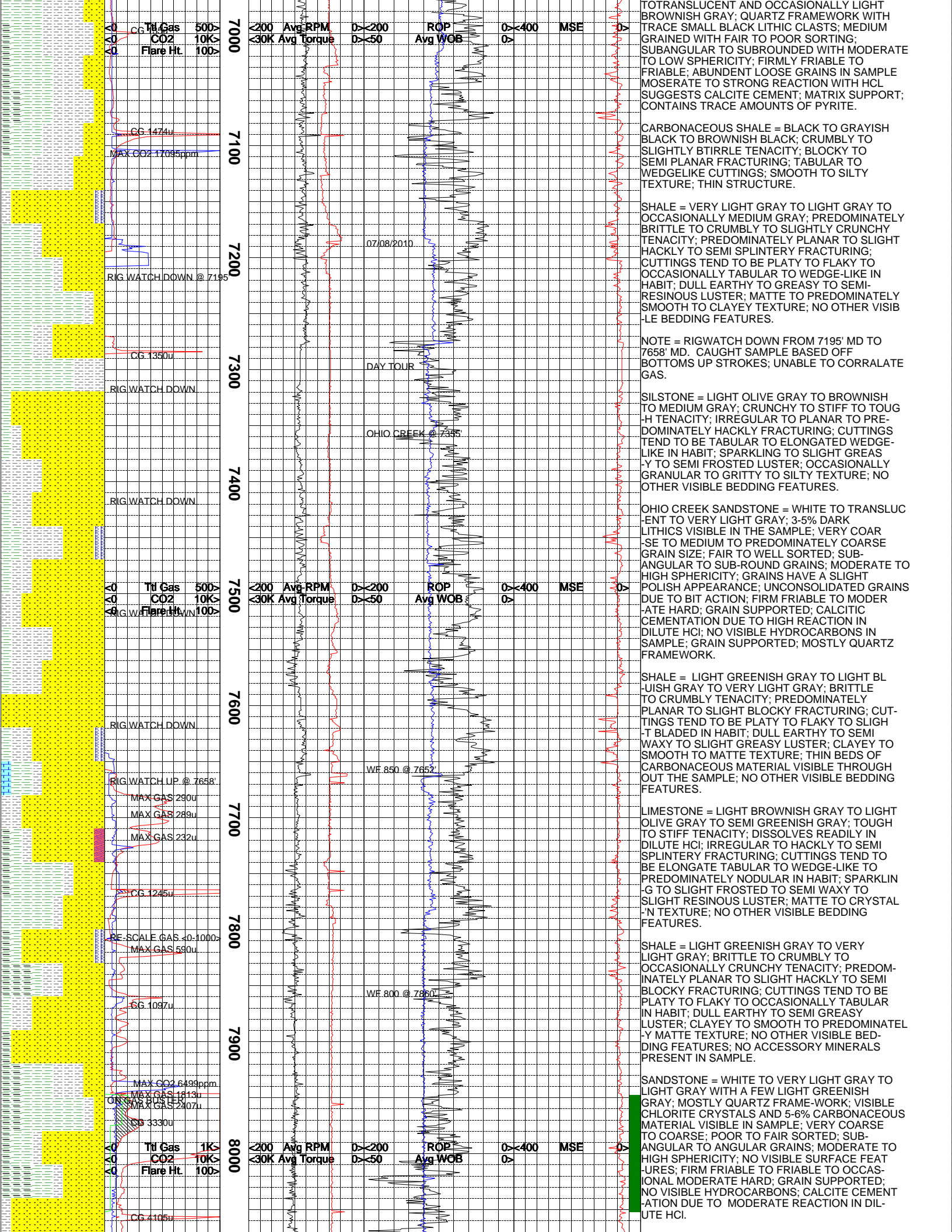
CARBONACEOUS SHALE = BROWNISH GRAY TO OLIVE GRAY TO DARK OLIVE GRAY; CRUMBLY TO CRUMBLY TO OCCASIONALLY STIFF TENACITY; PREDOMINATELY PLANAR TO SLIGHT HACKLY FRACTURING; VISIBLE BEDS OF CARBONACEOUS MATERIAL; VISIBLE VEINS OF PYRITE IN SAMPLE; CUTTINGS TEND TO BE WEDGE LIKE TO SEMI TABULAR IN HABIT; FROSTED TO EARTHY LUSTER; TEXTURE RANGES FROM SMOOTH TO SILTY; THICK STRUCTURE.

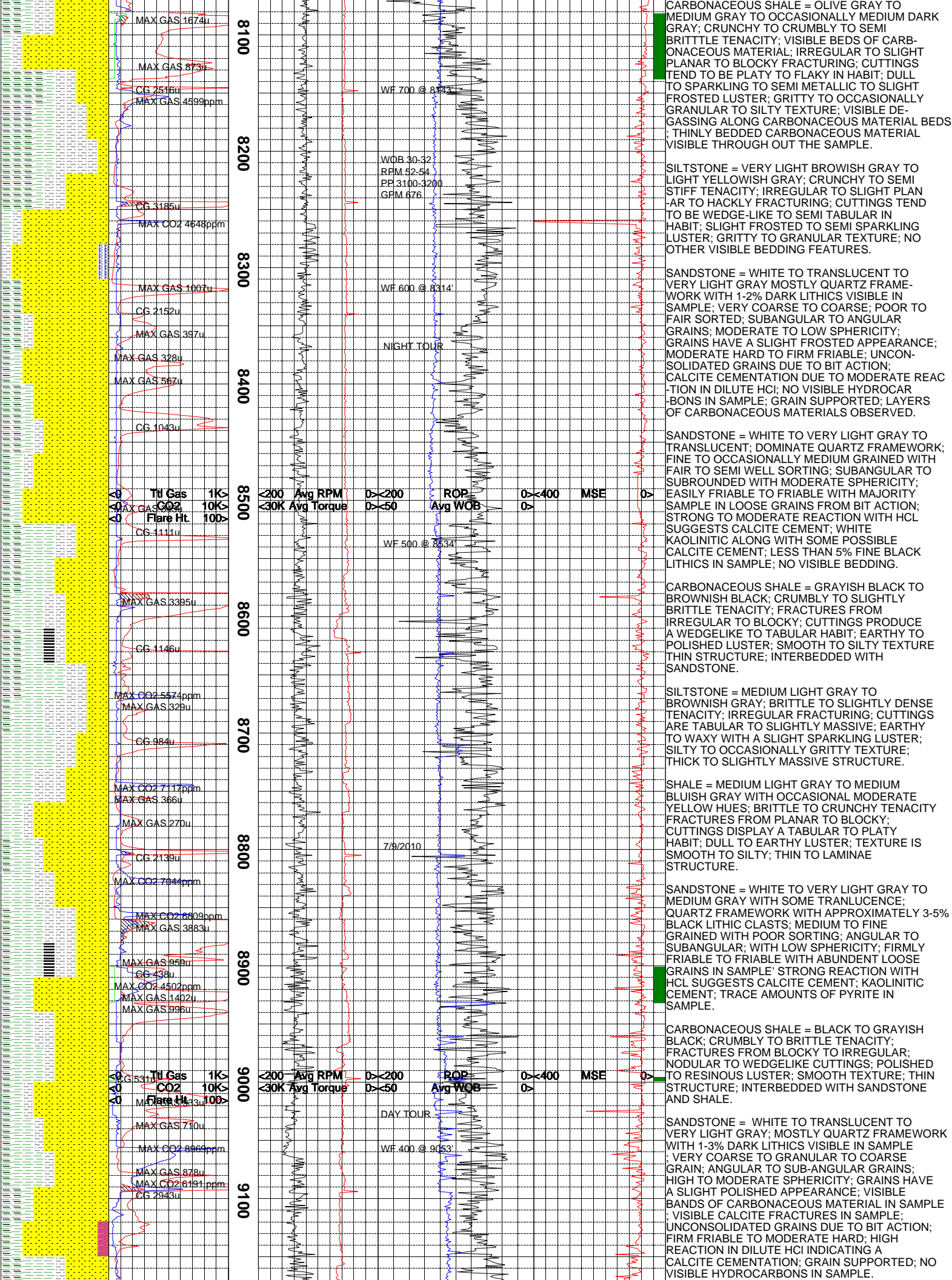
SANDSTONE = WHITE TO TRANSLUCENT TO MEDIUM LIGHT GRAY; DOMINANT QUARTZ FRAMEWORK WITH APPROXIMATELY 10% FINE BLACK LITHIC CLASTS EMBEDDED; COARSE TO FINE GRAINED WITH POOR SORTING; ANGULAR TO VERY ANGULAR WITH LOW SPHERICITY; EASILY FRIABLE TO FRIABLE TO OCCASIONALLY FIRMLY FRIABLE; STRONG TO MODERATE STRONG REACTION WITH HCL SUGGESTS CALCITE CEMENT; MATRIX SUPPORTED WITH CALCITE MATRIX; ABUNDANT PYRITE IN SAMPLE AS AN ACCESSORY MINERAL; NO VISIBLE BEDDING.

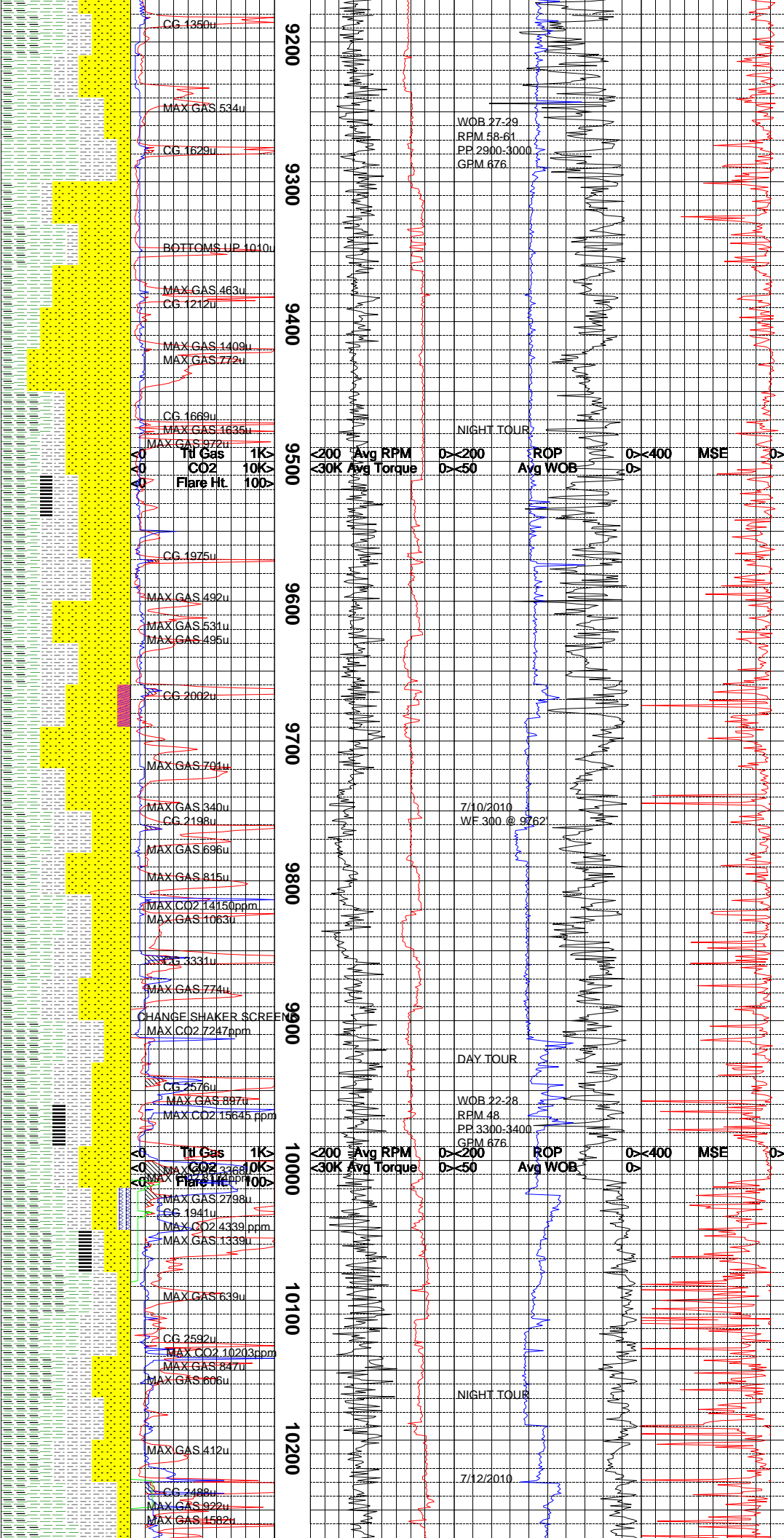
SHALE = PALE BLUE TO MEDIUM BLUSH GRAY TO MEDIUM GRAY; BRITTLE TO SLIGHTLY CRUMBLY TENACITY; FRACTURES FROM PLANAR TO SLIGHTLY SPLINTERY; CUTTINGS ARE PLATY TO FLAKY TO SEMI TABULAR; WAXY TO DULL LUSTER; SILTY TO SMOOTH TEXTURE; GRADING FROM SILTSTONE; OCCASIONAL DUSKY RED AND DARK GREENISH YELLOW HUES OBSERVED ON SOME OF THE SAMPLE; THICK STRUCTURE.

SILTSTONE = MEDIUM DARK GRAY TO MODERATE BROWN TO MODERATE OLIVE BROWN; CRUMBLY TO SLIGHTLY BRITTLE TENACITY; IRREGULAR TO BLOCKY FRACTURING; CUTTINGS ARE TABULAR TO SLIGHTLY MASSIVE HABIT; EARTHY TO WAXY LUSTER; TEXTURE MOSTLY RANGES FROM GRITTY TO SILTY AND OCCASIONALLY SLIGHTLY CLAYEY; THICK STRUCTURE.

CARBONACEOUS SHALE = GRAYISH BLACK TO







SHALE = VERY LIGHT GRAY TO YELLOWISH GRAY TO OCCASIONALLY LIGHT GREENISH GRAY ; BRITTLE TO CRUMBLY TO OCCASIONALLY SEMI-MALLEABLE TENACITY; IRREGULAR TO PREDOMINATELY PLANAR TO SEMI HACKLY FRACTURING; CUTTINGS TEND TO BE PLATY TO SEMI ELONGATED TABULAR TO SLIGHT WEDGE-LIKE IN HABIT; DULL EARTHY TO SEMI GREASY TO SLIGHT WAXY LUSTER; SMOOTH TO CLAYEY TO OCCASIONALLY MATTE TEXTURE; NO OTHER VISIBLE BEDDING FEATURES.

CARBONACEOUS SHALE = LIGHT BROWNISH GRAY TO LIGHT OLIVE GRAY TO BROWNISH BLACK; CRUNCHY TO CRUMBLY TO SEMI BRITTL-E TENACITY; IRREGULAR TO BLOCKY TO SEMI SPLINTERY FRACTURING; CUTTINGS TEND TO BE PLATY TO FLAKY IN HABIT; SLIGHT FROST-ED TO SEMI SPARKLING TO SLIGHT GREASY LUSTER; SMOOTH TO SEMI GRITTY TO SILTY TEXTURE; VISIBLE BEDS OF CARBONACEOUS MATERIAL; GRADES INTO A FINE GRAIN SILTSTONE.

SHALE = VERY LIGHT GRAY TO LIGHT BROWNIS-H GRAY TO MEDIUM GRAY; CRUNCHY TO BRITTLE TO CRUMBLY TENACITY; PREDOMINATE-LY PLANAR TO HACKLY FRACTURING; CUTTING TEND TO BE PLATY TO FLAKY TO ELONGATED TABULAR IN HABIT; DULL EARTHY TO SLIGHTLY WAXY LUSTER; TEXTURE IS SMOOTH; STRUCTURE IS THIN TO LAMINAE.

SANDSTONE = WHITE TO LIGHT GRAY TO OCCASIONALLY MEDIUM DARK GRAY; QUARTZ FRAMEWORK WITH APPROXIMATELY 5-10% BLACK LITHIC CLASTS; COARSE TO FINE GRAINED WITH POOR SORTING; ANGULAR TO SUBANGULAR WITH LOW TO MODERATE SPHERICITY; FIRMLY FRIABLE TO OCCASIONALLY MODERATE HARD; MODERATE TO STRONG REACTION WITH HCL SUGGESTS CALCITE CEMENT; MATRIX SUPPORT; FINER GRAINED SANDSTONE TENDS TO BE MORE BROWNISH GRAY AND IS GRADING INTO SILTSTONE.

SHALE = MEDIUM BLuish GRAY TO MEDIUM LIGHT GRAY WITH OCCASIONAL MODERATE YELLOW HUES; TENACITY IS BRITTLE TO CRUNCHY TO OCCASIONALLY SLIGHTLY CRUMBLY PLANAR TO SPLINTERY FRACTURING; CUTTINGS ARE FLAKY TO TABULAR; SMOOTH TO SILTY TEXTURE; LAMINAE TO THIN STRUCTURE; FRACTURE FILL OBSERVED RUNNING THROUGH SOME OF THE SAMPLE.

CARBONACEOUS SHALE = BLACK TO GRAYISH BLACK; BRITTLE TENACITY; BLOCKY TO IRREGULAR FRACTURING; CUTTINGS ARE NODULAR TO WEDGELIKE; RESINOUS TO POLISHED LUSTER; SMOOTH TO SILTY TEXTURE THIN STRUCTURE; HIGH GAS ASSOCIATED WITH SAMPLE.

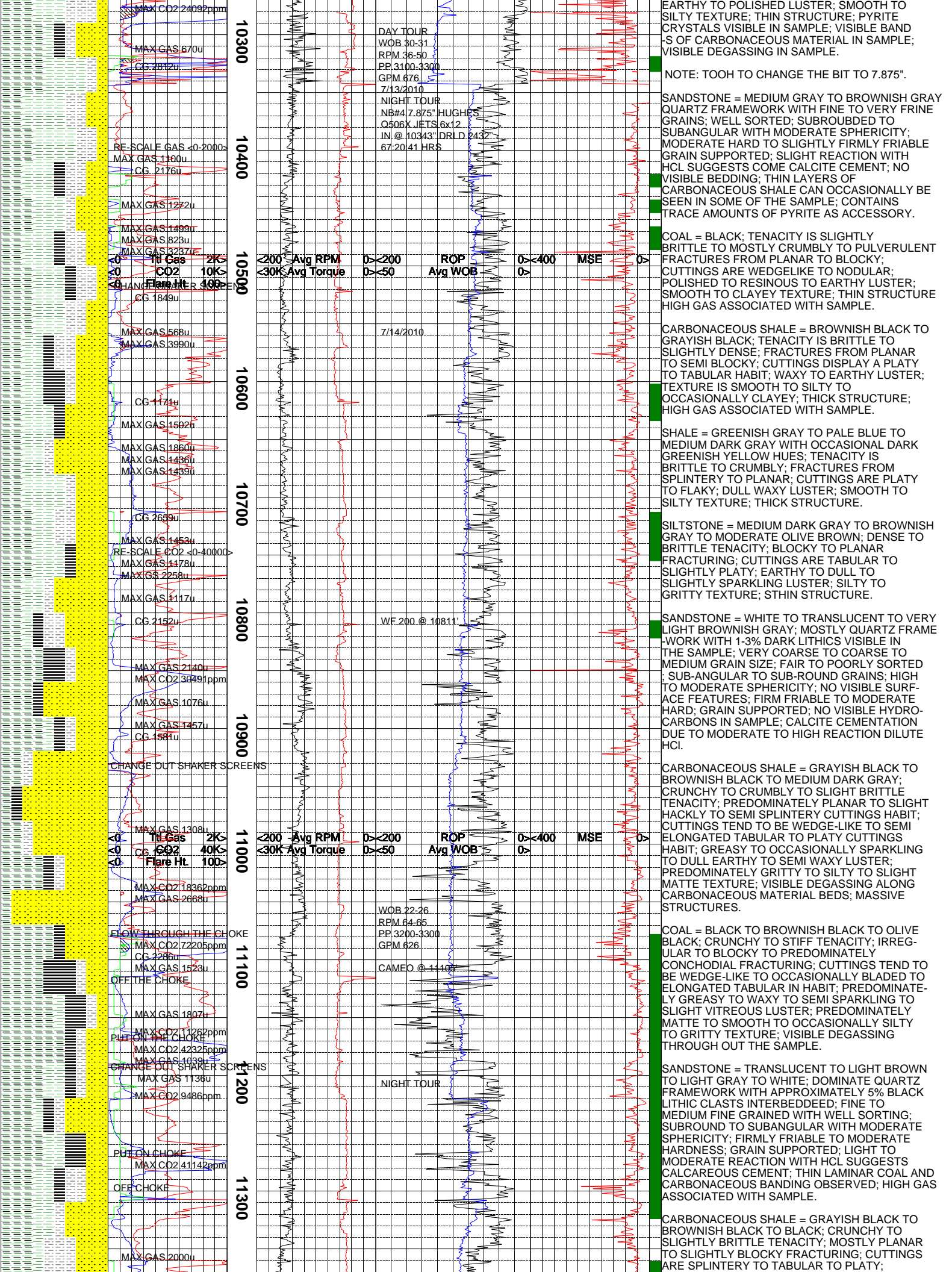
SILTSTONE = BROWNISH GRAY TO OLIVE GRAY; DENSE TO CRUMBLY TENACITY; FRACTURES FROM BLOCKY TO IRREGULAR; CUTTINGS ARE MASSIVE TO TABULAR; EARTHY TO DULL TO WAXY WITH A SLIGHT SPARKLING LUSTER; SILTY TO GRITTY TEXTURE; GRADING FROM FINE GRAINED SANDSTONE.

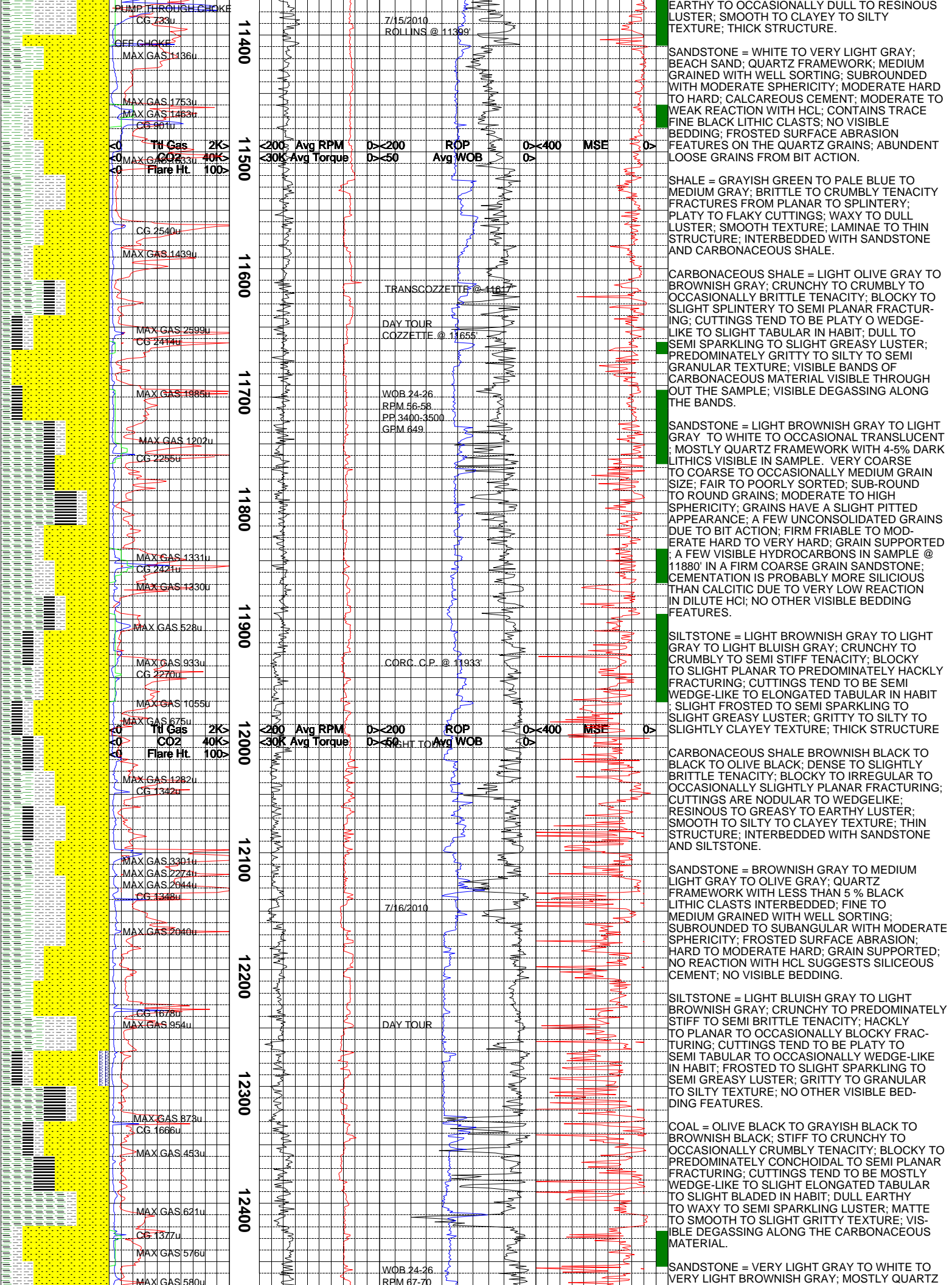
SANDSTONE = LIGHT BROWNISH GRAY TO LIGHT OLIVE GRAY TO WHITE TO VERY LIGHT GRAY; MOSTLY QUARTZ FRAMEWORK WITH 5-6 % DARK LITHICS VISIBLE IN THE SAMPLE; COARSE TO MEDIUM TO FINE GRAIN; POOR TO FAIR SORT-ED; SUB-ROUND TO ROUND GRAINS; LOW TO MODERATE SPHERICITY; GRAINS HAVE A SLIGHT FROSTED APPEARANCE; FIRM FRIABLE TO MODERATE HARD; CALCITE CEMENTATION DUE TO HIGH REACTION IN DILUTE HCl; NO VISIBLE HYDROCARBONS IN SAMPLE; GRAIN SUPPORTED; VISIBLE BANDS OF CARBONACEOUS SHALE.

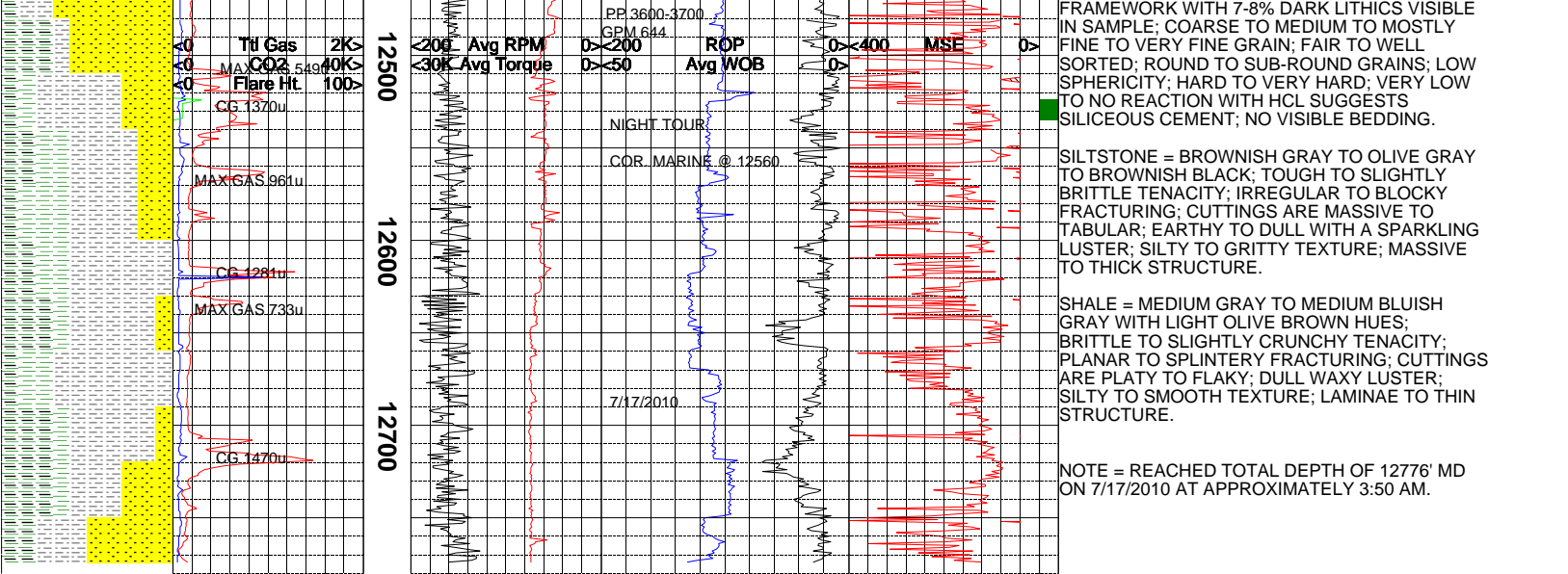
SHALE = VERY LIGHT GREENISH GRAY TO LIGHT GRAY; CRUNCHY TO CRUMBLY TO SEMI BRITTLE TENACITY; PREDOMINATELY PLANAR TO SLIGHT BLOCKY FRACTURING; CUTTINGS TEND TO BE PLATY TO FLAKY IN HABIT; DULL EARTHY TO SEMI GREASY LUSTER; SMOOTH TO CLAYEY TO SLIGHT MATTE TEXTURE; NO OTHER VISIBLE BEDDING FEATURES.

SILTSTONE = VERY LIGHT GRAY TO MEDIUM LIGHT GRAY TO LIGHT OLIVE GRAY; CRUNCHY TO CRUMBLY TO PREDOMINATELY STIFF TENA-CITY; PLANAR TO IRREGULAR TO SLIGHTLY BLOCKY FRACTURING; CUTTINGS ARE TABULAR TO SLIGHTLY MASSIVE; DULL TO EARTHY WITH A SLIGHT SPARKLING LUSTER; SILTY TO GRITTY TEXTURE; THICK STRUCTURE.

CARBONACEOUS SHALE = BROWNISH BLACK TO GRAYISH BLACK TO BLACK; BRITTLE TO CRUMBLY TENACITY; IRREGULAR TO PLANAR TO OCCASIONALLY SLIGHTLY BLOCKY FRACTURING; CUTTINGS ARE TABULAR TO WEDGELIKE;







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