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New Iberia, LA
(337) 364-2322
Anchorage, AK
(907) 561-2465

MUDLOG MD

COMPANY ExxonMobil Production
WELL FRU 197-28A5
FIELD PICEANCE CREEK
REGION ROCKIES
COORDINATES LAT: 39.9344449000
LON: 108.295900000
ELEVATION GL = 6,082'
KB = 6,109'
COUNTY, STATE RIO BLANCO, CO
API INDEX 051031163300
SPUD DATE 08/05/2010
CONTRACTOR HELMRICH AND PAYNE
CO. REP. RICKY T. OWENS
RIG/TYPE 215 / FLEX 3
LOGGING UNIT UNIT 051
GEOLOGISTS GEORGE BAKER
DEVIN CLAAR
ADD. PERSONS BILL JOHANNING
TRISH ORTIZ
CO. GEOLOGIST MEL, ANIE BIGGS

LOG INTERVAL

CASING DATA

DEPTHS: 149' TO 12,529'
DATES: 8/05/2010 TO 8/25/2010
SCALE: 1" = 100'

16" AT 120'
10.75" AT 3,566'
AT
AT

MUD TYPES

HOLE SIZE

SPUD MUD TO 3,576'
BARO-TROL PLUS TO 12,529'
TO
TO

14.75" TO 3,576'
8.75" TO 12,529'
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	

<300 ROP 0>
 ft/hr
 <50 Avg WOB 0>
 klbs

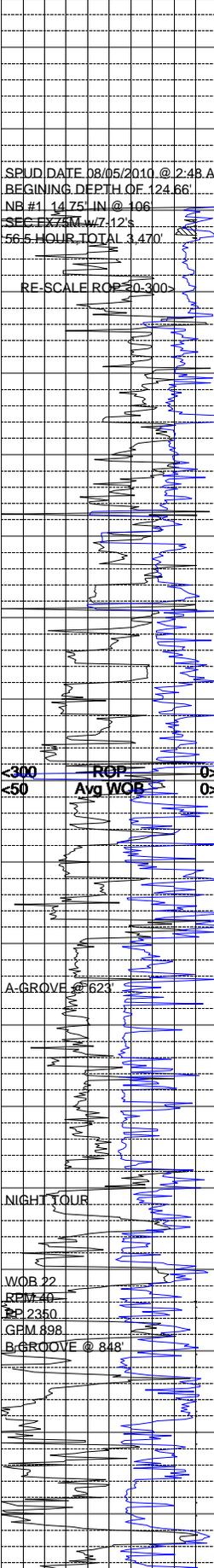
Depth

Lithology

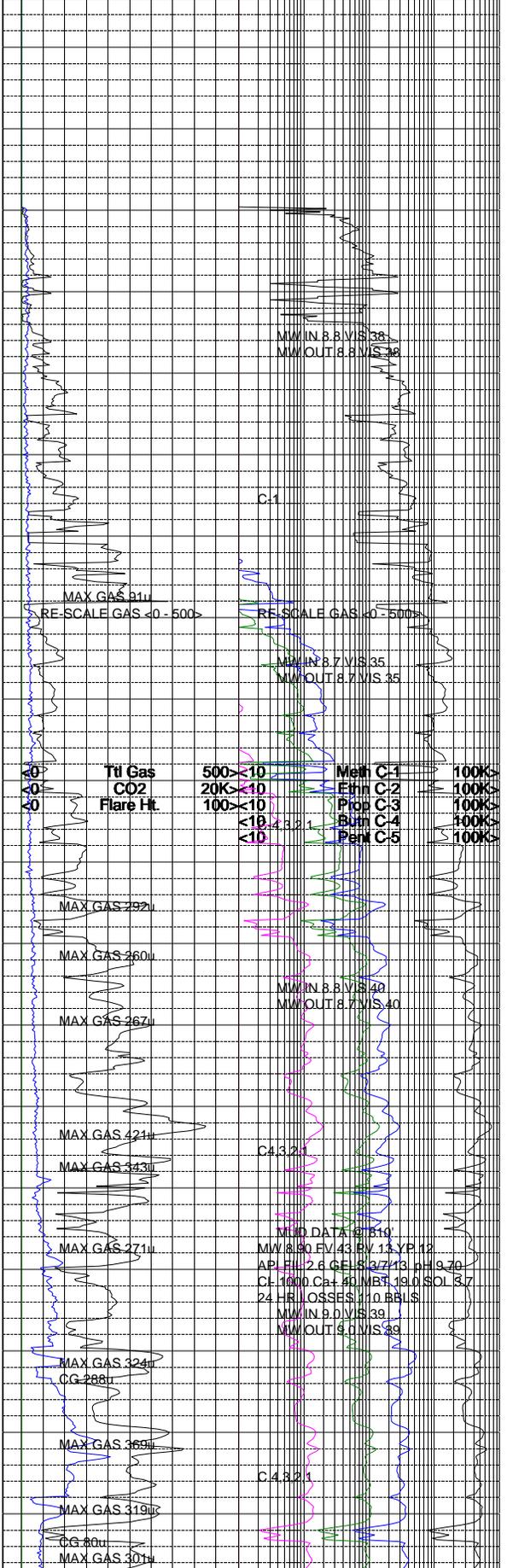
MGS
 <0 Ttl Gas 4K> <10 Meth C-1 100K>
 units ppm
 <10 Ethn C-2 100K>
 <0 CO2 10K> <10 Prop C-3 100K>
 ppm
 <0 Flare Ht. 100> <10 Butn C-4 100K>
 ft <10 Pent C-5 100K>

Interp. Lith

Remarks
 Survey Data, Mud Reports, Other Info.



100
 200
 300
 400
 500
 600
 700
 800
 900
 10



Interp. Lith

Remarks
 Survey Data, Mud Reports, Other Info.

SPLUD DATE 08/05/2010 @ 2:48 A.M.
 BEGINING DEPTH OF 124.66'
 NB #1 14.75 IN @ 106
 SEC EX 7.7M @ 7.12s
 56.5 HOUR TOTAL 3.470

RE-SCALE ROP 30-300

<300 ROP 0>
 <50 Avg WOB 0>

A-GROVE @ 623

NIGHT TOUR

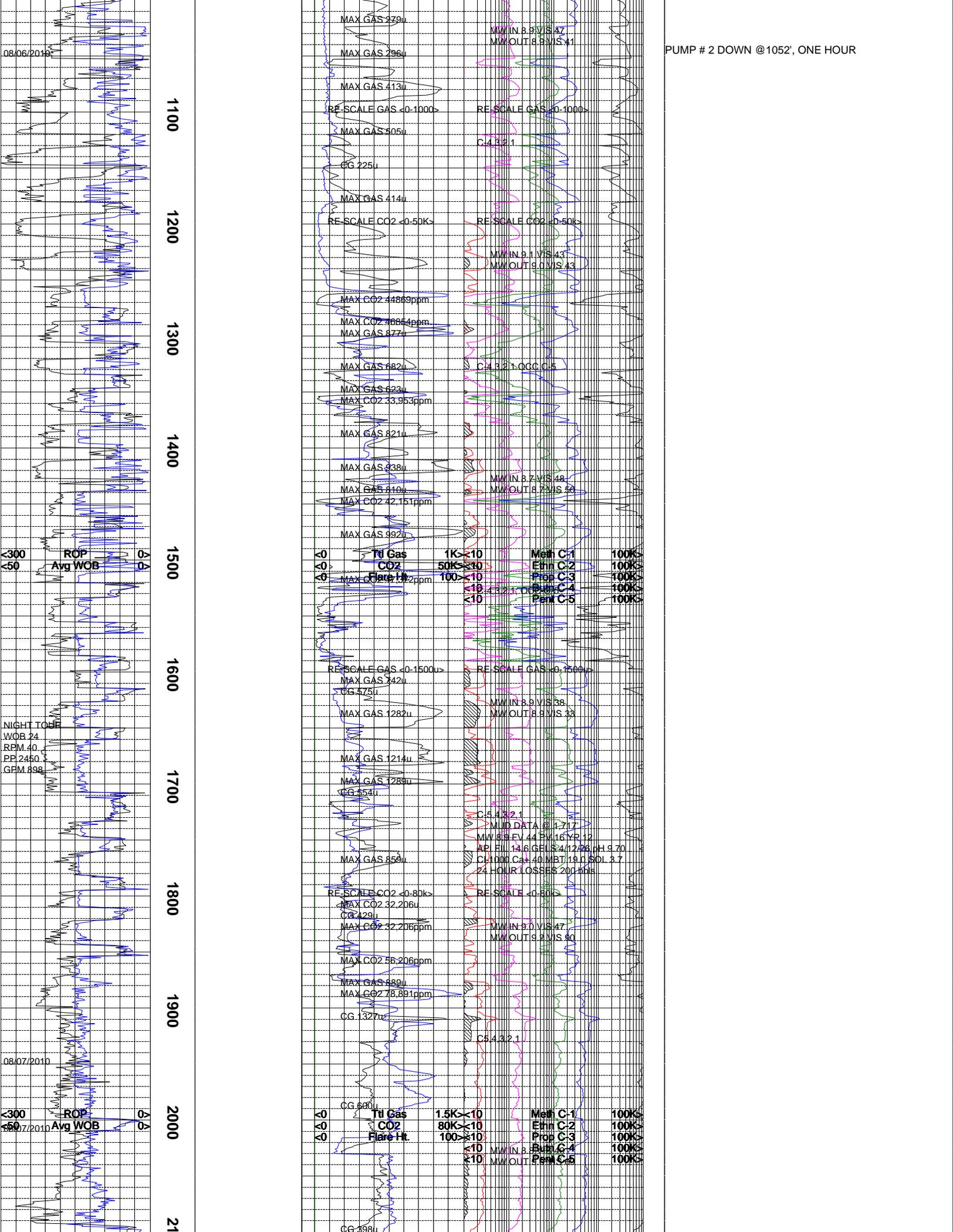
WOB 22
 RPM 40
 BP 2350
 GPM 898
 B-GROOVE @ 848

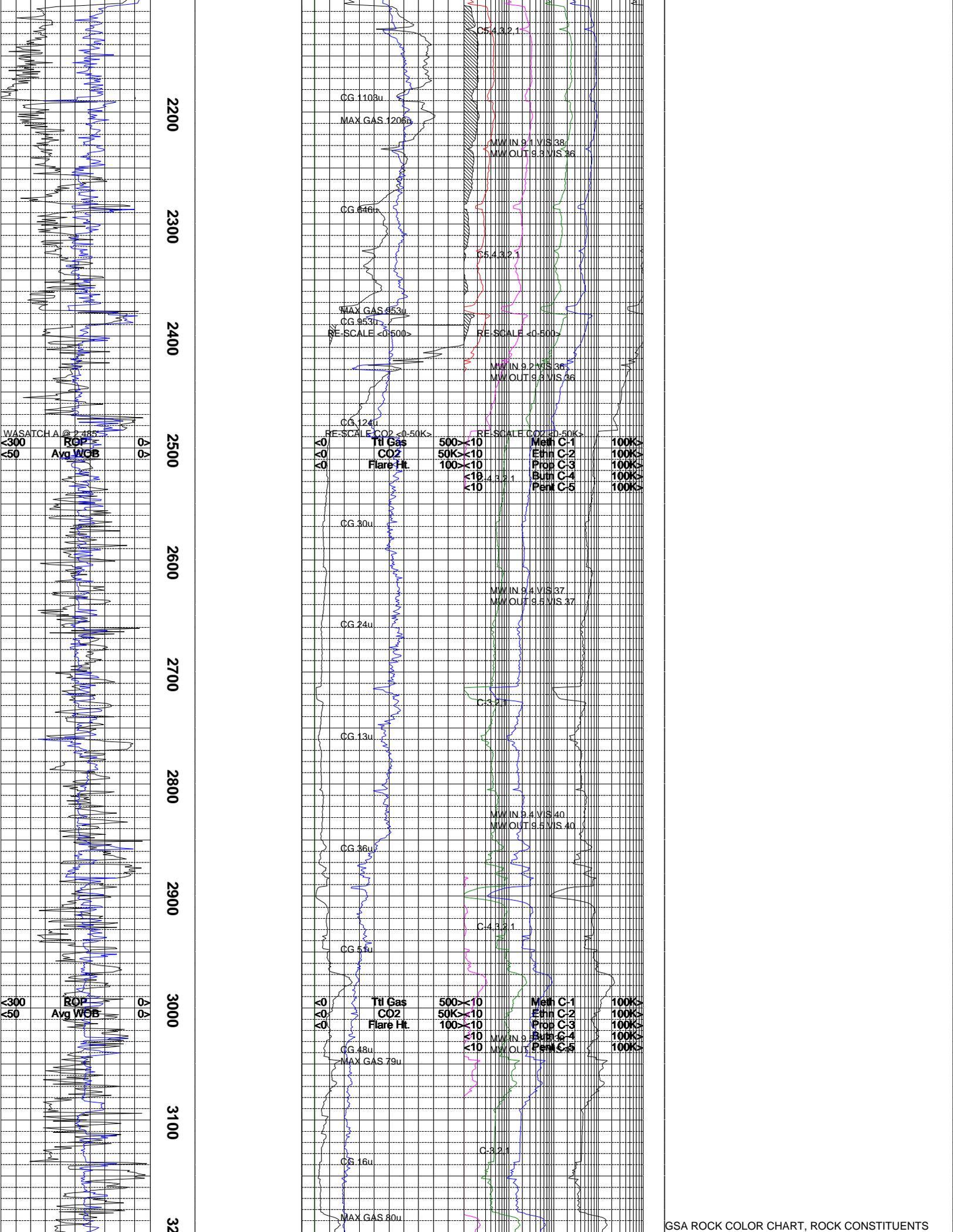
<300 ROP 0>

<0 Ttl Gas 500> <10 Meth C-1 100K>
 <0 CO2 20K> <10 Ethn C-2 100K>
 <0 Flare Ht. 100> <10 Prop C-3 100K>
 <10 4.3.2.1 Butn C-4 100K>
 <10 Pent C-5 100K>

MUD DATA @ 810
 MW 8.80 FV 43 BV 13 YP 12
 AP FL 2.6 GE 8.3 Z 13 p 19.70
 CF 1000 Ca+ 50 NBS 19.0 SOL 3.7
 24 HR LOSSES 110 BBL/S
 MW IN 9.0 VIS 39
 MW OUT 5.0 VIS 39

PUMPS DOWN @ 962' , 1 1/2 HOURS





2200

2300

2400

2500

2600

2700

2800

2900

3000

3100

3200

CG 1108u
MAX GAS 1206u

CG 646u

MAX GAS 953u
CG 953u
RE-SCALE <0.500>

CG 124u
RE-SCALE CO2 <0.50K>

CG 30u

CG 24u

CG 13u

CG 36u

CG 54u

CG 48u
MAX GAS 79u

CG 16u

MAX GAS 80u

C5.4.3.2.1

C5.4.3.2.1

C5.4.3.2.1

C5.4.3.2.1

C5.4.3.2.1

C5.4.3.2.1

M/M IN 9.1 V/S 38
M/M OUT 9.3 V/S 36

M/M IN 9.2 V/S 36
M/M OUT 9.8 V/S 36

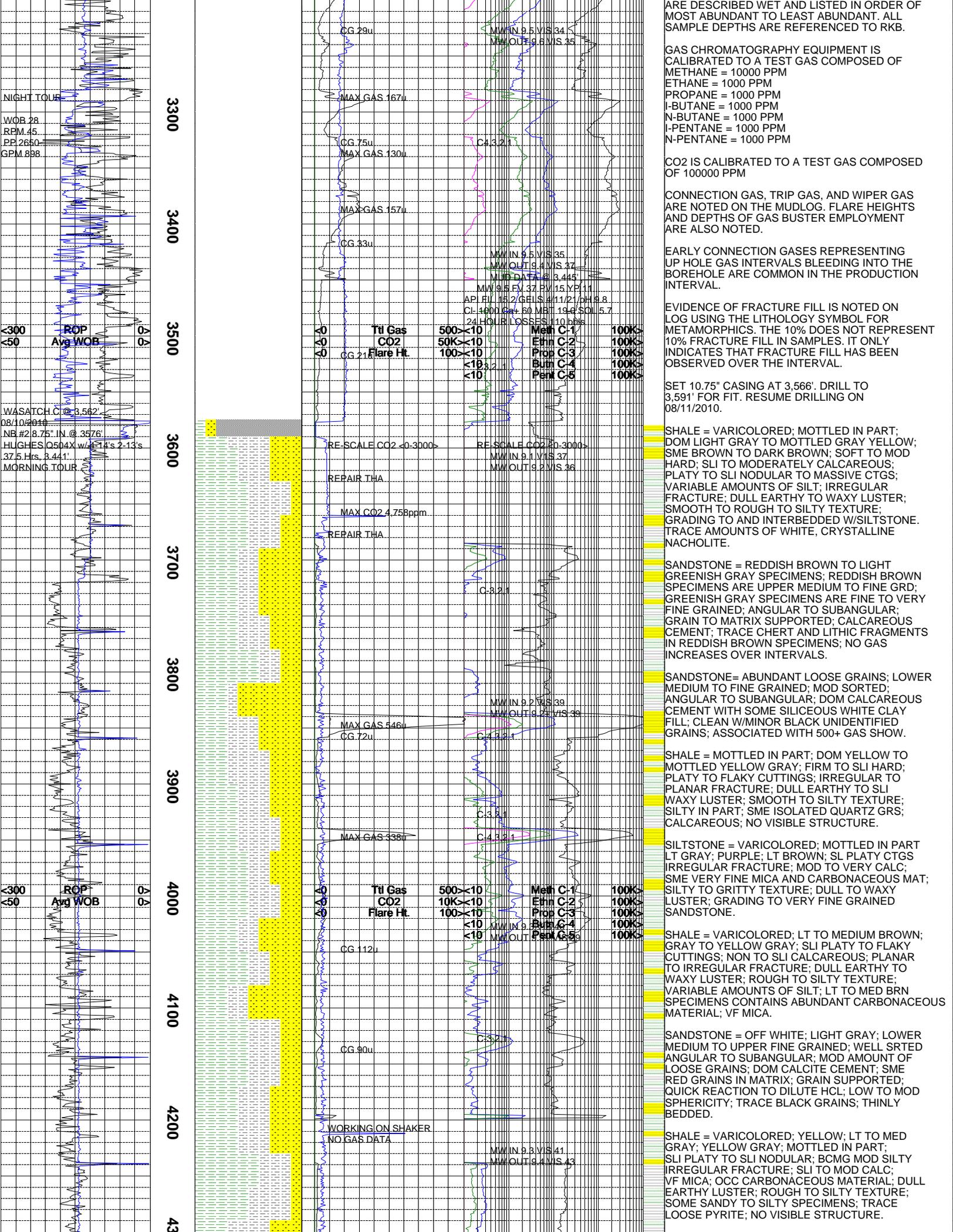
M/M IN 9.4 V/S 37
M/M OUT 9.5 V/S 37

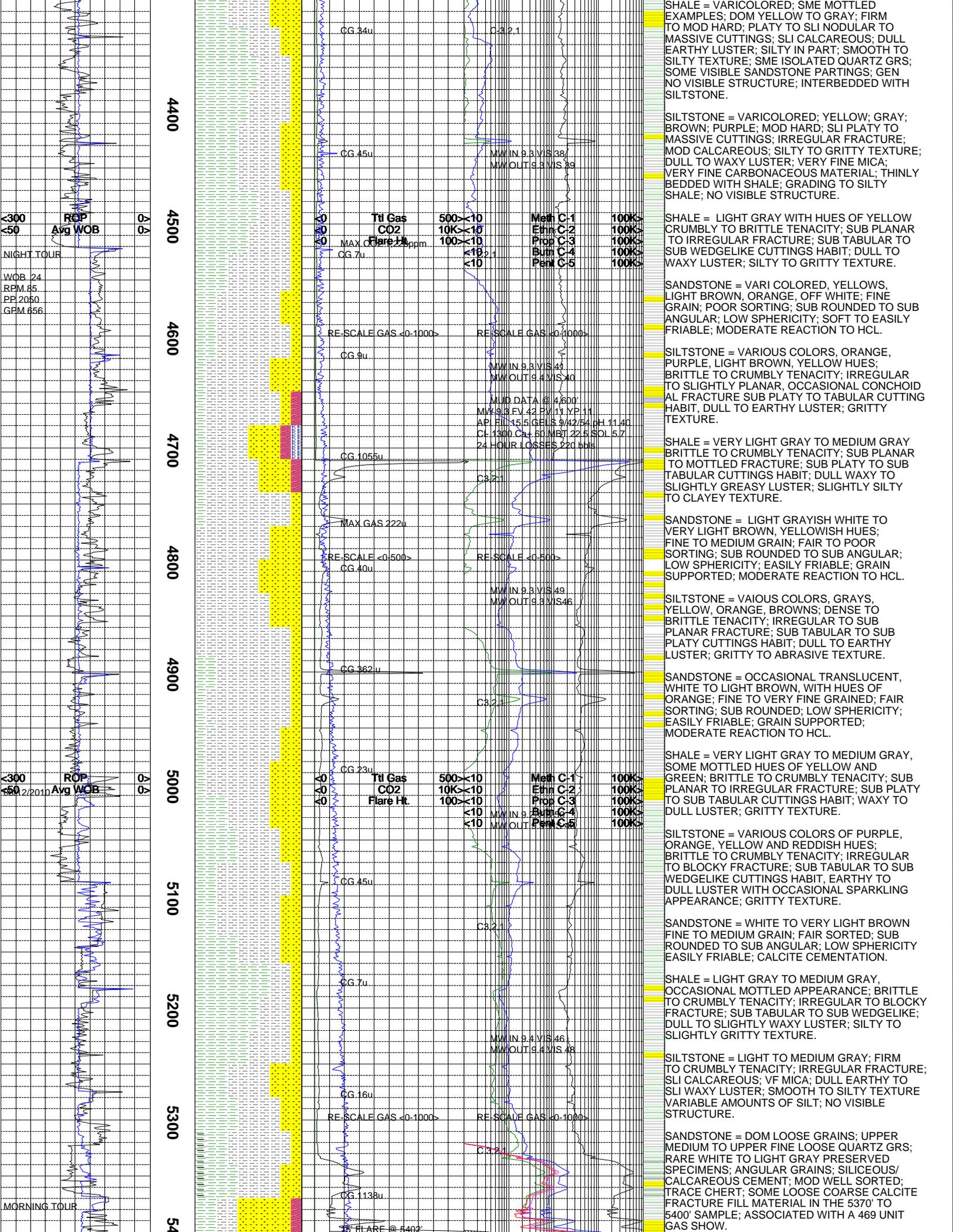
M/M IN 9.4 V/S 40
M/M OUT 9.5 V/S 40

M/M IN 9.4 V/S 36
M/M OUT 9.5 V/S 36

Ttl Gas	500 > 10	Meth C-1	100K >
CO2	50K > 10	Ethn C-2	100K >
Flare Ht	100 > 10	Prop C-3	100K >
	< 10	Butn C-4	100K >
	< 10	Pent C-5	100K >

WASATCH A @ 7-285
300
50
ROP
Avg WGB
Δ
Δ





MORNING TOUR
WOB 25K
RPM 70
PP 2400
GPM 656

300 ROP
50 Avg WOB

NB# 3.8.75" IN @ 7017
Hughes Q506FX W6-12
95 Hrs 4255'
8/14/2010

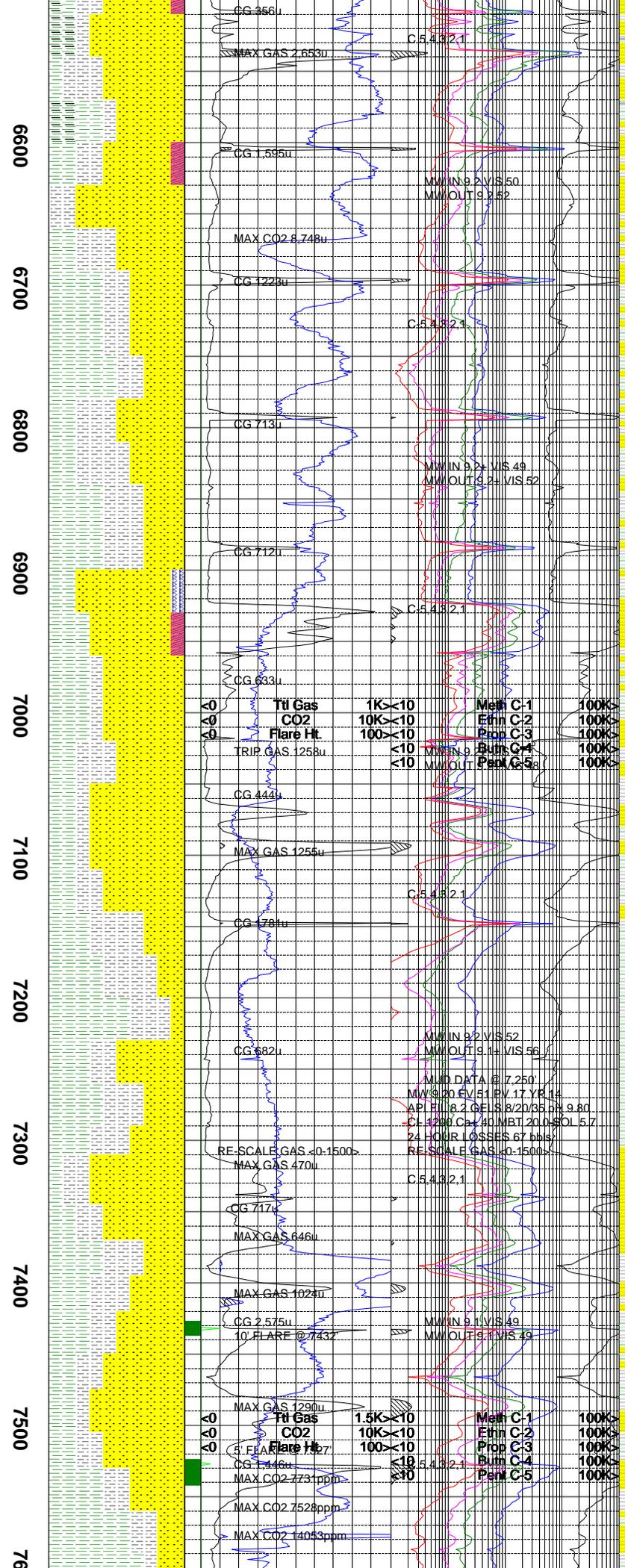
NIGHT TOUR

OHIO CREEK @ 7.310

WOB 28
RPM 70
PP 2200
GPM 629

300 ROP
50 Avg WOB

WE 850 @ 7.580



CARBONACEOUS SHALE = DARK BROWN TO VERY DARK BROWN; DENSE TENACITY; BLOCKY TO PLANAR FRACTURE; SCALY TO NODULAR CUTTINGS HABIT; EARTHY LUSTER; GRITTY TO ROUGH TEXTURE; SME CARBONACEOUS MATERIAL.

SANDSTONE = OFFWHITE TO LIGHT GRAY; HARD PRESERVED SPECIMENS; FINE TO VERY FINE GRAINED; ANGULAR TO SUBROUNDED; MOD WELL SORTED; LOW TO MOD SPHERICITY; DOM CALCITE CEMENT WITH FAST REACTION TO DILUTE HCL; POOR VISIBLE POROSITY; MOD CLEAN WITH TRACE AMOUNTS OF UNIDENT BLACK GRAINS; THINLY BEDDED WITH SHALE.

SHALE = DOM LIGHT TO MEDIUM GRAY; SME REDBROWN SPECIMENS; SOFT TO SLI HARD; PLATY TO FLAKY CUTTINGS; PLANAR TO BLKY TO IRREGULAR FRACTURE; MODERATELY CALC; VF MICA; OCC W/SME CARBONACEOUS MATERIAL NO VISIBLE STRUCTURE.

SANDSTONE = LIGHT BROWN TO WHITE; FLAKY CUTTINGS; FINE TO VERY FINE GRAINED; ANG TO SUBANGULAR; DOM CALCITE CEMENT; GRAIN SUPPORTED; TRACE VERY HARD SILICEOUS SPECIMENS; OCC SME ARGILLACEOUS PARTINGS TIGHT POROSITY; OCC SPECKLED WITH CARB MATERIAL; THINLY BEDDED WITH SHALE.

SILTSTONE = LT TO MEDIUM GRAY; MOTTLED REDDISH GRAY EXAMPLES; HARD; PLATY TO FLAKY CUTTINGS; IRREGULAR FRACTURE; SILTY TEXTURE; SLI SPARKLING LUSTER; VERY CALCAREOUS; OCC SPECKLED WITH CARB MATERIAL; TRACE PYRITE.

SANDSTONE = ABUNDANT LOOSE GRAINS; WHITE TO SALT AND PEPPER APPEARANCE; LOWER MEDIUM TO FINE GRAINED; ANGULAR TO SUBANGULAR; SILICEOUS CEMENT W/MINOR LOOSE WHITE KAOLIN CLAY MATRIX MATERIAL IN SAMPLES; TRACE MICA; RED TO GREEN GRS IN MATRIX; COARSE CALCITE ADHERING TO GRAIN CLUSTERS- FRACTURE FILL MATERIAL IN THE 6930'-6960' SAMPLES; ASSOCIATED W MINOR GAS INCREASES.

TRIP OUT AT 7017' TO CHANGE OUT BHA

SANDSTONE = ABUNDANT CLEAR TO TRANSP GRAINS; WH TO LT GRAY; SALT AND PEPPER APPEARANCE; DOM LOWER MEDIUM GRAINED; MOD HARD PRESERVED SPECIMENS; GRAIN SUPPORTED; SILICEOUS CEMENT W/MINOR CALCITE FILL; SME WHITE CLAY SILICEOUS FILL; BROWN MICA; SME SHALE PARTINGS; TRACE CHERT; LITHIC FRAGMENTS; DOM ANGULAR GRAINS; ASSOCIATED WITH MINOR GAS SHOWS.

SHALE = LT GRAY TO LT GREENISH GRAY; SME LT BROWN; SOME MOTTLED PURPLE TO BROWN; SOFT TO CRUNCHY; PLATY TO FLAKY CUTTINGS; IRREGULAR FRACTURE; NON CALCAREOUS; DULL EARTHY TO WAXY LUSTER; SMOOTH TO SLI SILTY TEXTURE; VF MICA; SME SCATTERED CARBONACEOUS MATERIAL; DECREASE SILT CONTENT WITH DEPTH; NO VISIBLE STRUCTURE.

SANDSTONE = WHITE; FINE TO MEDIUM GRAIN; FAIR SORTED; SUB ROUNDED TO SUB ANGULAR; LOW SPHERICITY; FIRM TO FRI; GRAIN SUPPORTED; MODERATE TO LOW REACTION TO HCL DILUTION; UNIDENTIFIED DARK INCLUSIONS, SALT AND PEPPER APPEARANCE; INCREASE IN ROP AND GAS

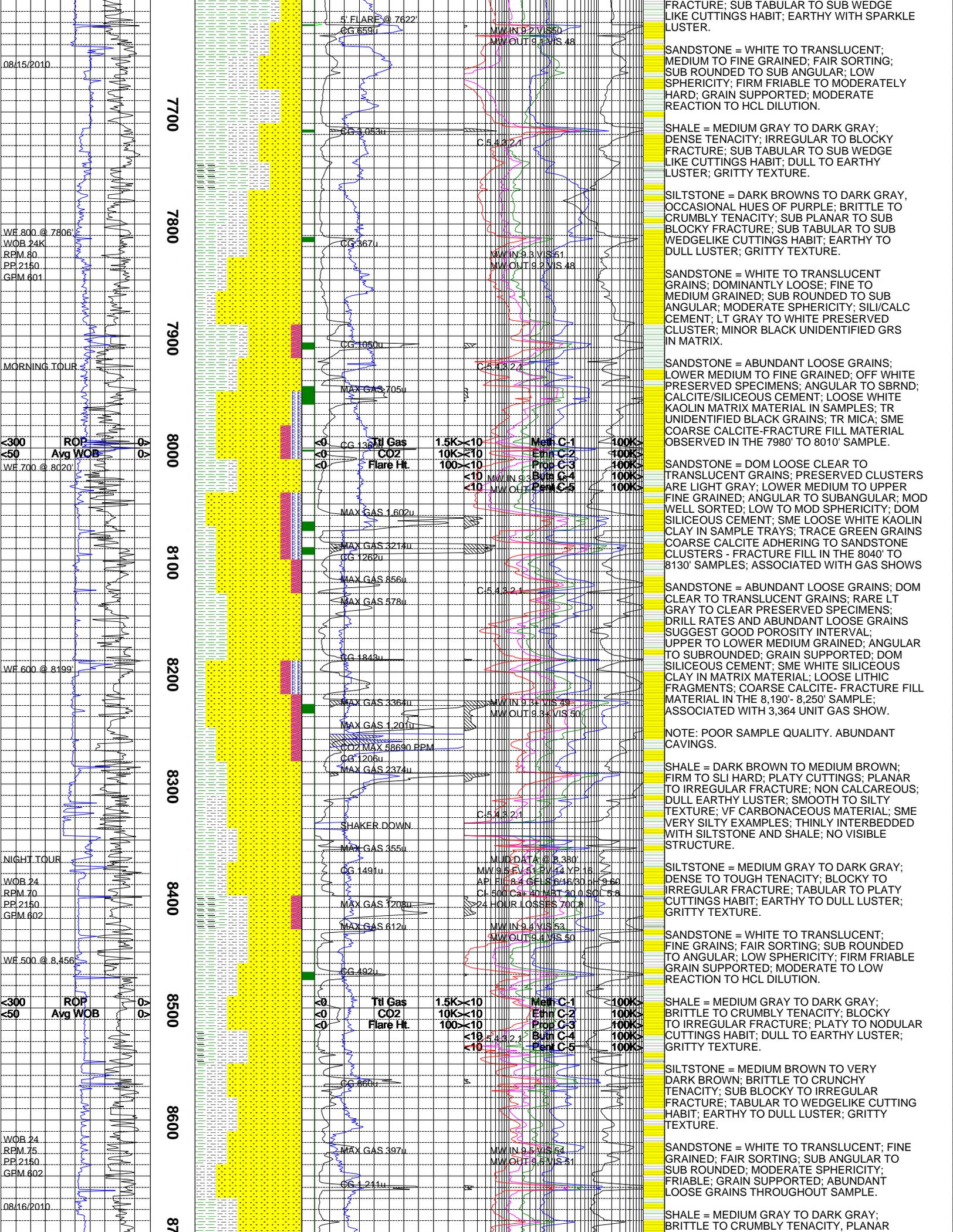
SHALE = MEDIUM GRAY TO DARK GRAY; BRITTLE TO CRUMBLY TENACITY; BLOCKY TO PLANAR FRACTURE; SUB TABULAR TO ELONGATED CUTTINGS HABIT; WAXY TO GREASY LUSTER; CLAYEY TO SILTY TEXTURE.

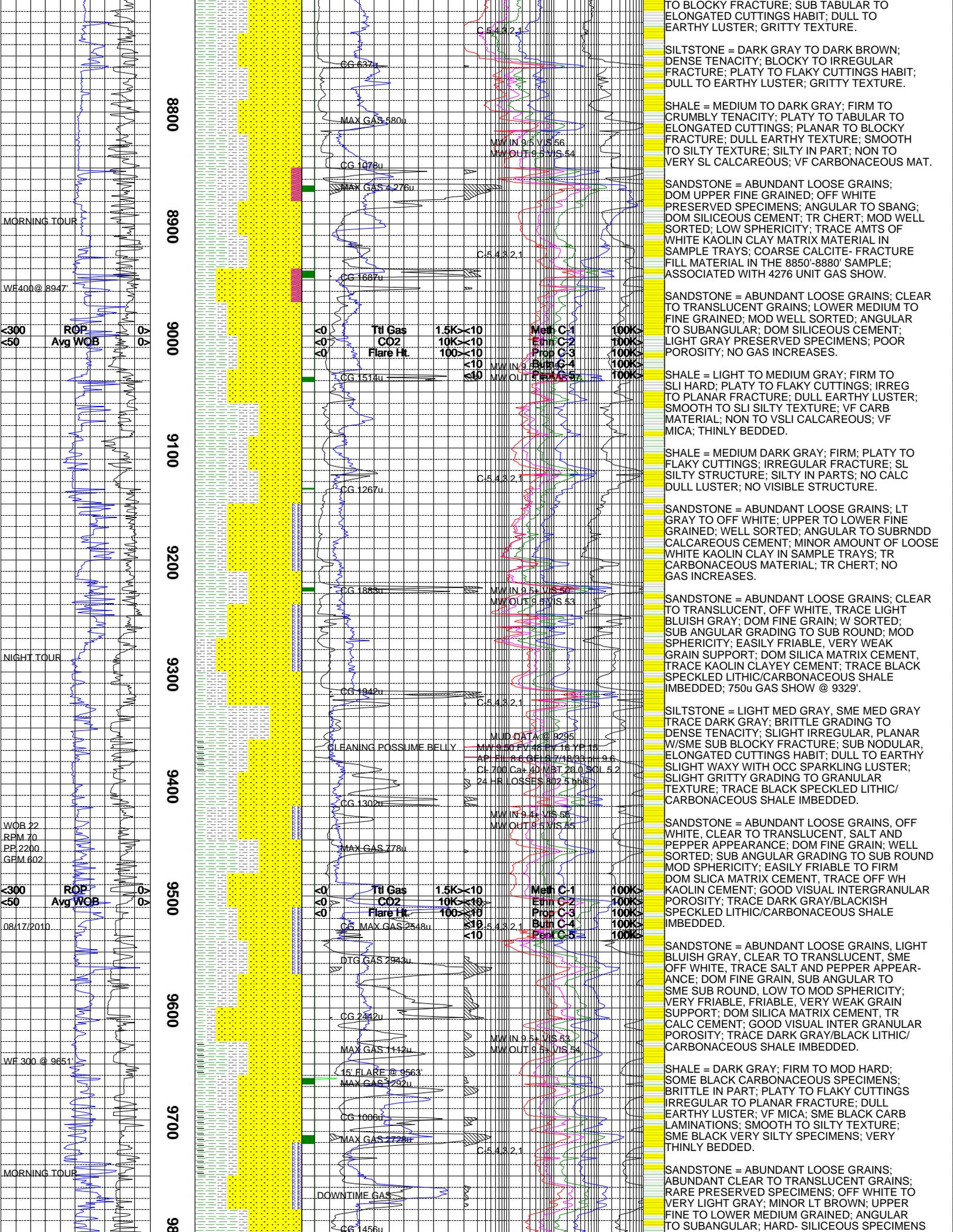
SILTSTONE = MEDIUM GRAY TO DARK GRAY; DENSE TENACITY; BLOCKY TO IRREGULAR FRACTURE; PLATY TO TABULAR CUTTINGS HABIT; DULL TO EARTHY LUSTER; GRITTY TEXTURE.

SANDSTONE = DOMINANTLY WHITE; OCCASIONAL DARK BROWN; FINE TO MEDIUM GRAINED; FAIR SORTED; SUB ROUNDED TO SUB ANGULAR; LOW SPHERICITY; GRAIN SUPPORTED; LOW REACTION TO DILUTE HCL; UNIDENTIFIED BLACK INCLUSIONS THROUGH OUT.

SHALE = MEDIUM GRAY TO DARK GRAY; DENSE TO TOUGH TENACITY; BLOCKY TO IRREGULAR FRACTURE; SUB PLATY TO ELONGATED CUTTINGS HABIT; WAXY TO DULL LUSTER; SILTY TO GRITTY TEXTURE.

SILTSTONE = MEDIUM BROWN WITH OCCASIONAL REDDISH HUES; BRITTLE TO CRUMBLY TENACITY; PLANAR TO BLOCKY





8800
8900
9000
9100
9200
9300
9400
9500
9600
9700
9800

MORNING TOUR
WE400 @ 8947
300 ROP
50 Avg WOB
NIGHT TOUR
WOB 22
RPM 70
PP 2200
GPM 602
08/17/2010
MORNING TOUR

CG 637u
MAX GAS 580u
CG 1078u
MAX GAS 4276u
CG 1687u
Ttl Gas 1.5K < 10
CO2 10K < 10
Flare Ht 100 < 10
CG 1514u
CG 1267u
CG 1885u
CG 1842u
CLEANING POSSUM BELLY
CG 1302u
MAX GAS 778u
CG MAX GAS 2548u
DTG GAS 2993u
CG 2342u
MAX GAS 1412u
15' FLARE @ 9563'
MAX GAS 292u
CG 1006u
MAX GAS 2726u
CG 1456u

Mud Data @ 8295
Mw 9.50 Fv 48.67 Jc 1.12 YP 15
AP 21.86 GFLR 7748/03 21.96
CL 700 Cat. 40 MBT 28.0 SOL 5.2
24 HR LOSSES 802.5 bbls

Meth C-1 100K <
Ethn C-2 100K <
Prog C-3 100K <
Burn C-4 100K <
Perf C-5 100K <

TO BLOCKY FRACTURE; SUB TABULAR TO ELONGATED CUTTINGS HABIT; DULL TO EARTHY LUSTER; GRITTY TEXTURE.

SILTSTONE = DARK GRAY TO DARK BROWN; DENSE TENACITY; BLOCKY TO IRREGULAR FRACTURE; PLATY TO FLAKY CUTTINGS HABIT; DULL TO EARTHY LUSTER; GRITTY TEXTURE.

SHALE = MEDIUM TO DARK GRAY; FIRM TO CRUMBLY TENACITY; PLATY TO TABULAR TO ELONGATED CUTTINGS; PLANAR TO BLOCKY FRACTURE; DULL EARTHY TEXTURE; SMOOTH TO SILTY TEXTURE; SILTY IN PART; NON TO VERY SL CALCAREOUS; VF CARBONACEOUS MAT.

SANDSTONE = ABUNDANT LOOSE GRAINS; DOM UPPER FINE GRAINED; OFF WHITE PRESERVED SPECIMENS; ANGULAR TO SBANG; DOM SILICEOUS CEMENT; TR CHERT; MOD WELL SORTED; LOW SPHERICITY; TRACE AMTS OF WHITE KAOLIN CLAY MATRIX MATERIAL IN SAMPLE TRAYS; COARSE CALCITE FRACTURE FILL MATERIAL IN THE 8850'-8880' SAMPLE; ASSOCIATED WITH 4276 UNIT GAS SHOW.

SANDSTONE = ABUNDANT LOOSE GRAINS; CLEAR TO TRANSLUCENT GRAINS; LOWER MEDIUM TO FINE GRAINED; MOD WELL SORTED; ANGULAR TO SUBANGULAR; DOM SILICEOUS CEMENT; LIGHT GRAY PRESERVED SPECIMENS; POOR POROSITY; NO GAS INCREASES.

SHALE = LIGHT TO MEDIUM GRAY; FIRM TO SLI HARD; PLATY TO FLAKY CUTTINGS; IRREG TO PLANAR FRACTURE; DULL EARTHY LUSTER; SMOOTH TO SLI SILTY TEXTURE; VF CARB MATERIAL; NON TO VSLI CALCAREOUS; VF MICA; THINLY BEDDED.

SHALE = MEDIUM DARK GRAY; FIRM; PLATY TO FLAKY CUTTINGS; IRREGULAR FRACTURE; SL SILTY STRUCTURE; SILTY IN PARTS; NO CALC DULL LUSTER; NO VISIBLE STRUCTURE.

SANDSTONE = ABUNDANT LOOSE GRAINS; LT GRAY TO OFF WHITE; UPPER TO LOWER FINE GRAINED; WELL SORTED; ANGULAR TO SUBRNDD CALCAREOUS CEMENT; MINOR AMOUNT OF LOOSE WHITE KAOLIN CLAY IN SAMPLE TRAYS; TR CARBONACEOUS MATERIAL; TR CHERT; NO GAS INCREASES.

SANDSTONE = ABUNDANT LOOSE GRAINS; CLEAR TO TRANSLUCENT, OFF WHITE, TRACE LIGHT BLUISH GRAY; DOM FINE GRAIN; W SORTED; SUB ANGULAR GRADING TO SUB ROUND; MOD SPHERICITY; EASILY FRIABLE, VERY WEAK GRAIN SUPPORT; DOM SILICA MATRIX CEMENT, TRACE KAOLIN CLAYEY CEMENT; TRACE BLACK SPECKLED LITHIC/CARBONACEOUS SHALE IMBEDDED; 750u GAS SHOW @ 9329'.

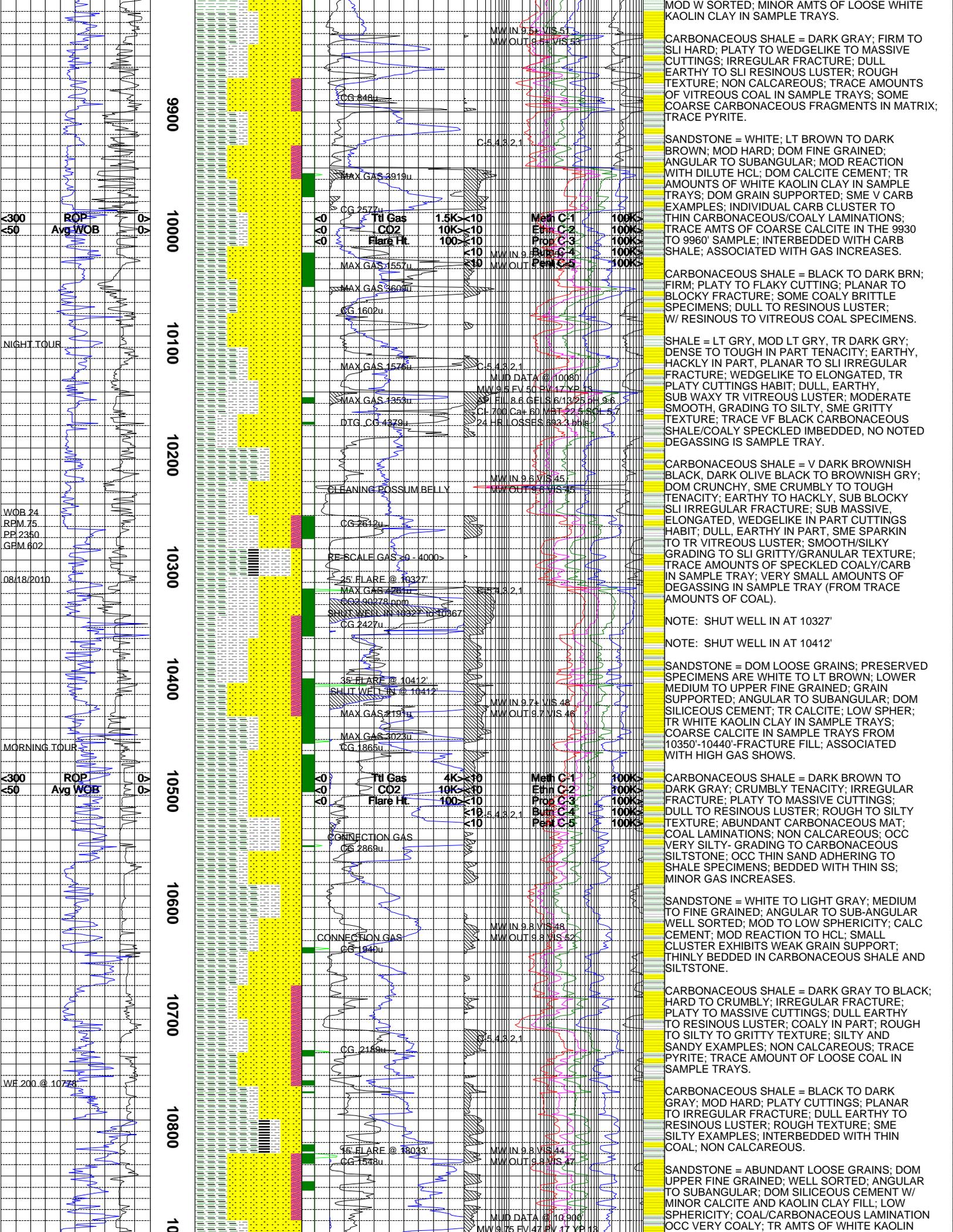
SILTSTONE = LIGHT MED GRAY, SME MED GRAY TRACE DARK GRAY; BRITTLE GRADING TO DENSE TENACITY; SLIGHT IRREGULAR, PLANAR W/SME SUB BLOCKY FRACTURE; SUB NODULAR, ELONGATED CUTTINGS HABIT; DULL TO EARTHY SLIGHT WAXY WITH OCC SPARKLING LUSTER; SLIGHT GRITTY GRADING TO GRANULAR TEXTURE; TRACE BLACK SPECKLED LITHIC/CARBONACEOUS SHALE IMBEDDED.

SANDSTONE = ABUNDANT LOOSE GRAINS, OFF WHITE, CLEAR TO TRANSLUCENT, SALT AND PEPPER APPEARANCE; DOM FINE GRAIN; WELL SORTED; SUB ANGULAR GRADING TO SUB ROUND MOD SPHERICITY; EASILY FRIABLE TO FIRM DOM SILICA MATRIX CEMENT, TRACE OFF WH KAOLIN CEMENT; GOOD VISUAL INTERGRANULAR POROSITY; TRACE DARK GRAY/BLACKISH SPECKLED LITHIC/CARBONACEOUS SHALE IMBEDDED.

SANDSTONE = ABUNDANT LOOSE GRAINS, LIGHT BLUISH GRAY, CLEAR TO TRANSLUCENT, SME OFF WHITE, TRACE SALT AND PEPPER APPEARANCE; DOM FINE GRAIN, SUB ANGULAR TO SME SUB ROUND, LOW TO MOD SPHERICITY; VERY FRIABLE, FRIABLE, VERY WEAK GRAIN SUPPORT; DOM SILICA MATRIX CEMENT, TR CALC CEMENT; GOOD VISUAL INTER GRANULAR POROSITY; TRACE DARK GRAY/BLACK LITHIC/CARBONACEOUS SHALE IMBEDDED.

SHALE = DARK GRAY; FIRM TO MOD HARD; SOME BLACK CARBONACEOUS SPECIMENS; BRITTLE IN PART; PLATY TO FLAKY CUTTINGS IRREGULAR TO PLANAR FRACTURE; DULL EARTHY LUSTER; VF MICA; SME BLACK CARB LAMINATIONS; SMOOTH TO SILTY TEXTURE; SME BLACK VERY SILTY SPECIMENS; VERY THINLY BEDDED.

SANDSTONE = ABUNDANT LOOSE GRAINS; ABUNDANT CLEAR TO TRANSLUCENT GRAINS; RARE PRESERVED SPECIMENS; OFF WHITE TO VERY LIGHT GRAY; MINOR LT BROWN; UPPER FINE TO LOWER MEDIUM GRAINED; ANGULAR TO SUBANGULAR; HARD- SILICEOUS SPECIMENS



9900
10000
10100
10200
10300
10400
10500
10600
10700
10800
10

300 ROP
50 Avg WOB

NIGHT TOUR

WOB 24
RPM 75
PP 2350
GPM 602

08/18/2010

MORNING TOUR

300 ROP
50 Avg WOB

WE 200 @ 10720

CG 448u

MAX GAS 3919u

CG 2577u

Ttl Gas 1.5K <10
CO2 10K <10
Flare Ht 100 <10

MAX GAS 1557u

MAX GAS 3609u

CG 1602u

MAX GAS 1576u

MAX GAS 1353u

DTG CG 4379u

CLEANING DOSSUM BELLY

CG 2612u

RE SCALE GAS = 0 - 4000 >

25 FLARE @ 10327

MAX GAS 4281u

CG 2427u

35 FLARE @ 10412

SHUT WELL IN @ 10412

MAX GAS 2191u

MAX GAS 3073u

CG 1865u

CONNECTION GAS
CG 2869u

CONNECTION GAS
CG 1948u

CG 2169u

45 FLARE @ 10803

CG 1548u

MW IN 9.5 VIS 51
MW OUT 9.5 VIS 53

C 5 4 3 2 1

Meth C-1 100K <
Ethn C-2 100K <
Prog C-3 100K <
Burn C-4 100K <
Perm C-5 100K <

MW IN 9.5 VIS 45
MW OUT 9.5 VIS 47

C 5 4 3 2 1

Meth C-1 100K <
Ethn C-2 100K <
Prog C-3 100K <
Burn C-4 100K <
Perm C-5 100K <

MW IN 9.7 VIS 48
MW OUT 9.7 VIS 46

C 5 4 3 2 1

Meth C-1 100K <
Ethn C-2 100K <
Prog C-3 100K <
Burn C-4 100K <
Perm C-5 100K <

MW IN 9.5 VIS 48
MW OUT 9.3 VIS 52

C 5 4 3 2 1

Meth C-1 100K <
Ethn C-2 100K <
Prog C-3 100K <
Burn C-4 100K <
Perm C-5 100K <

MW IN 9.5 VIS 44
MW OUT 9.3 VIS 47

MWD DATA @ 10,906
MW 9.75 FV 47 PV 17 YP 13

CARBONACEOUS SHALE = DARK GRAY; FIRM TO SLI HARD; PLATY TO WEDGELIKE TO MASSIVE CUTTINGS; IRREGULAR FRACTURE; DULL EARTHY TO SLI RESINOUS LUSTER; ROUGH TEXTURE; NON CALCAREOUS; TRACE AMOUNTS OF VITREOUS COAL IN SAMPLE TRAYS; SOME COARSE CARBONACEOUS FRAGMENTS IN MATRIX; TRACE PYRITE.

SANDSTONE = WHITE; LT BROWN TO DARK BROWN; MOD HARD; DOM FINE GRAINED; ANGULAR TO SUBANGULAR; MOD REACTION WITH DILUTE HCL; DOM CALCITE CEMENT; TR AMOUNTS OF WHITE KAOLIN CLAY IN SAMPLE TRAYS; DOM GRAIN SUPPORTED; SME V CARB EXAMPLES; INDIVIDUAL CARB CLUSTER TO THIN CARBONACEOUS/COALY LAMINATIONS; TRACE AMTS OF COARSE CALCITE IN THE 9930 TO 9960' SAMPLE; INTERBEDDED WITH CARB SHALE; ASSOCIATED WITH GAS INCREASES.

CARBONACEOUS SHALE = BLACK TO DARK BRN; FIRM; PLATY TO FLAKY CUTTING; PLANAR TO BLOCKY FRACTURE; SOME COALY BRITTLE SPECIMENS; DULL TO RESINOUS LUSTER; W/ RESINOUS TO VITREOUS COAL SPECIMENS.

SHALE = LT GRY, MOD LT GRY, TR DARK GRY; DENSE TO TOUGH IN PART TENACITY; EARTHY, HACKLY IN PART, PLANAR TO SLI IRREGULAR FRACTURE; WEDGELIKE TO ELONGATED, TR PLATY CUTTINGS HABIT; DULL, EARTHY, SUB WAXY TR VITREOUS LUSTER; MODERATE SMOOTH, GRADING TO SILTY, SME GRITTY TEXTURE; TRACE VF BLACK CARBONACEOUS SHALE/COALY SPECKLED IMBEDDED, NO NOTED DEGASSING IS SAMPLE TRAY.

CARBONACEOUS SHALE = V DARK BROWNISH BLACK, DARK OLIVE BLACK TO BROWNISH GRY; DOM CRUNCHY, SME CRUMBLY TO TOUGH TENACITY; EARTHY TO HACKLY, SUB BLOCKY SLI IRREGULAR FRACTURE; SUB MASSIVE, ELONGATED, WEDGELIKE IN PART CUTTINGS HABIT; DULL, EARTHY IN PART, SME SPARKIN TO TR VITREOUS LUSTER; SMOOTH/SILKY GRADING TO SLI GRITTY/GRAANULAR TEXTURE; TRACE AMOUNTS OF SPECKLED COALY/CARB IN SAMPLE TRAY; VERY SMALL AMOUNTS OF DEGASSING IN SAMPLE TRAY (FROM TRACE AMOUNTS OF COAL).

NOTE: SHUT WELL IN AT 10327'

NOTE: SHUT WELL IN AT 10412'

SANDSTONE = DOM LOOSE GRAINS; PRESERVED SPECIMENS ARE WHITE TO LT BROWN; LOWER MEDIUM TO UPPER FINE GRAINED; GRAIN SUPPORTED; ANGULAR TO SUBANGULAR; DOM SILICEOUS CEMENT; TR CALCITE; LOW SPHER; TR WHITE KAOLIN CLAY IN SAMPLE TRAYS; COARSE CALCITE IN SAMPLE TRAYS FROM 10350'-10440'-FRACTURE FILL; ASSOCIATED WITH HIGH GAS SHOWS.

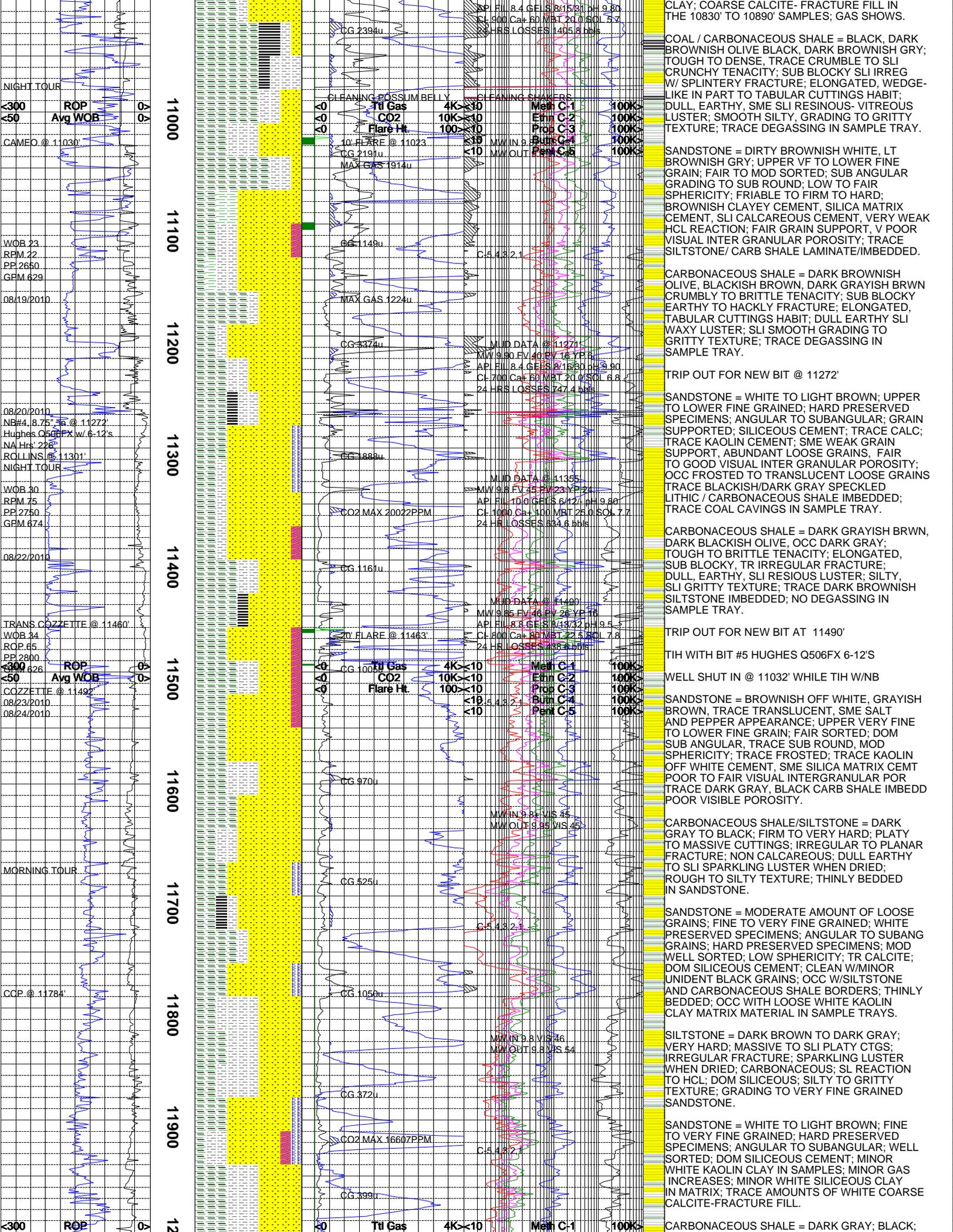
CARBONACEOUS SHALE = DARK BROWN TO DARK GRAY; CRUMBLY TENACITY; IRREGULAR FRACTURE; PLATY TO MASSIVE CUTTINGS; DULL TO RESINOUS LUSTER; ROUGH TO SILTY TEXTURE; ABUNDANT CARBONACEOUS MAT; COAL LAMINATIONS; NON CALCAREOUS; OCC VERY SILTY- GRADING TO CARBONACEOUS SILTSTONE; OCC THIN SAND ADHERING TO SHALE SPECIMENS; BEDDED WITH THIN SS; MINOR GAS INCREASES.

SANDSTONE = WHITE TO LIGHT GRAY; MEDIUM TO FINE GRAINED; ANGULAR TO SUB-ANGULAR WELL SORTED; MOD TO LOW SPHERICITY; CALC CEMENT; MOD REACTION TO HCL; SMALL CLUSTER EXHIBITS WEAK GRAIN SUPPORT; THINLY BEDDED IN CARBONACEOUS SHALE AND SILTSTONE.

CARBONACEOUS SHALE = DARK GRAY TO BLACK; HARD TO CRUMBLY; IRREGULAR FRACTURE; PLATY TO MASSIVE CUTTINGS; DULL EARTHY TO RESINOUS LUSTER; COALY IN PART; ROUGH TO SILTY TO GRITTY TEXTURE; SILTY AND SANDY EXAMPLES; NON CALCAREOUS; TRACE PYRITE; TRACE AMOUNT OF LOOSE COAL IN SAMPLE TRAYS.

CARBONACEOUS SHALE = BLACK TO DARK GRAY; MOD HARD; PLATY CUTTINGS; PLANAR TO IRREGULAR FRACTURE; DULL EARTHY TO RESINOUS LUSTER; ROUGH TEXTURE; SME SILTY EXAMPLES; INTERBEDDED WITH THIN COAL; NON CALCAREOUS.

SANDSTONE = ABUNDANT LOOSE GRAINS; DOM UPPER FINE GRAINED; WELL SORTED; ANGULAR TO SUBANGULAR; DOM SILICEOUS CEMENT W/ MINOR CALCITE AND KAOLIN CLAY FILL; LOW SPHERICITY; COAL/CARBONACEOUS LAMINATION OCC VERY COALY; TR AMTS OF WHITE KAOLIN



COAL / CARBONACEOUS SHALE = BLACK, DARK BROWNISH OLIVE BLACK, DARK BROWNISH GRAY; TOUGH TO DENSE, TRACE CRUMBLE TO SLI CRUNCHY TENACITY; SUB BLOCKY SLI IRREG W/ SPLINTER FRACTURE; ELONGATED, WEDGE-LIKE IN PART TO TABULAR CUTTINGS HABIT; DULL, EARTHY, SME SLI RESINOUS-VITREOUS LUSTER; SMOOTH SILTY, GRADING TO GRITTY TEXTURE; TRACE DEGASSING IN SAMPLE TRAY.

SANDSTONE = DIRTY BROWNISH WHITE, LT BROWNISH GRAY; UPPER VF TO LOWER FINE GRAIN; FAIR TO MOD SORTED; SUB ANGULAR GRADING TO SUB ROUND; LOW TO FAIR SPHERICITY; FRIABLE TO FIRM TO HARD; BROWNISH CLAYEY CEMENT, SILICA MATRIX CEMENT, SLI CALCAREOUS CEMENT, VERY WEAK HCL REACTION; FAIR GRAIN SUPPORT, V POOR VISUAL INTER GRANULAR POROSITY; TRACE SILTSTONE/ CARB SHALE LAMINATE/IMBEDDED.

CARBONACEOUS SHALE = DARK BROWNISH OLIVE, BLACKISH BROWN, DARK GRAYISH BRWN CRUMBLY TO BRITTLE TENACITY; SUB BLOCKY EARTHY TO HACKLY FRACTURE; ELONGATED, TABULAR CUTTINGS HABIT; DULL EARTHY SLI WAXY LUSTER; SLI SMOOTH GRADING TO GRITTY TEXTURE; TRACE DEGASSING IN SAMPLE TRAY.

TRIP OUT FOR NEW BIT @ 11272'

SANDSTONE = WHITE TO LIGHT BROWN; UPPER TO LOWER FINE GRAINED; HARD PRESERVED SPECIMENS; ANGULAR TO SUBANGULAR; GRAIN SUPPORTED; SILICEOUS CEMENT; TRACE CALC; TRACE KAOLIN CEMENT; SME WEAK GRAIN SUPPORT, ABUNDANT LOOSE GRAINS, FAIR TO GOOD VISUAL INTER GRANULAR POROSITY; OCC FROSTED TO TRANSLUCENT LOOSE GRAINS TRACE BLACKISH/DARK GRAY SPECKLED LITHIC / CARBONACEOUS SHALE IMBEDDED; TRACE COAL CAVINGS IN SAMPLE TRAY.

CARBONACEOUS SHALE = DARK GRAYISH BRWN, DARK BLACKISH OLIVE, OCC DARK GRAY; TOUGH TO BRITTLE TENACITY; ELONGATED, SUB BLOCKY, TR IRREGULAR FRACTURE; DULL, EARTHY, SLI RESIOUS LUSTER; SILTY, SLI GRITTY TEXTURE; TRACE DARK BROWNISH SILTSTONE IMBEDDED; NO DEGASSING IN SAMPLE TRAY.

TRIP OUT FOR NEW BIT AT 11490'

TIH WITH BIT #5 HUGHES Q506FX 6-12'S

WELL SHUT IN @ 11032' WHILE TIH W/NB

SANDSTONE = BROWNISH OFF WHITE, GRAYISH BROWN, TRACE TRANSLUCENT, SME SALT AND PEPPER APPEARANCE; UPPER VERY FINE TO LOWER FINE GRAIN; FAIR SORTED; DOM SUB ANGULAR, TRACE SUB ROUND, MOD SPHERICITY; TRACE FROSTED; TRACE KAOLIN OFF WHITE CEMENT, SME SILICA MATRIX CEMENT POOR TO FAIR VISUAL INTERGRANULAR POR TRACE DARK GRAY, BLACK CARB SHALE IMBEDD POOR VISIBLE POROSITY.

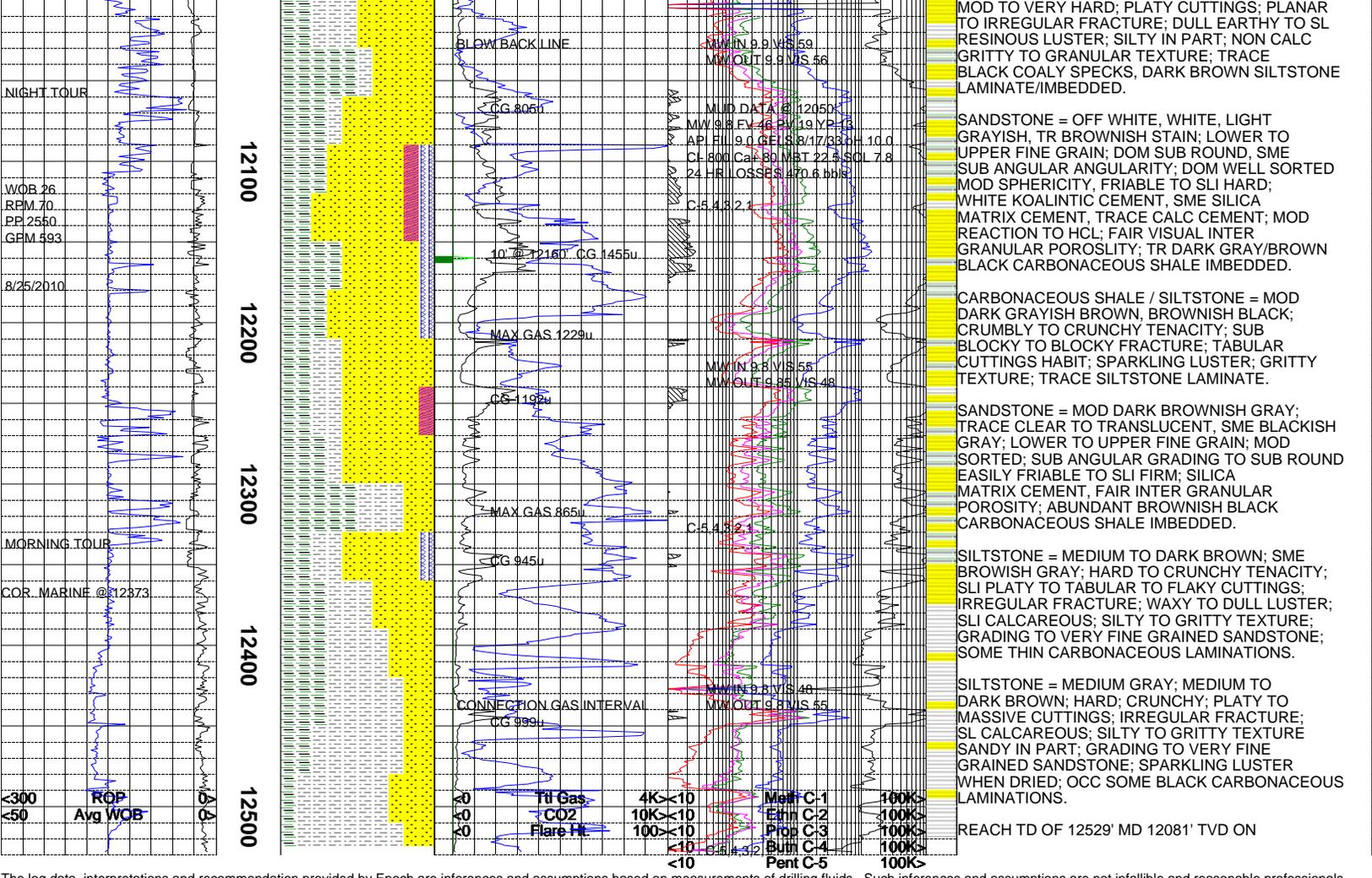
CARBONACEOUS SHALE/SILTSTONE = DARK GRAY TO BLACK; FIRM TO VERY HARD; PLATY TO MASSIVE CUTTINGS; IRREGULAR TO PLANAR FRACTURE; NON CALCAREOUS; DULL EARTHY TO SLI SPARKLING LUSTER WHEN DRIED; ROUGH TO SILTY TEXTURE; THINLY BEDDED IN SANDSTONE.

SANDSTONE = MODERATE AMOUNT OF LOOSE GRAINS; FINE TO VERY FINE GRAINED; WHITE PRESERVED SPECIMENS; ANGULAR TO SUBANG GRAINS; HARD PRESERVED SPECIMENS; MOD WELL SORTED; LOW SPHERICITY; TR CALCITE; DOM SILICEOUS CEMENT; CLEAN W/MINOR UNIDENT BLACK GRAINS; OCC W/SILTSTONE AND CARBONACEOUS SHALE BORDERS; THINLY BEDDED; OCC WITH LOOSE WHITE KAOLIN CLAY MATRIX MATERIAL IN SAMPLE TRAYS.

SILTSTONE = DARK BROWN TO DARK GRAY; VERY HARD; MASSIVE TO SLI PLATY CTGS; IRREGULAR FRACTURE; SPARKLING LUSTER WHEN DRIED; CARBONACEOUS; SL REACTION TO HCL; DOM SILICEOUS; SILTY TO GRITTY TEXTURE; GRADING TO VERY FINE GRAINED SANDSTONE.

SANDSTONE = WHITE TO LIGHT BROWN; FINE TO VERY FINE GRAINED; HARD PRESERVED SPECIMENS; ANGULAR TO SUBANGULAR; WELL SORTED; DOM SILICEOUS CEMENT; MINOR WHITE KAOLIN CLAY IN SAMPLES; MINOR GAS INCREASES; MINOR WHITE SILICEOUS CLAY IN MATRIX; TRACE AMOUNTS OF WHITE COARSE CALCITE-FRACTURE FILL.

CARBONACEOUS SHALE = DARK GRAY; BLACK;



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