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

MUDLOG MD

COMPANY EXXONMOBIL
WELL PCU-297-11B1
FIELD PICEANCE CREEK
REGION ROCKY MT
COORDINATES LAT.39.879628000
LON.108.240365000
ELEVATION GL = 7126'
KB = 7143'
COUNTY, STATE RIO BLANCO CO. CO
API INDEX 051031137800
SPUD DATE 04/10/2009
CONTRACTOR HELMERICH PAYNE
CO. REP. RICKY T. OWENS
RIG/TYPE FLEX 3
LOGGING UNIT MLU038
GEOLOGISTS GEORGE BAKER
BRENDA MARSH
ADD. PERSONS BILL JOHANNING
DEVIN CLAAR
CO. GEOLOGIST MICHAEL HOWELL

LOG INTERVAL

CASING DATA

DEPTHS: 3960' TO 8976'
DATES: 09/21/2009 TO 09/26/2009
SCALE: 1" = 100'

16" AT 130'
10.75 AT 3953'
AT
AT

MUD TYPES

HOLE SIZE

LSND TO 8976'
TO
TO
TO

9.875" TO 8976'
TO
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	KAOLINIC	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>
 klbs

Depth
 3600
 3700
 3800
 3900
 4000
 4100
 4200
 4300
 4400

Lithology

MGS
 <0 Ttl Gas 1K>
 units
 <0 CO2 50K>
 ppm
 <0 Flare Ht. 100>
 ft

Interp. Lith

Remarks
 Survey Data, Mud Reports, Other Info.

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. ALL SAMPLE DEPTHS ARE REFERENCED TO RKB.

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

CO2 IS CALIBRATED TO A TEST GAS COMPOSED OF 100000 PPM.

1 UNIT OF GAS = 200 PPM C-1 ME

CONNECTION GAS, TRIP GAS AND WIPER GAS ARE NOTED ON THE MUD LOG. FLARE HEIGHTS AND DEPTHS OF GAS BUSTER USEAGE ARE ALSO NOTED.

EARLY CONNECTION GASES REPRESENTING UP HOLE GAS INTERVALS BLEEDING INTO THE BOREHOLE ARE COMMON IN THE PRODUCTION INTERVAL.

EVIDENCE OF FRACTURE FILL IS NOTED ON THE LOG USING THE LITHOLOGY SYMBOL FOR METAMORPHICS. THE 10% DOES NOT REPRESENT 10% FRACTURE FILL IN SAMPLE. IT ONLY INDICATES THAT FRACTURE FILL HAS BEEN OBSERVED OVER THE INTERVAL.

SURVEY DATA @ 3968'
 INC. 25.05
 AZIMUTH: 187.66
 TVD: 3704.15

EPOCH WELL SERVICES COMMENCED LOGGING OPERATIONS 09/21/2009 AT 14:00 @ 3960'.
 DRILL TO 3986' AND PERFORM F.I.T.

SHALE = YELLOW; LIGHT GRAY; MOTTLED IN PART; FIRM; PLATY TO SLI FLAKY CUTTINGS; IRREGULAR FRACTURE; DULL EARTHY LUSTER; SMOOTH TO SILTY TEXTURE; MOD CALCAREOUS IN SILTY EXAMPLES; VARIABLE AMOUNTS OF SILT; NO VISIBLE STRUCTURE.

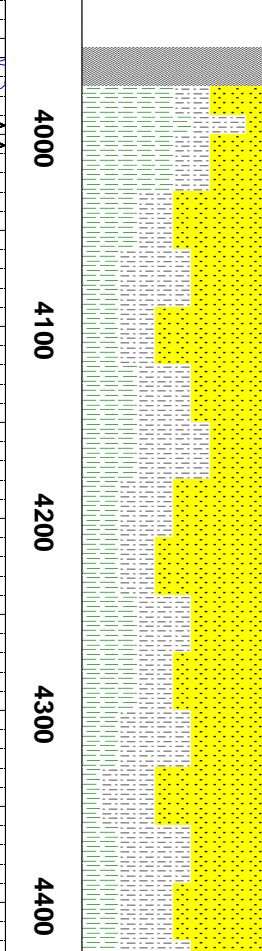
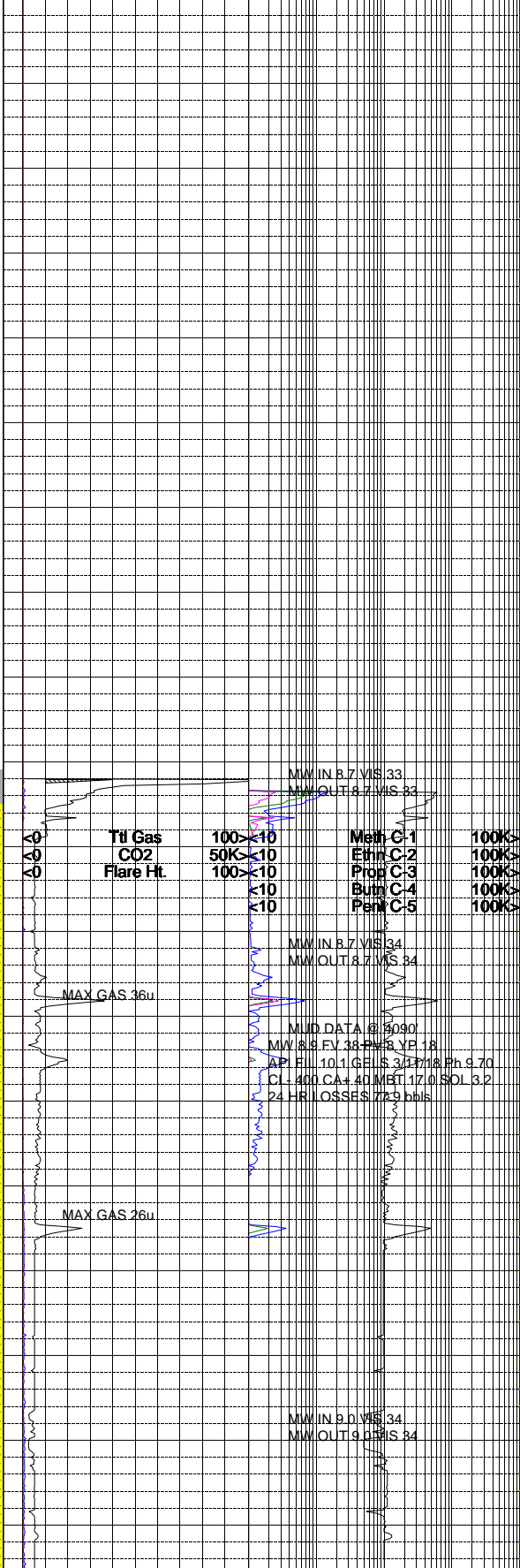
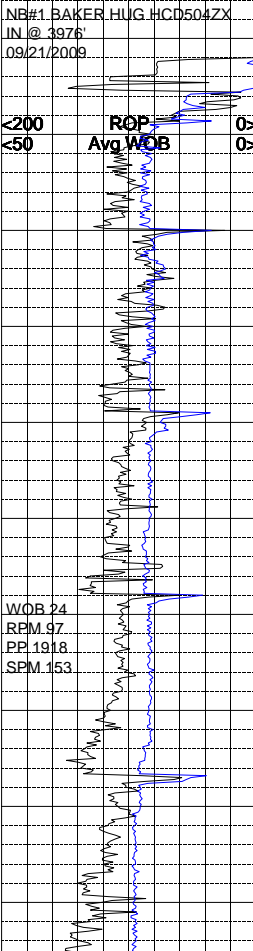
SANDSTONE = LIGHT YELLOWISH BROWN, LIGHT BLUISH GRAY, TRACES TRANSLUCENT QUARTZ GRAINS; UPPER VERY FINE TO UPPER FINE GRAIN; POOR TO FAIR SORTING; PREDOMINATELY SUB ANGULAR TO SUB ROUND ANGULARITY; LOW SHERICITY; TRACE FROSTED SURFACE FEATURES; EASILY FRIABLE TO SLIGHT FIRM; SILICIA MATRIX CEMENT; TRACE CLAY CEMENT; WEAK GRAIN SUPPORT; POOR VISUAL INTER GRANULAR POROSITY; SOME DARK LITHIC AND CARBONACEOUS SHALE IMBEDDED.

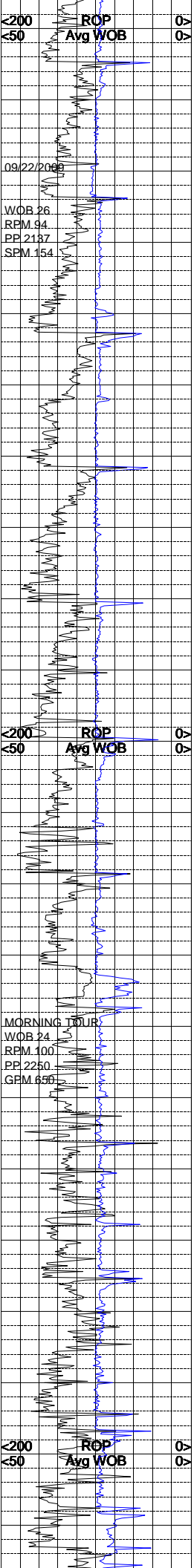
SILTSTONE = BROWN TO DARK BROWN, LIGHT BROWNISH GRAY; PULVERULENT TO CRUMBLY TENACITY; SUB BLOCKY TO BLOCKY FRACTURE; WEDGELIKE, SUB MASSIVE CUTTINGS HABIT; DULL EARTHY SLIGHT WAXY LUSTER; GRITTY TO SMOOTH TEXTURE; SEMI THICK STRUCTURE, GRADING TO SANDSTONE; TRACES BLACK LITHIC IMBEDDED.

SHALE = LIGHT GRAYISH RED, BROWNISH GRAY, LIGHT GRAY; CRUNCHY TO BRITTLE TENACITY; SUB BLOCKY, BLOCKY, IRREGULAR IN PART FRACTURE; TABULAR, SUB MASSIVE CUTTINGS HABIT; DULL, WAXY LUSTER; GRITTY, CLAYEY TEXTURE; SEMI MASSIVE THICK STRUCTURE; GRADING TO SILTSTONE.

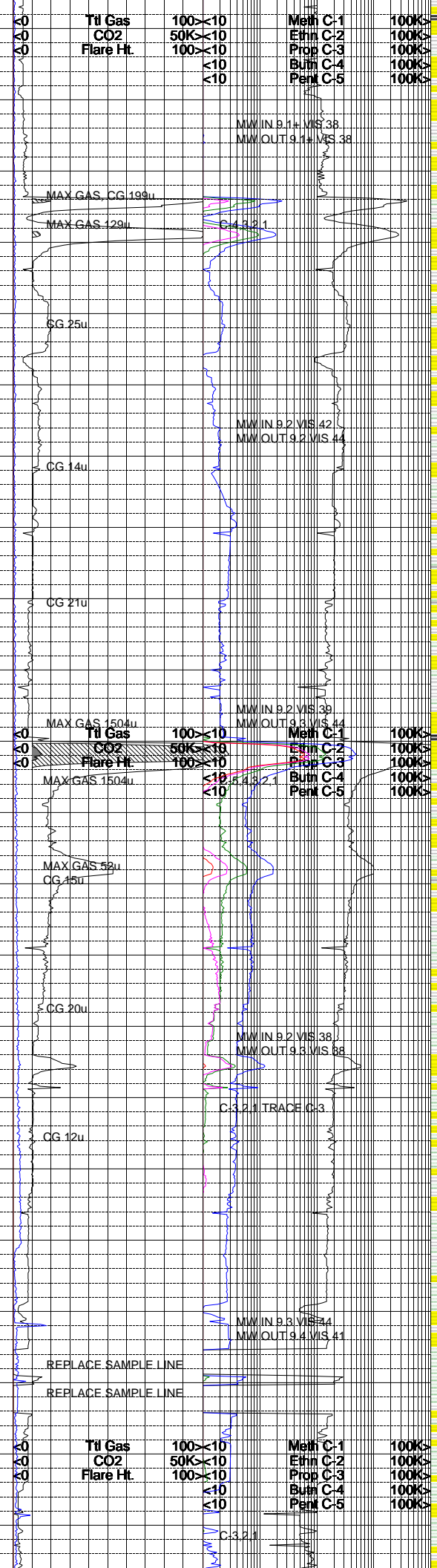
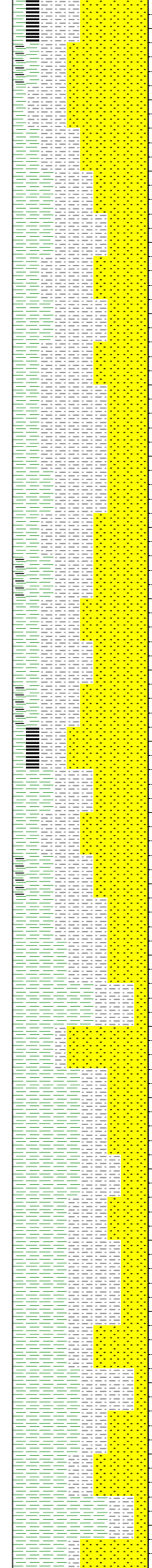
SANDSTONE = TRANSLUCENT, LIGHT YELLOWISH BROWN, PALE GRAYISH ORANGE; LOWER TO UPPER FINE GRAIN; POOR TO FAIR SORTING; PREDOMINATELY SUB ROUNDED TRACE SUB ANGULAR; LOW TO MODERATE SPHERICAL; POLISH TO FROSTED SURFACE FEATURES; EASILY FRIABLE TO FRIABLE; SILICA CEMENT; VERY WEAK GRAIN SUPPORTED; TRACES BLACK COAL IMBEDDED.

SILTSTONE = LIGHT GRAYISH BROWN, PALE YELLOWISH BROWN, LIGHT GRAYISH ORANGE;





4500
4600
4700
4800
4900
5000
5100
5200
5300
5400
5500



PULVERULENT, CRUNCHY TENACITY, SUB BLOCKY, BLOCKY FRACTURE; ELONGATED; WEDGELIKE, SUB MASSIVE CUTTINGS HABIT; DULL, EARTHY, SLIGHT WAXY LUSTER; GRITTY, SILTY TEXTURE; SEMI MASSIVE, THICK STRUCTURE; GRADING TO SANDSTONE; TRACES BLACK SPECKLED LITHIC IMBEDDED.

SANDSTONE = CLEAR TO TRANSLUCENT, LIGHT GRAYISH BLUE, OFF WHITE; QUARTZ FRAMEWORK; LOWER TO UPPER FINE GRAIN; FAIR TO WELL SORTED; PREDOMINATELY SUB ROUND TO ROUND ANGULARITY; MODERATE SPHERICITY; FROSTED TO POLISH SURFACE FEATURE; VERY FRIABLE TO FRIABLE; SOME SILICA MATRIX CEMENT, VERY WEAK GRAIN SUPPORT, GOOD VISUAL INTER GRANULAR POROSITY; BLACK SPECKLED COAL IMBEDDED.

SILTSTONE = DUSKY YELLOWISH, PALE YELLOWISH BROWN; PULVERULENT, CRUMBLY, SLIGHT BRITTLE TENACITY; EARTHY, SUB BLOCKY, IRREGULAR IN PART FRACTURE; WEDGELIKE, TABULAR CUTTINGS HABIT; DULL, RESINOUS LUSTER; GRITTY TO GRANULAR TEXTURE; SEMI MASSIVE THICK STRUCTURE; TRACES BLACK LITHIC IMBEDDED.

SHALE = MEDIUM LIGHT GRAY, LIGHT BLuish GRAY, SOME LIGHT BROWNISH GRAY; CRUNCHY, PULVERULENT IN PART TENACITY, SUB BLOCKY, BLOCKY, SLIGHT IRREGULAR FRACTURE; WEDGELIKE, TABULAR, SOME SEMI MASSIVE CUTTINGS HABIT; EARTHY, DULL, TRACE RESINOUS LUSTER; SILTY TO CLAYEY TEXTURE; SUB MASSIVE TO THICK STRUCTURE; GRADING TO SILTSTONE.

SANDSTONE = MODERATE YELLOWISH BROWN, CLEAR TO TRANSLUCENT, TRACE OFF WHITE WITH BLACK SPECKLED LITHIC IMBEDDED; PREDOMINATELY QUARTZ FRAMEWORK; UPPER VERY FINE TO LOWER FINE GRAIN; FAIR SORTING; PREDOMINATELY SUB ROUND TO SOME SUB ANGULAR ANGULARITY; MODERATE SPHERICITY; FROSTED IN PART; EASILY FRIABLE TO FRIABLE, TRACE UNCONSOLIDATED GRAIN POSSIBLE DUE TO PDC BIT ACTION AND WEAK GRAIN SUPPORT; FAIR VISUAL INTER GRANULAR POROSITY.

SHALE = PALE YELLOWISH BROWN, SOME LIGHT BROWNISH GRAY; MODERATE LIGHT GRAY; MALLEABLE TO CRUNCHY TENACITY; SUB BLOCKY TO BLOCKY, SOME IRREGULAR IN PART FRACTURE; WEDGELIKE, SEMI MASSIVE CUTTINGS HABIT; DULL, WAXY IN IN PART LUSTER; SILTY TO CLAYEY TEXTURE; SUB MASSIVE TO SLIGHTLY THICK STRUCTURE.

SILTSTONE = YELLOWISH BROWN TO LIGHT YELLOW GRAY; SME GRAY; MOTTLED IN PART; MASSIVE TO WEDGELIKE TO SLI PLATY; FIRM; BLOCKY TO IRREGULAR FRAC; DULL EARTHY LUSTER; SILTY TEXTURE; SLI TO MODERATELY CALCAREOUS; VF MICA; THINLY BEDDED.

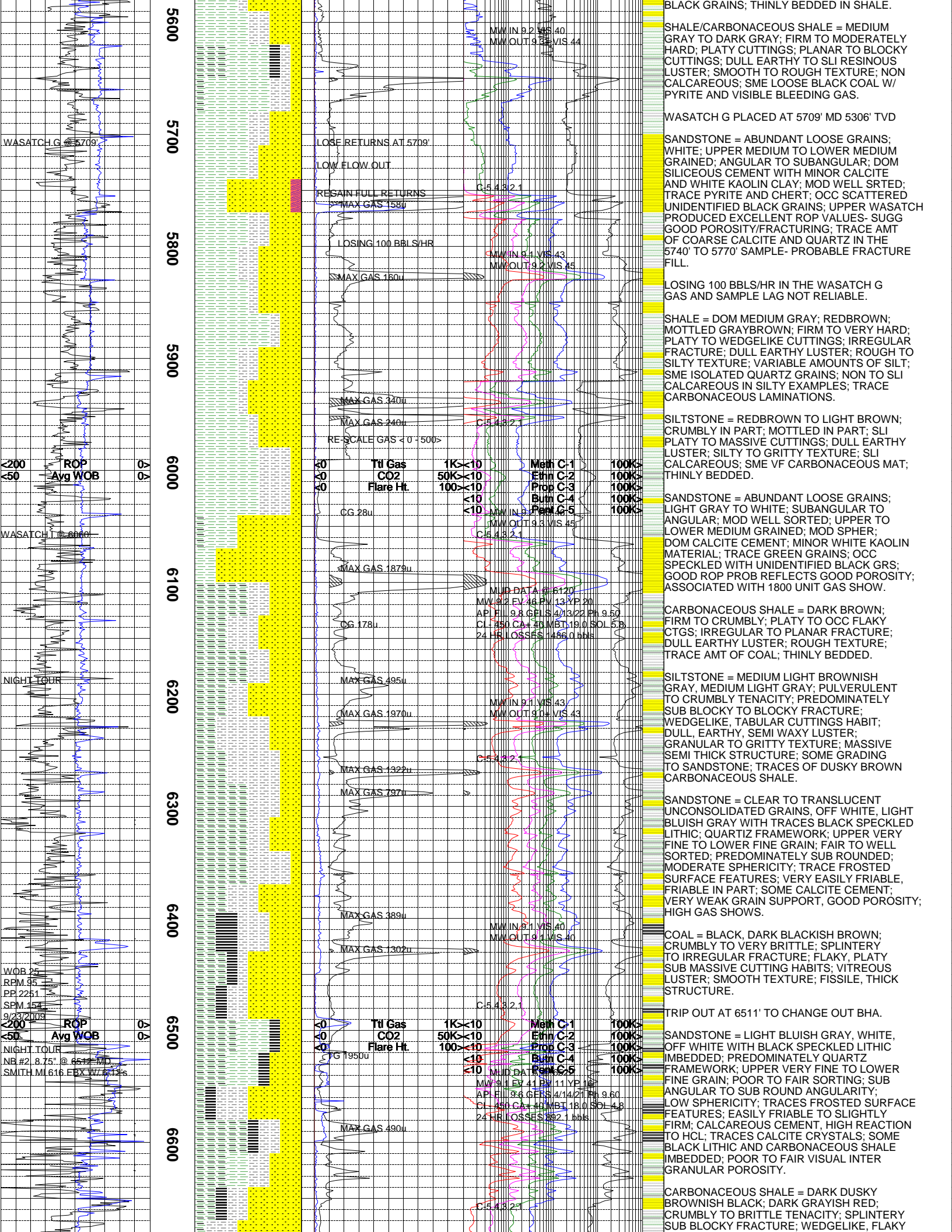
SANDSTONE = ABUNDANT LOOSE GRAINS; PRESERVED SPECIMENS WHITE TO LIGHT GRAY; LOWER MEDIUM TO FINE GRAINED; ANGULAR TO SUBANGULAR; DOM CALCITE CEMENT; MODERATELY WELL SORTED; TRACE GREEN GRAINS; ASSOCIATED W/ GAS INCREASES; MODERATELY CALCAREOUS; THINLY BEDDED IN SHALE.

SHALE = VARICOLORED; MOTTLED IN PART; LIGHT YELLOWISH BROWN; YELLOW GRAY TO LIGHT GRAY; FIRM TO SLI HARD; SLI PLATY CUTTINGS; BLOCKY TO IRREGULAR FRACTURE; DULL EARTHY TO SLI WAXY LUSTER; SLI TO MODERATELY CALCAREOUS IN SILTY EXAMPLES; SMOOTH TO ROUGH TO SILTY TEXTURES IN SILTY EXAMPLES; NO VISIBLE STRUCTURE.

SANDSTONE = DOM LOOSE GRAINS; SME WHITE TO LIGHT GRAY PRESERVED SPECIMENS; TRACE PUUPLE MOTTLED EXAMPLES; UPPER FINE GRAINED; WELL SORTED; ANGULAR TO SUBANGULAR; MOD SPHERICITY; DOM CALCITE CEMENT; GRAIN SUPPORTED; PR VISIBLE POROSITY IN PRESERVED SPECIMENS; NO SAMPLE SHOWS.

SHALE = LIGHT BROWN; REDDISH BROWN; GRAY BROWN; MOTTLED IN PART; FIRM; SLI PLATY CUTTINGS; IRREGULAR FRACTURE; NON CALCAREOUS; ROUGH TO SMOOTH TEXTURE; OCC SILTY WITH SILTY TEXTURE; NO VISIBLE STRUCTURE.

SANDSTONE = VARICOLORED; LIGHT GRAY; WHITE; LT BROWN TO PURPLE; LOWER MEDIUM TO FINE GRAINED; ANGULAR TO SUBANGULAR; GRAIN TO MATRIX SUPPORTED; CALCITE CEMENT; SME REDBROWN LITHIC FRAGMENTS; OCC SPECKLED WITH UNIDENT



5600
5700
5800
5900
6000
6100
6200
6300
6400
6500
6600

WASATCH G @ 5709'
WASATCH T @ 6060'
NIGHT TOUR
WOB 25
RPM 95
PP 2251
SPM 154
9/23/2009
NIGHT TOUR
NB # 3.8.75' @ 6514' MD
SMITH M.616.FBX W/ 6.12's

LOSE RETURNS AT 5709'
LOW FLOW OUT
REGAIN FULL RETURNS
LOSING 100 BBL/S/HR
RE-SCALE GAS < 0 - 500 >
CG 28u
CG 178u
CG 1950u

MAX GAS 158u
MAX GAS 150u
MAX GAS 340u
MAX GAS 240u
MAX GAS 1879u
MAX GAS 495u
MAX GAS 1970u
MAX GAS 1322u
MAX GAS 797u
MAX GAS 389u
MAX GAS 302u
MAX GAS 490u

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

MUD DATA @ 6120
MW 9.2 EV 46 PV 13 YP 20
API FL 9.8 GELS 4/13/22 PH 9.50
CL 450 CA 40 MBT 18.0 SOL 5.8
24 HR LOSSES 146.0 bbls

MUD DATA @ 6506.5
MW 9.1 EV 41 PV 11 YP 16
API FL 9.6 GELS 4/14/21 PH 9.60
CL 450 CA 40 MBT 18.0 SOL 4.8
24 HR LOSSES 82.1 bbls

SHALE/CARBONEOUS SHALE = MEDIUM GRAY TO DARK GRAY; FIRM TO MODERATELY HARD; PLATY CUTTINGS; PLANAR TO BLOCKY CUTTINGS; DULL EARTHY TO SLI RESINOUS LUSTER; SMOOTH TO ROUGH TEXTURE; NON CALCAREOUS; SMC LOOSE BLACK COAL W/ PYRITE AND VISIBLE BLEEDING GAS.

WASATCH G PLACED AT 5709' MD 5306' TVD

SANDSTONE = ABUNDANT LOOSE GRAINS; WHITE; UPPER MEDIUM TO LOWER MEDIUM GRAINED; ANGULAR TO SUBANGULAR; DOM SILICEOUS CEMENT WITH MINOR CALCITE AND WHITE KAOLIN CLAY; MOD WELL SORTED; TRACE PYRITE AND CHERT; OCC SCATTERED UNIDENTIFIED BLACK GRAINS; UPPER WASATCH PRODUCED EXCELLENT ROP VALUES- SUGG GOOD POROSITY/FRACTURING; TRACE AMT OF COARSE CALCITE AND QUARTZ IN THE 5740' TO 5770' SAMPLE- PROBABLE FRACTURE FILL.

LOSING 100 BBL/S/HR IN THE WASATCH G GAS AND SAMPLE LAG NOT RELIABLE.

SHALE = DOM MEDIUM GRAY; REDBROWN; MOTTLED GRAYBROWN; FIRM TO VERY HARD; PLATY TO WEDGELIKE CUTTINGS; IRREGULAR FRACTURE; DULL EARTHY LUSTER; ROUGH TO SILTY TEXTURE; VARIABLE AMOUNTS OF SILT; SMC ISOLATED QUARTZ GRAINS; NON TO SLI CALCAREOUS IN SILTY EXAMPLES; TRACE CARBONEOUS LAMINATIONS.

SILTSTONE = REDBROWN TO LIGHT BROWN; CRUMBLY IN PART; MOTTLED IN PART; SLI PLATY TO MASSIVE CUTTINGS; DULL EARTHY LUSTER; SILTY TO GRITTY TEXTURE; SLI CALCAREOUS; SMC VF CARBONEOUS MAT; THINLY BEDDED.

SANDSTONE = ABUNDANT LOOSE GRAINS; LIGHT GRAY TO WHITE; SUBANGULAR TO ANGULAR; MOD WELL SORTED; UPPER TO LOWER MEDIUM GRAINED; MOD SPHER; DOM CALCITE CEMENT; MINOR WHITE KAOLIN MATERIAL; TRACE GREEN GRAINS; OCC SPECKLED WITH UNIDENTIFIED BLACK GRNS; GOOD ROP PROB REFLECTS GOOD POROSITY; ASSOCIATED WITH 1800 UNIT GAS SHOW.

CARBONEOUS SHALE = DARK BROWN; FIRM TO CRUMBLY; PLATY TO OCC FLAKY CTGS; IRREGULAR TO PLANAR FRACTURE; DULL EARTHY LUSTER; ROUGH TEXTURE; TRACE AMT OF COAL; THINLY BEDDED.

SILTSTONE = MEDIUM LIGHT BROWNISH GRAY, MEDIUM LIGHT GRAY; PULVERULENT TO CRUMBLY TENACITY; PREDOMINATELY SUB BLOCKY TO BLOCKY FRACTURE; WEDGELIKE, TABULAR CUTTINGS HABIT; DULL, EARTHY, SEMI WAXY LUSTER; GRANULAR TO GRITTY TEXTURE; MASSIVE SEMI THICK STRUCTURE; SOME GRADING TO SANDSTONE; TRACES OF DUSKY BROWN CARBONEOUS SHALE.

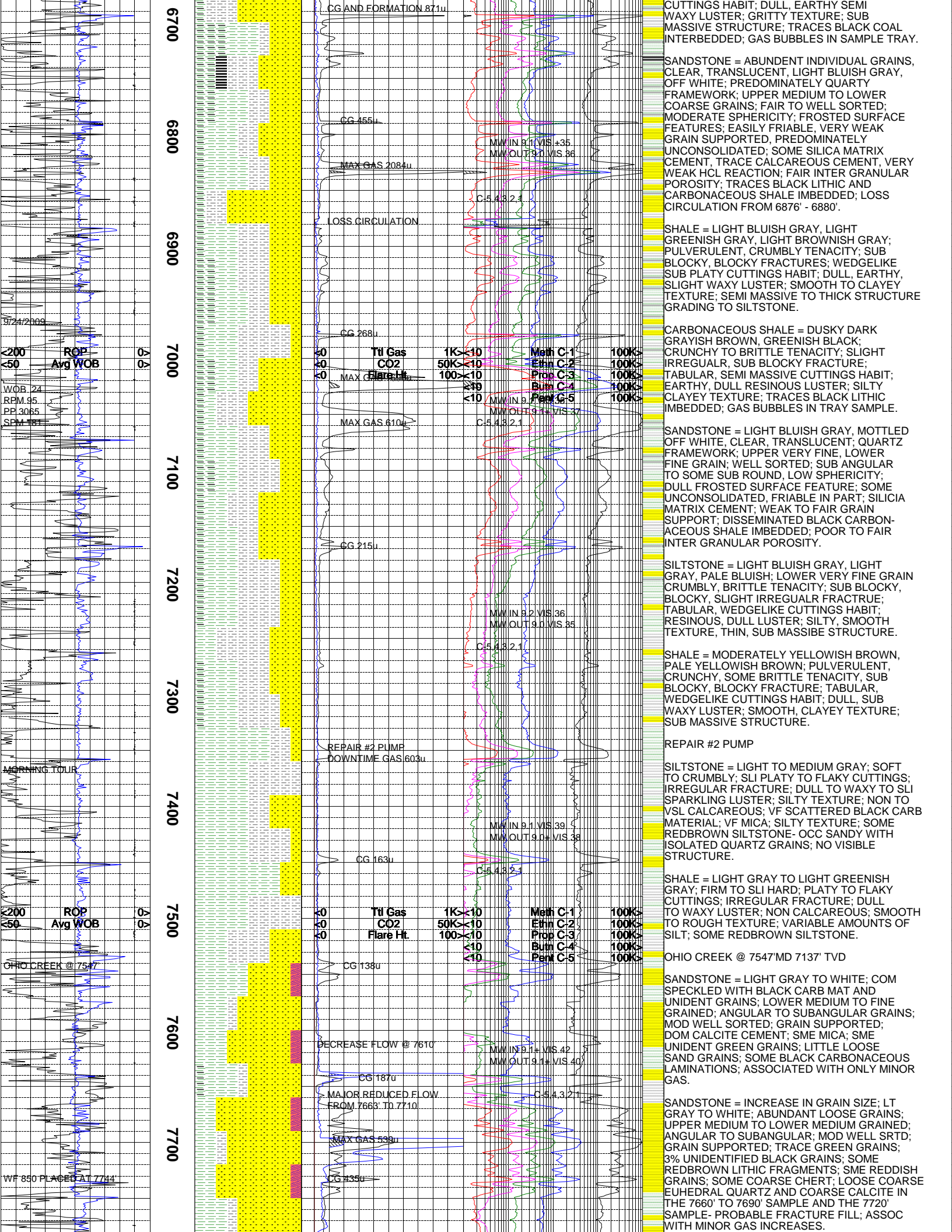
SANDSTONE = CLEAR TO TRANSLUCENT UNCONSOLIDATED GRAINS, OFF WHITE, LIGHT BLUISH GRAY WITH TRACES BLACK SPECKLED LITHIC; QUARTZ FRAMEWORK; UPPER VERY FINE TO LOWER FINE GRAIN; FAIR TO WELL SORTED; PREDOMINATELY SUB ROUNDED; MODERATE SPHERICITY; TRACE FROSTED SURFACE FEATURES; VERY EASILY FRIABLE, FRIABLE IN PART; SOME CALCITE CEMENT; VERY WEAK GRAIN SUPPORT, GOOD POROSITY; HIGH GAS SHOWS.

COAL = BLACK, DARK BLACKISH BROWN; CRUMBLY TO VERY BRITTLE; SPLINTERY TO IRREGULAR FRACTURE; FLAKY, PLATY SUB MASSIVE CUTTING HABITS; VITREOUS LUSTER; SMOOTH TEXTURE; FISSILE, THICK STRUCTURE.

TRIP OUT AT 6511' TO CHANGE OUT BHA.

SANDSTONE = LIGHT BLUISH GRAY, WHITE, OFF WHITE WITH BLACK SPECKLED LITHIC IMBEDDED; PREDOMINATELY QUARTZ FRAMEWORK; UPPER VERY FINE TO LOWER FINE GRAIN; POOR TO FAIR SORTING; SUB ANGULAR TO SUB ROUND ANGULARITY; LOW SPHERICITY; TRACES FROSTED SURFACE FEATURES; EASILY FRIABLE TO SLIGHTLY FIRM; CALCAREOUS CEMENT, HIGH REACTION TO HCL; TRACES CALCITE CRYSTALS; SOME BLACK LITHIC AND CARBONEOUS SHALE IMBEDDED; POOR TO FAIR VISUAL INTER GRANULAR POROSITY.

CARBONEOUS SHALE = DARK DUSKY BROWNISH BLACK; DARK GRAYISH RED; CRUMBLY TO BRITTLE TENACITY; SPLINTERY SUB BLOCKY FRACTURE; WEDGELIKE, FLAKY



6700
6800
6900
7000
7100
7200
7300
7400
7500
7600
7700

CG AND FORMATION 871u

CG 455u

MAX GAS 2084u

LOSS CIRCULATION

CG 268u

Til Gas 1K < 10
CO2 50K < 10
Flare Ht 100 < 10

MAX GAS 610u

CG 215u

REPAIR #2 PUMP
DOWNTIME GAS 603u

CG 163u

Til Gas 1K < 10
CO2 50K < 10
Flare Ht 100 < 10

CG 138u

DECREASE FLOW @ 7610

CG 187u

MAJOR REDUCED FLOW
FROM 7663' TO 7710'

MAX GAS 539u

CG #35u

MW IN 9.1 VIS 35
MW OUT 9.0 VIS 36

C-5 4.3 2.1

MW IN 9.1 VIS 37
MW OUT 9.0 VIS 38

MW IN 9.2 VIS 36
MW OUT 9.0 VIS 35

MW IN 9.1 VIS 39
MW OUT 9.0 VIS 38

MW IN 9.1 VIS 42
MW OUT 9.1 VIS 40

CUTTINGS HABIT; DULL, EARTHY SEMI WAXY LUSTER; GRITTY TEXTURE; SUB MASSIVE STRUCTURE; TRACES BLACK COAL INTERBEDDED; GAS BUBBLES IN SAMPLE TRAY.

SANDSTONE = ABUNDENT INDIVIDUAL GRAINS, CLEAR, TRANSLUCENT, LIGHT BLuish GRAY, OFF WHITE; PREDOMINATELY QUARTZ FRAMEWORK; UPPER MEDIUM TO LOWER COARSE GRAINS; FAIR TO WELL SORTED; MODERATE SPHERICITY; FROSTED SURFACE FEATURES; EASILY FRIABLE, VERY WEAK GRAIN SUPPORTED, PREDOMINATELY UNCONSOLIDATED; SOME SILICA MATRIX CEMENT, TRACE CALCAREOUS CEMENT, VERY WEAK HCL REACTION; FAIR INTER GRANULAR POROSITY; TRACES BLACK LITHIC AND CARBONACEOUS SHALE IMBEDDED; LOSS CIRCULATION FROM 6876' - 6880'.

SHALE = LIGHT BLuish GRAY, LIGHT GREENISH GRAY, LIGHT BROWNISH GRAY; PULVERULENT, CRUMBLY TENACITY; SUB BLOCKY, BLOCKY FRACTURES; WEDGELIKE SUB PLATY CUTTINGS HABIT; DULL, EARTHY, SLIGHT WAXY LUSTER; SMOOTH TO CLAYEY TEXTURE; SEMI MASSIVE TO THICK STRUCTURE GRADING TO SILTSTONE.

CARBONACEOUS SHALE = DUSKY DARK GRAYISH BROWN, GREENISH BLACK; CRUNCHY TO BRITTLE TENACITY; SLIGHT IRREGULAR, SUB BLOCKY FRACTURE; TABULAR, SEMI MASSIVE CUTTINGS HABIT; EARTHY, DULL RESINOUS LUSTER; SILTY CLAYEY TEXTURE; TRACES BLACK LITHIC IMBEDDED; GAS BUBBLES IN TRAY SAMPLE.

SANDSTONE = LIGHT BLuish GRAY, MOTTLED OFF WHITE, CLEAR, TRANSLUCENT; QUARTZ FRAMEWORK; UPPER VERY FINE, LOWER FINE GRAIN; WELL SORTED; SUB ANGULAR TO SOME SUB ROUND, LOW SPHERICITY; DULL FROSTED SURFACE FEATURE; SOME UNCONSOLIDATED, FRIABLE IN PART; SILICIA MATRIX CEMENT; WEAK TO FAIR GRAIN SUPPORT; DISSEMINATED BLACK CARBONACEOUS SHALE IMBEDDED; POOR TO FAIR INTER GRANULAR POROSITY.

SILTSTONE = LIGHT BLuish GRAY, LIGHT GRAY, PALE BLuish; LOWER VERY FINE GRAIN CRUMBLY, BRITTLE TENACITY; SUB BLOCKY, BLOCKY, SLIGHT IRREGULAR FRACTURE; TABULAR, WEDGELIKE CUTTINGS HABIT; RESINOUS, DULL LUSTER; SILTY, SMOOTH TEXTURE, THIN, SUB MASSIVE STRUCTURE.

SHALE = MODERATELY YELLOWISH BROWN, PALE YELLOWISH BROWN; PULVERULENT, CRUNCHY, SOME BRITTLE TENACITY, SUB BLOCKY, BLOCKY FRACTURE; TABULAR, WEDGELIKE CUTTINGS HABIT; DULL, SUB WAXY LUSTER; SMOOTH, CLAYEY TEXTURE; SUB MASSIVE STRUCTURE.

REPAIR #2 PUMP

SILTSTONE = LIGHT TO MEDIUM GRAY; SOFT TO CRUMBLY; SLI PLATY TO FLAKY CUTTINGS; IRREGULAR FRACTURE; DULL TO WAXY TO SLI SPARKLING LUSTER; SILTY TEXTURE; NON TO VSL CALCAREOUS; VF SCATTERED BLACK CARB MATERIAL; VF MICA; SILTY TEXTURE; SOME REDBROWN SILTSTONE- OCC SANDY WITH ISOLATED QUARTZ GRAINS; NO VISIBLE STRUCTURE.

SHALE = LIGHT GRAY TO LIGHT GREENISH GRAY; FIRM TO SLI HARD; PLATY TO FLAKY CUTTINGS; IRREGULAR FRACTURE; DULL TO WAXY LUSTER; NON CALCAREOUS; SMOOTH TO ROUGH TEXTURE; VARIABLE AMOUNTS OF SILT; SOME REDBROWN SILTSTONE.

OHIO CREEK @ 7547 MD 7137' TVD

SANDSTONE = LIGHT GRAY TO WHITE; COM SPECKLED WITH BLACK CARB MAT AND UNIDENT GRAINS; LOWER MEDIUM TO FINE GRAINED; ANGULAR TO SUBANGULAR GRAINS; MOD WELL SORTED; GRAIN SUPPORTED; DOM CALCITE CEMENT; SME MICA; SME UNIDENT GREEN GRAINS; LITTLE LOOSE SAND GRAINS; SOME BLACK CARBONACEOUS LAMINATIONS; ASSOCIATED WITH ONLY MINOR GAS.

SANDSTONE = INCREASE IN GRAIN SIZE; LT GRAY TO WHITE; ABUNDANT LOOSE GRAINS; UPPER MEDIUM TO LOWER MEDIUM GRAINED; ANGULAR TO SUBANGULAR; MOD WELL SORTD; GRAIN SUPPORTED; TRACE GREEN GRAINS; 3% UNIDENTIFIED BLACK GRAINS; SOME REDBROWN LITHIC FRAGMENTS; SME REDDISH GRAINS; SOME COARSE CHERT; LOOSE COARSE EUHEDRAL QUARTZ AND COARSE CALCITE IN THE 7660' TO 7690' SAMPLE AND THE 7720' SAMPLE- PROBABLE FRACTURE FILL; ASSOC WITH MINOR GAS INCREASES.

9724/2009
ROP
Avg WOB
WOB 24
RPM 95
PP 3065
SPM 144

MORNING TOUR

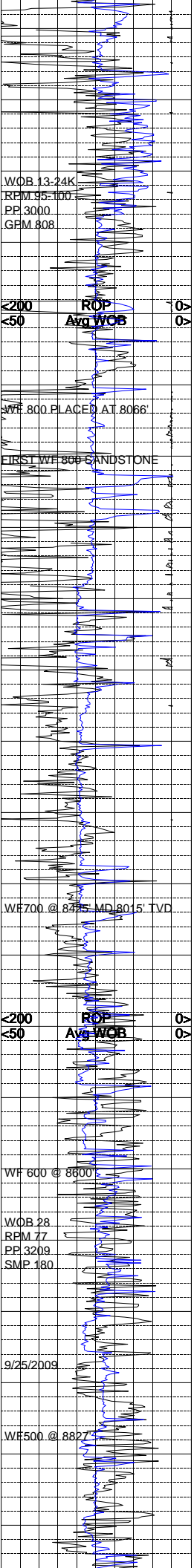
ROP
Avg WOB

OHIO CREEK @ 7547

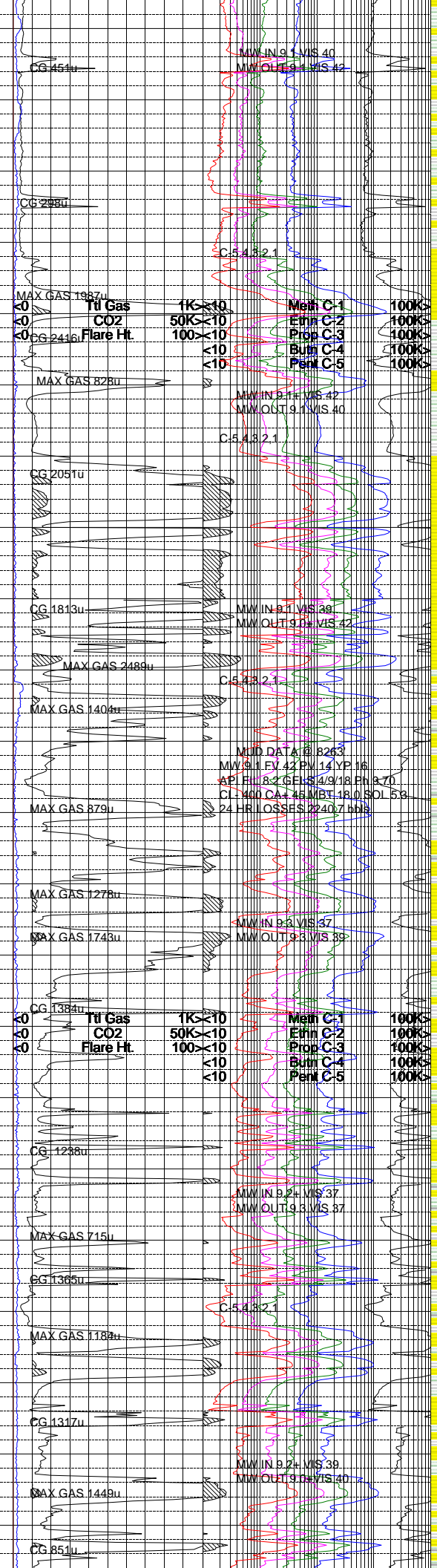
DECREASE FLOW @ 7610

MAJOR REDUCED FLOW FROM 7663' TO 7710'

WF 850 PLACED AT 7744



7800
7900
8000
8100
8200
8300
8400
8500
8600
8700
8800



SHALE = LIGHT TO MEDIUM GRAY; LT BROWN; LIGHT GREENISH GRAY; FIRM TO MODERATELY HARD; PLATY TO FLAKY CUTTINGS; DULL EARTHY TO WAXY LUSTER; VF CARB MAT; SMOOTH TO ROUGH TEXTURE; NON TO VSLI CALCAREOUS; NO VISIBLE STRUCTURE.

SILTSTONE = LIGHT GREEN; LIGHT GREENISH GRAY; SME MEDIUM GRAY TO LIGHT BROWN; FIRM; PLATY TO FLAKY CUTTINGS; IRREGULAR FRACTURE; DULL WAXY LUSTER; NON CALC; SILTY TEXTURE; SME ISOLATED FINE TO MED QUARTZ GRAINS IN MATRIX; OCC SPECKLED WITH CARBONACEOUS MATERIAL; NO VISIBLE STRUCTURE.

SANDSTONE = LIGHT GRAY TO OFF WHITE; ABNT LOOSE GRAINS; UPPER MEDIUM TO LOWER MEDIUM; MOD WELL SORTED; DOM CALCITE CEMENT; ANGULAR TO SUB ROUNDED; GRAIN SUPPORTED; SME CHORITIZED GRAINS; SOME SCATTERED BLACK UNIDENTIFIED GRAINS; TRACE AMOUNTS OF WHITE KAOLIN FILL; SAND INTERVAL FROM 7990' TO 8000' SHOWED VERY HIGH ROP VALUES W/ MAX GAS AT 1987u COARSE CALCITE IN THE 7960' TO 8010' SAMPLES- PROBABLY FRACTURE FILL.

SHALE = LT GREEN TO LIGHT GRAY; SME MEDIUM GRAY TO BLACK; FIRM; SME VERY HARD SILICEOUS SPECIMENS; IRREGULAR FRACTURE; WAXY TO DULL EARTHY LUSTER; ROUGH TO OCC SLI SILTY TEXTURE.

SANDSTONE = ABUNDANT LOOSE GRAINS; LIGHT GRAY TO GRAYISH WHITE; UPPER TO LOWER MEDIUM GRAINED; SME LOOSE LOWER COARSE GRAINS; ANGULAR TO SUB ROUNDED; MOD WELL SORTED; DOM CALCITE CEMENT; SOME LOOSE WHITE KAOLIN MATRIX MATERIAL; TRACE GREEN GRAINS; TR CHERT; WF800 EXHIBITS GOOD ROP SUGGESTS GOOD POROSITY; ASSOCIATED WITH GOOD GAS INCREASES; COARSE CALCITE IN THE 8170' TO 8230' SAMPLES- PROBABLE FRACTURE FILL.

SANDSTONE = ABNT CLEAR TRANSLUCENT LOOSE GRAINS, GRAYISH OFF WHITE, TRACE BLACK LITHIC IMBEDDED; UPPER MEDIUM TO LOWER COARSE GRAINS; FAIR TO WELL SORTED PREDOMINATELY SUB ROUNDED, TRACE SUB ANGULAR; MODERATE SPHERICITY; POLISH TO ETCHED SURFACE FEATURES; PREDOMINATELY UNCONSOLIDATED TO EASILY FRIABLE; CALCITE CEMENT, HIGH REACTION TO HCL; 8340' TO 8400' HIGH GAS SHOWS; GOOD VISUAL INTER GRANULAR POROSITY.

CARBONACEOUS SHALE = DARK DUSKY BROWN, GRAYISH BROWN; CRUMBLY, BRITTLE TENACITY, SUB BLOCKY, EARTHY SLIGHT IRREGULAR FRACTURE; WEDGELIKE, PLATY CUTTINGS HABIT; DULL, EARTHY LUSTER; GRITTY, CLAYEY TEXTURE; SUB MASSIVE STRUCTURE.

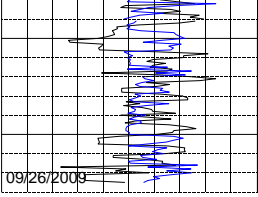
SHALE = LIGHT GRAY, LIGHT BROWNISH GRAY; PULVERULENT TO SLIGHT CRUNCHY; SPLINTERY TO BLOCKY FRACTURE; ELONGATED, WEDGELIKE TO SUB MASSIVE CUTTINGS HABIT; DULL, EARTHY SLIGHT WAXY LUSTER; SILTY TO CLAYEY TEXTURE; TRACE SANDSTONE INTERBEDDED; MODERATE HIGH GAS SAMPLES.

SANDSTONE = VERY LIGHT GRAYISH WHITE, OFF WHITE, SOME CLEAR TO TRANSLUCENT; LOOSE UNCONSOLIDATED GRAINS MEDIUM TO COARSE; PREDOMINATELY QUARTZ FRAMEWORK; POOR TO FAIR SORTING; SUB ANGULAR TO SUBROUND; MODERATE SPHERICITY; FROSTED SURFACE FEATURES; FRIABLE IN PART; CALCAREOUS CEMENT; CLUSTERS WERE VERY CRUMBLY; FAIR VISUAL INTERGRANULAR POROSITY; INCREASE GAS SHOWS THROUGHOUT; TRACE BLACK LITHIC INTERBEDDED.

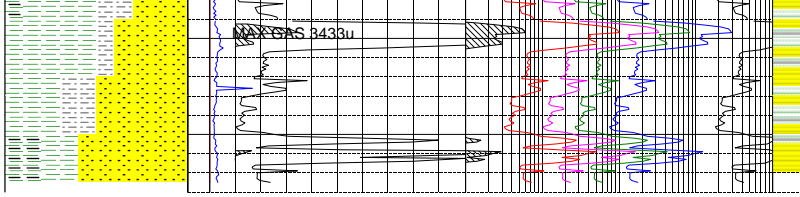
SHALE = LIGHT BLuish GRAY, LIGHT GRAY, LIGHT BROWNISH GRAY, SOME CRUMBLY TO BRITTLE; SUB BLOCKY TO BLOCKY FRACTURE; ELONGATED, WEDGELIKE CUTTLING HABIT; DULL WAXY LUSTER; GRITTY TO CLAYEY TEXTURE; THIN STRUCTURE; TRACE BLACK CARBONACEOUS SHALE.

SANDSTONE = LIGHT BLuish GRAY, LIGHT OFF WHITE, CLEAR TO TRANSLUCENT; LOWER TO UPPER FINE GRAIN; FAIR SORTING; PREDOMINATELY SUB ANGULAR, TRACE SUB ROUND, EASILY FRIABLE TO FRIABLE; CALCAREOUS CEMENT, HIGH REACTION TO HCL; FAIR VISUAL INTERGRANULAR POROSITY; TRACE DARK GRAY, BLACK SPECKLED LITHIC INTERBEDDED; ELEVATED GAS SHOW THROUGHOUT.

CARBONACEOUS SHALE = DARK DUSKEY



0068



BROWN, DARK BROWNISH BLACK, CRUMBLY
 BRITTLE TENACITY; EARTHY SUB BLOCKY
 FRACTURE; TABULAR, SUB MASSIVE CUTTINGS
 HABIT; RESINOUS, DULL LUSTER; GRITTY
 TEXTURE; THICK STRUCTURE.
 TD FOR INTERMEDIATE CASING AT 8976' MD
 TWISTED OFF BHA WHEN TRIPPING. FISHING
 UNSUCCESSFULL. CEMENT AND SIDETRACK WELL

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