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

Drilling Dynamics MD

COMPANY	ExxonMobil Oil Corporation
WELL	PCU 297-12A1
FIELD	Piceance Creek
REGION	Rocky Mountains
COORDINATES	Lat: 39.8890710
	Long: 108.2372410
ELEVATION	GL: 7183.6'
	RKB: 7197'
COUNTY, STATE	Rio Blanco, Colorado
API INDEX	051031115700
SPUD DATE	09/22/2009
CONTRACTOR	HP DRILLING
CO. REP.	M. SADLER / J. WOODS
RIG/TYPE	326 FLEX FOUR
LOGGING UNIT	CANRIG UNIT ML036
GEOLOGISTS	John Morris
	Bill Johanning
ADD. PERSONS	
CO. GEOLOGIST	CHRIS ALBA

LOG INTERVAL

DEPTHS:	4111'	**TO**	6282'
DATES:	6/16/2009	**TO**	6/18/2009
SCALE:	1" = 100'		

MUD TYPES

WATER BASE	**TO**	5730'
DSF	**TO**	6200'
LSND	**TO**	6282'
	TO	

CASING DATA

16.000"	**AT**	150'
10.750"	**AT**	4111'
	AT	
	AT	

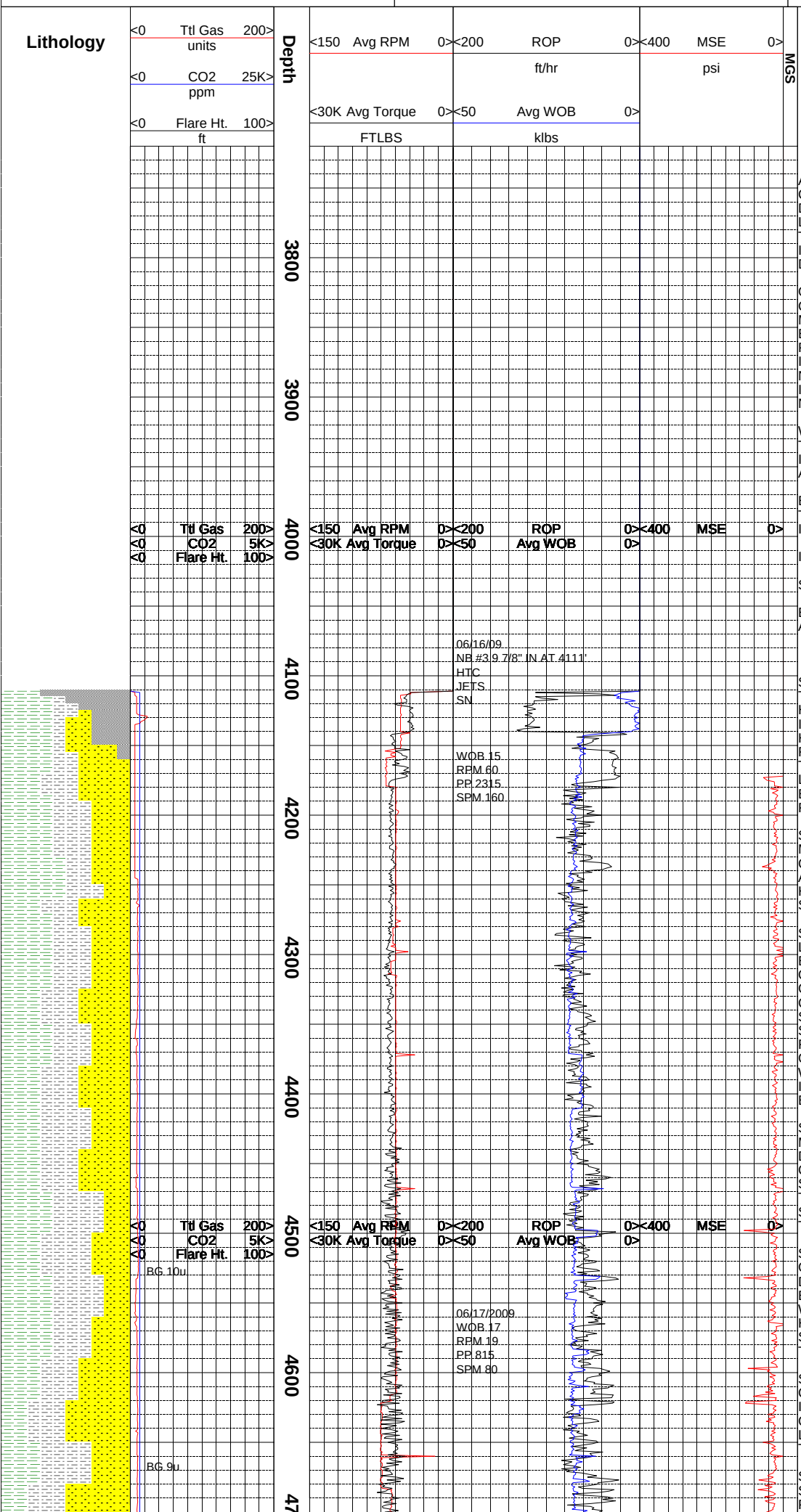
HOLE SIZE

14.250"	**TO**	4111'
9.875"	**TO**	6282'
	TO	
	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



Remarks

Survey Data, Mud Reports, Other Info.

ALL ROCK COLORS ARE REFERENCED TO THE CONNECTION GASES AS WELL AS TRIP AND DOWNTIME GASES ARE NOTED ON THE LOG. LARGE CONNECTION GASES WHICH APPEAR ON THE MUD LOG USUALLY REFLECT UPHOLE GAS INTERVALS BLEEDING GAS INTO THE BOREHOLE DURING CONNECTIONS.

GAS CHROMATOGRAPHY EQUIPMENT IS CALIBRATED TO A TEST GAS COMPOSED OF
METHANE = 10040 PPM
ETHANE = 990 PPM
PROPANE = 1000 PPM
I-BUTANE = 1010 PPM
N-BUTANE = 1000 PPM
I-PENTANE = 1000 PPM
N-PENTANE = 1000 PPM

WHEN THE MUD IS CIRCULATED THROUGH THE GAS BUSTER, THE INTERVAL IS MARKED IN THE MGS COLUMN AND SIZE OF FLARES ARE NOTED.

EVIDENCE OF FRACTURE FILL IS NOTED ON THE MUD LOG. KAOLIN PERCENTAGE IN SS INTERVALS IS ALSO NOTED ON THE MUD LOG.

I UNIT OF GAS = 200 PPM METHANE

SET 10 3/4" SURFACE CASING AT 4111'

EPOCH COMMENCED LOGGING ON 6/16/2009 AT 4111' MD.

NOTE: DRILLING WITH POWER DRIVE AND MWD

SHALE = DARK YELLOWISH BROWN, MEDIUM TO DARK OLIVE GRAY; FIRM TO MODERATELY HARD; CRUMBLY TO MODERATELY TOUGH; IRREGULAR, PLANER AND WEDGELIKE CUTTINGS HABIT; MATTE TO OCCASIONALLY SLIGHTLY RESINOUS LUSTER DOMINANTLY SMOOTH TEXTURE; SLIGHTLY TO VERY CALCAREOUS; LOCALLY SILTY, GRADING IN PART AND INTER BEDDED WITH SILTSTONE; POOR TO MODERATE FISSILITY.

SILTSTONE = DARK YELLOWISH BROWN TO MEDIUM GRAY; FIRM TO MODERATELY HARD; CRUMBLY TO OCCASIONALLY TOUGH; IRREG AND SUBBLOCKY OR WEDGELIKE CUTTINGS HABIT; MATTE LUSTER WITH SCATTERED SPARKLES; MODERATELY CALCAREOUS

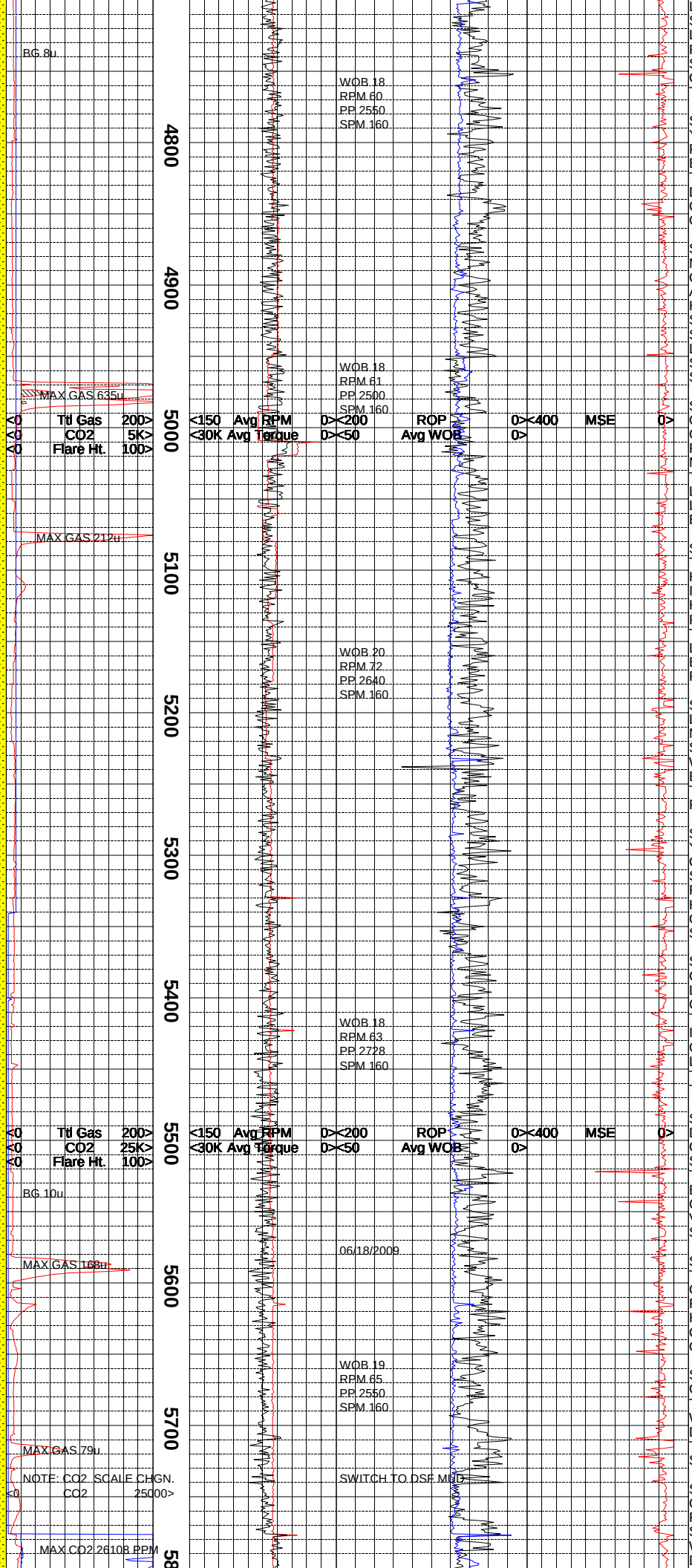
SANDSTONE = PALE YELLOWISH LIGHT BROWN, LIGHT OFF WHITE, LIGHT PALE GRAYISH BROWN; SOME CLEAR TO SLIGHT TRANSLUCENT; QUARTZ FRAMEWORK; UPPER TO LOWER FINE GRAIN SIZE; POOR TO FAIR SORTING; CONSOLIDATED IN PART; PREDOMINATELY SUBANGULAR ANGULARITY; SEMI FROSTED SURFACE FEATURES; EASILY FRIABLE TO FIRM FRIABLE; CLAY MATRIX CEMENT; WEAK GRAIN SUPPORTED; TRACES CALCITE CEMENT; WEAK HCL REACTION; VERY POOR VISUAL INTER GRANULAR POROSITY; TRACES DARK BROWNISH SILTSTONE INTERBEDDED.

SHALE = DARK YELLOWISH ORANGE, LIGHT MODEDRATE YELLOWISH BROWN, TRACES DARK YELLOWISH BROWN; PULVERULENT , CRUNCHY TENACITY; EARTHY TO SUB BLOCKY SLIGHT IRREGULAR FRACTURE; WEDGELIKE TABULAR CUTTINGS HABIT; DULL EARTHY SLIGHT WAXY LUSTER, GRITTY TO CLAYEY TEXTURE; MASSIVE STRUCTURE.

SHALE = LIGHT BLUISH GRAY, LIGHT PURPLE GRAY, MODERATE GRAYISH ORANGE; CRUMBLY DENSE TENACITY; EARTHY, SUBBLOCKY TO BLOCKY SLIGHT IRREGULAR FRACTURE; WEDGELIKE, TABULAR, SUBBLOCKY CUTTINGS HABIT; DULL EARTHY LUSTER; GRITTY TO SMOOTH TEXTURE; THICK MASSIVE STURCTURE; TRACE SILTSTONE INTERBEDDED.

SILTSTONE = LIGHT GRAYISH ORANGE HUES; CRUMBLY, CRUNCHY TENACITY; SUB BLOCKY, IRREGULAR FRACTURES; WEDGELIKE, TABULAR CUTTINGS HABIT; DULL EARTHY, FROSTED LUSTER, GRANULAR TO CLAYEY TEXTURE; THICK MASSIVE STRUCTURE.

SANDSTONE = VERY LIGHT GRAYISH WHITE, SLIGHT OFF WHITE, LIGHT BLUISH GRAY; PREDOMINATELY QUARTZ FRAMEWORK;



LOWER FINE GRAIN SIZE; POOR SROTED; SUBANGULAR TO ANGULAR ANGULARITY; LOW SPHERICITY; TRACE FROSTED SURFACE FEATURE; FRIABLE TO FIRM FRIABLE; SILICA MATRIX CEMENT, TRACE CALCITE CEMENTATION, SOME HCL REACTION; TRACE LITHIC AND SILTSTONE INTERBEDDED.

SHALE = LIGHT BLUISH GRAY, LIGHT PALE YELLOWISH BROWN, VERY LIGHT GRAY; PULVERULENT, CRUMBLY TENACITY; SUB BLOCKY, BLOCKY SLIGHT IRREGULAR FRACTURE; WEDGELIKE, EQUART CUTTINGS HABIT; DULL EARTHY , WAXY LUSTER; GRANULAR, CLAYEY TEXTURE; THICK STURCTURE; GRADING TO A GRITTY SILTSTONE.

SILTSTONE = PURPLISH BROWN, LIGHT TO MEDIUM GRAY; FIRM TO MODERATELY HARD; CRUMBLY TO OCCASIONALLY TOUGH; IRREG AND SUBBLOCKY OR WEDGELIKE CUTTINGS HABIT; MATTE LUSTER WITH SCATTERED SPARKLES; MODERATELY CALCAREOUS; SCATTERED CARBONACEOUS SPECKS; LOCALLY COMMON VERY FINE SAND, OCC SANDY, GRADES IN PART TO VERY FINE SANDSTONE.

SANDSTONE = VERY LIGHT GRAY TO WHITE; OCC WITH SLIGHT BROWNISH HUES; FIRM CLASTS RANGE FROM VERY FINE LOWER TO FINE LOWER; SUBANGULAR TO SUBROUND; MODERATELY SORTED; QUARTZ RICH, SCATTERED TO COMMON DARK GRAY TO BLACK LITHICS; CLAY MATRIX; LIGHT CALC CEMENT; LOCALLY SILTY, GRADES TO AND IS INTERBEDDED WITH SILTSTONE.

SHALE = DARK YELLOWISH BROWN, MEDIUM TO DARK OLIVE GRAY; FIRM TO MODERATELY HARD; CRUMBLY TO MODERATELY TOUGH; IRREGULAR, PLANER AND WEDGELIKE CUTTINGS HABIT; MATTE TO OCCASIONALLY SLIGHTLY RESINOUS LUSTER DOMINANTLY SMOOTH TEXTURE; SLIGHTLY TO VERY CALCAREOUS; LOCALLY SILTY, GRADING IN PART AND INTER BEDDED WITH SILTSTONE; POOR TO MODERATE FISSILITY.

SILTSTONE = MODERATE YELLOWISH BROWN, LIGHT GRAYISH BROWN; SLIGHTLY FRIM TO MODERATELY HARD, SEMI CRUMBLY TENACITY; SUBBLOCKY TO SLIGHT IRREGULAR FRACTURE; WEDGELIKE MASSIVE CUTTINGS HABIT; DULL EARTHY RESINOUS LUSTER; GRITTY T CLAYEY TEXTURE; MASSIVE STURCTURE, NO HCL REACTION.

SHALE = LIGHT YELOWISH GRAY, MODERATE YELLOWISH BROWN, LIGHT GRAYISH BROWN; CRUMBLY TO SLIGHTLY FRIM TENACITY; SUB BLOCKY, EARTHY TO SLIGHTLY IRREGULAR FRACTURE; WEDGELIKE, TABULAR CUTTING HABIT; DULL WAXY, EARTHY IN PART LUSTER; GRITTY TO SILTY TEXTURE; THICK MASSIVE STRUCTURE, GRADING TO GRITTY SILTSTONE.

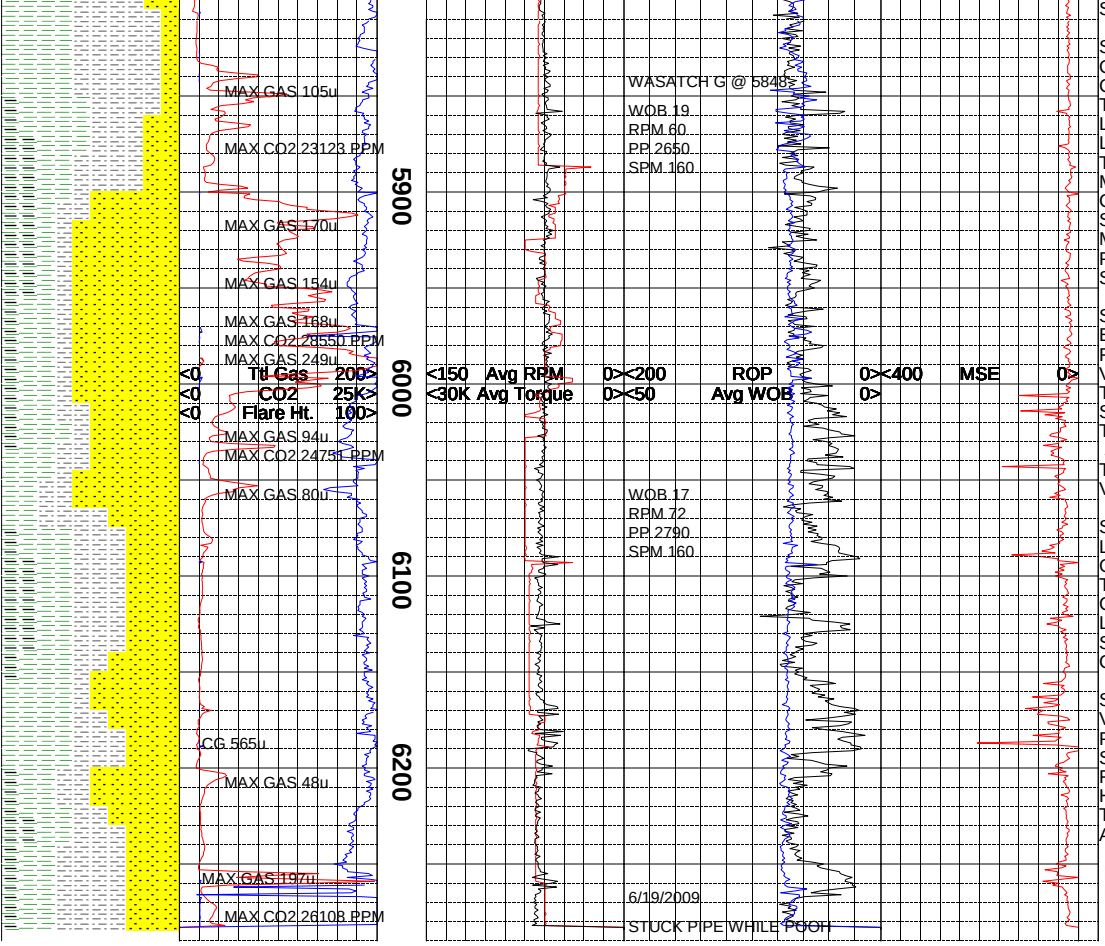
SILTSTONE = MODERATELY YELLOWISH GRAYISH ORANGE, PALE YELLOWISH BROWN, LIGHT DUSKY YELLOWISH BROWN; SEMI CRUMBLY, FIRM TO MODERATELY HARD TENACITY; SUB BLOCKY, BLOCKY SEMI IRREGULAR FRACTURE; WEDGELIKE, EQUANT CUTTINGS HABIT; DULL WAXY SEMI FROSTED LUSTER; GRITTY GRADING TO SEMI SILTY TEXTURE; MASSIVE SEMI THICK STRUCTURE; TRACES OF SANDSTONE IMBEDDED.

SANDSTONE = LIGHT GRAYISH ORANGE, SOME DULL OFF WHITE, LIGHT BLUISH MODERATE GRAY; UPPER FINE GRAIN SIZE; POOR SORTED SUBANGULAR TO SUBROUND ANGULARITY; TRACES FROSTED SURFACE FEATURES; EASILY FRIABLE TO MODERATE FIRM; CLAY MATRIX CEMENT, TRACE SILICA CEMENT; VERY WEAK CALCITE CEMENT; WEAK GRAIN SUPPORT; TRACES SILTSTONE IMBEDDED.

SHALE = MODERATE YELLOWISH BROWN, TRACE LIGHT BLUISH GRAY; PULVERULENT, CRUMBLY TENACITY; SUBBLOCKY, BLOCKY FRACTURE; WEDGELIKE, TABULAR CUTTINGS HABIT; DULL WAXY LUSTER; GRITTY TO CLAYEY TEXTURE; MASSIVE STRUCTURE; GRADING TO SILTSTONE.

SILTSTONE = LIGHT GRAYISH BROWN, LIGHT GRAYISH YELLOW; BRITTLE TO DENSE TENACITY; SUB BLOCKY, BLOCKY FRACTURE; WEDGELIKE TABULAR CUTTINGS HABIT; DULL FROSTED RESINOUS LUSTER; SILTY TO SLIGHT GRITTY TEXTURE; MASSIVE STRUCTURE; GRADING TO SANDSTONE.

SILTSTONE = PALE LIGHT BROWN, GRAYISH ORANGE, PALE BROWN; SOFT TO SLIGHTLY FIRM, SOME CURUMBLY TENACITY; EARTHY SEMI IRREGULAR, SUBBLOCKY FRACTURE; WEDGELIKE, SUBBLOCKY CUTTING HABIT; DULL EARTHY, GRITTY TEXTURE; MASSIVE



STRUCTURE.

SANDSTONE = WHITE TO VERY LIGHT GRAY, OCCASIONALLY LIGHT GREENISH GRAY; COMMON "PEPPERED" APPEARANCE; FRIABLE TO HARD; CLASTS RANGE FROM VERY FINE LOWER TO FINE UPPER, RARELY MEDIUM LOWER; MODERATELY SORTED; SUBANGULAR TO SUBROUND; DOMINANTLY QUARTZ WITH MINOR LITHICS; A FEW PIECES WITH COMMON CARBONACEOUS MATTER; MOSTLY GRAIN SUPPORTED; CLAY MATRIX; LIGHT TO MODERATE CALCITE CEMENT; GRADES IN PART TO AND IS INTERBEDDED WITH SILTSTONE.

SANDSTONE = VERY LIGHT GRAY, LIGHT BLUISH GRAY; PREDOMINATELY QUARTZ FRAMEWORK; LOWER TO SLIGHTY UPPER VERY FINE GRAIN; WELL SORTED; SUBANGULAR TO SOME SUBROUND ANGULARITY; LOW SPHERICITY; FROSTED IN PART; FRIABLE TO FIRM FRIABLE; PREDOMINATELY GRAIN SUPPORTED, TRACES OF CALCITE CEMENT; TRACES BLACK LITHICS SPECKLED IMBEDDED; VERY TIGHT, NO VISUAL POROSITY.

SHALE = DARK TO DUSKY YELLOWISH BROWN, LIGHT TO MEDIUM GRAY, OCCASIONAL LIGHT GREENISH GRAY; FIRM TO HARD; CRUMBLY TO TOUGH; TABULAR, BLOCKY AND PLATY CUTTINGS; MATTE TO SLIGHTLY SHINY LUSTER SMOOTH TO SILTY TEXTURE; NON TO SLIGHTLY CALCAREOUS; RARELY WITH HIGH CARBONACEOUS CONTENT.

SILTSTONE = DARK REDDISH BROWN, TRACES VERY DUSKY RED, LIGHT YELLOWISH BROWN; PULVERULENT, CRUNCHY TENACITY; SUBBLOCKY TO BLOCKY SLIGHT IRREGULAR FRACTURE; WEDGELIKE, EQUANT CUTTINGS HABIT; DULL EARTHY LUSTER; GRITTY TEXTURE; MASSIVE STRUCTURE; GRADING TO A SANDSTONE.

NOTE: C.O. AT 6282'. PIPE STUCK WHILE POOH. SIDETRACK WELL.