

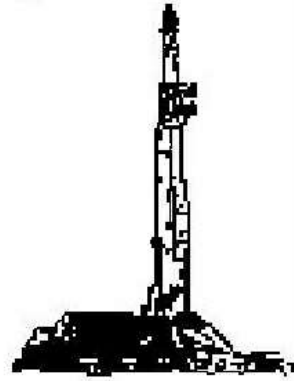
# **G**OOLSBY BROTHERS and associates, inc.

575 Union Blvd, Suite 208  
Lakewood, CO 80228  
303-945-2860 Office



## **Geological Wellsite Supervision**

***www.goolsbybrothers.com***



**Scale 1:240 (5"=100') Imperial  
Measured Depth Log**

**Well Name:** Armstrong #1

**API:** SWSE Section 21, T3S, R 51W, , 600' FSL, 2040' FEL

**Location:** Washington County, Colorado

**License Number:** API 05-121-11088

**Spud Date:** 10/30/2019

**Surface Coordinates:** Lat 39.7731, Long -103.09279

**Region:** Wild Cat

**Drilling Completed:** 11/04/2019

**Bottom Hole** Same

**Coordinates:**

**Ground Elevation (ft):** 4,667'

**K.B. Elevation (ft):** 4,675'

**Logged Interval (ft):** 3,400' **To:** 4,205' **Total Depth (ft):** 4,205'

**Formation:** D Sand and J Sand Target

**Type of Drilling Fluid:** Water-based Gel

Printed by StripLog from WellSight Systems 1-800-447-1534 [www.WellSight.com](http://www.WellSight.com)

### **OPERATOR**

**Company:** St Croix Exploration Co.

**Address:** 600 South Cherry Street

Suite 200

Glendale, CO 80246

### **GEOLOGIST**

**Name:** John G. Thomas, CPG

**Company:** Goolsby Brothers & Associates, Inc. ([www.goolsbybrothers.com](http://www.goolsbybrothers.com))

**Address:** 575 Union Blvd.

Suite 208,

Lakewood CO. 80228

### **Logs**

### **Casing**

## Contractors

### ROCK TYPES

	Bent
	Arg ss
	Cht
	Clyst
	Coal
	Congl
	Dol
	Gyp

	Ls
	Mrlst
	Sh
	Shcol
	Shgy
	Ss
	Cement
	Sltst

	Ss
	Chlk
	Mdstn
	Fracture
	Anhyd
	Mdstn
	Ss
	Sltly sh

	Arg dol
	Clybasedsltst
	Carb sh
	Carb chalk
	Arg lmy ss

### ACCESSORIES

MINERAL	
	Anhy
	Arggrn
	Arg
	Bent
	Bit
	Brecfrag
	Calc
	Carb
	Chtdk
	Chtlt
	Dol
	Feldspar
	Ferrpel
	Ferr
	Glau
	Gyp
	Hvymin
	Kaol
	Marl

	Minxl
	Nodule
	Phos
	Pyr
	Salt
	Sandy
	Silt
	Sil
	Sulphur
	Tuff

FOSSIL	
	Algae
	Amph
	Belm
	Bioclst
	Brach
	Bryozoa
	Cephal
	Coral

	Crin
	Echin
	Fish
	Foram
	Fossil
	Gastro
	Oolite
	Ostra
	Pelec
	Pellet
	Pisolite
	Plant
	Strom

STRINGER	
	Anhy
	Arg
	Bent
	Coal
	Dol

	Gyp
	Ls
	Mrst
	Sltstrg
	Ssstrg

TEXTURE	
	Boundst
	Chalky
	Cryxln
	Earthy
	Finexln
	Grainst
	Lithogr
	Microxln
	Mudst
	Packst
	Wackest

### OTHER SYMBOLS

POROSITY TYPE	
	Earthy
	Fenest
	Fracture
	Inter
	Moldic
	Organic
	Pinpoint
	Vuggy

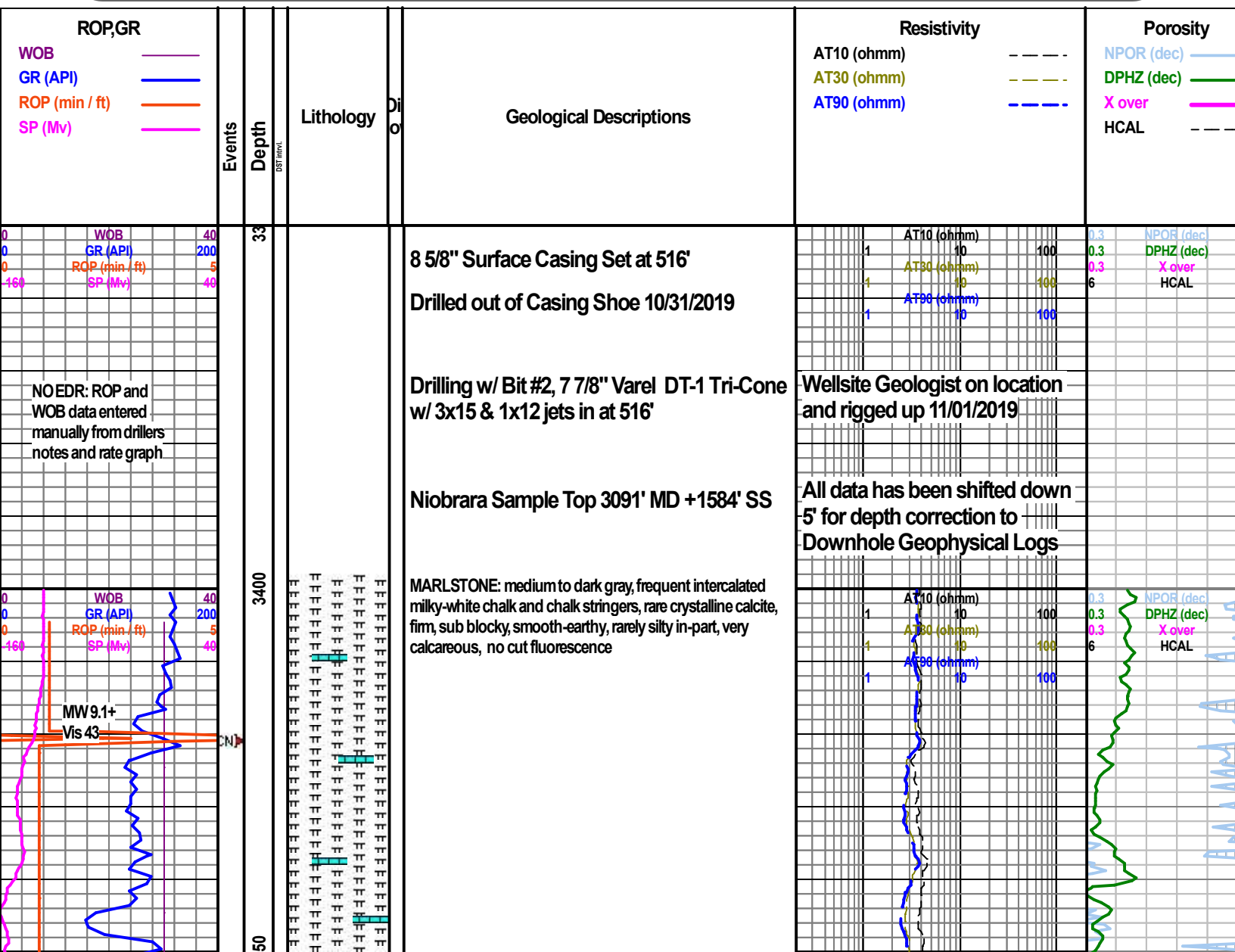
SORTING	
	Well
	Moderate
	Poor

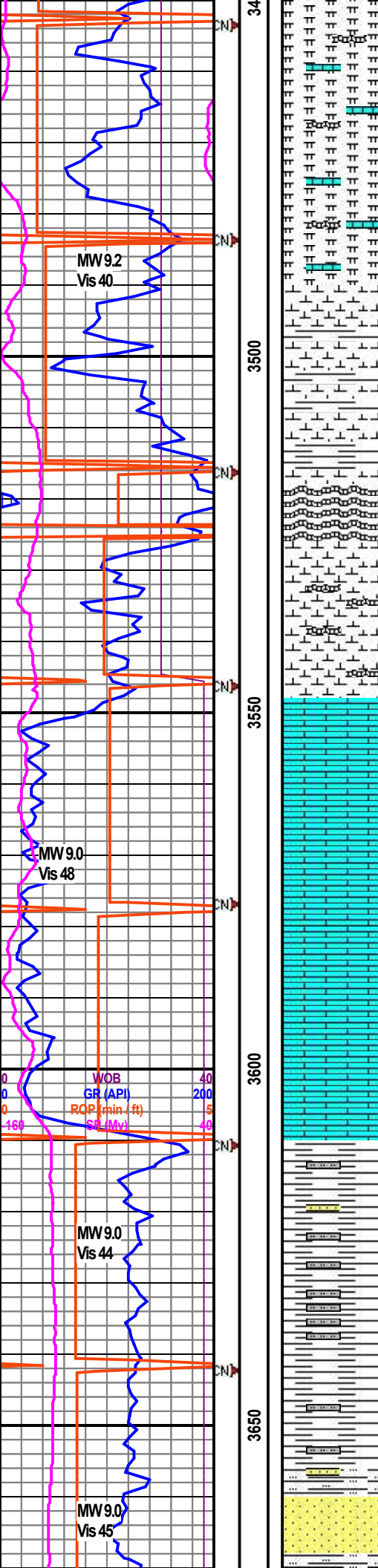
ROUNDING	
	Rounded
	Subrnd
	Subang
	Angular

OIL SHOWS	
	Uniform
	Spotted
	Quiescent
	Dead
	Patchy
	Vspotty

INTERVALS	
	Core
	Dst

EVENTS	
	Trip_point
	New bit
	Connection(cn)
	Survey(mwd)
	Survey(dropped)
	Survey(wireline)
	Casing_shoe(1)
	Off bottom
	Sidewall core





**MARLSTONE:** medium to dark gray, frequent intercalated milky-white chalk and chalk stringers, rare crystalline calcite, firm, sub blocky, smooth-earthly, rarely silty in-part, very calcareous, no cut fluorescence; occasional off-white bentonite stringers

**SHALE:** medium to dark gray, trace black carbonaceous, smooth to earthy, sub blocky, some sub platy, some moderately calcareous mudstone, rare pyrite, slow bleeding milky cut fluorescence, no residual dry cut fluorescence

### Wiper Trip/ Bit Trip @ 3520'

- poor sample quality after trip

### FT HAYS 3548' MD 1065' SS

**LIMESTONE:** white - frequently clayey, trace buf, rare trace lt gray shaley interbeds, occasional very fine to fine angular sand in matrix-supported stringers, rare crystalline calcite fragments, firm-hard, no cut fluorescence

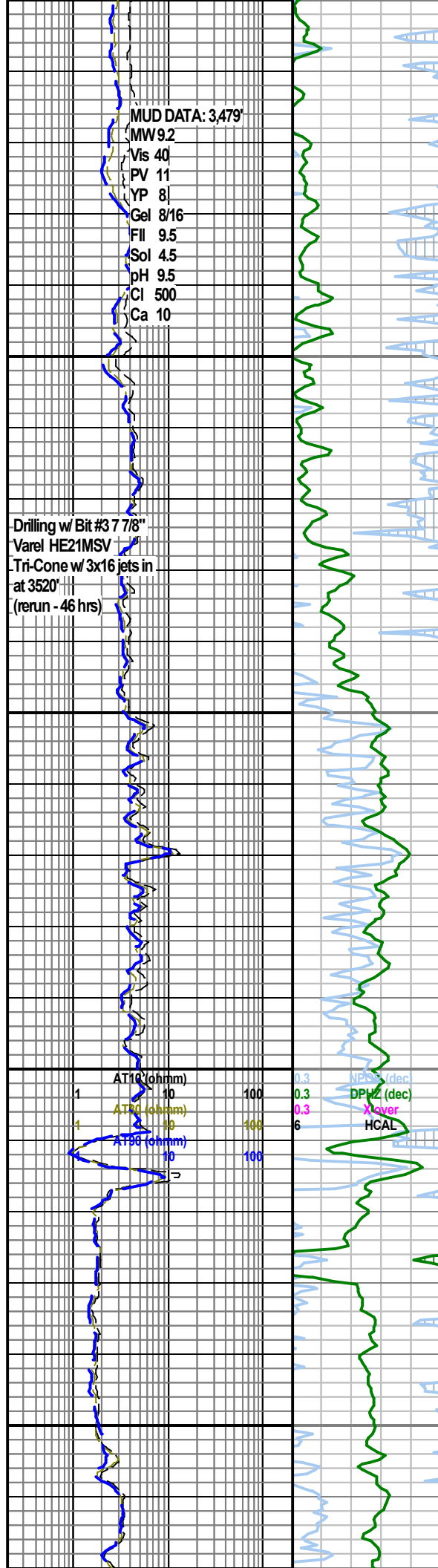
**LIMESTONE:** white - frequently clayey, trace buf, rare trace lt gray shaley interbeds, occasional very fine to fine angular sand in matrix-supported stringers, rare crystalline calcite fragments, firm

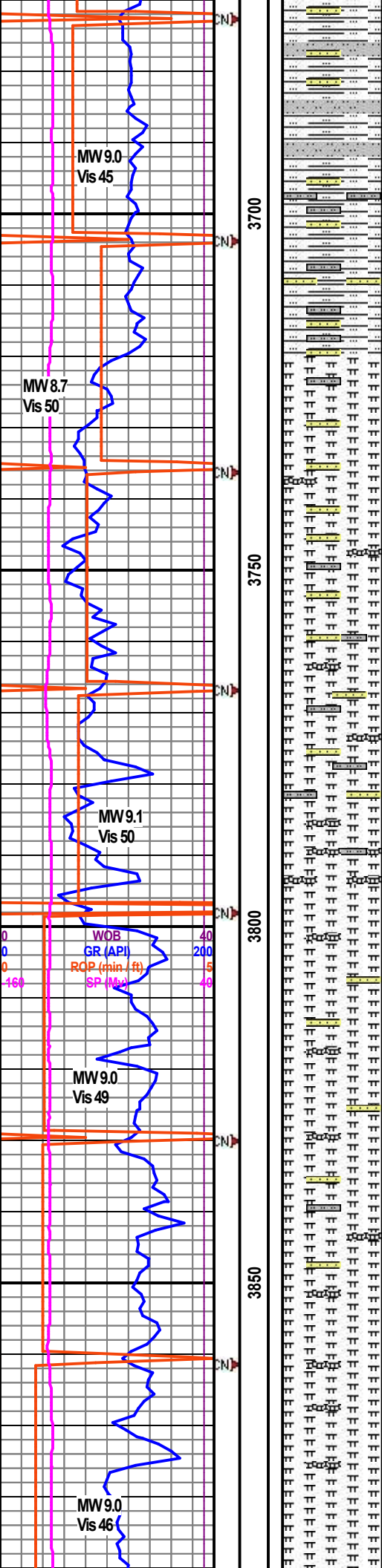
### CARLILE 3610' MD 1065' SS

**SHALE:** medium to dark gray, firm, sub blocky, earthy-slightly abrasive, occasionally silty in-part, slightly calcareous to non calcareous, rare very fine sandstone stringers, no cut fluorescence

**SHALE:** medium to dark gray, firm, sub blocky, earthy-slightly abrasive, frequently silty in-part grading to shaley siltstone, slightly calcareous to non calcareous

**SANDSTONE:** clear, white-opaque, frequent trace dark mineral grains, very fine, occasional trace-some fine, sub rounded-rounded, trace-some sub angular, well sorted, slightly calcareous, poor-fair porosity, no cut fluorescence





SILTY SHALE: medium to dark gray, well indurated, sub blocky-sub platy, earthy to gritty, silty, occasional trace-some very fine sand, non-to-slightly calcareous

SILTSTONE: gray, well indurated, sub blocky, abrasive, argillaceous, slightly calcareous, frequent trace to some very fine sand

### GREENHORN 3720' MD 955' SS

SILTY/SANDY MARLSTONE: medium to dark gray, trace brown gray, occasional light gray to off white mottling, firm, silty, argillaceous, some argillaceous very fine grain sandstone, some fine-medium sandstone occasionally comprised of calcite grains, very calcareous, rare black carbonaceous stain, slow bleeding milky cut fluorescence, no residual dry cut flor

MARLSTONE: medium to dark gray, trace brown gray, occasional light gray to off white mottling, firm, silty, argillaceous, some very fine sandstone stringers, very calcareous, rare black carbonaceous stain, occasional trace bentonite

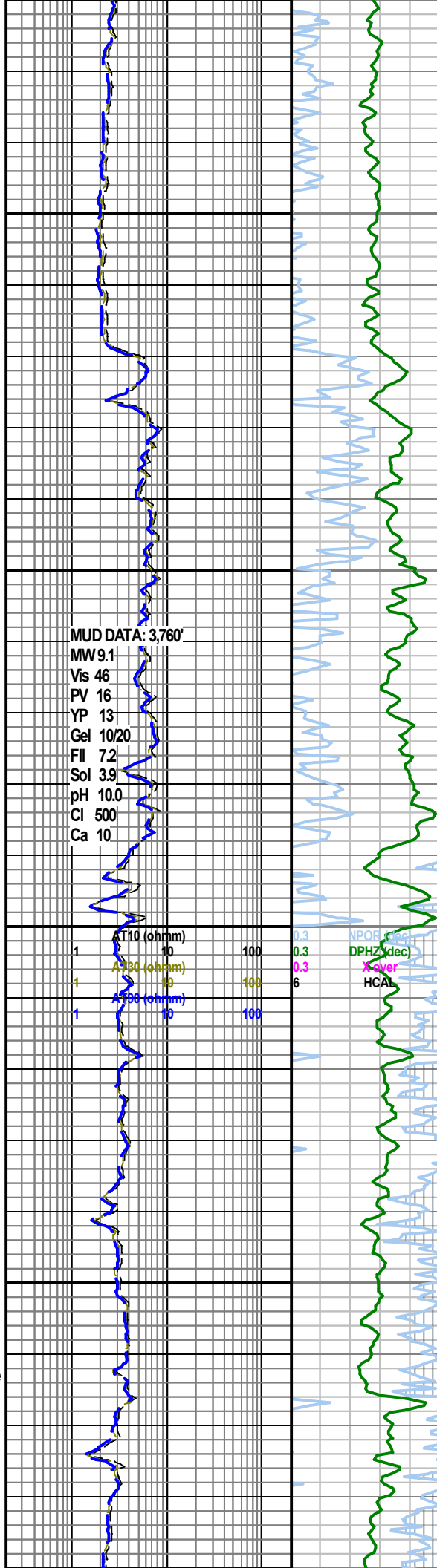
MARLSTONE: medium to dark gray, decreasing trace light gray to off white mottling, firm, silty, argillaceous, some very fine sandstone stringers, very calcareous, rare black carbonaceous stain, increasing off-white bentonite (~30%) with dull gray-yellow mineral fluorescence

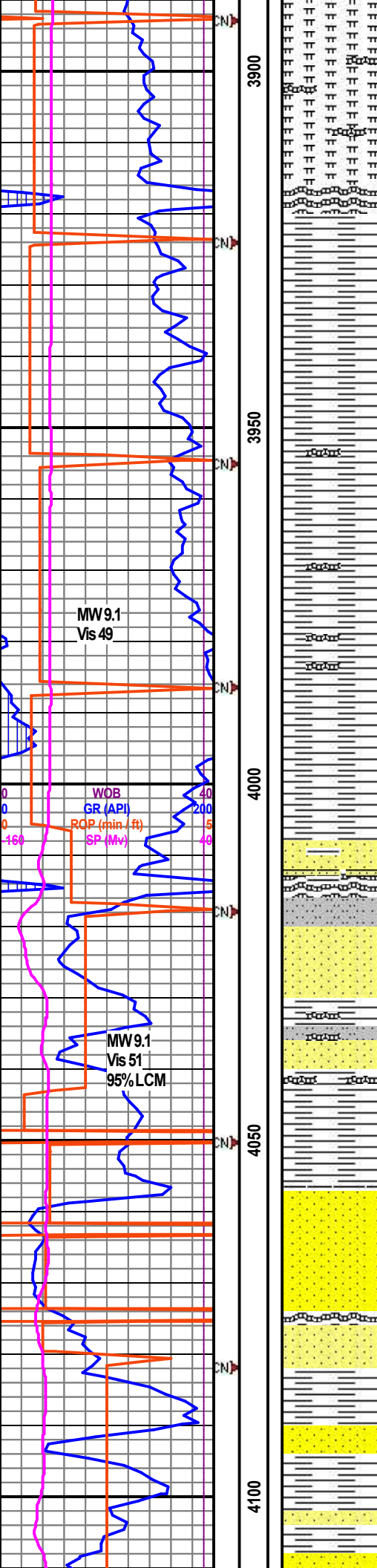
### Wiper Trip at 3,793'

MARLSTONE: medium dark gray, trace light gray to off white mottling, firm, some silty, trace very fine sandstone stringers, very calcareous, trace black carbonaceous stain, trace off-white bentonite with dull gray-yellow mineral fluorescence, slow bleeding milky cut fluorescence, faint yellow residual dry cut flor

MARLSTONE: medium dark gray, trace light gray to off white mottling, firm, some silty, trace very fine sandstone stringers, very calcareous, rare black carbonaceous stain, trace off-white bentonite with dull gray-yellow mineral fluorescence

MARLSTONE: medium dark gray, rare light gray to off white mottling, firm, earthy-slightly abrasive/ silty ip, very





calcareous, rare black carbonaceous stain, trace off-white bentonite with dull gray-yellow mineral fluorescence

### X Bentonite: 3917' MD 758' SS

BENTONITE: very light gray, some white translucent, trace light brown mica, firm, sub platy, yellow-green mineral fluorescence

SHALE: medium to dark gray, firm, sub platy, earthy, slightly silty in-part, non-calcareous

SHALE: dark gray, firm, sub blocky, smooth to earthy, occasionally silty in-part, slightly carbonaceous, non-calcareous, slow bleeding milky cut fluorescence, spotty faint yellow residual dry cut floor

SHALE: dark gray, trace black, firm, sub blocky, smooth to earthy, occasionally silty in-part, slightly carbonaceous, non-calcareous, slow bleeding milky cut fluorescence, no residual dry cut floor

SHALE: dark gray, trace black, firm, sub blocky, smooth to earthy, occasionally silty in-part, slightly carbonaceous, non-calcareous, slow bleeding milky cut fluorescence, faint yellow residual dry cut floor; occasional bentonite stringers

SHALE: As above, occasional pyrite nodules

### D SAND 4008' MD 667' SS

SS: cl, frq tr-sm wh-opq, occ tr dk mnrl grs, occ tr-sm pyr nods, occ dk gy shly mtr, var vlf, tr all f, sb rd-rd, tr sb ang, wl srt, sl calc-silc, occ tt cmt, tr lse cmt, por rng est 8-13%; occ bent strgs, slo mky cut flr, no dry cut flr

SLTST: lt gy-brn, wl ind, sb blk, rgh, tr v f sand

SS: cl, tr wh-opq, vf, sb rd-rd, pore est 11%, no cut flr

SS: cl, occ tr wh-opq, occ tr lt bm stn, vf, tr-w f, sb rd-rd, wl srt, silc, pore est 10-13%; no cut flr, freq bent strgs

### HUNTSMAN: 4040' MD 635' SS

SH: dk gy to blk, fm, sb blk, smth, tr rthy

Circulate b/u @ 4045'

### J SAND 4056' MD 619' SS

Circulate b/u @ 4058'

SS: cl, occ tr wh-opq, med, sm-w f, sb rd-rd, v wl srt, uncon, no stain, por range est 26-32%

SS: a/a, rar clast & pitted crs gr w/ tr bm stn

Circulate b/u @ 4070'

SS: cl, occ tr wh-opq, occ tr mky wh silc mtr, rar tr v lt bm stn, rar tr gn glau, f, tr med, tr vf, por range est 12-25%

Bent: mky wh, occ tr brn mic, yel-gn mnrl flr

Sh: dk gy fm, sb plty, smth-rthy

SS: cl, occ tr wh-opq, occ tr mky wh silc mtr, occ tr gy sh frags, rar tr v lt bm stn, rar tr gn glau, f, tr med, tr vf, rar crs, por range est 12-22%

SS: cl, occ tr wh-opq, occ tr mky wh silc mtr, rar gy sh frags, f, tr-w vf, por range est 12-20%; slow mky cut flr, v fnt yel

