



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

Well Name: ANDERSON-SCHWARTZ TRUST
Well Id: #1
Location: 107' FNL, 775' FWL, Sec 32-T19S-R30W, Lane County, Kansas
License Number: API: 15-101-22621 Region: Lane County
Spud Date: 02/27/2019 Drilling Completed: 03/13/2019
Surface Coordinates: Lat: 38.3657751
Long: -100.6644372
Bottom Hole Vertical hole
Coordinates:
Ground Elevation (ft): 2927' K.B. Elevation (ft): 2935'
Logged Interval (ft): 3700' To: RTD Total Depth (ft): 4725'
Formation: Mississippian at RTD
Type of Drilling Fluid: Chemical

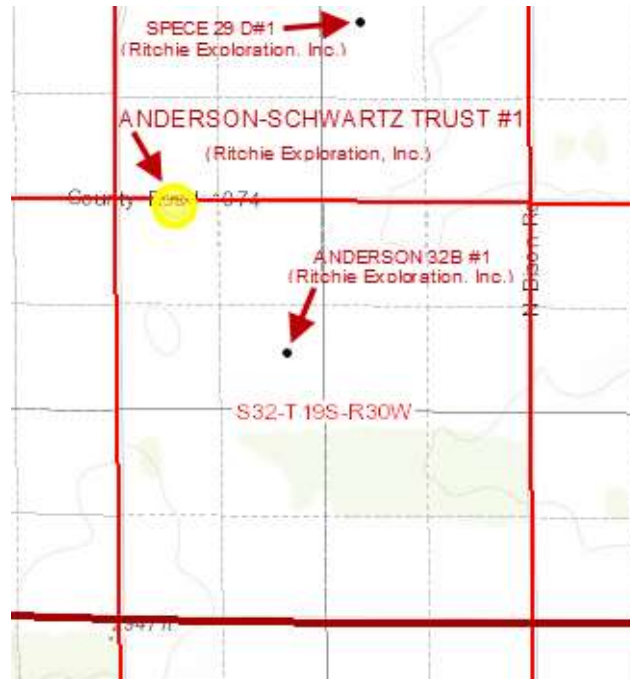
Printed by MUD.LOG from WellSight Systems 1-800-447-1534 www.WellSight.com

OPERATOR

Company: Ritchie Exploration, Inc.
Address: 8100 E. 22nd Street N., Bldg 700
Wichita, KS 67226
316-691-9500

GEOLOGIST

Name: Kent R. Matson
Company: Matson Geological Services, LLC
Address: 33300 W. 15th Street S.
Garden Plain, Kansas 67050
316-644-1975; kent4m@hotmail.com



COMMENTS

Ritchie Exploration Company Geologist: John Goldsmith, 316-640-0236 (cell).

Contractor: WW Drilling Company, Rig #12.

Tool Pusher: Calvin Pfannenstiel, 785-743-8120 (cell).

Surface Casing: 8 5/8" set at 221' (KB) w/165sx cement by QES.

Production Casing: Based on field observations of drill cuttings, DST results and electric log evaluation, production casing was installed.

Mud by: Mud-Co/Service Mud, Inc., Reid Atkins, 785-694-3741 (cell).

DST's by: Diamond Testing, Tim Venters, 620-388-6333 (cell).

Logs by: Pioneer (DI w/GR, CND, Micro, and Sonic), Ian Mabb, 785-623-9741 (cell).

RTD= 4725'

LTD= 4725'

FORMATION TOPS

FORMATION	SAMPLE TOPS		LOG TOPS	
	Depth	Datum	Depth	Datum
Stotler	3549'	-614	3548'	-613
Heebner Shale	3940'	-1005	3940'	-1005
Lansing	3987'	-1052	3988'	-1053
Muncie Creek Shale	4170'	-1235	4170'	-1235
Stark Shale	4276'	-1341	4274'	-1339
Hushpuckney Shale	4316'	-1381	4212'	-1377
Base of KC	4360'	-1425	4356'	-1421
Marmaton	4398'	-1463	4395'	-1460
Altamont	4412'	-1477	4408'	-1473
Pawnee	4488'	-1436	4486'	-1434
Myrick Station	4517'	-1582	4515'	-1580
Fort Scott	4531'	-1596	4530'	-1595
Cherokee Shale	4551'	-1616	4552'	-1617
Johnson	4589'	-1654	4588'	-1653
Mississippian	4616'	-1681	4614'	-1679
RTD	4725'	-1790		
LTD			4725'	-1790

ROCK TYPES

LITHOLOGY

	Anhy
	Cht
	Coal
	Congl
	Dol
	Gyp
	Lmst
	Salt
	Shale
	Shcol
	Shgy
	Sltst
	Ss
	Carb sh
	Dol
	Dtd
	Gry sh
	Sandy lms
	Shale
	Sltstn
	Shlyslts

	Sitysh
	Sdy dolo
	Silty dolo
	Shy dolo
	Shaly ls

FOSSIL

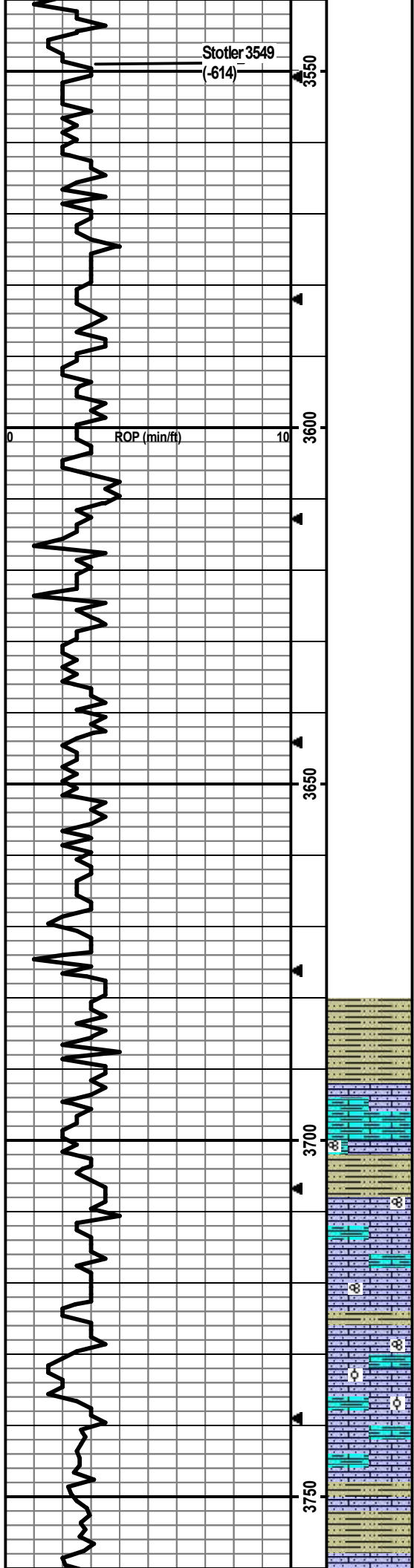
	Algae
	Amph
	Belm
	Bioclst
	Brach
	Bryozoa
	Cephal
	Coral
	Crin
	Echin
	Fish
	Foram
	Fossil
	Gastro
	Oolite

MINERAL

	Ostra
	Pelec
	Pellet
	Pisolite
	Plant
	Strom
	Fuss
	Oomold
	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
	Chlorite
	Dol
	Sand
	Sly

Rate of Penetration (ROP) ROP (min/ft)	Depth	Lithology	CFS Point	Oil Shows	Geological Descriptions	Remarks
	33				Morning Report Depth/Activity (7:00 am) 02/27/2019, MIRU/Spud. 02/28, drilling @ 221'. 03/01, drilling @ 1541'. 03/02, drilling @ 2703'. 03/03, drilling @ 3275'. 03/04, drilling @ 3707'. 03/05, drilling @ 4086'. 03/06, DST #1 @ 4240'. 03/07, drilling @ 4374'. 03/08, DST #2 @ 4450'. 03/09, DST #3 @ 4500'. 03/10, On the bank, depth @ 4525', working on site flooding problem. 03/11, DST#4 @ 4610'. 03/12, DST#5 @ 4632'. 03/13, DST#6 @ 4648'. TD @ 4725'. Electric logged.	Mud-Co/Service Mud Inc. Check #1 @ 0' 02/27/19, predrilling instructions. Mud-Co/Service Mud Inc. Check #3 @ 1724' 03/01/19 09:40am wt vis pH chl 8.9 30 7.0 320 Filt LCM n/c tr Mud-Co/Service Mud Inc. Check #4 @ 2813' 03/02/19 10:45am wt vis pH chl 9.6 32 7.0 25000 Filt LCM n/c 2 Mud-Co/Service Mud Inc. Check #5 @ 3295' 03/03/19 08:00am wt vis pH chl 9.2 29 7.0 22000 Filt LCM n/c 2
	3400				Anhydrite: Top @ 2249', Base @ 2265' (based on drill time). Conducted 740 bbls drilling mud displacement @ 3430'-3449'.	Mud-Co/Service Mud Inc. Check #6 @ 3732' 03/04/19 08:00am wt vis pH chl 8.9 48 11.0 2400 Filt LCM 6.4 3 Mud-Co/Service Mud Inc. Check #7 @ 4097' 03/05/19 09:00am wt vis pH chl 9.3 49 10.0 3000 Filt LCM 8.0 2 Mud-Co/Service Mud Inc. Check #8 @ 4240' 03/06/19 08:00am wt vis pH chl 9.3 48 9.5 4000 Filt LCM 11.2 1
	3450				Formation tops and lithologies have been adjusted to correlate to the electric log. ROP Data began @ 3500' on 03/03/2019	Mud-Co/Service Mud Inc. Check #9 @ 4416' 03/07/19 09:40am wt vis pH chl 9.6 47 10.5 3000 Filt LCM 9.6 1 Mud-Co/Service Mud Inc. Check #10 @ 4450' 03/08/19 07:50am wt vis pH chl 9.3 53 10.5 4000 Filt LCM 7.2 1 Mud-Co/Service Mud Inc. Check #11 @ 4500' 03/09/19 07:45am wt vis pH chl 9.0 46 10.0 3400 Filt LCM 8.8 2
	3500					Mud-Co/Service Mud Inc. Check #12 @ 4525' 03/10/19 05:50pm wt vis pH chl 8.6 55 11.0 2500 Filt LCM 7.2 2 Mud-Co/Service Mud Inc. Check #13 @ 4610' 03/11/19 09:15am wt vis pH chl 8.8 58 10.5 3000 Filt LCM n/c 2



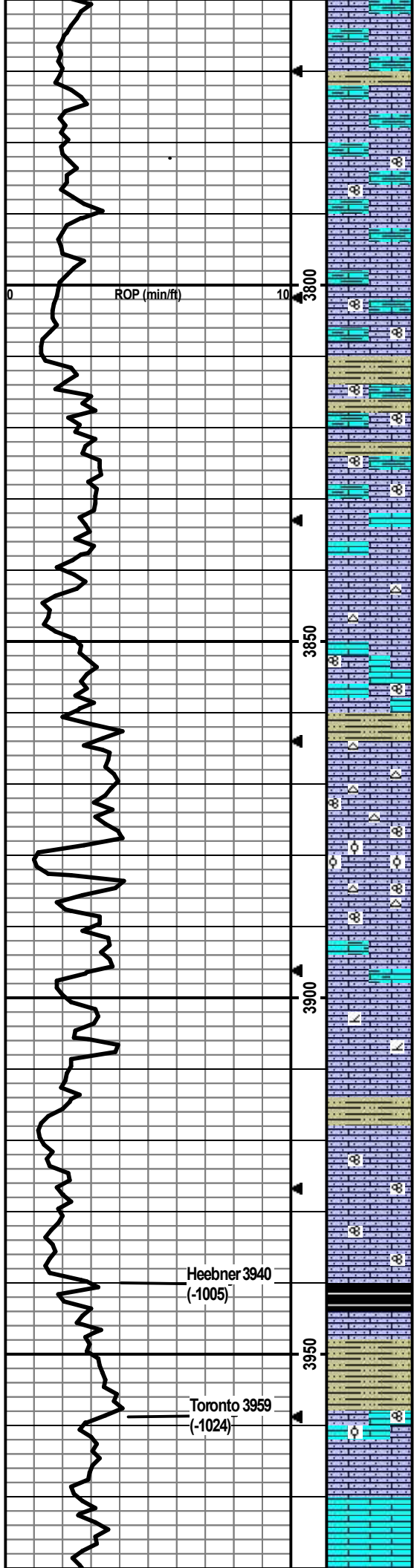
8.0 2
 Mud-Co/Service Mud Inc. Check #14 @ 4632' 03/12/19 10:20am
 wt vis pH chl
 8.9 52 10.0 4000
 Filt LCM
 8.0 2

Mud-Co/Service Mud Inc. Check #15 @ 4648' 03/13/19 09:15am
 wt vis pH chl
 8.8 48 9.5 4400
 Filt LCM
 8.0 2

Survey Record
Deg @ Ft
 0.5 @ 221'
 0.25 @ 4240'
 0.75 @ 4725'

Drill cutting samples at 10' intervals start at 3700'.

- SH: lt-dk gry, vry silty, carb, soft-firm, no odor, ns.
- LS: lt bm/lt gry, f-med xtal, vry silty/sndy, arg, some chalky, foss frags, no vis por, no odor, ns.
- LS: cm/lt bm/lt gry, micro-m xtal, vry silty/sndy, foss frags/fush, min ppt-vf in-xtal por, no odor, ns.
- LS: cm/lt-m bm/gry, micro-m xtal, vry silty/sndy, some arg, min chalky, no vis por, no odor, ns.
- LS: lt-m bm/gry, vf-m xtal, silty/sndy, chalky, arg, foss frags/fush, no vis por, no odor, ns. Some SH: gry, some silty, firm, no odor, ns.
- LS: cm/lt bm/lt gry-bm, f-m xtal, silty/sndy, chalky, arg, foss frags/ool, ppt-m in-xtal/oo-castic por, no odor, ns.
- LS: lt-m bm/gry-bm, vf-f xtal, vry silty/sndy, chalky, arg, foss frags, no vis por, no odor, ns.
- LS: lt bm/lt gry-bm/gry, f-m xtal, vry silty/sndy, arg, foss frags, no vis por, no odor, ns. SH: lt-dk gry, some vry silty, carb, firm.



LS: cm/lt bm/lt gry-bm, micro-med xtal, some vry silty/sndy, some chalky, some arg, foss frags, no vis por, no odor, ns.

LS: cm/lt gry/lt bm, micro-m xtal, silty/sndy, some vry chalky, arg, foss frags, no vis por, no odor, ns.

LS: lt gry/lt gry-bm, micro-med xtal, silty/sndy, vry chalky, some arg, foss frags/fusln, no vis por, no odor, ns.

LS: cm/lt gry-bm/lt bm, micro-fn xtal, chalky, silty/sndy,, arg, foss frags, no vis por, no odor, ns.

LS: cm/lt-m bm/some gry mottling, micro-med xtal, vry silty, some chalky, arg, foss frags/fusln, no vis por, no odor, ns.

SH: m-dk gry/blk, silty, silt carb, firm.

LS: lt-m bm/lt gry-bm, micro-fn xtal, vry silty, chalky, foss frags/fusln, min por w/in fusln, no odor, ns.

LS: cm/lt-m bm, vf-m xtal, silty/sndy, some chalky, arg, foss frags/fusln, no vis por, no odor, ns.

LS: lt gry/lt gry-bm, micro-m xtal, some silty/sndy, min chalky, no vis por, no odor, ns.

LS: cm/lt bm/lt gry-bm, micro-f xtal, some silty, some chalky, wht chert, foss frags, no vis por, no odor, ns.

LS: lt-m bm, micro-f xtal, min silty/sndy, some chalky, foss frags/fusln, min ppt-f in-xtal por, no odor, ns.

LS: cm/lt bm/lt gry-bm, micro-med xtal, silty/sndy, chalky, wht chert, foss frags/fusln, some ppt-f in-xtal por, no odor, ns.

LS: cm/lt-med bm, micro-m xtal, some silty/sndy, min chalky, wht/cm chert, foss frags/fusln/dense crs ool, min ppt-m in-xtal por, no odor, ns.

LS: cm/lt-m bm/lt gry-bm, micro-m xtal, silty/sndy, wht chert, foss frags/fusln, min ppt-f in-xtal por, no odor, ns.

LS: lt-m bm, micro-med xtal, some silty/sndy, some chalky, arg, foss frags, no vis por, no odor, ns.

LS: cm/lt-m bm, micro-m xtal, some chalky, silty, some dolomitic, foss frags, min ppt-vf in-xtal por, no odor, ns.

LS: cm/lt-m bm, micro-m xtal, some silty/sndy, foss frags, min ppt-f in-xtal por, no odor, ns. SH: m-dk gry/blk, min silty, silt carb, firm.

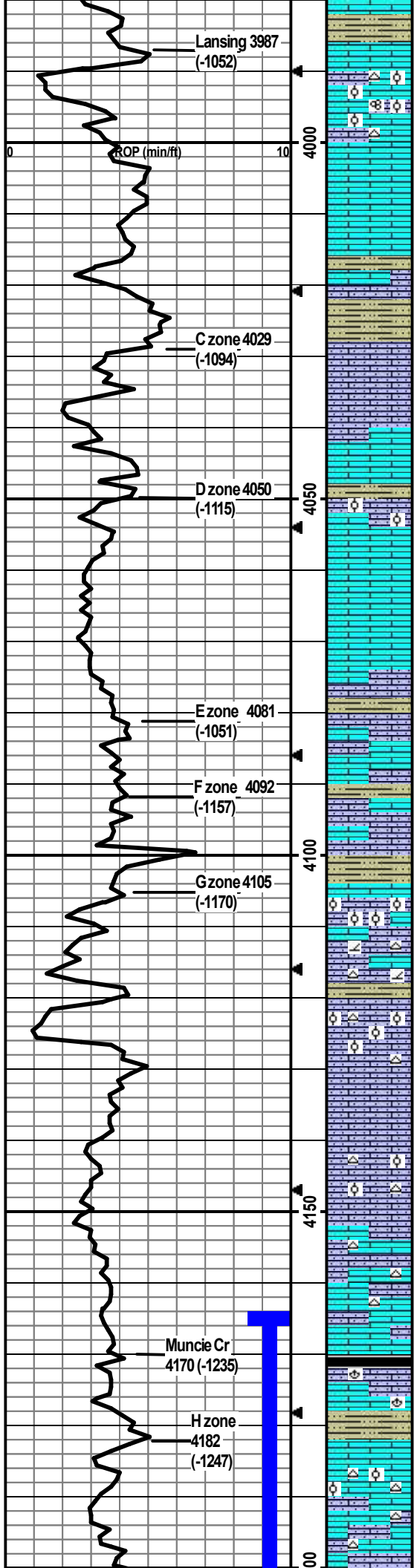
LS: cm/lt-m bm w/dk bm inclusions, f-m xtal, silty/sndy, some chalky, arg, foss frags/fusln, min in-fusln por, no odor, ns.

SH: lt-dk gry/blk, silt carb, some vry silty/sndy, firm, fissile.

SH: lt-dk gry, some vry silty/sndy, soft-firm. LS: cm/lt-m bm, micro-med xtal, some chalky, min foss frags/fusln/min dense ool, ppt-f in-xtal por, no odor, ns.

LS: cm/lt-m bm/lt gry, micro-med xtal, some chalky, some silty/sndy, foss frags, no vis por, no odor, ns.

LS: wht/cm, micro-f xtal, some chalky, foss frags, min ppt-f in-xtal por, no odor, ns.



LS: lt-m gry-cm, micro-f xtal, min foss frags, no vis por, no odor, ns. SH: lt-m gry/lt green-gry/dk maroon, slit carb, min silty, firm.

LS: cm/lt bm, micro-m xtal, some silty, wht chert, foss frags/fusin/abund ool, f-crs in-xtal por w/med oo-castic por, no odor, ns.

LS: cm/lt gry, micro-f xtal w/some 2ndary xtals, min foss frags/dense ool, no vis por, no odor, ns. Sample has flood of m-dk gry SH assumed from above.

LS: cm/lt-m bm/lt gry-bm, micro-f xtal w/some 2ndary xtals, min foss frags, dense no vis por, no odor, ns.

LS: cm/lt bm, micro-med xtal, foss frags/fusin, silty/sndy, chalky, Some SH: med-dk gry, some silty, slit carb, firm.

LS: cm/lt bm/lt gry, micro-med xtal, some silty/sndy, smpl vry chalky, foss frags/grainy, min ppt-f in-xtal por, no odor, ns.

LS: cm/min lt gry, micro-m xtal, some chalky, foss frags, no vis por, no odor, ns.

LS: cm/lt bm, micro-f w/some med xtal, slit silty/sndy, some chalky, some foss frags/min dense ool, no vis por, no odor, ns.

LS: cm/min lt bm, micro-f w/some med xtal, some chalky, min foss frags, no vis por, no odor, ns.

LS: cm/lt-m bm/lt gry, micro-m xtal, some 2ndry xtals, some silty/sndy, some chalky, min foss frags, no vis por, no odor, ns. Min SH: lt-m gry, vry silty/sndy, carb, firm.

LS: cm/lt-m bm/lt gry, micro-m xtal w/some 2ndry xtals, silty/sndy, some chalky, min foss frags, no vis por, no odor, ns.

LS: cm/lt bm, micro-m xtal, some chalky, some silty/sndy, foss frags, no vis por, no odor, ns.

SH: med-dk gry/blk, silty, slit carb, firm.

LS: cm/lt brn, micro-med xtal, some silty/sndy, some chalky, foss frags w/abund dense ool, min ppt in-xtal por, no odor, ns.

LS: cm/lt bm, micro-med xtal, some silty/sndy, some chalky, some dolomitic, foss frags, cm/lt gry chert, ppt-vf in-xtal por, no odor, ns.

LS: cm/lt-med bm, micro-med xtal, some chalky, silty/sndy, wht/lt gry chert some ool, foss frags w/abund med ool, abund med oo-castic por, no odor, ns.

4150' sample not collected.

LS: cm/lt bm, micro-med xtal, some chalky, some silty, wht chert, foss frags/dense ool, min ppt-f in-xtal por, no odor, ns.

LS: cm/lt bm/min lt gry, micro-f xtal, some silty, wht chert, min foss frags, no vis por, ns.

LS: cm/lt bm/lt gry, micro-med, some silty/sndy, some chalky, min wht chert, foss frags, no vis por, no odor, ns.

SH: dk gry/blk, slit silty, slit carb, firm.

LS: cm/lt-m bm, micro-med w/some 2ndry xtals, some silty, some chalky, foss frags/brac, no vis por, no odor, ns.

SH: lt-dk gry, some silty, slit carb, soft-firm.

LS: cm/lt brn/lt-m gry, micro-med xtal, some chalky, abund wht/lt gry/lt brn chert, foss frags/dense ool, 3 pcs w/ppt-m in-xtal por w/sfo, slit odor, dul yel flor, sfo.

LS: cm/lt-med bm/lt gry, micro-m xtal, some silty/sndy, some chalky, wht/lt gry chert, some ppt-f in-xtal por, no odor, ns.

Stop/30"/60"

CFS @ 4010'
Stop/30"/60"

CFS @ 4040'
Stop/30"/60"

CFS @ 4070'
Stop/30"/60"

CFS @ 4090'
Stop/30"/60"

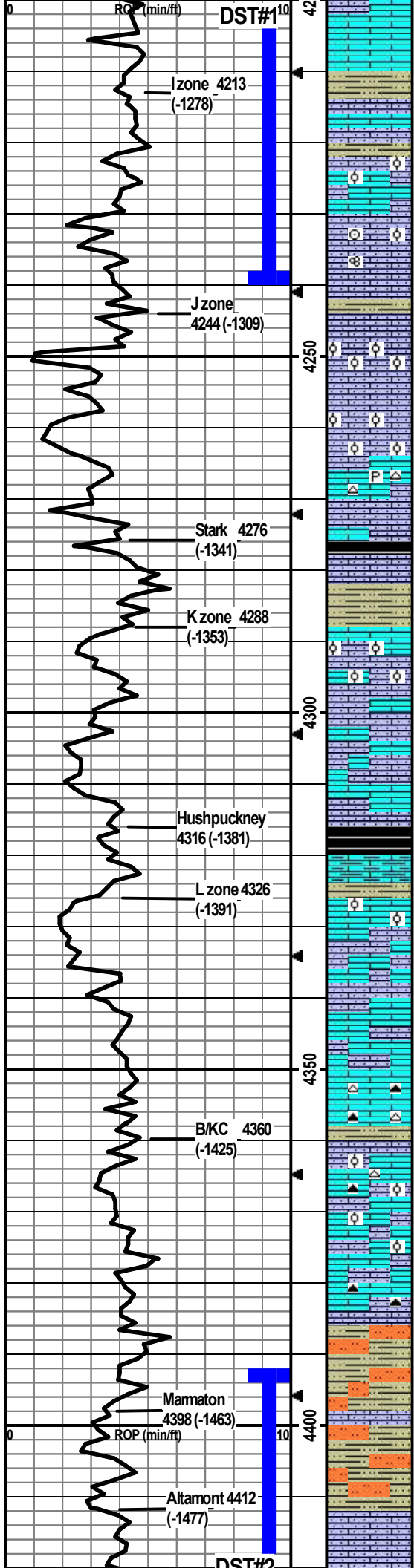
CFS @ 4100'
30"/60"

CFS @ 4130'
Stop/30"/60"

Conducted 10 stand short trip at the 4147' connection to replace seals in mud pump.

**DST1) 4164-4240
Lansing H & I**

Zones
30/45/30/30
1st) 1/4" blow built to 2.1"; no BB.
2nd) SB built to 1.5"; no BB.
IFP 12-41#
ISIP 887#
FFP 42-66#
FSIP 836#
HP 2039-2009#
Recvd: 30' M/w/trace oil, 60' M.



LS: cm/lt bm/lt gry, micro-f xtal, some chalky, wht/lt gry chert, no vis por, no odor, ns.

SH: lt-dk gry, slt silty, slt carb, firm.

LS: lt-m bm, micro-f xtal, some silty, some chalky, no vis por, no odor, ns.

LS: cm/lt-m bm/lt gry, micro-f xtal, some silty, some chalky, min foss frags/dense ool, no vis por, no odor, ns.

LS: cm/lt-m bm/lt gry, micro-m xtal, silty/sndy/chalky, abund foss frags/fusln/crin/dense ool, min ppt-f in-xtal por, slt crush odor, 2 pcs w/sfo w/ppt-m in-xtal, dul yel flor, ssfo.

SH: lt-dk gry/blk, some vry silty, firm.

LS: cm/lt bm, micro-med xtal, silty, some chalky, foss frags, no vis por, no odor, ns.

LS: cm/lt gry/lt bm, micro-m xtal, some chalky, some sndy, foss frags w/abund f-crs ool, f-crs oo-castic por, no odor, ns.

LS: cm/lt gry/lt bm, micro-m xtal, some silty, some chalky, min pyritic, wht chert, foss frags, no vis por, no odor, ns.

LS: cm/lt-m bm, micro-m xtal, some silty, some chalky, foss frags, no vis por, no odor, ns.

SH: blk, slt carb, platy, fissile, firm.

LS: crm/med brn, micro-m xtal, some silty/sndy, some chalky, foss frags, min ppt-f in-xtal por, no odor, ns.

SH: lt gry, vry silty, some friable, carb, firm.

LS: cm/lt gry, micro-m xtal, some vry silty/sndy, some chalky, foss frags some w/abund ool, mostly dense wf-crs oo-castic por, no odor, ns.

LS: cm/lt bm/lt gry, micro-m xtal, some silty/sndy, abund chalk, min wht chert, foss frags/fusln, no vis por, no odor, ns.

LS: cm/lt-m bm, micro-m xtal, some silty, some chalky, foss frags, 3 pcs w/ppt-f in-xtal por w/sfo, yel flor, no odor, sfo.

SH: m-dk gry/blk, some silty, slt carb, firm.

LS: cm/lt bm/dk gry-bm, micro-m xtal, sample vry chalky, some sndy, some arg, foss frags/dense ool, no vis por, no odor, ns.

LS: cm/lt gry/lt gry-bm, micro-f xtal, sample vry chalky, some silty, foss frags some grainy, min ppt-f in-xtal por, no odor, ns.

LS: cm/lt gry, micro-f xtal, less chalk than above, some silty, foss frags, no vis por, no odor, ns.

LS: cm/lt-m bm/lt gry, micro-med xtal, some chalky, lt-dk gry-bm chert, foss frags, no vis por, no odor, ns. Min SH: dk bm/dk gry, vry silty, firm.

LS: cm/lt-m bm/lt gry, micro-med xtal, chalky, some silty, min bm chert, foss frags/dense ool, no vis por, no odor, ns.

LS: cm/lt-m bm, micro-m xtal, some chalky, some silty, dk bm chert, foss frags/dense ool, no vis por, no odor, ns.

LS: lt-m bm, micro-m xtal, chalky, silty, dk bm chert, foss frags, no vis por, no odor, ns.

SH: m-dk gry/green-gry/brn, vry silty, slt carb; Sltstn: gry, pred qtz, arg, friable, no odor, ns.

SH: lt-dk gry/green-gry/brn, vry silty, slt carb, firm. Sltstn: lt-m gry, pred qtz, arg, friable, no odor.

LS: crm/brn, micro-med xtal, some silty, some chalky, no vis por, no odor, ns.

LS: cm/lt-m bm, micro-f xtal, some vry silty/chalky, foss frags/grainy, no vis por, no odor, ns. Flood of SH/Sltstn as above.

LS: cm/lt-m bm, micro-f xtal, some chalky, silty, foss frags/grainy, no vis por, no odor.

CFS @ 4210'
Stop/30"/60"

For DST #1 at 4240',
conducted 32 stand wiper
trip, then cir hole clean for 1
hr.
Attempted pipe strap when
TOH for DST #1 but was
too windy.

CFS @ 4240'
Stop/30"/60"

CFS @ 4261'
Stop/30"/60"

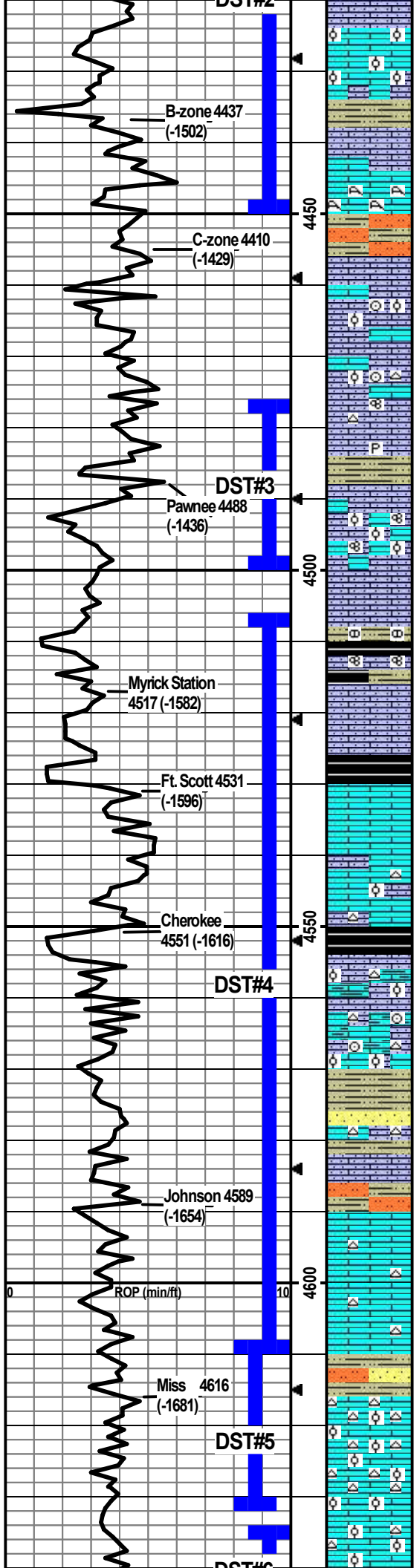
CFS @ 4310'
Stop/30"/60"

CFS @ 4350'
Stop/30"/60"

**DST2) 4392-4450
Altamont A & B
zones**

30/56/45/60
Blocks stuck on 1st shut so ran
long on time from 45min.
1st) 1" blow built to BOB in 3min;
built to 7" BB.
2nd) 1/4" blow built to BOB in
5min; no BB.
IFP 55-369#
ISIP 852#
FFP 415-622#
FSIP 842#
HP 2121-2110#
Recvd: 485' GIP; 1345' GCO
(3%G, 97%O); 190' GCMCO
(18%G, 28%M, 54%O); 120'
MCGCO (2%M, 3%G, 95%O).

CFS @ 4420'



LS: cm, micro-med xtal, some chalky, foss frags/abund dense ool, no vis por, no odor, ns.

LS: cm/lt brn, micro-med, some vry chalky, some silty/sndy, foss frags/dense ool, min ppt-f in-xtal/med oo-castic por, 7 pcs w/fm in-xtal por, dul flor, no odor, sfo. SH: m-dk gry, silty, firm.

LS: crm/lt brn, micro-m xtal, silty/sndy, some chalky, foss frags/abund lattice coral, no vis por except in coral w/med columnar por, no odor, ns. Some SH: m-dk gry/blk, silty, slt carb, firm.

SH: m-dk gry/lt green-gry, slt carb, firm-hard, fissile. Min Slstn: lt-m gry, pred qtz, arg, hard but friable, no odor, ns.

LS: crm/lt-m brn, micro-med xtal, some silty/sndy/arg/chalky, foss frags, no vis por, no odor, ns.

LS: cm/lt brn, micro-m xtal, some silty/sndy, chalky, foss frags/crin/ool, min ppt-f in-xtal por, no odor, ns.

LS: crm/lt-m brn/lt gry-brn, micro-m xtal, some silty/sndy, some chalky, crm/lt brn chert, foss frags w/min crin/fusin/ool, no vis por, no odor, ns.

LS: crm/lt-m brn, micro-m xtal, silty/sndy, some chalky, min pyritic, foss frags, no odor, ns.

SH: m-dk gry/blk/min lt green-gry, some vry silty/sndy, soft-firm. Some Slstn: gry/crm, pred qtz, arg, firm, friable, no odor, ns.

LS: wht/crm/lt brn, micro-m xtal, some silty/sndy, some chalky, foss frags/fusin/ool, 17 pcs w/fm in-xtal/in-ool por w/bm oil staining and fo when crushed, dul yel flor, slt cup odor, gsfo.

LS: lt-m brn/lt gry-brn, micro-med xtal, silty/sndy, foss frags, no vis por, no odor, ns. Flood of SH: m-dk gry/blk/dk red-brn/lt brn/green-gry, some vry silty, slt carb, LS nodules, firm-hard.

LS: lt-m brn/gry-brn, micro-f xtal, silty, min foss frags/fusin, no vis por, no odor, ns. Cont flood of SH as above w/blk SH.
(NOTE: Myrick samples were bad due to snow melt water diluting mud.)

LS: crm/lt-m brn, micro-m xtal, some silty/chalky, min foss frags, no vis por, no odor, ns.

SH: dk gry/blk, slt carb, firm, fissile.

Sample all hulls and SH, no LS. Borehole damage due to flood conditions at the site. See side note.

Sample mostly SH due to borehole damage. LS: crm/lt-m brn/lt gry, micro-m xtal, some chalky/silty, lt brn chert, foss frags/min chalky ool, no vis por, no odor, ns.

SH: dk gry/blk, slt carb, firm, fissile.

LS: crm/lt-m brn/gry, vf-m xtal, silty, some chalky/arg, lt brn chert, foss frags/some chalky ool, no vis por, no odor, ns.

LS: crm/lt-m brn, m-dk gry, f-m xtal, some chalky, some silty/sndy, some arg, brn chert, some w/abund foss frags/crin/grainy, no vis por, no odor, 60min sample w/chalky ool, 1 pce in 60min w/staining and blk tar oil and brn fo when crushed w/ppt-f in-xtal por, ssfo.

SH: m-dk gry/blk, some vry silty, firm. Min SS: gry, vf-f, pred qtz, arg, hard, friable, no odor, ns.

LS: crm/lt-m brn/lt gry, f-m xtal, some chalky, some silty/sndy, brn chert, foss frags, 5 pcs w/staining and fo w/crush w/ppt-f, dull yel flor, no odor, sfo.

LS: crm/lt-m brn/lt gry-brn, micro-m xtal, some chalky/silty, crm/lt brn chert, 3 pcs w/staining and fo on break w/ppt-f por, dul yel flor, no odor, 2 pcs in 60min, ssfo. SH: lt-dk gry/green-gry, silty, slt carb, firm. Min Slstn: lt gry, arg, friable, no odor, ns.

LS: lt-m brn, micro-f xtal, some chalky, some lt brn chert, min foss frags, 9 pcs w/ppt in-xtal por w/staining, dul yel flor w/crush cut, no odor, sfo.

LS: crm/lt-m brn, micro-f xtal, some chalky, some lt brn chert, min foss frags, 17 pcs w/staining, dul yel flor w/crush cut, ppt in-xtal por, good odor, sfo.

SH: lt-dk gry/green-gry, some silty, firm. Slstn/SS: lt gry/lt brn, vf-f, pred qtz, some arg, friable, no show.

LS: crm/lt-m brn, micro-m xtal, wht chalky w/blk tar oil, abund wht/lt gry chert, dense ool and loose LS nodules/ool, blk tar oil does not flor/cut, 3 pcs of chert w/staining and flor/cut, min ppt-f in-xtal/frac por in chert, slt odor, ssfo.

LS: lt brn, micro-f xtal, abund wht chert, chalky some w/blk tar oil w/some flor/cut, 11 pcs LS/2 pcs chert w/staining and flor cut w/ppt in-xtal por, gd odor, sfo.

LS: crm/lt brn, micro-m xtal, some chalky, wht chert, some foss frags w/abund ool, 6 pcs w/staining and sfo on crush w/ppt in-xtal/in-ool por, dul yel flor/cut, slt odor, sfo.

CFS @ 4424
Stop/30"/60"

For DST #2 at 4450', conducted 12 stand wiper trip, then cir hole clean for 1 hr. Conducted pipe strap while TOH; was 2.40' short to the board.

CFS @ 4450'
Stop/30"/60"

DST3) 4477-4500
Pawnee
30/45/45/60
1st) SB built to 6"; no BB.
2nd) SB built to 7.75"; no BB.
IFP 11-70#
ISIP 639#
FFP 76-109#
FSIP 638#
HP 2116-2116#
Recvd: 105' GIP; 312' Total Fluid:
2' CO; 25' WCOCM (7%W, 37%O,
56%M); 60' OCWCM (4%O, 7%W,
89%M); 60' OCWCM (8%O, 34%W,
58%M); 60' OCWCM (5%O, 13%M,
82%W).

CFS @ 4480'
Stop/30"/60"

CFS @ 4500'
Stop/30"/60"

(NOTE: Myrick samples bad due to snow melt water diluting mud.)

CFS @ 4525'
Stop/30"/60"

At 4525': From approx 12:00pm 03/09/19 thru 07:00pm 03/10/19 drilling was suspended due to flooding of the entire drill pad area from melting snow. Entire area was covered with as least 1' of water. Mud pits were completely covered. TOH with drill string and mitigated flooding with pumping off site and dozer work. Displaced complete mud system.

CFS @ 4570'
Stop/30"/60"

CFS @ 4570'
Stop/30"/60"

CFS @ 4590'
Stop/30"/60"

CFS @ 4610'
Stop/30"/60"

CFS @ 4632'
Stop/30"/60"

Spergen 4643 JSI #8 (-1708)

LS: crm/lt brn, micro-m xtal, some chalky, wh/lt gry pyritic chert, some foss frags/abund ool, slit odor but no show, few pcs DOLO: crm, vff, sugary, hard, no show.

CFS @ 4648
Stop/30"/60"

**DST4) 4506-4610
Myrick thru
Johnson**

30/45/45/60
1st) 1/2" built to 3.25"; no BB.
2nd) SB built to 1.5"; no BB.
IFP 16-39#
ISIP 1101#
FFP 42-58#
FSIP 924#
HP 2083-2082#
Recvd: 70' total fluid; 5' O, 65' OCM (6%O, 94%M).

**DST5) 4608-4632
Upper
Mississippian**

30/30/30/30
1st) 1/4" built to 3/4"; no BB.
2nd) SB thru out; no BB.
IFP 11-12#
ISIP 22#
FFP 12-12#
FSIP 21#
HP 2136-2135#
Recvd: 5' M w/trc of oil.

**DST6) 4634-4648
Spergen**

30/45/45/65
1st) SB built to 3.75"; no BB.
2nd) SB built to 3"; no BB.
IFP 11-41#
ISIP 1210#
FFP 43-78#
FSIP 1209#
HP 2171-2138#
Recvd: 155' total fluid; 10' O, 85' OCM (8%O, 92%M), 60' OCWCM (6%O, 42%W, 52%M).

DOLO: crm/lt brn/lt gry, vff xtal, sugary, 6 pcs w/sfo w/fcrs in-xtal por; dul yel flor/cut, slit odor, sfo.

DOLO: crm/lt brn/lt gry, vf-f xtal, sugary, ppt-m w/min crs in-xtal por; 7 pcs w/sfo, dul yel flor/cut, slit odor, sfo.

DOLO: crm/lt gry, vf-f xtal, sugary, ppt-m in-xtal por; 10-15% of sample w/sfo, dul yel flor, gd odor, gsfo.

DOLO: crm/lt brn, vf-f xtal, sugary, ppt-crs in-xtal por, ~10% of sample w/sfo, dul yel flor, gd odor, gsfo.

DOLO: crm/lt brn/lt gry, vf-f xtal, sugary, ppt-crs in-xtal por; 6 pcs w/sfo 1 pcs with blk tar oil, dul yel flor/cut, slit odor, sfo.

DOLO: lt brn/lt-m gry/some w/dk gry mottling, vf-f xtal, sugary, some LS inclusions, foss frags, ppt-crs w/some vug por, no vis oil but got oil cut from several pcs, 4 pcs w/blk tar, dul yel flor/cut, slit odor, sfo.

DOLO: crm/lt brn/lt gry w/some dk gry mottling, vf-f xtal, sugary, some LS and chert inclusions, ppt-crs w/some vug por, no odor, ns.

DOLO: lt brn/lt gry-brn/lt gry/some dk gry mottling, vf-f xtal, sugary, some LS and chert inclusions, some oolitic, ppt-crs in-xtal por, no odor, ns. Min LS: crm, vf-m xtal, foss frags/ool, chalky, no vis por, no odor, ns.

Sample mostly DOLO as above. LS: lt brn/lt gry mottled, some chalky, foss frags/crin/fusln/ool, no vis por, no odor, ns.

TD @4725'

CFS @4725'
Stop/30"/60"

Cir 1.5 hr to collect samples and condition hole then TOH for logging.

RTD 4725', -1790
LTD 4725', -1790

