KOLAR Document ID: 1315700

Confidentiality Requested:
☑ Yes ☐ No

KANSAS CORPORATION COMMISSION
OIL & GAS CONSERVATION DIVISION

Form ACO-1
January 2018
Form must be Typed
Form must be Signed
All blanks must be Filled

WELL COMPLETION FORM
WELL HISTORY - DESCRIPTION OF WELL & LEASE

OPERATOR: License # 32211
Name: O'Brien Energy Resources Corp.
Address 1: 18 CONGRESS ST, STE 207
Address 2:
City: PORTSMOUTH State: NH Zip: 03801 + 4091
Contact Person: Joseph Forma
Phone: (603) 427-2099
CONTRACTOR: License # 5929
Name: Duke Drilling Co., Inc.
Wellsite Geologist: Peter Debenham
Purchaser:

Designate Type of Completion:
☑ New Well ☐ Re-Entry ☐ Workover
☑ Oil ☐ WSW ☐ SWD
☐ Gas ☐ DH ☐ EOR
☐ OG ☐ GSW
☐ CM *(Coal Bed Methane)*
☐ Cathodic ☐ Other *(Core, Expl., etc.)*:

If Workover/Re-entry: Old Well Info as follows:
Operator:
Well Name:
Original Comp. Date: Original Total Depth:
☐ Deepening ☐ Re-perf. ☐ Conv. to EOR ☐ Conv. to SWD
☐ Plug Back ☐ Liner ☐ Conv. to GSW ☐ Conv. to Producer

☐ Commingled Permit #:
☐ Dual Completion Permit #:
☐ SWD Permit #:
☐ EOR Permit #:
☐ GSW Permit #:

5/9/2016 Spud Date or Recompletion Date
5/14/2016 Date Reached TD
7/10/2016 Completion Date or Recompletion Date

API No.: 15-119-21395-00-00
Spot Description:
SE - SW - NE - SW Sec. 20 Twp. 33 S. R. 29 ☐ East ☑ West
1420 Feet from ☐ North / ☑ South Line of Section
1658 Feet from ☐ East / ☑ West Line of Section
Footages Calculated from Nearest Outside Section Corner:
☐ NE ☐ NW ☐ SE ☑ SW
GPS Location: Lat: *(e.g. xx.xxxxx)* , Long: *(e.g. -xxx.xxxxx)*
Datum: ☐ NAD27 ☐ NAD83 ☐ WGS84
County: Meade
Lease Name: SHINOGLE Well #: #2-20
Field Name:
Producing Formation: Morrow
Elevation: Ground: 2649 Kelly Bushing: 2662
Total Vertical Depth: 6405 Plug Back Total Depth:
Amount of Surface Pipe Set and Cemented at: 1490 Feet
Multiple Stage Cementing Collar Used? ☐ Yes ☑ No
If yes, show depth set: Feet
If Alternate II completion, cement circulated from:
feet depth to: w/ sx cmt.

Drilling Fluid Management Plan
(Data must be collected from the Reserve Pit)

Chloride content: 16200 ppm Fluid volume: 900 bbls
Dewatering method used: Hauled to Disposal
Location of fluid disposal if hauled offsite:
Operator Name: Max Papay LLC
Lease Name: Sneed License #: 34021
Quarter NW Sec. 14 Twp. 34 S. R. 30 ☐ East ☑ West
County: Meade Permit #: 15-119-20027-0001

AFFIDAVIT

I am the affiant and I hereby certify that all requirements of the statutes, rules and regulations promulgated to regulate the oil and gas industry have been fully complied with and the statements herein are complete and correct to the best of my knowledge.

Submitted Electronically

KCC Office Use ONLY

☑ **Confidentiality Requested**
Date: 08/30/2016
☑ **Confidential Release Date:** 08/30/2018
☑ **Wireline Log Received** ☐ **Drill Stem Tests Received**
☑ **Geologist Report / Mud Logs Received**
☐ **UIC Distribution**
ALT ☑ **I** ☐ **II** ☐ **III** **Approved by:** Karen Ritter **Date:** 08/30/2016

Operator Name: O'Brien Energy Resources Corp. Lease Name: SHINOGLE Well #: #2-20

Sec. 20 Twp. 33 S. R. 29 ☐ East ☑ West County: Meade

INSTRUCTIONS: Show important tops of formations penetrated. Detail all cores. Report all final copies of drill stems tests giving interval tested, time tool open and closed, flowing and shut-in pressures, whether shut-in pressure reached static level, hydrostatic pressures, bottom hole temperature, fluid recovery, and flow rates if gas to surface test, along with final chart(s). Attach extra sheet if more space is needed.

Final Radioactivity Log, Final Logs run to obtain Geophysical Data and Final Electric Logs must be emailed to kcc-well-logs@kcc.ks.gov. Digital electronic log files must be submitted in LAS version 2.0 or newer AND an image file (TIFF or PDF).

Drill Stem Tests Taken ☐ Yes ☑ No
(Attach Additional Sheets)

Samples Sent to Geological Survey ☑ Yes ☐ No

Cores Taken ☐ Yes ☑ No

Electric Log Run ☑ Yes ☐ No

Geologist Report / Mud Logs ☐ Yes ☐ No

List All E. Logs Run:

Neutron
Induction
Micro

☑ Log Formation (Top), Depth and Datum ☐ Sample

Name: Attached Top: Attached Datum: Attached

CASING RECORD ☑ New ☐ Used
Report all strings set-conductor, surface, intermediate, production, etc.

Purpose of String	Size Hole Drilled	Size Casing Set (In O.D.)	Weight Lbs. / Ft.	Setting Depth	Type of Cement	# Sacks Used	Type and Percent Additives
Surface	12.25	8.625	24	1490	A-Conn	475	3%CaCl &1/4# floseal
Production	7.875	5.5	10.5	6376	AA2	170	1/4# defoamer

ADDITIONAL CEMENTING / SQUEEZE RECORD

Purpose:	Depth Top Bottom	Type of Cement	# Sacks Used	Type and Percent Additives
☐ Perforate ☐ Protect Casing ☐ Plug Back TD ☐ Plug Off Zone	-			
	-			

1. Did you perform a hydraulic fracturing treatment on this well? ☑ Yes ☐ No *(If No, skip questions 2 and 3)*
2. Does the volume of the total base fluid of the hydraulic fracturing treatment exceed 350,000 gallons? ☐ Yes ☑ No *(If No, skip question 3)*
3. Was the hydraulic fracturing treatment information submitted to the chemical disclosure registry? ☐ Yes ☐ No *(If No, fill out Page Three of the ACO-1)*

Date of first Production/Injection or Resumed Production/ Injection:	Producing Method: ☐ Flowing ☐ Pumping ☐ Gas Lift ☐ Other *(Explain)*

Estimated Production Per 24 Hours	Oil Bbls.	Gas Mcf	Water Bbls.	Gas-Oil Ratio	Gravity

DISPOSITION OF GAS:	METHOD OF COMPLETION:	PRODUCTION INTERVAL:
☐ Vented ☐ Sold ☐ Used on Lease *(If vented, Submit ACO-18.)*	☐ Open Hole ☐ Perf. ☐ Dually Comp. *(Submit ACO-5)* ☐ Commingled *(Submit ACO-4)*	Top / Bottom

Shots Per Foot	Perforation Top	Perforation Bottom	Bridge Plug Type	Bridge Plug Set At	Acid, Fracture, Shot, Cementing Squeeze Record *(Amount and Kind of Material Used)*

TUBING RECORD: Size: Set At: Packer At:

Mail to: KCC - Conservation Division, 266 N. Main, Suite 220, Wichita, Kansas 67202

Form	ACO1 - Well Completion
Operator	O'Brien Energy Resources Corp.
Well Name	SHINOGLE #2-20
Doc ID	1315700

Tops

Name	Top	Datum
Heebner	4438	-1776
Toronto	4474	-1812
Lansing	4608	-1946
Marmaton	5274	-2612
Cherokee	5429	-2767
Atoka	5715	-3053
Morrow	5770	-3108
Mississippi Chester	5914	-3252
Basal Chester	6103	-3441
Ste Genevieve	6151	-3489
St. Louis	6252	-3590

Form	ACO1 - Well Completion
Operator	O'Brien Energy Resources Corp.
Well Name	SHINOGLE #2-20
Doc ID	1315700

Perforations

Shots Per Foot	Perforation Record	Material Record	Depth
2	6080-6082 CIBP @ 6050		
2	5898-5922 CIBP @ 5882	Acidize w/ 2500 gal 15% HCL	perfs
2	5822-5832	Acidize w/ 2000 gal NEFE 7.5% HCL	perfs
2	5800-5810	Frac w/ 30,000# 20/40 sand & 846 gelled wtr	perfs

Form	ACO1 - Well Completion
Operator	O'Brien Energy Resources Corp.
Well Name	SHINOGLE #2-20
Doc ID	1315700

Casing

Purpose Of String	Size Hole Drilled	Size Casing Set	Weight	Setting Depth	Type Of Cement	Number of Sacks Used	Type and Percent Additives
Surface	12.25	8.625	24	1490	A-Conn	475	3%CaCl &1/4# floseal
Production	7.875	5.5	10.5	6376	AA2	170	1/4# defoamer

BASIC ENERGY SERVICES

PRESSURE PUMPING

Liberal Yard #1717 - Phone 620-624-2277 - 1700 S. Country Estates Road, Liberal KS 67901

Job Log

Customer:	Obrien Energy	Cement Pump No.:	38117, 19919 8Hrs.	Operator TRK No.:	78938		
Address:		Ticket #:	1718 13208 L	Bulk TRK No.:	14354, 19578 Santiago		
City, State, Zip:		Job Type:	Z42 Cement Production Casing				
Service District:	1718 Liberal, Ks.	Well Type:	OIL				
Well Name and No.:	SHINOGLE 2-20	Well Location:	20	County:	33	State:	29

Type of Cmt	Sacks	Additives	Truck Loaded On		
Premium / Common	50	NEAT	14354, 19578 Santiago	Front	Back
AA2	170	5% W-60, 10% SALY, .6% C-15, 1/4# DEFOAMER, 5# GILSONITE		Front	Back
				Front	Back

Lead/Tail:	Weight #1 Gal.	Cu/Ft/sk	Water Requirements	CU. FT.	Man Hours / Personnel	
Lead:	15.6	1.18	5.22	59	Man Hours:	8.5
Tail:	14.8	1.52	6.64	258.4	# of Men on Job:	3

Time (am/pm)	(BPM)	Volume (BBLS)	Pumps T	Pumps C	Pressure(PSI) Tubing	Pressure(PSI) Casing	Description of Operation and Materials
9:15							CALLED OUT FOR JOB
13:45							ON LOC.
2:00 PM							SAFETY MEETING
12:00 AM							RIG UP
3:15 PM							WAIT ON RIG
18:30							CIRCULATE
							RIG TO P.T.
7:19 PM							PRESSURE TEST TO 2500PSI
19:21							PUMP 500GAL, MUD FLUSH
19:30							CEMENT RAT AND MOUSE
19:51	3.5	45.7 slurry				90	PUMP 170SX AA2 @ 14.8#
20:06							SHUTDOWN / W.P. / DROP PLUG
20:15	6	30				100	DISPLACE
	6	40				100	
	6.1	50				110	
	6.1	60				100	
	6.1	70				100	
	6	80				380	
20:33	2	90				570	SLOW RATE
20:39		100.7				610	LAND PLUG PRESSURE UPT TO 1500PSI
20:41							RELEASE FLOAT — HELD
							JOB COMPLETE

Size Hole	7 7/8"	Depth				TYPE	PLUG CONTAINER		
Size & Wt. Csg.	4 1/2" 10.5#	Depth	6376'	New / Used		Packer		Depth	
tbg.		Depth				Retainer		Depth	
Top Plugs		Type				Perfs		CIBP	

Customer Signature:	Basic Representative:	Daniel Beck
	Basic Signature:	Daniel Beck
	Date of Service:	5/15/2016

BASIC

PAGE	CUST NO	YARD #	INVOICE DATE
1 of 1	1002969	1718	05/17/2016

INVOICE NUMBER

92124218

Pratt (620) 672-1201

BILL TO
O'BRIEN ENERGY RESOURCES
18 CONGRESS ST SUITE 207
PORTSMOUTH
NH US 03801

ATTN: Kimberley Proctor

JOB SITE

LEASE NAME	Shinogle 2-20
LOCATION	
COUNTY	Meade
STATE	KS
JOB DESCRIPTION	Cement-New Well Casing/Pi
JOB CONTACT	

JOB #	EQUIPMENT #	PURCHASE ORDER NO.	TERMS	DUE DATE
40935700	19570		Net - 30 days	06/16/2016

For Service Dates: 05/10/2016 to 05/10/2016

0040935700

Pd. 5/31/2016
Ck# 12463

171813655L Cement-New Well Casing/Pi 05/10/2016
Cement Surface Casing

	QTY	U of M	UNIT PRICE	INVOICE AMOUNT
A-Con' Blend	325.00	EA		
Premium Plus Cement	150.00	EA		
Calcium Chloride	1,200.00	EA		
Celloflake	119.00	EA		
C-51	62.00	EA		
"Guide Shoe - Regular, 8 5/8"" (Blue)"	1.00	EA		
"Flapper Type Insert Float Valve, 8 5/8"	1.00	EA		
Antelope Strd Bow Cent. 8 5/8 X 12 1/4	3.00	EA		
"Cmt Basket, Canvas 8 5/8"	1.00	EA		
"Top Rubber Cmt Plug, 8 5/8"""	1.00	EA		
"Unit Mileage Chg (PU, cars one way)"	30.00	MI		
Heavy Equipment Mileage	90.00	MI		
"Proppant & Bulk Del. Chgs., per ton mil	671.00	EA		
Blending & Mixing Service Charge	475.00	BAG		
Plug Container Util. Chg.	1.00	EA		
Depth Charge; 1001'-2000'	1.00	EA		
"Service Supervisor, first 8 hrs on loc.	1.00	EA		

PLEASE REMIT TO:
BASIC ENERGY SERVICES,LP
PO BOX 841903
DALLAS,TX 75284-1903

SEND OTHER CORRESPONDENCE TO:
BASIC ENERGY SERVICES,LP
801 CHERRY ST, STE 2100
FORT WORTH, TX 76102

SUB TOTAL
TAX
INVOICE TOTAL

O'Brien Energy Resources, Inc.

Shinogle No. 2-20, Singley Field

Section 20, T33S, R29W

Meade County, Kansas

May, 2016

Well Summary

The O'Brien Energy Resources, Corporation, Shinogle No. 2-20 was drilled to a total depth of 6400' in the Mississippi St. Louis Formation. The only drilling problem that occurred was stuck drill pipe at 5026'(pipe stuck at 3670') during a wiper trip and necessitated pumping Nitrogen to free up.

The Shinogle No. 2-20 was drilled approximately 1320' to the Southwest of the Shinogle No. 1-20. Formation tops ran relatively high relative to this offset. The Cherokee, Atoka and Morrow ran 4' high. The Morrow "A" SS and "B" SS came in 9' and 13' high. The Basal Chester and St. Louis ran 7' high.

An excellent hydrocarbon show occurred in the Morrow "B" Sandstone(5822'-5832') and consists of a sandstone in 25% of the samples: Light to medium brown, salt and pepper, speckled green, friable, fine upper to fine lower well sorted subround grains, siliceous cement, calcareous, clean, glauconitic, excellent intergranular porosity, vuggy porosity, bright light yellow hydrocarbon fluorescence in most the sand, excellent fast streaming cut, occasional medium brown matrix oil stain and traces of live oil, slight oil odor, excellent show. A 280 Unit gas kick was documented.

A Morrow "A" Sandstone was documented from 5800' to 5810' and consists of a Sandstone: Speckled green, medium to dark mottled gray to brown, dark green, hard to friable, very fine well sorted subround grains, siliceous cement, calcareous, very glauconitic, poor visible to occasional good intergranular porosity, very light mottled pale blue hydrocarbon fluorescence, faint streaming cut, trace mottled oil stain. No formation gas was recorded on the hotwire.

A 360 Unit gas kick was recorded from a Lower Morrow transitional zone from 5896' to 5910' and consisting of finely interbedded Sandstones and Shale. The Sandstones noted contained a light speckled bluegreen hydrocarbon fluorescence in 2% of the samples with a slow weak bleeding cut and traces of mottled oil staining.

Additional tight Limestone shows were noted in the Upper Chester and Basal Chester.

4 ½" production casing was run on the Shinogle No. 5/15/16.

Respectfully Submitted,

Peter Debenham

WELL DATA

Operator:	O'Brien Energy Resources, Inc., John Forma – Portsmouth, NH Geologist: Paul Wiemann – Denver, CO
Prospect Geologist:	Ed Schuett, David Ward, Denver,
Well:	Shinogle No. 2-20, Singley Field
API No.:	15-119-21395
Field:	Singley
Location:	1320' FSL & 1650' FWL, Section 20, T33S, R29W, Meade County, Kansas – 15 miles SE of Meade.
Elevation:	Ground Level 2649', Kelly Bushing 2662'
Contractor:	Duke Drilling Rig No. 9, T.P. Emidgio Rojas., Drillers Victor Martinez, Alejandro V., Ferando Jurado
Company Man:	Roger Pearson – Liberal, Kansas
Spud Date:	5/9/16
Total Depth:	5/14/2016, Driller 6400', Logger 6405', Mississippi St. Louis
Casing Program:	35 joints of new 8 5/8", J55, 24Lbs/ft, set at 1489' with 325 sacks Acomm(3%cc, 1/5 floseal), tail 150 sacks Class C(2%cc & ¼ lb floseal) – serices by Basic Energy. 4 ½" production casing to TD.
Mud Program:	Service Mud/Mud Co., engineer Justin Whiting, displaced 2600'.
Wellsite Consultant:	Peter Debenham with mudlogging trailer, Call depth 4400', Box 350, Drake, CO 80515, 720/220-4860.
Samples:	30' to TD. Zones of interest saved.
Electric Logs:	Weatherford, engineer Adam Sill, 1) Array Induction, 2) Neutron/Density, 3) Microlog, high resolution.
Status:	4 ½" production casing run 5/15/16.

WELL CHRONOLOGY

DATE	6 AM DEPTH	FOOTAGE	RIG ACTIVITY
5/9/16			Move to location and rig up rotary tools. Pump water and mix spud mud. Drill rath hole and mouse hole. Spud in 12 ¼" to 150'.
5/10	1587'	1437'	Survey(3/4 deg.). To 1500' and circulate. Trip out and run 35 joints of new 8 5/8", J55, 24Lbs/ft, set at 1489' with 325 sacks Acomm(3%cc, 1/5 floseal), tail 150 sacks Class C(2%cc & ¼ lb floseal) – services by Basic Energy. Plug down 1 pm – did circulate to surface. Breat down landing joint and nipple up BOP. Trip in and pressure test BOP to 600 PSI in 15 minutes. Drill plug and cement and 7 7/8" hole to 1587' and circulate. Trip for Bit No. 3.
5/11	3380'	1793'	Bit trip. Displace mud system at 2600'. Survey(1 deg.).
5/12	5026	1646'	Survey(1 ¼ deg.). To 5026' and circulate and short trip.
5/13	5370'	344'	Wiper trip – stuck pipe at 3670'. Wait on Nitrogen and rig up same. Pump nitrogen and work stuck pipe. Free up and trip out. Trip in and ream 3000' to 4000' and circulate on bottom.
5/14	6400'TD	1030'	Survey(1 ½ deg.). To 6400'TD and circulate. Wiper trip and circulate and trip out for logs and run Elogs.
5/15	TD		Run logs. Trip to bottom and circulate. Trip out laying down and run and cement 4 ½" production casing to TD. Rig down.

BIT RECORD

NO.	MAKE	TYPE	SIZE	OUT	FOOTAGE	HOURS
1	PLT 619		12 ¼"	1500'	1500'	6 1/4
2	A28Q	RR	7 7/8"	1587'	87'	3/4
3	PLT 616		7 7/8"	6400'	4813'	50 ½
				Total Rotating Hours:		57 1/2
				Average:		113.3 Ft/hr

DEVIATION RECORD – degree

767' ¾, 1500' 1 ½, 2594' 1, 3574' 1, 4489' 1 ¼, 5656' 1 ½, TD ¼

MUD PROPERTIES

DATE	DEPTH	WT	VIS	PV	YP	pH	WL	CL	LCM-LBS/BBL
5/9	0’	Make up water							
5/10	1500’	10.2	38	8	8	8.0	n/c	14.8K	12
5/11	2380’	9.5	29	2	2	7.0	N/C	78k	0
5/12	4143’	9.0	45	13	15	12.0	8.4	4.35k	½
5/13	5026’	9.0	52	16	18	10.5	8.4	5.7k	2
5/13	5026’	9.0	46	13	14	10.5	8.0	6.3k	2
5/14	6153’	9.2	50	1717	10.0	10.0	8.0	4.6k	4
5/15	6400’TD	9.25	52	16	17	10.5	8.0	3.6k	4

ELECTRIC LOG FORMATION TOPS- KB Elev. 2662’

			*Shinogle No. 1-20	
FORMATION	DEPTH	DATUM	DATUM	POSITION
Heebner	4438’	-1776’	-1769’	+6’
Toronto	4474’	-1812’	-1807’	-5’
Lansing	4608’	-1946’	-1945’	-1’
Marmaton	5274’	-2612’	-2609’	-3’
Cherokee	5429’	-2767’	-2769’	+2’
Atoka	5715’	-3053’	-3057’	+4’
Morrow	5770’	-3108’	-3111’	+3’
Morrow “A” SS	5798’	-3136’	-3145’	+9’
Morrow “B” SS	5822’	-3160’	-3173’	+13’
Mississippi Chester	5914’	-3252’	-3250	+3’
Basal Chester	6103’	-3441’	-3447’	+6’
Ste Genevieve	6151’	-3489’	-3497’	+16’
St. Louis	6252’	-3590’	-3597’	+7’
TD	6400’	-3738’		

*O’Brien Energy Corp., Shinogle No. 2-20, 660’FSL & 2310’FWL, Sec. 20 – approximately 1320’ to the NE., K.B. Elev. 2675’.

Petrolific Consulting Services

Peter Debenham
P.O. Box 350
Drake, Colorado 80515

Wellsite Geology
720/220-4860
petrolific@earthlink.net

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

Well Name:	O'Brien Energy, Shinogle No. 2-20, Singley Field
Location:	1320'FSL & 1650'FWL, Section 20, 33S, R29W, Meade Co., KS
Licence Number:	API: 15-119-21294 Region: Hougoton
Spud Date:	5/9/16 Drilling Completed: 5/14/16
Surface Coordinates:	1320'FSL & 1650'FWL, Section 20, 33S, R29W, Meade Co., KS
Bottom Hole Coordinates:	1320'FSL & 1650'FWL, Section 20, 33S, R29W, Meade Co., KS
Ground Elevation (ft):	2649' K.B. Elevation (ft): 2662'
Logged Interval (ft):	4200' To: TD Total Depth (ft): 6400'
Formation:	Lansing, Morrow, Chester, St. Louis
Type of Drilling Fluid:	Chemical Gel/LSND/LCM, mud up 2600'

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

OPERATOR

Company: O'Brien Energy Resources, Corp.
Address: 18 Congress St., Suite 207
Portsmouth, NH 03801
President/Owner John Forma, Geologist Paul Wiemann

GEOLOGIST

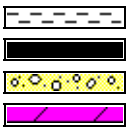
Name: Wellsite: Peter Debenham
Company: Petrolific Consulting Services
Address: P.O. Box 350
Drake, CO 80515
720/220-4860, Petrolific@gmail.com

Comments

Engineer Roger Pearson, Duke Drilling Rig No. 9, T.P. Emidgio Rojas., Drillers Victor Martinez, Alejandro V., Ferando Jurado, Sevice Mud Justin Whiting, Weatherford engineer , 8 5/8" set to 1489', 4 1/2" production casing set to TD on 5/15/16.

ROCK TYPES


Anhy
Bent
Brec
Cht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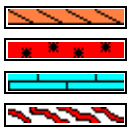
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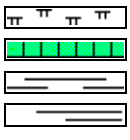
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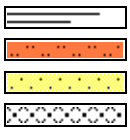
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ACCESSORIES

FOSSIL
- Algae
- Amph
- Belm
- Bioclst
- Brach
- Bryozoa
- Cephal
- Coral
- Crin
- Echin
- Fish
- Foram
- Fossil
- Gastro
- Oolite
- Ostra
- Pelec
- Pellet
- Pisolite
- Plant
- Strom

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

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

INTERVALS
- Core
- Dst

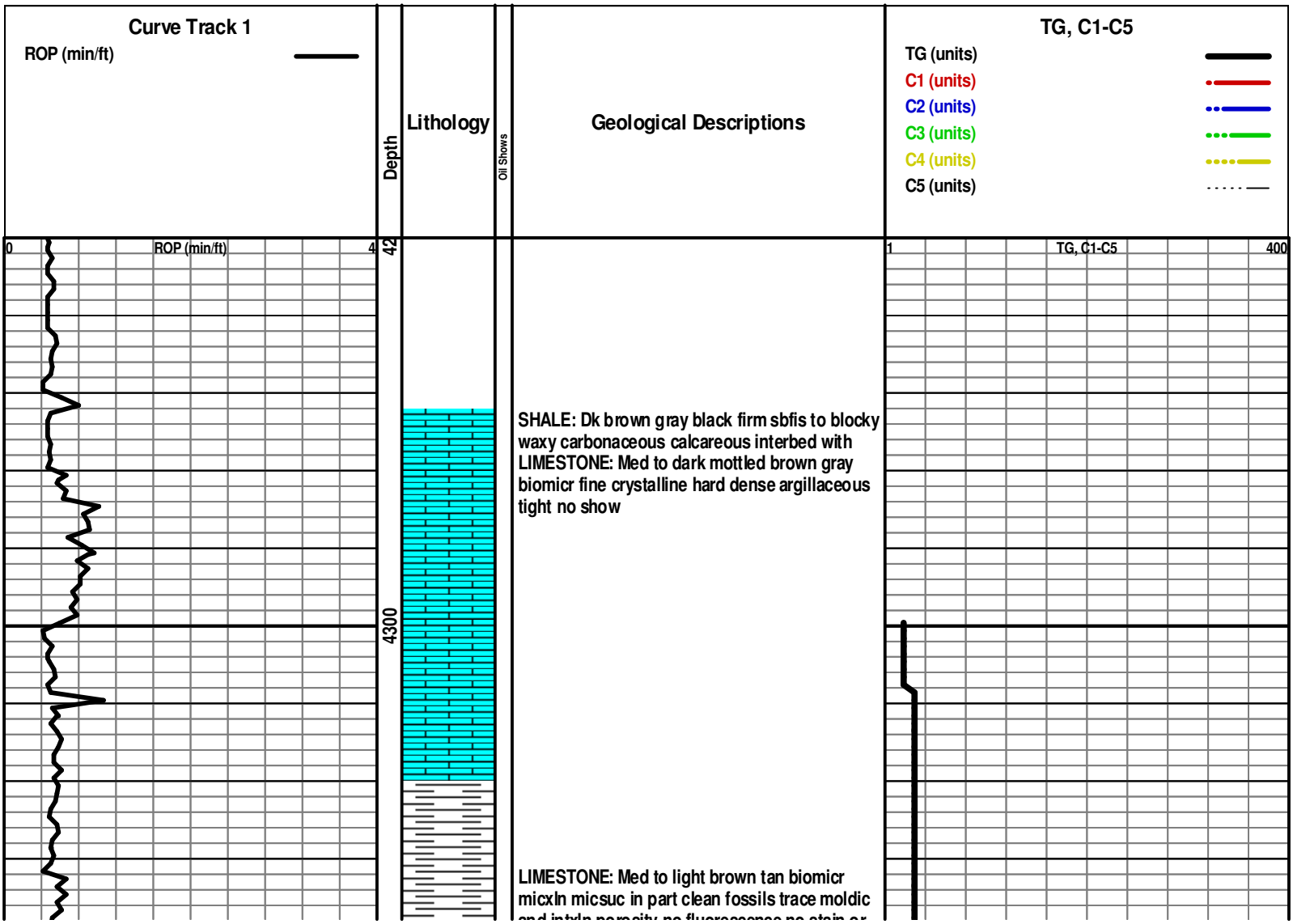
EVENTS
- Rft
- Sidewall

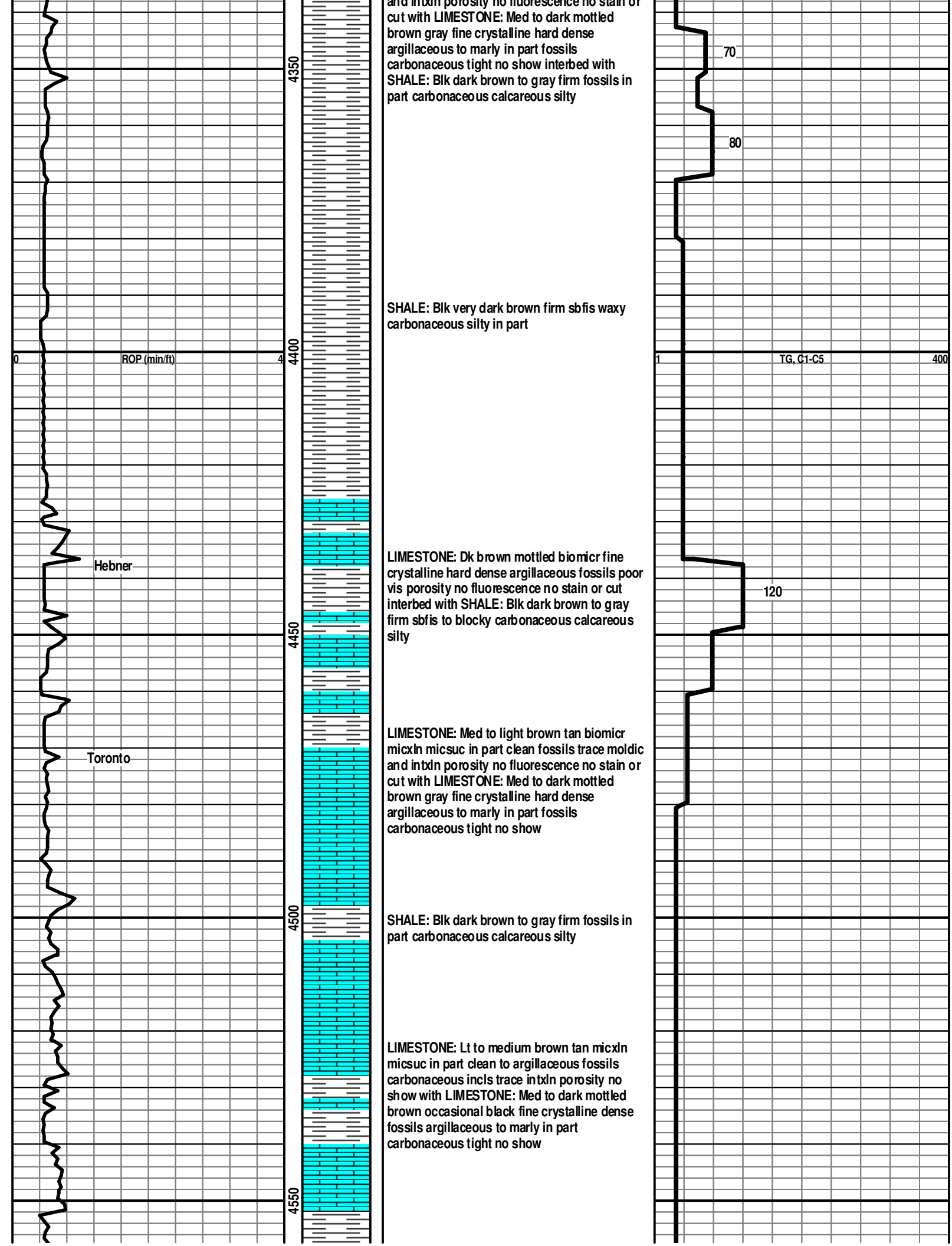
POROSITY TYPE
- Earthy
- Fenest
- Fracture
- Inter
- Moldic
- Organic
- Pinpoint
- Vuggy

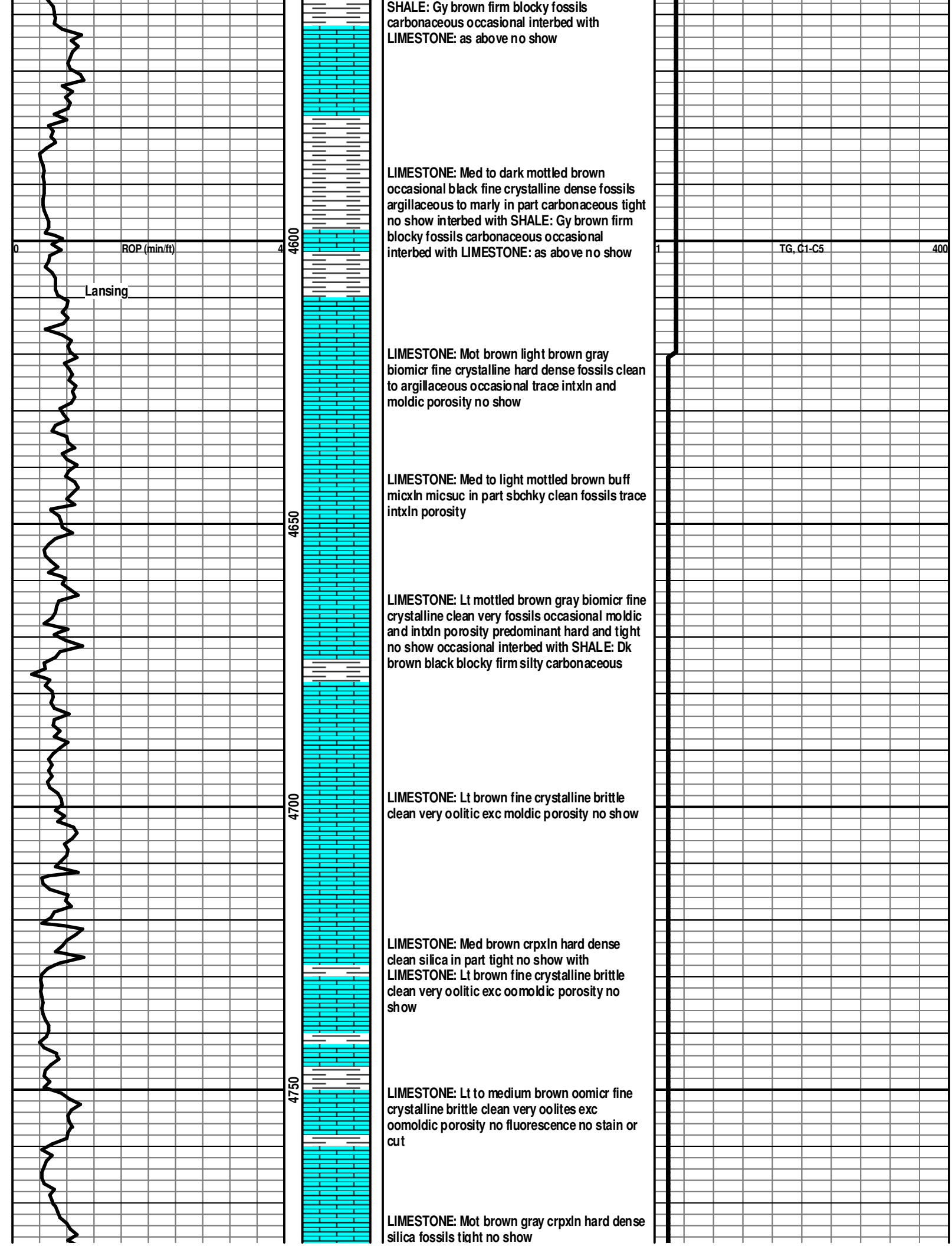
SORTING
- Well
- Moderate
- Poor

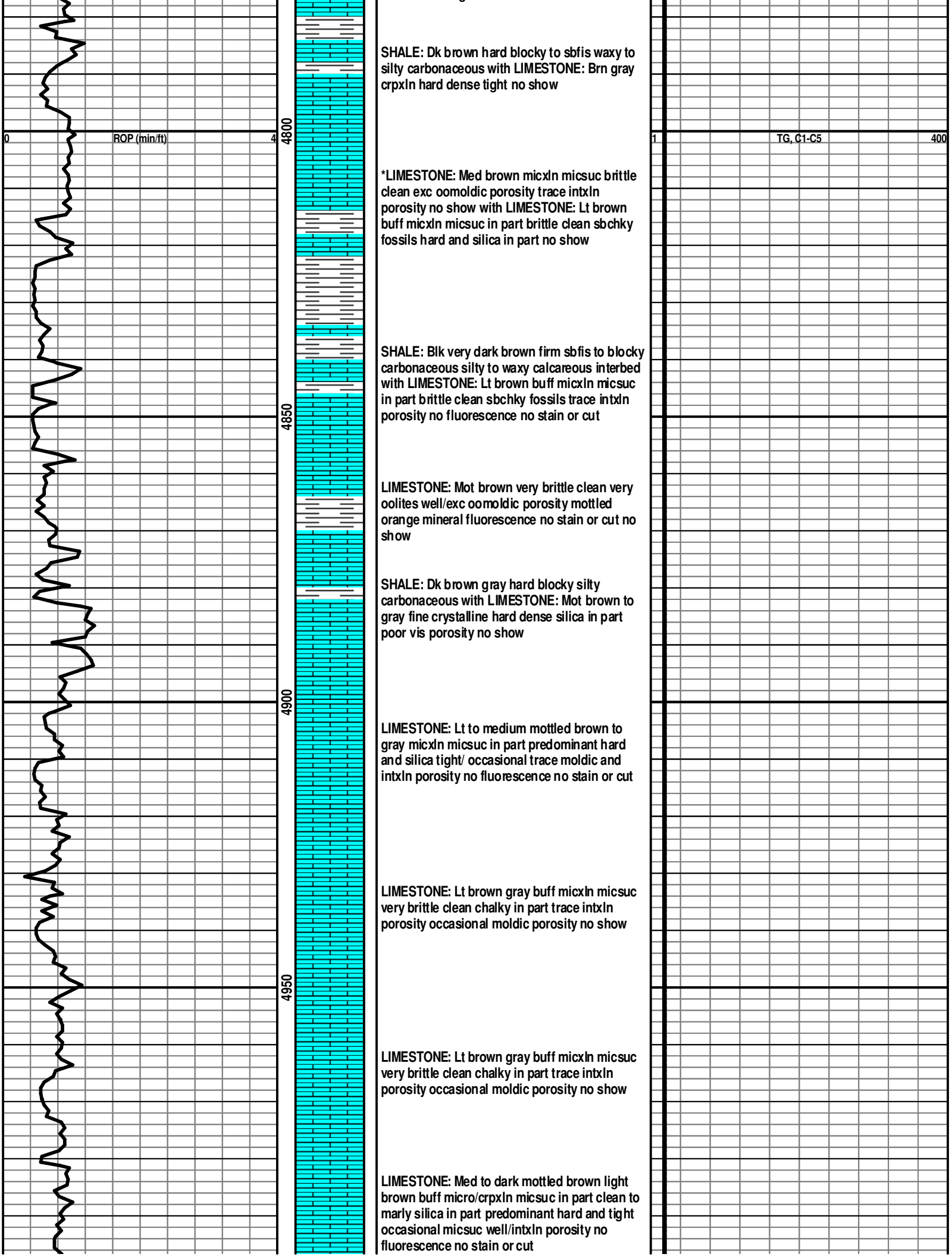
ROUNDING
- Rounded
- Subrnd
- Subang
- Angular

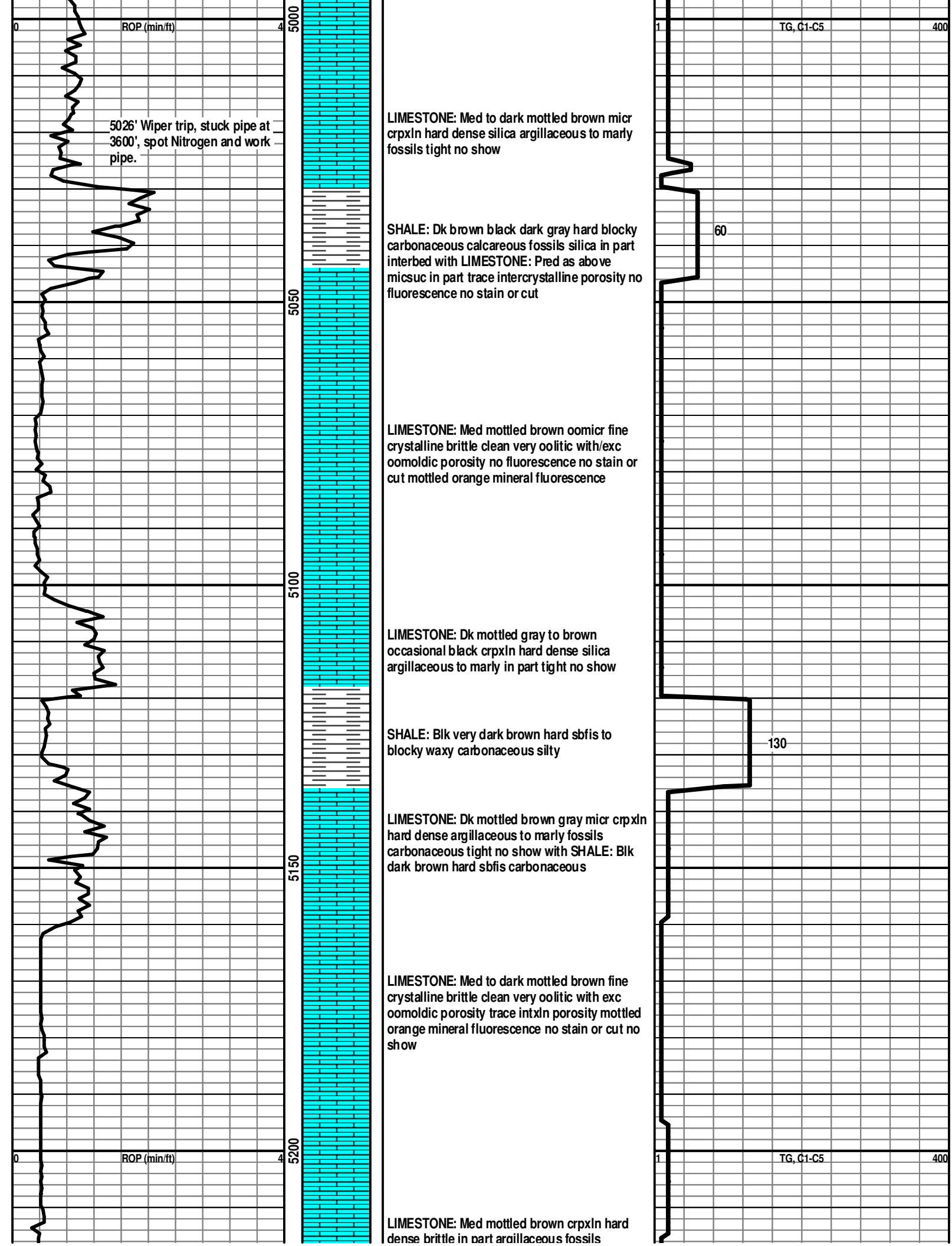
OIL SHOWS
- Even
- Spotted
- Ques
- Dead

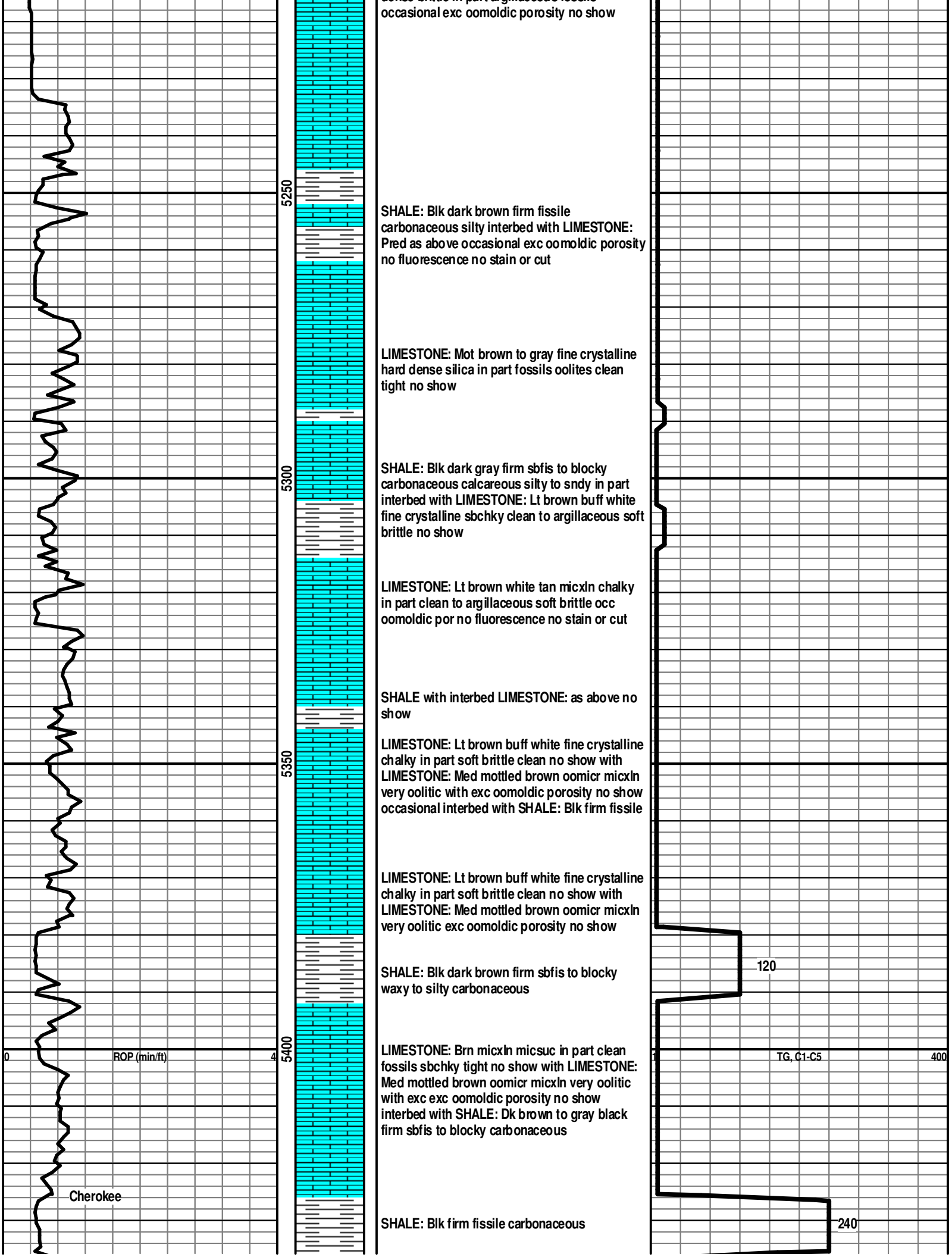


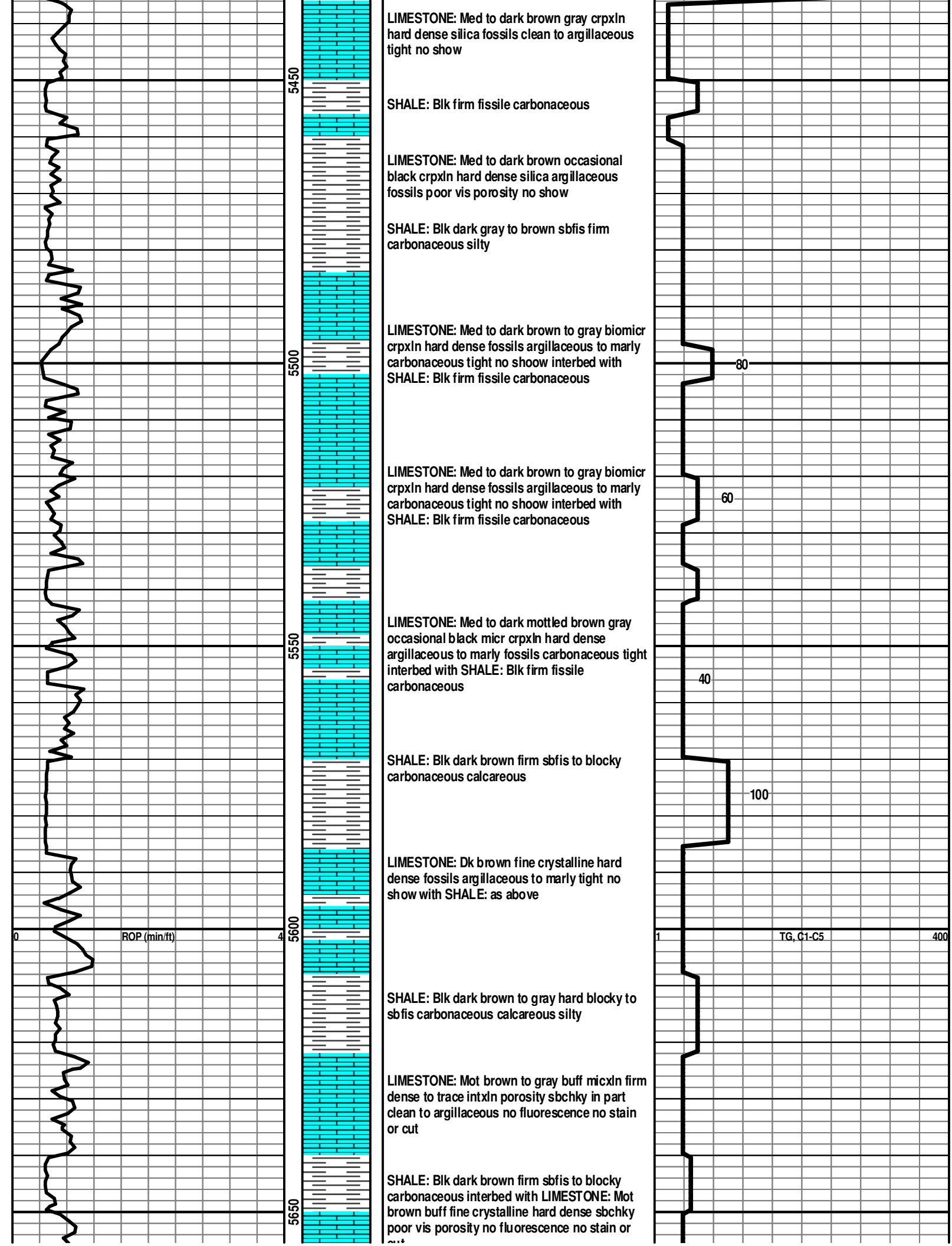

and intxln porosity no fluorescence no stain or cut with LIMESTONE: Med to dark mottled brown gray fine crystalline hard dense argillaceous to marly in part fossils carbonaceous tight no show interbed with SHALE: Blk dark brown to gray firm fossils in part carbonaceous calcareous silty
70
80
4350
SHALE: Blk very dark brown firm sbfis waxy carbonaceous silty in part
0
ROP (min/ft)
4
4400
1
TG, C1-C5
400
Hebner
LIMESTONE: Dk brown mottled biomicr fine crystalline hard dense argillaceous fossils poor vis porosity no fluorescence no stain or cut interbed with SHALE: Blk dark brown to gray firm sbfis to blocky carbonaceous calcareous silty
120
4450
Toronto
LIMESTONE: Med to light brown tan biomicr micxln micsuc in part clean fossils trace moldic and intxln porosity no fluorescence no stain or cut with LIMESTONE: Med to dark mottled brown gray fine crystalline hard dense argillaceous to marly in part fossils carbonaceous tight no show
4500
SHALE: Blk dark brown to gray firm fossils in part carbonaceous calcareous silty
LIMESTONE: Lt to medium brown tan micxln micsuc in part clean to argillaceous fossils carbonaceous incls trace intxln porosity no show with LIMESTONE: Med to dark mottled brown occasional black fine crystalline dense fossils argillaceous to marly in part carbonaceous tight no show
4550

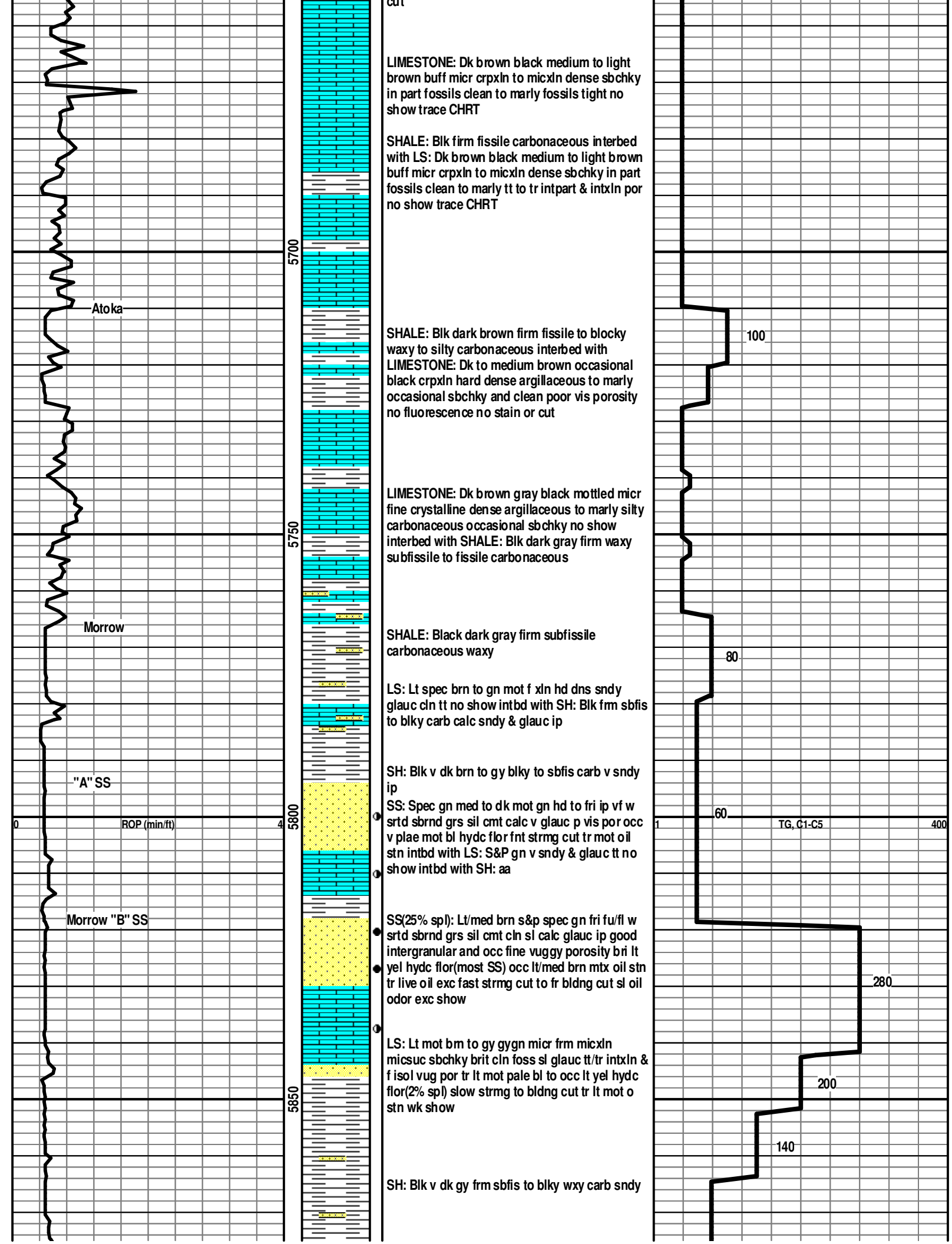

0
ROP (min/ft)
4
Lansing
4600
4650
4700
4750
SHALE: Gy brown firm blocky fossils carbonaceous occasional interbed with LIMESTONE: as above no show
LIMESTONE: Med to dark mottled brown occasional black fine crystalline dense fossils argillaceous to marly in part carbonaceous tight no show interbed with SHALE: Gy brown firm blocky fossils carbonaceous occasional interbed with LIMESTONE: as above no show
LIMESTONE: Mot brown light brown gray biomicr fine crystalline hard dense fossils clean to argillaceous occasional trace intxln and moldic porosity no show
LIMESTONE: Med to light mottled brown buff micxln micsuc in part sbchky clean fossils trace intxln porosity
LIMESTONE: Lt mottled brown gray biomicr fine crystalline clean very fossils occasional moldic and intxln porosity predominant hard and tight no show occasional interbed with SHALE: Dk brown black blocky firm silty carbonaceous
LIMESTONE: Lt brown fine crystalline brittle clean very oolitic exc moldic porosity no show
LIMESTONE: Med brown crpxln hard dense clean silica in part tight no show with LIMESTONE: Lt brown fine crystalline brittle clean very oolitic exc oomoldic porosity no show
LIMESTONE: Lt to medium brown oomicr fine crystalline brittle clean very oolites exc oomoldic porosity no fluorescence no stain or cut
LIMESTONE: Mot brown gray crpxln hard dense silica fossils tight no show
1
TG, C1-C5
400

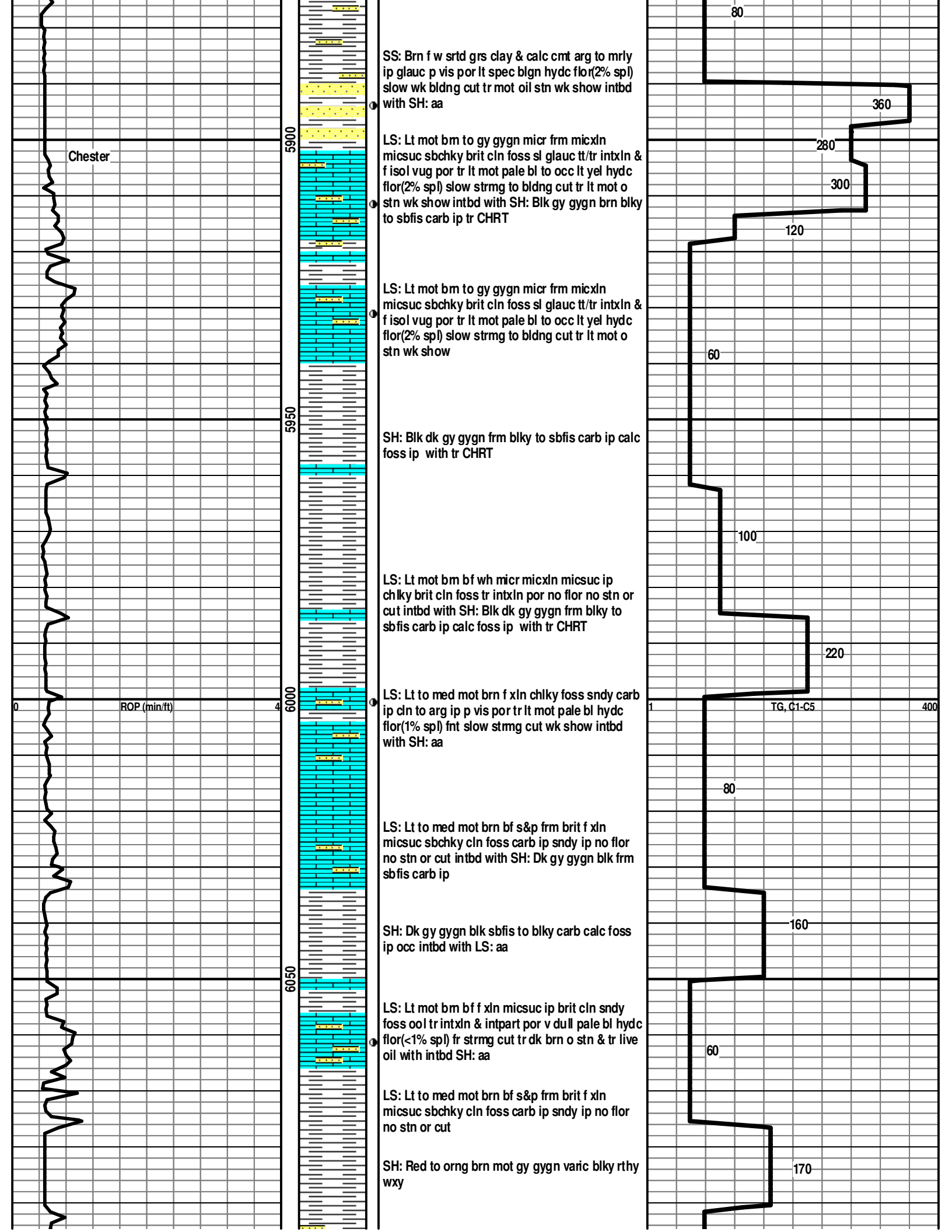

0
ROP (min/ft)
4
4800
4850
4900
4950
1
TG, C1-C5
400
SHALE: Dk brown hard blocky to sbfis waxy to silty carbonaceous with LIMESTONE: Brn gray crpxln hard dense tight no show
*LIMESTONE: Med brown micxln micsuc brittle clean exc oomoldic porosity trace intxln porosity no show with LIMESTONE: Lt brown buff micxln micsuc in part brittle clean sbchky fossils hard and silica in part no show
SHALE: Blk very dark brown firm sbfis to blocky carbonaceous silty to waxy calcareous interbed with LIMESTONE: Lt brown buff micxln micsuc in part brittle clean sbchky fossils trace intxln porosity no fluorescence no stain or cut
LIMESTONE: Mot brown very brittle clean very oolites well/exc oomoldic porosity mottled orange mineral fluorescence no stain or cut no show
SHALE: Dk brown gray hard blocky silty carbonaceous with LIMESTONE: Mot brown to gray fine crystalline hard dense silica in part poor vis porosity no show
LIMESTONE: Lt to medium mottled brown to gray micxln micsuc in part predominant hard and silica tight/ occasional trace moldic and intxln porosity no fluorescence no stain or cut
LIMESTONE: Lt brown gray buff micxln micsuc very brittle clean chalky in part trace intxln porosity occasional moldic porosity no show
LIMESTONE: Lt brown gray buff micxln micsuc very brittle clean chalky in part trace intxln porosity occasional moldic porosity no show
LIMESTONE: Med to dark mottled brown light brown buff micro/crpxln micsuc in part clean to marly silica in part predominant hard and tight occasional micsuc well/intxln porosity no fluorescence no stain or cut

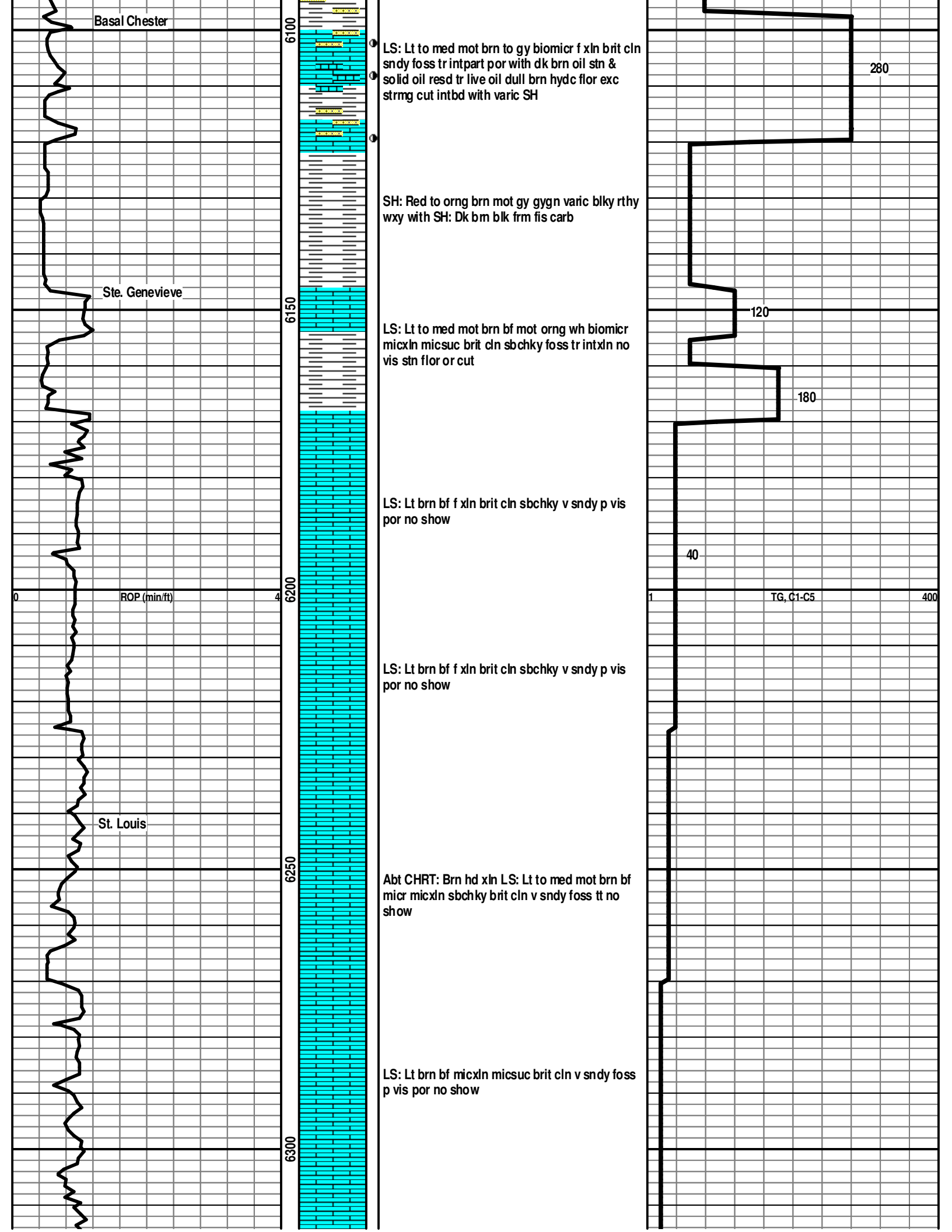

0
ROP (min/ft)
4
5000
5050
5100
5150
5200
5026' Wiper trip, stuck pipe at 3600', spot Nitrogen and work pipe.
LIMESTONE: Med to dark mottled brown micr crpxln hard dense silica argillaceous to marly fossils tight no show
SHALE: Dk brown black dark gray hard blocky carbonaceous calcareous fossils silica in part interbed with LIMESTONE: Pred as above micsuc in part trace intercrystalline porosity no fluorescence no stain or cut
LIMESTONE: Med mottled brown oomicr fine crystalline brittle clean very oolitic with/exc oomoldic porosity no fluorescence no stain or cut mottled orange mineral fluorescence
LIMESTONE: Dk mottled gray to brown occasional black crpxln hard dense silica argillaceous to marly in part tight no show
SHALE: Blk very dark brown hard sbfis to blocky waxy carbonaceous silty
LIMESTONE: Dk mottled brown gray micr crpxln hard dense argillaceous to marly fossils carbonaceous tight no show with SHALE: Blk dark brown hard sbfis carbonaceous
LIMESTONE: Med to dark mottled brown fine crystalline brittle clean very oolitic with exc oomoldic porosity trace intxln porosity mottled orange mineral fluorescence no stain or cut no show
LIMESTONE: Med mottled brown crpxln hard dense brittle in part argillaceous fossils
1
TG, C1-C5
400
60
130

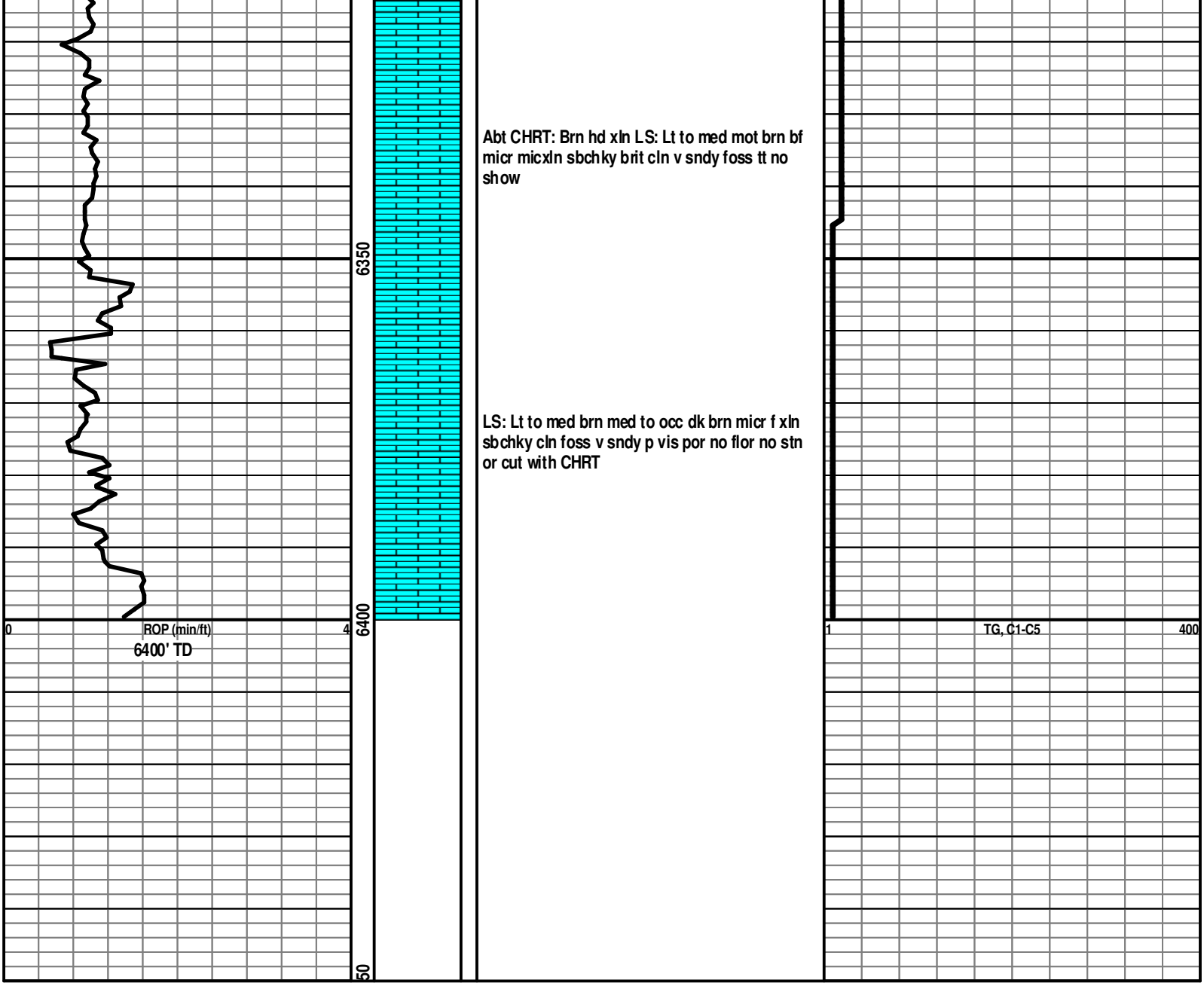

occasional exc oomoldic porosity no show
5250
SHALE: Blk dark brown firm fissile carbonaceous silty interbed with LIMESTONE: Pred as above occasional exc oomoldic porosity no fluorescence no stain or cut
LIMESTONE: Mot brown to gray fine crystalline hard dense silica in part fossils oolites clean tight no show
5300
SHALE: Blk dark gray firm sbfis to blocky carbonaceous calcareous silty to sndy in part interbed with LIMESTONE: Lt brown buff white fine crystalline sbchky clean to argillaceous soft brittle no show
LIMESTONE: Lt brown white tan micxln chalky in part clean to argillaceous soft brittle occ oomoldic por no fluorescence no stain or cut
SHALE with interbed LIMESTONE: as above no show
5350
LIMESTONE: Lt brown buff white fine crystalline chalky in part soft brittle clean no show with LIMESTONE: Med mottled brown oomicr micxln very oolitic with exc oomoldic porosity no show occasional interbed with SHALE: Blk firm fissile
LIMESTONE: Lt brown buff white fine crystalline chalky in part soft brittle clean no show with LIMESTONE: Med mottled brown oomicr micxln very oolitic exc oomoldic porosity no show
120
SHALE: Blk dark brown firm sbfis to blocky waxy to silty carbonaceous
5400
0
ROP (min/ft)
4
LIMESTONE: Brn micxln micsuc in part clean fossils sbchky tight no show with LIMESTONE: Med mottled brown oomicr micxln very oolitic with exc exc oomoldic porosity no show interbed with SHALE: Dk brown to gray black firm sbfis to blocky carbonaceous
1
TG, C1-C5
400
Cherokee
SHALE: Blk firm fissile carbonaceous
240


0
ROP (min/ft)
4
5450
5500
5550
5600
5650
LIMESTONE: Med to dark brown gray crpxln hard dense silica fossils clean to argillaceous tight no show
SHALE: Blk firm fissile carbonaceous
LIMESTONE: Med to dark brown occasional black crpxln hard dense silica argillaceous fossils poor vis porosity no show
SHALE: Blk dark gray to brown sbfis firm carbonaceous silty
LIMESTONE: Med to dark brown to gray biomicr crpxln hard dense fossils argillaceous to marly carbonaceous tight no shoow interbed with SHALE: Blk firm fissile carbonaceous
LIMESTONE: Med to dark brown to gray biomicr crpxln hard dense fossils argillaceous to marly carbonaceous tight no shoow interbed with SHALE: Blk firm fissile carbonaceous
LIMESTONE: Med to dark mottled brown gray occasional black micr crpxln hard dense argillaceous to marly fossils carbonaceous tight interbed with SHALE: Blk firm fissile carbonaceous
SHALE: Blk dark brown firm sbfis to blocky carbonaceous calcareous
LIMESTONE: Dk brown fine crystalline hard dense fossils argillaceous to marly tight no show with SHALE: as above
SHALE: Blk dark brown to gray hard blocky to sbfis carbonaceous calcareous silty
LIMESTONE: Mot brown to gray buff micxln firm dense to trace intxln porosity sbchky in part clean to argillaceous no fluorescence no stain or cut
SHALE: Blk dark brown firm sbfis to blocky carbonaceous interbed with LIMESTONE: Mot brown buff fine crystalline hard dense sbchky poor vis porosity no fluorescence no stain or
80
60
40
100
1
TG, C1-C5
400


cut
LIMESTONE: Dk brown black medium to light brown buff micr crpxln to micxln dense sbchky in part fossils clean to marly fossils tight no show trace CHRT
SHALE: Blk firm fissile carbonaceous interbed with LS: Dk brown black medium to light brown buff micr crpxln to micxln dense sbchky in part fossils clean to marly tt to tr intpart & intxln por no show trace CHRT
5700
Atoka
SHALE: Blk dark brown firm fissile to blocky waxy to silty carbonaceous interbed with LIMESTONE: Dk to medium brown occasional black crpxln hard dense argillaceous to marly occasional sbchky and clean poor vis porosity no fluorescence no stain or cut
100
LIMESTONE: Dk brown gray black mottled micr fine crystalline dense argillaceous to marly silty carbonaceous occasional sbchky no show interbed with SHALE: Blk dark gray firm waxy subfissile to fissile carbonaceous
5750
Morrow
SHALE: Black dark gray firm subfissile carbonaceous waxy
80
LS: Lt spec brn to gn mot f xln hd dns sndy glauc cln tt no show intbd with SH: Blk frm sbfis to blky carb calc sndy & glauc ip
"A" SS
SH: Blk v dk brn to gy blky to sbfis carb v sndy ip
SS: Spec gn med to dk mot gn hd to fri ip vf w srtd sbrnd grs sil cmt calc v glauc p vis por occ v plae mot bl hydc flor fnt strmg cut tr mot oil stn intbd with LS: S&P gn v sndy & glauc tt no show intbd with SH: aa
0
ROP (min/ft)
4
5800
60
1
TG, C1-C5
400
Morrow "B" SS
SS(25% spl): Lt/med brn s&p spec gn fri fu/fl w srtd sbrnd grs sil cmt cln sl calc glauc ip good intergranular and occ fine vuggy porosity bri lt yel hydc flor(most SS) occ lt/med brn mtx oil stn tr live oil exc fast strmg cut to fr bldng cut sl oil odor exc show
280
LS: Lt mot brn to gy gygn micr frm micxln micsuc sbchky brit cln foss sl glauc tt/tr intxln & f isol vug por tr lt mot pale bl to occ lt yel hydc flor(2% spl) slow strmg to bldng cut tr lt mot o stn wk show
200
5850
140
SH: Blk v dk gy frm sbfis to blky wxy carb sndy


Chester
0
ROP (min/ft)
4
5900
5950
6000
6050
SS: Brn f w srtd grs clay & calc cmt arg to mrly ip glauc p vis por lt spec blgn hydc flor(2% spl) slow wk bldng cut tr mot oil stn wk show intbd with SH: aa
LS: Lt mot brn to gy gygn micr frm micxln micsuc sbchky brit cln foss sl glauc tt/tr intxln & f isol vug por tr lt mot pale bl to occ lt yel hydc flor(2% spl) slow strmg to bldng cut tr lt mot o stn wk show intbd with SH: Blk gy gygn brn blky to sbfis carb ip tr CHRT
LS: Lt mot brn to gy gygn micr frm micxln micsuc sbchky brit cln foss sl glauc tt/tr intxln & f isol vug por tr lt mot pale bl to occ lt yel hydc flor(2% spl) slow strmg to bldng cut tr lt mot o stn wk show
SH: Blk dk gy gygn frm blky to sbfis carb ip calc foss ip with tr CHRT
LS: Lt mot brn bf wh micr micxln micsuc ip chlky brit cln foss tr intxln por no flor no stn or cut intbd with SH: Blk dk gy gygn frm blky to sbfis carb ip calc foss ip with tr CHRT
LS: Lt to med mot brn f xln chlky foss sndy carb ip cln to arg ip p vis por tr lt mot pale bl hydc flor(1% spl) fnt slow strmg cut wk show intbd with SH: aa
LS: Lt to med mot brn bf s&p frm brit f xln micsuc sbchky cln foss carb ip sndy ip no flor no stn or cut intbd with SH: Dk gy gygn blk frm sbfis carb ip
SH: Dk gy gygn blk sbfis to blky carb calc foss ip occ intbd with LS: aa
LS: Lt mot brn bf f xln micsuc ip brit cln sndy foss ool tr intxln & intpart por v dull pale bl hydc flor(<1% spl) fr strmg cut tr dk brn o stn & tr live oil with intbd SH: aa
LS: Lt to med mot brn bf s&p frm brit f xln micsuc sbchky cln foss carb ip sndy ip no flor no stn or cut
SH: Red to orng brn mot gy gygn varic blky rthy wxy
1
TG, C1-C5
400
80
360
280
300
120
60
100
220
80
160
60
170


Basal Chester
Ste. Genevieve
St. Louis
0
ROP (min/ft)
4
6100
6150
6200
6250
6300
LS: Lt to med mot brn to gy biomicr f xln brit cln sndy foss tr intpart por with dk brn oil stn & solid oil resd tr live oil dull brn hydc flor exc strmg cut intbd with varic SH
SH: Red to orng brn mot gy gygn varic blky rthy wxy with SH: Dk brn blk frm fis carb
LS: Lt to med mot brn bf mot orng wh biomicr micxln micsuc brit cln sbchky foss tr intxln no vis stn flor or cut
LS: Lt brn bf f xln brit cln sbchky v sndy p vis por no show
LS: Lt brn bf f xln brit cln sbchky v sndy p vis por no show
Abt CHRT: Brn hd xln LS: Lt to med mot brn bf micr micxln sbchky brit cln v sndy foss tt no show
LS: Lt brn bf micxln micsuc brit cln v sndy foss p vis por no show
280
120
180
40
1
TG, C1-C5
400


6350
6400
0
ROP (min/ft)
4
6400' TD
1
TG, C1-C5
400
Abt CHRT: Brn hd xln LS: Lt to med mot brn bf micr micxln sbchky brit cln v sndy foss tt no show
LS: Lt to med brn med to occ dk brn micr f xln sbchky cln foss v sndy p vis por no flor no stn or cut with CHRT