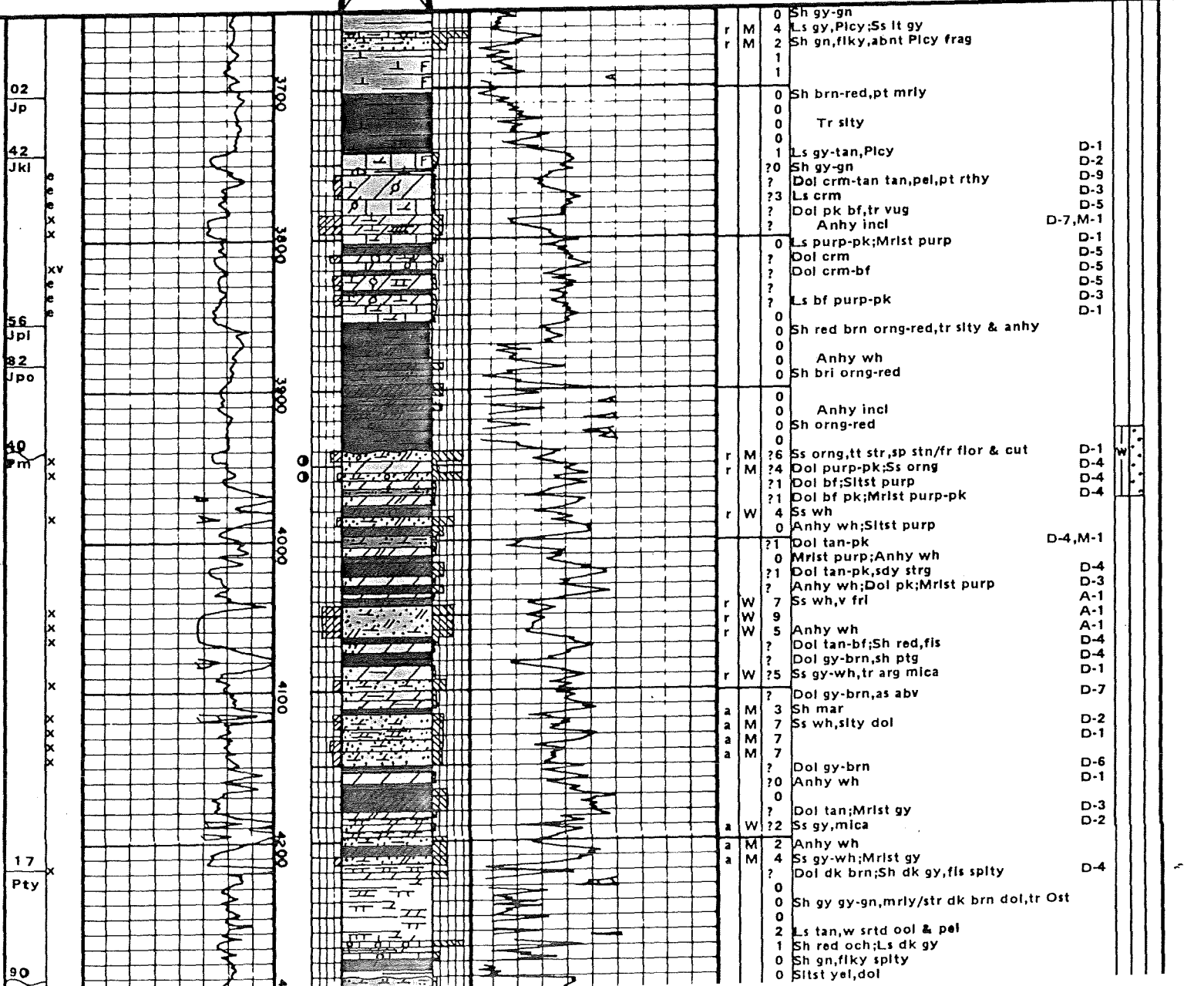
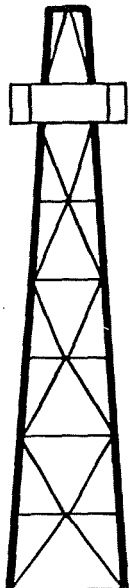


American/Canadian Stratigraphic

GL03778

LITHOLOGIC SYMBOLS and ABBREVIATIONS



LOG FORM

FORMATION TOPS FOOTNOTES	POROSITY TYPES	OIL STAIN	POROSITY GRADES	LITHOLOGY	CRYSTAL, GRAIN OR FRAGMENT SIZE	ROUNDING	SORTING	PERCENT OF FRAMEWORK	DESCRIPTION	DIAGENESIS	DST - RESULT	DST - INTERVAL	CORE - INTERVAL
1	2	3	4	5	6	7	8	9	10		11	12	13

COLUMN 1

FORMATION TOPS
FOOTNOTES
FAULTS

$\frac{65}{Kbc}$
1*



Normal
Reverse
Overturned strata

COLUMN 2

POROSITY TYPES

- | | |
|--|---|
| X INTERCRYSTALLINE, INTERGRANULAR, INTERFRAGMENTAL | O ORGANIC-bridged, intrafossil |
| φ INTEROOLITIC, INTERPELLETOID | F FRACTURE |
| V VUGGY-voids greater than 1/16mm | e EARTHY-low permeability, crystals less than 1/16mm |
| P PINPOINT-voids less than 1/16mm | □ FENESTRAL-voids from gas bubbles, shrinkage cracks & birdseye texture |
| ∫ MOLDIC | |

COLUMN 3

OIL SHOWS

STAIN PRESENT

- Even staining, fluoresces in solvent
- Spotted staining, fluoresces in solvent
- D Dead, asphaltic, bitumen, etc.
- Questionable, no fluorescence in solvent

NO STAIN PRESENT

- Oil zone (from production data)
- ▲ Gas zone (from production data)

COLUMN 4

POROSITY GRADES

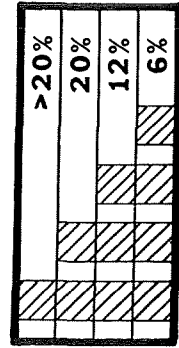
FOUR DIVISIONS — (right to left)

Division 1 3% — 6% Poor porosity with low permeability

Division 2 6% — 12% Fair porosity

Division 3 12% — 20% Good porosity

Division 4 OVER 20% Excellent porosity



COLUMN 5

ROCK TYPE

	BRECCIA
	CONGLOMERATE
	SANDSTONE
	SILTSTONE
	SHALE, gray
	SHALE, black
	SHALE, colored
	CLAYSTONE, gray
	CLAYSTONE, colored
	BENTONITE
	CHERT, bedded
	MARLSTONE, calcareous
	LIMESTONE, mudsupported (FW < 7)
	LIMESTONE, grainsupported (FW 7 or >)
	MARLSTONE, dolomitic
	DOLOMITE
	SIDERITE, LIMONITE, or HEMATITE
	ANHYDRITE, primary
	ANHYDRITE, secondary
	GYPSUM
	SALT
	COAL, pure and interbedded
	GLACIAL TILL
	IGNEOUS, basic
	IGNEOUS, acidic
	TUFF
	WELDED TUFF
	METAMORPHIC

	CHERT, tripolitic
	ARGILLACEOUS
	SHALE, laminae
	CARBONACEOUS FLAKES
	COAL, thin beds
	CEMENTING BITUMENOUS SUBSTANCE
	CALCAREOUS
	MARLSTONE, stringers-calc.
	LIMESTONE, stringers
	DOLOMITIC
	MARLSTONE, stringers-dol.
	DOLOMITE, stringers
	ANHYDRITIC
	ANHYDRITE, stringers
	GYPSIFEROUS
	GYPSUM, stringers
	SALT CAST or INFILL
	PHOSPHATE PELLETS
	FERRUGINOUS GRAINS or PELLETS
	FERRUGINOUS
	FERRUGINOUS, stringers
	NODULES
	TUFFACEOUS

SYMBOLS USED FOR SIGNIFICANT OCCURRENCES
(may be less than 10%)

	HEAVY, DARK MINERALS
	GLAUCONITE
	BENTONITE
	PYRITE
	KAOLIN
	PLANT SPORES
	PLANT REMAINS
	FISH REMAINS
	MINERAL CRYSTALS

ROCK BUILDERS

F = < 20%	2 symbols = 50 to 70%
1 symbol = 20 to 50%	3 symbols = 70 to 100%

ORGANIC

	FORAMINIFERA
	CRINOID
	PELECYPOD
	BIOLASTIC or FRAGMENTAL

	AMPHIPORA
	CORAL
	STROMATOPOROID
	BRYOZOA
	BRACHIOPOD
	OSTRACOD
	CEPHALOPOD
	GASTROPOD
	SCAPHOPOD
	BELEMNITE
	ECHINOID
	FOSSILS < 20%

ORGANIC or NON ORGANIC

	OOLITES
	PISOLITE 2mm. or over
	PSEUDO OOLITES or PELLETS
	INTRACLASTS

FRAMEWORK ALGAE

	SKELETAL
	OOTOID

NON-FRAMEWORK ALGAE

	NON-DESCRIPT
	LAMINATED

MISCELLANEOUS

	KARST TOPOGRAPHY
	NO SAMPLES
	CANNOT INTERPRET, cavings etc.
	QUESTIONABLE INTERPRETATION

TEXTURES

	EARTHY
	CHALKY
	LITHOGRAPHIC
	CRYPTOCRYSTALLINE

ACCESSORIES

1 symbol = 10% or 20%
2 symbols = 30% or 40%
3 symbols = 50%

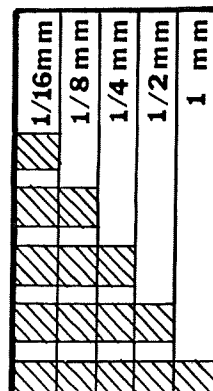
	SANDY
	SANDSTONE, stringers
	SILTY
	SILTSTONE, stringers
	PEBBLES > 2mm.
	SAND GRAINS > 1 to 2mm.
	ARGILLITE GRAIN
	FELDSPAR
	BRECCIA, fragment
	SILICEOUS
	CHERT, light and dark

COLUMN 6

CRYSTAL, GRAIN or FRAGMENT SIZE

FIVE DIVISIONS (left to right) WENTWORTH SCALE

- Division 1 .004mm — .0625mm Silt
- Division 2 .0625mm — .125mm Very fine
- Division 3 .125mm — .250mm Fine
- Division 4 .250mm — .500mm Medium
- Division 5 .500mm — 1.000mm Coarse



COLUMN 7

ROUNDING

- A ANGULAR
- a SUBANGULAR
- R ROUNDED
- r SUBROUNDED

COLUMN 8

SORTING

- W WELL 1 or 2 sizegrades
- M MEDIUM 3 or 4 sizegrades
- P POOR 5 or more sizegrades

COLUMN 9

FRAMEWORK

FRAMEWORK IS A RATIO BETWEEN CLASTIC MATERIAL OVER 1/16mm AND PRIMARY VOID FILLER OR MATERIAL 1/16mm AND LESS. ORGANIC DEPOSITS (fossils) ARE CONSIDERED AS FRAMEWORK WHETHER GROWING IN PLACE OR TRANSPORTED.

- 0 0 to 5%
- 1 10%
- 2 20%
- 3 30%
- 4 40%
- 5 50%
- 6 60%
- 7 70%
- 8 80%
- 9 90%
- C 100%
- ?5 QUESTIONABLE INTERPRETATION
- ? UNINTERPRETABLE

COLUMN 10

DESCRIPTION

USED FOR INFORMATION THAT CANNOT BE PRESENTED IN COLUMNS 1 THROUGH 9, E.G. COLOR, SPECIFIC FOSSIL IDENTIFICATION, OBSERVATIONS ON BEDDING, INDURATION, HARDNESS, STRUCTURE, ETC.

DESCRIPTIVE TERMS ARE ABBREVIATED. (see abbreviation list)

DIAGENESIS To the right of written description

TYPE





M	METASOMATISM	SECONDARY CEMENTATION
D	DOLOMITIZATION	A ANHYDRITE
R	RECRYSTALLIZATION	S SILICA
F	FRACTURING	K KAOLIN
L	LEACHING	C CARBONATE and OTHERS

DEGREE

1	10%	5	50%	9	90%
2	20%	6	60%	C	100%
3	30%	7	70%	?	Uninterpretable
4	40%	8	80%		

COLUMN 11

DRILL STEM & WIRELINE TEST RESULTS

	GAS RECOVERY
	OIL RECOVERY
	WATER RECOVERY
	GAS, OIL & WATER RECOVERY

COLUMN 12

DRILL STEM & WIRELINE TEST INTERVALS

	DRILL STEM TEST INTERVAL
	WIRELINE TESTED ZONE

COLUMN 13

CORED INTERVALS

	CORED INTERVAL
	SIDEWALL CORE

COMMON ABBREVIATIONS

@	At	coln	Colonial	grnl	Granule	nod	Nodule
abnt	Abundant	com	Common	grnt	Granite	num	Numerous
abv	Above	conc	Concretion (ary)	grnt.w	Granite wash		
acic	Acicular	conch	Conchoidal	gsy	Greasy	o	Oil
aft	After	Cono	Conodont	gvl	Gravel	occ	Occasional
aglm	Agglomerate	contm	Contaminated	gy	Gray	och	Ochre
Alg	Algae (al)	coq	Coquina	gyp	Gypsum (iferous)	od	Odor
alt	Altered (ing)	Cor	Coral	gywk	Graywacke	olvn	Olivine
amb	Amber	crbnt	Carbonate			onc	Oncolites
amor	Amorphous	Crin	Crinoid (al)	hd	Hard	ooc	Oocast (ic)
<u>Amph</u>	<u>Amphipora</u>	crm	Cream	hem	Hematite (ic)	ool	Oolite (ic)
amt	Amount	crpxl	Cryptocrystalline	hex	Hexagonal	oom	Oomold (ic)
ang	Angular	ctd	Coated	hi	High	op	Opaque
anhed	Anhedral	ctc	Contact	hornbd	Hornblende	org	Organic
anhy	Anhydrite (ic)	cvg	Cavings	hrtl	Horizontal	org	Orange
app	Appear	<u>Cyp</u>	<u>Cypridopsis</u>	hvy	Heavy	orth	Orthoclase
apr	Apparent			hydc	Hydrocarbon	Ost	Ostracod
aprox	Approximate (ly)	dd	Dead			ovgth	Overgrowth
arg	Argillaceous	deb	Debris	ig	Igneous	ox	Oxidized
argl	Argillite	decr	Decrease (ing)	imbd	Imbedded		
ark	Arkose (ic)	dend	Dendrite (ic)	imp	Impression	p	Poor (ly)
asph	Asphalt (ic)	dess	Desiccation	incl	Included (sion)	<u>Para</u>	<u>Paraparchites</u>
		dism	Disseminated	incr	Increase (ing)	pbl	Pebble
bar	Barite (ic)	dk	Dark (er)	ind	Indurated	pel	Pellet
bcm	Become (ing)	dns	Dense (er)	indst	Indistinct	<u>Pent</u>	<u>Pentamerus</u>
bd	Bed	dol	Dolomite (ic)	lnoc	<u>Inoceramus</u>	perm	Permeability
bdd	Bedded	dolst	Dolostone	intbd	Interbedded	pet	Petroleum (iferous)
bdeye	Birdseye	drsy	Druse (y)	intcl	Intraclast (s)	phos	Phosphate (ic)
bdg	Bedding	dtrl	Detrital (us)	intfrag	Interfragmental	pisol	Pisolite (ic)
<u>Belm</u>	<u>Belemnites</u>			intgran	Intergranular	pit	Pitted
bent	Bentonite (ic)	Ech	Echinoid	intgwn	Intergrown	pk	Pink
bf	Buff	elg	Elongate	intlml	Interlaminated	plag	Plagioclase
biocl	Bioclastic	<u>Endo</u>	<u>Endothyra</u>	intpt	Interpretation	plas	Plastic
biot	Biotite	euhed	Euhedral	intr	Intrusion (ive)	Plyc	Pelecypod
bioturb	Bioturbated	<u>Euryamph</u>	<u>Euryamphipora</u>	intstl	Interstitial	pl	Plant
bit	Bitumen (inous)			intv	Interval	plty	Platy
bl	Blue (ish)	f	Fine (ly)	intxl	Intercrystalline	pol	Polish (ed)
bldr	Boulder (256 mm +)	fau	Fauna	ireg	Irregular	por	Porous (sity)
blk	Black	Fe	Iron-Ferruginous	irid	Iridescent	pos	Possible (ility)
blky	Blocky	Fe-mag	Ferro-magnesian	<u>Ivan</u>	<u>Ivanovia</u>	p-p	Pin point
bnd	Band (ed)	fenst	Fenestral			pred	Predominant (ly)
boudg	Boudinage	Fe-st	Ironstone	kao	Kaolin	pres	Preserved (ation)
Brac	Brachiopod	fib	Fibrous			prim	Primary
brhg	Branching	fis	Fissile	lam	Laminated	pris	Prism (atic)
brec	Breccia (ted)	fl	Fill (ed)	lav	Lavender	prly	Pearly
bri	Bright	fld	Feldspar (thic)	lchd	Leached	prob	Probable (ly)
brit	Brittle	flk	Flake	len	Lentil (cular)	prom	Prominent (ly)
brd	Bored	flky	Flaky	lig	Lignite (ic)	prphy	Porphyry
brn	Brown	flor	Fluorescence	lith	Lithographic	psdo	Pseudo
Bry	Bryozoa	fls	Flesh	lmn	Limonite (ic)	pt	Part (ly)
bulb	Bulbous	flt	Fault (ed)	lmpy	Lumpy	ptch	Patch (es)
bur	Burrowed	fltg	Floating	lmy	Limy	ptg	Parting
		fmt	Faint (ly)	lrg	Large (er)	purp	Purple
c	Coarse (ly)	Foram	Foraminifera	ls	Limestone	pyr	Pyrrite (ic) (ized)
¢	Core	fos	Fossil (iferous)	lse	Loose	pyrbit	Pyrobitumen
calc	Calcite (areous)	fr	Fair	lstr	Lustre	pyrxn	Pyroxene
carb	Carbonaceous	frac	Fracture (ed)	lt	Light (er)		
<u>Casph</u>	<u>Calcisphaera</u>	frag	Fragment (al)			qtz	Quartz
cbl	Cobble (64-256 mm)	fri	Friable	m	Medium	qtzc	Quartzitic
Ceph	Cephalopod	fri	Friable	magn	Magnetic	qtzs	Quartzose
cgl	Conglomerate	frmwk	Framework	magnt	Magnetite	qtzt	Quartzite
<u>Chaet</u>	<u>Chaetetes</u>	fros	Frosted	mar	Maroon		
chal	Chalcedony	Fus	Fusulinid	mas	Massive	rad	Radiate (ing)
Chara	Charophytes	<u>Fvst</u>	<u>Favosites</u>	mat	Material,matter	rd	Round (ed)
chit	Chitin (ous)			meta	Metamorphic	<u>Ren</u>	<u>Renalcis</u>
chk	Chalk (y)	g	Good	mica	Mica (eous)	repl	Replaced (ing) (ment)
chlor	Chlorite	<u>Gal</u>	<u>Galeolaria</u>	mic	Micro	resd	Residue (al)
cht	Chert	Gast	Gastropod	mky	Milky	rexl	Recrystallize (ation)
chty	Cherty	gil	Gilsonite	mnr	Minor	rhmb	Rhomb (ic)
Chtz	Chitinozoa	<u>Girv</u>	<u>Girvanella</u>	mnr1	Mineral (ized)	rmn	Remains (nant)
cl	Clastic	gl	Glass (y)	mnut	Minute	rr	Rare
cln	Clean	glau	Glauconite (ic)	Mol	Mollusca	rsns	Resinous
clr	Clear	<u>Glob</u>	<u>Globigerina</u>	mot	Mottled	rthy	Earthy
clus	Cluster	glos	Gloss (y)	mr1st	Marlstone	rug	Rugose (Rugosa)
cly	Clay (ey)	gn	Green	mrly	Marly		
clyst	Claystone	gns	Gneiss	msm	Metasomatic	s	Small
cmt	Cement (ed)	gr	Grain (ed)	mtx	Matrix	sa	Salt
cncn	Concentric	gran	Granular	musc	Muscovite	sa-c	Salt cast (ic)
cntr	Center (ed)	Grap	Graptolite			S	Sulphur
col	Color (ed)	grd	Grade (ed)			s&p	Salt & pepper
		grdg	Grading	n	No,none		

sat	Saturated	<u>Solen</u>	<u>Solenopora</u>	sy-Ca	Sparry calcite	vgt	Varigated
sb	Sub	sp	Spot (ted) (ty)	sz	Size	vit	Vitreous
sc	Scales	spec	Speck (led)			vn	Vein
Scaph	Scaphopod	Spg	Sponge	tab	Tabular	volc	Volcanics
scat	Scattered	sph	Spherules	<u>Tas</u>	<u>Tasmanites</u>	vps	Very poor samples
scha	Schist	<u>Sphaer</u>	<u>Sphaerocodium</u>	<u>Tent</u>	<u>Tentaculites</u>	vrtl	Vertical
Scol	Scolecodonts	sphal	Sphalerite	tex	Texture	vrvd	Varved
sd	Sand (1/16-2 mm)	spic	Spicule (ar)	<u>Tham</u>	<u>Thamnopora</u>	vug	Vug (gy) (ular)
sdly	Sandy	spl	Sample	thk	Thick		
sec	Secondary	splty	Splintery	thn	Thin	/	With
sed	Sediment (ary)	Spr	Spore	thru	Throughout	w	Well
sel	Selenite	srt	Sort (ed) (ing)	tns	Tension	wh	White
sept	Septate	ss	Sandstone	tr	Trace	wk	Weak
sft	Soft	<u>Stach</u>	<u>Stachyodes</u>	trip	Tripoli (ic)	wthrd	Weathered
sh	Shale	stmng	Streaming	trnsl	Translucent	wtr	Water
shad	Shadow	stn	Stain (ed) (ing)	trnsp	Transparent	wvy	Wavy
shy	Shaly	str	Streak	tt	Tight (ly)	wxy	Waxy
sid	Siderite (ic)	strg	Stringer	tub	Tubular		
sil	Silica (eous)	stri	Striated	tuf	Tuffaceous	xbd	Cross-bedded
sks	Slickensided	Strom	Stromatoporoid			xbdg	Cross-bedding
sl	Slight (ly)	stromlt	Stromatolite	uncons	Unconsolidated	xl	Crystal (line)
sln	Solution	struc	Structure	unident	Unidentifiable	xlam	Cross-laminated
slky	Silky	styl	Stylolite (ic)	up	Upper		
silt	Silt	<u>Stylio</u>	<u>Styliolina</u>			yel	Yellow
siltst	Siltstone	suc	Sucrosic	v	Very		
silty	Silty	sug	Sugary	var	Variable	zeo	Zeolite
sm	Smooth	surf	Surface	vccl	Varicolored	zn	Zone
sol	Solitary	<u>Syring</u>	<u>Syringopora</u>	ves	Vesicular		

ENGINEERING ABBREVIATIONS

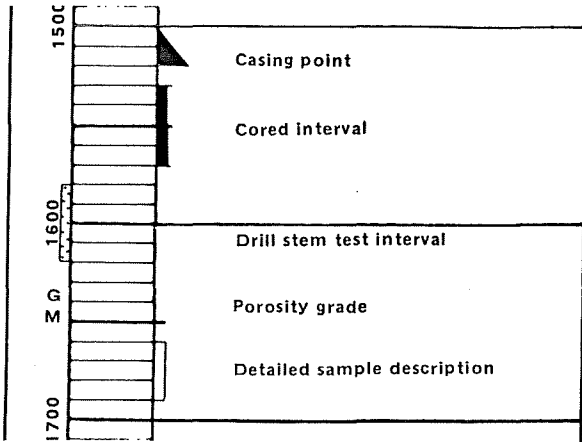
AOF	absolute open flow	GCM	gas cut mud	perf	perforated
BHFP	bottom hole flow pressure	GCW	gas cut water	PD	per day
BHP	bottom hole pressure	GAP	good air blow	PH	per hour
BHSIP	bottom hole shut in pressure	GIP	good initial puff	pkr	packer
BHT	bottom hole temperature	GOR	gas-to-oil ratio	psi	pounds per square inch
BO	barrels of oil	GR	ground		
BOPD	barrels of oil per day	GTS	gas to surface	rec	recovered
BOPH	barrels of oil per hour	gty	gravity	RT	rotary table
brk	brackish	HO	heavy oil	SAB	strong air blow
BW	barrels of water	IAB	initial air blow	SGCM	slight gas cut mud
BWPD	barrels of water per day	IP	initial production	SGCW	slight gas cut water
BWPH	barrels of water per hour			SI	shut in
		KB	kelly bushing	SIP	shut in pressure
circ	circulate (ed) (tion)			SO	show of oil
ck	choke			SO&G	show of oil and gas
comp	completed (tion)	loc	location	SO&W	show of oil and water
crd	cored	LSD	legal subdivision	SOCM	slight oil cut mud
csg	casing			SOCW	slight oil cut water
(D)	development	MCFG	thousand cubic feet of gas	sqz	squeezed
D & A	dry and abandoned	MCMCFG	million cubic feet of gas	SSO	slight show of oil
decr	decreasing	MCO	mud cut oil	SW	salt water
DF	derrick floor	MCW	mud cut water	swbd	swabbed
dist	distillate	O&G	oil and gas	T.D.	total depth
drlr	driller	O&SW	oil and salt water	TSTM	too small to measure
DST	drill stem test	OC	oil cut	tstg	testing
		OCM	oil cut mud		
est	estimated	OFM	oil flecked mud	V.op	valve open
		op	open		
FTAB	faint air blow	OTD	old total depth	(W)	wildcat
FAB	fair air blow	OTS	oil to surface	WAB	weak air blow
fl/	flowed (ing)	OWDD	old well drilled deeper	WCM	water cut mud
FP	flowing pressure	OWPB	old well plugged back	WIP	weak initial puff
		OWWO	old well worked over	wtr	water
ga	gauged			wtr cush	water cushion
G&OCM	gas and oil cut mud	PB	plugged back		

MECHANICAL LOG ABBREVIATIONS

BHCS	bore hole compensated sonic	ES	electric	ML	microlog, minilog
Cal	caliper	IES	induction electric	MLL	microlaterolog
CN	compensated neutron	FDL	formation density log	N	Neutron
DI	dual induction log	GL	guard log	S	sonic, acoustilog
DIL	dual induction laterolog	GR	gamma ray	SNP	sidewall neutron porosity log
DLL	dual laterolog	LL	laterolog	SP	spontaneous potential
DL	density log	LL8	laterolog-8	PL	proximity log

DISCONTINUED LOG FORMS AND SYMBOLS

LOG FORM: TO JULY 1957



ROCK TYPES

- CONGLOMERATE or DRIFT
- GRANITE WASH or ARKOSE
- SILTSTONE
- IGNEOUS
- VOLCANIC & BASIC DEBRIS
- SIDERITE

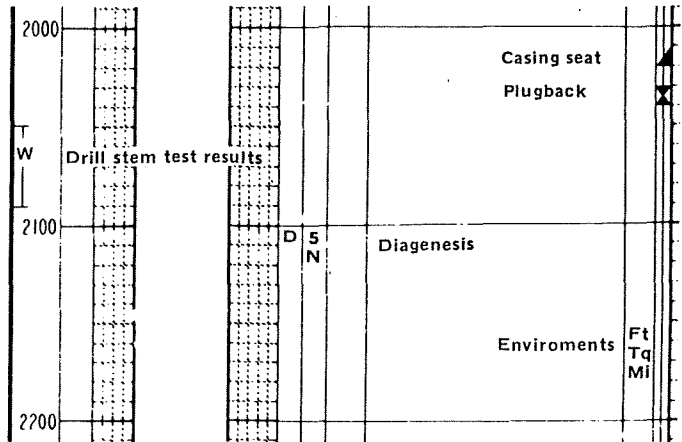
ACCESSORIES

- SANDY LIMESTONE
- SILTY LIMESTONE
- DOLOMITIC LIMESTONE
- SANDY SHALE
- SILTY SHALE
- MARL, CHALK
- FISH FRAGMENTS
- IRONSTONE NODULES

POROSITY

- S Slight
- P Poor
- M Medium
- G Good

LOG FORM: JULY 1957 TO APRIL 1976



ROCK TYPES

- GRANITE WASH
- PRIMARY DOLOMITE

ACCESSORIES

- OOLITIC CHERT
- SANDY CHERT
- SECONDARY OPAL SPHERES
- CALCITE, DOLOMITE CRYSTALS

OIL SHOWS

- NO STAIN PRESENT, NON-COMMERCIAL OIL ZONE
- NO STAIN PRESENT, NON-COMMERCIAL GAS ZONE

DIAGENESIS

- K KAOLINIZATION OF GRAINS
(NOW USED FOR KAOLIN CEMENT ONLY)
- N NO DIAGENESIS

ENGINEERING DATA

- CASING SEATS
- PLUGBACK

ENVIRONMENTS

LACUSTRINE				TRANSITIONAL				MARINE					
R	Residual	Lt	Turbulent	Lt	Turbulent	Tt	Turbulent	Mt	Turbulent				
E	Eolian	La	Agitated	La	Agitated	Ta	Agitated	Ma	Agitated				
G	Glacial	Li	Intermittent	Li	Intermittent	Ti	Intermittent	Mi	Intermittent				
C	Colluvial	Lq	Quiet	Lq	Quiet	Tq	Quiet	Mq	Quiet				
I	Igneous	Le	Euxinic	Lb	Bog	Tb	Bog	Me	Euxinic				
V	Volcanic	Lb	Bog			Tp	Penesaline	Mp	Penesaline				
	FLUVIAL	Lp	Penesaline	Ca	Aeolian	Ts	Saline	Ms	Saline				
Ft	Turbulent	Ls	Saline	Cl	Lacustrine	Th	Hypersaline	Mh	Hypersaline				
Fa	Agitated	Lh	Hypersaline	Cs	Swamp	Td	Deltaic	Mr	Reef				
Fu	Intermittent	Lr	Reef	Cr	Residual	Tb	Beach	Mo	Organic				
Fq	Quiet	Lo	Organic	Cf	Fluvial	Tl	Lagoonal	July, 1957-JAN., 1958					
Fb	Bog							Mn	Normal				
								Me	Epineritic				
								Mi	Infraneritic				
								Ms	Penesaline				
								Mr	Restricted				
								Ma	Abyssal				