PR85/015 B

NORTHERN TERRITORY
GEOLOGICAL SURVEY

Enclosure 3

①

AMOCO AUSTRALIA PETROLEUM COMPANY

AMOCO COMPOSITE WELL LOG

WELL: **BROADMERE NO. 1**

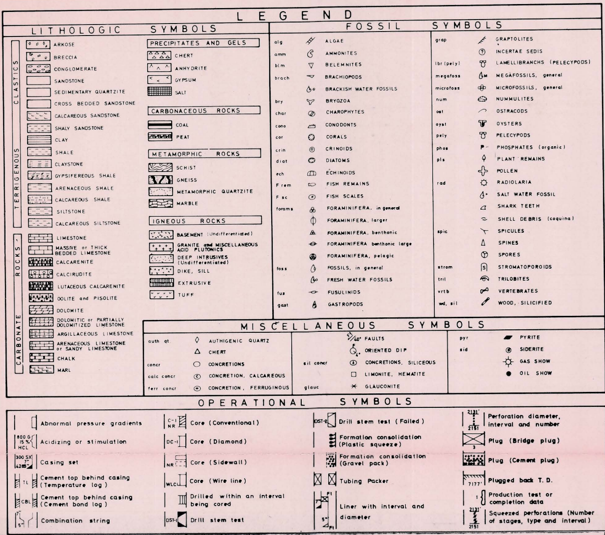
WELL DATA

COORDINATES: S16° 19' 47.963" LAT E 135° 19' 16.896" LONG.
COUNTRY: Australia
AREA: O.P. 191 Northern Territory
ELEVATION: K. B. to Mean Sea L. 578' (176.17m); Ground Level 555' (169.16m)
SPUD DATE: May 15, 1984
COMPLETION DATE: Abandoned Aug. 30, 1984
TOTAL DAYS: 109
TOTAL DEPTH: 7133' (2174.1m)
PLUG BACK TOTAL DEPTH: Surface
CASING: Last casing 13⅜" at 3224' (982.67m)
RIG TYPE: National 110
OWNED BY: Richter
CONTRACTOR: Richter
CLASSIFICATION WHEN STARTED: Wildcat
CLASSIFICATION AFTER COMPLETED: Dry and Abandoned
METHOD OF COMPLETION: Plugged and Abandoned
GEOLOGISTS: R.G. McCullough, C.E. Revilla, M.B. Womer
PALEONTOLOGIST: None

LOGGING DATA

RUN No.	TYPE	DATE	SERVICE COMPANY	FIRST READING	LAST READING
1.	ISF-BHC Sonic-GR-SP-CAL	May 18, 1984	Schlumberger	905' (275.84m)	52' (15.85m)
1.	DLL-MSFL-GR-SP.	June 08, 1984	"	4154' (1266.14m)	906' (276.15m)
2.	ISF-BHC Sonic-MSFL-GR-SP	June 08, 1984	"	"	"
1.	LDL-CNL-GR	June 09, 1984	"	"	"
1.	HDT	June 09, 1984	"	"	"
1.	CST.	June 09, 1984	"		
1.	VSP.	June 11, 1984	"	4154' (1266.14m)	0' (0m)
1.	RFT.	July 03, 1984	"	2577' (785.47m)	1530' (466.34m)
3.	ISF-BHC Sonic-MSFL-GR-SP	August 20, 1984	"	6640' (2023.87m)	3223' (982.37m)
2.	DLL-GR-SP	August 20, 1984	"	6631' (2021.13m)	3572' (1088.74m)
2.	LDL-CNL-GR	August 20, 1984	"	6643' (2024.79m)	3722' (1134.46m)
2.	HDT.	August 21, 1984	"	6644' (2025.09m)	4030' (1228.34m)
2.	CST.	August 21, 1984	"	6611' (2015.03m)	4296' (1309.42m)

LEGEND



LITHOLOGIC SYMBOLS

TERRIGENOUS – CLASTICS
- ARKOSE
- BRECCIA
- CONGLOMERATE
- SANDSTONE
- SEDIMENTARY QUARTZITE
- CROSS BEDDED SANDSTONE
- CALCAREOUS SANDSTONE
- SHALY SANDSTONE
- CLAY
- SHALE
- CLAYSTONE
- GYPSIFEREOUS SHALE
- ARENACEOUS SHALE
- CALCAREOUS SHALE
- SILTSTONE
- CALCAREOUS SILTSTONE

CARBONATE ROCKS -
- LIMESTONE
- MASSIVE or THICK BEDDED LIMESTONE
- CALCARENITE
- CALCIRUDITE
- LUTACEOUS CALCARENITE
- OOLITE and PISOLITE
- DOLOMITE
- DOLOMITIC or PARTIALLY DOLOMITIZED LIMESTONE
- ARGILLACEOUS LIMESTONE
- ARENACEOUS LIMESTONE or SANDY LIMESTONE
- CHALK
- MARL

PRECIPITATES AND GELS
- CHERT
- ANHYDRITE
- GYPSUM
- SALT

CARBONACEOUS ROCKS
- COAL
- PEAT

METAMORPHIC ROCKS
- SCHIST
- GNEISS
- METAMORPHIC QUARTZITE
- MARBLE

IGNEOUS ROCKS
- BASEMENT (Undifferentiated)
- GRANITE and MISCELLANEOUS ACID PLUTONICS
- DEEP INTRUSIVES (Undifferentiated)
- DIKE, SILL
- EXTRUSIVE
- TUFF

FOSSIL SYMBOLS

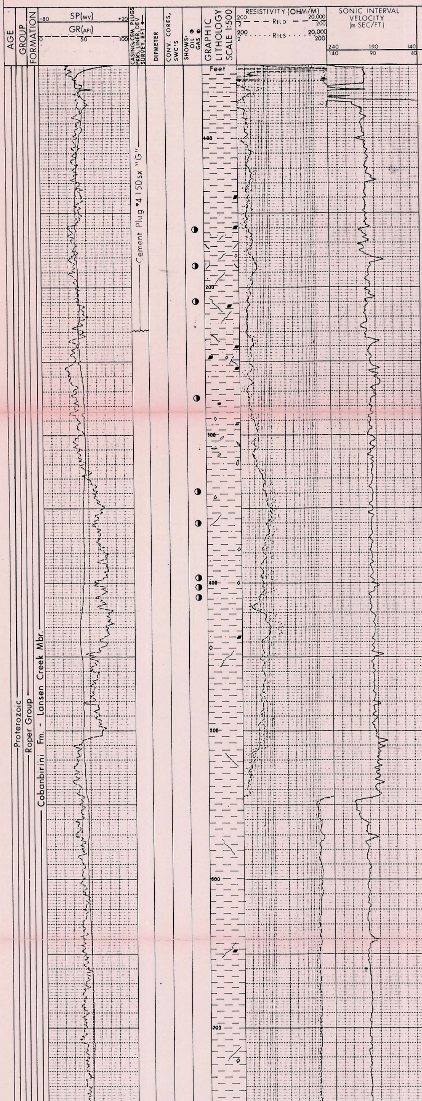
alg	ALGAE
amm	AMMONITES
blm	BELEMNITES
brach	BRACHIOPODS
	BRACKISH WATER FOSSILS
bry	BRYOZOA
char	CHAROPHYTES
cono	CONODONTS
cor	CORALS
crin	CRINOIDS
diat	DIATOMS
ech	ECHINOIDS
F rem	FISH REMAINS
F sc	FISH SCALES
forams	FORAMINIFERA, in general
	FORAMINIFERA, larger
	FORAMINIFERA, benthonic
	FORAMINIFERA benthonic large
	FORAMINIFERA, pelagic
foss	FOSSILS, in general
	FRESH WATER FOSSILS
fus	FUSULINIDS
gast	GASTROPODS
grap	GRAPTOLITES
	INCERTAE SEDIS
lbr (pely)	LAMELLIBRANCHS (PELECYPODS)
megafoss	MEGAFOSSILS, general
microfoss	MICROFOSSILS, general
num	NUMMULITES
ost	OSTRACODS
oyst	OYSTERS
pely	PELECYPODS
phos	PHOSPHATES (organic)
pls	PLANT REMAINS
	POLLEN
rad	RADIOLARIA
	SALT WATER FOSSIL
	SHARK TEETH
	SHELL DEBRIS (coquina)
spic	SPICULES
	SPINES
	SPORES
strom	STROMATOPOROIDS
tril	TRILOBITES
vrtb	VERTEBRATES
wd, sil	WOOD, SILICIFIED

MISCELLANEOUS SYMBOLS

auth qt.	AUTHIGENIC QUARTZ
	CHERT
concr	CONCRETIONS
calc concr	CONCRETION, CALCAREOUS
ferr concr	CONCRETION, FERRUGINOUS
	60° FAULTS
	4° ORIENTED DIP
sil concr	CONCRETIONS, SILICEOUS
	LIMONITE, HEMATITE
glauc	GLAUCONITE
pyr	PYRITE
sid	SIDERITE
	GAS SHOW
	OIL SHOW

OPERATIONAL SYMBOLS

- Abnormal pressure gradients
- 800 G 15 % HCL — Acidizing or stimulation
- 300 SX 7" 4265' — Casing set
- TL — Cement top behind casing (Temperature log)
- CBL — Cement top behind casing (Cement bond log)
- 7" 5" — Combination string
- C-1 NR — Core (Conventional)
- DC-1 — Core (Diamond)
- NR — Core (Sidewall)
- WLC — Core (Wire line)
- Drilled within an interval being cored
- DST-1 — Drill stem test
- DST-2 — Drill stem test (Failed)
- Formation consolidation (Plastic squeeze)
- Formation consolidation (Gravel pack)
- Tubing Packer
- 7" Ft 5" Ft — Liner with interval and diameter
- 2131' 2151 — Perforation diameter, interval and number
- 3 — Plug (Bridge plug)
- Plug (Cement plug)
- 7177' — Plugged back T. D.
- 1 — Production test or completion data
- 2131' 2151 — Squeezed perforations (Number of stages, type and interval)



LITHOLOGIC DESCRIPTION & REMARKS

Shale: dark grey to black, mod firm to soft, pyritic with v fine qtz. crystals on surfaces of bedding planes.

Shale: A. A., Trace quartz vein material, clear, pyritic. V rare brown stain with yellow fluorecence and bright streaming yellow cut fluorecence Probable fracture surfaces. Trace Oil Show.

Shale: A. A., V.rare to trace fluorecence slow cut fluorecence

Shale: dark grey to black, with thin interbed of light grey shale firm to hard, blocky. V common fine disseminated pyrite. Common pyrite crystals. Rare calcite crystals (fracture fill ?) Dull brown to orange fluorecence Trace Oil Show

Shale: dark grey to black. A.A. Common to abundant, (1cm), spherical (calcitic/dolomitic ?) Ooids. Rare bright yellow fluorecence with slow streaming cut fluorecence Trace Oil Show.

Shale: A.A., blocky to splintery.

Shale: Med grey to dark grey, firm, blocky to sub-fissile, non-calc. Rare fine disseminated pyrite. Trace to rare argillaceous dolomite? No visible porosity. V rare golden yellow fluorscence slow streaming cut, pale yellow residue. Trace Oil Show.

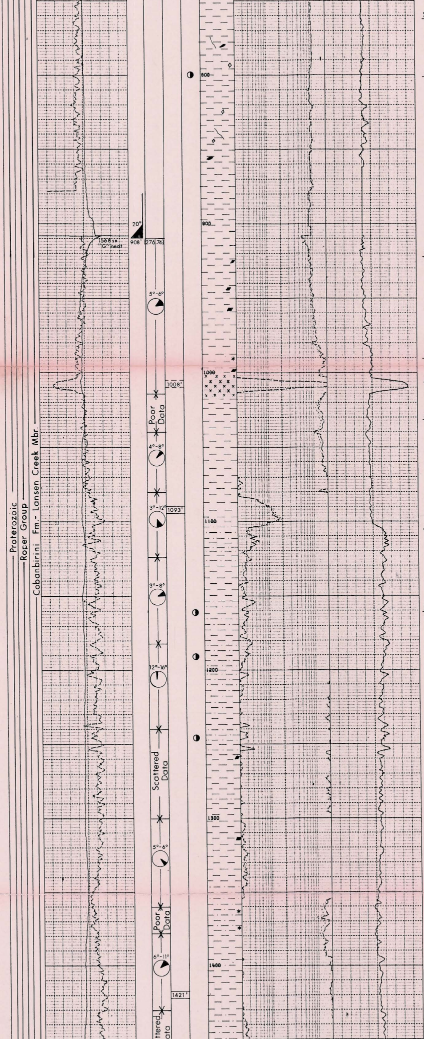
Shale: grey to black, A.A.. Rare disseminated pyrite.

Shale: light grey to green A.A. Trace dolomitic shale.

Shale: grey, A. A., trace to rare blue/green shale.

Shale: Blocky, A.A.

Shale: A.A., clasts of black to brown shale within light grey/green shale matrix.



Shale: medium grey to green-grey, firm to hard, blocky to sub-fissile, non-calc.

Shale: green, A.A. Trace authigenic quartz. Trace Oil Show.

Shale: A.A., becoming dominantly fissile. V rare wispy laminations of black Fe sulfide.

Shale: A.A., trace glauconite

Igneous: creamy white (felds par), white to green, hard, blocky fracture, polycrystalline Mottled texture.

Shale: light green/grey to black, hard, fissile to blocky, non-calc., siliceous. Trace Calcite : white to light grey with fine disseminated pyrite within the calcite.

Mudstone: Light brown, firm, blocky, siliceous, grading to siltstone, interbedded with light green and black shales. No shows.

Siltstone/Mudstone: medium grey to light brown, blocky, firm, siliceous. V.weak cream to pale yellow crush cut fluorecence. Trace Oil Show.

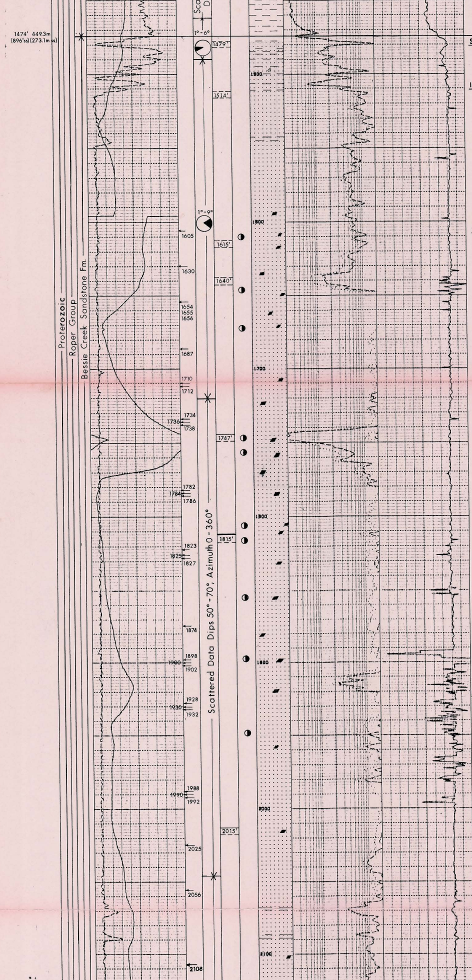
Siltstone/Mudstone: A.A., trace brown stain, very faint white cut fluorecence Trace Pyrite. Trace Oil Show.

Shale/Mudstone: light green, firm to hard, fissile, non-calc, siliceous. Mudstone. A.A.

Shale/Mudstone: A.A., common to trace glauconite.

Shale: dark green to black, fissile, firm, non-calc siliceous, micromicaceous.

Shale/Mudstone: A.A., Trace glauconite.



Sandstone: translucent to light brown, fine to medium grained, sub-ang to sub-rnded, poor to fair sort. Commonly disaggregated. No shows.

Interbedded with Shale: dark green to black, fissile, firm, non-calc., siliceous.

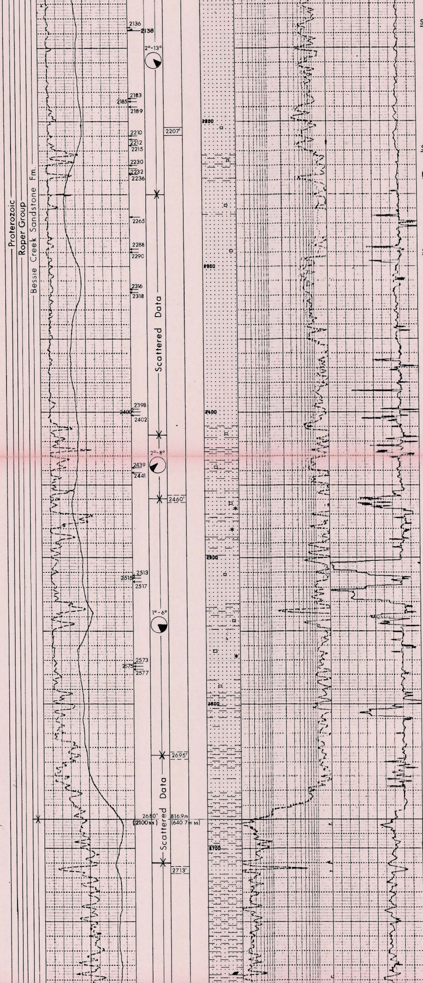
Sandstone: clear to light tan, med grained with occasional coarse grains, sub-ang, fair sort. Commonly disaggregated. Common Pyrite. Spotty dark brown stain. No fluorecence, v weak pale orange to tan cut fluorecence Creamy white to orange streaming crush cut fluorecence Pyrite associated with hydrocarbon stain. Trace Oil Show.

Sandstone: medium to dark grey, predominately med to coarse grained, sub-rounded, mod to well sorted. Commonly disaggregated. Common Pyrite. Trace to common spotty dark brown stain, no fluorecence v weak pale golden yellow slow streaming crush cut fluorecence. Pyrite associated with hydrocarbon stain. Trace Oil Show.

Sandstone: a a , Spotty dark brown stain. No Crush Cut Fluorecence Dry samples; spotty, dull, golden yellow slow streamming cut fluorecence. V poor to trace Oil Show.

Sandstone: A. A., poorly sorted. No shows.

Sandstone: creamy white to light green, fine grained, well sorted, sub-rounded. Trace Pyrite. No shows.



Sandstone: med grey to tan, mod to well sorted, sub-rounded to sub-angular. No shows.

Sandstone: red to pink, fine to medium grained, sub-ang to sub-rnded. Commonly disaggregated. V common hematite.
Interbedded with Shale: violet to red, fissile to blocky, hard, non-calc., siliceous. Common hematite. No shows.

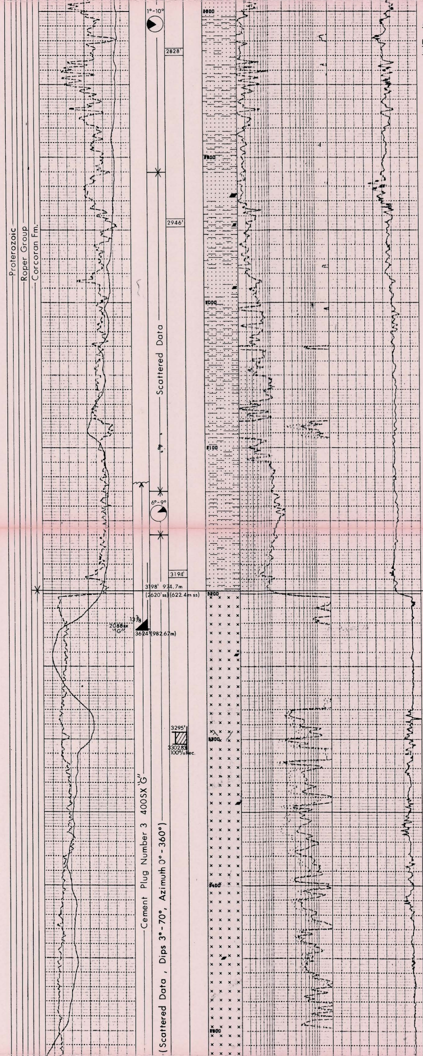
Sandstone: A.A., No shows.

Sandstone: A.A.
Interbedded with Shale: reddish brown, fissile to blocky, hard, hematitic. Non-calc, siliceous. Clay rich. Trace siltstone. No Shows.

Sandstone: A.A.
Shale: A.A., Trace siltstone and trace glauconite. No shows.

Shale: dark grey to black, blocky to fissile, non-calc., siliceous.
Interlaminated to interbedded with Sandstone: grey, vfn to fn grained, mod to well sorted, sub-ang, siliceous. No shows; and
Siltstone: white to yellow, mod to well sorted, sub-rnded, siliceous. No shows.

A.A., Trace Pyrite and Mica.



Mudstone: med to dark grey, blocky to fissile, non-calc, siliceous.

Interbedded to interlaminated with Sandstone/Siltstone: light grey, v fine grained, well sorted sub-rnded. No shows.

Diorite Sill: dark green to white, mottled texture, v. hard, v. ang fragments. Intergrowths of euhedral and anhedral, white to dark grained silicate minerals, increasing in coarsness of crystalinity with depth. Individual cutting fragments commonly mono-crystaline. Average crystal size is 1cm.

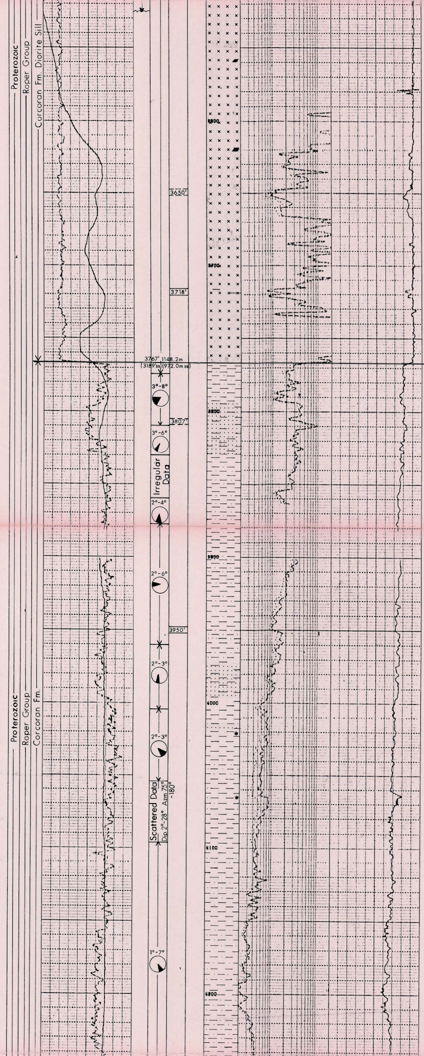
3320' to 3302.22 from Core.

Amdels Petrographic Description

Pyroxene: 34%
Orthoclase: 25%
Plagioclase: 20%
Amphibole: 10%
Chlorite: 4%
Quartz: 3%
Iron Oxide: 3% (probably magnetite)
Biotite: 1%

Petrographic description 3320' Diorite:

Dark green with white and pink mottling coarsely x-talline (approx. 1cm), v. hard, v. angular fragments. Intergrowth of euhedral and anhedral, light and dark silicate minerals: Feldspar, predom. Plagioclase, proxene, and other Ferromagnesion Minerals. Trace pyrite, sparry calcite. Cutting fragments commonly monomineralic.



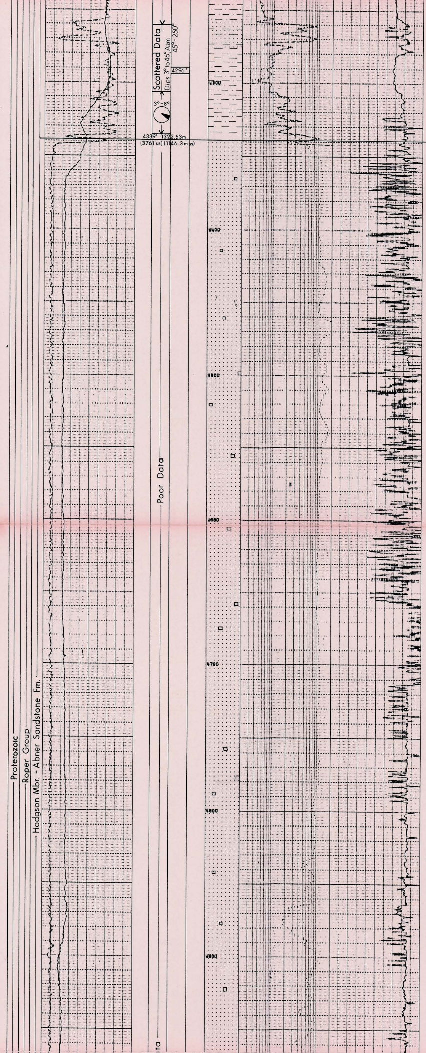
Diorite: A.A., decreasing in crystal size.

Interbedded Siltstone: light to medium grey/
green, granular, indistinct grain boundaries
v. hard, blky to conchoidal fracture.
Highly silicified. No shows.
Shale: light green to grey, brittle, fissile to blocky,
v. hard, non-calc., siliceous.

Siltstone: A.A., trace mica. No shows.

Shale: A.A., trace to common glauconite.

Siltstone/Shale: A.A., trace glauconite. No shows.



Sandstone: lt gy to translucent, fn to coarse, predom fn to med grnd, sub-rnd, commonly ang due to fracture charact. Mod sort. No shows.

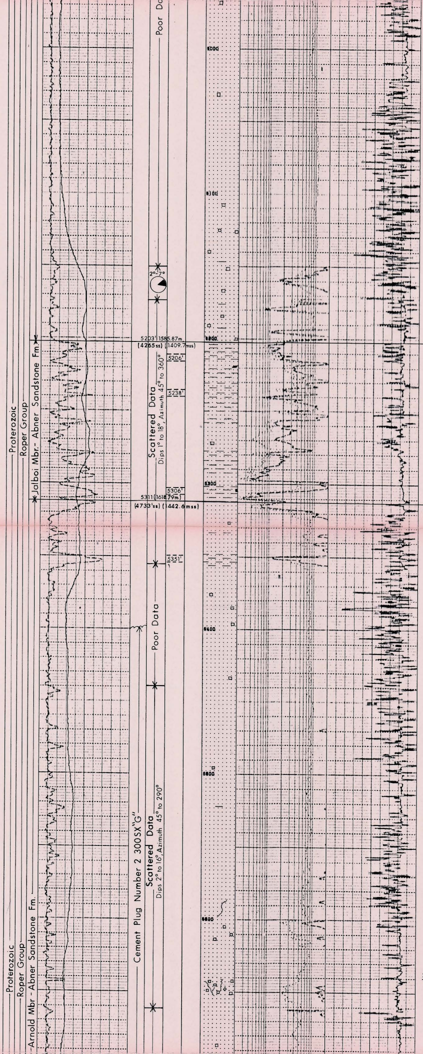
Sandstone: clr to crmy white to pink, fn to crse grnd, predom fn to med grnd, poor to fair sort, sub-rnded to rnded.

Quartzite: Conchoidal frac, v. hard. Silica cmt with trace of intergran hematite. Massive. No shows.

Petrographic Description:

Quartz: >95%
Goethite/limonite: 2%
? Kaolinite: 1-2%
Poros: trace.

Sandstone: A.A. trace hematite cmt. No show.

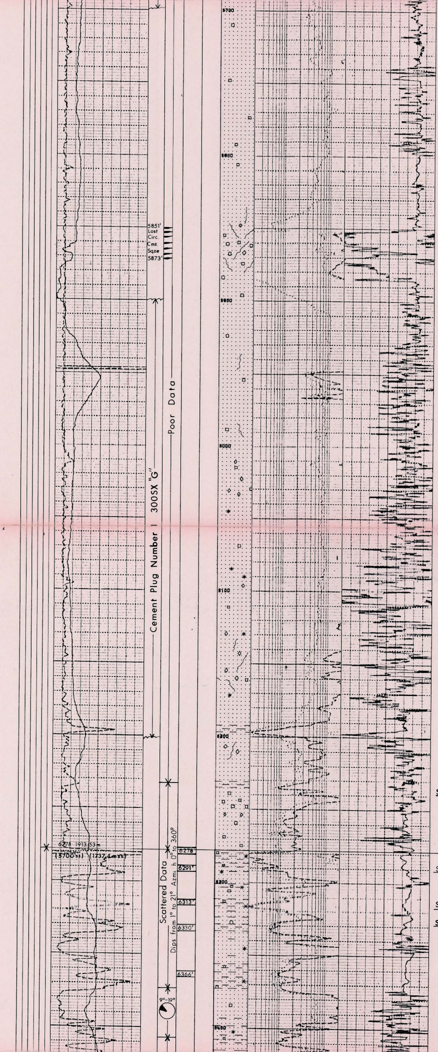


Sandstone: A.A., trace to v common intergranular hematite and specular hematite? No Shows.

Sandstone: crmy wht to red/brn, fn grnd. Quartz Arenite. Blky fract, firm to hard. Silica and hematitic cmt. Interlaminated to interbedded with Siltstone: maroon to red/brn hematitic and micaceous. Hard, silica and hematitic cmt. No shows.

Sandstone: clr to pale yellow to red/brn, fn to v.crse grnd, predom fn to med grnd, mod to well sorted, sub-rnded to rnded. Silica cmt with trace to common intergran hematite where fracturing is more common Massive Quartz Arenite. Trace to common specular hematite. No show.

Sandstone: translucent to dk gy, v fn to coarse, pred fn to med, ang to rnded. Quartz Arenite/Quartzite. Common hematite and specular hematite. Trace Kaolin. No shows.



Lost Circulation Zone:

Sandstone: A.A., rare authigenic qtz x-tal faces but typically coated by hematite. Fracture fill: authigenic qtz either as anhedral clr to milky splinters or shards as 1mm pyramidal to dipyramidal clr qtz x-tals, perfectly euhedral. No shows.

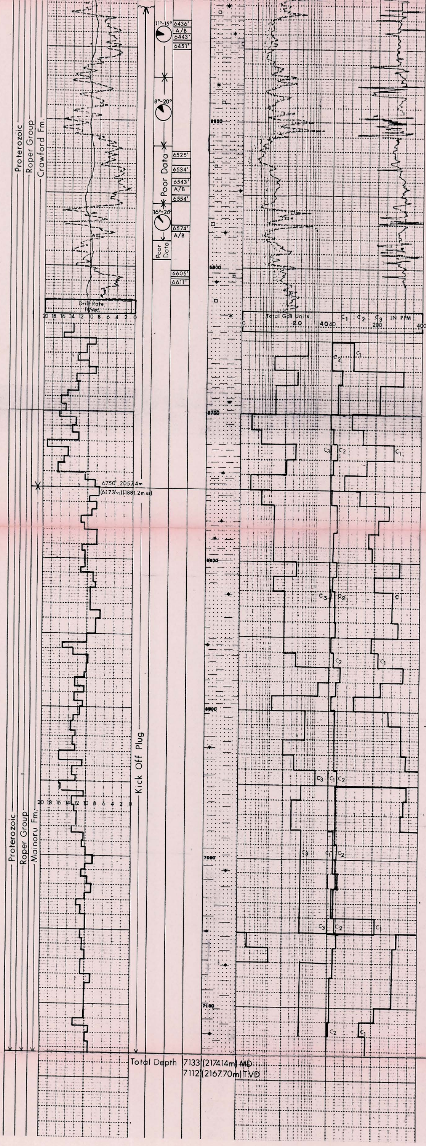
Sandstone: A.A., trace glauconite, and authigenic qtz. No shows.

Sandstone: A.A., v common authigenic qtz and specular hematite. No shows.

Sandstone: clr to lt grn/gry to reddish brn, v fn to cse grnd, predom fn grnd, poor to fair sort, sub-rnded to rnded. Interbedded to interlaminated with:

Siltstone: yellow to orange blky frac, siliceous.

Shale: var between dk gry to blk, fissile to blky, non-calc, siliceous. Acc: glauconite, hematite and mica. Coarsening upward cycles are common. No shows.



Shale: dk gry to blk, splintery to fissile, firm to hard. Micromicaceous, siliceous.

No wireline log below this point.

Sandstone: lt to med gry, predom indist grn boundries, poor sort, sub-rnded, silty and clay rich, hard silica cmt. No vis por. No Shows.

Interbedded with Shale: dk gry, firm, fissile to sub-fissile, micaceous, non-calc. A phyllitic sheen in part. No shows.

Sandstone: A.A., Shale A.A.; v common mica. No shows.

Sandstone: lt to med gry, med to fn grnd, mod sort, sub-ang to sub-rnded, blky fract. Siliceous. No vis por. No shows. Trace v fn grnd sandstone/siltstone: poor sort, silica cmt. Commonly with shale laminae A.A. No shows.

Sandstone: A.A., increasingly calcareous No vis por. No shows.