Northern Petroleum (UK) Ltd

Composite Log

Savio-1

Well Data

Well Name:	Savio-1		
Country:	Italy	**Region:**	Emilia - Romagna
Area:	Po Valley	**Province:**	Ravenna
Licence:	Savio	**Municipality:**	San Pietro in Vincoli
Status:	Plugged and Abandoned - Dry Hole		
Rig:	HDI Ideco M 1200		
Latitude:	44 18' 23.93"		
Longitude:	12 08' 24.67"		
Depth Datum:	RotaryTable		
Elevation:	16.7m		
TD:	4000m		
Spud Date:	13 Mar 2009	**Completion Date:**	10 May 2009
TD Date:	03 May 2009	**Release Date:**	10 May 2009

Partners, Contractors, Geologists

Partners:

Northern Petroleum (UK) Ltd	80%
Avobone Italy S.r.l.	20%

Contractors:

Drilling	Hydrodrilling
Mud Logging	Geolog
Drilling Fluids	AVA
Cementation	BJ
Wireline Logs	Baker Atlas
Deviation	Baker Hughes
Coring	Core Pro
Core Handling & Stabilisation	Kirk Petrophysics

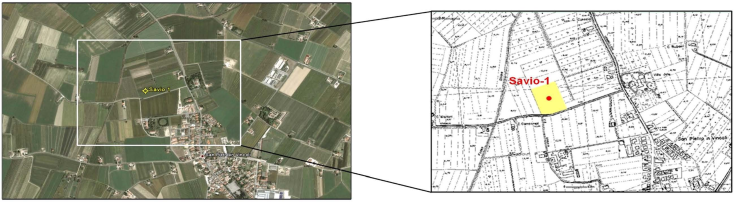
Geologists:

Paolo Martini	from 2500m to 4000m
Natalie Wells	from 2500m to 4000m

Remarks:

13/03/2009	0m	Savio-1 Spud.
19/03/2009	413m	Commenced drilling 12 1/4" hole.
25/03/2009	2500m	Finished drilling 12 1/4" Section.
29/03/2009	2496m	Finished RIH with 9 5/8" Casing, performed cement job.
02/04/2009	2500m	Commenced drilling 8 1/2" hole.
10/04/2009	3708m	Finished drilling 8 1/2" Section.
13/04/2009	3720m	RIH with Core Barrel and cut 12m Core.
15/04/2009	3720m	Completed Checkshot and Wireline Logging Programme.
15/04/2009	3720m	Well suspended by UNMIG pending approval from the Environment and National Heritage Ministries. Well controlled with the bit inside the 9 5/8" Casing shoe with a wiper trip to bottom approximately every 3 days.
30/04/2009	3720m	Approval from UNMIG received to drill ahead to 4000m.
04/05/2009	4000m	Well TD.
05/05/2009	4000m	Completed Wireline Logging Programme and prepared to P&A.

Location Map



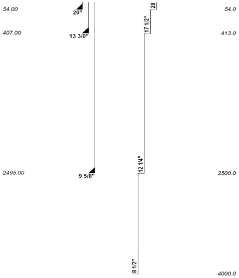
Well Configuration and Logging Runs

Hole and Casing Details

Bit Size (")	Hole MD (m)	Casing Size (")	Type	Shoe MD (m)	Hanger MD (m)	Comments
20"	54.0	20"	Casing	54.00		
17 1/2"	413.0	13 3/8"	Casing	407.00		
12 1/4"	2500.0	9 5/8"	Casing	2495.00		
8 1/2"	4000.0		Casing			

Wireline Logging Summary

Run	Hole Size (")	Suite	Dates	Interval MD (m)	Max Temp.	Comments
1	8 1/2"	CS	12/04/09 - 13/04/09	400-3710	N/A°C	
2	8 1/2"	GR, SP, 3DEX, HDIL, DEL2, ORIT	13/04/09	2495-3717	69°C	GR to surface.
3	8 1/2"	GR, CN, ZDEN, XMAC, STAR	13/04/09 - 14/04/09	2495-3717	69°C	
4	8 1/2"	GR, HDIL, XMAC	05/05/09	3600-4000	70°C	
5	12 1/4"	GR, RPM, CCL	05/05/09	700-1520	°C	Logs through 9 5/8" casing



Key

- Breccia
- Conglomerate
- Sand/Sandstone
- Silt/Siltstone
- Clay/Claystone
- Marl
- Tuff
- Extrusive
- Intrusive

- Limestone
- Dolomite
- Dolomitic Limestone
- Calcareous Dolomite
- Chert
- Anhydrite
- Halite
- Polyhalite
- Coal/Lignite

- Sandy
- Silty
- Argillaceous
- Calcareous
- Dolomitic
- Chalky
- Glauconitic
- Mic Micaceous
- Pyritic

- Carbonaceous
- Bituminous
- Oolitic
- Fossils
- Shell Fragments
- Microfossils
- Spicules
- Plant Fragments
- Rootlets

- Core
- (no recovery)
- SWC, recovery (lithology)
- SWC, no recovery
- Casing Shoe
- Liner Hanger
- 89° Dip (Good)

- DST
- Perforations
- 3002psi RFT, Sample
- 3002psi RFT, No Sample
- Fail RFT, Fail
- Depth: 3525m TVDBRT: 3495m Incl: 70 Azi: 20 Survey

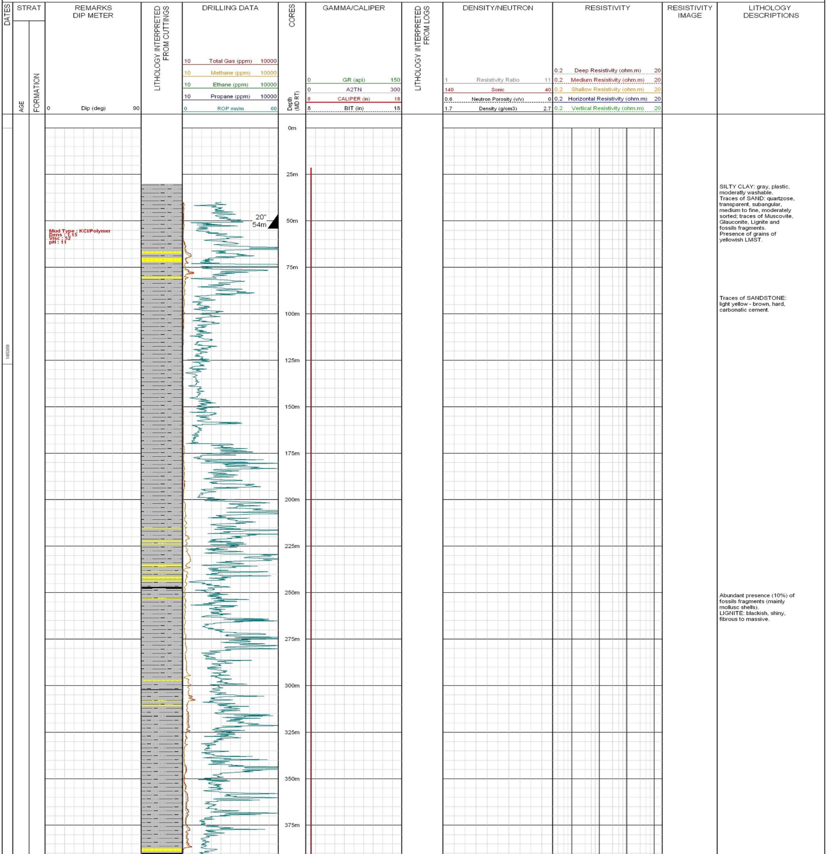
SHOWS

- Oil Shows
- Gas Shows
- Cond. Shows
- Oil & Gas Shows
- Oil & Cond. Shows
- Gas & Cond. Shows
- Oil, Gas & Cond. Shows

Depth Range: 0m - 4000m MD

Scale: 1:1000

Author: Natalie Wells
Date: 21/09/2009

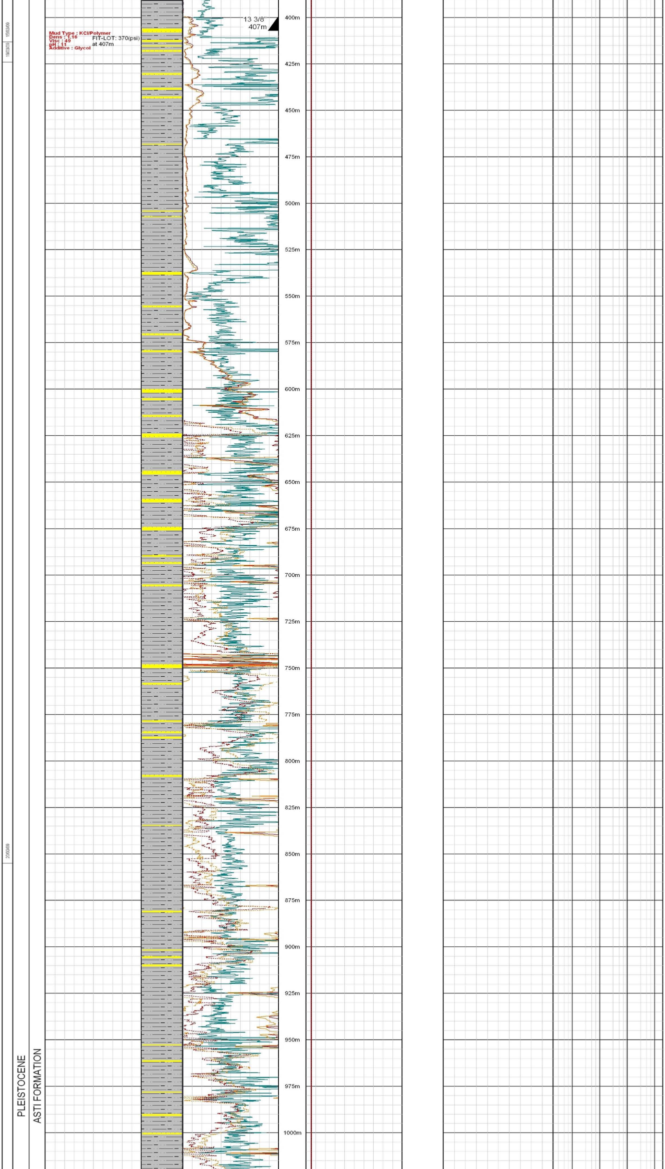


Mud Type : KCl/Polymer
Dens : 1.15
Visc : 52
pH : 11

SILTY CLAY: gray, plastic, moderatly washable.
Traces of SAND: quartzose, transparent, subangular, medium to fine, moderately sorted; traces of Muscovite, Glauconite, Lignite and fossils fragments.
Presence of grains of yellowish LMST.

Traces of SANDSTONE: light yellow - brown, hard, carbonatic cement.

Abundant presence (10%) of fossils fragments (mainly mollusc shells).
LIGNITE: blackish, shiny, fibrous to massive.



SILTY CLAY: gray, plastic, moderatly washable.
Traces of SAND: quartzose, transparent, subangular, medium to fine, moderately sorted; traces of Muscovite, Glauconite and Lignite.
Abundance of fossils fragments from 420 to 480m.

Abundant fossils fragments.

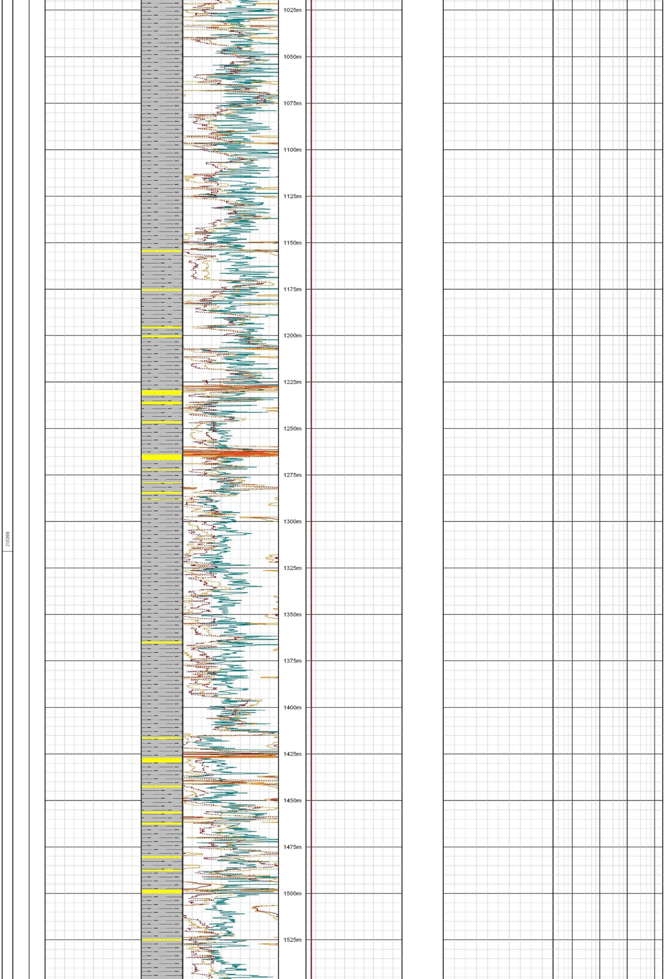
SILTY CLAY: gray, plastic, moderatly washable.
Traces of SAND: quartzose, transparent, subangular, medium to fine, moderately sorted; traces of Muscovite and Glauconite.

SILTY CLAY: grey, plastic, moderately washable.
Traces of SAND: quartzose, transparent, subangular, medium to fine, moderately sorted; traces of Muscovite, Glauconite and Lignite.

Traces of blackish Lignite.

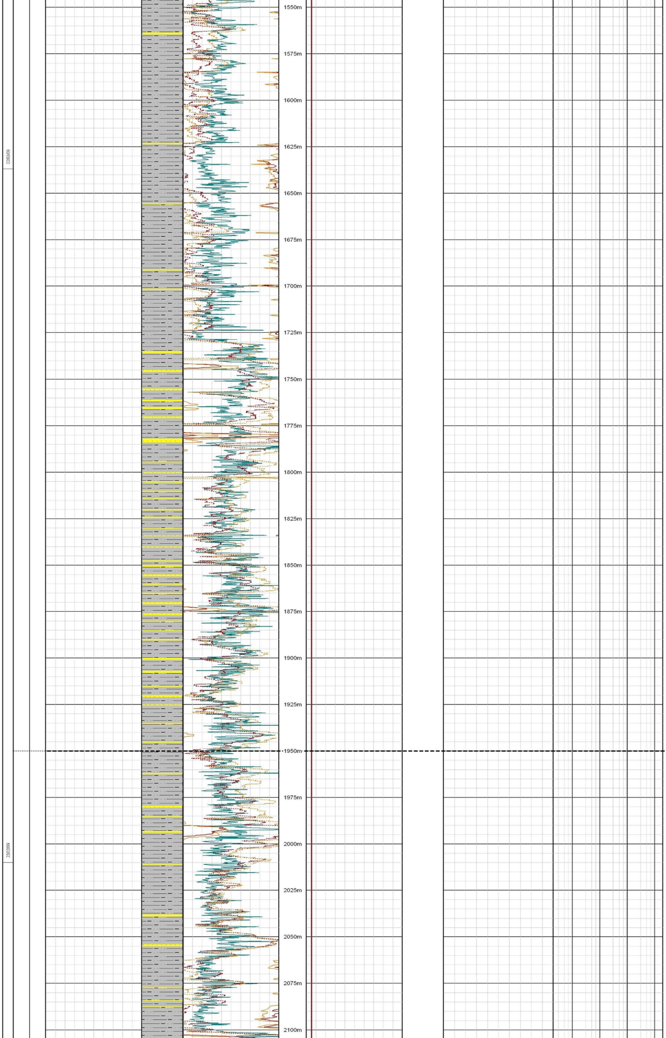
Traces of blackish Lignite.

SILTY CLAY: gray, plastic, moderatly washable.
Traces of SAND: quartzose, transparent, subangular, medium to fine, moderately sorted; traces of Muscovite.



SILTY CLAY: gray, plastic,
moderatly washable.
Traces of SAND: quartzose,
transparent, subangular,
medium to fine, moderately
sorted; traces of Muscovite.
Traces of Lignite from 1280
to 1340 m

SILTY CLAY: gray, plastic,
moderatly washable.
Traces of SAND: quartzose,
transparent, subangular,
medium to fine, moderately
sorted; traces of Muscovite
and Lignite.

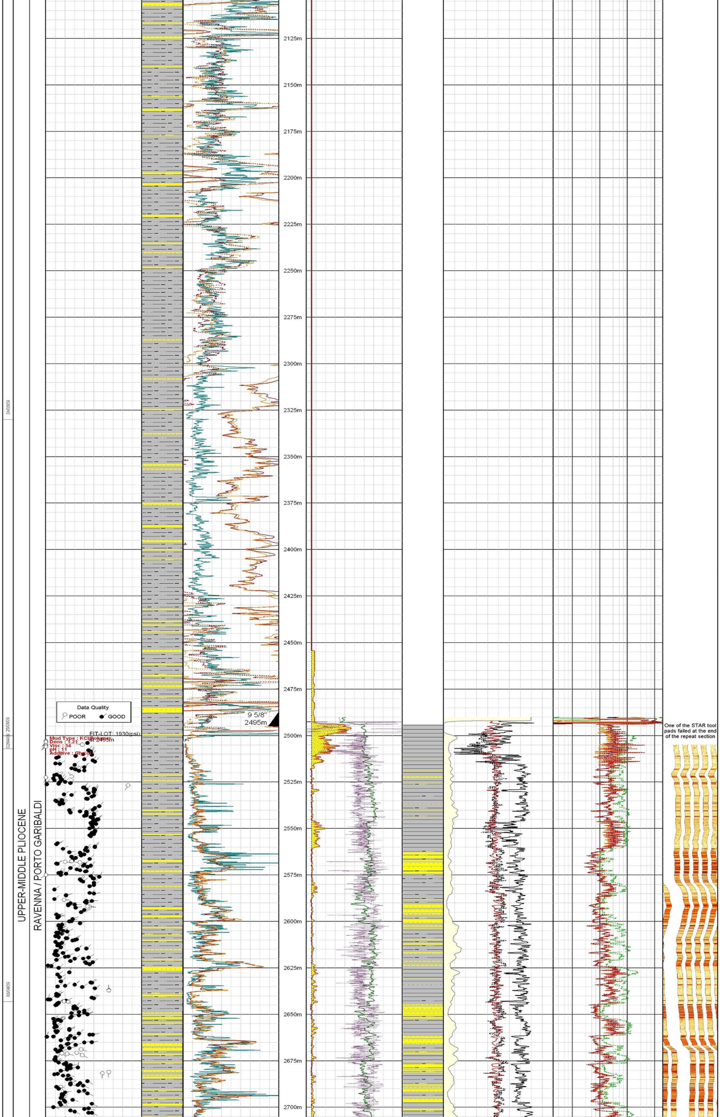


SILTY CLAY: gray, plastic, moderatly washable.
SAND: quartzose, transparent, subangular, medium to fine, moderately sorted; traces of Muscovite, Glauconite and Lignite.

TOP RAVENNA FM.

TWT - 1.755s 1950m (-1933.3m TVDSS)

SILTY CLAY: gray, plastic, moderatly washable.
Traces of SAND: quartzose, transparent, subangular, medium to fine, moderately sorted; traces of Muscovite, Glauconite and Lignite.

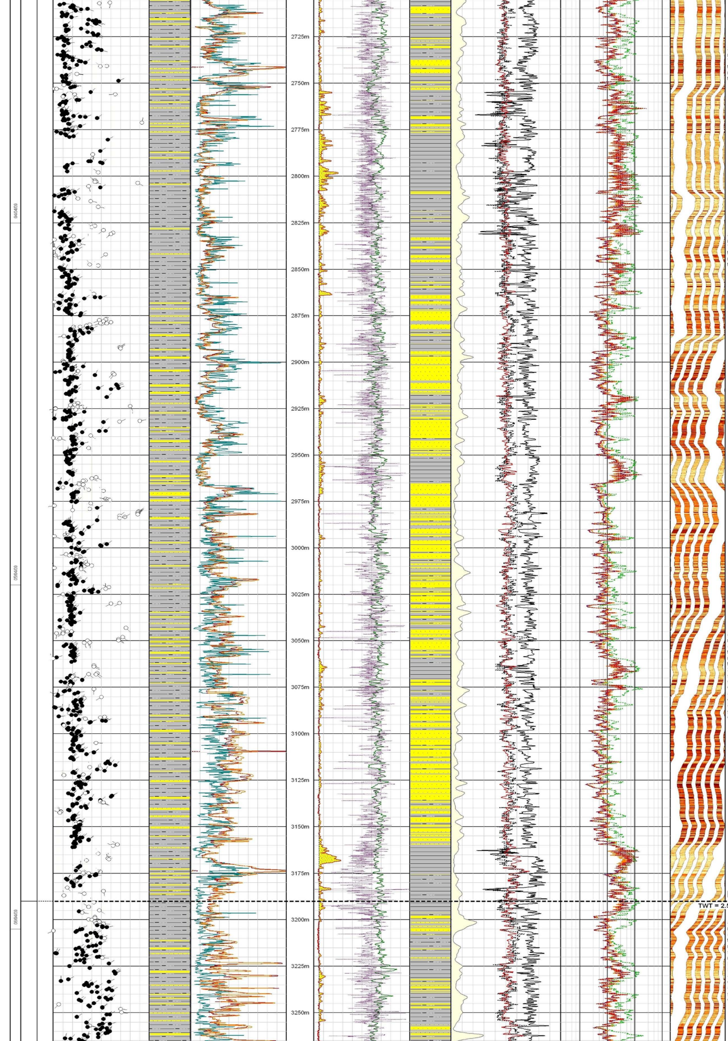


One of the STAR tool pads failed at the end of the repeat section

SILTY CLAY: gray, plastic, moderatly washable.
Traces of SAND: quartzose, transparent, subangular, medium to fine, moderately sorted; traces of Muscovite, Glauconite and Lignite.

SILTY CLAY: gray, plastic, moderatly washable.
Traces of SAND: quartzose, transparent, subangular, medium to fine, moderately sorted; traces of Muscovite, Glauconite and Lignite.

SILTY CLAY: gray, plastic, moderatly washable.
SAND: quartzose, transparent, fine to very fine, moderately sorted, angular to subangular.
Traces of Muscovite, Glauconite and Lignite.
Traces of Foraminifera.



SILTY CLAY: gray, plastic, moderatly washable. Traces of SAND: quartzose, transparent, fine to very fine, moderately sorted, angular to subangular.

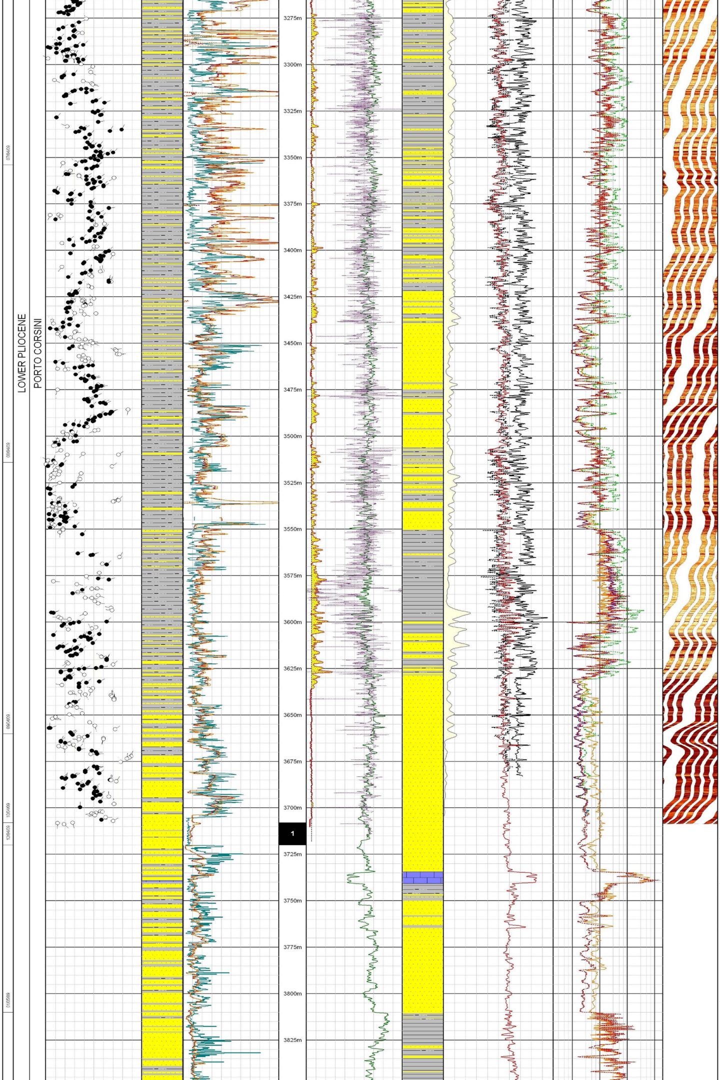
SILTY CLAY: gray, plastic, moderatly washable. Traces of SAND: quartzose, transparent, fine to very fine, moderately sorted, angular to subangular.

SILTY CLAY: gray, plastic, moderatly washable. SAND : quartzose, transparent to whitish, medium to very fine (coarse to very fine from 3045 m to 3050 m), subrounded to subangolar moderately sorted. Traces of Muscovite, Glauconite and Pyrite. SILTSTONE whitish, soft, carbonatic cement SANDSTONE qz, whitish to grey, medium hard, carbonatic cement

PORTO CORSINI FM.

TWT = 2.543s 3190m (-3173.3m TVDSS)

SILTY CLAY: gray, plastic, moderatly washable. SAND : quartzose, transparent to whitish, medium to very fine, subrounded to subangolar moderately sorted. Traces of Muscovite, Glauconite and Pyrite. SILTSTONE whitish, soft, carbonatic cement SANDSTONE Quartz, whitish to grey, medium hard, carbonatic cement.



SILTY CLAY: gray, plastic, moderatly washable.
SAND : quartzose, transparent to whitish, medium to very fine, subrounded to subangolar moderately sorted. Traces of Muscovite, Glauconite and Pyrite.

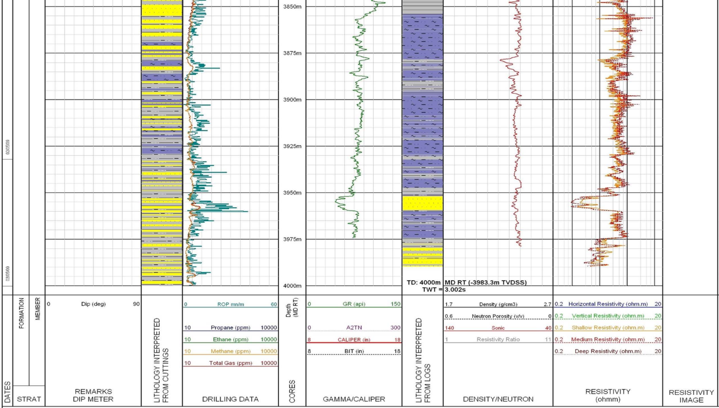
SILTY CLAY: gray, plastic, moderatly washable.
SAND : quartzose, transparent to whitish, medium to very fine, subrounded to subangolar moderately sorted. Traces of Muscovite, Glauconite and Pyrite.
Presence of sandstone Quartz, whitish, medium hard, carbonatic cement

SILTY CLAY: gray, plastic, moderatly washable.
SAND : quartzose, transparent to whitish, medium to very fine, subrounded to subangolar moderately sorted. Traces of Muscovite, Glauconite and Pyrite.

SAND: quartzose, fine to very fine, very rarely medium, grading to SILT, well compacted, no visible cement, mod. to well sorted, sub angular to sub rounded, presence of Mica, Lignite and Glauconite, no visible foraminiferas. CLAY content 5-10%

SILTY CLAY: gray, plastic, moderatly washable.
SAND : quartzose, transparent to whitish, medium to very fine, subrounded to subangolar moderately sorted. Traces of Muscovite, Glauconite and Pyrite.
Presence of Limestone white and gray from hard to moderately hard.

SAND : quartzose, transparent to whitish, medium to very fine, rarely coarse, subrounded to subangolar moderately sorted. Presence of Muscovite, Glauconite and Pyrite.
SILTY CLAY: gray, plastic, moderatly washable.



SILTY CLAY: gray, plastic, moderatly washable.
SILTY MARL : from grey to dark gray, soft, mod fissile, partially washable
SAND : quartzose, transparent to whitish, medium to very fine, rarely coarse, subrounded to subangolar moderately sorted. Presence of Muscovite, Glauconite and Pyrite.

SILTY CLAY: gray, plastic, moderatly washable.
SAND : quartzose, transparent to whitish, medium to very fine, rarely coarse, subrounded to subangolar moderately sorted. Presence of Muscovite, Glauconite and Pyrite.
SILTY MARL : from gray to dark gray, soft, moderately fissile, partially washable.

LITHOLOGY DESCRIPTIONS

Results

Bit Data

BIT No	MAKE	TYPE	SIZE (")	TFA / JETS	DEPTH IN (m)	PROGRESS (m)
1	Smith	SMITH-XR-C (Steel)	16	3 x 18/32" + 1 x 15/32"	54	359
2	Smith	SMITH-Si519HBPX (PDC	12 1/4	7 x 14/32"	413	2087
3	Smith	SMITH-M519BPX (PDC)	8 1/2	5 x 15/32"	2500	1500

Conventional Cores

No.	Recovery		Drilled Depth (m)		Formation	Comments
	m	%	Top	Base		
1	12	100.00	3708.00	3720.00	Porto Corsini	Fine to very fine sand, very rarely medium grained, grading to silt, well compacted, no visible cement, moderately to well sorted, sub-angular to sub-rounded, mostly Quartz, with Mica & Lignite, possible shell fragments. No visible forams. Calcimetry 12%. Clay content 5-10%

Mud Data

Depth (m)	Mud Type	Density	Viscosity	O/W	pH	Comments
54	KCl/Polymer	1.15	52		11	
407	KCl/Polymer/Glycol	1.16	49		11	
2500	KCl/Polymer/Glycol	1.21	54		11	

FIT-LOT

LOT / FIT / Loss Event	Date	Shoe Depth (m MD)	LOT reference (m TVDSS)	MW at time of LOT	P Hydrostatic	P Surface Max applied	P Surface at leak-off	Gradient to reference	Drilling Info
FIT	19/03/2009	407	390.3	1.16		370	370	1.78	Leak-off pressure reached.
FIT	02/04/2009	2495	2478.3	1.18		1930	1930	1.71	Leak-off pressure reached.