4-7-87 Tu w/ Bob C., Judy C., Larry P.

184 - 172

184

272 - 184 - 190 - 234

GYRE
NR1

GREEN CANYON - GULF OF MEXICO

OCS RES. MANAGEMENT MAP

NOS NG 15-3 (OCS)

AREA 272

LINEAR BLACK OILY SEDS. - FOLLOW FAULTS...

MUSSELS - METHANE

TUBE WORMS CLAMS - BACTERIA - HYDROGEN SULFIDE

LINEAR FEATURES - MUSSELS DISPERSED
- CLAMS

3.5 kH

12 kH depth

SNIFFERS - GAS CHROM.

MARCH 2 1987 MET SUB IN 184
SUB - BOTTOM SURVEYS
SAMPLE BASKET OVER WIPE-OUT ZONE
GYRE → 272 - SAMPLING - TRAWLS - CRITTERS

MAINLY CLAYS

(STA 10) PISTON CORE (PC) 20' WIPE-OUT 24' PEN (TO FIN)
4 SEC. REC. (~3" ID)
Archive 1/2 LAST 1/2 FULL
2 GEOTECH - BOTTOM OF SEC 1
- " " " 2 H_2S
W ON NON GEOTECH SECTION

avoided walls
10 Samples
10cm long of 1/2 of core

272 AREA (STA 11) NON WIPE-OUT ZONE "

2 GEOTECH - BOTTOM OF SEC 1
" " " 2
W

11 Samples

SEC 3 FINE SAND/SILT LAYER

SPLIT, DESCRIBE, SAMPLE ALL 4 SECTIONS
AFTER P.C.

BOX CORES 272

PUSH CORES FR 2 BOX CORES

(STA 10) - BOX CORE - PUSH SAMPLE 10" WIPE-OUT
2 BOX CORE - PUSH CORES
WAXED ONE

(STA 11) - BOX CORE — PUSH SAMPLE 10"
1 BOX CORE - PUSH CORE

WIPE OUT - GASSEY - GAS EXPANSION CRACKS - H_2S

OIL STAINING - TOP OF SEC 4 STA 10

SURFACE - FORAMS

MOST SILT / CLAY

WIPE-OUT - STA 10 - EXPANSION CRACKS ** GEOTECH
- CHEESE CAKE
- SEC 3 + 4

AREA 272

TRAWL 1 - CRITTERS
CEMENTED CARBONATE, SHELL HASH - 3 PIECES TAKEN

TRAWL 2 - N.R. (GEOLOGICAL)

BOX CORE - NO SAMPLE

MARCH 5
NR-1 FILLED UP BASKET
TRIPPED WT - CAME UP
TUBE WORMS, MUSSELS MAINLY

3 NR-1 PUSH CORES - SMELLED OILY AREAS 184 - 272 - 184

ALL BADLY WASHED
SEC 1, 2, 3 c/c 10"
4 50 c/c
5 < 1 c/c

In Basket - Oily Rock
Cemented Carbonate Rock
Oozing Oil

March 10 Sub Surfaced (Sub Depth Publish Photo Limit 724m - Classified)

6 Push Cores Out Of Rack → Zodiac → Gyre
Science Crew Change (2nd Change)
Best - But Some Still Washed
6, 7, 8, 9, 10, 11 (184-190 Area)

Completely Washed
75% Full
Some Carbonate Rubble
Some Mussels, Worms ...

March 11 NR-1 Basket Up
12, 13 (192, 234 Area)
Washed
Oily H_2S
Carbonate
200 cc Recovery (40%)

(Sta 30) Box Core (192, 234 Area)

2 Push Cores From Box Core

Forams Fr Top - Whirl-Pac

(Sta 31) Piston Core Non-Wipe Out (184 Area)
4 Sec
Top Of Fin Pen
Split, Described, Sampled Sec 1 & 2
3 & 4 Sec In Texas

2 Geotech Bottom Sec 1
2

+ ω

No Oil, Odor, Stains

Clay/Silty

Foram Layer On Top - Whirl Pac

IMMEDIATELY AFTER P.C.

(STA 32) BOX CORE (184, [redacted] AREA)
NON WIRE OUT

2 PUSH CORES

(STA 33) P.C. WIRE OUT (184 AREA)

TOP OF FIN PEN
4 SEC

SPLIT 1, 2, 3
4 UNSPLIT @ TEXAS A&M

GAS FR HYDRATE FROSTING - ICE PARTICLES
ABOVE MID SEC 2 UP LINER INTO BARREL
LABELED SEC 1

1 OUTOF 152 cm 28 cm VOID AT TOP - BADLY DISTURBED
2 92 cm recovery

CLAY / SILT

GEOTECH - BOTT SEC 1 DISTURBED - SHOT UP BARREL LOST ~1'
- 2 GAS VOID

SEC 1 : GAS CHARGED, GAS HYDRATES FR: 50 cm ? ON DOWN

GAS HYDRATES IN ALL SECS.

DEPTHS NEED TO BE RE CALC FR: TOP SED SURFACE

CLAY/SILT MINOR SAND

CARBONATE RUBBLE : 1/2 THRU SEC 1
STARTED CLOSE TO SED SURFACE
NON UNIFORM

GAS EXPANSION CRACKS
HEAVILY OIL STAINED
H_2S ODOR

SEISMIC RECORD POOR

(STA 34) BOX CORE (184 AREA) WIPE OUT

2 PUSH CORES

OILY SED
MUSSELS, TUBE WORMS ...
IN A SEEPAGE SITE

1 PUSH CORE TO WILEY FOR FORAMS

THERMO METHANE + BACTERIA → CARBONATE
50-60 % CARBONATE < 3m
LIT. SEARCH ~10% " > 3m

CARBONATE RUBBLE - V. IRREGULAR
EMBEDDED IN CLAY
CARBONATE CHIMNEY IN AREAS

1) PC's, NR-1 CORES
MINERALOGY - ETHELENE CHLORIDE - CLEAN UP
SULFUR EFFECTS - VACUUM
ACETONE

MINERALOGY, GEOTECH, STRATIG, GEOCHEM

OFR - DATA

CONF. PAPER

JOURNAL PAPERS

TIME: NO DEAD LINE

IF SMELL OIL ~> 10%

30 g dry TEXTURE FOR LARRY DRY @ < 60°C

JUDY TO CLEAN FOR GEOCHEM & LARRY

42-381 50 SHEETS 5 SQUARE
42-382 100 SHEETS 5 SQUARE
42-389 200 SHEETS 5 SQUARE
NATIONAL Made in U.S.A.

4-20-87 w/ Bob C. & Judy C.

Piston Cores w/ Oil	Push Cores w/ Oil
10	10
33	11
	34 a lot of oil

Methalene Chloride

Hexane - leaves karogens behind

organics vs karogens

acedic acid rids organics & karogens

100 ppm background for hydrocarbons - hexane extractable
i.e., 0.001 %
some wipe-out zones had 7% hydrocarbons

KK - MP Repeated Methylene Chloride 4-5 Times
70% Off Each Time
Insolubles Left

George Claypool - Organic Geochem. - Denver

Bob Miller

5-6-87

Geotech Sample Intervals
Piston Cores
G-87-2

Piston Core Geotech Section	Calc. Distance from Top of Core
10PC-1-1	58-83cm ✓
10PC-1-2	210-235cm ✓
11PC-1-1	84-109cm ✓
11PC-1-2	236-261cm ✓
3[illegible]C-1-1	41-66cm ✓
31PC-1-2	193-218cm ✓
33PC-1-1	112-137cm ✓
33PC-1-2	179-204cm ✓

4-20-87 w/ L.P.

SMEAR SLIDE PREPARATION

(Olin Hall Rm. 314)

1. Wet interior of dried consolidation sample until clay becomes soft or use core specimens directly for other samples.
2. Wet glass plate after having etched I.D. number into it.
3. Smear sample on glass plate with toothpick.
4. Place sample glass plate on a hot plate at a temperature between 240 and 250°F. ~260°F The temperature is measured by a surface thermometer.
5. Dry all water off sample glass plate.
6. Drop Canada Balsam liquid mounting medium onto glass plate. 1-3 Drops Piccolyte Don't boil 5-6 min
7. Leave sample glass plate on stove for 3 to 5 minutes to remove volatiles from Canada Balsam. 5-6 min
8. Place cover slide on top of mounting medium, being careful to avoid trapping air bubbles under cover slip.
9. Remove any trapped air bubbles from under cover slip by gently applying pressure and moving slip.
10. Remove glass plate from hot plate and let cool.

62 strips
used total
33 Grasses Bank
9 B.H. Sed Trap
14 GOM

X-RAYED 4-23-87
(~6.8 cm ID)

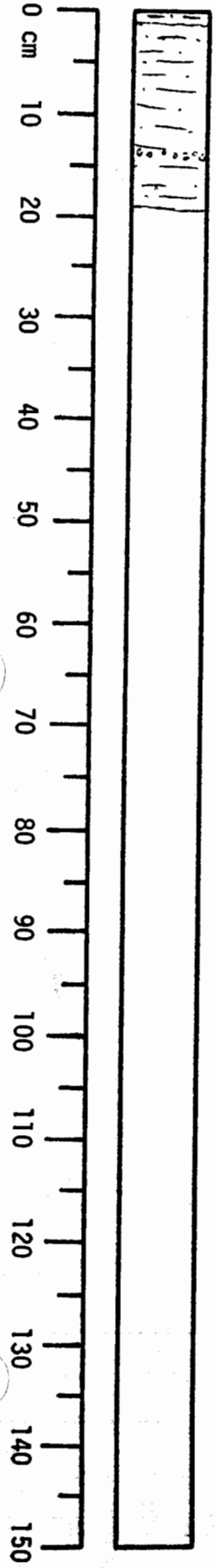
4-21-87 G-87-2 GEOTECH CORES (G.O.M.)

		(TOO FAST)	RUN	kV	SPD	SmAp (1 PASS)
S ✓	10 BC-1-2	140V TOGGLE →	28	105	← 33	
		120V TOGGLE →	& 29			
S ✓	10 PC-1-1	127-152 cm	30	"	"	
S ✓	10 PC-1-2	127-152 cm	31	"	"	
ONLY BOX CORE S ✓	11 BC-1-1	* (@ 1.5 cm)	32	"	"	
S ✓	11 PC-1-1	127-152 cm	33	120		
S ✓	11 PC-1-2	127-152 cm	34	120		
S ✓	30 BC-1-2		35	120		
S ✓	31 PC-1-1	127-152 cm	36	120		
✓	31 PC-1-2	127-152 cm	37	120		
✓	32 BC-1-2		38	120		
✓	33 PC-1-1	127-152 cm	39	120		
✓	33 PC-1-2	* (@ 9 cm) 127-152 cm	40	120		
✓	34 BC-1-2		41	120		

120 kV @ SPD = ← 33 (@ 120V TOGGLE SETTING) IS BEST

SMEAR SLIDES (*)
PALEO.SAMPLE (P)
MINER.SAMPLE (M)
HYDROL.SAMPLE (H)

GRAPHIC REPRESENTATION



VISUAL CORE DESCRIPTION

SITE						CORE			SEC	
1	0	B	C					1		1

OBSERVER: LP

length 18cm

BOX CORE #1
PUSH CORE #1
WIPEOUT ZONE

Upper Portion 0-1.25 cm
Silt clayey or Clay silty, with some fine sand-sized foraminifera, dark grains, + fecal pellets.
2.5Y 4/2 Dark grayish-brown, very soupy (siphoned off + placed in a jar prior to splitting

Consolidation changes at 1.5, 8-9, + 14 cm where core sediment get stiffer toward bottom; almost friable at bottom

This "friable" layer is carb. rubble? found at 13.5-14.5cm

Colors
1.5 - 8 cm 5Y 4/1 dark gray
interface 8 - 14cm 5Y 4/1 (but darker + grayer)
14 - 18cm 5Y 5/1 gray

Silt, clayey, sandy (very-fine - fine) some small gas voids throughout gritter (larger coarse component content than other push cores) faint oily smell; stiffer sediments at ~~bottom~~ 13-15 cm of core contain coarse sand-sized carbonate grains, perhaps the initial stage of carbonate rubble formation.

Samples 1.5-8 cm paleo, sem, chem, xRD, + Lithology
9 cm-14cm hydrocarbon, paleo, xRD, CHEM, SEM, + lithology
14-18 cm paleo, sem, xRD, CHEM, lithology;

Check for carb rubble in this sample.

SMEAR SLIDES (*)
PALEO.SAMPLE (P)
MINER.SAMPLE (M)
HYDROL.SAMPLE (H)

GRAPHIC REPRESENTATION

VISUAL CORE DESCRIPTION

SITE		CORE	SEC
1 1 B C		1	1

G-87-2

OBSERVER
LP

Box CORE #1
PUSH CORE #1
NON Wipeout ZONE

Length: 19cm

Upper Portion 0-1.5cm
Silt clayey or Clay silty with
fine sand-sized foraminifera,
and fecal pellets(?).
2.5Y 4/2 dark grayish-brown
very soupy (siphoned off or
placed in a jar)

0 cm 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150

SMEAR SLIDES (*)
PALEO.SAMPLE (P)
MINER.SAMPLE (M)
HYDROL.SAMPLE (H)

GRAPHIC REPRESENTATION

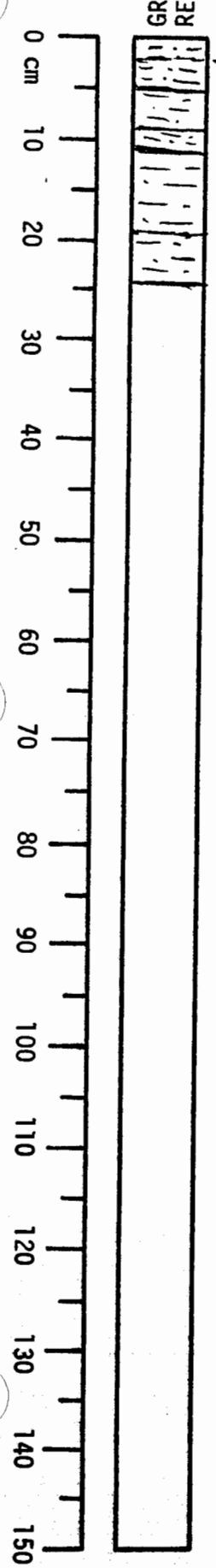
VISUAL CORE DESCRIPTION

SITE		CORE	SEC
3 0 B C		1	1

G-87-2

OBSERVER: LP

length 24 cm



Box Core #1
PUSH CORE #1
NON-WIPEOUT

Upper Portion 0-4cm
Silt clayey with fine sand-sized foraminifera and fecal pellets(?)
2.5Y 4/2 dark grayish-brown
very soupy (siphoned off & placed in a jar (0-2cm))

4-8cm { Silt, very clayey sticky
2.5Y 3/2 dark grayish-brown

8-11cm { Silt, clay, sands (~5-10% foraminifera), sticky
2.5Y 4.5/2 grayish-brown → dark grayish brown

11-23cm
Silt clayey, with sparce medium sand-sized grains (foraminifera?) sticky
5Y 5/1 gray, sticky

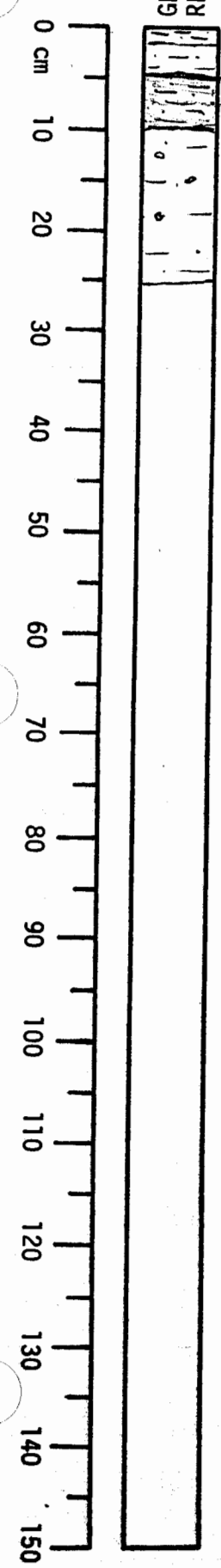
Samples 5-8cm SEM, Paleo, Chem, XRD, & lithology

8-11cm Paleo, XRD, CHEM, lithology, SEM

13-23cm Hydrocarbon, Paleo, CHEM, Lithology, SEM

SMEAR SLIDES (*)
PALEO.SAMPLE (P)
MINER.SAMPLE (M)
HYDROL.SAMPLE (H)

GRAPHIC REPRESENTATION



VISUAL CORE DESCRIPTION

SITE		CORE	SEC
3 2 B C		1	1

OBSERVER: LP

length: 25cm

BOX CORE #1

G-87-2
PUSH CORE #1

NON WIPEOUT ZONE

Upper Portion 0-1.5cm
Silt, Clayey, some sand-sized foraminifera and fecal pellets
2.5Y 4/2 dark grayish brown, very soupy. (siphoned off + placed in a separate jar.)
W. Pong is interested in lithology change (next 1.5 cm interval sampled for Pong 4/15/85

Silt clay slightly darker than above
2 components 2.5Y 4/2 dark grayish-brown
2.5Y 3/2 very dark grayish-brown

Silt clay some sparce sand sized grains
5Y 4/1 dark gray, some small burrows or gas bubbles, sticky

Note: a) appears to be more clayey toward bottom
b) more compacted, less watery toward bottom

Samples 3

0 → [illegible] cm	Lith, paleo, sem, chem, XRD
4-9 cm	Lith, paleo, sem, chem, + XRD
11-21 cm	Lith, paleo, sem, chem, XRD Texas A&M hydrocarbon

opened to remove water + take off soupy layer 4/14/87
split + described, + sampled 4/15/87

SMEAR SLIDES (*)
PALEO.SAMPLE (P)
MINER.SAMPLE (M)
HYDROL.SAMPLE (H)

GRAPHIC REPRESENTATION

VISUAL CORE DESCRIPTION

SITE		CORE	SEC
3 4 B C		1	1

H_2S Odor when split

OBSERVER: LP

length 2½c

G-87-2

Box Core #1 Push Core #1

WIPE OUT ZONE

Upper Portion 0-1.5cm

Silt clayey, some sand sized black grains, foraminifera, + fecal pellets (?)
2.5Y 4/2 dark grayish brown,
very soupy (siphoned off + placed in a separate jar. some of lower layer may have gotten scrapped off into the jar small amount.)
Black blebs in soupy water are cohesive + may be devolitized oil but no sheen on surface.
slight diesel fuel odor.

Silt, clayey, little or no very fine sand,
5Y 4/1 dark gray
sticky, gas bubbles ~4cm + a larger void 18-22cm, pelecypod shell at 23cm
mottled oil staining (sheen) at 8-11 cm.
blebs of hydrocarbons noticable when sediment is smeared on hand, H_2S odor, oil blebs + sheen on spatula after sampling

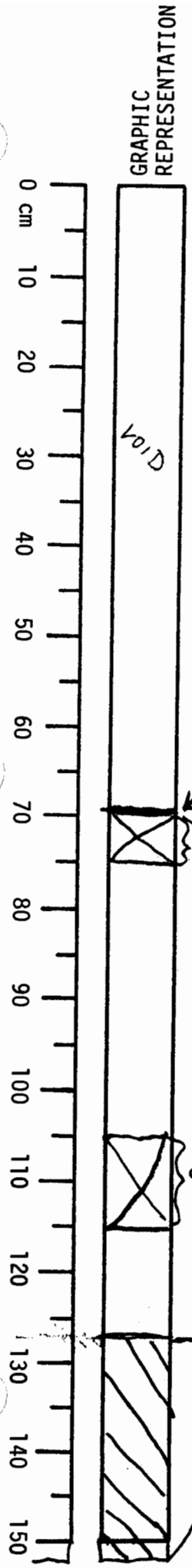
Samples 5-15cm
Lith, XRD, SEM, chem, Paleo, + hydrocarbon

SMEAR SLIDES (*)
PALEO.SAMPLE (P)
MINER.SAMPLE (M)
HYDROL.SAMPLE (H)

VISUAL CORE DESCRIPTION

SITE		CORE	SEC
1OPC-	1-	1	

OBSERVER: RFC

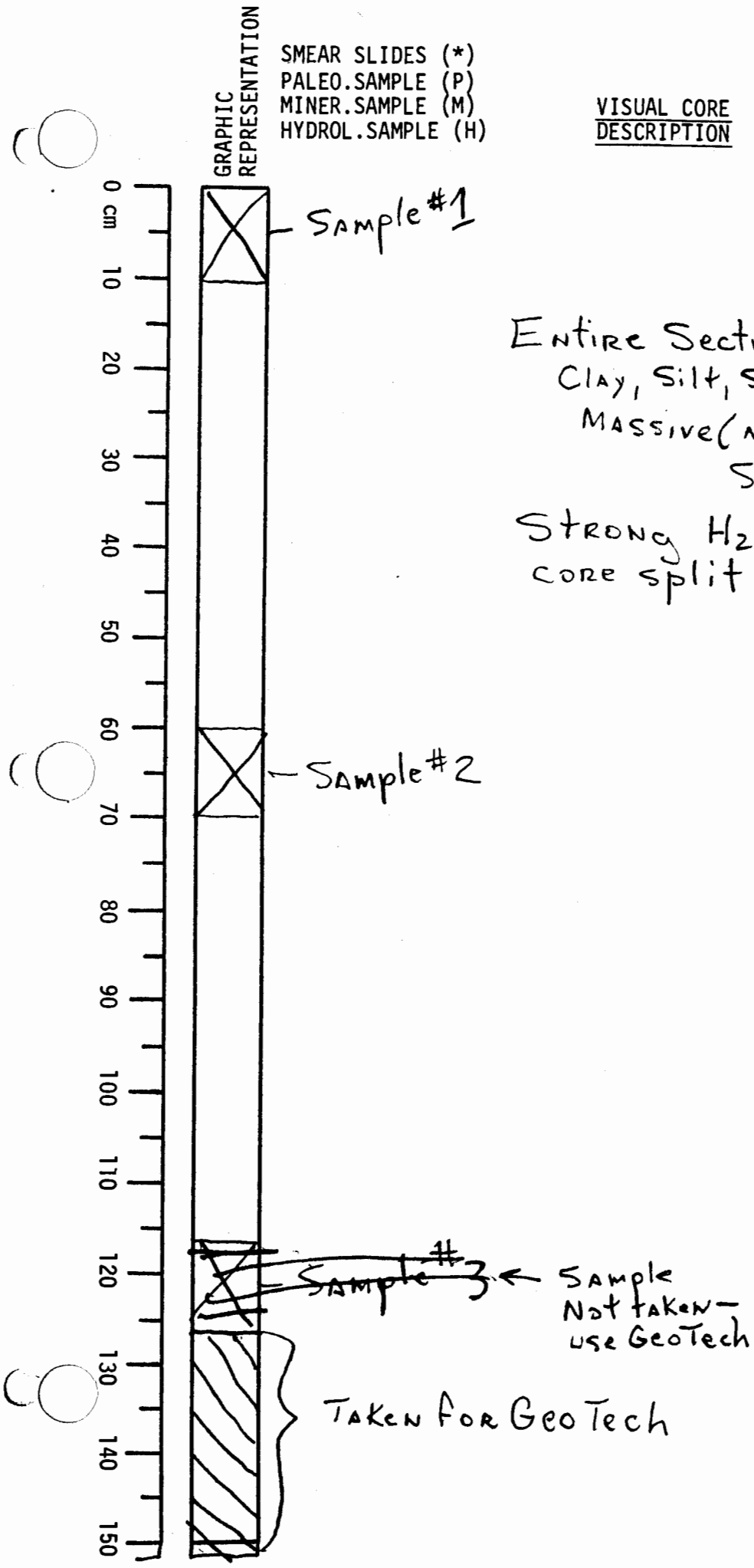


SMEAR SLIDES (*)
PALEO.SAMPLE (P)
MINER.SAMPLE (M)
HYDROL.SAMPLE (H)

VISUAL CORE DESCRIPTION

SITE		CORE	SEC
1 0 P C -	1	- 2	

OBSERVER
RFC



Entire Section
Clay, Silt, Sand (5GY 4/1)
Massive (no distinct layering)
Sticky
Strong H_2S Odor when core split open

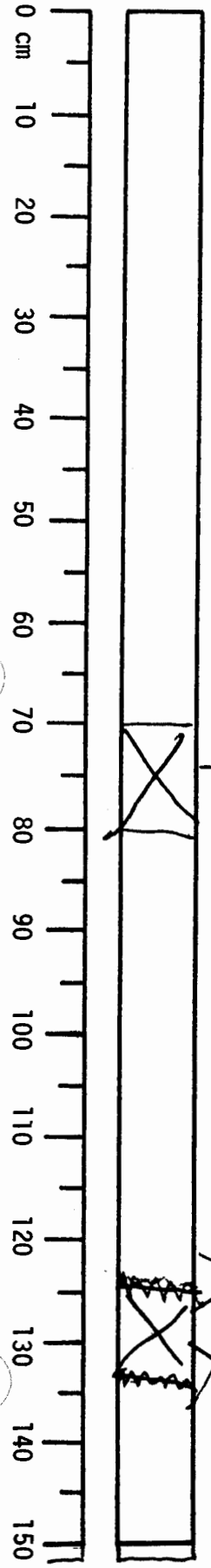
SMEAR SLIDES (*)
PALEO.SAMPLE (P)
MINER.SAMPLE (M)
HYDROL.SAMPLE (H)

VISUAL CORE DESCRIPTION

SITE					CORE			SEC	
1	0	P	C	-	1	-	3		

OBSERVER: RFC

GRAPHIC REPRESENTATION



Entire Section
Clay, Silt (5GY 4/1)
Occasional small (thin) shell fragments (<3mm)
1-2 every 3 inches (Sticky)

Entire section charged with methan
- expansion cracks theough out its length
- Strong H_2S odor when opened

Sample #1

No distinct layering except for very weak color band change at 124-133cm

Very weak color changes, basic color is still 5GY 4/1

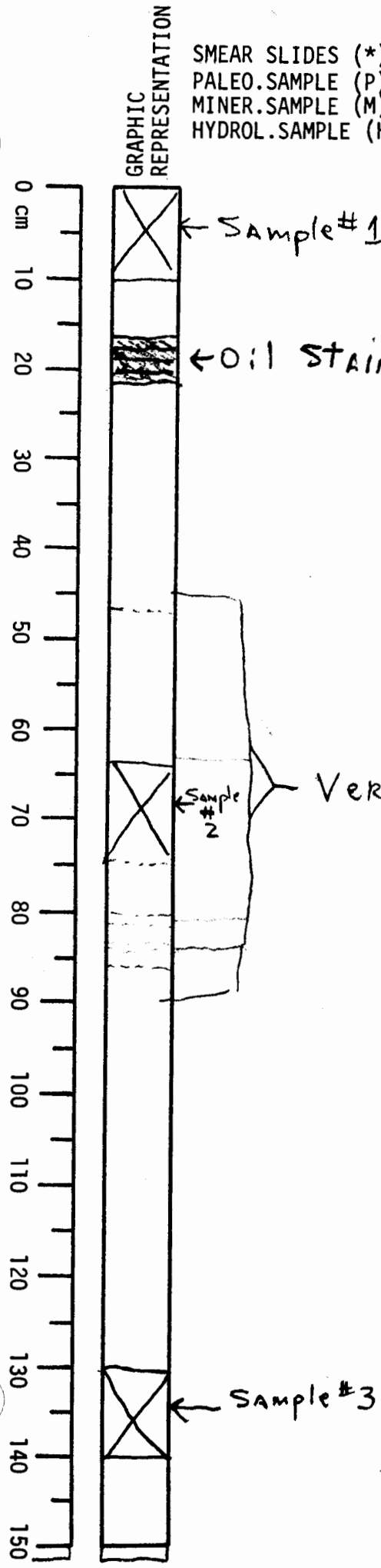
Sample #2 (Color band)

SMEAR SLIDES (*)
PALEO.SAMPLE (P)
MINER.SAMPLE (M)
HYDROL.SAMPLE (H)

VISUAL CORE DESCRIPTION

SITE		CORE	SEC
10PC-	1	-4	

OBSERVER: RFC



Oil appears to have seeped into the sediment along zones of weakness, parting the sediment + forming horizontal cracks

Entire Section
Clay, Silt, minor Sand (5GY 4/1)
(Sticky)

Entire section charged with methane - expansion cracks throughout its length

Strong H_2S Odor when opened

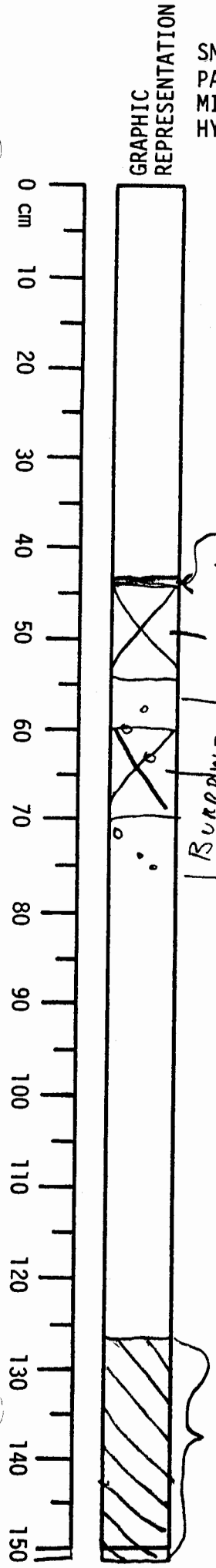
Very Weak Color band changes
Basic color is still 5GY 4/1

SMEAR SLIDES (*)
PALEO.SAMPLE (P)
MINER.SAMPLE (M)
HYDROL.SAMPLE (H)

VISUAL CORE DESCRIPTION

SITE					CORE			SEC	
1	1	P	C	-	1	-	1		

OBSERVER: RFC



Sample#1 (Foram-Rich Layer)

Top of core ← Foram rich layer on top (2.5Y 4/4)
Approx. 1cm thick (Soupy)

Sample#3

Entire Core Clay, Silt, Sand
(5Y 5/1) (Sticky)

Sample#2

No Black Mottling as was found in 10PC-1-1

No distinct layering
No H_2S Odor

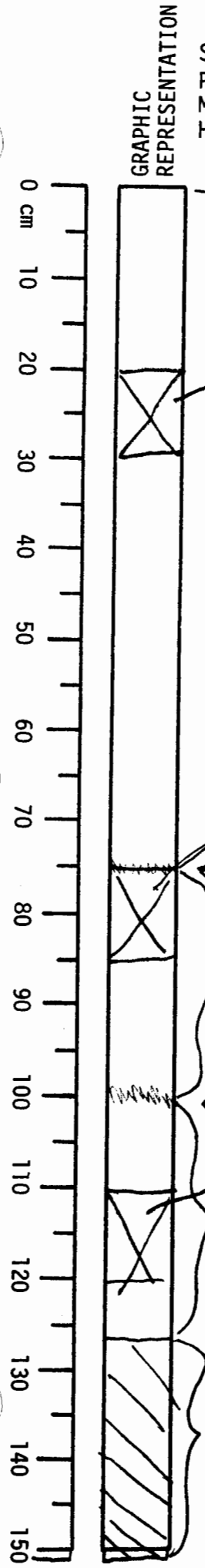
Saved for Geotech (127-152 cm)

SMEAR SLIDES (*)
PALEO.SAMPLE (P)
MINER.SAMPLE (M)
HYDROL.SAMPLE (H)

VISUAL CORE DESCRIPTION

SITE						CORE		SEC	
1	1	P	C	-	1	-	2		

OBSERVER
RFC



Sample #1

Clay, Silt, Sand (5Y 5/1) (Sticky)

Sample #2

No sharp boundary - gradual color change

Clay, Silt (2.5Y 4/2)

Sample #3

Clay, Silt (5Y 4/1)

Taken for GeoTech

- No distinct layering in entire core. Gradual color changes at 75 cm + 100 cm
- No H_2S Odor

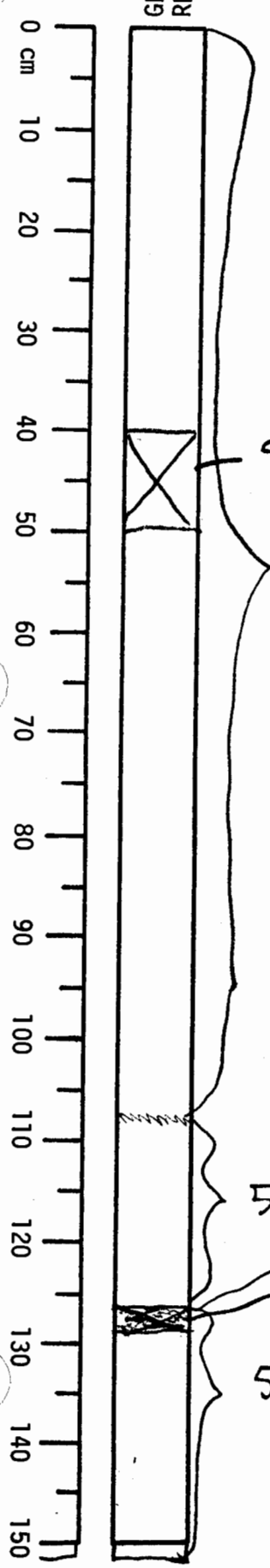
GRAPHIC REPRESENTATION

SMEAR SLIDES (*)
PALEO.SAMPLE (P)
MINER.SAMPLE (M)
HYDROL.SAMPLE (H)

VISUAL CORE DESCRIPTION

SITE		CORE	SEC
1 1 P C -	1	- 3	

OBSERVER
RFC



Entire Section (Sticky)
- Clay+Silt except for fine sand silt layer at 126 to 129 cm
  - 5Y 4/1 → 0 to 108 cm
  - 5Y 5/1 → 108 to 126 cm
  - 5Y 4/1 → 126 to 152 cm
- Occasional black smearing on cut face of section throughout section
- No H_2S Odor
- No sign of Methane gas (expansion cracks)

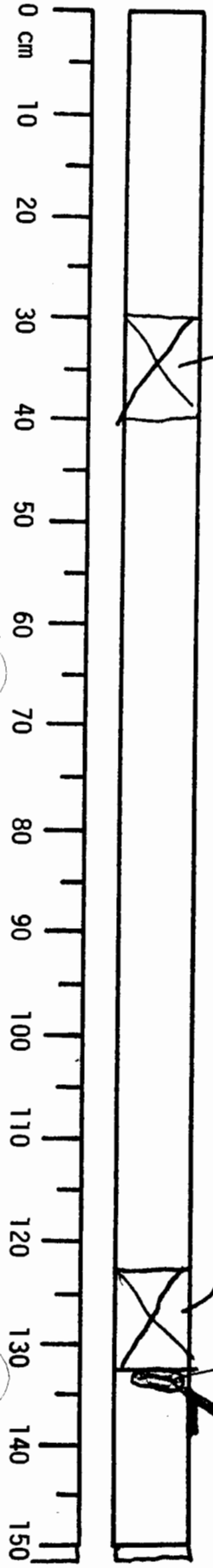
GRAPHIC REPRESENTATION

SMEAR SLIDES (*)
PALEO.SAMPLE (P)
MINER.SAMPLE (M)
HYDROL.SAMPLE (H)

VISUAL CORE DESCRIPTION

SITE					CORE			SEC	
1	1	P	C	-	1	-	4		

OBSERVER: RFC



Entire Section
- Clay + Silt (minor Sand (5Y 4/1)
- Minor Color Bands throughout core but basic color is 5Y 4/1 (Sticky)
- No H_2S Odor
- No gas expansion cracks

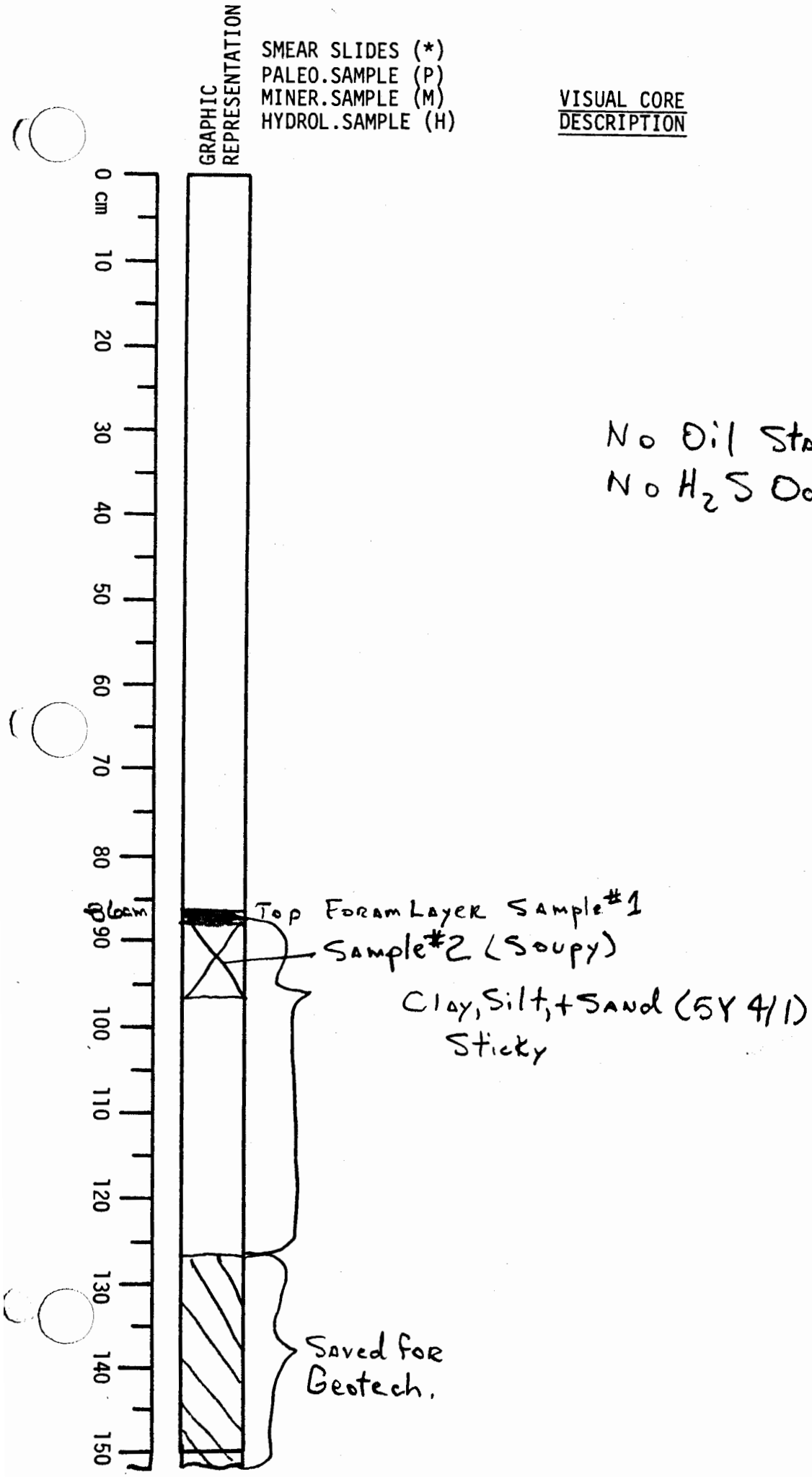
SMEAR SLIDES (*)
PALEO.SAMPLE (P)
MINER.SAMPLE (M)
HYDROL.SAMPLE (H)

GRAPHIC REPRESENTATION

VISUAL CORE DESCRIPTION

SITE						CORE			SEC	
3	1	P	C	-	1	-	1			

OBSERVER
RFC



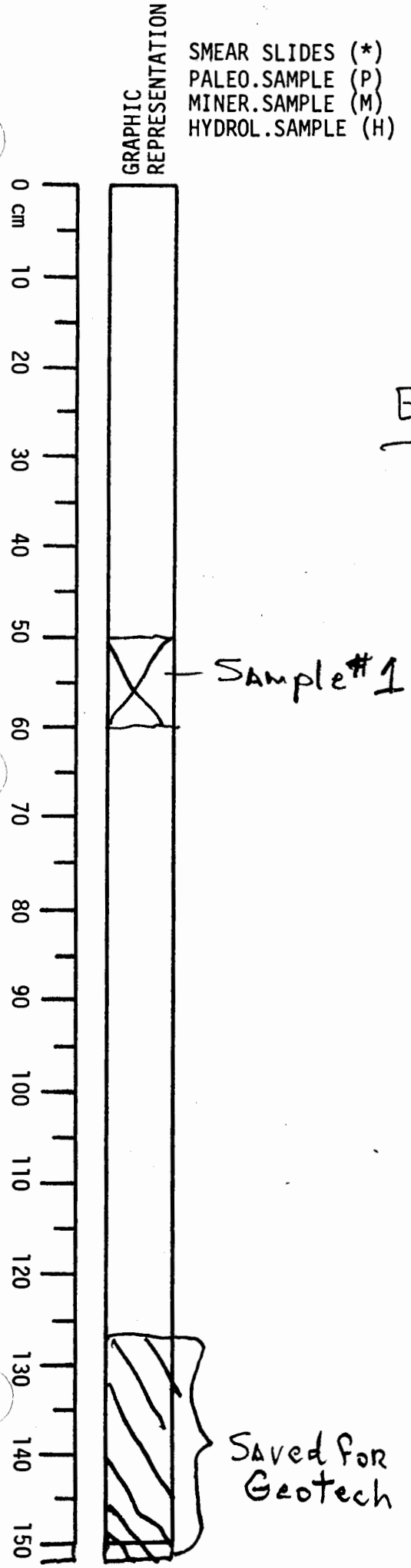
No Oil Stain
No H_2S Odor

SMEAR SLIDES (*)
PALEO.SAMPLE (P)
MINER.SAMPLE (M)
HYDROL.SAMPLE (H)

VISUAL CORE DESCRIPTION

SITE						CORE		SEC	
3	1	P	C	-	1	-	2		

OBSERVER
RFC



Entire Core Section

Clay, Silt 5Y 4/1

No Oil

No H_2S Odor

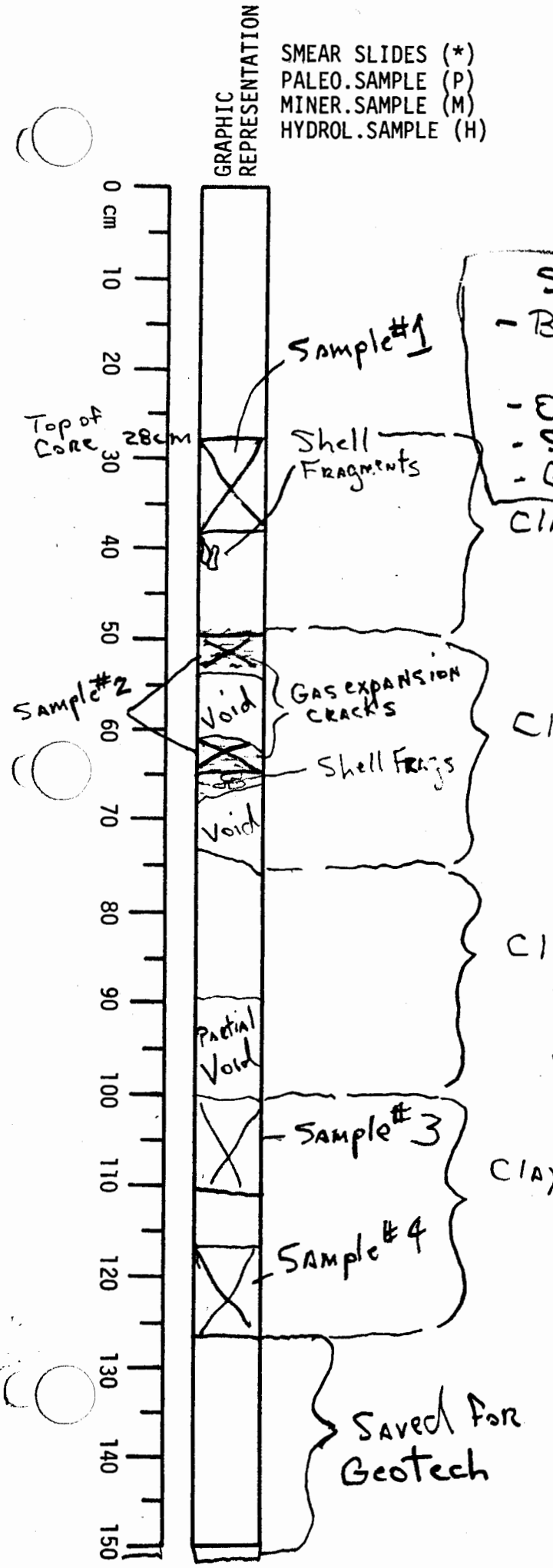
Sticky

SMEAR SLIDES (*)
PALEO.SAMPLE (P)
MINER.SAMPLE (M)
HYDROL.SAMPLE (H)

VISUAL CORE DESCRIPTION

SITE						CORE		SEC	
3	3	P	C	-	1	-	1		

OBSERVER
RFC



Seds gas charged
- Basic color throughout 5Y 4/1
- Oil stained throughout
- Strong H_2S odor when split
- Gas Hydrate from 50cm on down.

Clay, Silt, minor Sand
Sticky

Clay, Silt, Sand
Sticky

Carb. Rubble up to 1-2cm dia.

Clay, Silt, Sand + Cemented (Carb.) Seds.
Soupy ← Disrupted by gas expansion
to
Sticky

Clay, Silt, Sand + Cemented Carb. Rubble up to 3cm dia.
Sticky, Porous due to gas hydrate

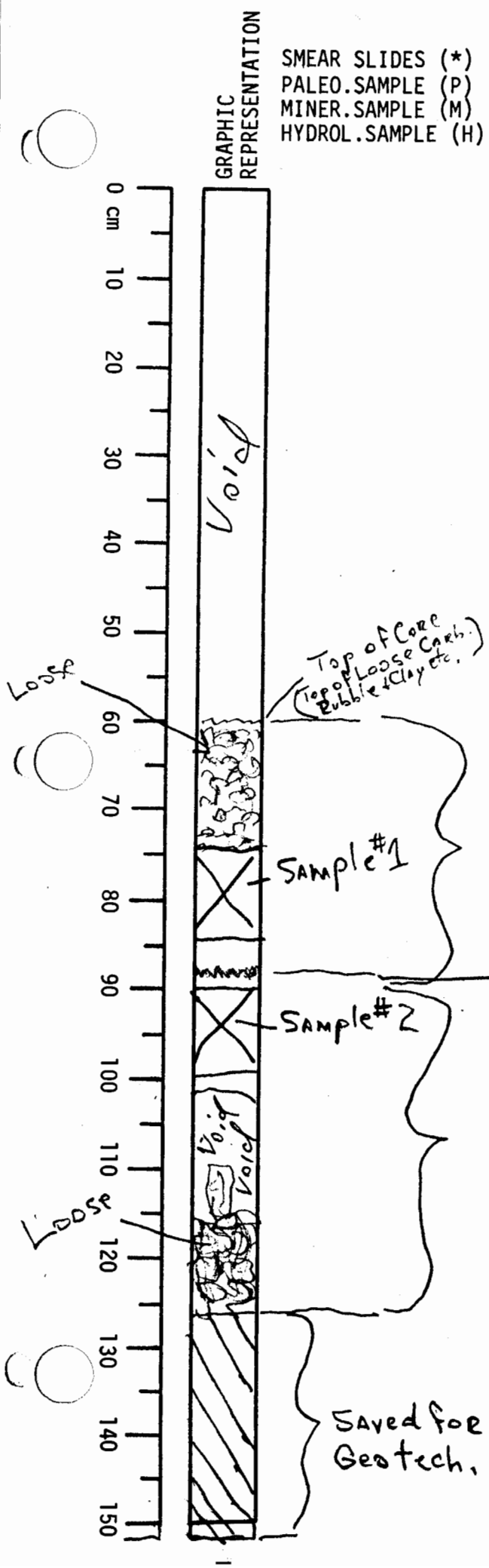
This section was recovered from core barrel by sliding another liner in. Sed. from the middle of section 2 to top of core were shot up the barrel by gas hydrate decomposition. This section disrupted. Approx. one foot (30.5cm) lost off top.

SMEAR SLIDES (*)
PALEO.SAMPLE (P)
MINER.SAMPLE (M)
HYDROL.SAMPLE (H)

VISUAL CORE DESCRIPTION

SITE					CORE			SEC		
3	3	P	C	-	1	-	2			

OBSERVER: RFC



- Basic Color throughout - 5Y 4/1
  - Oil Stained Throughout
  - H_2S Odor on spliting
  - Gas Hydrate in Section
- Core Disrupted by gas expansion from decomposition of gas hydrate
  Seds. gas charged

Clay, Silt, + Sand with Carb. Rubble (up to 3-4 cm in dia.)
Sticky - Oil Stained

Boundary Carb. Rubble / No Carb. Rubble

Clay, Silt - Sticky to Plastic
- Oil Stained
- No Carb. Rubble

Saved for Geotech. ⇐ This section has a large gas void - may not be good for geotech.

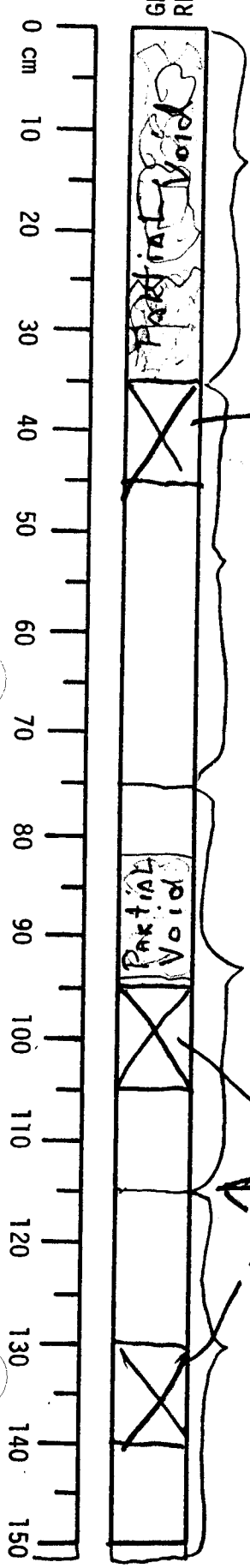
SMEAR SLIDES (*)
PALEO.SAMPLE (P)
MINER.SAMPLE (M)
HYDROL.SAMPLE (H)

VISUAL CORE DESCRIPTION

SITE	CORE	SEC
33PC-1-3		

OBSERVER: RFC

GRAPHIC REPRESENTATION



Oil Stained
Clay, Silt, Sand
(5Y 4/1)
Few Pieces
Carb Rubble ~
3-4cm dia.
Sticky to Plastic

Basic Color 5Y 4/1 down to 115cm
- Oil Stained Throughout
- H_2S. Odor on Spliting
- Hydrates in section
- Gas Charged Seds

Then N4/0 to 152cm

Moderate Core disruption

Sample #1

Clay, Silt, Sand (5Y 4/1)
- Oil Stained
- Rel. Free of Carb. rubble
Sticky to Plastic

Carb. Rubble Zone with Matrix of
Clay, Silt, Sand (5Y 4/1)
Heavily Oil Stained
Pieces of Carb Rubble 3-6cm dia. throughout entire zone
Sticky

Sample #2

Separate piece of carb. rubble removed at 115cm — Size = 5x5cm (irreg. shape)

Sample #4

Sample #3

Clay, Silt (N 4/0)
Occasional oil staining
No Carb. Rubble
Sticky to Plastic

Peggy FYE BLDG
W/ GENE WHELAN 4-21-87 , BOB C.

Pyrolysis 4-7 / DAY ~$100/SAMPLE

Brooks → GAS

- Run Machines -

Late May - Early June - Run Machine

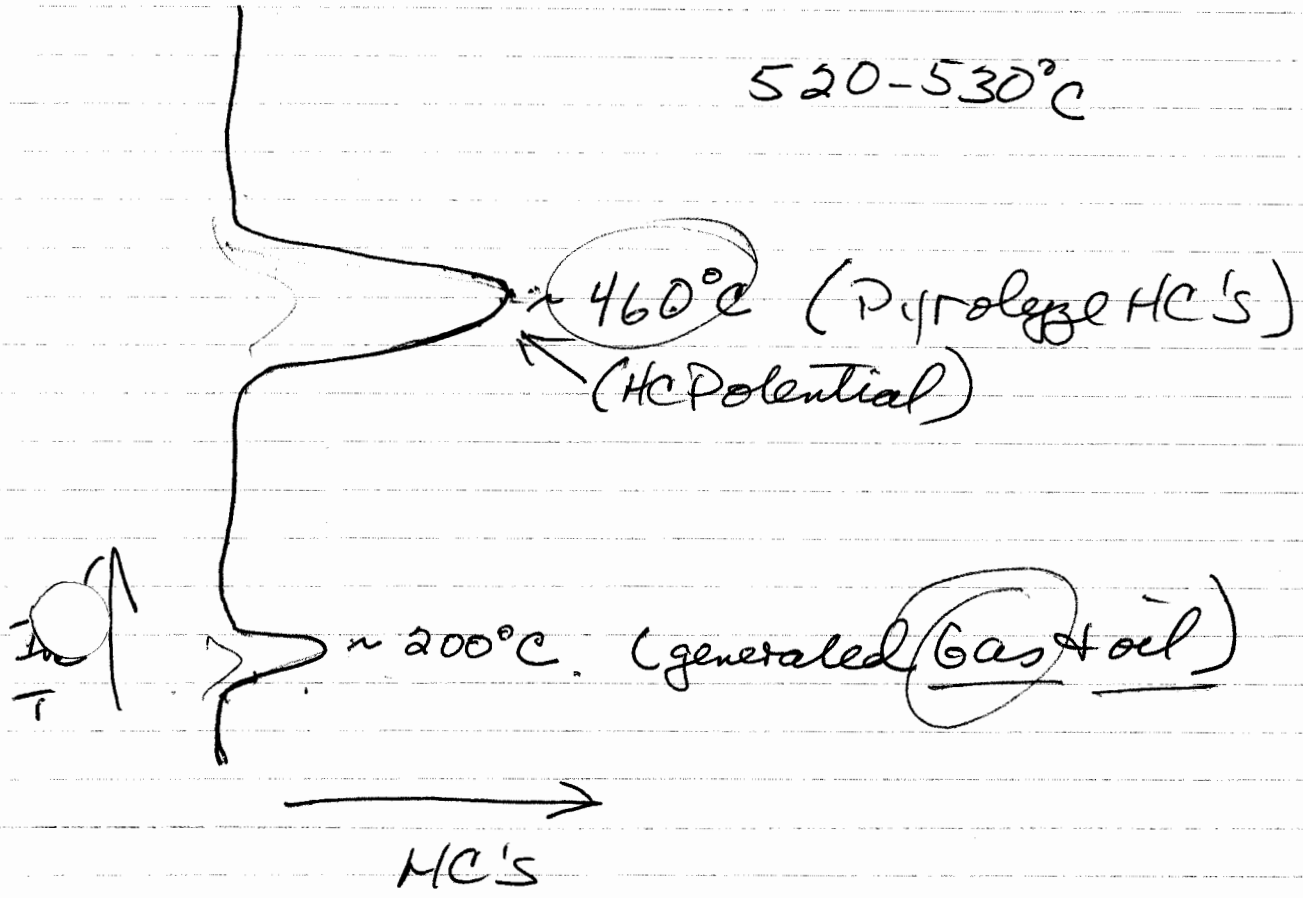
-

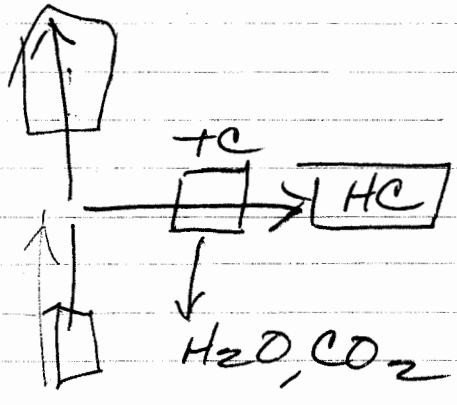
Claypool, George - Expert on Pyrolysis - Denver

Pat Hasher - Reston

NATIONAL 42-381 50 SHEETS 5 SQUARE 42-382 100 SHEETS 5 SQUARE 42-389 200 SHEETS 5 SQUARE Made in U.S.A.

USGS Bob Commbau (Gosnold)
Bill Winter (Crawford)





ROCK EVAL
CDS Pyroprobe