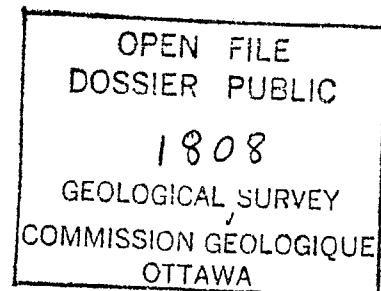


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Report No. EPGS-DOM.1-88MPA

Vitrinite reflectance (Ro)  
of dispersed organics  
from  
Mobil-Texaco-PEX  
Venture B-13



Eastern Petroleum Geology Subdivision  
Atlantic Geoscience Centre, G.S.C., Dartmouth  
January 19, 1988

## REPORT NO. EPGS-DOM.1-88MPA

Vitrinite reflectance (Ro) of dispersed organics from Mobil-Texaco-PEX  
Venture B-13.

G.S.C. Locality No.: D195

Location: 44°02'11.6"N, 59°32'03.5"W

R.T. Elevation: 33.8m

Water Depth: 24.7m

Total Depth: 5368

Sample Interval: 411 - 5368m

Interval Studied: 1265 - 5100m

Depth Units: Meters referenced to R.T.

Vitrinite reflectance has been determined on 19 rotary cuttings samples and 2 core samples (Table II) from Mobil-Texaco-PEX Venture B-13 which was classified as a delineation well for the Venture gas field and is located on the Scotian Shelf approximately 13 km east of Sable Island.

Data acquisition and manipulation for this report utilized the Zeiss Photomultiplier III Zonax system interfaced with a IBM-PC AT clone microcomputer to provide improved speed and reliability of data acquisition.

Sample preparation followed the procedures listed in Appendix I. The analysis of the well revealed the thermal maturation intervals given in Table I. The specific maturation levels, as set out in this report, were based on those of Dow (1977) with modified terminology (Appendix II).

Table I  
Inferred Thermal Maturation Levels\*

(Seafloor)-1575m	0.25 - 0.4	% Ro	immature
1575-2346m	0.4 - 0.5	% Ro	immature approaching maturity
2346-2976m	0.5 - 0.6	% Ro	marginally mature
2976m	0.6	% Ro	onset of significant oil generation
3971m	0.8	% Ro	peak of oil generation
4742m	1.0	% Ro	onset of significant wet gas generation
5100m T.D.	1.19	% Ro	within oil window
(5373m)	1.2	% Ro	onset of significant dry gas generation
(5780m)	1.35	% Ro	oil floor
(7139m)	2.0	% Ro	wet gas preservation limit

Note: ( ) indicate depth extrapolated at 0.126 log Ro/km

\* Maturation levels are provided for all types of organic matter. Actual hydrocarbon products depend on type of organic matter present.

#### Remarks

Sample coverage of vitrinite reflectance data (Figure 1, Table II) was good over most of the section penetrated by Venture B-13. The data are plotted on a log Ro vs. linear depth scale and a linear regression line was calculated by the least squares method. The 'error bars' plotted on the maturation profile (Figure 1) indicate one standard deviation on either side of the mean and may be deceptively small for samples with very few readings. The slope of the maturation line is 0.126 log Ro/km.

Selection of the reflectance population which represented the true maturation of the sediments was significantly aided by the histogram display plot (Figure 2). This interpretation tool helps to reveal linear trends (populations) in the Ro data. It also demonstrates the effects of cavings, geology, casing points and other factors on the vitrinite reflectance populations.

The lithology strip plot (Figure 1) was produced directly from the E.P.G. LITHFILE database which extracts data from digitized CANSTRAT logs.

The vitrinite reflectance data provides evidence that the thermal regime at Venture B-13 was suitable for the generation and preservation of hydrocarbons within the drilled section assuming potential source rocks and traps were present.

#### References

Dow, W.G., 1977. Kerogen studies and geological interpretations. Journal of Geochemical Exploration, no. 7, p. 77-99

Mobil-Texaco-PEX, 1982. Well history report Mobil-Texaco-PEX Venture B-13. Open File report, Department of Energy, Mines and Resources, Ottawa.

January 19, 1988

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Table II

Summary of kerogen - based vitrinite reflectance

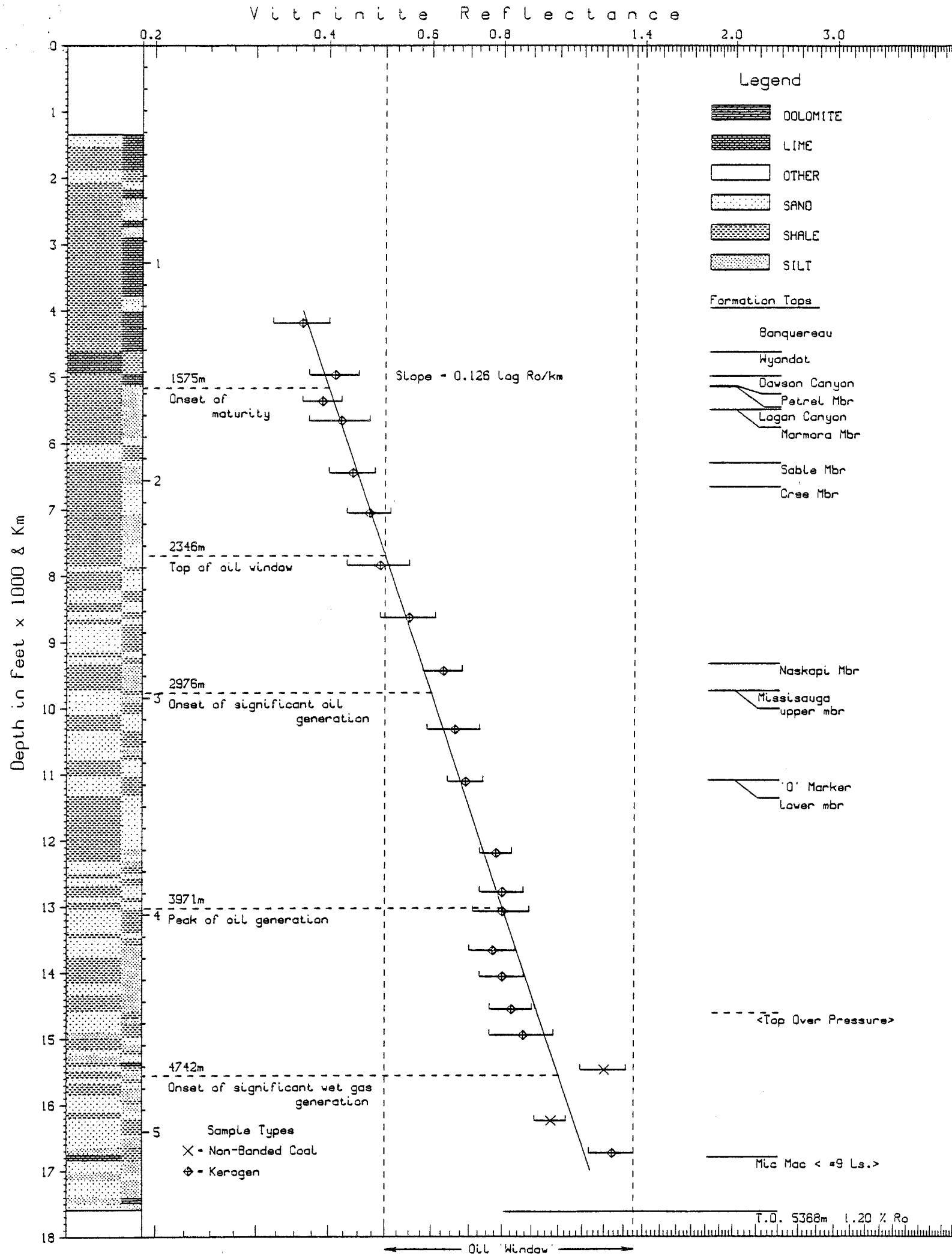
Seq. #	Sample #	Depths in meters	Mean Ro (SD) non-rotated	Number of Readings Total	Readings Edited
1	K0178A	1265-1275	0.36( $\pm .04$ )	13	9
2	K0178B	1505-1515	0.41( $\pm .04$ )	25	2
3	K0178C	1605-1635	0.39( $\pm .03$ )	13	5
4	K0179A	1715-1725	0.42( $\pm .05$ )	38	25
5	K0179B	1925-1965	0.44( $\pm .04$ )	33	15
6	K0179C	2105-2150	0.47( $\pm .04$ )	30	23
7	K0180A	2320-2390	0.49( $\pm .06$ )	36	25
8	K0180C	2620-2630	0.55( $\pm .06$ )	60	32
9	K0181A	2865-2875	0.63( $\pm .05$ )	57	27
10	K0181B	3135-3145	0.66( $\pm .07$ )	72	36
11	K0182A	3375-3385	0.69( $\pm .05$ )	64	27
12	K0182B	3705-3715	0.78( $\pm .05$ )	49	35
13	K0182C	3885-3895	0.80( $\pm .07$ )	61	46
14	K0183A	3975-3985	0.80( $\pm .09$ )	62	51
15	K0183B	4155-4165	0.77( $\pm .07$ )	29	21
16	K0183C	4275-4285	0.80( $\pm .07$ )	55	47
17	K0184A	4425-4435	0.83( $\pm .07$ )	71	57
18	K0184B	4545-4555	0.87( $\pm .11$ )	57	49
19	PH1445	4716.41	1.20( $\pm .11$ )	71	69
20	PH1446	4950.14	0.97( $\pm .06$ )	56	53
21	K0184C	5090-5100	1.24( $\pm .11$ )	41	25

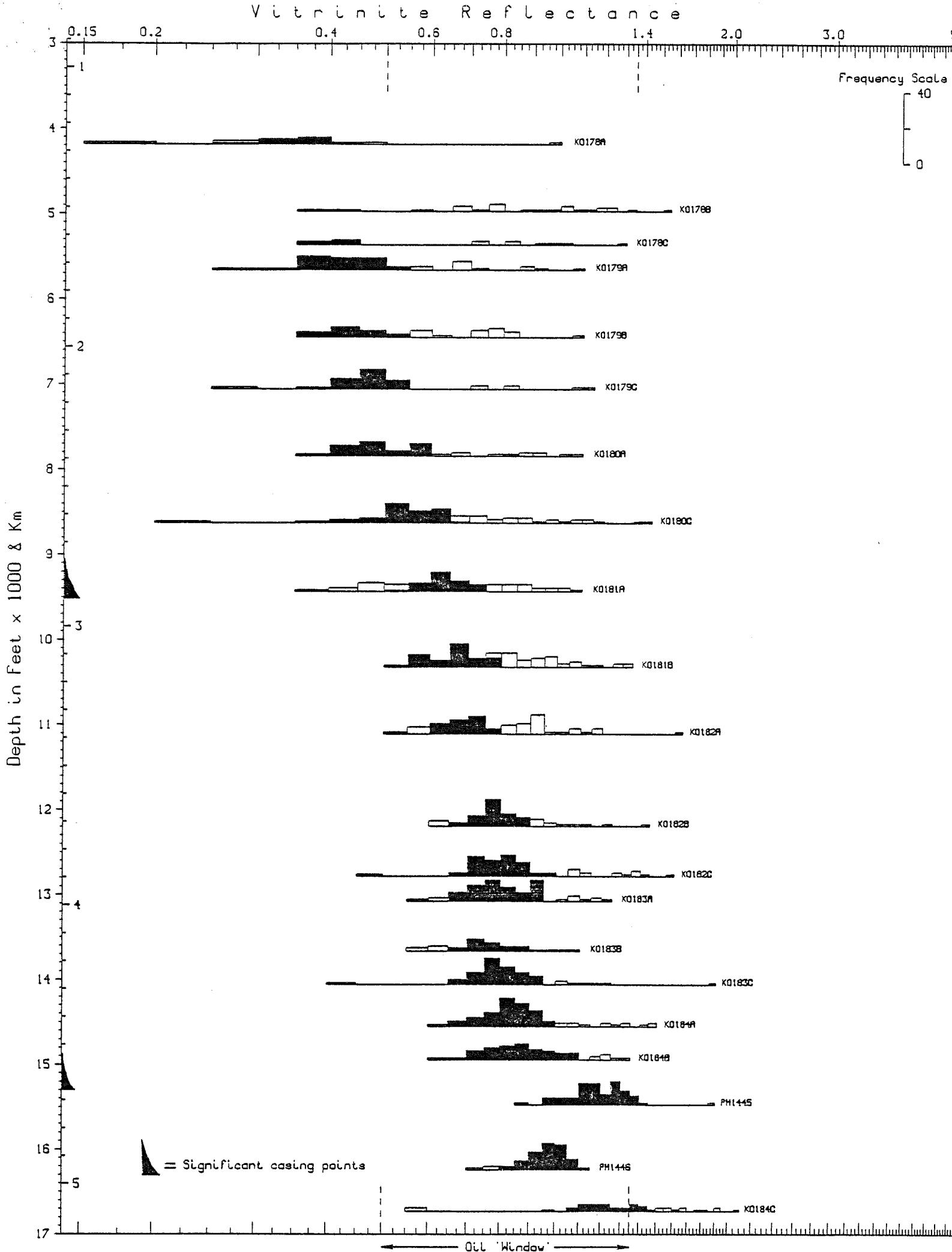
Note: All samples are kerogen concentrate type except for 19 and 20 which were made from small coaly inclusions found in conventional cores.

Table III  
Formation Tops (Wade, pers. comm.)\*

Formation	Depth
Banquereau	in casing
Wyandot	1407.0m
Dawson Canyon	1516.0m
Petrel Mbr	1563.2 - 68.4m
Logan Canyon	1671.4m
Marmora Mbr	1671.4m
Sable Mbr	1920.0m
Cree Mbr	2027.5m
Naskapi Mbr	2841.0m
Mississauga	2966.7m
upper mbr	2966.7m
"O" Marker	3377.0 - 85.0m
middle mbr	3385.0m
lower mbr	4138.0m
Top overpressure	-4450.0m
Mic Mac (#9 Ls.)	5112.0m
T.D.	4500m

\* Preliminary stratigraphic picks.





## APPENDIX I

### Sample Preparation Method

#### COGLA Lab preparation

Preliminary Wash

Samples dried in oven

- Split:
- a. all of coarse to Petrology Lab
  - b.  $\frac{1}{2}$  medium to Palynology Lab
  - c. rest of medium and all of fine combined for Micropaleo Lab

Split "b" is delivered to Palynology Lab and treated as follows:

#### PALYNOLOGY Lab preparation

20-30 grams placed in 250 ml plastic beaker.

Add 10% HCl till reaction ceases (removes carbonates).

Washed (rinsed) 3 times.

Conc. HF overnight (removes silicates).

Washed (rinsed) 3 times.

Heated (60-65°C) conc. HCl (remove fluorides caused by HF).

Washed 3 times.

Then put into 15 ml test tube with 4-5 ml 4% Alconox.

Differential centrifuge at 1500 rpm for 90 sec.

Decant.

Wash 3 times with centrifuging.

Float off organic fraction using 2.0 S.G. ZnBr solution.

Centrifuge 1000 rpm, 8 min.

Float fraction into second test tube.

Wash 3 times with centrifuging.

Kerogen smear slide made.

Remaining kerogen material delivered to Vitrinite Reflectance Lab.

#### VITRINITE REFLECTANCE Lab preparation

Excess water pipetted off.

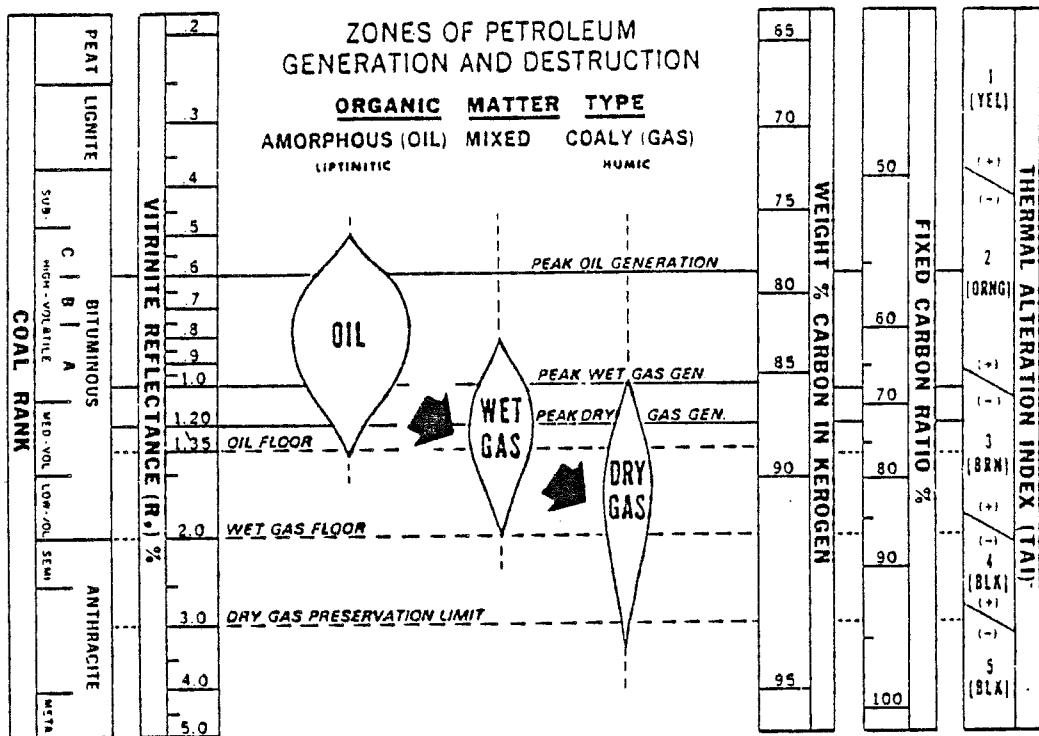
Freeze dried.

Mounted using epoxy resin (EPO-TEK 301) in predrilled plastic stubs.

Polished using modified coal petrology polishing methods.

Examined under oil lens at approximately 800x mag'n.

Appendix II (Dow, 1977)



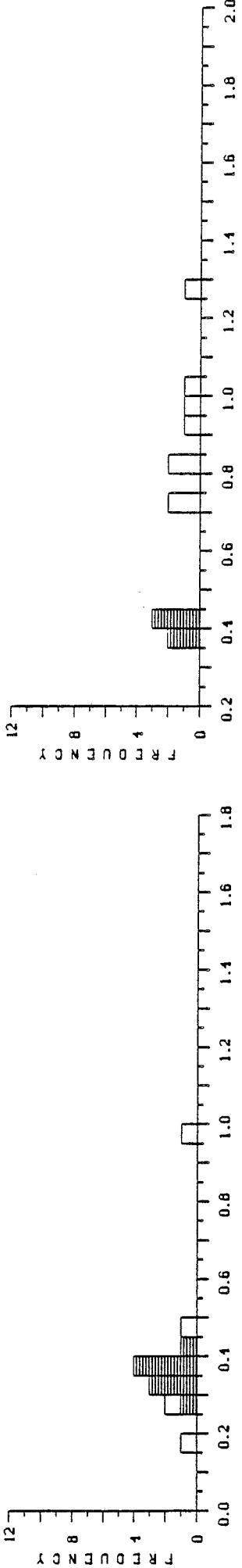
Note: In this report, the terminology used to describe the various maturation levels has been modified. The 'peak' designation, as used in this figure, has been changed to 'onset of significant' and 0.8  $R_o$  is here used as the 'peak of oil generation' (Table I, Figure 1).

**Appendix III**  
**Sample Reports**

KD1788, 1505-1515M, VENTURE B-13

COL >	1	2	3	4	5	6	7	8	9	0
ROW	.19	.25	.29<	.30<	.33<	.34<	.36<	.38<	.39<	.39<
1	.42<	.48	.98							
TOTAL	.39	.19	.19	.13	.19	.98	.510	.510	.510	.510
EDIT<	.36	.04	.9	.29	.42	.42	.320	.320	.320	.320

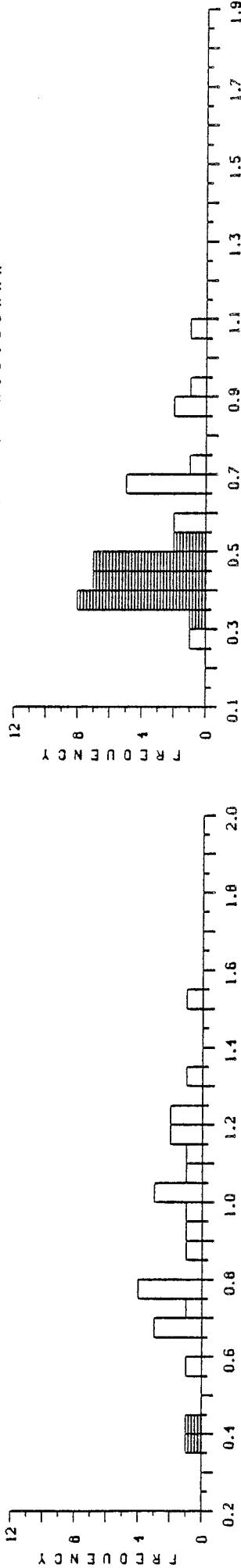
## REFLECTANCE HISTOGRAM



KD1788, 1515-1525M, VENTURE B-13

COL >	1	2	3	4	5	6	7	8	9	0
ROW	.38<	.43<	.59	.65	.68	.69	.71	.75	.76	.77
1	.77	.87	.93	.98	1.02	1.02	1.04	1.07	1.11	1.15
2	1.17	1.23	1.24	1.33	1.33	1.51				
TOTAL	.91	.28	.25	.38	.51	.22.85	.22.85	.22.85	.22.85	.22.85
EDIT<	.41	.04	.2	.39	.43	.43	.81	.81	.81	.81

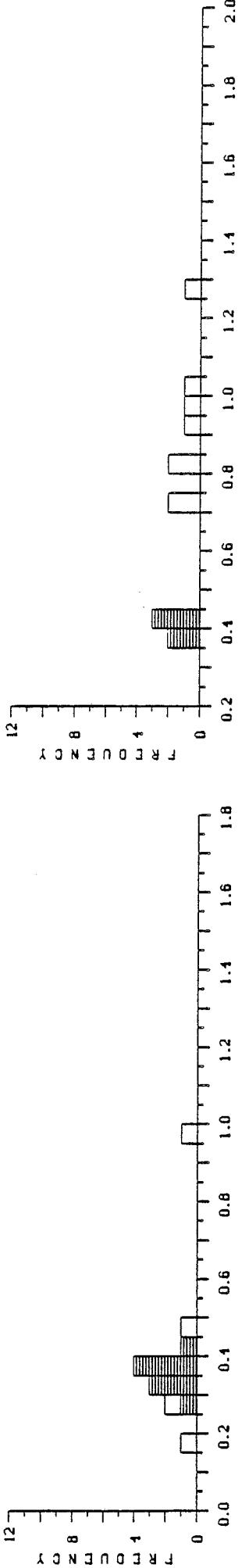
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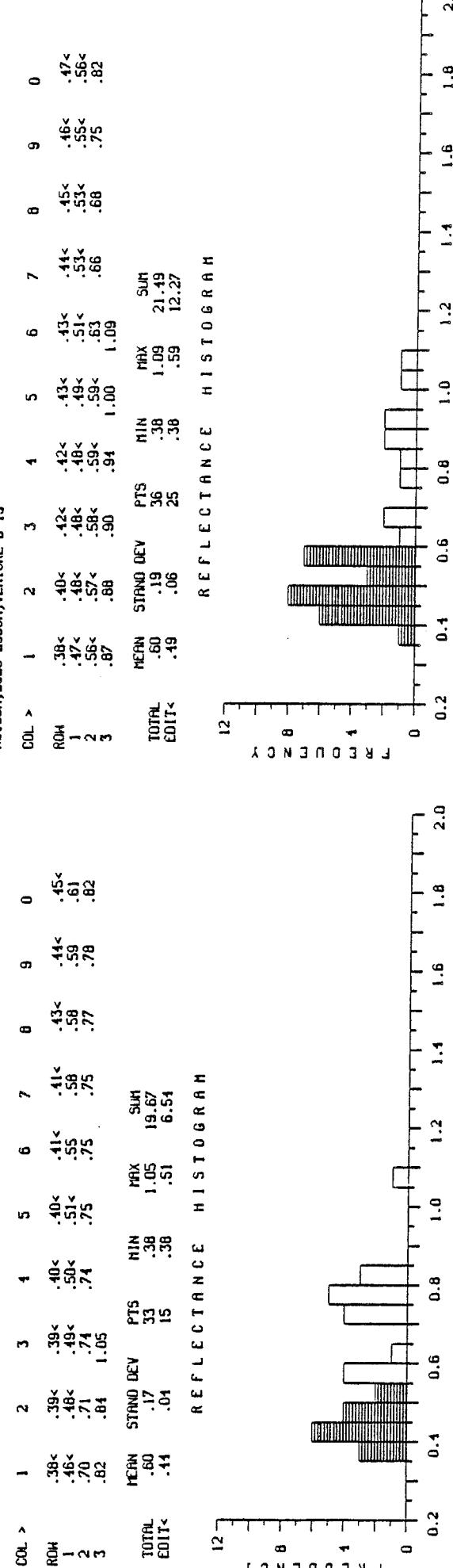
KD1788, 1265-1275M, VENTURE B-13

COL >	1	2	3	4	5	6	7	8	9	0
ROW	.19	.25	.29<	.30<	.33<	.34<	.36<	.38<	.39<	.39<
1	.42<	.48	.98							
TOTAL	.39	.19	.19	.13	.19	.98	.510	.510	.510	.510
EDIT<	.36	.04	.9	.29	.42	.42	.320	.320	.320	.320

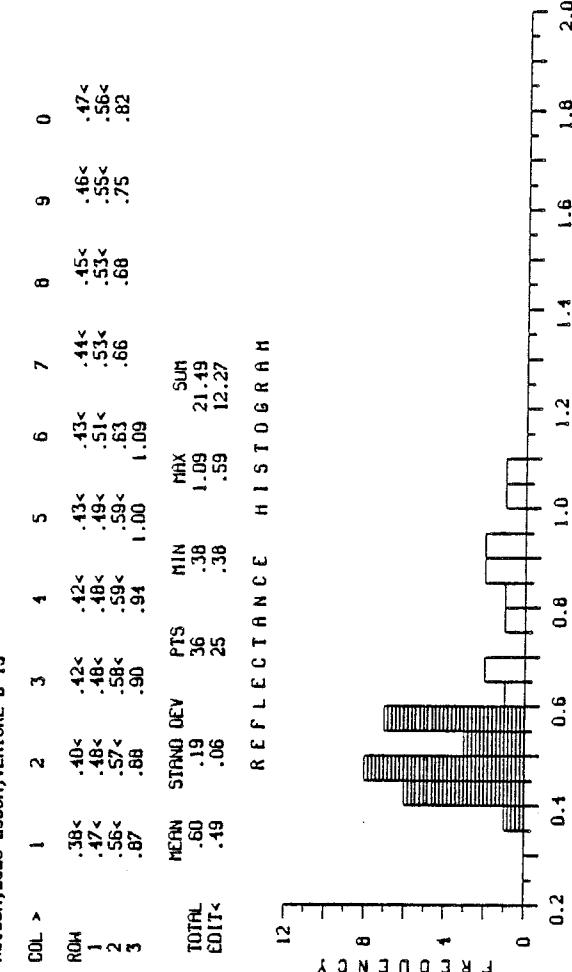
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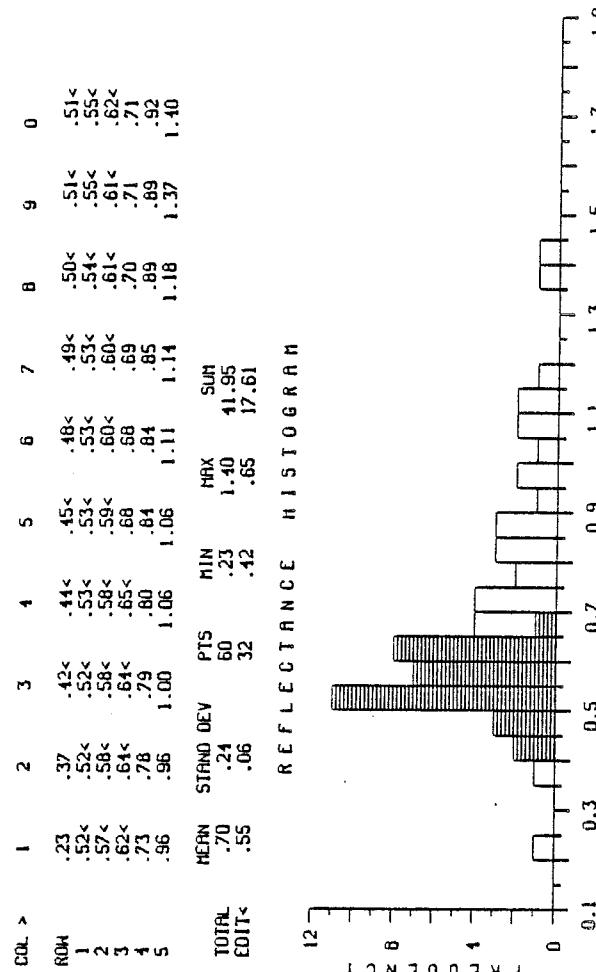
K0179C, 2105-2150M, VENTURE B-13



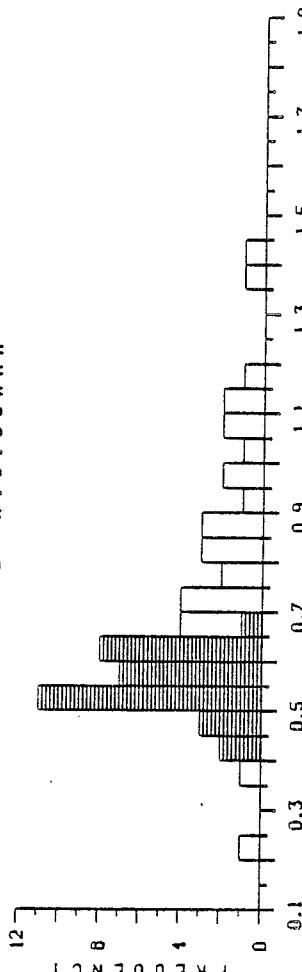
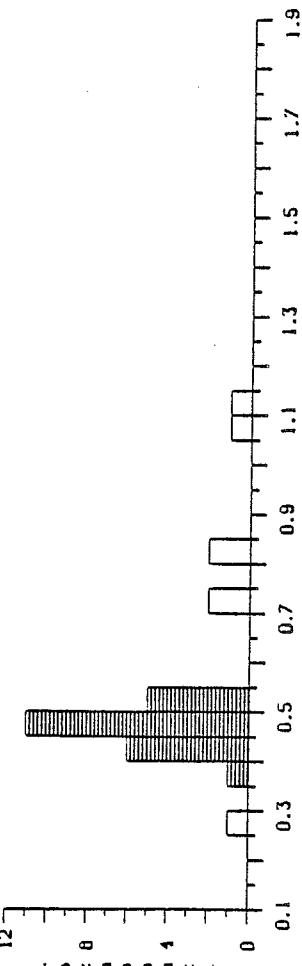
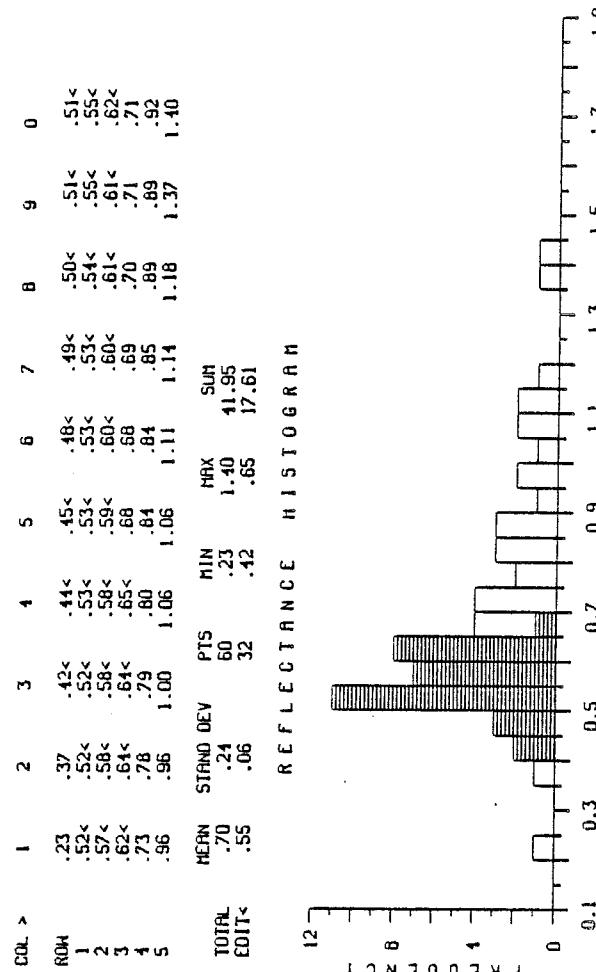
K0180R, 1925-1965M, VENTURE B-13

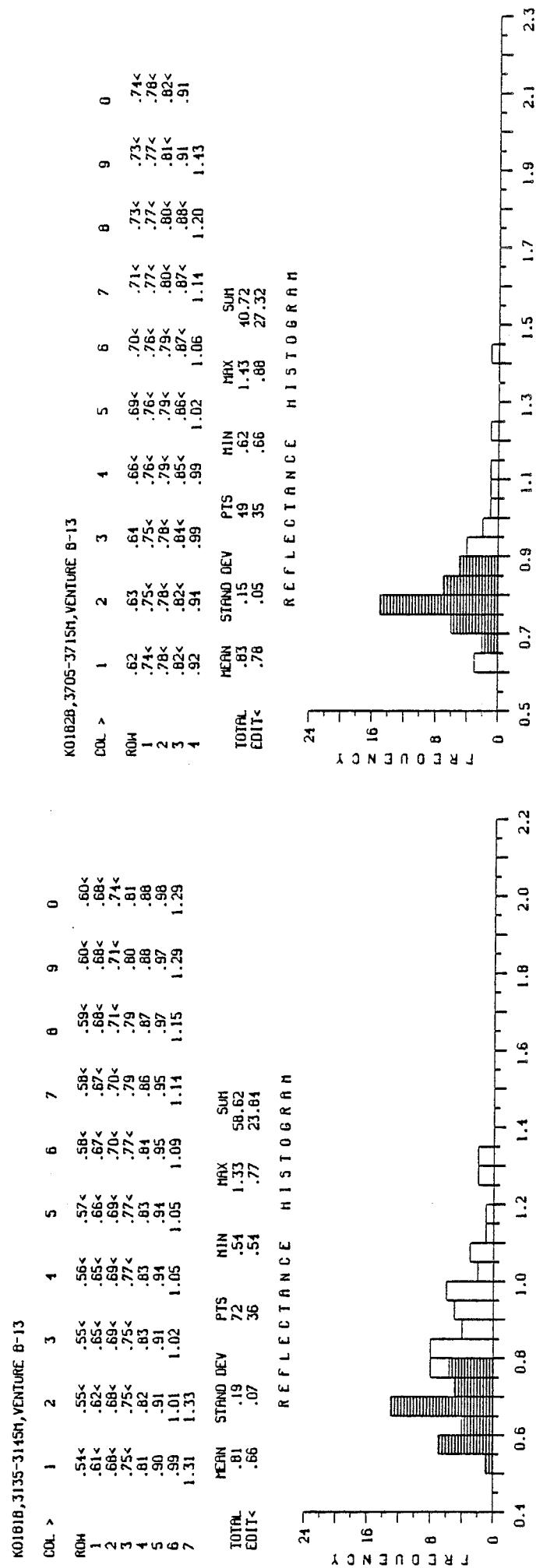
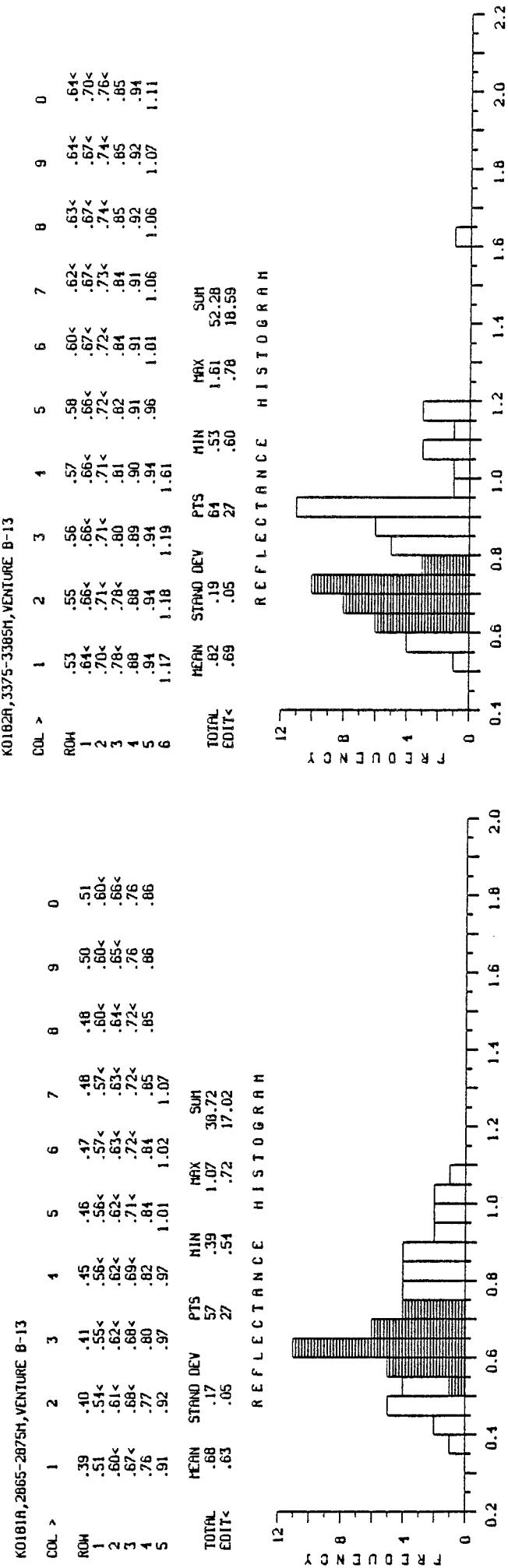


K0179C, 2105-2150M, VENTURE B-13



K0180R, 2320-2390M, VENTURE B-13

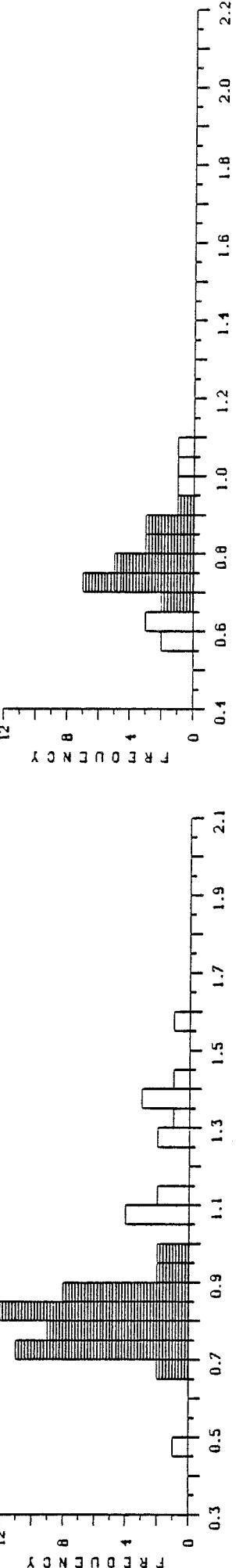




K0162C, 3885M, VENTURE B-13

COL >	1	2	3	4	5	6	7	8	9	0
ROW	.49	.67<	.69<	.70<	.70<	.71<	.71<	.72<	.72<	
1	.73<	.73<	.73<	.75<	.76<	.76<	.76<	.77<	.77<	
2	.77<	.78<	.79<	.80<	.80<	.81<	.81<	.81<	.81<	
3	.82<	.82<	.83<	.83<	.84<	.85<	.86<	.87<	.87<	
4	.86<	.89<	.89<	.90<	.90<	.92<	.95<	.96<	.96<	
5	.99	1.12	1.14	1.27	1.28	1.32	1.35	1.37	1.39	1.43
6	1.56									

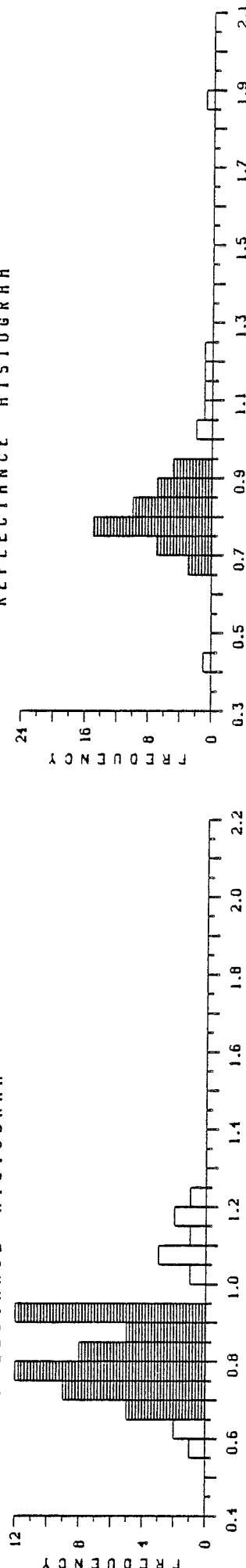
REFLECTANCE HISTOGRAM



K0163A, 3985M, VENTURE B-13

COL >	1	2	3	4	5	6	7	8	9	0
ROW	.55	.62	.62	.66<	.67<	.68<	.68<	.69<	.70<	
1	.70<	.71<	.72<	.72<	.73<	.74<	.74<	.75<	.75<	
2	.76<	.76<	.77<	.77<	.78<	.79<	.79<	.80<	.80<	
3	.80<	.80<	.82<	.82<	.82<	.83<	.84<	.85<	.87<	
4	.89<	.89<	.90<	.90<	.90<	.91<	.92<	.92<	.93<	
5	.93<	.94<	.94<	.94<	1.04	1.05	1.07	1.08	1.13	
6	1.19	1.23								

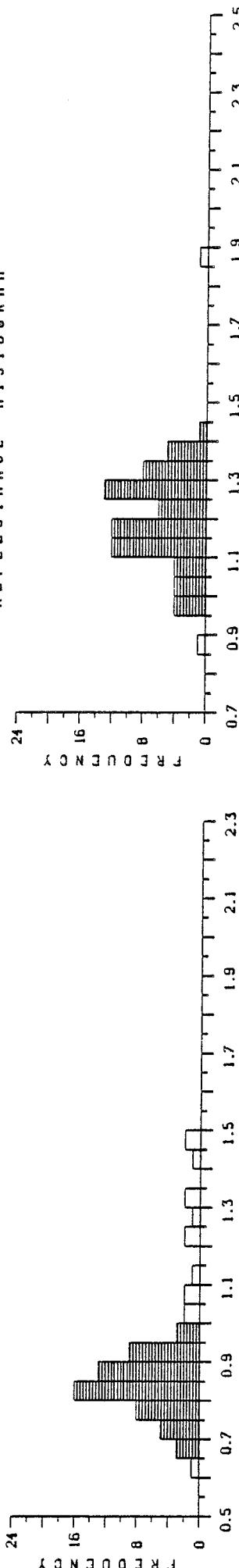
REFLECTANCE HISTOGRAM



## K0184R, 4425-4435N, VENTURE B-13

COL >	1	2	3	4	5	6	7	8	9	0
ROW	.60	.68<	.69<	.76<	.70<	.72<	.72<	.73<	.75<	
1	.75<	.76<	.76<	.77<	.77<	.78<	.78<	.80<	.80<	
2	.80<	.81<	.81<	.82<	.82<	.82<	.82<	.83<	.84<	
3	.84<	.84<	.84<	.85<	.85<	.85<	.86<	.86<	.86<	
4	.86<	.88<	.88<	.88<	.89<	.89<	.90<	.90<	.91<	
5	.91<	.91<	.91<	.91<	.91<	.91<	.91<	.91<	.91<	
6	.97	1.09	1.13	1.20	1.24	1.29	1.30	1.34	1.41	1.47
TOTAL	.90	.19	.71	.60	.17	63.82	SUM			
EDIT<	.83	.07	.57	.68	.95	47.16				

REFLECTION HISTOGRAM



## K0184C, 5090-5100M, VENTURE B-13

COL >	1	2	3	4	5	6	7	8	9	0
ROW	.56	.57	.97	1.07<	1.08<	1.10<	1.10<	1.10<	1.14<	1.15<
1	1.15<	1.19<	1.19<	1.22<	1.23<	1.23<	1.23<	1.26<	1.26<	1.30<
2	1.31<	1.35<	1.35<	1.35<	1.36<	1.40<	1.41<	1.42<	1.48	1.50
3	1.53	1.55	1.57	1.63	1.66	1.67	1.76	1.84	1.93	1.93
4	2.07									

