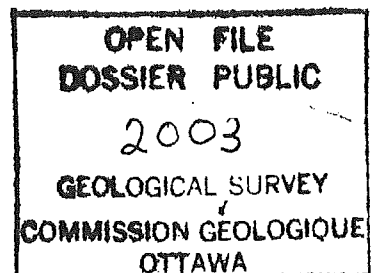


Report No. EPGs-DOM.6-88MPA

Vitrinite reflectance (Ro)  
of dispersed organics  
from  
Husky-Bow Valley et al.  
**South Griffin J-13**

Eastern Petroleum Geology Subdivision  
Atlantic Geoscience Centre, G.S.C., Dartmouth  
October 3, 1988



Vitrinite reflectance (Ro) of dispersed organics from  
 Husky-Bow Valley et al. South Griffin J-13.

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G.S.C. Locality No.: D243                      Location: 44°22'37.77"N, 58°01'54.76"W

R.T. Elevation: 39.6m                      Water Depth: 63.4m                      Total Depth: 5911m

Sample Interval: 450 - 5911m                      Interval Studied: 950 - 4980m

Depth Units: Meters referenced to R.T.

Vitrinite reflectance has been determined on 19 rotary cuttings samples (Table II) from the Husky-Bow Valley et al. South Griffin J-13 wildcat well located on the Scotian Shelf approximately 408km east of Halifax, Nova Scotia. The well was plugged and abandoned as a dry hole.

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)-2017m	0.19 - 0.4	% Ro	immature
2017-2616m	0.4 - 0.5	% Ro	immature approaching maturity
2616-3105m	0.5 - 0.6	% Ro	marginally mature
3105m	0.6	% Ro	onset of significant oil generation
3876m	0.8	% Ro	peak of oil generation
4475m	1.0	% Ro	onset of significant wet gas generation
4964m	1.2	% Ro	onset of significant dry gas generation
5280m	1.35	% Ro	oil floor
5911m T.D.	1.71	% Ro	beyond oil preservation limit
(6334m)	2.0	% Ro	wet gas preservation limit

Note: ( ) indicate depth extrapolated at 0.162 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 for vitrinite reflectance analysis (Figure 1, Table II) was good over the section penetrated by South Griffin J-13. The data were 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 0.162 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 South Griffin J-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
- Husky-Bow Valley et al., 1984. Well history report Husky-Bow Valley et al. South Griffin J-13. OpenFile report, Department of Energy, Mines and Resources, Ottawa.

October 3, 1988

  
M.P. Avery  
Eastern Petroleum Geology

MPA

- |                                     |                                       |
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| Central Technical Files, Ottawa     | D.F. Sherwin, CNOBP, St. John's       |

Table II

**Summary of kerogen - based vitrinite reflectance**

Seq. #	Sample #	Depths in meters	Mean Ro (SD) non-rotated	Number of Readings	
				Total	Edited
1	K0637A	560-570	0.20(±.02)	19	19
2	K0637B	800-810	0.29(±.03)	35	22
3	K0637C	1280-1290	0.31(±.04)	23	23
4	K0638A	1525-1535	0.34(±.05)	12	2
5	K0638C	2005-2015	0.38(±.03)	44	15
6	K0639A	2240-2375	0.46(±.06)	29	27
7	K0639B	2600-2610	0.51(±.05)	38	34
8	K0639C	2840-2850	0.53(±.06)	50	29
9	K0640A	3085-3095	0.60(±.09)	36	25
10	K0640B	3205-3215	0.64(±.05)	47	20
11	K0640C	3325-3335	0.67(±.08)	33	26
12	K0641A	3585-3595	0.71(±.07)	44	40
13	K0641B	3735-3745	0.79(±.07)	47	33
14	K0641C	3885-3895	0.79(±.09)	48	48
15	K0642A	4035-4045	0.94(±.06)	54	15
16	K0642B	4245-4345	0.97(±.08)	36	7
17	K0642C	4695-4705	0.99(±.05)	38	19
18	K0643A	4935-4945	1.18(±.06)	44	19
19	K0643B	5055-5065	1.23(±.07)	51	29
20	K0643C	5475-5485	1.41(±.07)	44	15
21	K0644A	5655-5785	1.67(±.11)	55	44

Note: All samples are kerogen concentrate type.

Table III

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

Formation	Depth
Banquereau	in casing
Wyandot	1587m
Dawson Canyon	1774m
Petrel Mbr	1873-1880m
Logan Canyon	2170m
Marmora Mbr	2170m
Sable Mbr	2254m
Cree Mbr	2297m
Naskapi Mbr	2882m
Missisauga	3214m
upper mbr	3214m
"O" Marker	3502-2592m
lower mbr	3592m
Mic Mac	4612m
Top OverPressure	5023m
T.D.	5035m

\* Preliminary stratigraphic picks.

# Vitrinite Reflectance

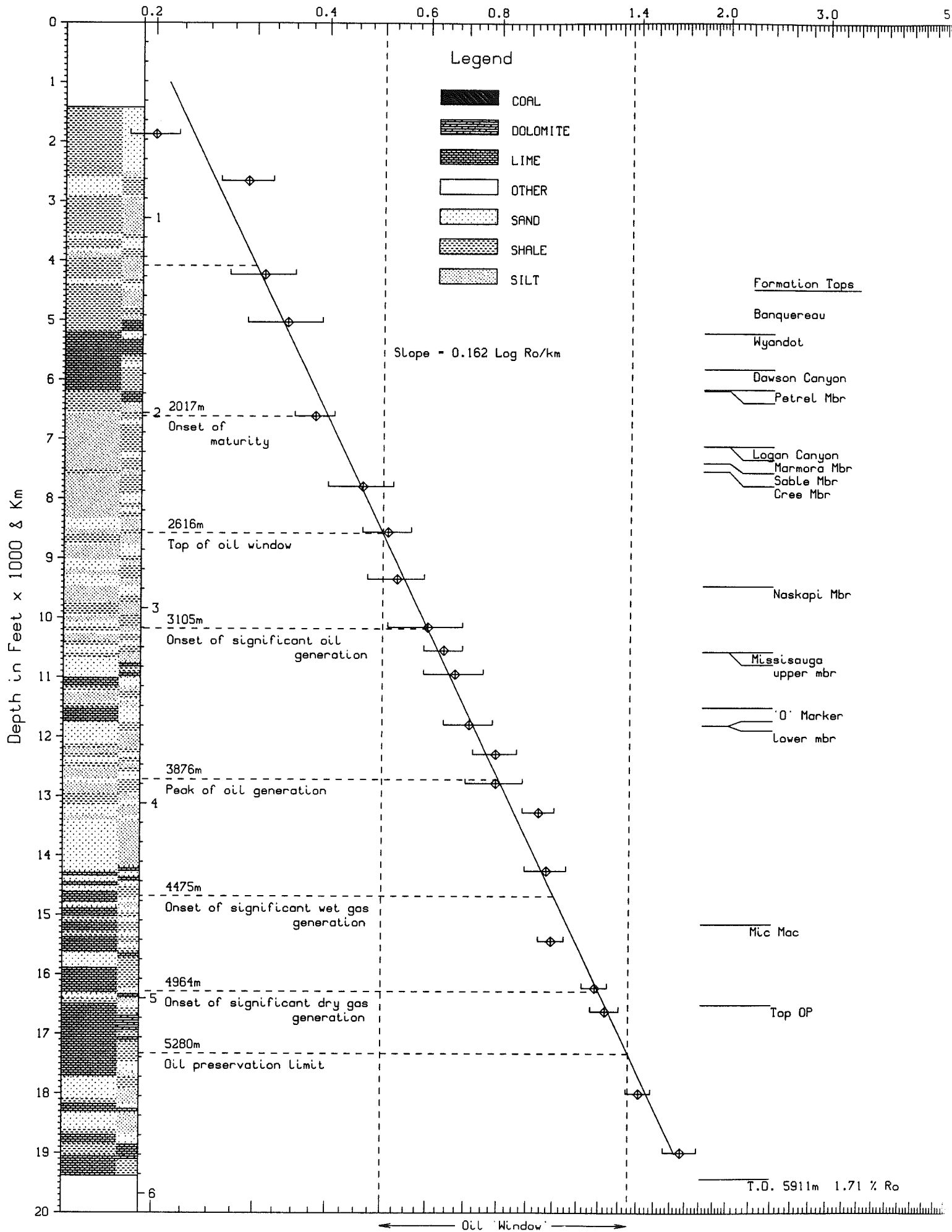


Fig. 1 South Griffin J-13 < Maturation Profile >

Vitrinite Reflectance

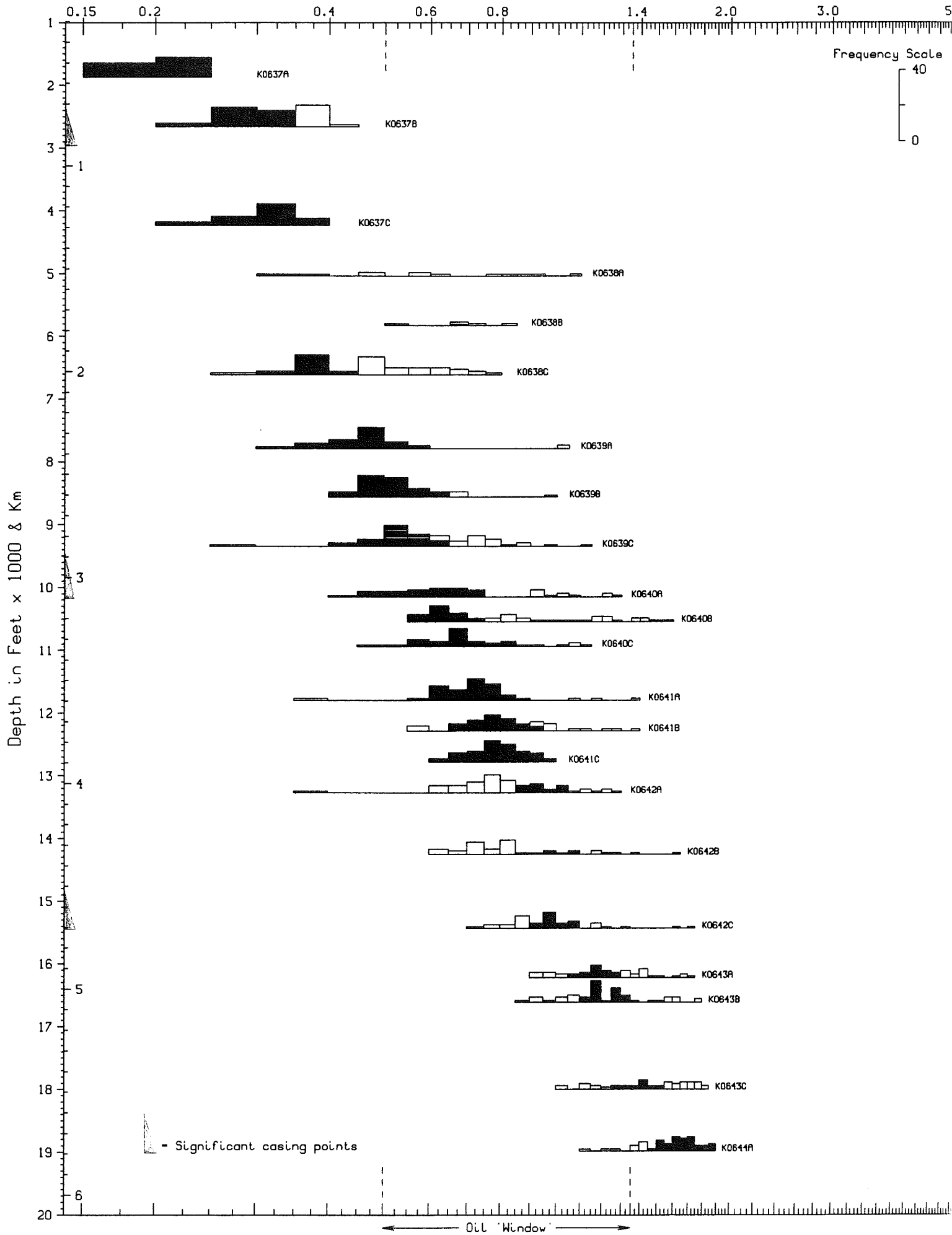


Fig. 2 South Griffin J-13 < Histograms >

## 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.

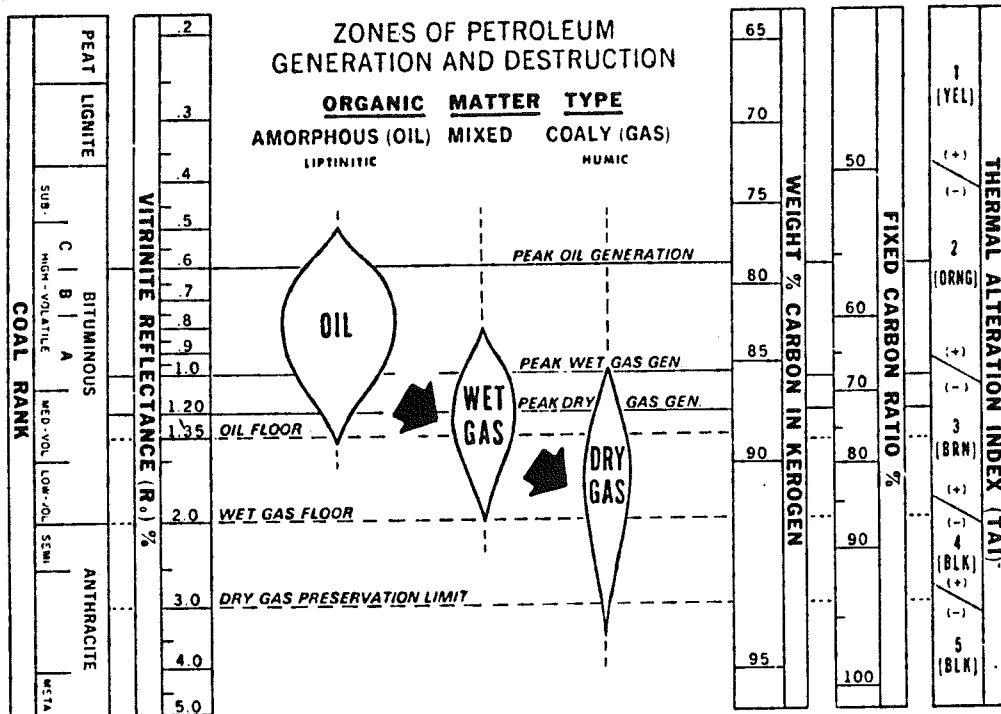
Mounted using epoxy resin (EPO-TEK 301) in predrilled plastic stubs.

Polished using modified coal petrology polishing methods.

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



Appendix II (Dow, 1977)



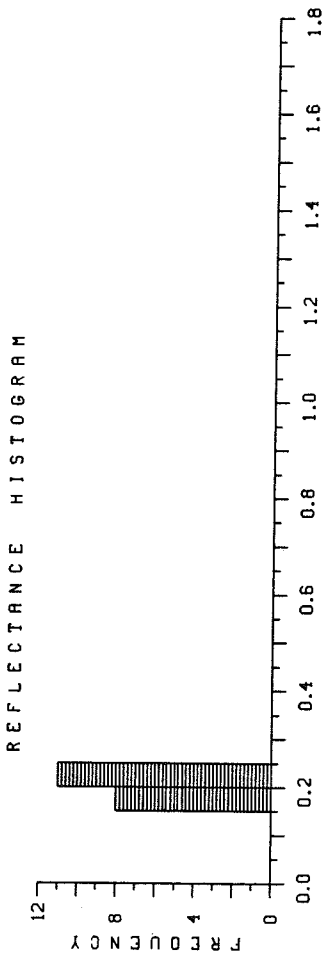
Note: In this report, the terminology used to describe the various maturation levels has been modified. The 'peak' designation, as used in this figure, has been changed to 'onset of significant' and 0.8 Ro is here used as the 'peak of oil generation' (Table I, Figure 1).

Appendix III  
Sample Reports

K0637A,560-570M,SOUTH GRIFFIN J-13

COL >	1	2	3	4	5	6	7	8	9	0
ROW	.16<	.18<	.18<	.19<	.19<	.19<	.19<	.19<	.20<	.20<
1	.21<	.21<	.21<	.22<	.22<	.22<	.22<	.23<	.24<	.24<

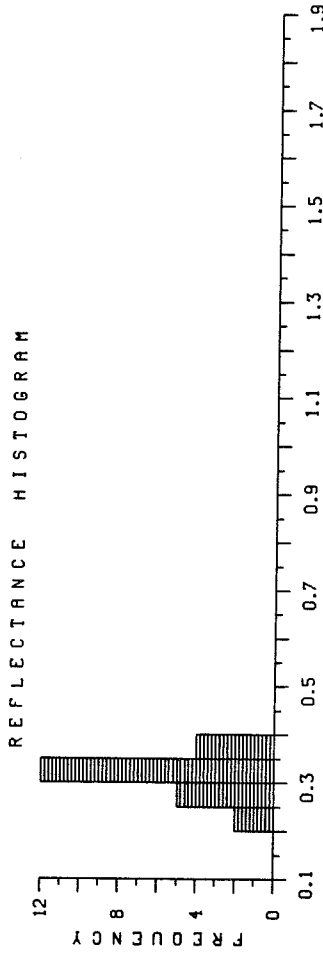
MEAN	STAND DEV	PTS	MIN	MAX	SUM
TOTAL	.20	.02	.19	.24	3.85
EDIT<	.20	.02	.16	.24	3.85



K0637C,1280-1290M,SOUTH GRIFFIN J-13

COL >	1	2	3	4	5	6	7	8	9	0
ROW	.23<	.23<	.26<	.26<	.27<	.27<	.28<	.30<	.30<	.30<
1	.30<	.31<	.31<	.32<	.32<	.33<	.33<	.34<	.34<	.35<
2	.36<	.37<	.37<							

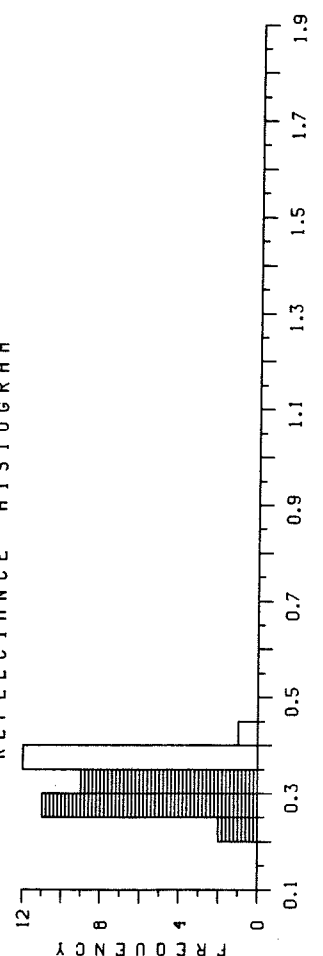
MEAN	STAND DEV	PTS	MIN	MAX	SUM
TOTAL	.31	.04	.23	.37	7.05
EDIT<	.31	.04	.23	.37	7.05



K0637B,800-810M,SOUTH GRIFFIN J-13

COL >	1	2	3	4	5	6	7	8	9	0
ROW	.22<	.24<	.25<	.25<	.27<	.27<	.27<	.27<	.28<	.29<
1	.29<	.29<	.29<	.30<	.31<	.31<	.32<	.32<	.33<	.33<
2	.33<	.33<	.35	.35	.35	.36	.36	.36	.36	.36
3	.36	.37	.38	.39	.40					

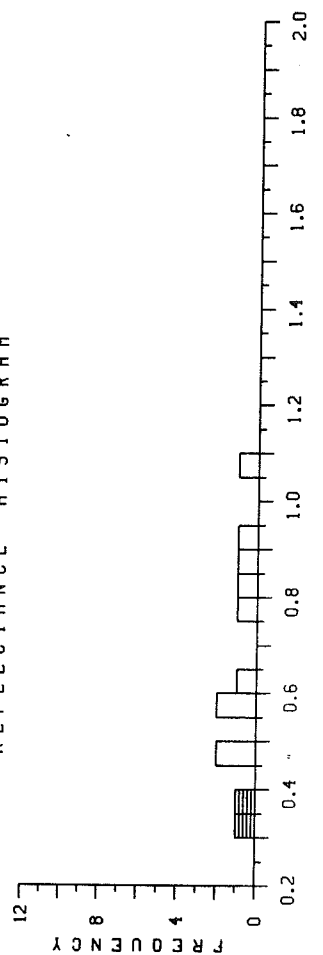
MEAN	STAND DEV	PTS	MIN	MAX	SUM
TOTAL	.32	.05	.35	.40	11.11
EDIT<	.29	.03	.22	.33	6.36



K0638A,1525-1535M,SOUTH GRIFFIN J-13

COL >	1	2	3	4	5	6	7	8	9	0
ROW	.31<	.38<	.46	.49	.57	.59	.61	.79	.82	.89
1	.93	1.05								

MEAN	STAND DEV	PTS	MIN	MAX	SUM
TOTAL	.66	.23	.12	.31	7.89
EDIT<	.35	.05	2	.31	.69

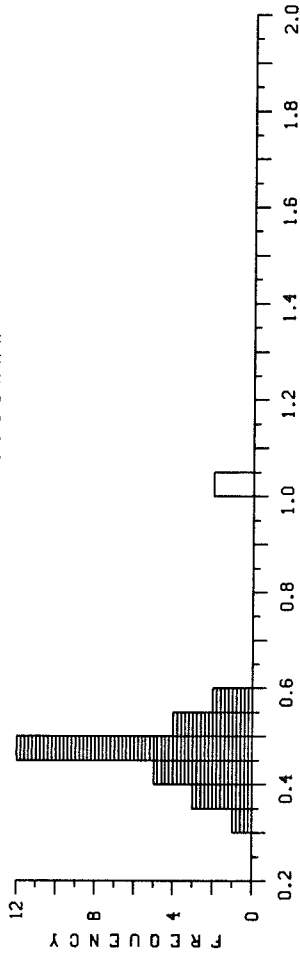


K0639A,2240-2375M,SOUTH GRIFFIN J-13

COL >	1	2	3	4	5	6	7	8	9	0
ROW	.33<	.35<	.36<	.39<	.40<	.40<	.41<	.41<	.43<	.45<
1	.45<	.46<	.46<	.46<	.47<	.47<	.47<	.48<	.48<	.49<
2	.49<	.50<	.52<	.53<	.54<	.57<	.59<	1.01	1.03	

MEAN	STAND DEV	PTS	MIN	MAX	SUM
TOTAL	.50	29	.33	1.03	14.40
EDIT<	.46	27	.33	.59	12.36

REFLECTANCE HISTOGRAM

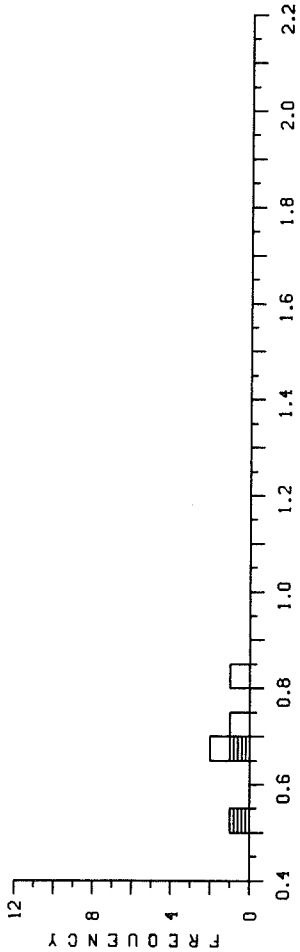


K0638B,1765-1775M,SOUTH GRIFFIN J-13

COL >	1	2	3	4	5	6	7	8	9	0
ROW	.53<	.66<	.69	.73	.84					

MEAN	STAND DEV	PTS	MIN	MAX	SUM
TOTAL	.69	5	.53	.84	3.45
EDIT<	.60	2	.53	.66	1.19

REFLECTANCE HISTOGRAM

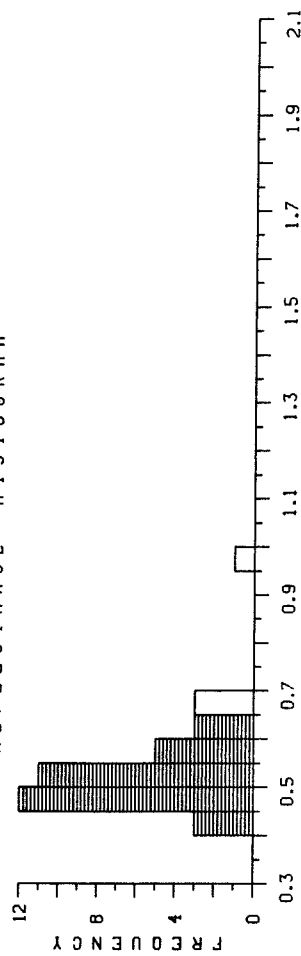


K0639B,2600-2610M,SOUTH GRIFFIN J-13

COL >	1	2	3	4	5	6	7	8	9	0
ROW	.40<	.43<	.43<	.45<	.46<	.47<	.47<	.47<	.48<	.48<
1	.49<	.49<	.49<	.49<	.49<	.50<	.50<	.50<	.52<	.53<
2	.53<	.53<	.53<	.54<	.54<	.54<	.55<	.56<	.56<	.57<
3	.59<	.60<	.60<	.61<	.65	.67	.68	.96		

MEAN	STAND DEV	PTS	MIN	MAX	SUM
TOTAL	.54	38	.40	.96	20.34
EDIT<	.51	34	.40	.61	17.38

REFLECTANCE HISTOGRAM

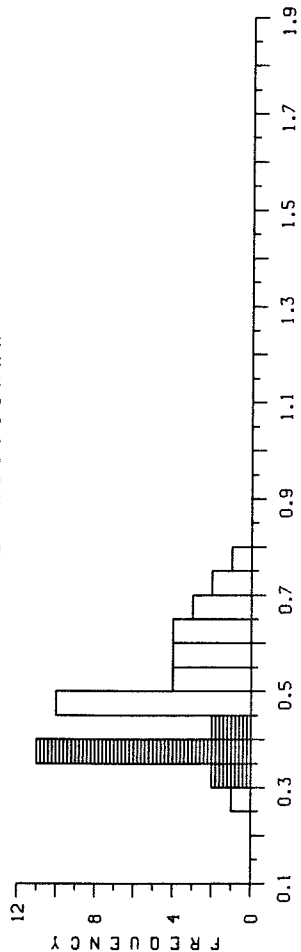


K0638C,2005-2015M,SOUTH GRIFFIN J-13

COL >	1	2	3	4	5	6	7	8	9	0
ROW	.27	.32<	.34<	.36<	.36<	.37<	.37<	.37<	.37<	.39<
1	.39<	.39<	.39<	.42<	.44<	.45	.46	.47	.47	.47
2	.47	.47	.47	.48	.48	.50	.51	.51	.52	.52
3	.55	.56	.56	.57	.60	.62	.63	.63	.66	.67
4	.69	.70	.73	.78						

MEAN	STAND DEV	PTS	MIN	MAX	SUM
TOTAL	.49	44	.27	.78	21.61
EDIT<	.38	15	.32	.44	5.66

REFLECTANCE HISTOGRAM

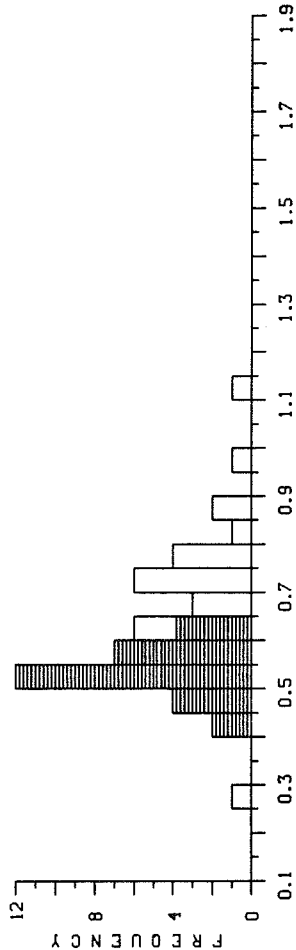


K0639C, 2840-2850M, SOUTH GRIFFIN J-13

COL >	1	2	3	4	5	6	7	8	9	0
ROW	.28	.40	.43	.47	.47	.48	.49	.50	.50	.50
1	.51	.51	.51	.52	.52	.52	.53	.53	.54	.56
2	.56	.57	.58	.58	.58	.58	.61	.62	.62	.62
3	.64	.64	.65	.65	.65	.70	.71	.73	.73	.73
4	.74	.75	.76	.77	.79	.84	.85	.87	.96	1.14

	MEAN	STAND DEV	PTS	MIN	MAX	SUM
TOTAL	.62	.15	50	.28	1.14	30.99
EDIT<	.53	.06	29	.40	.62	15.41

REFLECTANCE HISTOGRAM

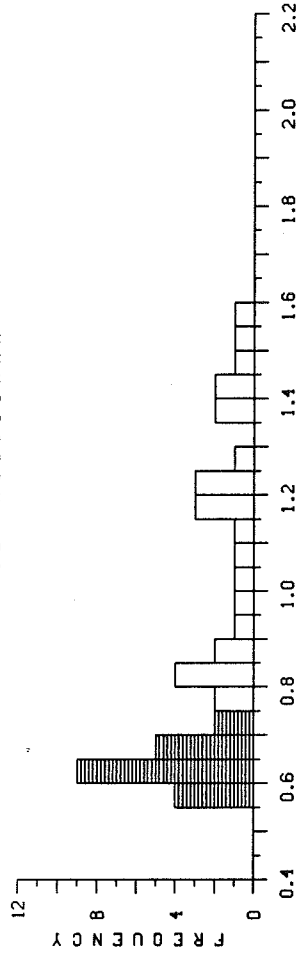


K0640B, 3205-3215M, SOUTH GRIFFIN J-13

COL >	1	2	3	4	5	6	7	8	9	0
ROW	.57	.57	.58	.59	.61	.61	.62	.62	.62	.62
1	.63	.64	.64	.66	.66	.69	.69	.69	.70	.73
2	.78	.79	.80	.80	.81	.82	.85	.87	.90	.99
3	1.00	1.05	1.10	1.15	1.16	1.19	1.21	1.22	1.24	1.27
4	1.35	1.37	1.41	1.43	1.45	1.54	1.57			

	MEAN	STAND DEV	PTS	MIN	MAX	SUM
TOTAL	.64	.05	47	.57	1.57	42.86
EDIT<	.64	.05	20	.57	.73	12.74

REFLECTANCE HISTOGRAM

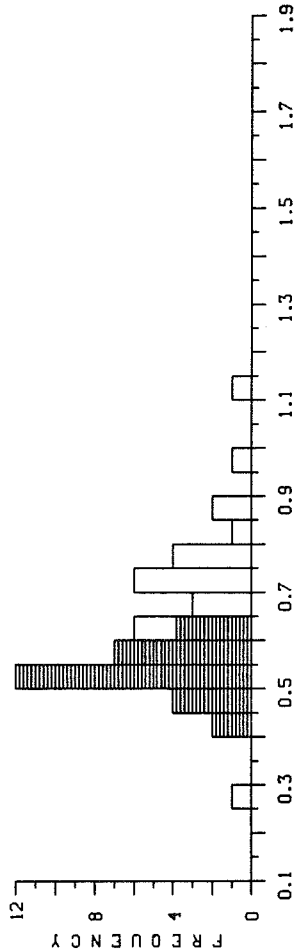


K0640A, 3085-3095M, SOUTH GRIFFIN J-13

COL >	1	2	3	4	5	6	7	8	9	0
ROW	.44	.45	.48	.49	.51	.52	.54	.55	.55	.59
1	.59	.60	.61	.61	.63	.63	.65	.65	.66	.66
2	.67	.72	.73	.73	.74	.91	.92	.92	.94	.95
3	1.03	1.04	1.09	1.22	1.24	1.28				

	MEAN	STAND DEV	PTS	MIN	MAX	SUM
TOTAL	.74	.23	36	.44	1.28	26.54
EDIT<	.60	.09	25	.44	.74	15.00

REFLECTANCE HISTOGRAM

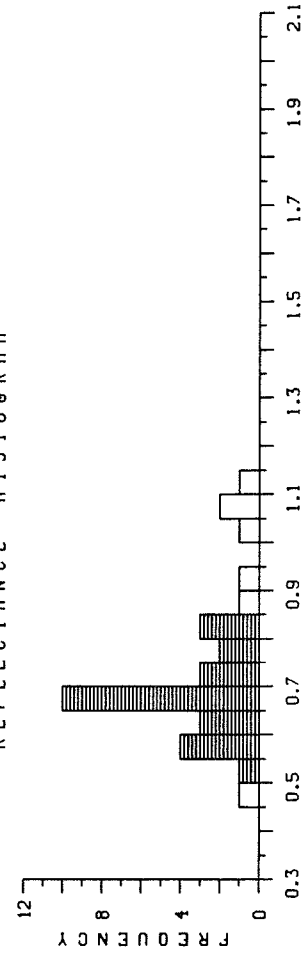


K0640C, 3325-3335M, SOUTH GRIFFIN J-13

COL >	1	2	3	4	5	6	7	8	9	0
ROW	.46	.52	.55	.56	.57	.59	.60	.60	.60	.65
1	.65	.67	.67	.67	.68	.68	.68	.68	.69	.69
2	.73	.74	.78	.78	.80	.80	.80	.80	.89	.91
3	1.08	1.09	1.13							

	MEAN	STAND DEV	PTS	MIN	MAX	SUM
TOTAL	.73	.17	33	.46	1.13	24.10
EDIT<	.67	.08	26	.52	.80	17.50

REFLECTANCE HISTOGRAM

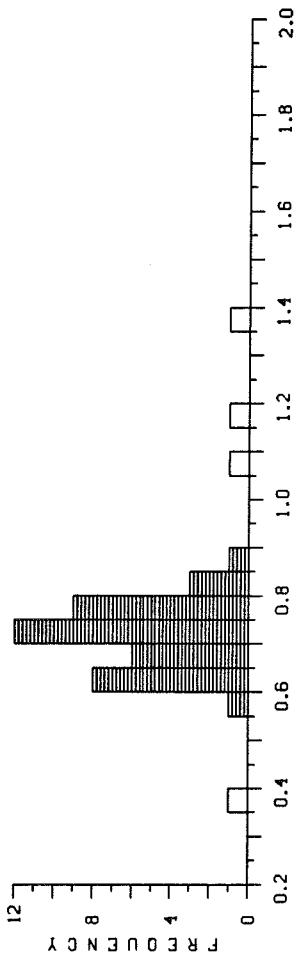


K0641A, 3585-3595M, SOUTH GRIFFIN J-13

COL >	1	2	3	4	5	6	7	8	9	0
ROW	.37	.57	.60	.60	.61	.61	.62	.62	.63	.64
1	.67	.68	.68	.69	.69	.69	.70	.70	.70	.71
2	.71	.71	.72	.72	.73	.73	.74	.74	.75	.76
3	.76	.77	.77	.78	.78	.78	.79	.82	.83	.84
4	.85	1.05	1.16	1.35						

MEAN	STAND DEV	PTS	MIN	MAX	SUM
TOTAL	.74	44	.37	1.35	32.41
EDIT<	.71	40	.57	.85	28.48

REFLECTANCE HISTOGRAM

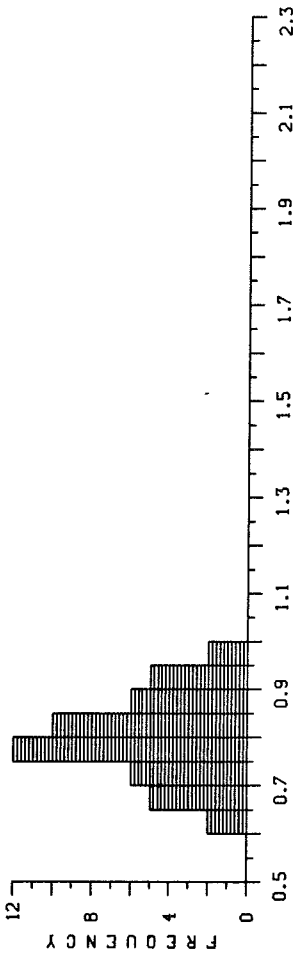


K0641C, 3885-3895M, SOUTH GRIFFIN J-13

COL >	1	2	3	4	5	6	7	8	9	0
ROW	.62	.62	.65	.67	.68	.68	.69	.71	.72	.73
1	.73	.73	.73	.75	.75	.76	.76	.76	.76	.77
2	.78	.78	.78	.78	.79	.80	.81	.81	.82	.82
3	.82	.82	.82	.83	.83	.86	.86	.86	.88	.89
4	.89	.90	.90	.90	.91	.94	.97	.97		

MEAN	STAND DEV	PTS	MIN	MAX	SUM
TOTAL	.79	48	.62	.97	38.09
EDIT<	.79	48	.62	.97	38.09

REFLECTANCE HISTOGRAM

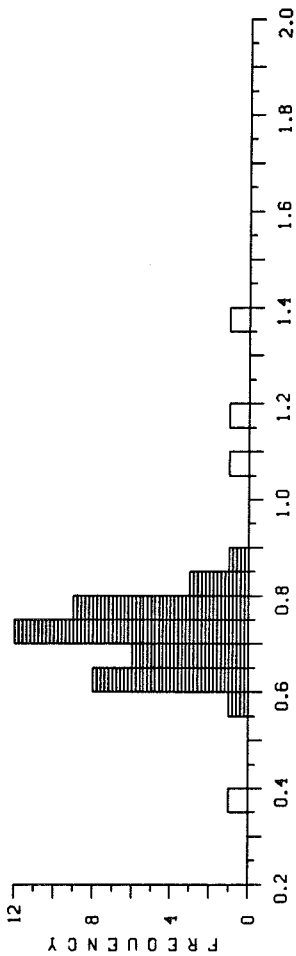


K0641B, 3735-3745M, SOUTH GRIFFIN J-13

COL >	1	2	3	4	5	6	7	8	9	0
ROW	.56	.57	.59	.65	.67	.68	.68	.70	.71	.73
1	.73	.74	.74	.75	.75	.77	.77	.77	.78	.78
2	.78	.79	.80	.81	.82	.83	.84	.84	.84	.85
3	.87	.87	.88	.90	.90	.91	.94	.94	.95	.97
4	.97	.98	1.09	1.11	1.23	1.29	1.37			

MEAN	STAND DEV	PTS	MIN	MAX	SUM
TOTAL	.84	47	.56	1.37	39.50
EDIT<	.79	33	.65	.91	25.94

REFLECTANCE HISTOGRAM

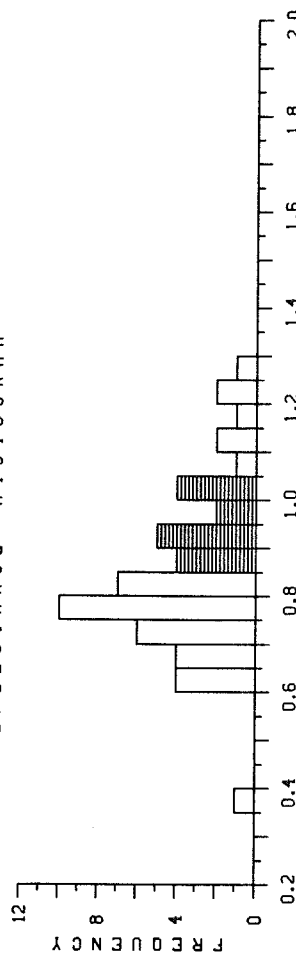


K0642A, 4035-4045M, SOUTH GRIFFIN J-13

COL >	1	2	3	4	5	6	7	8	9	0
ROW	.39	.60	.64	.64	.64	.65	.68	.69	.69	.70
1	.70	.71	.72	.73	.74	.75	.75	.77	.78	.78
2	.78	.78	.78	.79	.79	.80	.80	.81	.82	.83
3	.83	.84	.86	.86	.87	.88	.88	.89	.91	.92
4	.92	.95	.96	1.00	1.03	1.03	1.04	1.09	1.11	1.14
5	1.16	1.22	1.23	1.28						

MEAN	STAND DEV	PTS	MIN	MAX	SUM
TOTAL	.85	54	.39	1.28	45.68
EDIT<	.94	15	.86	1.04	14.05

REFLECTANCE HISTOGRAM

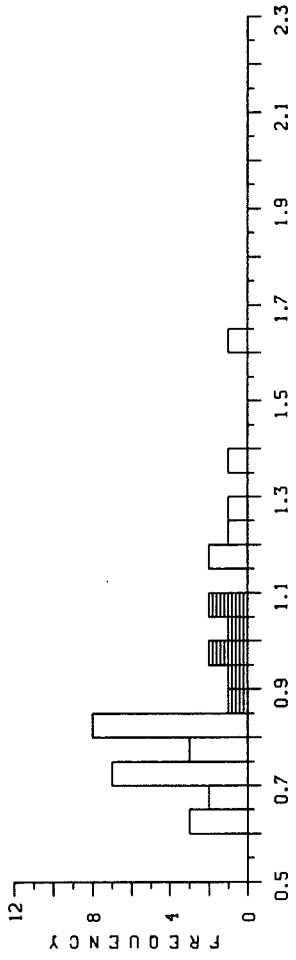


K0642B, 4245-4345M, SOUTH GRIFFIN J-13

COL >	1	2	3	4	5	6	7	8	9	0
ROW	.62	.64	.64	.66	.69	.70	.72	.72	.72	.74
1	.74	.74	.78	.79	.79	.80	.80	.80	.80	.82
2	.82	.83	.83	.85	.91	.95	.97	1.02	1.05	1.07
3	1.15	1.15	1.24	1.26	1.37	1.63				

MEAN	STAND DEV	PTS	MIN	MAX	SUM
TOTAL	.88	36	.62	1.63	31.81
EDIT<	.97	7	.85	1.07	6.82

REFLECTANCE HISTOGRAM

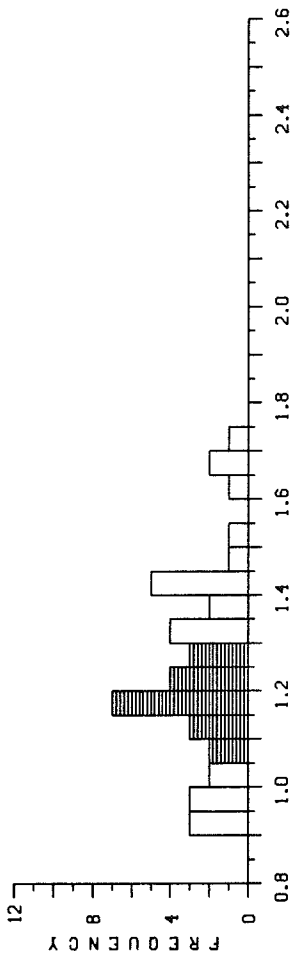


K0643A, 4935-4945M, SOUTH GRIFFIN J-13

COL >	1	2	3	4	5	6	7	8	9	0
ROW	.92	.93	.94	.95	.97	.98	1.02	1.03	1.05	1.08
1	1.11	1.13	1.14	1.15	1.15	1.15	1.16	1.17	1.18	1.18
2	1.21	1.22	1.23	1.24	1.25	1.25	1.28	1.30	1.31	1.31
3	1.33	1.35	1.39	1.41	1.41	1.42	1.44	1.44	1.45	1.54
4	1.62	1.67	1.68	1.73						

MEAN	STAND DEV	PTS	MIN	MAX	SUM
TOTAL	1.25	44	.92	1.73	54.87
EDIT<	1.18	19	1.05	1.28	22.33

REFLECTANCE HISTOGRAM

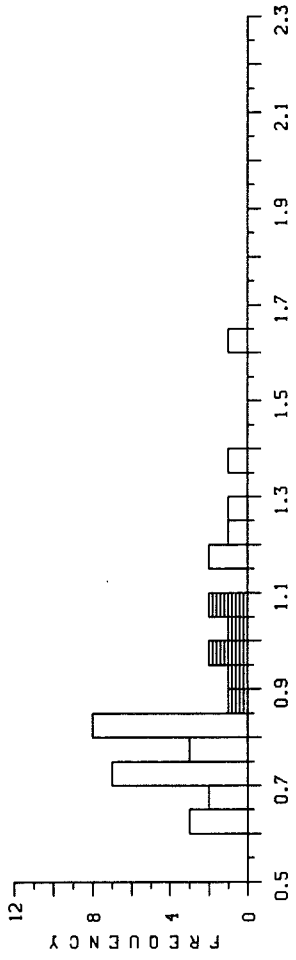


K0642C, 4695-4705M, SOUTH GRIFFIN J-13

COL >	1	2	3	4	5	6	7	8	9	0
ROW	.73	.76	.77	.83	.83	.85	.86	.86	.87	.88
1	.88	.89	.91	.92	.93	.95	.96	.96	.96	.96
2	.96	.97	.98	.99	1.00	1.02	1.04	1.05	1.07	1.08
3	1.09	1.15	1.15	1.18	1.24	1.32	1.61	1.74		

MEAN	STAND DEV	PTS	MIN	MAX	SUM
TOTAL	1.01	38	.73	1.74	38.20
EDIT<	.99	19	.91	1.09	18.80

REFLECTANCE HISTOGRAM

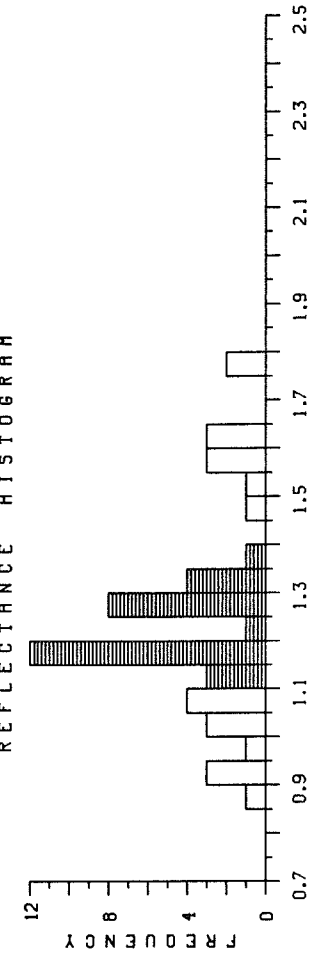


K0643B, 5055-5065M, SOUTH GRIFFIN J-13

COL >	1	2	3	4	5	6	7	8	9	0
ROW	.87	.91	.92	.93	.98	1.02	1.02	1.04	1.05	1.07
1	1.08	1.09	1.11	1.12	1.13	1.16	1.16	1.17	1.17	1.17
2	1.18	1.18	1.19	1.19	1.19	1.19	1.19	1.20	1.25	1.26
3	1.26	1.27	1.28	1.28	1.28	1.29	1.32	1.33	1.33	1.33
4	1.36	1.45	1.50	1.55	1.55	1.57	1.61	1.61	1.62	1.76
5	1.78									

MEAN	STAND DEV	PTS	MIN	MAX	SUM
TOTAL	1.25	51	.87	1.78	63.52
EDIT<	1.23	29	1.11	1.36	35.54

REFLECTANCE HISTOGRAM

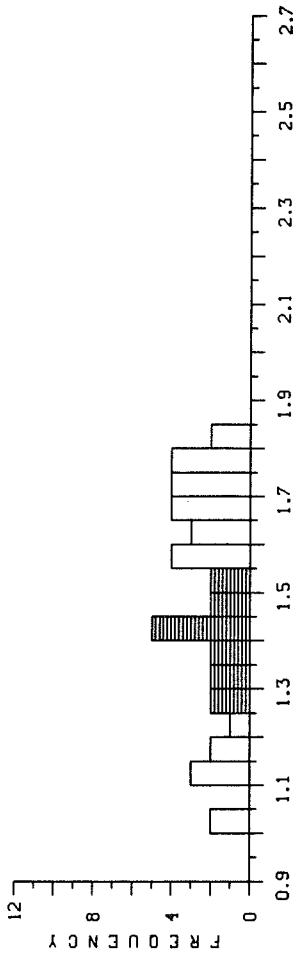


K0643C,5475-5485M,SOUTH GRIFFIN J-13

COL >	1	2	3	4	5	6	7	8	9	0
ROW	1.01	1.02	1.11	1.14	1.14	1.16	1.17	1.22	1.28<	1.29<
1	1.32<	1.34<	1.39<	1.39<	1.40<	1.40<	1.41<	1.43<	1.44<	1.48<
2	1.49<	1.50<	1.52<	1.55	1.56	1.58	1.59	1.61	1.64	1.64
3	1.65	1.67	1.68	1.69	1.71	1.71	1.72	1.73	1.76	1.77
4	1.77	1.79	1.80	1.80						

TOTAL	MEAN	STAND	DEV	PTS	MIN	MAX	SUM
EDIT<	1.41	.23	.07	44	1.01	1.80	65.47
				15	1.28	1.52	21.08

REFLECTANCE HISTOGRAM



K0644A,5655-5785M,SOUTH GRIFFIN J-13

COL >	1	2	3	4	5	6	7	8	9	0
ROW	1.13	1.21	1.28	1.35	1.37	1.39	1.40	1.41	1.41	1.42
1	1.44	1.49<	1.50<	1.50<	1.50<	1.51<	1.51<	1.52<	1.55<	1.58<
2	1.59<	1.59<	1.60<	1.60<	1.61<	1.63<	1.63<	1.63<	1.63<	1.64<
3	1.65<	1.65<	1.66<	1.66<	1.67<	1.68<	1.68<	1.70<	1.70<	1.70<
4	1.72<	1.72<	1.73<	1.74<	1.74<	1.76<	1.76<	1.77<	1.81<	1.82<
5	1.82<	1.86<	1.86<	1.87<	1.89<					

TOTAL	MEAN	STAND	DEV	PTS	MIN	MAX	SUM
EDIT<	1.67	.17	.11	55	1.13	1.89	88.24
				44	1.49	1.89	73.43

REFLECTANCE HISTOGRAM

