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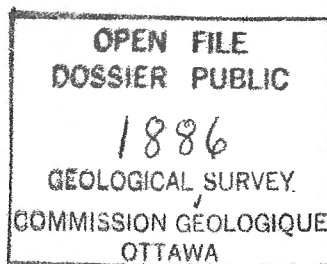
**BUJAK DAVIES GROUP**

SUMMARY OF THE PALYNOLOGICAL  
ANALYSIS OF 19 WELLS FROM THE  
GRAND BANKS

REPORT NO. 87-0066, 88-0008

APRIL 1988

CALGARY, ALBERTA





7

PALYNOLOGICAL BIOSTRATIGRAPHY OF  
ARCHER K-19, GRAND BANKS

REPORT NO. 87-0066  
AUGUST, 1987  
CALGARY, ALBERTA

BIOSTRATIGRAPHIC SUMMARY: ARCHER K-19

- 900-1130m Deflandrea heterophlycta Zone (early Oligocene)
- 1150-1490m Diphyes colligerum Zone (late Eocene)
- 1510-1790m Adnatosphaeridium reticulense Zone (middle Eocene)
- 1810-1970m Areoligera senonensis Zone (early Eocene)
- 1990-2090m Palaeoperidinium pyrophorum Zone (early Paleocene)
- 2110-2150m Stellatopollis sp. A Zone: Subzones 11A-B (early  
Albian)
- 2170-2210m Parvisaccites amplus Zone: Subzone 10C (late Aptian)
- 2230-2240m Pseudoceratium pelliferum Zone: Subzones 7A-B  
(early Valanginian)
- 2260-2330m Cerebropollenites macroverrucosus Zone: Subzones 6A-B  
(late Berriasian to early Valanginian)
- 2350-2420m Ctenidodinium panneum Zone: Subzone 5A (Portlandian  
to early Berriasian)
- 2440-2450m Gonyaulacysta dualis Zone: Subzones 4A-  
(late Kimmeridgian to Portlandian)
- 2470-2700m Subtilisphaera paeminosa Zone: Subzone 3C (late  
Kimmeridgian)

- 2691-2887m Subtilisphaera paeminosa Zone: Subzones 3A-B (middle to late Kimmeridgian)
- 2890-2960m Pilosisorites sp. A Zone: Subzone 2C (middle Kimmeridgian)
- 2980-3230m Pilosisorites sp. A Zone: Subzone 2B (early to middle Kimmeridgian)
- 3250-3650m Pilosisorites sp. A Zone: Subzone 2A (early Kimmeridgian)
- 3640-3650m possible Scriniodinium crystallinum Zone: Subzone 1B (possible early Kimmeridgian)
- 3668-4090m Gonyaulacysta jurassica Zone or older (Oxfordian or older)
- 4120-4290m possible Diacanthum filapicatum Zone (possible Bathonian)

ARCHER K-19: FORMATIONS

Interval considered: 900-4290m

From: K.D. McAlpine, February 16, 1988

|            |                               |
|------------|-------------------------------|
| 900-1908m  | Banquereau                    |
| 1908-1929m | South Mara unit               |
| 1929-1970m | Dawson Canyon (Petrel Member) |
| 1970-1974m | Dawson Canyon                 |
| 1974-2112m | Nautilus Shale                |
| 2112-2170m | Ben Nevis                     |
| 2170-2423m | Avalon                        |
| 2423-2445m | Eastern Shoals                |
| 2445-2471m | Whiterose Shale (upper)       |
| 2471-2486m | "B" Marker                    |
| 2486-2500m | Whiterose Shale (lower)       |
| 2500-2609m | Hibernia                      |
| 2609-3019m | Hibernia (Fortune Bay Shale)  |
| 3019-3172m | Jeanne d'Arc                  |
| 3172-3279m | Rankin                        |
| 3279-3449m | Rankin (Egret Member)         |
| 3449-4290m | Rankin                        |





PALYNOLOGICAL ANALYSIS OF THE  
INTERVAL 1600-5145M:  
BACCALIEU I-78

REPORT #87-0066  
DECEMBER, 1987

CALGARY, ALBERTA

BIOSTRATIGRAPHIC SUMMARY

|            |   |
|------------|---|
| 1600-1640m | Probable Eocene (undifferentiated)  |
| 1660-1755m | Possible Middle to Late Cretaceous (undifferentiated)                                   |
| 1775-1825m | Possibly Barremian or older (undifferentiated)  |
| 1845-2171m | <u>Cerebropollenites macroverrucosus</u> Zone (late Berriasian<br>to early Valanginian) |
| 2171-2415m | <u>Ctenidodinium panneum</u> Zone: Subzone 5B (early<br>Berriasian)                     |
| 2435-2805m | Possibly <u>Ctenidodinium panneum</u> Zone: Subzone 5A (early<br>Berriasian)            |
| 2825-2865m | <u>Subtilisphaera paeminosa</u> Zone: Subzone 3C (late<br>Kimmeridgian)                 |
| 2885-2955m | <u>Subtilisphaera paeminosa</u> Zone: Subzone 3B (late<br>Kimmeridgian)                 |
| 2975-3288m | <u>Subtilisphaera paeminosa</u> Zone: Subzone 3A (middle<br>Kimmeridgian)               |
| 3288-3390m | <u>Pilosisporites</u> sp. A Zone: Subzone 2C (middle<br>Kimmeridgian)                   |
| 3410-3775m | Possible <u>Pilosisporites</u> sp. A Zone: Subzone 2B (early to<br>middle Kimmeridgian) |

3795-4345m      Pilosporites sp. A Zone: Subzone 2A (early  
Kimmeridgian)

4365-5145m      Undifferentiated Jurassic

Remarks: The combined effect of low palynomorph recovery, poor preservation, high frequency of cavings, high abundances of lignitic mud additives and intense red staining have reduced considerably the reliability of the identification of palynological species and the age determinations.

BACCALIEU I-78: FORMATIONS

Interval considered: 1600-5145m

From: K.D. McAlpine, February 18, 1988

|            |                       |
|------------|-----------------------|
| 1600-1712m | Banquereau            |
| 1712-1845m | Nautilus Shale        |
| 1845-3190m | Whiterose Shale       |
| 3190-3274m | Hibernia              |
| 3274-3431m | Fortune Bay Shale     |
| 3431-3648m | Jeanne d'Arc          |
| 3648-4208m | Rankin                |
| 4208-4334m | Rankin (Egret Member) |
| 4334-4561m | Rankin                |
| 4561-4975m | Voyager               |
| 4975-5145m | Downing               |



1

PALYNOLOGICAL BIOSTRATIGRAPHY OF  
THE INTERVAL 550-4865M,  
BEN NEVIS I-45, GRAND BANKS

REPORT NO. 87-0066  
AUGUST, 1987  
CALGARY, ALBERTA

BIOSTRATIGRAPHIC SUMMARY: BEN NEVIS I-45

- 550- 770m Deflandrea heterophlycta Zone (early Oligocene)
- 790- 920m Diphyes colligerum Zone (late Eocene)
- 940-1130m possible Adnatosphaeridium reticulense Zone (possible  
middle Eocene)
- 1150-1490m Adnatosphaeridium reticulense Zone (middle Eocene)
- 1510-1610m Areoligera senonensis Zone (early Eocene)
- 1630-1760m Palaeoperidinium pyrophorum Zone (early Paleocene)
- 1780-1790m Pervosphaeridium truncigerum Zone (Santonian)
- 1810-1910m Surculosphaeridium longifurcatum Zone: Subzones  
14A-B (Turonian)
- 1930-2020m Kiokansium polypes Zone: Subzone 13B (late  
Cenomanian)
- 2050-2060m Kiokansium polypes Zone: Subzone 13A (early  
Cenomanian)
- 2080-2570m Parvisaccites amplus Zone: Subzones 10A-C  
(Aptian)
- 2590-2650m Subtilisphaera terrula Zone: Subzones 9A-D  
(Hauterivian to Barremian undifferentiated)

- 2680-2840m Muderongia staurota Zone: Subzones 8A-C (late Valanginian to early Hauterivian undifferentiated)
- 2860-2960m Pseudoceratium pelliiferum Zone: Subzone 7C (middle Valanginian)
- 2980-3110m Pseudoceratium pelliiferum Zone: Subzone 7B (early Valanginian)
- 3130-3260m Cerebropollenites macroverrucosus Zone to Pseudoceratium pelliiferum Zone: Subzones 6A to 7A (late Berriasian to early Valanginian undifferentiated)
- 3280-3350m Ctenidodinium panneum Zone: Subzone 5C (early Berriasian)
- 3370-3530m Ctenidodinium panneum Zone: Subzone 5B (early Berriasian)
- 3550-4010m Ctenidodinium panneum Zone: Subzone 5A (Portlandian to early Berriasian)
- 4030-4365m possible Gonyaulacysta dualis Zone: Subzone 4A-B (possible late Kimmeridgian to Portlandian)
- 4265-4365m Subtilisphaera paeminosa Zone: Subzone 3B (late Kimmeridgian)
- 4505-4515m possible Pilosisorites sp. A Zone: Subzone 2B (possible early to middle Kimmeridgian)



4535-4575m Pilosisorites sp. A Zone: Subzone 2B (early to middle  
Kimmeridgian)

4595-4865m Pilosisorites sp. A Zone: Subzone 2A (early  
Kimmeridgian)

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Ben Nevis I-45 .....4

BEN NEVIS I-45: FORMATIONS

Interval considered: No data available



PALYNOLOGICAL BIOSTRATIGRAPHY  
OF THE INTERVAL 995-4450M,  
GOLCONDA C-64

REPORT NO. 87-0066  
NOVEMBER, 1987

CALGARY, ALBERTA

|             |  |
|-------------|--|
| 995-1105m:  | probable <u>Areosphaeridium arcuatum</u> Zone (probable early Oligocene)   |
| 1025-1085m: | <u>Areosphaeridium arcuatum</u> Zone (early Oligocene)   |
| 1115-1345m: | <u>Diphyes colligerum</u> Zone (late Eocene)   |
| 1355-1765m: | <u>Adnatosphaeridium reticulense</u> Zone (middle Eocene)  |
| 1775-1795m: | <u>Kiokansium polypes</u> Zone: Subzone 13A (early Cenomanian)   |
| 1805-1825m: | <u>Pseudoceratium pelliiferum</u> Zone: Subzones 7A-D (early to middle Valanginian)  |
| 1835-1855m: | <u>Scriniodinium crystallinum</u> Zone: Subzone 1A (early Kimmeridgian) to <u>Pilososporites</u> Sp. A Zone: Subzone 2A (early Kimmeridgian) |
| 1865-2035m: | <u>Gonyaulacysta jurassica</u> Zone: Subzone 0B (late Oxfordian)   |
| 2045-2665m: | <u>Hystrihogonyaulax</u> #EA Zone: Subzone 0A (early Oxfordian)  |
| 2675-3295m: | <u>Ctenidodinium sellwoodii</u> Zone (late Bathonian to early Callovian)   |
| 3305-4255m: | probable Middle Jurassic (undifferentiated)  |
| 4265-4450m: | probable Early Jurassic  |

GOLCONDA C-64: FORMATIONS

Interval considered: 995-4440m

From: K.D. McAlpine, February 18, 1988

|            |                        |
|------------|------------------------|
| 995-1777m  | Banquereau             |
| 1777-1872m | Rankin (Egret Member)  |
| 1872-2353m | Rankin                 |
| 2353-3055m | Voyager                |
| 3055-3707m | Downing                |
| 3707-3802m | Downing (Whale Member) |
| 3802-4440m | Downing                |



PALYNOLOGICAL ANALYSIS OF THE  
INTERVAL 720-5170FT,  
GRAND FALLS H-09, GRAND BANKS

REPORT NO. 87-0066

February 1988

CALGARY, ALBERTA



BIOSTRATIGRAPHIC SUMMARY

- 720- 750ft: Diphyes colligerum Zone and possible Adnatosphaeridium reticulense Zone (?middle and late Eocene)
- 900- 930ft: Areoligera senonensis Zone (early Eocene)
- 990-1110ft: Ceratiopsis speciosa Zone (late Paleocene)
- 1170-1290ft: possible Palaeoperidinium pyrophorum Zone (possible early Paleocene)
- 1350-1560ft: Dinogymnium euclaense Zone (Maastrichtian)
- 1620-1890ft: Odontochitina operculata Zone (Campanian)
- 1950-2430ft: Oligosphaeridium pulcherrimum Zone to Pervosphaeridium truncigerum Zone (Coniacian to Santonian)
- 2490-2520ft: Surculosphaeridium longifurcatum Peak Zone (Turonian)
- 2580-3150ft: Chichaouadinium sp. A Zone (middle to late Albian)
- 3210-3240ft: Parvisaccites amplius Zone (Aptian)
- 3300-3510ft: possible Subtilisphaera terrula Zone or older  
(possible Barremian or older)
- 3540-4050ft: Ctenidodinium panneum Zone or older (Portlandian to early Berriasian or older)

4110-5130ft: Gonyaulacysta jurassica Zone (Oxfordian)

5160-5190ft: Zone not assigned (possible Liassic to Bajocian)

GRAND FALLS H-09: FORMATIONS

Interval considered: 720-5180ft

From: EPGS-STRAT. 19-77JAW

|             |                                    |
|-------------|------------------------------------|
| 720-1046ft  | Banquereau                         |
| 1046-2844ft | Dawson Canyon                      |
| 2844-2880ft | Dawson Canyon (Petrel Member)      |
| 2880-2935ft | Dawson Canyon                      |
| 2935-3385ft | Logan Canyon (Eider Member)        |
| 3385-4094ft | Mic Mac                            |
| 4094-4750ft | Abanaki                            |
| 4750-5180ft | Middle Jurassic (Green-grey Shale) |



PALYNOLOGICAL BIOSTRATIGRAPHY  
OF HEBRON I-13, GRAND BANKS

REPORT #87-0066

CALGARY, ALBERTA

BIOSTRATIGRAPHIC SUMMARY: HEBRON I-13

- 390- 580m Deflandrea heterophlycta Zone (early Oligocene)
- 600- 760m Diphyes colligerum Zone (late Eocene)
- 780-1000m Adnatosphaeridium reticulense Zone (middle Eocene)
- 1020-1150m possible Areoligera senonensis Zone (possible early Eocene)
- 1170-1360m Areoligera senonensis Zone (early Eocene)
- 1380-1505m Palaeoperidinium pyrophorum Zone (early Paleocene)
- 1505-1515m Dinogymnium euclaense Zone (Maastrichtian)
- 1535-1570m Pervosphaeridium truncigerum Zone to Odontochitina operculata Zone (Santonian to Campanian)
- 1590-1600m Oligosphaeridium pulcherrimum Zone (Coniacian)
- 1620-1630m Surculosphaeridium longifurcatum Zone: Subzone 14B (late Turonian)
- 1650-1660m Surculosphaeridium longifurcatum Zone: Subzone 14A (early Turonian)
- 1680-1690m Kiokansium polypes Zone: Subzone 13B (late Cenomanian)
- 1710-1720m Kiokansium polypes Zone: Subzone 13A (early Cenomanian)

- 1770-1780m Chichaouadinium sp. A Zone: Subzones 12B-C (late-middle Albian)
- 1800-1830m Chichaouadinium sp. A Zone: Subzone 12A (middle Albian)
- 1850-1975m Stellatopollis sp. A Zone: Subzone 11A (early Albian)
- 1995-2055m Subtilisphaera terrula Zone: Subzones 9A-B (early to late Hauterivian)
- 2075-2230m Muderongia staurota Zone: Subzone 8C (early Hauterivian)
- 2250-2260m Muderongia staurota Zone: Subzone 8B (late Valanginian)
- 2280-2350m Muderongia staurota Zone: Subzone 8A (late Valanginian)
- 2370-2470m Pseudoceratium pelliiferum Zone: Subzone 7C (middle Valanginian)
- 2490-2620m Pseudoceratium pelliiferum Zone: Subzone 7A (early Valanginian)
- 2640-2885m Cerebropollenites macroverrucosus Zone: Subzone 6B (early Valanginian)
- 2905-3000m Cerebropollenites macroverrucosus Zone: Subzone 6A (late Berriasian)

- 3020-3090m Ctenidodinium panneum Zone: Subzone 5C (early Berriasian)
- 3110-3270m Ctenidodinium panneum Zone: Subzone 5A (Portlandian to early Berriasian)
- 3290-3300m Gonyaulacysta dualis Zone: Subzones 4A-B (Portlandian to late Kimmeridgian)
- 3320-3510m Subtilisphaera paeminosa Zone: Subzone 3C (late Kimmeridgian)
- 3530-3630m Subtilisphaera paeminosa Zone: Subzones 3A-B (middle to late Kimmeridgian)
- 3650-3775m Pilosisorites sp. A Zone: Subzone 2C (middle Kimmeridgian)
- 3835-4030m Pilosisorites sp. A Zone: Subzone 2B (early to middle Kimmeridgian)
- 4050-4540m Pilosisorites sp. A Zone: Subzone 2A (early Kimmeridgian)
- 4560-4720m Gonyaulacysta jurassica Zone (late Oxfordian)



HEBRON I-13: FORMATIONS

Interval considered: No data available



PALYNOLOGICAL ANALYSIS OF THE  
INTERVAL 980-4505M,  
LINNET E-36, GRAND BANKS

REPORT No. 86-0066  
February, 1988

CALGARY, ALBERTA

BIOSTRATIGRAPHIC SUMMARY

- 980-1110m: Deflandrea heterophlycta Zone (early Oligocene)
- 1130-1650m: Diphyes colligerum Zone (late Eocene)
- 1670-2110m: Adnatosphaeridium reticulense Zone (middle Eocene)
- 2130-2470m: Areoligera senonensis Zone (early Eocene)
- 2490-2500m: Ceratiopsis speciosa Zone (late Paleocene)
- 2520-2530m: Palaeoperidinium pyrophorum Zone (early Paleocene)
- 2550-2650m: Dinogymnium euclaense Zone (Maastrichtian)
- 2670-2710m: Odontochitina operculata Zone (Campanian)
- 2730-2770m: Zone not differentiated (Coniacian to Santonian)
- 2790-2800m: Surculosphaeridium longifurcatum Peak Zone  
(Turonian)
- 2820-3130m: Kiokansium polypes Zone (Cenomanian)
- 3150-3220m: Chichaouadinium vestitum Zone (Albian)
- 3240-3760m: Parvisaccites amplius Zone (early Albian)
- 3780-4120m: Subtilisphaera perlucida Zone (Aptian)

Bujak Davies Group

Linnet E-36: D215. . . . 2

4140-4240m: Possible Rubospora Zone (possible Mississippian)

4260-4505m: Zone not assigned (Ordovician to Silurian)

LINNET E 63: FORMATIONS

Interval considered: No data available



PALYNOLOGICAL BIOSTRATIGRAPHY  
OF THE INTERVAL 2320-4570M,  
NORTHCOR ET AL., NARWHAL F-99

REPORT # 87-0066  
NOVEMBER, 1987

CALGARY, ALBERTA



PALYNOLOGICAL SUMMARY: NARWHAL F-99

- 2320-2390m: Cannosphaeropsis sp. A Zone (late Miocene or older)
- 2390-2450m: Pentadinium laticinctum Zone (middle Miocene or older)
- 2420-2860m: Areosphaeridium arcuatum Zone (early Oligocene)
- 2860-2890m: Diphyes colligerum Zone (late Eocene)
- 2890-3270m: Adnatosphaeridium reticulense Zone and Apectodinium homomorphum Zone undifferentiated (early to (middle Eocene)
- 3280-3290m: Odontochitina operculata Zone (Campanian)
- 3305-3310m: Possible Surculosphaeridium longifurcatum Zone (early to late Turonian)
- 3310-3315m: Kiokansum polypes Zone (early to late Cenomanian)
- 3315-3370m: Chichaouadinium sp. A Zone (middle to late Albian)
- 3370-3420m: Stellatopollis sp. A Zone (early Albian)
- 3420-3450m: Parvisaccites amplius Zone (late Aptian)
- 3450-3490m: Subtilisphaera terrula Zone (early to late Barremian)

4475-4570m: No zonal Assignment (possible Late Jurassic)

NARWHAL F-99: FORMATIONS

Interval considered: No data available



PALYNOLOGICAL ANALYSIS OF THE  
INTERVAL 915-5280M:  
NORTH BEN NEVIS P-93

REPORT NO. 87-0066  
DECEMBER, 1987

CALGARY, ALBERTA

BIOSTRATIGRAPHIC SUMMARY

|            |   |
|------------|---|
| 915-1070m  | <u>Deflandrea heterophlycta</u> Zone (early Oligocene)                                    |
| 1090-1400m | <u>Diphyes colligerum</u> Zone (late Eocene)  |
| 1415-1655m | <u>Adnatosphaeridium reticulense</u> Zone (middle Eocene)                                 |
| 1695-1975m | <u>Areoligera senonensis</u> Zone (early Eocene)  |
| 1995-2035m | <u>Ceratiopsis speciosa</u> Zone (late Paleocene)   |
| 2055-2155m | <u>Palaeoperidinium pyrophorum</u> Zone (early Paleocene)                                 |
| 2180-2190m | <u>Dinogymnium euclaense</u> Zone (Maastrichtian)   |
| 2210-2280m | <u>Odontochitina operculata</u> Zone (Campanian)  |
| 2300-2310m | <u>Surculosphaeridium longifurcatum</u> Zone: Subzones 14 A/B<br>(early to late Turonian) |
| 2330-2490m | <u>Kiokansium polypes</u> Zone: Subzone 13 A/B (early to late<br>Cenomanian)              |
| 2510-2640m | <u>Chichaouadinium</u> Zone: Subzone 12 A-C (middle to late<br>Albian)                    |
| 2660-2840m | <u>Parvisaccites amplus</u> Zone: Subzone 10C (late Aptian)                               |
| 2860-3040m | <u>Parvisaccites amplus</u> Zone : Subzone 10B ("mid" Aptian)                             |

BIOSTRATIGRAPHIC SUMMARY cont'd

- 3040-3330m Parvisaccites amplius Zone: Subzone 10A (early Aptian)
- 3345-3475m Subtilisphaera terrula Zone: Subzone 9D (late  
Barremian)
- 3495-3565m Subtilisphaera terrula Zone: Subzone 9B/C (early  
Barremian to late Hauterivian)
- 3585-3655m Subtilisphaera terrula Zone: Subzone 9A (early to late  
Hauterivian)
- 3675-3715m Muderongia staurota Zone: Subzones 8A/B (late  
Valanginian)
- 3735-3775m Pseudoceratium pelliferum Zone: Subzone 7D (middle  
Valanginian)
- 3795-3885m Pseudoceratium pelliferum Zone: Subzone 7C (middle  
Valanginian)
- 3905-4005m Pseudoceratium pelliferum Zone: Subzone 7B (early  
Valanginian)
- 4025-4335m Pseudoceratium pelliferum Zone: Subzone 7A (early  
Valanginian)
- 4355-4455m Cerebropollenites macroverrucosus Zone: Subzones 6A/B  
(early Valanginian to Late Berriasian)
- 4475-4575m probable Ctenidodinium panneum Zone: Subzone 5C (early  
Berriasian)

BIOSTRATIGRAPHIC SUMMARY cont'd

|            |  |
|------------|--|
| 4595-4725m | <u>Ctenidodinium</u> <u>panneum</u> Zone: Subzone B (early<br>Barriasian)                        |
| 4745-4905m | <u>Ctenidodinium</u> <u>panneum</u> Zone: Subzone A (Portlandian to<br>early Berriasian)         |
| 4925-5165m | <u>Glossodinium</u> <u>dimorphum</u> Zone: Subzone B (Portlandian)                               |
| 5180-5215m | <u>Glossodinium</u> <u>dimorphum</u> Zone: Subzone A (late<br>Kimmeridgian to early Portlandian) |
| 5215-5280m | Indeterminate  |



NORTH BEN NEVIS P-93: FORMATIONS

Interval considered: 915-5282m

From: K.D. McAlpine, February 16, 1988

|            |                               |
|------------|-------------------------------|
| 915-1882m  | Banquereau                    |
| 1882-2104m | Banquereau (South Mara unit)  |
| 2104-2328m | Dawson Canyon                 |
| 2328-2387m | Dawson Canyon (Petrel Member) |
| 2387-2406m | Dawson Canyon                 |
| 2406-2735m | Nautilus Shale                |
| 2735-2975m | Ben Nevis                     |
| 2975-3117m | Ben Nevis (Lower Ben Nevis)   |
| 3117-3513m | Avalon                        |
| 3513-4480m | Whiterose Shale (upper)       |
| 4480-4536m | "B" Marker                    |
| 4536-4796m | Hibernia (Hebron Well Member) |
| 4796-5262m | Hibernia                      |
| 5262-5282m | Fortune Bay Shale             |



PALYNOLOGICAL BIOSTRATIGRAPHY  
OF THE INTERVAL 395-4203M,  
PANTHER P-52

REPORT # 87-0066  
NOVEMBER, 1987

CALGARY, ALBERTA

PALYNOLOGICAL SUMMARY: PANTHER P-52

- 395-525m: Cannosphaeropsis sp. A Zone or older (late Miocene or older)
- 555-675m: Apteodinium sp. B Zone (early Miocene)
- 695-705m: Chiropteridium mespilanum Zone (late Oligocene)
- 725-1115m: Areosphaeridium arcuatum Zone (early Oligocene)
- 1135-1625m: Diphyes colligerum Zone (late Eocene)
- 1645-2235m: Adnatosphaeridium reticulense Zone (middle Eocene)
- 2255-2625m: Areoligera senonensis Zone (early Eocene)
- 2645-2655m: possible Palaeoperidinium pyrophorum Zone (possible early Paleocene)
- 2675-2805m: Pilosisorites sp. A Zone: Subzone 2C (middle Kimmeridgian)
- 2825-2865m: Pilosisorites sp. A Zone: Subzone 2B (early to middle Kimmeridgian)
- 2885-2955m: Pilosisorites sp. A Zone: Subzone 2A (early Kimmeridgian)
- 2975-4080m: Scriniodinium crystallinum Zone: Subzones 1A-B (early Kimmeridgian)
- 4110-4203m: Gonyaulacysta jurassica Zone: Subzone OB (late Oxfordian)

PANTHER P-52: FORMATIONS

Interval considered: 395-4203m

From: K.D. McAlpine, February 17, 1988

|            |                       |
|------------|-----------------------|
| 395-2642m  | Banquereau            |
| 2642-2653m | (Unnamed limestone)   |
| 2653-2846m | Fortune Bay Shale     |
| 2846-3141m | Jeanne d'Arc          |
| 3141-3257m | Rankin                |
| 3257-3408m | Rankin (Egret Member) |
| 3408-3790m | Rankin                |
| 3790-4203m | Voyager               |



PALYNOLOGICAL BIOSTRATIGRAPHY OF THE INTERVAL  
710-3970m, RANKIN M-36, GRAND BANKS

REPORT NO. 87-0066  
JULY, 1987

CALGARY, ALBERTA

BIOSTRATIGRAPHIC SUMMARY: RANKIN M-36

- 710- 880m Deflandrea heterophlycta Zone (early Oligocene)
- 910- 920m Diphyes colligerum Zone (late Eocene)
- 950-1000m Adnatosphaeridium reticulense Zone (middle Eocene)
- 1025-1085m possible Areoligera senonensis Zone (possible early  
Eocene)
- 1115-1365m Dinogymnium euclaense Zone (Maastrichtian)
- 1395-1445m Odontochitina operculata Zone (Campanian)
- 1475-1525m Surculosphaeridium longifurcatum Zone: Subzones 14A-B  
(Turonian)
- 1555-1645m Kiokansium polypes Zone: Subzone 13B (late  
Cenomanian)
- 1675-1685m Kiokansium polypes Zone: Subzone 13A (early  
Cenomanian)
- 1715-1840m Chichaouadinium Zone: Subzone 12C (late Albian)
- 1840-1850m Chichaouadinium Zone: Subzone 12B (middle Albian)
- 1860-1960m Chichaouadinium Zone: Subzone 12A (middle Albian)
- 1960-2005m Stellatopollis sp. A Zone: Subzones 11A-B (early  
Albian)



- 2025-2170m Parvisaccites amplius Zone: Subzone 10C (late Aptian)
- 2170-2280m Pilosisorites sp. A Zone: Subzone 2C (middle Kimmeridgian)
- 2300-2370m Pilosisorites sp. A Zone: Subzone 2B (early to middle Kimmeridgian)
- 2385-2590m Pilosisorites sp. A Zone: Subzone 2A (early Kimmeridgian)
- 2610-2680m possible Scriniodinium crystallinum Zone: Subzone 1B (early Kimmeridgian)
- 2700-2810m Scriniodinium crystallinum Zone: Subzone 1A (early Kimmeridgian)
- 2840-3025m Gonyaulacysta jurassica Zone (late Oxfordian)
- 3055-3185m Hystrihogonyaulax #EA Zone (early Oxfordian)
- 3205-3265m Gonyaulacysta adecta Zone (late Callovian)
- 3285-3375m Ctenidodinium sellwoodii Zone (early Callovian)
- 3405-3970m Diacanthum filapicatum Zone (late Bathonian)

RANKIN M-36: FORMATIONS

Interval considered: 710-3970m

From: K.D. McAlpine, February 12, 1988

|            |                               |
|------------|-------------------------------|
| 710-1011m  | Banquereau                    |
| 1011-1063m | South Mara unit               |
| 1063-1447m | Dawson Canyon                 |
| 1447-1582m | Dawson Canyon (Petrel Member) |
| 1582-1730m | Eider                         |
| 1730-2033m | Nautilus Shale                |
| 2033-2166m | Ben Nevis                     |
| 2166-2233m | Fortune Bay Shale             |
| 2233-2386m | Jeanne d'Arc                  |
| 2386-2436m | Rankin                        |
| 2436-2491m | Rankin (Egret Member)         |
| 2491-3144m | Rankin                        |
| 3144-3752m | Voyager                       |
| 3752-3970m | Downing                       |



PALYNOLOGICAL ANALYSIS OF THE  
INTERVAL 800-5035M, SOUTH MARA C-13 WELL,  
GRAND BANKS

REPORT NO. 88-0008

MARCH 1988

CALGARY, ALBERTA

BIOSTRATIGRAPHIC SUMMARY

- 800- 960m: Diphyes colligerum Zone (late Eocene)
- 980-1350m: Adnatosphaeridium reticulense Zone (middle Eocene)
- 1370-1890m: Areoligera senonensis Peak Zone (early Eocene)
- 1910-1950m: Ceratiopsis speciosa Zone (late Paleocene)
- 1970-2040m: Palaeoperidinium pyrophorum Zone (early Paleocene)
- 2060-2100m: Pervosphaeridium truncigerum Zone to Dinogymnium euclaense Zone (Santonian to Maastrichtian)
- 2120-2190m: Oligosphaeridium pulcherrimum Zone (Coniacian)
- 2210-2340m: Surculosphaeridium longifurcatum Zone (Turonian)
- 2360-2460m: Chichaouadinium sp. A Zone: Subzone 12C (late Albian)
- 2480-2610m: Chichaouadinium sp. A Zone: Subzone 12B (middle Albian)
- 2625-2665m: Chichaouadinium sp. A Zone: Subzone 12A (middle Albian)
- 2685-2845m: Parvisaccites amplus Zone: Subzone 10C (late Aptian)
- 2865-2985m: Parvisaccites amplus Zone: Subzone 10A (early Aptian)
- 3015-3115m: Subtilisphaera terrula Zone: Subzone 9D (late Barremian)

- 3135-3235m: Muderongia staurota Zone: Subzone 8B (late Valanginian)
- 3255-3265m: Pseudoceratium pelliiferum Zone: Subzones 7C/D (middle Valanginian)
- 3285-3415m: Pseudoceratium pelliiferum Zone: Subzones 7A/B (early Valanginian)
- 3435-4110m: Cerebropollenites macroverrucosus Zone: Subzone 6B (early Valanginian)
- 4130-4350m: Ctenidodinium panneum Zone: Subzones 5B/C (early Berriasian)
- 4370-4380m: Ctenidodinium panneum Zone: Subzone 5A (Portlandian to early Berriasian)
- 4400-4500m: Glossodinium dimorphum Zone: Subzone 4A (late Kimmeridgian to early Portlandian)
- 4520-4620m: Subtilisphaera paeminosa Zone: Subzone 3C (late Kimmeridgian)
- 4640-4650m: Probable Subtilisphaera paeminosa Zone: Subzone 3B (late Kimmeridgian)
- 4670-4740m: Subtilisphaera paeminosa Zone: Subzone 3A (middle Kimmeridgian)
- 4760-4920m: Pliosporites sp. A Zone: Subzone 2C (middle Kimmeridgian)
- 4940-5035m: Pilosporites sp. A Zone: Subzone 2A (early Kimmeridgian)

SOUTH MARA C-13: FORMATIONS

Interval considered: 800-5035m

From: K.D. McAlpine February 16, 1988

|            |                               |
|------------|-------------------------------|
| 800-1840m  | Banquereau                    |
| 1840-1980m | South Mara unit               |
| 1980-2186m | Dawson Canyon                 |
| 2186-2250m | Dawson Canyon (Petrel Member) |
| 2250-2313m | Dawson Canyon                 |
| 2313-2682m | Nautilus Shale                |
| 2682-2829m | Ben Nevis                     |
| 2829-2962m | Ben Nevis (Lower Ben Nevis)   |
| 2962-3132m | Avalon                        |
| 3132-3226m | Eastern Shoals                |
| 3226-3268m | "A" Marker                    |
| 3268-3684m | White Rose Shale (upper)      |
| 3684-3923m | Catalina                      |
| 3923-3974m | "B" Marker                    |
| 3974-4196m | Hibernia (Hebron Well Member) |
| 4196-4609m | Hibernia                      |
| 4609-4814m | Fortune Bay Shale             |
| 4814-5035m | Jeanne d'Arc                  |





PALYNOLOGICAL BIOSTRATIGRAPHY  
OF THE INTERVAL 710-4665m,  
SOUTH TEMPEST G-88, GRAND BANKS

REPORT NO. 87-0066  
SEPTEMBER, 1987

CALGARY, ALBERTA

BIOSTRATIGRAPHIC SUMMARY: SOUTH TEMPEST G-88

|            |  |
|------------|--|
| 710- 750m  | <u>Apteodinium</u> sp. B Zone or older (early Miocene or older)  |
| 770- 780m  | <u>Chiropteridium mespilanum</u> Zone or older (late Oligocene or older)                                   |
| 800-1165m  | <u>Areosphaeridium arcuatum</u> Zone (early Oligocene)   |
| 1185-1405m | <u>Diphyes colligerum</u> Zone (late Eocene)   |
| 1425-2185m | <u>Adnatosphaeridium reticulense</u> Zone (middle Eocene)  |
| 2205-2605m | <u>Areoligera senonensis</u> Zone (early Eocene)   |
| 2685-2815m | <u>Cerebropollenites macroverrucosus</u> Zone: Subzone 6B (early Valanginian)                              |
| 2835-2845m | <u>Cerebropollenites macroverrucosus</u> Zone: Subzone 6A (late Berriasian)                                |
| 2865-2905m | <u>Ctenidodinium panneum</u> Zone: Subzones 5A-B (Portlandian to early Berriasian)                         |
| 2925-2965m | possible <u>Gonyaulacysta dualis</u> Zone: possible Subzones 4A-B (late Kimmeridgian to early Portlandian) |
| 2985-3025m | <u>Subtilisphaera paeminosa</u> Zone: Subzone 3C (late Kimmeridgian)                                       |

- 3045-3115m      Subtilisphaera paeminosa Zone: Subzone 3B (late  
Kimmeridgian)
- 3165-3265m      Subtilisphaera paeminosa Zone: Subzone 3A (middle  
Kimmeridgian)
- 3285-3985m      Pilosisorites sp. A Zone: Subzone 2A (early  
Kimmeridgian)
- 3645-4665m      Scriniodium crystallinum Zone: Subzones 1A-B (early  
Kimmeridgian)

SOUTH TEMPEST G-88: FORMATIONS

Interval considered: 710-4665m

From: K.D. McAlpine, February 17, 1988

|            |                                 |
|------------|---------------------------------|
| 710-2602m  | Banquereau Formation            |
| 2602-2672m | South Mara unit                 |
| 2672-2699m | (Unnamed limestone)             |
| 2699-3143m | Whiterose Shale                 |
| 3143-3237m | Fortune Bay Shale               |
| 3237-3529m | Jeanne d'Arc Formation          |
| 3529-3730m | Rankin Formation                |
| 3730-3814m | Rankin Formation (Egret Member) |
| 3814-4305m | Rankin                          |
| 4305-4665m | Voyager Formation               |



PALYNOLOGICAL BIOSTRATIGRAPHY  
OF TERRA NOVA K-08, GRAND BANKS

REPORT NO. 87-0066

JULY, 1987

CALGARY, ALBERTA

BIOSTRATIGRAPHIC SUMMARY: TERRA NOVA K-08

- 695- 735m Deflandrea heterophlycta Zone (early Oligocene)
- 755- 945m Diphyes colligerum Zone (late Eocene)
- 965-1070m Adnatospheeridium reticulense Zone (middle Eocene)
- 1090-1100m Areoligera senonensis Zone (early Eocene)
- 1120-1190m Palaeoperidinium pyrophorum Zone (early Paleocene)
- 1270-1280m Dinogymnium euclaense Zone (Maastrichtian)
- 1290-1300m Odontochitina operculata Zone (Campanian)
- 1320-1330m Pervosphaeridium truncigerum Zone (Santonian)
- 1350-1360m Oligosphaeridium pulcherrimum Zone (Coniacian)
- 1380-1420m Surculosphaeridium longifurcatum Zone: Subzone 14B  
(late Turonian)
- 1440-1450m Surculosphaeridium longifurcatum Zone: Subzone 14A  
(early Turonian)
- 1470-1480m Kiokansium polypes Zone: Subzones 13A-B (early to  
late Cenomanian)
- 1500-1540m Chichaouadinium sp. A Zone: Subzones 12B-C (middle to  
late Albian)

- 1560-1660m Chichaouadinium sp. A Zone: Subzone 12A (middle  
Albian)
- 1680-1690m Parvisaccites amplus Zone: Subzone 10C (late Aptian)
- 1710-1750m Parvisaccites amplus Zone: Subzones 10A-B  
(early to "mid" Aptian)
- 1770-1810m Subtilisphaera terrula Zone: Subzone 9C (early  
Barremian)
- 1830-1870m Subtilisphaera terrula Zone: Subzone 9B (late  
Hauterivian)
- 1890-1900m Muderongia staurota Zone: Subzones 8A-B (late  
Valanginian)
- 1920-1960m Pseudoceratium pelliferum Zone: Subzones 7C-D (middle  
Valanginian)
- 1990-2020m Pseudoceratium pelliferum Zone: Subzone 7B (early  
Valanginian)
- 2040-2080m Pseudoceratium pelliferum Zone: Subzone 7A (early  
Valanginian)
- 2100-2230m Cerebropollenites macroverrucosus Zone: Subzone 6B  
(early Valanginian)
- 2280-2290m Cerebropollenites macroverrucosus Zone: Subzone 6A  
(late Berriasian)
- 2310-2590m Ctenidodinium panneum Zone: Subzones 5B-C (early  
Berriasian)



- 2610-2650m Ctenidodinium panneum Zone: possible Subzone 5A  
(possible Portlandian to possible early Berriasian)
- 2670-2770m Gonyaulacysta dualis Zone: Subzones 4A-B (late  
Kimmeridgian to Portlandian)
- 2810-2820m Subtilisphaera paeminosa Zone: Subzone 3C (late  
Kimmeridgian)
- 2840-2910m Subtilisphaera paeminosa Zone: Subzones 3A-B  
(middle to late Kimmeridgian)
- 2930-3060m Pilosisorites sp. A Zone: Subzone 2C (middle  
Kimmeridgian)
- 3080-3450m Pilosisorites sp. A Zone: Subzone 2B (early to  
middle Kimmeridgian)
- 3455-3660m Pilosisorites sp. A Zone: Subzone 2A (early  
Kimmeridgian)
- 3680-3720m Scriniodium crystallinum Zone: Subzone 1B  
(early Kimmeridgian)
- 3721-4320m Gonyaulacysta jurassica Zone (late Oxfordian)
- 4370-4470m Hystrihogonyaulax #EA Zone (early Oxfordian)

TERRA NOVA K-08: FORMATIONS

Interval considered: 695-4470m

From: K.D. McAlpine, February 12, 1988

|            |                               |
|------------|-------------------------------|
| 695-1135m  | Banquereau                    |
| 1135-1289m | South Mara unit               |
| 1289-1393m | Dawson Canyon                 |
| 1393-1441m | Dawson Canyon (Petrel Member) |
| 1441-1466m | Dawson Canyon                 |
| 1466-1534m | Eider                         |
| 1534-1582m | Nautilus Shale                |
| 1582-1656m | Ben Nevis                     |
| 1656-1774m | Avalon                        |
| 1774-1895m | Eastern Shoals                |
| 1895-2264m | Whiterose Shale (upper)       |
| 2264-2385m | Catalina                      |
| 2385-2483m | "B" Marker                    |
| 2483-2650m | Hibernia (Hebron Well Member) |
| 2650-2974m | Hibernia                      |
| 2974-3188m | Fortune Bay                   |
| 3188-3548m | Jeanne d'Arc                  |
| 3548-3641m | Rankin                        |
| 3641-3790m | Rankin (Egret Member)         |
| 3790-4286m | Rankin                        |
| 4286-4470m | Voyager                       |



PALYNOLOGICAL BIOSTRATIGRAPHY  
OF THE TRAVE E-87 WELL, GRAND BANKS

REPORT # 87-0066  
SEPTEMBER, 1987

CALGARY, ALBERTA

BIOSTRATIGRAPHIC SUMMARY: TRAVE E-87

- 740- 990m Deflandrea heterophlycta Zone (early Oligocene)
- 1040-1200m Diphyes colligerum Zone (late Eocene)
- 1220-1650m Adnatosphaeridium reticulense Zone (middle Eocene)
- 1670-1800m possible Areoligera senonensis Zone (possible early Eocene)
- 1820-2130m Areoligera senonensis Zone (early Eocene)
- 2150-2340m Ceratiopsis speciosa Zone (late Paleocene)/Cerebropollenites macroverrucosus Zone: Subzone 6A (late Berriasian)
- 2360-2490m: Ctenidodinium panneum Zone: Subzone 5A (Portlandian to early Berriasian)
- 2510-2520m Gonyaulacysta dualis Zone: Subzone 4A-B (late Kimmeridgian to Portlandian)
- 2540-2640m Subtilisphaera paeminosa Zone: Subzone 3C (Late Kimmeridgian)
- 2660-2730m Subtilisphaera paeminosa Zone: Subzone 3B (middle to late Kimmeridgian)

- 2750-2850m Pilosisorites sp. A Zone: Subzone 2B (early to middle  
Kimmeridgian)
- 2870-3330m Pilosisorites sp. A Zone: Subzone 2A (early  
Kimmeridgian)
- 3350-3390m Scriniodinium crystallinum Zone: Subzone 1A (early  
Kimmeridgian)
- 3410-3570m possible Gonyaulacysta jurassica Zone: Subzone 0B (late  
Oxfordian)
- 3590-3930m definite Gonyaulacysta jurassica Zone: Subzone 0B (late  
Oxfordian)
- 3950-3985m Hystrihogonyaulax #EA Zone: Subzone 0A (early Oxfordian)

TRAVE E-87: FORMATIONS

Interval considered: 740-3985m

From: K.D. McAlpine December 16, 1987

|            |                               |
|------------|-------------------------------|
| 740-2112m  | Banquereau                    |
| 2112-2139m | South Mara unit               |
| 2139-2298m | Hibernia (Hebron Well Member) |
| 2298-2520m | Hibernia                      |
| 2520-2737m | Fortune Bay Shale             |
| 2737-2850m | Jeanne d'Arc                  |
| 2850-3046m | Rankin                        |
| 3046-3165m | Rankin (Egret Member)         |
| 3165-3775m | Rankin                        |
| 3775-3985m | Voyager                       |





PALYNOLOGICAL BIOSTRATIGRAPHY  
OF THE INTERVAL 780-3745M,  
VOYAGER J-18, GRAND BANKS

REPORT #87-0066

CALGARY, ALBERTA

BIOSTRATIGRAPHIC SUMMARY: VOYAGER J-18

- 780-790m      probable Areosphaeridium arcuatum Zone (probable early Oligocene)
- 810-940m      Areosphaeridium arcuatum Zone (early Oligocene)
- 960-1240m    Diphyes colligerum Zone (late Eocene)
- 1260-1270m   possible Areoligera senonensis Zone (possible early Eocene)
- 1290-1330m   Areoligera senonensis Zone (early Eocene)
- 1350-1420m   Palaeoperidinium pyrophorum Zone (early Paleocene)
- 1440-1510m   possible Chichaouadinium sp. A Zone: Subzones 12A-C (possible Albian)
- 1525-1565m:   Parvisaccites amplus Zone: Subzone 10B ("mid" Aptian)
- 1665-1765m:   Pseudoceratium pelliiferum Zone: Subzone 7A (early Valanginian)
- 1785-1915m:   Cerebropollenites macroverrucosus Zone: Subzone 6A (late Berriasian)
- 1935-2035m:   Subtilisphaera paeminosa Zone: Subzone 3C (late Kimmeridgian)

- 2055-2245m: Pilosisorites sp. A Zone: Subzone 2C (middle  
Kimmeridgian)
- 2265-2365m: Pilosisorites sp. A Zone: Subzone 2B (early to middle  
Kimmeridgian)
- 2505-2725m: Scriniodinium crystallinum Zone: Subzones 1A-B (early  
Kimmeridgian)
- 2745-2845m: Gonyaulacysta jurassica Zone: Subzone 0B (late Oxfordian)
- 2865-3145m: Undifferentiated Jurassic
- 3165-3415m: Hystrichogonyaulax #EA Zone: Subzone 0A (early Oxfordian)
- 3435-3535m: Ctenidodinium sellwoodii Zone (early Callovian)
- 3570-3745m: Diacanthum filapicatum Zone (late Bathonian)

VOYAGER J-18: FORMATIONS

Interval considered: 780-3730m

From: K.D. McAlpine, February 17, 1988

|            |                               |
|------------|-------------------------------|
| 780-1299m  | Banquereau                    |
| 1299-1401m | South Mara unit               |
| 1401-1468m | Avalon                        |
| 1468-1585m | Eastern Shoals                |
| 1585-1627m | Catalina                      |
| 1627-1675m | "B" Marker                    |
| 1675-1814m | Hibernia (Hebron Well Member) |
| 1814-2041m | Hibernia                      |
| 2041-2277m | Fortune Bay Shale             |
| 2277-2513m | Jeanne d'Arc                  |
| 2513-2713m | Rankin                        |
| 2712-2812m | Rankin (Egret Member)         |
| 2812-3246m | Rankin                        |
| 3246-3730m | Voyager                       |



PALYNOLOGICAL BIOSTRATIGRAPHY  
OF THE INTERVAL 2075-4550M,  
WHITEROSE J-49, GRAND BANKS

REPORT NO. 87-0066  
NOVEMBER, 1987

CALGARY, ALBERTA

BIOSTRATIGRAPHIC SUMMARY: WHITE ROSE J-49

- 2075-2205m: Adnatosphaeridium reticulense Zone (middle Eocene)
- 2225-2295m: Apectodinium homomorphum Zone (early Eocene)
- 2315-2325m: Palaeoperidinium pyrophorum Zone (early Paleocene)
- 2345-2470m: Surculosphaeridium longifurcatum Zone: Subzone 14A-B  
(early to late Turonian)
- 2490-2560m: Chichaouadinium sp. A Zone: Subzone 12B (middle  
Albian)
- 2580-2710m: Subtilisphaera terrula Zone: Subzone 9D (late  
Barremian)
- 2730-3025m: Pseudoceratium pelliferum Zone: Subzones 7A-B (early  
Valanginian)
- 3045-3320m: Cerebropollenites macroverrucosus Zone: Subzone 6B  
(early Valanginian)
- 3340-3350m: possible Cerebropollenites macroverrucosus Zone:  
Subzone 6A (possible late Berriasian)
- 3370-3645m: Cerebropollenites macroverrucosus Zone: Subzone 6A  
(late Berriasian)
- 3645-4425m: Ctenidodinium panneum Zone or older: Subzone 5B or  
older (early Berriasian or older)
- 4425-4550m: possible Late Jurassic (?Kimmeridgian)

WHITEROSE J-49: FORMATIONS

Interval considered: 2075-4550m

From: K.D. McAlpine, February 17, 1988

|            |                               |
|------------|-------------------------------|
| 2075-2346m | Banquereau                    |
| 2346-2407m | South Mara unit               |
| 2407-2438m | Wyandot                       |
| 2438-2462m | Dawson Canyon                 |
| 2462-2507m | Dawson Canyon (Petrel Member) |
| 2507-2956m | Nautilus Shale                |
| 2956-3094m | Ben Nevis                     |
| 3094-3237m | Avalon                        |
| 3237-3269m | Eastern Shoals                |
| 3269-3699m | Whiterose Shale (upper)       |
| 3699-3718m | "B" Marker                    |
| 3718-3941m | Whiterose Shale (lower)       |
| 3941-4449m | Hibernia                      |
| 4449-4550m | Fortune Bay                   |





PALYNOLOGICAL BIOSTRATIGRAPHY  
OF THE INTERVAL 2235-3340M,  
WHITEROSE L-61, GRAND BANKS

REPORT NO. 87-0066  
NOVEMBER, 1987

CALGARY, ALBERTA

BIOSTRATIGRAPHIC SUMMARY: WHITEROSE L-61

- 2235-2435m: Areoligera senonensis Zone (early Eocene)
- 2460-2500m: Ceratiopsis speciosa Zone (late Paleocene)
- 2520-2560m: Palaeoperidinium pyrophorum Zone (early Paleocene)
- 2580-2590m: Dinogymnium enclaense Zone (Maastrichtian)
- 2610-2745m: Surculosphaeridium longifurcatum Zone (Turonian)
- 2765-2865m: Parvisaccites amplus Zone Subzones 10 A-B (early to middle Aptian)
- 2885-2985m: Subtilisphaera terrula Zone (Hauterivian to Barremian)
- 3005-3135m: Muderongia staurota Zone (late Valanginian to early Hauterivian)
- 3155-3340m: Pseudoceratium pelliiferum Zone (early to late Valanginian)

REMARKS

Due to the high abundances of lignitic mud additives, the persistence of caved Tertiary material, the strong staining of the palynomorphs, and the scarcity of indigenous palynomorphs, the age and zonal assignments are highly tentative. This is especially true in the Lower Cretaceous sequence.

WHITEROSE L-61: FORMATIONS

Interval considered: 2235-3330m

From: K.D. McAlpine, February 17, 1988

|            |                               |
|------------|-------------------------------|
| 2235-2470m | Banquereau                    |
| 2470-2536m | South Mara unit               |
| 2536-2604m | Wyandot                       |
| 2604-2617m | Dawson Canyon                 |
| 2617-2650m | Dawson Canyon (Petrel Member) |
| 2650-2758m | Eider                         |
| 2758-2864m | Nautilus Shale                |
| 2864-3007m | Ben Nevis                     |
| 3007-3104m | Avalon                        |
| 3104-3330m | Eastern Shoals                |



PALYNOLOGICAL BIOSTRATIGRAPHY OF THE  
INTERVAL 935-4625M,  
WHITEROSE N-22, GRAND BANKS

REPORT NO. 87-0066  
MARCH 1988

CALGARY, ALBERTA

BIOSTRATIGRAPHIC SUMMARY: WHITEROSE N-22

- 935-1155m     Areosphaeridium arcuatum Zone (early Oligocene)
- 1175-1605m     Diphyes colligerum Zone (late Eocene)
- 1625-1815m     Adnatosphaeridium reticulense Zone (middle Eocene)
- 1835-1905m     possible Areoligera senonensis Zone (possible early  
Eocene)
- 1925-2325m     Areoligera senonensis Zone: Subzone A (early Eocene)
- 2345-2355m     possible Odontochitina operculata Zone (possible  
Campanian)
- 2405-2415m     possible Chichaouadinium #EA Zone (possible Albian)
- 2435-2445m     Parvisaccites amplus Zone (Aptian)
- 2465-2715m     Subtilisphaera terrula Zone (early Hauterivian to  
Barremian undifferentiated)
- 2735-2775m     Muderongia staurota Zone (late Valanginian to early  
Hauterivian)
- 2825-2895m     Pseudoceratium pelliiferum Zone: Subzone 7C (middle  
Valanginian)
- 2915-2925m     Pseudoceratium pelliiferum Zone: possible Subzone 7B  
(early Valanginian)

- 2945-3135m     Pseudoceratium pelliiferum Zone: Subzone 7A (early Valanginian)
- 3155-3195m     Ctenidodinium panneum Zone: Subzone 5B (early Berriasian)
- 3215-3225m     Ctenidodinium panneum Zone: Subzone 5A (Portlandian to early Berriasian)
- 3245-3580m     Subtilisphaera paeminosa Zone: Subzone 3C (late Kimmeridgian)
- 3575-3885m     Subtilisphaera paeminosa Zone: Subzone 3B (late Kimmeridgian)
- 3905-3945m     Pilosisorites sp. A Zone: Subzone 2C (middle Kimmeridgian)
- 3965-4095m     Pilosisorites sp. A Zone: Subzone 2B (early to middle Kimmeridgian)
- 4115-4245m     Pilosisorites sp. A Zone: Subzone 2A (early Kimmeridgian)
- 4265-4625m     Gonyaulacysta jurassica Zone (late Oxfordian)



WHITEROSE N-22: FORMATIONS

Interval considered: 935-4625m .

From: K.D. McAlpine February 17, 1988

|            |                               |
|------------|-------------------------------|
| 935-2332m  | Banquereau                    |
| 2332-2379m | South Mara unit               |
| 2379-2387m | Wyandot                       |
| 2387-2415m | Dawson Canyon                 |
| 2415-2436m | Dawson Canyon (Petrel Member) |
| 2436-2445m | Dawson Canyon                 |
| 2445-2575m | Nautilus Shale                |
| 2575-2661m | Ben Nevis                     |
| 2661-2700m | Avalon                        |
| 2700-2728m | Eastern Shoals                |
| 2728-2821m | Whiterose Shale (upper)       |
| 2821-2847m | "A" Marker                    |
| 2847-3085m | Whiterose Shale (upper)       |
| 3085-3100m | "B" Marker                    |
| 3100-3357m | Whiterose Shale (lower)       |
| 3357-3772m | Hibernia                      |
| 3772-3940m | Fortune Bay Shale             |
| 3940-4005m | Jeanne d'Arc                  |
| 4005-4284m | Rankin                        |
| 4284-4625m | Voyager                       |

