

March 25, 1980

TO: Husky/U. S. Geological Survey

RE: Husky/U.S.G.S.  
Walakpa #1  
Sec. 9, 20N/19W, U.B.M.  
North Slope, Alaska

PALYNOLOGY REPORT

A total of 224 samples were processed and analyzed from the subject well. The total consists of 42 ditch cuttings composited mostly into 90' intervals, 13 sidewall cores and 169 core samples. The total sequence examined ranges from 90-3666' T.D.

Included with this report are Figures 1 and 2 which illustrate the distribution of the ditch samples, and the cores and sidewall cores, respectively. A summary of the findings is given below.

90-1650'

Undifferentiated bisaccates (A), Araucariacites australis (R-A), Callialasporites dampieri (R-F), Classopollis classoides (R), Deltoidospora spp. (R-F), Densosporites spp. (R, reworked), Exesipollenites tumulus (R), Gleicheniidites senonicus (R), Osmundacidites spp. (R), Schizosporis parvus (R), Taxodiaceae (R).

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98-1650' (con't.)

*Aptea polymorpha* (R), *Batioladinium jaegeri* (R), *Cyclonephelium distinctum* (R), *Gardodinium trabeculosum* (R), *Muderongia asymmetrica* (R), *Odontochitina operculata* (R), *Oligosphaeridium complex* (R), *O. complex* (thick wall) (R), *Palaeoperidinium cretaceum* (R), *Pseudoceratium retusum* (R).

AGE: Early Cretaceous, Aptian to Albian  
(P-M18)

ENVIRONMENT: Marine to Marginal Marine

The above interval is dated Aptian-Albian (P-M18) based on the presence of several taxa such as *Callialasporites dampieri*, *Batioladinium jaegeri*, *Gardodinium trabeculosum*, *Muderongia asymmetrica*, and *Pseudoceratium retusum*, and the absence of *Luxadinium propatulum* and Genus "W" which marks the P-M17 zonule.

1650-1920'

Undifferentiated bisaccates (R-A), *Araucariacites australis* (R-F), *Callialasporites dampieri* (R), *Deltoidospora* spp. (R), *Gleicheniidites senonicus* (R), *Taxodiaceae* (R).

*Batioladinium jaegeri* (R), *Cribroperidinium edwardsi* (R), *Cyclonephelium distinctum* (R-A), *Gardodinium trabeculosum* (R-F), *Muderongia simplex* (R), *M. tetracantha* (R), *Odontochitina operculata* (R-A), *Oligosphaeridium complex* (R-A), *Palaeoperidinium cretaceum* (R-C), *Tasmanaceae* (R-F).

AGE: Early Cretaceous, probable Neocomian  
(P-M18a)

ENVIRONMENT: Marine

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1650-1920' (con't.)

The interval above is defined by the marked increase in abundance of microplankton taxa, but without the usual Neocomian marker fossils as noted below in the P-M19 interval.

1920-2064'

Undifferentiated bisaccates (R-A), Araucariacites australis (R-F), Callialasporites dampieri (R-F), Classopollis classoides (R-F), Deltoidospora spp. (R-F), Exesipollenites tumulus (R-F), Gleicheniidites senonicus (R), Lycopodiumsporites spp. (R), Taxodiaceae (R).

Clathroctenocystis elegans (R), Cleistosphaeridium spp. (R-C), Cribroperidinium edwardsi (R-A), Cyclonephelium distinctum (R-A), Gardodinium trabeculosum (R-C), Gonyaulacysta cretacea (R), Herendeenia pisciformis (R), Hystrichosphaeridium recurvatum (R), indeterminate cysts (R-A), Muderongia simplex (R-A), M. sp. N (R), Odontochitina operculata (R-A), Oligosphaeridium complex (R-A), O. complex (thick wall) (R-A), Palaeoperidinium cretaceum (R-A), Tanyosphaeridium variecalamum (R), Tenua anaphrissa (R-Q), Tubotuberella apatela (R).

AGE: Early Cretaceous, Neocomian (P-M19)

ENVIRONMENT: Marine

The P-M19 zonule is recognized by the generally increased abundance of dinoflagellate cysts, and by the presence of such taxa as: Clathroctenocystis elegans, Herendeenia pisciformis, Muderongia sp. N, and Tubotuberella apatela. The base of this

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1920-2064' (con't.)

interval is determined by the lowest occurrence of Oligosphaeridium complex in Core #6 at 2064 feet.

2065-2077'

Undifferentiated bisaccates (R-C), Araucariacites australis (R-C), Deltoidospora spp. (R-F), Endosporites spp. (R, reworked), Exesipollenites tumulus (R-A), Osmundacidites (R), Punctatisporites spp. (R, reworked), Spinotriletes spp. (R, reworked).

Cleistosphaeridium spp. (R), Cyclonephelium distinctum (R), Gonyaulacysta sp. (R), indeterminate cysts (R-A), Muderongia simplex (R), Tenua anaphrissa (R), T. hystrix (R).

AGE: Indeterminate

ENVIRONMENT: Marine to Marginal Marine

Based on the palynomorphs found, this interval cannot be placed either into the Neocomian or Late Jurassic with any certainty.

2078-2190'

Undifferentiated bisaccates (R-A), Apiculatisporis spp. (R, reworked), Araucariacites australis (R), Callialasporites dampieri (R-F), Cirratriradites spp. (R, reworked), Deltoidospora spp. (R-F), Densosporites spp. (R, reworked), Endosporites spp. (R, reworked), Exesipollenites tumulus (R-F), Gleicheniidites senonicus (R), Lycopodiumsporites semimurus (R), L. spp. (R), Punctatisporites spp. (R, reworked).

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2078-2190' (con't.)

Acanthosphaera sp. (R), Gonyaulacysta cladophora (R-F), G. jurassica (R-F), Pareodinia alaskense (R), P. ceratophora (R-F), P. osmingtonense (R), Scriniodinium crystallinum (R), Senoniasphaera jurassica (R), Sirmiodinium grossi (R), Stephanolytron redeliffense (R), Tenua rioulti (R), Tubotuberella apatela (R), Wanea sp. (R).

AGE: Late Jurassic, Kimmeridgian to Tithonian (P-M21)

ENVIRONMENT: Marine

The P-M21 zonule is defined at the top by the first occurrence of Gonyaulacysta jurassica in Core #6 at 2078 feet. The lower limit of this unit is defined by Nannoceratopsis pellucida which establishes the P-M22 horizon.

2190-2370'

Undifferentiated bisaccates (R-A), Araucariacites australis (R), Callialasporites dampieri (R-F), Cerebropollenites mesozoicus (R-A), Classopollis classoides (R-F), Deltoidospora spp. (R-A), Densosporites spp. (R, reworked), Exesipollenites tumulus (R-C), Gleicheniidites senonicus (R), Hymenozonotriletes lepidophytus (R-F, reworked), Lycopodiumsporites semimurus (R), L. spp. (R), Punctatisporites spp. (R, reworked), Undifferentiated verrucate spores (R).

Ctenidodinium ornatum (F), Endoscrinium galeritum (R), Gonyaulacysta cladophora (R-A), G. jurassica (R),

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2190-2370' (con't.)

*Micrhystridium* spp. (R), *Nannoceratopsis pellucida* (R), *Pareodinia ceratophora* (R), *Tapeinosphaeridium pericompsum* (A), *Tasmanaceae* (R), *Tenua verrucosa* (R), *Valensiella ovula* (R).

AGE: Late Jurassic, Oxfordian (P-M22)

ENVIRONMENT: Marine

As stated earlier the P-M22 zonule is recognized by the first occurrence of *Nannoceratopsis pellucida*. Other taxa of importance are: *Ctenidodinium ornatum*, *Endoscrinium galeritum*, and *Tenua verrucosa*.

2370-2640'

Undifferentiated bisaccates (R-A), *Apiculatisporis* spp. (R, reworked), *Araucariacites australis* (R-F), *Callialasporites dampieri* (R), *Cerebropollenites mesozoicus* (R-F), *Classopollis classoides* (F-A), *Deltoidospora* spp. (R-A), *Endosporites* spp. (R, reworked), *Exesipollenites tumulus* (R-A), *Punctatisporites* (R, reworked), Undifferentiated verrucate spores (R).

*Endoscrinium galeritum* (R), *E. luridum* (R), *Gonyaulacysta cladophora* (R), *G. jurassica* (R), *Nannoceratopsis gracilis* (R), *N. pellucida* (R), *Scrinocassis dictyota* (R), *Tasmanaceae* (R), *Tubotuberella apatela* (R).

AGE: Early to Middle Jurassic (P-M23)

ENVIRONMENT: Marine

The P-M23 zonule is based on the entire range of *Nannoceratopsis gracilis* which occurs in the ditch samples from 2370 to 2640 feet.

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2640-3087'

Undifferentiated bisaccates (R-A), Apiculatisporis (R, reworked), Araucariacites australis (R-F), Callialasporites dampieri (R), Cerebropollenites mesozoicus (R-F), Cirratridites spp. (R, reworked), Classopollis classoides (R-A), Corrugatisporites sp. (R), Deltoidospora spp. (R-F), Denso-sporites spp. (R, reworked), Exesipollenites tumulus (R-A), Lycopodiumsporites semimurus (R), L. spp. (R), Punctatisporites spp. (R, reworked), Rogalskaisporites cicatricosus (R), Sphaeripollenites classopollides (R), Undifferentiated verrucate spores (R), Vitreisporites pallidus (R).

Gonyaulacysta cladophora (R), G. jurassica (R), Micrhystridium spp. (R), Tasmanaceae (R-F), Tytthodiscus sp. (R).

AGE: Early to Middle Jurassic, Undifferentiated  
(P-M23 to P-M24)

ENVIRONMENT: Marginal Marine

The above interval remains Jurassic in age down to 3087 feet based on rare occurrences of Lycopodiumsporites semimurus and Gonyaulacysta jurassica in Core #10. Further definition as to the age of this section is not possible.

3090-3360'

Undifferentiated bisaccates (R-A), Araucariacites australis (R), Classopollis classoides (R), Crassispora (R, reworked), Deltoidospora spp. (R-F), Densosporites spp. (R, reworked), Punctatisporites (R-F, reworked), Undifferentiated verrucate spores (R).

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3090-3360' (con't.)

Tasmanaceae (R).

AGE: Indeterminate

ENVIRONMENT: Nonmarine to Marginal Marine

3360-3381'

Deltoidospora spp. (R-F), Densosporites spp. (R, reworked),  
Kraeuselisporites apiculatus (R), Leptolepidites argenteaefor-  
mis (R), Punctatisporites spp. (R-F, reworked), Sphaeripollen-  
ites classopolloides (R), Tsugaepollenites jonkeri (R), Undif-  
ferentiated verrucate spores (R-F).

Micrhystridium spp. (R), Noricysta sp. (R), Sverdrupiella muta-  
bilis (R), Tasmanaceae (F-C), Tylthodiscus (R).

AGE: Late Triassic, Norian (P-M26)

ENVIRONMENT: Marine

The P-M26 zonule is recognized by the presence of Sverdrupiella mutabilis and Noricysta sp. Evidence for this unit was found only in samples from Core #11.

3384-3420'

Undifferentiated bisaccates (R), Apiculatisporis lanjouwii (R),  
Araucariacites australis (R), Deltoidospora spp. (R), Dulhun-  
tyspora minuta (R), Leptolepidites argenteaeformis (R), Tsuga-  
epollenites jonkeri (R), Undifferentiated verrucate spores (R-F).

Micrhystridium spp. (R), Tasmanaceae (R-C).



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3384-3420' (con't.)

AGE: Middle to Late Triassic (P-T15)

ENVIRONMENT: Nonmarine to Marginal Marine

Based on the taxa present, the lower portion of Core #11 can only be dated as Middle to Late Triassic (P-T15).

3545-3666'

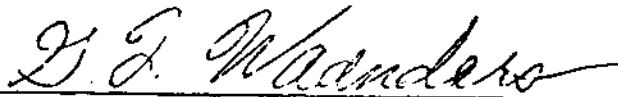
Undifferentiated bisaccates (R), Araucariacites australis (R),  
Deltoidospora spp. (R), Densosporites (R).

Microhystridium spp. (R).

AGE: Indeterminate

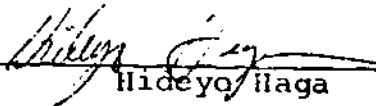
ENVIRONMENT: Indeterminate

Interpreted by:



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