MICROPALEO CONSULTANTS, INC.

USGS/HUSKY - NPRA

KOLUKTAK NO. 1

API #50-119-20001

SEC. 27, T5N/R11W UM

NORTH SLOPE, ALASKA

Prepared by:

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BIOSTRATIGRAPHY REPORT

Job No. 22-113 **March, 2003**

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FORAMINIFERA REPORT

Interpreted by

Michael B. Mickey

FORAMINIFERA SUMMARY

110-3420'

Age.	Early Cretaceous Middle to Late Albian	
Zone.	F-9	
Environment.	110-2030':	Nonmarine to Marginal Marine (Alluvial Plain to Transitional)
	2030-3420':	Inner to Middle Neritic (Inner to Middle Shelf)

3420-5882'T.D.

Age.	Early Cretaceous Aptian? to Early Albian
Zone.	F-10
Environment.	Outer Neritic to Upper Bathyal (Outer Shelf to Upper Slope)

INTRODUCTION

Scope

Micropaleo Consultants, Inc. processed, picked and analyzed for Foraminifera 229 ditch samples from the USGS/Husky Koluktak No. 1 well. Sampling covered the interval 110 to 5882 feet total depth. This work was done as part of M.C.I. Job Number 22-113.

Procedures

Standard techniques were used to process the material. All samples were boiled in Quaternary-O and washed over 20 and 200 mesh screens. Frequency symbols correspond to the following numerical values: very rare (1), rare (2 - 4), frequent (5 -25), common (26 - 100), abundant (101 - 999) and prolific (1000+). The picked foram slides and residues are reposited at the State of Alaska Geological Materials Center in Eagle River, Alaska.

Certain factors such as shelf widths, basin configuration and overall basin depths associated with Arctic Mesozoic basins are not completely understood at present. The paleoenvironments presented in this report reflect relative basinal position only and should not be tied to specific water depths. Generally, neritic corresponds to shelf or deltaic environments, while bathyal corresponds to slope or prodelta environments and bathyal (starved basin) corresponds to distal (far from the source) deposition. As an example, prodelta deposits could represent deposition as shallow as middle neritic or as deep as bathyal (slope) depending on the delta type and shelf width. With a narrow shelf, a river-dominated deltaic system could build across the shelf and the prodelta deposits would be in a bathyal (slope) depth. A tide-dominated deltaic system associated with a wide shelf could result in middle neritic prodelta deposition.

Format

A listing of the age, environment, fauna and occasional lithology comments for each biostratigraphic interval follows. A generalized summary of the well is presented in the Conclusions section at the end of the Foraminifera Report. A Foraminifera Distribution Chart (Figure F-1) and a High Resolution Biostratigraphy Plot (Figure B-1) containing foram diversity/abundance plots, a cumulative faunal plot and paleoenvironmental plot(s) are in pockets at the back of this report.

RESULTS

110-3420'

Age. Early Cretaceous
Middle to Late Albian

Zone. F-9

Environment. 110-2030': Nonmarine to Marginal Marine
(Alluvial Plain to Transitional)
2030-3420': Inner to Middle Neritic
(Inner to Middle Shelf)

Fauna. *Trochammina mcmurrayensis, Verneuilinoides borealis, Textularia topagorukensis, Miliammina awunensis, M. manitobensis, Ammodiscus rotalarius, Ammobaculites fragmentarius, Haplophragmoides topagorukensis, H. kirki, Lenticulina macrodisca, Gaudryinella irregularis, Gavelinella awunensis, G. stictata, Psamminopelta subcircularis, Valvulineria loetterlei, Eurycheilostoma grandstandensis, Globorotalites alaskensis, Saracenaria projectura, Bathysiphon vitta, Marginulinopsis collinsi, M. jonesi*, shell fragments, *Inoceramus* prisms, *Ditrupa cornu*, pyrite, with intervals of abundant to prolific coal (seam?) above 1190 feet.

3420-5882'T.D.

Age.	Early Cretaceous Aptian? to Early Albian
Zone.	F-10
Environment.	Outer Neritic to Upper Bathyal (Outer Shelf to Upper Slope)
Fauna.	*Haplophragmoides gigas, H. excavatus, H. topagorukensis, Glomospirella gaultina, Gaudryina nanushukensis, G. subcretacea, G. barrowensis, Trochammina mcmurrayensis, T. rainwateri, Saccammina lathrami, Valvulineria loetterlei, Ammobaculites fragmentarius, Verneuilinoides borealis, Bathysiphon vitta, Lenticulina gryci, L. macrodisca, Miliammina awunensis, M. ischnia, M. manitobensis, Gavelinella awunensis, G. stictata, Globulina prisca, Ammodiscus rotalarius, Saracenaria projectura, Textularia topagorukensis, Eurycheilostoma grandstandensis, E. robinsonae, Hippocrepina barksdalei, Gaudryinella irregularis, Psamminopelta subcircularis, Conorboides umiatensis, Vaginulinopsis schloenbachi, Globorotalites alaskensis, Vaginulina exilis, Tritaxia manitobensis, Quadrimorphina ruckerae, Inoceramus* prisms, megaspores, *Ditrupa cornu*, pelmatozoan fragments and frequent to common pyrite.

CONCLUSIONS

The USGS/Husky Koluktak No. 1 well penetrated the following biostratigraphic sequence based on foraminiferal analysis:

- 5772+ feet (110-5882'T.D.) of Aptian? to Albian age (Early Brookian - Rift Sequence) alluvial plain, shelf topsets and upper slope foresets.

PALYNOLOGY REPORT

Interpreted by:

Hideyo Haga

PALYNOLOGY SUMMARY

110-1220'?

Age.	Early Cretaceous Middle - Late Albian
Zone.	P-M17
Environment.	Marine

1220?-5882'T.D.

Age.	Early Cretaceous Aptian - Early Albian
Zone.	P-M18
Environment.	Marine
Remarks.	This age assignment is based on negative evidence.

INTRODUCTION

Purpose and Scope

The USGS/Husky Koluktak No. 1 well completed drilling in April, 1981. During the drilling process, a palynological study was conducted of ditch sample material from the well. A total of 68 palynology samples were examined in the course of this investigation. The sample coverage was from 110 feet to the total depth of 5882 feet.

This report provides an updated format from the original data. Some of the taxa have been revised to reflect the newer taxonomic assignments that have evolved over the decades since the initial study.

Procedures

At the time the well was drilled, the palynological samples were processed in San Diego, California, using techniques that were standard for the time. The chemical treatments involved the use of hydrochloric, hydrofluoric and nitric acids. The resulting kerogen residues were further concentrated by physical separation with heavy liquids and a sieving/panning technique. Permanent slide mounts were made of the residue concentrates. The coverslip mounting medium used was a synthetic resin sold under the brand name of "Coverbond".

The original palynomorph distribution chart data were entered into a desktop PC using proprietary software to compile new format charts. The charts are located in the pocket.

The Palynomorph Distribution Chart (Figure P-1) lists the occurrence and abundance of recorded taxa in each sample. Included on this chart are the diversity and abundance curves for the spore-pollen and the microplankton cysts.

High Resolution Biostratigraphy Plots - Foraminifera/Palynomorphs (Figure B-1) are also provided. This chart includes additional palynology parameters in the form of a cumulative plot that illustrates the relative abundance of the nonmarine, marine and miscellaneous palynomorph components.

RESULTS

Based on the palynomorph assemblages observed, an age and generalized environment of deposition were interpreted for each palynostratigraphic subdivision. The environments, as interpreted from the palynological preparations, are simply categorized as nonmarine, marginal marine or marine. These categories are based on the absence, or presence and diversity of microplankton. In this well, all strata are designated as marine.

The entire well consists of Aptian to Albian section. A tentative boundary is placed at 1220 feet and subdivides the strata into two intervals.

110-1220'?

Age. Early Cretaceous
Middle to Late Albian

Zone. P-M17

Environment. Marine

Palynomorphs. The spore-pollen assemblage contains the Early Cretaceous species *Trilobosporites apiverrucatus* and *T. perverulentus*. Other forms present include *Aequitriradites spinulosus, Cicatricosisporites hallei, C. venustus* and *Contignisporites cooksonii*. Fairly consistent occurrences of reworked Paleozoic spores are also noted.

The important dinocyst marker species for this interval is *Pseudoceratium expolitum*. Scattered specimens of reworked Neocomian and Late Triassic species were recorded.

Discussion. The base of this interval is tentatively placed below the lowest occurrence of *Pseudoceratium expolitum*.

1220?-5882'T.D.

Age. Early Cretaceous
Aptian to Early Albian

Zone. P-M18

Environment. Marine

Palynomorphs. The interval carries a general Aptian - Albian palynomorph assemblage and lacks any restrictive Albian markers.

The spore-pollen assemblage remains similar to the above interval, but with reduced diversity.

The dinocyst assemblage increases in diversity but most occurrences are rare. The species recorded include *Imbatodinium jaegeri*, *Odontochitina operculata*, *Oligosphaeridium complex*, *Muderongia asymmetrica*, *Palaeoperidinium cretaceum*, *Pseudoceratium polymorphum* and *P. retusum*.

Common to this interval are numerous scattered occurrences of reworked Carboniferous, Triassic, Jurassic and Neocomian palynomorphs.

Discussion. Although the assemblage is similar to the overlying Middle - Late Albian, P-M17 zonule, there is an absence of Albian-restrictive species. This negative evidence is the primary basis for the age assignment.

CONCLUSIONS

Palynological analysis of the USGS/Husky Koluktak No. 1 well provides the following generalized palynostratigraphic succession:

- Marine Middle to Late Albian strata are identified between 110 feet and 1220? feet.

- Based largely on negative evidence, an interval of Aptian - Early Albian strata are designated between 1220? feet and the total depth of 5882 feet. These strata are also of marine origin.