MESOZOIC-CENOZOIC-PALAEOZOIC

ENVIRONMENTAL STUDY

N. NWT, YUKON, ARCTIC COAST

by

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Environmental interpretation of Mesozoic-Cenozoic-Palaeozoic rocks, Northern N.W.T.-Yukon-Arctic Coast

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The area covered in this study lies in the area from 66° to 70° North Latitude and 126° to 141° West Longitude, which includes part of the northern Yukon Territory, the northern part of the Northwest Territories, and the Arctic coastal plain. Approximately 3,100 feet of cores of Mesozoic, Cenozoic, and Palaeozoic rocks were examined from the standpoint of depositional environment. A description of each facies unit with a corresponding environmental interpretation is given in the text. The environmental interpretation of each formation also is noted at data points on the map.

Two facies cross sections were constructed to provide a correlation and facies framework for the environmental interpretations.

Included

1 Map of study area with environmental interpretation of formations examined.
Scale 1" = 8 miles.

1 W-E Mechanical log facies cross section of Palaeozoic formations (A-A')

1 N-S Mechanical log facies cross section of Mesozoic-Cenozoic formations (B-B')

TRIAD BP ARCO HUME RIVER A-53

Lat. 66° 02' N.; Long. 129° 09' W.

Upper Ramparts Formation

796-801 (Rec. 5') Calcirudite, light-brown, composed of irregular bulbous stromatoporoids 10%, dendroid stromatoporoids 30%, tabular stromatoporoids 5%, Alreolitid corals 5% - in matrix of fine-grained fossil debris.

Environmental interpretation: platform to back-reef dendroid stromatoporoid facies; shallow well aerated reefal shoal deposition.

801-822 (Rec. 21') Calcilutite/calcarenite, brown to light-brown, laminated micrites, coalescent pellets, pellets, and low amplitude stylolites common; rare dendroid and bulbous stromatoporoids.

Environmental interpretation: interior lagoon; quiet, shallow-water deposition.

822-866 (Rec. 22') Calcirudite, light-brown, composed of dendroid stromatoporoids 30%, irregular tabular stromatoporoids 10%, subspherical stromatoporoids 5%, in matrix of coarse-grained fossil debris trace black bituminous material.

Environmental interpretation: fore-reef dendroid stromatoporoid facies; relatively high energy fore-reef deposition - fossils abundant and abraded.

ATLANTIC COLUMBIAN CARBON ARCTIC CIRCLE ONTARATUE K-4

Lat. 66° 33' N.; Long. 130° 46' W.

Upper Cambrian

7966-8026 (Rec. 60') Sandstone, light-grey to white, fine grained, sub rounded, poorly sorted; grading to siltstone, light-grey, forms distinct slightly distorted beds to 1/2 inch thick dipping from 10 to 20°. Interbedded with shale, grey, green, and red pyritic. Ratio of shale to sandstone approximately 1:1.

Environmental interpretation: delta front.

8090-8126 (Rec. 5.2') Shale, grey, fissile, with beds dipping to 10°.

Environmental interpretation: open-marine.

Upper Cambrian (cont'd.)

8761-8784 (Rec. 22.5') Siltstone, grey, slightly cross bedded with thin ¼ to ½ inch interbeds of shale, black, fissile, pyritic. More shale with beds dipping and distorted toward base of interval.

Environmental interpretation: prodelta.

SHELL ARCTIC RED RIVER O-27

Lat. 66° 46' N.; Long. 132° 49' W.

Lower part of
Lower Gossage Formation

5188-5217 (Rec. 28') Dolomite, grey to brown, fine to medium grained, relicts of fine irregular laminations; a dolomitized laminated calcarenite/calcilutite originally composed of pellets? coalescent pellets? and micrite, and possibly algal? materials.

Environmental interpretation: semi restricted shoal deposits, stagnant shallow interior carbonate platform with periodic mechanical action from tides and/or storms to produce pelletal fragments as well as nourishment of algal growth.

UNION etal MOBIL COLVILLE D-45

Lat. 67° 14' N.; Long. 125° 09' W.

Lower Cambrian

3018-3032 (Rec. 14') Shale, black, silty, relatively competent with fine interlaminations of light-grey siltstone.

Environmental interpretation: prodelta?

3032-3060 (Rec. 28') Sandstone, light-grey, fine to medium grained, medium sorting, sub rounded, bedded, highly burrowed with beds partly to completely disrupted.

Environmental interpretation: delta front?

3060-3080 (Rec. 20') Shale, grey-black, fissile.

Environmental interpretation: prodelta?

3080-3102 (Rec. 22') Sandstone, light-grey, fine to medium grained, medium to poor sorting sub rounded, irregular fine bedded, slightly dipping, burrowed.

Environmental interpretation: delta front?

3102-3114 (Rec. 12') Shale, black, silty, relatively competent thin interbeds of siltstone and sandstone light-grey fine grained, rare small nodules of sandstone.

Environmental interpretation: prodelta?

3114-3160 (Rec. 46') Sandstone, grey, medium to coarse grained, sub rounded, with lithic fragments common, massive to slightly bedded, 1 to 2 foot beds of shale, black fissile common toward base of interval (3126-3160).

Environmental interpretation: prodelta?

3160-3233 (Rec. 70') Sandstone, light-grey rarely to buff, medium grained, subangular medium sorting, graded beds, cross beds, massive, rare thin beds of green shale. Uppermost 10 feet of interval mottled and slightly disrupted.

Environmental interpretation: delta-distributary channel facies?

CHEVRON GULF RIDGE YT F-48

Lat. 67° 17' N.; Long. 137° 53' W.

Upper Jurassic

4647-4674 (Rec. 26.5') Sandstone grading to siltstone, light-grey, fine grained, well sorted, sub angular to sub rounded, massive, bituminous spicules common in places, quartzose cement, glauconite trace to rare, pyrite trace.

Environmental interpretation: delta front.

UNION IOE STONEY G-06

Lat. 67° 35' N.; Long. 135° 15' W.

Lower Hume Formation

5493-5541 (Rec. 48') Calcilutite, light brown to brown, composed of irregular clasts formed by early? brecciation, clasts outlined by black bituminous material. Laminae and low-amplitude stylolites apparent in some clasts. Clasts composed of coalescent pellets and micrite. Argillaceous partings common.

Environmental interpretation: relatively deep interior semi restricted - early? post lithification brecciation.

UNION IOE STONEY G-06

Lat. 67° 35' N.; Long. 135° 15' W.

Lower Hume Formation

5493-5541 (Rec. 48') Calcilutite, light brown to brown, composed of irregular clasts formed by early? brecciation, clasts outlined by black bituminous material. Laminae and low-amplitude stylolites apparent in some clasts. Clasts composed of coalescent pellets and micrite. Argillaceous partings common.

Environmental interpretation: relatively deep interior semi restricted - early? post lithification brecciation.

GULF MOBIL EAST REINDEER A-01

Lat. 68° 04' N.; Long. 134° 00' W.

Lower Cretaceous

7544-7579 (Rec. 35') Sandstone, brown fine to medium grained, well sorted, well rounded quartz and minor chert in calcareous siliceous argillaceous matrix; intercalated with flat shale pebbles, produced by pulling apart and disruption of shale laminae. Mixing of argillaceous and sandy layers produces a mottling effect. Cross bedding is apparent where lamination is distinct, also slump structures, mini faults and boudins, rare chert and siderite nodules.

Environmental interpretation: prodelta.

GULF EAST REINDEER P-60

Lat. 68° 39' N.; Long. 133° 43' W.

Palaeozoic?

4560-4593 (Rec. 33') Shale, dark grey, blocky, horizontal partings, silty, slightly sandy, slightly calcareous, with some parting planes slickensided, floating chert pebbles one to 3 cm and larger common.

Palaeozoic?

5183-5201 (Rec. 16.5') Shale, dark grey, slightly calcareous, blocky, with floating chert pebbles common, contorted bedding.

GULF IMP. SHELL REINDEER F-36

Lat. 69° 05' N.; Long. 134 °39' W.

Reindeer Formation

3160-3194 (Rec. 29.5') Shale, dark grey to black, non calcareous, slightly carbonaceous, with frequent light grey very fine grained sand and silt laminae. Sandstone consists of quartz with minor chert and coal fragments, slightly calcareous, showing slump structures, escape burrows, and small scale cross bedding.

Environmental interpretation: fluvial to upper delta plain.

Reindeer Formation (cont'd.)

3602-3625 (Rec. 23') Shale, dark grey to black,with frequent light grey, very fine grained, slightly calcareous, very argillaceous sandstone and siltstone laminae, with small scale cross bedding.

Environmental interpretation: upper delta plain.

3625-3658 (Rec. 33') Shale, dark grey to black, non calcareous, carbonaceous, with common light grey, silt and sandstone stringers up to 6-8 inches thick; siderite nodules and bands common.

Environmental interpretation: delta plain.

GULF IMP. SHELL TITALIC K-26

Lat. 69° 05' N.; Long. 135° 06' W.

Reindeer Formation

4830-4840 (Rec. 10') Sandstone, grey, medium grained, sub angular, well sorted, 60% quartz, 20% chert, 10% coal and argillite grains in clay matrix; good porosity, more argillaceous and less porous towards the base of interval, laminae of dark grey carbonaceous shale common, sandstone shows cross bedding and grades into dark grey sandy shale.

Environmental interpretation: delta plain.

4840-4850 (Rec. 10') Sandstone, grey, medium grained, very fine grained to coarse grained with upward fining,breaks of dark grey shale common, carbonaceous and coaly partings with rare plant imprints.

Environmental interpretation: delta plain.

Reindeer Formation (cont'd.)

9046-9054 (Rec. 8') Sandstone, grey, well sorted, sub rounded, 60% quartz, 20% chert grains, slightly glauconitic, kaolinitic, sideritic, argillaceous matrix, good porosity, rare argillaceous laminae and dark grey shale streaks outlining cross bedding.

Environmental interpretation: delta front to proximal prodelta.

9054-9055.5 (Rec. 1.5') Shale, grey, bentonitic, non calcareous, sideritic, with siderite nodules, cross bedded with interlaminated sandstone streaks thoroughly to partially giving a mottled sedimentary boudinage appearance.

Environmental interpretation: delta front.

9055.5-9061.5 (Rec. 6') Sandstone, grey, sub rounded, well sorted, glauconitic, slightly calcareous, kaolinitic matrix composed of quartz and chert grains. Rare coal grains and shale chips, good porosity, rare siderite nodules.

Environmental interpretation: offshore bar-prodelta.

9061.5-9064.9 (Rec. 3') Shale, dark grey, sandy, silty, sideritic, micaceous, carbonaceous, slightly calcareous.

Environmental interpretation: prodelta.

SHELL UNIPKAT I-22

Lat. 69° 11' N.; Long. 135° 20' W.

Reindeer Formation

4796-4811 (Rec. 15') Sandstone, grey, 60% quartz, 30% chert, coal grains common, kaolin and weathered feldspar common, trace glauconite, micaceous, argillaceous slightly calcareous matrix. Siderite nodules, shale chips and blocks, laminae showing dips up to 20°. Flame structures and distinct cross bedding common.

Environmental interpretation: lower delta plain-upper delta front.

Fish River Group

10,215-10,242 (Rec. 25') Sandstone, grey, medium grained, sub angular, well sorted, 60% quartz, 20% chert, 10% coal, trace glauconite and coal grains in slightly calcareous, argillaceous matrix, rare beds of siderite and rare chert nodules, large shale clasts common, shale laminae with pull apart structures common, good porosity.

Environmental interpretation: delta front.

GULF MOBIL YA YA M-33

Lat. 69° 12' N.; Long. 134° 39' W.

Fish River Group

6607-6627 (Rec. 20') Sandstone, grey, sub angular, well sorted, consisting of 60% quartz, 25% black chert, rare coal and argillite grains in clay matrix. Sandstone is friable and soft, weathered feldspar grains and kaolin common, slightly calcareous, good porosity. Dark grey, non calcareous, slightly carbonaceous disrupted streaks common, contorted bedding and sedimentary boudinage structures common.

Environmental interpretation: delta front.

Fish River Group (cont'd.)

7915-7939 (Rec. 24') Sandstone, grey, medium grained, well sorted, compact, 60% quartz, 20% chert, 10% argillite grains in calcareous and sideritic matrix with kaolin and weathered feldspar common. Vertical fractures filled with calcite. Some of the vertical fractures show slickensided surfaces. Rare chert nodules and shale pebbles.

Environmental interpretation: delta front.

IOE YAYA P-53

Lat. 69° 12' N.; Long. 134° 42' W.

Reindeer Formation

5487-5512 (Rec. 25') Mudstone, grey, bentonitic, silty, very sandy, interbedded with fine laminae of medium grey sandstone with small scale cross bedding. Sandstone is slightly calcareous, argillaceous and tight. Disturbed bedding due to burrowing.

Environmental interpretation: prodelta.

SHELL NIGLINTGAK H-30

Lat. 69° 19' N.; Long. 135° 20' W.

Beaufort Formation

3534-3566 (Rec. 32') Sandstone, grey, fine to medium grained, 65% quartz, 25% chert, 10% coal grains, finely disseminated siderite, slightly calcareous, finely interbedded with mudstone laminae, siderite nodules, slump structures and mini faults. Sandstone is glauconitic, micaceous, slightly calcareous and has fair porosity.

Environmental interpretation: delta front.

Beaufort Formation?

3636-3696 (Rec. 30') Sandstone, grey, 70% quartz, 20% chert, 10% coal and argillite, trace glauconite, siderite grains, weathered feldspar grains in argillaceous slightly calcareous, and kaolinitic matrix; sub angular, well sorted grains good porosity and friable; the sandstone is massive with rare streaks of carbonaceous material showing horizontal laminations.

Environmental interpretation: delta front sandstone.

3696-3714 (Rec. 15.5') Sandstone, grey; 60% quartz, 20% chert, remainder coal chips, mica flakes, glauconite, argillite grains, siderite, well sorted sub angular grains in argillaceous kaolinitic slightly calcareous matrix with fair porosity and massive bedding. Rare dark grey non calcareous shale streaks.

Environmental interpretation: delta front.

Reindeer Formation

5844-5849 (Rec. 5') Sandstone, grey, consists mainly of quartz, chert, coal, feldspar grains, mica flakes, argillite grains, siderite in clayey matrix fine to medium grained, well cemented sub angular and well sorted with poor porosity and showing horizontal laminations. Rare siderite nodules.

Environmental interpretation: delta front.

5849-5877 (Rec. 28') Sandstone, grey, 65% quartz, 25% chert, 10% coal, siderite, mica, glauconite in kaolinitic slightly calcareous argillaceous matrix; well sorted sub angular commonly grading to very thin laminae of dark grey non calcareous mudstone. At the base of interval sandstone and mudstone are mixed.

Environmental interpretation: delta front.

5877-5904 (Rec. 27') Sandstone, grey, fine to medium grained with occasional bands of coarse grained calcareous, glauconitic sandstone with shale pebbles and blocks. Sandstone with fair porosity and slight oil stains.

Environmental interpretation: delta front.

Reindeer Formation (cont'd.)

6960-6972 (Rec. 12') Sandstone, grey very fine to fine grained, quartz, chert, coal, argillite, mica, feldspar grains, glauconite in slightly calcareous sideritic argillaceous matrix, fair to poor porosity; sandstone grades into dark grey shale in basal 3 inches.

Environmental interpretation: delta front.

6972-6974.5 (Rec. 2.5') Shale, dark grey, hard and blocky, carbonaceous, non calcareous and pyritic.

Environmental interpretation: prodelta.

IOE TUKTU O-19

Lat. 69° 20' N.; Long. 132° 45' W.

Lower Cretaceous

6513-6543 (Rec. 30') Sandstone, grey, very argillaceous in places grading to sandy shale, thoroughly mixed and highly bioturbated, grains consist mainly of quartz and chert with minor amounts of coal, glauconite, and feldspar grains. Sandstone is 10% silty and 20% argillaceous. The bioturbation produces a mosaic like fabric with some laminae disrupted and pulled apart.

Environmental interpretation: prodelta.

Lower Cretaceous (cont'd.)

6883-6913 (Rec. 30') Sandstone, brown, well sorted, well rounded, composed of quartz and chert grains, siliceous and calcareous cement, glauconitic, slightly argillaceous, in places clay content increases to form distinct shale laminae that are pulled apart and disrupted forming mottlings dark grey argillaceous and grey sandy parts; floating granules and pebbles common, where laminae are not disturbed sedimentary boudinage structures are apparent.

Environmental interpretation: prodelta.

IOE TAGLU C-42

Lat. 69° 21' N.; Long. 134° 56' W.

Reindeer Formation

8466-8482.5 (Rec. 16.5') Sandstone, grey, medium grained, sub angular, well sorted, good porosity, 60% quartz, 25% black chert grains, 5% coal grains, frequent weathered feldspar grains, muscovite, trace clay, trace glauconite, calcareous; sideritic, occasional ironstone nodules, shale chips and chert pebbles; rare paper thin shale laminae, very rare streaks of shale pebbles and chert pebble conglomerates.

Environmental interpretation: delta front, possibly inter distributory trough deposit.

8482.5-8484 (Rec. 1.5') Mudstone, grey bentonitic, silty, sandy burrow mottled, occasional bands of sandy mudstone grading to argillaceous sandstone.

Environmental interpretation: prodelta deposit in close proximity to delta front.

8484-8499 (Rec. 5') Sandstone, grey, medium grained, sub angular, well sorted, with good porosity, consists of 60% quartz, 25% chert, 5% weathered feldspar and muscovite, trace glauconite, calcareous and sideritic. Frequent coal grains. Massive with very rare streaks of carbonaceous material.

Environmental interpretation: delta front sandstone.

8499-8506 (Rec. 7') Mudstone, grey, bentonitic, silty, trace very fine grained sandy disturbed bedding planes indicating burrowing, disseminated carbonaceous particles.

Environmental interpretation: prodelta mudstone.

Reindeer Formation (cont'd.)

9412-9430 (Rec. 18') Sandstone, grey, 50% quartz, 30% chert grains, 20% coal and rock fragments, trace glauconite, kaolinite and weathered feldspar; slightly calcareous and sideritic. Very rare laminae of carbonaceous material indicating low angle cross bedding.

Environmental interpretation: stream mouth bar deposit in delta front.

9430-9452 (Rec. 22') Mudstone, grey, mottled, with blebs of light-grey sandstone and silt contorted bedding, flame structures indicating turbidite type of deposition.

Environmental interpretation: prodelta.

9452-9472 (Rec. 20') Sandstone, grey, framework mostly chert, quartz and coal fragments, trace siderite, calcite and glauconite, argillaceous and kaolinitic matrix, sub angular, well sorted grains, good porosity, friable homogeneous sandstone with little trace of bedding.

Environmental interpretation: delta front.

9472-9494 (Rec. 24') Sandstone, grey, medium to coarse grained, sub angular, well sorted, good porosity.Near the top of interval porosity is reduced by argillaceous material and siderite grains filling pores, fining upward sequences common.

Environmental interpretation: delta front.

9494-9526 (Rec. 30') Mudstone, grey, silty very fine grained sandy, with contorted bedding highly disrupted and broken into sandstone blebs floating in mud matrix, siderite nodules; coal grains and chips. Mudstone grades into a very fine grained sandstone toward base of interval.

Environmental interpretation: turbid prodelta mudstones.

9526-9532 (Rec. 6') Sandstone, grey, medium grained well sorted, sub angular, good porosity, calcareous, argillaceous, glauconitic, sideritic and kaolinitic, cross bedded, with blocks of mudstone floating in sandstone.

Environmental interpretation: prodelta.

9532-9546 (Rec. 14') Sandstone, with rip up mud clasts and cross bedding with mudstone interbeds.

Environmental interpretation: prodelta.

9546-9491 (Rec. 45') Mudstone, grey and sandstone, very fine grained interbedded with increasing amount of silt and strongly cross bedded toward base of interval.

Environmental interpretation: prodelta.

9591-9592 (Rec. 1') Sandstone, grey, medium grained, sub angular, well sorted, trace clay, calcareous, glauconitic with good porosity.

Environmental interpretation: delta front-marine bar.

9592-9594 (Rec. 2') Sandstone, grey, medium grained sub angular, glauconitic, calcareous, well sorted, good porosity.

Environmental interpretation: delta front-marine bar.

9594-9597 (Rec. 3') Mudstone, grey, very silty, grading to siltstone.

Environmental interpretation: prodelta.

9597-9607 (Rec. 10') Sandstone, grey, grades through fining upward sequence to fine grained at the top and medium grained to coarse grained at the base with increasing porosity toward the base.

Environmental interpretation: delta front.

9607-9619 (Rec. 12') Sandstone, grey, very fine grained, argillaceous matrix; interbedded with grey mudstone, bentonitic, siltstone, light-grey, slightly calcareous cross bedded.

Environmental interpretation: prodelta.

9619-9647 (Rec. 28') Sandstone, grey, medium grained, well sorted, sub angular, slightly calcareous, coal grains, trace glauconite, fair porosity. The framework is 65% quartz, 25% chert grains, 10% rock fragments; relatively homogeneous with trace of bedding outlined by carbonaceous laminae.

Environmental interpretation: offshore marine bar delta front.

9647-9650 (Rec. 3') Mudstone, grey, mottled, blebs of sandstone, grey, very fine to fine grained, argillaceous.

Environmental interpretation: prodelta.

9650-9652 (Rec. 2') Sandstone, coarsening upward sequence from very fine grained to medium grained at top of interval, consists of quartz and chert grains, minor clay, coal and siderite. Slightly calcareous commonly weathered feldspar grains.

Environmental interpretation: delta front.

9652-9658.5 (Rec. 6.5') Sandstone, grey, very fine grained, argillaceous with poor porosity, minor unconformity is indicated at base of interval.

Environmental interpretation: delta front.

IOE TAGLU C-42 (cont'd.)

9658.5-9712 (Rec. 53.5') Sandstone, grey, medium grained, quartz 50%, chert 30%, coal grains and rock fragments 20%, trace oil stain, glauconite, slightly calcareous, grades from coarse to fine grained, massive with very rare bedding planes, well sorted, sub angular, with excellent porosity. Siderite nodules and grains common.

Environmental interpretation: delta front.

9712-9760 (Rec. 48') Sandstone, grey, coarse to very coarse grained at top of interval, fine grained at base of interval, rare streaks of chert granules and pebbles, very homogeneous, glauconitic, sideritic and kaolinitic, sub angular, moderate sorting, fair porosity.

Environmental interpretation: delta front.

9760-9766.5 (Rec. 6.5') Sandstone, grey, fine to medium grained well sorted, sub angular, argillaceous, slightly calcareous, quartz 60%, chert 20%, siderite grains, coal and rock fragments are minor constituents, trace of glauconite and kaolinite. Parallel bedding, slightly disrupted.

Environmental interpretation: delta front.

Reindeer Formation (cont'd.)

10,416-10,473 (Rec. 57') Sandstone, grey, fine to medium grained, well sorted, sub angular, 50% quartz grains, 30% chert grains, 20% rock fragments, coal grains, kaolinitic, with increasing amounts of siderite toward base, rare mudstone laminae. Massive with some indication of minor cross bedding. Abundant siderite nodules two feet from the base. Good porosity.

Environmental interpretation: delta plain-toward delta front.

10,473-10,533 (Rec. 60') Sandstone, fine to medium grained, well sorted, sub angular, fair porosity; consisting of quartz 60%, 25% chert grains, remainder consists of rock fragments and coal grains. Siderite nodules common, slightly glauconitic with rare very calcareous sandstone. Homogeneous bedding with minor interbeds of mudstone at base; massive at top of interval with flame structures, disrupted and bio turbated at base of interval.

Environmental interpretation: delta front.

IMPERIAL IOE PIKIOLIK E-54

Lat. 69° 23' N.; Long. 132° 44' W.

Lower Cretaceous

7821-7832 (Rec. 11') Shale, dark grey, non calcareous, brittle, pyritic, sideritic with pods of light grey slightly calcareous siltstone.

Environmental interpretation: marine.

7832-7851 (Rec. 19') Shale, dark grey, non calcareous, pyritic, sideritic, with blebs, lenses, and streaks of siltstone, pyrite and siderite nodules common; boudinage structures very common.

Environmental interpretation: marine.

IMPERIAL IOE PIKIOLIK M-26

Lat. 69° 25' N.; Long. 132° 37' W.

Fish River Group

2317-2333 (Rec. 16') Mudstone, thin bedded, fissile, becomes gumbo like on wetting, medium grains, sandy, silty, carbonaceous, commonly grading to argillaceous sandstone; sandstone, thin bedded, ver- argillaceous, friable, composed mainly of quartz and chert grains, coal, mica, siderite and glauconite are the minor constituents. Slightly calcareous kaolinitic, argillaceous matrix; poor to trace porosity, intermixed with one to four inch long lenses of clay.

Environmental interpretation: prodelta.

2333-2365 (Rec. 8') Interbedded sandstone 40% and mudstone 60%; sandstone, very argillaceous, fine to medium grained, composed mainly of chert and quartz grains; mudstone, micaceous with sandy streaks showing cross bedding and in places disrupted lamination with floating blebs of sandstone in the mudstone.

Environmental interpretation: prodelta.

Fish River Group (cont'd.)

2833-2844 (Rec. 11') Mudstone, dark grey, non calcareous, sandy, contains argillaceous sandstone and coal interbeds 1/2 to 1 inch; cross bedding.

Environmental interpretation: prodelta.

Fish River Group (cont'd.)

3416-3436 (Rec. 18') Mudstone, grey, bentonitic, silty, finely disseminated carbonaceous material common; micaceous, blocky, rare siderite nodules.

Environmental interpretation: prodelta.

Fish River Group (cont'd.)

5546-5576 (Rec. 30') Shale, dark grey, non calcareous, bentonitic, bituminous, micaceous, with small pods 1/10 to 1/2 inch thick of sandstone and siltstone floating in dark grey to black shale; pyritic with nodules and blebs of pyrite.

Environmental interpretation: prodelta.

IMPERIAL IOE PIKIOLIK M-26 (cont'd.)

Fish River Group (cont'd.)

5633-5645 (Rec. 11.5') Shale, dark grey to black, pyritic, sideritic, rare pyritic nodules, 1/2 to 1 inch thick blebs of siltstone.

Environmental interpretation: prodelta.

IOE MAYOGIAK J-17

Lat. 69° 26' N.; Long. 132° 48' W.

Fish River Group

3023-3033 (Rec. 6.5') Siltstone, grey, sideritic, micaceous, carbonaceous, with streaks of sandstone, very fine to fine grained, sub angular, poorly sorted.

Environmental interpretation: prodelta.

Fish River Group (cont'd.)

3855-3857 (Rec. 2') Sandstone, grey, very fine to fine grained, mostly quartz, 20% chert and coal grains in clay matrix; partly unconsolidated interbedded with fine mudstone laminae.

Environmental interpretation: prodelta.

3857-3859 (Rec. 2') Mudstone, grey, with silty sandstone stringers.

Environmental interpretation: delta front-grading to prodelta.

3859-3863 (Rec. 4') Sandstone, grey, very argillaceous, very fine grained and tight, interbedded mudstone laminae and streaks, slightly calcareous trace siderite, carbonaceous with coal fragments.

Environmental interpretation: offshore prodelta.

3863-3879 (Rec. 16') Sandstone, grey, 60% quartz, 20% chert, 10% argillite grains, remainder coal fragments, mica flakes, trace glauconite, siderite in clay matrix with siltstone/claystone partings sub angular fair sorting with poor porosity, good oil stain.

Environmental interpretation: delta front changing to prodelta. Offshore bar.

3879-3893 (Rec. 14') Mudstone, grey, silty and carbonaceous, micaceous with rare sandstone and siltstone interbeds. Very slightly calcareous with scattered siderite nodules.

Environmental interpretation: prodelta.

3895-3919 (Rec. 24') Mudstone, grey, carbonaceous, silty, sideritic, with siderite nodules, siltstone and sandstone partings common.

Environmental interpretation: prodelta.

IOE MAYOGIAK J-17 (cont'd.)

Fish River Group (cont'd.)

7146-7163 (Rec. 17') Mudstone, grey, silty, grading to siltstone and very fine grained sandstone bands, mudstone, carbonaceous, silty, sideritic, very high angle of dip.

Environmental interpretation: prodelta.

Lower Cretaceous, Pre-Maestrichtian

8818-8832 (Rec. 14') Sandstone, light grey, fine grained, sub angular, well sorted quartzose, slightly calcareous, glauconitic, pyritic, with poor to fair porosity, common dark grey shale laminae, rare worm boring, good oil stain.

Environmental interpretation: marine prodelta.

8832-8858 (Rec. 26') Siltstone, brown, with interbeds of very fine to fine grained calcareous sandstone and dark grey shale; siltstone, slightly calcareous, pyritic, carbonaceous, pelecypod shell fragments.

Environmental interpretation: prodelta.

Lower Cretaceous (cont'd.)

8960-8984 (Rec. 24') Sandstone, light grey, upward coarsening from siltstone at the base to fine grained sandstone at the top, sub angular, well sorted quartz grains with dolomite and calcite cement; poor porosity and good oil stain, grading at the base to dark grey silty, sandy shale with pyrite and pelecypod fragments.

Environmental interpretation: marine deep water.

8984-8995 (Rec. 11') Sandstone, brown, fine to very fine grained, sub angular, well sorted, quartzose with calcite and dolomite cement, silty and argillaceous, pyritic, rare siderite nodules, interlaminated with shale, dark grey; siltstone, grey, slightly calcareous and glauconitic.

Environmental interpretation: prodelta.

8995-9021 (Rec. 25') Siltstone, dark grey, argillaceous, slightly calcareous, glauconitic, pyritic, rarely grading into brown very fine grained argillaceous silty sandstone, pelecypod shell fragments rare.

Environmental interpretation: marine.

IOE MAYOGIAK J-17 (cont'd.)

9021-9034 (Rec. 13') Siltstone, dark grey, slightly calcareous, slightly sandy, pyritic, grading in places to very thin dark grey sideritic shale laminae.

Environmental interpretation: marine.

9034-9056 (Rec. 17') Siltstone, dark grey, dolomitic, sideritic, pyritic, micaceous, argillaceous, in places grading to dark grey shale, and brown very fine grained sandstone.

Environmental interpretation: marine deep water.

Lower Cretaceous (cont'd.)

9366-9375.5 (Rec. 9.5') Siltstone, dark grey, carbonaceous, argillaceous, pyrite, glauconitic, and hard.

Environmental interpretation: marine deep water.

Devonian

9375.5-9383 (Rec. 7.5') Dolomite, light grey, very fine grained, argillaceous, slightly calcareous, pyritic, secondary calcite filling fractures, trace to poor porosity.

Environmental interpretation:

GULF MOBIL KILAGMIOTAK F-48

Lat. 69° 27' N.; Long. 134° 11' W.

Reindeer Formation

12,351-12,357 (Rec. 3.5') Sandstone, grey, medium grained, sub angular, moderately sorted with unoriented chert granules (1-2 cm diameter), slightly calcareous to non calcareous, argillaceous, rare coal grains.

Environmental interpretation: delta front.

IOE MALLIK L-38

Lat. 69° 27' N.; Long. 134° 39' W.

Beaufort Formation

3016-3026 (Rec. 2') Sand, grey, loose, medium grained, composed of chert, quartz and glauconite grains intermixed with granules and pebbles of chert, quartzite and sandstone.

Environmental interpretation: delta front.

Reindeer Formation

7543-7558 (Rec. 15') Mudstone, grey, bentonitic, non calcareous, carbonaceous, silty, sandy, thin bedded, with rare chert granules.

Environmental interpretation: prodelta muds.

IMP ATERTAK E-41

Lat. 69° 30' N.; Long. 132° 42' W.

Fish River Group

3127-3147 (Rec. 19.5') Sandstone, grey, very fine grained, composed of quartz, chert, and coal grains in very argillaceous matrix, trace glauconite, silty, rarely grading to sandy, non calcareous, micaceous mudstone. Sandstone has good porosity and permeability. Mudstone has siderite nodules and ripple cross bedding.

Environmental interpretation: prodelta.

Fish River Group (cont'd.)

3935-3955 (Rec. 20') Mudstone, thin bedded, well laminated, becomes gumbo like on wetting, rare sandstone pebbles and siderite nodules. Mudstone is slightly carbonaceous, non calcareous, micaceous and silty.

Environmental interpretation: prodelta.

Fish River Group (cont'd.)

4015-4045 (Rec. 30') Mudstone, grey, non calcareous, slightly carbonaceous, interbedded with equal amounts of light grey siltstone and very fine grained sandstone. Siltstone slightly calcareous, argillaceous and sandy. Sandstone grey, very fine grained, argillaceous, composed mainly of quartz and chert grains. Mudstone in places contains floating granules and pebbles of chert.

Environmental interpretation: prodelta.

Fish River Group (cont'd.)

4076-4096 (Rec. 18') Mudstone, grey, becomes gumbo-like when wet, very slightly carbonaceous, non calcareous, slightly silty, rare floating chert pebbles.

Environmental interpretation: prodelta muds.

Fish River Group (cont'd.)

4098-4118 (Rec. 12') Mudstone, grey, gumbo-like when wet, silty, carbonaceous, rarely grading to grey argillaceous sandstone. Sandstone composed of quartz, chert, and coal grains in clay matrix with poor to fair porosity and oil staining; grains are sub angular and well sorted.

Environmental interpretation: prodelta.

Fish River Group (cont'd.)

4148-4154 (Rec. 6') Mudstone, grey, non calcareous, interbedded with 3-4 inch thick beds of argillaceous sandstone, slightly glauconitic, well sorted, sub angular, composed of quartz, chert and coal grains, clay matrix with poor to fair porosity.

Environmental interpretation: prodelta.

4154-4174 (Rec. 20') Mudstone, grey, with very thin streaks of sandstone and siltstone with disrupted bedding and common boudinage structures.

Environmental interpretation: prodelta.

Fish River Group (cont'd.)

4460-4464 (Rec. 4') Sandstone, very silty, argillaceous, micaceous and carbonaceous with good oil stain, frequent mudstone laminae, horizontal bedding.

Environmental interpretation: prodelta.

4464-4478 (Rec. 14') Mudstone, grey, carbonaceous, micaceous, non calcareous, rare beds of argillaceous sandstone and siltstone 10-20% consisting of very fine grained sandy mudstone grading to argillaceous sandstone with poor porosity and trace oil stain.

Environmental interpretation: prodelta.

Fish River Group (cont'd.)

5465-5490 (Rec. 25') Mudstone, grey, hard, blocky, non calcareous, with fine streaks of siltstone. Ironstone, pyrite and siderite nodules common.

Environmental interpretation: deep water marine.

IOE MALLIK A-06

Lat. 69° 30' N.; Long. 134° 30' W.

Beaufort Formation

3123-3133 (Rec.8') Mudstone, bentonitic, micaceous, silty, slightly carbonaceous. Core broken in pieces.

Environmental interpretation: prodelta mudstone.

Beaufort Formation (cont'd.)

4039-4049 (Rec. 6') Sandstone, grey, 60% quartz, 25% chert, 5% weathered feldspar grains, 5-10% interstitial clay; sub angular, moderately sorted, poor porosity. Interbedded thin mudstone laminae up to 4" thick. Mudstone grey, carbonaceous, silty and very fine grained sandstone.

Environmental interpretation: prodelta.

Beaufort Formation (cont'd.)

4467-4477 (Rec. 5') Mudstone, grey, intermixed with light-grey very fine grained sandstone (20-30%) mottled. Mudstone, bentonitic, silty, and "gumbo" like.

Environmental interpretation: prodelta.

Reindeer Formation

8656-8684 (Rec. 28') Shale, dark grey, carbonaceous, micaceous, silty with paper thin laminae of very fine grained quartz sand and silt, plant fragments common; core is broken with common slickensided surfaces present indicating minor faulting.

Environmental interpretation: the thin silt laminae, minifaults and pull apart structures suggest a prodelta environment.

Reindeer Formation (cont'd.)

9266-9281 (Rec. 15') Shale, dark grey, fissile, non calcareous, with common laminae of very fine grained sandstone. Some laminae contain convolute bedding, minifaults and contorted bedding. Slickensided surfaces are common. A streak of conglomerate consisting of rock fragments and chert granules and pebbles is present at 9281 feet below which the mudstone grades into sandstone.

Environmental interpretation: prodelta.

9281-9289 (Rec. 8') Sandstone, grey, 20% chert and shale clasts, poor sorting, coarse to medium grained and fine grained quartz and chert grains in argillaceous matrix, rare chert granules and pebbles, shale clasts, common shale laminae outline convolute and rare contorted beds. Rare indication of high angle cross bedding toward base of interval.

Environmental interpretation: prodelta.

9289-9291 (Rec. 2') Shale, with streaks of sandstone, parallel lamination, slickensides, with common rip up clasts and flame structures.

Environmental interpretation: prodelta.

Reindeer Formation (cont'd.)

9655-9661.5 (Rec. 6.5') Shale, dark grey non calcareous, sandy in places grading into argillaceous sandstone laminae, slightly carbonaceous.

Environmental interpretation: prodelta.

Reindeer Formation (cont'd.)

10,519-10,526.5 (Rec. 7.5') Sandstone, grey, 70% quartz grains, 20% chert pebbles, 10% shale clasts and coal grains, in argillaceous matrix. Shale blocks and floating clasts (rip up clasts) common in the massive sandstone with very rare chert granule laminae as the only indication of bedding; chert granules and grains fine upward; rare siderite nodules; slickensided shale and mudstone partings common.

Environmental interpretation: prodelta turbidite.

10,526.5-10,529.5 (Rec. 3') Interbedded grey medium grained, very argillaceous and silty sandstone, and grey shale thin bedded suggesting slow deposition in less agitated waters.

Environmental interpretation: prodelta.

10,529.5-10,534 (Rec. 4.5') Sandstone, grey, fine grained, moderately sorted sub angular with poor porosity; very finely laminated with interbeds of thin mudstone laminae grading to interbedded mudstone and sandstone. Sandstone is slightly calcareous, rare ironstone nodules, rip up clasts and flame structures.

Environmental interpretation: prodelta.

10,534-10,537 (Rec. 3') Sandstone, grey, 60% quartz, 20% chert grains, 20% coal, micaceous, weathered feldspar, and argillite grains, sub angular, well sorted, with some interstitial clay reducing porosity.

Environmental interpretation: delta plain-proximity to delta front.

10,537-10,538 (Rec. 1') Mudstone, dark grey, silty, micaceous, carbonaceous, non calcareous, blocky.

Environmental interpretation: delta plain.

10,538-10,541 (Rec. 3') Sandstone, grey, medium grained, argillaceous with poor to fair porosity, blocks of shale with high angles of inclination (30^{o}+) common, trace cross bedding.

Environmental interpretation: delta plain.

10,541-10,545.5 (Rec. 4.5') Mudstone, dark grey, non calcareous, blocky, with rare 4-6" long blebs of sandstone, finely disseminated carbonaceous material common.

Environmental interpretation: delta plain.

10,545.5-10,552.5 (Rec. 7') Sandstone, grey with blocks of mudstone, commonly intermixed and mottling, no indication of original bedding suggests highly turbid environment of deposition. Occasional contorted bedding, wavy bedding and streaks of parallel lamination. Frequent mudstone streaks.

Environmental interpretation: prodelta.

10,552.5-10,561 (Rec. 8.5') Mudstone, dark grey, with interbeds of sandstone, vertical fractures in the sandstone are filled with secondary calcite. Non calcareous, slightly carbonaceous sandy streaks in the mudstone with dips up to 30^{o} (some are almost vertical). The mudstone shows frequent slickensides.

Environmental interpretation: prodelta.

Reindeer Formation (cont'd.)

11,805-11,855 (Rec. 50') Shale, dark grey, with finely disseminated carbonaceous material, micaceous, silty, sandy beds dip 10-20^{o} interbedded with streaks of very fine grained sandstone and siltstone, rare siderite nodules and bands; minifaults, common slickensides.

Environmental interpretation: prodelta.

IOE MAGAK A-32

Lat. 69° 31' N.; Long 132° 07' W.

Proterozoic

5004-5024 (Rec. 18') Siltstone, grey, argillaceous with clay content increasing in places to form greenish grey shale laminae, finely disseminated pyrite common.

Proterozoic (cont'd.)

5142-5160 (Rec. 18') Quartzite, grey, with ghost textures of medium grained sub angular well-sorted quartz sandstone, very pyritic forming nodules and disseminated crystals.

ELF IMPERIAL AMAGUK H-16

Lat. 69° 35' N.; Long. 131° 02' W.

Lower Cretaceous

3098-3108 (Rec. 10') Sandstone, grey, very fine grained, slightly glauconitic, calcareous, 20% silt, 20-50% argillaceous material grading to sandy shale, tight.

Environmental interpretation: offshore marine.

Proterozoic

4112-4120 (Rec. 8') Quartzite, grey, well rounded, well sorted, medium to coarse grained quartz sandstone, metamorphosed; interbedded with thin beds of dark grey siliceous shale. Vertical fractures filled with calcite grains and pyrite.

4120-4123 (Rec. 3') Shale, dark grey, hard, blocky.

IOE IVIK J-26

Lat. 69° 35' N.; Long. 134° 20' W.

Beaufort Formation

5490-5499 (Rec. 8') Mudstone, grey, fissile, sandy, non calcareous, bentonitic.

Environmental interpretation: prodelta.

Reindeer Formation

8100-8130 (Rec. 30') Sandstone, grey, medium grained, 60% quartz, 25% chert, 10% coal, argillite grains and weathered feldspar; clayey matrix, sub rounded, well sorted, good porosity, occasional streaks of carbonaceous material, massive grading into very argillaceous tight sandstone at base of interval.

Environmental interpretation: marine-deltaic.

8130-8181 (Rec. 47') Sandstone, grey, medium to coarse grained, very argillaceous, no glauconite, weathered feldspar and kaolin common, quartz grains approximately 65%, chert 20%, rest coal and argillite grains with kaolin; clayey matrix disseminated siderite grains with rare nodules of ironstone and siderite; rare streaks of mudstone, highly disrupted vague horizontal laminations.

Environmental interpretation: prodelta.

8181-8185 (Rec. 4') Mudstone, dark grey, non calcareous, with blebs of argillaceous medium grained sandstone.

Environmental interpretation: prodelta.

8185-8189 (Rec. 4') Sandstone, grey, medium grained sub angular, well sorted quartz, chert, coal, argillite and feldspar grains in mud matrix with highly contorted bedding, mudstone and sandstone intermixed.

Environmental interpretation: delta front to prodelta.

Reindeer Formation (cont'd.)

8191-8193 (Rec. 2') Sandstone, grey, medium grained, argillaceous, intermi-ed with mudstone, grey, non marine.

Environmental interpretation: delta front-prodelta.

IOE IVIK J-26 (cont'd.)

8193-8196 (Rec. 3') Sandstone, grey, medium grained, calcareous, kaolinitic composed mainly of quartz, chert and coal grains. Sub angular, well sorted with fair porosity.

Environmental interpretation:

8196-8231 (Rec. 45') Sandstone, very fine grained to fine grained and mudstone, grey, non calcareous, interbedded; toward base of interval the sandstone and mudstone is completely mixed indicating a high degree of bio-turbation.

Environmental interpretation: delta fringe sandstone (bar finger sandstone).

Reindeer Formation (cont'd.)

8745-8765 (Rec. 20') Sandstone, grey, medium grained, sub angular, well sorted, quartz, chert, coal and weathered feldspar in slightly calcareous clay matrix. Poor to fair porosity/ with low angle cross bedding.

Environmental interpretation: prodelta.

8765-8785 (Rec. 20') Sandstone, with frequent interbeds of grey mudstone, minifaults common, commonly mottled.

Environmental interpretation: prodelta.

8785-8795 (Rec. 10') Shale, dark grey, sandy and silty with blebs of grey, fine to medium grained sandstone.

Environmental interpretation: prodelta.

8795-8825 (Rec. 30') Sandstone, grey, medium grained, sub angular, well sorted, quartz, chert, and coal grains in slightly calcareous, argillaceous matrix with some kaolin, poor porosity. Rare siderite nodules, rare streaks of mudstone showing contorted bedding.

Environmental interpretation: prodelta.

8825-8845 (Rec. 20') Sandstone and mudstone interbedded with high degree of bio turbation, shale blocks and rip up clasts indicate turbid environment.

Environmental interpretation: prodelta.

Reindeer Formation (cont'd.)

10,211-10,232 (Rec. 20.5') Shale, dark grey, non calcareous, slightly carbonaceous with interbedded sandstone, medium grained, argillaceous, containing rip up shale clasts; rare sandstone blebs floating in shale.

Environmental interpretation: prodelta.

Reindeer Formation (cont'd.)

10,480-10,505 (Rec. 21') Sandstone, grey, slightly to non calcareous, fine to medium grained, interbedded with grey shale; sandstone laminae outline cross bedding and in places the laminations are highly disrupted; rare siderite nodules and bands; shale, grey, non calcareous, slightly carbonaceous and blocky common.

Environmental interpretation: prodelta.

Reindeer Formation (cont'd.)

11,329-11,382 (Rec. 53') Shale, dark grey, non calcareous with very thin, very fine grained sandstone laminations 1/10" to 6" thick; parallel bedding.

Environmental interpretation: prodelta.

IMPERIAL IOE KIMIK D-29

Lat. 69° 38' N.; Long. 132° 22' W.

Fish River Group

4270-4282 (Rec. 7.5') Shale, grey, bentonitic, micaceous, silty and sandy, rarely grading into argillaceous sandstone of quartz, chert, glauconite, and feldspar grains, silty argillaceous matrix.

Environmental interpretation: marine shale.

Fish River Group (cont'd.)

4406-4426 (Rec. 16') Sandstone, grey, medium grained, well sorted, sub rounded, composed of quartz, chert and coal grains with minor glauconite and feldspar grains mica trace in argillaceous and silty matrix, slightly calcareous.

Environmental interpretation: prodelta.

?Fish River Group (cont'd.)

7636-7662 (Rec. 26') Shale, dark grey, hard, blocky with rare interbeds of sandstone toward base of interval, slickensided.

Environmental interpretation: marine shales.

IOE NATAGNAK H-50

Lat. 69° 49' N.; Long. 131° 40' W.

Lower Cretaceous

5642-5671 (Rec. 29') Shale, dark grey, silty, grading to very fine grained sandstone, slightly calcareous, pyritic, rare ironstone and siderite nodules, brittle and fissile.

Environmental interpretation: open marine.

Lower Cretaceous (cont'd.)

6001-6041 (Rec. 40') Sandstone, dark grey and brown, mottled, fine to very fine grained, composed of quartz, chert and feldspar grains, trace glauconite in calcareous, argillaceous matrix; clay content increased in places to form shale laminae which are disrupted, distorted and pulled apart forming a mosaic fabric similar to flow structures, interbeds of dark grey sandy, silty shale common.

Environmental interpretation: open marin.

Lower Cretaceous (cont'd.)

6162-6184 (Rec. 19') Conglomerate, composed mainly of chert and quartzite pebbles and granules in a calcareous,argillaceous sandy matrix, calcite cement, matrix completely fills pore spaces; limestone and other lithic granules and pebbles common, no porosity.

Environmental interpretation: lower delta plane to upper delta front.

Lower Cretaceous (cont'd.)

6186-6211 (Rec. 20') Conglomerate composed of well rounded chert, limestone, sandstone, and quartzite pebbles and granules, 2 cm-6 cm in diameter - in mudstone matrix, slightly sandy, silty, and calcareous forming 30-40% of the rock; no porosity.

Environmental interpretation: possibly a braided stream deposit.

6211-6225 (Rec. 10') Conglomerate, composed of quartzite, limestone, and chert granules and pebbles in sandy clayey matrix, grains show no specific orientation.

Environmental interpretation: braided stream deposit.

IOE NATAGNAK H-50 (cont'd.)

Proterozoic

6334-6337 (Rec. 2') Quartzite, grey, metamorphosed granule conglomerate and medium to coarse grained quartz and chert sandstone, rare graded beds.

Proterozoic (cont'd.)

6364-6383 (Rec. 19') Quartzite, grey, original texture of chert and quartz granule conglomerate, vertical fractures.

6383-6392 (Rec. 7') Quartzite, grey, with outlines of granules, pebbles and coarse grained sand, cross bedded with upward fining sequences.

6392-6404 (Rec. 12') Quartzite, grey, ghost textures of granule conglomerate and coarse to medium grained sandstone.

IOE KANGUK I-24

Lat. 69° 53' N.; Long. 131° 05' W.

Upper Cretaceous

3924-3936 (Rec. 12') Shale, dark grey, horizontal partings, thinly bedded, with interbeds of light grey to white shales. Shale slightly calcareous, pyritic.

Environmental interpretation: open-marine shales.

Lower Cretaceous/Pre Cretaceous

4561-4564 (Rec. 3') Sandstone, grey, medium grained, quartz and 10 to 20% black chert with trace glauconite grains, siderite and pyrite in silty, slightly calcareous, argillaceous matrix with poor to fair porosity, grains are well sorted and well rounded.

Environmental interpretation: transgressive marine sandstone.

Proterozoic

4564-4568 (Rec. 4') Quartzite, grey, with ghost textures of medium grained quartz sandstone with minor chert. Vertical fractures filled with calcite.

4568-4576 (Rec. 8') Shale, dark grey, slightly calcareous, siliceous, hard blocky with streaks of quartzite, grey very fine to silt sized grain outlines.

4576-4576.5 (Rec. 0.5') Conglomerate, composed of angular grains and pebbles of quartzite and dark grey shale in calcite cement, mosaic-like texture.

4576.5-4592 (Rec. 15.5') Quartzite, grey, fine to medium grained, with rare streaks of hard siliceous dark grey shale; graded bedding.

4592-4602 (Rec. 10') Shale, dark grey, hard, siliceous and blocky.

4602-4607 (Rec. 5') Quartzite, grey, with interbeds of dark grey shale, cross bedded boudinage and flame structures common, fractured with calcite veins filling fractures, brecciated.

Proterozoic (cont'd.)

5239-5244 (Rec. 5') Quartzite, grey, composed of medium grained quartz sandstone, highly metamorphosed, calcite veins filling fractures, pyritic.

5244-5254 (Rec. 10') Shale, dark grey, slightly calcareous, siliceous, slump structures and cross bedding common.

GULF MOBIL PARSONS N-10

Lat. 69° 59' N.; Long. 133° 31' W.

Lower Cretaceous

9025-9072 (Rec. 46') Sandstone, brown, fine grained, well rounded, well sorted, composed of quartz and minor chert grains. Trace coal grains, slightly calcareous, glauconitic and pyritic, siliceous and silty. Shale fragments, chert form streaks of conglomerate with upward fining and imprication. Rare streaks of dark grey shale with cross bedding and boudinage structures, fair porosity.

Environmental interpretation: prodelta.

Lower Cretaceous (cont'd.)

9172-9184 (Rec. 11') Sandstone, brown, fine grained, quartzose, with minor chert, trace of glauconite, coal and pyrite in calcareous, siliceous, argillaceous matrix. Some specks of kaolin also present in the matrix. Poor to fair porosity. Rare shale streaks pyritic, carbonaceous and coaly outlining boudinage structures.

Environmental interpretation: lower delta plain to upper delta front.

9184-9186 (Rec. 2') Shale, dark grey to black, pyritic, carbonaceous, coaly subbituminous.

Environmental interpretation: lower delta plain to upper delta front.

9186-9188 (Rec. 2') Siltstone, grey, very fine grained, with interbeds of sandstone, grey, fine grained, b urrows, roots and borings common.

Environmental interpretation: lower delta plain to upper delta front.

9188-9190 (Rec. 2') Shale, dark grey, carbonaceous, non calcareous.

Environmental interpretation: delta plain.

9190-9192 (Rec. 2') Sandstone, brown, very fine grained, with 30 to 50% silt and argillaceous material. Disrupted laminae and pull apart structures common.

Environmental interpretation: delta plain.

9192-9202 (Rec. 10') Sandstone, grey, very fine grained, grading to siltstone, interbedded with dark grey shale, burrows and boudinage structures common.

Environmental interpretation: delta plain.

Lower Cretaceous (cont'd.)

9325-9341.5 (Rec. 16.5') Shale, dark grey, with rare thin interbeds siltstone, pyritic, slightly calcareous, with slickensides

Environmental interpretation: lower delta plain.

9341.5-9346 (4.5') Shale, dark grey, slightly calcareous, carbonaceous.

Environmental interpretation: delta plain.

9346-9361 (Rec. 15') Sandstone, brown, massive, medium grained, well rounded, well sorted, composed of quartz grains and minor chert with traces of glauconite; pyrite and feldspar grains in calcareous, siliceous, argillaceous matrix. Fair porosity. Cross bedding and rare mini faults outlined by rare argillaceous laminae.

Environmental interpretation: delta front.

9361-9375 (Rec. 14') Sandstone, brown, massive, fine to medium grained, sub rounded, fair sorting.

Environmental interpretation: delta front.

9375-9398 (Rec. 23') Sandstone, brown fine to medium grained, calcareous, glauconitic, pyritic, well rounded, well sorted quartz grains and minor chert grains in argillaceous matrix. Good porosity, small scale cross bedding and boudinage structures.

Environmental interpretation: delta front.

9398-9431 (Rec. 33') Sandstone, brown, glauconitic, calcareous, slightly argillaceous, well rounded, well sorted quartz and minor chert grains with traces of glauconite, coal, and pyrite. Fair porosity, ripple cross bedded, finely laminated in places. Vertical fractures filled with calcite and pyrite. Rare dark grey shale streaks disrupted by mini faults and escape burrows.

Environmental interpretation: delta front.

9431-9437 (Rec. 6') Sandstone, brown, medium grained, well sorted, highly laminated, mini faults and cross bedding common.

Environmental interpretation: delta front.

9437-9466 (Rec. 29') Sandstone, brown, very fine grained, well sorted, well rounded quartz with rare chert, pyrite, and glauconite grains in argillaceous matrix, slightly calcareous, clay content increases to form argillaceous laminae which are highly disrupted to form a mottled fabric similar to flow structures.

Environmental interpretation: delta front.

9466-9480 (Rec. 14') Sandstone, brown, medium grained, mottled, well sorted, with pull apart structures of shale laminae disrupted to form many flat shale clasts in sandstone matrix.

Environmental interpretation: prodelta.

9480-9512 (Rec. 32') Sandstone, brown, medium grained and well sorted, mottled, with grey argillaceous discontinuous laminae produced by disruption of shale laminae, glauconitic, pyritic, siliceous, slightly calcareous, poor to fair porosity.

Environmental interpretation: delta front.

B
NORTH

B'
SOUTH

IOE NUKTAK C-22
69°41'N, 134° 51'W
KB 150

IMP IVIK J-26
69°35'N, 134° 20'W
KB 90

IMP MALLIK A-06
69° 30'N, 134°30'W
KB 116

IMP TAGLU C-42
69° 30'N, 134°45'W
KB 44

GULF MOBIL YAYA M-33
69° 13'N, 134°40'W
KB 161

GULF IMP SHELL REINDEER F-36
69° 5'N, 134° 39'W
KB 52

GULF MOBIL SIKU C-55
69°04'N, 133°44'W
KB 129

GULF MOBIL PARSONS N-10
69°00'N, 133° 30'W
KB 222

GULF EAST REINDEER P-60
68°39'N, 133°45'W
KB 380

BEAUFORT FM.

REINDEER FM.

PRE-MAESTRICHTIAN

L. CRET.

BASAL CRET.

PROTEROZOIC
QUARTZITE

DK GY SH WITH FLOATING PEBBLES OCC. QTZITE STREAKS

DK GY SH WITH FLOATING QTZITE PEBBLES

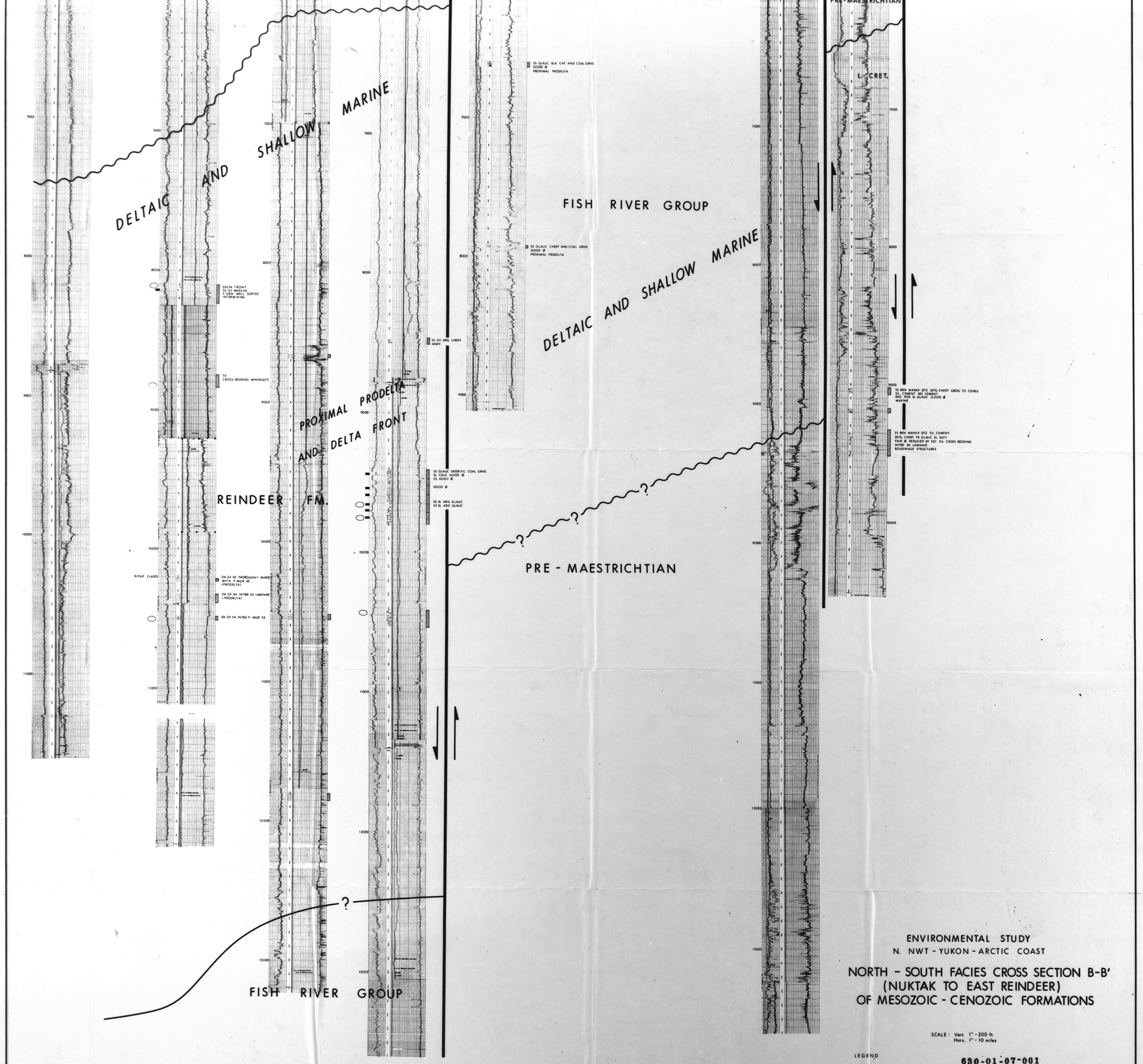
DELTAIC AND MARINE BEAUFORT FM.

PROXIMAL PRODELTA MUDSTONE

DELTAIC AND SHALLOW MARINE

SS GLAUC BLK CHT AND COAL GANS GOOD @ PROXIMAL PRODELTA

FISH RIVER GROUP



ENVIRONMENTAL STUDY
N. NWT - YUKON - ARCTIC COAST

NORTH - SOUTH FACIES CROSS SECTION B-B'
(NUKTAK TO EAST REINDEER)
OF MESOZOIC - CENOZOIC FORMATIONS

SCALE: Vert. 1" - 200 ft.
Horz. 1" - 10 miles

630-01-07-001

LEGEND
- IRONSTONE NODULES
- CARBONACEOUS MATERIAL
- VV BENTONITE
- CORED INTERVAL

N.R. FISCHBUCH P.Geol. Ph.D.

BEAUFORT FORMATION
PRODELTA PROXIMAL
PRODELTA MUDSTONE
REINDEER FORMATION
DELTA FRONT
SANDSTONE

BEAUFORT FORMATION
DELTA FRONT LOOSE
SAND
REINDEER FORMATION
PRODELTA MUDSTONE

BEAUFORT FORMATION
PRODELTA MUDSTONE
REINDEER FORMATION
DELTA FRONT AND
PRODELTA SANDSTONE
AND SHALE

FISH RIVER GROUP
PRODELTA SHALES

FISH RIVER GROUP
PRODELTA SHALES

LOWER CRETACEOUS
MARINE SHALE &
SANDSTONE PRODELTA
SANDSTONE AND
BRAIDSTREAM
DEPOSITS
PROTEROZOIC QUARTZITE
FLUVIAL SAND BODIES

UPPER CRETACEOUS
MARINE
LOWER CRETACEOUS
MARINE TRANSGRESSIVE
SANDSTONE

BEAUFORT FORMATION
PRODELTA MUDSTONE
REINDEER FORMATION
PRODELTA AND DISTAL
DELTA PLAIN
SHALE AND SANDSTONE

FISH RIVER GROUP
PRODELTA SANDSTONE
AND SHALE

REINDEER FORMATION
DISTAL DELTA PLAIN
DELTA FRONT
SANDSTONE

LOWER CRETACEOUS
OFFSHORE MARINE
PROTEROZOIC
QUARTZITE AND SHALE

REINDEER FORMATION
DELTA FRONT
SANDSTONE
FISH RIVER GROUP
DELTA FRONT
SANDSTONE

REINDEER FORMATION
DELTA FRONT
LOWER DELTA PLAIN–
UPPER DELTA FRONT
SANDSTONE AND SHALE
FISH RIVER GROUP
DELTA FRONT
SANDSTONE

FISH RIVER GROUP
DELTA FRONT
SANDSTONE

PROTEROZOIC
SHALE AND
SILTSTONE

FISH RIVER GROUP
PRODELTA SHALE

REINDEER FORMATION
DELTA FRONT
SANDSTONE

REINDEER FORMATION
PRODELTA SHALES

LOWER CRETACEOUS
MARINE SHALE

LOWER CRETACEOUS
PRODELTA SHALES
AND SANDSTONE

REINDEER FM.
DELTA PLAIN
TO DELTA FRONT
SANDSTONE

LOWER CRETACEOUS
LOWER DELTA PLAIN
DELTA FRONT AND
PROXIMAL PRODELTA
SANDSTONE

PALEOZOIC ?
MARINE SHALE
AND SILTSTONES

LOWER CRETACEOUS
PRODELTA
SANDSTONE

LOWER CAMBRIAN
PRODELTA MARINE
SHALES AND
SANDSTONE

UPPER JURASSIC
OPEN MARINE
SILTSTONES &
SHALES

LOWER HUME FM.
SEMI RESTRICTED
BRECCIATED
LIMESTONE

LOWER GOSSAGE FORMATION
SEMI RESTRICTED SHOAL
DOLOMITE

UPPER CAMBRIAN
OPEN MARINE SHALES
AND LIMESTONES

UPPER RAMPARTS FM.
FORE REEF STROM. LIMESTONE

ENVIRONMENTAL STUDY
N. NWT – YUKON – ARCTIC COAST
SCALE 1" = 8 miles

630-01-07-001

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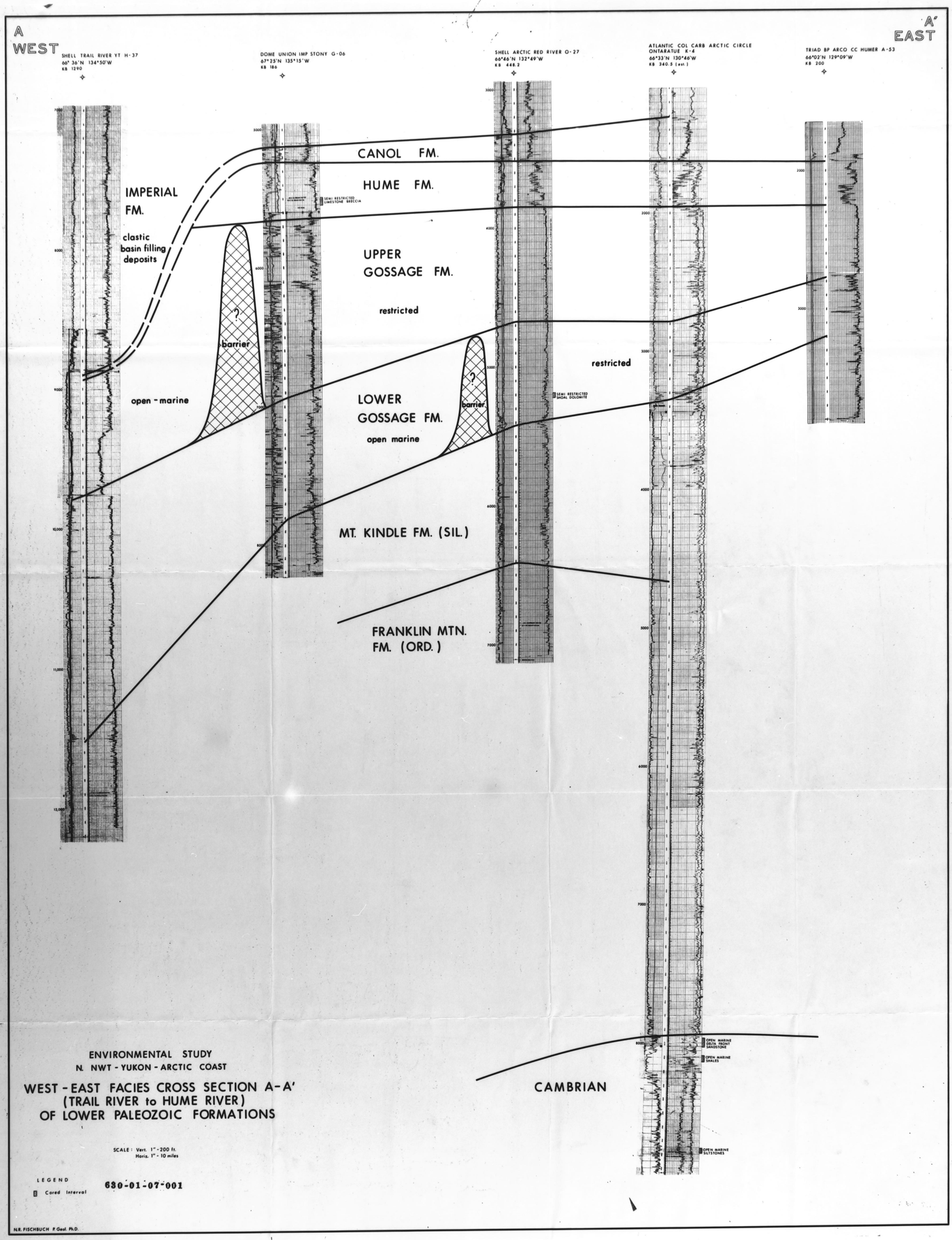

ENVIRONMENTAL STUDY
N. NWT - YUKON - ARCTIC COAST

WEST - EAST FACIES CROSS SECTION A-A'
(TRAIL RIVER to HUME RIVER)
OF LOWER PALEOZOIC FORMATIONS

SCALE: Vert. 1" - 200 ft.
Horiz. 1" - 10 miles

LEGEND
Cored Interval

630-01-07-001

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