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Report file no.
13562

GANK-1
GANK-1A

Sedimentology of the GANK-1 and GANK-1A cores drilled by grønArctic Energy Inc., Kuussuaq, Nuussuag, West Greenland

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Copenhagen
01-04-1997

DANMARKS OG GRØNLANDS GEOLOGISKE UNDERSØGELSE RAPPORT 1996/83

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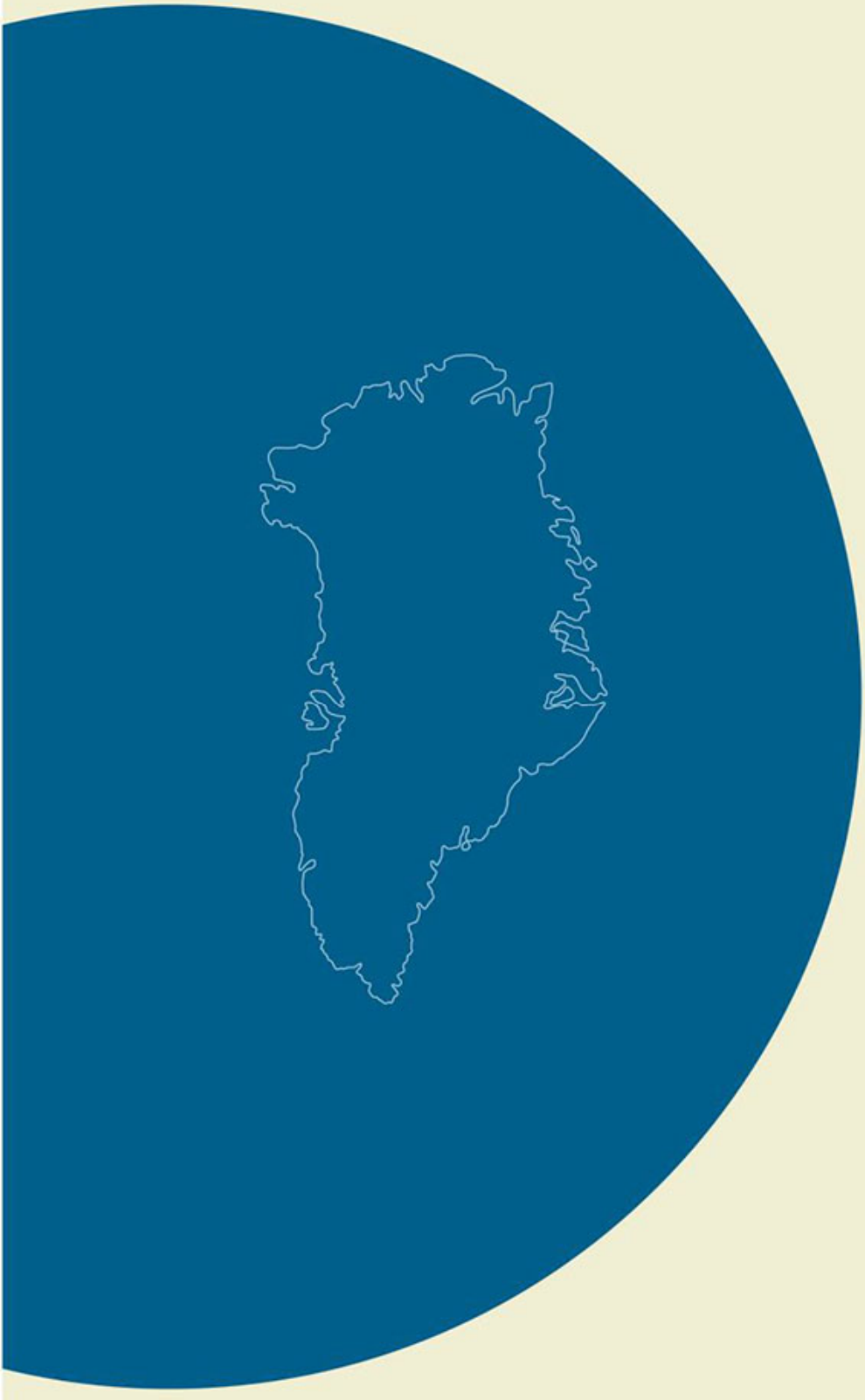

GEOLOGICAL SURVEY OF DENMARK AND GREENLAND
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Contents

Introduction

In May 1995 grønArctic Energy Inc., Canada was awarded an exclusive licence to explore for hydrocarbons on the southern and western part of the Nuussuaq peninsula in West Greenland. As part of the commitments under this licence three slim core holes (GANE#1, GANK#1 and GANT#1) were drilled in July and August 1995.

The GANK#1 well is situated close to the river Kuussuaq, about 10 km east of the outlet at western end of the Aaffarsuaq valley (Fig. 1). Drilling was carried out by Petro Drilling Company Ltd., Canada. A wire-line diamond drilling outfit (Longyear Fly-in model 44) was used. The GANK#1 well was drilled to a total depth of 398.98 m. At this depth the drilling rods became stuck and a sidetrack well GANK#1A was kicked-off at 218.55 m. GANK#1A was terminated at a depth of 332.84 m (Dahl *et al.*, 1995). GANK#1A did, however, never sidetrack but continued down close to and partly in the GANK#1 hole. The sediment core diameter in GANK#1 is 63.5 mm (HQ rods) in the depth interval 114.9–167.94 m and 47.6 mm (NQ rods) in the depth interval 167.94–398.98 m. In GANK#1A the sediment core diameter is 47.6 mm (NQ rods). A total of 731.82 m with a recovery close to 100% was drilled in GANK#1 and GANK#1A, of which 498.70 m of the core were sediments. The remaining part of the core was volcanics. All technical data from the drilling programme and drill site sampling programme are presented in Dahl *et al.* (1996).

The purpose of the GANK#1 well and its auxiliary GANK#1A was to penetrate the Tertiary volcanics exposed at the surface and to intersect the Cretaceous–Paleocene sediments below. The Geological Survey of Denmark and Greenland (GEUS) carried out the geological services at the well site which included preparation of a preliminary geological description of the cores and collection of samples (Dahl *et al.*, 1995). This was followed by detailed sedimentological and organic geochemical analyses in Copenhagen. The organic geochemistry of sediments, oils and gases of the wells has been reported by Christiansen *et al.* (1996), and the present report should be read together with this. The palynostratigraphy of the cores will be reported by September 1st, 1997. The aim of the present report is to present a detailed sedimentological analysis of the cores from GANK#1 and GANK#1A.

Geological setting

The margin of West Greenland was formed by extensional opening of the Labrador Sea in late Mesozoic–early Cenozoic time. A complex of linked basins stretch from the Labrador Sea to northern Baffin Bay (Rolle, 1985; Chalmers, 1991; Chalmers & Pulvertaft, 1993; Chalmers *et al.*, 1993). A conspicuous element of this tectonic framework is the Ungava transform fault system. It is a NE-trending zone of anatomising strike-slip faults which accommodated different amounts of extension and rotational opening of Labrador Sea and Baffin Bay. At its north-eastern end, much of the strike-slip motion associated with the Ungava fault is dispersed across an array of smaller scale strike-slip faults which encompass Disko Island and Nuussuaq Peninsula. grønArctic (1996) suggested that the Nuussuaq Basin straddling Nuussuaq and northern Disko is a pull-apart basin formed by a wrench couple or releasing bend at the end of the Ungava fault zone.

The Albian–Danian succession is attributed to a protracted period of left-lateral wrench controlled subsidence (grønArctic, 1996). However, subsidence came to an abrupt end with regional uplift (Dam & Sønderholm, in press), followed by a short period of very rapid subsidence and extrusion of Paleocene hyaloclastites and succeeded by flood basalts. The regional uplift has been attributed to either major plate and stress field reorganisation (cf. Roest & Srivastava, 1989; Chalmers *et al.*, 1993; Chalmers & Laursen, 1995) or the arrival of a mantle plume to the base of the lithosphere (cf. Lawver & Müller, 1994).

The GANK#1 well is situated in a volcanic terrain at Kuussuaq, along a NW-trending structural complex of the southern margin of Nuussuaq and northern Disko (grønArctic, 1996). The well is probably located along a major fault-controlled Upper Cretaceous–Paleocene slope separating a platform to the east from basinal areas west of Itilli (Dam & Sønderholm, 1994). The closest exposed sediments to the well occur in the Itilli valley c. 15 km towards NW (Dam & Sønderholm, 1994), in the Aaffarsuaq valley c. 5 km towards E, and at Nuuk Killeq c. 8 km towards SE (Fig. 1).

Palynology and biostratigraphy

A palynological screening examination of samples from GANK#1 and GANK#1A has been carried out by H. Nøhr-Hansen, GEUS. A full palynological examination of the cores will be completed by September 1st, 1997. The analysed samples include the same palynoflora as that present in GANE#1, suggesting a middle Late Paleocene age of the sediments (H. Nøhr-Hansen, pers. comm., 1996).

Facies description

The sedimentary succession underlying the hyaloclastites in the Kuussuaq area was cored in both GANK#1 (114.90 m–398.98 m) and GANK#1A (218.55–332.84 m), and a preliminary facies description based on the well site work was reported by Dahl *et al.* (1995). After the cores arrived at GEUS in Copenhagen they were logged at scale 1:50 (Tables 1, 2). Five facies associations have been recognised (Fig. 2; Tables 1, 2). These are: 1) mudstone, 2) thinly interbedded sandstone and mudstone, 3) bioturbated mudstone and thinly interbedded sandstone and mudstone, 4) slumped mudstone, and 5) interbedded massive sandstone and mudstone. The sedimentary succession is dominated by mudstones which in many cases are strongly fractured. This makes it difficult to distinguish between mudstones deposited from suspension, turbidite currents, debris flows or slumping, and although the deposits reflect all these processes the vertical facies interpretation shown in figure 2 should be taken with some reservation in the most fractured intervals.

Facies association 1: Mudstone

Description. This facies association is common throughout the succession in both GANK#1 (114.9–115.5 m; 119.4–126.35 m; 129.1–141.75 m; 151.2–159.5 m; 177.8–180.5 m; 194.1–197.8 m; 225.2–239 m; 246.5–253.3 m; 257.6–263 m; 263.85–265.25 m; 280.55–286.95 m; 300.65–304.5 m; 332.25–350.45 m (including a volcanic sill in 336.85–347.05 m); 358.5–385.5 m; and 389.25–392.1 m) and GANK#1A (222.3–236.6 m; 244–250.35 m; 254.5–260.45 m; 260.95–262.75 m; 273.25–274.75 m; 298–301.95 m), and occurs in intervals 0.6–27 m thick (Fig. 2, Tables 1, 2). The facies association consists of dark grey to black mudstones, in most cases containing less than 5% sandstones, but occasionally up to 25%. The mudstones are hard and brittle and are commonly completely broken or broken into small platelets, the surfaces of which are very smooth and glass-like. Lamination is usually not visible and is mainly seen when thin siltstone and sandstone laminae are present. The content of total organic carbon (TOC) is moderate with most values between 2.5% and 4%. The Hydrogen Index varies from 50 to 200. Total sulphur values (TS) of the mudstones are high and range from less than to 5% (Christiansen *et al.*, 1996). Fractures filled with calcite or calcite as small concretions or in layers up to 35 cm thick are common. The mudstones are generally non-bioturbated, but in places weakly to moderately bioturbated with *Helminthopsis horizontalis*. Plant debris is occasionally present. Interbedded with the mudstone are occasionally very thin

laminae (1–3 mm thick) to thinly bedded (less than 4 cm thick) siltstone to very coarse-grained sandstone. The siltstones and sandstones have a sharp base and are normal graded. Also thinly bedded sandy mudstone to muddy sandstone less than 10 cm thick are present, commonly with floating hyaloclastite clasts. These beds have a sharp base and top. The hyaloclastite clasts are in some cases calcified and embedded in calcite concretions.

Interpretation. The high TS values and the palynological screening analysis suggest a marine depositional environment. Because of the common fracturing of the core it is difficult to see whether a primary lamination is present or not. However, when present it suggests deposition from suspension and the absence of benthic dwelling invertebrates suggests restricted oxygen conditions at the sea bottom during deposition. Some of the mudstones may, however, very well have been deposited from debris flows or turbidite currents. The interbedded normal graded siltstone and sandstone streaks were deposited from low-density turbidity currents, whereas the sandy mudstones and muddy sandstones were deposited from debris flows. The common occurrence of calcite concretions is probably due to an early diagenetic effect.

Facies association 2: Thinly interbedded sandstone and mudstone

Description. This association is very uncommon in both GANK#1 (145.55–151.2; 191.25–194.1 m; 115.5–119.4 m; 275.9–278.3 m) and GANK#1A (274.25–275.2 m) (Fig. 2, Tables 1, 2). It consists of sharply based graded laminae and beds of fine-to coarse-grained sandstone and sharply based muddy sandstone, capped by grey parallel laminated mudstone (Facies D of Mutti & Ricci Lucchi, 1972; Facies F of Mutti, 1992). The sandstone content varies from 15–50%. The sandstones are generally less than 5 cm thick, but beds up to 30 cm thick do occur. The sandstones have sharp bases, are well-sorted, and show well-developed normal grading. Sedimentary structures include parallel lamination, but the thicker beds are generally massive. The muddy sandstones are massive, often contain volcanic clasts, have sharp bases and tops, and are poorly sorted. Dewatering structures, shell fragments, and calcite concretions occur.

Interpretation. The thinly interbedded sandstone and mudstone association is interpreted as deposits of traction and fall-out processes associated with various stages of sedimentation from waning low-density currents. The presence of sharp, flat based, normally graded, massive sandstones suggests

deposition from sand-rich turbulent flows (S_3 of Lowe, 1982). The massive muddy sandstones were deposited from thin debris flows.

Facies association 3: Bioturbated mudstone and thinly interbedded sandstone and mudstone

Description. This association is characteristic of both GANK#1 (159.5–160.65 m; 197.8–198.95 m; 265.25–269.45 m; 286.95–300.65 m; 304.5–305.1 m; 350.5–358.5 m; 385.5–389.8 m; 398.4–399.28 m) and GANK#1A (262.75–266.85 m; 282.75–298 m; 301.95–302.15 m), however, in many cases it has been very difficult to recognise this facies from other mudstone facies due to the fracturing of the cores. It consists of moderately to heavily bioturbated mudstone and thinly interbedded sandstone and mudstone, very similar to those of Facies associations 1 and 2. The only identifiable trace fossils are *Planolites* isp. and *Helminthopsis horizontalis.* Occasionally small graded sandstone streaks up to 3 mm thick occur in the bioturbated mudstone. The bioturbated thinly interbedded sandstone and mudstone association consists of sharply based graded laminae and beds of fine- to medium-grained sandstone up to 15 cm thick, or massive sandy mudstone and muddy sandstone with sharp bases and tops, up to 65 cm thick, capped by grey mudstone. Volcanic clasts, less than 5 cm across and mudstone rip-up clasts frequently occur in the massive beds.

Interpretation. Planolites isp. was probably produced by infaunal organisms combining the activities of deposit-feeding and locomotion, thus producing endostratal pascichnia burrows. The dominance of these burrows suggests that the interstitial environment must have been characterised by at least some oxygen to allow respiration. The high degree of bioturbation of the sediment indicates relatively slow sedimentation, little physical reworking and abundant food supplies. The thinly interbedded sandstone and mudstone is interpreted as deposits of traction and fall-out processes associated with various stages of sedimentation from waning low-density currents and debris flows.

Facies association 4: Contorted mudstone

Description. This association has only been recognised in one interval, present in both GANK#1 (239–246.5 m) and GANK#1A (236.6–244 m) (Fig. 2, Tables 1, 2). It occurs in a highly broken part of the core and it has therefore not been possible to delimit this interval with any great accuracy. This facies association consists of dark grey to black mudstone containing less than 10% sandstone,

closely associated with mudstones of Facies association 1. The diagnostic feature of this mudstone is a strongly rolled and contorted lamination, the surfaces of which are very smooth and glasslike. Calcite coatings commonly occur along these surfaces. Interbedded with the mudstone are in places very thin folded fine-grained sandstone laminae, concretions and volcanic clasts. In some cases the mudstone is bioturbated.

Interpretation. The strongly rolled and contorted lamination of this facies association is attributed to slumping, a common feature of many slopes.

Facies association 5: Interbedded massive sandstone and massive mudstone

Description. This facies association is the most common association in both GANK#1 (126.3–129.1 m; 141.45–144.45 m; 160.65–177.8 m; 180.5–191.25 m; 198.95–225.2 m; 253.3–257.6 m; 263–263.85 m; 269.45–275.95 m; 278.15–280.55 m; 305.1–332.25) and GANK#1A (218.55–222.3 m; 250.35–254.9 m; 260.45–261 m; 266.85–273.25m; 275.2–277.4 m; 302.15–329.55 m) (Fig. 2, Tables 1, 2). It consists of very different lithologies, all characterised by a chaotic nature. The massive sandstone facies consists of fine- to very coarse-grained poorly sorted sandstone. Basal and upper contacts are most commonly sharp. Bed thickness ranges from thin beds, less than 5 cm thick to 1.8 m. Normal grading is usually absent, but inverse grading has been recognised in a few beds. The mud fraction in this facies ranges from 10% to 50%, and the bulk of the mudstone seems to be primary (i.e. depositional). Most beds are clast supported, but the most mud-rich beds are matrix supported. Rounded and subrounded mudstone clasts and volcanic clasts are common. The mudstone clasts range in size from 2 mm to more 15 cm, the volcanic clasts range from 3 mm to 60 cm. Most clasts are floating in the sandstones, but clasts may also be concentrated at the base, in the middle or in the upper part of the beds. In some cases, platy mudstone clasts are aligned parallel to bedding planes producing a platy or planar clast fabric. In a few cases sharply based well-sorted graded sandstones occur. These beds are up to 25 cm thick and occur interbedded with the muddy sandstones.

The mudstones consist of dark grey to black mudstone with scattered sandstone grains and floating volcanic and mudstone clasts and reworked calcite concretions. Thin very disturbed sandstone stringers also occur. A common feature of the mudstone is a strongly rolled and contorted lamination of the mudstones, the surfaces of which is very smooth and glasslike. Calcite coating is

common along the surfaces. The main difference between these beds and the contorted mudstones of Facies association 4 is the presence of scattered sandstone grains in this facies association. It has not been possible to delineate each single mudstone bed, but they do occur in intervals up to 10 m thick. The mudstones are commonly fractured.

Interpretation. The mudstone facies represents true debris flow deposits in which a cohesive, muddy matrix supports the clasts. Deposition from cohesive debris flows occurs by "freezing" when internal shear stress no longer exceeds the total yield strength of debris (Johnson, 1970).

The presence of more than 10% mudstone matrix and floating clasts in matrix-supported sand indicates matrix strength, which is the principal particle-support mechanism in debris flows (Middleton & Hampton, 1973). The long axis orientation of the mudstone clasts aligned parallel to the bedding surface can be used to infer laminar flow conditions, a property common to debris flow (cf. Shanmugan & Moiola, 1995). Moreover, the sharp boundaries and the non-grading nature of the sandstones suggest that the sandstones were deposited from debris flows. The sharply based graded sandstones are attributed to rapid suspension deposition from high-density turbidite currents.

Depositional model

During the Early Paleocene the western part of Nuussuaq was dominated by turbidites in a slope and submarine fan setting (Dam & Sønderholm, 1994; in press; Dam, 1996). However, the sedimentary features of the sediments cored in GANK#1 and GANK#1A indicate that the Kuussuaq area was characterised by mass flow deposition. Depositional processes were dominated by muddy debris flows, sandy debris flows, slumps and only very little attribution from density currents and fall-out from suspension. The high TS values and the palynological screening examination suggest a marine depositional environment. Apart from the lower part of GANK#1 the cored succession shows a chaotic vertical arrangement without any cyclical repetition of facies. In the lowermost part of GANK#1 (350.45–399.28 m) two coarsening-upward cycles occur of which only the uppermost cycle is complete. It consists of mudstone (Facies association 1) grading upward into bioturbated thinly interbedded sandstone and mudstone (Facies association 3). This succession is 35 m thick. Similar coarsening-upward successions have been described from the Serfat and Eqalulik areas (Dam & Nøhr-Hansen, 1995; Dam, 1996) and are interpreted as depositional lobes in a submarine fan environment. The mudstone was deposited in the lobe fringe area and the

bioturbated thinly interbedded sandstone and mudstone on the outer and lower part of the fan. The large degree of bioturbation in the upper part of the cycle is not common in other ancient examples of depositional lobes, but is common in both the Serfat and Eqalulik cores. It indicates relatively slow sedimentation, little physical reworking, and abundant food supplies in an environment that became progressively more oxygenated as the coarsening-upward unit was built up. This together with the large terrestrial imprint in the palynology and the general geological setting of the area suggests that these lobes are not deep-sea lobes in a strict sense, but could have been deposited at shallower depths.

Although some intervals exhibit thinning-upward and thickening-upward trends, true turbidites are absent in most of the remaining part of GANK#1 and GANK#1A deposits. The cycle concept, therefore, is not meaningful in these intervals because plastic debris flows and slumps that dominate these intervals do not emplace sediment in a predictable or organised manner as do fluidal turbidity currrents. Thus the trends observed in the mass flow deposits of GANK#1 and GANK#1A is attributed to chance occurrences of random debris flows and slumps. Regional and local tectonic activity is likely to have generated changing sea-floor gradients, seismicity, and slope instability, thereby triggering slumps and debris flows. Distinguishing deposits of mass-transport processes, such as debris flows, from those of turbidity currents has important implications for predicting reservoir geometry. Debris flows, which have plastic flow rheology, can form discontinuous, disconnected sand bodies that are harder to delineate and less economical to develop than deposits of fluidal turbidite currents, which potentially produce more laterally continuous, interconnected sand bodies. Turbidites, characteristic of conventional fans, tend to fill low areas on the sea floor because of deposition from suspension in fluidal flows. Debris-flow and slump deposits may not necessarily conform the shape of the sea floor because of the depositional "freezing" of cohesive flows (Embley, 1980) and the sudden emplacement of slumps. This fundamental difference in deposition is critical in understanding the geometry and distribution of sandstone and in developing a reliable depositional model. For example, depositional lobes formed by turbidity currents develop sheetlike sand bodies, several kilometres wide, whereas debris flows and slumps generate discontinuous sediment bodies (cf. Shanmugan and Moiola, 1991; Shanmugan *et al.*, 1994). Based on these assumptions it will be difficult to establish a reservoir model for the GANK#1 area on the present data.

A very good bed by bed correlation is possible between GANK#1 and GANK#1A. A correlation, based on lithology with GANE#1 and GANE#1A, situated c. 6 km E of the GANK#1 well, has not, however, been possible. The sedimentary succession cored in GANE#1 and GANE#1A is more ordered than the GANK#1 cores and deposition took place mainly in turbidite channels and interdistributary slope areas, contrary to the GANK#1 and GANK#1A cores that mainly consist of mass flow deposits. Volcanic clasts occur throughout the cored succession at GANK#1. In GANE#1 volcanic clasts only occur in the upper part of the GANE#1 cores, suggesting that the base of GANK#1 is no older that the level with the first occurrence of volcanic clasts in GANE#1. A palynological screening examination suggests a Paleocene age of the GANK#1 sediments, probably the same age as GANE#1 (H. Nøhr-Hansen, pers. comm., 1996).

Hydrocarbon shows

During drilling of GANK#1 bleeding oil and impregnation with oil were observed in the hyaloclastite cover (86–96 m) (Dahl *et al.*, 1995). H_2S was detected in 361.8 m and gas burned in the flare-line in 384 m. During drilling of GANK#1A small bubbles of air and gas were observed in the drilling fluid in 244–290 m (Dahl *et al.*, 1995). During relogging of the core in Copenhagen oil impregnation was discovered in debris flow sandstones in the interval 330.15–331.15 m. The organic geochemistry of the sediments, oil and gases is presented by Christiansen *et al.* (1996).

Conclusions

Based on the sedimentological analyses of the GANK#1 and GANK#1A cores, the following main conclusions can be drawn.

- A bed by bed correlation between GANK#1 and GANK#1A is possible, but a lithostratigraphic correlation between GANK#1 and GANE#1 cannot be made.

- A palynological screening examination suggests a middle Late Paleocene age of the sediments and a marine depositional environment (H. Nøhr-Hansen, pers. comm., 1996). A marine depositional environment is also indicated by the high TS values (Christaiansen *et al.* (1996).

- The cored sediments can be divided into 5 facies associations: 1) mudstone, 2) thinly interbedded sandstone and mudstone, 3) bioturbated mudstone and thinly interbedded sandstone and mudstone, 4) slumped mudstone, and 5) interbedded massive sandstone and mudstone. The facies associations indicate that deposition took place in a slope environment dominated by mass flow deposits and that deposition took place during the initial phase of volcanism in the area. Turbidite currents only played a minor role on deposition.

- During relogging of the sediments oil impregnation of the sediments was discovered in one interval (330.15–331.15 m). The organic geochemistry of the oil is described in Christiansen *et al.* (1996).

Acknowledgements

Funding of the project was provided from the Greenland Home Rule Administration and the Danish State through the Government of Greenland Minerals Office and the Mineral Resources Administration for Greenland. Flemming G. Christiansen and Chris Pulvertaft are thanked for discussions and comments on an earlier version of the report, and Henrik Nøhr-Hansen is thanked for placing preliminary palynological data at my disposal. Jette Halvskov and Nina Turner helped with the technical preparation of the report.

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Figures

Fig. 1. Geological map of central West Greenland showing location of the GANK#1 well and other wells in the area. Based on maps from the Geological Survey of Greenland.

Fig. 2. Generalized logs from the two cores that penetrate the sedimentary succession underneath the volcanic cover.

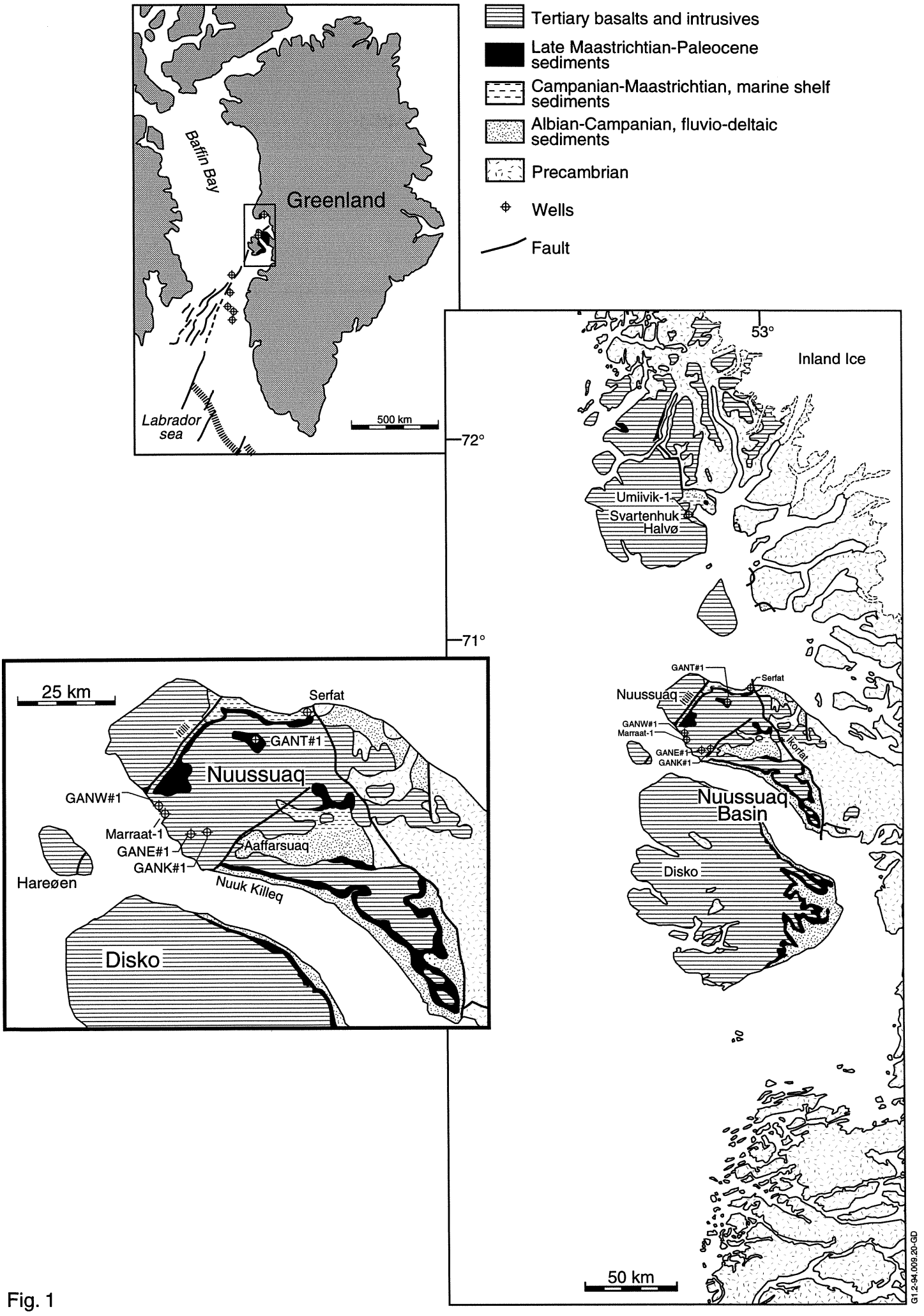
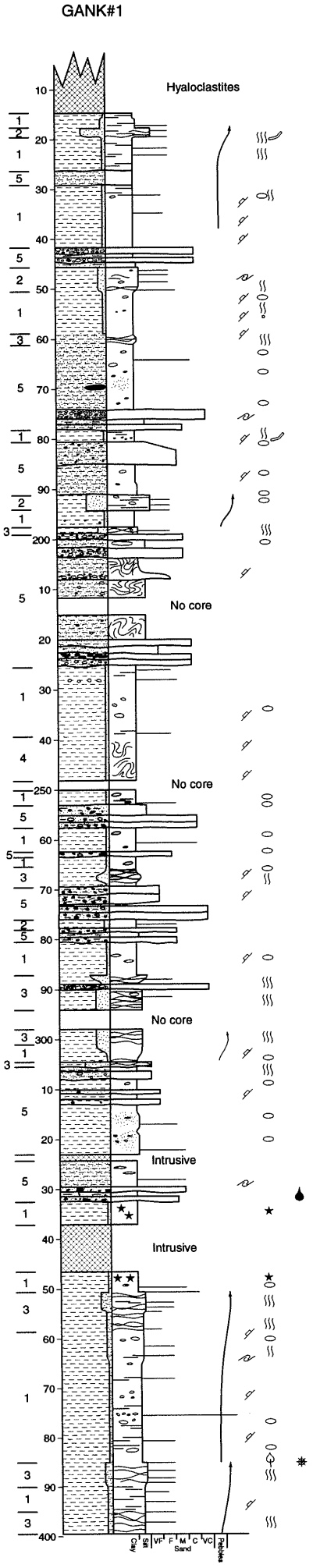

Tertiary basalts and intrusives
Late Maastrichtian-Paleocene sediments
Campanian-Maastrichtian, marine shelf sediments
Albian-Campanian, fluvio-deltaic sediments
Precambrian
Wells
Fault
Baffin Bay
Greenland
Labrador sea
500 km
53°
72°
71°
Inland Ice
Umiivik-1
Svartenhuk Halvø
GANT#1
Serfat
Nuussuaq
GANW#1
Marraat-1
GANE#1
GANK#1
Ikorfat
Nuussuaq Basin
Disko
50 km
25 km
Aaffarsuaq
Nuuk Killeq
Hareøen
G1.2-94.009.20-GD

Fig. 1



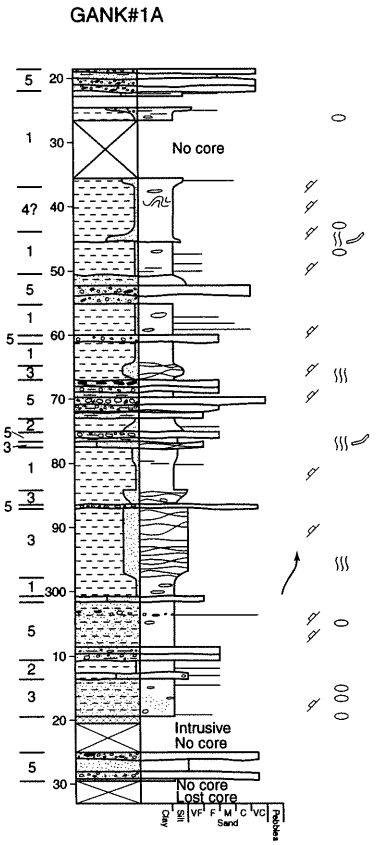


Fig. 2

G6.1-96.023/GD

LEGEND

Facies associations

1 Mudstone

2 Thinly interbedded sandstone and mudstone

3 Bioturbated mudstone and thinly interbedded sandstone and mudstone

4 Contorted mudstone

5 Interbedded massive sandstone and massive mudstone

 Volcanic sills and hyaloclastites

 Clay and siltstone

 Muddy sandstone/sandy mudstone

 Sandstone with pebbles and mudstone clasts

 Parallel lamination

 Slumbing

 Disturbed bedding

 Cross-lamination

 Bioturbation

 Concretions

 Plant and wood fragments

 Weakly bioturbated

 Moderately bioturbated

 Heavily bioturbated

 *Planolites* isp.

 Fractures

 Pyrite

 Oil

 Gas

 CU-succession

 FU-succession

Table 1

Table 1. Detailed log of the sedimentary succession in the GANK#1 core.

SHEET 1 OF 20

CORE DESCRIPTION
SEDIMENTOLOGICAL DATA SHEET

439201

THE GEOLOGICAL SURVEY OF DENMARK AND GREENLAND

LOCALITY:
UTM COORDINATES : 70°28'35"N 53°51'59"W
ELEVATION: 91 m

ELEVATION OF DRILL FLOOR ABOVE GROUND-LEVEL: 2 m
UNIT:
AGE:

WELL NO: GANK #1
BOX NO:
CORE DIAMETER: (cm/mm)
INTERVAL:

SCALE: 1:50
DATE: 25/1-95 + 26/1
GEOLOGIST: GD

AGE	LITHOSTRATIGRAPHIC UNIT	BOX NO	DRILLER'S DEPTH REFERENCE TO.....	LITHOLOGY	GRAIN SIZE AND SEDIMENTARY STRUCTURES (CLAY, SILT, SAND VF F M C VC, PEBBL F M C, CO; 0.0039, 0.0625, 0.125, 0.25, 0.5, 1, 2, 8, 16, 64)	BIOTURBATION/FOSSILS	COLOUR	ACCESSORIES/HC SHOWS	SORTING (VP, P, M, W, VW)	POROSITY	RECOVERY	FACIES	DEPOSITIONAL ENVIRONMENT	PHOTO NO.	SAMPLE NO.	REMARKS, DESCRIPTION AND INTERPRETATION
		BOX # 117	385													
			86													
		BOX # 118	87												627 121	
1272' 387.71	3		88													
		BOX # 119	89												628 122	
1278' 389.53	1		390													
			91													
			92													
1288' 392.58		BOX # 120	93												629 123	
	3		94													
			95													
1299' 395.94		BOX # 121	96												124	
			97												630 125	
			98													
1309' 398.98		BOX # 122	99													
			400		M W P G B											

SHEET 2 OF 20

CORE DESCRIPTION
SEDIMENTOLOGICAL DATA SHEET

THE GEOLOGICAL SURVEY OF DENMARK AND GREENLAND

LOCALITY: 70° 28' 35" N 53° 51' 59" W
UTM COORDINATES :
ELEVATION: 91 m

ELEVATION OF DRILL FLOOR ABOVE GROUND-LEVEL: 2 m
UNIT:
AGE:

WELL NO: 439201 GANK#1
BOX NO:
CORE DIAMETER: (cm/mm)
INTERVAL:

SCALE: 1:50
DATE: 26/1-96
GEOLOGIST: CJ

AGE	LITHOSTRATIGRAPHIC UNIT	BOX NO	DRILLER'S DEPTH REFERENCE TO.....	LITHOLOGY	GRAIN SIZE AND SEDIMENTARY STRUCTURES	BIOTURBATION/FOSSILS	COLOUR	ACCESSORIES/HC SHOWS	SORTING (VP, P, M, W, VW)	POROSITY	RECOVERY	FACIES	DEPOSITIONAL ENVIRONMENT	PHOTO NO.	SAMPLE NO.	REMARKS, DESCRIPTION AND INTERPRETATION
1214' 370.03			370													
		BOX # 113	71													
			72				kalcit bank.							622 115		
1222' 372.47			73													
		BOX # 114	74											116		
1228' 374.29			75													
			76				kalcit bank							623 117		
1237' 377.04	1	BOX # 115	77											624		
			78				kalcit bank									
			79													
			380											118		
1247' 380.09		BOX # 116	81											625 119		
			82													
			83				kalcit bank									
		BOX # 117	84													
1260' 384.05														626 120		
1262' 384.62			385		M W P G B		vedfyld < 5mm									

SHEET 3 OF 20

CORE DESCRIPTION

SEDIMENTOLOGICAL DATA SHEET

THE GEOLOGICAL SURVEY OF DENMARK AND GREENLAND

LOCALITY:
UTM COORDINATES: 70° 28' 35" N 53° 51' 59" W
ELEVATION: 91 m

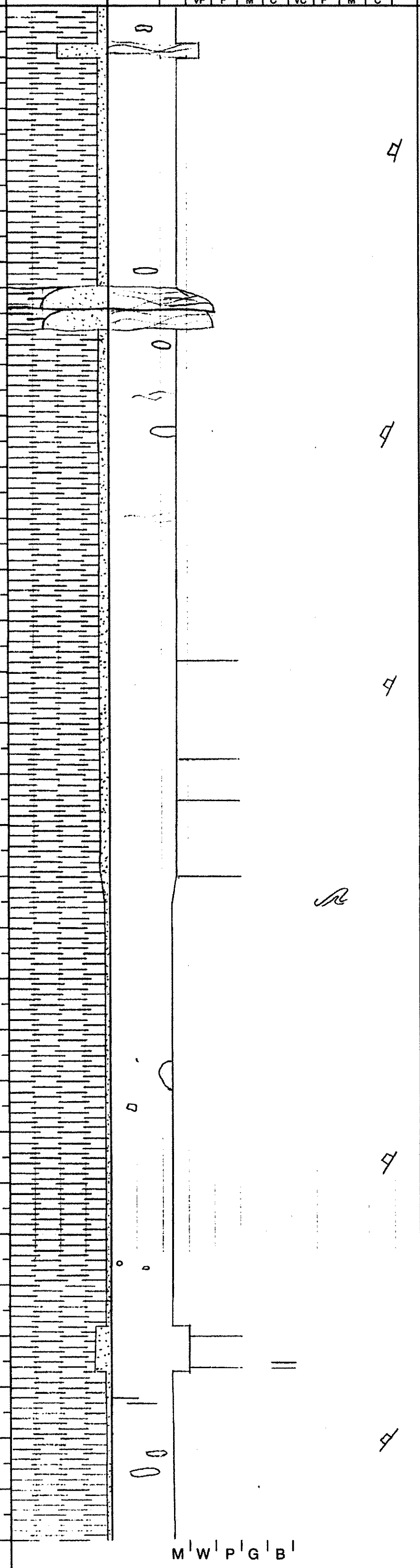
ELEVATION OF DRILL FLOOR ABOVE GROUND-LEVEL: 2 m
UNIT:
AGE:

WELL NO: 439201 GANK #1
BOX NO:
CORE DIAMETER: (cm/mm)
INTERVAL:

SCALE: 1:50
DATE: 26/1 -96 + 31/1
GEOLOGIST: GD

AGE	LITHOSTRATIGRAPHIC UNIT	BOX NO	DRILLER'S DEPTH REFERENCE TO..........	LITHOLOGY	GRAIN SIZE AND SEDIMENTARY STRUCTURES	BIOTURBATION/FOSSILS	COLOUR	ACCESSORIES/HC SHOWS	SORTING (VP, P, M, W, VW)	POROSITY	RECOVERY	FACIES	DEPOSITIONAL ENVIRONMENT	PHOTO NO.	SAMPLE NO.	REMARKS, DESCRIPTION AND INTERPRETATION
			355			§§§	kalcit konk.									
1167' 355.70	3	Box # 108	56			§§									617 109	
			57			§§	Helminthopsis horizontalis									
						§§§ §§§	kalcit konk Helminthopsis horizontalis								110	
			58			§§	kalcit konk									
1177' 358.75		Box # 109	59				kalcit kon									
			360												618 111	
1187' 361.80		Box # 110	61, 62													
			63			§§ §§§									619 112	
1197' 364.85	1	Box # 111	64, 65				kalcit konk.									
			66, 67												620 113	
1207' 367.89		Box # 112	68												621 114	
			69				kalcit konk.									
			370													

Grain size scale: 0.0039, 0.0625, 0.125, 0.25, 0.5, 1, 2, 8, 16, 64; CLAY | SILT | SAND (VF, F, M, C, VC) | PEBBL. (F, M, C) | CO



M W P G B

SHEET 4 OF 20

CORE DESCRIPTION
SEDIMENTOLOGICAL DATA SHEET

THE GEOLOGICAL SURVEY OF DENMARK AND GREENLAND

LOCALITY: 70° 28' 35" N
UTM COORDINATES: 53° 51' 59" W
ELEVATION: 91 m

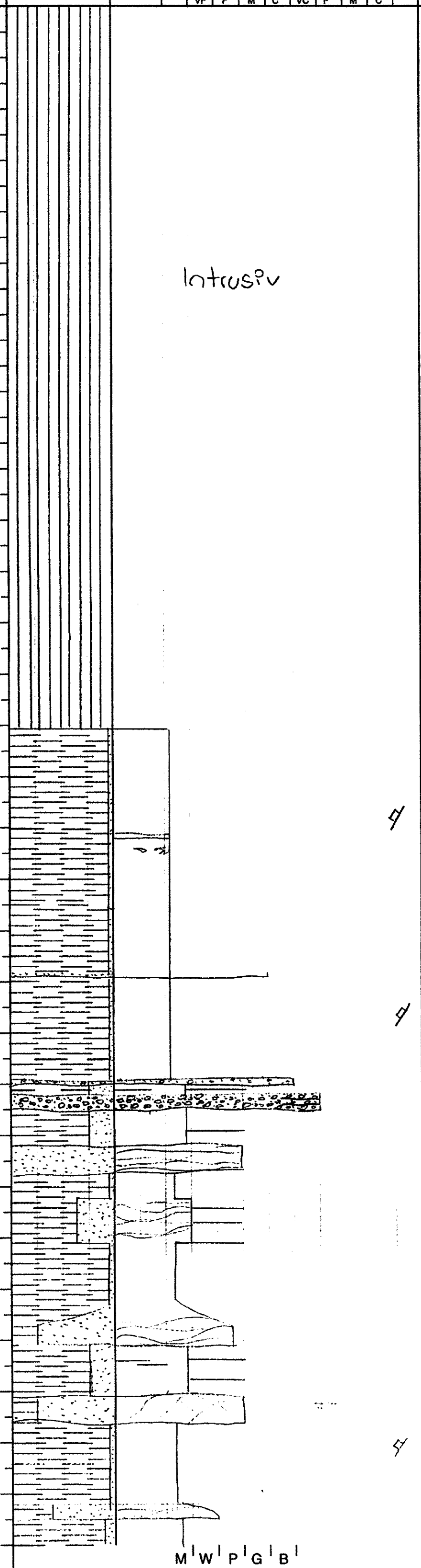
ELEVATION OF DRILL FLOOR ABOVE GROUND-LEVEL: 2m
UNIT:
AGE:

WELL NO: 439201 GANK #1
BOX NO:
CORE DIAMETER: (cm/mm)
INTERVAL:

SCALE: 1:50
DATE: 31/1 -96
GEOLOGIST: GD

AGE	LITHOSTRATIGRAPHIC UNIT	BOX NO	DRILLER'S DEPTH REFERENCE TO.........	LITHOLOGY	GRAIN SIZE AND SEDIMENTARY STRUCTURES	BIOTURBATION/FOSSILS	COLOUR	ACCESSORIES/HC SHOWS	SORTING (VP, P, M, W, VW)	POROSITY	RECOVERY	FACIES	DEPOSITIONAL ENVIRONMENT	PHOTO NO.	SAMPLE NO.	REMARKS, DESCRIPTION AND INTERPRETATION
1117' 340.46		BOX # 103	340												612 104	
1129' 344.12		BOX # 104	43		Intrusiv										613 105	
1131' 344.73		BOX # 105	46												614 106	
1140' 347.47	1	BOX # 105	48			Sort		Pyrit								
1147' 349.61	1	BOX # 106	350			Sort									615 107	MARKER BEDS EVT KORRELATION TIL GANE #1
1157 352.6	3	BOX # 107	52												616 108	
		BOX # 108	355													

Grain size scale: CLAY | SILT | SAND (VF, F, M, C, VC) | PEBBL. (F, M, C) | CO — 0.0039, 0.0625, 0.125, 0.25, 0.5, 1, 2, 8, 16, 64



SHEET 5 OF 20

CORE DESCRIPTION
SEDIMENTOLOGICAL DATA SHEET

THE GEOLOGICAL SURVEY OF DENMARK AND GREENLAND

LOCALITY: 70°28'35" N
UTM COORDINATES : 53°51'59" W
ELEVATION: 91 m

ELEVATION OF DRILL FLOOR ABOVE GROUND-LEVEL: 2 m
UNIT:
AGE:

WELL NO: 439201 GANK # 1
BOX NO:
CORE DIAMETER: (cm/mm)
INTERVAL:

SCALE: 1:50
DATE: 31/1-96 + 2/2
GEOLOGIST: GD

AGE	LITHOSTRATIGRAPHIC UNIT	BOX NO	DRILLER'S DEPTH REFERENCE TO.....	LITHOLOGY	GRAIN SIZE AND SEDIMENTARY STRUCTURES	BIOTURBATION/FOSSILS	COLOUR	ACCESSORIES/HC SHOWS	SORTING (VP, P, M, W, VW)	POROSITY	RECOVERY	FACIES	DEPOSITIONAL ENVIRONMENT	PHOTO NO.	SAMPLE NO.	REMARKS, DESCRIPTION AND INTERPRETATION
1067' 326.22		BOX # 97	325		CLAY SILT VF F M C VC F M C CO (0.0039 0.0625 0.125 0.25 0.5 1 2 8 16 64)			Pyrit								
			26					Pyrit								
1073' 327.05			27											607 99		
	5	BOX # 98					Kalcit konk.							233		
			28				Kalcit konk									
			29													
1084' 330.40		BOX # 99	330					δ Duft af olie								
			31											608 100		
								δ Duft af olie						232		
								Den nye olie								
1090' 332.23			32											609 101		
	1	BOX # 100	33					Pyrit								
							Sort	Pyrit						231		
			34													
			35					Pyrit						610 102		
1101' 335.58		BOX # 101	36				Lys Grå + sort	Normal gen. klump								
			37													
1109' 338.02		BOX # 102	38											611 103		
			39													
1114' 339.55			340		M W P G B											

SHEET 6 OF 20

CORE DESCRIPTION
SEDIMENTOLOGICAL DATA SHEET

THE GEOLOGICAL SURVEY OF DENMARK AND GREENLAND

LOCALITY:
UTM COORDINATES : 70° 28' 35" N 53° 51' 59" W
ELEVATION: 91 M
ELEVATION OF DRILL FLOOR ABOVE GROUND-LEVEL: 2 m
UNIT:
AGE:
WELL NO: 439201 GANK # 1
BOX NO:
CORE DIAMETER: (cm/mm)
INTERVAL:
SCALE: 1:50
DATE: 2/2-96
GEOLOGIST: GD

AGE	LITHOSTRATIGRAPHIC UNIT	BOX NO	DRILLER'S DEPTH REFERENCE TO.....	LITHOLOGY	GRAIN SIZE AND SEDIMENTARY STRUCTURES (CLAY · SILT · SAND VF F M C VC · PEBBL. F M C · CO)	BIOTURBATION/FOSSILS	COLOUR	ACCESSORIES/HC SHOWS	SORTING (VP, P, M, W, VW)	POROSITY	RECOVERY	FACIES	DEPOSITIONAL ENVIRONMENT	PHOTO NO.	SAMPLE NO.	REMARKS, DESCRIPTION AND INTERPRETATION
1027' 311.51		BOX # 92	310											601	93	
			11													
			12													
		BOX # 93	13											602	94	
1031' 314.25			14													
		314.45	15													
	51	BOX # 94	16					kalcit kerle						603	95	
1041' 317.30			17													
			18													
		BOX # 95	19											604	96	
			320					kalcit hard 42cm								
1052' 320.69			21													
		BOX # 96	22											605	97	
1060' 323.09			23													
			24											606	98	
			325		M W P G B											

SHEET 7 OF 20

CORE DESCRIPTION
SEDIMENTOLOGICAL DATA SHEET

THE GEOLOGICAL SURVEY OF DENMARK AND GREENLAND

LOCALITY:
UTM COORDINATES : 70° 28' 35" N 53° 51' 59" W
ELEVATION: 91 m

ELEVATION OF DRILL FLOOR ABOVE GROUND-LEVEL: 2 m
UNIT:
AGE:

WELL NO: 439201 GANK #1
BOX NO:
CORE DIAMETER:
INTERVAL:

(cm/mm)

SCALE: 1:50
DATE: 2/2-96+5/2
GEOLOGIST: GD

AGE	LITHOSTRATIGRAPHIC UNIT	BOX NO	DRILLER'S DEPTH REFERENCE TO.....	LITHOLOGY	GRAIN SIZE AND SEDIMENTARY STRUCTURES	BIOTURBATION/FOSSILS	COLOUR	ACCESSORIES/HC SHOWS	SORTING (VP, P, M, W, VW)	POROSITY	RECOVERY	FACIES	DEPOSITIONAL ENVIRONMENT	PHOTO NO.	SAMPLE NO.	REMARKS, DESCRIPTION AND INTERPRETATION
977' 297.79	3	BOX # 88	295 96 97 98 99	No core	CLAY SILT SAND (VF F M C VC) PEBBL. (F M C) CO; 0.0039 0.0625 0.125 0.25 0.5 1 2 8 16 64											
984' 299.92			300			?										
987' 300.84		BOX # 89	01 02			4								598 90		
993' 302.67	1	BOX # 90	03 04			4								234 599		
	3		05			kalcit kalk								91		
1002' 305.41	5	BOX # 91	06 07 08			4								600 92		
1012' 308.46		BOX # 92	09 300		M W P G B	kalcit kalk.										

SHEET 8 OF 20

CORE DESCRIPTION

SEDIMENTOLOGICAL DATA SHEET

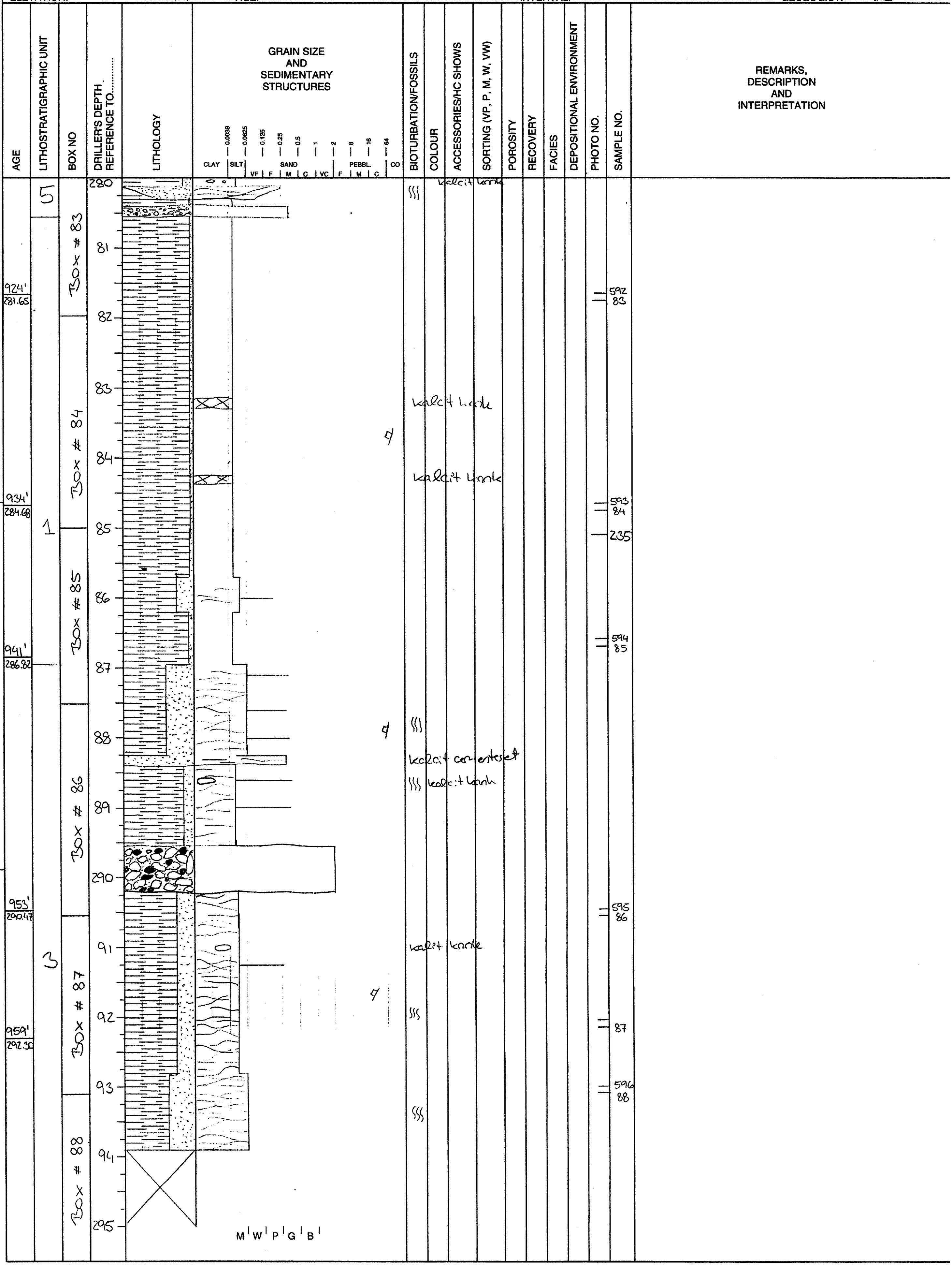
THE GEOLOGICAL SURVEY OF DENMARK AND GREENLAND

LOCALITY: 70° 28' 35" N
UTM COORDINATES: 53° 51' 59" W
ELEVATION: 91 m

ELEVATION OF DRILL FLOOR ABOVE GROUND-LEVEL: 2 m
UNIT:
AGE:

WELL NO: 439201 GANK #1
BOX NO:
CORE DIAMETER: (cm/mm)
INTERVAL:

SCALE: 1:50
DATE: 5/2-96 + 6/2
GEOLOGIST: GD



SHEET 9 OF 20

CORE DESCRIPTION

SEDIMENTOLOGICAL DATA SHEET

THE GEOLOGICAL SURVEY OF DENMARK AND GREENLAND

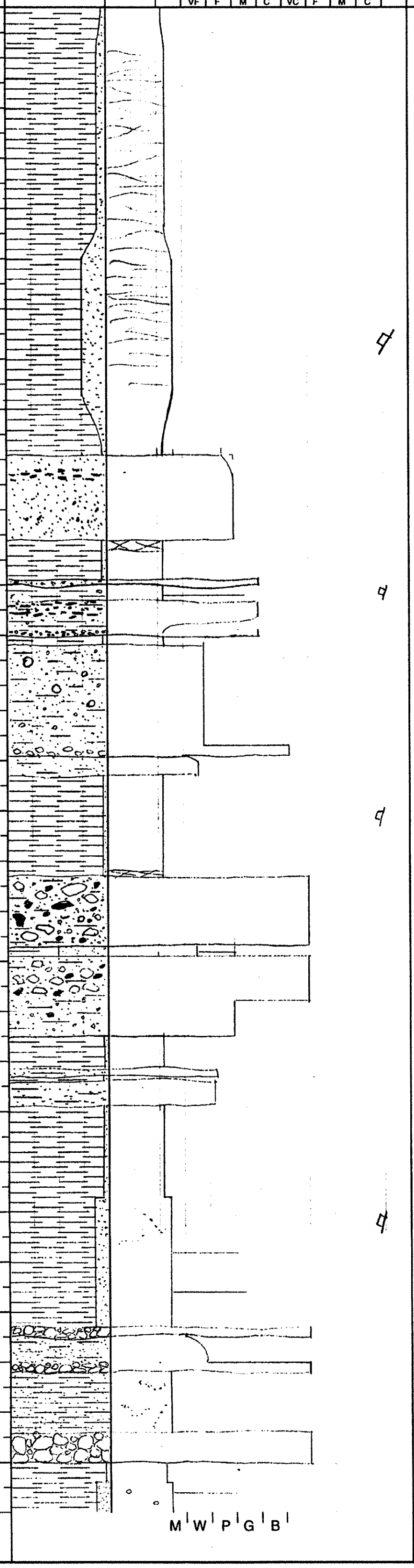
LOCALITY: 70°28'35"N 53°51'59"W
UTM COORDINATES:
ELEVATION: 91 m

ELEVATION OF DRILL FLOOR ABOVE GROUND-LEVEL: 2 m
UNIT:
AGE:

WELL NO: 439201 GANK #1
BOX NO:
CORE DIAMETER: (cm/mm)
INTERVAL:

SCALE: 1:50
DATE: 6/2-96
GEOLOGIST: GD

AGE	LITHOSTRATIGRAPHIC UNIT	BOX NO	DRILLER'S DEPTH REFERENCE TO..........	LITHOLOGY / GRAIN SIZE AND SEDIMENTARY STRUCTURES (CLAY, SILT 0.0039–0.0625, SAND VF F M C VC 0.125–2, PEBBL. F M C 2–64, CO)	BIOTURBATION/FOSSILS	COLOUR	ACCESSORIES/HC SHOWS	SORTING (VP, P, M, W, VW)	POROSITY	RECOVERY	FACIES	DEPOSITIONAL ENVIRONMENT	PHOTO NO.	SAMPLE NO.	REMARKS, DESCRIPTION AND INTERPRETATION
			265											587 78	
873' 266.09	3	BOX #78	66				?								
			67												
		BOX #79	68												
			69				Fasurening?							238	
887' 270.36	5		270				Flossende olie; også ud [illegible]; kalcit kanke.							237, 236, 588 79	
		BOX #80	71				Fra [illegible] også olie [illegible] til [illegible] ?!								
893' 272.19			72											589 80	
			73				kalcit kanke								
		BOX #81	74												
904' 275.54			75											590 81	
	2	BOX #82	76												
			77												
914' 278.59	5		78											591 82	
			79												
			280												



SHEET 10 OF 20

CORE DESCRIPTION
SEDIMENTOLOGICAL DATA SHEET

THE GEOLOGICAL SURVEY OF DENMARK AND GREENLAND

LOCALITY: 70° 28' 35" N
UTM COORDINATES: 53° 51' 59" W
ELEVATION: 91 m

ELEVATION OF DRILL FLOOR ABOVE GROUND-LEVEL: 2m
UNIT:
AGE:

WELL NO: 439201 GANK #1
BOX NO:
CORE DIAMETER: (cm/mm)
INTERVAL:

SCALE: 1:50
DATE: 6/12-96
GEOLOGIST: OD

AGE	LITHOSTRATIGRAPHIC UNIT	BOX NO	DRILLER'S DEPTH REFERENCE TO.....	LITHOLOGY	GRAIN SIZE AND SEDIMENTARY STRUCTURES	BIOTURBATION/FOSSILS	COLOUR	ACCESSORIES/HC SHOWS	SORTING (VP, P, M, W, VW)	POROSITY	RECOVERY	FACIES	DEPOSITIONAL ENVIRONMENT	PHOTO NO.	SAMPLE NO.	REMARKS, DESCRIPTION AND INTERPRETATION
822' 250.55	1	BOX # 73	250		CLAY | SILT | SAND (VF F M C VC) | PEBBL (F M C) | CO; 0.0039 0.0625 0.125 0.25 0.5 1 2 8 16 64											
			51			4										
			52			kalcit kank								582 73		
			53			kalcit kank										
			54													
837' 255.12	5	BOX # 74	55											583 74		
			56													
		BOX # 75	57			kalcit cemented kalcit kank										
			58			kalcit kank										
			59											584 75 585 76		
853' 259.99	1	BOX # 76	260													
			61			4										
			62													
862' 262.74	5	BOX # 77	63			kalcit kank								586 77		
	1		64			4 kalcit kank										
			265		M W P G B											

SHEET 11 OF 20

CORE DESCRIPTION

SEDIMENTOLOGICAL DATA SHEET

THE GEOLOGICAL SURVEY OF DENMARK AND GREENLAND

LOCALITY: 70°28'35"N
UTM COORDINATES: 53°51'59"W
ELEVATION: 91 m

ELEVATION OF DRILL FLOOR ABOVE GROUND-LEVEL: 2m
UNIT:
AGE:

WELL NO: 439201 GANK #1
BOX NO:
CORE DIAMETER: (cm/mm)
INTERVAL:

SCALE: 1:50
DATE: 6/2-96 + 7/2
GEOLOGIST: GD

AGE	LITHOSTRATIGRAPHIC UNIT	BOX NO	DRILLER'S DEPTH REFERENCE TO.........	LITHOLOGY	GRAIN SIZE AND SEDIMENTARY STRUCTURES (CLAY, SILT, SAND VF F M C VC, PEBBL. F M C, CO; 0.0039, 0.0625, 0.125, 0.25, 0.5, 1, 2, 8, 16, 64)	BIOTURBATION/FOSSILS	COLOUR	ACCESSORIES/HC SHOWS	SORTING (VP, P, M, W, VW)	POROSITY	RECOVERY	FACIES	DEPOSITIONAL ENVIRONMENT	PHOTO NO.	SAMPLE NO.	REMARKS, DESCRIPTION AND INTERPRETATION
		Box #68	235				kalcit knol.							=	68	
			36													
777' 236.83	1		37													
		Box #69	38											=	577 69	
	?		39													
787' 239.87		Box #70	240											=	578 70	
			41													
795' 242.32			42													
	4	Box #71	43			ss								=	579 71	
			44			kalcit knol.										
			45													
		Box #72	46		?	ss	?									
809' 246.58	2		47												580	
	1	Box #73	48	No core										=	581 72	
			49													
820' 249.93			250		M W P G B											

SHEET 12 OF 20

CORE DESCRIPTION
SEDIMENTOLOGICAL DATA SHEET

THE GEOLOGICAL SURVEY OF DENMARK AND GREENLAND

LOCALITY: 70° 28' 35" N 53° 51' 59" W
UTM COORDINATES :
ELEVATION: 91 m

ELEVATION OF DRILL FLOOR ABOVE GROUND-LEVEL: 2m
UNIT:
AGE:

WELL NO: 439201 GANK#1
BOX NO:
CORE DIAMETER: (cm/mm)
INTERVAL:

SCALE: 1:50
DATE: 7/12-96 + 8/12
GEOLOGIST: GD

AGE | LITHOSTRATIGRAPHIC UNIT | BOX NO | DRILLER'S DEPTH REFERENCE TO..... | LITHOLOGY | GRAIN SIZE AND SEDIMENTARY STRUCTURES (CLAY, SILT, SAND VF F M C VC, PEBBL. F M C, CO; 0.0039, 0.0625, 0.125, 0.25, 0.5, 1, 2, 8, 16, 64) | BIOTURBATION/FOSSILS | COLOUR | ACCESSORIES/HC SHOWS | SORTING (VP, P, M, W, VW) | POROSITY | RECOVERY | FACIES | DEPOSITIONAL ENVIRONMENT | PHOTO NO. | SAMPLE NO. | REMARKS, DESCRIPTION AND INTERPRETATION

727' 221.59
757' 224.64
745' 227.08
755' 230.12
767' 233.78

51
1

BOX # 63
BOX # 64
BOX # 65
BOX # 66
BOX # 67

220 21 22 23 24 25 26 27 28 29 230 31 32 33 34 235

No core

Sandy
Sandy
calcite bank

M | W | P | G | B |

570 63
571 64
572 65
573
574 66
575 67
576

SHEET 13 OF 20

CORE DESCRIPTION
SEDIMENTOLOGICAL DATA SHEET

THE GEOLOGICAL SURVEY OF DENMARK AND GREENLAND

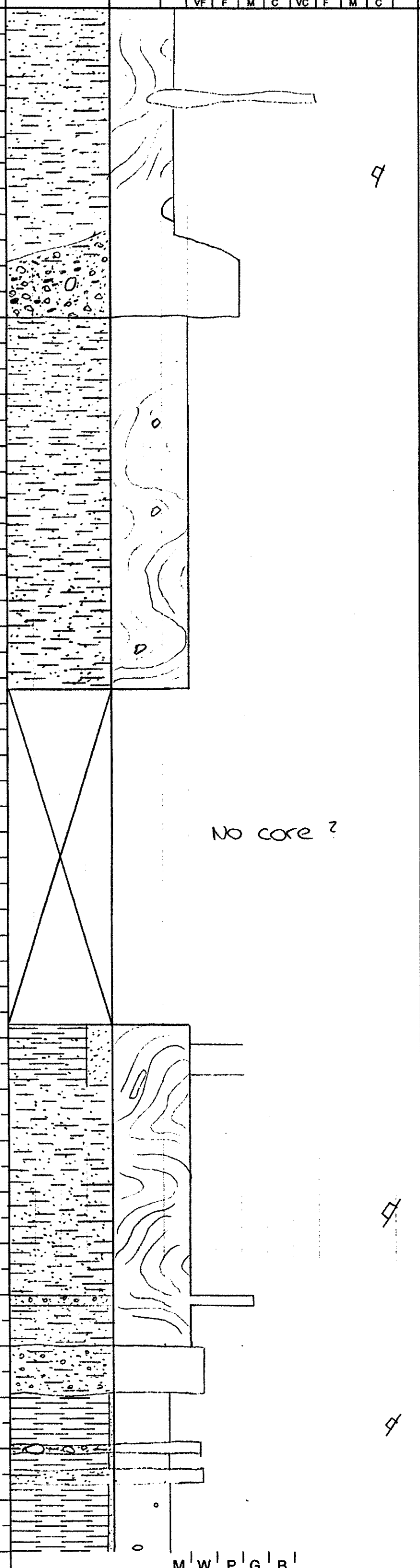
LOCALITY: 70° 28' 35" N 53° 51' 59" W
UTM COORDINATES :
ELEVATION: 91 m

ELEVATION OF DRILL FLOOR ABOVE GROUND-LEVEL: 2 m
UNIT:
AGE:

WELL NO: 439201 GANK#1
BOX NO:
CORE DIAMETER: (cm/mm)
INTERVAL:

SCALE: 1:50
DATE: 8/2-96
GEOLOGIST: GD

AGE	LITHOSTRATIGRAPHIC UNIT	BOX NO	DRILLER'S DEPTH REFERENCE TO..........	LITHOLOGY	GRAIN SIZE AND SEDIMENTARY STRUCTURES (CLAY, SILT, SAND: VF F M C VC, PEBBL.: F M C, CO; 0.0039, 0.0625, 0.125, 0.25, 0.5, 1, 2, 8, 16, 64)	BIOTURBATION/FOSSILS	COLOUR	ACCESSORIES/HC SHOWS	SORTING (VP, P, M, W, VW)	POROSITY	RECOVERY	FACIES	DEPOSITIONAL ENVIRONMENT	PHOTO NO.	SAMPLE NO.	REMARKS, DESCRIPTION AND INTERPRETATION
	5	Box # 58	205													
677' 206.35			06												566 59	
		Box # 59	07		ɸ	Kalcit konk	Grønlig	∆ Meget meget svag duft af die.-ndeler!!								
684' 208.48			08												567 60	
		Box # 60	09, 210, 11				Saltiga									
694' 211.53															568 61	
	÷		12, 13, 14		No core ?											
		Box # 61	15, 16, 17, 18		ɸ	Kalcit konk	Saltgrå									
715' 217.93															569 62	
717' 218.54		Box # 62	19, 220		ɸ	Kalcit konk										



SHEET 14 OF 20

CORE DESCRIPTION
SEDIMENTOLOGICAL DATA SHEET

THE GEOLOGICAL SURVEY OF DENMARK AND GREENLAND

LOCALITY: 70°28'35" N
UTM COORDINATES: 53°51'59" W
ELEVATION: 91 m

ELEVATION OF DRILL FLOOR ABOVE GROUND-LEVEL: 2m
UNIT:
AGE:

WELL NO: 439201 GANK # 1
BOX NO:
CORE DIAMETER: (cm/mm)
INTERVAL:

SCALE: 1:50
DATE: 8/2-96
GEOLOGIST: GD

AGE	LITHOSTRATIGRAPHIC UNIT	BOX NO	DRILLER'S DEPTH REFERENCE TO.....	LITHOLOGY	GRAIN SIZE AND SEDIMENTARY STRUCTURES (CLAY, SILT, SAND VF F M C VC, PEBBL. F M C, CO; 0.0039, 0.0625, 0.125, 0.25, 0.5, 1, 2, 8, 16, 64)	BIOTURBATION/FOSSILS	COLOUR	ACCESSORIES/HC SHOWS	SORTING (VP, P, M, W, VW)	POROSITY	RECOVERY	FACIES	DEPOSITIONAL ENVIRONMENT	PHOTO NO.	SAMPLE NO.	REMARKS, DESCRIPTION AND INTERPRETATION
638' 191.41	5	BOX # 53	190					kalcit kank						560		
			91											558	53	
	2	BOX # 54	92					kalcit kank								
								kalcit kank								
			93					kalcit cementeret								
			94													
639' 194.77	1	BOX # 55	95											559	54	
641' 195.38														561	55	
			96			SSS										
			97													
649' 197.82	3	BOX # 56	98					kalcit kank						562	56	
						S										
			99					kalcit kank								
			200													
		BOX # 57	01					kalcit kank								
661' 201.47	5													563	57	
			02													
			03				Corr									
667' 203.30		BOX # 58												564	58	
			04					kalcit kank								
								kalcit kank						565		
			205													

M | W | P | G | B |

SHEET 15 OF 20

CORE DESCRIPTION
SEDIMENTOLOGICAL DATA SHEET

THE GEOLOGICAL SURVEY OF DENMARK AND GREENLAND

439201

LOCALITY:
UTM COORDINATES :
ELEVATION:
70° 28' 35" N
53° 51' 59" W
91 m

ELEVATION OF DRILL FLOOR ABOVE GROUND-LEVEL: 2m
UNIT:
AGE:

WELL NO: GANK # 1
BOX NO:
CORE DIAMETER: (cm/mm)
INTERVAL:

SCALE: 1:50
DATE: 8/2 -96 + 9/2
GEOLOGIST: GD

AGE | LITHOSTRATIGRAPHIC UNIT | BOX NO | DRILLER'S DEPTH REFERENCE TO..... | LITHOLOGY | GRAIN SIZE AND SEDIMENTARY STRUCTURES (CLAY, SILT, SAND VF F M C VC, PEBBL. F M C, CO; 0.0039, 0.0625, 0.125, 0.25, 0.5, 1, 2, 8, 16, 64) | BIOTURBATION/FOSSILS | COLOUR | ACCESSORIES/HC SHOWS | SORTING (VP, P, M, W, VW) | POROSITY | RECOVERY | FACIES | DEPOSITIONAL ENVIRONMENT | PHOTO NO. | SAMPLE NO. | REMARKS, DESCRIPTION AND INTERPRETATION

5

1

5

Box # 48

Box # 49

Box # 50

Box # 51

Box # 52

Box # 53

175
76
77
78
79
180
81
82
83
84
85
86
87
88
89
190

589'
179.53

610'
185.93

620'
188.98

621'
189.28

No core

No core

kalcit konk.

kalcit konk.

kalcit konk.

554
49

555
50

556
51

557
52

M | W | P | G | B

SHEET 16 OF 20

CORE DESCRIPTION
SEDIMENTOLOGICAL DATA SHEET

THE GEOLOGICAL SURVEY OF DENMARK AND GREENLAND

LOCALITY: 70°28'35" N 53°51'59" W
UTM COORDINATES :
ELEVATION: 91 m

ELEVATION OF DRILL FLOOR ABOVE GROUND-LEVEL: 2 m
UNIT:
AGE:

WELL NO: 439201 GANK #1
BOX NO:
CORE DIAMETER: (cm/mm)
INTERVAL:

SCALE: 1:50
DATE: 9/2-96
GEOLOGIST: GD

AGE	LITHOSTRATIGRAPHIC UNIT	BOX NO	DRILLER'S DEPTH REFERENCE TO.....	LITHOLOGY	GRAIN SIZE AND SEDIMENTARY STRUCTURES	BIOTURBATION/FOSSILS	COLOUR	ACCESSORIES/HC SHOWS	SORTING (VP, P, M, W, VW)	POROSITY	RECOVERY	FACIES	DEPOSITIONAL ENVIRONMENT	PHOTO NO.	SAMPLE NO.	REMARKS, DESCRIPTION AND INTERPRETATION
527' 160.63	3	BOX # 42	160		CLAY SILT SAND PEBBL. CO										547 43	
			161													
		BOX # 43	162				kalcit kaak.									
			163												548 44	
537' 163.68			164												549	
		BOX # 44	165				kalcit bank									
			166												550 45	
547' 166.73	5		167													
		BOX # 45	168				kalcit bank								46 551	
551' 167.94																
		BOX # 46	169				kalcit bank									
557' 169.77			170				kalcit bank								552 47	
			171													
		BOX # 47	172				kalcit bank									
564' 171.90			173													
		BOX # 48	174				oyster shell debris								553 48	
574' 174.96			175		M W P G B											

SHEET 17 OF 20

CORE DESCRIPTION
SEDIMENTOLOGICAL DATA SHEET

THE GEOLOGICAL SURVEY OF DENMARK AND GREENLAND

LOCALITY: 70°28'35" N 53°51'59" W
UTM COORDINATES :
ELEVATION: 91 m

ELEVATION OF DRILL FLOOR ABOVE GROUND-LEVEL: 2 m
UNIT:
AGE:

WELL NO: 439201 GANK #1
BOX NO:
CORE DIAMETER: (cm/mm)
INTERVAL:

SCALE: 1:50
DATE: 9/2-96
GEOLOGIST: GD

AGE	LITHOSTRATIGRAPHIC UNIT	BOX NO	DRILLER'S DEPTH REFERENCE TO.....	LITHOLOGY	GRAIN SIZE AND SEDIMENTARY STRUCTURES (CLAY, SILT, SAND VF F M C VC, PEBBL. F M C, CO; 0.0039, 0.0625, 0.125, 0.25, 0.5, 1, 2, 8, 16, 64)	BIOTURBATION/FOSSILS	COLOUR	ACCESSORIES/HC SHOWS	SORTING (VP, P, M, W, VW)	POROSITY	RECOVERY	FACIES	DEPOSITIONAL ENVIRONMENT	PHOTO NO.	SAMPLE NO.	REMARKS, DESCRIPTION AND INTERPRETATION
477' 145.39			145													
		BOX # 37	146													
			147													
	2		148				kalcit kank								39	
487' 148.44		BOX # 38													541	
			149				kalcit kank									
			150				kalcit kank pseudofrag									
		BOX # 39	151				kalcit kank.								542 40	
497' 151.49			152													
			153				kalcit kank									
		BOX # 40	154				kalcit kank.								543 41	
507' 154.53	1		155													
			156													
		BOX # 41	157												544 42	
517' 157.58			158													
			159												545 546	
		BOX # 42	160		M W P G B											

CORE DESCRIPTION
SEDIMENTOLOGICAL DATA SHEET

THE GEOLOGICAL SURVEY OF DENMARK AND GREENLAND

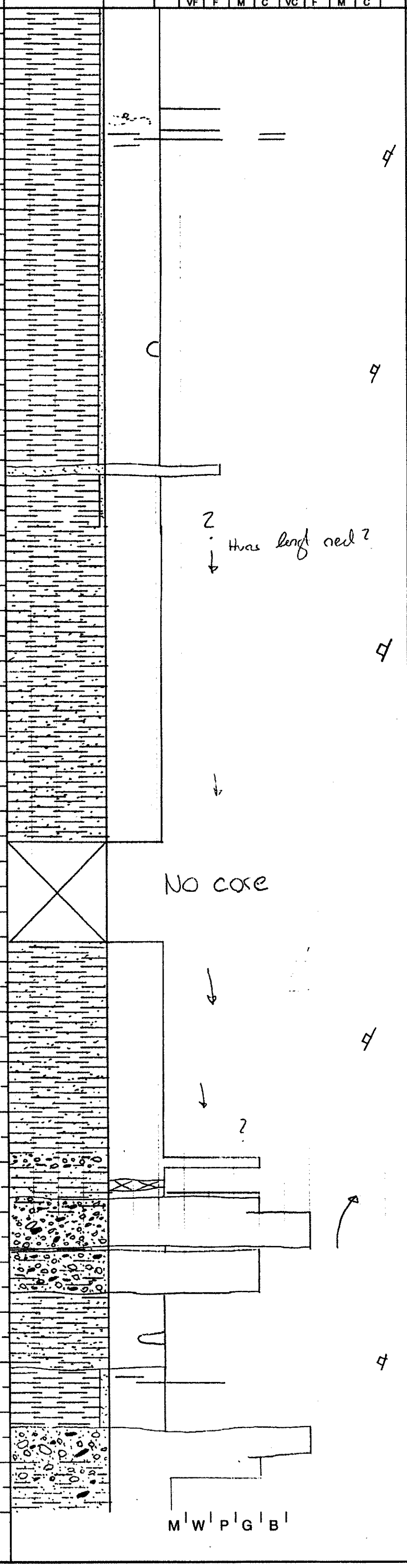
LOCALITY: 70° 28' 35" N
UTM COORDINATES: 53° 51' 59" W
ELEVATION: 91 m

ELEVATION OF DRILL FLOOR ABOVE GROUND-LEVEL: 2 m
UNIT:
AGE:

WELL NO: 439201 GANK #1
BOX NO:
CORE DIAMETER: (cm/mm)
INTERVAL:

SCALE: 1:50
DATE: 9/2-96 + 12/2
GEOLOGIST: GD

AGE	LITHOSTRATIGRAPHIC UNIT	BOX NO	DRILLER'S DEPTH REFERENCE TO.........	LITHOLOGY	GRAIN SIZE AND SEDIMENTARY STRUCTURES	BIOTURBATION/FOSSILS	COLOUR	ACCESSORIES/HC SHOWS	SORTING (VP, P, M, W, VW)	POROSITY	RECOVERY	FACIES	DEPOSITIONAL ENVIRONMENT	PHOTO NO.	SAMPLE NO.	REMARKS, DESCRIPTION AND INTERPRETATION
427' 130.14	1	Box # 32	130											246	33, 533	
			31			ss										
			32											245	34, 534	
		132.49														
437' 133.19		Box # 33	33		C	kalcit konk										
			34											244	35, 535	
		135.13	35		? Hvor langt ned ?											
447' 136.24		Box # 34	36											243	36, 536	
			37													
		137.94	38											242		
			39		No core											
457' 139.2?		Box # 35	140											241	538, 537	
			41		?	kalcit konk.								240		
467' 142.34	5	Box # 36	42												539, 37	
470' 143.26			43			kalcit konk										
			44												540, 38	
			145													



SHEET 19 OF 20

CORE DESCRIPTION
SEDIMENTOLOGICAL DATA SHEET

THE GEOLOGICAL SURVEY OF DENMARK AND GREENLAND

LOCALITY:
UTM COORDINATES : 70° 28' 35"N 53° 51' 59"W
ELEVATION: 91 m
ELEVATION OF DRILL FLOOR ABOVE GROUND-LEVEL: 2 m
UNIT:
AGE:
WELL NO: 439201 GANK # 1
BOX NO:
CORE DIAMETER: (cm/mm)
INTERVAL:
SCALE: 1:50
DATE: 12/2-96
GEOLOGIST: GD

AGE	LITHOSTRATIGRAPHIC UNIT	BOX NO	DRILLER'S DEPTH REFERENCE TO.....	LITHOLOGY	GRAIN SIZE AND SEDIMENTARY STRUCTURES (CLAY, SILT, SAND VF F M C VC, PEBBL. F M C, CO; 0.0039, 0.0625, 0.125, 0.25, 0.5, 1, 2, 8, 16, 64)	BIOTURBATION/FOSSILS	COLOUR	ACCESSORIES/HC SHOWS	SORTING (VP, P, M, W, VW)	POROSITY	RECOVERY	FACIES	DEPOSITIONAL ENVIRONMENT	PHOTO NO.	SAMPLE NO.	REMARKS, DESCRIPTION AND INTERPRETATION
	1		115													
		115.80														
			16												253	
		Box # 27	17													
387' 117.95	2		18												29 529 222	
		118.79														
		Box # 28	19													
			120												251	
397' 121.00			21												30 530	
		121.50														
	1	Box # 29	22												250	
			23													
407' 124.09			24												31 531 289	
		124.20														
		Box # 30	25													
			26												248	
417' 127.10			27												32 532	
	5	127.10														
		Box # 31	28												247	
			29													
425' 129.54		129.54														
			130													

M | W | P | G | B

SHEET 20 OF 20

CORE DESCRIPTION
SEDIMENTOLOGICAL DATA SHEET

THE GEOLOGICAL SURVEY OF DENMARK AND GREENLAND

LOCALITY:
UTM COORDINATES : 70°28'35" N 53°51'59" W
ELEVATION: 91 m

ELEVATION OF DRILL FLOOR ABOVE GROUND-LEVEL: 2. m
UNIT:
AGE:

WELL NO: 439201 GANK# 1
BOX NO:
CORE DIAMETER: (cm/mm)
INTERVAL:

SCALE: 1:50
DATE: 12/2-96
GEOLOGIST: GD

AGE	LITHOSTRATIGRAPHIC UNIT	BOX NO	DRILLER'S DEPTH REFERENCE TO.....	LITHOLOGY	GRAIN SIZE AND SEDIMENTARY STRUCTURES (CLAY | SILT | SAND: VF F M C VC | PEBBL.: F M C | CO; 0.0039 0.0625 0.125 0.25 0.5 1 2 8 16 64)	BIOTURBATION/FOSSILS	COLOUR	ACCESSORIES/HC SHOWS	SORTING (VP, P, M, W, VW)	POROSITY	RECOVERY	FACIES	DEPOSITIONAL ENVIRONMENT	PHOTO NO.	SAMPLE NO.	REMARKS, DESCRIPTION AND INTERPRETATION
			110	HYALOCLASTITES												
			11													
			12													
			13													
			14													
			115	M W P G B											26 528	

Table 2

Table 2. Detailed sedimentological log of the of the GANK#1A core.

SHEET 1 OF 8

CORE DESCRIPTION
SEDIMENTOLOGICAL DATA SHEET

THE GEOLOGICAL SURVEY OF DENMARK AND GREENLAND

LOCALITY: 70° 28' 35" N
UTM COORDINATES : 53° 51' 59" W
ELEVATION: 91 m

ELEVATION OF DRILL FLOOR ABOVE GROUND-LEVEL: 2 m
UNIT:
AGE:

WELL NO: 439201 GANK # 1A
BOX NO:
CORE DIAMETER: (cm/mm)
INTERVAL:

SCALE: 1:50
DATE: 13/2-96
GEOLOGIST: GD

AGE	LITHOSTRATIGRAPHIC UNIT	BOX NO	DRILLER'S DEPTH REFERENCE TO.....	LITHOLOGY	GRAIN SIZE AND SEDIMENTARY STRUCTURES (CLAY | SILT | SAND VF F M C VC | PEBBL. F M C | CO; 0.0039 0.0625 0.125 0.25 0.5 1 2 8 16 64)	BIOTURBATION/FOSSILS	COLOUR	ACCESSORIES/HC SHOWS	SORTING (VP, P, M, W, VW)	POROSITY	RECOVERY	FACIES	DEPOSITIONAL ENVIRONMENT	PHOTO NO.	SAMPLE NO.	REMARKS, DESCRIPTION AND INTERPRETATION
1067' 325.22	5	BOX # 30A	323		No core											
			24													
			25													
			26												666	
															155	
			27		No core											
1075' 327.76			28													
		BOX # 31A	29													
			330		No core											
			31													
1087' 331.32		BOX # 32A													667	
			32												668	
1092' 332.84			33		BASE GANK # 1A											
			34													
			35													
			36													
			37													
			338		M | W | P | G | B |											

SHEET 2 OF 8

CORE DESCRIPTION
SEDIMENTOLOGICAL DATA SHEET

THE GEOLOGICAL SURVEY OF DENMARK AND GREENLAND

LOCALITY:
UTM COORDINATES : 70° 28' 35" N 53° 51' 59" W
ELEVATION: 91 m

ELEVATION OF DRILL FLOOR ABOVE GROUND-LEVEL: 2 m
UNIT:
AGE:

WELL NO: 439201 GANK # 1A
BOX NO:
CORE DIAMETER: (cm/mm)
INTERVAL:

SCALE: 1:50
DATE: 13/2-96
GEOLOGIST: GD

AGE	LITHOSTRATIGRAPHIC UNIT	BOX NO	DRILLER'S DEPTH REFERENCE TO.....	LITHOLOGY	GRAIN SIZE AND SEDIMENTARY STRUCTURES	BIOTURBATION/FOSSILS	COLOUR	ACCESSORIES/HC SHOWS	SORTING (VP, P, M, W, VW)	POROSITY	RECOVERY	FACIES	DEPOSITIONAL ENVIRONMENT	PHOTO NO.	SAMPLE NO.	REMARKS, DESCRIPTION AND INTERPRETATION
1017' 309.98		Box # 26A	308													
			09												150	
			310												362	
		Box # 27A	11													
			12													
1027' 313.03			13												151	
	51														363	
		Box # 28A	14													
			15													
															152	
1037' 316.08			16												364	
		Box # 29A	17													
			18													
			19												153	
1047' 319.13		Box # 30A	320													
															154	
			21													
			22													
1057' 322.17			323													

Intrusiv

No core

M | W | P | G | B

SHEET 3 OF 8

CORE DESCRIPTION
SEDIMENTOLOGICAL DATA SHEET

THE GEOLOGICAL SURVEY OF DENMARK AND GREENLAND

LOCALITY: 70° 28' 35" N
UTM COORDINATES: 53° 51' 59" W
ELEVATION: 91 m

ELEVATION OF DRILL FLOOR ABOVE GROUND-LEVEL: 2 m
UNIT:
AGE:

WELL NO: 439201 GANK # 1A
BOX NO:
CORE DIAMETER: (cm/mm)
INTERVAL:

SCALE: 1:50
DATE: 13/2-96
GEOLOGIST: GD

AGE	LITHOSTRATIGRAPHIC UNIT	BOX NO	DRILLER'S DEPTH REFERENCE TO.....	LITHOLOGY	GRAIN SIZE AND SEDIMENTARY STRUCTURES	BIOTURBATION/FOSSILS	COLOUR	ACCESSORIES/HC SHOWS	SORTING (VP, P, M, W, VW)	POROSITY	RECOVERY	FACIES	DEPOSITIONAL ENVIRONMENT	PHOTO NO.	SAMPLE NO.	REMARKS, DESCRIPTION AND INTERPRETATION
967' 294.74	3	BOX # 21A	293		CLAY SILT SAND PEBBL. CO										143 656	
973' 296.57		BOX # 22A	94 95 96 97												144 657 145	
977' 297.79	1	BOX # 23A	98 99 300 01												658 146	
984' 299.92																
992' 302.36	2	BOX # 24A	02 03 04												147 659	
999' 304.50	5	BOX # 25A	05 06 07												148 660	
1007' 306.93			308		M W P G B										149 661	

? kalcit konk. kalcit konk. kalcit konk.

SHEET 4 OF 8

CORE DESCRIPTION
SEDIMENTOLOGICAL DATA SHEET

THE GEOLOGICAL SURVEY OF DENMARK AND GREENLAND

LOCALITY: 70°28'35" N
UTM COORDINATES : 53°51'59" W
ELEVATION: 91 m

ELEVATION OF DRILL FLOOR ABOVE GROUND-LEVEL: 2 m
UNIT:
AGE:

WELL NO: 439201 GANK # 1A
BOX NO:
CORE DIAMETER: (cm/mm)
INTERVAL:

SCALE: 1:50
DATE: 13/2-96
GEOLOGIST: GD

AGE	LITHOSTRATIGRAPHIC UNIT	BOX NO	DRILLER'S DEPTH REFERENCE TO.....	LITHOLOGY	GRAIN SIZE AND SEDIMENTARY STRUCTURES	BIOTURBATION/FOSSILS	COLOUR	ACCESSORIES/HC SHOWS	SORTING (VP, P, M, W, VW)	POROSITY	RECOVERY	FACIES	DEPOSITIONAL ENVIRONMENT	PHOTO NO.	SAMPLE NO.	REMARKS, DESCRIPTION AND INTERPRETATION
917' 279.50	1	BOX # 16A	278													
			279													
		BOX # 17A	280											652 138		
			281													
925' 281.94			282													
		BOX # 18A	283											139		
931' 283.77			284													
			285													
			286			SSS								653 140		
941' 286.82	3	BOX # 19A	287				Light brown.									
			288				Light brown									
			289											141		
969' 295.26			290											655 142		
		BOX # 20A	291													
			292													
959' 292.50			293		M W P G B											

SHEET 5 OF 8

CORE DESCRIPTION
SEDIMENTOLOGICAL DATA SHEET

THE GEOLOGICAL SURVEY OF DENMARK AND GREENLAND

439201

LOCALITY: 70° 28' 35" N
UTM COORDINATES : 53° 51' 59" W
ELEVATION: 91 m

ELEVATION OF DRILL FLOOR ABOVE GROUND-LEVEL: 2 m
UNIT:
AGE:

WELL NO: GANK # 1A
BOX NO:
CORE DIAMETER: (cm/mm)
INTERVAL:

SCALE: 1:50
DATE: 13/2-96 + 14/2
GEOLOGIST: GD

AGE	LITHOSTRATIGRAPHIC UNIT	BOX NO	DRILLER'S DEPTH REFERENCE TO.....	LITHOLOGY	GRAIN SIZE AND SEDIMENTARY STRUCTURES	BIOTURBATION/FOSSILS	COLOUR	ACCESSORIES/HC SHOWS	SORTING (VP, P, M, W, VW)	POROSITY	RECOVERY	FACIES	DEPOSITIONAL ENVIRONMENT	PHOTO NO.	SAMPLE NO.	REMARKS, DESCRIPTION AND INTERPRETATION
8691 / 264.87	3	BOX # 12A	263												133	
															646	
			64													
			65			≈										
8741 / 266.40			66													
															647	
			67					ikke så typisk i GANK # 1								
		BOX # 13A	68				kalcit kalk								648	
															134	
8841 / 269.44			69													
	5		270													
		BOX # 14A	71												135	
															651	
			72													
895' / 272.80			73				kalcit kalk.									
	1															
		BOX # 15A	74													
	2		75												652	
															136	
905' / 275.84	5		76													
		BOX # 16A	77			≈									653	
															137	
			78													

M | W | P | G | B |

SHEET 6 OF 8

CORE DESCRIPTION
SEDIMENTOLOGICAL DATA SHEET

THE GEOLOGICAL SURVEY OF DENMARK AND GREENLAND

439201
WELL NO: GANK # 1A
BOX NO:
CORE DIAMETER: (cm/mm)
INTERVAL:

LOCALITY:
UTM COORDINATES : 70° 28' 35" N 53° 51' 59" W
ELEVATION: 91 m

ELEVATION OF DRILL FLOOR
ABOVE GROUND-LEVEL: 2 m
UNIT:
AGE:

SCALE: 1:50
DATE: 14/2-96 +20/2
GEOLOGIST: GD

AGE	LITHOSTRATIGRAPHIC UNIT	BOX NO	DRILLER'S DEPTH REFERENCE TO.....	LITHOLOGY	GRAIN SIZE AND SEDIMENTARY STRUCTURES	BIOTURBATION/FOSSILS	COLOUR	ACCESSORIES/HC SHOWS	SORTING (VP, P, M, W, VW)	POROSITY	RECOVERY	FACIES	DEPOSITIONAL ENVIRONMENT	PHOTO NO.	SAMPLE NO.	REMARKS, DESCRIPTION AND INTERPRETATION
			248													
	1	BOX # 7A	49													
821' 250.24			250											642 128		
			51													
	51	BOX # 8A	52					Kalcit kank.						129		
831' 253.29			53											643		
			54													
		BOX # 9A	55											130		
841' 256.34	1		56					Kalcit kank						644		
			57													
		BOX # 10A	58											131		
851' 259.38			59					Kalcit kank.						645		
	5		260													
	1	BOX # 11A	61													
861' 262.19			62											132		
	2		63		M W P G B											

SHEET 7 OF 8

CORE DESCRIPTION
SEDIMENTOLOGICAL DATA SHEET

THE GEOLOGICAL SURVEY OF DENMARK AND GREENLAND

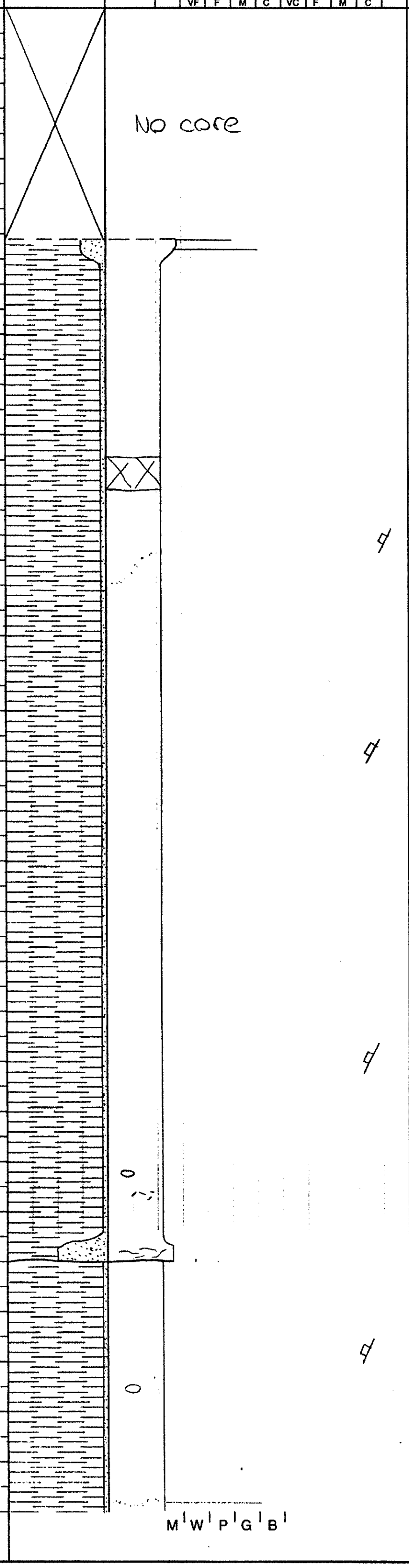
LOCALITY:
UTM COORDINATES: 70°28'35" N 53°51'59" W
ELEVATION: 91 m

ELEVATION OF DRILL FLOOR ABOVE GROUND-LEVEL: 2 m
UNIT:
AGE:

WELL NO: 439201 GANK#1A
BOX NO:
CORE DIAMETER: (cm/mm)
INTERVAL:

SCALE: 1:50
DATE: 20/2-96
GEOLOGIST: GD

AGE	LITHOSTRATIGRAPHIC UNIT	BOX NO	DRILLER'S DEPTH REFERENCE TO........	LITHOLOGY	GRAIN SIZE AND SEDIMENTARY STRUCTURES	BIOTURBATION/FOSSILS	COLOUR	ACCESSORIES/HC SHOWS	SORTING (VP, P, M, W, VW)	POROSITY	RECOVERY	FACIES	DEPOSITIONAL ENVIRONMENT	PHOTO NO.	SAMPLE NO.	REMARKS, DESCRIPTION AND INTERPRETATION
	1	Box # 2A	233		No core											
			34													
772' 235.31			35													
	?—	Box # 3A	36												638 634	
			37			Kalcit konk.										
781' 238.05			38													
			39													
	4	Box # 4A	240													
791' 241.10			41												635 639	
			42													
		Box # 5A	43												640 126	
801' 244.14	?—		44													
			45			Kalcit konk. o skaller?										
	1	Box # 6A	46			ss Helminthopsis horizontalis									127 641	
811' 247.19			47			Kalcit konk										
			248													



SHEET 8 OF 8

CORE DESCRIPTION

SEDIMENTOLOGICAL DATA SHEET

THE GEOLOGICAL SURVEY OF DENMARK AND GREENLAND

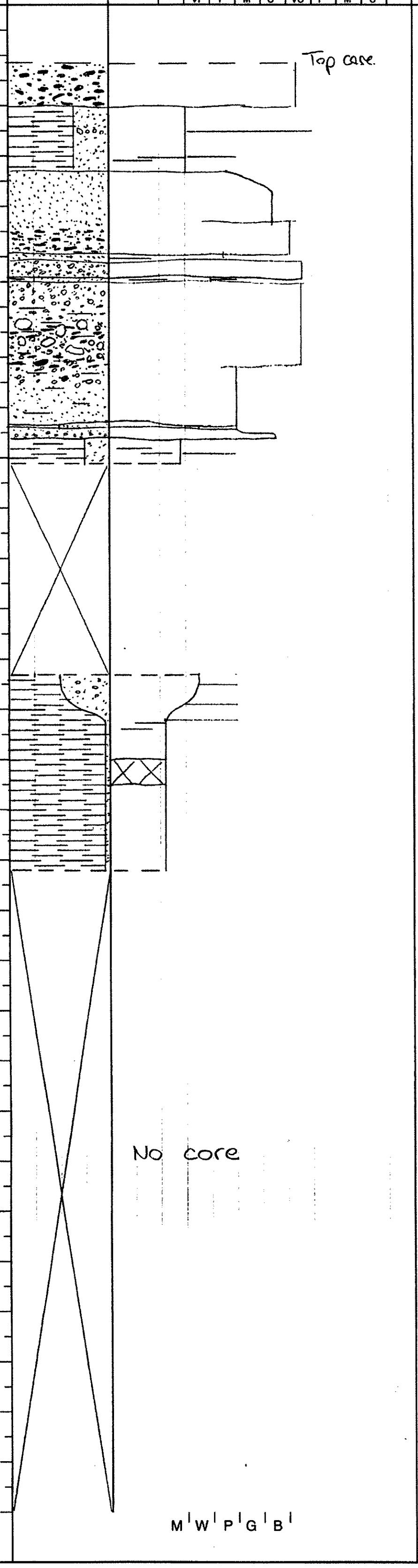
LOCALITY: 70° 28' 35" N
UTM COORDINATES: 53° 51' 59" W
ELEVATION: 91 m

ELEVATION OF DRILL FLOOR ABOVE GROUND-LEVEL: 2 m
UNIT:
AGE:

WELL NO: 439201 GANK # 1A
BOX NO:
CORE DIAMETER: (cm/mm)
INTERVAL:

SCALE: 1:50
DATE: 20/2-96
GEOLOGIST: OD

AGE	LITHOSTRATIGRAPHIC UNIT	BOX NO	DRILLER'S DEPTH REFERENCE TO........	LITHOLOGY	GRAIN SIZE AND SEDIMENTARY STRUCTURES (CLAY, SILT, SAND VF F M C VC, PEBBL. F M C, CO; 0.0039, 0.0625, 0.125, 0.25, 0.5, 1, 2, 8, 16, 64)	BIOTURBATION/FOSSILS	COLOUR	ACCESSORIES/HC SHOWS	SORTING (VP, P, M, W, VW)	POROSITY	RECOVERY	FACIES	DEPOSITIONAL ENVIRONMENT	PHOTO NO.	SAMPLE NO.	REMARKS, DESCRIPTION AND INTERPRETATION
	5	Box # 1A	218 – 19 – 220		Top core										636, 632	
727' 221.59			21 – 22				Cugul??									
737' 224.64	1	Box # 2A	23 – 24 – 25 – 26			kalcit kaok									633, 637	
			27 – 28 – 29 – 230 – 31 – 32 – 33		No core											



M | W | P | G | B