ORKUSTOFNUN
Vatnsorkudeild

HÓLMSBERG

GEOLOGICAL REPORT

Skúli Víkingsson
Bjarni Kristinsson

OS82042/VOD25 B

MAY 1982

ORKUSTOFNUN
GRENSÁSVEGI 9, 108 REYKJAVÍK

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1.0 INTRODUCTION

The work described in this report was carried out in accordance with a contract between Orkustofnun and AV (Almenna verkfræðistofan), dated March 8 1982, in connection with the proposed oil storage and harbor project at Hólmsberg and Helguvík South West Iceland.

The work performed by Orkustofnun included:

(1) Core drilling. Eight boreholes were drilled, thereof three 60 m deep and five 15 m deep.

(2) Core logging: (a) General geological logging of the cores. Graphic core logs are shown in Appendix 1. (b) Rock mass quality classification after the NGI*) Q-system of the uppermost 15 meters of the core from each borehole.

(3) Construction of a geological section of the exposed rocks in the Hólmsberg coastal cliffs between the Helguvík and Bergvík coves. The main purpose was to correlate stratigraphic boundaries which might occur in the boreholes, and thus get a better picture of the geology of the project sites.

(4) Geophysical logging of the boreholes. This includes measurements of the groundwater table and determination of the boundary between fresh and salt groundwater in the 60 m deep holes.

2.0 GENERAL DESCRIPTION OF THE GEOLOGY

All the rocks exposed in the Hólmsberg cliffs and the rocks penetrated by the boreholes belong to the same compound lava flow, except that borehole B-5 reached through it. The rock type is olivine tholeiite. The lava flow can be followed at least to Keflavík in the south and to Bergvík in the north. It is clearly marked by glacial erosion but the glacier has not shaped the landscape on a larger scale. All the rocks of the Rosmhvalanes peninsula (see Fig. 1) are olivine tholeiitic lava flows, and Jónsson (1978) assumes that they were erupted during the last interglacial period.

Olivine tholeiites are known from all ages of Icelandic geological history but they are particularly common in the Upper Pleistocene and Lower Holocene rocks of South-West Iceland. These lava flows can often be traced back to their origin, which are almost always lava shields. These lava shields are of different sizes, but common features are a very distinct shield-like form

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*) Norwegian Geotechnical Institute

provided that the topography did not prevent it, and that each of them are made up of a single lava flow composed of numerous flow-units. Olivine tholeiite lavas have a low viscosity and a high content of dissolved gases and tend to cool as a pahoehoe lava, at least in the vicinity of the eruptive vent, but farther away aa type lavas occur. Walker (1971) concludes that the compound nature and the special topographic form of the lava shields are due to the low rate of lava extrusion (which may last for years) as well as the low viscosity of the lava.

2.1 Structure

The rocks exposed in the Hólmsberg cliffs display all the characteristics of a compound lava flow. Some parts of the exposed section show many flow-units of different thicknesses, but in other places one thick flow-unit makes up the whole cliff. These thick flow-units commonly exceed 25 m in thickness. The division of the lava flow into flow-units can occasionally be uncertain. Sometimes a clear boundary between flow-units grades into a horizontal weakness in a single thicker unit. A boundary between units must have different sets of cooling cracks above and below, thus indicating that each of the units cooled separately. When the cooling cracks extend through a horizontal boundary or weakness zone the lava flow is called multiple. In the sections, multiple parts of the lava flow are grouped under the same category as the thick flow-units, but the horizontal fractures shown on the sections should indicate where the lava flow is of a distinct multiple character.

Each flow-unit usually lies directly on top of another unit but interbedded scoria occur.

The compound nature of the shield lavas, makes it somewhat difficult to distinguish between different lava flows. The criteria that can be used are as follows: (1) a distinct difference in composition between the underlying and the overlying lava flows, (2) weathered surface of the underlying lava flow or (3) sedimentary layers interbedded between the two lava flows. No such indications have been found, neither in the sea cliff section nor in the boreholes except B-5 (see 4.0). This leads to the conclusion that all the flow-units belong to the same lava flow.

2.2 Texture

The texture of the basalt is typical for olivine tholeiites with large crystals compared with basalt in general. Plagioclase, olivine and even pyroxene (augite) crystals are commonly visible to the naked eye. Small phenocrysts of these are frequently abundant but their size and abundance vary within the same lava flow and are therefore a bad criterion for distinguishing between different lava flows. The crystal matrix is loosely constructed with voids between crystals, a feature generally thought to be caused by degassing of the crystallizing melt.

3.0 GEOLOGICAL SECTION HELGUVÍK-BERGVÍK

The section is devided into three parts showing the geological features exposed in the sea cliffs of Hólmsberg, from Helguvík cove to Ritunípa promontory, which limits the Bergvík cove to the north. Each part of the section was made by projecting the landscape horizontally to a vertical plane. On the map (Fig. 2) the locations of these planes are shown as lines A-A, B-B, C-C, D-D and E-E. Boundaries between the geological features are drawn with help from photographs taken from the sea.

In the sections the rocks are divided into the following units: 1) Thick flow-units, 2) Medium thick and distinguishable flow-units, 3) Thin and hardly distinguishable flow-units, cube jointed lava and alike, 4) Scoriaceous lava.

1) Thick flow-units. Major fractures are shown. These flow-units are generally thicker than 5 m. The fractures appearing in the rock and shown in the sections are all assumed to have been formed while the lava was cooling due to contraction. No tectonic fractures have been observed. Most of the fractures are either joints nearly perpendicular to the cooling surfaces of the flow-unit or nearly horizontal cracks parallel to the surfaces. As described above (2.1), at least part of the horizontal cracks and weakness zones are originally boundaries between flow-units, but the time between the superimposition of the two flow-units was not long enough for the lower unit to cool sufficiently for contraction cracks to be formed.

2) Medium thick and distinguishable flow-units. These flow-units are usually 1 to 5 m thick and fractures are not shown in the sections.

3) Thin and indistinguishable flow-units, cube-jointed lava and alike. Most of the rocks grouped under this category are of flow-units a few tens of cm thick, but where the flow-units become very thin usually they also become irregular in thickness and extent. Cube jointing occasionally occurring in thick flow-units are also grouped under this category. Where prominent boundaries occur between flow-units, they are shown with

thick lines.

4) Scoriaceous lava. Intervening scoria and thin flow-units are indicated by screens 3 and 4 combined.

Slope stability is good as demonstrated by the steep cliffs. Loose scoria is less stable than other parts of the cliffs. This can for example be seen just west of the Stakksnípa promontory, where scoria forms the edge between the level ground and the cliffs. There a scoriaceous lava forms a slope of 30-40 degrees instead of an almost vertical cliff elsewhere.

4.0 CORE DRILLING

Eight boreholes were drilled. Five on the tank site and three near Stakksnípa promontory. Five of the holes were 15 m deep, but three 60 m deep (two of them at Stakksnípa). Graphic core logs are shown in Appendix 1. Rock mass quality was classified according to the NGI Q-system for the first 15 meters cf the core from each borehole. (See Appendix 2).

All the holes were situated on the same previously described compound lava flow and only one of them reached its lower limit. Looking at the Hólmsberg cliffs (see sections) it seems obvious that correlations of contacts between flow-units can only be done across quite short distances. Thus no certain correlations can be made between the holes or between the holes and the sections, with the exception that B-7 and B-8 seem to fit satisfactorily in with the cliff section next to them (section B-B). The thick flow-unit next to surface in both of these holes is probably the same as that exposed in the Stakksnípa promontory to the right on section B-B.

The only borehole to reach trough the compound lava flow was B-5. At 59 m depth (or 31 m below sea level) there was a sedimentary layer, which indicates that the underlying lava flow is of a different age. Another indication of a stratigraphic boundary was found in that same hole at 32 m depth (or 5 m below sea level). There a slightly weathered or sand-infiltrated scoria is overlain by lava. It is far from certain that this latter boundary distinguishes between two different lava flows. It could be a boundary between two flow-units of the same lava flow, as time between superimposition of flow-units can be several years.

4.1 Rock mass quality

Rock quality analyses were carried out for the uppermost 15 m of core in all the holes, i. e. B-1 to B-8.

Rock mass quality and support requirements were evaluated according to the NGI-system (Barton et al. 1974) which has been used at Orkustofnun since 1980. The NGI-system has one important shortcoming with regard to Iceland. It is hardly based on any basalt case at all. Since joints in basalt are mainly columnar jointing due to cooling contraction of molten lava, they are not continuous throughout the rock mass, and are therefore inadequately accounted for in the NGI-system which deals with joints due to regional tectonics. Therefore it has been modified a little in an attempt to adjust it to Icelandic conditions. Also the NGI-system is based on observations in exposures which lead to somewhat different results than in cores. Following are the changes made on the NGI-system concerning basalt (of the kind in the Hólmsberg area), and the reasons for the numbers given to each parameter.

RQD: Using $\geq$ 10 cm long core pieces.

Jn: The number 9 has been agreed upon for medium and large columnar basalts such as we are dealing with at Hólmsberg until further experience permits reevaluation.

Jr: This is determined by taking the average of the numbers in the Jr column (gerð/type) and add 0.5. This should compensate for the fact that when basalt is observed in an exposure many discontinuous joints are found whose discontinuous nature is not recognised in a core. Time will tell if 0.5 is the correct figure.

Ja: Here the number 1.0 was used for all the holes according to the NGI-system. This basalt is a typical late Quaternary lava in the respect that the joint walls are unaltered and contain only surface staining, but no particularly problematic minerals.

Jw: Since all the holes are dry for the top 15 meters the number 1.0 was given everywhere according to the NGI-system.

SRF: The number 2.5 has been chosen here as the most suitable on a regional scale, according to the NGI-system, even though no stress measurements have been made. Regional stress measurements are not considered necessary under these obviously low stress conditions. However the number 5.0 is more suitable when referring to each single basalt column i. e. local failures, with the result of 50% lowering of each Q-value in Table 2.

Table 2 shows Q values for each drillhole and the factors it is made of. The placing of each Q value on the NGI tunnel support chart is shown in a diagram below Table 2. The joint analysis charts of each hole make up Appendix 2. The legend for the rock quality analyses is also in Appendix 2. This is mostly based on experience with Icelandic rock formations and also on Barton et al. 1974.

The equivalent dimension refers to an open circular pit with a 10 m high rock wall. The ESR (excavation support ratio) value is estimated to be between 2.5 and 5, giving the equivalent dimension a value between 2 and 4.

Of 11 Q values obtained, 8 were fair/good and 3 were poor/fair. In 3 drillholes, the core was given two Q values. In B-1 the reason is that the uppermost 3 m of the core are much more jointed than the rest. In B-4 the last 3 m are more jointed than the upper part. In B-6 the top 2 m of the core are more jointed than the rest of the core. The three depth intervals mentioned above in B-1, B-4 and B-6 make up the three poor/fair Q-values on the tunnel support chart. It is reasonable to believe that these are due to local anomalies such as boundaries between lava units or scoria, and are of no regional importance. Consequently the regional rock quality can be given the Q value of 9 to 10 which is fair/good. According to the NGI-system this does not require support. This is in accordance with the experience of columnar basalts in Icelandic tunnels even when considerably brecciated. However, precautions should be taken because of possible fallout of single columns during construction. In longer periods of time columns are bound to fall out of place because of frost action. It depends on construction design if this needs to be taken into consideration.

Because of the nature of lava shields, local loose scoria occurs in the rock mass. This too can cause local failures during construction but are unlikely to become a major problem.

The coating on the joint surfaces is probably exclusively silt usually light yellow or brownish in color and unconsolidated.

The rock quality analyses did not show anything that could not have been expected from the description of the regional geology in 2.1.

5.0 GEOPHYSICAL LOGGING

According to the contract with AV, Orkustofnun was to perform the following borehole measurements: (1) Determination of ground water level in the boreholes. (2) Determination of the interface between fresh and saline ground water. The results so far obtained appear in Table 3.

(1) In addition to direct measurements of depths to ground water, automatic water level recorder was placed in each of the 60 m deep holes for a 24 hours period in order to detect short-termed fluctuations of the ground water table. The fluctuations recorded harmonize clearly with the ocean tides and the range of fluctuations is up to 60% of the tidal range in Keflavík harbor at the same time (in B-7).

(2) The interface between fresh and saline ground water was determined by means of conductivity logging. A prominent increase in electrical conductivity marks the interface in B-7 and B-8, but in B-5 low conductivity was observed right through the hole.

For supporting the salinity limit data obtained by the conductivity logging, temperature logging was also carried out, because a rise in temperature often coincides with the increase in conductivity, confirming the boundary between the two kinds of fluids. In these holes, however, such marked rise in temperature has not been observed so far.

6.0 CONCLUSIONS

All the rocks on the project sites on land belong to the same compound lava flow. Most of the rocks down to 15 m depth or so are of sound basalt as far as can be deduced from the outcrops in the cliffs and the borehole data. Local scoriaceous lava might occur although it is not penetrated by the holes.

Rock quality classification has been carried out for the uppermost 15 m of the holes. It is based on the NGI-system with several minor changes to suit core analysis and Icelandic conditions. Regional rock quality has been estimated to be of the Q value 9 to 10 (fair/good). However, there should be no need for any large scale support according to experience gained in similar rock formations in Iceland. Local failures can not be ruled out. Single basalt columns falling out of place or local loose scoria might call for precaution and possibly some support during construction.

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TABLE 1

COORDINATES OF BOREHOLES

NAME	X	Y	EL.
B-1	723230.68	399929.18	26.19
B-2	723317.56	400057.15	25.08
B-3	723327.09	400363.30	27.00
B-4	723088.61	400128.83	25.87
B-5	723031.95	399922.52	27.71
B-6	722657.89	399482.35	25.00
B-7	722587.94	399307.10	23.09
B-8	722725.30	399324.28	23.88

Coordinates: Lambert

TABLE 2

Rock quality according to the NGI-system

Hole	m el.	m depth	RQD:Jn	Jr:Ja	Jw:SRF	Q
B-1	23.4-20.0	2.85- 6.15	40:9	2.6:1	1:2.5	4.6
"	20.0-11.0	6.15-15.15	98:9	2.4:1	1:2.5	10.4
B-2	22.8- 9.9	2.25-15.20	79:9	2.4:1	1:2.5	8.4
B-3	25.3-11.8	1.70-15.15	91:9	2.8:1	1:2.5	11.3
B-4	24.4-13.4	1.50-12.50	90:9	2.3:1	1:2.5	9.2
"	13.4-10.6	12.50-15.30	30:9	2.3:1	1:2.5	3.1
B-5	26.5- 8.8	1.20-18.95	96:9	2.7:1	1:2.5	11.5
B-6	23.6-21.5	1.45- 3.50	52:9	1.9:1	1:2.5	4.4
"	21.5- 9.8	3.50-15.15	94:9	1.8:1	1:2.5	7.5
B-7	22.2- 5.2	0.85-17.90	91:9	2.3:1	1:2.5	9.3
B-8	23.5- 5.9	0.40-15.90	85:9	2.6:1	1:2.5	9.8

$= \frac{10}{2.5} = 4$

$= \frac{10}{5} = 2$

Figure 3. Tunnel support chart showing 38 categoris of support which are determined by the tunneling quality (Q) and the equivalent dimension (D_e) of the excavation.

B-1 to B-8

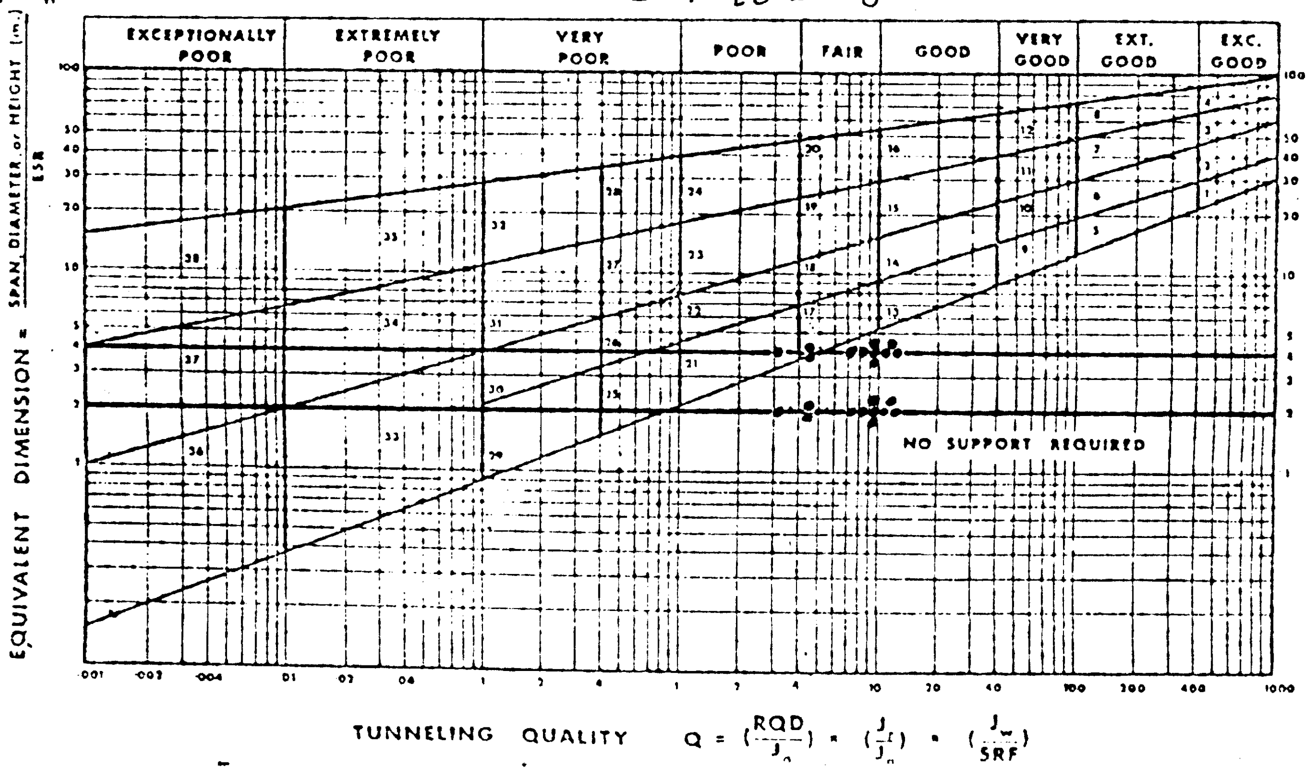


TABLE 3

Ground water measurements

	DEPTH	EL.	DATE
B-5			
MEAN WATER LEVEL	27.1	0.6	0505-0506
INTERFACE (FRESH/SALINE)	NOT REACHED		
THICKNESS OF FRESH LENS: > 30 m			
RANGE OF FLUCTUATION/RANGE OF TIDE: 0.05-0.1			
B-7			
MEAN WATER LEVEL	22.2	0.9	0424-0425
INTERFACE (FRESH/SALINE)	51	-28	0424
- - - - - -	45	-22	0505
THICKNESS OF FRESH LENS: APPR. 22 m			
RANGE OF FLUCTUATION/RANGE OF TIDE: 0.6			
B-8			
MEAN WATER LEVEL	23.1	0.8	0506-0507
INTERFACE (FRESH/SALINE)	55	-31	0505
THICKNESS OF FRESH LENS: APPR. 32 m			
RANGE OF FLUTUATION/RANGE OF TIDE: 0.25			

B-5 (APRIL 24)

DEPTH m	EL. m	TEMP. °C	EL.COND. µmhos
28	-0.3	6.0	202
30	-2.3	6.0	207
32	-4.3	6.1	215
34	-6.3	6.3	225
36	-8.3	6.4	225
38	-10.3	6.6	215
40	-12.3	6.8	210
42	-14.3	7.0	322
44	-16.3	7.5	437
46	-18.3	7.5	437
48	-20.3	7.6	440
50	-22.3	7.7	448
52	-24.3	7.7	463
54	-26.3	7.7	475
56	-28.3	7.9	740
57.5	-29.8		800
58	-30.3	7.8	
59.7	-32	7.8	

B-5 (MAY 5)

DEPTH m	EL. m	TEMP. °C	EL.COND. µmhos
27	0.7	6.9	219
28	-0.3	5.8	207
30	-2.3	5.8	205
32	-4.3	5.9	218
34	-6.3	6.0	222
36	-8.3	6.2	222
38	-10.3	6.3	220
40	-12.3	6.5	322
42	-14.3	6.8	500
44	-16.3	7.0	585
46	-18.3	7.2	610
48	-20.3	7.5	635
50	-22.3	7.7	600
52	-24.3	7.7	685
54	-26.3	7.7	710
56	-28.3	7.8	1170
57	-31.3		1200
58	-30.3	7.8	1240
59.5	-31.8	7.8	1680

B-7 (APRIL 25)

DEPTH m	EL. m	TEMP. °C	EL.COND. µmhos
23.5	-0.4		1060
24	-0.9	6.4	1040
26	-2.9	6.5	1020
28	-4.9	6.6	1020
30	-6.9	6.7	1025
32	-8.9	6.9	1000
34	-10.9	7.1	980
36	-12.9	7.3	970
38	-14.9	7.3	990
40	-16.9	7.6	950
42	-18.9	7.9	990
44	-20.9	8.2	870
46	-22.9	8.4	850
48	-24.9	8.7	900
50	-26.9	8.9	1040
51	-27.9		1040
52	-28.9	9.6	25400
54	-30.9	10.2	28000
56	-32.9	10.3	28700
58	-34.9	10.3	
60	-36.9	10.5	

B-7 (MAY 5)

DEPTH m	EL. m	TEMP. °C	EL.COND. µmhos
23	0.1		960
24	-0.9	6.7	960
26	-2.9	6.8	960
28	-4.9	7.0	960
30	-6.9	7.1	960
32	-8.9	7.3	960
34	-10.9	7.5	960
36	-12.9	7.9	990
38	-14.9	8.0	1010
40	-16.9	8.3	1060
42	-18.9	8.6	1170
44	-20.9	8.9	2150
46	-22.9	9.2	24500
48	-24.9	9.4	27000
50	-26.9	9.6	27100
52	-28.9	9.9	27300
54	-30.9	10.1	27500
56	-32.9	10.2	27500
58	-34.9	10.3	27500
60	-36.9	10.7	27900

B-8 (MAY 5)

DEPTH m	EL. m	TEMP. °C	EL.COND. µmhos
23	0.9	6.0	269
24	-0.1	6.0	272
26	-2.1	6.1	277
28	-4.1	6.3	285
30	-6.1	6.5	294
32	-8.1	6.7	318
34	-10.1	7.2	396
36	-12.1	7.3	458
38	-14.1	7.4	508
40	-16.1	7.5	575
42	-18.1	7.8	643
44	-20.1	8.0	695
46	-22.1	8.4	1120
47	-23.1		1640
48	-24.1	8.8	1870
50	-26.1	8.9	1950
51	-27.1		2500
52	-28.1	9.3	4100
54	-30.1	9.6	5800
56	-32.1	10.0	21700
58	-34.1	10.4	23500
59	-35.1	10.6	24000

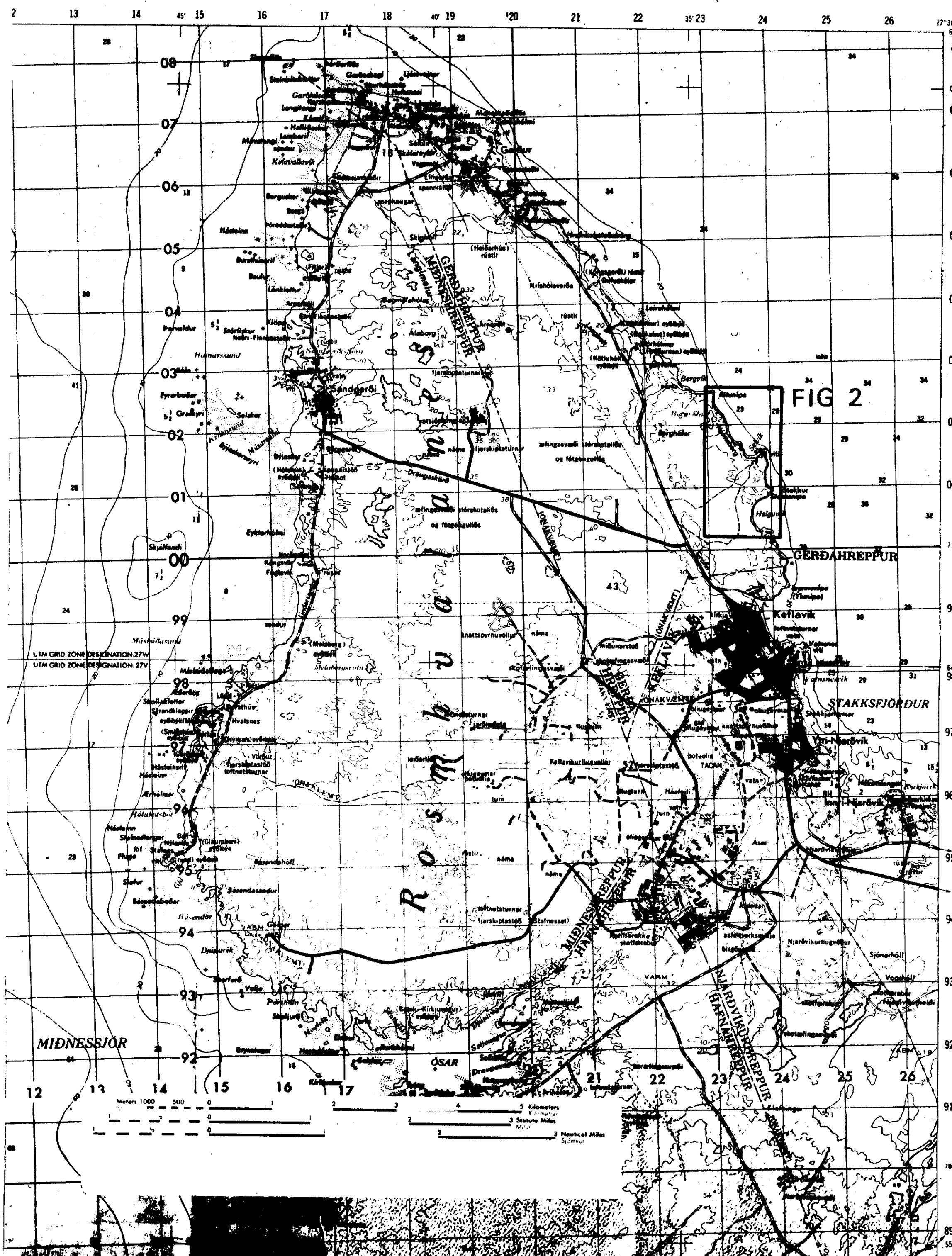


Fig. 1: Location map. (A part of Sheet 1512IV Keflavík published by Landmælingar Íslands (Icelandic Geodetic Survey) and DMAHTC U.S.A.).

APPENDIX 1

Graphic core logs

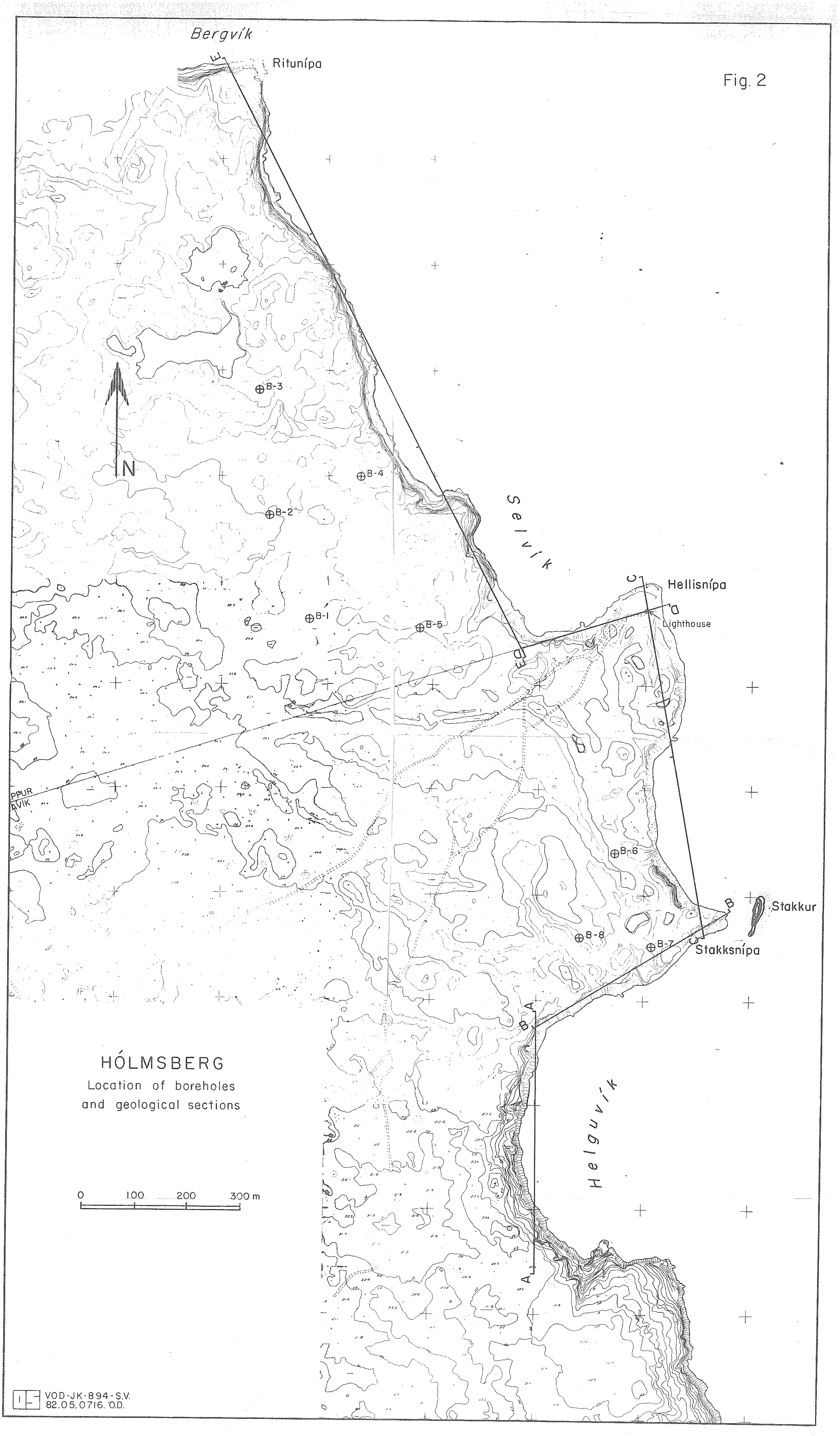
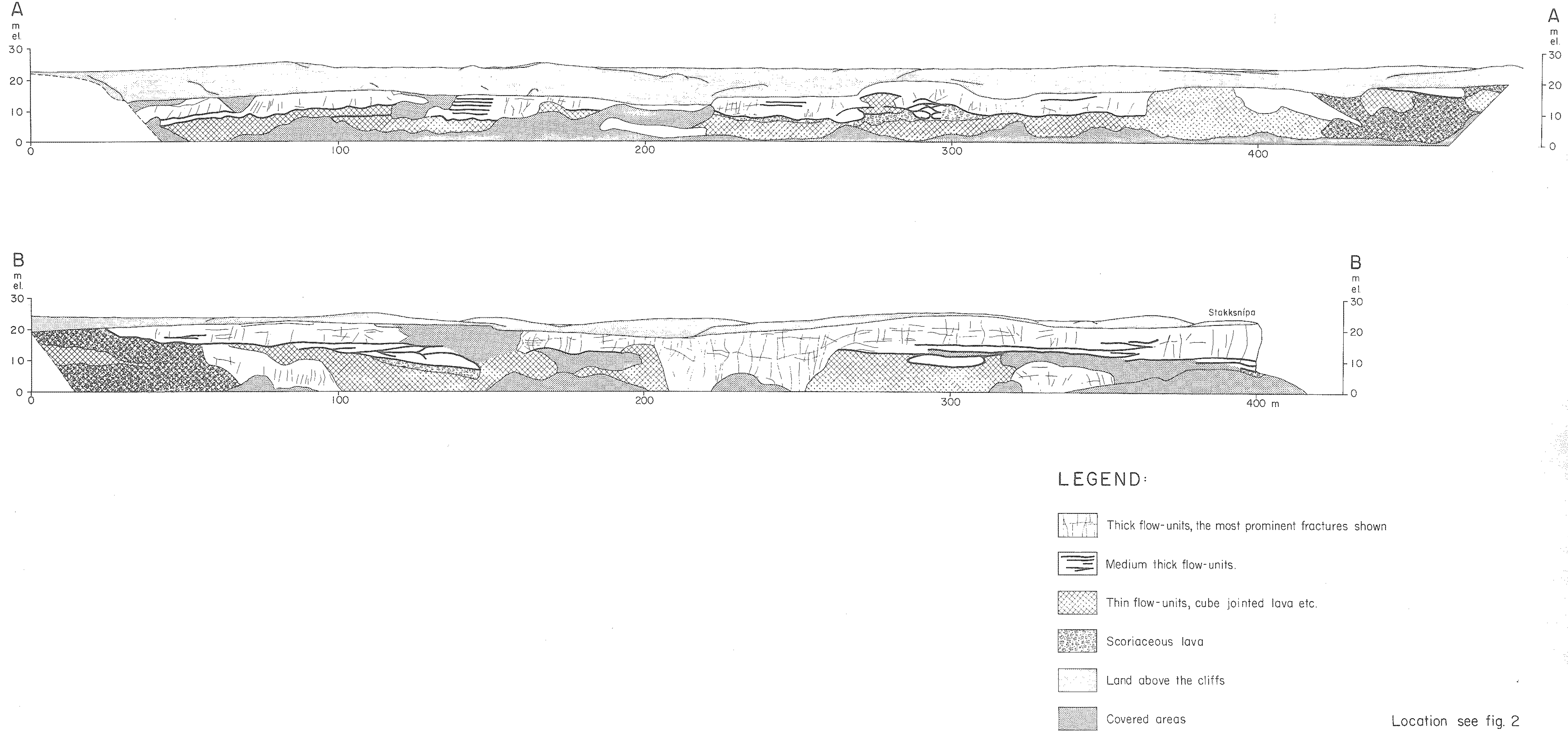


Fig. 2
Bergvík
Rituníp a
Selvík
Hellisnípa
Lighthouse
Stakkur
Stakksnípa
Helguvík
N
B-1
B-2
B-3
B-4
B-5
B-6
B-7
B-8
HÓLMSBERG
Location of boreholes
and geological sections
0 100 200 300 m
VOD-JK-894-S.V.
82.05.0716. O.D.

Fig. 3



Location see fig. 2

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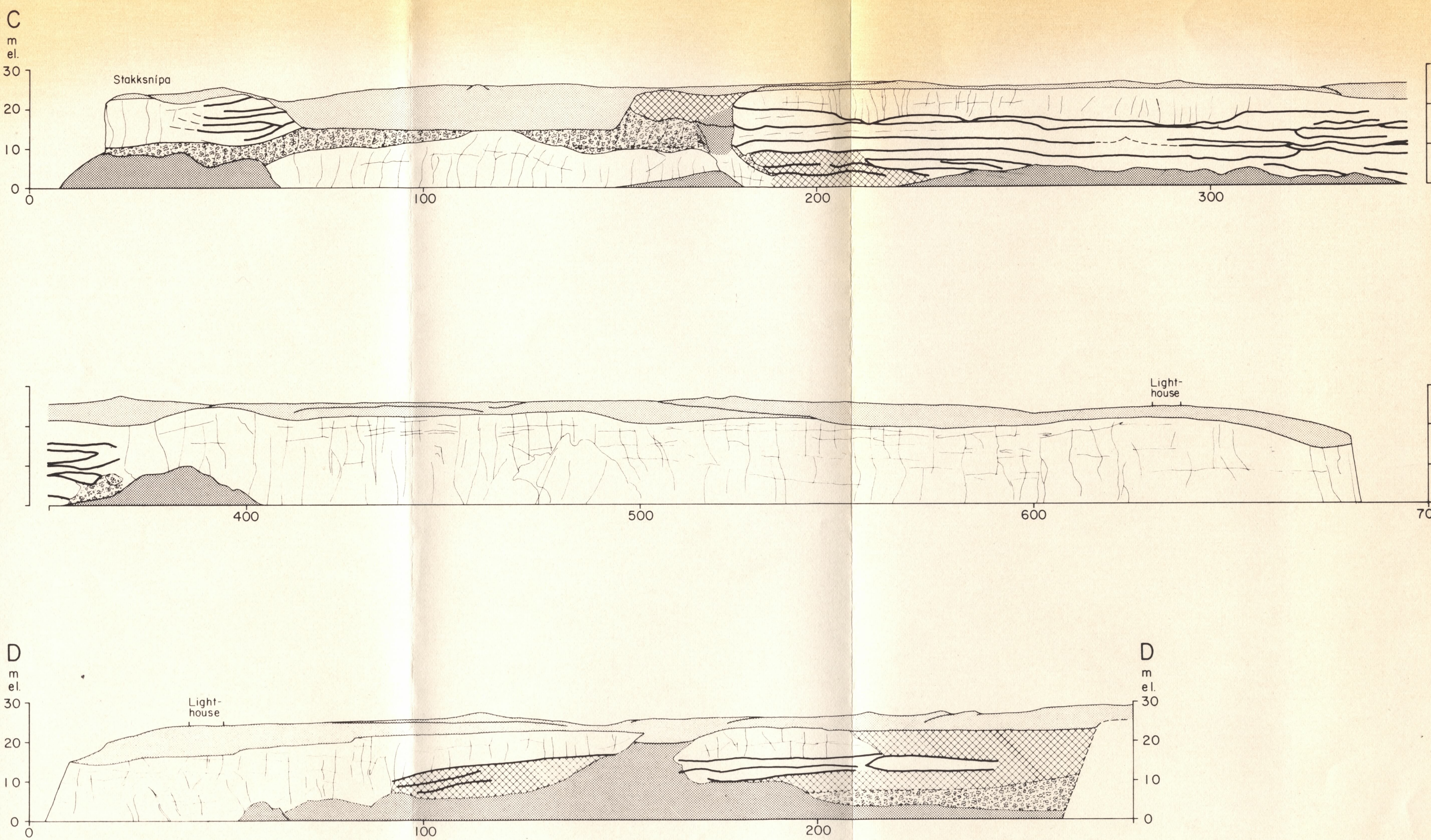
Fig. 4



Location see fig. 2
Legend see fig 3

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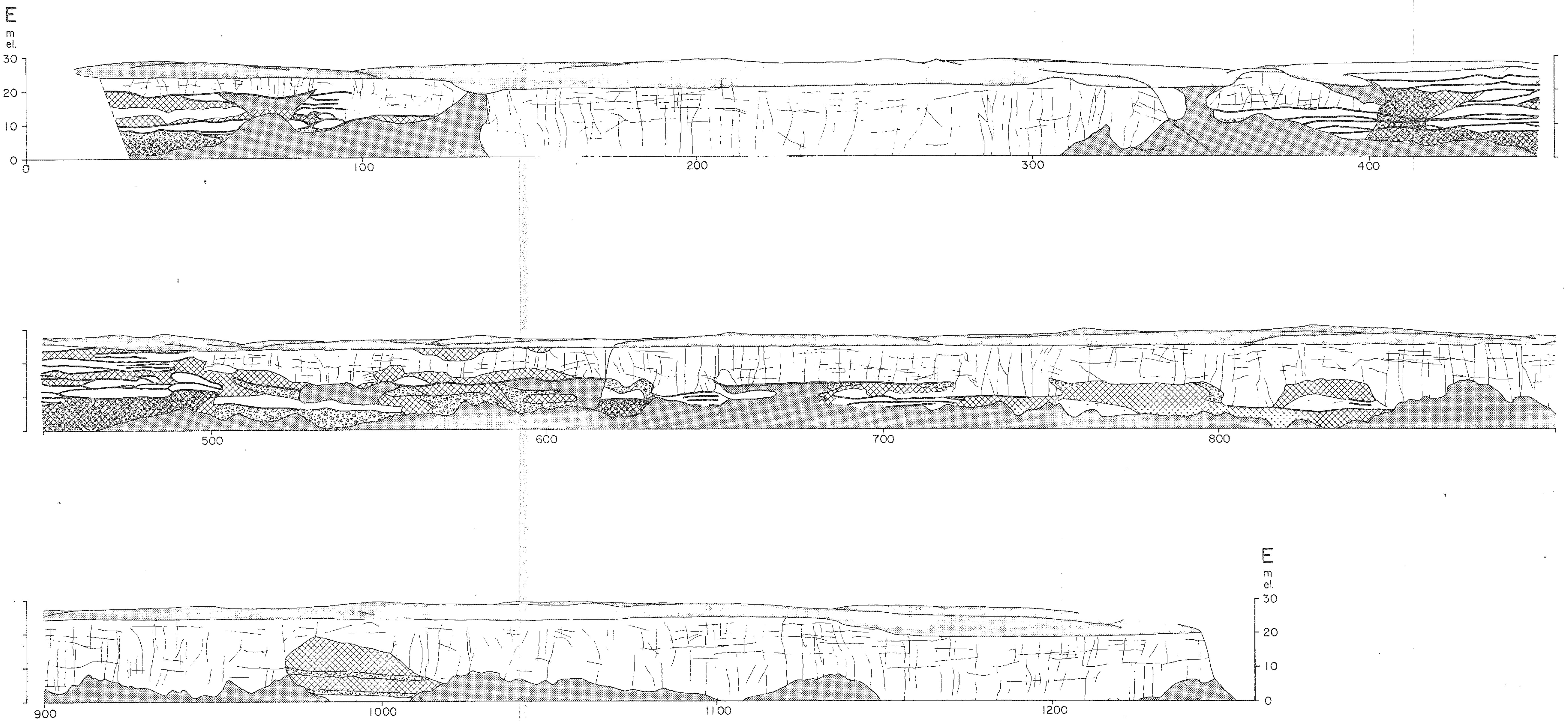
Fig. 5



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VOD JK 894 SZ
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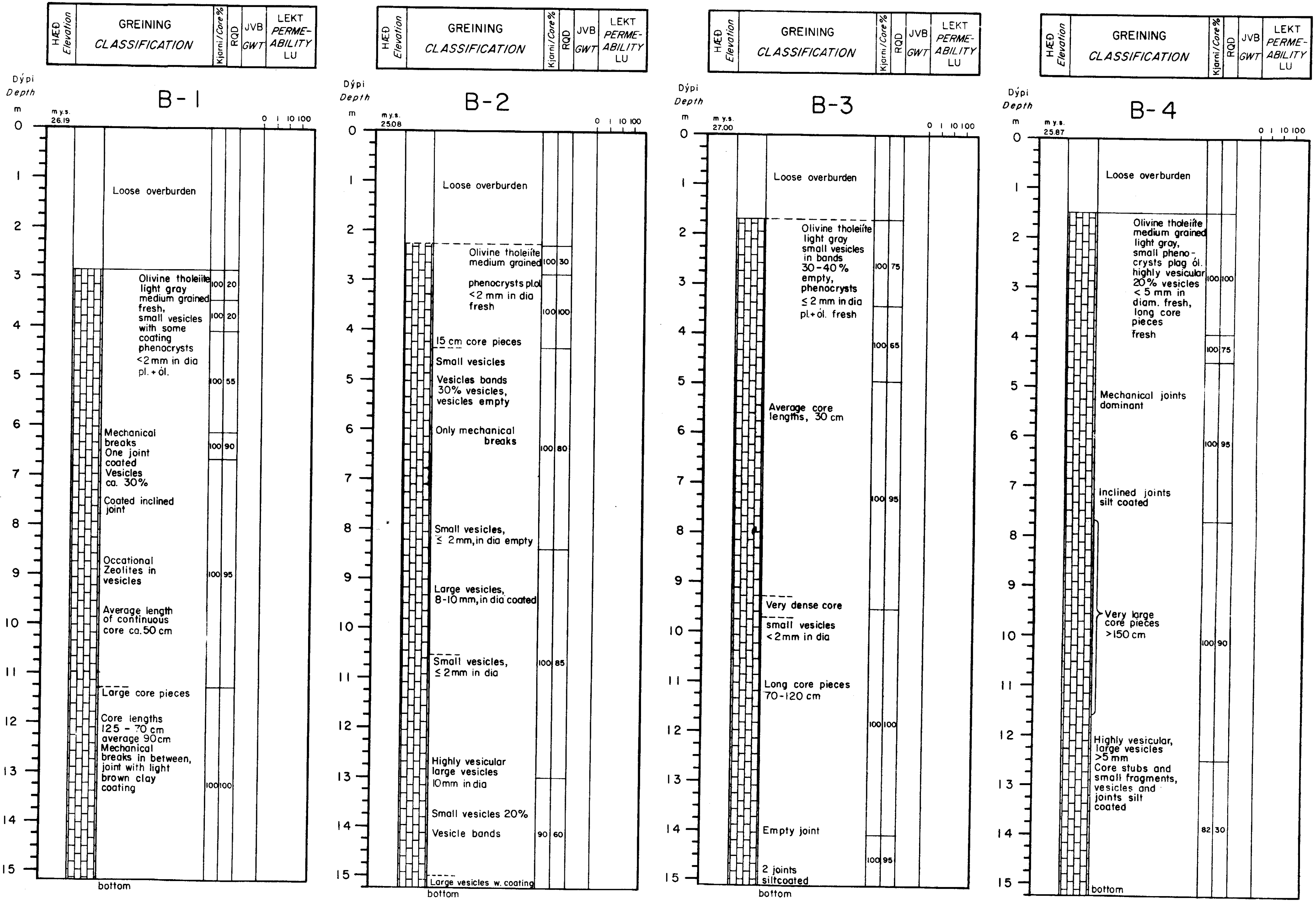

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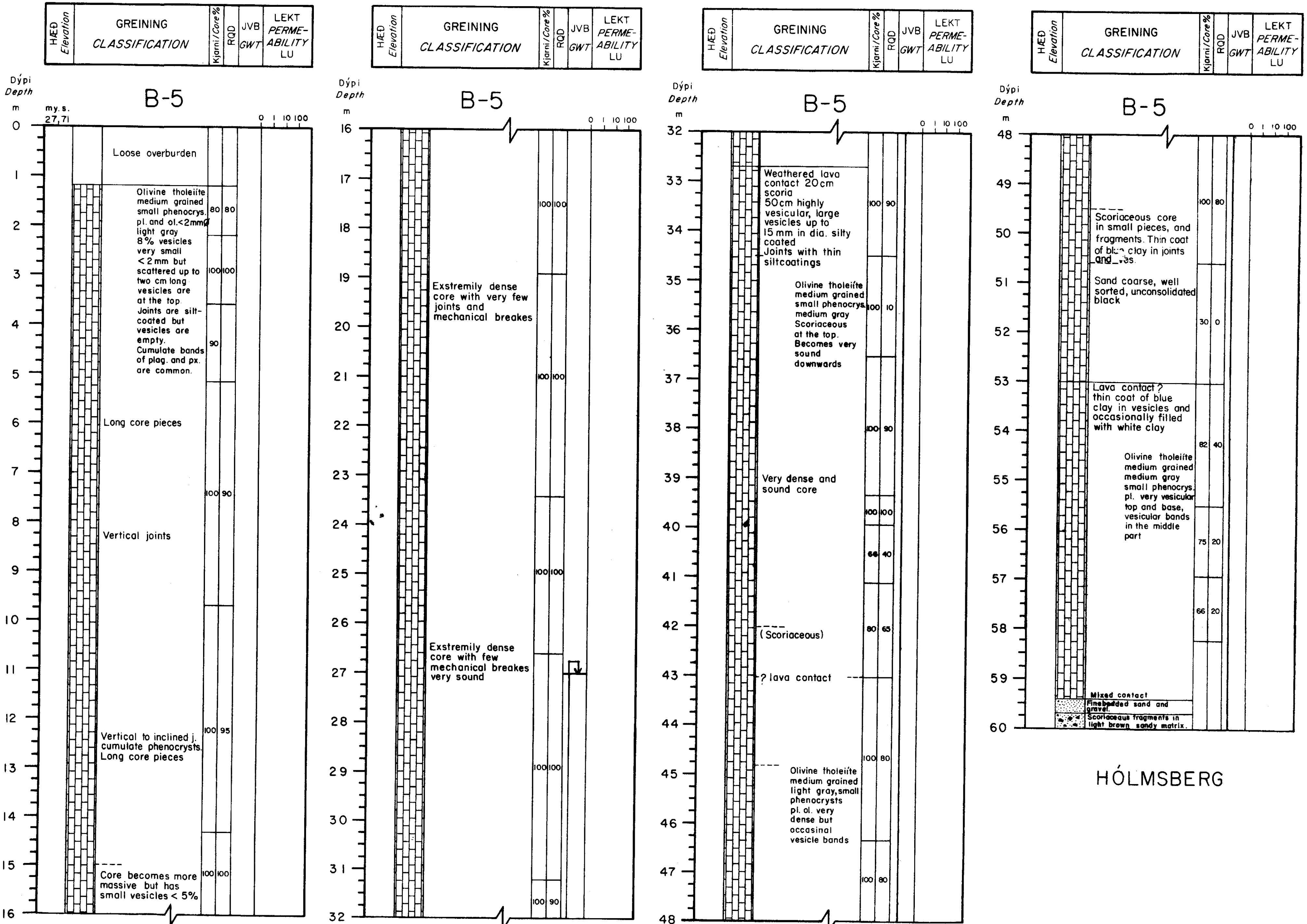

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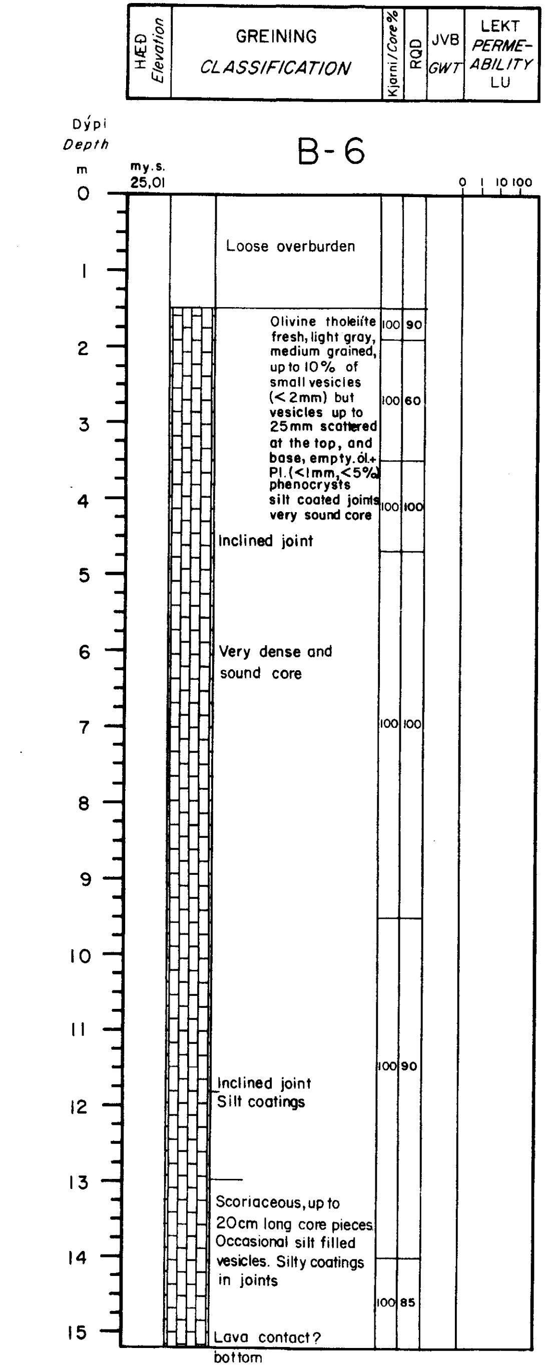

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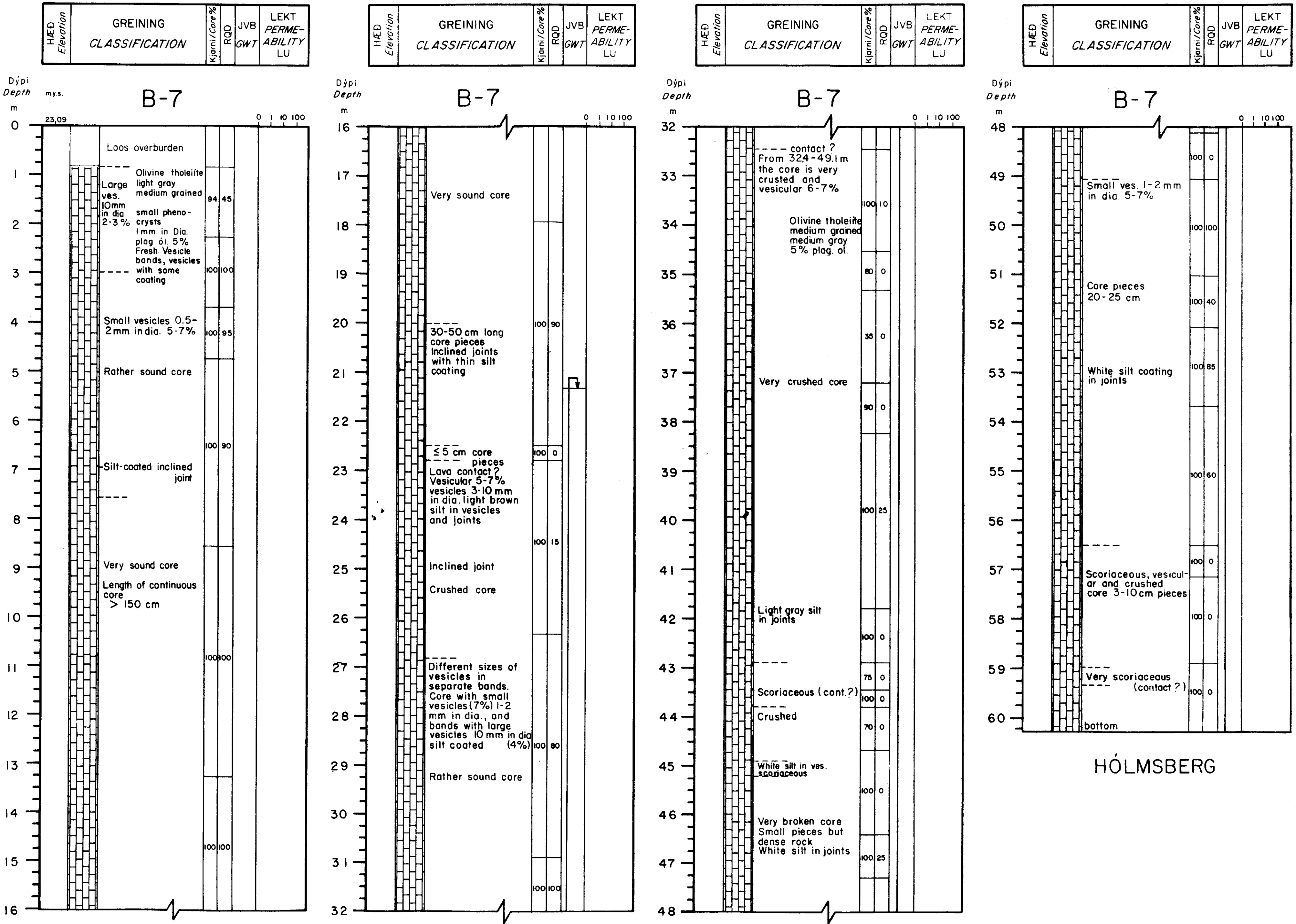
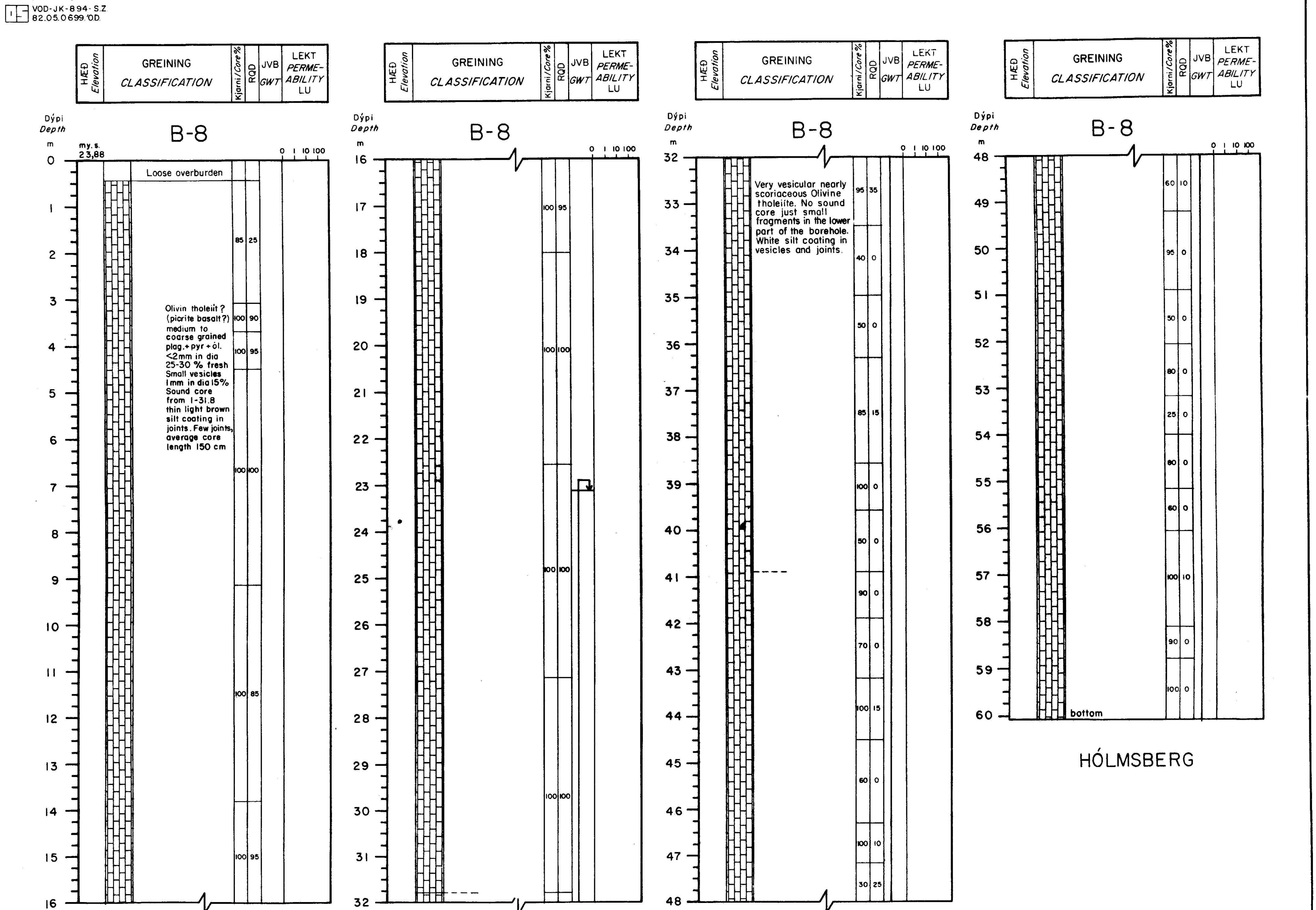
82.05.0699.OD




VOD-JK-894-S.Z
82.05.0699.OD.
HÆÐ Elevation
GREINING CLASSIFICATION
Kjarni/Core %
RQD
JVB GWT
LEKT PERME-ABILITY LU
Dýpi Depth m
B-8
my.s. 23,88
0 1 10 100
Loose overburden
Olivin tholeiit ? (picrite basalt?) medium to coarse grained plag.+pyr+öl. <2mm in dia 25-30 % fresh Small vesicles 1mm in dia 15% Sound core from 1-31.8 thin light brown silt coating in joints. Few joints, average core length 150 cm
85 25
100 90
100 95
100 100
100 85
100 95
100 95
100 100
100 100
100 100
100 100
Very vesicular nearly scoriaceous Olivine tholeiite. No sound core just small fragments in the lower part of the borehole. White silt coating in vesicles and joints.
95 35
40 0
50 0
85 15
100 0
50 0
90 0
70 0
100 15
60 0
100 10
30 25
60 10
95 0
50 0
80 0
25 0
80 0
60 0
100 10
90 0
100 0
bottom
HÓLMSBERG

APPENDIX 2

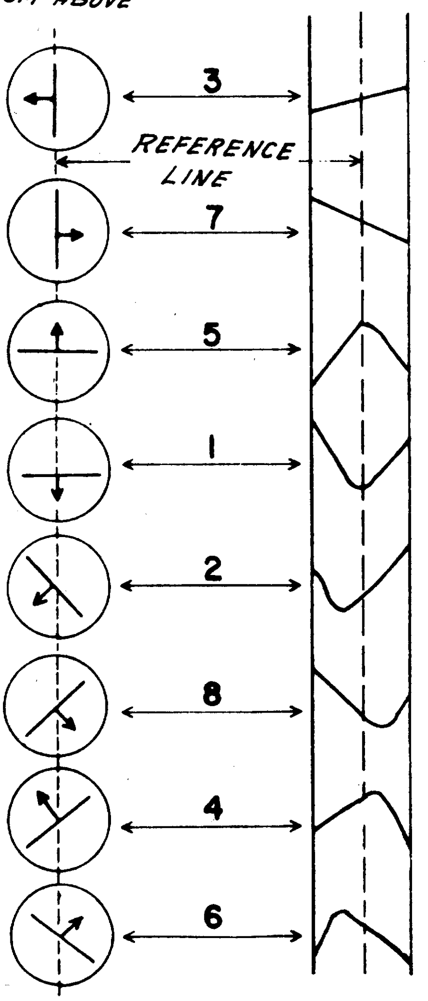
Rock mass quality

ORKUSTOFNUN
VOD-MJ-900 BAH
81.10.1240e

LEGEND FOR ROCK QUALITY ANALYSIS

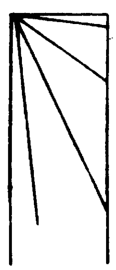
I

JOINT POSITION ACC. TO REF. LINE



II

FLOKKUR/CLASS



0-5° flokkur	0
5-35° flokkur	1
35-65° flokkur	2
65-85° flokkur	3
85-90° flokkur	4

III

THICKNESS OF JOINT COATING

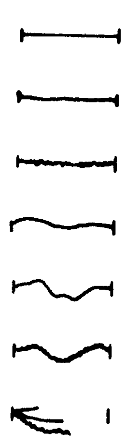
J_a

NO COATING	1
DISCONT. COATING	2
COATED	3
FILLING	4

IV

GERÐ/TYPE

J_r



Bein, rennislétt ummerki hreif. leirskænt.	0,5
Bein, slétt.	1,0
Bein, hrufótt eða óregluleg	1,5
Bylgjótt, rennislétt ummerki hreif. leirskænt.	1,5
Bylgjótt, slétt	2,0
Bylgjótt, hrufótt eða óregluleg	3,0
Ósamfelld	4,0

VOD-MJ-900-BAH
81.06 0745-EBF

SPRUNGUGREINING

STAÐUR / Location: Hólmsberg — HOLA / Borehole: B-1 — BORKRÓNA / Drill Bit: NQ — DAGS. / Date: 82.04.22

BOR / Drill rig: Dugandi — DÝPI FRÁ / Depth interval: 0 — TIL / to: 10.0 M / m

STEFNA HOLU / Orientation of boreh.: Vertical — BLAÐ NR / Sheet no.: 1 — AF / of: 2 — GREINT AF / Logged by: B.K.

Columns: Dýpi, m / Depth | Sprungur / Joints | Flokkur / Class | Fylling / Fill | Gerð / Type | Teg. fyll. / Type of fill | Leiðarlína / Ref. line | Sprungulýsing / Description of joints | Sprungur á meter / Joints per meter (0 2 4 6 8 10) | Kjarni % / Core | RQD % (0 20 40 60 80) | Lekt Lu / Permeability (0 1 10 100) | Hæð / Elevation m y.s. | Snið / Column | Lýsing jarðlaga / Classification | Prófanir á sýnum og athugasemdir / Testing of samples and notes | RQD/Jn betra verra | Jr/Ja betra verra | Jw/SRF betra verra | Q betra verra

Depth (m)	Description
0 – 2.7	Elevation 26,2. Loose overburden
2.7	Elevation 23,4

Depth (approx., m)	Sprungur	Flokkur	Fylling	Gerð	Teg. fyll.
2.9–3.0		1, 2, 1	2, 3, 3	1.5, 3, 1	L. silt, L. silt, "
3.2–3.3		1, 1, 3	3, 3, 3	1.5, 1.5, 1.5	"
3.5		1	3	1.5	"
3.8	8	4	3	3	"
4.0	3, 7	1, 2	2, 2	1.5, 1.5	", "
4.1	2	1	3	2	"
4.2	8	3, 1, 1	2, 2, 2	2, 1.5, 1.5	", "
4.6	5	3	2	2	"
4.7	3, 8	1, 3	2, 3	1.5, 3	", "
4.9	1	2	2	1.5	"
5.2–5.4	7, 5, 4/4, 4/1	•, 4, 3, 3, 3, 3	2, 3, 3, 3, 3, 3	1.5, 3, 3, 3, 3, 3	", ", ", "
5.6	3	2	1	4	"
6.0	3	1	1	3	
6.1–6.2	3, 3, 3	1, 0, 0	3, 2, 2	1.5, 1.5, 1.5	", ", "
7.0	2	1	2	1.5	"
7.3	8	2	2	1.5	"
7.6	2	3	4	3	"
7.7	8	3	1	2	"
8.0	8	2	3	3	"

Interval (m)	Sprungulýsing	Sprungur á meter	Kjarni %	RQD %
2.7 – 3.4	MECHANICALLY CHRUSHED	(crushed)	100	20
3.4 – 4.0	Chrush, coated vert. joint type 1–1.5; 1 Mec. fr.	(crushed)	100	20
4.0 – 6.2	1 mec. fr.	8	100	55
6.2 – 6.7	5 mec. fr	4	100	88
6.7 – 10.0	12 mec. fr.	1	100	100

All coatings look the same, light brown silt.

Elevation 20,0 at approx. 6.2 m; Column: N.

Lýsing jarðlaga / Classification (from 2.7 m): OLIVINE THOLEIITE, fresh, light gray, medium grained, small PHenochry. Plag + oliv. vesicles usually coated to some extent with silt

At approx. 9 m: single zeolites in vesicles

Interval	RQD/Jn	Jr/Ja	Jw/SRF	Q
2.7 – 6.2 m	40/9	2.6/1	1/2.5	4.6
6.2 – 10.0 m	98/9	2.4/1	1/2.5	10.4

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SPRUNGUGREINING

STAÐUR *Location*: Hólmsberg — HOLA *Borehole*: B-1 — BORKRÓNA *Drill Bit*: NQ — DAGS. *Date*: 82.04.22

BOR *Drill rig*: Dvgandi — DÝPI FRÁ *Depth interval*: 10.0 — TIL *to*: 15.15 M *m*

STEFNA HOLU *Orientation of boreh.*: Vertical — BLAÐ NR *Sheet no.*: 2 — AF *of*: 2 — GREINT AF *Logged by*: B.K.

Dýpi, m *Depth*	Sprungur *Joints*	Flokkur *Class*	Fylling *Fill*	Gerð *Type*	Teg. fyll. *Type of fill*	Leiðarlína *Ref. line*	Sprungulýsing *Description of joints*	Sprungur á meter *Joints per meter* (0 2 4 6 8 10)	Kjarni % *Core*	RQD % (0 20 40 60 80)	Lekt Lu *Permeability* (0 1 10 100)	Hæð *Elevation* m.y.s.	Snið *Column*	Lýsing jarðlaga *Classification*	Prófanir á sýnum og athugasemdir *Testing of samples and notes*	RQD/Jn betra/verra	Jr/Ja betra/verra	Jw/SRF betra/verra	Q betra/verra
11																			
	3	0	3	1,5	"		— —												
12													N						
13	3	0	2	1,5	"		Gmec.p	<1	100	100									
14																			
15.15												11,0							
16																			

VOD-MJ-900-BAH
81.06.0745-EBF

SPRUNGUGREINING

STAÐUR / Location: Hálmsberg — HOLA / Borehole: B-2 — BORKRÓNA / Drill Bit: NQ — DAGS. / Date: 82.04.22

BOR / Drill rig: Dugandi — DÝPI FRÁ / Depth interval: 0 — TIL / to: 10.0 M / m

STEFNA HOLU / Orientation of boreh.: Vertical — BLAÐ NR. / Sheet no.: 1 — AF / of: 2 — GREINT AF / Logged by: BK

Dýpi, m / Depth	Sprungur / Joints	Flokkur / Class	Fylling / Fill	Gerð / Type	Teg. fyll. / Type of fill	Sprungulýsing / Description of joints	Sprungur á meter / Joints per meter	Kjarni % / Core	RQD %	Lekt Lu / Permeability	Hæð / Elevation m.y.s.	Lýsing jarðlaga / Classification	Prófanir á sýnum og athugasemdir / Testing of samples and notes	RQD/Jn	Jr/Ja	Jw/SRF	Q
0–2.2						Loose overburden					25.1						
2.2											22.8						
~2.4		1	2	2	L.silt	mechanical fractures	2	100	30			OLIVINE tholeiite fresh Light gray medium grained small Phenochry. Pl. + ol. vesicles usually coated to some extent 30% ves.					
~2.8		0	3	3	L.silt												
2.9–4.2						3 Mec. fractures	1	100	100								
4	1	1	2	1	"	crushed, mec. and normal.											
~4.2		[1]	[2]	[15]													
4.8–5.3						crushed. prob. mechanical. uncoated.								79/9	2.4/1	1/2.5	8.4
~5.3	7	1	3	2	"	+ 9 mechanical fractures											
~5.8	1	0	2	1.5	"							(N)					
~5.9	4	1	2	1.5	"												
6	3	1	3	1.5	"		2	100	80								
~6.5	7	1	3	1	"												
~7.2												30% vesicles					
~8.1	2	3	2	3	"												
~8.3	1	2	2	1.5	"												
~8.8	8	3	2	1.5	"												
~8.9	8	3	3	1.5	"												
~9.1	7	1	3	3	"												
~9.1	7	0	2	1.5	"												
~9.4	8, 2	3	1/1	2, 15													
~9.7	6	1	2	2	"												
10	3	1	2	1	"												

VOD-MJ-900-BAH
81.06 0745-EBF

SPRUNGUGREINING

STAÐUR / Location: Hólmsberg HOLA / Borehole: B-2 BORKRÓNA / Drill Bit: NQ DAGS. / Date: 82.04.22

BOR / Drill rig: Durgandi DÝPI FRÁ / Depth interval: 10.0 TIL / to: 15.2 M / m

STEFNA HOLU / Orientation of boreh.: Vertical BLAÐ NR. / Sheet no.: 2 AF / of: 2 GREINT AF / Logged by: BK

Dýpi, m Depth	Sprungur Joints	Flokkur Class	Fylling Fill	Gerð Type	Teg. fyll. Type of fill	Sprungulýsing Description of joints	Sprungur á meter Joints per meter	Kjarni % Core	RQD %	Hæð Elevation m.y.s.	Lýsing jarðlaga Classification
	4	1	2	1.5	-"-						
	4	2	2	1.5	-"-						
	4	2	1	1.5							
11						15 Mec. fract.	4	100	85		
	3	2	3	1	-"-						
	7	2	2	1	-"-						
12	8	2	2	1	-"-						
		1	2	3	-4-						
		0	2	3	-"-						
		1	3	3	-"-						
		1	2	3	-"-						
13		1	2	3	-"-						
		3	2	3	-"-						
		3	2	1.5	-"-						
	2	1	1	1.5							
14	5	1	2	2	-"-	10 Mec. fr.	3	100	60		20% ves
	8	1	1	2							
	4	2	1	2							
15										9.9	
16											

Snið Column: N

Additional blank columns on the form: Leiðarlína Ref. line; Lekt Lu Permeability (scale 0, 1, 10, 100); Prófanir á sýnum og athugasemdir Testing of samples and notes; RQD/Jn betra/verra; Jr/Ja betra/verra; Jw/SRF betra/verra; Q betra/verra.

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81.06.0745-EBF

SPRUNGUGREINING

STAÐUR / Location: Hálmsberg — HOLA / Borehole: B-3 — BORKRÓNA / Drill Bit: NQ — DAGS. / Date: 820430

BOR / Drill rig: Dugandi — DÝPI FRÁ / Depth interval: 0 — TIL / to: 10.0 M / m

STEFNA HOLU / Orientation of boreh.: Vertical — BLAÐ NR. / Sheet no.: 1 — AF / of: 2 — GREINT AF / Logged by: B.K. + J.R.

Columns: Dýpi, m / Depth; Sprungur / Joints; Flokkur / Class; Fylling / Fill; Gerð / Type; Teg. fyll. / Type of fill; Leiðarlína / Ref. line; Sprungulýsing / Description of joints; Sprungur á meter / Joints per meter (0 2 4 6 8 10); Kjarni % / Core; RQD % (0 20 40 60 80); Lekt Lu / Permeability (0 1 10 100); Hæð / Elevation m.y.s.; Snið / Column; Lýsing jarðlaga / Classification; Prófanir á sýnum og athugasemdir / Testing of samples and notes; RQD/Jn; Jr/Ja; Jw/SRF; Q (betra / verra)

Depth scale: 1, 2, 3, 4, 6, 7, 8, 9, 10

Hæð / Elevation: 27.0 (top); 25.3 (top of rock)

0 – ~1.65 m: Loose overburden

Depth (approx.)	Sprungur / Joints	Flokkur / Class	Fylling / Fill	Gerð / Type	Teg. fyll. / Type of fill
~2.35		1	2	1.5	L-silt
		4	4	3	-"-
~2.75	1	2	2	3	-"-
~3.0	4	2	2	3	-"-
	6	3	2	1.5	-"-
	7	2	3	1	-"-
	7	3	4	3	-"-
~3.4	6	1	1	1.5	
	8	1	3	3	-"-
	6	3	3	3	-"-
	7	1	4	3	-"-
~3.9	1	3	4	3	-"-
~4.3	8	1	4	1.5	-"-
~4.65	2	4	2	1.5	-"-
~5.0	4	2	2	3	-"-
	2	2	4	3	-"-
~9.55	3	0	1	1.5	

Interval (approx.)	Sprungulýsing / Description of joints	Sprungur á meter / Joints per meter	Kjarni % / Core	RQD %
~1.65 – 3.35 m	7mec. fr.	4	95	75
~3.35 – 5.0 m	vert. joint; 5mec. fr.	5	100	65
~5.0 – 9.6 m	11mec. fr.	<1	95	95

Lýsing jarðlaga / Classification: OLIVINE THOLEIITE fresh light gray medium grained sm. phenoc. Plag + Ol. vec. usually coated to some extent with silt

Snið / Column: (N)

RQD/Jn: 91/9 — Jr/Ja: 2.8/1 — Jw/SRF: 1/2.5 — Q: 11.3

VOD-MJ-900-BAH
81.06.0745-EBF

SPRUNGUGREINING

STAÐUR *Hólmsberg* Location — HOLA *B-3* Borehole — BORKRÓNA *NQ* Drill Bit — DAGS. *82.04.30* Date

BOR *Dugandi* Drill rig — DÝPI FRÁ *10.0* Depth interval — TIL *15.15* M to m

STEFNA HOLU *Vertical* Orientation of boreh. — BLAÐ NR *2* Sheet no. — AF *2* of — GREINT AF *B.K. + J.R.* Logged by

Dýpi, m Depth	Sprungur Joints	Flokkun Class	Fylling Fill	Gerð Type	Teg. fyll. Type of fill	Leiðarlína Ref line	Sprungulýsing Description of joints	Sprungur á meter Joints per meter (0 2 4 6 8 10)	Kjarni % Core	RQD % (0 20 40 60 80)	Lekt Lu Permeability (0 1 10 100)	Hæð Elevation m.y.s.	Snið Column	Lýsing jarðlaga Classification	Prófanir á sýnum og athugasemdir Testing of samples and notes	RQD/Jn betra verra	Jr/Ja betra verra	Jw/SRF betra verra	Q betra verra
11																			
							7mec. fr.	<1	100	100									
12	3	1	1	1.5									N						
13																			
	4	1	2	1.5	L-silt														
14																			
	8	3	4	3	L-silt		4mec. fr.	<1	100	95									
	8	3	3	3	-11-														
15												11.8							
16																			

VOD-MJ-900-BAH
81.06.0745-EBF

SPRUNGUGREINING

STAÐUR / *Location*: Hólmsberg — HOLA / *Borehole*: B-4 — BORKRÓNA / *Drill Bit*: NQ — DAGS. / *Date*: 820429

BOR / *Drill rig*: Dugandi — DÝPI FRÁ / *Depth interval*: 0 — TIL / *to*: 10.0 M / *m*

STEFNA HOLU / *Orientation of boreh.*: Vertical — BLAÐ NR. / *Sheet no.*: 1 — AF / *of*: 2 — GREINT AF / *Logged by*: B.K.

Dýpi, m *Depth*	Sprungur *Joints*	Flokkur *Class*	Fylling *Fill*	Gerð *Type*	Teg. fyll. *Type of fill*	Leiðarlína *Ref. line*	Sprungulýsing *Description of joints*	Sprungur á meter *Joints per meter* (0 2 4 6 8 10)	Kjarni % *Core*	RQD % (0 20 40 60 80)	Lekt Lu *Permeability* (0 1 10 100)	Hæð *Elevation* m y.s.	Snið *Column*	Lýsing jarðlaga *Classification*	Prófanir á sýnum og athugasemdir *Testing of samples and notes*	RQD/Jn betra/verra	Jr/Ja betra/verra	Jw/SRF betra/verra	Q betra/verra
0–1.5							Loose overburden					25,9							
1.5												24,4		OLIVINE THOLEIITE fresh light gray med. grain. sm. phenocr. 2% ves, usually coated with silt to some extent.					
1.7	1 / 3	2	2 / 2	1,5 / 1,5	L.SKEL / -"-														
1.5–3.0							6 Mec. fract.	3	100	100									
2.4		0	2	1,5	-"-														
2.8		0	2	1,5	-"-														
3.0	3 / 3	0 / 0	2 / 2	1,5 / 1,5	-"- / -"-														
3.5	3 / 6 / 5	1 / 0 / 0	2 / 2 / 2	1,5 / 1,5 / 1,5	-"- / -"- / -"-														
3.0–4.5							4 Mec. fra.	3	100	75									
5.4	8 / 8	4 / 0	3 / 1	3 / 1.5	-"-		6 Mec. fr.									90 / 9	2,3 / 1	1 / 2,5	9,2
4.5–7.7								>2	100	95			(N)						
6.5	4	2	4	1,5	-"-														
7.0	3 / 6	3 / 1	3 / 3	1,5 / 3	-"- / -"-														
7.4–7.7		4	4	1,5	-"-		chrushed, coated												
7.7–10																			

VOD-MJ-900-BAH
81.06 0745-EBF

STAÐUR *Location* Hólmsberg   HOLA *Borehole* B-4   BORKRÓNA *Drill Bit* NQ   DAGS. *Date* 82.04.29

DÝPI FRÁ 10.0 TIL 15.30 M

STEFNA HOLU *Orientation of boreh.* Vertical   *Sheet no.*   of

Dýpi, m *Depth*	Sprungur *Joints*	Flokkur *Class*	Fylling *Fill*	Gerð *Type*	Teg. fyll. *Type of fill*	Leiðarlína *Ref. line*	Sprungulýsing *Description of joints*	Sprungur á meter *Joints per meter* (0 2 4 6 8 10)	Kjarni % *Core*	RQD % (0 20 40 60 80)	Lekt Lu *Permeability* (0 1 10 100)	Hæð *Elevation* m.y.s.	Snið *Column*	Lýsing jarðlaga *Classification*	Prófanir á sýnum og athugasemdir *Testing of samples and notes*	RQD/Jn betra/verra	Jr/Ja betra/verra	Jw/SRF betra/verra	Q betra/verra
10.0–12.4							6 mec. fr.	1	95	90									
11.4	6	1	3	1,5	– " –														
12	4	3	4	3	BRUNT SILT								W						
12.2	4	1	3																
12.4	0 / 0	2 / 4	1,5 / 1,5		L. GRÁIT SILTI							13,4							
13.2–13.6	0 / 1 / 0 / 0 / 1	3 / 4 / 3 / 4 / 1	1,5 / 1,5 / 1,5 / 1,5 / 1,5		– " –		2 mec. fr.									30/9	2,3/1	1/2,5	3,1
13.8	1	1	1,5				3 mec. fr. incontinuously coated	75	80	30									
14.4–14.7	1 / 1 / 1 / 1 / 1	2 / 3 / 3 / 3 / 2	1,5 / 1,5 / 1,5 / 1,5 / 3		– " –		core loss												
14.8–15.3							chrushed incont. coat.					10,6							

VOD-MJ-900-BAH
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SPRUNGUGREINING

STAÐUR (Location): Hólmsberg — HOLA (Borehole): B-5 — BORKRÓNA (Drill Bit): NQ — DAGS. (Date): 29.4.'82

BOR (Drill rig): Dugandi — DÝPI FRÁ (Depth interval): 0 — TIL (to): 10.0 M (m)

STEFNA HOLU (Orientation of boreh.): Vertical — BLAÐ NR. (Sheet no.): 1 — AF (of): 2 — GREINT AF (Logged by): B.K

Dýpi, m Depth	Sprungur Joints	Flokkur Class	Fylling Fill	Gerð Type	Teg. fyll. Type of fill	Sprungulýsing Description of joints	Sprungur á meter Joints per meter	Kjarni % Core	RQD %	Lekt Lu Permeability	Hæð Elevation m.y.s.	Lýsing jarðlaga Classification	RQD/Jn	Jr/Ja	Jw/SRF	Q
0–1.2						Loose overburden					27.7					
1.2											26.5	OLIVINE THOLEIITE fresh light gray med grain. small Phenochryst. plag + ol. 8% vesicles empty. fractures silty coated				
	4	2	3		Basalt	Chrushed, mec + normal	>1	80	80							
	8 / 7	0 / 0	2 / 2	3 / 3	-"- / -"-	vert. joint										
2	3	1	3	1,5	-"-	3 Mec. fr.										
	3	0	2	1,5	-"-											
	3	0	2	1,5	-"-											
3						4 Mec. fr.	<1	100	100							
4	4 / 5	3 / 1	2 / 2	3 / 1,5	-"- / -"-	~30cm vert. joint										
	7	1	3	3	-"-	2 Mec. fr.	3	90	90							
	7	1	3	1,5	-"-											
5													96/9	2,7/1	1/2,5	11.5
6	7	1	3	3	-"-											
7						12 Mec. fr.	1	100	90							
8	2 / 3	1 / 0	2 / 3	1,5 / 1,5	-"- / -"-											
9	8	4	4	3	-"-											
	2	1	2	1,5		vert. joint										
10																

Snið (Column): N

VOD-MJ-900-BAH
8106.0745-EBF

SPRUNGUGREINING

STAÐUR / Location: Hólmsberg
HOLA / Borehole: B-5
BORKRÓNA / Drill Bit: NQ
DAGS. / Date: 29.4.'82
BOR / Drill rig: Ungandi
DÝPI FRÁ / Depth interval: 10.0
TIL / to: 16.50 M / m
STEFNA HOLU / Orientation of boreh.: Vertical
BLAÐ NR. / Sheet no.: 2
AF / of: 2
GREINT AF / Logged by: BK.

Dýpi, m / Depth	Sprungur / Joints	Flokkur / Class	Fylling / Fill	Gerð / Type	Teg. fyll. / Type of fill	Leiðarlína / Ref. line	Sprungulýsing / Description of joints	Sprungur á meter / Joints per meter	Kjarni % / Core	RQD %	Lekt Lu / Permeability	Hæð / Elevation m y.s.	Snið / Column	Lýsing jarðlaga / Classification	Prófanir á sýnum og athugasemdir / Testing of samples and notes	RQD/Jn betra verra	Jr/Ja betra verra	Jw/SRF betra verra	Q betra verra
11																			
	6	3	4	3	< SILT		9 Mec. frac.	<1	100	95									
12																			
13													(N)						
	2	2	3	1.5	"														
	3	4	2	3															
	6	3	4	1.5	"														
14																			
							2 Mec. fr.	<1	100	100				Core more massive <5% vesicles					
	7	2	2	3	"														
	4	3	2	1.5	"														
16												8,8							
17																			

Scale (Sprungur á meter): 0 2 4 6 8 10 — RQD: 0 20 40 60 80 — Lekt: 0 1 10 100

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SPRUNGUGREINING

STAÐUR / Location: Holmsberg — HOLA / Borehole: B-6 — BORKRÓNA / Drill Bit: NQ — DAGS. / Date: ....

BOR / Drill rig: Duganði — DÝPI FRÁ / Depth interval: 0 — TIL / to: 10.0 M / m

STEFNA HOLU / Orientation of boreh.: Vertical — BLAÐ NR. / Sheet no.: 1 — AF / of: 2 — GREINT AF / Logged by: BK.

Dýpi, m / Depth	Sprungur / Joints	Flokkur / Class	Fylling / Fill	Gerð / Type	Teg. fyll. / Type of fill	Leiðarlína / Ref. line	Sprungulýsing / Description of joints	Sprungur á meter / Joints per meter (0 2 4 6 8 10)	Kjarni % / Core	RQD % (0 20 40 60 80)	Lekt Lu / Permeability (0 1 10 100)	Hæð / Elevation m.y.s.	Snið / Column	Lýsing jarðlaga / Classification	Prófanir á sýnum og athugasemdir / Testing of samples and notes	RQD/Jn betra verra	Jr/Ja betra verra	Jw/SRF betra verra	Q betra verra
0							Loose overburden					25,0							
1																			
~1.5							Chrushed, Light brown coating IN MOST fract. 50/50 mec/normal fractures		100	0		23.6		OLIVINE THOLEIITE fresh. Light gray. medium arained. Phenocrysts Plag. <5% AND <1mm. <10% ves. And <2mm empty. Silty coated Joints					
2		2	2	2	SILT											52/9	1,9/1	1/2,5	4,4
		0	3	1,5	-"-														
	4	2	2	1,5	-"-														
	1	1	2	1,5	-"-														
							4 Mec. fr.	5	90	60									
	3	0	3	1,5	-"-														
3	5	3	2	1	-"-														
	2	3	2	1	-"-														
	4	3	2	1	-"-														
		0	2	1,5	-"-							21,5							
	4	0	2	1	-"-														
4							6 Mec. fr.	1	100	100									
													N						
5	2	2	2	1	-"-														
	2	2	2	1	-"-														
	5	0	4	1	-"-														
6																94/9	1,8/1	1/2,5	7,5
	1	0	4	1,5	-"-														
7								2	100	100									
	7	0	2	1	-"-														K-1 / K-2
8																			
							15 Mec. fr.												
9	2	2	4	1	-"-														
	4	1	2	1,5	-"-														
	7	3	2	1,5	-"-														
10																			

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SPRUNGUGREINING

STAÐUR / Location: Hálmsberg — HOLA / Borehole: B-6 — BORKRÓNA / Drill Bit: NQ — DAGS. / Date:

BOR / Drill rig: Dugandi — DÝPI FRÁ / Depth interval: 10.0 — TIL / to: 15.15 M / m

STEFNA HOLU / Orientation of boreh.: Vertical — BLAÐ NR. / Sheet no.: 2 — AF / of: 2 — GREINT AF / Logged by: BK

Dýpi, m Depth	Sprungur Joints	Flokkur Class	Fylling Fill	Gerð Type	Teg. fyll. Type of fill	Leiðarlína Ref.line	Sprungulýsing Description of joints	Sprungur á meter Joints per meter (0 2 4 6 8 10)	Kjarni % Core	RQD % (0 20 40 60 80)	Lekt Lu Permeability (0 1 10 100)	Hæð Elevation m.y.s.	Snið Column	Lýsing jarðlaga Classification	Prófanir á sýnum og athugasemdir Testing of samples and notes	RQD/Jn betra verra	Jr/Ja betra verra	Jw/SRF betra verra	Q betra verra
10																			
	7	0	2	1,5	SILT														
11																			
	2	2	2	1,5	"		15 Mec. fr.	2	100	90									
12													N						
	2	2	4	1,5	"														
	7	3	2	1,5	"														
13							---												
	2	2	3	1,5	"		scoriaceous												
	6	4	3	2	"														
14	7	1	2	1	"														
	7	1	3	1,5	"		3 Mec. fr.	2	95	85									
15	2	2	3	1,5	"							9,8							
16																			

SPRUNGUGREINING

STAÐUR / Location: Hólmsberg — HOLA / Borehole: B-7 — BORKRÓNA / Drill Bit: N.Q. — DAGS. / Date:

BOR / Drill rig: Dugandi — DÝPI FRÁ / Depth interval: 0 TIL / to 10.0 M / m

STEFNA HOLU / Orientation of boreh.: Vertical — BLAÐ NR. / Sheet no.: 1 AF / of 2 — GREINT AF / Logged by: BK

Columns: Dýpi, m / Depth; Sprungur / Joints; Flokkur / Class; Fylling / Fill; Gerð / Type; Teg. fyll. / Type of fill; Leiðarlína / Ref. line; Sprungulýsing / Description of joints; Sprungur á meter / Joints per meter (0 2 4 6 8 10); Kjarni % / Core; RQD % (0 20 40 60 80); Lekt Lu / Permeability (0 1 10 100); Hæð / Elevation m y.s.; Snið / Column; Lýsing jarðlaga / Classification; Prófanir á sýnum og athugasemdir / Testing of samples and notes; RQD/Jn; Jr/Ja; Jw/SRF; Q (betra / verra)

Elevation at top: 23.1

0 – 0.9 m: Loose overburden

Elevation 22.2 (0.9 m)

Classification: OLIVINE THOLEIITE, FRESH, Light gray, medgrained, Phenocysts ~1 mm Ø, PLAG+OL<5%

Depth (approx.), m	Joints	Class	Fill	Type	Type of fill	Description of joints
0.9	=	2	2	1.5	Br. silt	Brown coating
1.1–1.8						6 Mec. fr.
1.5	8	0	3	1.5	L. silt	Light coloured coating
1.75	3	0	4	1.5	-"-	
1.85	1	1	4	1.5	B. silt	Chrushed, reddish silt coat.
1.9	1	3	3	3		
2.15	5	1	3	1.5	-"-	
2.2	4	1	2	1.5	-"-	
2.35	3	0	2	2	-"-	
2.7	4	1	3	1.5	G. silt	gray coating
2.75	3	1	2	1.5	B. silt	
3.0						3 Mec. fr.
3.4	3	0	3	3	-"-	
4.2						3 Mec. fr.
5.2	2	2	3	1.5	-"-	
5.6	1	2	3	1.5	-"-	
6.0						9 Mec. fr.
6.6	3	0	2	1.5	-"-	
6.65	2	3	3	1.5	L. silt	
7.0	3	3	3	1.5	-"-	
7.3	3	3	3	1.5	-"-	V. joint
7.35	7	3	3	3	-"-	
8.0	4	4	2	3	-"-	V. joint
9.1	6	2	3	1	-"-	

Core run, m	Joints per meter	Core %	RQD %
0.9 – 2.4	>4	95	45
2.4 – 3.8	3	100	95
3.8 – 4.8	0	100	90
4.8 – 8.6	2	100	90
8.6 – 10.0			

At 5 m (Column): (N)

RQD/Jn	Jr/Ja	Jw/SRF	Q
91/9	2.3/1	1/2.5	9.3

Depth scale: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10

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SPRUNGUGREINING

STAÐUR *Hólmsberg* Location — HOLA *B-7* Borehole — BORKRÓNA *NQ* Drill Bit — DAGS. Date

BOR *Dugandi* Drill rig — DÝPI FRÁ *10* Depth interval — TIL *17.90* M to m

STEFNA HOLU *Vertical* Orientation of boreh. — BLAÐ NR. *2* Sheet no. — AF *2* of — GREINT AF *BK* Logged by

Dýpi, m Depth	Sprungur Joints	Flokkur Class	Fylling Fill	Gerð Type	Teg. fyll. Type of fill	Leiðarlína Ref. line	Sprungulýsing Description of joints	Sprungur á meter Joints per meter (0 2 4 6 8 10)	Kjarni % Core	RQD % (0 20 40 60 80 100)	Lekt Lu Permeability (0 1 10 100)	Hæð Elevation m.y.s.	Snið Column	Lýsing jarðlaga Classification	Prófanir á sýnum og athugasemdir Testing of samples and notes	RQD/Jn betra/verra	Jr/Ja betra/verra	Jw/SRF betra/verra	Q betra/verra
11							5 Mec. fr.	<1	100	100									
12																			
13																			
14													N						
	7	2	4	1.5	-"-														
15							5 Mec. fr.	1	100	100									
16	3	2	4	1.5	-"-														
	6	0	4	3	-"-		vert. joint												
17	4	1	4	1.5	-"-														
18												5.2							

K-1 / K-2 (right margin, at approx. 14.4 m)

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SPRUNGUGREINING

STAÐUR / *Location*: Hólmsberg — HOLA / *Borehole*: B-8 — BORKRÓNA / *Drill Bit*: NQ — DAGS. / *Date*: 82.05.02

BOR / *Drill rig*: Dugandi — DÝPI FRÁ / *Depth interval*: 0 — TIL / *to*: 10.0 M / *m*

STEFNA HOLU / *Orientation of boreh.*: Vertical — BLAÐ NR. / *Sheet no.*: 1 — AF / *of*: 2 — GREINT AF / *Logged by*: B.K.

Dýpi, m *Depth*	Sprungur *Joints*	Flokkur *Class*	Fylling *Fill*	Gerð *Type*	Teg. fyll. *Type of fill*	Sprungulýsing *Description of joints*	Sprungur á meter *Joints per meter* (0 2 4 6 8 10)	Kjarni % *Core*	RQD % (0 20 40 60 80)	Lekt Lu *Permeability* (0 1 10 100)	Hæð *Elevation* m y.s.	Lýsing jarðlaga *Classification*	Prófanir á sýnum og athugasemdir *Testing of samples and notes*	RQD/Jn	Jr/Ja	Jw/SRF	Q
0–0.4						Loose overburden					23.9 / 23.5						
	3	0	2	1.5	L.SILT	1 Mec. fr.						OLIVINE THOLEIITE LIGHT GRAY medium grained PHENOCRY. PLAG + OL. 25-30% VESICLES 0.5-1 cm ϕ					
	7, 5, 3	1, 3, 0	2, 2, 2	1.5, 1.5	-"-	vert. joint											
1	7, 6	1, 2	2, 2	1.5, 3	-"-	chrushed, partly coated	76	85	25								
	4	1	2	1.5	-"-												
	7, 3	1, 1	2, 2	1.5, 1.5	-"-	3 Mec. fr.											
2	2	1	1	1.5													
	7	1	2	1.5	-"-												
	3	0	4	1.5	-"-	v. joint											
	3	4	3	3	R.silt												
	8	1	2	3	L.silt												
	5	1	3	1.5	R.silt												
3	3	0	2	4	L.silt	4 Mec. fr.	6	100	90								
	6, 1	3, 2	2, 2	3	-"-												
	3	0	3	1.5	-"-												
	2	2	3	1.5	-"-												
4	7	1	3	3	-"-	5 Mec. fr.	4	100	95					85/9	2.6/1	1/2.5	9.8
	7, 2	3, 2	2, 3	2, 1.5	-"-												
5	7	1	2	2	-"-							(N)					
6–7						16 Mec. fr.	1	100	100								
7	6	2	2	2	-"-												
8	7	2	2	1.5	-"-												
9–10																	

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SPRUNGUGREINING

STAÐUR / Location: Hólmsberg — HOLA / Borehole: B-8 — BORKRÓNA / Drill Bit: NQ — DAGS. / Date: 82.05.02

BOR / Drill rig: Dugandi — DÝPI FRÁ / Depth interval: 10.0 — TIL / to: ___ M / m

STEFNA HOLU / Orientation of boreh.: Vertical — BLAÐ NR. / Sheet no.: 2 — AF / of: 2 — GREINT AF / Logged by: B.K.

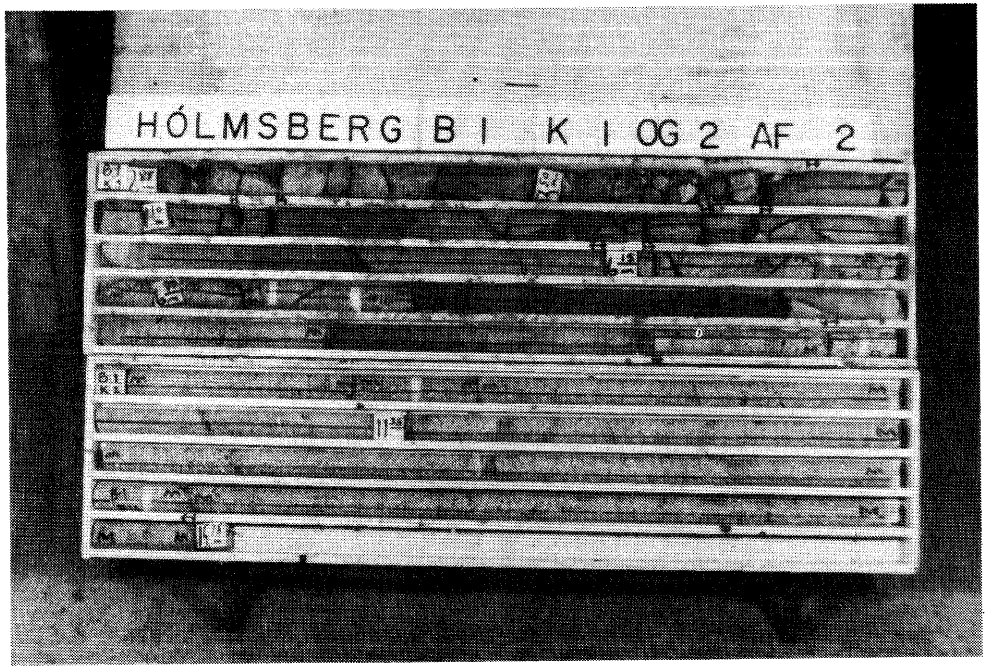
Dýpi, m / Depth	Sprungur / Joints	Flokkur / Class	Fylling / Fill	Gerð / Type	Teg. fyll. / Type of fill	Leiðarlína / Ref line	Sprungulýsing / Description of joints	Sprungur á meter / Joints per meter	Kjarni % / Core	RQD %	Lekt Lu / Permeability	Hæð / Elevation m.y.s.	Snið / Column	Lýsing jarðlaga / Classification	Prófanir á sýnum og athugasemdir / Testing of samples and notes	RQD/Jn betra/verra	Jr/Ja betra/verra	Jw/SRF betra/verra	Q betra/verra
11	8, 8	3, 1, 3	2, 2, 2	3, 1.5, 3	= " =														
	8, 7	3, 1	2, 2	2, 1.5	- " -														
	1	3	3	3	- " -		8 Mec. fr.	2	100	95									
13	1	1	2	1.5	- " -								N						
14–16							1 Mec. fr.	0	100	95									
16												5.9							

Depth scale: 11, 12, 13, 14, 16

Sprungur á meter scale: 0 2 4 6 8 10 — RQD scale: 0 20 40 60 80 — Lekt scale: 0 1 10 100

APPENDIX 3

Core photographs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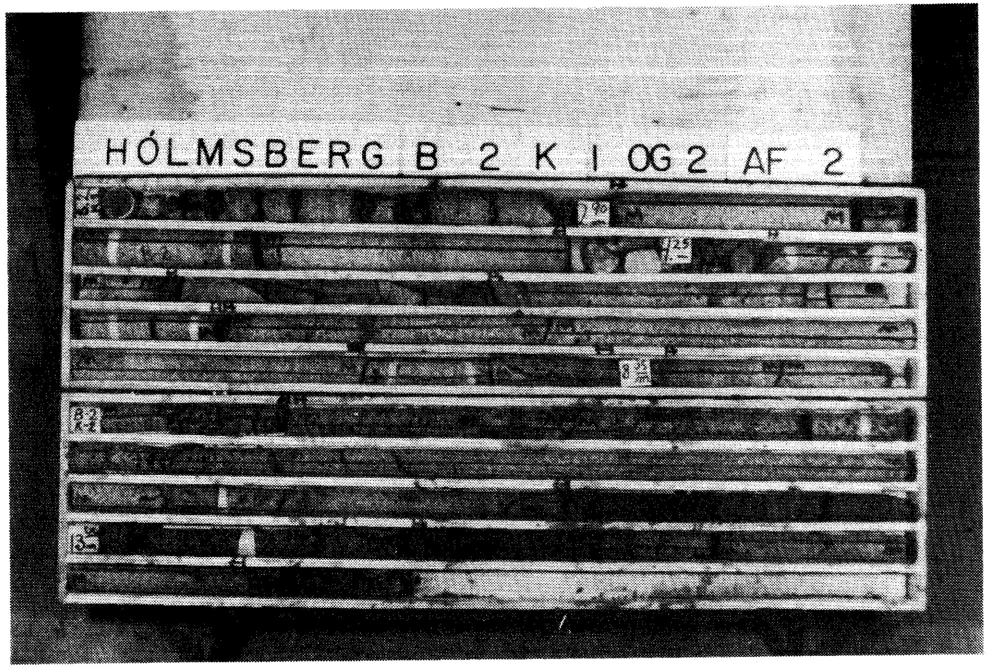
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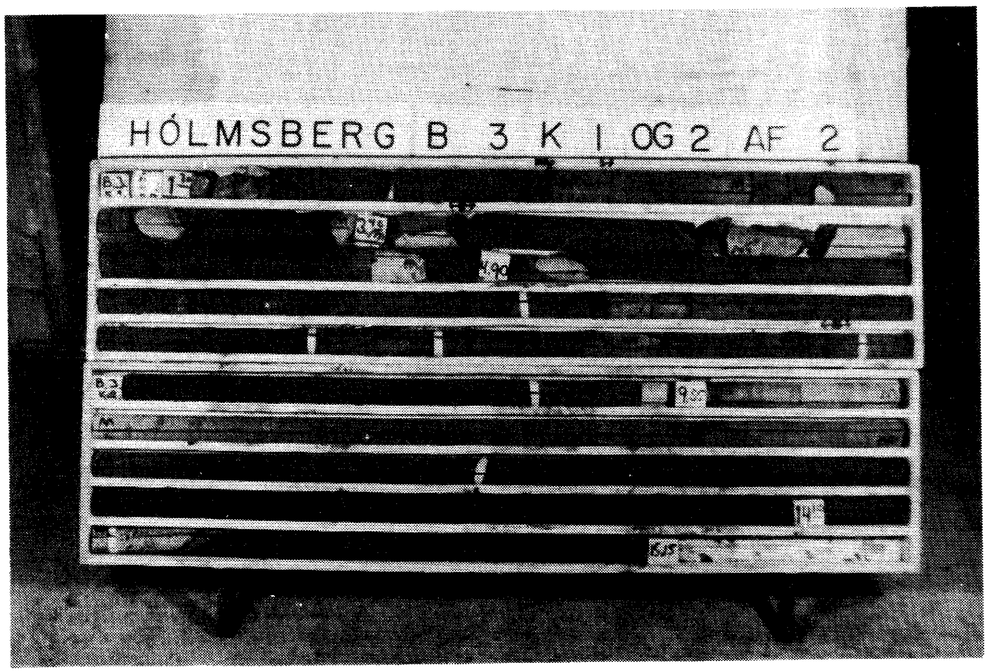
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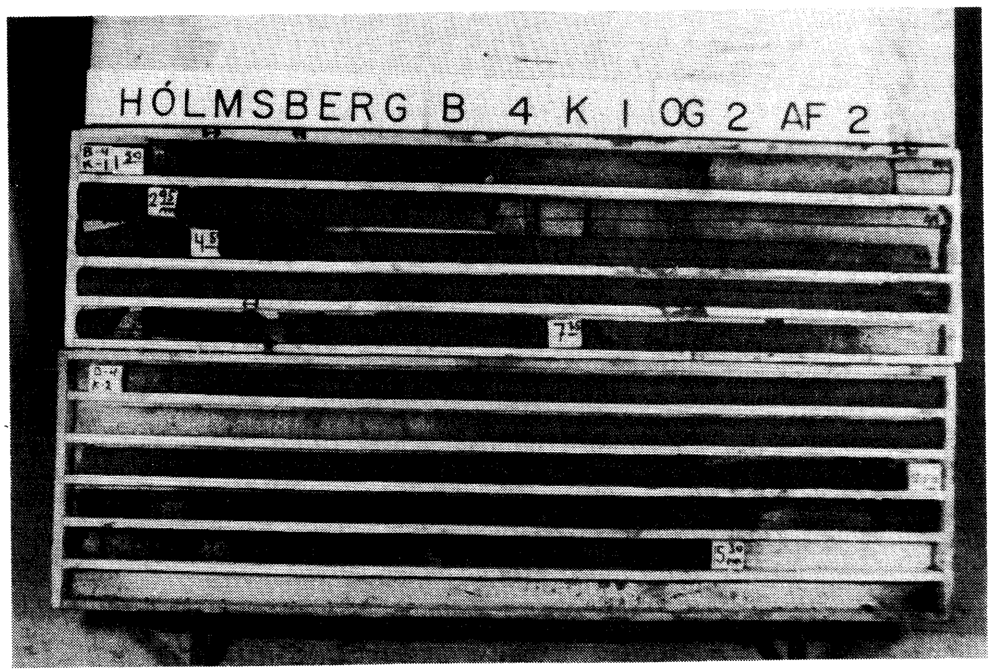
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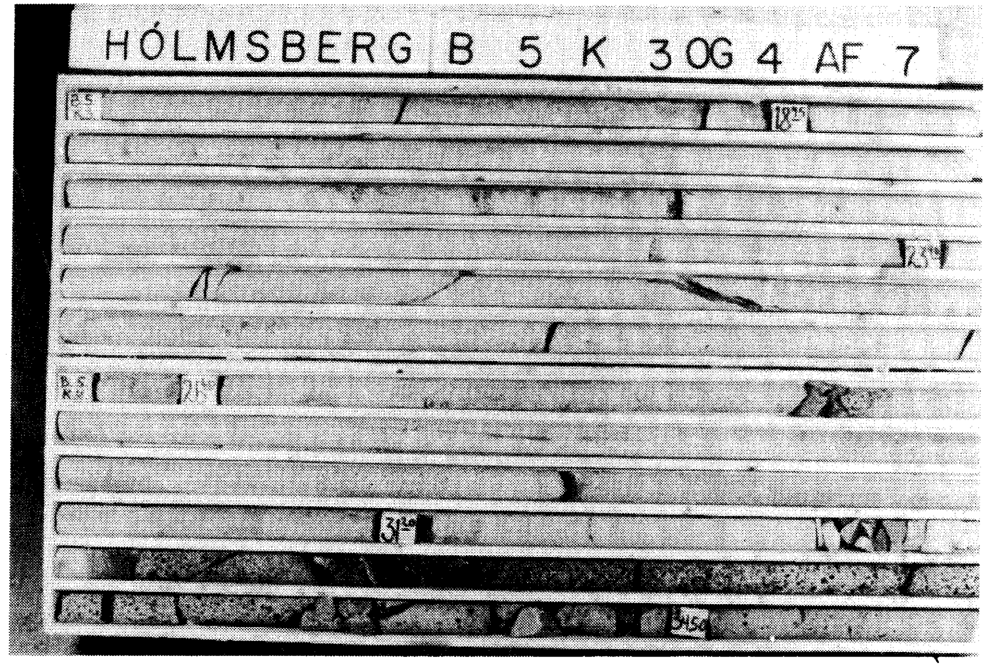
HÓLMSBERG B 5 K 1 OG 2 AF 7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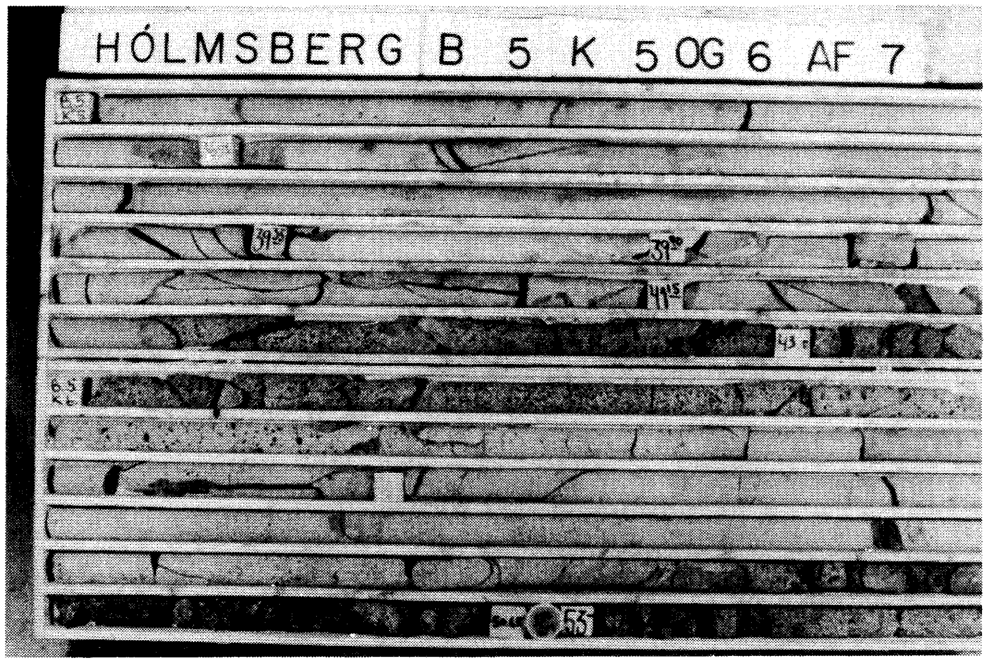
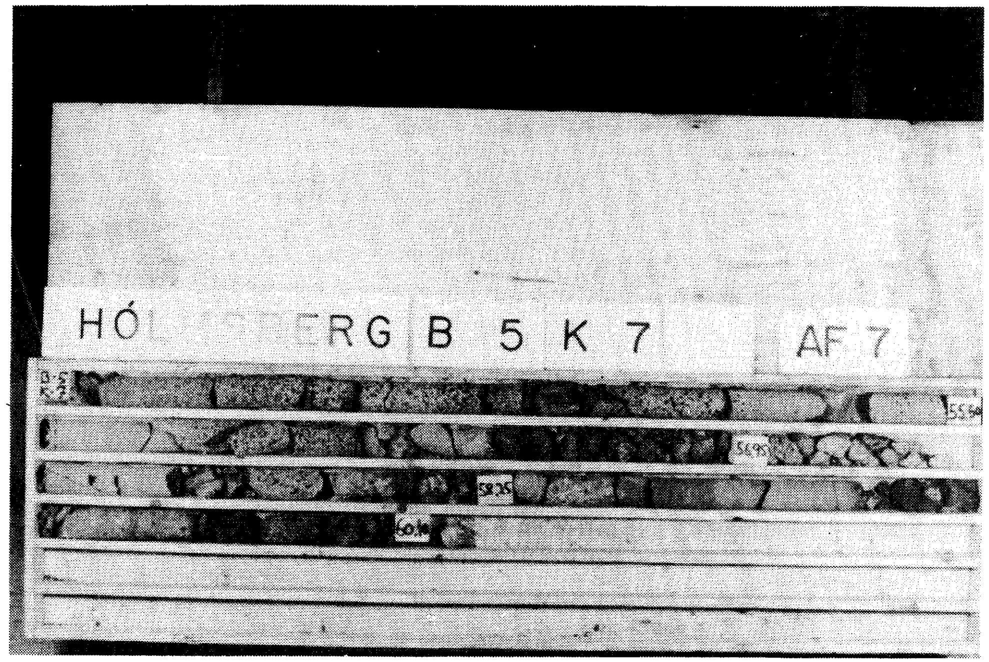
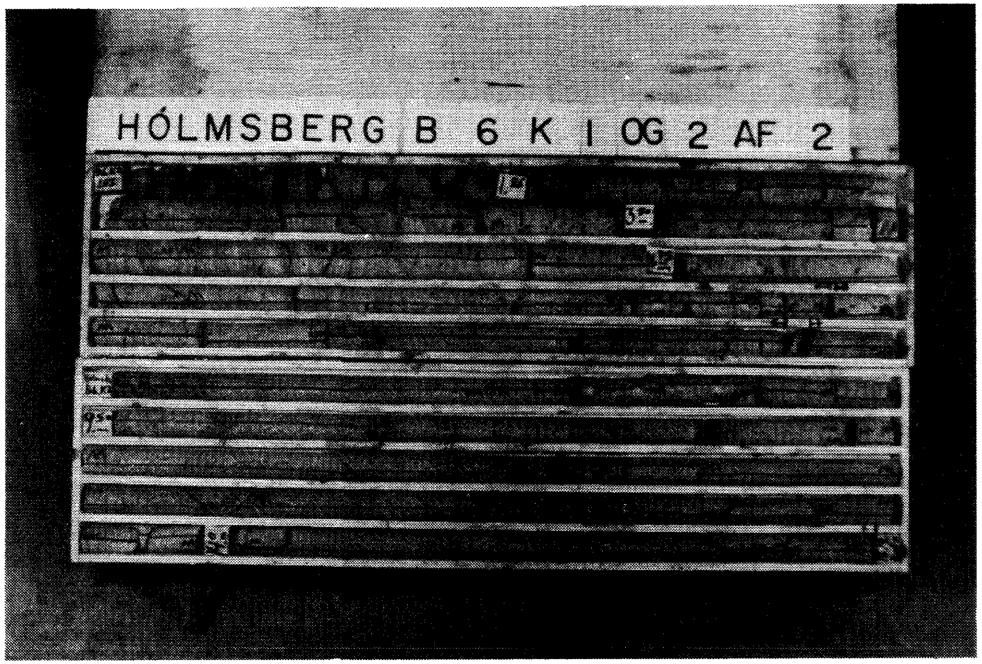

HÓLMSBERG B 5 K 5 OG 6 AF 7


B 5 K 7
AF 7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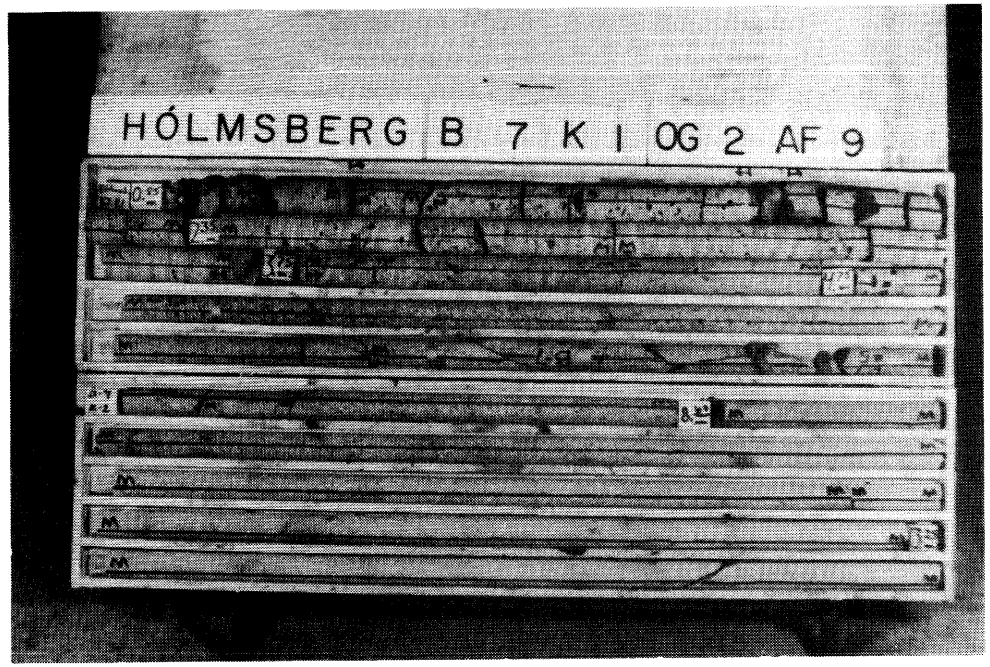
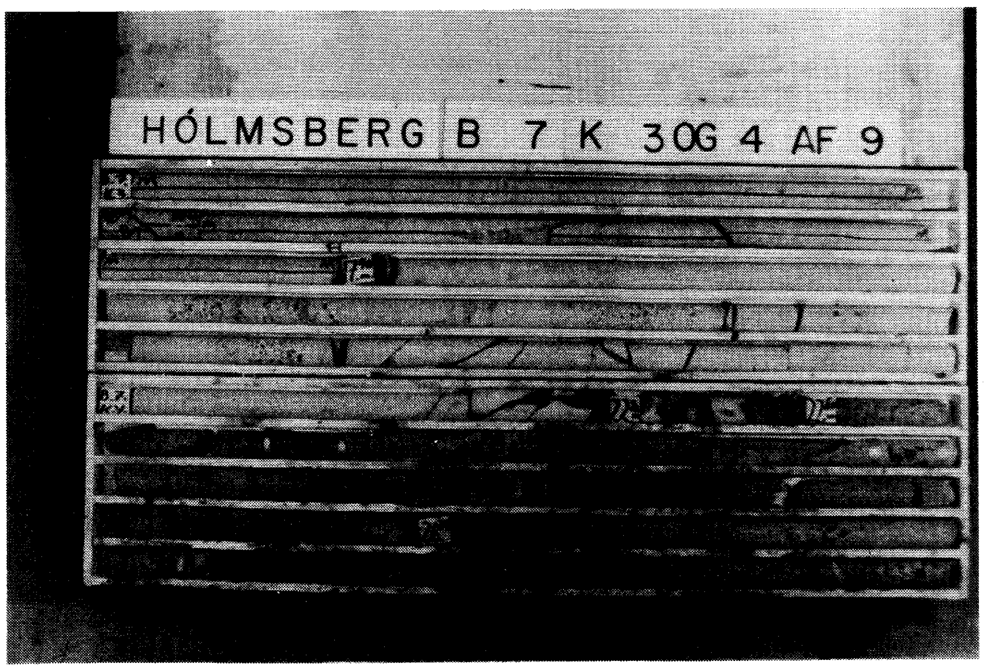

HÓLMSBERG B 7 K 1 OG 2 AF 9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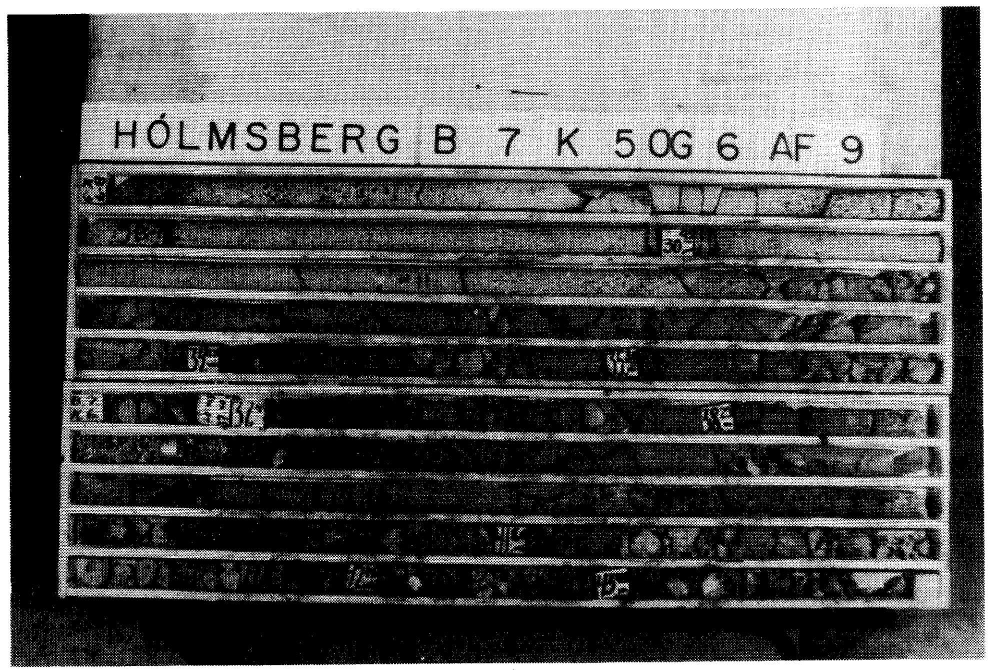
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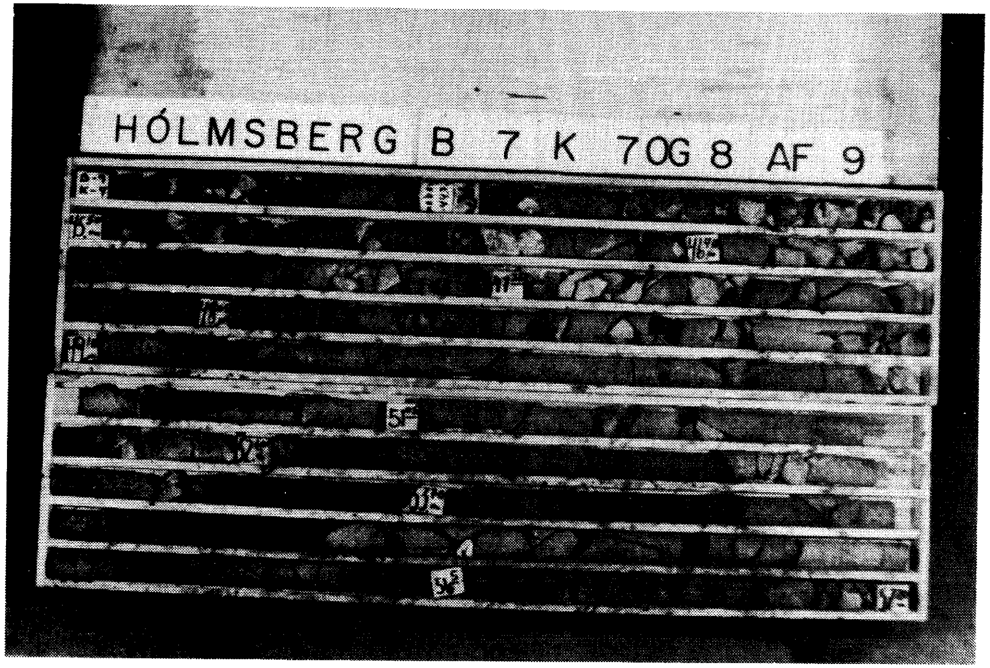
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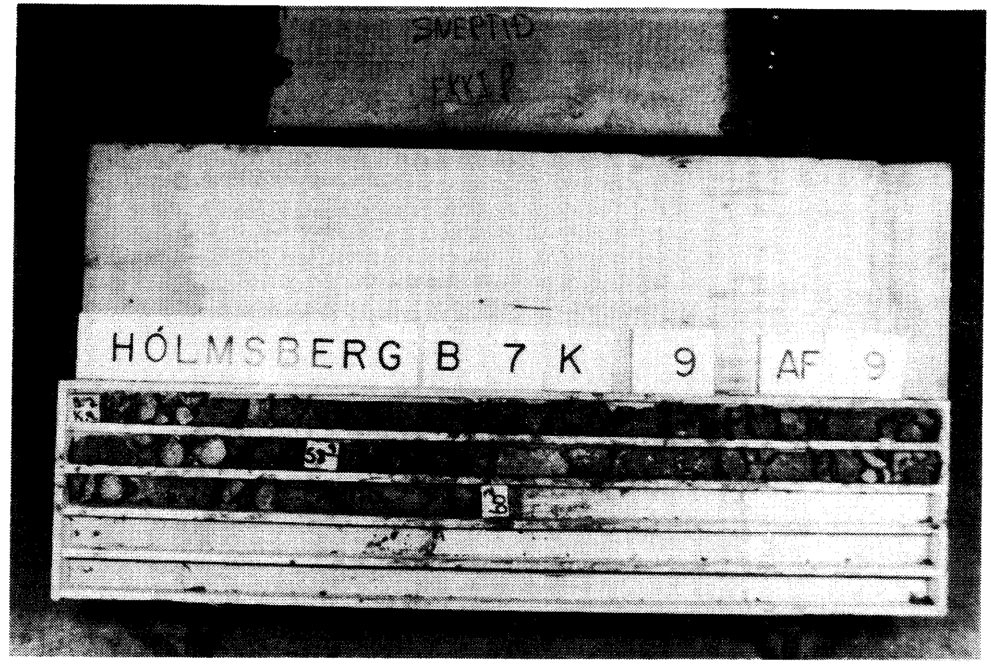
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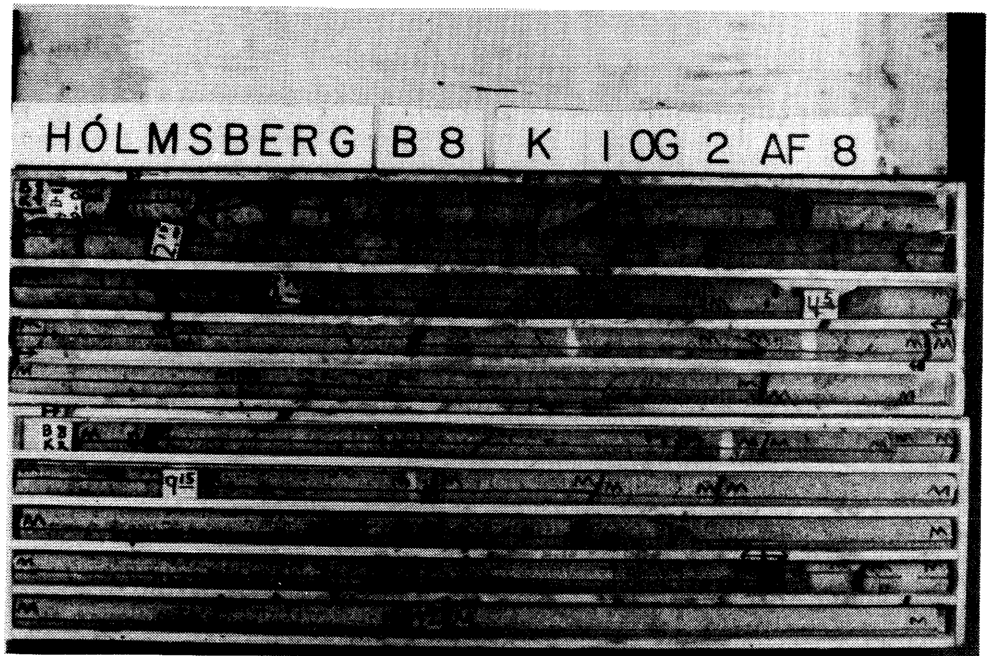
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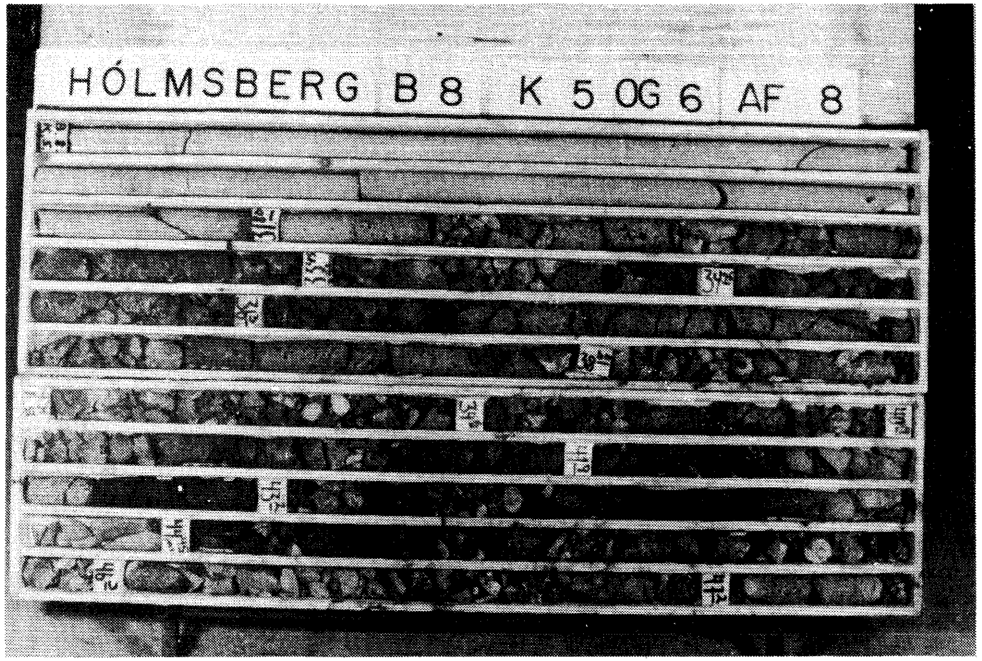
HÓLMSBERG B 8 K 3 OG 4 AF 8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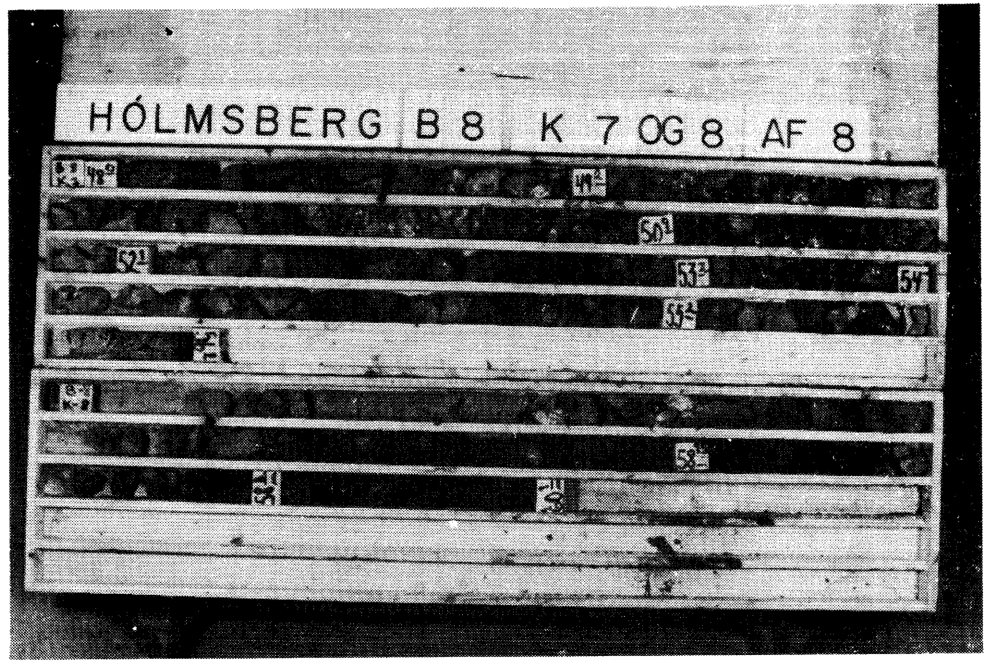
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