Report

On the Geology of the Ridge Dráttarhlíð

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Report.

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Dráttarhlíð.

The ridge Dráttarhlíð which separates the two lakes, Thingvallavatn and Úlfljótsvatn, consists of a basic tuff mixed up with irregular chunks and pillows of porfyritic dolerite. Both these rock types are of volcanic origin and represent different phases in the same eruption.

A series of diamond core drillings showed, that the tuff rests on a thick moraine layer (see accompanying Geological Section through Dráttarhlíð). In the bores IV and V the boundary between the tuff and the moraine lies in the altitude of 86 - 87 m and 77 - 80 m. resp. The moraine bed dips gently to west. At the mouth of the river Efra Sog into the lake Úlfljótsvatn it rises several m above the lake, and disappears under the surface of the lake near the tailrace of the planned power plant. Evidently, the planned intake tunnel by far the greater part will pass through the tuff and the dolerite pillow lava, although it is not excluded, that some hillocks of the moraine may reach the profile of the tunnel. On the other side the tailrace probably will for the most part run in the moraine.

In bore IV, on 6 - 10 m depth some rounded pebbles occurred in the core. Such xenolithic material might be derived from the underlying moraine during the eruption giving rise to the tuff. It is also possible, that the tuff contains some minor beds of fluvioglacial character.

Two or three tectonic systems are present in the morphology of the ridge. The prevailing one strikes N30-35°E, following the general trend of the other big tectonic elements in the area around lake Thingvallavatn, and in the south-west of Iceland. In the ridge Dráttarhlíð this tectonic system is represented by numerous fissures in the rock, and some grass grown depressions in the area also follow that direction.

A tectonic system of local character strikes in the same direction as the ridge Dráttarhlíð - Kaldárhöfði or N50°E. A lot of tectonic fissures follow this system, which probably also represents the trend of the feeder channels for the tuff and the doleritic porphyry.

Some morphological features in the Dráttarhlíð-area run in the direction N35°W. Fissures running in that direction are not observed, but some grass grown depressions might indicate zones of tectonic crushing.

The geological aspects on the technical properties of the eruptive rocks of the area are rather vague. Firstly the drillings did not deliver any compact cores, and secondly the rocks in Dráttarhlíð differ so much from the rock formation at Irafoss, that comparisons can hardly be done. It shall only be stated, that the eruptive rocks of Dráttarhlíð, even if cracked and ragged, seem to be in possession of rather great friction. Along the river Efra Sog and west of its outlet from lake Thingvallavatn they form high cliffs and big caves, which have resisted the weathering for thousands of years.

Some 20 years ago a small experimental tunnel was blasted into the pillow lavas on the south side of the Dráttarhlíð ridge. That tunnel still keeps its original form and its walls and roof do not display any signs of decay.

The Open Cuts for Intake and Tailrace.

In order to measure the depth of the water and the thickness of the loose sediment on the bottom of the lakes in the front of the intake resp. tailrace, soundings were carried out in limited areas in both the lakes. The soundings were carried out from a boat by an iron rod with a sharp point. The results shown in accompanying maps 1559 and 1559-1 look plausible, even if the possibility is not excluded, that in some of the measured points the rod was staggered by boulders. At the water line of lake Thingvallavatn, the loose sediments consist of coarse gravel and boulders, which made soundings impossible. In order to get some idea of their thickness, diamond drillings down to rock bottom were carried out in four places.

The Dam Site.

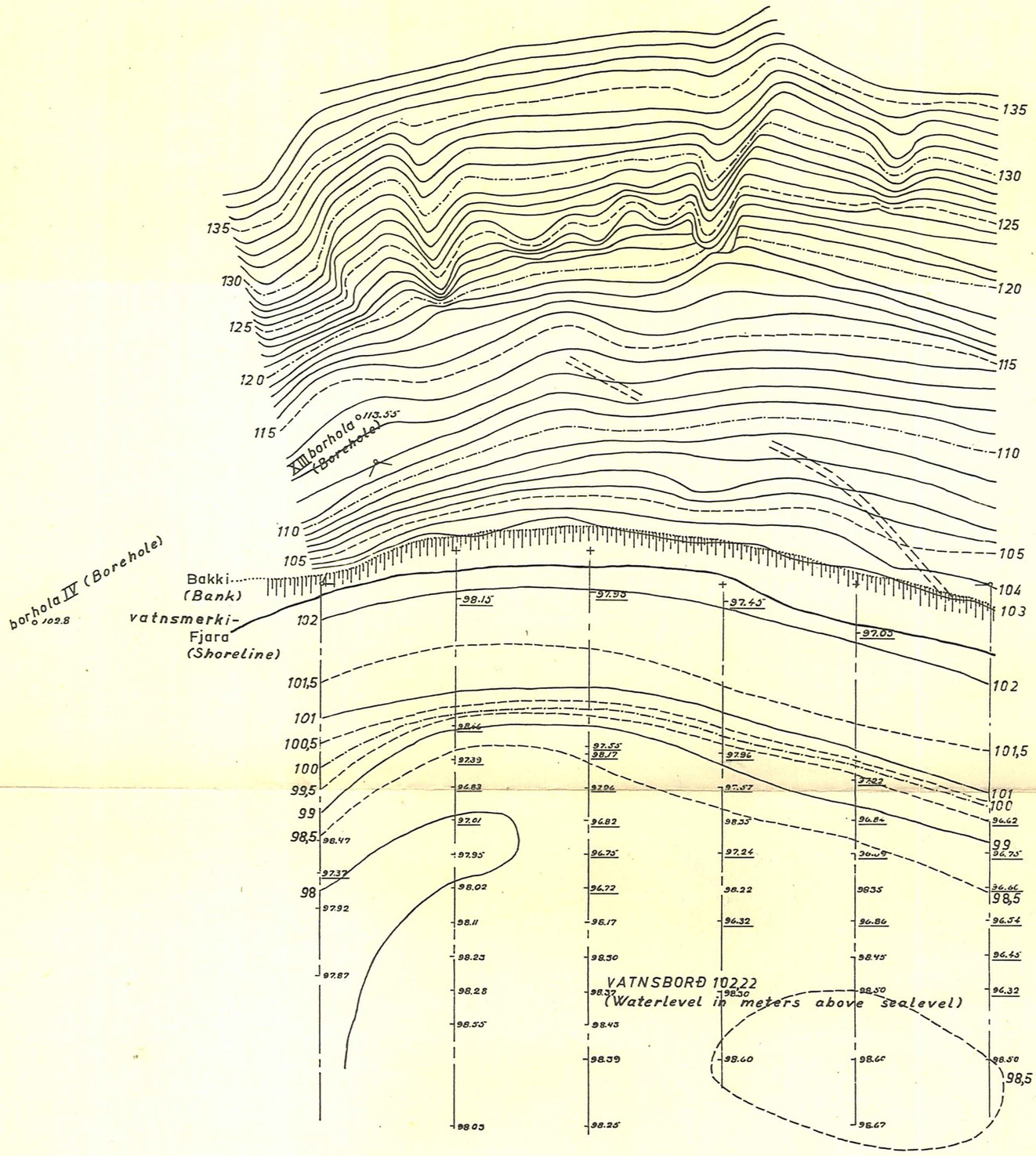
The first diamond core drillings made in the Efra Sog area were carried out on the lava plain north of the outlet of the river from lake Thingvallavatn. The drillings showed, that the lava rests on a thick bed of moraine.

In the outlet, between the mouth of the river and the outlet bay, is sited a flat ridge or threshold on which the planned dam will be built. Normally the maximal depth of water on the threshold is scarcely two m., but the heavy current impedes an investigation of the bottom. As far as the threshold can be investigated from the north, it consists of a clayey moraine. Probably the moraine continues quite close to the southern shore.

Reykjavík, October 1st 1954.

Tómas Tryggvason

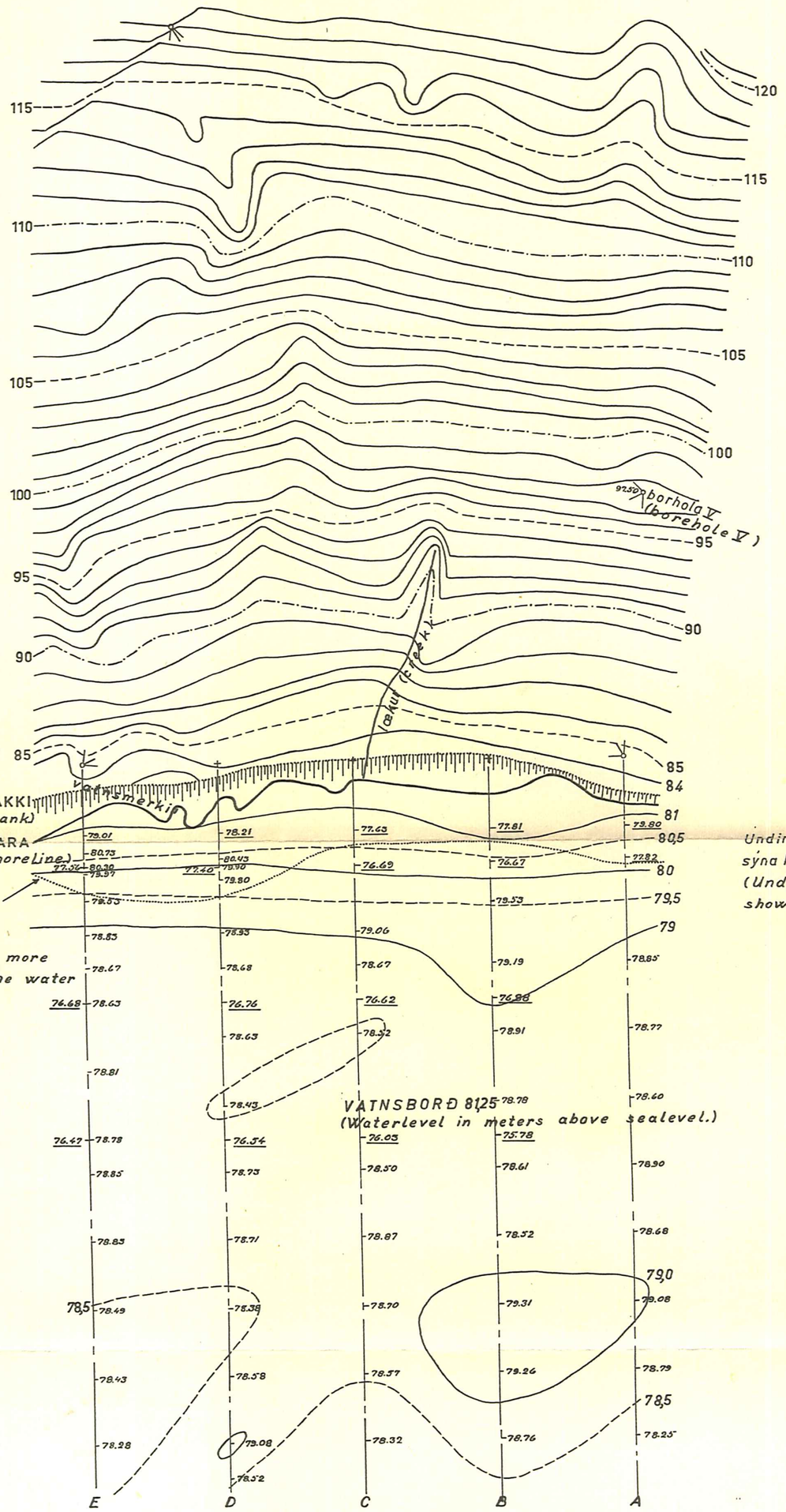
Geologist



Undirstrikuð tölurnar sýna kóta við fast berg
(Underlined figures show elevation of firm rock.)

Rafmagnsveita Reykjavíkur			
Frumdr: A.P	Hallamæling í Dráttarh. við þinguallavatn (Survey of Drättarhlíð)	1559	
Teikn:		R- 19/12 '52	
Yfirf: G.D.		M=1:500	A-2
Afh:			

('ÓNÁKVÆM STAÐSETNING)



Boranir fyrir utan þessa línu sýna meir en 4m frá vatnsbordi niður á fasta klöpp

(Borings beyond this line, show more than 4 meters depth from the water level down to firm rock.)

Undirstrikadar tölur sýna kóta við fast berg

(Underlined figures show elevation of firm rock.)

Rafmagnsveita Reykjavíkur			
Frumdr.: A.P.	Hallamæling í Dráttarhl. við Úlfljótsvatn (Survey of Drattarhlíð.)	1559-1	
Teikn.:		R- 9/12 '52	
Kóp.: G.D.		M-1:500	A-2
Athj.:			

Altitude in m.

Horizontal Scale
0 10 20 30 40 50 100m

Vertical Scale
0 2 4 6 8 10 20m

Haughólar

Geological Section
through Dráttarhlíð N-S

T. Tr. 1953

XIV 123.7

XIII

113.0

Finiglacial Terrace

III 110.1

II 109.3

I 108.3

IV 102.8

The Outlet
of River Sog
from Lake Þingvallavatn

V 97.5

Lake
Úlfljótsvatn

81.4
80.2

Porphyritic
Dolerite
and
Basic Tuff

Post glac- ial Lava

Younger Mora ine

Older Moraine

Basic Tuff

130 120 110 100 90 80 70 60