

ORKUSTOFNUN
Jarðkönnunardeild

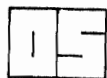
M Ý R D A L S S A N D U R

Investigation of the pumice layer

Preliminary report
by
Freyr Þórarinsson
Freysteinn Sigurðsson
Kristján Ágústsson

OS JKD 7811

September 1978.
Jarðefnarannsóknir hf.
Vík, Mýrdal, Iceland.



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Mýrdalssandur- an investigation of the pumice layer.

In accordance with a request by Jarðefnaiðnaður hf., Hella (dated 1978.06.20.), a geophysical survey was carried out on Mýrdalssandur by the National Energy Authority, Department of Economic Geology (OS-JKD) in July 1978 (78.07.04.-78.07.10.). The survey consisted of vertical electrical soundings (VES), using a Schlumberger array, and seismic profiles including both refraction and reflection measurements (with ABEM Trio and Hunttec instruments, respectively). Some necessary geological field work was carried out alongside the geophysical survey. The survey area is bordered by river Múlakvísl in the west and river Blautakvísl in the east and stretches upward from the seashore to include Hafursey-mountain in the north.

The aim of the survey was to investigate the thickness of pumice on Mýrdalssandur and specifically the thickness of pumice above ground water table. The VES measurements were thus distributed all over the survey area so as to measure these thicknesses. The seismic measurements were carried out on two profiles south of Hjörleifshöfði-mountain, one of these close to the sea, and one profile 1 km north of Hjörleifshöfði. The purpose of these was twofold: One was to establish the interpretation of the VES measurements, especially as regards the depth to bedrock, and the second was to get a more detailed picture of the bedrocks topography. The geological investigations (carried out jointly by OS-JKD and Gylfi Einarsson of Technological Institute of Iceland) indicated that Hjörleifshöfði-mountain is a residual from a complex of neo-pleistocene volcanic ridges running approx. N-S. The bedrock thus could be expected to lie at lesser depths along this ridge than to the east and west of Hjörleifshöfði.

In september 1978 the VES measurements had been interpreted, but the seismic profiles were at that stage only interpreted in terms of depth to bedrock close to the sites of VES measurements. The difference between these methods in interpreted depth to bedrock was less than 10% (this is subject to further revision of the interpretations.). The results show (fig.1) the pumice to be thinnest around Hjörleifshöfði, less than 30 m thick, and thicken both away from the mountain and upward Mýrdalssandur from the sea.

The thickness of the pumice is thus 40 m near the sea south of Hjørleifshöfði, and 50 m or more near Blautakvísl and Múlakvísl to the east and the west of the mountain, respectively. Higher inland, by Hafursey-mountain, the thickness seems to be 80-100 m, but as no seismic work was done there, this is a more uncertain estimate of the depth down to bedrock. The thickness of dry pumice (fig. 2), i.e. the depth to ground water table, measures 3-5 m around Hjørleifshöfði. The water table is considerably lowered near the several stream channels (Midkvísl, Sandvatn and others), since these drain their surroundings in the upper part of the channels. Along the main road from the bridge on Múlakvísl to Hafursey-mountain the thickness of dry pumice is 10-20 m and reaches 30 m or more around Hafursey.

In table 1 are listed the resistivities of different layers according to the VES measurements.

Table 1.

Resistivities of stratigraphic units

5000-15000	Dry pumice	
10000-43000	do	mixed with gravel
300-500	Wet pumice	lower (southern) part of the area
500-700	do	in vicinity of Hafursey
180-280	Wet bedrock	
180	do	contaminated with salt

Geologist Freysteinn Sigurðsson supervised the project and was in charge of the geological investigations, geophysicist Kristján Agústsson was in charge of the VES measurements and geophysicist Freyr Thorarínsson was in charge of the seismic measurements,

0
1
2
3
4
5 km

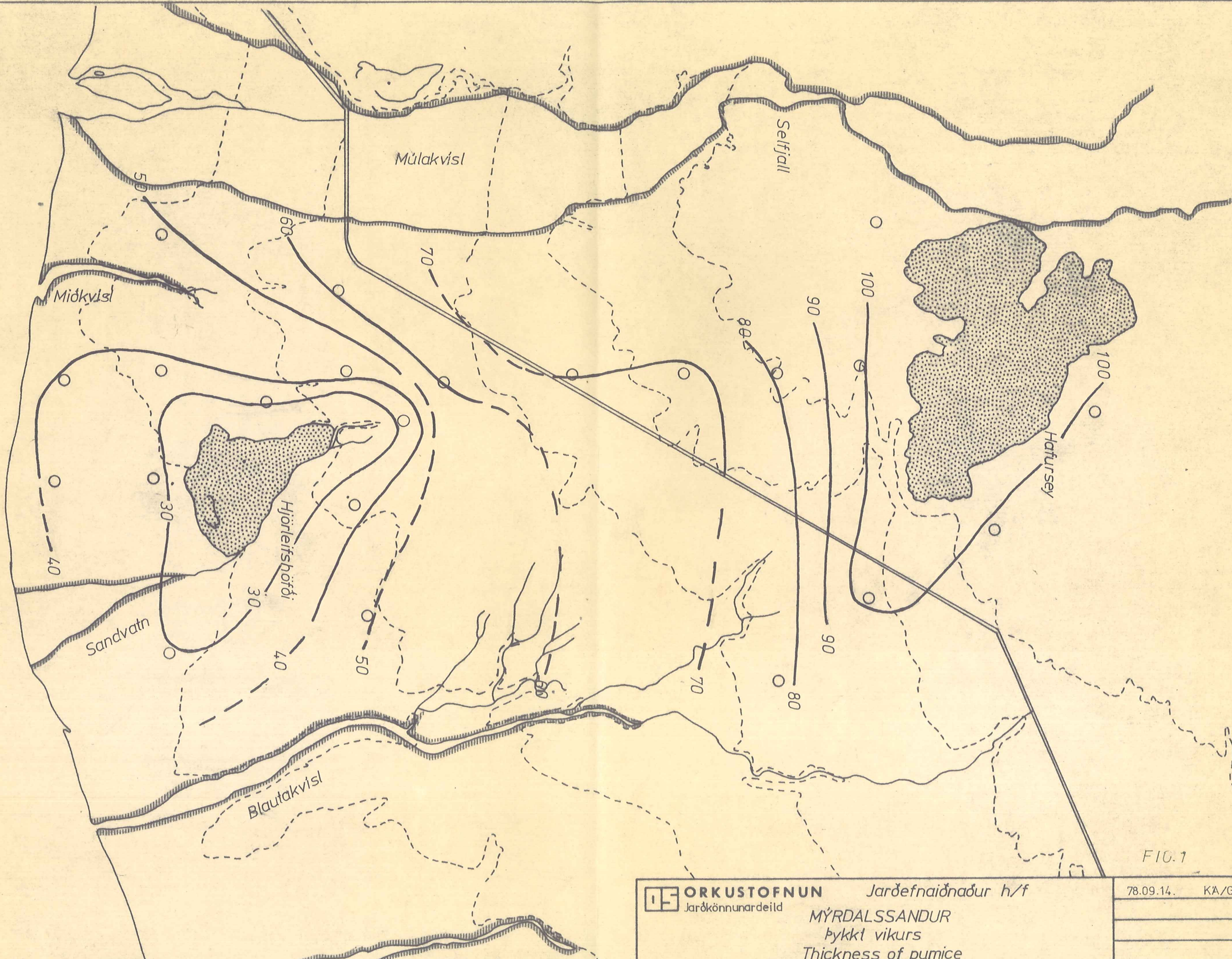

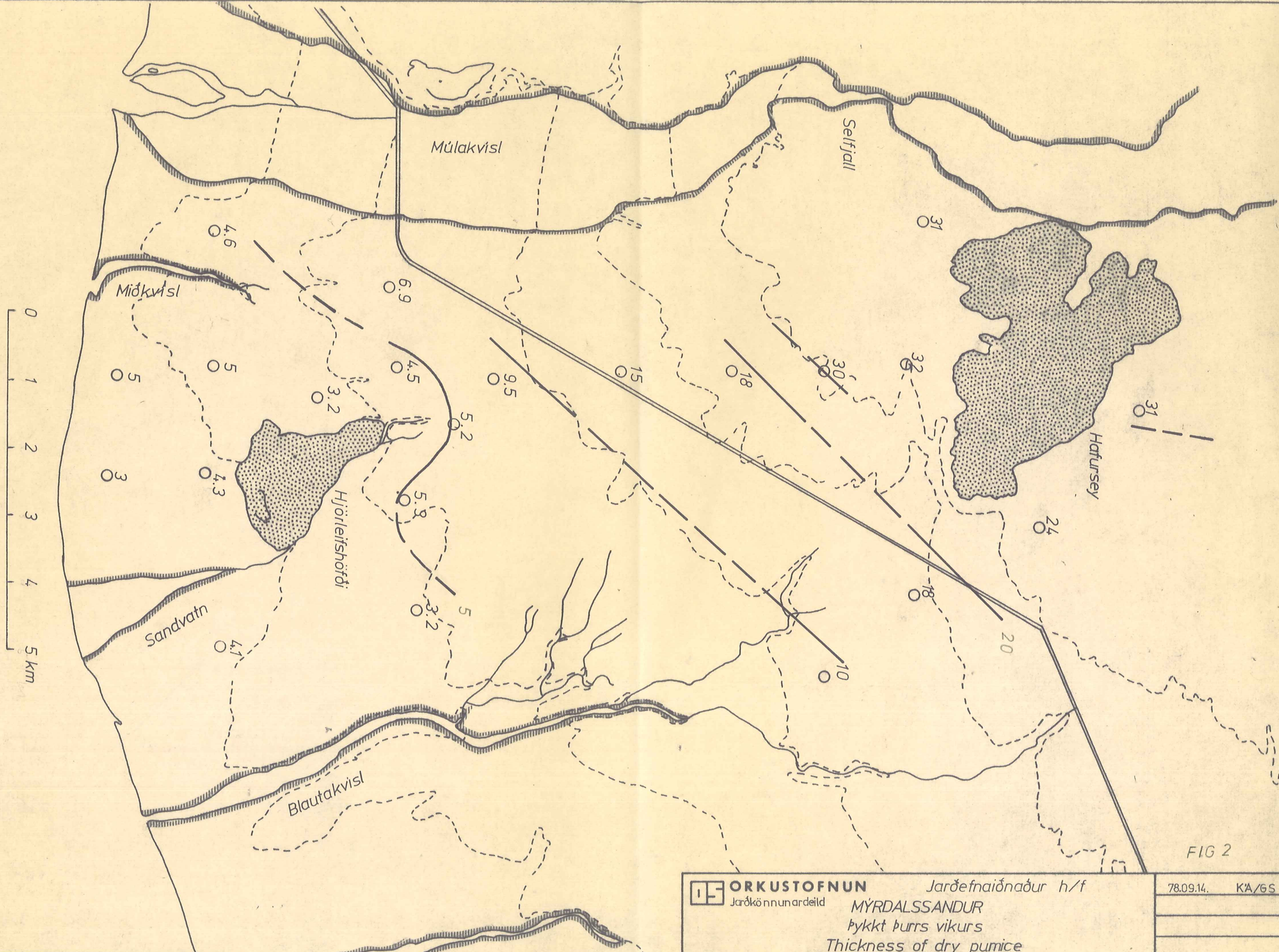



FIG.1

 ORKUSTOFNUN Jarðkönnunardeild	Jarðefnafræðingur h/f	78.09.14.	KA/GS
	MÝRDALSSANDUR		
	þykkt vikurs Thickness of pumice		



0
1
2
3
4
5 km

FIG 2

 ORKUSTOFNUN Jarðkönnunardeild	Jarðefnafræðingur h/f MÝRDALSSANDUR Þykkt þurrs vikurs Thickness of dry pumice	78.09.14.	KA/GS