

## Reviewer 1

Thanks for the comments the time taken to go through the article:

### General Comments

Thanks for the assessment of the high quality of the science, significance and presentation.

### Specific comments

- *Shouldn't subsection 2-1 "Study site" be included in the introduction section rather than the Methodology section? And 2 subsections are labelled "2-1": the "Study site" one and the "Aquifer characterisation" one.*

Thanks for the comment. I find its generally 50/50 whether to put the explanation of the study site in the introduction or methods. Happy to put it into the Introduction if that makes it clearer

- *section 3-1: line 5: Could you explicit what define the groundwater catchment boundaries? Except for one indication on Figure S1 there is no discussion of this.*

We have used the surface water catchment boundary as it extends from the defined glacial valley onto the sandur as an approximate indication of the groundwater catchment boundary. It is marked on Figure 1 – but I note that we have not put it in the legend – which we'll correct. Later in the paper – the SIs are much more powerful at defining the zone of interaction between the river and the groundwater – so the groundwater catchment is only used to help give an approximation of groundwater flow within the Sandur

- *section 3-1: line 21: How do you know that the underlying bedrock has very low transmissivity? Thanks to tests in the 2 dedicated piezometers?*

Yes – two piezometers drilled into the lavas – and the experience of local community in trying to get water supplies from the lava.

- *section 3-2: lines 26-31: Could you explicit how you calculate the mean estimated annual groundwater flow through the shallow part of the aquifer and the total depth of the aquifer?*

The groundwater flow methodology is explained in the methods section (p 5 lines 5 – 10). We use Darcy's equation and parameterise with the head – which we have measured, the permeability which is measured in the top 15 m of the aquifer, the width of the aquifer from the approximate groundwater catchment taken from the surface water catchment using dGPS. The measurement of the total depth of the aquifer is discussed in page 5 (lines 13 – 19). There is some limited evidence that the aquifer may become more consolidated at depth – so we quote a flow through the shallow depths (<40 m) as well as through the full depth. We can modify the methods section to explicitly mention the darcy equation

- *Just to be sure I got this right: if there are tills under Virkisjökull glacier, they are not in continuity with the sandur downstream?*

That right – there is negligible direct contact between the glacier and the sandur – primarily because of a bedrock high between the glacier and the sandur

### Technical sections

Thanks – we will modify as suggested