Response to the comments from anonymous Reviewer #2.

Specific comments

1) The paper objective should be clearly stated in the introduction. It is shortly mentioned at lines 3-5, page 11832.

Agree, we will expand this part.

2) References at page 11831, lines 1-3, are quite limited. A long list of papers could be added and I wonder whether the chosen references are the more appropriate.

The included references are meant to document the availability of high resolution geophysical mapping techniques. The chosen references are appropriate in the sense that they are all related to high resolution geophysical mapping techniques; nevertheless, we will take the reviewer's advice and include a few more references of relevance.

3) The description of the geological data (page 11832, line 23 to page 11833, line 5) is rather poor. Moreover, some cross sections could help to illustrate the geological structure.

We will expand this part and add a cross section.

4) Page 11833, line 9; page 11835, line 16. Which data? Field raw data, e.g., apparent resistivity? Or the results of field data inversion? These results are used to differentiate lithologies: how is the effect that the spatial variability of pore water electrical conductivity has on the bulk resistivity accounted for?

The data uses are inverted data (Høyer et al. 2011) after careful data processing of field data.

The spatial variability in pore water resistivity /salinity is low in the area. Although we cannot exclude the presence of saline groundwater at very great depths in some parts of the area, this does not have any significant impact on the model. Furthermore this would be significantly below the domain, where the SSV model is applied (down -70 m). The SSV concept does account for pore water salinity.

We will elaborate on these issues in the revised version.

5) Page 11833, lines 14-15. What is the SSV model? I could not find the referenced paper.

The SSV model is a 3D lithological model developed by an objective and semi-automatic inversion method. In the meantime more accessible journal papers have been published on the method, which will be included in the revised version.

6) Sections 3.1 and 3.2 should be rewritten, as the terms appearing in the equations are not clearly and completely defined, so that it is very difficult to follow the development.

We will take the advice of the reviewer and rewrite the two sections.

7) Page 11835, line 18. I do not understand how the log data, which are discretized at 0.2 m resolution, are compared with SkyTEM data, which are discretized at 5 m resolution (see page 11833, line 10).

The 0.2 m log data from the boreholes were aggregated for every 5 m to allow for a comparison. We will make this clear in the revision.

8) Section 3.3. I think that it would have been more appropriate to work with the logarithm of resistivity rather than with resistivity itself. Equation (6) shows that P_S is related to lnR. Moreover, the difference between 10 ohm m and 20 ohm m is much more relevant, from the point of view of geological interpretation, than the difference between 110 ohm and 120 ohm m. Therefore, my opinion is that it would have been more appropriate to bin resistivity with a log scale.

We have tried to bin resistivity on a log scale but it does not make an important difference. After all the range of resistivity variation is only 10-140 ohmm and the bin interval is 1 ohmm.

9) The geometry of the groundwater model, in particular its bottom, should be better explained at page 11837, line 17 to page 11838, line 1.

Page 11837, line 17 is about geometry of clay bodies used in TiGenerator.

The description of the geometry of the groundwater model starts on page 11837 line27. We do not think this part is particularly important regarding the result and discussion and that it needs more explanation. Furthermore, cross sections with model discretization are shown in Fig. 8 to Fig. 10.

10) The choice of a 15-meters-thick shallow layer is not coherent with the rest of the model. I understand that this choice is motivated by the difficulty of modeling cells which become dry in MODFLOW, but other computer programs are available, which could deal with this problem or even some packages for MODFLOW (see, e.g., doi:10.1111/j.1745-6584.2011.00829.x, doi:10.1111/j.1745-6584.2001.tb02474.x, http://pubs.usgs.gov/tm/tm6a37/).

We started by considering other options, but unfortunately these alternatives including MODFLOW-NWT do not work with the Hydrogeologic-Unit Flow (HUF) package. The HUF package is the most suitable package in our case since it maintains the geological structures in most cells of the numerical flow model.

11) The boundary conditions for the flow models must be discussed.

Agree, will do in the revised version.

Technical corrections

We appreciate the suggestions, which will be incorporated in the revision.

References

Høyer, A.-S., Lykke-Andersen, H., Jørgensen, F., Auken, E., 2011. Combined interpretation of SkyTEM and high-resolution seismic data. Physics and Chemistry of the Earth, Parts A/B/C 36, 1386–1397.