Dear Reviewer;

We thank you for your review and comments; we attach the response indicating the changes we have made. We are confident that we have given a satisfactory response to your suggestions.

A document has been attached in which the proposed changes are differentiated in red text. In addition, a new figure is included, which was not possible to include in the interactive response.

−) But keep in mind that the corrections to inferred interval transmissivity still involve skin and turbulent inflow contributions, negligible at ultra-low pumping rates. …

In the manuscript, the "skin" effects are mentioned and it is specifically stated that the determination of stretches is made precisely in order not to take into account the different values that these effects may take in each screen.

As mentioned in the manuscript, the groundwater flow does not become turbulent even for the maximum flow rate used (for which the groundwater velocity has been calculated in those vicinities, in particular, for a radius equal to that of the well).

−) The ability to infer head differences in situ for multi-level aquifers has a lot more application than just correcting measured transmissivity for the presence of those head differences.

−) But even more relevance can be added by citing the need to understand the large-scale structure of aquifers concerning recharge …

In discussion section, L-476, we have added:

"This study has allowed to carry out the hydrological and hydraulic division of the studied basin that had not been done before, and such division involve a more precise obtaining of the permeability values in each stretch (and hence in its corresponding aquifer) which was neither been before. Certainly, the new procedure developed to obtain the hydraulic head differences in heterogeneous granular basins and the results obtained for the first time in the Madrid basin may allow hydrogeological hypotheses to understand the large-scale structure of aquifers concerning recharge. According to the results obtained, the fact that the Madrid Basin is considered a single aquifer should be replaced, at least from a depth of 200 m, by a sequence of stretches -aquifers- differentiated by their different permeability values. From 345 m depth (the one of stretch 4), it was also found that the aquifers corresponding to stretches 4, 5 and 6 have different "hydraulic heads" than the upper aquifers. One hypothesis would be that this means different "recharge pathways". So that it could be deduced that above 345 m the Madrid Basin can be considered a single heterogeneous aquifer (with different sub-aquifers of different permeability), and below 345 m, the Madrid Basin consists of a sequence of confined aquifers (the last three coarse-grained ones shown in the well-logs, see Fig. 4) that are hydraulically separated from the rest of the aquifers.

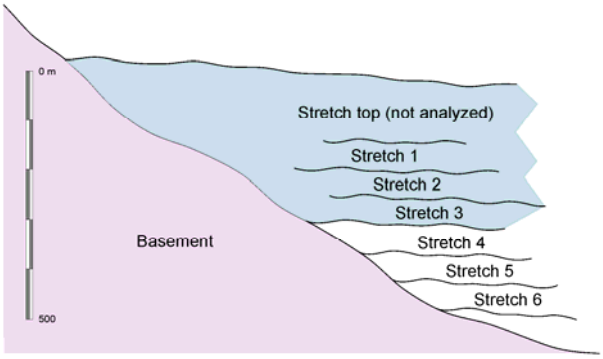

Figure 10. Large-scale scheme of NW arc of the Madrid basin

It should be emphasized that the hydrogeological hypotheses that can be made as the previous scheme must be contrasted with results in more wells within the NW arc of the Madrid Basin."

−) … and contaminant communication rather than just a correction to standard ump test evaluations of transmissivity based on the assumption of a single aquifer.

Just next to above text, we have added:

"The division of the studied well also allows proposing a strategy regarding the arsenic propagation in the Madrid basin. The obtained results indicate the stretch of the studied well that is "activated" when the dynamic level exceeds the "hydraulic head" of the aquifer to which it corresponds, is the rather connected to a point -or zone- where the arsenic focus is. As the exploitation of that stretch in different points of the basin will cause the contaminant to move towards those points, that critical dynamic level should be not allowed."