Final response to the interactive comments (hess-2016-374-RC1 and hess-2016-374-RC2)

We see the point made by the reviewer, that the presentation of the multiple aspects makes the paper hard to follow. We thus decided to focus on the following key question(s):

- How relates the intrinsic vulnerability of this widespread, yet scarcely addressed type of carbonate-rock settings (thin-bedded carbonate/siliciclastic alternations) to surface conditions (soil cover, land management, surface karst phenomena) and subsurface factors (bedding, aquitard-aquifer sequences, faulting, and subsurface karst)?
- Does this relation reflect in the hydrochemical state as a function of depth and slope positions?

In line with reviewer´s suggestions, we will lay a strong focus on the intrinsic vulnerability by exemplifying how the surface and subsurface compartments interact with the fluids and affect hydrochemistry of the aquifers within such a rural catchment with only little anthropogenic impact.

The manuscript will be harmonized according to the suggestions of RC2:

- We will condense the characterization of the site in one chapter. The section on methods and site description will be divided in two compact sections.
- We will highlight the significance of the setting-specific site characteristics for the understanding of groundwater quality and subsurface architecture.
- We will emphasize anthropogenic hazards for an extended discussion of our results about intrinsic vulnerability.
- We will highlight the role of fault zones and caprock sinkholes for fluid flow based on additional results from mapping and digital elevation model (DEM) analysis.

Accordingly, we propose to revise the manuscript as follows:

- The uniqueness and capacities of the Hainich CZE will be illustrated in the introduction.
- We will highlight the importance of thin bedded carbonate-siliciclastic aquifer systems and the characteristics of these setting; this includes the description of flow paths which are predominantly fractures and subordinately karst cavities.
- We will extend the discussion of groundwater quality by emphasizing recharge-area surface properties and the subsurface structure. This will also include a discussion of “natural” and “anthropogenic” substances in the groundwater.
- We will emphasize the relationships between surface properties (land use, soil cover), karstification and aquifer stratigraphy for resulting groundwater hydrochemistry (following hess-2016-374-RC1),
- We will discuss intrinsic aquifer vulnerability.
- Fault zone inventory will be added to the results. Fault-related cross-formational flow (apart from fault zones) between the identified multi-storey aquifers will be discussed; this will also include a definition and explanation of caprock sinkholes.
- Although, groundwater quality fluctuations are very complex and will therefore be discussed in a separate research article, we will add an example of time series data (i.e. nitrate fluctuation) to the

results section; this will help to assess mean values of hydrochemistry in the context of seasonal changes.

- Chapter 4.3 which is not well related to the hydrochemical clustering will be transformed to a much shorter discussion of the distribution of karstification subsequent to the hydrochemical discussion.
- The conclusions will be more focused on the relationship between land use, infiltration potential and hydrochemistry and the consequences for the “intrinsic vulnerability”