REGIONAL-SCALE IDENTIFICATION OF SURFACE WATER AND GROUNDWATER INTERACTION USING HYDROCHEMISTRY AND MULTIVARIATE STATISTICAL METHODS, WAIRARAPA VALLEY, NEW ZEALAND.

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Response to overview comments from Reviewer 1

We thank the reviewer for the positive comments on the manuscript. In the overview response, the reviewer makes only two specific comments, to which we reply below.

1. The reviewer requests more explanation of the results of the principal component analysis (PCA), specifically to understand how we determined how many components were necessary to explain the dataset.

   Our revised manuscript will provide more detail on the procedures used in PCA. We neglected to mention that all input variables were standardised by z-scoring according to Equation 2 prior to PCA. All of the standardised variables used in PCA are therefore distributed around a mean of zero with a standard deviation of one. PCA was then conducted using varimax rotation. The first component has an eigenvalue of 7.1 and explains 57.5% of the variation in the dataset. The second component has an eigenvalue of 1.9 and explains 15.8% of the variation in the dataset. The third component has an eigenvalue of 0.8 and explains only 6.9% of the variation in the dataset. Because we had standardised the input variables, it was reasonable to use the Kaiser criterion and retain only those components having eigenvalues greater than one (components with eigenvalues less than one explain less variation than any single variable).

2. The reviewer suggests that we compare results obtained when the statistical analyses are performed using different software packages (R, SPSS, etc.).

   This is an interesting question but we believe that it is well outside the scope of our study.