**Article Highlights**

* An approach to solving predominantly elliptic steady-state convection-diffusion problems in a finite volume (FV) framework is presented.
* The method of QR decomposition is used to solve the local (standardised) linear least-squares problem.
* For rigorous code verification, we employ the method of manufactured solutions (MMS).
* Current efforts in estimating the discretisation error are focused on *a posteriori* methods.
* Despite having proven accurate for smooth problems, *p*-adaptation is typically not as successful when applied in the presence of singularities.