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Corrigendum to Water Upconing in Underground Hydrogen Storage: Sensitivity Analysis to Inform Design of Withdrawal*

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Correction to Table 2

There are three numbers in Table 2 of the original paper (Oldenburg et al., 2024*) that were incorrect. Specifically, the value of the density of hydrogen (H_2) for the DB model and the values of density and viscosity of H_2 for the TOUGH2 model listed in Table 2 of the original paper were incorrect.

A corrected Table 2 is shown below. The erroneous values in Table 2 were not used in any of the modeling and simulation. Accurate values for density and viscosity in the modeling and simulation come from CoolProp for the DB model and from EOS7CH for the TOUGH2 simulations.

*Citation to published paper:

Oldenburg, C.M., Finsterle, S. and Trautz, R.C., 2024. Water Upconing in Underground Hydrogen Storage: Sensitivity Analysis to Inform Design of Withdrawal. Transport in Porous Media, 151(1), pp.55-84.

Table 2 (corrected). Properties of the H_2-water upconing system for comparison against the DB model.

Property	DB model	Used for TOUGH2
Gas cap thickness, total reservoir thickness, and radial extent (outer radius) of the reservoir	infinite, infinite, infinite	50 m, 100 m (with open boundary at bottom), 100 m (open boundary condition)
Porosity (ϕ)	0.10	0.10
Permeability (k_H)	1.0×10^{-12} m^2	1.0×10^{-12} m^2
Permeability (k_V)	1.0×10^{-12} m^2	1.0×10^{-12} m^2
Relative permeability (k_{rel})	Not applicable	Linear with $S_{lr} = 0.99$
Distance from well to H_2-water interface (d)	10 m	10 m
Extraction rate of rate of H_2 (Q_m)	-5.5 kg s^{-1}	-5.5 kg s^{-1}
Density of water	996 kg m^{-3}	996 kg m^{-3}
Density of H_2	7.32 kg m^{-3}	7.87 kg m^{-3}
Viscosity of water	6.54×10^{-4} Pa s	5.11×10^{-4} Pa s
Viscosity of H_2	9.31×10^{-6} Pa s	9.53×10^{-6} Pa s