

Groundwater Evolution and Flow Pattern Determination using Hydrogeochemical and Stable Isotopic Data of The Volcanic and Lacustrine Deposit in Bandung-Soreang Groundwater Basin, West Java, Indonesia
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Rifky Meisa Anugrah Rifky, Bandung | Indonesia, Indonesia

anugrahrifkymeisa@gmail.com

Bambang Sunarwan Bambang, Pakuan University, Bandung | Indonesia, Indonesia

Fikri Noor Azy Fikri, Ecosystem Guard, Bandung | Indonesia, Indonesia

Dasapta Erwin Irawan Dasapta, Bandung Institute of Technology, Bandung | Indonesia, Indonesia

Ahmad Egi Pratama Hanif Ahmad, Ecosystem Guard, Bandung | Indonesia, Indonesia

T. Setiawan, Geological Survey of Indonesia, Bandung | Indonesia, Indonesia

Yudhi Listiawan Yudhi, Padjadjaran University, Bandung | Indonesia, Indonesia

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The study of the groundwater evolution and recharge area determination has been carried out in the Bandung-Soreang Groundwater Basin using hydrogeochemical data and stable isotopes. This study is required as part of the groundwater management consideration in order to conserve groundwater in the Bandung City and its surroundings. Bandung-Soreang Groundwater Basin has geomorphological characteristics that form a basin surrounded by volcanic mountains which once inundated by water that formed the lake. The research area has lithology which are consisting of a Volcanic Rocks and Lacustrine Deposit. Hydrogeochemical Data was taken from 95 springs, 138 wells, and 84 wells drilled (maximum depth 200 meters) and stable isotopes deuterium, tritium and oxygen conducted at 172 locations across the upstream of Bandung-Soreang Groundwater Basin. Hydrogeochemical Analysis has been conducted in order to determine the pattern of groundwater evolution using major chemical elements plotting method in the piper diagram has obtained distribution of hydrogeochemical facies in the shallow aquifer are CaHCO₃, NaKHCO₃, MgHCO₃, CaSO₄, and CaMgCl with facies CaHCO₃ spreading 60% of the study area. Then, in the deep aquifer, hydrogeochemical facies are dominated with CaHCO₃, NaKHCO₃, and MgHCO₃. Stable isotope analysis ^{+2H} Deuterium and ^{+18O} Oxygen to determine groundwater flow patterns has been done with plotting the correlation between these two elements that generate the flow pattern of shallow aquifer which has trending from north to south (Dago – downtown Bandung), while the deep aquifer is trending from northeast to southwest (northern part of the Bandung district – Cimahi) Analysis of stable isotope Tritium (3H) is used to determine the age of groundwater that shows the distribution of age at the shallow and deep aquifer. The age pattern which has been obtained are the groundwater older relative to the northwest and getting older from the southeast toward center.

