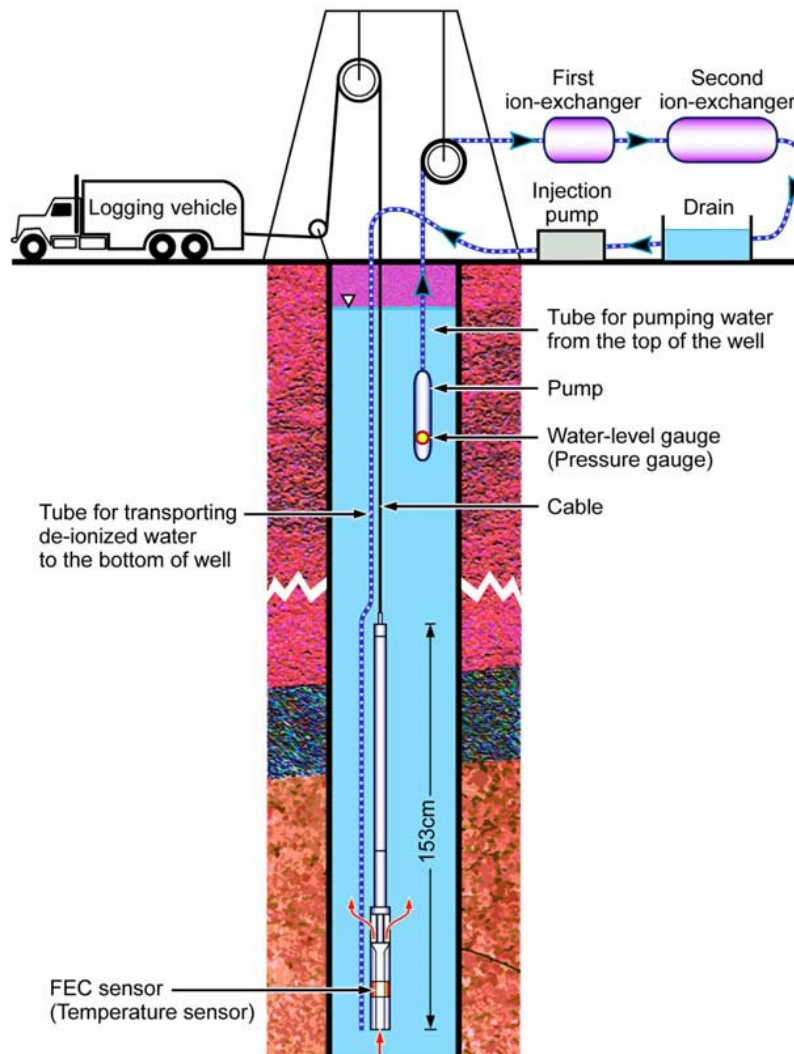
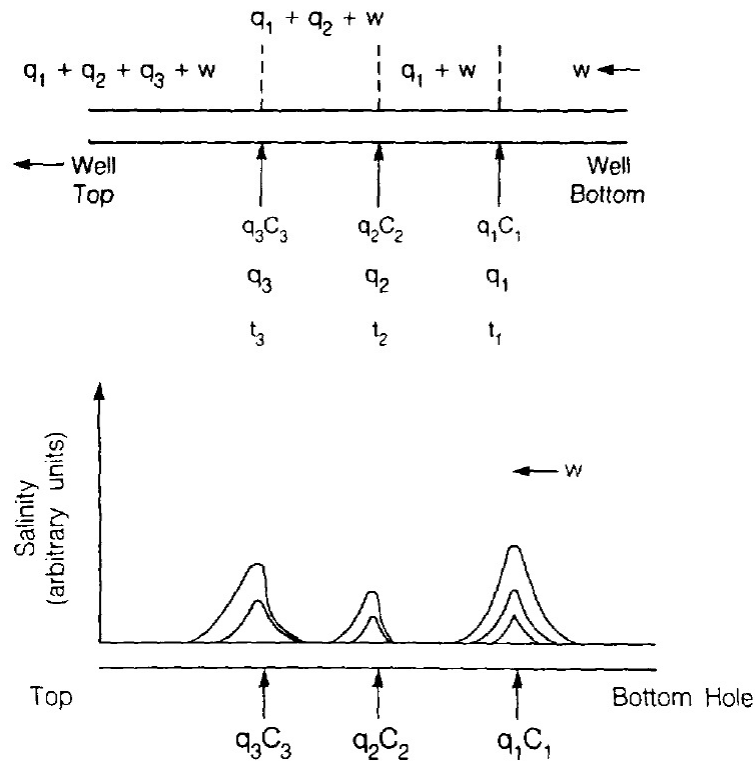


The flowing fluid electric conductivity (FFEC) logging method is a well-logging technique that may be used to estimate flow rate, salinity, transmissivity, and hydraulic head of individual fractures or high permeability zones intersected by a wellbore.

- Wellbore fluid is first replaced with fluid of a contrasting electric conductivity.



- FEC logging is done without pumping the well, with the FEC probe moving from the top to the bottom of the well, producing a baseline (static) FEC profile.
- Repeated FEC logging is done while the well is pumped. Zones where fluid flows into the wellbore (called inflow points) show peaks in the FEC logs, which grow and migrate up the well over time. This peak growth and movement may be analyzed to infer inflow rate and salinity of the individual fractures.



- Conducting the procedure with two or more pumping rates (multi-rate FFEC logging) enables individual fracture transmissivity and hydraulic head to be determined also. Predictions of hydraulic head are often less accurate because they are calculated by taking the difference between two uncertain quantities.
- Points at which fluid flows out of the well into individual fractures (outflow points) may also be included in the analysis. If a wellbore intercepts fractures with distinct hydraulic heads, internal flow within the wellbore may occur when the well is not pumped, with fluid from a high-hydraulic head fracture flowing into the wellbore, flowing along the wellbore, then flowing out into a low-hydraulic head fracture. Additionally, the combination of an inflow point and an outflow point at the same depth may be used to represent regional groundwater flow past the wellbore.
- The results of FFEC logging may be compared with independent salinity measurements and with transmissivity and hydraulic head values obtained from packer tests.