

7.7 Nitrate removal units

Ion exchange, using nitrate-specific anion exchange resins, can be used to remove nitrate ions from water. Water is passed through a bed of anion exchange resin and the anions in the water, including nitrate, are replaced by chloride ions. The resins used are 'nitrate selective', i.e. nitrate is exchanged in preference to other ions such as sulphate and bicarbonate. The chloride concentration in the treated water will invariably be increased, possibly to above the indicator parameter value of 250 mg/l; this could have an adverse effect on the taste of the water but probably would not have implications for health. However, excessive chloride concentrations could lead to corrosion of pipework and fittings.

Ion exchange units are installed in-line and the resin is regenerated as required (manually or automatically) with sodium chloride solution (brine). Microbiological growth on the resin could result in the formation of nitrite from nitrate but, as the brine also acts as a disinfectant, this should not be a problem provided that regeneration is performed at intervals of five days or less. Units incorporating replaceable or disposable cartridges containing resin are also available.

Where anion exchange treatment is applied to a source that exhibits unsatisfactory bacteriological quality, it will be necessary to provide a disinfection stage after the resin.