Extensive pilot plant trials were conducted comparing the long term effect of polymeric and inorganic coagulants on filter performance in terms of head loss development, backwash efficiency and water quality. The use of polymeric coagulants for potable water treatment has become popular in South Africa. It has been postulated that the use of polymers has resulted in an increase in filter problems. The long term impacts of polymeric coagulants on filters investigation was effected by feeding raw water into two identical water treatment streams. One stream employs an inorganic coagulant (alum) whilst the other stream employs blended polymeric coagulant (Z553D).

Filtered turbidity analysis, floc retention analysis and head loss developments were measured during the study. The alum dosed filters maintained the same run length at 100% over dosage. Polymeric dosed filters experienced depth filtration during earlier filtration times (leading to longer filter runs) and then surface filtration (with shorter filter run times) was observed during the later runs. The change in floc penetration behaviour on the polymeric dosed filters resulted in a 50% decrease in filter runs. The backwash efficiency in all the filters was adequate and the decrease in the polymeric filter run times was due to the unreacted residual polymer coating the filter media, thus increasing the adhesive forces on the filter media, preventing depth filtration.

Continued polymer coagulant overdose can result in the reduction of filter run times. This will negatively affect the projected plant water and energy usage. Polymeric coagulant will result in long term filter operational problems due to over dosage sensitivity. Alum coagulants are more forgiving and not as sensitive to over dosage.

**Topic:** Drinking water and bulk water supply