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Application and evaluation of the washing effect in the collector well using pilot plant with washing device

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Riverbed/bank filtration (RBF) is a natural process used as a first step in drinking water treatment. RBF systems consist of well fields that draw water from an aquifer that is hydraulically connected to surface waters.
The benefits of RBF are multiple and include a reduction of turbidity, total coliform, microbial contaminants natural organic matter, and organic contaminants.
Some of the disadvantages of RBF include the difficulty of preventing river water from infiltrating the aquifer in in-stances of severe river contamination, the geochemical reaction of the infiltrate with aquifer materials that may raise the aqueous concentrations of Fe2+, Mn2+, As, NH4+, CH4, Ca2+ and HCO_3- , and clogging of the riverbed. For example, has demonstrated that riverbed clogging may decrease the specific capacity of RBF wells (flow reduction in the collector well etc.).
The objective of this study is to optimization and evaluation the washing effect on various nozzle type and intervals, soil retention rate in the collector well using pilot plant with washing device for prevention flow reduction in the collector well.
The Pilot plant experiments were conducted under various conditions; two kinds nozzle type (spray nozzle of circle type (single – Full Cone, multi – Hollow Cone) and spray nozzle of fan shape type (Veejet)), two different nozzle intervals (200 mm, 400mm) and a various soil retention rate in the collector well ($10 \sim 40\%$).
The results of experiment showed that in the nozzle type case, the washing effect of the veeject nozzle was more effective than other (Full Cone, Hollow Cone) nozzle through spray results (range, strength and height).
In the nozzle interval conditions, washing effect is 200 mm better than 400 mm through spray distance and soil height.
The washing efficiency in the collector well increased on soil retention rate decreased and the nozzle injection pressure increased using washing device