



AquaNES Water Treatment Site India

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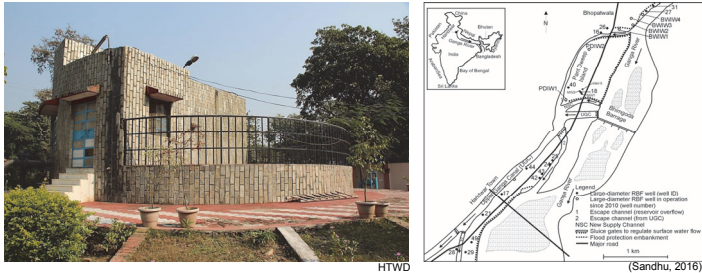


Site 5

Scope of WP 1 activities – Bank Filtration combined with electro-chlorination

In Uttarakhand two different small scale solar driven electro-chlorination units will be installed. Their main feature is the electrolytic and chemical free production of disinfectant for the supply of safe drinking water for remote villages. The first unit will receive filtrate that has passed the banks of the river and infiltrated into a large diameter bottom entry well. The second unit will receive filtrate that has passed the river bed and infiltrated into a Koop-well.

Bottom entry well setup



Figures 1- 3: Haridwar demo site for bottom entry well

Koop-well setup



Figures 6-7: Koop-well demo site in Julu, near Haridwar

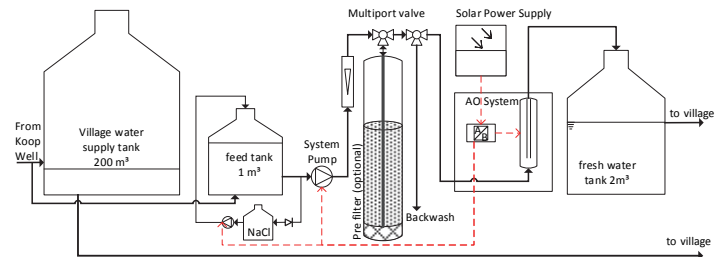


Figure 8: Proposed flow chart for Koop-well site

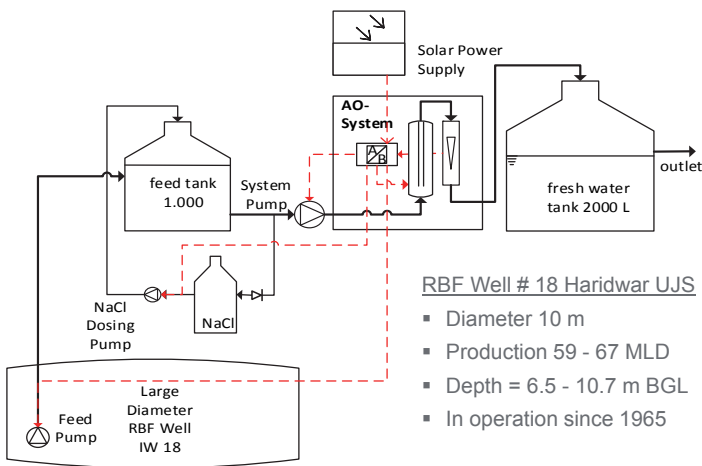


Figure 4: Proposed flow chart for bottom entry infiltration well site

Data of infiltration wells

Table 1: Water quality parameters

Parameter	Bottom entry well	Koop Well
EC [$\mu\text{S}/\text{cm}$]	384	332
pH	7.8	7.6
Chloride [mg/L]	6.1 (NaCl dosing may be required)	2.7 (NaCl dosing required)
Iron [mg/L]	0.05	0.06
Manganese [mg/L]	0.02	< 0.002
Phosphate [mg/L] ($\text{PO}_4\text{-P}$)	--	--
Total Hardness (calc.) [$^\circ\text{dH}$]	4.9	6.0
Arsenic [$\mu\text{g}/\text{L}$]	2.2	1.1
Calcium [mg/L]	22.3	31.7
Nitrate $\text{NO}_3\text{-N}$ [mg/L]	3.3	0.2

Targets

- Market-ready coupling of BF with small scale solar driven on-site electro-chlorination modules for disinfection (TRL 6-8).
 - Bank Filtrate
 - Koop Well
 - Pre-Filtration unit
- Minimization of chloride dosing
- Evaluation of ORP measurements
- Implementation of online monitoring in India

Pilot plant setup

- Flow rate: $Q = 300 - 500 \text{ L/h}$
- Residual chlorine $0.3 - 0.6 \text{ mg/L}$
- Pre-filtration
- BF and Koop-well supply

Performance Evaluation

- Energy consumption
- Water quantity
- Removal of turbidity and pathogens

Literature

Sandhu C (2015) A Concept for the Investigation of Riverbank Filtration Sites for Potable Water Supply in India. PhD thesis, TU Dresden, Faculty of Environmental Sciences, Dresden, in cooperation with University of Applied Sciences (HTW) Dresden, Faculty of Civil Engineering & Architecture, Division of Water Sciences, Dresden, Germany

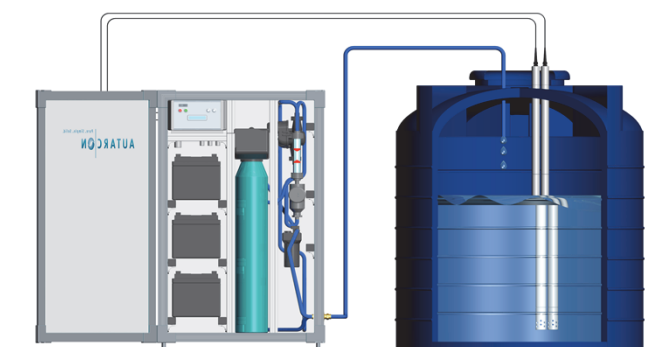


Figure 5: Planned system setting

