

Supplementary Documents

Drinking Water Production for CKDu Affected Areas of Sri Lanka Using Nano-Filtration Membrane Technology: From Laboratory to Practice

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Table S1. The list of equipment used in pilot plant construction

Category	Name	Specification /model	Number
Pretreatment system			
1	Raw water tank	volume: 300L, material: Stainless steel	1
2	Pre-filter	Stainless steel strainer ~ 100 μ m Flow 3m ³ /h	1
3	Liquid level switch		2
4	Raw water pump	Flow rate: 2m ³ , lift: 32m, power: 550W , material: stainless steel	1
5	Pressure gauge	0-0.6MPa	1
6	Multi media filter	ϕ 350*1400 material: FRP	1
	Filler 1	Refined quartz sand (~2mm)	150 kg
	Filler 2	Activated Carbon	50 kg
7	Automatic softner	ϕ 350*1400 material: FRP	1
	filler	Ion exchange resin	75 kg
Nanofiltration device			
1	Precision filter	2m ³ /h material: PE , pore : 10 μ m	1
2	Filter element	20 inch 5 micron	1
3	Security Filter	2m ³ /h material: PE , pore : 5 μ m	1
4	Nanofiltration device	Output: 1 T / h design temperature: 25 C	1
5	Vertical multistage high pressure pump	Flow rate: 2.94m ³ lift: 83m power: 1.5kW material: stainless steel	1
6	Pressure vessle	4 inch, material: stainless steel.	4
7	Dosing pump	200ml/h, 5bar	1
8	Dosing box	50L	1
9	Frame	Stainless steel	1
10	Pressure switch	0~0.6MPa	1
11	Product water flowmeter	1~10GPM	1
12	Concentrated water flowmeter	0~5GPM	1
13	Concentrated water	1~10GPM	1

	return flowmeter		
14	Conductivity meter		1
15	Inlet pressure gauge	0~1.6MPa	1
16	Concentrated water pressure gauge	0~1.6MPa	1
(3) Scale inhibitor dosing device			
1	Metering pump	200ml/h, 5bar	1
2	Liquid level switch		1
3	Metering box	50L	1
(4) Cleaning device			
1	Cleaning water tank	50L	1
(5) Water supply system			
1	Treatwd water tank	Volume: 500L, material: stainless steel	1
2	Liquid level switch		2
3	Solenoid valve	DN40, PN0.6, Stainless steel	1
4	Water supply pump	Flow rate: 5.0m3/h lift: 26m power: 0.75kW material: stainless steel	1
5	Ultraviolet sterilizer	flow: 2T/h	1
6	Ozone generator	Ozone production is 300 milligrams per hour AC220V	1
(6) Pipes and valves			1
(7) Electric control system			1
(8) Housing box / room	Housing	Size: long 2050* width 1650* hight 2200mm Material: hot-dip galvanized sheet, spray molding powder.	1



Figure S1. Constructed NF water treatment station

Equation S1

- Equation to calculate hardness values based on Ca and Mg concentrations in equivalent of CaCO₃ mg/L

$$\text{Hardness [mg/L]} = 2.497 [\text{Ca, mg/L}] + 4.118 [\text{Mg, mg/L}]$$

Table S2. Locations of RO Plants

Plant number	X	Y	Latitude	Longitude
RO1	164639	372434	8.5597	80.4504
RO2	171129	339015	8.2576	80.5096
RO3	219761	146785	6.5192	80.9504
RO4	219356	149230	6.5413	80.9468
RO5	217096	154069	6.5851	80.9263
RO6	225871	146026	6.5123	81.0057
RO7	180483	302581	7.9281	80.5947
RO8	135984	328748	8.1644	80.1907
NF plant	141472	328148	8.1590	80.2410