

Private Homeowner Drinking Water Issues

Presenter

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Water Treatment

disinfection

anion exchange

oxidation

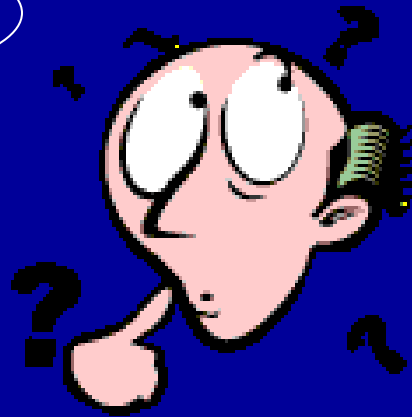
cation exchange

pH adjustment

filtration

adsorption

demineralization



Match the pollutant with the correct process!

Recommendations

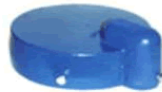
- Evaluate Existing Source
- Maintenance and Inspection
- Repair Existing Source
- Pollution Control Measures
- Treatment- POU, POE, or other

Explore all of them before taking action!

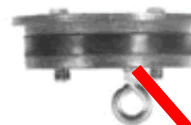
Evaluate Well Change Well Cap

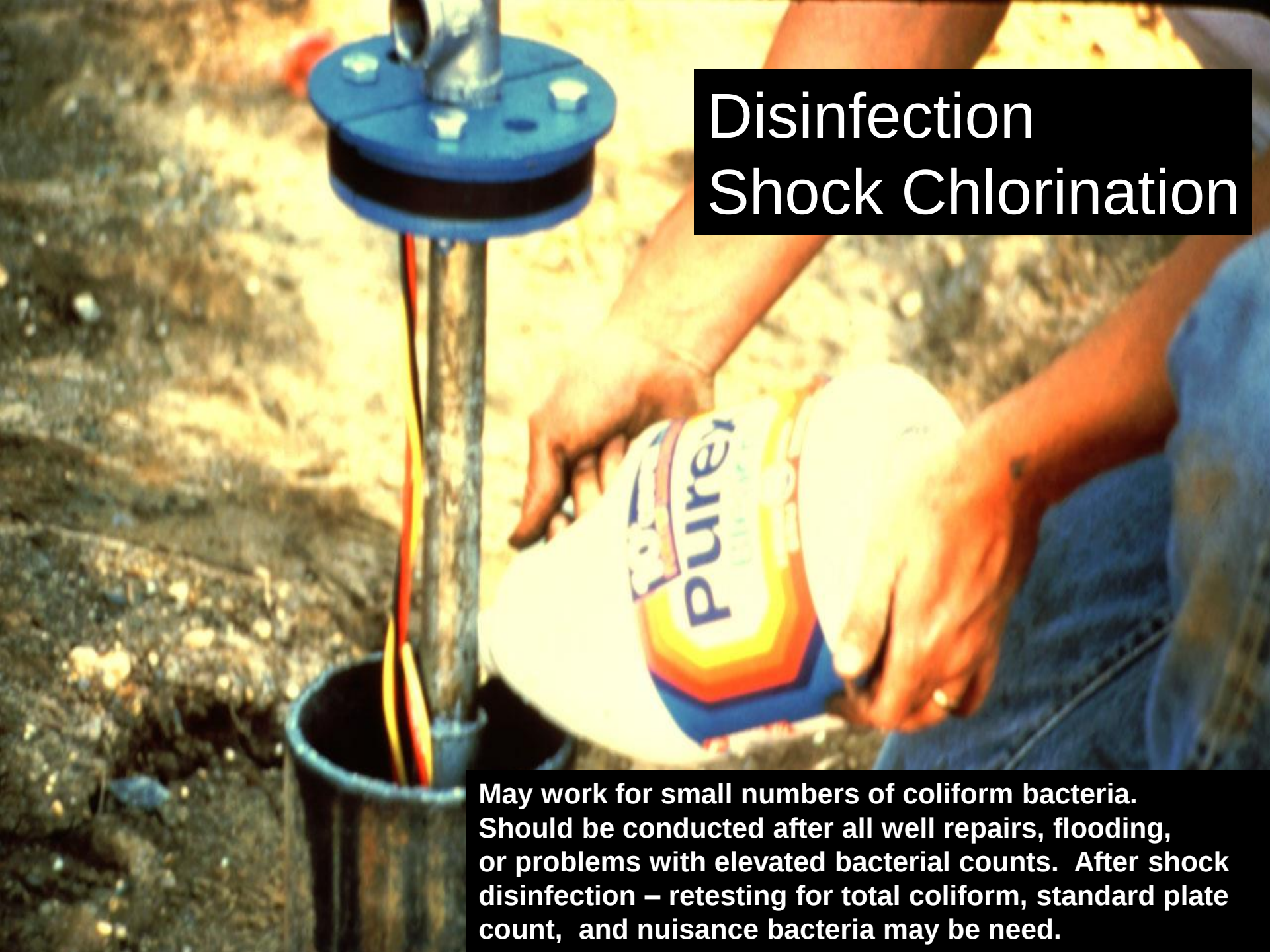
Loose-fitting vs. Sanitary
Sealed Well Caps

CAP



SEAL



A close-up photograph showing a person's hands pouring a white liquid from a white plastic jug labeled 'Pureit' into a blue plastic device. The device is mounted on a metal rod that goes into a well. The background is a rough, sandy or rocky surface.

Disinfection Shock Chlorination

May work for small numbers of coliform bacteria. Should be conducted after all well repairs, flooding, or problems with elevated bacterial counts. After shock disinfection – retesting for total coliform, standard plate count, and nuisance bacteria may be need.

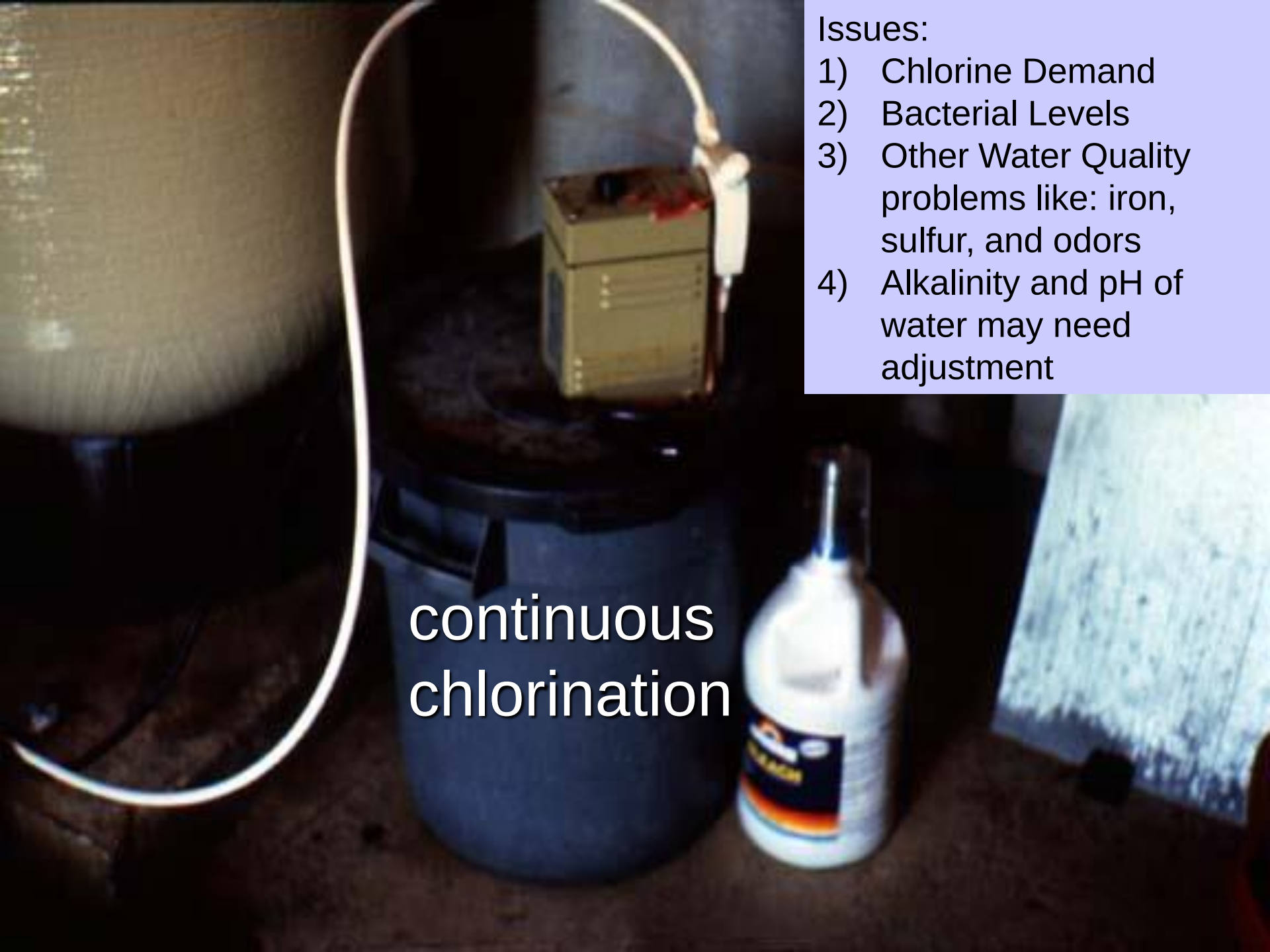
Iron / Nuisance Bacteria

- Periodic shock well disinfections
- Drop tablets chlorinators
- Chlorine feed system
- Ozone treatment
- UV treatment — may be possible
probably Class A Unit (turbidity, hardness, iron,
manganese issues)



Whole House Treatment

Point of Entry (POE)



continuous
chlorination

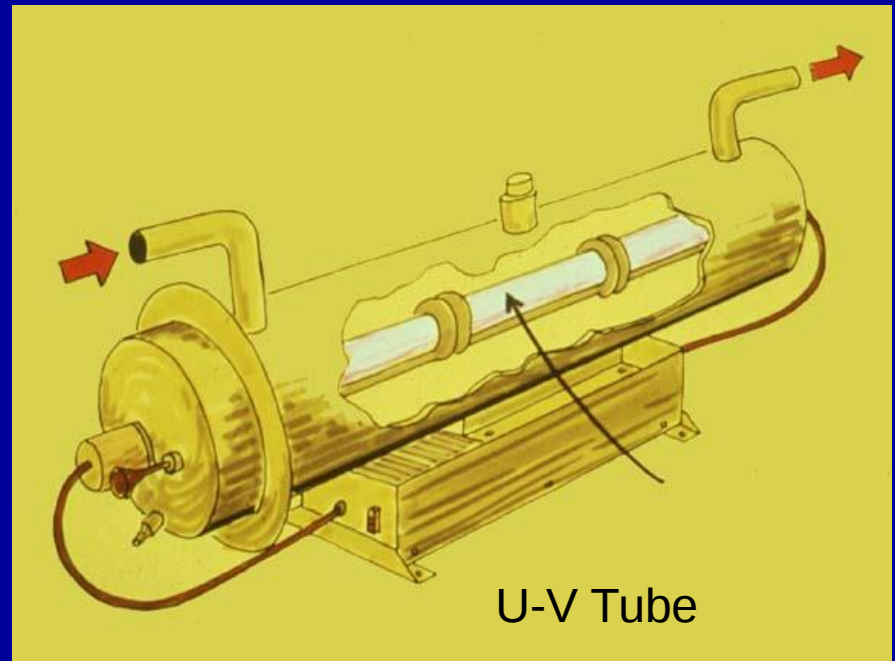
Issues:

- 1) Chlorine Demand
- 2) Bacterial Levels
- 3) Other Water Quality problems like: iron, sulfur, and odors
- 4) Alkalinity and pH of water may need adjustment

U-V Sterilizer

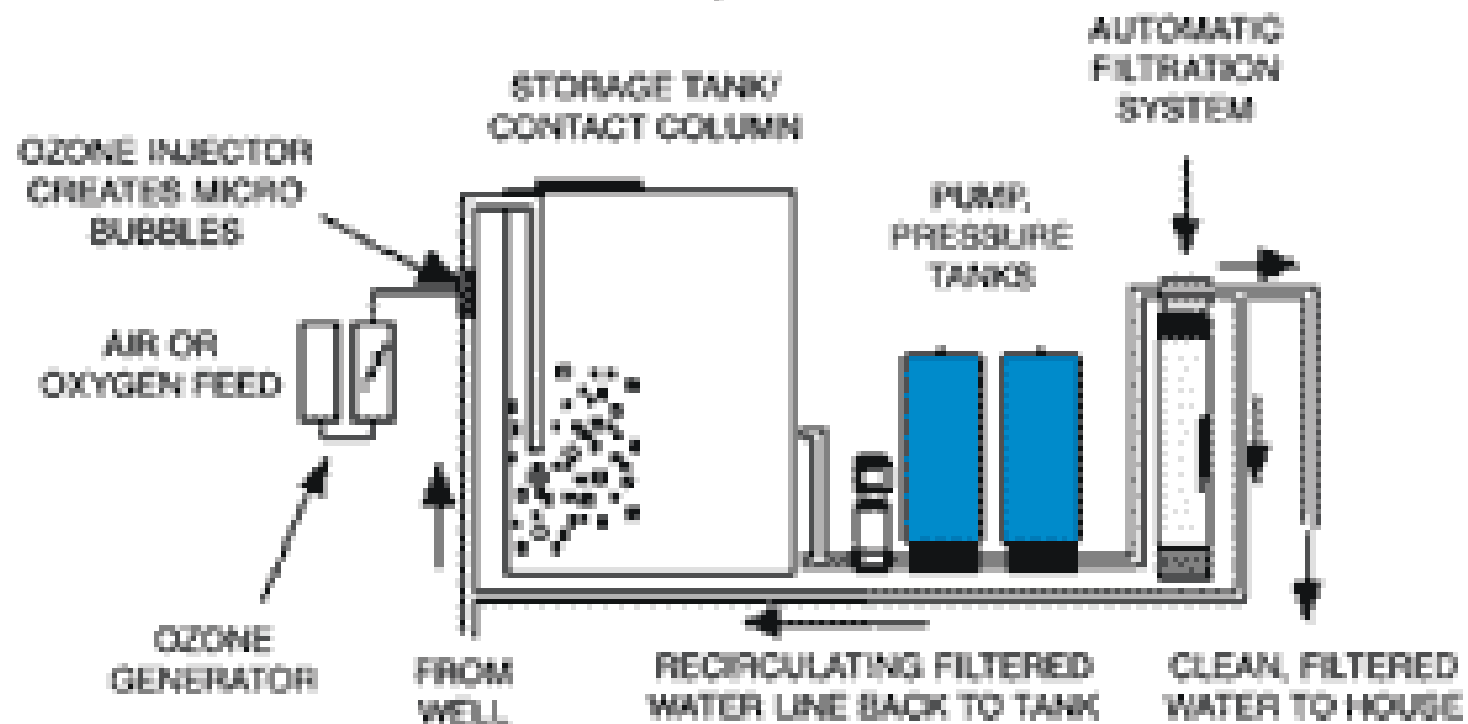
The Selection of UV
Unit system depends on the
following:

- a) General Water Quality
- b) Turbidity
- c) Hardness
- d) Iron and Manganese
- e) Bacterial Levels
- f) Source Water Type and Overall
Water Quality ?



Ozone

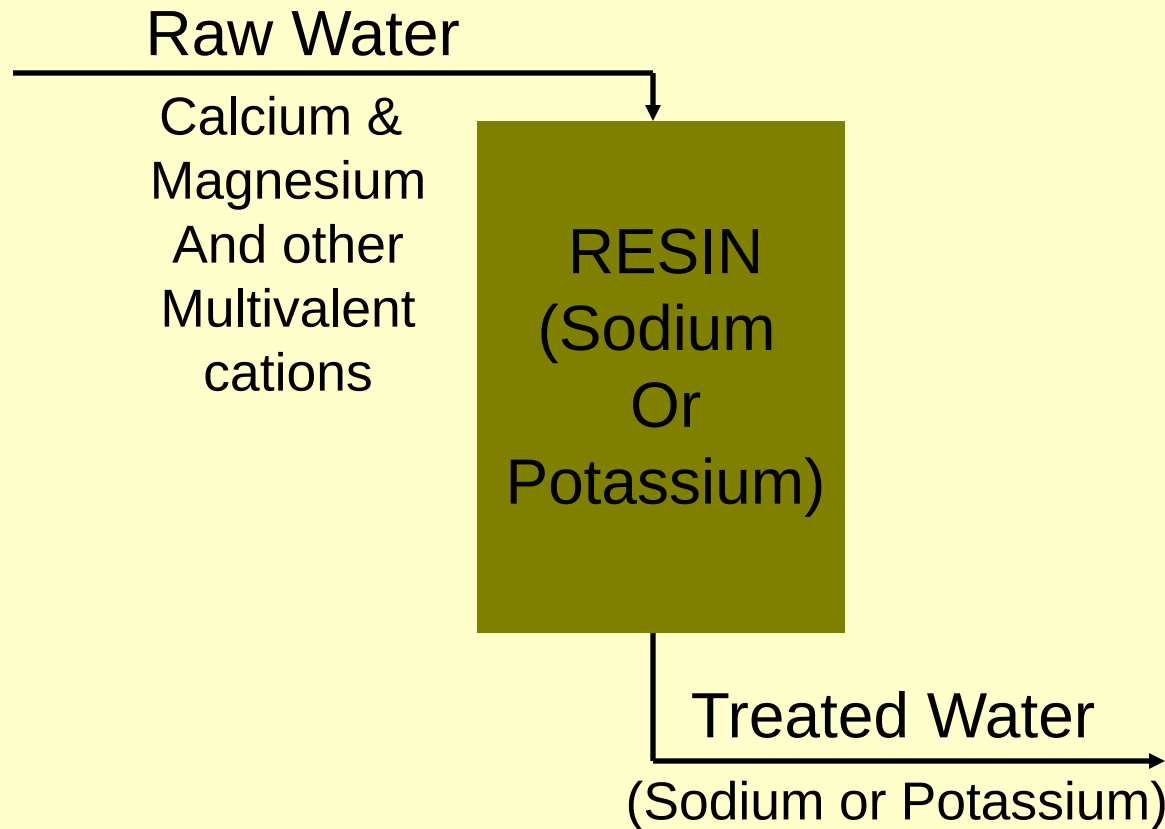
AUTOMATIC OZONE INJECTION, FILTRATION AND RECIRCULATION SYSTEM FOR IRON, MANGANESE



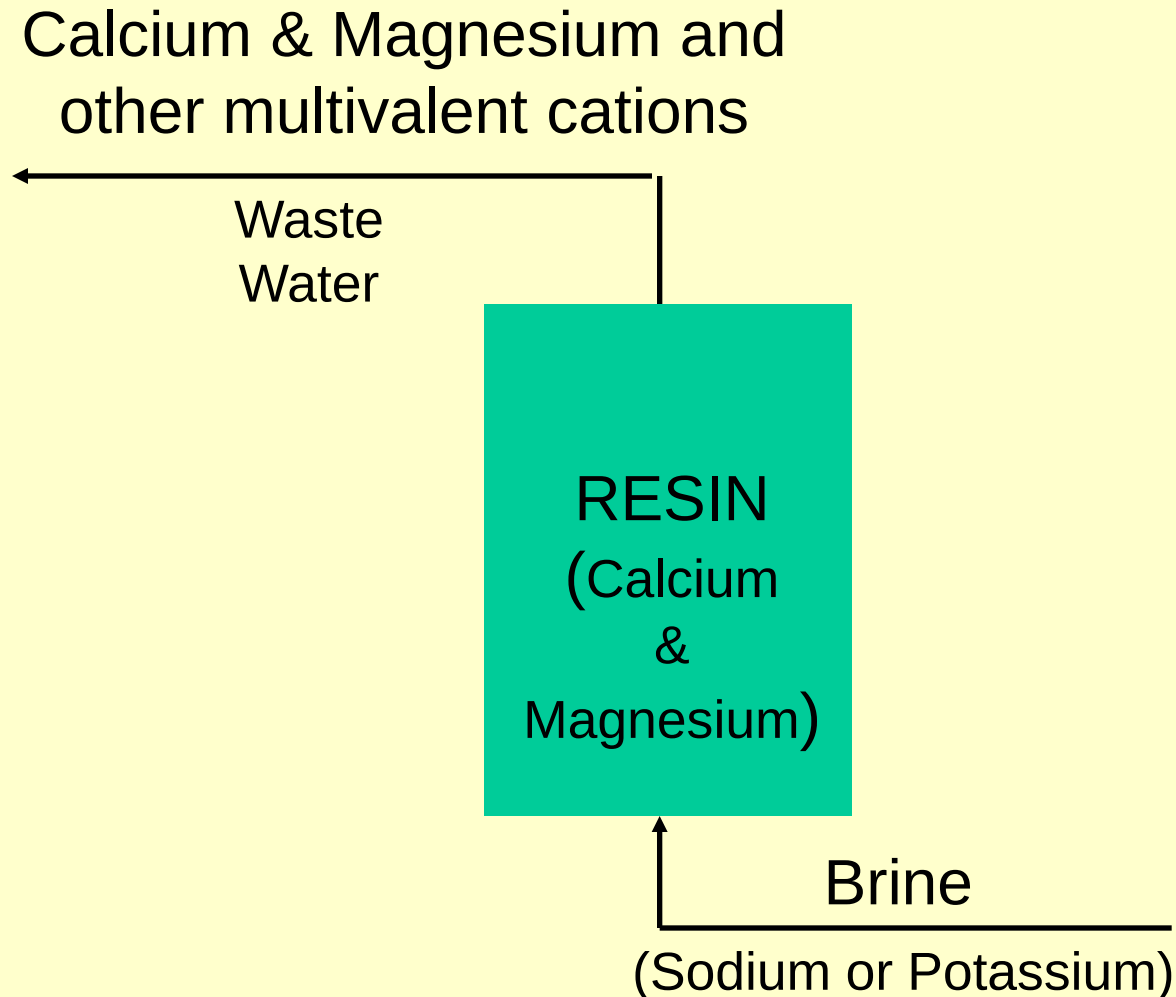
Water Softener

Do Not Remove All the Water Hardness !

Ion Exchange: Sodium for Calcium & Magnesium



Recharge with Brine



Carbon Filtration

- Uses
 - Remove man-made organic chemicals
 - Remove miscellaneous tastes and odor from water – **assuming no bacterial problems**
 - Remove radon gas from water
- Maintenance
 - Carbon must be replaced routinely

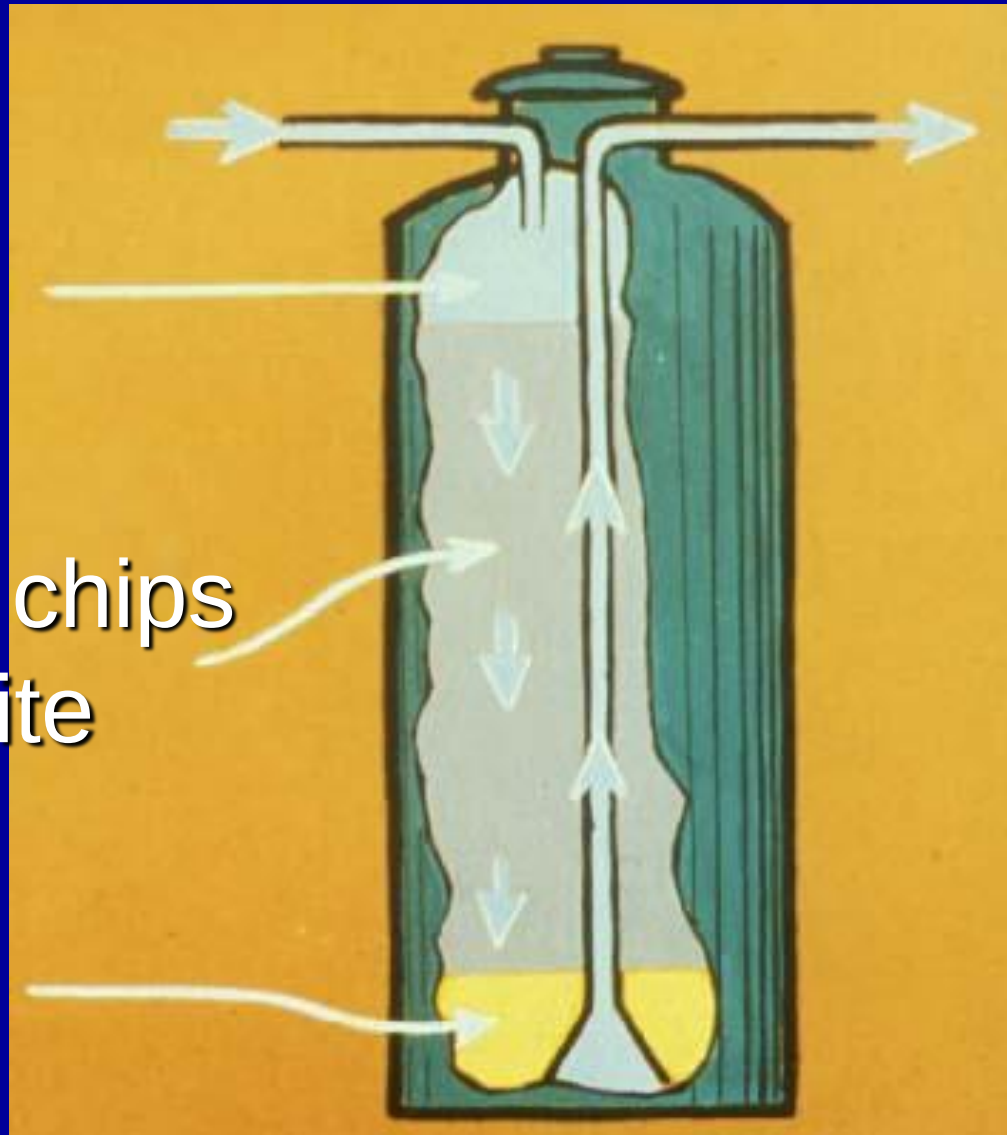


Acid (Corrosive Water) Control

Water

Limestone chips
or calcite

Gravel



Iron Removal

- Form and concentration is important
 - Oxidized = visible, orange stain
 - Reduced = colorless
- Removal Methods
 - Water Softener
 - Chlorination / Filtration
 - Oxidizing Filter
 - Ozone

Hydrogen Sulfide

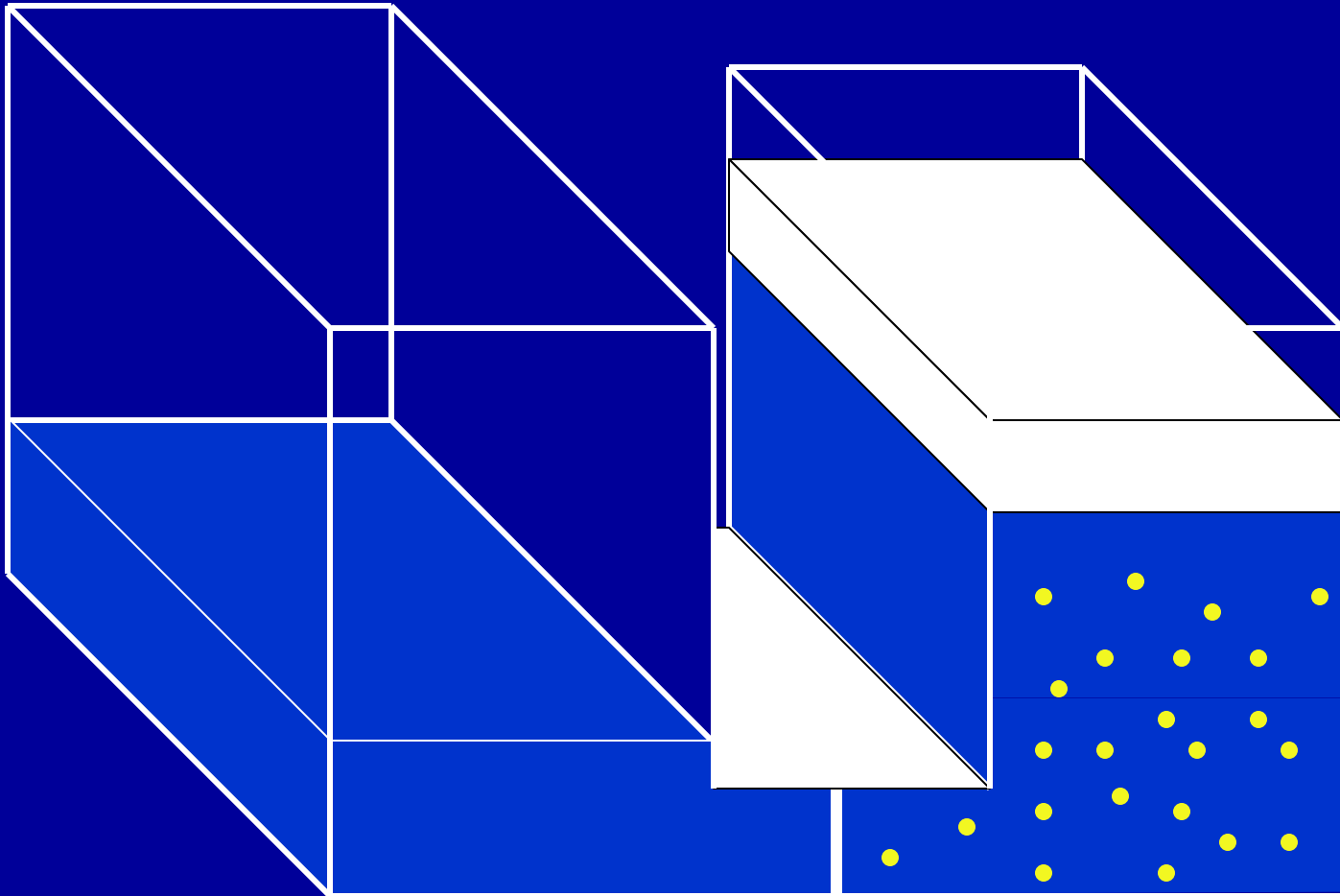
- Hot water only?
 - Adjust water heater to a temperature of 160C for 12 to 24 hours and then flush
 - remove or replace rod in heater (Warranty Issues)
- Carbon Filtration- no bacterial problem
- Chlorination/ Contact Tank / Filtration
- Aeration- no bacterial problem
- Oxidizing filter- manganese greensand

At the Sink

Point of Use (POU)

Reverse Osmosis

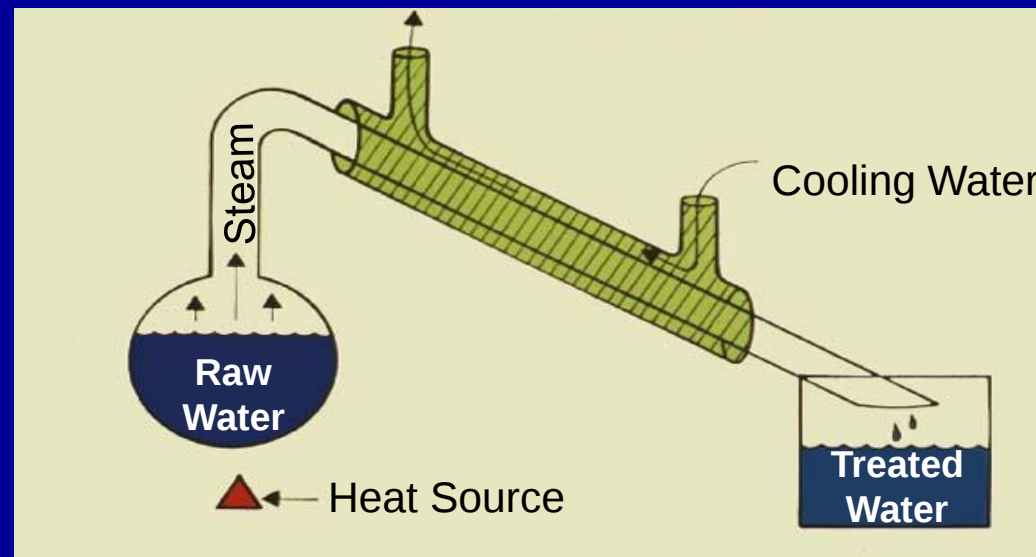
- force water through membrane
- removes many contaminants





Distillation

- heat water to boiling
- condense vapor
- ions left behind
- energy intensive



Units are rated for Water that meets Drinking Water Standards
Not for Water with Levels above the Drinking Water Standard



Typically these are small carbon-block filters that will remove particles, reduce odors and taste problems, and have a limited exchange capacity for hardness and trace metals.

Before You Buy Treatment Equipment

Get the Facts- Not the Sales Pitch

- Have your water tested by a reputable accredited, approved, and/or certified lab
 - Don't rely on in-home water test results.
 - Don't rely on free water tests.
- Consult unbiased water quality experts and get multiple quotes for a system.
- Explore all alternatives
 - Well rehabilitation, New source, Local Pollution Control, Maintenance

Tips for Buying Treatment Equipment

- Seek reputable companies that have been around
- Ask for customer references
- Research company history
- Beware of hard sale techniques (scare tactics)
- Ask about maintenance requirements
- Get a detailed warranty
- Look for NSF and WQA certifications
- EPA certification means nothing
- Get everything in writing!
- If it sounds too good - it is!

Sample No. 1

Test	Result	Maximum Contaminant Level (MCL)
Coliform bacteria	2 /100 mL	<1 /100 mL
Nitrate-N	1 mg/L	10 mg/L
pH	6.7	6.5 to 8.5**
Hardness	100 mg/L 6 gpg	No MCL (7-10 gpg is very hard)
Iron	0 mg/L	0.3 mg/L **

gpg = grains per gallon (1 gpg = 17.1 mg/L), ** = Recommended standard (RMCL)

Recommendation ?

Shock chlorination and retesting, possible continuous disinfection

Sample No. 2

Test	Result	Maximum Contaminant Level (MCL)
Coliform bacteria	150 /100 mL	<1 /100 mL
Nitrate-N	1 mg/L	10 mg/L
pH	6.7	6.5 to 8.5**
Hardness	100 mg/L 6 gpg	No MCL (7-10 gpg is very hard)
Iron	0 mg/L	0.3 mg/L **

gpg = grains per gallon (1 gpg = 17.1 mg/L), ** = Recommended standard (RMCL)

Recommendation ?

Shock Treatment and Retesting and Possibly Chlorination or UV light or Ozone

Sample No. 3

Test	Result	Maximum Contaminant Level (MCL)
Coliform bacteria	0 /100 mL	<1 /100 mL
Nitrate-N	1 mg/L	10 mg/L
pH	6.8	6.5 to 8.5**
Hardness	34 mg/L 2 gpg	No MCL (7-10 gpg is very hard)
Iron	7.0 mg/L	0.3 mg/L **

gpg = grains per gallon (1 gpg = 17.1 mg/L), ** = Recommended standard (RMCL)

Recommendation ?
Oxidizing filter or Ozone

Sample No. 4

Test	Result	Maximum Contaminant Level (MCL)
Coliform bacteria	0 /100 mL	<1 /100 mL
Nitrate-N	1 mg/L	10 mg/L
pH	7.0	6.5 to 8.5**
Hardness	154 mg/L 9 gpg	No MCL (7-10 gpg is very hard)
Iron	0.5 mg/L	0.3 mg/L **

gpg = grains per gallon (1 gpg = 17.1 mg/L), ** = Recommended standard (RMCL)

Recommendation ?
Water softener

Sample No. 5

Test	Result	Maximum Contaminant Level (MCL)
Coliform bacteria	0 /100 mL	<1 /100 mL
Nitrate-N	3 mg/L	10 mg/L
pH	5.1	6.5 to 8.5**
Hardness	17 mg/L 1 gpg	No MCL (7-10 gpg is very hard)
Iron	0 mg/L	0.3 mg/L **

gpg = grains per gallon (1 gpg = 17.1 mg/L), ** = Recommended standard (RMCL)

Recommendation ?
Acid Neutralizing Filter

Sample No. 6

Test	Result	Maximum Contaminant Level (MCL)
Coliform bacteria	0 /100 mL	<1 /100 mL
Nitrate-N	27 mg/L	10 mg/L
pH	7.0	6.5 to 8.5**
Hardness	100 mg/L 6 gpg	No MCL (7-10 gpg is very hard)
Iron	0 mg/L	0.3 mg/L **

gpg = grains per gallon (1 gpg = 17.1 mg/L), ** = Recommended standard (RMCL)

Recommendation ?
POU system or anion exchange



Questions?

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