

**INFORMATION SHEET
METHODS FOR REMOVING URANIUM FROM DRINKING WATER**

There are options to remove uranium from drinking water using point-of-use (POU) devices based on the principles of either reverse osmosis or point-of-entry (POE) devices based on ion exchange. Systems utilizing these principles are capable of providing adequate amounts of drinking water for residential use in an economical manner. A brief discussion of these approaches is provided below.

1. What is reverse osmosis?

Reverse osmosis (RO) is a process that filters most impurities from water by passing the water through a very fine membrane that keeps the minerals, including uranium, behind.

2. Who can use reverse osmosis?

The RO unit works for small point-of-entry systems, institutions, and individual households.

3. Can I use the reverse osmosis unit to treat my entire water supply?

It is generally only economical to use it for drinking/cooking water supplies in institutions and households. High-capacity systems to treat the entire water supply are very expensive.

4. Is the reverse osmosis unit reliable?

Yes, the RO unit is reliable.

5. How effective is the reverse osmosis unit?

Tests show that the RO unit generally removes 90 per cent of the uranium. The efficiency of the unit depends on the manufacturer and the type of membrane in the unit. Higher efficiencies can be obtained.

7. Is the reverse osmosis unit affected by raw water quality?

An RO unit may be greatly affected by raw water that is muddy or cloudy, hard, or high in chlorine and dissolved minerals. You may need to upgrade the quality of your raw water with a pre-filter before you use reverse osmosis.

8. How practical or difficult is the reverse osmosis unit to operate and maintain?

The RO unit is simple to operate and to maintain. It is practical for institutions and households. It can be practical for small point-of-entry systems that use high-quality units.

9. How much does the reverse osmosis unit cost?

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A unit that is large enough to treat household drinking/cooking water is expected to be in the \$700 - \$1000 range (2005 prices) plus the installation. Central systems or institutional-size units are more expensive.

8. About how long does the reverse osmosis unit last?

The RO unit has a long life but does require proper maintenance for peak operation.

9. How much does it cost operate and maintain the reverse osmosis unit?

RO units work off pump pressure so the operating cost is low. The membrane should last up to five years, depending on the quality of your raw water. The cost of replacement membrane filters is relatively economical.

10. What happens to the substances that are taken from the water?

They are flushed through the your septic system or drainage system.

11. How much waste water is created by the reverse osmosis unit and how is it disposed of?

Half of the water drawn from a well and processed through an RO unit will be waste water, which is flushed out the drainage system. Waste water can be recycled in some systems.

12. Does the reverse osmosis unit remove other contaminants from water supplies?

The RO unit can remove a wide range of contaminants including arsenic, chloride, and nitrates. It removes nearly all particles and most ions you might expect to find in drinking water.

13. Does reverse osmosis have any side effects?

Water treated by the RO unit can be corrosive because so much of the mineral has been removed. In general this is not a problem in a point-of-use system. Point-of-entry might require an additional treatment step to protect water pipes and plumbing fixtures against corrosion.

14. Where can I get the reverse osmosis unit?

For more information check the Yellow Pages of your telephone book under the heading Water Treatment for a list of water treatment dealers. The Internet also provides links to various sources of information for purchasing a water treatment unit.

The following section of this Fact Sheet discusses the application of anionic exchange-based system to remove uranium.

15. How does anion exchange remove uranium?

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Anionic exchange units work on the principle of exchanging less harmful anions (i.e. sulphates) bound to a resin with the anions present in the water (i.e. negatively charged uranium complex) to be removed.

16. I use an anion exchange-based unit to treat my entire water supply?

Anion exchange systems are typically point-of-entry (POE) systems, meaning that they treat all of the water coming into the home.

17. How effective is the anion exchange unit?

Anionic exchange units are effective but require maintenance. The efficiency of the unit depends on the manufacturer and the model.

18. Is the anion exchange unit affected by raw water quality?

An ion exchange unit may be greatly affected by raw water that is hard or high in chlorine or dissolved minerals. Systems under such operating conditions will require more frequent recharge of the ion exchange resin as well as other maintenance.

19. How practical or difficult is the anionic exchange unit to operate and maintain?

The anion exchange unit does require more frequent maintenance. Recharge of the ion exchange resin results in waste that must be disposed of properly. Due to the technical skills required in properly maintaining anion exchange-based systems, it is more practical for these systems to be used in institutions rather than in households.

20. About how long does the anion exchange unit last?

As typical of any water treatment devices, the unit has a long life but does require proper maintenance for peak operation. The frequency of maintenance will depend on the raw water quality.

CONCLUSION

This Information Sheet has provided a brief overview of the treatment systems. While reverse osmosis-based systems are easier to operate for residential use, a water treatment professional should be consulted for advice on your particular situation. He or she will also be able to provide you with a more accurate cost of the system, installation costs, and maintenance costs.