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# ENVIRONMENTAL Fact Sheet

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WD-WSEB-2-10

2002

## Magnetic/Electronic Water Treatment Devices

### Hardness

Hardness is a major water quality problem in some wells in New Hampshire. The principle problems associated with hardness include, the occurrence of a soft soap scum residue and the accumulation of a hard mineral scale on the inside of piping, particularly at points where water is heated. There are no health concerns, associated with hardness.

### Water Softening and Membrane Separation

The conventional water treatment method for reducing hardness minerals is by either "water softening" or, more recently, by "membrane separation". Water softening, known technically as "ion exchange", uses the sodium portion of ordinary salt to exchange with the hardness minerals. In the newer process, nanofiltration membrane material is used to separate hardness minerals from water by crossflow "filtration." In either treatment method, laboratory tests conducted on the finished water determine the success of treatment by measuring the amount of residual hardness remaining in the treated water. Please see fact sheet [WD-WSEB-3-6](#) and [3-12](#) for more detail concerning the removal of hardness in drinking water **using water softening**.

### Magnetic / Electronic Treatment Processes

A newest method of proposed treatment consists of using magnetic or electric energy fields (abbreviated M/E in this document) to "condition" the water so that the scale formation associated with the presence of hardness is either reduced or totally eliminated. This treatment method has low capital and operational cost and does not use chemicals. The effectiveness of M/E treatment however is disputed.

### Effectiveness

Some non-conventional, long term side-by-side comparative tests have reportedly been performed on M/E treatment devices. Some of these studies are reported to have produced beneficial results. These studies have been generally conducted in Europe.

There are many brand names in the M/E field with different explanations of how their proprietary treatment process works. Assuming some merit in the process, there may be widely difference efficiencies between various brand names.

Since M/E methods do not remove the hardness minerals, conventional testing for the hardness remaining in treated water, **can not be used** to judge the treatment effectiveness. This has created a dilemma related to how to **scientifically** judge the effectiveness of these devices. **As of this writing, DES does not have sufficient independent technical data to judge the effectiveness of M/E treatment.**

### The Future

There has been significant disagreement between opponents and advocates of M/E treatment in the

past relative to how to evaluate M/E methods. More recently, there seems to be some agreement that a detailed scientific study is needed to conclusively prove the worth of these devices. Issues that still need to be resolved before that study can begin include:

Who will fund the study?

Who will develop the test protocol?

Who will conduct the third party testing?

Which device(s) will "represent" the M/E treatment industry?

### **Testing Entity**

One of the possible third party testing entities that might do such evaluation would be NSF, International. This group is identified below.

### **Professional Groups**

M/E devices are most commonly categorized as part of the point-of-use (POU) or point-of-entry (POE) drinking water treatment profession. The professional group representing this industry is the Water Quality Association identified below. In addition a newly forming organization that may represent just the M/E portion of the treatment industry is shown below to the right.

#### **NSF, International**

3475 Plymouth Road Box 130140  
Ann Arbor, MI 48113-0140  
1-313-769-8010

#### **Water Quality Association**

(POU), 4151 Naperville Road  
Leslie, IL 60532-3696  
1-630-505-0160

#### **US Physical Water Cond. Assoc.**

Charles H. Sanderson Jr.  
Fort Wayne, IN

### **Periodicals**

For more information concerning M/E treatment please refer to:

1. The April 1998 issue of Water Technology magazine. This article explains, in detail, the present status of the M/E treatment debate and the potential for its resolution.
2. Also see a more general M/E article in the October, 1998 edition of *Water Conditioning and Purification* magazine.

### **FOR MORE INFORMATION**

For an overall listing of water supply related fact sheets, please request DES fact sheet [WD-WSEB-15-2](#). For more information concerning water treatment of private wells, please call the DES's Water Supply Engineering Bureau at 271-3139. We would appreciate your comments concerning this fact sheet. Drinking water fact sheets are available through the DES web site at:

<http://www.des.nh.gov/wseb>, then select: [fact sheets](#). Please check the DES internet annually for updates to this document. 3/02