

DATE: June 3, 2024

FILE REF: 3320

TO: **Wisconsin Licensed Well Drillers**FROM: Marty Nessman, Private Water Supply Section Manager  
Bureau of Drinking Water and GroundwaterSUBJECT: **MODIFICATION TO SPECIAL WELL CASING PIPE DEPTH  
AREAS # 79a and 79b,  
Outagamie County (entire county) and Winnebago County (entire county)**

Special Well Casing Pipe Depth Areas #79a and 79b are hereby modified for Outagamie and Winnebago Counties as described in detail below. This modification removes special casing requirements for portions of western Outagamie and northwestern Winnebago County and provides an option for mixing cement on-site when constructing wells that require less than 200 feet of cement grouted casing. These modifications only apply to casing requirements related to naturally occurring arsenic and do not apply to other casing requirements designed to prevent contamination of drinking water from other sources.

**EFFECTIVE DATE:** This modification to Special Well Casing Pipe Depth Areas #79a and 79b is effective June 3, 2024.

**LOCATION**

This modification applies to existing Special Well Casing Pipe Depth Areas #79a and 79b, which apply in the entire land areas of Outagamie and Winnebago County.

**Special casing depth requirements are rescinded and no longer apply to entirety of the following Townships within each county:**

**Outagamie:**

T. of Deer Creek - T24N, R 15E  
T. of Maine – T24N, R16E  
T. of Maple Creek and North Part of Liberty – T 23N, R15E

**Winnebago:**

T. of Wolf River – T20N, R14E

**Special casing depth requirements have been modified, as indicated on the attached maps, for the following Townships within each county:**

**Outagamie:**

T. of Bovina – T23N, R16E  
T. of Dale & Hortonia – T21N, R15E  
T. of Liberty and Hortonia – T22N, R15E  
T. of Ellington – T20N, R14E

**Winnebago:**

T. of Winchester – T20N, R15E  
T. of Rushford and Omro – T18N, R14E  
T. of Pogan – T19N, R14E  
T. of Winneconne – T19N, R15E

### **JUSTIFICATION**

The establishment of this “Special Well Casing Pipe Depth Area” was based on the potential that new wells constructed in this area to minimum Private Well Code (NR 812) specifications would be at significant risk to arsenic contamination. The drilling and construction specifications have been very successful at reducing incidence of wells producing water over the arsenic standard of 10 ppb. Recently the department was petitioned to consider removing additional casing and grouting requirements in portions of western Outagamie and northwest Winnebago Counties where Cambrian sandstone is the first bedrock encountered, and to provide an option for the use of neat cement grout mixed on-site in areas where 200 feet or less of cement grouted casing is required.

### **NEW WELL CONSTRUCTION, GROUTING AND DISINFECTION SPECIFICATIONS**

Within this “Special Well Casing Pipe Depth Area”, private wells shall be constructed with alternate construction methods and more stringent specifications for construction, grouting and disinfection. Attached to this memo are modified maps showing the areas within Outagamie and Winnebago Counties that require additional casing depths and construction features.

Any new well construction, or existing well reconstruction, within this area on or after the effective date shall be constructed, cement-grouted and disinfected to the following specifications:

1. For 6-inch diameter wells, the upper-enlarged drillhole shall have a minimum diameter of 8 <sup>3</sup>/<sub>4</sub> inches rather than the minimum 8-inch diameter. For larger diameter wells, the upper-enlarged drillhole shall be at least 2 inches larger in diameter than the nominal diameter of the permanent well casing pipe.
2. The upper-enlarged drillhole shall be constructed using rotary mud-circulation methods or cable-tool methods. Rotary-air methods may **not** be used for this purpose. The size of the mud pit shall have a volume large enough to provide for efficient removal of drill cuttings. Further, a centrifuge sand separator shall be properly installed for continuous use with the mud circulation system to help remove sand-sized drill cuttings that may contain arsenic-laden sulfide minerals.
3. Water used to mix the drilling mud slurry shall have a pH between 7 and 8.5. If the pH is below 7, it shall be slowly treated with soda ash to achieve a pH within this range.
4. **For areas where more than 200 feet of cement grouted casing is required, the cement grout shall be ordered from a commercial concrete company, shall be ordered free of aggregate, and shall have a slurry density of at least 15.2 lbs./ gallon, but preferably should have a density of 15.6 lbs./gal. The grout density shall be measured with a mud balance at the well site. For areas where 200 feet or less of cement grouted casing is required, if cement grout can't readily be obtained from a commercial concrete company, cement grout meeting the requirements of NR 812.11 (15) (b) may be mixed on-site. The grout density of each batch of grout**

**shall be measured with a mud balance at the well site and the number of batches mixed and the mud weight of each batch shall be recorded in the comments section of the well construction report submitted to the department.**

5. The grout shall be adequately screened to remove any unexpected aggregate before it enters the grout pump hopper.
6. The cement grout shall be pumped into the annular space using either the “Bradenhead” or the “Grout Shoe” method and the grouting operation shall be done in a manner according to the requirements of s. NR 812.20.
7. At completion of the grouting procedure, the grout shall flow out the top of the annular space with the same density as the grout being pumped from the hopper and shall have a density of at least 15.2 lbs./gal. The grout density shall be measured with a mud balance.
8. The cement grout shall be allowed to set for at least 24 hours before the construction of the lower bedrock drillhole is commenced. **If the cement is mixed with 2% calcium chloride the lower drillhole work can begin at 18 hours.**
9. To avoid introduction of air (and oxygen) into the aquifers, the lower open bedrock drillhole shall be constructed using rotary-mud or “rotary-wash” drilling methods, i.e. rotary water-circulation methods. Rotary-air methods may **not** be used for this purpose. As an alternative, the lower drillhole may be constructed using cable-tool methods or with other drilling methods provided they do not inject air into the aquifer and are approved by the Department.
10. Upon completion of the well, an approved additive-free liquid chlorine (sodium hypochlorite) product shall be used to disinfect the well. Dry calcium hypochlorite products (granular or pellet type) shall not be used. The chlorine solution shall not have a concentration greater than 100 milligrams per liter (mg/l), and there shall be no more than 30 minutes of contact time in the well. After this time has elapsed, the solution shall be thoroughly flushed out of the well with water, not with air.