

The statement of scope for this rule, SS 119-19, was approved by the Governor on December 5, 2019, published in Register No. 768A2 on December 9, 2109, and approved by the Natural Resources Board on February 26, 2020. This rule was approved by the Governor on insert date.

**ORDER OF THE STATE OF WISCONSIN NATURAL RESOURCES BOARD  
RENUMBERING, AMENDING, AND CREATING RULES**

The Wisconsin Natural Resources Board proposes an order to **re number** NR 812.10 (12); to **amend** NR 812.12 (5) (b), 812.13 (4) (b) and (8) (a), 812.14 (3) (a), (4) (intro.), (b) (intro.) and (c), 812.15 (2) (c), 812.31 (2) (a) and NR 812.46 (1) (a) 5.; and to **create** NR 812.07 (79x), 812.10 (12) (b), 812.12 (5) (c), 812.13 (7) (b) 4., (8) (d) 3. and 4., 812.14 (3) (e), (4) (d), (5) (c) 3., and (e), relating to well construction and pump installation and affecting small business.

**DG-25-19**

**Analysis Prepared by the Department of Natural Resources**

**1. Statute Interpreted:**

Sections 280.11 and 281.34, Wis. Stats.

**2. Statutory Authority:**

Section 227.11(2)(a)(intro.), chs. 280 and 281, Wis. Stats.

**3. Explanation of Agency Authority:**

Section 227.11(2)(a)(intro.), Wis. Stats., provides that a state agency, “may promulgate rules interpreting the provisions of any statute enforced or administered by the agency, if the agency considers it necessary to effectuate the purpose of the statute,” subject to certain restrictions.

Chapter 280, Wis. Stats., establishes the statutory authority and framework for regulation of well drilling, heat exchange drilling and pump installation.

Section 280.11, Wis. Stats., specifically directs the department to prescribe, publish and enforce minimum reasonable standards and rules for methods to be pursued to obtain pure drinking water for human consumption, and to establish safeguards deemed necessary in protecting the public health against the hazards of polluted sources of impure water supplies intended or used for human consumption. This statute gives the department general supervision and control over all methods of obtaining groundwater for human consumption including the construction or reconstruction of wells, authority to prescribe, amend, modify or repeal any applicable rule, and to perform any act deemed necessary for the safeguarding of public health.

Section 280.13, Wis. Stats., gives the department the authority to promulgate such rules as are reasonably necessary to carry out and enforce the provisions of ch. 280, Wis. Stats.

Chapter 281, Wis. Stats., gives the department authority to regulate groundwater withdrawals (s. 281.34, Wis. Stats.), establish, administer and maintain a safe drinking water program no less stringent than the requirements of the safe drinking water act (s. 281.17(8)(a), Wis. Stats.) and includes enforcement authorities (s. 281.98, Wis. Stats.).

**4. Related Statutes or Rules:**

Chapter NR 146, Wis. Adm. Code, implements the licensing and registration requirements of ch. 280, Wis. Stats., for water well drillers, heat exchange drillers, pump installers and rig operators.

Chapter NR 809, Wis. Adm. Code, establishes minimum standards and procedures for the protection of the public health, safety and welfare in the obtaining of safe drinking water.

### **5. Plain Language Analysis:**

Although thermoplastic casing is an approved material in Wisconsin, it's current use is restricted to wells that terminate in unconsolidated formations only. Wisconsin is the only state in the upper Midwest, and one of only three states nationally, that prohibits the use of thermoplastic casing for wells that terminate in bedrock formations. This puts Wisconsin's well drillers and homeowners at a disadvantage when it comes to safe and affordable options for well construction. Specific edits include:

1. Allows construction of wells using thermoplastic casing to terminate in bedrock formations. All neighboring states (and most states in the U.S.) allow this.
2. Allows the use of cementous grout as an annular space seal for wells with thermoplastic casing. All neighboring states allow the use of cementous grout in bedrock wells, although Minnesota restricts the depth of thermoplastic cased wells into limestone and dolomite bedrock to 5 feet.
- 3 Allows clamp-on, bolt-on, or bolt-through pitless adapters for all wells (currently these are only allowed for wells serving single families). This was proposed during the last rule revision too late to include in the rule. After consulting with the DNR Public Water Program, the perceived risk to ground water and public health was deemed to be minimal.
4. Adds maximum annular space requirements for wells constructed with thermoplastic casing and cementous grout to prevent damage from pressure and heat of hydration. This suggested rule revision is unique to Wisconsin as an added precaution and is not present in neighboring states' regulations.
5. Clarifies s. NR 812.13 (4) (b), Wis. Adm. Code, making the use of a packer or shale trap to provide a sand seal between the bottom of a casing and the top of a screen optional rather than required. This was a clarification of the rule suggested by an industry member of the PVC Casing Study Group.
6. Allows the department to investigate wells that it suspects have suffered damage to thermoplastic casing. This suggested rule revision is an added precaution to allow department staff to investigate wells constructed with thermoplastic casing that they suspect have been damaged during construction.

### **6. Summary of, and Comparison with, Existing or Proposed Federal Statutes and Regulations:**

Federal law does not directly regulate the construction of wells or heat exchange drillholes, and does not regulate the installation of pumps. For public drinking water systems, Wisconsin is a primacy state, with the primary responsibility to enforce state drinking water regulations consistent with the federal Safe Drinking Water Act. One federal requirement of Wisconsin's primacy role, 40 CFR § 142.10(b)(5), is that the state assures that the design and construction of new or substantially modified public water system facilities will be capable of compliance with the state primary drinking water regulations. For non-community public drinking water systems, ch. NR 812, Wis. Adm. Code, provides the design and construction standards to meet this federal requirement.

### **7. If Held, Summary of Comments Received During Preliminary Comment Period and at Public Hearing on the Statement of Scope:**

A preliminary public hearing on the statement of scope was not held.

### **8. Comparison with Similar Rules in Adjacent States:**

The department considered well regulations related to thermoplastic casing for all neighboring states, plus Indiana and Ohio. All six states allow the use of thermoplastic casing terminating in bedrock, and the use

of cementous grout for thermoplastic casing. Wisconsin does not.

Illinois, Indiana, Iowa, Michigan and Ohio allow drilling through thermoplastic casing; Minnesota and Wisconsin prohibit drill-through. DG-25-19 would not lift that prohibition in Wisconsin.

Five of the six states (except Indiana) have specific prohibitions against driving or mechanically advancing thermoplastic casing. Indiana has no specific prohibition against it. DG-25-19 would not lift that prohibition in Wisconsin. All six states allow the construction of water wells terminating in bedrock using thermoplastic casing and cementous grout. Currently, ch. NR 812, Wis. Adm. Code, prohibits both of these practices

## **9. Summary of Factual Data and Analytical Methodologies Used and How Any Related Findings Support the Regulatory Approach Chosen:**

Most of the rule revisions simplify, clarify and streamline rule language to allow for increased use of thermoplastic casing for water wells. Data and methodologies used to support substantive changes include:

- An external advisory group of well drillers was convened to provide input and review proposed changes to construction standards in NR 812 Subchapter II.
- Department staff investigated current research and studies of the efficacy of using thermoplastic casing for water wells; those include:
  - Manual on the Selection and Installation of Thermoplastic Water Well Casing, produced by the National Water Well Association and the Plastic Pipe Institute, 1980
  - “The Effects of Well Casing Material on Ground Water Quality,” By the USEPA (EPA/540/4-91/005), October 1991
  - “Thermoplastic Casing Use Potential in Consolidated Formations in Wisconsin and Using Cementous Grouts with PVC Wells in Wisconsin,” PowerPoint presentation by Bruce Walker, Licensed Wisconsin Well Driller, updated, 2020
  - “North America’s Cinderella Pipe Story: A Look at PVC Pipes’ Climb to the Top,” by Bob Walker, JAI, Vol. 8, No. 7
  - “Selection of PVC Well Casing Based on Hydraulic Collapse Considerations,” CertainTeed Technical Bulletin No. 40-37-02D
  - “Important Design Considerations for the Use of PVC to Construct Large-Diameter Water Wells,” Roscoe Moss Company Technical Memorandum 008-1
  - Mechanical Properties of PVC Well Screen and Casing, U.S. Department of the Interior Bureau of Reclamation Denver Office Research and Laboratory Services Division Applied Sciences Branch, July 1989
  - AWWA Standard for Water Wells, American Water Works Association, February 1, 1998.
  - “PVC Well Casing and Screen – Selection and Precautions,” Boode Waterwell Systems
  - “Selecting PVC Casing Using Resistance to Hydraulic Collapse Pressure Data,” CertainTeed Bulletin #2, 1985
  - “The Effects of Sunlight Exposure on PVC Pipe and Conduit,” JM Eagle Technical Bulletin, January 2009

## **10. Analysis and Supporting Documents Used to Determine the Effect on Small Business or in Preparation of an Economic Impact Report:**

The department analyzed information in DNR well construction records and from interviews with randomly-selected drilling companies to assess the economic impact of this rule. Seven cost proposals for drilling and well installation from existing DNR well construction companies that construct wells using both steel and thermoplastic casing were used. In addition, any numbers submitted by well drillers in response to the EIA and during the public comment period will be assessed and included in the final calculations.

**11. Effect on Small Business (initial regulatory flexibility analysis):**

The majority of businesses impacted by the rule are small businesses. There are currently 237 drillers and approximately 1240 pump installers doing business in the state. The total economic impact of the proposed rule revision is estimated to be a one-time cost of \$62,500.

There is also an estimated compliance benefit (cost savings) to new well owners of \$893,095 per year.

**12. Agency Contact Person:**

Frank Fetter, Bureau of Drinking and Groundwater - DG/5  
Department of Natural Resources,  
101 S. Webster Street  
Madison, WI 53703  
[franklin.fetter@wisconsin.gov](mailto:franklin.fetter@wisconsin.gov)  
(608) 264-6139

**13. Place where comments are to be submitted and deadline for submission:**

Written comments may be submitted at the public hearings, by regular mail, or email to:

Frank Fetter – DG/5  
Department of Natural Resources  
101 S. Webster Street  
Madison, WI 53703  
[DNRNR812PublicComments@wisconsin.gov](mailto:DNRNR812PublicComments@wisconsin.gov)  
(608) 264-6139

Comments may be submitted to the department contact person listed above or to [DNRAAdministrativeRulesComments@wisconsin.gov](mailto:DNRAAdministrativeRulesComments@wisconsin.gov) until the deadline given in the upcoming notice of public hearing. The notice of public hearing and deadline for submitting comments will be published in the Wisconsin Administrative Register and on the department's website, at <https://dnr.wi.gov/calendar/hearings/>. Comments may also be submitted through the Wisconsin Administrative Rules Website at <https://docs.legis.wisconsin.gov/code/chr/active>.

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**RULE TEXT**

**SECTION 1. NR 812.07 (79x) is created to read:**

**NR 812.07 (79x)** "PSI" means pressure expressed in pounds of force per square inch of area.

**SECTION 2. NR 812.10 (12) is renumbered (12) (a).**

**SECTION 3. NR 812.10 (12) (b) is created to read:**

**NR 812.10 (12)** (b) When a well continues to be bacteria-positive after multiple attempts to correct the issue, the department may test or contract to test the welded or threaded joints for leakage using a packer and pressure gauge or by a comparable testing procedure. The adapter or unit joints shall be tested and proven watertight under a pressure of not less than 14 psi. A soap and water solution shall be applied to welds to identify any leaks, and all leaks shall be repaired with additional welding prior to starting the pressure test. The pressure shall be maintained for at least 30 minutes.

**SECTION 4. NR 812.12 (5) (b) is amended to read:**

**NR 812.12 (5)** (b) A drive shoe or casing shoe is not required for any thermoplastic or temporary outer casing.

**SECTION 5. NR 812.12 (5) (c) is created to read:**

**NR 812.12 (5)** (c) For a well constructed with thermoplastic casing, the casing may be held down mechanically within an upper-enlarged borehole during grouting to prevent the casing from floating.

**SECTION 6. NR 812.13 (4) (b) is amended to read:**

**NR 812.13 (4)** (b) A packer or shale trap ~~shall~~may be used to provide a sand seal between the bottom of a well casing pipe and the top of a screen. Packers and shale traps shall meet the requirements of s. NR 812.11 (13).

**SECTION 7. NR 812.13 (7) (b) 4. is created to read:**

**NR 812.13 (7)** (b) 4. A well constructed with thermoplastic casing shall have an upper enlarged drillhole no more than 4 inches greater than the nominal diameter of the casing when cement grout is used.

**SECTION 8. NR 812.13 (8) (a) is amended to read:**

**NR 812.13 (8)** (a) Grouting material shall meet the requirements of s. NR 812.11 (15) and shall be placed in an annular space in accordance with the requirements specified in s. NR

812.20. A flowing well ~~constructed with steel or thermoplastic casing~~ shall be grouted using the materials specified in s. NR 812.15. ~~Potable~~ A potable high capacity well shall be grouted using the materials specified in s. NR 812.152.

**SECTION 9. NR 812.13 (8) (d) 3. and 4. are created to read:**

**NR 812.13 (8) (d) 3.** Neat cement.

4. Sand-cement.

**SECTION 10. NR 812.14 (3) (a) is amended to read:**

**NR 812.14 (3) (a) *Material.*** ~~Only steel~~ Steel and thermoplastic well casing pipe meeting the requirements of s. NR 812.11 (6) ~~and (7)~~ may be used as permanent casing for bedrock wells. ~~Thermoplastic well casing pipe meeting the requirements of s. NR 812.11 (7) may only be used as a liner for bedrock wells.~~

**SECTION 11. NR 812.14 (3) (e) is created to read:**

**NR 812.14 (3) (e) *Damaged or deformed thermoplastic casing.*** A well using thermoplastic casing terminating in bedrock shall be free of cracks and free of deformation and the inside diameter shall remain within manufacturer's specifications after construction or reconstruction. Casing integrity may be confirmed by a pressure test or other means. A failed well constructed with thermoplastic casing shall have the casing removed or drilled out prior to filling and sealing.

Note: A pressure test is defined as holding 14 psi for at least one half-hour.

**SECTION 12. NR 812.14 (4) (intro.), (b) (intro.) and (c) are amended to read:**

**NR 812.14 (4) DRIVING OR ADVANCING CASING.** A well driller or well constructor may drive or mechanically advance steel casing from the ground surface to the top of bedrock when the depth to the top of bedrock is equal to the minimum casing depths under sub. (3) or deeper. When steel casing is driven or mechanically advanced to the top of bedrock, it shall be completed in accordance with all of the following:

(b) *Annular space sealing.* Clay slurry, sodium bentonite slurry, or granular bentonite shall be maintained around ~~the steel~~ casing during advancement using any of the following methods:

(c) *Driving to a firm seat.* ~~The~~ Steel casing shall be driven or advanced to a firm seat into the top of bedrock.

**SECTION 13. NR 812.14 (4) (d), (5) (c) 3. and (5) (e) are created to read:**

**NR 812.14 (4) (d)** *Mechanically holding down thermoplastic casing.* For a well constructed with thermoplastic casing, the casing may not be driven to a firm seat. However, the casing may be held down mechanically within an upper enlarged borehole during grouting to prevent the casing from floating.

**(5) (c) 3.** For a well constructed using thermoplastic casing, to a depth not more than 5 feet into limestone, dolomite, shale, or granite.

(e) *Maximum diameter.* For a well using thermoplastic casing, the maximum diameter of an upper enlarged drillhole shall be not more than 4 inches greater than the outside diameter of the casing pipe.

**SECTION 14. NR 812.15 (2) (c) is amended to read:**

**NR 812.15 (2) (c)** *Grouting requirement.* The annular space of a flowing well shall be grouted with neat cement using the methods specified in s. NR 812.20. ~~Flowing wells constructed with thermoplastic casing may be grouted with neat cement.~~

**SECTION 15. NR 812.31 (2) (a) is amended to read:**

**NR 812.31 (2) (a)** A pitless subsurface pipe connection to a well casing pipe shall be made with a weld-on, clamp-on, bolt-on or bolt-through pitless adapter or with a pitless unit, except that a bolt-through adapter may only be installed for a well constructed with polyvinyl chloride well casing pipe that has a permanently attached well screen. ~~A clamp-on, bolt-on or bolt-through pitless adapter may only be installed for a well that will serve a single family residence. Weld-on adapters~~ A weld-on adaptor or pitless ~~units~~unit shall be welded or threaded

to the well casing pipe according to sub. (3) or (4). All welding shall be performed in accordance with s. NR 812.18. A pitless adapter or pitless unit shall be installed according to any approval conditions and according to the manufacturer's instructions.

**SECTION 16. NR 812.46 (1) (a) 5. is amended to read:**

**NR 812.46 (1) (a) 5.** After corrective action following a total coliform bacteria—positive test result as required under s. NR 812.10 (12) (a) or 812.27 (8).

**SECTION 17. EFFECTIVE DATE.** This rule takes effect on the first day of the month following publication in the Wisconsin Administrative Register as provided in s. 227.22 (2) (intro.), Stats.

**SECTION 18. BOARD ADOPTION.** This rule was approved and adopted by the State of Wisconsin Natural Resources Board on [DATE].

Dated at Madison, Wisconsin \_\_\_\_\_.

STATE OF WISCONSIN  
DEPARTMENT OF NATURAL RESOURCES

BY \_\_\_\_\_

For Preston D. Cole, Secretary