CR 82-30

State of Wisconsin \ DEPARTMENT OF NATURAL RESOURCES

*Carroll D. Besadny*
*Secretary*

BOX 7921
MADISON, WISCONSIN 53707

STATE OF WISCONSIN )
)
DEPARTMENT OF NATURAL RESOURCES ) ss



TO ALL TO WHOM THESE PRESENTS SHALL COME, GREETINGS:

I, Carroll D. Besadny, Secretary of the Department of Natural Resources and custodian of the official records of said Department, do hereby certify that the annexed copy of Natural Resources Board Order No. WQ-6-82 was duly approved and adopted by this Department on June 24, 1982. I further certify that said copy has been compared by me with the original on file in this Department and that the same is a true copy there of, and of the whole of such original.

IN TESTIMONY WHEREOF, I have hereunto set my hand and affixed the official seal of the Department at General Executive Facility #2 in the City of Madison, this 31st day of August, 1982.

Carroll D. Besadny

Carroll D. Besadny, Secretary

(SEAL)

11-1-82

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

IN THE MATTER of renumbering s. NR 112.08(2); amending ss. NR 112.03(24), 112.08(2)(intro.), 112.085(1)(a)(title) and (d)5., 112.14(1)(c), (2)(c) and(7)(title), 112.17(4)(a)2., 112.23(1)(a), (b)(intro), (2)(intro.) and (a); and creating ss. NR 112.085(intro.), (1)(title). and (2) and 112.14(8) of the Wisconsin Administrative Code pertaining to the use of thermoplastic well casing in private wells.

WQ-6-82



Analysis Prepared by Department of Natural Resources

Section NR 112.08(2), Wis. Adm. Code, permits only steel pipe meeting certain minimum specifications to be used as well casing. The creation of s. NR 112.085, Wis. Adm. Code, will permit the use of thermoplastic pipe meeting the proposed requirements in potable wells developed in an unconsolidated formation. The section gives detailed information on the type of thermoplastic material that can be used and how it must be handled during storage and installation.

Section NR 112.14, 112.17 and 112.23 are also amended to permit the use of thermoplastic pipe.

The rule changes are intended to provide for the use of thermoplastic well casing in such a manner as to assure protection for the groundwater and the water supply when a well is constructed. They are also intended to provide some protection against failure of the casing material and to restrict reconstruction of wells with thermoplastic casing to screen replacement.

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Pursuant to the authority vested in the State of Wisconsin Natural Resources Board by ss. 144.025, 144.04, 162.01 and 162.03, Stats., the State of Wisconsin Natural Resources Board hereby renumbers, amends and creates rules interpreting ss. 144.025, 162.01 and 162.03, Stats., as follows:

SECTION 1 - Section NR 112.03(24) is amended to read:

(24) "Existing installations" means those ~~made prior to April 10, 1953~~ which are not newly constructed or reconstructed prior to the effective date of provisions of ch. NR 112 in effect at the time of the inspection.

SECTION 2 - Section NR 112.08(2)(intro.) is amended to read:

(2) SPECIFIC. The requirements of ~~s. NR 112.08(1)~~ sub. (1) for drilled-type wells for low capacity supplies, including community systems serving less than 15 living units and non-community systems, but excluding schools, shall be deemed to be fulfilled when the minimum construction and material requirements set forth in s. NR 112.085, table 1 and in pars. (a) through ~~(i)~~ (e) ~~below~~ are met, and for high capacity water systems and school water systems when minimum construction and material requirements of table 3 and also pars. (a) through ~~(i)~~ (e) are met, except for sewage treatment plant water systems, ~~where~~ a minimum of 100 feet of well casing pipe shall be installed.

Note: See appendix figures A1 through A25 for low capacity water supply standards required by table 1.

SECTION 3 - Sections NR 112.08(2)(a), (b), (c) and (d) are renumbered to be section NR 112.085(1)(a), (b), (c) and (d) respectively, and section NR 112.085(1)(a) (title), as renumbered, is amended to read:

(a) ~~Well casing pipe.~~ Dimensions and weights.

SECTION 4 - Sections NR 112.08(2)(e), (f), (g), (h) and (i) are renumbered to be sections NR 112.08(2)(a), (b), (c), (d) and (e) respectively.

SECTION 5 - Section NR 112.085(intro.) is created to read:

NR 112.085 WELL CASING PIPE. The protective well casing pipe shall be of steel or thermoplastic material complying with the requirements and restrictions of this section.

SECTION 6 - Section NR 112.085(1) (title) is created to read:

(1) STEEL CASING PIPE.

SECTION 7 - Section NR 112.085(1)(d)5. as renumbered is amended to read:

5. The ~~above~~ listed ASTM, API and AWWA references are available for inspection at the offices of the department of natural resources, the secretary of state and the revisor of statutes and may be obtained for personal use from the American Society for Testing and Materials~~;~~, 1916 Race Street, Philadelphia, Pennsylvania 19103, the American Petroleum Institute, Division of Production, 300 Conigan Tower Building, Dallas, Texas 75201 and from the American Water Works Association, ~~666~~ 6666 West Quincy, Denver, Colorado 80235.

SECTION 8 - Section NR 112.085(2) is created to read:

(2) THERMOPLASTIC CASING PIPE. (a) Pipe and material specifications. 1. The thermoplastic well casing pipe and couplings shall be new polyvinyl chloride (PVC) material produced to and meeting the current ASTM F-480 standard except that the impact resistance requirements specified in the current ASTM D 2241 standard may be substituted for the impact resistance requirements specified in ASTM F 480. PVC material shall conform to cell

classification 12454-B or 12454-C as designated by markings of PVC 1120 or 1220. The material shall be formulated to include a filler material to resist ultra-violet degradation. The solvent cement shall conform to the ASTM D-2564 standard. No used or reclaimed materials may be used. Either integral bell pipe or one piece couplings shall be used.

2. The pipe shall have a standard dimension ratio (SDR) of 21, 17, or 13.5.

3. The nominal casing size shall be at least 5 inches.

4. The well casing pipe, couplings, cement, primer and other components shall be evaluated and approved for use as well casing in potable water supplies by the National Sanitation Foundation (NSF) Testing Laboratories, Inc., P.O. Box 1468, Ann Arbor, Michigan 48106 or an equivalent laboratory approved by the department. Such laboratory must approve the materials as being acceptable for use as well casing for potable water supplies. Approvals of alternate laboratories will be based on the demonstration of unbiased, reliable and appropriate testing methods at least as stringent as NSF methods.

5. The well casing pipe and couplings shall be marked in accordance with the current ASTM F-480 specification and this section. The pipe shall be marked at least every 5 feet showing the nominal size; standard dimension ratio; type of material; the designation 1120 or 1220; the wording - "well casing" - followed by impact classification; designation "ASTM F-480" including year of issue of the standard with which the well casing pipe complies; manufacturer's name or trademark; manufacturer's code for resin manufacture, lot number and date of manufacture; and the NSF-WC designation or other approved laboratory's seal or mark. Couplings shall be marked with all of the above information except the standard dimension ratio, the wording "well casing", and manufacturer's code for resin, lot and date.

(b) Storage and inspection. 1. The pipe and couplings may not be stored by the driller in direct sunlight for periods exceeding 3 months. It is recommended that pipe and coupling inventories be rotated or utilized to minimize exposure to ultraviolet radiation.

2. The pipe shall be stored in such a manner as to prevent deformation, sagging or bending.

3. Prior to use, the pipe and couplings shall be inspected for cuts, deformations, gouges, deep scratches, damaged ends and other imperfections. Any pipe or couplings having such defects shall be rejected.

4. Pipe bells and couplings shall be manufactured to close tolerances to ensure an interference fit at the joint. Should a joint not have an interference fit allowing the dry pipe to enter the socket between 1/2 and 2/3 of the socket depth when inserted by hand, the pipe or coupling shall be rejected.

(c) Assembly. Joining techniques including procedures for cutting, cleaning of joints, use of primers, application of cement, assembly and hardening of solvent cement joints shall be in accordance with this section and the manufacturer's recommendations.

1. 'Cutting'. The installer shall use a fine tooth handsaw with little or no set or a plastic pipe cutter equipped with extra-wide rollers and thin cutting wheels for cutting the pipe. Pipe ends shall be cut square using a miter box when sawed. Standard steel pipe or tubing cutters may not be used for cutting plastic pipe.

2. 'Cleaning'. The installer shall clean all dirt, dust, and moisture from pipe ends and couplings. The installer may use only chemical or mechanical cleaners which are suitable for the particular plastic material being used. All burrs shall be removed.

3. 'Primer'. The installer shall use a primer to prepare the pipe and coupling surfaces in order to form a continuous bond when cemented.

4. 'Cement application'. The joint shall be completed immediately following application of the solvent cement. A solvent cement shall be used which provides sufficient open time for making good joints, but which also cures rapidly to initial set. At temperatures below 32°F a cement formulated for use below 32°F shall be used. The installer shall apply a moderate and even coat of cement to the inside of the pipe bell or coupling to cover the length of the joining surface only. The installer shall then quickly apply an even coat of cement to the outside of the pipe to a length equal to the depth of the pipe coupling socket.

5. The installer shall make the joint as quickly as possible after application of the cement, and before it dries; reapply cement before assembling if the cement dries partially; insert the pipe into the coupling socket, turning the pipe at least 1/4 turn before it seats to insure even distribution of cement; make sure that the pipe is inserted to the full depth of the coupling socket, and remove excess solvent cement from the exterior of the joint with a clean, dry cloth.

6. A newly assembled joint may not be moved until after sufficient time has elapsed to adequately cure the joint to withstand the installation stresses without movement or damage. It is recommended that all joints be allowed to cure at least 15 minutes if the ambient temperature is 60°F or above, at least 1/2 hour if between 40 and 60°F, and at least one hour if the ambient temperature is below 40°F before the pipe is moved and installed. Cure times may be reduced when temperatures are above the bottom of the above ranges. In no case shall cure times be less than 1/3 of the times recommended above. Cure times shall be increased by 50% when the relative humidity is over 60%. No pins, screws or fasteners may be installed in the joint.

7. For threaded couplings used for screens and pitless adapters, only approved lubricant specifically intended for use with PVC pipe is acceptable. A threaded joint shall be tightened by no more than one full turn using a strap wrench.

8. When a well screen is used, it shall be a telescoping type screen. The casing must be pulled back to expose the screen. An approved packer shall be used to seal the space between the screen and the casing. A small diameter drill stem or rod bearing on the screen bottom plate may be used to place the screen.

(d) Installation requirements. 1. The well casing pipe may not be driven, pushed or forced into the formation. When pulling back a casing to expose a screen, the force applied may not exceed the casing weight.

2. The casing shall be set in an outer drillhole full of drilling mud or a temporary casing which shall in either case be at least 4 inches larger than the nominal pipe size. A permanent tag bearing the message "plastic well casing" shall be attached to the top of the well casing.

3. Thermoplastic well casing pipe may be used only for wells developed in unconsolidated formations and constructed in accordance with lines a, b and c of table 1 and lines b and c of table 3.

4. No drilling tools such as drillbits or stabilizers shall be placed in the casing nor shall any drilling or reconstruction occur after placement of the casing in the well. This restriction does not preclude the installation or replacement of telescoping screens.

5. Thermoplastic well casing pipe shall be used only for wells where the annular space is sealed with drilling mud or clay slurry. Cement grout may not be used. The thermoplastic well casing shall be set in the drilling mud of a drillhole constructed with rotary-mud equipment or within a temporary casing driven the entire depth of the permanent casing if constructed with other equipment.

6. Any pitless subsurface connection to the thermoplastic well casing shall be made in accordance with s. NR 112.14(1)(b) or (2)(b) and (8). The portion of the well casing above a pitless adapter may be either steel or PVC well casing pipe meeting the requirements of this section. Note: See NR 112.14(8).

7. Threaded pipe is not permitted. Threaded couplings may only be used for installation of pitless adapters after placement of the casing.

8. If the portion of the well casing pipe which extends above the frost line is thermoplastic material, the upper terminus of the well shall be contained in a well house or in a capped oversized steel casing which extends from above the top of the thermoplastic well casing to a depth of below the frost level.

(e) The listed ASTM standards are available for inspection at the offices of the department of natural resources, the secretary of state and the revisor of statutes and may be obtained for personal use from the American Society for Testing and Materials, 1916 Race Street, Philadelphia, Pennsylvania 19103.

SECTION 9 - Section NR 112.14(1)(c) is amended to read:

(c) On off-set installations in basements, the pump impeller or cylinder shall be located preferably at an elevation above the ground surface or at least at an elevation not subject to flooding and in any case at least 2 feet above the basement floor. Any buried suction pipe shall be enclosed in a pressure conduit. Pressure conduits may terminate at the end of the horizontal line entering a basement if the elevation of the pipe entrance is 2 feet or more above the basement floor and the basement is in active use and not subject to flooding. Pressure conduit shall meet the minimum pipe specifications of ~~NR-112.08(2)(a)-and-(d)-for-the-diameter-used.~~ the state plumbing code, ch. H 62, Wis. Adm. Code. A shallow well pump discharge line shall discharge through a seal-cross fitting before entering the pressure tank.

SECTION 10 - Section NR 112.14(2)(c) is repealed and recreated to read:

(c) On off-set installations in basements, the pump impeller or cylinder shall be located preferably at an elevation above the ground surface or at least at an elevation not subject to flooding and in any case at least 2 feet above the basement floor. Any buried suction pipe shall be enclosed in a conduit. It is recommended that the conduit be pressurized. Conduits may terminate at the end of the horizontal line entering a basement if the

elevation of the pipe entrance is 2 feet or more above the basement floor and the basement is in active use and not subject to flooding. Nonpressure conduit shall be at least 4 inches in diameter and conform to s. NR 112.085. Pressure conduit shall meet the minimum pipe specifications of the state plumbing code, ch. H 62.19. A shallow well pump discharge line shall discharge through a seal-cross fitting before entering the pressure tank.

SECTION 11 - Section NR 112.14(7) (title) is amended to read:

(7) PITLESS ADAPTER ~~WELL-AND-PIPE~~ CONNECTIONS TO STEEL WELL CASINGS.

SECTION 12 - Section NR 112.14(8) is created to read:

(8) PITLESS ADAPTER CONNECTIONS TO THERMOPLASTIC WELL CASINGS. No welding of steel well casing or a pitless adapter is permitted after steel well casing is attached to thermoplastic well casing. If a weld-on pitless adapter is to be utilized in cases allowed by sub. (2), the adapter shall be welded to the steel portion of the casing pipe before the steel casing is threaded into a thermoplastic coupling. The PVC coupling shall be threaded onto the steel casing or adapter before it is solvent cemented to the top of the PVC casing.

SECTION 13 - Section NR 112.17(4)(a)2. is amended to read:

2. In case the pump unit is not located over the well, and the shallow well pump suction pipe, submersible pump discharge pipe or jet pump piping emerges from the top thereof, an approved type seal with expandable rubber gasket or approved equivalent seal shall be provided between the well casing

and the piping. A similar type seal with expandable rubber gasket shall be provided at the terminal of a nonpressure conduit containing suction, submersible or jet pump piping. It is recommended that any buried suction line for an off-set pump installation be enclosed in a pressure conduit.

SECTION 14 - Section NR 112.23(1)(a) is amended to read:

(a) Location. The location shall reasonably conform to the provisions of s. NR 112.07 or the separation requirements in effect at the time of the well or pump installation, or, if more recent, at the time of installation of any contaminant source.

SECTION 15 - Section NR 112.23(1)(b)(intro.) is amended to read:

(b) Construction. The underground construction shall be in reasonable compliance with ss. NR 112.08 and 112.085 as to depth and type of casing and curbing or with the minimum requirements in effect at the time of construction. ~~Existing well~~ Well pits, pump pits, pressure-tank pits, pressure-tank access pits and subsurface pumprooms adjoining basements existing prior to April 10, 1953, shall meet the following requirements:

SECTION 16 - Section NR 112.23(2)(intro.) is amended to read:

(2) PUMP INSTALLATION. ~~Existing pump~~ Pump installations existing prior to April 10, 1953, shall conform to the following requirements~~:~~. Existing installations made after that date shall conform to the requirements in effect at the time of the installation. When a new pump installation is necessary, it shall comply with the current requirements of this chapter.

SECTION 17 - Section NR 112.23(2)(a) is amended to read:

(a) Offset units. For installations completed after April 10, 1953, suction piping shall be enclosed in a conduit in accordance with s. NR 112.14(2)(c). If nonpressure conduit pipe is used to enclose suction, submersible or jet pump piping, it shall be a minimum of new 4-inch diameter or larger diameter pipe meeting the specifications of s. NR 112.085(1) or, for thermoplastic cased wells, with s. NR 112.085(2). Such conduit may terminate in a basement if the elevation of the pipe is at least 2 feet above the basement floor and the basement is in active use and is not subject to flooding. For installations completed prior to April 10, 1953, ~~The~~ the suction line of an offset shallow well pump or the piping of an offset jet pump shall be contained in a sealed conduit between the well and a basement, be connected to the well through a stuffing box or short sealed conduit in a conforming well pit, or be connected to the well with a pitless adapter approved prior to April 10, 1953. Nonpressure conduit shall enter the basement so that the bottom of the conduit is at least 6 inches above the basement floor.

Note: It is recommended that the pump impeller or cylinder of pump units located in basements be located above the ground level or be at least 2 feet above the floor.

SECTION 18 - Cross references. In the sections listed in column "A", change the cite listed in column "B" to the cite listed in column "C".

| Column A | Column B | Column C |
|---|---|---|
| NR 112.03(40) | NR 112.08(2) | NR 112.085 |
| NR 112.11(2)(d) | NR 112.08(2)(d) | NR 112.085(1)(d) |
| NR 112.11(2)(h) | NR 112.08(a) and (d) | NR 112.085(1)(a) and (d) |
| NR 112.14(7)(a)3. | NR 112.08(2) | NR 112.085(1) |
| NR 112.08(2) table 3 line "a", column "11" second paragraph, last sentence | NR 112.08(2)(d) | NR 112.085(1)(d) |

The foregoing rules were approved and adopted by the State of Wisconsin Natural Resources Board on June 24, 1982.

The rules contained herein shall take effect as provided in s. 227.026(1)(intro.), Stats.

Dated at Madison, Wisconsin August 31, 1982

STATE OF WISCONSIN DEPARTMENT OF NATURAL RESOURCES

By Carroll D. Besadny
Carroll D. Besadny, Secretary

(SEAL)