CHAPTER 33 - NONPUBLIC WATER WELL CONSTRUCTION ORDINANCE OF DUBUQUE COUNTY, IOWA

Adopted September 5, 1989
Amended July 19, 2010
Amended June 6, 2011
Amended July 30, 2012
Amended July 15, 2013
Amended June 16, 2014
Amended August 10, 2015

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PART 1
INTRODUCTION

33-1 APPLICABILITY. The provisions contained herein apply to all nonpublic water wells constructed after the effective date of this ordinance and include existing water wells undergoing major rehabilitation or reconstruction.

33-2 DEFINITIONS.

33-2.1 **"Abandoned well"** means a well whose use has been permanently discontinued. A well shall be considered abandoned when its condition is such that continued use is impractical or no longer desired.

33-2.2 **"Administrative authority"** means local boards of health.

33-2.3 **"Annular space"** means the open space between the well hole excavation and the well casing.

33-2.4 **"Cesspool"** means a covered excavation, lined or unlined, into which wastes from toilets or urinals are discharged for disposal. Cesspools are not an approved method of sewage disposal.

33-2.5 **"Compensation for well interference"** means payment to the owner of a nonregulated well for damages caused by a lowered water level in the well due to withdrawal of water for a permitted use.

33-2.6 **"Established grade"** means the permanent point of contact of the ground to artificial surface with the casing or curbing of the well.

33-2.7 **"Grout"** means a material used to seal the annular space between the casing and the bore hold and shall consist of neat cement, concrete, heavy drilling mud or heavy bentonite water slurry. Heavy drilling mud or heavy bentonite water slurry when used as grout shall be of sufficient viscosity to require a time of at least seventy (70) seconds to discharge one (1) quart of the material through an API (American Petroleum Institute) marsh funnel viscometer.

33-2.8 **"Major rehabilitation or reconstruction"** means replacement, extension or removal of all or a portion of the well casing.

33-2.9 **"Nonpublic water supply"** means a water system that has fewer than fifteen (15) service connections or serves less than twenty-five (25) people for less than sixty (60) days a year.

33-2.10 **"Nonregulated well"** means a well used to supply water for a nonregulated use (a use of water less than twenty-five thousand (25,000) gallons per day which is not required to have a water use permit.)

33-2.11 **"Permitted use"** means a use of water in excess of twenty-five thousand (25,000) gallons per day which requires a water use permit pursuant to chapters 50 through 52 of the rules of the Iowa Environmental Protection department and Iowa Code chapter 455B, division III, part 4.

33-2.12 **“Pitless adaptor”** means an assembly designed for attachment to a well casing which permits below-frost discharge from the well and allows vertical access to the interior of the well for the installation or removal of the pump or its

appurtenances thereby eliminating the need for frost pits.

33-2.13 **“Polluted or contaminated”** means alteration of the physical, chemical, or biological quality of the water so that it is harmful or potentially injurious to the health of the user or for the intended use of the water.

33-2.14 **"Pumps and pumping equipment"** means any equipment or materials utilized or intended for use in withdrawing or obtaining water for any use, including seals and tanks, together with fittings and controls.

33-2.15 **"Stuffing box"** means an approved receptacle in which packing may be compressed to form a watertight or airtight junction between two objects.

33-2.16 **"Vertical zone of contamination"** means that depth of geological formation, generally near the ground surface, containing connecting pore spaces, crevices or similar openings, including artificial channels, such as unprotected wells, through which contaminated water may gain access to a well or to a ground water source.

33-2.17 **"Well"** means any excavation that is drilled, driven, dug, bored, augured, jetted, washed or is otherwise constructed for the purpose of withdrawing water.

33-2.18 **"Well seal"** means a device used to cap or seal a well that establishes or maintains a junction between the casing of the well and the piping, electric conduit or equipment installed therein, as to prevent water or other foreign material from entering the well at the uppermost terminal.

a **"Well cap"** means a snug-fitting, nonwatertight device used above flood level that excludes dust and vermin and allows for venting.

b **"Sanitary seal"** means a watertight fitting used on wells that terminate in a frost pit or well house.

33-3 GENERAL. The administrative authority shall have the authority to visit well sites during any phase of the work in progress without prior notice. The administrative authority may also by rule require the issuance of permits, the posting of performance bonds, the submission of water well logs, and other data as necessary. The issuance of permits shall be coordinated with the withdrawal permits by the Iowa Department of Natural Resources.

a The administrative authority shall not issue any permits under this chapter for any non-public water well construction for property in the Southwest Arterial Corridor that lies within the County limits of the County of Dubuque as shown delineated on drawings at the County Zoning Department from the effective date of this section to July 1, 2016, except where a vested right to the issuance of such approval occurred to any person, firm or corporation as a matter of law prior to the effective date of this section. Notwithstanding the foregoing, the administrative authority may approve a requested permit under this Chapter upon a determination that the proposed non-public water well will not negatively impact the acquisition of right-of-way along the preferred alignment of the Southwest Arterial Corridor. The administrative authority shall consider any recommendation from the Southwest Arterial Technical Committee regarding potential negative impacts, if any, that would result in the approval of the requested permit. [Amended July 19,

2010, June 6, 2011, July 30, 2012, July 15, 2013, June 16, 2014 and August 10, 2015]

33-4 VARIANCES. Variances to these rules may be granted by the local boards of health provided sufficient and proposed alternative information is afforded to substantiate the need and propriety for such action. Variances and reasoning shall be in writing.

33-5 through 33-10 Reserved.

PART 2
LOCATION OF WELLS

33-11 LOCATION OF WELLS. Wells shall be located with due consideration given to the lot size, contour, porosity and absorbency of the soil, local ground water conditions, and other factors necessary to implement the basic rules contained herein. The lack of specific distances to other possible sources of contamination such as refuse disposal sites, buried oil and gasoline storage tanks, etc., does not minimize their potential hazard. These must be evaluated in each particular situation and a distance arrived at that is based on pertinent facts. The administrative authority should be called upon for assistance in determining a proper distance in these cases.

33-12 MINIMUM DISTANCES. The following lateral distances shall apply for the common sources of contamination listed in Table 33-13.

33-13 MINIMUM LATERAL DISTANCE.

Sources of Contamination	Minimum Lateral Distance
Lagoons or waste treatment facilities and sanitary landfills.	1,000 feet
Cesspools.	150 feet
Preparation or storage area for spray materials, commercial fertilizers or chemicals that may result in ground water contamination.	150 feet
Drainage or improperly abandoned wells.	100 feet
Soil absorption field, pit privy or similar disposal unit..	100 feet

Confined feeding operation. . . . . 100 feet

Septic tank, concrete vault privy, sewer or tightly joined tile or equivalent material, sewer-connected foundation drain, or sewers under pressure. . 50 feet

Ditches, streams or lake. . . . . 25 feet

Sewer of cast iron with leaded or mechanical joints, independent clear water drains, or cisterns.. . . . . 10 feet

Pumphouse floor drain draining to ground surface (Drains must not be connected to any sewer or drainage system.). . . . . 5 feet

33-14 RELATION TO BUILDINGS. With respect to buildings, the well shall be located so that it will be reasonably accessible for cleaning, treatment, repair, test, inspection and other maintenance. Wells shall not be located in basements.

33-15 AREAS SUBJECT TO FLOODING.

33-15.1 Wells shall not be located in areas subject to flooding unless the casing is grouted and extends at least one foot above the level of the highest known flood and is equipped with a well cap, or is otherwise protected as prescribed in writing by the administrative authority.

33-15.2 The ground surface immediately adjacent to the well casing shall be compacted and graded so that surface water is diverted away from the casing. Well platforms are not recommended other than indicated in 33-41.1 and 33-63.3.

33-16 through 33-20 Reserved.

PART 3
STANDARDS FOR WELL CONSTRUCTION, MAJOR REHABILITATION OR RECONSTRUCTION

33-21 WATER USED IN CONSTRUCTION. Water used in the construction process shall be obtained from a source that will not result in contamination of the well. To preclude iron bacteria contamination, chlorination of the water utilized, with an initial dosage of 50 mg/l (50ppm), shall be accomplished.

33-22 MINIMUM PROTECTIVE DEPTH OF WELLS. All wells shall be watertight to such depths as is necessary to exclude pollution. Ordinarily, the top ten feet (10') of soil will be subject to intermittent contamination; and in some cases, this zone may extend to even greater depths. Under no circumstances shall water be

derived from a depth of less than twenty feet (20') unless a variance is granted in accordance with section 33-4.

33-23 WELLS LOCATED WITHIN FROST PITS.

33-23.1 In new construction, wells are not permitted to be located within frost pits since they present a sanitary hazard to the water supply be providing access of flood or surface waters to the well.

EXCEPTION: Wells are permitted to be located within frost pits of augured or bored wells which do not penetrate consolidated formations. See 33-42.

33-23.2 When existing wells located within frost pits undergo major rehabilitation or reconstruction,

a The casing shall be extended as outlined in 33-15, a pitless adaptor installed in accordance with 33-55, the curbing of the pit removed at least two feet (2') below the ground surface, the area of the pit filled with a clean backfill, tamped, and the area graded in accordance with 33-15.2.

b The well casing shall be provided with a sanitary seal.

33-24 FROST PITS LOCATED ADJACENT TO WELLS.

33-24.1 Frost pits that do not contain wells within are permitted for the purpose of housing pressure tanks, valves, etc., provided they are not located closer than ten feet (10') from any well. The walls of the frost pit are to be constructed of six-inch (6") poured concrete, four-inch (4") reinforced concrete, two-inch (2") special concrete mix, vibrated and reinforced or eight-inch (8") concrete blocks.

33-24.2 The junction of the walls and the water lines, electrical conduits and roof, etc., shall be watertight.

33-24.3 The roof of the frost pit shall be constructed of watertight four-inch (4") minimum reinforced concrete, and any opening shall be provided with a raised curbing extending at least four-inches (4") higher than established grade. A substantial watertight, overhanging, tight-fitting type cover shall be provided.

33-24.4 An independent floor drain, discharging to ground surface and fitted with a brass, bronze or copper 16-mesh screen, to prohibit the entrance of pests, should be provided.

33-25 EQUIPMENT LOCATED WITHIN THE WELL CASING. In new construction, no equipment shall be located within the well casing except submersible pumps, pump jets, drop pipes, air lines, and the necessary wiring and switches to operate the pumping equipment. When existing wells undergo major rehabilitation or reconstruction, auxiliary equipment shall be removed from within the casing and be properly relocated to areas such as a pump house, basement, or frost pit as outlined in 33-24.

33-26 WELL SEALS. The uppermost terminal of all wells shall extend not less than twelve inches (12") above established grade and shall be equipped with an

appropriate well cap or sanitary seal. When pump wiring or drop pipes extend through the seal, they shall be equipped with properly fitting grommets to further exclude vermin or other sources of contamination.

33-27 BURIED WELL SEALS. Buried well seals, where the casing terminates below ground surface, are not permitted on new construction. Existing installation, upon major reconstruction, rehabilitation or pump replacement, shall have the casing extended and the area graded as provided for in 33-15.2.

33-28 VENTS. Vents shall be constructed so as to exclude dust, birds, animals and insects, and shall terminate in an inverted U construction, the opening of which is at least twelve inches (12") above ground surface and is covered with a brass, bronze, or copper 16-mesh screen.

33-29 PLUMBNESS AND ALIGNMENT. Casings, after installation, shall be sufficiently plumb and straight so as not to interfere with the installation and operation of the pump.

33-30 CRITERIA FOR WELL INTERFERENCE PROTECTION.

33-30.1 Chapter 54 of the Administrative Rules of Iowa provides an administrative means for owners of nonregulated wells to receive compensation for well interference caused by permitted uses. To be eligible for any future compensation for well interference, nonregulated wells constructed after July 1, 1986, must be constructed to allow for future well interference. This allowance shall be at least ten feet (10') or half the pumping drawdown in the well, whichever is greater, based on the design capacity of the new well. However, in no situation must the nonpumping water level be protected below the top of a confined aquifer to half the normal saturated thickness of an unconfined aquifer. Shallow aquifers which are only slightly confined may be classified as unconfined aquifers for this purpose. Flowing wells must be constructed to accommodate a pump capable of supplying a sufficient water supply when the nonpumping water level is at the top of a confined aquifer or a hundred feet (100') below the surface, whichever is higher. Consideration should be given to future conditions such as drought and reduced well efficiency.

33-30.2 If a permitted use exists prior to the construction of a nonregulated well, no compensation for well interference will be allowed unless a significant change in the permitted use occurs. A physical change to withdrawal facilities may be considered a significant change to a permitted use (e.g., moving the withdrawal location, installing a new well, or installing a higher-capacity pump.) Therefore, a person desiring to construct a nonregulated well should first obtain information concerning nearby permitted uses. The department of natural resources will provide information on permitted uses upon request.

33-31 ACCESS PORT FOR MEASUREMENT OF WATER LEVELS. New wells and wells which undergo major rehabilitation or reconstruction shall be equipped with an access port having a minimum diameter of three-fourths inch (3/4"). The access port must be fitted with a threaded cap or plug and be located to allow insertion of a steel tape or electric probe into the well for measurement of water levels. When a spool type of pitless adapter is used which obstructs the casing from having a clear opening to the water, a three-fourth-inch (3/4") pipe must be attached to the spool and brought to the surface below the well cap to facilitate a water level probe.

33-32 through 33-40 Reserved.

PART 4
TYPES OF WELL CONSTRUCTION

33-41 DRILLED WELLS. Drilled wells are constructed in consolidated or unconsolidated formations and may penetrate more than one water-bearing formation. Good construction and development practices require the placement of grout in the annular space to prevent surface water from entering the formation and to prevent highly mineralized or polluted water from mingling with higher quality water. To facilitate the placement of this seal or grout, the diameter of the drill hole, for at least the uppermost twenty feet (20'), shall be a minimum of five inches (5") greater than the outside diameter of the casing. Casing shall then be grouted as provided for in section 33-54.

33-41.1 Drilled wells in unconsolidated formations. In no case shall less than twenty feet (20') of permanent casing be installed in wells drilled in unconsolidated formations. If caving is experienced and a liner pipe is to be left in place, the annular space between the permanent casing and the liner pipe shall be grouted in accordance with section 33-54 for its entire length. If grouting in accordance with section 33-54 is not possible, a monolithic, reinforced, concrete platform, of sufficient thickness and depth to prevent cracking due to frost heave, which slopes away from the well, shall be installed at ground surface for a distance of not less than three feet (3') in all directions from the casing.

33-41.2 Drilled wells in consolidated formation. Limestones and dolomites which are cracked, creviced, etc., should be viewed with suspicion as a source of ground water supply if they are the uppermost bedrock formation and have a thin mantle of overburden. As the depth of overburden decreases, there is an increased risk of contamination entering the formation.

a Earth mantle more than thirty feet (30') in thickness. Where these geological conditions exist, the casing shall be firmly seated into firm rock, and the annular space around the casing through the earth mantle shall be grouted in accordance

with section 33-54.

b Earth mantle less than thirty feet (30') in thickness. In instances where the earth mantle is less than thirty feet (30') in thickness, the well casing shall extend to a depth of at least forty feet (40') and be seated in firm rock, and the annular space grouted in accordance with section 33-54.

c Rock below creviced formations. When the uppermost bedrock consists of creviced limestone or dolomite and the well is to obtain water from a lower formation, the casing shall be extended through the creviced formation and be seated in firm rock. In instances where shale underlies creviced limestone or dolomite formations, the casing shall extend through the shale and be seated in firm rock. The annular space shall be grouted in accordance with section 33-54.

33-42 BORED OR AUGURED WELLS. Bored or augured wells shall be constructed with a watertight casing in a borehole that is at least six inches (6") greater than the outside diameter of the casing. This annular space shall be grouted in accordance with section 33-54. Concrete pipe, vitrified pipe and similar precast curbing have construction joints and cannot be depended upon to be watertight and therefore shall not be used as casing in the uppermost ten feet (10') of the well unless they are properly grouted. In no case shall less then twenty feet (20') of casing be installed. When these materials are used for casing or when existing dug or bored wells undergo major rehabilitation or reconstruction, they shall be constructed as follows:

33-42.1 Buried slab-type construction.

a The concrete or vitrified pipe casing shall be terminated not less than ten feet (10') below ground surface.

b The casing shall be fitted with a reinforced concrete or steel plate into which a watertight steel or thermoplastic casing is firmly imbedded or connected to a pipe cast or welded into the plate. This casing shall be at least six inches (6") in diameter and shall extend from the plate to not less than twelve inches (12") above established grade.

c A twelve inch (12") concrete seal shall be poured over and around the plate.

d After the concrete seal has set, the annular space between the steel or thermoplastic casing and the borehole shall be backfilled with clean soil.

e During the backfilling process, the earth shall be thoroughly tamped to minimize settling. Grading around the well shall then be accomplished in accordance with 33-15.2.

33-42.2 Or bored wells with extended casings of concrete, vitrified pipe, etc. (only allowed if written authority is provided by administrative authority).

a This type of casing shall be terminated not less than twelve inches (12") above finished grade.

b Since this type of casing has construction joints, the borehole shall not be less than six inches (6") greater than the outside diameter of the casing to a depth of not less than ten feet (10'), and the annular space shall be grouted with cement or concrete

in accordance with section 33-15.2.

c A watertight, four-inch (4") reinforced, concrete well cap shall be provided.

33-42.3 The use of pitless adaptors is recommended even in this type of construction. The pitless adaptor or other transition piping designed to extend through the casing shall be installed prior to grouting in order that the grout can provide a watertight seal. The use of a frost pit that is not located over the casing as outlined in 33-23.2 or a pumphouse as outlined in 33-61 may be used to house the pressure tank, valves, etc.

33-42.4 Augured or bored wells which do not penetrate consolidated formations are permitted to terminate in tile frost pits provided that the pit walls, floor, and cover are constructed and sealed so as to not permit entry of any contamination.

a Pit walls (concrete tile). The pit shall extend twelve inches (12") above natural grade. Pipe nipples or adaptors for entrance of water line and electric conduit through wall shall be mechanically sealed or poured in place.

b Pit floor. The pit floor shall be constructed of neat cement or concrete, and the well casing shall extend at least six inches (6") above the floor.

c Pit, manhole or well cover. The pit, manhole or well cover shall be constructed of concrete and shall have a diameter two inches (2") larger than the outer diameter of the pit, manhole, or well opening. If manholes are provided, the joint between a manhole and the pit cover shall be raised at least two inches (2") above the top of the pit cover.

d Pit excavation. The annular space between sides of the pit excavation and outer diameter of pit tiles shall be a minimum of two inches (2"). The annular space outside the pit wall shall be continuous with annular space outside the well casing.

e Grouting. Grouting of the annular space of the pit and well shall be accomplished in one continuous operation and in accordance with 33-42 and 33-54 except that in cases where concrete grout is applied from the surface, a mechanical concrete vibrator shall be employed by extending the vibrator to a depth of at least two feet (2') below the pit floor into the annular space outside the well casing during application of the grout.

33-43 FLOWING ARTESIAN WELLS. Drilling operations shall extend into but not through the formation confining the water. The casing shall then be installed and the annular space grouted and allowed to set. After setting, the drill hole shall then be extended into the confining formation. Flow control from the well shall be provided by valved pipe connections or a receiving tank set at an altitude corresponding to that of the artesian head. Under no circumstances shall the water flow uncontrolled to waste. A direct connection between the discharge pipe and a receiving tank, sewer, or other source of contamination is prohibited.

33-44 DRIVEN SANDPOINT WELLS. Through the vertical zone of contamination to a depth of not less than that indicated in section 33-22, the unperforated, watertight pipe of a driven well shall conform to the specifications as indicated in

Table 33-52.1d. Protection against freezing shall be accomplished by requiring that a pitless adaptor as outlined in section 33-55 or a frost pit as outlined in section 33-24 is properly installed. Under no circumstances shall thermoplastic well casing be driven.

33-45 SPRINGS. While springs are utilized as a water source in isolated instances, the quality of the water obtained therefrom varies greatly since they are merely a breakout of groundwater and are subject to intermittent contamination. Information regarding utilization of springs as a source of water should be sought from the administrative authority prior to its development.

33-46 through 33-50 Reserved.

PART 5
MATERIAL STANDARDS

33-51 All materials utilized in well water construction shall conform to the standards of the American Water Works Association (AWWA), the American Petroleum Institute (API), the American Society for Testing and Materials (ASTM), and the National Water Well Association (NWWA) except as modified by these standards.

33-52 WATER WELL CASING AND COUPLINGS.

33-52.1 Steel or iron water well casing and couplings.

a Each length of casing shall be legibly marked in accordance with API or ASTM marking specifications showing the manufacturer's or processor's name or trademark, size in inches, weight in pounds per foot, whether seamless or welded (type of weld), and the API or ASTM specification or trade monogram.

b Pipe used as casing in the permanent construction of a well shall be a new pipe produced to recognized standards of the API or ASTM, or other grade weldable new pipe having a quality equal to or greater than those specified. All diameter steel shall have minimum weights and thickness as specified in Table 33-52.1d

c All casing pipe joints shall be watertight welded construction or threaded couplings.

d Minimum casing pipe and coupling weights and dimensions

Wgt. Lbs. Per Ft.	Pipe	Couplings

Size in Inches	Threads & Coupling	Plain End	Thickness in Inches	Diameter-Inches Ext.	Diameter-Inches Int.	Threads Per Inch	Ext. Diameter Inches	Length in Inches
1	1.70	1.68	.133	1.315	1.049	11-1/2	1.576	2-5.8
1-1/4	2.30	2.27	.140	1.660	1.380	11-1/2	1.900	2-3/4
1-1/2	2.75	2.72	.145	1.900	1.610	11-1/2	2.200	2-3/4
2	3.75	3.65	.154	2.375	2.067	11-1/2	2.750	2-7/8
2-1/2	5.90	5.79	.203	2.875	2.469	8	3.250	2-15/16
3	7.70	7.58	.216	3.500	3.068	8	4.000	4-1/16
3-1/2	9.25	9.11	.226	4.000	3.548	8	4.625	4-3/16
4	11.00	10.79	.237	4.500	4.026	8	5.200	4-5/16
5	15.00	14.62	.258	5.563	5.047	8	6.296	4-1/2
6	19.45	18.97	.280	6.625	6.065	8	7.390	4-11/16
6-5/8 OD	20.00	19.49	.288	6.625	6.049	8 R	7.390	7-1/4
7	20.22	19.54	.272	7.000	6.366	8 R	7.657	7-1/4
8	25.55	24.70	.277	8.625	8.071	8	9.625	5-1/16
10	35.75	34.25	.307	10.750	10.136	8	11.750	5-9/16
12	45.45	43.77	.330	12.750	12.090	8	14.000	5-15/16
14 OD	57.00	54.57	.375	14.000	13.250	8	15.000	6-3/8
16 OD	65.30	62.58	.375	16.000	15.250	8	17.000	6-3/4
18 OD	73.00	70.59	.375	18.000	17.250	8	19.000	7-1/8
20 OD	81.00	73.60	.375	20.000	19.250	8	21.000	7-5/8

R = Round Threads

33-52.2 Thermo plastic water well casings and couplings. Only those water well casings and couplings complying with ANSE ASTM F-480-76 will be considered as conforming to these regulations. Under no circumstances shall thermo-plastic water well casing be driven.

33-53 GROUTING GUIDES. Protective casing that is to be grouted shall have sufficient guides attached to the casing so as to permit the unobstructed flow and deposition of grout.

33-54 GROUTING. Materials and procedures for grouting shall be as follows:

33-54.1 Concrete grout. The mixture shall consist of cement, sand and water, in the proportion of one bag cement (94 lbs) and an equal volume of sand to not more than six (6) gallons of clean water. Concrete grout shall be used only on bored or augured wells as noted in section 33-42.

33-54.2 Neat cement grout. The mixture shall consist of one bag of cement (94 lbs) to not more than six (6) gallons of clean water. Additives such as bentonite, "aquajel", or similar materials, may be added up to five percent (5%) by weight to increase

fluidity and to control shrinkage.

33-54.3 Heavy drilling fluid. When this material is used as grout in a rotary drilled well, it shall contain a high percentage of clay or bentonite to minimize shrinkage of the slurry within the annular space. Heavy bentonite water slurry is a mixture of ten percent (10%) by weight of bentonite added to clean water or approximately five percent (5%) bentonite added to drilling mud. Bentonite shall contain eighty-five percent (85%) of the mineral montmorillonite and shall meet API Standard 13A, March 1966. Saline, acid or alkaline substances or other additives to cause a temporary increase in viscosity of the bentonite slurry are not permitted as a component of grouting material.

33-54.4 Application. Grouting shall be performed by adding the mixture from the bottom of the annular space upward in one continuous operation until the annular space is filled or to the point of the pitless adaptor attachment. The only exception to this method of application is in situations such as the construction of bored or augured wells where the annular space is six inches (6") or greater to depths of not more than twenty feet (20'). In this situation, the grout may be applied from the surface providing care is taken to ensure an even flow to all sides of the casing for the entire pour, which shall be continuous until the annular space is completely grouted.

33-55 PITLESS ADAPTOR UNITS. Pitless adaptor units conforming to Pitless Adaptor Standard No. 1 (PAS-1) as promulgated by the water systems council are considered as complying with these regulations. This standard is available for inspection at the Des Moines office of the department of natural resources or may be obtained for personal use from the Pitless Adaptor Division, Water Systems Council, 212 North La Salle Street, Chicago, Illinois 60601.

33-56 through 33-60 Reserved.

PART 6
PUMP INSTALLATION

33-61 PUMP HOUSE APPURTENANCES. When pump houses are utilized, they shall be constructed above established grade permitting access to the well and pump for maintenance and repair. The pump room shall be provided with an independent floor drain that discharges to ground surface. The outside opening of this drain line shall be fitted with a brass, bronze or copper 16-mesh screen to exclude the entrance of pests.

33-62 PUMP HOUSE FLOORS. The top of the well casing shall terminate at least twelve inches (12") above the pump house floor. The pump house floor shall be

constructed of concrete that is not less than four inches (4") in thickness and is sloped away from the casing. A watertight seal of asphalt or similar material, to provide resiliency, shall be provided between the casing and the pump house floor.

33-63 PUMPS AND PUMPING EQUIPMENT. All pumps shall be designed, installed and maintained so that priming is not required for ordinary use. Pumps that have unprotected openings into the interior of the pump or casing shall not be used.

33-63.1 Submersible pumps. Submersible pump discharge lines shall leave the well through a properly installed pitless adaptor or through a sanitary seal.

33-63.2 Other power pumps. Other power pumps located over the well shall be mechanically joined to the casing or on a pump foundation or stand in such a manner as to effectively seal the top of the well. A sanitary seal shall be used where the pump is not located over the well, and the pump delivery or suction pipe emerges from the top thereof. If these units are located in a basement, all suction lines shall be elevated at least twelve inches (12") above the floor and shall be encased in a protective galvanized steel pipe.

33-63.3 Hand pumps or similar devices. Pumps of this type shall be fitted with a gasket and bolted securely to the platform to provide a watertight seal, have a closed spout, directed downward, and a pump rod that operates through a stuffing box.

33-64 through 33-70 Reserved.

PART 7
DISINFECTION AND ANALYSIS

33-71 WELL DISINFECTION. All new, repaired or reconditioned wells or pump installations shall be thoroughly pumped to waste until all dirt and foreign materials are removed and the water is reasonably clear. Superchlorination, with calcium or sodium hypochlorite compounds with a concentration of at least 100 part per million (ppm), shall then be accomplished simultaneously throughout the water well distribution system by the contractor.

33-72 WATER ANALYSIS. The contractor or owner of new, repaired or reconditioned well or pump installations, upon properly disinfecting the well or pump installations, as out lined in section 33-71, shall submit a water specimen to the university hygienic laboratory at Iowa City (previously known as the state hygienic laboratory) and to another approved laboratory for bacterial and nitrate analysis. Information regarding the procurement of water specimen, bottles, fees, etc., can be obtained from local boards of health, the department of natural resources or the university hygienic laboratory.

33-73 through 33-80 Reserved.

PART 8
HYDROPNEUMATIC (PRESSURE) TANKS, FILTERS AND MISCELLANEOUS WATER TREATMENT EQUIPMENT

33-81 Properly sized tanks, filters, and other treatment equipment shall be installed in accordance with the manufacturer's directions and shall maintain a pressure of fifteen pounds (15 lbs) at highest point usage under normal demand. Where applicable, AWWA Standards for Steel Tanks, Standpipes, Reservoirs, and Elevated Tanks Storage (D100-59) shall be followed.

33-82 through 33-90 Reserved.

PART 9
ABANDONMENT OF WELLS

33-91 ABANDONMENT OF WELLS.

33-91.1 Abandoned wells are a hazard to the waterbearing formation as well as to the physical well-being of people. In addition to providing easy access to pollution entering formations supplying water to other wells in the vicinity, numerous cases of injury and death have resulted from persons or animals falling into unprotected, improperly abandoned wells.

33-91.2 Wells no longer used shall be properly abandoned as outlined in Dubuque County Ordinance Chapter 32 - Well Abandonment.

33-91.3 Under no circumstances shall abandoned wells be used for the disposal of garbage, septic tank sludge or effluents, as a receptacle for field tile drainage, or for any other type of unauthorized disposal of waste materials.

33-92 through 33-98 Reserved.

PART 10
ENACTMENT

33-99 EFFECTIVE DATE. This ordinance and amendments shall be in effect after its final passage, approval and publications as provided by law.