TITLE II: PUBLIC HEALTH

CHAPTER I.

WATER WELLS

ARTICLE I: PRIVATE WATER WELL CONSTRUCTION PERMIT

The purpose of this Ordinance is to adopt the Private Water Well Construction Permit rules of the Iowa Administrative Code (Chapter 38).

SECTION 1. DEFINITIONS.

Abandoned Well	A water well which is no longer in use or which is in such a state of disrepair that continued use for the purpose of accessing groundwater is unsafe or impracticable.
Agreement	A signed document between the Department and the County Board of Supervisors with which the Department delegates the authority to issue private well drilling permits to the County Board of Supervisors or its designee.
Construction	The physical act or process of making a water well including, but not limited to, siting, excavation, construction and installation of equipment and materials necessary to maintain and operate the well.
Contiguous	Any number of parcels of land that physically touch one another, including tracts of land separated by roads, railroads or streams, except that for the purpose of reporting on other existing wells on the property, the radius of a contiguous piece of land shall be limited to one mile from the site of the new well constructed.
Contractor	A person engaged in the business of well construction or reconstruction. The term may include a corporation, partnership, sole proprietorship, association or any other business entity as well as any employee or officer of the entity.
County	Muscatine County Board of Health
Department	Iowa Department of Natural Resources
Director	The Director of the Department or designee.
Groundwater	Any water below the surface of the earth.
Inactive Water Well	A water well that is not currently in use and is capped or sealed to prevent the entrance of contaminants into the well, but is in such a condition that it can be activated to produce a safe supply of water.
Landowner	An individual, trust, partnership, corporation, government or governmental subdivision or agency, association or other legal entity that has legal or equitable title to a piece of land.
Landowner's Agent	A person who acts for or in place of the landowner by authority from the landowner.
Private Water Well	A well that does not supply a public water supply system.
Protected Source	A surface water or groundwater source recognized by rule as deserving special protection in order to ensure its long-term availability, in terms of either quality or quantity, or both, to preserve the public health and welfare.

Public Water Supply System — A system for the provision to the public of piped water for human consumption, if such system has at least fifteen (15) service connections or regularly serves an average of at least twenty-five (25) individuals daily at least sixty (60) days out of the year. The term includes: (1) any collection, treatment, storage and distribution facilities under control of the supplier of water and used primarily in connection with the system, and, (2) any collection (including wells) or pretreatment storage facilities not under the control which are used primarily in connection with the system.

Water Well — An excavation that is drilled, cored, bored, augured, washed, driven, dug, jetted, or otherwise constructed for accessing groundwater. Water well does not include an open ditch or drain tiles.

SECTION 2. FORMS. The following application form is currently in use: Well Construction Permit #542-0988.

SECTION 3. PERMIT REQUIRED.

3.1 When permit required. A landowner or landowner's agent shall not drill or construct a new private water well without first obtaining a well construction permit issued by the Department or by a County Board of Supervisors or the Board's designee authorized to issue permits pursuant to rule 38.15(455B) of the Iowa Administrative Code. (Refer to Section 15 of this Ordinance) Examples of private water well requiring well construction permits include, but are not limited to: domestic wells, livestock wells, irrigation wells, recreational-use wells, monitoring wells, heat pump wells, industrial wells, and dewatering wells, except that dewatering wells shall be exempt from the construction standards of Chapter 49 (Nonpublic Water Wells) of the Iowa Administrative Code.

3.2 Exemptions. The following types of excavations do not need private water well construction permits: soil borings, percolation test holes, sand and gravel and limestone exploration holes, excavations for storing and extracting natural gas or other products, gravel pits and quarries and all monitoring wells required as part of a permit or a construction approval issued by the Department. Test holes, used to determine the availability, quality or depth of groundwater are also exempt provided that all the following conditions are met.

a. The use of the test hole is limited to the conduct of the test only.

b. The duration of the test is not more that seven consecutive days.

c. The test hole is properly closed immediately after the test is completed in accordance with Chapter 39 "Requirements for Properly Plugging Abandoned Wells" of the Iowa Administrative Code.

3.3 Caveat. Nothing in these rules shall be construed as exempting public water supply wells from the construction permit and water withdrawal permit provisions of the environmental protection commission rules, 567- Iowa Administrative Code.

SECTION 4. FORM OF APPLICATION. Application shall be made on forms supplied by the County. Each application shall list all wells, including abandoned wells, on the applicant's property contiguous to the well site described in the application and shall describe the location of each well site. The location site shall be given in the form of a legal land description (section, township and range) to the nearest quarter of a quarter of a section and noted on a map or aerial photograph. The list of wells to be registered shall include but is not limited to abandoned wells, inactive wells, agricultural drainage wells, irrigation wells, domestic wells, and livestock wells.

SECTION 5. FEES.

5.1 Fee Payment. Each application shall be accompanied by a nonrefundable fee determined by the Board of Supervisors, made payable to the Muscatine County Treasurer. More than one proposed well on one contiguous piece of property may be listed on one application and only one fee need be paid irrespective of the number of wells listed on the application form. A proper application shall consist of a fully and properly completed form and nonrefundable fee.

5.2 Exemption. The County is exempt from the fee payment requirements of these rules.

SECTION 6. WELL MAINTENANCE AND RECONSTRUCTION.

A private well construction permit is required for all replacement wells. A private well construction permit is not required for the repair, maintenance, rehabilitation or reconstruction of an existing well. Changes in physical dimensions in these exemptions include, but are not limited to: deepening the well and changing the diameter or length or the casing or the screen.

SECTION 7. EMERGENCY PERMITS.

7.1 Emergency Permits. Emergency permit applications may be made on approved County forms as provided for in (Section 4) and the reporting requirements shall be on a routine basis in accordance with 15.3 of this Ordinance.

SECTION 8. PERMIT ISSUANCE AND CONDITIONS.

8.1 When issued. Upon receipt of a complete application, the County shall issue a permit to the landowner or landowner's agent except as provided in Rules 38.7(455B), 38.12(455B) of the Iowa Administrative Code (refer to Sections 7, 12, and 15 of this Ordinance).

8.2 Not withdrawal permit. Each permit shall include notification that a private well construction permit is not a water withdrawal permit and does not eliminate the necessity of obtaining any water withdrawal permits required in 567-Chapter 51 and 52 of the Iowa Administrative Code. A water withdrawal permit is required before an applicant can withdraw more than 25,000 gallons of water per day from any source or combination of sources in the State of Iowa.

8.3 Construction by registered well driller. Each well construction permit shall require that each well shall be constructed by a registered well driller in compliance with 567-Chapters 37 and 49 of the Iowa Administrative Code. However, temporary dewatering wells at construction sites shall be exempt from the construction standards of Chapter 49.

SECTION 9. NONCOMPLIANCE. Violations of any of the provisions of this Chapter may be addressed by the County pursuant to Iowa Code sections 455B.109, 455B.175 and 455B.191.

SECTION 10. EXPIRATION OF A PERMIT. A private well construction permit shall expire one calendar year from the date of issuance. If construction of the proposed well is not started prior to the expiration date, a new application plus a new nonrefundable fee must be filed.

SECTION 11. TRANSFERABILITY. A private well construction permit is not transferable.

SECTION 12. DENIAL OF A PERMIT. The County may deny a private well construction permit if granting the permit would lead to the violation of State law, would result in groundwater

contamination, would lead to withdrawal from a protected source, or the Director determines that the well would threaten public health or the environment. Examples of wells that could threaten public health or the environment and, therefore, may be denied construction permits include, but are not limited to: in-situmining wells, wells which may result in a negative impact on an identified point source of groundwater contamination and cause leachate plume to spread or migrate, underground injection wells except as provided in 50.6(4) and 62.9 of the Iowa Code.

SECTION 13. APPEAL OF A PERMIT DENIAL. Any applicant aggrieved by a decision issued under the provisions of this Chapter may file a notice of appeal with the County. The notice of appeal must be filed within thirty (30) days of the date of the permit decision. The form of the notice of appeal and appeal procedures are governed by 567 - Chapter 7 of the Iowa Code. Appeal of a permit denied by a County which has been delegated authority to issue private water well permits shall be administered by the County in accordance with their appeal or judiciary review process and can only by appealed to the Department if delegation to the County is suspended, rescinded or revoked.

SECTION 14. DELEGATION OF AUTHORITY TO COUNTY BOARD OF SUPERVISORS.

15.1 Application by Board. A County Board of Supervisors requesting the authority to issue private well construction permits shall apply to the Department in accordance with Iowa Code Chapter 28E. The application shall include statement of agreement to comply with 567 - Chapter 38. Additional information may be requested by the Department.

15.2 County Standards. The County Board of Supervisors may impose additional standards as local conditions dictate, but cannot by less stringent than those required by the provisions of this Chapter.

15.3 Information to Department. The delegation agreement shall provide for the method format and frequency of reporting all permit application information to the Department.

15.4 Board Authority. After delegation of authority to a County Board of Supervisors, all applications in that County shall be made to the Board of its designee except that all new private well permit applications by State or Federal agencies shall be made to the Department.

15.5 Term of Delegation. The delegation of authority may be for up to five years and may be redelegated at the discretion of the Department.

SECTION 15. JURISDICTION. The provisions of this regulation shall apply throughout Muscatine County, Iowa, including cities and towns therein; provided such cities have not adopted a Board of Health pursuant to Chapter 137, Code 1973, in which event the provisions of this regulation shall not apply to said City.

SECTION 16. PENALTY. Any person who violates any provision of these rules and regulations or any lawful order of the Board of Health, its officers, or authorized agents shall be guilty of a misdemeanor and shall be punished by a fine not to exceed one hundred (100) dollars or by imprisonment in the County jail for not more than thirty (30) days. Each additional day of neglect or failure to comply with such provision, rule or lawful order after notice of violation by the Board shall constitute a separate offense.

ARTICLE II: NONPUBLIC WATER WELLS

The purpose of this Ordinance is to adopt the Nonpublic Water Well Rules of the Iowa Administrative Code (Chapter 49).

SECTION 1. DEFINITIONS.

Abandoned Well	A well whose use has permanently discontinued. A well shall be considered abandoned when its condition is such that continued use is impractical or no longer desired.
County	Muscatine County Board of Health.
Annular Space	The open space between the well hole excavation and the well casing.
Cesspool	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.
Compensation For Well Interference	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.
Established Grade	The permanent point of contact of the ground to the artificial surface with the casing or curbing of the well.
Grout	A material used to seal the annual 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 quart of the material through an API (American Petroleum Institute) marsh funnel viscometer.
Major Rehabilitation or Reconstruction	Replacement, extension or removal of all or a portion of the well casing.
Nonpublic Water Supply	A water system that has fewer than fifteen (15) service connections or serves less than twenty-five (25) people, or one that has more than fifteen (15) service connections or services more than twenty-five (25) people for less than sixty (60) days a year.
Nonregulated Well	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).
Permitted Use	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 Department of Natural Resources' rules and Iowa Code Chapter 455B, Division III, Part 4.
Pitless Adapter	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.
Polluted or Contaminated	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.
Pumps and Pumping Equipment	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.
Stuffing Box	An approved receptacle in which packing may be compressed to form a watertight or airtight junction between two objects.
Vertical Zone of Contamination	Depth of geological formation, generally near the ground surface, containing connecting pore spaces, crevices or similar openings, including artificial channels, such as protected wells, through which contaminated water may gain access to a well or to a ground water source.

Well — Any excavation that is drilled, driven, dug, bored, augured, jetted, washed or is otherwise constructed for the purpose of withdrawing water.

Well Seal — 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, so as to prevent water or other foreign material from entering the well at the uppermost terminal.

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

2. Sanitary seal - a watertight fitting used on wells that terminate in a frost pit or well house.

SECTION 2. APPLICABILITY. These provisions apply to all nonpublic water wells constructed after the effective date of this Ordinance and include existing water wells undergoing major rehabilitation or reconstruction. These provisions do not apply to irrigation or livestock wells unless such wells are part of or are connected to a water system, which services as a source of drinking water for humans; or through poor construction or operation such wells can allow significant contamination to enter ground water.

SECTION 3. GENERAL. The Muscatine County Board of Health shall have the authority to visit well sites during any phase of the work in progress without prior notice. The County may also 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 issued by the Iowa Department of Natural Resources.

SECTION 4. VARIANCES. Variances to these rules may be granted by the County provided sufficient and proposed alternative information is afforded to substantiate the need and propriety for such action. Variances and reasoning shall be in writing.

SECTION 5. 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 County authority should be called upon for assistance in determining a proper distance in these cases.

5.1 Minimum distance. The following minimum lateral distances shall apply for the common sources of contamination:

Sources of Contamination	**Minimum Lateral Distance**
Lagoons or waste treatment facilities and sanitary landfills	1,000 feet
Cesspools	150 feet
Preparation of storage area for spray materials, commercial Fertilizer 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 operations	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 lakes	25 feet
Sewer of cast iron with leaded or mechanical joints, independent	

clear water drains, or cisterns	10 feet
Pump house floor drain draining to ground surface. (Drains must not be connected to any sewer or drainage system.)	5 feet

5.2 Access. A 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.

5.3 Areas subject to flooding:

a. 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 County.

b. 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 Sections 7.1(a) and 9.3(c).

SECTION 6. STANDARDS FOR WELL CONSTRUCTION, MAJOR REHABILITATION OR RECONSTRUCTION.

6.1 Water use in construction. Water use in the construction process shall be obtained from a source that will not result in contamination of the well. Water used shall be chlorinated with a dosage of 50 mg/l (50 ppm) to prevent iron bacteria contamination.

6.2 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.

6.3 Wells located within frost pits:

a. In new construction, wells are not permitted to be located within frost pits since they present a sanitary hazard to the water supply by 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 Section 7.2)

b. When existing wells located within frost pits undergo major rehabilitation or reconstruction:

(1) The casing shall be extended as outlined in Section 5.3(a); a pit less adaptor shall be installed in accordance with Section 8.4; the curbing of the pit shall be removed at least two feet (2') below the ground surface; the area of the pit shall be filled with a clean backfill, tamped; and the area shall be graded in accordance with Section 5.3(b).

(2) The well casing shall be provided with a sanitary seal.

6.4 Frost pits located adjacent to wells. 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.

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

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.

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, shall be provided.

6.5 Equipment located with 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 6.4.

6.6 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 exclude contamination.

6.7 Buried well seals. Buried well seals, are not permitted on new construction where the casing terminated below ground surface. Existing installations, upon major reconstruction, rehabilitation or pump replacement, shall have the casing extended and the area graded as provided for in 5.3(b).

6.8 Vents. Vents shall be constructed 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 the ground surface and is covered with a brass, bronze, or copper 16-mesh screen.

6.9 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.

6.10 Criteria for well interference protection. Chapter 54 of the Iowa Administrative Code provides an administrative means for owners of non-regulated wells to receive compensation for well interference caused by permitted uses. To be eligible for any future compensation for well interference, non-regulated 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 non-pumping 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 non-pumping 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.

If a permitted use exists prior to the construction of a non-regulated 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 non-regulated well should first obtain information concerning nearby permitted uses. The Department of Natural Resources will provide information on permitted uses upon request.

6.11 Access port for measurement of water levels. New wells and wells which undergo 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 pit less adapter is used which obstructs the casing from having a clear opening to the water, a three-fourths 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.

SECTION 7. TYPES OF WELL CONSTRUCTION.

7.1 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 8.3.

a. 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 8.3 for its entire length. If grouting in accordance with Section 8.3 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.

b. Drilled wells in consolidated formation. Limestone 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.

(1) 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 8.3.

(2) 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 8.3.

(3) 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 8.3.

7.2 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 8.3. Concrete pipe, vitrified pipe and similar precast jointed curbing shall not be used as casing in the uppermost ten feet (10') of the well unless properly grouted. In no case shall less than 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:

a. Buried slab-type construction.

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

(2) The casing shall be fitted with a reinforced concrete or steel plate a watertight steel or thermoplastic casing firmly attached. 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.

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

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

(5) During the backfilling process, the earth shall be thoroughly tamped to minimize settling. Grading around the well shall then be accomplished in accordance with Section 5.3(b).

b. Bored wells with extended casing of concrete, vitrified pipe, etc. only allowed if written authority is provided by administrative authority.

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

(2) 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 per Section 8.3.

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

c. The use of pitless adapters is recommended even in this type of construction. The pit less adaptor or other transition piping designed to extend through a watertight seal. A frost pit that is not located over the casing as outlined in Section 6.3(b) or a pump house as outlined in rule 49.8(135) of the Iowa Administrative Code may be used to house the pressure tank, valves, etc.

d. Casing shall be installed prior to grouting in order that the grout can provide a sanitary seal. Augured or bored wells that do not penetrate consolidated formations may terminate in tile frost pits provided that the pit walls, floor, and cover are constructed and sealed to prevent contamination.

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

(2) 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.

(3) 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.

(4) 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 annual space outside the well casing.

(5) Grouting. Grouting of the annular space of the pit and well shall be accomplished in one continuous operation and in accordance with Sections 7.2 and 8.3 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.

7.3 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.

7.4 Driven sandpoint wells. Through the vertical zone of contamination to a depth of not less than that indicated in Section 6.2, the non-perforated, watertight pipe of a driven well shall conform to the specifications as indicated in Table A. Protection against freezing shall be accomplished by requiring that a pitless adaptor as outlined in Section 8.4 or a frost pit as outlined in Section 6.4 is properly installed. Under no circumstances shall thermoplastic well casing be driven.

7.5 Springs. While springs are utilized as a water source in isolated instances, the quality of the water obtained there from 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 administration authority prior to its development.

SECTION 8. MATERIAL STANDARDS.

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.

8.1 Water Well Casing.

a. Steel or iron water well casing and couplings.

(1) 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.

(2) Pipe used as casing in the permanent construction of a well stand be 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 A.

(3) All casing pipe joints shall be watertight welded construction or threaded couplings.

b. Thermoplastic water well casings and couplings. Only those water well casings and couplings complying with ANSI ASTM F-480-76 will be considered as conforming to these regulations. Under no circumstances shall be thermoplastic water well casing be driven.

8.2 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.

8.3 Grouting. Materials and procedures for grouting shall be as follows:

a. 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 augered well as noted in Section 7.2.

b. 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.

c. 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 annual 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.

d. 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 augered wells where the annular space is six inches (6") or greater to depths of not more than twenty feet (20'). In this saturation, 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.

8.4 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 Divisions, Water System Council, 212 North La Salle Street, Chicago, Illinois 60601.

SECTION 9. PUMP INSTALLATION.

9.1 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 pests.

9.2 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 slopped 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.

9.3 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.

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

b. 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.

c. 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.

SECTION 10. WELL DISINFECTION. All new, repaired or reconditioned wells or pump installations shall be thoroughly pumped of waste until all dirt and foreign materials are removed and the water is reasonably clear. The well shall then be disinfected with a calcium or sodium hypochlorite solution in a concentration of at least 100 parts per million (ppm).

SECTION 11. WATER ANALYSIS. After disinfecting the well or pump installations, as outlined in Section 10 a water specimen shall be submitted to the University Hygienic Laboratory at Iowa City (previously known as the State Hygienic Laboratory) or to another approved laboratory for bacterial and nitrate analysis. And the results shall be reported to the County.

SECTION 12. HYDROPNEUMATIC (PRESSURE) TANKS, FILTERS, AND MISCELLANEOUS WATER TREATMENT EQUIPMENT. 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 (15) pounds at highest point usage under normal demand. Where applicable, AWAA Standards for Steel Tanks, Standpipes, Reservoir, and Elevated Tank Storage (D 100-59) shall be followed.

SECTION 13. ABANDONMENT OF WELLS. Abandoned wells are a hazard and shall be properly abandoned as outlined in Public Information Circular No. 11 entitled "Plugging Procedures for Domestic Wells" as proved by the Department. A copy of this circular is available for inspection at the Des Moines office of the Department of Natural Resources. Personal copies may be obtained from the Geological Survey Bureau of the Department, North Capital Street, Iowa City, Iowa 52242.

Abandoned wells may not 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.

SECTION 14. JURISDICTION. The provisions of this regulation shall apply throughout Muscatine County, Iowa, including cites and towns therein; provided such cities have not adopted a Board of Health pursuant to Chapter 137, Code 1973, in which event the provisions of this regulation shall not apply to said City.

SECTION 15. PENALTY. Any person who violates any provision of these rules and regulations or any lawful order of the Board of Health, its officers, or authorized agents shall be guilty of a misdemeanor and shall be punished by a fine not to exceed one hundred (100) dollars or by imprisonment in the County jail for not more than thirty (30) days. Each additional day of neglect or failure to comply with such provision, rule or lawful order after notice of violation by the Board shall constitute a separate offense.

TABLE A
Minimum
casing pipe and coupling
weight and dimensions

	Per Ft.		Pipe			Couplings		
Size in Inches	Threads & Coupling	Plain End	Thickness in Inches	Diameter External	Inches Internal	Threads per Inch	External 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	20.00	19.49	.288	6.625	6.049	8R	7.390	7-1/4
OD	20.00	19.54	.272	7.000	6.366	8R	7.657	7-1/4
7	25.55	24.70	.277	8.625	8.071	8	9.625	5-1-16
8	35.75	34.25	.307	10.750	10.136	8	11.750	5-9-16
10	45.45	43.77	.330	12.750	12.090	8	14.000	5-15/16
12	57.00	54.57	.375	14.000	13.250	8	15.000	6-3/8
14 OD	65.30	62.58	.375	16.000	15.250	8	17.000	6-3/4
16 OD	73.00	70.59	.375	18.000	17.250	8	19.000	7-1/8
18 OD	81.00	73.60	.375	20.000	19.250	8	21.000	7-5/8
20 OD								

R=Round Threads

ARTICLE III. REQUIREMENTS FOR PROPERLY PLUGGING ABANDONED WELLS

The purpose of this Ordinance is to adopt the rules of Iowa Code Section 455B.190, as amended by 1989 Iowa Acts, Senate File 441, concerning the procedures for the proper plugging of abandoned wells.

SECTION 1. DEFINITIONS.

Abandoned Well	Water well which is no longer in use or which is in such a state of disrepair that continued use for the purpose of accessing water is unsafe or impractical.
Agricultural Lime	All calcium and magnesium products sold for agricultural purposes in the oxide, hydrate, or carbonate form.
Approved	Accepted or acceptable under an applicable specification state or cited in these rules.
Aquifer	A water-bearing geologic formation capable of yielding a usable quantity of water to a well or spring.
Bentonite	A naturally occurring highly plastic, colloidal clay composed largely of the mineral montmorillonite which expands upon wetting.
Bentonite Grout	A mixture of ten percent (10%) processed bentonite (by weight) and water which is free of (or Slurry) contaminants, turbidity and settleable solids.
Bentonite Pellets	A form of processed bentonite, which can be used directly for sealing applications in well plugging operations.
Bentonite Products	The forms of bentonite, which can be used for sealing materials in wells, including, graded bentonite, bentonite pellets and bentonite grout.
Casing	A tubular retaining structure installed in an excavated hole to maintain the well opening.
Class 1 Well	A well one hundred feet or less in depth and eighteen inches or more in diameter.
Class 2 Well	A well more than one hundred feet in depth or less than eighteen inches in diameter or a bedrock well. Bedrock wells include: (a) wells completed in a single aquifer; (b) wells completed in a single unconfined aquifer; and (c) wells completed in multiple aquifers.
Class 3 Well	A sandpoint well or a well fifty feet or less in depth constructed by joining a screened drive point with lengths of pipe and driving the assembly into a shallow sand and gravel aquifer.
Concrete	A mixture of one sack (94 pounds) or portland cement, an equal amount by volume of sand and gravel or crushed stone and not more than six gallons of water which is free of contaminants, turbidity and settleable solids.
Confined Aquifer	An aquifer in which the groundwater is under pressure greater than atmospheric pressure. The static water level in a well tapping a confined aquifer rises to a level above the top of the aquifer.
Crushed Stone	Class A road stone (predominantly limestone) well graded with six to sixteen percent fines, which will pass a 200 sieve.
Department	The Department of Natural Resources created under Iowa Code Section 455A.2.
Designated Agent	A person other than the State, designated by a County Board of Supervisors to review and confirm that a well has been properly plugged.

Director	The director of the Department.
Filling Materials	Agricultural lime, soil, sand, gravel, crushed stone and pea gravel used to occupy space between and below sealing materials in abandoned wells being plugged.
Frost Pit	A sunken area located directly over or within four feet of a well and used to house the equipment for discharging water from a well into the water system.
Graded Bentonite	Bentonite, which is crushed and sized for pouring and easy handling. Like processed bentonite, it swells when hydrated with water and will form a plastic, essentially impermeable mass.
Gravel	Class B stone screened from river sand or quarried, and of such size as will pass a two and one-half inch screen one hundred percent (100%0 and be retained one hundred percent (100%) on a three-quarter inch (3/4") screen.
Groundwater	Any water beneath the surface of the earth.
Grout	For the purposes of this chapter, a fluid mixture of cement and water (neat cement); sand, cement and water (sand cement grout); or bentonite and water (bentonite grout or slurry) of a consistency that can be forced through a pipe and placed as required.
Limestone	Sedimentary rock, which contains greater than fifty percent (50%) calcium carbonate and has a strong reaction with hydrochloric acid (HC1).
Neat Cement	A mixture of one sack (94 pounds) of portland cement to not more than six gallons of water, which is free from contaminants, turbidity or settleable solids. Bentonite up to two percent (2%) by weight of cement may be added to reduce shrinkage.
Owner	The titleholder of the land where an abandoned well is located.
Pea Gravel	Gravel sized from one-eighth inch to three-eighths inch in diameter.
Plug	The closure of an abandoned well with plugging materials by procedures which will permanently seal the well from contamination by surface drainage and permanently seal off the well from contamination into an aquifer. This involves the proper application of filling and sealing materials.
Processed Bentonite	Bentonite which has been kiln dried and processed into pellets for direct use in well sealing applications or into powder or coarse granules for use in bentonite grout for sealing.
Registered Water Well Contractor	A water well contractor registered with the department in accordance with Section 567 –Chapter 37.
Sand	Clean, medium-textured quartz (concrete sand) and shall be at least twenty-five percent (25%) with diameters between 2.0 and 0.25mm, less than thirty-five percent (35%) with diameters between 0.25 and 0.05 mm and less than five percent (5%) with diameters between 0.0002 and .05 mm.
Sandpoint Well	A small diameter water well constructed by joining a screened drive point with lengths of pipe and driving the assembly into a shallow sand and gravel aquifer.
Sand Cement Grout	A mixture of one sack (94 pounds) of portland cement, an equal amount of volume of sand and not more than six gallons of water, which is free from contaminants, turbidity and settleable solids.
Sealing	The proper placement of sealing materials into an abandoned well to seal off flow into, out of or between aquifers.

Sealing Materials — Bentonite products. Sealing materials may also include neat cement, sand cement grout and concrete.

Standby Well — A water well which is temporarily taken out of service with the expectation of being returned to service at a future date.

Static Water Level — The water level in a water well or aquifer when the well in not flowing or being pumped; sometimes referred to as the water line.

Tremie Pipe — A device, usually a small diameter pipe, that carries grouting materials to the bottom of the hole and which allows pressure grouting from the bottom up without introduction of air pockets.

Unconfined Aquifer — An aquifer in which the static water level does not rise above the top of the aquifer, i.e., the the pressure of the water in the aquifer is approximately equal to that of the atmosphere.

Water Well — An excavation that is drilled, cored, bored, augered, washed, driven, dug, jetted or otherwise constructed for accessing groundwater.

SECTION 2. FORMS. The following form is currently in use: Abandoned Water Well Plugging Record #542-1226.

SECTION 3. ABANDONED WELL PLUGGING SCHEDULE.

3.1 Class 1 Wells. Wells abandoned prior to 3-1-90 must be properly plugged by July 1, 1995.

3.2 Class 2 Wells. Wells abandoned prior to 3-1-90 must be properly plugged by July 1, 2000.

3.3 Class 3 Wells. Wells abandoned prior to 3-1-90 must be properly plugged by July 1, 2000.

3.4 Contamination sources. All classes of wells abandoned prior to the effective date of this rule and located less than two hundred feet (200') from an active well supplying potable water or located less than six hundred sixty feet (660') from a point source of potential contamination which may include but is not limited to industrial waste site; uncontrolled hazardous waste sites; petroleum storage areas; hazardous waste treatment, storage, or disposal areas; agricultural chemical storage areas; animal feedlots, and wastewater treatment facilities. All must be properly plugged by July 1, 1993.

3.5 Wells abandoned after the effective date of the rule. All classes of well which are abandoned on or after the effective date of this rule must be properly plugged within ninety (90) days of the date of abandonment.

SECTION 4. ABANDONED WELL OWNER RESPONSIBILITIES.

4.1 Plugging Requirements. The owner is responsible for insuring the abandoned well is plugged pursuant to this Chapter.

4.2 Affidavit. It is the responsibility of the owner to certify, on DNR Form 542-1226 "Affidavit of Well Plugging", that an abandoned well has been plugged in accordance with the requirements and time schedule contained in this Chapter. This affidavit must include confirmation of the well plugging by the designated agent for the County or a registered water well contractor. Within thirty (30)

calendar days of the date the plugging was completed, the owner shall submit to the department a copy of DNR Form 542-1226.

SECTION 5. ABANDONED WELL PLUGGING MATERIALS.

5.1 Sealing Materials. Approved sealing materials are bentonite products (grade bentonite, bentonite pellets and bentonite grout), neat cement, sand cement grout and concrete.

5.2 Filling Materials. Approved filling materials include agricultural lime, soil, sand, pea gravel, gravel and crushed stone. The filling materials shall be free of debris, foreign matter and any toxic or agricultural chemical residue. Filling materials are not required for well plugging.

SECTION 6. ABANDONED WELL PLUGGING PROCEDURES.

6.1 Freedom from obstruction. Abandoned wells must be checked before they are plugged in order to ensure there are no obstructions that may interfere with plugging operations. Drop pipes, check valves, pumps, and other obstructions shall be removed if practical.

6.2 Class 1 Wells. These wells may be plugged by pouring filling and sealing materials from the top of the well or by using tremie pipes, except for sand cement grout or concrete placed below the static water level, which must be placed by tremie pipe or dump bailer.

Filling materials of sand, gravel, crushed stone, pea gravel or agricultural lime shall be placed up to one foot below the static water level; soils are not permitted below the static water level due to naturally occurring bacteriological, organic and inorganic contaminants. A minimum of one foot of bentonite pellets, graded bentonite or neat cement shall be placed on top of the filling material up to the static water level as a seal. Sand cement grout or concrete applied with a tremie pipe or dump bailer also may be used on top of the filing material up to the static water level and in standing water above the static water level to act as a seal. Filling material may then be added up to four feet below the ground surface.

It is preferable that the filling materials be omitted and that sealing materials be used to fill the entire well up to four feet below the ground surface. Sand cement grout or concrete shall be placed with a tremie pipe or dump bailer when used below the static water level.

The casing pipe and any curbing, frost pit or pump house structure shall be removed to a depth of four feet below the ground surface and shall be capped by a minimum of one foot of bentonite pellets, graded bentonite, neat cement, sand cement grout or concrete. The cap shall extend six or more inches beyond the outside diameter of the top of the remaining well casing and shall terminate three feet below the ground surface. The remaining three feet (below the ground surface) shall then be backfilled with soil and graded so that surface water is directed away from the abandoned well location.

6.3 Class 2 Wells Other Than Bedrock Wells. Filling material consisting of sand, gravel, crushed stone or pea gravel shall be placed in the bottom of the well up to four feet below the static water level. A minimum of four feet of sealing materials consisting of any bentonite products or neat cement shall be added above the filling material up to the original static water level. If bentonite grout or neat cement is used, it shall be placed by tremie pipe. If graded bentonite or bentonite pellets are used, they may be added by pouring in place and agitating to avoid bridging. Sealing materials shall be added above the static water level up to four feet below the ground surface. If bentonite grout is used from the static water

level to the top of the well, it should be capped by neat cement, sand cement grout or concrete terminating four feet below the ground surface. It is preferable that the filling materials be omitted and that sealing materials be used to fill the entire well up to four feet below the ground surface.

Casing pipe and any curbing, frost pit or pump house structure shall be removed to a depth of four feet below the ground surface. The remaining four feet shall then be backfilled with soil and graded so that surface water is directed away from the abandoned well location.

6.4 Class 2 Bedrock Wells. If the details of well construction are unknown, the well shall be tremied full of neat cement or bentonite grout up to four feet below the ground surface. If bentonite grout is used from the static water level to the top of the well, it should be capped by neat cement, sand cement grout or concrete terminating four feet below the ground surface.

The casting pipe and any curbing, frost pit or pump house structure shall be removed to a depth of four feet below the ground surface. The remaining four feet shall then be backfilled with soil and the surface shall then be graded to divert water away from the abandoned well location.

a. Bedrock wells completed in a single confined aquifer. Before proceeding to plug the well, a bridge plug or packer shall be placed at or below the bottom of the casing to stop the flow of water where the pressure in the confined aquifer causes the water to flow from the well to the surface. In such cases, filling materials shall be placed in the lower porting of the well before the bridge plug or packer is set.

   Filling material consisting of pea gravel, crushed stone or gravel shall be placed from the bottom of the well up to ten feet below the bottom of the casing or confining layer, whichever is lower. Sealing materials consisting of any bentonite products, sand cement grout or neat cement shall be placed from the top of the filling material to at least ten feet (10') above the bottom of the casing or confining layer or to the static water level, which ever is higher. If bentonite grout, neat cement or sand cement grout is used, it shall be placed by tremie pipe. If bentonite pellets or graded bentonite are used, they shall be added by pouring in place and agitating to avoid bridging. The casing shall then be filled up to four feet below the ground surface with sealing materials. If bentonite grout is used from the static water level to the top of the well, it should be capped by neat cement, sand cement grout or concrete terminating four feet below the ground surface.

   It is preferable that the filling materials be omitted and that approved sealing materials be used to fill the entire well up to four feet below the ground surface.

   The casing pipe and any curbing, frost pit or pump house structure shall be removed to a depth of four feet below the ground surface. The remaining four feet shall then be backfilled with soil and graded so that surface water is directed away from the abandoned well location.

b. Bedrock wells completed in a single unconfined aquifer. The plugging procedure for these wells is the same as for bedrock wells completed in a single confined aquifer except that a bridge plug or packer is not required to stop the flow of water since this problem will not exist in this type of well.

c. Bedrock wells completed in multiple, aquifers. For the lowest aquifer, filling material consisting of pea gravel, crushed stone or gravel shall be placed from the bottom of the well up to ten feet below the bottom of the casing or confining layer, whichever is lower. Neat cement tremied in place shall then

be placed as a sealing material on top of the fill and extend upward at least twenty feet (20'). Sealing materials shall then be placed in at least the top ten feet (10') feet of each subsequent aquifer and extend at least ten feet (10') into the confining layer of casing above. The same type of filling materials and sealing procedures shall apply for each subsequent aquifer. Filling material may be placed from the top of the uppermost aquifer seal up to the static water level of the well. The casing shall then be filled with approved sealing or filling materials to four feet below the ground surface. If bentonite grout is used from the static water level to the top of the well, it should be capped by neat cement, sand cement grout, or concrete terminating four feet below the ground surface.

It is preferable that the filling materials be omitted and approved sealing materials be used to fill the entire well up to four feet below the ground surface. Sand cement grout or concrete shall be applied with a tremie line or dump bailer when applied below the static water level.

The casing pipe and any curbing, frost pit or pump house structure shall be removed to a depth of four feet (4') below the ground surface. The remaining four feet (4') shall then be backfilled with soil and graded so that surface water is directed away from the abandoned well location.

6.5 Class 3 Wells. The preferred method of plugging a sandpoint well is to pull the casing and sandpoint out of the ground, allowing the hole to collapse and fill. If the sandpoint and casing cannot be extracted, they shall be tremied full of neat cement or completely sealed with bentonite products.

The casing pipe and any curbing, frost pit or pump house structure shall be removed to a depth of four feet (4') below the ground surface. The remaining four feet (4') shall then be backfilled with soil and graded so that surface water is directed away from the abandoned well location.

SECTION 7. DESIGNATED AGENT. A County's Board of Supervisors shall appoint an individual to be responsible to review and confirm an abandoned well to be properly plugged as required by 567--39.7 and authorized by 455B.190.5. The designation is effective upon notification to the Department by the Chairperson of the Board of Supervisors. This notification will include the identity of the designated agent and the length of appointment. Changes in a designated agent will require new notification by the Chairperson to the Department.

SECTION 8. DESIGNATION OF STANDBY WELLS.

8.1 Standby Wells. A standby well must be disinfected prior to being taken out of use for a long period of time and must be disinfected and, as a minimum, checked for bacteria and nitrates when placed back in service. Disinfection of standby wells shall be done in accordance with AWWA (American Water Works Association) Standard A100. The well must not be subject to contamination by surface drainage or from other causes, and the well casing must be provided with an air-tight cover when the well is not in use.

8.2 Caveat. Nothing in these rules shall be construed as exempting public water supply wells from requirements set forth in the environmental protection commission rules, 567--Iowa Administrative Code.

SECTION 9. VARIANCES. In accordance with Iowa Code Section 455B.181, a variance to these rules may be granted by the Department provided sufficient information is submitted in writing to the Department to substantiate the need for a variance and to assure the protection of all aquifers penetrated by the affected well. When satisfactory justification has been submitted to the Director substantially demonstrating that a variance to these rules will result in equivalent effectiveness or improved effectiveness, a variance to these

rules may be granted by the Director. A denial of a variance may be appealed to the Environmental Protection Commission pursuant to 567--Chapter 7.

SECTION 10. JURISDICTION. The provisions of this regulation shall apply throughout Muscatine County, Iowa, including cites and towns therein; provided such cities have not adopted a Board of Health pursuant to Chapter 137, Code 1973, in which event the provisions of this regulation shall not apply to said City.

SECTION 11. PENALTY. Any person who violates any provision of these rules and regulations or any lawful order of the Board of Health, its officers, or authorized agents shall be guilty of a misdemeanor and shall be punished by a fine not to exceed one hundred (100) dollars or by imprisonment in the County jail for not more than thirty (30) days.

Each additional day of neglect or failure to comply with such provision, rule or lawful order after notice of violation by the Board shall constitute a separate offense.