

**CHAPTER 24**  
**NONPUBLIC WATER SUPPLY WELLS**

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**SEC. 24-1. PURPOSE AND SCOPE**

This purpose of this Chapter is to protect the public health by protecting groundwater supplies from contamination by establishing minimum standards for the construction, reconstructing, and plugging of non-public water supply wells; and providing for permits and permit fees; and providing penalties for violation of the provisions hereof. Excluded from this chapter are public water wells.

**SEC. 24-2. DEFINITIONS**

“Abandoned well” means a water well whose use has been permanently discontinued. A well shall be considered abandoned when its condition is such that continued use is

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impractical or no longer desired.

“Administrative authority” means the Scott County Board of Health.

“Agricultural lime” means all calcium and magnesium products sold for agricultural purposes in the oxide, hydrate, or carbonate form; such form being designated as quicklime, hydrated lime, carbonate of lime, and crushed or ground limestone which is used for agricultural purposes as a soil buffer.

“Anaerobic lagoon” means an impoundment, the primary function of which is to store and stabilize organic wastes. The impoundment is designed to receive waste on a regular basis, and the design waste loading rates are such that the predominant biological activity in the impoundment will be anaerobic. An anaerobic lagoon does not include:

1. A runoff control basin which collects and stores only precipitation-induced runoff from an open feedlot feeding operation; or
2. A waste slurry storage basin which is designed for complete removal of accumulated wastes from the basin at least semiannually; or
3. Any anaerobic treatment system which includes collection and treatment facilities for all off-gases.

“Annular space” means the space between the well hole excavation and the well casing or the space between two or more concentric well casings.

“Approved” means accepted or acceptable under an applicable specification stated or cited in this chapter.

“Aquifer” means a geological formation, group of formations, or part of a formation that contains sufficient saturated permeable material to yield significant quantities of water to wells and springs.

“Artesian well” means a well in an aquifer where the groundwater is confined under pressure and the static water level in the well stands above the top of the confined aquifer it taps.

“Bentonite” means a naturally occurring highly plastic, colloidal clay composed largely of the mineral montmorillonite which expands upon wetting.

“Bentonite grout (or slurry)” means a mixture of ten percent (10%) processed bentonite (by weight) and clean water.

“Bentonite pellets” mean a form of processed bentonite, which can be used directly for sealing applications in well plugging operations.

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“Bentonite products” mean the forms of bentonite, which can be used for sealing materials in wells, including graded bentonite, bentonite pellets and bentonite grout.

“Board of Health” means the Scott County Board of Health.

“Casing” means a tubular retaining structure, which is installed in the excavated hole to maintain the well opening.

“Cesspool” means a covered excavation, lined or unlined, into which waste from toilets or urinals are discharged for disposal. Cesspools are not an approved method of sewage disposal.

“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.

“Concrete” means a mixture of one sack (94 pounds) of portland cement, an equal amount by volume of sand and gravel or crushed stone and not more than six (6) gallons of clean water.

“Confined aquifer” means 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.

“Confinement building” means a building used in conjunction with a confinement feeding operation to house animals.

“Construction” means the physical act or process of making a water well including, but not limited to, siting, excavation, construction and the installation of equipment and materials necessary to maintain and operate the well.

“Conforming well” means a well that complies with the standards of this chapter, including wells properly plugged according to this Chapter.

“Crushed stone” means Class A or Class B crushed stone as defined in the specifications of the Iowa Department of Transportation.

“Deep well” means a well located and constructed in such a manner that there is a continuous layer of low permeability soil or rock at least 5 feet thick located at least 25 feet below the normal ground surface and above the aquifer from which water is to be drawn.

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“Earthen manure storage basin” means an earthen cavity, either covered or uncovered which, on a regular basis, receives waste discharges from a confinement feeding operation if accumulated wastes from the basin are completely removed at least once each year.

“Established grade” means the permanent point of contact of the ground to artificial surface with the casing or curbing of the well.

“Fill materials” mean soil, sand, gravel, crushed stone and agricultural lime used to occupy space between and below sealing materials in abandoned wells being plugged.

“Formed manure storage structure” means a structure, either covered or uncovered, used to store manure from a confinement feeding operation, which has walls and a floor constructed of concrete, concrete block, wood, steel, or similar materials. Similar materials may include, but are not limited to, plastic, rubber, fiberglass, or other synthetic materials. Materials used in a formed manure storage structure shall have the structural integrity to withstand expected internal and external load pressures.

“Graded bentonite” means bentonite, which is crushed and sized, for pouring and easy handling. Like processed bentonite, it swells when hydrated by fresh water and will form a plastic, essentially impermeable mass.

“Gravel” means Class C gravel as defined in the specifications of the Iowa Department of Transportation.

“Groundwater” means any water below the surface of the earth.

“Grout” means a material used to seal the annular space between the casing and the borehole and shall consist of neat cement, sand cement grout, high solids bentonite slurry, hydrated bentonite chips or heavy bentonite water slurry. 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.

“Health Department” means the Scott County Health Department.

“Health Officer” means the Director of the Scott County Health Department or the Director’s authorized representative.

“Health-related problem” means well water that contains any contaminant at a level that exceeds MCL’s (maximum contaminant levels), or HALs (health advisory levels) as adopted by the Iowa Department of Natural Resources.

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“Heavy drilling fluid” means water used for drilling which because of the natural clay content of the borehole or by addition of bentonite grout has a solids density of at least 10 percent by weight or a mud weight of at least 9.25 lb/gal.

“Landowner” means an individual, trust, partnership, corporation, government or government subdivision or agency, association or other legal entity that has legal or equitable title to a piece of land.

“Landowner’s agent” means a person who acts for or in place of the landowner by authority from the landowner.

“Limestone” means sedimentary rock, which contains greater than fifty percent (50%) calcium carbonate and has strong reaction with hydrochloric acid (HCl).

“Liner pipe” means a protective well casing pipe installed subsequent to initial construction to seal off a zone of bacterial or chemical contamination or a casing pipe installed during or subsequent to the initial well construction to seal off a casing formation.

“Low permeability material” means a geological unit of unconsolidated material (usually clay or till) or bedrock (usually shale) that is all or partially saturated and having permeability low enough ( $10^{-7}$  cm/sec) to give water in the aquifer artesian head.

“Neat cement” means a mixture of one sack (94 pounds) of portland cement to not more than six (6) gallons of clean water. Bentonite up to two percent (2%) by weight of cement may be added to reduce shrinkage.

“Non-public water supply well” means a well that does not supply a public water supply system.

“Non-regulated well” means a well used to supply water for a non-regulated use ( a use of water less than 25,000 gallons per day which is not required to have a water use permit)

“Open feedlot” means an unroofed or partially roofed animal feeding operation in which no crop, vegetation, or forage growth or residue cover is maintained during the period that animals are confined in the operation.

“Permit” means a formal written approval to construct, reconstruct, or plug a water well.

“Pitless adapter” means a device designed for attachment to one or more openings through a well casing. It shall be constructed so as to prevent the entrance of contaminants into the well through such openings, conduct water from the well, and protect the water from freezing or extremes of temperature, and provide access to water system parts within the

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well or its appurtenances thereby eliminating the need for frost pits.

“Pitless unit” means an assembly, which extends the upper end of the well casing to above grade. It shall be constructed so as to prevent the entrance of contaminants into the well, conduct water from the well, and protect the water from freezing or extremes of temperature, and shall provide full access to the well and to water system parts within the well. It shall provide a pitless well cap for the top terminal of the well.

“Plugging” means the proper closure of an abandoned well by procedures which will permanently seal the well from contamination by surface drainage; and where the well penetrates multiple or confined aquifers, will permanently seal off and prevent flow or contamination out of an aquifer or from one aquifer to another. Plugging involves the application of sealing materials and can include fill materials.

“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.

“Processed bentonite” means 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.

“Public water supply well” means a system for the provision to the public of piped water for human consumption, if such system has at least 15 service connections or regularly serves an average of at least 25 individuals daily at least 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 of the supplier which are used primarily in connection with the system.

“Pump pit” means a sunken area located directly over the well used to house the equipment for discharging water from a well into the water system.

“Pumps and pumping equipment” means any equipment or materials, including seals, tanks, fittings and controls utilized or intended for use in withdrawing or obtaining water for any use.

“Quaternary sediments” mean the unconsolidated materials above the bedrock.

“Rehabilitation or reconstruction” means modifying the original construction of a well. Rehabilitation or reconstruction includes, but is not limited to, deepening the well, removing all or a portion of the well casing, installing a liner, installing or replacing a screen

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with one of a different diameter or length, installing a pitless adapter, extending the casing, hydrofracturing a well, or any modification to the existing well structure. Replacing a screen with one of identical diameter and length, replacing a pitless adapter, or acidizing a well would be considered repair, not rehabilitation or reconstruction.

“Runoff control basin” means an impoundment designed and operated to collect and store runoff from an open feedlot.

“Sandpoint well” means a small diameter water well provided with a screened driving point which is driven or jetted into sand and gravel aquifers.

“Sand cement grout” means a mixture of one sack (94 pounds) of portland cement, an equal amount by volume of clean masonry sand and not more than six (6) gallons of clean water.

“Sanitary seal” means a watertight fitting, which uses mechanical compression that is installed on wells that terminate in a well house.

“Sealing” means the application of sealing materials (bentonite products, neat cement, sand cement grout or concrete) for plugging an abandoned well to seal off unwanted flow into, out of, or between aquifers.

“Shallow well” means a well located and constructed in such a manner that there is not a continuous layer of low permeability soil or rock (or equivalent retarding mechanism acceptable to the department) at least 5 feet thick, the top of which is located at least 25 feet below the normal ground surface and above the aquifer from which water is to be drawn.

“Standby well” means a water well which is temporarily taken out of service with the expectation of being returned to service in a future date and is in compliance with this Chapter.

“Static water level” means the water level in a water well when the well is not flowing or being pumped.

“Stuffing box” means an approved receptacle in which packing may be compressed to form a watertight or airtight junction between two objects.

“Tremie pipe” means a device, usually a small diameter pipe, that carries grouting material to the bottom of the hole and which allows pressure grouting from the bottom up without introduction of air pockets.

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“Unconfined aquifer” means an aquifer in which the static water level does not rise above the top of the aquifer.

“Vertical zone of contamination” means that depth of geological formation, generally near the ground surface, containing connection pore spaces, crevices or similar openings, including artificial channels, such as unprotected wells, through which contaminate water may gain access to a well or to a groundwater source.

“Water well” means an excavation that is drilled, cored, bored, augered, washed, driven, dug, jetted, or otherwise constructed for the purpose of exploring for groundwater, monitoring groundwater, utilizing the geothermal properties of the ground, or extracting water from or injecting water into the aquifer. “Well” does not include an open ditch, drain tiles, percolation test holes, an excavation made for obtaining or prospecting for oil, natural gas, minerals, or products mined or quarried, lateral geothermal heat exchange systems less than 20 feet deep, nor temporary dewatering wells such as those used during the construction of subsurface facilities only for the duration of the construction.

“Water well contractor” means a person engaged in the business of well construction, reconstruction, rehabilitation, or plugging. The term may include a person, firm, agent, corporation, partnership, sole proprietorship, association or any other business entity, as well as any employee or officer of such an entity.

“Well cap” means a snug-fitting, watertight device used above flood level that excludes dust and vermin and allows for screened venting.

“Well liner” means a pipe used to line the inside of a well hole but not designed to hold hydraulic or structural loading. Liners must be installed within a casing or in an ungrouted open borehole.

“Well seal” means a device used to cover or seal a well that established or maintains a junction between the casing of the well and the piping, electric conduit or equipment installed, so as to prevent water or other foreign material from entering the well at the uppermost terminal.

“Well screen” means the intake section of the well that obtains water from an aquifer and serves as a structural retainer to support the borehole in unconsolidated materials.

“Well services” means a new well construction, well reconstruction, installation of pitless equipment, or well plugging.

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**SEC. 24-3. APPLICATION FOR PERMIT TO CONSTRUCT, RECONSTRUCT OR PLUG A NON-PUBLIC WATER WELL**

- A. Any landowner or landowner's agent desiring a permit to construct, reconstruct, rehabilitate, or plug a non-public water well must file with the Scott County Health Department an application stating therein the owner's name, correct house number, name of street, or roadway, legal description and such other pertinent information as may be required.
- B. Upon approval of the application and payment of the fees, the Health Officer shall issue a permit for the construction, reconstruction, or plugging of said non-public water well.

**SEC. 24-4. NON-PUBLIC WATER WELL PERMIT**

- A. No person, firm, corporation, landowner or landowner's agent shall begin construction, reconstruction, or plugging of any non-public water well in the County of Scott, State of Iowa, without first having obtained a permit as set out in Sec. 24-2.
- B. Permits are non-transferable.
- C. Permit shall expire twelve (12) months from the date of receipt of permit fees.

**SEC. 24-5. FEES**

- A. The fee for a permit to construct, reconstruct or plug a non-public water well shall be payable at the time of application. The fees are:
  - 1. \$315.00 for a Permit to construct a waterwell.
  - 2. \$150.00 for driven (sandpoint) water well permit.
  - 3. \$15.00 for non-public water well plugging permit.
  - 4. \$15.00 for reconstruction, rehabilitation, or installation of liner.
  - 5. Investigation fee. Whenever any work for which a permit is required by this chapter has been commenced without first obtaining a permit, a special investigation shall be made before a permit may be issued for such work. An investigation fee of \$300.00, in addition to the permit fee, shall be collected whether the permit is then subsequently issued.

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The payment of an investigation fee shall not exempt any person from compliance with all other provisions of this chapter nor from any penalty prescribed by law.

- B. Permit fees are non-refundable.

**SEC. 24-6. REGISTRATION OF WATER WELL CONTRACTORS**

- A. Any person, firm, corporation, landowner, or landowner’s agent desiring to conduct water well construction, reconstruction, rehabilitation activities, or well plugging shall be performed by a certified well contractor or the property owner as specified in 567-IAC Chapter 82.
- B. It shall be the responsibility of the certified well contractor to ensure that a well construction permit has been issued prior to initiation of well construction or reconstruction. It shall also be the responsibility of the certified well contractor to ensure that all well services are performed in accordance with the provisions of this chapter. The certified well contractor shall submit water well logs within ninety days of the completion of the well drilling.

**SEC. 24-7. LOCATION OF WELLS**

- A. Wells shall be located with consideration given to the lot size, contour, porosity and absorbency of the soil, local groundwater conditions, flooding, and other factors necessary to implement the rules. The lack of specific distances to other possible sources of contamination, such as refuse disposal sites and high-pressure gas lines 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 well contractor shall consult the administrative authority for assistance in determining a proper distance in such cases.

Table #1

Sources of Contamination	Minimum Lateral Distance (feet)	
	Shallow Well	Deep Well
Formed manure storage structure, confinement building, feedlot solids Settling facility, open feedlot	200	100

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Public water supply well	400	200
		<u>All Wells</u>
Earthen manure storage basin, runoff control Basins and anaerobic lagoons (see Section 24-7, B below)		1000
Domestic Waste water lagoon		400
Sanitary landfills		1000
Preparation or storage area for spray materials, commercial fertilizers or chemicals that may result in groundwater contamination		100
Drainage wells		1000
Conforming wells		10
Nonconforming wells		100
Soil absorption field, any sewage treatment System with an open discharge, pit privy or Septic tank discharge line (not conforming to this Chapter)		100
Septic tank, concrete vault, privy, sewer of tightly joined tile or equivalent material, sewer-connected foundation drain, or sewers under pressure		50
Sewer of cast iron with leaded or mechanical joints, sewer of plastic pipe with glued or compression joints, independent clear water drains, cisterns, well pits, or pump house floor drains (Drains must not be connected to any sewer or drainage system.)		10
Hydrants		10
Property lines (unless mutual easement is Signed and recorded by both parties)		4

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Liquid hydrocarbon storage tanks	100
Ditches, streams, ponds or lakes	25
Cemetery	100
Cesspools	150

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- B. Exception to minimum lateral distances. The minimum separation distance between a well and an anaerobic lagoon, earthen manure slurry storage basin, earthen manure storage basin, or runoff control basin shall be 400 feet if the lagoon or basin was permitted by the department after January 1, 1989, or if the applicant demonstrates through percolation testing that the seepage loss through the lagoon or basin does not exceed 1/16 inch per day (0.0625 inch/day). The percolation test shall meet the requirements of ASTM-1587 and 567-subrule 65.15(11).
- C. Relation to buildings. The well shall be located so that no building interferes with reasonable access for cleaning, treatment, repair, testing, inspection and other maintenance. Wells shall not be located in basements.
- D. Easements. No well shall be located on a property not owned by the well owner unless an easement allowing such placement is reviewed and approved by the administrative authority and the easement is legally recorded.

**SEC. 24-8. GENERAL CONSTRUCTION REQUIREMENTS**

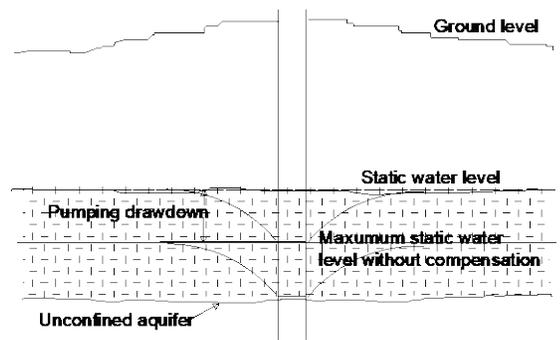
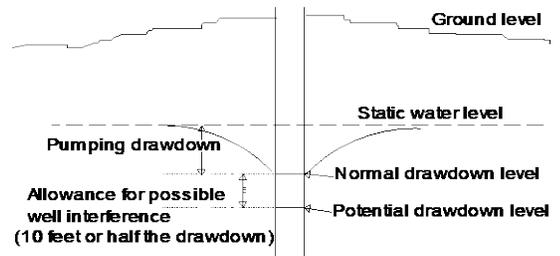
- A. Wells shall be planned and constructed to adapt to the geologic and groundwater conditions of the proposed well site to ensure reasonable utilization of every natural protection against contamination of the water-bearing formation(s) and the exclusion of possible sources of contamination, to attempt to produce bacterially safe water which is free of health-related problems.
- B. Water used in construction. Water used in the construction process shall be obtained from a potable water source that will not result in contamination of the well. Water used for drilling shall be treated with 3 pints of 5.25 percent sodium hypochlorite solution per 100 gallons of water or 0.25 pounds of 65 percent calcium hypochlorite per 100 gallons of water or other additives.
- C. Wellhead. The upper terminal casing of any new, reconstructed, or

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rehabilitated well shall extend at least 12 inches above established grade pump house floor, or the 100-year flood level, whichever is higher. A well cap or sanitary seal shall be installed immediately following well completion. A well cap shall be used on an exposed well, a sanitary seal only on a well terminating within a well house. Any openings in the cap or seal, such as for pump wiring or water depth measurement, shall be installed with a grommet or sealed except properly screened and oriented vent openings. A snug-fitting, non-water-tight well cap that excludes dust and vermin and allows venting shall be installed at the uppermost terminal or the well casing.

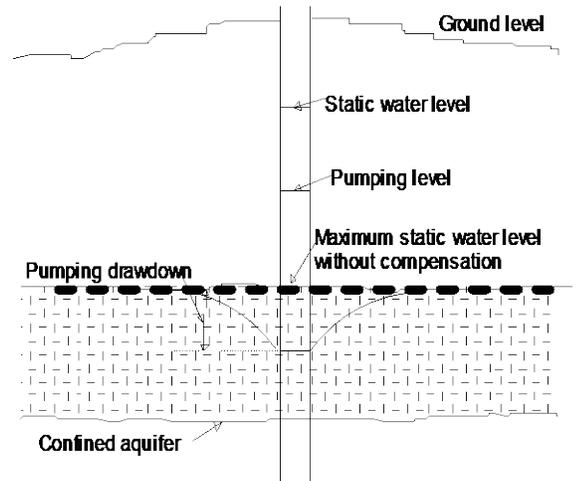
Criteria for well interference protection. Iowa Administrative Code 567-Chapter 54, provides an administrative process for owners of nonregulated wells to receive compensation for well interference cause by permitted uses. To be eligible for compensation due to well interference, nonregulated wells constructed after July 1, 1986 must be constructed to allow for some potential well interference. Allowance for potential well interference is accomplished by constructing a nonregulated well to anticipate a lowering of the of the static head of the well which may be caused by interference from a nearby permitted use well.

1. The well must be drilled deep enough to allow for setting the pump at least 10 feet or half the normal pumping drawdown, whichever is greater, below the initial recommended setting depth.
  
2. If the well draws from an unconfined aquifer, the static water level may drop to half the saturated thickness of the aquifer before well interference is considered, if the calculation in "1" above should indicate a shallower depth. Shallow aquifers that are only slightly confined may be classified as unconfined aquifers for this purpose.



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3. Where a well penetrates a confined aquifer, the static water level is protected only to the top of the aquifer if the calculation in "1" above should indicate a deeper level.
4. Protected levels for flowing wells will be considered the top of the confined aquifer or 100 feet below the surface, whichever is higher. Flowing wells must be constructed to accommodate a pump capable of supplying a sufficient water supply at protected levels.



5. The well design also needs to consider drought and reduced well efficiency. (Additional information is contained in Iowa Administrative Code 567 - Chapter 54.)

D. A well that is used to withdraw more than 25,000 gallons of water per day requires a water use permit from the Iowa Department of Natural resources. Upon obtaining such a permit, the well is called a permitted use. If a permitted use exists prior to the construction of a well without a water use permit, no compensation for well interference will be allowed unless a significant change in the permitted use occurs. A physical change to withdrawal facilities maybe considered a significant change to a permitted use (e.g., moving the withdrawal location, installing a new well, or installing a higher capacity pump). A person desiring to construct a well not requiring a water use permit should first obtain information concerning nearby permitted use well. The Department of Natural Resources will provide information on permitted use wells upon request.

- E. Access port for measurement of water levels. Permitted use wells shall be equipped with an access port having a minimum diameter of  $\frac{3}{4}$ -inch. The access port shall 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 clear access to the water, a  $\frac{3}{4}$ -inch pipe shall be attached to the spool and brought to the surface below the well cap to allow water level measurements. Wells not requiring a water use permit should e constructed with an access port for water level measurement for possible future well interference concerns.

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- F. Interconnection of aquifers. There may be local confining beds that serve an important protective function. Permitted use wells shall use casing and grouting to maintain a hydraulic separation between distinct aquifers separated by confining intervals. Extreme caution should be exercised in the construction of non-permitted use wells if allowing the well to connect aquifers across confining intervals, particularly in areas where that would open the aquifer to surficial contamination, i.e., in areas where the upper rock unit is unconfined or contains less than 40 feet of unconsolidated materials. The administrative authority shall be consulted when interconnection of aquifers across confining intervals is anticipated.

#### **SEC. 24-9. TYPES OF WELL CONSTRUCTION**

Wells may be drilled, cored, bored, augered, washed, driven, jetted, or otherwise constructed. All wells shall meet construction and sanitary standards as promulgated by Iowa Department of Natural Resources. At all times, attention must be given to the depth at which safe water can be obtained and to methods of excluding surface runoff and shallow contaminated groundwater.

- A. Drilled wells in unconsolidated materials.
  - 1. Depth. In no case shall less than 20 feet of permanent casing be installed in wells drilled in unconsolidated materials. If the alluvial aquifer where the water is to be drawn from is covered by less than 40 feet of low permeability materials, the well screen shall be set at the bottom of the water-bearing aquifer or at least 60 feet from the surface. (Deeper depths may be required if nitrate may be required if nitrate contamination is excessive.) If more than 40 feet of low permeability materials are present above the aquifer, the casing shall extend down at least to the top of aquifer.
  - 2. Grouting. Grout shall be placed to a minimum depth of 40 feet or along the full length of the casing where less than 40 feet of casing is set. Grouting the full length of the casing below 40 feet may be necessary to isolate any contaminated water lenses or aquifers. If a layer of low permeability material at least 5 feet thick is encountered less than 40 feet from the surface, the grout may be terminated no less than 5 feet below the top of this low permeability material, but in no case less than 20 feet from the ground surface. Grout must be placed in accordance with Section 24-10 D, except when driving casing. When driving casing a #8 mesh bentonite or bentonite grout must be maintained around the

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outside of the casing. The bottom of driven casing must be equipped with a drive shoe.

3. Annular space. The diameter of the borehole shall be at least 3 inches greater than the outside diameter of the well casing to the minimum grouting depth. When steel well casing pipe is installed using percussion methods, the annular space shall be at least 5 inches greater than the outside diameter of the well casing to a minimum depth of 25 feet.
  4. If the depth of casing is greater than 40 feet, the annular space below 40 feet shall be properly grouted. In this case, the annular space below 40 feet shall be kept as small as possible to avoid settling.
- B. Drilled wells in consolidated material.
1. Minimum casing depth. Casing shall extend to a depth of at least 40 feet and be seated in firm rock. When the uppermost bedrock consists of creviced limestone or dolomite that does not produce water, the casing shall extend through the creviced formation, be seated in firm rock and be properly grouted.
  2. Grouting. For bedrock wells, full-length grouting of the casing is required. Grout shall be placed to a minimum depth of 40 feet in accordance with Section 34-10,D, except when driving casing using percussion or casing-hammer/rotary drilling. When driving casing, #8 mesh bentonite or bentonite grout must be maintained around the outside of the casing. The bottom of driven casing must be equipped with a drive shoe. If a layer of low permeability material at least 5 feet thick is encountered less than 40 feet from the surface, the grout may be terminated no less than 5 feet below the top of this low permeability material, but in no case less than 20 feet from the ground surface. Where local conditions warrant, the administrative authority may require more extensive grouting to protect any aquifer(s) that are penetrated.
  3. Annular space. The borehole shall be at least 3 inches greater than the outside diameter of the well casing for the upper 40 feet or the minimum grouting depth. When steel casing pipe is installed using percussion, or casing-hammer/rotary methods, the annular space shall be at least 5 inches greater than the outside diameter of the well casing to a minimum depth of 25 feet. When bedrock wells are full-length pressure-grouted through the casing, the borehole diameter shall be 3-

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inches larger than the outside diameter of the casing for the minimum depth of at least 25 feet.

4. If the depth of casing is greater than 40 feet, the annular space below 40 feet shall be filled with grout. In this case, the annular space below 40 feet shall be kept as small as possible to avoid settling.
  5. In fractured rock, where circulation of slurry cannot be maintained, grouting may be done with bentonite chips. The chips shall be hydrated with one gallon of water per bag of bentonite.
- C. Bored and augered wells in unconsolidated materials. For bored or augered wells with concrete or clay tile casing at least 18 inches in diameter, buried-slab construction is required.
1. Casing. The concrete or vitrified clay pipe casing shall be terminated not less than 10 feet below ground surface and extend to a minimum depth of 20 feet. The casing shall be fitted with a reinforced concrete or steel plate into which a watertight steel or thermoplastic casing is firmly imbedded in or connected to a pipe cast or welded into the plate. This casing shall be at least 5 inches in diameter and shall extend from the plat to not less than 12 inches above established grade or the 100-year flood level, whichever is higher. A pitless adapter shall be installed below frost depth on the newly installed plastic or steel casing.
  2. Backfilling annular space. A 12-inch grout seal shall be poured over and around the plate. The annular space between the steel or thermoplastic casing and the borehole shall be backfilled with clean compacted soil free of debris or large organic material. 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 24-8, C.
- D. Driven and direct push wells. Sandpoint wells are typically constructed in sandy areas with a high water table. In areas where nitrate level is above 45 mg/l, administrative authority approval shall be obtained to construct a sandpoint well. Groundwater in these areas is often susceptible to contamination. This type of construction is not recommended for potable water supply. Sandpoint wells shall meet the requirements of this chapter except for casing depth and grouting requirements.

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- E. 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 full-length pressure-grouted and allowed to set. After allowing the grout to set, the drill hole shall be extended into the confined water-bearing 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.

SEC. 24-10            MATERIAL STANDARDS

- A. All materials utilized in well water construction, reconstruction, or rehabilitation 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 Ground Water Association (NGWA) except as modified by these standards.

- B. Water well casing.

- 1. Steel well casing and couplings.

- a. Steel well casing pipe shall have the dimensions and weights specified in Table #2. Well casing pipe shall be new steel pipe meeting one of the following standards:

ASTM A 53-96,  
ASTM A 106-95,  
ASTM A 589-95a- - Type I, II or III,  
API 5CT (5<sup>th</sup> Edition, 4/1/95),  
API 5D (3<sup>rd</sup> Edition, 8/1/92), or  
API 5L (41<sup>st</sup> Edition, 4/1/95).

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

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- d. Minimum casing pipe and coupling weights and dimensions are as follows:

Table #2

Minimum casing pipe and coupling weights and dimensions

Size (Inches)	WEIGHT (lbs/ft)		PIPE				COUPLINGS	
	Threads & Couplings	Plain End	Thickness (Inches)	External Diameter (inches)	Internal Diameter (Inches)	Threads per Inch	External Diameter (Inches)	Length (Inches)
1	1.70	1.68	.133	1.315	1.049	11 ½	1.576	2-5/8
1 ¼	2.30	2.27	.140	1.660	1.380	11 ½	1.900	2-3/4
1 ½	2.75	2.72	.145	1.90	1.610	11 ½	2.200	2-3/4
2	3.75	3.65	.154	2.375	2.067	11 ½	2.750	2-7/8
2 ½	5.90	5.79	.203	2.875	2.469	8	3.250	3-15/16
3	7.70	7.58	.216	3.500	3.068	8	4.000	4-1/16
3 ½	9.25	9.11	.226	4.000	3.548	8	4.625	4-3/16
4	11	10.79	.237	4.500	4.026	8	5.200	4-5/16
5	15	14.62	.258	5.563	5.047	8	6.296	4 ½
6	19.46	18.97	.280	6.625	6.065	8	7.390	4-11/16
6-5/8 OD	20	19.49	.288	6.625	6.049	8	7.390	4-11/16
7 OD	20	9.54	.272	7.000	6.366	8 R	7.657	4-11/16
8	29.35	28.55	.322	8.625	8.071	8	9.625	5-1/16
10	41.85	40.48	.365	10.750	10.136	8	11.750	5-9/16
12	51.15	49.56	.375	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	21.000	78.60	.375	20.000	19.250	8	21.000	7-5/8

R = Round Threads

2. Thermoplastic casing and couplings

- a. Materials. Thermoplastic well casing pipe and couplings shall be new polyvinyl chloride (PVC) or acrylonitrile-butadiene-styrene (ABS) material produced to and meeting the ASTM F 480 standard and shall have a standard dimension ratio (SDR) of 21, 17, or 13.5, a dimension ratio (DR) of 18 or 14, or a schedule 40 or 80 rating depending upon the specification. Styrene-rubber thermoplastic well casing pipe, including ASTM F 480, may not be used.
- b. Potable water standards. The thermoplastic well casing pipe, pipe couplings, cement, primer and other components used shall be approved for well casing pipe in potable water supplies by the NSF

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Standard Number 61 or the health effects portion of Standard Number 14 as they relate to well casing pipe, or an approved equivalent organization.

- c. Markings. Each length of casing shall be legibly marked showing the manufacturer's or processor's name or trademark size in inches and the ASTM F 480 specification or trade monogram.
- d. Casing joints. The thermoplastic pipe shall be assembled with either flush-threaded joints, integral-bell, solvent-cemented joints, one-piece solvent-cemented couplings or nonmetallic specifications in ASTM F 480.
- e. Hydraulic collapse pressure for plastic casing. The following table provides specifications for maximum hydraulic collapse pressure (in feet of water head) to which PVC well casing of different strengths can be installed.

Table #3  
PVC WELL CASING  
Maximum Hydraulic Loading (in feet of water head)<sup>(1)</sup>

SIZE	ASTM F 480 OR ASTM 2241			C-900		ASTM 1785	
	SDR 21	SDR 17	ASR 13.5	DR 18	DR 14	SCH. 40	SCH. 80
4"	257'	496'	1,024'	--	--	353'	1,055'
4 ½"	257'	496'	1,024'	--	--	--	--
5"	257'	496'	1,024'	--	--	236'	758'
6"	257'	496'	1,024'	490'	956'	177'	678'
8"	257'	496'	1,024'	490'	956'	121'	471'
10"	257'	496'	1,024'	490'	956'	90'	404'
12"	257'	496'	1,024'	490'	956'	74'	376'
16"	257'	496'	1,024'	490'	956'	70'	330'

**<sup>(1)</sup>Determined by formulae in ASTM F 480 with Poisson's ratio of .38**

- f. When cement grout is used with thermoplastic casing, the manufacturer's specifications for use shall be followed except in the top 40 feet.
- g. Thermoplastic pipe extending above ground shall be protected from ultraviolet light exposure.



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bentonite is required because circulation cannot be maintained as described in Section 24-9, B,5.

- E. Pitless adapters and pitless units.
  - 1. Pitless adapters and pitless units conforming to Pitless Adapter Standard – 97 as promulgated by the Water Systems Council are considered as complying with these regulations. A copy of this standard is available for inspection at the Des Moines office of the Department of Natural Resources records center or may be obtained for personal use from the Pitless Adapter Division, Water Systems Council, 800 Roosevelt Road, Bldg. C, Suite 20, Glen Ellyn, Illinois 60137.
  - 2. Pitless Adapters. All wells shall have a pitless adapter. Pump pits shall not be considered suitable in lieu thereof. A pitless subsurface pipe connection to a well casing pipe shall be made with a weld-on, clamp-on, or bolt-on pitless adapter or weld-on or threaded pitless unit. Above-ground discharge pitless adapters are prohibited.
  - 3. Grouting pitless adapters and pitless units. After connecting a pitless adapter or unit, the area surrounding the unit must be uniformly filled with dry bentonite.
  - 4. If the pitless adapter is gasketed, the opening in the casing shall be sawed, to the diameter recommended by the manufacturer, with a hole saw and not cut with a torch. The pitless adapter used shall have the correct curvature to fit the diameter of the casing.

#### **SEC. 24-11 REHABILITATION OR RECONSTRUCTION**

- A. All well rehabilitation or reconstruction must meet the requirements of this chapter. If the well feature needing rehabilitation/reconstruction cannot be brought into compliance with these rules, the well must be properly plugged.
- B. Installing a liner. If the rehabilitation/reconstruction will involve the placement of a liner, the certified well contractor must then determine whether the proposed rehabilitation/reconstruction is to be done to correct a health related problem. The work to be performed must then be done in accordance with paragraph "a" or "b" below.

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1. Standards for installation of a liner to correct a health-related problem.
  - a. The liner shall have a minimum of two sets of centering guides to allow the proper placement of grout. In no case shall the liner be driven into place.
  - b. The liner shall extend to the ground surface or top of the pitless adapter.
  - c. The annular space between the old casing and the liner shall be pressure-grouted in place throughout its entire length using an approved grout.
  
2. Standards for installation of a liner to correct a problem that is not health related.
  - a. The liner shall extend at least ten feet above the static water level or, if a caving zone is present, shall extend above this region.
  - b. The liner may be pressure grouted in place if there is a sufficient annular space for proper application of the grout.
  
3. Liner material standards. Liners must meet well casing standards as defined in this Chapter. Liners may be composed of either steel or thermoplastic with a minimum inside diameter of 4 inches. Steel liners must be new and have a minimum wall thickness of .188 inches. Plastic liners must have a standard dimension ratio of 26 or less or a schedule rating of SCH 40 or SCH 80. If the installation does not meet the definition of a liner, then casing material shall be used.

#### **SEC. 24-12      DISPOSAL OF DRILLING MUD**

Drilling fluid and mud remaining after construction of a well shall not be disposed of in a steam or storm sewer nor shall these materials be discharged into a sanitary sewer without permission of the owner and operator of the wastewater treatment facility.

- A. Pumphouse 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.

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- B. Pumphouse floors. The top of the well casing shall terminate at least 12 inches above the pumphouse floor. The pumphouse floor shall be constructed of concrete that is not less than 4 inches in thickness and is sloped away from the casing. A watertight seal to provide resiliency shall be provided between the casing and the pumphouse floor.
- C. Frost pits. Wells are not permitted to be located within frost pits. Frost pits that do not contain wells within are permitted for the purpose of housing pressure tanks and valves, for example, provided they are not located closer than ten feet from any well. Frost pits shall be constructed so as to be weatherproof and vermin-proof and an independent floor drain or a sump pump shall be provided. At the discretion of the Health Officer, when existing wells located within frost pits undergo rehabilitation/ reconstruction, the casing shall be extended as outlined in this Chapter, a pitless adapter installed, the curbing of the pit removed at least two (2) feet below the ground surface and the area of the pit filled with clean backfill, tamped, and the area graded.
- D. Buried casings. When the pump is repaired/replaced in an existing well with a buried casing, the casing shall be extended as outlined in this Chapter.
- E. Pumps and pumping equipment.
  - 1. General pump installation requirements. The installation of pumps shall be planned and carried out so the pump will be:
    - a. Installed so that it and its surroundings are in a sanitary condition;
    - b. Properly sized so as to provide the volume of water necessary, where obtainable, for an adequate water supply;
    - c. Designed to meet the well characteristics and not exceed the yield of the well except when the available aquifer is low producing;
    - d. Installed for operation without printing or breaking suction;
    - e. Installed in such manner as to provide adequate protection against contamination of the water supply from any surface or subsurface sources;
    - f. Installed in a manner so that it is accessible for maintenance, repair and removal.
  - 2. Lubrication. Pump motor lubricant or coolant oil shall be USDA or FDA

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approved food contact grade formulations.

3. Well/pump discharge. Every pump shall be installed with an above-ground discharge, an approved subsurface pitless adapter or pitless unit, or an approved subsurface well casing pipe connection.
  4. 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 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. If these units are located in a basement, all suction lines shall be elevated at least 12 inches above the floor and shall be encased in a protective galvanized steel pipe.
  5. Hand pumps or similar devices. A hand pump, hand pump head, stand, or similar device must have a closed and screened spout, directed downward. The pump must have a concrete slab at least 4 inches thick extending horizontally at least 1 foot in every direction from the well casing and sloped to divert water away from the casing. A watertight seal must be provided between the casing and the slab. A reciprocating pump rod must operate through a stuffing box.
  6. Well disinfection after pump installation or repair. Wells must be properly disinfected by the pump installer as described in this Chapter after the installation of repair pumps.
  7. Interconnections and cross connections. No connection between a well or boring and another well, boring, water supply system, or contamination source is allowed unless the connection is:
    - a. Protected by an air gap;
    - b. Protected by a backflow prevention device; or,
    - c. Between wells or borings that meet the construction standards of this Chapter, are used for the same purpose, and have equivalent quality water supply.
- F. Hydropneumatic (pressure) tanks. Pressure tanks should be sized by pump capacity and expected usage. They must be installed in accordance with manufacturer's directions and shall maintain a pressure of at least 15 pounds at highest point usage under normal demand.

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- G. Filters and water treatment equipment. Filters and water treatment equipment shall be installed and operated in accordance with manufacturers' directions.

SEC. 24-14. WELL DISINFECTION

- A. All new, repaired or rehabilitated wells shall be pumped to waste until the water is free of drilling mud, drill cuttings and sand, and the water is reasonably clear.
- B. Wells should be disinfected by the contractor following completion of construction, reconstruction, rehabilitated, or repaired and whenever the well seal or cap is removed and work is done within the casing. A chlorine solution such as sodium or calcium hypochlorite shall be used. Chlorine compounds having special additives shall not be used.
- C. The disinfectant shall be dispersed throughout the entire water column in the well. The disinfectant shall also be brought into contact with the inside of the well casing pipe above the static water level.
- D. The disinfectant shall remain in the well for a minimum of two hours if a concentration of at least 100 mg/l chlorine is achieved, or a minimum of twenty-four hours if at least 50 mg/l is achieved.
- E. For emergency situations, a contact time of a minimum of thirty minutes shall be provided at a chlorine concentration of at least 200 mg/l.
- F. The amount of HTH or household bleach required for a chlorine concentration of 200 mg/l is given in the following table:

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Table #4

Amount of Chlorine Disinfectant Required for Every 25 feet of Water in Well

WELL CASING DIAMETER (in inches)	4"	6"	8"	12"	18"	24"	30"	36"
Amount of pelleted HTH (in ounces containing ~70 percent Ca(OCl) <sub>2</sub> )	0.7	1.5	2.6	5.6	13	23	36	52
Amount of chlorine bleach (in pints containing 5.25 percent NaOCl)	0.5	1.2	2.1	4.7	10.6	18.8	29.3	42.2

- G. The disinfectant shall be introduced into the well in a solution of disinfectant and water. The solution shall contain not more than eight ounces of disinfectant per five gallons of water. In no case shall pressed pellets of disinfectant, when used for shock chlorination, be introduced directly into the well without first being dissolved.

**SEC. 24-15. WATER SAMPLING ANALYSIS**

- A. In all pressure water systems, provision shall be made for collection of water samples directly from the well by installation of a sampling faucet before the pressure tank, and prior to encountering any water treatment equipment. The sampling faucet shall be installed at least 12 inches above the floor, have a downturned spout and be in an accessible location. All sample faucets shall be metal and have a smooth (nonthreaded) outlet.
- B. The landowner or landowner's agent of a new, reconstructed, repaired, or rehabilitated well shall be responsible for submitting a water sample to a certified laboratory for coliform bacteria and nitrate analysis. The water sample shall be collected at least 10 days and not more than 30 days after a well is put into service following the construction, repair, or rehabilitation. The analysis results shall be submitted to the Scott County Health Department.
- C. If the water sample analysis detects presence of bacteria, the disinfection procedure described in this Chapter shall be repeated.
- D. In the event a landowner maintains an existing water well classified as Standby well, the landowner shall be required to reconstruct said well as to comply with this Chapter.

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- E. In the event a non-public water well used for human consumption is found through certified laboratory analysis to be "unsafe", by the Federal Safe Drinking Act Standards, the Scott County Health Department may declare this a public health nuisance pursuant to Scott County Code, Chapter 25, and designate the property to be unfit for human habitation.

**SEC. 24-16. ABANDONMENT OF WELLS**

- A. Abandoned wells are a contamination hazard to the water bearing formation as well as a physical hazard for people.
- B. Plugging rules. Abandoned wells shall be properly plugged as required in Iowa Administrative Code 567—Chapter 39.
- C. Waste disposal prohibition. Under no circumstances shall abandoned wells be used for the disposal of debris, solid waste, septic tank sludge or effluents, or for any other type of unauthorized disposal of waste materials, or as a receptacle for field tile drainage.

**SEC. 24-17. CLOSED CIRCUIT VERTICAL HEAT EXCHANGERS**

- A. These provisions apply to closed circuit vertical heat exchanger construction.
- B. Piping used must be 160 psi pressure-rated high-density polyethylene or polybutylene.
- C. Connection to piping must use socket fusion or butt fusion joining methods.
- D. Piping must be pressure-tested with air or potable water for 15 minutes at a pressure of 1.5 times the system operating pressure after installation in the borehole.
- E. The annular space between the vertical heat exchanger piping and the borehole must be grouted as required in Iowa Administrative Code 567-Chapter 49.9(3) using an approved grouting method and material. Grout shall be placed at least in the top 40 feet. Any confining layers between aquifers shall be replaced with grout. Grouting must be performed within 24 hours of completion of the borehole.

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- F. Only food-grade or USP-grade propylene glycol or calcium chloride may be used as heat transfer fluid. Any other materials or additives must be NSF-approved for drinking water applications. A permanent sign must be attached to the heat pump specifying that only approved heat transfer fluids must be used.
- G. A flow measurement device must be installed on each system.
- H. Water make-up lines to the vertical heat exchanger must be protected with a backflow prevention device.

#### **SEC. 24-18. INSPECTIONS**

Whenever the Health Officer has reasonable grounds to believe that a violation of this regulation exists, he/she may enter upon and make an inspection of such premises, dwelling or other building and to gather other necessary information, including water samples or other necessary specimens for the purpose of laboratory analysis. The landowner, landowner's agent or occupant of such premises shall permit the Health Officer to enter such premises and to make such inspections, and to obtain such samples, at the request of the Health Officer. Such inspection shall be made between the hours of 7:30 a.m. and 4:30 p.m., Monday through Friday and at other times with the consent of the occupant or in case of emergency. The provisions of this Section shall apply to all premises, buildings or dwellings, vacant or occupied. The Health Officer may make as many additional inspections of such premises as are deemed necessary. Every occupant of a dwelling or dwelling unit shall give the landowner thereof, or his agent or employee access to any part of such dwelling or dwelling unit, or its premises, at all reasonable times for the purpose of making such repairs or alterations as are necessary to effect compliance with the provisions of this regulation or with any lawful regulation adopted or any lawful order issued pursuant to the provisions of this ordinance.

#### **SEC. 24-19. REFUSAL OF ADMITTANCE**

In the event the Health Officer, in proceeding to enter any premises for the purpose of making an inspection to carry out the provisions of this ordinance, shall be refused entry, a complaint may be made under oath to any magistrate of the county and said magistrate shall thereupon issue his warrant directed to some peace officer of the county commanding him between the hours of sunrise and sunset, accompanied by the Health Officer, to enter upon such premises and to make such inspection, and to obtain such samples as may be required to carry out the provisions of this ordinance, which order shall be executed by said officer under the direction of the Health Officer.

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**SEC. 24-20. NOTICE**

- A. Whenever the Health Officer determines that there are reasonable grounds to believe that there has been a violation of any provision of this Chapter or any Chapter adopted pursuant thereto, he/she shall give notice of such alleged violation to the person or persons responsible therefore, as hereinafter provided. Such notice shall:
1. Be in writing.
  2. Include a statement of the reasons why it is being issued.
  3. Allow a reasonable time for the performance of any act it requires.
  4. Be served upon the landowner or his agent or the occupant, as the case may require; provided that such notice shall be deemed to be properly served upon such landowner or agent, or upon such occupant, if a copy thereof is sent by certified mail to his last known address; or if a copy thereof is posted in a conspicuous place in or about the premises affected by the notice, or if he is served with such notice by any other method authorized or required under the laws of this state.
- B. Such notice may contain an outline of remedial action which, if taken will effect compliance with the provisions of this regulation and with regulations adopted pursuant thereto.

**SEC. 24-21. HEARINGS**

In the event any person is aggrieved by any order made by the Health Officer, he/she may within twenty (20) days of the date of such order, appeal to the Board of Health and in writing, state his/her reasons for requesting such order to be rescinded or modified. The Board of Health shall review the actions of the Health Officer, and if reasonable grounds exist, shall modify, withdraw or order compliance with said order. Appeal from any order of the Board of Health may be taken within twenty (20) days to the District Court of Scott County, Iowa.

**SEC. 24-22. JURISDICTION**

The provisions of this Chapter shall apply throughout Scott County, Iowa, including cities and towns therein.

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SEC. 24-23. ENFORCEMENT

It shall be the duty of the Health Officer to enforce the provisions of this Chapter.

SEC. 24-24. MUNICIPAL INFRACTION

Any person, persons, firm, partnerships or corporations, whether acting alone or in concert with any other, who violates this ordinance shall be guilty of a municipal infraction and shall be penalized as set forth in Chapter 29 of the County Code of Scott County, Iowa.

SEC. 24-25. SEPARABILITY OF PROVISIONS

If any section, paragraph, clause or provision of this regulation shall be held invalid, the invalidity of such section, paragraph, clause or provision shall not affect any of the remaining provisions of this ordinance.

SEC. 24-26. APPLICABILITY

In the event of a difference between the provisions of this Chapter and those contained in applicable state rules and regulations (Iowa Department of Natural Resources Administrative Code 567 - Chapter 38 and 49), the most stringent standards will prevail.