

Minnesota Attorney General: Administrative Rules Proceedings

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Version 3
August 20, 2018

Our File #539

RULES REVIEW CHECKLIST

DATE RULES RECEIVED 9-6-79 Temporary Rule _____

Resubmitted and Received _____

DUE DATE 9-26-79

a. Returned to Agency w/o filing w/Secy of State 9-25-79
b. Approved 9-25 Date Sent Back to Agency _____

- -

1. Rules as Adopted ✓
2. Rules as Proposed ✓
3. Certificate of Board's Authorizing Resolution, where applicable n/a
4. Order for Hearing ✓
5. Notice of Hearing ✓
   (i) Sufficiency ✓
6. Secretary of State's List ✓
7. Certificate of Acquisition of Secretary of State's List ✓ — they have only 1 affidavit OK — copy
8. Affidavit of Mailing ✓
   (i) At least 30 days prior to hearing ✓
9. Statement of Need and Evidence ✓
10. Hearing Examiner's Report ✓ only 1 xerox, no original
11. Agency's Findings of Fact ✓
12. Certificate of Board's Resolution Adopting Rules, where applicable n/a
13. Order Adopting ✓
14. Report of Chief Hearing Examiner — need copies — copy
    (i) Finding of No Substantial Change ✓
    (ii) Permission to Incorporate by Reference, where applicable n/a
15. Certificate of Compliance with Rulemaking Procedures ? [ ]
16. Copy of Notice of Intent to Solicit Outside Opinion, where applicable ✓
17. Petition by Public, where applicable n/a.

Our File: 539

William G. Miller
Special Assistant
Attorney General

September 25, 1979

Joannie E. Hinderaker

In the Matter of Amendments to Rules Relating to Construction of Wells and to Water and Waste-water Facility Classification and Operator Certification.

cc: Duane Harves
Marshall Whitlock
Melvin Goldberg

ADMIN 1000 (Rev. 1/78)
SF-00006-01

Our File: # 539

STATE OF MINNESOTA

DEPARTMENT ATTORNEY GENERAL

Office Memorandum

TO : FILE

DATE: September 25, 1979

FROM : JOANNE E. HINDERAKER
Special Assistant
Attorney General

PHONE: 296-4692

SUBJECT: Section 1.218 C - "The Commissioner may order that the well be permanently plugged and abandoned."

I am approving this rule on the basis of my interpretation of the rule, i.e., 218 C 2 states that a permanently abandoned well "shall be" treated in a certain way, i.e., "disconnected" etc. If a well provides a potential or actual source of contamination the Commissioner "may order" permanent plugging and abandonment. My reading of this rule would also allow the Commissioner to order a temporary abandonment per 218 C. 1.

Also, it should be noted that 218 C. requires the owner to sample, disinfect, pump, or remove the contamination before the well is plugged. Such action may itself be enough to negate the contamination problem. Therefore a permanent abandonment order from the Commissioner may not be necessary. Thus I'm going to let the "may order" language stand as it is.

JEH/bw

PRINTED ON RECYCLED PAPER

STATEMENT OF COMPLIANCE WITH

MANUAL OF RULE MAKING PROCEDURES

I, Special Assistant Attorney General William G. Miller, do hereby declare that I have examined the proposed rules relating to Water Well Contractors and all related documents and that, based on such examinations and my personal familiarity with the applicable procedures, the Manual of Rule Making Procedures has been followed.

Dated: September 25, 1979

WILLIAM G. MILLER
Special Assistant
Attorney General

WATER WELL CONSTRUCTION CODE

AG's copy

7 MCAR §1.210 Definitions and Policies.

A. For the purposes of these ~~regulations~~ rules promulgated pursuant to Minnesota Statutes, Chapter 156A, as amended, the terms defined in this section have the meanings given them, except where the context clearly indicates otherwise.

B. the following terms apply primarily to the licensing ~~regulations~~ rules 7 MCAR 1.211 - 1.216, but are also applicable to the Water Well Construction Code, 7 MCAR 1.217 - 1.230 when used therein.

1. "Commissioner" means the commissioner of health or his or her authorized representative.

2. "Council" means the Water Well Contractors Advisory Council created pursuant to the provisions of Minnesota Statutes §156A.06 .

3. "Act" means Minnesota Statutes §§156A.01-156A.08, as amended, under which these rules ~~and regulations~~ are promulgated.

4. "APA" means the Administrative Procedure Act, Chapter 15, Minnesota Statutes.

5. "Person" means any natural person, corporation, partnership, or other business association.

6. "Applicant" means any person who applies for a water well contractor's license pursuant to the Act.

7. "Application for examination" means the application submitted by an applicant from which the commissioner determines whether the applicant is eligible to take the examination.

8. "Application for licensure" means the application submitted by an applicant upon his successful completion of the examination, or at the end of each calendar year for licensure renewal.

9. "Year of experience" means a year during which the applicant personally drilled five (5) water wells and was actively working in the trade for a period of 1,000 hours under the supervision of a licensed water well contractor. An applicant drilling 1,000 hours per year and completing fewer than 5 wells per year may qualify, if the experience is gained in constructing one or more large diameter wells (casing outer diameter is 10 inches or more) which are more than 500 feet deep. An applicant who seeks to qualify under this provision shall have his license limited to construction of such deep and large diameter wells.

a. Supervision of a drilling operation shall not be considered as an equivalent to personally drilling a well.

b. The experience must have been gained in Minnesota except that an applicant may provide the commissioner with information demonstrating that his experience was gained in an area with the same or similar geological and other well drilling conditions as in the applicant's proposed well drilling operations territory in Minnesota. Such experience may be considered as meeting the experience requirement of these ~~regulations~~ rules. Applicants from states having no standards or licensing programs, or standards less strict than those adopted pursuant to Chapter 156A shall have obtained at least one year of experience in Minnesota under the supervision of a licensed water well contractor, in addition to that which is required under 7MCAR 1.211.

10. "Licensee" means a person who is licensed as a water well contractor pursuant to the provisions of the Act and these rules ~~and regulations~~.

11. "Representative" means an individual who is in charge of the water well drilling and contracting operation and qualifies for licensure on behalf of a partnership, corporation, or other business association rather than on his own behalf.

12. "Upper termination of the well casing" means a point twelve (12) inches above the established ground surface.

13. "A water well drilling machine" means any machine or device such as a cable tool, hollow rod or auger used for construction of a water well including drive point wells or a hoist or machine used in the well repair service which involves the modification to the well casing, screen depth or diameter below the upper termination of the well casing.

C. The following terms apply to the Water Well Construction Code, 7 MCAR §1.217 - §1.230.

1. "Abandoned water well" means a well whose use has been permanently discontinued, or which is in such disrepair that its continued use for the purpose of obtaining ground water is impracticable or may be a health hazard.

2. "Administrative authority" means the Commissioner. When this code, 7 MCAR 1.217 - 1.230, is adopted by any municipality of the State, such municipality may apply to the Commissioher for authorization to act as an inspection agent of the administrative authority to enforce the provisions of the Act and these rules ~~regulations~~. The inspection agent's authority shall be limited to inspections to determine compliance with the provisions of these

~~regulations~~ rules and to exercise any other powers specifically given the administrative authority by these ~~regulations~~ rules. The Commissioner may grant such authority if the municipality demonstrates that at least one of its employees is qualified and familiar with the well drilling operations in that municipality. Such authorization may be revoked without cause by the Commissioner or released by the municipality on ten days written notice. This section shall not preclude the Commissioner or any municipality from reaching an agreement authorized by Minnesota Stat. §471.59.

3. "Annular space" means the space between two cylindrical objects one of which surrounds the other, such as the space between a drillhole and a casing pipe, or between a casing pipe and liner pipe.

4. "Approved basement" means a private home basement with walls and floor constructed of concrete or equivalent which is not subject to flooding and not located within a flood plain.

5. "Aquifer" means a water-bearing formation (soil or rock horizon) that transmits water in sufficient quantities to supply a well.

6. "Casing" means an impervious durable pipe placed in a well to prevent the walls from caving and to seal off surface drainage or undesirable water, gas or other fluids to prevent their entering the well and includes specifically but not limited to:

a. "Temporary casing" means a temporary casing placed in soft, sandy or caving surface formation to prevent the hole from caving during drilling.

b. "Protective casing" means the permanent casing of the well.

7. "Coliform group" means all of the aerobic and facultative anaerobic, gram-negative, nonspore-forming, rod-shaped bacteria which ferment lactose with gas formation within 48 hours at 35° centigrade.

8. "Director" means the director of the Division of Environmental Health of the Department, or his authorized representative, who shall carry out the administrative functions of these ~~regulations~~ rules on behalf of the Commissioner.

9. "Drawdown" means the extent of lowering of the water surface in a well and aquifer resulting from the discharge of water from the well.

10. "Dug well" means a well in which the side walls may be supported by material other than standard weight steel casing. Water enters a dug well through the side walls and bottom.

11. "Established ground surface" means the intended or actual finished grade (elevation) of the surface of the ground at the site of the well.

12. "Geological material" means all materials penetrated in drilling a well.

a. The following table lists materials other than consolidated rock classified according to average particlar size: (Wentworth 1922)

	Particle Diameters		Screen Slot No.	
Material	Millimeters	Inches	From	To
Clay	Up to 0.005	Up to 0.0002	---	---
Silt	0.005 - 0.062	0.0002 - 0.0025	---	---
Fine Sand	0.062 - 0.250	0.0025 - 0.010	2	10
Medium Sand	0.250 - 0.50	0.010 - 0.020	10	20
Coarse Sand	0.50 - 1.00	0.020 - 0.040	20	40
Very Coarse Sand	1.00 - 2.00	0.040 - 0.080	40	80
Fine Gravel	2.00 - 4.00	0.080 - 0.160	80	160
Coarse Gravel	4.00 - 62.5	0.160 - 2.50	160	and larger
Cobbles	62.5 - 250.0	2.50 - 10.0	---	---
Boulders	250.0 and larger	10.0 and larger		

b. "Alluvium" is a general term for clay, silt, sand, gravel or similar unconsolidated material deposited during comparative recent geologic time by a stream or other body of running water as a sorted or semi-sorted sediment.

c. "Glacial drift (unconsolidated)" means a general term applied to all rock material (clay, sand, gravel and boulders) transported by a glacier and deposited directly by or from the ice or by running water eminating from the glacier.

d. "Glacial outwash" means a stratified sand and gravel removed or washed out from a glacier by meltwater streams and deposited in front of or beyond the terminal moraine or the margin of an active glacier.

e. "Hardpan" is a term to be avoided if possible, but when used means a hard impervious layer composed chiefly of clay, cemented by relatively insoluble materials, which does not become plastic when mixed with water and definitely limits the downward movement of water and roots.

f. "Shale" means rock consisting of hardened silts and clays.

g. "Sandstone" means cemented or otherwise compacted sediment composed predominately of sand.

h. "Limestone" means rock which contains at least 80% of carbonates of calcium and has strong reaction with HCl (muriatic acid).

i. "Dolomite" means rock which contains at least 80% of carbonates of magnesium and has a weak reaction with HCl (muriatic acid).

j. "Gypsum" means a soft light colored formation of calcium sulfate crystals and may be found as streaks in a shale formation.

13. "Grout" means 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 70 seconds to discharge 1 quart of the material through an API (American Petroleum Institute) marsh funnel viscometer.

14. "Municipality" means a city, village, township, borough, county, district or other political subdivision of the State created by or pursuant to State law or any combination of such units acting cooperatively or jointly.

15. a. "Pitless adapter" means ~~a device or assembly of parts which will permit water to pass through the wall of the well casing or extension thereof, and which provides access to the well and to the parts of the water system within the well in a manner to prevent entrance of pollution into the well and the water produced.~~ a device for above or below ground discharge designed for attachment to one or more openings through a well casing, and constructed so as to prevent the entrance of contaminants into the well.

b. "Pitless unit" means an assembly with cap which extends the upper end of the well casing to above grade, and constructed so as to prevent the entrance of contaminants into the well.

16. "Pollution" or "contamination" means the presence or addition of any substance to water which is or may become injurious to the health, safety or welfare of the general public or private individuals using the well; which is or may become injurious to domestic, commercial, industrial, agricultural or other uses which are being made of such water.

17. "Potable water" means water which is safe for human consumption in that it is free from impurities in amounts sufficient to cause disease or harmful physiological effects.

18. "Pressure tank" or "hydropneumatic tank" means a closed water storage container constructed to operate under a designed pressure rating to modulate the water system pressure within a selected pressure range.

19. "Priming" means the first filling of a pump with water and the action of starting the flow in a pump.

20. "Pump house" means a building constructed over a well exclusively to protect the well, pump, and water treatment equipment.

21. "Pump room" or "well room" means an enclosed structure, either above or in a below grade approved basement housing the pump, top of the

well, a suction line or any combination thereof.

22. "Pumping water level" means the distance measured from the established ground surface to the water surface in a well being pumped at a specified rate for a specified period of time.

23. "Pumps and pumping equipment" means materials used or intended for use in withdrawing or obtaining ground water for any use, including without limitation, seals and other safeguards to protect the water from pollution and together with fittings, and controls to provide sanitary water storage facilities. "Installation of pumps and pumping equipment" means the selection of, and procedure employed in the placement and preparation for operation of, pumps and pumping equipment, including construction involved in making entrance to the well and establishing proper seals and other safeguards to protect ground water from pollution, including repairs to existing installations.

24. "Sewage" means the water carried waste products from residences, public buildings, including the excrementious or other discharges from the bodies of human beings or animals together with such ground water infiltration and surface water as may be present.

25. "Cesspool" means an underground pit into which raw household sewage or other untreated liquid waste is discharged and from which the liquid seeps into the surrounding soil or is otherwise removed.

26. "Seepage pit" or "dry well" means an underground pit into which a septic tank discharges household sewage or other liquid waste and from which the liquid seeps into the surrounding soil through the bottom and openings in the side of the pit.

27. "Septic tank" means a watertight tank of durable materials through which sewage flows very slowly and in which solids separate from the liquid to be decomposed or broken down by bacterial action.

28. "Sewer" means a pipe or conduit carrying sewage or into which sewage may back up.

29. "Subsurface disposal field," "seepage bed," "drainfield," "percolation system," or "tile absorption field" means a system composed of open jointed tile lines buried in stones and shallow trenches or beds for final disposal into the ground of sewage affluent from a septic tank. The septic tank effluent is applied to land by distribution beneath the surface through the open jointed lines.

30. "Static water level" means the distance measured from the established ground surface to the water surface in a well neither being pumped, nor under the influence of pumping nor flowing under artesian pressure.

31. "Subterranean gas" means a gas occurring below the land surface. It may be flammable such as methane or highly toxic as hydrogen sulfide and may be associated with ground water.

32. "Suction line" means a pipe or line connected to the inlet side of a pump or pumping equipment or any connection to a well casing that may conduct non-system water into the well because of negative pressures.

33. Water varieties mean:

a. "Ground water" means the water in the zone of saturation in which all of the pore spaces of the subsurface material are filled with water. The water that supplies springs and wells is ground water.

b. "Near surface water" means water in the zone immediately below the ground surface. It may include seepage from barnyards, disposal beds or leakage from sewers, drains, and similar sources of pollution.

c. "Surface water" means water that rests or flows on the surface of the ground.

34. "Well" means water well as defined in Minnesota Statutes, 156A.02, Subd. 1.

35. "Well seal" means a device or method used to protect a well casing or water system from the entrance of any external pollutant at the point of entrance into the casing of a pipe, electric conduit or water level measuring device.

36. "Well vent" means an outlet at the upper terminal of a well casing to allow equalization of air pressure in the well and escape of toxic or flammable gases when present.

37. "Yield" or "production" means the quantity of water per unit of time which may flow or be pumped from a well under specified conditions.

D. Policies

1. The rules ~~and regulations,~~ shall apply to all water wells in the State of Minnesota except those specifically exempted by the Act. Those aspects covered are the construction of new wells, the repair and maintenance of wells where specified, ~~and~~ the proper abandonment of wells, and the proper isolation of possible sources of contamination from existing wells to protect the quality of ground water aquifers for providing safe drinking water supplies.

2. Public Water Supply. In accordance with 7 MCAR § 1.136 , no system of water supply, where such system is for public use, shall be installed by any public agency or by any person or corporation, nor shall any such existing system be materially altered or extended, until complete plans and specifications for the installation, alternation, or extension, together with such information as the commissioner may require shall have been submitted in duplicate and approved by the Director insofar as any features thereof affect or tend to affect the public health. No construction shall take place except in accordance

with the approved plans. The plans for the well shall conform as specified by this well code. No municipal well may be drilled without approval of the site by the Director.

3. Modification by the Commissioner.

a. When the strict applicability of any provision of these rules ~~regulations~~ presents practical difficulties or unusual hardships, the Commissioner, in a specific instance, may modify the application of such provisions consistent with the general purpose of these ~~regulations~~ rules and the Act and upon such conditions as are necessary, in the opinion of the Commissioner, to protect the ground water of the State and the health, safety, and general well-being of persons using or potential users of the ground water supply.

b. Any request for modification shall be submitted to the administrative authority in writing and shall be signed by both the owner and the licensee. ~~Request for modification of the isolation distance from existing wells shall be submitted and signed by the owner.~~ In addition any ~~experts or~~ persons involved in providing documentary evidence in support of the request shall sign the request submitted by the owner. Such request shall specify in detail the nature of the modification being sought, ~~and~~ the reasons therefor, and the special precautions to be taken to avoid contamination of the well. The request shall also include: the proposed well depth, casing type and depth, method of construction and grouting, geological conditions likely to be encountered, and location of the well and of possible sources of contamination. Whether or not the requests are granted, the commissioner shall state in detail the reasons for the decision.

c. The owner of a water well is bound by all the provisions of 7MCAR §1.210 - §1.230 which relate to location, construction, maintenance and abandonment of wells.

7 MCAR §1.211 Licensing.

A. Qualifications

1. All applicants shall meet the following requirements:

a. A minimum of three (3) years' experience in water well drilling.

b. Honesty, integrity, and an ability to perform the work of a water well drilling contractor.

c. Submission to the Commissioner of properly completed applications.

2. All applicants must successfully complete the examination provided for in the Act and in these rules ~~and regulations~~.

B. Applications and Fees

1. All applicants shall submit two (2) applications. The first one shall be an application for examination. If the applicant qualifies, then he shall submit an application for licensure.

2. Application for Examination

a. An application for examination shall be submitted to the Commissioner on forms provided by him. The application shall be accompanied by the filing fee of $50.00. The fee shall be paid using only a money order, bank draft, or certified check made payable to the Minnesota State Treasurer.

b. The Commissioner shall not act upon the application until he has received reference letters from individuals who are familiar with the applicant's work experience, honesty, integrity, and ability to perform the work of a water well drilling contractor.

c. The filing fee for an application for examination shall not be refunded for any reason except when an applicant is not found to be qualified to take the written examination.

3. Application for Licensure

a. Upon satisfactory completion of the examination, the applicant must apply for a license within one year of the date on which is he is notified of passing the exam, upon forms provided by the Commissioner.

b. The application shall be accompanied by a license fee of $50.00. The fee shall be paid using only a money order, bank draft, or certified check made payable to the Minnesota State Treasurer. This fee shall not be refunded for any reason.

4. If an applicant passes the examination or qualifies for licensure but the Commissioner does not receive his application for licensure within one year from the date of the letter from the Commissioner notifying him of his eligibility for licensure, then no license may be issued. Such an applicant, in order to become licensed at some later date, shall requalify by submitting a new application for examination and the prescribed fee.

5. An individual may apply for examination as many times as he desires. Each application must be accompanied by the filing fee as prescribed by the Act.

C. Council Evaluation of Applicants

1. The Council shall evaluate each applicant and forward its recommendations to the Commissioner.

2. The Commissioner or Council may conduct oral interviews and require sworn affidavits and other supporting evidence to determine qualifications of the applicant.

D. Examination

1. No applicant shall be permitted to take the examination unless he has submitted an application for examination, the accompanying filing fee, and been determined to be qualified by the Council.

2. The applicant shall taken an examination which may be any combination of written, oral, or practical work as determined by the Commissioner with the advice of the Council. Satisfactory completion of the examination is a mandatory prerequisite for licensure.

3. An applicant which is a partnership, corporation, or other business association, shall designate one partner, officer, or other responsible full-time employee who shall be its representative to take the examination on its behalf. Upon licensure of the applicant, the representative shall be responsible for the supervision of all operations required of water well contractors by the Act and the rules ~~and regulations~~ adopted thereunder.

E. Denial of Application. An application for examination or license may be denied for any of the following reasons:

1. Failure of the applicant to complete the application.

2. Failure of the applicant to submit the application with the prescribed fee.

3. Failure of the applicant to meet the experience, reference, examination, and other qualifications required by the Act and these rules ~~and regulations~~.

4. Other sufficient causes as determined after notice and hearing in accordance with APA.

F. License and Renewal

1. No person shall drill, construct, or repair a water well within this State unless in possession of a valid license to do so issued by the Commissioner; provided, however, that persons installing or repairing pumps on a well shall not be licensed as water well contractors provided their work does not involve modifications to the well casing, screen, depth,

or diameter below the upper termination of the well casing.

2. The initial and renewal license shall not be transferable and expires on January 31 of the year after that for which it was issued. The initial license shall contain the name of the licensee; the licensee's representative, if applicable; the date of issue; and the license number.

3. Each licensee shall submit an application for license renewal on forms provided by the Commissioner no later than January 31 of the year for which application is made. The license renewal application shall be accompanied by a fee of $50. A penalty fee of $10 shall also be paid if the renewal is submitted after the January 31 deadline. Upon receipt of the application answered in a manner acceptable to the Commissioner, a licensee shall be sent a renewal license. The renewal license shall consist of a card in duplicate and contain the name of the licensee; the licensee's representative, if applicable; expiration date; and license number. One card shall be kept posted with the original license. The other shall be carried by the licensee or his representative.

4. Any licensee who does not renew his license within one year may have his license renewed only upon the recommendation of the Council and only after showing sufficient cause for not renewing. Until such showing is made and the renewal license issued, the licensee shall not work as a water well contractor.

5. A person who acts as a representative may not be in the employ of any water well contractor other than the one he represents.

6. In the case of those applicants who are subject to 7MCAR § 1.211 D.3. the licensee shall be the partnership, corporation, or other business association who that individual represents and not the representative.

a. When the representative leaves the licensee or is otherwise incapable of performing his responsibilities, the licensee shall inform the Commissioner within five (5) days of such fact and give the name of a qualified individual acceptable to the Commissioner, who shall be responsible for the acts of the licensee during the interim period while a new representative is being qualified. Although the licensee shall retain the same numbered license upon the licensing of the new representative, all applications, examinations, fees, and other requirements must be satisfied in order to qualify the new representative who must qualify within ninety (90) days. If he does not do so, the water well contractor shall be without a license and must cease operations.

b. If an individual has his own license and desires to act as a representative, or if a representative desires to obtain a license in his own name, the business association or the individual, as the case may be, need only submit an application for licensure and fee. The examination need not be retaken.

G. Suspension or Revocation of License; Reinstatement

1. Suspension or Revocation

a. The Commissioner may suspend or revoke the license of a water well contractor upon finding that the licensee has violated the provisions of the Act or the rules ~~and regulations~~ adopted thereunder. The Commissioner may initiate such proceedings upon his own motion or upon recommendation of the Council.

b. The Commissioner or Council may cause an investigation to be made in any case in order to determine whether there has been a violation of the Act or of these rules ~~and regulations~~, and, in so doing, may request the licensee to appear before them to determine the merits of the situation

in question. In each case the Council shall make a recommendation to the Commissioner as to whether proceedings under the Act and the APA would be appropriate.

c. Any disciplinary action taken under this section shall comply with the provisions of the APA.

d. A license may be suspended until certain conditions are fulfilled and/or for a specified period of time as determined to be most appropriate by the Commissioner. The suspended or revoked license along with the current renewal certificates shall be returned to the Commissioner by the licensee.

e. When the license of a water well contractor who is subject to the provisions of 7MCAR§1.211 D.3. is revoked or suspended, the disciplinary action shall apply to both the licensee and its representative.

2. Reinstatement

a. A revoked license may not be reinstated. The licensee who has had his license revoked may be relicensed by filing the usual applications and fees, and by taking the examination. The Commissioner shall require an investigation or hearing to determine whether the person should be issued a new license; provided, however, that in no case shall a new license be issued prior to one (1) year after the revocation has taken effect.

b. A licensee suspended for a specified period of time shall be automatically reinstated at the end of that time. Nothing herein shall be interpreted to prevent the making of such reinstatement conditional upon terms established by the Commissioner in his Order of Suspension.

c. A licensee suspended for an indefinite period of time may be reinstated at the Commissioner's own motion after due investigation to determine that the conditions upon which the suspension was based have

been corrected or upon the Commissioner receiving reasonable assurance to his satisfaction that such conditions will not reoccur.

d. The person whose license has been revoked or indefinitely suspended may petition the Commissioner for a hearing for reinstatement of his license. Such hearing shall be granted only upon a showing by the petitioner that reasonable grounds exist for such hearing.

H. Placement of Decals and License Number

1. A licensee shall place in a conspicuous location on both sides of each well drilling machine his license number in figures not less than three (3) inches high and one and a half (1½) inches wide. The number shall be in a contrasting color to the background.

2. Decals designating the year for which the license was issued or renewed and the words, "MINNESOTA LICENSED WATER WELL CONTRACTOR," shall be affixed directly adjacent to and below the license number on each well drilling machine. Water well contractors using a rope spool or other devices for well installation shall attach their decal on a portable display to be shown at the well site. The decals shall be issued by the Commissioner upon licensure and renewal.

I. Well Drilling Machine Registration

1. An initial or renewal license issued pursuant to Minn. Stat. Ch. 156A and the Water Well Contractors Rules, 7 MCAR 1.210 - 1.230, shall include the registration of one drilling machine. Each water well contractor shall pay an annual fee of $5 for the registration with the Commissioner of each additional drilling machine. Upon receipt of the required fee and information, a water well drilling machine registration card shall be issued for identification purposes for each drilling machine registered by the well

drilling contractor. The card shall be carried on the water well drilling machine at all times where it may be inspected by the Director. The card expires on January 31 of the year after that for which it was issued.

2. The registration card and duplicate decals furnished for a water well drilling machine are not transferable. The card and decals shall be returned to the Director when a water well drilling machine is sold, traded, or otherwise disposed of. A registration card and two (2) new decals for a drilling machine so transferred will be provided upon receipt of the water well drilling machine registration fee, the old card, the two (2) old decals and application for the new drilling machine.

7MCAR §1.217. Location of Wells

A. General Considerations. A well shall be located consistent with the general layout and surrounding area giving due consideration of the size of the lot, contour of the land, slope of the water table, rock formation, porosity and absorbency of the soil, local ground water conditions, and other factors necessary to implement the basic policies that follow.

B. A well shall be

1. Located on a site which has good surface drainage, at a higher elevation than, and at a sufficient distance from, cesspools, buried sewers, septic tanks, privies, barnyards and feedlots, or other possible sources of contamination so that the supply cannot be affected thereby, either underground or from the surface of the ground.

2. Located so that the well and its surrounding area can be kept in a sanitary condition.

3. Adequate in size, design and development for the intended use.

4. Constructed so as to maintain existing natural protection against pollution of water bearing formations and to exclude all known sources of pollution from entering the well.

5. Located at least 5 feet from a property line. A well constructed to produce water for a community public water supply[1] shall be located at least 50 feet from a property line. In locating any well, consideration shall be given to the sources of contamination from adjacent property.

C. Distance from Pollution or Contamination Sources

1. A well shall be at least:

a. One hundred fifty feet (150 ft.) from a preparation area or

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[1] Community public water supply as prescribed in 7MCAR Sec. 1.145 A.12, means a system providing piped water for human consumption, which serves 15 service connections or living units or regularly serves at least 25 persons residing in the area for more than six months of the year.

storage area of spray materials, commercial fertilizers or chemicals that may result in pollution of the soil or ground water.

b. One hundred feet (100 ft.) from a below grade manure storage area if in conformance with Minnesota Pollution Control Regulation SW52(2)(e).[12]

c. Seventy-five feet (75 ft.) from cesspools, leaching pits and dry wells.

d. Fifty feet (50 ft.) from a buried sewer, septic tank, subsurface disposal field, grave, animal or poultry yard or building, privy, or other contaminants that may drain into the soil.

e. Twenty feet (20 ft.) from a buried sewer constructed of cast iron pipe or plastic pipe (ASTM 2665 for polyvinyl chloride pipe or ASTM 2661 for acrylonitrile-butadiene-styrene pipe, as prescribed in the Minnesota Plumbing Code, 7MCAR §1.123 C.3) with tested watertight joints, ~~or~~ a pit or unfilled space below ground surface, a sump[3] or a petroleum storage tank except that a well may be drilled closer than 20 feet to an approved basement, but no closer than as provided in 7MCAR §1.217 D.1. A community public water supply well shall be isolated at least 50 feet from any source of contamination.

f. Wells with casings less than 50 feet in depth and not encountering at least 10 feet if impervious material shall be located at least 150 feet from cesspools, leaching pits, or dry wells and at least 100 feet from a

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[12] A below grade manure storage area may present a special hazard to ground water quality which may require a greater isolation distance than provided for in this rule depending upon hydrologic and geologic conditions.

[3] Sump means a water tight tank which receives sewage or liquid waste and which is located below the normal grade of the gravity system and must be emptied by mechanical means.

subsurface disposal field, manure storage pile or similar source of contamination.[2 4]

2. The safe distance that a well should be located from a waste landfill or waste stabilization pond (lagoon) cannot be assigned a fixed number because of the varieties of hydrologic and geologic parameters associated with the undertermined types and amounts of materials that may be carried by ground water from leachates discharged from the waste landfill or waste stabilization ponds (lagoons). It is recommended that wells not be located in an area between the landfill or waste stabilization ponds (lagoons) sites and the point of ground water discharge to a surface water source.

3. Any well that may intercept leachates from a waste landfill or waste stabilization pond (lagoon) by water withdrawal from the well shall not be used for potable water.

4. Wells installed for ground water quality monitoring purposes are exempt from provisions related to safe depths and isolation distances from sources of contamination; however, their construction shall otherwise be in accordance with Minnesota Statutes Chapter 156A and rules adopted thereunder. All observation wells shall be protected from damage.

a. Temporary observation wells (as defined in 7MCAR §1.218 D.1) shall be protected with a 6 foot high steel post and flag marker or sign.

b. Permanent observation wells (as defined in 7MCAR §1.218 D.2) shall be protected with 4 steel posts as prescribed in 7MCAR 1.224 F.4.b.

5. The administrative authority may modify the isolation distances in this rule for individual well installations. The request for modifications

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[2 4] For example, a manure storage pile would be considered as a potential source of contamination to the well; however, the presence of animals in open pasture in an area would not necessarily concentrate contaminants to the degree that would cause contamination to enter the ground water.

shall be made according to the provisions of 7 MCAR 1.2103. ~~in writing and signed by the licensee and the owner and shall state the reasons for the request.~~ A request for modification of the isolation distance from existing wells shall be submitted and signed by the owner. In addition any experts or persons involved in providing documentary evidence in support of the request shall sign the request. submitted by the owner. The request shall also include: the proposed well depth, geological formations ~~likely to be~~ encountered, casing type and depth, method of construction and grouting, and location of the well on the property in relation to possible sources of contamination.

D. Wells Adjacent to Buildings, Gas Lines or Overhead Electric Power Lines

1. A well shall be located:

a. At least 3 feet horizontally from a building or any projection thereof, except for a pumphouse, unless modified in writing by the administrative authority.

b. Accessible for cleaning, treatment, repair, test inspection, and other attention as may be necessary.

2. No well shall be located within the footing of any building or room beneath the floor under which there are buried sewers.

3. A well shall not be located within fifteen feet (15 ft.) of a gas line or overhead electric distribution line or twenty-five feet (25 ft.) from an electric transmission line which is in excess of 50 kV except for the underground electrical service line to the well. These distances should be observed when locating a gas line or overhead electric line in the vicinity of an existing well or known proposed well. Where there is a question of the voltage in an electrical line the 25 foot distance should be observed or where less distance is required the utility company should be consulted for their recommendation for safe distances.

E. Areas Subject to Flooding

1. A well shall not be located in areas subject to flooding unless the casing extends at least 2 feet above the level of the highest known flood of record or otherwise protected as prescribed in writing by the administrative authority.

2. The ground surface immediately adjacent to the well casing shall be graded so that surface water is diverted away from the casing.

3. The well shall be located at least 50 feet horizontally from the normal high water mark of a stream, river or lake and at a higher established ground surface elevation than the soil absorption system, septic tank, or other source of contamination.

4. For a community public water supply:

a. The surface of the ground at the well site shall be at least two feet above the highest known water level of any lake, pond, river, stream or any other body of surface water. the waters of which at the highest level would approach to within 50 feet measured horizontally of the well.

b. The earth surfaces shall be sloped to drain away from the well and be so graded as to prevent the accumulation and retention of surface water within 50 feet of the well.

c. Filling shall be protected from erosion by rip-rap or other suitable means.

5. Radial Water Collector. Projection of collectors shall be in areas and at depths approved by the Director. The exact location of all caisson construction joints and porthole assemblies shall be indicated. The caisson wall shall be substantially reinforced. Procedures shall be employed which

will assure minimum vertical rise of the collectors. The top of the caisson shall be covered with a watertight floor and pump openings shall be curbed. Pump discharge piping shall not be placed through the caisson walls. There shall be no construction joint within 10 feet of the original ground surface.

7 MCAR §1.218. General Protection of Ground Water Quality and Resources

A. Re-use of Water, Disposal, Recharge or Gas Storage Wells.

1. A well for the storage of gas or liquid under pressure may not be drilled without first having secured a permit therefor from the Commissioner of Natural Resources in accordance with Minnesota Statutes, Sections 84.57-58.

2. Water used for cooling parts of engines, air compressors, or other equipment or water used for air conditioning, shall not be returned to any part of the potable water system.

3. A well shall not be used for disposal of surface water, near surface water, or ground water or any other liquid gas or chemical.

B. Maintenance and Repair of Wells.

1. Every well shall be maintained in a condition whereby it will conserve and protect the ground water resources, and whereby it will not be a source or channel of contamination or pollution to the water supply of that well or any aquifer.

2. All materials used in maintenance, replacement or repair of any well shall meet the requirement of these ~~regulations~~ rules for new installation.

3. Broken, punctured, or otherwise defective or unserviceable casing, screens, fixtures, seals, or any part of the well head shall be repaired or replaced. The well shall be abandoned in accordance with the requirements of these ~~regulations~~ rules if such repair or replacement is not performed.

4. Repairs to wells completed with the well head terminating below ground (buried seal) where practicable, should include extending the well casing, ~~(~~ pitless adapter~~)~~, or pitless unit above the land surface. Extension of the casing above grade shall be accomplished in accordance with rules ~~and standards~~ for new wells.

5. Before acid treating a well, 7 MCAR 1.218 B.4. shall be complied with to prevent a hazardous condition caused by release of H_2S (hydrogen sulfide) or other toxic gases in a pit or confined space. All confined spaces shall be blown out with fresh air before entry and a supply of fresh air provided during occupancy. Pits or chambers should not be entered without a lifeline and adequate lifting power on the surface to quickly haul up a worker. Where there is any question whether the air supply procedure has provided a safe atmosphere, a self-contained breathing apparatus shall be worn (ordinarily canister-type gas masks to not protect against atmospheres low in oxygen).

C. Abandonment of Wells. Any water well which is to be abandoned must be abandoned in accordance with these rules. The owner of a well which is no longer being used will be ordered to sample the well and to disinfect or otherwise pump or remove the contamination before the well is plugged. If a well provides a potential or actual source of contamination for the aquifer, the Commissioner may order that the well be permanently plugged and abandoned.

1. Temporary.

a. Prior to placement into service or when temporarily removed from service, the well shall be sealed with a water-tight steel cap. A well removed from service and not permanently abandoned may be temporarily abandoned if approved in writing by the Commissioner. The licensee and the owner shall submit a request for temporary abandonment on forms provided by the Department.

b. The well shall be maintained whereby it is not a source or channel of contamination when not in service.

c. Until a well is permanently abandoned by sealing procedures, all provisions for protection of the water against contamination and pollution

and for maintaining satisfactory sanitary conditions around the well shall be carried out to the same extent as through the well were in routine use.

2. Permanent.

a. General. A well that is to be permanently abandoned shall be disconnected from the system and the hole filled to prevent contaminating materials from entering the water-bearing ground formations. Concrete or cement grout shall be used for sealing material; however, if the well is so large that the use of these materials is not practical, the filling materials should be selected so as to restore natural conditions as nearly as possible. Neat cement grout or concrete as defined in 7 MCAR 1.220 C(grouting) and 7 MCAR 1.210 C.13. are satisfactory for filling parts of wells in rock formations. Sand and heavy drilling fluid may be used in sand and gravel sections of wells.

b. All materials, debris and obstructions that may interfere with sealing operations shall be removed from the well. Liner pipe shall be removed or perforated when necessary to assure placement of an effective seal. The administrative authority will be consulted for instruction in case of abandonment of a contaminated well or where there is a question of proper procedure.

c. All casing and screen may be salvaged except casing that has been cemented in place. The well shall be filled with appropriate sealing materials as described in 7 MCAR 1.218 C.2. prior to removal of the casing.

d. The top of the hole shall be filled with 10 feet of cement or concrete grout to within 2 feet of the land surface. Casing remaining in the hole shall be cut off at least 2 feet below land surface. The remaining top 2 feet of hole shall be filled with native top soil.

e. An abandoned well shall be filled and sealed by one of the following methods in accordance with the materials penetrated, in such a manner as to

prevent it from acting as a channel for pollution. A report of the method of sealing shall be filed with the Commissioner on water well record forms provided:

(1) A well in unconsolidated desposits shall be filled with clean sand and puddled clay, neat cement grout or concrete grout to provide a permeability no greater than the natural condition.

(2) The section of a well in a cavernous or creviced rock (such as cavernous limestone or basalt lava rock, creviced granite, etc.) shall be filled with concrete or neat cement grout or alternate layers of concrete or neat cement grout, gravel or stone aggregate. The filling shall be completed at the top by a layer of neat cement grout or concrete grout extending at least ten feet (10 ft.) into the above overlying formation and finished as provided in 7 MCAR 1.218 C.2.

(3) When concrete, cement grout, puddled clay or heavy drilling fluid is used for sealing an abandoned well, it shall be inserted in the well through a grout pipe from the bottom of the well upward to the surface under pressure and in one continuous operation.

(4) Test wells shall be sealed to prevent the well from being a channel for the vertical movement of water and a source of contamination to the ground water supply in accordance with well abandonment provisions of 7 MCAR 1.218 C.

(5) The flow in a flowing well shall be confined, if possible,[53] and the well filled in accordance with well abandonment provisions of 7 MCAR 1.218 C.

f. The owner shall be responsible for the permanent sealing of an abandoned well except:

[53] Proper judgment shall be exercised in the feasibility and practicability of sealing flowing wells. In some cases the confining formation may have been so badly disturbed that sealing may only cause the flow to discharge in a less appropriate location. In other situations, the flow may have eroded so much material that the landscape has taken on the appearance of a natural spring. The sealing in this case may be impracticable, if not impossible.

(1) As mutually agreed upon in a written contract between the owner and licensee and in accordance with these rules and regulations to protect the ground water aquifer.

(2) When the licensee improperly locates, constructs, or completes the well or fails to meet the conditions of his contract; in which case the licensee shall be responsible for the sealing of the well.

g. A licensee shall permanently abandon any well that he removes from service in accordance with 7 MCAR §1.218 C. and shall report such abandonment to the Commissioner. A licensee shall report to the Commissioner any unsealed abandoned water wells.

D. Observation Wells

1. Observation wells installed for a temporary (not to exceed a period of six (6) months) purpose of obtaining hydrologic or other data shall be constructed by such methods and of such materials that they are not a source or channel of pollution or contamination to any ground water supply or aquifer. All observation wells shall be abandoned in accordance with procedure described in rule 7 MCAR 1.218C.

2. Permanent observation wells (exceeding a period of six (6) months) constructed for the purpose of obtaining hydrologic or other data shall meet the standards of construction for water supply wells except when prior permission has been obtained in writing from the Commissioner exempting the well from meeting specified standards established by these ~~regulations.~~ rules.

E. Test Holes and Borings. Test holes shall be permanently abandoned and sealed by the well contractor after the drilling, logging and testing have been completed unless:

1. The owner or his agent has submitted a request to the director and obtained his written permission to extend the time limit, or

2. The well is being completed as a water supply or other approved type well.

F. Dewatering and Depressurizing Wells

1. Dewatering and depressurizing wells shall be constructed in a manner and with such materials to prevent the contamination of the ground water system. Discharges from the dewatering system shall not be cross connected to a potable water supply.

2. Temporary Water Supply. There may be incidents during construction where nearby residences with private water supplies will lose their source of supply during dewatering operations. If such a situation occurs, the licensee shall cooperate with the homeowner as may be required to provide a temporary supply of water during construction operations, including, but not necessarily limited to, supplying bottled water for drinking and cooking purposes and potable bulk water for other uses.

3. The Commissioner shall be notified prior to commencement of a ground water dewatering operation by the licensee. The licensee shall report the approximate area to be dewatered, the maximum depth to be dewatered, the number of wells to be affected, and the measures that will be taken to provide potable water to persons adversely affected by the dewatering operation. This may be reported by phone. The licensee shall retain the name of the Commissioner's staff member taking the information and shall report this information in writing to the Commissioner within three days of commencement of the ground water dewatering operation.

4. The licensee shall comply with any orders issued by the Commissioner which may include but not be limited to the collection of water samples from wells in the dewatered area for analysis to determine any health hazards prior to the Commissioner relieving the licensee of responsibility

for furnishing a safe water supply to well owners in the area affected by the dewatering operation. If the licensee has been released of his responsibility but thereafter difficulties develop in the water supply of well owners in the area affected by the dewatering operation as a result of such operation, the licensee may again be required to comply with 7 MCAR §1.218 F.2.

G. Elevator Shafts. Wells constructed or holes drilled for the installation of elevator shafts or hydraulic cylinders shall be cased, sealed, and maintained in a manner to prevent the vertical movement of water as a source of contamination to the ground water or any aquifer and as approved by the Commissioner.

H. All Other Wells. All wells except those specifically exempted by the Act shall be constructed and maintained in accordance with standards for water supply wells except when prior exemption has been obtained from the Commissioner.

7MCAR §1.219 Other Water Sources, Cross Connections and Storage Reservoirs

A. Storage Reservoirs. If a storage reservoir, excluding a pressure tank, is used, plans shall be submitted to the administrative authority for approval. The plans shall meet the standards specified in the Manual of Water Supply Sanitation, Section VII, paragraph 715, published in 1969 by the Department.

B. Other Water Sources. In cases where a potable water supply cannot be obtained by well drilling, permission may be granted by the administrative authority to use springs, infiltration tile lines, or other similar sources as a water supply or to install water treatment facilities. Plans and specifications for such facilities, together with operating procedures, shall be approved by the administrative authority. The plans shall meet the standards of the Manual of Water Supply Sanitation, Section VI, published in 1962 by the Department.

C. Cross Connections. Cross connections between water wells and other systems or equipment containing water or other substances of unknown or questionable safety, including pesticides and fertilizers, are prohibited, except where equipped with a suitable protective device such as a break tank or backflow preventer which is approved by the Commissioner and which the owner agrees to install, test and maintain to assure proper operation.

7 MCAR §1.220 Standards for Construction of Wells

A. Casing for Permanent Wells

1. A permanent well casing used for the protective or outside casing shall be of at least standard weight (schedule 40) steel or iron pipe through 8 inches inside diameter. Larger diameter casing shall have minimum weights and thicknesses as specified in Table 1. Dimensions and weights of schedule 40 pipe are given in Standard B36.10-1959 of the American Standards Association, 29 West 39th Street, New York, New York and Standards A53-69a or A120-69 of the American Society for Testing Materials, 1916 Race Street, Philadelphia, Pennsylvania 19103. Casing for permanent wells shall be of ferrous material or, where permitted by statute, plastic material. For ferrous pipe, the specifications and installation procedures are prescribed below. For plastic pipe, the specifications and installation procedures are prescribed in 7 MCAR §1.224.

2. A protective well casing shall be watertight throughout its length, with threaded or welded joints or other types of joints given written approval by the Director. Recessed or reamed and drifted couplings shall be used on threaded casing, or, as an alternate, other couplings can be used but the design, taper and type of the thread of the coupling shall match that of the pipe. No thread shall be exposed on the pipe when the pipe is joined to the coupling. Other casing design or materials shall be approved only by official written order of the Commissioner.

3. Pipe used as the protective casing in the permanent construction of a well shall be new pipe produced to recognized standards of the American Society for Testing Materials, No. 5L (1970) of the American Petroleum Institute, 1271 Avenue of the Americas, New York, New York, or No. C201-66 and C202-64 of the American Water Works Association, 2 Park Avenue, New York, New York, or other grade weldable new pipe having a quality equal to or greater than those heretofore specified.

4. New pipe, when salvaged within 30 days of the drilling of a water well test hole or dry hole only, may be used as new pipe if still in new condition.

5. Pipe shall be marked with the specification designation or marked "Meets Minnesota Well Construction Code Standards." Such markings shall include wall thickness, weight per foot and identification of supplier. The Commissioner may require that such pipe be submitted to an independent testing laboratory for evaluation and verification that the pipe will equal or exceed minimum standards. Failure of the pipe supplier to submit the pipe for evaluation and verification or failure of the pipe to meet minimum standards specified in 7 MCAR 1.220 A.1.and 3. shall be sufficient cause for automatic rejection of such pipe for use in well construction in Minnesota.

6. Pipe intended for water well use that is sold within this State, regardless of specification designation, is subject to random examination by the administrative authority who may require any lot of pipe or part thereof containing defective lengths to be rejected. Defective lengths or lots shall include, but not be limited to:

a. Pipe with girth welded joints

b. Pipe with welded patches, and

c. Lots having more than 5% of the pipe with lengths less than 5 feet

7. Temporary, Inner, and Protective Casing; Liner

a. Temporary casings may be standard weight pipe or lighter pipe, but lightweight material shall be of such minimum thickness as is required to withstand the structural load imposed by conditions both inside and outside the well.

Table 1

Casing Pipe Weight and Dimensions

Size in Inches	Wgt. Lbs. Per Ft. Plain End	Wgt. Lbs. Per Ft. Thrds. & Cplgs.*	Wgt. Lbs. Per Ft. Thrds. R&D Cplgs.	Thickness in Inches	Diameter--Inches External	Diameter--Inches Internal	Thrds. per Inch	Couplings Minimum External Diameter Inches	Couplings Minimum Length Inches
1	1.68	1.68	1.70	.133	1.315	1.049	11½	1.576	2-5/8
1¼	2.27	2.28	2.30	.140	1.660	1.380	11½	1.900	2-3/4
1½	2.72	2.73	2.75	.145	1.900	1.610	11½	2.200	2-3/4
2	3.65	3.68	3.75	.154	2.375	2.067	11½	2.750	2-7/8
2½	5.79	5.82	5.90	.203	2.875	2.469	8	3.250	3-15/16
3	7.58	7.62	7.70	.216	3.500	3.068	8	4.000	4-1
3½	9.11	9.20	9.25	.226	4.000	3.548	8	4.625	4-3/16
4	10.79	10.89	11.00	.237	4.500	4.026	8	5.200	4-5/16
5	14.62	14.81	15.00	.258	5.563	5.047	8	6.296	4-1/2
6	18.97	19.18	19.45	.280	6.625	6.065	8	7.390	4-11/16
8	28.55	29.35		.322	8.625	7.981	8	9.625	5-1/16
10	40.48	41.85		.365	10.750	10.020	8	11.750	5-9/16
12	49.56	51.15		.375	12.750	12.000	8	14.000	5-15/16
14	54.57	57.00		.375	14.000	13.250	8	15.000	6-3/8
16	62.58	65.30		.375	16.000	15.250	8	17.000	6-3/4
18	70.59	73.00		.375	18.000	17.250	8	19.000	7-1/8
20	78.60	81.00		.375	20.000	19.250	8	21.000	7-5/8
22	86.61			.375	22.000	21.250			
24	94.62			.375	24.000	23.376			
26	102.63			.375	26.000	25.250			
30	118.65			.375	30.000	29.250			
32	126.66			.375	32.000	31.250			
34	134.67			.375	34.000	33.250			
36	142.68			.375	36.000	35.250			

*Nominal weight based on length of 20 feet including coupling.

b. In no case shall the casing have a wall thickness of less than specified in Table 1. An inner casing shall be surrounded by at least 2 nominal inches of neat cement grout when welded joints are used. Table 2 lists inner and outer pipe size combinations which would be appropriate to fulfill the requirements of this rule. If couplings are used the annular space shall be at least 4 inches in diameter larger than the outer diameter of the coupling. The annular space between the casing and open hole shall be grouted with neat cement, ~~or~~ concrete grout, or as provided in 7MCAR §1.220 C. D., E. or F.

c. An inner casing shall be grouted for its entire length with the grout material being added from the bottom upward in one continuous operation or as provided in 7MCAR §1.220 F.

Table 2

~~Permitted~~ Inner and Outer Casing Combinations
Providing the Minimum Annular Space
When Welded Joints Are Used

Inner Casing in nominal inches	Outer Casing in nominal inches
2	6
4	8
5	10
6	12
8	14
10	16
12	18
14	20
16	22
18	24
20	26
22	30
24	30
26	32
30	36

d. Casings to be grouted shall be provided with sufficient centering guides, welded to the casing, to permit unobstructed flow and

deposition of the grout.

8. A well drilled for irrigation purposes in shallow continuous glacial outwash material penetrating non-artesian water may be constructed of pipe as specified in Table ~~2~~3. The annular space shall be closed by washing the fine grained caving material around the casing.

Table ~~2~~3. Gauges for Steel or Galvanized Steel Casing Irrigation Wells in Shallow Continuous Glacial Outwash Material Penetrating Non-artesian Water.

Diameter of Plain and Perforated Casing (inches)				Diameter of Corrugated Metal Pipe (inches)		
12	14	16	18	12	15	18
Gauge				Gauge		
12	10	10	10	12	12	12

Well casing in Table ~~2~~3 shall be new pipe, however, salvaged pipe may be used if the condition of the salvaged pipe is yet of new pipe quality.

9. Under no conditions shall the casing inside diameter be less than 2 inches except for a driven well point which shall be equipped with a casing pipe of at least 1¼ inches inside diameter. The well shall also be of sufficient diameter to receive a pump or pumping apparatus of sufficient size to discharge the design capacity including anticipated decline in water levels.

10. Minimum Protective Depths of Wells.

a. All wells shall be watertight to such depth as may be necessary to exclude pollution. A well shall be constructed so as to seal off formations that are, or may be contaminated or undesireable ~~or contaminated with bacteria of sewage origin~~. → opposite of proposed wells

Requirements will be fulfilled to the minimum extent when the protective casing has been installed in conformity with the applicable construction set forth in 7 MCAR 1.220. Where it is not feasible to follow the standards contained in this section, the licensee shall obtain approval of the administrative authority as to the design of the well before proceeding. The acceptability of the formation for well development shall be based on the satisfactory results of analysis of the water. Any water-bearing formation yielding water which is contaminated, as evidenced by the presence of chemicals or bacteria of sewage origin, shall be regarded as unsatisfactory for use as a potable supply unless adequate treatment is provided. The Minnesota Department of Health shall be consulted for measures that may be feasible to adequately treat the water to provide a potable supply.

b. Any potable water supply well constructed entirely in glacial outwash or alluvium earth formations in which the casing does not extend to a depth of 50 feet below established ground level or through at least 10 feet of impervious soil formation shall be located in accordance with 7 MCAR 1.217 C.1.f.

11. A well casing or extension thereof shall extend vertically at least 12 inches above ground surface or above the floor of an approved basement offset, pump room or well room. However, in an above grade installation the casing shall extend at least 6 inches above the floor or slab.

12. Well casing offsets are prohibited.

B. Upper Casing. A well casing used for a potable water supply shall not be used as a suction line unless protected by a standard weight outer casing

to a depth of at least 10 feet. The top of both casings shall be finished in accordance with 7 MCAR 1.222.

C. Grouting

1. A well having an open annular space around the casing, or between the surface casing and protective casing, or between an inner casing surrounded by an outer casing shall be grouted from the lower termination of the casing to the ground surface or to the base of the pitless ~~adapter~~ unit. Grouting shall be commenced without delay upon completion of drilling of the well or any portion of a well which must be grouted. Grouting shall be performed by adding the mixture through the casing or a grout pipe from the bottom of the space to be grouted upward to the surface in one continuous operation. Concrete grout may be used in the dry portion of a hole. Neat cement grout or concrete grout shall be allowed to set a minimum of 12 hours when hi-early cement is used or a minimum of 48 hours when regular cement is used, before drilling operations are resumed. Heavy drilling mud or heavy bentonite water slurry may be used as grout in wells developed in glacial drift.

2. Concrete grout is a mixture of cement, sand and water, in the same proportion of 1 bag Portland cement (94 pounds) (ASTM C150-69a) and an equal volume of dry sand to not more than 6 gallons of clean water. Where large volumes are required to fill annular openings, gravel not larger than ½ inch size may be added. Concrete grout shall not be used as grout below the water level in the well.

3. Neat cement grout is a mixture of 1 bag (94 pounds) of Portland cement (ASTM C150-69a) to not more than 6 gallons of clean water. Bentonite up to 2% by weight of cement to reduce shrinkage or other admixtures (ASTM C494-68) to reduce permeability and/or control time of set may be used.

4. Heavy drilling fluid when used as grout in a rotary drilled well shall contain a high percentage of clay or bentonite to minimize shrinkage of the slurry within the annular space. Heavy bentonite water slurry is a mixture of 10% by weight of bentonite added to clean water or approximately 5% bentonite added to drilling mud. Bentonite shall contain 85% of the mineral montmorillinite and shall meet American Petroleum Institute specification 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.

D. Rotary, Bored or Augered Wells.

1. Rotary, bored or augured ~~type~~ wells shall be ~~constructed with a water-tight casing of 2" diameter or larger installed in an open hole having a diameter of at least 4" larger than the maximum outside diameter of the casing.~~ have the annular space around the casing ~~shall be~~ tightly sealed in accordance with the materials and procedures ~~described in~~ which are appropriate to the particular geological and hydrologic conditions at the well site, as prescribed in ~~described in~~ 7 MCAR 1.220 C., ~~or 1.220~~ F.; G.; H. and O. ~~A rotary, bored, or augured well completed in a drift formation may be sealed by pumping the well to collapse the formation; however the top 20 feet below the land surface shall be sealed in accordance with 7 MCAR 1.220 C. or 1.220 F. Any annular space remaining unfilled shall be grouted with neat cement or concrete using a tremie pipe to pump the grout under pressure from the bottom up in one continuous operation.~~

2. Drilling mud additives shall be stored in clean containers and shall be free of material that may adversely affect the well, aquifer, or quality of the water to be pumped from the well.

E. Driven Casing Wells

1. Where the upper drillhole is clay or similar material of 10 feet or more in thickness, the annular space between the drillhole and casing shall be kept filled with clay slurry or equivalent material when driving the protective casing. In lieu of this, a starting casing should be used and sealed with 20 feet of concrete grout. (When a pitless adapter or pitless unit is used, see 7 MCAR 1.221 C.1.).

2. The bottom of the protective well casing shall be equipped with a drive shoe or otherwise protected from damage during construction of the well as dictated by drilling procedures and conditions of each particular well.

F. Unconsolidated Glacial Drift Wells. A well drilled into unconsolidated glacial drift may be completed with a tight seal made around the protective casing if the annular space is closed by washing the fine-grained caving material around the casing prior to disinfection of the well. Wells shall be pumped promptly after setting the casing until clear, and native materials shall be washed immediately into the annular space. Any annular space remaining unfilled shall be grouted with neat cement or concrete using a tremie pipe to pump the grout under pressure from the bottom up in one continuous operation.

G. Rock Wells

1. Where rock is encountered, i.e., consolidated as opposed to unconsolidated geological material, at a depth greater than 25 feet from the surface the protective casing shall be equipped with a drive shoe which shall be driven firmly into stable rock to provide a tight joint that will prevent pollution or sand from entering the well.

2. Where rock is encountered within 25 feet of the surface, an oversized hole shall be drilled. Such hole shall be 4 inches larger than the nominal casing size when welded construction is used, and 4 inches larger in diameter than the coupling if threaded joints are used. The annular space shall be pressure grouted with neat cement or concrete grout as prescribed in TMCAR 1.220 D. C. to a depth sufficient to exclude water which is or may be contaminated.

3. In an area where a well can be developed only in fractured, jointed, but noncavernous rock, the casing may terminate in the formation if there is at least 25 feet of sand or clay material above the rock, there is no record of this rock containing contaminated or polluted water, and geologic conditions offer no natural direct surface or near surface water inlets into the rock aquifer. Where there is less overburden or deeper strata will not produce potable water, the administrative authority shall be consulted and its written approval obtained by the well owner for water treatment and well construction features necessary to provide a safe water supply.

H. Cavernous Rock Wells.

1. Geological formations which are creviced or cavernous (limestone or dolomite) ~~should~~ shall not be used as a potable source of ground water unless overlain by at least 50 feet of drift material and/or by a firm insoluble rock material (sandstone) extending for at least one mile horizontal distance from the well in all directions to render the movement of contaminated water in the formation to the well improbable. The casing ~~shall extend at least 10 feet below the pumping level.~~ shall be equipped with a drive shoe and seated into the top of the limestone or dolomite formation. ~~The casing shall extend at least feet below the pumping level. The well shall be cased and grouted at least 10 feet below the pumping level. The drill hole shall be at least 4 inches larger in diameter than the nominal casing size if~~

~~welded-construction-is-used,-and-4-inches-larger-than-the-couplings-if-threaded joints-are-used.---The-annular-space-shall-be-filled-with-neat-cement-or-concrete grout-as-provided-in-7--MCAR-1.220-C.~~

a. Where the pumping level is determined to be at least 10 feet above the top of the cavernous formation the well shall be cased at least 10 feet below the pumping level. Any unfilled annular space shall be sealed according to the procedure prescribed in either 7 MCAR 1.220 C. or F.

b. Where the pumping level is determined to be less than 10 feet above the top of the limestone or dolomite formation the drill hole shall be at least 4 inches larger in diameter than the nominal casing size if welded construction is used, and 4 inches larger than the couplings if threaded joints are used. The annular space shall be filled with neat cement or concrete grout as prescribed in 7 MCAR 1.220 C.

2. Wells Underlying Cavernous Rock. Where an adequate and safe water supply is available in a geological formation overlain by one or more faulty rock formations, all faulty rock formations should be completely cased off. The casing should extend at least 15 feet into the safe aquifer if such exists, or at least 15 feet into a stable, insoluble, noncavernous or noncreviced geological formation beneath the lowest faulty rock formation and above the aquifer and at least 10 feet below the pumping level. The drill hole extending through the creviced rock formation and 15 feet into the firm rock formation or aquifer should be at least 4 nominal inches larger in diameter than the casing if welded construction is used, and 4 nominal inches larger in diameter than the couplings if threaded joints are used. The annular space shall be filled with cement grout as provided in 7 MCAR 1.220 C.

3. Protective Mantle Over Cavernous and Noncavernous Aquifer. Where any faulty rock formation which overlies a safe aquifer is itself overlain by a protective mantle of drift, or by a firm insoluble consolidated formation

of sufficient depth and for a sufficient radius as described herein above (7MCAR §1.220 H.1.), the casing need not extend through the protected faulty rock formation. The casing shall also extend 10 feet below the pumping level. The acceptability of water taken from a well so constructed will be dependent upon treatment of the water, if the need for treatment is indicated by analytical studies of the water.

4. A well shall not provide water entry from more than one aquifer.

I. Flowing Artesian Wells

1. Flowing artesian wells should be constructed to prevent erosion of the aquifer or the overlying confining mantle.[6]

2. Flow control from a flowing artesian well shall be provided, consisting of valved pipe connections, water-tight pump connections or a receiving tank set at an altitude corresponding to that of the artesian head. A direct connection between the discharge pipe and a receiving tank or a sewer or other source of pollution or contamination shall be prohibited.

[6] This provision will not be interpreted so as to preclude licensees from attempting to drill a well in a flowing artesian area, when it is likely that a water well can be safely installed if proper precautionary measures are followed.

J. Well Screens. A well installed in unconsolidated sand and gravel aquifers shall ordinarily be fitted with a screen properly sized so the aquifer can be properly developed to produce sand-free water at the pumping rate of the permanent pump. Wells shall provide sand-free water to the extent that the sand will not interfere with the intended use and operation of the water supply system.

K. Capping. Temporary capping of a well until the pumping equipment is installed shall be such that no pollution or foreign objects can enter the well.

L. Yield Test. Every well shall be test pumped to produce a minimum initial supply of 600 gallons of sand-free water per hour if geological conditions permit. A well in which a pump of a capacity of 20 gallons per minute or more is to be installed shall be tested for yield and drawdown with periodic water level measurements being made where possible, during the drawdown and subsequent recovery periods. The well shall be test pumped at rates greater than is expected from the well during its normal usage as follows: up to 400 gpm--1.5 times; 400 to 600 gpm--1.4 times; 600 to 800 gpm--1.3 times; 800 to 1,000 gpm--1.2 times; 1,000 gpm and over--1.1 times. Shallow nonartesian wells used for irrigation purposes may be test pumped at a rate equivalent to the yield of the aquifer and for a period of at least 12 hours. Wells shall be test pumped for a minimum of one hour or more if more is required by the well owner or as prescribed by the consulting engineer or hydrologist.

M. Alignment. A well shall not vary from the vertical or alignment so as to interfere with installation and operation of the pump.

N. Drilling Water. Water used for drilling, development or rehabilitation purposes, other than from the well itself, shall be chlorinated clear water containing a free chlorine residual at the time of use and be conveyed in clean sanitary containers or water lines.

O. Dug or Bored Wells.

1. A dug or bored well constructed with materials other than those authorized in 7 MCAR 1.220 A. may be constructed only in glacial drift formations and shall:

a. be cased with material of sufficient strength to withstand the pressures of the formation;

b. be installed in an oversized hole at least ~~8~~ 6 inches in diameter larger than the casing; ~~c. have~~ with the annular space between the casing and the formation filled ~~4~~ 3 inches thick with neat cement or concrete grout placed in one operation to a depth sufficient to exclude water which is or may be contaminated, or to a depth of 10 feet, whichever is greater, or

c. be installed with a watertight concrete curbing or casing at least four inches thick poured in one operation to a depth sufficient to exclude water which is or may be contaminated, or 10 feet, whichever is greater. The annular space between the casing and the formation shall be filled as provided in 7MCAR §1.220 D. or F;

d. be protected with a heavy pre-cast overlapping steel reinforced concrete cover or a heavy locked overlapping metal cover not less than 3/16 inch in thickness. The cover shall be tight fitting so as to exclude vermin, dust, or other contaminants from the well.

e. have pump openings and any below grade connection sealed with concrete or cement as prescribed in c. above.

2. Prior to constructing a dug or bored well, the licensee shall obtain from the owner an agreement to the following conditions:

a. the owner will maintain the isolation distances prescribed in 7MCAR §1.217 C.1;

b. once per year, or as otherwise prescribed by the Minnesota Department of Health, the owner will have the water from the dug or bored well analyzed for nitrate and for bacteria. This agreement shall be documented on forms provided by the Minnesota Department of Health and shall be returned to the Department along with the water well record.

P. Well Development. The well shall be developed to remove: 1. native silts and clays deposited on the aquifer face during the drilling, 2. drilling fluid and 3. the predetermined finer fraction of the gravel pack, all of which shall be done to insure that the maximum practical specific capacity will be obtained from the completed well.

Q. Disposal of Material. Drilling mud, cuttings and discharged water shall not be disposed in a manner so as to create damage to public or private property. During the test pumping discharged water shall be piped to a point of overland drainage.

7MCAR §1.221. Well Casing Seals and Connections

A. Water level measurement design. Provisions shall be made in the well seal with a minimum ½-inch diameter threaded plug for future measurements of static and pumping water levels. A minimum 1-inch diameter threaded plug is preferred where feasible.

B. Above-Grade Connections. An above-grade connection into the top or side of a well casing shall be at least 12 inches above the established ground surface or 2 feet above the regional flood level whichever is higher, and constructed so as to exclude dirt or other foreign matter by one or more of the following methods, as may be applicable:

1. Threaded connection.

2. Welded connection.

3. Rubber expansion sealer.

4. Bolted flanges with rubber gaskets.

5. Overlapping well cap.

6. Extension of the casing at least 1 inch into the base of a power pump mounted and sealed on a concrete pedestal and at least 12 inches above the established ground surface or the floor of an approved basement, pump room, or well room.

C. Below-Grade Connection

1. A connection to a well casing made below ground, or less than 12 inches above the established ground surface, shall be protected by ~~threaded or welded joints or~~ a pitless adapter or pitless unit. The ~~threaded or welded joints or~~ pitless adapter or pitless unit shall be approved by the commissioner on the basis of design and materials. A below-ground connection shall not be submerged in water at the time of installation. The director will furnish a list of approved pitless adapters and pitless units that

meet the requirements of these rules. Native materials shall be packed tightly around the casing and pitless adapter or pitless unit after installation.

2. A connection to a well casing located at least 12 inches above the floor of an approved basement offset is considered equal to an above-grade installation for residential use only. An approved basement offset shall be a room with a floor 12 inches above the floor of an approved basement, shall extend beyond the footings of the building. The well shall extend 3 feet beyond any roof projection. Any basement located in a regional flood zone shall not be considered an approved basement. Water from a well located within a basement offset of a farm home may be piped for use in other farm buildings.

D. Other Methods. Any other method of connection to a well casing shall be specifically approved in writing by the Director before installation.

7MCAR §1.222. Pump Installation

A. Pump and Well Rooms. A room housing pumping equipment or the top of a well casing shall be constructed above the established ground surface permitting access to the pump and well for maintenance or repair, or may be located below-grade if the containing room is located in or attached to an approved basement.

B. Slabs, Platform and Floors. A well, except where an approved pitless adapter or pitless unit is used, shall be protected by a durable watertight concrete or equal slab, platform or floor, 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, which may be asphalt or similar material to provide resiliency, shall be provided between the casing and the platform, pump room or approved basement floor or slab.

C. Pumps and Pumping Equipment

1. A pump shall be constructed so that no unprotected openings into the interior of the pump or well casing exist.

2. A hand pump, hand pump head, stand or similar device shall have a closed spout, directed downward, and a pump rod that operates through a stuffing box.

3. A power driven pump shall be attached to the casing or approved suction or discharge line by a watertight connection, including flange connections, hose clamp type connections, or other flexible couplings, or shall have a base plate meeting the requirements of 7MCAR §1.221 A.

4. A pump shall be designed, installed and maintained so that priming is not required for ordinary use. Pumps installed for use only on a well water irrigation system are exempted but priming water shall be clear water

free of contamination and carrying a chlorine residual. An irrigation well equipped with a centrifugal pump may be primed without chlorination when the pump is filled with water taken directly from the well.

D. Water Suction Lines

1. A water suction line shall be constructed of copper, galvanized iron or steel, cast iron, or plastic pipe as approved by the Director, or other material given written approval by the Director. Aluminum pipe is acceptable for well water irrigation systems in addition to the above materials.

2. A water suction line extending outside the well casing shall not be used unless protected by one or more of the following methods:

a. Fully exposed in an approved basement offset, pump room or well room and at least 12 inches above the floor of an approved below-grade structure.

b. Fully exposed above grade.

c. Lying within an outer casing with the annular space filled with water from the system and maintained at system pressure.

3. An unprotected suction line may be installed below grade only for nonpotable irrigation wells located in agricultural fields and installed in shallow glacial outwash material penetrating nonartesian aquifers for manifold collection systems under negative pressures provided the area is

sufficiently isolated from potable water wells.

E. Pump Discharge Lines. A buried discharge line between the well casing and the pressure tank in any installation, including a deepwell turbine or a submersible pump, shall not be under negative pressure at any time. If a check valve is installed in a buried water line between the well casing and the pressure tank, the water line between the well casing and the check valve shall meet the requirements for a suction line unless equipped with an air release valve. Pump discharge lines shall be materials as approved for suction lines in 7 MCAR 1.222D.1. A frost proof yard hydrant shall be located at least 10 feet from the well.

F. Pressure Tanks. It is recommended that a pressure tank be installed in an approved pump room or well room. However, partially buried pressure tanks shall project horizontally above the ground or into an approved basement. A totally buried pressure tank may be used if the manufacturer's unit has been approved in writing by the Commissioner as to its design, type of material and specification for its installation. A pressure relief or air release valve on a pressure tank which may contain subterranean gases and which is located within a building shall be vented to the outside.

G. Vents

1. All wells shall be vented. A casing vent shall be of materials complying with 7 MCAR 1.222 D.1 with watertight joints terminating at least 2 feet above the regional flood level or one foot above the established ground surface or the floor of a pump room, well room or approved basement, whichever is higher. The casing vent shall be screened and point downward. Vents may be offset provided they meet the provision of this rule. Any submersible pump shall be installed with a vented cap on the ~~pitless adapter~~ top of the well casing or pitless unit to prevent drawing near surface water, mud, sand, etc., into the well through shielding around the electric cable. Flowing

artesian wells may be exempted if protected by a specially designed pitless ~~adapter~~ unit or if the casing is protected as provided in 7 MCAR 1.220 B. ~~For wells of an inch and one-quarter diameter casing or as otherwise protected to insure that contaminated water will not enter the well not using a drop pipe venting is not required when equipped with a suction pump provided the casing is protected in accordance with 7 MCAR 1.220 B.~~ Where the well casing on small diameter wells (one and one-half inch or less) is used as a suction pipe, the casing need not be equipped with a vented, cap, provided the casing is protected in accordance with 7 MCAR 1.220 B.

2. If toxic or flammable gases are present, they shall be vented from the well. The vent shall extend to the outside atmosphere above the roof level at a point where the gases will not produce a hazard. Openings in pump bases shall be sealed watertight. If the type of gas is not known and is to be carried through the water supply, the administrative authority shall be consulted for proper identification and treatment.

H. Sampling Faucet. In a pressure water system provision shall be made for collection of water samples by installation of a faucet or sampling device in a convenient location as near to the well as possible.

I. Disinfection

1. A new, repaired, or reconditioned well or pump installation shall be thoroughly pumped to waste until the water is as clear as is reasonably possible, dependent upon ground water conditions in the area. Thereafter the well and pumping equipment shall be disinfected with chlorine so applied that a concentration of at least 50 parts per million of chlorine shall be obtained in all parts of the well. The chlorine solution shall be introduced into the well in a manner to flush the well surfaces above the static level with chlorine solution. A minimum contact period of 2 hours shall be provided before pumping the well to waste and flushing the chlorine solution from the distribution system.

2. A licensee shall be responsible for chlorinating the work he performs on the well, pump or pumping equipment.

3. Disinfection in a well repair operation may be accomplished at the beginning of the operation with chlorine applied to obtain a concentration of 200 parts per million for the period of the well repair operation. The water shall be pumped to waste prior to taking of water samples or use being made of the water.

7MCAR §1.223. Records and Samples

A. Water Sample

1. Prior to placing the well into service, the licensee will be responsible for collecting one or more water samples from the installation for water quality analysis. Such samples shall be submitted to the Minnesota Department of Health in containers and in accordance with procedures issued by the Director. The results of the data will be stored in a ground water quality information system. The sample must be received within 30 hours of collection. Results of water sample analysis for a domestic supply not acceptable for drinking water will be reported to the well owner and the licensee along with recommendations for corrective actions. The results of the sample analysis is not intended to provide a basis of water quality for a transaction involving the sale or purchase of property.

2. If the licensee chooses to submit the water sample to a laboratory other than that of the Minnesota Department of Health, that laboratory must be certified by the Minnesota Department of Health for determination of the presence of coliform bacteria. The sample must be collected in containers approved by the Director and must be received by the certified laboratory within 30 hours of the time of collection. The costs of such analysis shall be paid by the licensee. Results of the analysis shall be submitted to the Minnesota Department of Health.

B. Water Well Records

1. A water well record shall be completed and submitted to the Commissioner by the licensee within 30 days after completion of any well. The licensee shall furnish the well owner one copy, the Director three copies and retain one copy in his files, of a well record containing such available information as required on the form furnished by the Director. Terms when used for describing formations on the well log form shall conform to

definitions set forth in these rules.

2. A water well record shall be submitted for a dry hole. Information on several dry holes within a small area may be submitted on a single well record form if the geologic materials are similar.

3. A well record shall be submitted after an abandoned well has been sealed showing the method of sealing.

C. Water Well Cutting Formation Samples. In order to improve the State's water information system, more detailed geologic and hydrologic information is needed about the rocks and sediments which contain the State's groundwater resources. Water well cuttings provide the least expensive source of this kind of information. The information derived from such a program is essential to the better understanding and protection of the State's groundwater resources. The following rules and procedures set forth the means by which such information shall be obtained.

1. The Commissioner in consultation with the Minnesota Geological Survey (hereinafter referred to as the Survey) shall determine areas where water well cutting samples are needed to provide subsurface geological and hydrological information required by the Commissioner, the Survey, and other State agencies for development of the State water information system. The general standards to be used in making such a determination are:

a. To obtain the minimum amount of detailed geologic and hydrologic information needed for the State water information system, at least one set of water well cutting samples per township in rural areas and at least one set of water well cutting samples per section in urban areas are required. The latest State Planning Agency Land-Use Map will be used for determining rural and urban areas for collection of well cutting formation samples.

b. The Commissioner in consultation with the Survey may determine that more information is required from specific areas for accuracy and detail in the State water information system.

c. Water well cutting samples will be required only where there is reason to believe that a well will encounter bedrock materials below glacial sediments or from a well which the licensee estimates will reach a depth of at least 200 feet. The Commissioner may require water well cutting samples from areas other than as specified in this subsection where needed for accuracy and detail in the State water information system.*

2. The Commissioner through the Survey shall notify licensees of the general areas from which water well cutting samples are required and provide the licensees most frequently operating within such areas with maps or lists indicating counties, townships, section, or other designated areas where cutting samples are required. In addition, the Commissioner shall specify the approximate number and depths of wells from which cutting samples are needed in the designated areas.

3. The Survey shall furnish all licensees so notified with well-cutting sample bags, labels, and return postage cards for collecting and reporting water well cutting samples.

4. Licensees so notified and supplied with sample collecting materials shall collect cutting samples during the course of drilling wells in the designated areas according to the requirements specified in the notification. Licensees not supplied with sample collecting materials but who shall have occasion to drill a well in an area designated for sampling shall notify the Survey.

*Any licensee who has reason to believe that a well may be of exceptional geologic or hydrologic interest is encouraged to call collect the Survey to inform that agency of the opportunity to obtain samples, even if the well is not within the area currently designated for collection of samples.

5. Licensees shall collect the cutting samples in an accurate manner so as to insure that they are representative of the materials encountered. Samples shall be taken at 5-foot intervals and at every change in rock or sediment type. The cuttings shall be placed in the sample bags provided by the Survey which shall have an attached tag on which the Commissioner's recording form well-record number of the well, the well owner's name, the well location, and the sample depth (example: 5 ft.) must be written.

6. Licensees shall notify the Survey within 30 days after the well's completion so that the cutting samples can be collected. Pending collection, the contractor shall store the samples in a proper manner, so that they are protected from weather and disturbance and segregated in such a way that all samples may be properly identified with respect to the Commissioner's recording form well-record number and depth interval.

7. The Survey, upon notification by the licensee, shall collect the samples from the contractor. The cutting samples shall be described and a geologic log prepared. The geologic log will be retained in the files of the Minnesota Geological Survey, with a copy being sent to the contractor.

7MCAR §1.224 Plastic Well Casing. In addition to complying with 7MCAR §§1.210-1.223, an installer who uses plastic well casing* must comply with the provisions of this rule with regard to construction and installation.

A. Definitions: The following terms shall have the meanings given them.

1. Installer means any person who constructs a well using plastic casing, whether or not such person is a driller or contractor who is licensed pursuant to Minn. Stat. ch. 156A.

2. Plastic, when used in 7MCAR §§ 1.210-1.224, means a thermoplastic pipe or casing material composed of either polyvinyl chloride (PVC) or acrylonitrile-butadiene-styrene (ABS).

B. Standards:

1. Any plastic pipe used for water well casing shall meet the standards of the American Society for Testing and Materials, 1916 Race Street, Philadelphia, Pennsylvania, 19103, which are referenced as Standard Specification for Thermoplastic Water Well Casing Pipe and Couplings Made in Standard Dimension Ratios (SDR), ASTM F-480. Such pipe shall be capable of withstanding pressures equal to or greater than 200 pounds per square inch (p.s.i.). Table ~~1~~ 1 lists the pipe included in ASTM F-480 which meets the 200 p.s.i. rating.

*Laws of 1977, Ch. 398, and Laws of 1979, Ch. 312 permit the use of plastic well casing in certain Minnesota counties. A list of these counties is appended at the end of this rule.

Table #4
Standard Thermoplastic Dimension Ratios (SDR) and Water Pressure Ratings (PR) at 23°C(73°F) for Non-Threaded PVC and ABS Plastic Pipe Equal to or Greater Than 200 p.s.i.

Pressure Rating of PVC Pipe Materials			
	PVC 1120 PVC 1220 PVC 2120	PVC 2116	PVC 2112
SDR	p.s.i.	p.s.i.	p.s.i.
13.5	315	250	200
17	250	200	
21	200		
Pressure Rating of ABS Pipe Materials			
	ABS 1316		ABS 2112
SDR	p.s.i.		p.s.i.
13.5	250		200
17	200		

2. Any plastic pipe, couplings, or components used in water well casing construction shall have the approval of a testing laboratory which has demonstrated the use of unbiased, reliable and appropriate testing methods, as determined by the Commissioner of Health. Such laboratory must approve the material as being intended for use in the transport of potable water. This approval shall be stamped on the pipe as prescribed below.

3. Pipe Markings:

a. Well Casing Pipe--The plastic well casing pipe shall be marked at least every 1.5 m (5 ft.), in letters not less than 5 mm (3/16 in.) high in a contrasting color with the following information:

(1) Nominal well casing pipe size (for example, 5 in.), as specified in ASTM-F-480,

(2) Well casing pipe standard dimension ratio, in accordance with designation code given in Table 1 (for example, SDR 17, 1316),

(3) Type of plastic casing pipe material (for example, ABS or PVC),

(4) The wording--"well casing"-- followed by the impact classification (for example, IC-3),

(5) Designation "ASTM F-480" including the year of issue of the standard with which the well casing pipe complies,

(6) Manufacturer's name or trademark,

(7) Manufacturer's code for resin manufacture, lot number, and date of manufacture,

(8) The seal or mark of the laboratory making the evaluation of the plastic for potable water use spaced at intervals specified by the laboratory, and

(9) Pressure rating (must be 200 p.s.i. or more).

b. Well Casing Pipe Coupling--Plastic well casing pipe couplings shall be marked in letters not less than 5 mm (3/16 in.) high, with the following information:

(1) Nominal well casing pipe coupling size (for example, 5 in.), as specified in ASTM-F-480,

(2) Type of plastic well casing pipe coupling material (for example, ABS or PVC),

(3) Designation "ASTM F-480," including year of issue of the standard with which the well casing pipe coupling complies,

(4) Manufacturer's name or trademark, and

(5) The seal or mark of the laboratory making the evaluation of the plastic for potable water use spaced at intervals specified by the laboratory.

C. Plastic well casing pipe size: Where a submersible pump is to be installed inside a plastic casing, the casing diameter shall be no less than five-inch nominal pipe size, as specified in ASTM-F-480.

D. Storage, handling and components: The installer shall:

1. Not use pipe and couplings that have been stored in direct sunlight. Pipe must be stored in such a manner so as to prevent sagging or bending.

2. Inspect pipe and couplings carefully for cuts, gouges, deep scratches, damaged ends and other major imperfections and shall not use any plastic pipe or coupling which has such defects or imperfections.

3. Use solvent cement meeting the requirements of the specifications for the particular plastic used. The cement used shall provide sufficient open time for making good joints but the installer shall complete joints immediately upon applying the solvent cement.

4. Use only pipe and coupling combinations that give close and satisfactory interference fits which will readily mate when the solvent cement is applied and the pieces are joined. The pipe shall enter the socket to between 1/2 or 2/3 of the socket depth when inserted and turned.

5. An installer may use plastic pipe couplings with molded or formed threads but he must use only the thread lubricant which is suitable for the particular type of plastic being used.

6. When the installer connects plastic pipe to a non-plastic well screen, he shall use a coupling appropriate for the specific transition intended.

E. Technique for joining plastic well casing:

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

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

3. Primer. The installer shall use a primer:

a. when, because of the type of plastic material being used, the pipe and coupling surfaces must be softened and dissolved in order to form a continuous bond between the mating surfaces, and/or

b. when the particular type of solvent cement being used requires one.

4. Cement application. The installer shall apply a moderate and even coat of cement[12] to the inside of the coupling to cover the distance of the joining surface only. The installer shall then quickly apply an even coat of cement to the outside of the pipe being joined to a distance which is equal to the depth of the pipe coupling socket.

5. Assembly. The installer shall:

a. make the joint as quickly as possible after application of the cement, and before it dries;

[12] Caution should be used when handling solvent cement to avoid skin contact or inhalation of vapors.

b. reapply cement before assembling if the cement dries partially;

c. insert the pipe into the coupling socket, turning the pipe to insure even distribution of cement.

d. make sure that the pipe is inserted to the full depth of the coupling socket, and assemble pipe by using pipe joiners;

e. remove excess solvent cement from the exterior of the joint with a clean, dry cloth;

f. tighten a threaded joint by no more than one full turn using a strap wrench;

g. not disturb the coupling joint until after the cement has set, in order to avoid damage to the joint and loss of fit;

h. allow sufficient time for the joint to develop good handling strength based on the setting times given in Table ~~2~~ 5.

Table ~~2~~ 5. Initial Set Time

Temperature Range During Initial Set Time °C (°F)	Set Time for Pipe Sizes 2 to 3 in.	Set Time for Pipe Sizes 3½ to 12 in.
15 to 40 (60 to 100)	30 min.	1 hrs.
5 to 15 (40 to 60)	2 hrs.	4 hrs.
-20 to +5 (0 to 40)	6 hrs.	12 hrs.

i. allow sufficient time for the joint to cure before the joined pipe can be dropped into the drilled hole. This additional cure time is specified in Table ~~3~~ 6.

Table ~~5~~ 6. Joint Cure Schedule

Ambient Temperature, °C	Nominal Pipe Sizes			
	2 to 3 in.		3½ to 12 in.	
	SDR 26 and above	SDR 21, 17, 13.5	SDR 26 and above	SDR 21, 17, 13.5
15 to 40	2 h*	12 h	6 h	24 h
5 to 15	4 h	24 h	12 h	48 h
-20 to +5	16 h	96 h	48 h	8 days

*When the relative humidity is above 60%, increase all of the above times by 50%.

F. Installation of plastic well casing:

1. The installer shall drill an open hole which is 4 inches larger than the nominal casing size.

2. An installer may not insert the drill stem inside the plastic casing when drilling any kind of well.

3. Grouting:

a. The installer shall fill the annular space between the drill hole wall and the casing pipe with grout (defined in 7 MCAR §1.210 C.3.) to assure equal loading around the casing in order to prevent collapse or deformation of the casing and to prevent any contamination from entering the well. Native sand may be used in non-artesian wells drilled in outwash material having no clay lense or lenses (a geological stratum composed of clay). The upper 30 feet in any type of well shall be grouted with neat cement grout (defined in 7 MCAR §1.220 C.3.) using a tremie pipe. A tremie pipe is one which is small enough to fit in the annular space and which carries the grout to the bottom of a hole. The grout shall be fed under pressure from the bottom to the top in one continuous operation.

b. When drilling a rock well, the installer shall seal the casing pipe into the bedrock using neat cement grout (defined in 7 MCAR §1.220 C.3.) .

c. Because of its high heat of hydration, grout made of rapid-setting cement is not permitted for use in wells which are cased with PVC pipe.~~3~~8

4. All plastic-cased wells must terminate above grade as prescribed in 7 MCAR §1.217 and 7 MCAR §1.220A. 11. . The installer may equip a plastic-cased well with a steel casing or steel pitless unit ~~(adapter)~~ which is satisfactory for use in plastic-cased wells, to a depth equal to or greater than the frost line. Where a steel casing or steel pitless unit is not used, the plastic casing shall be extended above grade to a distance prescribed in 7 MCAR §1.217 and 7 MCAR §1.220A. 11. , and must be protected with any one of the following:

a. an oversize steel casing which extends from the top of the plastic casing down to a depth below the frost line, or

b. at least 3 posts (schedule 40 steel pipe) of at least 4 inch diameter at equal distances from each other and which are placed 2 feet from the center of the plastic casing. Such posts shall be installed to a depth of 4 feet into solid ground, or to a depth of 2 feet if each post is surrounded with 1 foot of concrete to a depth of 2 feet, or

c. a well house which is constructed so as to provide a degree of protection which is equivalent to that provided in b. above.

8 ~~3~~This table shows the strength of PVC at various temperatures based on 73.4°F being 100% of its tested strength.

50°F	60°F	70°F	80°F	90°F	100°F	110°F	120°F	130°F	140°F	150°F
114%	107%	101%	95%	88%	83%	77%	72%	65%	40%	10%

5. The installer shall plug and abandon a bore hole as prescribed in 7 MCAR 1.218 C.2.:

a. whenever the plastic casing cannot be installed without exerting pressure, or

b. whenever a screen or pump cannot be installed without force, or

c. whenever the casing fails during the constuction or pumping stages.

APPENDIX

List of Counties Where Plastic Casing May be Used

Aitkin	Kandiyohi	Pipestone
Becker	Kittson	Polk
Beltrami	Lac Qui Parle	Pope
Benton	Lake of the Woods	Red Lake
Big Stone	Lincoln	Renville
Cass	Lyon	Rock
Chippewa	Mahnomen	Roseau
Clay	Marshall	Sherburne
Clearwater	Martin	Stearns
Cottonwood	Meeker	Swift
Crow Wing	Mille Lacs	Stevens
Douglas	Morrison	Todd
Grant	Murray	Traverse
Hubbard	Nobles	Wadena
Isanti	Norman	Wilkin
Itasca	Otter Tail	Yellow Medicine
Jackson	Pennington	

APPROVED AS TO FORM AND LEGALITY

SEP 25 1979 19

WARREN SPANNAUS, ATTORNEY GENERAL

BY Joanne Hinderaker
SPECIAL ASSISTANT ATTORNEY GENERAL

STATE OF MINNESOTA
DEPARTMENT OF STATE
FILED
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Joan Anderson Growe
Secretary of State
2:00 PM

(b) Who spends more than $250, not including his own traveling expenses and membership dues, in any year for the purpose of attempting to influence legislative or administrative action by communicating or urging others to communicate with public officials.

The statute provides certain exceptions. Questions should be directed to the Ethical Practices Board, 41 State Office Building, Saint Paul, Minnesota 55155, telephone (612) 296-5615.

October 16, 1978

Paul B. Johnson, Secretary
Water and wastewater Operators Certification Council

Warren R. Lawson, M.D.
Commissioner of Health

Proposed Revisions to Water Well Construction Code Rules as Proposed

7 MCAR § 1.210 ~~MHD 210~~ Definitions and policies.

A. ~~(a)~~ For the purposes of these regulations promulgated pursuant to Minn. Stat. ch. 156A (1976) as amended, the terms defined in this section have the meanings given them, except where the context clearly indicates otherwise.

B. ~~(b)~~ The following terms apply primarily to the licensing regulations, 7 MCAR §§ 1.211-1.216 ~~MHD 211-216~~, but are also applicable to the Water Well Construction Code, 7 MCAR §§ 1.217-1.230 ~~MHD 217-230~~, when used therein.

1. ~~(1) "Board means the Minnesota Board of Health, or its authorized representative.~~ "Commissioner" means the Commissioner of Health or his or her authorized representative.[1]

2. ~~(2)~~ "Council" means the Water Well Contractors Advisory Council created pursuant to the provisions of Minn. Stat. § 156A.06 (1976).

3. ~~(3)~~ "Act" means Minn. Stat. §§ 156A.01-156A.08 (1976), as amended, under which these rules and regulations are promulgated.

4. ~~(4)~~ "APA" means the Administrative Procedure Act, Minn. Stat. ch. 15 (1976).

5. ~~(5)~~ "Person" means any natural person, corporation, partnership, or other business association.

6. ~~(6)~~ "Applicant" means any person who applies for a water well contractor's license pursuant to the Act.

7. ~~(7)~~ "Application for examination" means the application submitted by an applicant from which the ~~board~~ commissioner determines whether the applicant is eligible to take the examination.

8. ~~(8)~~ "Application for licensure" means the application submitted by an applicant upon his successful completion of the examination, or at the end of each calendar year for licensure renewal.

9. ~~(9)~~ "Year of experience" means a year during which the applicant personally drilled five (5) water wells and was actively working in the trade for a period of 1,000 hours under the supervision of a licensed water well contractor. An applicant drilling 1,000 hours per year and completing fewer than 5 wells per year may qualify, if the experience is gained in constructing one or more large diameter wells which are more than 500 feet deep. An applicant who seeks to qualify under this provision shall have his license limited to construction of such deep and large diameter wells.

a. ~~(aa)~~ Supervision of a drilling operation shall not be considered as an equivalent to personally drilling a well. ~~however, supervision may be considered by the Board as experience meeting the requirements of these regulations on a case by case basis depending upon:~~

~~(aa1) The number of well drilling operations supervised during a year;~~

~~(aa2) The percentage of time spent at the site of a drilling operation;~~

~~(aa3) The type of activity performed as part of the applicant's supervisory responsibilities; and~~

~~(aa4) Other factors as may be relevant to each particular case.~~

b. ~~(bb)~~ The experience must have been gained in Minnesota except that an applicant may provide the ~~Board~~ commissioner with information demonstrating that his experience was gained in an area with the same or similar geological and other well drilling conditions as in the applicant's proposed well drilling oeprations territory in Minnesota. Such experience may be considered as meeting the experience requirement of these regulations. Applicants from states having no standards or licensing programs, or standards less strict than those adopted pursuant to Chapter 156A shall have obtained at least one year of experience in Minnesota under the supervision of a licensed water well contractor, in addition to that which is required under 7 MCAR § 1.211.

[1] The term "commissioner" replaces "board" pursuant to Laws of 1977, ch. 305, § 45.

10. (10) "Licensee" means a person who is licensed as a water well contractor pursuant to the provisions of the Act and these rules and regulations.

11. (11) "Representative" means an individual who is in charge of the water well drilling and contracting operation and qualifies for licensure on behalf of a partnership, corporation, or other business association rather than on his own behalf.

12. (12) "Upper termination of the well casing" means a point twelve (12) inches above the established ground surface.

13. (13) "A water well drilling machine" means any machine or device such as a cable tool, hollow rod or auger used for construction of a water well including drive point wells or a hoist or machine used in the well repair service which involves the modification to the well casing, screen depth or diameter below the upper termination of the well casing.

~~K.~~ (c) The following terms apply to the Water Well Construction Code, ~~MHD 217-230.~~ 7 MCAR § 1.217-§ 1.230:

1. (1) "Abandoned water well" means a well whose use has been permanently discontinued, or which is in such disrepair that its continued use for the purpose of obtaining ground water is impracticable or may be a health hazard.

2. (2) "Administrative authority" means the ~~Board~~ commissioner. When this code, 7 MCAR §§ 1.217-1.230 ~~(MHD 217-230)~~, is adopted by any municipality of the State, such municipality may apply to the ~~Board~~ commissioner for authorization to act as an inspection agent of the administrative authority to enforce the provisions of the Act and these regulations. The inspection agent's authority shall be limited to inspections to determine compliance ~~by licensees~~ with the provisions of these regulations 7 MCAR §§ 1.210-1.230 ~~(MHD 210-230)~~ and to exercise any other powers specifically given the administrative authority by these regulations. The ~~Board~~ commissioner may grant such authority if the municipality demonstrates that at least one of its employees is qualified and familiar with the well drilling operations in that municipality. Such authorization may be revoked without cause by the ~~Board~~ commissioner or released by the municipality on ten days written notice. This section shall not preclude the ~~Board~~ commissioner or any municipality from reaching an agreement authorized by Minn. Stat. § 471.59 (1976).

3. (3) "Annular space" means the space between two cylindrical objects one of which surrounds the other, such as the space between a drillhole and a casing pipe, or between a casing pipe and liner pipe.

4. (4) "Approved basement" means a private home basement with walls and floor constructed of concrete or equivalent which is not subject to flooding and not located within a flood plain.

5. (5) "Aquifer" means a water-beering formation (soil or rock horizon) that transmits water in sufficient quantities to supply a well..

6. (6) "Casing" means an impervious durable pipe placed in a well to prevent the walls from caving and to seal off surface drainage or undesirable water, gas or other fluids to prevent their entering the well and includes specifically but not limited to:

a. (aa) "Temporary casing" means a temporary casing placed in soft, sandy or caving surface formation to prevent the hole from caving during drilling.

b. (bb) "Protective casing" means the permanent casing of the well.

~~(cc) "Liner pipe" means a well casing installed without driving within a protective casing or open drillhole.~~

7. (7) "Coliform group" means all of the aerobic and facultative anaerobic, gram-negative, nonspore-forming, rod-shaped bacteria which ferment lactose with gas formation within 48 hours at 35° centigrade.

8. (8) "Director" means the director of the Division of Environmental Health of the Department, or his authorized representative, who shall carry out the administrative functions of these regulations on behalf of the ~~Board.~~ Commissioner.

9. (9) "Drawdown" means the extent of lowering of the water surface in a well and aquifer resulting from the discharge of water from the well.

10. (10) "Dug well" means a well in which the side walls may be supported by material other than standard weight steel casing. Water enters a dug well through the side walls and bottom.

11. (11) "Established ground surface" means the in-

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tended or actual finished grade (elevation) of the surface of the ground at the site of the well.

12. ~~(12)~~ "Geological material" means all materials penetrated in drilling a well.

a. ~~(aa)~~ The following table lists materials other than consolidated rock classified according to average particular size: (Wentwroth 1922)

Material	Particle Diameters Millimeters	Particle Diameters Inches	Screen Slot No. From	Screen Slot No. To
Clay	Up to 0.005	Up to 0.0002	—	
Silt	0.005 - 0.062	0.0002 - 0.0025	—	—
Fine Sand	0.062 - 0.250	0.0025 - 0.010	2	10
Medium Sand	0.250 - 0.50	0.010 - 0.020	10	20
Coarse Sand	0.50 - 1.00	0.020 - 0.040	20	40
Very Coarse Sand	1.00 - 2.00	0.040 - 0.080	40	80
Fine Gravel	2.00 - 4.00	0.080 - 0.160	80	160
Coarse Gravel	4.00 - 62.5	0.160 - 2.50	160 and larger	
Cobbles	62.5 - 250.0	2.50 - 10.0	—	—
Boulders	250.0 and larger	10.0 and larger		

b. ~~(bb)~~ "Alluvium" is a general term for clay, silt, sand, gravel or similar unconsolidated material deposited during comparative recent geologic time by a stream or other body of running water as a sorted or semi-sorted sediment.

c. ~~(cc)~~ "Glacial drift (unconsolidated)" means a general term applied to all rock material (clay, sand, gravel and boulders) transported by a glacier and deposited directly by or from the ice or by running water emanating from the glacier.

d. ~~(dd)~~ "Glacial outwash" means a stratified sand and gravel removed or washed out from a glacier by meltwater streams and deposited in front of or beyond the terminal moraine or the margin of an active glacier.

e. ~~(ee)~~ "Hardpan" is a term to be avoided if possible, but when used means a hard impervious layer composed chiefly of clay, cemented by relatively insoluble materials, which does not become plastic when mixed with water and definitely limits the downward movement of water and roots.

f. ~~(ff)~~ "Shale" means rock consisting of hardened silts and clays.

g. ~~(gg)~~ "Sandstone" means cemented or otherwise compacted sediment composed predominately of sand.

h. ~~(hh)~~ "Limestone" means rock which contains at least 80% of carbonates of calcium and has strong reaction with HCl (muriatic acid).

i. ~~(ii)~~ "Dolomite" means rock which contains at least 80% of carbonates of magnesium and has a weak reaction with HCl (muriatic acid).

j. ~~(jj)~~ "Gypsum" means a soft light colored formation of calcium sulfate crystals and may be found as streaks in a shale formation.

13. ~~(13)~~ "Grout" means 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 70 seconds to discharge 1 quart of the material through an API (American Petroleum Institute) marsh funnel viscometer.

14. ~~(14)~~ "Municipality" means a city, village, township, borough, county, district or other political subdivision of the State created by or pursuant to State law or any combination of such units acting cooperatively or jointly.

15. ~~(15)~~ "Pitless adapter" means a device or assembly of parts which will permit water to pass through the wall of the well casing or extension thereof, and which provides access to the well and to the parts of the water system within the well in a manner to prevent entrance of pollution into the well and the water produced.

16. ~~(16)~~ "Pollution" or "contamination" means the presence or addition of any substance to water which is or may become injurious to the health, safety or welfare of the general public or private individuals using the well; which is or may become injurious to domestic, commercial, industrial, agricultural or other uses which are being made of such water.

17. ~~(17)~~ "Potable water" means water which is safe for human consumption in that it is free from impurities in amounts sufficient to cause disease or harmful physiological effects.

18. ~~(18)~~ "Pressure tank" or "hydropneumatic tank"

means a closed water storage container constructed to operate under a designed pressure rating to modulate the water system pressure within a selected pressure range.

19. (19) "Priming" means the first filling of a pump with water and the action of starting the flow in a pump.

20. (20) "Pump house" means a building constructed over a well exclusively to protect the well, pump, and water treatment equipment.

21. (21) "Pump room" or "well room" means an enclosed structure, either above or in a below grade approved basement housing the pump, top of the well, a suction line or any combination thereof.

22. (22) "Pumping water level" means the distance measured from the established ground surface to the water surface in a well being pumped at a specified rate for a specified period of time.

23. (23) "Pumps and pumping equipment" means materials used or intended for use in withdrawing or obtaining ground water for any use, including without limitation, seals and other safeguards to protect the water from pollution and together with fittings, and controls to provide sanitary water storage facilities. "Installation of pumps and pumping equipment" means the selection of, and procedure employed in the placement and preparation for operation of, pumps and pumping equipment, including construction involved in making entrance to the well and establishing proper seals and other safeguards to protect ground water from pollution, including repairs to existing installations.

24. (24) "Sewage" means the water carried waste products from residences, public buildings, including the excrementious or other discharges from the bodies of human beings or animals together with such ground water infiltration and surface water as may be present.

25. (25) "Cesspool" means an underground pit into which raw household sewage or other untreated liquid waste is discharged and from which the liquid seeps into the surrounding soil or is otherwise removed.

26. (26) "Seepage pit" or "dry well" means an underground pit into which a septic tank discharges household sewage or other liquid waste and from which the liquid seeps into the surrounding soil through the bottom and openings in the side of the pit.

27. (27) "Septic tank" means a watertight tank of durable materials through which sewage flows very slowly and in which solids separate from the liquid to be decomposed or broken down by bacterial action.

28. (28) "Sewer" means a pipe or conduit carrying sewage or into which sewage may back up.

29. (29) "Subsurface disposal field," "seepage bed," "drainfield," "percolation system," or "tile absorption field" means a system composed of open jointed tile lines buried in stones and shallow trenches or beds for final disposal into the ground of sewage affluent from a septic tank. The septic tank effluent is applied to land by distribution beneath the surface through the open jointed lines.

30. (30) "Static water level" means the distance measured from the established ground surface to the water surface in a well neither being pumped, nor under the influence of pumping nor flowing under artesian pressure.

31. (31) "Subterranean gas" means a gas occurring below the land surface. It may be flammable such as methane or highly toxic as hydrogen sulfide and may be associated with ground water.

32. (32) "Suction line" means a pipe or line connected to the inlet side of a pump or pumping equipment or any connection to a well casing that may conduct non-system water into the well because of negative pressures.

33. (33) Water varieties mean:

a. (aa) "Ground water" means the water in the zone of saturation in which all of the pore spaces of the subsurface material are filled with water. The water that supplies springs and wells is ground water.

b. (bb) "Near surface water" means water in the zone immediately below the ground surface. It may include seepage from barnyards, disposal beds or leakage from sewers, drains, and similar sources of pollution.

c. (cc) "Surface water" means water that rests or flows on the surface of the ground.

34. (34) "Well" means water well as defined in Minn. Stat. § 156A.02, subd. 1 (1976).

35. (35) "Well seal" means a device or method used to protect a well casing or water system from the entrance of any external pollutant at the point of entrance into the casing of a pipe, electric conduit or water level measuring device.

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36. ~~(36)~~ "Well vent" means an outlet at the upper terminal of a well casing to allow equalization of air pressure in the well and escape of toxic or flammable gases when present.

37. ~~(37)~~ "Yield" or "production" means the quantity of water per unit of time which may flow or be pumped from a well under specified conditions.

D. ~~(d)~~ Policies.

1. ~~(1)~~ The rules and regulations, 7 MCAR § 1.210-1.230, ~~MHD 210-230,~~ shall apply to all water wells in the State of Minnesota except those specifically exempted by the Act. Those asepects covered are the construction of new wells, the repair and maintenance of wells where specified, ~~and~~ the proper abandonment of wells, and the proper isolation of possible sources of contamination from existing wells to protect the quality of ground water aquifers for providing safe drinking water supplies.

2. ~~(2)~~ Public water supply. In accordance with 7 MCAR § 1.136 ~~MHD 136~~ (formerly Reg. No. 10873), no system of water supply, where such system is for public use, shall be installed by any public agency or by any person or corporation, nor shall any such existing system be materially altered or extended, until complete plans and specifications for the installation, alternation, or extension, together with such information as the ~~State Board of Health~~ commissioner may require shall have been submitted in duplicate and approved by the Director insofar as any features thereof affect or tend to affect the public health. No construction shall take place except in accordance with the approved plans. The plans for the well shall conform as specified by this well code. No municipal well may be drilled without approval of the site by the Director.

3. ~~(3)~~ Modification by the ~~Board~~ commissioner

a. ~~(aa)~~ When the strict applicability of any provision of these regulations present practical difficulties or unusual hardships, the ~~Board~~ commissioner, in a specific instance, may modify the application of such provisions consistent with the general purpose of these regulations and the Act and upon such conditions as are necessary, in the opinion of the ~~Board~~ commissioner, to protect the ground water of the State and the health, safety, and general well-being of persons using or potential users of the ground water supply.

b. ~~(bb) The licensee shall state the specific exceptions requested plus explain in detail the reasons for such request.~~ Any request for modification shall be submitted to the administrative authority in writing and shall be signed by both the owner and the licensee. Request for modification of the isolation distance from existing wells shall be submitted and signed by the owner. In addition, any experts or persons involved in providing documentary evidence in support of the request shall sign the request submitted by the owner. Such request shall specify in detail the nature of the modification being sought and the reasons therefor. The request shall also include: the proposed well depth, casing type and depth, method of construction and grouting, and location of well and of possible sources of contamination. Whether or not the requests are granted, the ~~Board~~ commissioner shall state in detail the reasons for ~~its~~ the decision.

c. The owner of a water well is bound by all the provisions of 7 MCAR § 1.210-1.230 which relate to location, construction, maintenance and abandonment of wells.

7 MCAR § 1.211 ~~MHD 211~~ Licensing.

A. ~~(a)~~ Qualifications.

1. ~~(1)~~ All applicants shall meet the following requirements:

a. ~~(aa)~~ A minimum of three (3) years' experience in water well drilling.

b. ~~(bb)~~ Honesty, integrity, and an ability to perform the work of a water well drilling contractor.

c. ~~(cc)~~ Submission to the ~~Board~~ commissioner of properly completed applications.

2. ~~(2)~~ All applicants must successfully complete the examination provided for in the Act and in these rules and regulations.

B. ~~(b)~~ Applications and fees.

1. ~~(1)~~ All applicants shall submit two (2) applications. The first one shall be an application for examination. If the applicant qualifies, then he shall submit an application for licensure.

2. ~~(2)~~ Application for examination.

a. ~~(aa)~~ An application for examination shall be submitted to the ~~Board~~ commissioner on forms provided by ~~it~~ him. The application shall be accompanied by the filing fee of $50.00. The fee shall be paid using only a money order, bank draft, or certified check made payable to the Minnesota State Treasurer.

. ~~(bb)~~ The ~~Board~~ commissioner shall not act upon the application until ~~it~~ he has received reference letters from individuals who are familiar with the applicant's work experience, honesty, integrity, and ability to perform the work of a water well drilling contractor.

c. ~~(cc)~~ The filing fee for an application for examination shall not be refunded for any reason except when an

applicant is not found to be qualified to take the written examination.

3. ~~(3)~~ Application for licensure.

a. ~~(aa)~~ Upon satisfactory completion of the examination, the applicant ~~may~~ must apply for a license within one year of the date on which is he is notified of passing the exam, upon forms provided by the ~~Board~~ commissioner.

b. ~~(bb)~~ The application shall be accompanied by a license fee of $50.00. The fee shall be paid using only a money order, bank draft, or certified check made payable to the Minnesota State Treasurer. This fee shall not be refunded for any reason.

4. ~~(4)~~ If an applicant passes the examination or qualifies for licensure but the ~~Board~~ commissioner does not receive his application for licensure within one year from the date of the letter from the ~~Board~~ commissioner notifying him of his eligibility for licensure, then no license may be issued. Such an applicant, in order to become licensed at some later date, shall requalify by submitting a new application for examination and the prescribed fee.

5. ~~(5)~~ An individual may apply for examination as many times as he desires. Each application must be accompanied by the filing fee as prescribed by the Act.

C. ~~(c)~~ Council evaluation of applicants.

1. ~~(1)~~ The Council shall evaluate each applicant and forward its recommendations to the ~~Board~~ commissioner.

2. ~~(2)~~ The ~~Board~~ commissioner or Council may conduct oral interviews and require sworn affidavits and other supporting evidence to determine qualifications of the applicant.

D. ~~(d)~~ Examination.

1. ~~(1)~~ No applicant shall be permitted to take the examination unless he has submitted an application for examination, the accompanying filing fee, and been determined to be qualified by the Council.

2. ~~(2)~~ The applicant shall take an examination which may be any combination of written, oral, or practical work as determined by the ~~Board~~ commissioner with the advice of the Council. Satisfactory completion of the examination is a mandatory prerequisite for licensure.

3. ~~(3)~~ An applicant which is a partnership, corporation, or other business association, shall designate one partner, officer, or other responsible full-time employee who shall be its representative to take the examination on its behalf. Upon licensure of the applicant, the representative shall be responsible for the supervision of all operations required of water well contractors by the Act and the rules and regulations adopted thereunder.

E. ~~(e)~~ Denial of application. An application for examination or license may be denied for any of the following reasons:

1. ~~(1)~~ Failure of the applicant to complete the application.

2. ~~(2)~~ Failure of the applicant to submit the application with the prescribed fee.

3. ~~(3)~~ Failure of the applicant to meet the experience, reference, examination, and other qualifications required by the Act and these rules and regulations.

4. ~~(4)~~ Other sufficient causes as determined after notice and hearing in accordance with APA.

F. ~~(f)~~ License and renewal.

1. ~~(1)~~ No person shall drill, construct, or repair a water well within this State unless in possession of a valid license to do so issued by the ~~Board~~ commissioner; provided, however, that persons installing or repairing pumps on a well shall not be licensed as water well contractors provided their work does not involve modifications to the well casing, screen, depth, or diameter below the upper termination of the well casing.

2. ~~(2)~~ The initial and renewal license shall not be transferable and expires on ~~December~~ January 31 of the year after that for which it was issued. The initial license shall contain the name of the licensee; the licensee's representative, if applicable; the date of issue; and the license number.

3. ~~(3)~~ Each licensee shall submit an application for license renewal on forms provided by the ~~Board~~ commissioner no later than ~~December~~ January 31 of the year ~~preceding the year~~ for which application is made. The license renewal application shall be accompanied by a fee of $50. A penalty fee of $10 shall also be paid if the renewal is submitted after the ~~December~~ January 31 deadline. Upon receipt of the application answered in a manner acceptable to the ~~Board~~ commissioner, a licensee shall be sent a renewal

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license. The renewal license shall consist of a card in duplicate and contain the name of the licensee; the licensee's representative, if applicable; expiration date; and license number. One card shall be kept posted with the original license. The other shall be carried by the licensee or his representative.

4. ~~(4)~~ Any licensee who does not renew his license within one year may have his license renewed only upon the recommendation of the Council and only after showing sufficient cause for not renewing. Until such showing is made and the renewal license issued, the licensee shall not work as a water well contractor.

5. ~~(5)~~ A person who acts as a representative may not be in the employ of any water well contractor other than the one he represents.

6. ~~(6)~~ In the case of those applicants who are subject to 7 MCAR § 1.211 D.3. ~~MHD 211(d)(3)~~, the licensee shall be the partnership, corporation, or other business association who that individual represents and not the representative.

a. ~~(aa)~~ When the representative leaves the licensee or is otherwise incapable of performing his responsibilities, the licensee shall inform the ~~Board~~ commissioner within five (5) days of such fact and give the name of a qualified individual acceptable to the ~~Board~~ commissioner, who shall be responsible for the acts of the licensee during the interim period while a new representative is being qualified. Although the licensee shall retain the same numbered license upon the licensing of the new representative, all applications, examinations, fees, and other requirements must be satisfied in order to qualify the new representative who must qualify within ninety (90) days. If he does not do so, the water well contractor shall be without a license and must cease operations.

b. ~~(bb)~~ If an individual has his own license and desires to act as a representative, or if a representative desires to obtain a license in his own name, the business association or the individual, as the case may be, need only submit an application for licensure and fee. The examination need not be retaken.

G. ~~(g)~~ Suspension or revocation of license; reinstatement.

1. ~~(1)~~ Suspension or revocation.

a. ~~(aa)~~ The Board commissioner may suspend or revoke the license of a water well contractor upon finding that the licensee has violated the provisions of the Act or the rules and regulations adopted thereunder. The Board commissioner may initiate such proceedings upon its his own motion or upon recommendation of the Council.

b. ~~(bb)~~ The ~~Board~~ commissioner or Council may cause an investigation to be made in any case in order to determine whether there has been a violation of the Act or of these rules and regulations, and, in so doing, may request the licensee to appear before them to determine the merits of the situation in question. In each case the Council shall make a recommendation to the ~~Board~~ commissioner as to whether proceedings under the Act and the APA would be appropriate.

c. ~~(cc)~~ Any disciplinary action taken under this section shall comply with the provisions of the APA.

d. ~~(dd)~~ A license may be suspended until certain conditions are fulfilled and/or for a specified period of time as determined to be most appropriate by the ~~Board~~ commissioner. The suspended or revoked license along with the current renewal certificates shall be returned to the ~~Board~~ commissioner by the licensee.

e. ~~(ee)~~ When the license of a water well contractor who is subject to the provisions of 7 MCAR § 1.211 D.3. ~~MHD 211(d)(3)~~ is revoked or suspended, the disciplinary action shall apply to both the licensee and its representative.

2. ~~(2)~~ Reinstatement.

a. ~~(aa)~~ A revoked license may not be reinstated. The licensee who has had his license revoked may be relicensed by filing the usual applications and fees, and by taking the examination. The ~~Board~~ commissioner shall require an investigation or hearing to determine whether the person should be issued a new license; provided, however, that in no case shall a new license be issued prior to one (1) year after the revocation has taken effect.

b. ~~(bb)~~ A licensee suspended for a specified period of time shall be automatically reinstated at the end of that time. Nothing herein shall be interpreted to prevent the making of such reinstatement conditional upon terms established by the ~~Board~~ commissioner in ~~its~~ his Order of Suspension.

c. ~~(cc)~~ A licensee suspended for an indefinite period of time may be reinstated at the ~~Board's~~ commissioner's own motion after due investigation to determine that the conditions upon which the suspension was based have been corrected or upon the ~~Board~~ commissioner receiving reasonable assurance to ~~its~~ his satisfaction that such conditions will not reoccur.

d. ~~(dd)~~ The person whose license has been revoked or indefinitely suspended may petition the Board commissioner for a hearing for reinstatement of his license. Such hearing shall be granted only upon a showing by the petitioner that reasonable grounds exist for such hearing.

H. (h) Placement of decals and license number.

1. (1) A licensee shall place in a conspicuous location on both sides of each well drilling machine his license number in figures not less than three (3) inches high and one and a half (1½) inches wide. The number shall be in a contrasting color to the background.

2. (2) Decals designating the year for which the license was issued or renewed and the words, "MINNESOTA LICENSED WATER WELL CONTRACTOR," shall be affixed directly adjacent to and below the license number on each well drilling machine. Water well contractors using a rope spool or other devices for well installation shall attach their decal on a portable display to be shown at the well site. The decals shall be issued by the ~~Board~~ commissioner upon licensure and renewal.

I. (i) Well drilling machine registration.

1. (1) An initial or renewal license issued pursuant to Minn. Stat. ch. 156A (1976) and the Water Well Contractors Rules, 7 MCAR § 1.210-1.230 ~~Minn. Rules MHD 210-230.~~ shall include the registration of one drilling machine. Each water well contractor shall pay an annual fee of $5 for the registration with the ~~Board~~ commissioner of each additional drilling machine. Upon receipt of the required fee and information, a water well drilling machine registration card shall be issued for identification purposes for each drilling machine registered by the well drilling contractor. The card shall be carried on the water well drilling machine at all times where it may be inspected by the Director. The card expires on ~~December~~ January 31 of the year after that for which it was issued.

2. (2) The registration card and duplicate decals furnished for a water well drilling machine are not transferable. The card and decals shall be returned to the Director when a water well drilling machine is sold, traded, or otherwise disposed of. A registration card and two (2) new decals for a drilling machine so transferred will be provided upon receipt of the water well drilling machine registration fee, the old card, the two (2) old decals and application for the new drilling machine.

7 MCAR § 1.217 ~~MHD 217~~ Location of wells.

A. (a) General considerations. A well shall be located consistent with the general layout and surrounding area giving due consideration of the size of the lot, contour of the land, slope of the water table, rock formation, porosity and absorbency of the soil, local ground water conditions, and other factors necessary to implement the basic policies that follow.

B. (b) A well ~~or spring or buried reservoir~~ shall be:

1. (1) Located on a site which has good surface drainage, at a higher elevation than, and at a sufficient distance from cesspools, buried sewers, septic tanks, privies, barnyards and feedlots, or other possible sources of contamination so that the supply cannot be affected thereby, either underground or from the surface of the ground.

2. (2) Located so that the well and its surrounding area can be kept in a sanitary condition.

3. (3) Adequate in size, design and development for the intended use.

4. (4) Constructed so as to maintain existing natural protection against pollution of water bearing formations and to exclude all known sources of pollution from entering the well.

5. (5) ~~A well should be~~ Located at least 5 feet from a property line. A well constructed to ~~meet~~ produce water for a community public water supply ~~municipal water supply standards~~ shall be located at least 50 feet from a property line. In locating ~~the~~ any well, consideration shall be given to the sources of contamination from adjacent property.

C. (c) Distance from pollution ~~or~~ contamination sources.

(1) A well shall be at least:

a. (aa) One hundred fifty feet (150 ft.) from a preparation area or storage area of spray materials, commercial fertilizers or chemicals that may result in pollution of the soil or ground water.

b. (bb) One hundred feet (100 ft.) from a below grade manure storage area if in conformance with Minnesota Pollution Control Regulation SW52(2)(e)[1].

c. (cc) Seventy-five feet (75 ft.) from cesspools, leaching pits and dry wells.

d. (dd) Fifty feet (50 ft.) from a buried sewer, septic tank, subsurface disposal field, grave, animal or poultry yard or building, privy, ~~petroleum storage tank, or any other sewage or liquid~~ wastes or other contaminants that may drain into the soil.

[1] A below grade manure storage area may present a special hazard to ground water quality which may require a greater isolation distance than provided for in this rule depending upon hydrologic and geologic conditions.

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c. ~~(ee)~~ Twenty feet (20 ft.) from a buried sewer constructed of cast iron pipe or plastic pipe (ASTM 2665 for polyvinyl chloride pipe or ASTM 2661 for acrylonitrile-butadiene-styrene pipe, as prescribed in the Minnesota Plumbing Code, 7 MCAR § 1.123C.3, with tested watertight joints, ~~or other material acceptable to the board;~~ or a pit or unfilled space below ground surface, ~~except an approved basement~~ except that a well may be drilled closer than 20 feet to an approved basement, but no closer than as provided in 7 MCAR § 1.217 D.1. A community public water supply well shall be isolated at least 50 feet from any source of contamination.

f. ~~(ff)~~ Wells with casings less than 50 feet in depth and not encountering at least 10 feet of impervious material shall be located at least 150 feet from cesspools, leaching pits, or dry wells and at least 100 feet from a subsurface disposal field, manure storage pile or ~~or other~~ similar source of contamination.[2]

2. ~~(2)~~ The safe distance that a well should be located from a waste landfill or waste stabilization pond (lagoon) cannot be assigned a fixed number because of the varieties of hydrologic and geologic parameters associated with the undetermined types and amounts of materials that may be carried by ground water from leachates discharged from the waste landfill or waste stabilization ponds (lagoons). It is recommended that wells not be located in an area between the landfill or waste stabilization ponds (lagoons) sites and the point of ground water discharge to a surface water source.

3. ~~(3)~~ Any well that may intercept leachates from a waste landfill or waste stabilization pond (lagoon) by water withdrawal from the well shall not be used for potable water.

4. ~~(4)~~ Wells installed for ground water quality monitoring purposes are exempt from provisions related to safe depths and isolation distances from sources of contamination; however, their construction shall otherwise be in accordance with Minn. Stat. ch. 156A (1976) and rules adopted thereunder. All observation wells shall be protected from damage.

a. ~~(aa)~~ Temporary observation wells (as defined in 7 MCAR § 1.218 D.1.) shall be protected with a 6 foot high steel post and flag marker or sign.

b. ~~(bb)~~ Permanent observation wells (as defined in 7 MCAR § 1.218 D.2.) shall be protected with 4 steel posts as prescribed in 7 MCAR § 1.224 F.4.b.

[2] For example, a manure storage pile would be considered as a potential source of contamination to the well; however, the presence of animals in open pasture in an area would not necessarily concentrate contaminants to the degree that would cause contamination to enter the ground water.

5. ~~(5)~~ The administrative authority may modify the isolation distances in this rule for individual well installations. The request for modifications shall be made in writing ~~to~~ and signed by the licensee and the owner, ~~with a copy to the Board either~~ increasing ~~or~~ decreasing ~~the minimum isolation~~ distance and shall state the reasons for the ~~modification~~ request. ~~based on overburden, depth of well, character of the aquifer, maximum pumping rate, or other factors affecting the movement of pollution.~~ A request for modification of the isolation distance from existing wells shall be submitted and signed by the owner. In addition, any experts or persons involved in providing documentary evidence in support of the request shall sign the request submitted by the owner. The request shall also include: the proposed well depth, geological formations likely to be encountered, casing type and depth, method of construction and grouting, and location of the well on the property in relation to possible sources of contamintion.

D. ~~(d)~~ Wells adjacent to buildings, gas lines or overhead electric power lines.

1. ~~(1)~~ A well shall be located:

a. ~~(aa)~~ At least 3 feet horizontally from a building or any projection thereof, except for a pumphouse, unless modified in writing by the administrative authority.

b. ~~(bb)~~ Accessible for cleaning, treatment, repair, test inspection, and other attention as may be necessary.

2. ~~(2)~~ No well shall be located within the footing of any building or room beneath the floor under which there are buried sewers.

3. ~~(3)~~ A well shall not be located within fifteen feet (15 ft.) of a gas line or overhead electric distribution line or twenty-five feet (25 ft.) from an electric transmission line which is in excess of 50kV except for the underground electrical service line to the well. These distances should be observed when locating a gas line or overhead electric line in the vicinity of an existing well or known proposed well. Where there is a question of the voltage in an electrical line the 25 foot distance should be observed or where less distance is required the utility company should be consulted for their recommendation for safe distances.

E. ~~(e)~~ Areas subject to flooding.

1. ~~(1)~~ A well shall not be located in areas subject to flooding unless the casing extends at least 2 feet above the level of the highest known flood of record or otherwise protected as prescribed in writing by the administrative authority.

2. ~~(2)~~ The ground surface immediately adjacent to the

well casing shall be graded so that surface water is diverted away from the casing.

3. ~~(3)~~ The well shall be located at least 50 feet horizontally from the normal high water mark of a stream, river or lake and at a higher established ground surface elevation than the soil absorption system, septic tank, or other source of contamination.

4. ~~(4)~~ For a community public water supply:

a. The surface of the ground at the well site shall be at least two feet above the highest known water level of any lake, pond, river, stream or any other body of surface water, the waters of which at the highest level would approach to within 50 feet measured horizontally of the well.

b. The earth surfaces shall be sloped to drain away from the well and be so graded as to prevent the accumulation and retention of surface water within 50 feet of the well.

c. Filling shall be protected from erosion by rip-rap or other suitable means.

5. Radial water collector. Projection of collectors shall be in areas and at depths approved by the Director. The exact location of all caisson construction joints and portholde assemblies shall be indicated. The caisson wall shall be substantially reinforced. Procedures shall be employed which will assure minimum vertical rise of the collectors. The top of the caisson shall be covered with a watertight floor and pump openings shall be curbed. Pump discharge piping shall not be placed through the caisson walls. There shall be no construction joint within 10 feet of the original ground surface.

7 MCAR § 1.218 ~~MHD 218~~ General protection of ground water quality and resources.

A. ~~(a)~~ Re-use of water, disposal, recharge or gas storage wells.

1. ~~(1)~~ A well for the storage of gas or liquid under pressure may not be drilled without first having secured a permit therefor from the Commissioner of Natural Resources in accordance with Minn. Stat. §§ 84.57-.58 (1976).

2. ~~(2)~~ Water used for cooling parts of engines, air compressors, or other equipment or water used for air conditioning, shall not be returned to any part of the potable water system.

3. ~~(3)~~ A well shall not be used for disposal of surface water, near surface water, or ground water or any other liquid gas or chemical.

B. ~~(b)~~ Maintenance and repair of wells.

1. ~~(1)~~ Every well shall be maintained in a condition whereby it will conserve and protect the ground water resources, and whereby it will not be a source or channel of contamination or pollution to the water supply of that well or any aquifer.

2. ~~(2)~~ All materials used in maintenance, replacement, or repair of any well shall meet the requirement of these regulations for new installation.

3. ~~(3)~~ Broken, punctured, or otherwise defective or unserviceable casing, screens, fixtures, seals, or any part of the well head shall be repaired or replaced. The well shall be abandoned in accordance with the requirements of these regulations if such repair or replacement is not performed.

4. ~~(4)~~ Repairs to wells completed with the well head terminating below ground (buried seal) where practicable, should include extending the well casing (pitless adapter) above the land surface. Extension of the casing above grade shall be accomplished in accordance with rules and standards for new wells.

5. ~~(5)~~ Before acid treating a well, 7 MCAR § 1.218. B.4. ~~MHD 218(b)(4)~~ shall be complied with to prevent a hazardous condition caused by release of H_2S (hydrogen sulfide) or other toxic gases in a pit or confined space. All confined spaces shall be blown out with fresh air before entry and a supply of fresh air provided during occupancy. Pits or chambers should not be entered without a lifeline and adquate lifting power on the surface to quickly haul up a worker. Where there is any question whether the air supply procedure has provided a safe atmosphere, a self-contained breathing apparatus shall be worn (ordinarily canister-type gas masks do not protect against atmospheres low in oxygen).

C. ~~(c)~~ Abandonment of wells. Any water well which is to be abandoned must be abandoned in accordance with these rules. The owner of a well which is no longer being used will be ordered to sample the well and to disinfect or otherwise pump or remove the contamination before the well is plugged. If a well provides a potential or actual source of

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contamination for the aquifer, the commissioner may order that the well be permanently plugged and abandoned.

1. ~~(1)~~ Temporary.

a. ~~(aa)~~ Prior to placement into service or when temporarily removed from service, the well shall be sealed with a water-tight steel cap. A well removed from service and not permanently abandoned may be temporarily abandoned if approved in writing by the commissioner. The licensee and the owner shall submit a request for temporary abandonment on forms provided by the Department.

b. ~~(bb)~~ The well shall be maintained whereby it is not a source or channel of contamination when not in service.

c. ~~(cc)~~ Until a well is permanently abandoned by sealing procedures, all provisions for protection of the water against contamination and pollution and for maintaining satisfactory sanitary conditions around the well shall be carried out to the same extent as though the well were in routine use.

2. ~~(2)~~ Permanent.

a. ~~(aa)~~ General. A well that is to be permanently abandoned shall be disconnected from the system and the hole filled to prevent contaminating materials from entering the water-bearing ground formations. Concrete or cement grout shall be used for sealing material; however, if the well is so large that the use of these materials is not practical, the filling materials should be selected so as to restore natural conditions as nearly as possible. Neat cement grout or concrete as defined in 7 MCAR § 1.220 C. ~~MHD 220(c)~~ (grouting) and 7 MCAR § 1.210 C.13. ~~MHD 210(c)(13)~~ are satisfactory for filling parts of wells in rock formations. Sand and heavy drilling fluid may be used in sand and gravel sections of wells.

b. ~~(bb)~~ All materials, debris and obstructions that may interfere with sealing operations shall be removed from the well. Liner pipe shall be removed or perforated when necessary to assure placement of an effective seal. The administrative authority will be consulted for instruction in case of abandonment of a contaminated well or where there is a question of proper procedure.

c. ~~(cc)~~ All casing and screen may be salvaged except casing that has been cemented in place. The well shall be filled with appropriate sealing materials as described in 7 MCAR § 1.218 C.2.a. ~~MHD 218(c)(2)(aa)~~ prior to removal of the casing.

d. ~~(dd)~~ The top of the hole shall be filled with 10 feet of cement or concrete grout to within 2 feet of the land surface. Casing remaining in the hole shall be cut off at least 2 feet below land surface. The remaining top 2 feet of hole shall be filled with native top soil.

e. ~~(ee)~~ An abandoned well shall be filled and sealed by one of the following methods in accordance with the materials penetrated, in such a manner as to prevent it from acting as a channel for pollution. A report of the method of sealing shall be filed with the ~~Board~~ commissioner on water well record forms provided:

(1) ~~(ee1)~~ A well in unconsolidated deposits shall be filled with clean sand and puddled clay, neat cement grout or concrete grout to provide a permeability no greater than the natural condition.

(2) ~~(ee2)~~ The section of a well in a cavernous or creviced rock (such as cavernous limestone or basalt lava rock, creviced granite, etc.) shall be filled with concrete or neat cement grout or alternate layers of concrete or neat cement grout, gravel or stone aggregate. The filling shall be completed at the top by a layer of neat cement grout or concrete grout extending at least ten feet (10 ft.) into the above ~~under~~lying formation and finished as provided in 7 MCAR § 1.218 C.2. ~~MHD 218(c) (2).~~

(3) ~~(ee3)~~ When concrete, cement grout, puddled clay or heavy drilling fluid is used for sealing an abandoned well, it shall be inserted in the well through a grout pipe from the bottom of the well upward to the surface under pressure and in one continuous operation.

(4) ~~(ee4)~~ Test wells shall be sealed to prevent the well from being a channel for the vertical movement of water and a source of contamination to the ground water supply in accordance with well abandonment provisions of 7 MCAR § 1.218 C. ~~MHD 218(c).~~

(5) ~~(ee5)~~ The flow in a flowing well shall be confined, if possible[3], and the well filled in accordance with well abandonment provisions of 7 MCAR § 1.218 C. ~~MHD 218(c).~~

f. ~~(ff)~~ The owner shall be responsible for the permanent sealing of an abandoned well except:

(1) ~~(ff1)~~ As mutually agreed upon in a written contract between the owner and licensee and in accordance with these rules and regulations to protect the ground water aquifer.

[3] Proper judgment shall be exercised in the feasibility and practicability of sealing flowing wells. In some cases the confining formation may have been so badly disturbed that sealing may only cause the flow to discharge in a less appropriate location. In other situations, the flow may have eroded so much material that the landscape has taken on the appearance of a natural spring. The sealing in this case may be impracticable, if not impossible.

(2) ~~(ff)~~ When the licensee improperly locates, constructs, or completes the well or fails to meet the conditions of his contract: in which case the licensee shall be responsible for the sealing of the well.

g. ~~(gg)~~ A licensee shall permanently abandon any well that he removes from service in accordance with 7 MCAR § 1.218 C. and shall report such abandonment to the commissioner. A licensee shall report to the ~~Board~~ commissioner any unsealed abandoned water well of ~~which he becomes aware~~.

D. ~~(d)~~ Observation wells.

1. ~~(1)~~ Observation wells installed for a temporary (not to exceed a period of six (6) months) purpose of obtaining hydrologic or other data shall be constructed by such methods and of such materials that they are not a source or channel of pollution or contamination to any ground water supply or aquifer. All observation wells shall be abandoned in accordance with procedure described in rule 7 MCAR § *1.218 C.* ~~MHD 218(e).~~

2. ~~(2)~~ Permanent observation wells (exceeding a period of six (6) months) constructed for the purpose of obtaining hydrologic or other data shall meet the standards of construction for water supply wells except when prior permission has been obtained in writing from the ~~Board~~ commissioner exempting the well from meeting specified standards established by these regulations.

E. ~~(e)~~ Test holes and borings. Test holes shall be permanently abandoned and sealed by the well contractor after the drilling, logging and testing have been completed unless:

1. ~~(1)~~ The owner or his agent has submitted a request to the director and obtained his written permission to extend the time limit, or

2. ~~(2)~~ The well is being completed as a water supply or other approved type well.

F. ~~(f)~~ Dewatering and depressurizing wells.

1. ~~(1)~~ Dewatering and depressurizing wells shall be constructed in a manner and with such materials to prevent the contamination of the ground water system. Discharges from the dewatering system shall not be cross connected to a potable water supply.

2. ~~(2)~~ Temporary water supply. There may be incidents during construction where nearby residences with private water supplies will lose their source of supply during dewatering operations. If such a situation occurs, the licensee shall cooperate with the homeowner as may be required to provide a temporary supply of water during construction operations, including, but not necessarily limited to, supplying bottled water for drinking and cooking purposes and potable bulk water for other uses.

3. ~~(3)~~ The ~~Board~~ commissioner shall be notified prior to commencement of a ground water dewatering operation by the licensee. The licensee shall report the approximate area to be dewatered, the maximum depth to be dewatered, the number of wells to be affected, and the measures that will be taken to provide potable water to persons adversely affected by the dewatering operation. This may be reported by phone. The licensee shall retain the name of the ~~Board's~~ commissioner's staff member taking the information and shall report this information in writing to the ~~Board~~ commissioner within three days of commencement of the ground water dewatering operation.

4. ~~(4)~~ The licensee shall comply with any orders issued by the ~~Board~~ commissioner which may include but not be limited to the collection of water samples from wells in the dewatered area for analysis to determine any health hazards prior to the ~~Board~~ commissioner relieving the licensee of responsibility for furnishing a safe water supply to well owners in the area affected by the dewatering operation. If the licensee has been released of his responsibility but thereafter difficulties develop in the water supply of well owners in the area affected by the dewatering operation as a result of such operation, the licensee may again be required to comply with 7 MCAR § 1.218 F.2. ~~MHD 218(f)(2).~~

G. ~~(g)~~ Elevator shafts. Wells constructed or holes drilled for the installation of elevator shafts or hydraulic cylinders shall be cased, sealed, and maintained in a manner to prevent the vertical movement of water as a source of contamination to the ground water or any aquifer and as approved by the ~~Board~~ commissioner.

H. ~~(h)~~ All other wells. All wells except those specifically exempted by the Act shall be constructed and maintained in accordance with standards for water supply wells except when prior exemption has been obtained from the ~~Board.~~ commissioner.

7 MCAR § 1.219 ~~MHD 219~~ Other water sources, cross connections and storage reserviors.

A. ~~(a)~~ Storage reservoirs. If a storage reservoir, excluding a pressure tank, is used, plans shall be submitted to the administrative authority for approval. The plans shall meet

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the standards specified in the Manual of Water Supply Sanitation, Section VII, paragraph 715, published in 1969 by the Department.

B. ~~(b)~~ Other water sources. In cases where a potable water supply cannot be obtained by well drilling, permission may be granted by the administrative authority to use springs, infiltration tile lines, or other similar sources as a water supply or to install water treatment facilities. Plans and specifications for such facilities, together with operating procedures, shall be approved by the administrative authority. The plans shall meet the standards of the Manual of Water Supply Sanitation, Section VI, published in 1962 by the Department.

C. ~~(c)~~ Cross connections. ~~A physical connection is not permitted between a well meeting the requirements of these rules and another water supply which does not meet such requirements.~~ Cross connections between water wells and other systems or equipment containing water or other substances of unknown or questionable safety, including pesticides and fertilizers, are prohibited, except where equipped with a suitable protective device such as a break tank or backflow preventer which is approved by the commissioner and which the owner agrees to install, test and maintain to assure proper operation.

7 MCAR § 1.220 ~~MWD-220~~ Standards for construction of wells.

A. ~~(a)~~ Casing for permanent wells.

1. ~~(1)~~ A permanent well casing used for the protective or outside casing shall be of at least standard weight (schedule 40) steel or iron pipe through 8 inches inside diameter. Larger diameter casing shall have minimum weights and thicknesses as specified in Table 1. Dimensions and weights of schedule 40 pipe are given in Standard ~~Z-10~~ 10-1959 of the American Standards Association, 29 West 39th Street, New York, New York and Standards A53-69a or A120-69 of the American Society for Testing Materials, 1916 Race Street, Philadelphia, Pennsylvania 19103. Casing for permanent wells shall be of ferrous material or, where permitted by statute, plastic material. For ferrous pipe, the specifications and installation procedures are prescribed below. For plastic pipe, the specifications and installation procedures are prescribed in 7 MCAR § 1.224.

2. ~~(2)~~ A protective well casing shall be watertight throughout its length, with threaded or welded joints or other types of joints given written approval by the Director. Recessed or reamed and drifted couplings shall be used on threaded casing, or, as an alternate, other couplings can be used but the design, taper and type of the thread of the coupling shall match that of the pipe. No thread shall be exposed on the pipe when the pipe is joined to the coupling. Other casing design or materials shall be approved only by official written order of the ~~Board~~ commissioner.

3. Pipe used as the protective casing in the permanent construction of a well shall be new pipe produced to recognized standards of the American Society for Testing Materials, No. 5L (1970) of the American Petroleum Institute, 1271 Avenue of the Americas, New York, New York, or No. C201-66 and C202-64 of the American Water Works Association, 2 Park Avenue, New York, New York, or other grade weldable new pipe having a quality equal to or greater than those heretofore specified.

4. New pipe, when salvaged within 30 days of the drilling of a water well test hole or dry hole only, may be used as new pipe if still in new condition.

5 ~~(5)~~0 Pipe shall be marked with the specification designation or marked "Meets Minnesota Well Construction Code Standards." Such markings shall include wall thickness, weight per foot and identification of supplier. The ~~Board~~ 0Commissioner may require that such pipe be submitted to an independent testing laboratory for evaulation and verification that the pipe will equal or exceed minimum standards. Failure of the pipe supplier to submit the pipe for evaluation and verification or failure of the pipe to meet minimum standards specified in 7 MCAR § 1.220 A.1. and 3. sufficient cause for automatic rejection of such pipe for use in well construction in Minnesota.

6. Pipe intended for water well use that is sold within this State, regardless of specification designation, is subject to random examination by the administrative authority who may require any lot of pipe or part thereof containing defective lengths to be rejected. Defective lengths or lots shall include, but not be limited to:

a. ~~(aa)~~ Pipe with girth welded joints,

b. ~~(bb)~~ Pipe with welded patches, and

c. ~~(cc)~~ Lots having more than 5% of the pipe with lengths less than 5 feet

7. ~~(7)~~ Temporary, inner, and protective casing; liner.

a. ~~(aa)~~ Temporary casings may be standard weight or lighter pipe, but lightweight material shall be of such minimum thickness as is required to withstand the structural load imposed by conditions both inside and outside the well.

b. ~~(bb)~~ In no case shall the ~~inner casing or protective~~ casing have a wall thickness of less than specified in Table 1. ~~The~~ An inner casing shall be surrounded by at least 2 nominal inches of neat cement grout when welded joints are used. Table 2 lists inner and outer pipe size combina-

tions which would be appropriate to fulfill the requirements of this rule. If couplings are used the annular space shall be at least 4 inches in diameter larger than the outer diameter of the coupling. The annular space between the casing and open hole shall be grouted with neat cement, ~~or~~ concrete grout, or as provided in 7 MCAR § 1.220 D., E., or F. ~~MHD 220(d), (e), or (f).~~

c. ~~(ee) A liner~~ An inner casing shall be grouted for its entire length with the grout material being added from the bottom upward in one continuous operation or as provided in 7 MCAR § 1.220 F. ~~MHD 220(f).~~

Table 2
Permitted Inner and Outer Casing Combinations

Inner Casing in nominal inches	Outer Casing in nominal inches
2	6
4	8
5	10
6	12
8	14
10	16
12	18
14	20
16	22
18	24
20	26
22	30
24	30
26	32
30	36

d. ~~(dd)~~ Casings to be grouted shall be provided with sufficient centering guides, welded to the casing, to permit unobstructed flow and deposition of the grout.

8. ~~(8)~~ A well drilled for irrigation purposes in shallow continuous glacial outwash material penetrating non-artesian water may be constructed of pipe as specified in Table 3. The annular space shall be closed by washing the fine grained caving material around the casing.

Table 3. Gauges for Steel or Galvanized Steel Casing Irrigation Wells in Shallow Continuous Glacial Outwash Material Penetrating Non-artesian Water.

Diameter of Plain and Perforated Casing (inches)				Diameter of Corrugated Metal Pipe (inches)		
12	14	16	18	12	15	18
Gauge				Gauge		
12	10	10	10	12	12	12

Well casing in Table 3 shall be new pipe, however, salvaged pipe may be used if the condition of the salvaged pipe is yet of new pipe quality.

9. ~~(9)~~ Under no conditions shall the casing inside diameter be less than 2 inches except for a driven well point which shall be equipped with a casing pipe of at least 1¼ inches inside diameter. The well shall also be of sufficient diameter to receive a pump or pumping apparatus of sufficient size to discharge the design capacity including anticipated decline in water levels.

10. ~~(10)~~ Minimum protective depths of wells.

a. ~~(aa)~~ All wells shall be watertight to such depth as may be necessary to exclude pollution. ~~Ground water structures~~ A well shall be constructed so ~~designed~~ as to seal off formations that are, or may be, ~~contaminated or~~ undesirable or contaminated with bacteria of sewage origin.

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Table 1
Casing Pipe Weight and Dimensions

Size in Inches	Wgt. Lbs. Per Ft. Plain End	Wgt. Lbs. Per Ft. Thrds. & Cplgs.*	Wgt. Lbs. Per Ft. Thrds. R&D Cplgs.	Thickness in Inches	Diameter—Inches External	Diameter—Inches Internal	Thrds. per Inch	Couplings Minimum External Diameter Inches	Couplings Minimum Length Inches
1	1.68	1.68	1.70	.133	1.315	1.049	11½	1.576	2-5/8
1¼	2.27	2.28	2.30	.140	1.660	1.380	11½	1.900	2-3/4
1½	2.72	2.73	2.75	.145	1.900	1.610	11½	2.200	2-3/4
2	3.65	3.68	3.75	.154	2.375	2.067	11½	2.750	2-7/8
2½	5.79	5.82	5.90	.203	2.875	2.469	8	3.250	3-15/16
3	7.58	7.62	7.70	.216	3.500	3.068	8	4.000	4-1/16
3½	9.11	9.20	9.25	.226	4.000	3.548	8	4.625	4-3/16
4	10.79	10.89	11.00	.237	4.500	4.026	8	5.200	4-5/16
5	14.62	14.81	15.00	.258	5.563	5.047	8	6.296	4-1/2
6	18.97	19.18	19.45	.280	6.625	6.065	8	7.390	4-11/16
8	28.55	29.35		.322	8.625	7.981	8	9.625	5-1/16
10	40.48	41.85		.365	10.750	10.020	8	11.750	5-9/16
12	49.56	51.15		.375	12.750	12.000	8	14.000	5-15/16
14	54.57	57.00		.375	14.000	13.250	8	15.000	6-3/8
16	62.58	65.30		.375	16.000	15.250	8	17.000	6-3/4
18	70.59	73.00		.375	18.000	17.250	8	19.000	7-1/8
20	78.60	81.00		.375	20.000	19.250	8	21.000	7-5/8
22	86.61			.375	22.000	21.250			
24	94.62			.375	24.000	23.376			
26	102.63			.375	26.000	25.250			
30	118.65			.375	30.000	29.250			
32	126.66			.375	32.000	31.250			
34	134.67			.375	34.000	33.250			
36	142.68			.375	36.000	35.250			

*Nominal weight based on length of 20 feet including coupling.

Requirements will be fulfilled to the minimum extent when the protective casing has been installed in conformity with the applicable construction set forth in 7 MCAR § 1.220. ~~MHD 229.~~ Where it is not feasible to follow the standards contained in this section, the licensee shall obtain approval of the administrative authority as to the design of the well before proceeding. The acceptability of the formation for well development shall be based on the satisfactory results of analysis of the water. Any water-bearing formation yielding water which is contaminated, as evidenced by the presence of chemicals or bacteria of sewage origin, shall be regarded as unsatisfactory for ~~well development~~ use as a potable supply unless adequate treatment is provided. The Minnesota Department of Health shall be consulted for measures that may be feasible to adequately treat the water to provide a potable supply.

b. ~~(bb) The casing of~~ Any ~~well for a~~ potable water supply well constructed entirely in glacial outwash or alluvium earth formations ~~shall~~ in which the casing does not extend to a depth of 50 feet below established ground level or through at least 10 feet of impervious soil formation ~~and at least 5 feet below the pumping water level and shall be~~ located in accordance with 7 MCAR § 1.217C.1.f. ~~MHD 217(e)(1)(ee).~~

11. ~~(11)~~ A well casing or extension thereof shall extend vertically at least 12 inches above ground surface or above the floor of an approved basement offset, pump room or well room. However, in an above grade installation the casing shall extend at least 6 inches above the floor or slab.

12. ~~(12)~~ Well casing offsets are prohibited.

B. ~~(b)~~ Upper casing. A well casing used for a potable water supply shall not be used as a suction line unless protected by a standard weight outer casing to a depth of at least 10 feet. The top of both casings shall be finished in accordance with 7 MCAR § 1.222. ~~MHD 222.~~

C. ~~(c)~~ Grouting

1. ~~(1)~~ A well having an open annular space around the casing, or between the surface casing and protective casing, or ~~a liner and protective~~ between an inner casing surrounded by an outer casing shall be grouted from the lower termination of the casing to the ground surface or to the base of the pitless adapter. Grouting shall be commenced without delay upon completion of drilling of the well or any portion of a well which must be grouted. Grouting shall be performed by adding the mixture through the casing or a grout pipe from the bottom of the space to be grouted upward to the surface in one continuous operation. Concrete grout may be used in the dry portion of a hole. Neat cement grout or concrete

grout shall be allowed to set a minimum of 12 hours when hi-early cement is used or a minimum of 48 hours when regular cement is used, before drilling operations are resumed. Heavy drilling mud or heavy bentonite water slurry may be used as grout in wells developed in glacial drift. ~~Other materials of equivalent sealing properties shall have the written approval of the Director prior to their use.~~

2. ~~(2)~~ Concrete grout is a mixture of cement, sand and water, in the same proportion of 1 bag Portland cement (94 pounds) (ASTM C150-69a) and an equal volume of dry sand to not more than 6 gallons of clean water. Where large volumes are required to fill annular openings, gravel not larger than ½ inch size may be added. Concrete grout shall not be used as grout below the water level in the well.

3. ~~(3)~~ Neat cement grout is a mixture of 1 bag (94 pounds) of Portland cement (ASTM C150-69a) to not more than 6 gallons of clean water. Bentonite up to 2% by weight of cement to reduce shrinkage or other admixtures (ASTM C494-68) to reduce permeability and/or control time of set may be used.

4. ~~(4)~~ Heavy drilling fluid when used as grout in a rotary drilled well shall contain a high percentage of clay or bentonite to minimize shrinkage of the slurry within the annular space. Heavy bentonite water slurry is a mixture of 10% by weight of bentonite added to clean water or approximately 5% bentonite added to drilling mud. Bentonite shall contain 85% of the mineral montmorillinite and shall meet American Petroleum Insiitute specification 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.

D. ~~(d)~~ Rotary, bored or augered wells.

1. ~~(1)~~ Rotary, bored, or augered type wells shall be constructed with a watertight casing of 2" diameter or larger installed in an open hole having a diameter of at least ~~2"~~ 4" larger than the maximum outside diameter of the casing. The annular space around the casing shall be tightly sealed in accordance with material and procedures described in 7 MCAR § 1.220 C. ~~rule 220(c).~~ A rotary, bored, or augered well completed in a drift formation may be sealed by pumping the well to collapse the formation; however, the top 20 feet below the land surface shall be sealed in accordance with 7 MCAR § 1.220 C. or § 1.220 F. ~~rule 220(c) or 220(f).~~ Any annular space remaining unfilled shall be grouted with neat cement or concrete using a tremie pipe to pump the grout under pressure from the bottom up in one continuous operation.

2. ~~(2)~~ Drilling mud additives shall be stored in clean containers and shall be free of material that may adversely affect the well, aquifer, or quality of the water to be pumped from the well.

E. ~~(e)~~ Driven casing wells.

1. ~~(1)~~ Where the upper drillhole is clay or similar material of 10 feet or more in thickness, the annular space between the drillhole and casing shall be kept filled with clay slurry or equivalent material when driving the protective casing. In lieu of this, a starting casing should be used and sealed with 20 feet of concrete grout. (When a pitless adapter is used, see 7 MCAR § 1.221 C.1. ~~MHD 221(e)(1).~~

2. ~~(2)~~ The bottom of the protective well casing shall be equipped with a drive shoe or otherwise protected from damage during construction of the well as dictated by drilling procedures and conditions of each particular well.

F. ~~(f)~~ Unconsolidated glacial drift wells. A well drilled into unconsolidated glacial drift may be completed with a tight seal made around the protective casing if the annular space is closed by washing the fine-grained caving material around the casing prior to disinfection of the well. Wells shall be pumped promptly after setting the casing until clear, and native materials shall be washed immediately into the annular space.

G. ~~(g)~~ Rock wells.

1. ~~(1)~~ Where rock is encountered, i.e., consolidated as opposed to unconsolidated geological material, at a depth greater than 25 feet from the surface the protective casing shall be equipped with a drive shoe which shall be driven firmly into stable rock to provide a tight joint that will prevent pollution or sand from entering the well. ~~A drive shoe is not required on a casing installed without driving and which is to be grouted with neat cement or concrete in an oversized hole.~~

2. ~~(2)~~ Where rock is encountered within 25 feet of the surface, an oversized hole ~~4 nominal inches larger in diameter than the casing shall be drilled and the casing sealed with neat cement grout to a sufficient depth to exclude water which is contaminated.~~ shall be drilled. Such hole shall be 4 inches larger than the nominal casing size when welded construction is used, and 4 inches larger in diameter than the coupling if threaded joints are used. The annular space shall be pressure grouted with neat cement or concrete grout as prescribed in 7 MCAR § 1.220 D.1. to a depth sufficient to exclude water which is or may be contaminated.

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3. ~~(3)~~ In an area where a well can be developed only in fractured, jointed, but noncavernous rock, the casing may terminate in the formation if there is at least 25 feet of sand or clay material above the rock, there is no record of this rock containing contaminated or polluted water, and geologic conditions offer no natural direct surface or near surface water inlets into the rock aquifer. Where there is less overburden or deeper strata will not produce potable water, the administrative authority shall be consulted and its written approval obtained by the well owner for water treatment and well construction features necessary to provide a safe water supply.

H. ~~(h)~~ Cavernous rock wells.

1. ~~(1)~~ Geological formations which are creviced or cavernous should not be used as a source of ground water unless overlain by at least 50 feet of drift material and/or by a firm insoluble rock material extending for at least one mile horizontal distance from the well in all directions to render the movement of contaminated water in the formation to the well improbable. The casing shall extend at least 10 feet below the pumping level. The well shall be cased and grouted at least 10 feet below the pumping level. The drill hole shall be at least 4 inches larger in diameter than the nominal casing size if welded construction is used, and 4 inches larger than the couplings if threaded joints are used. The annular space shall be filled with neat cement or concrete grout as provided in 7 MCAR § 1.220 C. ~~The acceptability from a sanitary standpoint of water obtained from a well developed in such a protected faulty geological formation will be dependent upon treatment of the water if the need for such is indicated by analytical studies of the water.~~

2. ~~(2)~~ Wells underlying cavernous rock. Where an adequate and safe water supply is available in a geological formation overlain by one or more faulty rock formations, all faulty rock formations should be completely cased off. The casing should extend at least 15 feet into the safe aquifer if such exists, or at least 15 feet into a stable, insoluble, noncavernous or noncreviced geological formation beneath the lowest faulty rock formation and above the aquifer and at least 10 feet below the pumping level. The drill hole extending through the creviced rock formation and 15 feet into the firm rock formation or aquifer should be at least 4 nominal inches larger in diameter than the couplings if threaded joints are used. The annular space shall be filled with cement grout as provided in 7 MCAR § 1.220 C. ~~MHD 220(e).~~

3. ~~(3)~~ Protective mantle over cavernous and noncavernous aquifer. Where any faulty rock formation which overlies a safe aquifer is itself overlain by a protective mantle of drift, or by a firm insoluble consolidated formation of sufficient depth and for a sufficient radius as described herein above, 7 MCAR § 1.220 H.1. ~~(MHD 220(h)(1))~~, the casing need not extend through the protected faulty rock formation. The casing shall also extend 10 feet below the pumping level. The acceptability of water taken from a well so constructed will be dependent upon treatment of the water, if the need for treatment is indicated by analytical studies of the water.

4. ~~(4) The acceptability of the cavernous limestone for producing a safe water supply may not be known until a well is drilled and the water analyzed. In this case an oversized hole may be drilled into cavernous rock for later use in drilling to a deeper sandstone or other acceptable aquifer. An oversized hole shall be 4 nominal inches larger in diameter than the casing line and couplings to be inserted for reaching the deeper aquifer. The smaller casing shall be of sufficient diameter to insert a pump of sufficient capacity to lift water to the surface for the required supply. The casing shall also extend at least 10 feet below pumping level~~ A well shall not provide water entry from more than one aquifer.

~~(5) Wells terminating in cavernous rock for withdrawal of water for purposes other than domestic or community water supply shall be grouted in accordance with rule 220(e) to prevent vertical transfer of polluted or contaminated water between aquifers.~~

I. ~~(i)~~ Flowing artesian wells.

1. ~~(1)~~ Flowing artesian wells should be constructed to prevent erosion of the aquifer or the overlying confining mantle.[4]

2. ~~(2)~~ Flow control from a flowing artesian well shall be provided, consisting of valved pipe connections, watertight pump connections or a receiving tank set at an altitude corresponding to that of the artesian head. A direct connection between the discharge pipe and a receiving tank or a sewer or other source of pollution or contamination shall be prohibited.

J. ~~(j)~~ Well screens. A well installed in unconsolidated sand and gravel aquifers shall ordinarily be fitted with a screen properly sized so the aquifer can be properly developed to produce sand-free water at the pumping rate of the permanent pump. Wells shall provide sand-free water to the extent that the sand will not interfere with the intended use and operation of the water supply system.

K. ~~(k)~~ Capping. Temporary capping of a well until the pumping equipment is installed shall be such that no pollution or foreign objects can enter the well.

L. ~~(l)~~ Yield test. Every well shall be test pumped to

[4] This provision will not be interpreted so as to preclude licensees from attempting to drill a well in a flowing artesian area, when it is likely that a water well can be safely installed if proper precautionary measures are followed.

produce a minimum initial supply of 600 gallons of sand-free water per hour if geological conditions permit. A well in which a pump of a capacity of 20 gallons per minute or more is to be installed shall be tested for yield and drawdown with periodic water level measurements being made where possible, during the drawdown and subsequent recovery periods. The well shall be test pumped at rates greater than is expected from the well during its normal usage as follows: up to 400 gpm — 1.5 times; 400 to 600 gpm — 1.4 times; 600 to 800 gpm — 1.3 times; 800 to 1,000 gpm — 1.2 times; 1,000 gpm and over — 1.1 times. Shallow nonartesian wells used for irrigation purposes may be test pumped at a rate equivalent to the yield of the aquifer and for a period of at least 12 hours. Wells shall be test pumped for a minimum of one hour or more if more is required by the well owner or as prescribed by the consulting engineer or hydrologist.

M. ~~(m)~~ Alignment. A well shall not vary from the vertical or alignment so as to interfere with installation and operation of the pump.

N. ~~(n)~~ Drilling water. Water used for drilling, development or rehabilitation purposes, other than from the well itself, shall be chlorinated clear water containing a free chlorine residual at the time of use and be conveyed in clean sanitary containers or water lines.

O. ~~(o)~~ Dug or bored wells. ~~This type of well is authorized where geological conditions preclude the possibility of developing a satisfactory drilled well. The wells shall contain a watertight cover. Pump openings shall be curbed. The isolation distances for dug wells from sources of contamination shall be the same as rule MHD 217(c)(1)(ee).~~

~~(1) Concrete Wall or Curbing The upper 10 feet of the wall or curbing shall be at least 6 inches thick and be poured in one operation. There shall be no construction joint within 10 feet of the original ground surface.~~

~~(2) Pre-cast Curbing Concrete well pipe, vitrified pipe, and similar forms of pre-cast curbing have construction joints that cannot be depended upon to be watertight. Where used, such pre-cast curbing shall be encased in a 6-inch thick neat cement or concrete grout placed in one operation to a depth of at least 20 feet.~~

1. A dug or bored well constructed with materials other than those authorized in 7 MCAR § 1.220 A. may be constructed only in glacial drift formations and shall:

a. be cased with material of sufficient strength to withstand the pressures of the formation;

b. be installed in an oversized hole at least 8" in diameter larger than the casing;

c. have the annular space between the casing and the formation filled 4 inches thick with neat cement or concrete grout to a depth sufficient to exclude water which is or may be contaminated;

d. be protected with a heavy, pre-cast overlapping concrete cover;

e. have pump openings sealed with concrete or cement as prescribed in c. above.

2. Prior to constructing a dug or bored well, the licensee shall obtain from the owner an agreement to the following conditions:

a. the owner will maintain the isolation distances prescribed in 7 MCAR § 1.217 C.1.;

b. once per year, or as otherwise prescribed by the Minnesota Department of Health, the owner will have the water from the dug or bored well analyzed for nitrate and for bacteria.

This agreement shall be documented on forms provided by the Minnesota Department of Health and shall be returned to the Department along with the water well record.

P. ~~(p)~~ Well development. The well shall be developed to remove:

(1). native silts and clays deposited on the aquifer face during the drilling,

(2). drilling fluid, and

(3). the predetermined finer fraction of the gravel pack, all of which shall be done to insure that the maximum practical specific capacity will be obtained from the completed well.

Q. ~~(q)~~ Disposal of material. Drilling mud, cuttings and discharged water shall not be disposed in a manner so as to create damage to public or private property. During the test

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pumping discharged water shall be piped to a point of overland drainage.

7 MCAR § 1.221 ~~MHD 221~~ Well casing seals and connections.

A. ~~(a)~~ Water level measurement design. Provisions shall be made in the well seal with a minimum ½-inch diameter threaded plug for future measurements of static and pumping water levels. A minimum 1-inch diameter threaded plug is preferred where feasible.

B. ~~(b)~~ Above-grade connections. An above-grade connection into the top or side of a well casing shall be at least 12 inches above the established ground surface or 2 feet above the regional flood level whichever is higher, and constructed so as to exclude dirt or other foreign matter by one or more of the following methods, as may be applicable:

1. ~~(1)~~ Threaded connection.

2. ~~(2)~~ Welded connection.

3. ~~(3)~~ Rubber expansion sealer.

4. ~~(4)~~ Bolted flanges with rubber gaskets.

5. ~~(5)~~ Overlapping well cap.

6. ~~(6)~~ Extension of the casing at least 1 inch into the base of a power pump mounted and sealed on a concrete pedestal and at least 12 inches above the established ground surface or the floor of an approved basement, pump room, or well room.

C. ~~(c)~~ Below-grade connection

1. ~~(1)~~ A connection to a well casing made below ground, or less than 12 inches above the established ground surface, shall be protected by threaded or welded joints or by pitless adapter. The threaded or welded joints or pitless adapter shall be approved by the ~~Board~~ commissioner on the basis of design and materials. A below-ground connection shall not be submerged in water at the time of installation. The Director will furnish a list of approved pitless adapters that meet the requirements of these rules. Native materials shall be packed tightly around the casing and pitless adapter after installation.

2. ~~(2)~~ A connection to a well casing located at least 12 inches above the floor of an approved basement offset is considered equal to an above-grade installation for residential use only. An approved basement offset shall be a room with a floor 12 inches above the floor of an approved basement, shall extend beyond the footings of the building. The well shall extend 3 feet beyond any roof projection. Any basement located in a regional flood zone shall not be considered an approved basement. Water from a well located within a basement offset of a farm home may be piped for use in other farm buildings.

D. ~~(d)~~ Other methods. Any other method of connection to a well casing shall be specifically approved in writing by the Director before installation.

7 MCAR § 1. 222 ~~MHD 222~~ Pump installation.

A. ~~(a)~~ Pump and well rooms. A room housing pumping equipment or the top of a well casing shall be constructed above the established ground surface permitting access to the pump and well for maintenance or repair, or may be located below-grade if the containing room is located in or attached to an approved basement.

B. ~~(b)~~ Slabs, platform and floors. A well, except where an approved pitless adapter is used, shall be protected by a durable watertight concrete or equal slab, platform or floor, 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, which may be asphalt or similar material to provide resiliency, shall be provided between the casing and the platform, pump room or approved basement floor or slab.

C. ~~(c)~~ Pumps and pumping equipment.

1. ~~(1)~~ A pump shall be constructed so that no unprotected openings into the interior of the pump or well casing exist.

2. ~~(2)~~ A hand pump, hand pump head, stand or similar device shall have a closed spout, directed downward, and a pump rod that operates through a stuffing box.

3. ~~(3)~~ A power driven pump shall be attached to the casing or approved suction or discharge line by a watertight connection, including flange connections, hose clamp type connections, or other flexible couplings, or shall have a base plate meeting the requirements of 7 MCAR § 1.221 A. ~~MHD 221(a).~~

4. ~~(4)~~ A pump shall be designed, installed and maintained so that priming is not required for ordinary use. Pumps installed for use only on a well water irrigation system are exempted but priming water shall be clear water free of contamination and carrying a chlorine residual. An irrigation well equipped with a centrifugal pump may be primed without chlorination when the pump is filled with water taken directly from the well.

D. ~~(d)~~ Water suction lines.

1. ~~(1)~~ A water suction line shall be constructed of copper, galvanized iron or steel, cast iron, or plastic pipe as

approved by the Director, or other material given written approval by the Director. Aluminum pipe is acceptable for well water irrigation systems in addition to the above materials.

2. ~~(2)~~ A water suction line extending outside the well casing shall not be used unless protected by one or more of the following methods:

a. ~~(aa)~~ Fully exposed in an approved basement offset, pump room or well room and at least 12 inches above the floor of an approved below-grade structure.

b. ~~(bb)~~ Fully exposed above grade.

c. ~~(cc)~~ Lying within an outer casing with the annular space filled with water from the system and maintained at system pressure.

~~(dd) Surrounded by air space in a conduit which has a positive drainage by gravity to the ground surface or to an approved basement. Such conduit shall be directly connected to the well casing by a threaded or welded watertight joint. The openings into the casing shall be welded watertight or sealed in accordance with MHD 221. The total length of the suction line protected by the gravity drained conduit shall not exceed 20 feet.~~

3. ~~(3)~~ An unprotected suction line may be installed below grade only for nonpotable irrigation wells located in agricultural fields and installed in shallow glacial outwash material penetrating nonartesian aquifers for manifold collection systems under negative pressures provided the area is sufficiently isolated from potable water wells.

E. ~~(e)~~ Pump discharge lines. A buried discharge line between the well casing and the pressure tank in any installation, including a deepwell turbine or a submersible pump, shall not be under negative pressure at any time. If a check valve is installed in a buried water line between the well casing and the pressure tank, the water line between the well casing and the check valve shall meet the requirements for a suction line unless equipped with an air release valve. Pump discharge lines shall be materials as approved for suction lines in 7 MCAR § 1.222 D.1. ~~MHD 222(d)(1).~~ A frost proof yard hydrant shall be located at least 10 feet from the well.

F. ~~(f)~~ Pressure tanks. It is recommended that a pressure tank be installed in an approved pump room or well room. However, partially buried pressure tanks shall project horizontally above the ground or into an approved basement. A totally buried pressure tank may be used if the manufacturer's unit has been approved in writing by the ~~Board~~ commissioner as to its design, type of material and specification for its installation. A pressure relief or air release valve on a pressure tank which may contain subterranean gases and which is located within a building shall be vented to the outside.

G. ~~(g)~~ Vents.

1. ~~(1)~~ All wells shall be vented. A casing vent shall be of materials complying with 7 MCAR § 1.222 D.1. ~~MHD 222(d)(1)~~ with watertight joints terminating at least 2 feet above the regional flood level or one foot above the established ground surface or the floor of a pump room, well room or approved basement, whichever is higher. The casing vent shall be screened and point downward. Vents may be offset provided they meet the provision of this rule. Any submersible pump shall be installed with a vented cap on the pitless adapter to prevent drawing near surface water, mud, sand, etc., into the well through shielding around the electric cable. Flowing artesian wells may be exempted if protected by a specially designed pitless adapter or if the casing is protected as provided in 7 MCAR § 1.220 B. ~~220(b).~~ For wells of an inch and one quarter diameter casing or as otherwise protected to insure that contaminated water will not enter the well not using a drop pipe venting is not required when equipped with a suction pump provided the casing is protected in accordance with 7 MCAR § 1.220 B. ~~MHD 220(b).~~

2. ~~(2)~~ If toxic or flammable gases are present, they shall be vented from the well. The vent shall extend to the outside atmosphere above the roof level at a point where the gases will not produce a hazard. Openings in pump bases shall be sealed watertight. If the type of gas is not known and is to be carried through the water supply, the administrative authority shall be consulted for proper identification and treatment.

H. ~~(h)~~ Sampling faucet. In a pressure water system provision shall be made for collection of water samples by installation of a faucet or sampling device in a convenient location as near to the well as possible.

I. ~~(i)~~ Disinfection.

1. ~~(1)~~ A new, repaired, or reconditioned well or pump installation shall be thoroughly pumped to waste until the water is as clear as is reasonably possible, dependent upon ground water conditions in the area. Thereafter the well and pumping equipment shall be disinfected with

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chlorine so applied that a concentration of at least 50 parts per million of chlorine shall be obtained in all parts of the well. The chlorine solution shall be introduced into the well in a manner to flush the well surfaces above the static level with chlorine solution. A minimum contact period of 2 hours shall be provided before pumping the well to waste and flushing the chlorine solution from the distribution system.

2. ~~(2)~~ A licensee shall be responsible for chlorinating the work he performs on the well, pump or pumping equipment.

3. ~~(3)~~ Disinfection in a well repair operation may be accomplished at the beginning of the operation with chlorine applied to obtain a concentration of 200 parts per million for the period of the well repair operation. The water shall be pumped to waste prior to taking of water samples or use being made of the water.

7 MCAR § 1.223 ~~MHD-223~~ Records and samples.

A. ~~(a)~~ Water sample.

1. Prior to placing the ~~supply from a new or reconditioned~~ well into service, the licensee will be responsible for collecting one or more water samples from the installation for water quality analysis. Such samples shall be submitted to the Minnesota Department of Health in containers and in accordance with procedures issued by the Director. The results of the data will be stored in a ground water quality information system. The sample must be received within 30 hours of collection. Results of water sample analysis for a domestic supply not acceptable for drinking water will be reported to the well owner and the licensee along with recommendations for corrective actions. The results of the sample analysis is not intended to provide a basis of water quality for a transaction involving the sale or purchase of property.

2. If the licensee chooses to submit the water sample to a laboratory other than that of the Minnesota Department of Health, that laboratory must be certified by the Minnesota Department of Health for determination of the presence of coliform bacteria. The costs of such analysis shall be paid by the licensee. Results of the analysis shall be submitted to the Minnesota Department of Health.

B. ~~(b)~~ Water well records.

1. ~~(1)~~ A water well record shall be completed and submitted to the ~~Board~~ commissioner by the licensee within 30 days after completion of any well. The licensee shall furnish the well owner one copy, the Director three copies and retain one copy in his files, of a well record containing such available information as required on the form furnished by the Director. Terms when used for describing formations on the well log form shall conform to definitions set forth in these rules.

2. ~~(2)~~ A water well record shall be submitted for a dry hole. Information on several dry holes within a small area may be submitted on a single well record form if the geologic materials are similar.

3. ~~(3)~~ A well record shall be submitted after an abandoned well has been sealed showing the method of sealing.

C. ~~(c)~~ Water well cutting formation samples. In order to improve the State's water information system, more detailed geologic and hydrologic information is needed about the rocks and sediments which contain the State's groundwater resources. Water well cuttings provide the least expensive source of this kind of information. The information derived from such a program is essential to the better understanding and protection of the State's groundwater resources. The following rules and procedures set forth the means by which such information shall be obtained.

1. ~~(1)~~ The ~~Board~~ commissioner in consultation with the Minnesota Geological Survey (hereinafter referred to as the Survey) shall determine areas where water well cutting samples are needed to provide subsurface geological and hydrological information required by the ~~Board~~ commissioner, the Survey, and other State agencies for development of the State water information system. The general standards to be used in making such a determination are:

a. ~~(aa)~~ To obtain the minimum amount of detailed geologic and hydrologic information needed for the State water information system, at least one set of water well cutting samples per township in rural areas and at least one set of water well cutting samples per section in urban areas are required. The latest State Planning Agency Land-Use Map will be used for determining rural and urban areas for collection of well cutting formation samples.

b. ~~(bb)~~ The ~~Board~~ commissioner in consultation with the Survey may determine that more information is required from specific areas for accuracy and detail in the State water information system.

c. ~~(cc)~~ Water well cutting samples will be required only where there is reason to believe that a well will encounter bedrock materials below glacial sediments or from a well which the licensee estimates will reach a depth of at least 200 feet. The Board commissioner may require water well cutting samples from areas other than as specified in

this subsection where needed for accuracy and detail in the State water information system.*

2. (2) The ~~Board~~ commissioner through the Survey shall notify licensees of the general areas from which water well cutting samples are required and provide the licensees most frequently operating within such areas with maps or lists indicating counties, townships, section, or other designated areas where cutting samples are required. In addition, the ~~Board~~ commissioner shall specify the approximate number and depths of wells from which cutting samples are needed in the designated areas.

3. (3) The Survey shall furnish all licensees so notified with well-cutting sample bags, labels, and return postage cards for collecting and reporting water well cutting samples.

4. (4) Licensees so notified and supplied with sample collecting materials shall collect cutting samples during the course of drilling wells in the designated areas according to the requirements specified in the notification. Licensees not supplied with sample collecting materials but who shall have occasion to drill a well in an area designated for sampling shall notify the Survey.

5. (5) Licensees shall collect the cutting samples in an accurate manner so as to insure that they are representative of the materials encountered. Samples shall be taken at 5-foot intervals and at every change in rock or sediment type. The cuttings shall be placed in the sample bags provided by the Survey which shall have an attached tag on which the ~~Board's~~ commissioner's recording form well-record number of the well, the well owner's name, the well location, and the sample depth (example: 5 ft.) must be written.

6. (6) Licensees shall notify the Survey within 30 days after the well's completion so that the cutting samples can be collected. Pending collection, the contractor shall store the samples in a proper manner, so that they are protected from weather and disturbance and segregated in such a way that all samples may be properly identified with respect to the ~~Board's~~ commissioner's recording form well-record number and depth interval.

7. (7) The Survey, upon notification by the licensee, shall collect the samples from the contractor. The cutting samples shall be described and a geologic log prepared. The geologic log will be retained in the files of the Minnesota Geological Survey, with a copy being sent to the contractor.

7 MCAR § 1.224 Plastic well casing. In addition to complying with ~~MHD 240-223~~ (7 MCAR §§ 1.210-1.223), an installer who uses plastic well casing* must comply with the provisions of this rule with regard to construction and installation.

A. Definitions. The following terms shall have the meanings given them.

1. Installer means any person who constructs a well using plastic casing, whether or not such person is a driller or contractor who is licensed pursuant to Minn. Stat. ch. 156A (1976).

2. Plastic, when used in ~~MHD 210 through 224~~ (7 MCAR §§ 1.210-1.224), means a thermoplastic pipe or casing material composed of either polyvinyl chloride (PVC) or acrylonitrile-butadiene-styrene (ABS).

B. Standards.

1. Any plastic pipe used for water well casing shall meet the standards of the American Society for Testing and Materials, 1916 Race Street, Philadelphia, Pennsylvania, 19103, which are referenced as Standard Specification for Thermoplastic Water Well Casing Pipe and Couplings Made in Standard Dimension Ratios (SDR), ASTM F-480. Such pipe shall be capable of withstanding pressures equal to or greater than 200 pounds per square inch (p.s.i.). Table 1 lists the pipe included in ASTM F-480 which meets the 200 p.s.i. rating.

Table 1
Standard Thermoplastic Dimension Ratios (SDR) and Water Pressure Ratings (PR) at 23°C(73°F) for Non-Threaded PVC and ABS Plastic Pipe Equal to or Greater Than 200 p.s.i.

Pressure Rating of PVC Pipe Materials		
PVC 1120 PVC 1220 PVC 2120	PVC 2116	PVC 2112

*Any licensee who has reason to believe that a well may be of exceptional geologic or hydrologic interest is encouraged to call collect the Survey to inform that agency of the opportunity to obtain samples, even if the well is not within the area currently designated for collection of samples.

*Minn. Stat. § 156A.031 (1977 Supp.), permits the use of plastic well casing only in the following counties: Traverse, Grant, Douglas, Stevens, Pope, Big Stone, Swift, Lac qui Parle, Chippewa, Kandiyohi, Yellow Medicine, Renville, Lincoln, Lyon, Pipestone, Murray, Rock and Nobles.

KEY: RULES SECTION — Underlining indicates additions to proposed rule language. ~~Strike outs~~ indicate deletions from proposed rule language. PROPOSED RULES SECTION — Underlining indicates additions to existing rule language. ~~Strike outs~~ indicate deletions from existing rule language. If a proposed rule is totally new, it is designated "all new material."

SDR	p.s.i.	p.s.i.	p.s.i.
13.5	315	250	200
17	250	200	
21	200		

Pressure Rating of ABS Pipe Materials

	ABS 1316	ABS 2112
SDR	p.s.i.	p.s.i.
13.5	250	200
17	200	

2. Any plastic pipe, couplings, or components used in water well casing construction shall have the approval of a testing laboratory which has demonstrated the use of unbiased, reliable and appropriate testing methods, as determined by the Commissioner of Health. Such laboratory must approve the material as being intended for use in the transport of potable water. This approval shall be stamped on the pipe as prescribed below.

3. Pipe markings.

a. Well casing pipe. The plastic well casing pipe shall be marked at least every 1.5 m (5 ft.), in letters not less than 5 mm (3/16 in.) high in a contrasting color with the following information:

(1) Nominal well casing pipe size (for example, 5 in.), as specified in ASTM-F-480,

(2) Well casing pipe standard dimension ratio, in accordance with designation code given in Table 1 (for example, SDR 17, 1316),

(3) Type of plastic casing pipe material (for example, ABS or PVC),

(4) The wording — "well casing" — followed by the impact classification (for example, IC-3),

(5) Designation "ASTM F-480" including the year of issue of the standard with which the well casing pipe complies,

(6) Manufacturer's name or trademark,

(7) Manufacturer's code for resin manufacture, lot number, and date of manufacture,

(8) The seal or mark of the laboratory making the evaluation of the plastic for potable water use spaced at intervals specified by the laboratory, and

(9) Pressure rating (must be 200 p.s.i. or more).

b. Well casing pipe coupling. Plastic well casing pipe couplings shall be marked in letters not less than 5 mm (3/16 in.) high, with the following information:

(1) Nominal well casing pipe coupling size (for example, 5 in.), as specified in ASTM-F-480,

(2) Type of plastic well casing pipe coupling material (for example, ABS or PVC),

(3) Designation "ASTM F-480," including year of issue of the standard with which the well casing pipe coupling complies,

(4) Manufacturer's name or trademark, and

(5) The seal or mark of the laboratory making the evaluation of the plastic for potable water use spaced at intervals specified by the laboratory.

C. Plastic well casing pipe size. Where a submersible pump is to be installed inside a plastic casing, the casing diameter shall be no less than five-inch nominal pipe size, as specified in ASTM-F-480.

D. Storage, handling and components. The installer shall:

1. Not use pipe and couplings that have been stored in direct sunlight. Pipe must be stored in such a manner so as to prevent sagging or bending.

2. Inspect pipe and couplings carefully for cuts, gouges, deep scratches, damaged ends and other major imperfections and shall not use any plastic pipe or coupling which has such defects or imperfections.

3. Use solvent cement meeting the requirements of the specifications for the particular plastic used. The cement used shall provide sufficient open time for making good joints but the installer shall complete joints immediately upon applying the solvent cement.

4. Use only pipe and coupling combinations that give close and satisfactory interference fits which will readily mate when the solvent cement is applied and the pieces are joined. The pipe shall enter the socket to between 1/2 or 2/3 of the socket depth when inserted and turned.

5. An installer may use plastic pipe couplings with molded or formed threads but he must use only the thread lubricant which is suitable for the particular type of plastic being used.

6. When the installer connects plastic pipe to a non-plastic well screen, he shall use a coupling appropriate for the specific transition intended.

E. Technique for joining plastic well casing.

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

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

3. Primer. The installer shall use a primer:

a. when, because of the type of plastic material being used, the pipe and coupling surfaces must be softened and dissolved in order to form a continuous bond between the mating surfaces, and/or

b. when the particular type of solvent cement being used requires one.

4. Cement application. The installer shall apply a moderate and even coat of cement[2] to the inside of the coupling to cover the distance of the joining surface only. The installer shall then quickly apply an even coat of cement to the outside of the pipe being joined to a distance which is equal to the depth of the pipe coupling socket.

5. Assembly. The installer shall:

a. make the joint as quickly as possible after application of the cement, and before it dries;

b. reapply cement before assembling if the cement dries partially;

c. insert the pipe into the coupling socket, turning the pipe to insure even distribution of cement.

d. make sure that the pipe is inserted to the full depth of the coupling socket, and assemble pipe by using pipe joiners;

e. remove excess solvent cement from the exterior of the joint with a clean, dry cloth;

f. tighten a threaded joint by no more than one full turn using a strap wrench;

g. not disturb the coupling joint until after the cement has set, in order to avoid damage to the joint and loss of fit;

h. allow sufficient time for the joint to develop good handling strength based on the setting times given in Table 2.

Table 2. Initial Set Time

Temperature Range During Initial Set Time °C (°F)	Set Time for Pipe Sizes 2 to 3 in.	Set Time for Pipe Sizes 3½ to 12 in.
15 to 40 (60 to 100)	30 min.	1 hrs.
5 to 15 (40 to 60)	2 hrs.	4 hrs.
−20 to +5 (0 to 40)	6 hrs.	12 hrs.

i. allow sufficient time for the joint to cure before the joined pipe can be dropped into the drilled hole. This additional cure time is specified in Table 3.

Table 3. Joint Cure Schedule

Ambient Temperature, °C	Nominal Pipe Sizes			
	2 to 3 in.		3½ to 12 in.	
	SDR 26 and above	SDR 21, 17, 13.5	SDR 26 and above	SDR 21, 17, 13.5
15 to 40	2 h*	12 h	6 h	24 h
5 to 15	4 h	24 h	12 h	48 h
−20 to +5	16 h	96 h	48 h	8 days

*When the relative humidity is above 60%, increase all of the above times by 50%.

F. Installation of plastic well casing:

1. The installer shall drill an open hole which is 4 inches larger than the nominal casing size.

2. ~~An installer may not insert the drill stem or drilling equipment inside the plastic well casing when drilling any kind of well.~~ An installer may not drill thorugh a plastic cased well.

3. Grouting.

a. The installer shall fill the annular space between the drill hole wall and the casing pipe with grout (defined in ~~MHD 210(c)(3)~~(7 MCAR § 1.210 C.3.)) to assure equal load-

[2] Caution should be used when handling solvent cement to avoid skin contact or inhalation of vapors.

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ing around the casing in order to prevent collapse or deformation of the casing and to prevent any contamination from entering the well. Native sand may be used in non-artesian wells drilled in outwash material having no clay lense or lenses (a geological stratum composed of clay). The upper 30 feet in any type of well shall be grouted with neat cement grout (defined in ~~MHD 220(e)(3)~~ (7 MCAR § 1.220 C.3.)) using a tremie pipe. A tremie pipe is one which is small enough to fit in the annular space and which carries the grout to the bottom of a hole. The grout shall be fed under pressure from the bottom to the top in one continuous operation.

b. When drilling a rock well, the installer shall seal the casing pipe into the bedrock using neat cement grout (defined in ~~MHD 220(e)(3)~~ (7 MCAR § 1.220 C.3.)).

c. Because of its high heat of hydration, grout made of rapid-setting cement is not permitted for use in wells which are cased with PVC pipe.[3]

4. All plastic-cased wells must terminate above grade as prescribed in ~~MHD 217~~ (7 MCAR § 1.217) and ~~MHD 220(a)(11)~~ (7 MCAR § 1.220A. 11.) The installer may equip a plastic-cased well with a steel casing or steel pitless unit (adapter) which is satisfactory for use in plastic-cased wells, to a depth equal to or greater than the frost line. Where a steel casing or steel pitless unit is not used, the plastic casing shall be extended above grade to a distance prescribed in ~~MHD 217~~ (7 MCAR § 1.217) and ~~MHD 220(a)(11)~~ (7 MCAR § 1.220A. 11.), and must be protected with any one of the following:

a. an oversize steel casing which extends from the top of the plastic casing down to a depth below the frost line, or

b. at least 3 posts (schedule 40 steel pipe) of at least 4 inch diameter at equal distances from each other and which are placed 2 feet from the center of the plastic casing. Such posts shall be installed to a depth of 4 feet into solid ground, or to a depth of 2 feet if each post is surrounded with 1 foot of concrete to a depth of 2 feet, or

c. a well house which is constructed so as to provide a degree of protection which is equivalent to that provided in either ~~a.~~ or b. above.

5. The installer shall plug and abandon a bore hole as prescribed in Minn. Rule ~~MHD 218(e)(2)~~ (7 MCAR § 1.218 C. 2.).

a. whenever the plastic casing cannot be installed without exerting pressure, or

b. whenever a screen or pump cannot be installed without force, or

c. whenever the casing fails during the construction or pumping stages.

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[3] This table shows the strength of PVC at various temperatures based on 73.4°F being 100% of its tested strength.

50°F	60°F	70°F	80°F	90°F	100°F	110°F	120°F	130°F	140°F	150°F
114%	107%	101%	95%	88%	83%	77%	72%	65%	60%	10%

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ERRATA

3 SR 934 "7 MCAR § 1.210" should be underlined.

3 SR 934 7 MCAR § 1.210 B.9., the last sentence should be completely underlined.

3 SR 934 7 MCAR § 1.210 B.9.b., 6th line down, the word oeperations should read "operations".

3 SR 935 7 MCAR § 1.210 13.c. should read 7 MCAR § 1.210 C.

3 SR 935 7 MCAR § 1.210 C.5., the word beering should read "bearing".

3 SR 936 7 MCAR § 1.210 C.12.a., the word Wentwroth should read "Wentworth".

3 SR 936 7 MCAR § 1.210 C.12.a. Table, the first line immediately under "To" should be blank.

3 SR 938 7 MCAR § 1.210 D.1. delete the first "1".

3 SR 938 7 MCAR § 1.210 D.1., 4th line down, the word asepects should read "aspects".

3 SR 938 7 MCAR § 1.210 D.3. 6th line down, insert the before commissioner.

3 SR 938 7 MCAR § 1.211 strike through "MHD 211".

3 SR 399 7 MCAR § 1.211 F.3., 7th line down, omit underl ining under "31".

3 SR 941 7 MCAR § 1.211 I.1., underline "7 MCAR § 1.210-1.230". 13th line down, omit underlining under "31".

3 SR 941 "7 MCAR § 1.217" should be underlined.

3 SR 941 7 MCAR § 1.217 C., the word on should read "or".

3 SR 942 7 MCAR § 1.217 C.1.e., 7th line down, omit underlining under "a pit or unfilled space below ground surface, ~~exeept an approved basement~~".

3 SR 943 7 MCAR § 1.217 E.4., underline "For a community public water supply:"

3 SR 943 7 MCAR § 1.217 E.5., 3rd line down, the word porthold should read "porthole".

3 SR 943 7 MCAR § 1.218 "MHD 218" should have a line through the middle and should not be underlined.

3 SR 943 7 MCAR § 1.218 B.5., 3rd line down, H_sS should read "H_2S", 8th line down, the word adquate should read "adequate".

3 SR 944 7 MCAR § 1.218 C.1."a". should be underlined.

3 SR 944 7 MCAR § 1.218 C.2.e.(2), 8th line down, the word underlying should read "overlying".

3 SR 944 7 MCAR § 1.218 C.2.e.(5), 2nd line down, insert the superscript "3" after "possible".

3 SR 945 7 MCAR § 1.219, draw a line through "MHD 219" and strike the underlining.

3 SR 946 7 MCAR § 1.220 A.1., 6th line down, insert "B 36." after Standard

3 SR 946 7 MCAR § 1.220 A. "4. ~~(5)~~0 Pipe. . ." should read: "5. ~~(5)~~ Pipe. . ."; 2nd line down, Constructio should read "Construction"; 7th line down, minimu should read "minimum"; 10th line down, insert "~~MHD 220(a)(1) and (3)~~" at the end of the line.

3 SR 946 7 MCAR § 1.220 A.6.c., strike "c". after "c."

3 SR 946 7 MCAR § 1.220 A.7.a. delete the line under "Temporary casing s may be standard weight"

3 SR 946 7 MCAR § 1.220 A.7.b., 2nd line down, strike through "tive".

3 SR 947 7 MCAR § 1.220 A.8., 4th line down, 3 should read "4"; Table 2 should be labeled Table 3; the reference in the last sentence should be Table "3".

3 SR 948 7 MCAR § 1.220 A. Table 1, insert "e" in the column heading over the sixth column across, to read "Diameter -- Inches".

3 SR 949 7 MCAR § 1.220 D.1., 6th line down, underline "7".

3 SR 949 7 MCAR § 1.220 E.1. last line, close parentheses after ". . (c)(1)."

3 SR 950 7 MCAR § 1.220 H.4., 7th line down, line should read "liner".

3 SR 952 7 MCAR § 1.221 should be underlined.

3 SR 952 7 MCAR § 1.221 C.1., 9th line down, requrements should read "requirements".

3 SR 952 7 MCAR § 1.222 should be underlined.

3 SR 957 7 MCAR § 1.224 F.2., 3rd line down, thorugh should read "through".

3 SR 965 6 MCAR § 5.002 A.1.b., close parentheses after "milliliters"'

6 MCAR § 5.002 A.1.c. Process should read "Processes".

3 SR 966 6 MCAR § 5.002 A.1.c.(2) insert "(d)" before Filtration.

6 MCAR § 5.002 A.1.c.(2)(e) Disinfection, should read "5" and not 3 points.

3 SR 966 6 MCAR § 5.002 B.1.a.(2) should read as follows: "Design flow, average day or peak month's flow average day, whichever is larger."

3 SR 967 6 MCAR § 5.002 B.1.d.(4), underline "Preaeration with less than 2 hours' detention"

3 SR 968 6 MCAR § 5.003 A.3, A. should read "a".

3 SR 970 6 MCAR § 5.003 F, 2nd line down, secretary should read "director".

(A)

STATE OF MINNESOTA

COUNTY OF HENNEPIN

BEFORE THE MINNESOTA
COMMISSIONER OF HEALTH

In the Matter of Proposed * ADDITIONAL CHANGES TO
Amendments to Rules Relating * AMENDMENTS AS PROPOSED AND
to The Construction of Wells * JUSTIFICATION FOR CHANGES

At a hearing held on December 12, 1978 before Mr. George A. Beck, Hearing Examiner, the Commissioner proposed to amend the Minnesota Water Well Construction Code (7 MCAR §1.210-.230). The proposed amendments were published at 3 S.R. 934. Additional changes to the revisions as published were made in writing and were submitted along with the justification therefor to the Hearing Examiner in the Statement of Need and Reasonableness. At the hearing further changes were proposed by the commissioner's representative and by members of the public. These proposed changes will be discussed below.

7 MCAR §1.217 B. Community public water supply shall be defined in a footnote which shall read as follows:

"Community public water supply, as prescribed in 7 MCAR §1.145 A.12, means a system providing piped water for human consumption, which serves 15 service connections or living units or regularly serves at least 25 persons residing in the area for more than six months of the year."

7 MCAR §1.217 C.1.e. shall read as follows:

"Twenty feet (20 ft.) from a buried sewer constructed of cast iron pipe or plastic pipe (ASTM 2665 for polyvinyl chloride pipe or ASTM 2661 for acrylonitrile-butadiene-styrene pipe, as prescribed in the Minnesota Plumbing Code, MHD 123(c)(3)) with tested watertight joints, ~~or other material acceptable to the Board or~~ a pit or unfilled space below ground surface, a sump[4] or a petroleum storage tank, ~~except an approved basement~~ except that a well may be drilled closer than 20 feet to an approved basement, but no closer than

as provided in MHD 217(d)(1). A community public water supply well shall be isolated at least 50 feet from any source of contamination.

"[4]Sump means a water tight tank which receives sewage or liquid waste and which is located below the normal grade of the gravity system and must be emptied by mechanical means."

The changes proposed at the hearing involve the addition of two types of structures from which wells must be placed at least 20 feet. These are sump, which is defined in a footnote and petroleum storage tank, which was formerly contained in 7 MCAR §1.217 C.1.d. A representative from St. Louis County proposed the addition of the sump and upon considering the proposal we have determined that it is indeed useful to list this structure specifically rather than assume it would be covered under other sources of contamination in subpart d. Since both the sump as defined here and petroleum storage tanks are sealed, it is safe to allow them to be placed within 20 feet of a well. The proposed change and addition do not impose additional burdens on anyone and they do serve to protect the public health. Therefore they are both reasonable and necessary.

7 MCAR §1.218 B.4 shall read as follows:

Repairs to wells completed with the well head terminating below ground (buried seal) where practicable, should include extending the well casing, ~~(~~pitless adapter~~)~~, or pitless unit above the land surface. Extension of the casing above grade shall be accomplished in accordance with rules and standards for new wells."

The reasons for the changes are the following: in the existing rule the words "pitless adapter" were erroneously contained within parentheses when in fact they were not intended to be merely a parenthetical phrase but rather they were intended to be an additional

type of structure which should be brought above grade if alternatives were made. In the proposed amendments, a new term "pitless unit" is being defined. The new term logically belongs in this section since it provides yet another method by which the casing can be brought above grade when the well casing is being repaired or altered. The need for adopting the new term "pitless unit" was discussed in the Statement of Need and Reasonableness at page 5.

The title of Table 2 in 7 MCAR §1.220 A.7 shall read as follows:

" Table 2

Inner and Outer Casing Combinations providing the minimum annular space when welded joints are used."

The new addition to the title of the table clarifies the applicability of the information contained in the table.

7 MCAR §1.220 D.1. shall read as follows:

"Rotary, bored, or augered wells shall be constructed with a watertight casing of 2" diameter or larger, ~~installed in an open hole having a diameter of at least 2" larger than the maximum outside diameter of the casing.~~ The annular space around the casing shall be tightly sealed in accordance with materials and procedures described in 7 MCAR §1.220 C. A rotary, bored or augered well completed in a drift formation may be sealed by pumping the well to collapse the formation; however, the top 20 feet below the land surface shall be sealed in accordance with 7 MCAR §1.220 C. or F. and any annular space remaining unfilled shall be grouted with neat cement or concrete using a tremie pipe to pump the grout under pressure from the bottom up in one continuous operation."

The language to be deleted in the second and third lines was written in the existing rule as if it applied to all rotary, bored, or

augered wells including those which are constructed in drift. If the well is to be constructed in a glacial drift formation with standard weight steel casing the formation will collapse around the casing and drilling mud will fill the near-surface annular space. Over sized holes are required only when drilling into rock, and are specifically covered in other sections. The elimination of this requirement for an oversized hole reflects this determination. The new language being proposed in the last sentence was discussed in the Statement of Need and Reasonableness at page 17.

7 MCAR §1.220 H.1. shall read as follows:

"~~(1)~~ 1. Geological formations which are creviced or cavernous ~~should~~ shall not be used as a potable source of ground water unless overlain by at least 50 feet of drift material and/or by a firm insoluble rock material extending for at least one mile horizontal distance from the well in all direction to render the movement of contaminated water in the formation to the well improbable. ~~The easing shall extend at least 10 feet below the pumping level.~~ The ~~easing~~ well shall ~~extend~~ be cased and grouted at least 10 feet below the pumping level. Where the pumping level is determined to be above the cavernous formation and the casing is seated into solid rock, the well shall be grouted in accordance with 7 MCAR §1.220 D.1. Where the pumping level is determined to be below the top of the cavernous formation the drill hole shall be at least 4 inches larger in diameter than the nominal casing size if welded construction if used, and 4 inches larger than the couplings if threaded joints are used, and the annular space shall be filled with neat cement or concrete grout as provided in 7 MCAR §1.220 C. ~~The acceptability from a sanitary standpoint of water obtained from a well developed in such a protected faulty geological formation will be dependent upon treatment of the water if the need for such is indicated by analytical studies of the water.~~"

Several changes are being made to this section. In the first sentence, the use of cavernous formations without 50 feet of overlying drift is being prohibited outright, because such wells often yield water that is not bacteriologically safe and for which treatment on an individual basis is not practical. The existing language which used the word "should" lead to misunderstanding by the well contractors and the public as to applicability of the rule. The first sentence to be stricken is repeated as part of the following rewritten sentence. The last 2 new sentences prescribe special grouting requirements which are dependent upon the pumping level of the well. The phrase "pumping level" is defined in 7 MCAR §1.210 C.22. These changes only clarify what was intended in the existing rule.

7 MCAR §1.220 O.1.b, and c. shall read as follows:

"b. be installed in an oversized hole at least 6 inches in diameter larger than the casing with the annular space between the casing and the formation filled 3 inches thick with neat cement or concrete grout placed in one operation to a depth sufficient to exclude water which is or may be contaminated, or to a depth of 10 feet, whichever is greater, or

c. be installed with a watertight concrete curbing or casing at least four (4) inches thick poured in one operation to a depth sufficient to exclude water which is or may be contaminated or 10 feet whichever is greater. The annular space between the casing and the formation shall be filled as provided in 7 MCAR §1.220 D. or 7 MCAR §1.220 F."

7 MCAR §1.220 O.1.d. shall read as follows:

"d. "be protected with a heavy pre-cast overlapping steel reinforced concrete cover or a heavy locked overlapping metal cover not less than 3/16" in thickness. The cover shall be tight fitting so as to exclude vermin, dust, or other contaminants from the well."

These changes were proposed by St. Louis County and some of them were separately proposed by a water well contractor. Upon

reconsideration, we have determined that a hole which is 6 inches larger than the casing size, and which will result in 3 inches of grout around the casing is sufficient to seal off the formation and would serve the purpose here. The provision of an alternative casing/grouting method in subpart c allows the contractor more flexibility with regard to method of construction. The alternative does require a thicker (4" rather than 3" of grout required in subpart b) curbing or casing because no separate casing is installed in this instance. 7 MCAR §1.220 O.1.d. prescribes with greater specificity the type of cover which must be used to protect such a well. All the changes being proposed in this section are made for the purpose of assuring that a dug or bored well will produce safe drinking water for as long as it is pumped.

7 MCAR §1.220 O.1.e. shall read as follows:

> "have pump openings and any below-grade connection sealed with concrete or cement as prescribed in c. above."

The new phrase is to be added because there is a need to seal off all such connections from surface contamination and not just pump openings. The new addition will help assure that all predictable sites for entry of contaminants have been sealed off.

7 MCAR §1.221 C.1. shall read as follows:

> "A connection to a well casing made below ground, or less than 12 inches above the established ground surface, shall be protected by ~~threaded or welded joints or by~~ a pitless adapter or pitless unit. The ~~threaded or welded joints or~~ pitless adapter or pitless unit shall be approved by the ~~Board~~ Commissioner on the basis of design and materials. A below-ground connection shall not be submerged in water at the time of installation. The Director will furnish a list of approved pitless adapters and units that meet the requirements of these

rules. Native materials shall be packed tightly around the casing and pitless adapter or pitless unit after installation."

The changes being proposed regarding the use of pitless units and adapters are being made to reflect the new definitions for pitless adapter and pitless unit.

7 MCAR §1.222 B. shall read as follows:

"Slabs, Platform and Floors. A well, except where an approved pitless adapter or pitless unit is used, shall be protected by a durable watertight concrete or equal slab, platform or floor, 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, which may be asphalt or similar material to provide resiliency, shall be provided between the casing and the platform, pump room or approved basement floor or slab."

The phrase "or pitless unit" is being added in this section for the same reason as was noted several times earlier.

7 MCAR §1.222 G.1. shall read as follows:

"All wells shall be vented. A casing vent shall be of materials complying with 7 MCAR §1.222 D.1. with watertight joints terminating at least 2 feet above the regional flood level or one foot above the established ground surface or the floor of a pump room, well room or approved basement, whichever is higher. The casing vent shall be screened and point downward. Vents may be offset provided they meet the provision of this rule. Any submersible pump shall be installed with a vented cap on the top of the well casing or pitless ~~adapter~~ unit to

prevent drawing near surface water, mud, sand, etc., into the well through shielding around the electric cable. Flowing artesian wells may be exempted if protected by a specially designed pitless ~~adapter~~ unit or if the casing is protected as provided in 7 MCAR §1.220 B. ~~For wells of an inch and one quarter diameter casing or as otherwise protected to insure that contaminated water will not enter the well not using a drop pipe venting is not required when equipped with a suction pump provided the casing is protected in accordance with 7 MCAR §1.220 B.~~ Where the well casing on small diameter wells (one and one half inch or less) is used as a suction pipe, the casing need not be equipped with a vented cap, provided the casing is protected in accordance with 7 MCAR §1.220 B.

Most of the changes being made here relate to the use of the additional term "pitless unit", which has been discussed earlier. The last sentence has been rewritten to clarify its meaning and a new definition for small diameter wells is provided. Several drillers who have experience with such wells persuaded us that problems with possible contamination would not increase if casings up to 1.5 inch diameter were used as the vent pipe. This relaxation of the construction code seems reasonable since the public's health is not endangered thereby.

7 MCAR §1.224 F.2. shall read as follows:

"An installer may not insert the drill stem ~~or drilling equipment~~ inside the plastic casing when drilling any kind of well."

The provision prohibiting insertion of drilling equipment inside the plastic casing is being lifted since it prevented the driller from being able to use the equipment necessary to allow him to lift out

a screen which needed changing. The prohibition against insertion of the drill stem does remain since the drill stem can cause considerable damage to plastic casing once it is in place. The language which had been proposed in the published revision is being withdrawn because it was confusing and unclear.

All of the foregoing changes are proposed either for purposes of clarification of existing language, for the purpose of implementing policy into legally binding rule, or for the purpose of resolving problems which arose under or were not addressed in the existing code. For these reasons the revisions proposed here are necessary. Since none of the proposed changes are predicted to impose any serious burdens on either well owners or water well contractors and since the changes help further the purposes of the enabling legislation, they are reasonable.

Date: January 2, 1978

MINNESOTA DEPARTMENT OF HEALTH
DIVISION OF ENVIRONMENTAL HEALTH

Melvin Borman (for)
Richard L. Wade, Ph.D., M.P.H., Director
Division of Environmental Health

AMENDMENTS BEING PROPOSED
TO WELL CODE REVISIONS AT
HEARING OF DECEMBER 12, 1978

Changes to the existing well code which were not included in the version which was printed in the State Register are presented here. For any named subsection or part, the new language given below is to be substituted for that which appeared in tne printed version.

7 MCAR § 1.210 B.9. should have a definition of large diameter well and should read as follows:

"Year of experience" means a year during which the applicant personally drilled five (5) water wells and was actively working in the trade for a period of 1,000 hours under the supervision of a licensed water well contractor. An applicant drilling 1,000 hours per year and completing fewer than 5 wells per year may qualify, if the experience is gained in constructing one or more large diameter wells (casing outer diameter is 10 inches or more) which are more than 500 feet deep. An applicant who seeks to qualify under this provision shall have his license limited to construction of such deep and large diameter wells.

7 MCAR § 1.210 C.15. is being redefined thus:

a. "Pitless adapter" means ~~a device or assembly of parts which will permit water to pass through the wall of the well casing or extension thereof, and which provides access to the well and to the parts of the water system within the well in a manner to prevent entrance of pollution into the well and the water produced.~~ a device for above or below ground discharge designed for attachment to one or more openings through a well casing, and constructed so as to prevent the entrance of contaminants into the well.

b. "Pitless unit" means an assembly with cap which extends the upper end of the well casing to above grade, and constructed so as to prevent the entrance of contaminants into the well.

7 MCAR § 1.210 D.3.b. should read as follows:

b. ~~(bb) The licensee shall state the specific exceptions requested plus explain in detail the reasons for such request.~~ Any request for modification shall be submitted to the commissioner in writing and shall be signed by both the owner and the licensee. In addition, any persons involved in providing documentary evidence in support of the request shall sign the request submitted by the owner. Such request shall specify in detail the nature of the modification being sought, the reasons therefor, and the special precautions to be taken to avoid contamination of the well. The request shall also include: the proposed well depth, casing type and depth, method of construction and grouting, geological conditions likely to be encountered, and location of well and of possible sources of contamination. Whether or not the requests are granted, the ~~Board~~ commissioner shall state in detail the reasons for ~~its~~ the decision.

7 MCAR § 1.217 C.5. should read as follows:

The administrative authority may modify the isolation distances in this rule for individual well installations. ~~The modifications shall be made in writing to the owner, with a copy to the Board, either increasing or decreasing the minimum isolation distance and shall state the reason for the modification based on overburden, depth of well, character of aquifer, maximum pumping rate, or other factors affecting the movement of pollution.~~ A request for modification of the isolation distance from an existing well shall include information regarding the well depth, casing type and depth, method of construction and grouting, proposed location and design of potential source of contamination and soil conditions. Such request shall be signed by the owner and by those persons, such as soil scientists, hydrologists, sanitarians, disposal system designers, water well contractors and appropriate local officials involved in providing documentary evidence in support of the request. A copy of the request shall be sent to the commissioner.

7 MCAR § 1.218 B.4. sh· read as follows:

"Repairs to wells completed with the well head terminating below ground (buried seal) where practicable, should include extending the well casing, ~~(~~pitless adapter~~)~~, or pitless unit above the land surface. Extension of the casing above grade shall be accomplished in accordance with rules and standards for new wells."

7 MCAR § 1.220 D.1. should read as follows:

"Rotary, bored, or augered wells shall be constructed with a watertight casing of 2" diameter or larger. ~~installed in an open hole having a diameter of at least 2" larger than the maximum outside diameter of the casing.~~ The annular space around the casing shall be tightly sealed in accordance with material and procedures described in 7 MCAR § 1.220 C. A rotary, bored or augered well completed in a drift formation may be sealed by pumping the well to collapse the formation; however, the top 20 feet below the land surface shall be sealed in accordance with rule 220(c) and 220(f) 7 MCAR § 1.220 C. or F. and any annular space remaining unfilled shall be grouted with neat cement or concrete using a tremie pipe to pump the grout under pressure from the bottom up in one continuous operation."

7 MCAR § 1.222 G.1. sh.. read as follows:

"All wells shall be vented. A casing vent shall be of materials complying with 7 MCAR § 1.222 D.1. with watertight joints terminating at least 2 feet above the regional flood level or one foot above the established ground surface or the floor of a pump room, well room or approved basement, whichever is higher. The casing vent shall be screened and point downward. Vents may be offset provided they meet the provision of this rule. Any submersible pump shall be installed with a vented cap on the top of the well casing or pitless ~~adapter~~ unit to prevent drawing near surface water, mud, sand, etc., into the well through shielding around the electric cable. Flowing artesian wells may be exempted if protected by a specially designed pitless ~~adapter~~ unit or if the casing is protected as provided in 7 MCAR § 1.220 B. ~~For wells of an inch and one quarter diameter~~

~~casing or as otherwise protected to insure that contaminated water will not enter the well not using a drop pipe venting is not required when equipped with a suction pump provided the casing is protected in accordance with 7 MCAR § 1.220 B.~~ Where the well casing on small diameter wells (one and one quarter inch or less) is used as a suction pipe, the casing need not be equipped with a vented cap, provided the casing is protected in accordance with 7 MCAR § 1.220 B.

7 MCAR § 1.220 H. should read as follows:

"~~(1)~~ 1. Geological formations which are creviced or cavernous ~~should~~ shall not be used as a potable source of ground water unless overlain by at least 50 feet of drift material and/or by a firm insoluble rock material extending for at least one mile horizontal distance from the well in all directions to render the movement of contaminated water in the formation to the well improbable. The drill hole shall be at least 4 inches larger in diameter than the nominal casing size if welded construction is used, and 4 inches larger than the couplings if threaded joints are used. The ~~casing~~ well shall ~~extend~~ be cased and grouted at least 10 feet below the pumping level. The annular space shall be filled with neat cement or concrete grout as provided in MHD 220(c). ~~The acceptability from a sanitary standpoint of water obtained from a well developed in such a protected faulty geological formation will be dependent upon treatment of the water if the need for such is indicated by analytical studies of the water.~~"

7 MCAR § 1.221 C.1. should read as follows:

"A connection to a well casing made below ground, or less than 12 inches above the established ground surface, shall be protected by ~~threaded or welded joints or by~~ a pitless adapter or pitless unit. The ~~threaded or welded joints or~~ pitless adapter or pitless unit shall be approved by the ~~Board~~ Commissioner on the basis of design and materials. A below-ground connection shall not be submerged in water at the time of installation. The Director will furnish a list of approved pitless adapters and units that meet the requirements of these rules. Native materials shall be packed tightly around the casing and pitless adapter or pitless unit after installation."

7 MCAR § 1.222 B. should read as follows:

"Slabs, Platform and Floors. A well, except where an approved pitless adapter or pitless unit is used, shall be protected by a durable watertight concrete or equal slab, platform or floor, 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, which may be asphalt or similar material to provide resiliency, shall be provided between the casing and the platform, pump room or approved basement floor or slab."

7 MCAR § 1.223 A.2. should read as follows:

"If the licensee chooses to submit the water sample to a laboratory other than that of the Minnesota Department of Health, that laboratory must be certified*by the Minnesota Department of Health for determination of the presence of coliform bacteria. The sample must be collected in containers approved by the Director and must be received by the certified laboratory within 30 hours of the time of collection. The costs of such analysis shall be paid by the licensee. Results of the analysis shall be submitted to the Minnesota Department of Health.

*pursuant to the procedure prescribed in 7 MCAR § 1.143 (MHD 143).

* * * * *

STATE OF MINNESOTA
OFFICE OF HEARING EXAMINERS

FOR THE COMMISSIONER OF HEALTH AND
THE WATER AND WASTEWATER OPERATORS CERTIFICATION COUNCIL

In the Matter of Amendments to Rules Relating to Construction of Wells and to Water and Wastewater Facility Classification and Operator Certification.

REPORT OF HEARING EXAMINER

The above-entitled matter came on for hearing before State Hearing Examiner George A. Beck on December 12, 1978, at 12:30 p.m. in Room 15 of the Minnesota Department of Health Building at 717 Delaware Street Southeast, City of Minneapolis, County of Hennepin, State of Minnesota.

This Report is a part of a rule hearing proceeding pursuant to Minn. Stat. Sec. 15.0411 to Sec. 15.0417 and Sec. 15.052, to determine whether the proposed rules should be adopted and given the force of law. A copy of this Report may be obtained from the Office of Hearing Examiners for the cost of reproduction.

Members of the agency panel appearing at the hearing included: Pauline Bouchard, Staff Attorney, Department of Health; Verne Carlson, Chairman, Water and Wastewater Operators Certification Council; William Lloyd, member, Water and Wastewater Operators Certification Council; Paul Johnson, Engineering Consultant to the Department of Health; and Edwin H. Ross, Supervisor, Groundwater Quality Control Unit, Minnesota Department of Health.

Seven public witnesses appeared and spoke at the hearing. The Department and the Council submitted 20 written exhibits. Twelve written comments were received from the public subsequent to the publication of the Notice of Hearing through the end of the 20 calendar day period for written comments following the hearing.

Based upon all the testimony, exhibits and written comments, the Hearing Examiner makes the following:

FINDINGS OF FACT

1. On October 18, 1978, the Department and the Council filed the following documents with the Chief Hearing Examiner:

(a) Copies of the proposed rules.
(b) A proposed Order for Hearing.
(c) A proposed Notice of Hearing.
(d) A Statement of number of persons expected to attend and length of hearing.
(e) A Certificate of Resolution by the Council.

2. On November 6, 1978, a Notice of Hearing and copies of the proposed rules were published at 3 State Register 934.

3. On November 9, 1978, the Department and Council mailed the Notice of Hearing to all persons and associations who had registered their names with the Secretary of State to receive such notice and to all members of the Minnesota Legislature.

4. On November 16, 1978, the Department and the Council filed the following documents with the Hearing Examiner:

(a) The Order for Hearing.
(b) The Notice of Hearing as mailed.
(c) The Notice of Hearing and proposed rules as published in the State Register.
(d) Affidavit of Receipt of the Secretary of State's list.
(e) Certificate of the Secretary of State.
(f) Affidavit of Mailing of the Notice of Hearing.
(g) Statement of Agency Testimony.
(h) Statement of Need and Reasonableness.

The documents were available for inspection at the Office of Hearing Examiners from the date of filing to the date of the hearing.

5. The record remained open through January 2, 1979, for the receipt of written comments and statements.

6. The Water and Wastewater Treatment Operators Certification Council cites Minn. Stat. Sec. 115.79 as authority for promulgation of the proposed rules. That section reads as follows:

> The council, with the advice and approval of the state department of health and the Minnesota pollution control agency, and in accordance with any other appropriate state laws shall make such rules and regulations as are necessary to carry out the intent of sections 115.71 to 115.82. The rules and regulations shall include but are not limited to, provisions establishing the bases for classification of water supply systems and wastewater treatment facilities in accordance with section 115.72 and provisions establishing qualifications of applicants and procedures for examination of candidates and such other provisions as are necessary for the administration of sections 115.71 to 115.82.

7. The Department of Health states that its authority to amend the rules relating to construction of wells is contained in Minn. Stat. Ch. 156A. Minn. Stat. Sec. 156A.03, subd. 1 provides that:

> The state board of health shall regulate and license the drilling and constructing of all water wells within the state, examine and license water well contractors and, after consultation with the commissioner of natural resources and the pollution control agency establish standards for the design, location and construction of water wells within the state.

Minn. Stat. Sec. 156A.05, subd. 2 reads as follows:

> Subd. 2. The board of health shall by December 31, 1971, in the manner prescribed by Minnesota Statutes, Chapter 15, hold a public hearing and promulgate rules and regulations necessary to carry out the purposes of sections 156A.01 to 156A.08 including, but not limited to:
>
> (a) Issuance of licenses for qualified water well contractors.
>
> (b) Establishment of conditions for examination and review of applications for license.
>
> (c) Establishment of conditions for revocation and suspension of license.
>
> (d) Establishment of minimum standards for design, location and construction of wells to effectuate the purpose and intent of sections 156A.01 to 156A.08.
>
> (e) Establishment of a system for inspection of wells during construction.

8. At the hearing, the agency submitted written exhibits documenting the approval of the rules offered by the Council by the Executive Director of the Pollution Control Agency and by the Commissioner of Health, pursuant to Minn. Stat. Sec. 115.72, subd. 2 and Sec. 115.79. (Exs. 12, 13) In regard to the amendments proposed by the Department of Health, a Certificate of Consultation was entered into the record signed by the Commissioner of the Department of Natural Resources indicating compliance with Minn. Stat. Sec. 156A.03, subd. 1. The record does not contain a Certificate of Consultation from the Pollution Control Agency in regard to the well code amendments as required by Minn. Stat. Sec. 156A.03, subd. 1.

Rules Relating to Water and Wastewater Facility Classification and Operator Certification

9. The Water and Wastewater Certification Council proposes to repeal its existing rule 6 MCAR Sec. 5.001 and adopt three new rules which incorporate a good deal of the repealed rule. The revision of the old rule is primarily due to a need to particularize the classification and rating system for wastewater treatment plants and to clarify the qualifications of persons who could be certified to operate different classes of systems or facilities.

10. 6 MCAR Sec. 5.001 sets out the purpose of the proposed rules and supplies certain definitions. This proposed rule drew no public comment. The need and reasonableness were demonstrated in the Statement of Need and Reasonableness. (Ex. 3, p. 24-27) The word "regulations" contained in Sec. 5.001 A.3. should be changed to "rules".

11. 6 MCAR Sec. 5.002 specifies the criteria by which systems and facilities will be classified. This proposed rule drew no public comment. The agency's written submission adequately demonstrates the need for and reasonableness of the proposed rule. (Ex. 3, p. 27-28) At the hearing, the Council indicated that Sec. 5.002 B.1.a.(2) should read "design flow, average day, or peak month's flow, average day, whichever is larger". The Council also proposed, in regard to Sec. 5.002 C., that the word "sewage" contained in that subsection be changed to the word "wastewater" since the two words are synonymous and the word "sewage" is not used elsewhere in the proposed rules. (Ex. 19, p. 3) Neither of these changes would appear to be substantial.

12. 6 MCAR Sec. 5.003 sets out the qualifications for certification, the examination procedure, the renewal procedure and repeats the fees which were set in the repealed rule. Two general comments were received in regard to this proposed rule. In regard to Sec. 5.003 A., Bruce A. Nelson, Executive Director of the Alexandria Lake Area Sanitary District, stated he believed that the proposed rules would result in lengthening of the experience requirements in order to obtain certification. His concern is that individuals who come into the field with a strong educational background may be discouraged by the the experience requirement. (Ex. I) The Council stated that the proposed rule does slightly increase the experience requirement for an A Certificate because in the past, many applicants with only two years experience did not possess a sufficiently wide variety of skills to enable them to assume control

of an A system or facility. The Council noted that the qualifications for B and C Certificates are unchanged in regard to experience and the requirement is lessened in regard to a D Certificate. (Ex. 3, p. 29) Donald O. Blood, Public Works Superintendent for the City of Brooklyn Park, commented in regard to Sec. 5.003 B., that different lists should be developed for operators of distribution systems and operators of treatment plants and that if a person passing one test seeks to be employed in the other area further training or retesting should be required. (Ex. J, p. 1; Ex. F) The rule, as proposed, would seem to permit this and the Council may consider these comments as a matter of policy. In regard to Sec. 5.003 E., dealing with certification renewal, Mr. Blood commented that he supported the concept of training courses and would like to see a variety of courses offered from year to year. (Ex. J, p. 2)

13. The Council proposed several amendments to Sec. 5.003 at the hearing. It was suggested that Sec. 5.003 A.2.e.(2) be amended to read as follows:

> When one applies for an S-A certificate, he or she shall have been certified as an S-B operator for two years.

The amendment deletes the requirement that an applicant possess an S-C certificate when applying for an S-B certificate. It was suggested that 6 MCAR Sec. 5.003 A.3.b.(3) be amended to read as follows:

> An applicant may be given credit for taking the same course more than once if there is a substantial difference in course content, only upon approval of the council.

The amendment is offered to make it clear that credit will be given for taking the same course the second time only if there is a difference in course content. In regard to Sec. 5.003 B.1.a., the word "should" in the rule is suggested to be changed to "shall" making submission of an application for examination 15 days prior to the date of the examination mandatory. The Council also suggested that Sec. 5.003 C.2. be amended to read as follows:

> No restricted certificate will be granted if reclassification was the result of a major alteration to the system or facility, the operation of which would require considerably more knowledge or experience than that required by the system or facility as it was formerly classified.

This amendment was proposed to require a reevaluation of this system or facility which is independent of the qualifications of the current operator. (Ex. 19, p. 1-3) It was also suggested at the hearing that the word "secretary" in Sec. 5.003 F. be changed to the word "director" to conform to the rest of the rule. None of these changes appear to be substantial.

14. The record adequately demonstrates the need for and reasonableness of 6 MCAR Sec. 5.003. See, Exhibit 3, p. 28-32. It should be noted that there is a numbering-lettering problem in the rule as printed in the State Register at Sec. 5.003 A.3.a.(1).

Amendments to Rules Relating to the Construction of Wells

15. Several amendments were suggested to 7 MCAR Sec. 1.210 which contains definitions and policies. At the hearing, the Department suggested changes

in two definitions. In regard to Sec. 1.210 B.9, the Department suggested that the phrase, "one or more large diameter wells" appearing in the definition be defined by adding the following language directly after that phrase: "(casing outer diameter is 10 inches or more)". The Department also suggested that the definition of "pitless adapter" at Sec. 1.210 C.15. be amended to read as follows:

> 15.a. "Pitless adapter" means a device for above or below ground discharge designed for attachment to one or more openings through a well casing, and constructed so as to prevent the entrance of contaminants into the well.
>
> b. "Pitless unit" means an assembly with cap which extends the upper end of the well casing to above grade, and constructed so as to prevent entrance of contaminants into the well.

Neither of these proposed changes would appear to be substantial. (Ex. 14, p. 1)

16. Curtis E. Anderson, Supervising Sanitarian of the St. Louis County Health Department, proposed that the following new definition be added to the definition section:

> Sump. A water tight tank which received sewage or liquid waste and which is located below the normal grade of the gravity system and must be emptied by mechanical means.

(Ex. C, p. 1) Mr. Anderson suggests this definition is necessary to a later amendment he proposes to Sec. 1.217 C.1.d. The Commissioner may consider this addition.

17. The Department's proposed amendment to Sec. 1.210 D.3.b. provides that any experts or persons involved in providing documentary evidence in support of a request for modification shall sign the request submitted by the owner. Robert M. Hutchinson, Director of Environmental Services for Anoka County, stated that if this requirement were to apply to representatives of official agencies such as local building or health departments it would cause problems because of the possibility of incurring liability on the part of the governmental agency. He believes that this would be a cumbersome process requiring county board or city council action and would discourage cooperation between local officials and the health department. (Ex. D, p. 1) The Department proposed an amendment to Sec. 1.210 D.3.b. at the hearing so that the subsection would read as follows:

> Any request for modification shall be submitted to the commissioner in writing and shall be signed by both the owner and the licensee. In addition, any persons involved in providing documentary evidence in support of the request shall sign the request submitted by the owner. Such request shall specify in detail the nature of the modification being sought, the reasons therefor, and the special precautions to be taken to avoid contamination of the well. The request shall also include: the proposed well depth, casing type and depth, method of construction and grouting, geological conditions likely to be encountered, and location of well and of possible sources of contamination. Whether or not the requests are granted, the commissioner shall state in detail the reasons for the decision.

The amendment offered at the hearing does not appear to be substantial. It does not address the comment by Mr. Hutchinson which the Department may consider as a matter of policy.

18. The proposed amendments to Sec. 1.210 were shown to be needed and reasonable. (Ex. 3, p. 2-8) It should be noted that throughout this rule and throughout the rules proposed for amendment in regard to the construction of wells, the word "regulations" is used. This word should either be replaced by the word "rule" or deleted where used in conjunction with the word "rules". This would not be a substantial change.

19. The amendments to 7 MCAR Sec. 1.211 dealing with licensing were primarily housekeeping in nature, attracted no public comments, and were demonstrated to be needed and reasonable. (Ex. 3, p. 8-9)

20. 7 MCAR Sec. 1.217 deals with location of wells. At Sec. 2.217 B.5., the Department proposed to replace the phrase, "municipal water supply" with "community public water supply" because the latter is the language currently used to describe all water supplies whether municipal or private. John S. Johnson of Johnson Brothers Well Drilling Company and five other well drillers, suggested that the phrase, "community public water supply" should be carefully defined and included in these rules. (Ex. L, p. 1, 4) The Department proposed that the following definition of "community public water supply" be included in a footnote to this rule subsection:

> "Community public water supply" as prescribed in 7 MCAR Sec. 1.145 A.12., means a system providing piped water for human consumption, which serves 15 service connections or living units or regularly serves at least 25 persons residing in the area for more than six months of the year.

With the new definition, the amendment is needed and reasonable.

21. Section 1.217 C.1.d. was proposed to be amended to delete the specific phrase "petroleum storage tank" from the requirement that a well has to be 50 feet distant and to add a general phrase, "or other contaminants" which the Department believes would expand the possible types of contaminating sources in the rule. Mr. Johnson suggested that while it is true that it is often difficult or even impossible to maintain a 50 foot separation distance between a buried oil tank and a well, the rule should be amended to require at least a 20 foot distance between a buried oil or gas tank and a well. (Ex. L, p. 1, 4) Mr. Anderson suggested that the word "sump" be included among the specific items and that the word "buried" be added before "petroleum storage tank" since these two items are common contamination sources often overlooked by contractors and homeowners. (Ex. C, p. 1) The only testimony offered by the Department in support of the change in this subsection was that the amendment would, "by use of more general language, expand the possible types of contaminating sources from which a proposed well must be built at least 50 feet." (Ex. 3, p. 10) The agency has accordingly failed to demonstrate by an affirmative presentation of facts the need for or reasonableness of deleting the term "petroleum storage tank". This problem is cured by the revision suggested by the Department of Section 1.217 C.1.e. below. The Department may consider the public comments made

22. Section 1.217 C.1.e. was the subject of an amendment offered by the Department at the hearing. This amendment incorporates the suggestions made by Mr. Johnson and Mr. Anderson in regard to the previous rule subsection in that they provide that both sumps and petroleum storage tanks may be no closer than 20 feet to a well. (Ex. 18, p. 1) The amendment as amended at the hearing would read as follows:

> Twenty feet (20 ft.) from a buried sewer constructed of cast iron pipe or plastic pipe (ASTM 2665 for polyvinyl chloride pipe or ASTM 2661 for acrylonitrile-butadiene-styrene pipe, as prescribed in the Minnesota Plumbing Code, MHD 123(c)(3)) with tested watertight joints, a pit or unfilled space below ground surface, a sump[4] or a petroleum storage tank, except that a well may be drilled closer than 20 feet to an approved basement, but no closer than as provided in MHD 217(d)(1). A community public water supply well shall be isolated at least 50 feet from any source of contamination.
>
> [4]Sump means a water tight tank which received sewage or liquid waste and which is located below the normal grade of the gravity system and must be emptied by mechanical means.

So amended, the proposed rule is needed and reasonable.

23. Section 1.217 C.1.f. was the subject of several comments. Mr. Anderson suggested that the phrase, "and not encountering at least 10 feet of impervious material" be deleted from this rule since it almost impossible to make this determination and, even if it does exist at the well site, it may not exist at the contamination source site. (Ex. C, p. 1) Both Melvin McGowan and Larry Fyle of the Minnesota Onsite Sewage Treatment Contractors Association stated that the isolation distance as set out in this rule make it impossible to place a well on many substandard size lots. They supported a reduction in these distances. Mr. Anderson opposed any such change and suggested that the variance procedure was adequate to handle any exceptions. (Ex. H) The amendments which were originally offered by the Department to this subsection and as published in the State Register do not address the isolation distances. Consequently, any change in these distances would likely constitute a substantial change without adequate notice. The matter of isolation distances was the subject of extensive comments during PCA rule hearings in regard to WPC 40 in November of 1977. The PCA decided to defer to the distances set out in the Health Department's Well Code according to a June, 1978 Memorandum from the PCA to the Health Department. The PCA documented the public concern over this question, acknowledged a lack of good data concerning water well setbacks and suggested a joint effort to resolve the problems which have occurred as a result of the 100 foot water well setback requirement. An October 12, 1978 Memorandum from the PCA to the Health Department which reviewed these proposed well code rule amendments noted that the amendments did not address the problem of isolation distances between existing water supply wells and new onsite sewage treatment systems. (Ex. K) It is the Department's position, set out in a July 17, 1978 memorandum to the PCA, that the isolation distances are proper given the existing state of knowledge and that variance procedures can alleviate any hardship. Accordingly, the Health Department suggested no revision of the distances in

this rule proceeding. The proposed changes to this rule subsection have been shown to be needed and reasonable. The attention of Messrs. McGowan and Fyle is directed toward Minn. Stat. Sec. 15.0415, which would permit them to petition the Health Department to amend the isolation distances.

24. The proposed amendment to Sec. 1.217 C.5. sets out the requirements for a request for modification of the isolation distance. Mr. Hutchinson again noted that requiring public officials to sign the request would raise liability problems and the possibility of approval by a city council or county board. (Ex. D) Mr. Nelson stated that the variance procedure should not have mandatory requirements for submission since some of the information set out in the proposed amendment is impossible to gather in regard to an old well. Nelson pointed out that the cost of moving an old well because of inability to obtain a variance can cost in excess of $4,000. (Exs. I, G) At the hearing, the Department offered an amendment to its proposed amendment which would have the subsection read as follows:

> The administrative authority may modify the isolation distances in this rule for individual well installations. A request for modification of the isolation distance from an existing well shall include information regarding the well depth, casing type and depth, method of construction and grouting, proposed location and design of potential source of contamination and soil conditions. Such request shall be signed by the owner and by those persons, such as soil scientists, hydrologists, sanitarians, disposal system designers, water well contractors and appropriate local officials involved in providing documentary evidence in support of the request. A copy of the request shall be sent to the commissioner.

The amendment makes it clear that appropriate local officials are included within the requirements of the rule. The Department states that the language requires all of the information which is necessary in order for the decision maker to be able to make a reasoned judgment as to whether or not a potential source of contamination could be placed close to an existing well. (Ex. 3, p. 13) The amendment cannot be said to be so arbitrary as to be unreasonable, however, the Department should consider the comments made by Messrs. Nelson and Hutchinson prior to final adoption. It would appear that the rule could be easily rewritten to require submission of only that data which can be obtained with a reasonable effort.

25. The agency proposed an amendment to 7 MCAR Sec. 1.218 B.4. at the hearing which would strike the parentheses surrounding the words "pitless adapter" and add the phrase, "or pitless unit" immediately after "pitless adapter". (Ex. 14, p. 3; Ex. 18, p. 2) This would not appear to be a substantial change and is needed and reasonable.

26. 7 MCAR Sec. 1.219 deals with other water sources, cross connections and storage reservoirs, drew no public comment, and was shown to be needed and reasonable. (Ex. 3, p. 15-16)

27. 7 MCAR Sec. 1.220 sets out standards for construction of wells. The amendments to Sec. 1.220 A.7.b. and c. are intended to clarify that there must be at least two inches of annular space around the casing to assure

that a grout pipe may be inserted to the bottom of the casing. (Ex. 3, p. 16) Mr. Johnson stated that from the 5 by 10 inch inner and outer casing, on up, the figures in Table 2 constitute a change in the existing rule. Mr. Johnson believes that this would result in increased cost because of the requirement for more grout around the well without any benefit. Subsequent to the hearing, the agency proposed that the title of Table 2 be changed to read "Inner and Outer Casing Combinations providing the minimum annular space when welded joints are used". (Ex. 18, p. 3) Insofar as Table 2 does in fact increase the amount of grout required around the well the Department has failed to affirmatively show why such an increase is needed. The balance of the proposed amendment is needed and reasonable.

28. Mr. Johnson also commented in regard to Sec. 1.220 A.7.d. that centering guides placed on pipe to be grouted served no useful purpose. (Ex. L, p. 2, 4) This section was not proposed for amendment by the Department, however. The Department may consider this comment for a future rule hearing.

29. The Department proposed to amend Sec. 1.220 A.10.a. by further defining contamination to mean "contaminated with bacteria of sewage origin". Mr. Hutchinson commented that this limitation was inappropriate since there were other forms of contamination which may be hazardous but not associated with biological indicators. (Ex. D, p. 1) The Department's presentation indicated that this section was merely being rewritten for clarity without any substantive changes. (Ex. 3, p. 17) The proposed amendment appears to narrow the language of the rule. There are no facts in the record to support such a change.

30. In regard to Sec. 1.220 A.10.b., Mr. Anderson again suggested that the language concerning 10 feet of impervious soil formation be deleted since it is impossible to determine. (Ex. C, p. 2) The Department may consider this suggestion although adopting the suggestion would appear to approach a substantial change.

31. Section 1.220 D. sets out the requirements for rotary, bored or augered wells. The amendment to Sec. 1.220 D.1. as originally proposed changed "the open hole having a diameter of at least two inches larger than the maximum outside diameter of the casing" to four inches. At the hearing, Mr. Johnson indicated that this would greatly increase costs since it would double the time and cost of bits and would require well drillers to carry two sizes of drill pipe. Johnson also commented that this change would be unenforceable since you cannot check the grouting with a TV camera. In his written comments, Mr. Johnson suggested that this section apply only to rotary wells. Johnson stated that he did not know of any drillers who are cement grouting all wells completed in rock and that the only wells being grouted are those specifically requiring grout because of insufficient protective cover or water levels below the top of the rock formation. (Ex. C) In the Statement of Need, the Department stated that the requirement that the annular space be filled with grout under pressure from the bottom up is imposed to assure that the entire space will be grouted since material dumped from the top bridges and does not completely fill the annular space. The

Department stated that the grout provides additional casing protection from corrosive waters in some formations. (Ex. 3, p. 17) The Department did propose a revision of the amendment which deleted the four inch language and which would have rule read as follows:

> Rotary, bored, or augered wells shall be constructed with a watertight casing of 2" diameter or larger. The annular space around the casing shall be tightly sealed in accordance with material and procedures described in 7 MCAR Sec. 1.220 C. A rotary, bored or augered well completed in a drift formation may be sealed by pumping the well to collapse the formation; however, the top 20 feet below the land surface shall be sealed in accordance with 7 MCAR Sec. 1.220 C. or F. and any annular space remaining unfilled shall be grouted with neat cement or concrete using a tremie pipe to pump the grount under pressure from the bottom up in one continuous operation.

The Department noted that oversized holes are required only when drilling into rock. (Ex. 18, p. 3-4) The rule subsection, as amended, is needed and reasonable. The Department may consider Mr. Johnson's suggestions at Exhibit L, p. 2, 5, 6.

32. The Department proposed an amendment to Sec. 1.220 H.1. which would require that cavernous rock wells not only be cased but that such a well must also be grouted to 10 feet below the pumping level. Mr. Johnson stated that the phrase, "10 feet below pumping level" should be defined and commented that wells with sufficient protective cover and water level should not have to be grouted. (Ex. L, p. 3) The Department proposed a revision of the proposed amendment so that Sec. 1.220 H.1. would read as follows:

> 1. Geological formations which are creviced or cavernous shall not be used as a potable source of ground water unless overlain by at least 50 feet of drift material and/or by a firm insoluble rock material extending for at least one mile horizontal distance from the well in all direction to render the movement of contaminated water in the formation to the well improbable. The well shall be cased and grouted at least 10 feet below the pumping level. Where the pumping level is determined to be above the cavernous formation and the casing is seated into solid rock, the well shall be grouted in accordance with 7 MCAR Sec. 1220 D.1. Where the pumping level is determined to be below the top of the cavernous formation the drill hole shall be at least 4 inches larger in diameter than the nominal casing size if welded construction is used, and 4 inches larger than the couplings if threaded joints are used, and the annular space shall be filled with neat cement or concrete grout as provided in 7 MCAR Sec. 1.220 C.

The Department stated that the grouting required in the amendment is necessary because such formations contain fractured rock which can easily collapse once the well is pumped and the underground water pressure changes. (Ex. 3, p. 18) As revised, the proposed amendment is needed and reasonable.

33. Section 1.220 O. sets out the requirements for dug or bored wells. Section 1.220 O.1.b. provides that the well be installed in an oversized hole at least eight inches in diameter larger than the casing. The eight-inch figure was objected to by Duane Spartz of Spartz and Sons Well Company of Iona, Minnesota and by Senator Marion Menning who stated that six inches was the proper diameter because the turntables on almost all of the augering machines in their area are started with 36 inch casings. (Ex. B, p. 1) Mr. Anderson proposed that the following language be added to the proposed rule subsection:

With the annular space between the casing and the formation filled four inches thick with neat cement or concrete grout placed in one operation to a depth sufficient to exclude water which is or may be contaminated or 10 feet whichever is greater, or

Anderson stated that the minimum standard for depth of protective (watertight) casing is necessary particularly in dug wells which are often constructed by the homeowner. (Ex. C, p. 2) In response to these comments, the Department proposed to revise the rule subsection to read as follows:

b. be installed in an oversized hole at least 6 inches in diameter larger than the casing with the annular space between the casing and the formation filled 3 inches thick with neat cement or concrete grout placed in one operation to a depth sufficient to exclude water which is or may be contaminated, or to a depth of 10 feet, whichever is greater, or

The Department stated that a hole six inches larger than the casing size is sufficient, and that the language proposed by Mr. Anderson in regard to both O.1.b. and O.1.c. will provide a contractor more flexibility with regard to the method of construction. (Ex. 18, p. 5-6) So amended, the amendment is needed and reasonable.

34. In regard to Sec. 1.220 O.1.c., Mr. Spartz and Senator Menning suggested changing the four inch figure to three inches since four of the five machines operating in their area start with a 36 inch hole. (Ex. B, p. 1) Mr. Anderson again proposed language which was adopted by the Department. Anderson stated that the alternative of a poured concrete casing should be available for a dug well since shallow aquifers which often have slow recovery rates are the only source of water in many areas and require a large reservoir to serve as a domestic water supply. (Ex. C, p. 2) The Department suggested that Sec. 1.220 O.1.c. read as follows:

c. be installed with a watertight concrete curbing or casing at least four (4) inches thick poured in one operation to a depth sufficient to exclude water which is or may be contaminated or 10 feet whichever is greater. The annular space between the casing and the formation shall be filled as provided in 7 MCAR Sec. 1.220 D. or 7 MCAR Sec. 1.220 F.

The Department noted that this alternative does require a thicker (four inch instead of the three inch of grout required in subpart b.) curbing or casing because no separate casing is installed in this instance. (Ex. 18, p. 6) So revised, the proposed amendment is needed and reasonable.

35. In regard to Sec. 1.220 O.1.d., Mr. Anderson proposed additional language specifying steel reinforcing and concrete covers and allowing the alternative of a metal overlapping cover if capable of being locked to prevent access. (Ex. C, p. 2-3) The suggestion was adopted by the Department which proposed that the subsection read as follows:

d. be protected with a heavy pre-cast overlapping steel reinforced concrete cover or a heavy locked overlapping metal cover not less than 3/16" in thickness. The cover shall be tight fitting so as to exclude vermin, dust, or other contaminants from the well.

These changes would assure that a dug or bored well will produce safe drinking water for so long as it is pumped. So revised, the subsection is needed and reasonable.

36. The Department proposed adding the phrase, "and any below-grade connection" after the word "openings" in Sec. 1.220 O.1.e. in order to help assure that all predictable sites for entry of contaminants have been sealed off. (Ex. 18, p. 6) The proposed subsection is needed and reasonable.

37. Section 1.220 O.2. requires the licensee to obtain an agreement from the owner. Senator Menning commented that this section should be eliminated or applied to all bored or drilled wells in the state. Mr. Spartz commented that the forms involved may create a problem in regard to transfer or resale of the property and creates unnecessary paperwork for the well digger. (Ex. B, p. 1) The Department stated that since dug or bored wells are more likely to become contaminated than other types of wells, this justifies a requirement that the owner be made aware of the pitfalls of this mode of well construction by being made to agree that he will sample the well annually for bacteria. (Ex. 3, p. 19) The proposed rule is needed and reasonable.

38. 7 MCAR Sec. 1.221 governs well casing seals and connections. The Department proposed a revision of the proposed amendment to Sec. 1.221 C. at the hearing so that that subsection would read as follows:

> A connection to a well casing made below ground, or less than 12 inches above the established ground surface, shall be protected by a pitless adapter or pitless unit. The pitless adapter or pitless unit shall be approved by the Commissioner on the basis of design and materials. A below-ground connection shall not be submerged in water at the time of installation. The Director will furnish a list of approved pitless adapters and units that meet the requirements of these rules. Native materials shall be packed tightly around the casing and pitless adapter or pitless unit after installation.

The changes were proposed to reflect the new definitions for pitless adapter and pitless unit. (Ex. 18, p. 7) The revision is not substantial and so amended the proposed rule is needed and reasonable.

39. A similar revision was proposed by the Department in regard to Sec. 1.221 B. by inserting the phrase, " or pitless unit" after "pitless adapter" in the existing rule. This is not a substantial change and is needed and reasonable. (Ex. 14, p. 5; Ex. 18, p. 7)

40. Section 1.222 B. deals with pump installation in regard to slabs, platforms and floors. The Department again proposed at the hearing an amendment of this section to insert the term "or pitless unit" after the term "pitless adapter" in the existing rule. This is not a substantial change and is needed and reasonable. (Ex. 14, p. 5; Ex. 18, p. 7)

41. 7 MCAR Sec. 1.222 G. deals with vents and was the subject of a proposed amendment by Mr. Anderson who suggested that the last sentence in that subsection be replaced by the language "where the casing on small diameter wells (1½ inch or smaller) is used as a suction pipe, the casing need not be equipped with a vented cap, provided the casing is protected in accordance with 7 MCAR Sec. 1.220 B." (Ex. C, p. 3) Mr. Anderson stated that this revision would clarify the wording. The Department proposed to amend the subsection to read as follows:

> All wells shall be vented. A casing vent shall be of materials complying with 7 MCAR Sec. 1.222 D.1. with water-tight fit and terminate at least 2 feet above the highest flood level or the final grade of the established ground surface or the floor of a pump room, well room or

approved basement, whichever is higher. The casing vent shall be screened and point downward. Vents may be offset provided they meet the provision of this rule. Any submersible pump shall be installed with a vented cap on the top of the well casing or pitless unit to prevent drawing near surface water, mud, sand, etc., into the well through shielding around the electric cable. Flowing artesian wells may be exempted if protected by a specially designed pitless unit or if the casing is protected as provided in 7 MCAR Sec. 1.220 B. Where the well casing on small diameter wells (one and one half inch or less) is used as a suction pipe, the casing need not be equipped with a vented cap, provided the casing is protected in accordance with 7 MCAR Sec. 1.220 B.

The Department stated that the last sentence was rewritten to clarify its meaning and a new definition for small diameter wells provided. The Department stated that possible contamination would not increase if casings up to 1.5 inch diameter were used as the vent pipe. (Ex. 18, p. 8) So revised, the proposed rule subsection is needed and reasonable.

42. 7 MCAR Sec. 1.223 deals with records and samples. In regard to Sec. 1.223 A., dealing with water samples, Mr. Spartz and Senator Menning stated that after the well is installed, the licensee should submit a log of the well to the owner with a water sample kit and instructions on how to take the water sample and that the well owner should then be responsible for sending in water samples rather than the licensee. There was no change proposed to this rule subsection by the Department in this rule proceeding, however. The Department might consider this for a future rule hearing.

43. Section 1.223 A.2. governs submission of water sample to laboratories other than the Minnesota Department of Health. This proposed rule subsection received specific support from Jerome A. Crest of the Community Health Services Agency of Douglas, Grant, Stevens and Traverse Counties. (Ex. A.) The Department submitted a revision of the language at the hearing so that the subsection would read as follows:

If the licensee chooses to submit the water sample to a laboratory other than that of the Minnesota Department of Health, that laboratory must be certified* by the Minnesota Department of Health for determination of the presence of coliform bacteria. The sample must be collected in containers approved by the Director and must be received by the certified laboratory within 30 hours of the time of collection. The costs of such analysis shall be paid by the licensee. Results of the analysis shall be submitted to the Minnesota Department of Health.

*pursuant to the procedure prescribed in 7 MCAR Sec. 1.143 (MHD 143).

So revised, the proposed rule subsection is needed and reasonable.

44. 7 MCAR Sec. 1.224 deals with plastic well casings. At Sec. 1.224 F.2., the Department proposed replacing the existing language with the sentence "an installer may not drill through a plastic cased well". Mr. Johnson stated that this language is confusing and could have several meanings. He requested that it be changed to clearly reflect the intent of the Department. (Ex. L, p. 7) In its written submission, the Department proposed a revision which would have Sec. 1.224 F.2. read as follows:

An installer may not insert the drill stem inside the plastic casing when drilling any kind of well.

The Department stated that it was withdrawing the first proposal since it was unclear while maintaining the prohibition against the insertion of the drill stem since this can cause considerable damage to plastic casing once it is in place. (Ex. 18, p. 8-9) So amended, the proposed language is needed and reasonable.

45. All of the subsections proposed for amendment contained within the above cited rules which have not been specifically addressed are found to be shown be needed and reasonable by an affirmative presentation of facts through the Agency's Statement of Need and its oral presentation at the hearing.

Based upon the foregoing Findings of Fact, the Hearing Examiner makes the following:

CONCLUSIONS

1. That the Department of Health and the Water and Wastewater Operators Certification Council gave proper notice of the promulgation of the proposed rules and rule amendments.

2. That the Department and Council have statutory authority to promulgate the proposed rules and rule amendments.

3. That the Department and Council have fulfilled all relevant substantive and procedural requirements of law or rule, except as indicated at Finding of Fact No. 8.

4. That the Department and Council have demonstrated the need for and the reasonableness of the proposed rules and rule amendments by an affirmative presentation of facts in the record, except as noted at Findings of Fact No. 27 and 29.

5. That a finding of need or reasonableness by the Hearing Examiner does not and should not preclude or discourage the Department or the Council from modifying the language of a rule subsection based upon a further examination of the public comments provided that no substantial change is made and provided that the final rule is based upon facts appearing in the record.

Based upon the foregoing Conclusions, the Hearing Examiner makes the following:

RECOMMENDATION

It is recommended that the proposed rules and rule amendments be adopted by the Department and the Council with consideration given to the Findings of Fact herein.

Dated: January 19, 1979.



GEORGE A. BECK
Hearing Examiner

N O T I C E

Pursuant to Minn. Stat. Sec. 15.0412, subd. 4, this Report shall be available for review to all affected individuals upon request for at least five days.

Thereafter, the Commissioner of Health and the Water and Wastewater Operators Certification Council shall, if they proposed to adopt the rules as originally proposed or amended, submit a copy of the Order Adopting Rules, a copy of any additional agency findings, a copy of the rules as originally proposed, and a copy of the rules as adopted to the Chief Hearing Examiner for review pursuant to Minn. Stat. Sec. 15.052, subd. 4. The submission to the Chief Hearing Examiner shall precede review by the Attorney General. The Chief Hearing Examiner shall complete his review and submit his report to the Commissioner and the Council on the issues of substantial changes in the rule and compliance with Minn. Stat. Sec. 15.0412 within ten calendar days. The Commissioner and the Council will be responsible for filing the rules with the Attorney General and for notifying persons who have indicated that they wish to be notified of such filing.

STATE OF MINNESOTA

COUNTY OF HENNEPIN

BEFORE THE MINNESOTA

COMMISSIONER OF HEALTH

In the Matter of Amendments to Rules Relating to the Construction of Wells	* * *	FINDINGS AND CONCLUSIONS

The above entitled matter came on for hearing before the Commissioner of Health on the 12th of December, 1978 at 12:30 p.m. in Room 105 of the Minnesota Department of Health Building, presided over by George Beck of the Minnesota Office of Hearing Examiners, after proper notice as required by Minn. Stats. § 15.0412 (1978) had been served upon all persons, associations and other interested groups registered with the Secretary of State for that purpose.

After affording interested persons an opportunity to present written and oral data, statements and arguments, having heard all of the testimony, having considered all of the evidence adduced and upon the records, files and proceedings herein, I hereby adopt the Findings which were contained in the report submitted by the Hearing Examiner on January 20, 1979, a copy of which is attached hereto and made a part hereof with the following exceptions:

1) In Finding #8, the report states that the record does not contain a certificate of consultation from the Minnesota Pollution Control Agency (P.C.A.) as required by Minn. Stat. § 156A.03, subd. 1. The record does show that two different sets of comments were made by the P.C.A. (Commissioner's Exh. #11 and Public Exh. #K). A reading of either of these sets of comments reveals that the P.C.A. had in fact been contacted regarding the proposed amendments to the extent that they had received, read and were now commenting on the proposed amendments. Such comments are evidence of the fact that the agency was consulted. This evidence satisfactorily demonstrates that such consultation took place and fulfills all requirements of relevant law.

2) Finding #24. The Hearing Examiner suggests that the commissioner relax the requirements for information contained in the amendment to 7 MCAR § 1.217 C.5. The Commissioner is mindful of the problems which could be created by demanding the information which is

listed in the proposed amendment. He is also mindful of the more serious consequences which could result if the well becomes contaminated because a variance to shorten the isolation distance had been granted on the basis of sketchy or unreliable information. After having weighed the alternatives, the Commissioner adheres to the initial proposal of the Minnesota Department of Health because it will ultimately provide the greatest degree of public health protection which can be assured under the circumstances.

3) Finding #27. Apparently the Hearing Examiner has misunderstood the purpose of Table 2. It is the case that "nominal" pipe size (included in the table) is not the same as the true diameter. Rather, nominal size means a range of diameters which are within a certain percentage, plus or minus, of the stated size. For the larger diameter pipes, this means that there can be a difference of several inches in the inside diameter of such piping. That table merely lists those sizes of commercially available pipe which, when used in the combination given, will leave at least a nominal 2 inch space between the inner and outer casing. The size combinations listed in the table are not mandatory, but only recommended. The only requirement that a contractor must meet is that for the 2 inch minimum annular space. The fact that more than 2 inches of grout may be required with some pipe size combinations is due to the fact that no other pipe sizes are presently available. The contractors who reviewed the proposed revisions know this is the case and did not object to the size combinations given in the table, probably for this very reason. The table should remain in the text of the rule as it was proposed at the hearing, as it serves a useful and informative function.

4) Finding #29. The Commissioner has chosen to not adopt part of the revised language which was proposed at the hearing, having taken note of the comments made by a person who testified at the hearing, and the examiner's finding that there were insufficient facts to support the revision. The relevant portion of the revised rule, 7 MCAR § 1.220 A.10. will read as follows:

"Minimum protective depth of wells.

a. ~~(aa)~~ All wells shall be watertight to such depths as may be necessary to exclude pollution. ~~Ground-water structures~~ A well shall be constructed so ~~designed~~ as to seal off formations that are, or may be, contaminated or undesirable ~~or contaminated with bacteria of sewage origin.~~"

5) Finding #31. Certain portions of Rule 220 elicited a considerable number of comments from drillers who objected to the revisions as proposed. As a result of the Hearing Examiner's comments with regard to the proposals made by Mr. Johnson, the Commissioner has chosen to adopt the following revisions:

7 MCAR § 1.220 D. shall read as follows:

"Rotary, bored or augered wells shall be ~~constructed with a watertight casing of 2 inch diameter or larger installed in an open hole having a diameter of at least 2 inches larger than the maximum outside diameter of the casing~~ drilled and the annular space around the casing shall be tightly sealed in accordance with the materials and procedures ~~described in~~ which are appropriate to the particular geologic and hydrologic conditions at the well site, as prescribed in 7 MCAR § 1.220 C,F,G,H, and O. ~~in rule 220(e). A rotary, bored or augered well completed in a drift formation may be sealed by pumping the well to collapse the formation however the top 20 feet below the land surface shall be sealed in accordance with rule 220(e) or 220(f).~~"

7 MCAR § 1.220 F. shall read as follows:

"Unconsolidated glacial drift wells. A well drilled into unconsolidated glacial drift may be completed with a tight seal made around the protective casing

if the annular space is closed by washing the fine-grained caving material around the casing prior to disinfection of the well. Wells shall be pumped promptly after setting the casing until clear, and native materials shall be washed immediately into the annular space. Any annular space remaining unfilled shall be grouted with neat cement or concrete using a tremie pipe to pump the grout under pressure from the bottom up in one continuous operation."

7 MCAR § 1.220H.1. shall read as follows:

"1. Geological formations which are creviced or cavernous (limestone or dolomite) shall not be used as a potable source of ground water unless overlain by at least 50 feet of drift material and/or by a firm, insoluble rock material (sandstone) extending for at least one mile horizontal distance from the well in all directions to render the movement of contaminated water in the formation to the well improbable. ~~The well shall be cased and grouted at least 10 feet below the pumping level.~~ The casing shall be equipped with a drive shoe and seated into the top of the limestone or dolomite formation.

a. Where the pumping level is determined to be at least 10 feet above the top of the cavernous formation ~~and the casing is seated into solid rock, the well shall be grouted in accordance with 7MCAR §1.220 D.1.~~ the well shall be cased at least 10 feet below the pumping level. Any unfilled annular space shall be sealed according to the procedure prescribed in either 7MCAR §1.220 C. or F.

b. Where the pumping level is determined to be

~~below the top of the cavernous~~ less than 10 feet above the top of the limestone or dolomite formation the drill hole shall be at least 4 inches larger in diameter than the nominal casing size if welded construction is used, and 4 inches larger than the couplings if threaded joints are used~~, and~~. The annular space shall be filled with neat cement or concrete grout as prescribed in 7MCAR §1.220 C."

7 MCAR § 1.220 D. The revisions to 7 MCAR § 1.220 D. include striking the phrase which requires that the minimum diameter of any casing be 2 inches because this requirement is already addressed in 7 MCAR § 1.220 A.9. The specific requirement for the size of the drill hole is being deleted from this section because different geological conditions, rather than mode of construction, should dictate the size of hole which should be drilled. New language reflects this focus on the site's geological factors. These factors should determine the size of drill hole to be used and the new language cross-references to these different conditions. These cross-referenced sections do not result in the imposition of any new standards of construction for rotary, bored or augered wells. Rather they reflect a recognition that the existing rule and the revision as originally proposed were confusing and occasionally may have seemed contradictory. The last two sentences in the revision as originally proposed should be deleted because the grouting of drift wells is more appropriately discussed in the revision of section F (shown above) where the construction of drift wells is specifically addressed.

7 MCAR § 1.220 F. The new sentence regarding grouting which had been proposed for addition to section 7 MCAR § 1.220 D. has been transferred to this section because it is more appropriate to include the provision here under the heading of drift wells.

7 MCAR § 1.220 H. The revision being adopted here reflects the concerns raised by drillers both at the hearing and in post hearing correspondence. The revised version proposed at the hearing did not adequately differentiate between wells which have their pumping level at different distances above the creviced formation. The drillers who had objected to the language in the existing rule were still confused by the revision which was proposed at the hearing. The version which is written above incorporates some of the drillers' suggestions and makes clear, eg. in subpart H.1.b., that additional precautions must be taken in constructing those wells where the pumping level is less than 10 feet above the top of the creviced formation.

The aforementioned changes are made in response to the need for clarity and the need to reconcile the regulatory language with construction methods which are both feasible and protective of the safety of underground waters which may be used for drinking.

With the foregoing exceptions, I hereby accept as my own the remaining Findings of Fact and Conclusions contained in the report of the Hearing Examiner.

DATED: July 31, 1979

STATE OF MINNESOTA

George R. Pettersen M.D.

George R. Pettersen, M.D.
Commissioner of Health

STATE OF MINNESOTA
OFFICE OF HEARING EXAMINERS

FOR THE COMMISSIONER OF HEALTH AND
THE WATER AND WASTEWATER OPERATORS CERTIFICATION COUNCIL

IN THE MATTER OF AMENDMENTS TO)
RULES RELATING TO CONSTRUCTION)
OF WELLS AND TO WATER AND WASTE-)
WATER FACILITY CLASSIFICATION)
AND OPERATOR CERTIFICATION.)

REPORT OF THE
CHIEF HEARING EXAMINER

WHEREAS, a hearing was held on December 12, 1978, before George A. Beck, a Hearing Examiner of the State Office of Hearing Examiners, on the above-entitled matter in compliance with Minn. Stat. § 15.0412, subd. 4; and

WHEREAS, the Report of Hearing Examiner made pursuant to Minn. Stat. § 15.052, subd. 3, was issued to the Department of Health on January 19, 1979; and

WHEREAS, the Department of Health has now determined to adopt rules pursuant to Minn. Stat. § 15.0412, subd. 4; and

WHEREAS, the Department of Health has submitted said rules to the Chief Hearing Examiner for review pursuant to Minn. Stat. § 15.052, subd. 4, and 9 MCAR § 2.110; and

WHEREAS, the Chief Hearing Examiner finds that the final proposed rules are not substantially different from those proposed at the public hearing and that the Department of Health has met all requirements of Minn. Stat. § 15.0412, subd. 4.

NOW, THEREFORE, upon receipt of this Report, the Department of Health has the responsibility of submitting the complete hearing record and the rules as adopted by the Department to the Attorney General, notifying all persons who requested to be informed that the hearing record has been submitted to the Attorney General, and publishing in the State Register, all pursuant to Minn. Stat. § 15.0412, subd. 4.

Dated this 22nd day
of August, 1979.

Duane R. Harves

DUANE R. HARVES
Chief Hearing Examiner

ADMIN 1000 (Rev. 1/78)
SF-00006-01

STATE OF MINNESOTA

DEPARTMENT Attorney General

Office Memorandum

TO : Lee Sheehy
Special Assistant
Attorney General

DATE: September 6, 1979

FROM : William G. Miller
Special Assistant
Attorney General

PHONE: 341-7272

SUBJECT: In the Matter of Amendments to Rules Relating to Construction of Wells and to Water and Waste-Water Facility Classification and Operator Certification

I have enclosed for your review the record and appropriate documents of the hearing in the above referenced matter. You will note that the hearing regarding these rules was held concurrently with the hearing on a set of rules related to the Certification of Water and Waste-Water Facility Classification. This other set of rules has already been reviewed and approved by you.

Please contact me with any questions or comments.

WGM:rlb

Enclosure
cc: Pauline Bouchard

PRINTED ON RECYCLED PAPER

STATE OF MINNESOTA

COUNTY OF HENNEPIN

BEFORE THE MINNESOTA

COMMISSIONER OF HEALTH

In the Matter of Amendments to Rules Relating to the Construction of Wells	* * *	ORDER ADOPTING AND AMENDING RULES

The above-entitled matter came on for hearing before the Commissioner of Health on the 12th day of December, 1978 at 12:30 p.m. in Room 105 of the Minnesota Department of Health Building, after proper notice as required by Minn. Stat. § 15.0412 (1978) had been served upon all persons, associations and other interested groups registered with the Secretary of State for that purpose.

After affording interested persons an opportunity to present written and oral data, statements and arguments, having heard all of the testimony, having considered all of the evidence adduced and upon the records, files and proceedings herein, and applicable statutory standards and criteria, and having confirmed the need for the above-captioned rules,

NOW, THEREFORE, IT IS ORDERED THAT 7 MCAR § 1.210 through 7 MCAR § 1.224 as amended, copies of which are attached to this order and made a part hereof, are adopted, this 31st day of July, 1979, pursuant to authority vested in me by Minn. Stat. § 156A.03 and 156A.05 (1978).

STATE OF MINNESOTA

George R. Pettersen M.D.

George R. Pettersen, M.D.
Commissioner of Health

STATE OF MINNESOTA

COUNTY OF HENNEPIN

BEFORE THE MINNESOTA
COMMISSIONER OF HEALTH
AND THE WATER AND WASTEWATER
OPERATORS CERTIFICATION
COUNCIL

In the Matter of Amendments *
to Rules Relating to *
Construction of Wells and *
to Water and Wastewater *
Facility Classification and *
Operator Certification *

ORDER FOR HEARING

In order to effectively implement certain statutory provisions, the commissioner of health deems it necessary to consider adoption of the proposed amendments to the water well construction code (MHD 210-225), pursuant to authority vested in him by Minn. Stat. §156A.05 Subd. 2(1976).

The Water and Wastewater Operators Certification Council proposes to amend and revise WWOB-1 pursuant to authority vested in it by Minn. Stat. §115.79(1976).

NOW, THEREFORE, IT IS ORDERED this 16th day of October, 1978 that a public hearing on the proposed rules captioned above be held in Room 115, Minnesota Department of Health Building, 717 Delaware Street S.E., Minneapolis, Minnesota on December 12, 1978, commencing at 12:30 p.m., and continuing until all persons or representatives of associations or other interested groups have had an opportunity to be heard.

IT IS FURTHER ORDERED, that notice of said hearing be published in the State Register and be given to all persons or representatives of associations or other interested groups who have registered their names with the Secretary of State for that purpose and to all persons who are presently members of the Minnesota Legislature.

STATE OF MINNESOTA
WATER AND WASTEWATER OPERATORS
CERTIFICATION COUNCIL

PAUL B. JOHNSON
Secretary

STATE OF MINNESOTA

WARREN R. LAWSON, M.D.
Commissioner of Health

STATE OF MINNESOTA

COUNTY OF HENNEPIN

BEFORE THE MINNESOTA COMMISSIONER OF HEALTH AND THE WATER AND WASTEWATER OPERATORS CERTIFICATION COUNCIL

In the Matter of Amendments to Rules Relating to Construction of Wells and to Water and Wastewater Facility Classification and Operator Certification *

NOTICE OF HEARING

Notice is hereby given that a public hearing in the above-entitled matter will be held pursuant to Minn. Stat. §15.0412 Subd. 4 (1976), in Room 115, Minnesota Department of Health Building, 717 Delaware Street S.E., Minneapolis, Minnesota on December 12, 1978 commencing at 12:30 p.m.

All interested or affected persons will have an opportunity to participate concerning the amendments to the rules captioned above. Statements may be made orally and written material may be submitted. In addition, whether or not an appearance is made at the hearing, written statement or material may be submitted by mail to George Beck, Hearing Examiner, at Room 300, 1745 University Avenue, Saint Paul, Minnesota 55104, telephone 612/296-8103, either before the hearing or within five (5) working days after the close of the hearing. The hearing examiner may keep the record open for a longer period not to exceed 20 calendar days. All such statements will be entered into and become part of the record. Testimony or other evidence to be submitted for consideration should be pertinent to the matter at hand. For those wishing to submit written statements or exhibits, it is requested that at least three (3) copies be furnished. In addition, it is suggested, to save time and avoid duplication, that those persons, organizations, or associations having a common viewpoint or interest in these proceedings join together

where possible and present a single statement in behalf of such interests. The conduct of the hearing shall be governed by the rules of the Office of Hearing Examiners.

If adopted, the amendments proposed by the commissioner* of health would result in changes to the water well construction code (MHD 210-225) primarily in the following areas: Definitions, information required for a variance, protection for observation wells, additional requirements for community wells, abandonment, isolation distances from existing wells, size of casing and drill hole, grouting, rock wells, dug or bored wells, suction lines and water sampling procedures. Only housekeeping changes are being proposed in the provisions which govern the licensing of water well contractors. The authority of the commissioner to make such revisions is contained in Minn. Stat. §156A.05 Subd. 2 (1976).

If adopted, the amendments proposed by the Water and Wastewater Operators Certification Council (hereafter council) would revise existing rule WWOB-1 by separating it into three new rules WWOC-1, 2, and 3, by establishing a points system for classification of wastewater treatment facilities, by making minor revisions to the system for classification of water treatment systems, and by making minor revisions to the operator qualifications required for certification in a particular class. The authority of the council to promulgate such revisions to its rules is contained in Minn. Stat. §115.79 (1976).

Copies of the proposed amendments are now available and at least one free copy may be obtained by writing to the Minnesota Department of Health, Division of Environmental Health, 717 Delaware Street S.E., Minneapolis, Minnesota 55440. Additional copies will be available at the door on the date of the hearing.

Notice is hereby given that 25 days prior to the hearing, a statement of need and reasonableness will be available for review at the Minnesota Department of Health, at the Minnesota

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*Laws 1977, Chapter 305 §39, transfers to the commissioner of health all of the rulemaking authority formerly held by the board of health.

Pollution Control Agency, and at the Office of Hearing Examiners. This statement of need and reasonableness will include a summary of all of the evidence which will be presented by the department, and the council at the hearing justifying both the need for and the reasonableness of the proposed rules. Copies of the statement of need and reasonableness may be obtained from the Office of Hearing Examiner at a minimal charge.

Any person may request notification of the date on which the hearing examiner's report will be available, after which date the commissioner and the council may not take any final action on the rules for a period of five working days. Any person may request notification of the date on which the hearing record has been submitted to the Attorney General by the agency. If you desire to be so notified, you may so indicate at the hearing. After the hearing, you may request notification by sending a written request to the hearing examiner, in the case of the hearing examiner's report, or to the agency, in the case of the agency's submission or resubmission to the Attorney General.

In addition, please be advised that Minn. Stat. ch. 10A requires each lobbyist to register with the State Ethical Practices Board within five (5) days after he commences lobbying. A lobbyist is defined in Minn. Laws 1978, ch. 463, §11 as any individual:

> (a) Engaged for pay or other consideration, or authorized by another individual or association to spend money, who spends more than five hours in any month or more than $250, not including his own travel expenses and membership dues, in any year, for the purpose of attempting to influence legislative or administrative action by communicating or urging others to communicate with public officials; or
>
> (b) Who spends more than $250, not including his own traveling expenses and membership dues, in any year for the purpose of attempting to influence legislative or administrative action by communicating or urging others to communicate with public officials.

The statute provides certain exceptions. Questions should be directed to the Ethical Practices Board, 41 State Office Building, Saint Paul, Minnesota 55155, telephone (612)296-5615.

STATE OF MINNESOTA

/s/ Paul B. Johnson
PAUL B. JOHNSON, SECRETARY
Water and Wastewater Operators
Certification Council

STATE OF MINNESOTA

/s/ Warren R. Lawson, M.D.
WARREN R. LAWSON, M.D.
Commissioner of Health

Exhibit No. 8

File No. HHS-79-016-05

HAR Date 12/12/78

RECEIVED
NOV 16 1978
OFFICE OF HEARING EXAMINERS

STATE OF MINNESOTA

COUNTY OF HENNEPIN

In the Matter of Amendments
to Rules Relating to
Construction of Wells and
to Water and Wastewater
Facility Classification and
Operator Certification

AFFIDAVIT OF RECEIPT
OF THE
SECRETARY OF STATE'S LIST

Linda Bruemmer, being duly sworn upon oath, deposes and says:

1. That she is an employee of the Minnesota Department of Health.

2. That on the 6th day of November, 1978, she called the Minnesota Secretary of State's office and requested a current list of all representatives of associations or other interested groups or persons who had registered their names with the Secretary of State for the purpose of obtaining notices of public hearings relating to the promulgation of rules or amendments thereto pursuant to Minn. Stat. § 15.0412 subd. 4 (1976).

3. That on the 8th day of November, 1978, in response to the above request, the Secretary of State provided her with such a list, a photocopy of which is attached hereto and incorporated by reference.

Further affiant sayeth not.

Linda Bruemmer
LINDA BRUEMMER

Subscribed and sworn to before me
this 8 day of November, 1978.

Louise K Kanneck

[illegible] NOTARY PUBLIC
[illegible] MINNESOTA
My Commission Expires [illegible]

STATE OF MINNESOTA

COUNTY OF RAMSEY

In the Matter of Amendments
to Rules Relating to
Construction of Wells and
to Water and Wastewater
Facility Classification and
Operator Certification

CERTIFICATE

I hereby certify that the 581 general labels, the 12 page list for the Minnesota Pollution Control Agency, and the 9 page list for the Minnesota State Department of Health, all of which are attached and made a part hereof, constitute the complete lists of persons, associations, and other interested groups who as of 8:15 o'clock A.m., this 8th day of Nov, 1978, have requested pursuant to Minn. Stat. §15.0412 subd. 4 (1976), that their names be placed on file with the Secretary of State for the purpose of receiving notice of public hearing on proposed rules and amendments thereto on the subject captioned above.

SECRETARY OF STATE

JOAN ANDERSON GROWE

By Joan Anderson Growe
Donna Bent

STATE OF MINNESOTA

COUNTY OF RAMSEY

In the Matter of Amendments
to Rules Relating to
Construction of Wells and
to Water and Wastewater
Facility Classification and
Operator Certification

AFFIDAVIT OF MAILING

Nancy Lee A. Whited, being first duly sworn, deposes and says:

That on the 9 day of November, 1978, at the City of Roseville, County of Ramsey, State of Minnesota, she served the attached Notice of Hearing by depositing in the United States mail at said City of Roseville, a true and correct copy thereof, properly enveloped, with postage prepaid, to all persons and associations at the addresses listed on the Certificate of the Secretary of State attached and made a part hereof as Exhibit A, to all persons and associations at the addresses listed on Exhibit B, attached and made a part hereof, as well as to all members of the Minnesota Legislature as of the date of mailing.

Nancy Lee A Whited

Subscribed and sworn to before me
this 9 day of November, 1978.

Lila Holmdahl

LILA HOLMDAHL
NOTARY PUBLIC - MINNESOTA
HENNEPIN COUNTY
My Commission Expires Nov. 1, 1983

STATE OF MINNESOTA

COUNTY OF HENNEPIN

BEFORE THE MINNESOTA
COMMISSIONER OF HEALTH
AND THE WATER AND WASTEWATER
OPERATORS CERTIFICATION
COUNCIL

In the Matter of Amendments *
to Rules Relating to *
Construction of Wells and *
to Water and Wastewater *
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STATEMENT OF NEED

AND REASONABLENESS

The existing well code was adopted in 1974, pursuant to legislation authorizing the commissioner of health to adopt rules regarding the construction of water wells to assure safe drinking water and protection of the aquifer. Minn. Stat. Chap. 156A (1976). The rules have been enforced by the Minnesota Department of Health since their adoption. Numerous problems have arisen regarding the meaning, applicability and scope of certain provisions. Because of these problems, it was felt the time had come to make certain revisions which would clarify the meaning and hopefully help to increase assurance that drinking water produced from wells is indeed safe and that ground water sources are being protected to the extent reasonably feasible within the limits prescribed by law. The fundamental principle underlying the water well construction code is that the method of construction should assure that the aquifer from which the well draws will remain free of contamination from surface materials. Every change proposed here is intended to provide greater assurance that such protection will be maintained. Although this rationale will not be repeated in every instance where it is applicable in the discussion which follows, it does nevertheless serve as the basis for all of the proposed changes which deal with construction and location of wells.

The existing labels, adopted under the old system, are being changed to the MCAR outline format, for the purpose of complying with the policies of the Office of the State Register. The subject matter of any particular rule (number) is the same under the MCAR format as it was under the previous system.

The proposed changes will be discussed in the sequence in which they appear in the existing rule.

7 MCAR §1.210 B. 1. defines "commissioner" to allow for use of the single term throughout the code.

7 MCAR §1.210 B.9. adds an additional requirement to the amount of experience which an applicant must have before he can be licensed. Under the existing rule an applicant could conceivably have spent as little as a few hundred hours drilling shallow wells and such a person would be considered qualified. The 1,000 hours requirement is a much more meaningful measure of a person's experience than is the existing requirement of 5 wells. The addition of the provision regarding the drilling of fewer than 5 wells per year if these are very deep, large diameter wells is made in recognition of the fact that some drillers acquire a year's worth of experience working on a single well. At the hearing the agency will propose to define a "large diameter" well by adding a diameter measure to the proposed rule, to read as follows:

"Year of experience" means a year during which the applicant personally drilled five (5) water wells and was actively working in the trade for a period of 1,000 hours under the supervision of

a licensed water well contractor. An applicant drilling 1,000 hours per year and completing fewer than 5 wells per year may qualify, if the experience is gained in constructing one or more large diameter wells (casing outer diameter is 10 inches or more) which are more than 500 feet deep. An applicant who seeks to qualify under this provision shall have his license limited to construction of such deep and large diameter wells.

The type of experience gained in drilling such large wells is just as valuable and as deserving of credit as is that acquired in the drilling of several smaller wells. In recognition of the fact that this type of experience is not as broad as that obtained in working on numerous smaller wells, the license to be issued to such a driller will be limited to drilling deep, large-diameter wells.

7 MCAR §1.210 B.9.a. Some language allowing an applicant to offer alternative kinds of experience is being deleted because, in fact, supervision in a field setting such as this cannot be evaluated fairly and equally for all applicants. In addition, it does not really reflect experience as a driller. For these reasons, supervision will no longer be considered as qualifying for one applying for a driller's license.

7 MCAR §1.210 B.9.b. adds a requirement which must be met by persons who have gained most of their drilling experience outside of Minnesota. The reasons for this are the following: the geology of Minnesota is sufficiently

different from that of other states that it is necessary for one to have had supervised experience drilling in the state before such a person should be allowed to hold himself out to the public as a qualified driller. For the same reason, having worked under the supervision of a licensed driller will help insure that the outsider has learned about conditions in Minnesota from one familiar with these conditions and the Minnesota well code.

7 MCAR §1.210 B.11. would expand the responsibilities of one who acts as a contractor's representative to require that the representative actually be in charge and have control over the contractor's drilling operations to assure compliance with the well code. Hopefully this added language clarifies a situation which has caused numerous problems in the past, e.g., the representative was a mere figurehead who disclaimed any responsibility for certain of the day to day operations.

7 MCAR §1.210 C.2. would delete the phrase "by licensee" because this phrase seems to limit the population which is to be governed by the terms of the code. The law states that the construction standards apply to all wells drilled in the state without limitation as to who does the drilling. This strikeout merely eliminates any uncertainty which might have existed for persons who wondered whether the code applied to them or not.

7 MCAR §1.210 C.6.b.(cc) is being stricken altogether because the use of the term "liner pipe" implied that piping which did not have to comply with the specifications for casing pipe could be used as casing

under certain conditions. Much discussion took place between enforcement personnel and drillers as to whether liner pipe was or was not considered to be casing. By eliminating all references to "liner" pipe, the rule in effect prohibits the use for well casing, of any pipe which does not meet the requirements of casing imposed in 7 MCAR §1.220.

7 MCAR §1.210 C.15. At the hearing, we will propose the following amendment to the definition of pitless adapter:

210 C.15.a. "Pitless adapter" means ~~a device or assembly of parts which will permit water to pass through the wall of the well casing or extension thereof, and which provides access to the well and to the parts of the water system within the well in a manner to prevent entrance of pollution into the well and the water produced.~~ a device for above or below ground discharge designed for attachment to one or more openings through a well casing, and constructed so as to prevent the entrance of contaminants into the well.

b. "Pitless unit" means an assembly with cap which extends the upper end of the well casing to above grade, and constructed so as to prevent the entrance of contaminants into the well.

This change is being proposed as a result of name changes made by the industry. Prior to adoption of the original code in 1974, only the phrase "pitless adapter" was used. It referred to either a manufactured unit with connections or to the welding or clamping on to the casing of a below grade connection. Adoption of the new definition will eliminate any confusion as to exactly what is being described when the term "pitless adapter" is used.

7 MCAR §1.210 C.32. expands the defintion of suction line to include additional types of connections which might serve to introduce water into the well. The addition is being made to assure that all such connections comply with the requirements for suction lines and their installation as imposed in 7 MCAR §1.222 D., for the purpose of protecting the well water from possible sources of contamination.

7 MCAR §1.210 D.1. A new phrase is being added to the list of subjects governed by the code, i.e., maintenance of proper isolation distances from existing wells. The rationale for adding this phrase is addressed in detail in the discussion under 7 MCAR §1.217 C.5. below.

7 MCAR §1.210 D.3.b. This variance provision is being rewritten to eliminate problems which have arisen because of the way in which the rule is presently written. The proposed revision requires the signature of both licensee and owner on a variance request regarding new construction or modification of the well to assure that the owner is cognizant of the fact that a non-code installation is proposed. The type of information which must be presented by the applicants is specified so that an applicant knows the criteria upon which the decision will be based and also to help expedite processing of the request. At the hearing we will proposed to amend the proposed section. The section will read as follows:

7 MCAR §1.210 D.3.b. ~~(bb) The licensee shall state the specific exceptions requested plus explain in detail the reasons for such request.~~ Any request for modification shall be submitted to the

~~administrative-authority~~ commissioner in writing and shall be signed by both the owner and the licensee. ~~Request-for-modification of-the-isolation-distance-from-existing-wells-shall-be-submitted and-signed-by-the-owner.~~ In addition, any ~~experts or~~ persons involved in providing documentary evidence in support of the request shall sign the request submitted by the owner. Such request shall specify in detail the nature of the modification being sought, the reasons therefor, and the special precautions to be taken to avoid contamination of the well. The request shall also include: the proposed well depth, casing type and depth, method of construction and grouting, geological conditions likely to be encountered, and location of the well and of possible sources of contamination. Whether or not the requests are granted, the ~~Board~~ commissioner shall state in detail the reasons for ~~its~~ the decision.

The third sentence is being stricken because it belongs more appropriately in 7 MCAR §1.217 C.5. New language is being added in the fifth sentence, which reads thus: "and the special precautions to be taken to avoid contamination of the well." We proposed to amend the sixth sentence by adding the requirement that information regarding geological conditions must be submitted along with the request for modification. Both of these amendments are proposed for addition to this section because the information which is sought would be most valuable to the decision-maker who must judge whether or not the modifications requested would result in a safe installation.

7 MCAR §1.210 D.3.c. is a new provision. This is being proposed because in the past, numerous occasions have arisen where the well owners have questioned the applicability of the code to them once a well is constructed. Although the law states that the construction code applies to any individual (Minn. Stat. §156A.02 S. 3 (1976)), many have claimed that the code did not apply to them, especially in cases involving alterations or modifications. Problems arise when the owner of a well would be moving a possible source of contamination such as a septic tank, closer to a well than is permitted in 7 MCAR §1.217. Hopefully, this restatement of the scope of applicability of the statute will eliminate some of these problems.

7 MCAR §1.211 B.3.a. imposes a one year limit on the time within which a person who has passed the exam may apply for a license. This limit was found to be necessary because a number of examinees were delaying their application for license for years. This created record-keeping problems for those administering the program. In some cases those who had passed the exam but had not yet obtained a license were passing themselves off as licensed contractors. Hopefully the new one-year limit will eliminate these problems and help us locate these drillers in order to be able to respond more quickly to customer complaints.

7 MCAR §1.211 F.2., 3., and I.1. The deadline for license renewal has been changed from December 31 to January 31. This is being done at the recommendation of the Advisory Council to accomodate such a request from the industry. A number of drillers argued that since the

drilling season often extends into late fall, they do not have sufficient time in which to collect and submit all the relevant well logs and water samples before they have to complete their renewal application. The renewal application requires the licensee to include certain information on wells drilled during the previous year. The January 31 deadline will give drillers enough time to be able to obtain and submit all the required information. Since the change in deadline date would pose no administrative problems, we feel it is only reasonable to accomodate the industry's request in this matter.

7 MCAR §1.217 B. would have the words "or spring or buried reservoir" stricken from the rule because the law cannot provide for regulation of the placement of such naturally occuring bodies of water. The words were inadvertently inserted when the existing rule was adopted and are now being stricken for the record. The remaining changes in subpart 5 are definitional. "Municipal water supply" would be replaced with "community public water supply" because this more emcompassing phrase is the one currently being used to describe all water supplies which serve certain numbers of people, whether municipal or private, pursuant to the Safe Drinking Water Act of 1977. (Minn. Stat. §144.382, Subd. 4 (1977 Supp) and 7 MCAR §1.145 B.12.) Since the ultimate purpose of the well code is to insure the production of safe drinking water, it is appropriate that the code should address matters of concern for all community water supplies, regardless of type of ownership.

7 MCAR §1.217 C.1.d. would, by use of more general language, expand the possible types of contaminating sources from which a proposed well must be built at least 50 feet.

7 MCAR §1.217 C.1.e. adds language regarding the use of plastic sewer pipe, as permitted in the Minnesota Plumbing Code. The new language allows for use of the same isolation distance as that which is imposed for cast iron pipe, in recognition of the fact that the two prescribed materials have been judged to possess similar characteristics with regard to their safe use as sewer line. This subpart includes two new possible sources of contamination, ie., pit or unfilled space below ground surface, from which a well must be located at least 20 feet away. The exception regarding placement of a well near an approved basement is merely a clarification of what was contained in the original version.

7 MCAR §1.217 C.1.f. adds the words "with casings" because the determining factor in deciding whether a well is protected from the entry of contaminants is the depth of the casing rather than the depth of the well itself. The proposed addition reflects this difference.

7 MCAR §1.217 C.4. adds a new language relating to the need for protection of observation wells. While such wells may not be used to produce potable water, they nevertheless can act as conduits for surface contaminants if they are damaged near the surface. A distinction is made

between temporary and permanent observation wells, as to the degree of protection which must be afforded to each type. It seems reasonable that persons installing permanent observation wells should have to protect them by relatively permanent means, e.g., 4 steel posts set in concrete, whereas the warning device for a temporary well should be something which does give notice but which is also relatively easy to remove, once the well is abandoned.

7 MCAR §1.217 C.5. A slightly modified version of this part will be proposed at the hearing. The revised proposal will read as follows:

> 7 MCAR §1.217 C.5. The administrative authority may modify the isolation distances in this rule for individual well installations. ~~The modifications shall be made in writing to the owner, with a copy to the Board, either increasing or decreasing the minimum isolation distance and shall state the reason for the modification based on overburden, depth of well, character of aquifer, maximum pumping rate, or other facts affecting the movement of pollution.~~ A request for modification of the isolation distance from an existing well shall include information regarding the well depth, casing type and depth, method of construction and grouting, proposed location and design of the potential source of contamination and soil conditions.

Such request shall be signed by the owner and by those persons, such as soil scientists, hydrologists, sanitarians, disposal system designers, water well contractors and appropriate local officials involved in providing documentary evidence in support of the request. A copy of the request shall be sent to the commissioner.

The portion which is being stricken has been included in the general variance provision contained in 7 MCAR §1.210 D.3.b. The new language specifically addresses the matter of requests for changes from prescribed isolation distances when a well owner wishes to move a potential source of contamination after the well has been constructed.

A new provision is being added because of the fact that there seemed to be a gap in the rules particularly as they relate to the enforcement of isolation distances for the purpose of protecting aquifers which serve as sources of drinking water Heretofore, the rules applied only to new construction of wells while seeming to ignore the serious consequences which might result if an owner moves a source of contamination closer to a well. The same public health principles apply, regardless of whether a well was constructed before or after a potential source of contamination. In numerous instances since adoption of the well construction code, the Minnesota Department of Health has been called upon to decide whether or not a septic tank or drainfield could be moved closer to an existing well than would be permitted under 7 MCAR §1.217. Although departmental personnel recognized the need for being able to make such a determination, no one felt

that the existing rules permitted the exercise of such authority. The Minnesota Pollution Control Board and several county health and zoning officials have urged the commissioner of health to enforce the isolation distances with respect to existing wells. With adoption of the proposed rule, the agency is declaring publicly that it will exercise jurisdiction in these matters. Owners of existing wells will now be able to proceed more clearly, by availing themselves of the variance procedure under 7 MCAR §1.210 (or 7 MCAR §1.217 C.5.).

The new proposal requests all of the information which we feel would be necessary in order for the decision-maker to be able to make a reasoned judgment as to whether or not a potential source of contamination could be placed close to an existing well.

Minn. Stats. Chap. 156A (1976) authorizes the commissioner of health to regulate the construction and placement of wells. The legislative intent and purpose as stated in Minn. Stats. §156A.01, is to protect the health and general welfare by providing a means for the protection of underground water in a sanitary and reasonable manner. It seems reasonable that as the agency charged with enforcing the well code, we should also be examining those conditions or activities which, because of their proximity to existing wells, could detrimentally affect the quality of water in such wells. It is our position that it is more reasonable to infer from the stated legislative intent, that the commissioner of health is permitted to regulate in this area, than that there should be no public health agency involvement at all.

7 MCAR §1.217 E.4. adopts new requirements for community water supply wells which may have to be constructed in areas subject to flooding. Each of the provisions addresses a different condition, each of which could develop into a possible source of contamination. Because community wells serve large numbers of people who might become ill if the well should be contaminated, there is a need for greater protection of such wells. The protection provided for here allows the community to continue to use the well during the flood rather than to have to discontinue reliance on the well during floods.

7 MCAR §1.218 C. imposes new requirements regarding when and how a water well should be abandoned. The need for such requirements arises because the results of a study of ground water quality in southeastern Minnesota reveal that improperly abandoned wells are a major source of contamination of aquifers in that part of the state. A well owner is being made to sample a well before abandonment so that a decision can be made as to whether the well is safe to be capped or whether it should be disinfected or pumped out before capping. The last sentence of the section provides that the commissioner may order an owner to plug a well which may be a source of contamination. This provision is included to put everyone concerned on notice that this is one of those areas in which the commissioner will exercise authority pursuant to Minn. Stat. §156A.05, Subd. 1 (1976) which states. . . "The [commissioner] of health shall possess all powers reasonable and necessary to enable it to exercise effectively the authority granted to it by sections

156A.01 to 156A.08." The risks created by the existence of a well which is not being maintained or used are high enough that the authority to exercise that power which is "reasonable and necessary" should include the authority to issue orders for corrective action.

7 MCAR §1.218 C.1.a. requires that one who seeks to temporarily abandon a well must notify the commissioner. If the department of health knows of the location of these wells, it is in a better position to decide after inspection, whether the well could be a source of contamination to the aquifer and whether appropriate measures should be taken to eliminate this potential.

7 MCAR §1.218 C.2.g. specifies that a licensee who abandons a well for an owner must do so in accordance with this rule and also requires that such abandonment be reported. Such reporting will assist the agency in keeping its active well records current. In addition, once departmental inspectors know where these abandoned wells are located, they will be able to inspect them to see whether the wells have been properly abandoned, or whether additional work must be done to assure that the well is sealed off.

7 MCAR §1.219 C. The stricken phrase has been rewritten to allow for the use of protective anti-siphon devices which will prevent the flow of unsafe materials back into the well. This provision is written in recognition of the fact that in many instances well owners

connect, or allow the connection of their wells, to lines which contain unsafe materials. An outright prohibition of such cross-connections has not been effective in preventing their use. An example of such back siphonage occurred in Hayfield, Minnesota, in the summer of 1978 when a tank truck which contained a pesticide, was connected to a municipal water line. A negative pressure developed and the pesticide contaminated the entire municipal supply. Farmers use their irrigation system to feed fertilizers and pesticides on crops. Without appropriate back flow preventer devices these materials could flow back through the well and contaminate the aquifer. This threat increases with each new irrigation system. The Department of Health has compiled a list of devices which the commissioner has approved and these are very effective in preventing back siphonage. We hope that by requiring the use of such devices, the likelihood of back siphonage will be greatly reduced.

7 MCAR §1.220 A.7.a. Nothing in this part is new language and nothing should have been underlined as if it were new language.

7 MCAR §1.220 A.7.b. As rewritten, this subsection clarifies the issue regarding the size of the annular space, ie., there must be at least 2 inches around the casing (4 inches total). This distance applies around casing and casing couplings, when these are used. The purpose for requiring such a space is to assure that there is sufficient space to insert a grout pipe to the bottom of the casing. This grouting is necessary in order to provide a seal between the outer casing and the formation, and

between the outer casing and the inner casing, to prevent vertical flow of potentially contaminated water into an otherwise protected aquifer.

7 MCAR §1.220 A.7.c. The word "liner" is being replaced with "inner" as discussed earlier with reference to §210 C.6.b.

7 MCAR §1.220 A.10.a. and b. are merely being rewritten for clarity and do not include any substantive changes.

7 MCAR §1.220 C. clarifies the types of spaces which must be grouted. The last sentence regarding the request for permission to use other grouting materials is being deleted because there are, in fact, no other materials with equivalent sealing properties.

7 MCAR §1.220 D.1. The diameter of a hole which is to accomodate the casing for this type of well must be of a size which is larger than the outer diameter of the casing by 4 inches rather than 2 inches as was formerly permitted. The 2 inches was an error in the 1974 version. This requirement is being imposed because at least 2 inches of space is required to insert a grout pipe to the bottom of the casing to allow grouting to provide the necessary vertical seal. The requirement that the annular space be filled with grout under pressure from the bottom up is imposed to assure that the entire space will be grouted. Material dumped from the top bridges and does not completely fill the annular space, which is necessary. The grout provides additional casing protection from corrosive waters in some formations.

7 MCAR §1.220 G.1. eliminates what was essentially a permissive provision without changing the requirements for safe construction of wells in rock formations.

7 MCAR §1.220 G.2. merely rewords the existing language to clarify the point at which the 4 inches width is to be measured. In such formations it is important that there by a layer of grout which is at least 2 inches thick all around the casing to provide enough material to seal the rock off effectively.

7 MCAR §1.220 H.1. A new provision requires that a cavernous rock well not only be cased but that such a well must also be grouted to 10 feet below the pumping level. Such grouting is necessary because such formations contain fractured rock which can easily collapse once the well is pumped and the underground water pressure changes. Installation of casing and grouting to 10 feet below the pumping level helps to prevent such a collapse around the pump. The last sentence is being stricken because the matter of acceptability of a well as a potable water source is discussed in more general terms earlier in 7 MCAR §1.220 A.10.

7 MCAR §1.220 H.4. All of the language being stricken from this subsection is already contained in other subsections of the rule and is being eliminated to avoid repetition. The new sentence which would bar entry of water from more than one aquifer is necessary to help prevent

cross-contamination between aquifers. Because the probability of such cross-contamination is high in the case of wells drilled into cavernous formations, it is important that wells drilled into such formations be carefully cased and grouted to reduce the possibility of such cross-contamination.

7 MCAR §1.220 H.5. is being stricken altogether because the exception it created for non-drinking water wells was shown to be counter-productive. Under the existing rule, these wells could be constructed with less care than that which was required for wells to be used for domestic purposes. However, this less careful method of construction resulted in a number of collapsed wells which were then left idle, to serve as points of entry for surface contaminants. The primary purpose of the well code, ie., to protect ground waters, is clearly not being served as long as this unsafe mode of construction is permitted.

7 MCAR §1.220 O. is being completely rewritten. New construction requirements are being added to the existing ones because dug or bored wells which are not constructed with steel or plastic casing (as required in 7 MCAR §1.220 A.) are much more likely to become contaminated than are other types of wells. For this reason, we have found it necessary to impose more stringent grouting and maintenance requirements than those imposed for steel or plastic-cased wells. The same reason also justifies the requirement that the owner be made aware of the pitfalls of this mode of well construction by being made to agree that he will sample the well annually for bacteria. The revised section deletes the provision that dug wells could be installed

only in areas where drilled or other types of conventional wells were not feasible. Interpretation and enforcement of the deleted provision was too subjective to be of practicable use.

7 MCAR §1.222 D.2.c. Part of this subsection is being stricken because the method prescribed here did not provide adequate protection. The existence of an opening to the casing facilitated the entry of contaminants which could not be easily seen because the entry is below grade. Because of this greater potential for contamination and because this method is not frequently used, we have decided to delete this alternative method in its entirety.

7 MCAR §1.222 G.1. is being changed to require that the vent need only be one foot above the ground or floor. This is the height which was intended in the original rule. One foot is the minimum prescribed height to the top of the casing. It makes little sense to require that the vent be one foot higher than the casing, when both of these are equally likely points of entry for contaminants. One foot has been shown to provide adequate protection. At the hearing, amendments will be made to the proposed revision. We will propose that 7 MCAR §1.222 G.1. read as follows:

> "All wells shall be vented. A casing vent shall be of materials complying with 7 MCAR §1.222 D.1. with watertight joints terminating at least 2 feet above the regional flood level or <u>one foot above</u> the established ground surface or the floor of a pump room, well room or approved basement, whichever is higher. The casing vent shall be screened and

point downward. Vents may be offset provided they meet the provision of this rule. Any submersible pump shall be installed with a vented cap on the ~~pitless adapter~~ top of the well casing or pitless unit to prevent drawing near surface water, mud, sand, etc., into the well through shielding around the electric cable. Flowing artesian wells may be exempted if protected by a specially designed pitless adapter or if the casing is protected as provided in ~~229(b)~~ 7 MCAR §1.220 B. ~~For wells of an inch and one quarter diameter casing or as otherwise protected to insure that contaminated water will not enter the well not using a drop pipe venting is not required when equipped with a suction pump provided the casing is protected in accordance with MHD 220(b).~~ Where the well casing on small diameter wells (one and one quarter inch or less) is used as a suction pipe, the casing need not be equipped with a vented cap, provided the casing is protected in accordance with 7 MCAR §1.220 B.

The phrase "pitless adapter" is to be changed to "top of the well casing or pitless unit. . ." In the existing version there was no requirement regarding placement of the vent cap in relation to the casing. This was an oversight in the original rule which is being rectified here. Since all wells must be vented, it is inappropriate to suggest that when a submersible pump is used, only a pitless unit must be vented, but an ordinary casing need not be. The need to vent is the same with both

types of installations. The last sentence is merely a clarification of the existing provision with regard to venting small diameter wells.

7 MCAR §1.223 A.1. A phrase is being deleted because it contributes nothing to the meaning of the provision.

7 MCAR §1.223 A.2. is a new provision which is being proposed primarily for the convenience of contractors who could not meet the 30-hour maximum when submitting samples to the Health Department laboratory for analysis. The requirement that results of the analysis of the water sample be sent to the Department of Health is authorized by Minn. Stat. §156A.07, Subd. 4 (1976) which states, in part:

> ". . .The department of health may. . .(2) Establish. . . procedures for submission of . . . water samples or other special information which may be required. . . to protect, develop and manage, for the public health and welfare. . ."

At the hearing, we will amend the proposed revision to read as follows:

> "If the licensee chooses to submit the water sample to a laboratory other than that of the Minnesota Department of Health, that laboratory must be certified* by the Minnesota Department of Health for determination of the presence of coliform bacteria. The sample must be collected in containers approved by the Director and must be received by the certified laboratory within 30 hours of the time of collection. The costs of such analysis shall be paid by the licensee. Results

* pursuant to the procedure prescribed in 7 MCAR §1.143 (MHD 143)

of the analysis shall be submitted to the Minnesota Department of Health."

The proposed amendment would specify more clearly which procedure must be followed by the licensee to protect the integrity of the sample. The procedure which is prescribed will help assure that the sample is uncontaminated (by collection in a soiled or unsterile container) and that the sample is not so old that any questionable organisms which might have been present at the time of collection have since died. Either of these conditions could produce a false negative result, which could ultimately lead people to consume water which was bacterially unsafe.

7 MCAR §1.224 F.2. The language which was to be stricken in the proposed revision should not be stricken and should remain in effect. The new sentence which was proposed to be added is to be deleted. These amendments will be made at the public hearing.

All of the changes made in the proposed revision which appeared in the State Register (3 S.R. 957) and those noted in this Statement of Need and Reasonableness have been proposed as a result of experience gained in administration of the 1974 version of the code. The changes are necessary in order to provide better protection to the health of persons who drink water from underground sources. The changes are reasonable in that they impose upon the well drilling industry only those restrictions which are necessary to assure that, to the greatest extent permitted, underground waters which are now safe for human consumption will remain so in the future.

* * * * * *

REVISIONS TO 6MCAR5.001 (WWOB-1)

The Water and Wastewater Operators Certification Council seeks to revise existing rule WWOB-1 (6MCAR §5.001) in its entirety by repealing the existing rule and by proposing the adoption of three new rules. The substance of the three proposed rules is essentially the same as that which was contained in WWOB-1, except that the three distinct content areas have each been assigned a rule number. A comparison of the existing rule and the proposed new rules will be made below, along with justification for the proposed changes.

The Water and Wastewater Treatment Operators Certification Council is revising this rule pursuant to authority contained in Minn. Stat. §115.79 (1976) which states in part "The council...shall make such rules and regulations as are necessary to carry out the intent of sections 115.71 to 115.82. [the law relating to certification of operators] The rules and regulations shall include but are not limited to, provisions establishing the bases for classification of water supply systems and wastewater treatment facilities...and provisions establishing qualifications of applicants and procedures for examination of candidates and such other provisions as are necessary for the administration of sections 115.71 to 115.82." Minn. Stat. §115.79(1976).

The authority to adopt rules necessarily carries with it the responsibility to revise those rules when conditions change sufficiently to render applicability of the old rules impractical or unrealistic. With regard to WWOB-1 there was an urgent need to particularize the classification and rating system for wastewater treatment plants and to clarify the qualifications of persons who could be certified to operate different classes of systems

or facilities. The need for and effect of each proposed change will be discussed individually and with greater specificity below.

A preliminary explanation regarding the use of certain terms in WWOB-1 is appropriate here. WWOB-1 refers to a "board." When WWOB-1 was promulgated, the enabling statute called for a certification "board." Minn. Stat. §115.71 S.4 (1971). Laws 1975, Chap. 271, §4 amended the law by changing the term to "council." WWOB-1 was not reprinted to incorporate that change. WWOB-1 also referred to the "secretary" meaning the executive secretary of the former state board of health. This board was abolished in 1977 (Laws 1977, Chap. 305 § 39) and all of its authority was transferred to the commissioner of health. Where WWOB-1 used the term "secretary," the revised version substitutes the term "commissioner."

6MCAR5.001 A. This portion of 6MCAR5.001 states the purpose of the rules. This purpose embodies the council's interpretation of the intent of the legislature when it enacted the mandatory certification law.

B. This portion of 6MCAR5.001 contains the definitions of certain terms which are used with some frequency throughout the rules, and for which specific definitions are necessary if we are to eliminate confusion and misunderstanding.

A few new definitions have been added. The terms "agency", "department", "facility" and "system" are defined in order to permit the use of a single word in place of a long phrase and to have the meaning of the word be clearly understood wherever it appears in the rules.

B.4. "Population equivalent" is a term of art used in the wastewater treatment field. This is the same definition as that which is used in the existing rule.

In WWOB-1 many of the definitions were taken directly from the statute. Since it is no longer permited (with a few exceptions) to repeat in a rule a term which is statutorily defined (Minn. Stat. §15.0412 Subd. 1, 1977 Supp) certain terms which were defined in WWOB-1 have been deleted from the proposed revision. The definitions which have been deleted are the following:

b.(2) "Board" (should read council),

b.(5) "Director"

b.(7) "Secretary"

b.(8) "Wastewater certificate"

b.(9) "Wastewater treatment facility"

b.(10) "Wastewater treatment facility operator"

b.(11) "Water certificate"

b.(12) "Water supply system"

b.(13) "Water supply system operator"

B.5. "Responsible experience" is a new term which is being defined in the revised rule. It replaces WWOB-1(b)(4) "direct responsibility or direct responsible charge" which was found to be unworkable in several instances. The new term defines "responsible experience" without reference to the need for supervision because many supplies and facilities are one-person operations where there are no other workers for an operator to supervise. Yet these people are as much in charge of operation as are those in supervisory capacities. For a similar reason, the definition includes both shift and non-shift type operations. The council feels that the new term and definition will facilitate the decision regarding who should or should not be required to be a certified operator.

WWOB-1(c) relating to severability of portions of the rule has not been repeated in the proposed rules, because the principles of statutory construction found in Minn. Stats. Chap. 645 (1976) apply and need not be repeated in rule form.

6MCAR5.002 specifies the criteria by which systems and facilities will be classified. Similar criteria were contained in WWOB-1(d) relating to classification of systems.

WWOB-1(d)(1)		proposed 6MCAR5.002A.1.
(aa)	Water Supply Source	a.
(bb)	Quality of Water Supply	b.
(cc)	Unit Treatment Processes	c.(1)
		c.(2)
(dd)	Distribution Storage Capacity	d.
(ee)	Number of Wells	e.

In the proposed rule, an additional category was created for systems with more than 15 wells.

(ff)	Population affected	f.
WWOB-1(d)(2)	Class of Water Supply System	6MCAR5.002 A.2.

In the proposed rule, the number of points for a Class D system was increased from 25 to 30.

The point system for wastewater treatment facilities has been completely changed in the new rule. In the old rule, classification was based on a very global measure which focused primarily on the size of the population served by the facility. Over the years, that system of classification has proven to be unworkable and generally unsatisfactory because it did not take into account some other equally important factors, such as type of treatment required pursuant to a National Pollution Discharge Elimination System permit,

and type and quantity of industrial effluent. The proposed classification system is based on experience gained by the agency in trying to work with the old classification system and the need for more quantified criteria, and a model classification system prepared by a nationally recognized organization, the Association of Boards of Certification for Operating Personnel, Ames, Iowa, in water and wastewater utilities.[1] The proposed system assigns points to each of the processes and techniques which are now in use in treatment facilities. The number of points assigned is based on the degree of difficulty of a particular process or technique and on the level of operator training required to carry out the necessary procedures.

6MCAR5.002 B.2 prescribes for facilities a classification system with the same range of points as that which is prescribed for water systems.

6MCAR5.002 B.3 repeats the classification system used in the existing rule for collection type facilities, with minor changes in Classes S-C and S-D. The Council feels that the existence of pumping facilities is no longer a meaningful distinguishing factor, whereas differences in population in the range of 0-1500, and 1500-15,000 do have independent significance and facilities with these characteristics ought to be treated differently.

6MCAR5.002 C. relates to reclassification of a system much as was prescribed in the existing rule WWOB-1(h)(5). The provision merely serves as a warning that a system or facility could be reclassified if circumstances changed sufficiently to require an operator with more training or experience.

6MCAR5.003 groups all the provisions relating to operator qualifications, examination and certification. Subpart A.1 repeats some of the language of the existing rule at WWOB-1(f)(1). 6MCAR5.003 A.2 prescribes

[1] cf Appendix A

the minimum qualifications necessary before one can take the examination to be certified at a particular level. The qualifications in the proposed rule are slightly more stringent than those in the existing rule. The new rule requires that an applicant have possessed a B certificate for 2 years and have had at least 4 years of experience (or 8 years for one who is not a college graduate) in an A or B system or facility. The existing rule does not require that the applicant be already certified as a Class B operator, and requires only 3 years experience in an A or B system or facility. The reason for the proposed increase in experience is that in the past many applicants with only 2 years' experience did not seem to possess a sufficiently wide variety of skills to enable them to assume control of an A system or facility. With the imposition of both new requirements the persons who do get an A certificate in the future will be better able to operate such a plant than are those who are certified as A operators under the existing rule. The requirement that an applicant for an A certificate pass an oral exam merely puts into rule form what has heretofore been the Council's policy. The qualifications imposed for applicants for B or C certificates are the same in the proposed rule (6MCAR5.003 A.2.b.&c) as they are in the existing rule (WWOB-1(f)(3)&(4)). The proposed rule expands the field of potential applicants for the D certificate by allowing those who have no experience, but who have completed a course of study in the relevant area to apply for a D certificate. The new provision also allows the Council to eliminate the need for an "operator-in-training" certificate which could be issued under existing WWOB-1(g)(3)(cc).

In the existing rule the qualifications for those who apply for S-type certificates are different from those imposed on applicants for a

regular certificate in the same class. In the proposed rule the qualifications for one applying for an S-type certificate are the same as those for one applying for a regular certificate. The Council feels the requirement should be the same to eliminate the confusion which exists because of the differences under the existing rule and also because there is a need for persons to have more experience in the A and B classes than has been required in the past. The Council's informal evaluation of the performance of persons presently holding A and B certificates demonstrates that imposing a requirement for additional experience will help assure that those who are certified in the future will be better equipped to handle the variety of problems which can arise in a more complicated system or facility.

6MCAR5.003 A.3 allows an applicant to substitute experience for education and vice versa, much in the same manner as is provided in the existing rule, WWOB-1(h)(7)&(8). A limitation on the type of experience which will be considered acceptable is imposed in the proposed rule.

6MCAR5.003 A.3.a. The new rule provides that experience gained in one occupational setting is not directly transferable when one is applying for certification in a different work setting. These provisions are an acknowledgement of the fact that many operators shift occupational settings. The provisions also reflect the fact that not all of the experience gained in a system will be useful in a facility and vice versa. In order to assure that operators who are certified in a certain class possess sufficient knowledge, the Council feels it is necessary to limit the type of experience which can be applied to that which is directly related to the new work setting.

6MCAR5.003 A.3.b(3) provides that the Council may approve credit for taking the same course more than once. This refers to continuing education

courses which operators are required to take. The Council reserves the right to give such approval if the content of the course is substantially different from that which the applicant took on a previous occasion.

The examination procedure prescribed in proposed 6MCAR5.003 B. is substantially the same as that which is found in the existing rule WWOB-1(g). The proposed rule shortens the time within which one must submit the application for examination from 30 days to 15 days because the 30-day limit was not being systematically enforced. Another minor change (6MCAR5.003 B.2.f.) reduces the time interval after which an applicant may retake an examination from 6 months (WWOB-1(g)(2)(dd)) to 3 months. Since exams are typically given several times each year, applicants complained that they were being unfairly delayed in their attempts to be certified in a higher class. The Council feels that a three month interval will preclude the remembering of specific questions found on the last exam taken while also providing sufficient time for the operator to gain the knowledge sufficient to pass the exam upon retake.

WWOB-1(g)(1)(cc) which specifically allowed a person who was not qualified to take an examination has been deleted because the Council was being called on to make numerous case-by-case evaluations in instances where they were clearly not necessary. The Council hopes that by specifying more clearly when substitutions in qualifications can be made, that all applicants will have a better chance to be evaluated more equally.

6MCAR5.003 C. expands somewhat on the existing rule (WWOB-1(h)(5))by limiting the availability of a restricted certificate to those instances where reclassification is not based on a major change in process. The proposed rule sets out no time limits because none are contained in the law.

6MCAR5.003 D. essentially repeats what is now contained in WWOB-1(g)(3)(aa).

6MCAR5.003 E. repeats WWOB-1(h)(1) and adds the requirement that an operator has 30 days' grace after the date of expiration within which to renew a certificate. This provision helps assure that renewals will be made in a timely manner in order to help minimize the time spent by the staff in handling renewals.

6MCAR5.003 E.2. is a new provision which limits the right of a D certificate holder to renew if that person has not had at least one year's work experience. This provision reflects the Council's opinion that an operator must have actual, in-plant experience before such a person can be certified. The provision also acknowledges a recognition of the fact that a recent training course graduate may not have had the opportunity to gain much experience and the proposed provision gives such an applicant 3 years (the term of the initial certificate) in which to gain on-the-job experience. The Council feels that if a D certificate holder has not been able to gain at least one year's in-plant working experience, then that person's certificate should not be renewed.

6MCAR5.003 F.addresses the matter of reinstatement in slightly more detail than does the existing WWOB-1(g)(3)(ee).

6MCAR5.003 G contains the fee schedule which is the same as that contained in the existing rule in WWOB-1(i).

Several of the other provisions contain in WWOB-1 are not mentioned in the preceding discussion, either because the issue being addressed no longer exists, e.g., grandfather provisions and the former voluntary certification program, or because the same material is already prescribed in the statute, e.g., WWOB-1(k) Violations. Minn. Stats. §115.80 (1976).

The rule revision being proposed here imposes the minimum requirements to assure, (a) that water supply systems and wastewater treatment facilities are classified in a manner which reflects the complexity of their operation, and (b) that persons in charge of those systems and facilities possess sufficient knowledge and experience to operate them in a manner which will assure compliance with applicable laws and ultimately the protection of the public health and environment.

Each of the above proposed revisions is necessary in order to assure that only the best qualified persons are certified to operate systems which have a direct effect on the public's health. The proposed revisions 1) only set out limits and requirements which are designed to promote proper operation of systems and facilities, 2) impose minimum burdens on persons who would apply for certification, and 3) further the goals specified in the law. Therefore, the proposed revisions are reasonable.

STATE OF MINNESOTA
DEPARTMENT OF HEALTH

Nov. 14, 1978

Dr. Richard L. Wade, PhD, MPH, Director
Division of Environmental Health

. . . (f) Services for a constituent by a member of the legislature or a constitutional officer in the executive branch, performed from the beginning of the term of office to adjournment sine die of the legislature in the election year for the office held; . . .''

QUESTIONS

In light of the above, could the Board respond to the following questions:

1. What criteria, if any, are used to determine whether an expense is made for the purpose of influencing an election (i.e., a campaign expenditure) or for any other purpose (i.e., a non-campaign disbursement)? Is the determination based upon the item's content (e.g., is it informative or political to whom it is sent, i.e., to a constituent or the media); its time of release or use (e.g., before or after adjournment); or who pays for it (e.g., the candidate or his campaign committee)?

2. Are news releases, press statements, speeches, radio beepers, photographs, editorial columns and letters to the editor which do not mention the member's voting record, legislative programs, ''campaign pledges,'' etc., which are sent by a legislator to the media after adjournment considered to be a campaign expenditure and subject to the reporting requirements? What, if any, of these items are sent to constituents?

3. Are other informative materials (i.e., materials which do not mention the member's voting record, etc.) such as a bill, map, legislative manual, news clipping, data from a state department or agency, state department or agency rules and regulations, a film (e.g., ''Legislatures Today'') or a pamphlet (e.g., ''How a Bill Becomes a Law'') which are sent by a legislator to a constituent after adjournment considered a campaign expenditure and subject to the reporting requirements?

4. Are informative letters (i.e., ones which make no reference to the member's voting record, etc.) which are sent to a constituent after adjournment considered a campaign expenditure? What if they are sent in response to a constituent's letter or request? What if that constituent's letter or request is received after adjournment?

5. If any of the items mentioned in questions 2, 3 and 4 are considered a campaign expenditure, must the legislator include the cost of stationery and/or stamps provided as part of his allotment by the legislature? Must he also include the cost of having such material typed by a secretary who is employed by the legislature?

6. Under any of the above circumstances, does it matter if the legislator is not seeking reelection? What if he is seeking election to another office?

7. What if any of the items mentioned above are sent to residents of a district other than the legislator's?

May we have your opinion on the above questions at your earliest convenience?

Sincerely,

Raymond J. Albrecht
State Representative

Department of Health Environmental Health Division

Notice of Intent to Solicit Outside Opinion Regarding Proposed Revision of Rules and Adoption of New Rules Relating to Various Subjects

Notice is hereby given, pursuant to the provisions of Minn. Stat. § 15.0412, §ubd. 6 (1976) that the Commissioner of Health will propose the amendment and revision of existing rules and the adoption of new rules.

All interested parties desiring to submit data or views relating to the proposed adoption, amendment or revision of the rules noted below should address their comments (either written or oral) to Ms. Pauline Bouchard, Minnesota Department of Health, Division of Environmental Health, 717 Delaware S.E., Minneapolis, Minnesota 55440 or by calling 612/296-5525. Evidence submitted for consideration should be pertinent to the matter at hand. Any material received by the Department of Health will become part of the hearing record.

Amendments and revisions to rules relating to the following subjects are proposed:

1. licensing of plumbers;
2. public water supplies;
3. construction and abandonment of water wells;
4. license fees for hotels, restaurants and resorts;
5. children's camps; and
6. swimming pools.

New rules are proposed relating to the following subjects:

1. a sanitation code for food service facilities; and

2. installation of water conditioning equipment and licensing of water conditioning contractors and installers.

Any materials submitted shall be reviewed and considered by the Department of Health during the preparation of the proposed rules. Notice of the public hearing on the proposed rules shall be published in the *State Register* and given to all interested parties who have registered with the Secretary of State's Office in accordance with the provisions of the Administrative Procedures Act.

Pollution Control Agency Air Quality Division

Order for Hearing and Notice of Hearing on Application of Ford Motor Company for a Variance from Minn. Reg. APC 9 for the Operation of Certain Painting Facilities at Its Twin Cities Assembly Plant

It is hereby ordered and notice is hereby given that a hearing concerning the above-entitled matter will be held on May 31, 1978, at Highland Branch Library, 1974 Ford Parkway, St. Paul, Minnesota 55116, beginning at 9:30 a.m. and continuing until all persons can be heard.

The hearing will be held before William Seltzer, 1745 University Avenue, St. Paul, Minnesota 55104, (612) 296-8105, a Hearing Examiner appointed by the Chief Hearing Examiner of the State of Minnesota. All parties have the right to be represented by legal counsel or any other representative of their choice throughout the proceeding. The hearing will be conducted pursuant to the contested case procedures set out in Minn. Stat. § 15.0411 through Minn. Stat. § 15.052 and Minn. Reg. HE 201 through HE 222. Questions concerning discovery or other matters concerning this proceeding may be directed to Special Assistant Attorney General Jocelyn Furtwangler Olson, (296-7343), or Thomas Townsend, Division of Air Quality (296-7271), Minnesota Pollution Control Agency, 1935 W. County Road B2, Roseville, Minnesota 55113.

The purpose of this hearing will be to consider testimony and evidence bearing upon the application of Ford Motor Company for a variance of Minn. Reg. APC 9, "Control of Odors in the Ambient Air," for the operation of the following painting facilities located at its Twin Cities Assembly Plant, 966 South Mississippi River Boulevard, St. Paul, Minnesota:

(1) Hood and fender prime oven

(2) Hood and fender enamel oven

(3) Body prime oven

(4) Body enamel spray booth

(5) Body enamel oven

(6) Body tutone enamel oven

(7) Oil house building

Ford Motor Company seeks a variance from the requirements of Minn. Reg. APC 9 until November 1, 1979.

The Minnesota Pollution Control Agency is authorized to hold such hearing and grant such a variance by Minn. Stat. § 116.07 subd. 5 (1976) and pursuant to its regulation, Minn. Reg. MPCA 6.

Any person who desires to become a party to this case must submit a timely petition to intervene to the Hearing Examiner, pursuant to Minn. Reg. HE 210, showing how that person's legal rights, duties, and privileges may be affected by the decision in this case. The petition must also set forth the grounds and purpose for which intervention is sought. A party to a case has the right to present evidence and argument with respect to the issues and to cross-examine witnesses. Interested persons may present oral or written statements at the hearing without becoming parties.

Any person desiring to intervene as a party must submit to the Hearing Examiner and serve upon all existing parties a Petition to Intervene by May 25, 1978. At the present time the representatives of parties to this proceeding who should be served with such Petition to Intervene are:

Mr. George Kircos
Ms. Marcia J. Swinehart
Attorneys for Ford Motor Company
Office of General Counsel
Ford Motor Company
The American Road
Dearborn, Michigan 48121
(313) 322-2958
(313) 323-3794

Ms. Jocelyn F. Olson
Attorney for MPCA Staff
Minnesota Pollution Control Agency
1935 W. County Road B2
Roseville, Minnesota 55113
(612) 296-7343

A Notice of Appearance form, enclosed with this order, is to

STATE OF MINNESOTA

COUNTY OF HENNEPIN

BEFORE THE MINNESOTA

COMMISSIONER OF HEALTH

In the Matter of Proposed
Amendments to the Rules
Relating to the Construction
and Abandonment of Wells

CERTIFICATION

OF CONSULTATION

RECEIVED

DEC 8 1978

Minn. Dept. of Health
Div. of Env. Health

I, Joseph N. Alexander, do hereby certify that I have appointed and designated Sarah Tufford, Supervisor, Development Section, to represent the Minnesota Department of Natural Resources for the purpose of consultation on the revision of standards for the design, location, construction and abandonment of water wells within the State of Minnesota. Ms. Tufford has actively consulted with the representatives of the Minnesota Department of Health concerning the development of the above-captioned rules in compliance with Minn. Stat. §156A.03, Subd. 1 (1976).

Dated:

STATE OF MINNESOTA

DEPARTMENT OF NATURAL RESOURCES

Joseph N. Alexander

Joseph N. Alexander
Commissioner

Exhibit No. 15
File No. HHs-79-016-GAB
GAB Date 12/12/78