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Details:

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WISCONSIN STATE LEGISLATURE ...
PUBLIC HEARING - COMMITTEE RECORDS

2009-10

(session year)

Joint

(Assembly, Senate or Joint)

Committee for Review of Administrative Rules (JCR-AR)

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INFORMATION COLLECTED BY COMMITTEE FOR AND AGAINST PROPOSAL

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- Miscellaneous ... **Misc**

* Contents organized for archiving by: Stefanie Rose (LRB) (June 2012)

(e) *Cover.* Sufficient earth or other suitable cover shall be provided over mains to prevent freezing. A minimum cover of 5 to 7 feet is required unless determined by the department to be unnecessary in specific cases. Insulation may be required at some installations to prevent freezing.

(f) *Thrust restraint.* All tees, bends, plugs and hydrants shall be provided with thrust blocking, tie rods, or a joint restraint system designed to prevent movement.

(g) *Locating wire.* All underground components of public water mains, including mains, hydrant leads, and water services to be constructed of nonconductive material, shall be provided with a locating wire or other department approved equally effective means that can be used to locate the components.

(h) *Erosion control.* Construction site erosion control shall be provided in accordance with s. NR 811.09 (2).

(3) PIPE BURSTING. Department approval is required prior to installing any replacement water mains using the pipe bursting method. Replacement water mains installed through the pipe bursting method shall meet the following requirements in addition to the applicable requirements of sub. (2).

(a) The interior of the water mains shall be thoroughly cleaned of any debris and thoroughly disinfected prior to installation. Water samples shall be collected from the newly installed replacement water mains and sampled for bacteriological quality in accordance with s. NR 810.09 (4).

(b) The installed water mains shall be tested to meet at minimum the applicable AWWA pressure and leakage test requirements in effect at the time of testing prior to being placed in service.

(c) Unless department approval is obtained for the use of other pipe materials, only butt fused DR 9 or 11 HDPE pipe, butt fused DR 14 or 18 PVC pipe or properly restrained ductile iron pipe shall be used for installation as part of the pipe bursting process.

NR 811.74 Separation of water mains and sanitary or storm sewer mains.

(1) GENERAL. The following factors shall be considered in planning separation of water and sewer mains: materials and type of joints for water and sewer pipes, soil conditions, service and branch connections into the water main and sewer line, compensating variations in the horizontal and vertical separations, space for repair, and alterations of water and sewer pipes.

(2) HORIZONTAL SEPARATION. The following horizontal separation requirements shall be met:

(a) Water mains shall be laid at least 8 feet horizontally from any existing or proposed sanitary sewer main, storm sewer main, or sanitary or storm sewer manhole. The distance shall be measured center to center.

(b) In cases where it is not practical to maintain an 8-foot horizontal separation distance, the department may allow exceptions to that requirement on a case-by-case basis, if supported by data from the design engineer. The following requirements shall be met in order for the department to approve a center to center horizontal separation distance of less than 5 feet:

1. The bottom of the water main shall be at least 18 inches above the top of the sewer main and the minimum horizontal separation distance shall be 3 feet measured edge-to edge.

2. A profile of the rock surface as determined from exploration shall be shown on the plan when high bedrock is the reason for the exception to the 8-foot separation distance.

Note: See Figure No. 10 in the Appendix.

(3) VERTICAL SEPARATION. If water mains cross over sanitary or storm sewer mains, the water main shall be laid at such an elevation that the bottom of the water main is at least 6 inches above the top of the sewer main. If water mains cross under sanitary or storm sewer mains, a minimum vertical separation distance of 18 inches shall be maintained between the top of the water main and the bottom of the sewer main. At crossings, one full length of water pipe shall be centered above or below the sewer so that both joints will be as far from the sewer as possible. Special structural support for the water and sewer pipes may be required by the department after a determination that added support is necessary to meet the requirements of this chapter.

(4) EXCEPTION. If it is not possible to obtain the proper horizontal and vertical separation as specified in subs. (2) and (3), a gravity sanitary or storm sewer main shall be constructed of materials and with joints that are equivalent to water main standards of construction from manhole to manhole and air pressure tested to assure water tightness in

accordance with the 4 psi pressure testing requirements given in s. NR 811.12 (5) (d) 2. Department approval is required for any exception to the requirements in subs. (2) and (3).

(5) FORCE MAINS. No exception to the 8-foot separation distance may be granted for sanitary sewer force main installations unless the requirement in sub. (2) (b) is met.

(6) SEWER MANHOLES. No water pipe may pass through or come into contact with any part of a sanitary or storm sewer manhole.

NR 811.75 Separation of water mains and other contamination sources. (1) Proposed water mains shall be adequately separated from any potential source of contamination. The following minimum horizontal separation distances shall be maintained:

(a) Eight feet between a water main and a POWTS holding, treatment or dispersal component, sanitary sewer lift-station or grave site.

(b) Twenty five feet between a water main and a buried main or tank containing gasoline, diesel, bio-diesel, ethanol, other alternative fuel, fuel oil, petroleum product, motor fuel, burner fuel, lubricant, waste oil, or hazardous substance.

(c) Fifty feet between a water main and a sanitary landfill.

(2) Water mains may not pass through landfills.

NR 811.76 Surface water crossings. Surface water crossings, whether over or under water, present special problems. For this reason, the department shall be consulted before final plans are prepared. The design shall meet the following requirements:

(1) ABOVE-WATER CROSSINGS.

(a) The pipe shall be adequately supported and anchored, protected from damage and freezing, and accessible for repair or replacement.

(b) A means to accommodate bridge expansion such as an expansion joint shall be provided to the water main if the corresponding bridge has expansion joints.

(c) Shut-off valves shall be provided at both ends of a bridge crossing if the bridge has expansion joints so that the section can be isolated for testing or repair. The valves shall be easily accessible and not subject to flooding.

(2) UNDERWATER CROSSINGS.

(a) A minimum cover of 2 feet shall be provided over the pipe.

(b) When crossing water courses which are greater than 15 feet in width, the following shall be provided:

1. The pipe shall be of special construction, having flexible, watertight joints. Butt fused DR 9 or 11 HDPE pipe or butt fused DR 14 or 18 PVC pipe are an acceptable alternative.

2. Shut-off valves shall be provided at both ends of water crossings so that the section can be isolated for testing or repair. The valves shall be easily accessible, and not subject to flooding, and the valve closest to the supply source shall be in a manhole. Unless the department approves an equivalent method, permanent taps shall be made on the pipe within the manhole on either side of the valve to allow insertion of a small water meter to determine leakage during system pressure testing.

NR 811.77 Common casing crossings. In some cases, such as highway crossings, it becomes desirable due to extremely high construction costs to install water mains, sanitary sewers, force mains or storm sewers within a common casing. The following requirements apply:

(1) Any sewers shall be constructed of water main class pipe and joints and pressure and leakage tested in accordance with the requirements in s. NR 811.12 (5) (d) 2.

(2) The water main shall be located above the sewer main and be adequately supported.

(3) A vertical separation distance of 6 inches shall be maintained between the bottom of the water main and the top of the sewer main.

(4) Normal separation distances shall be provided as close as possible to the ends of the casing.

(5) Force mains shall be installed within an intermediate casing within the larger casing. The intermediate casing shall extend a minimum of five feet beyond each end of the larger casing.

(6) The remaining space in the casing may be filled if desired.

NR 811.78 Water loading stations. Water loading stations shall comply with the requirements of this section to prevent contamination of both the public water supply and potable water vessels being filled.

(1) There may be no backflow or backsiphonage to the public water supply. Either a free air break shall be provided as shown in Figure No. 11 in the Appendix or alternatively, a reduced pressure principle backflow preventer shall be installed on the water loading piping. Cross connection control shall be provided to meet the requirements of s. Comm. 82.41.

(2) The piping arrangement shall prevent contaminants from being transferred from a hauling vessel to others subsequently using the station.

(3) Hoses may not be contaminated by contact with the ground.

Note: It is recommended that a water meter be installed on the piping at all water loading stations to record water usage. It is also recommended that a free air break be installed in place of installing a reduced pressure principle backflow preventer.

SUBCHAPTER XI, WATER PRESSURE BOOSTER STATIONS

NR 811.79 General. If the storage or primary pumping facilities cannot provide a minimum static pressure of 35 psi throughout the distribution system at street elevation, it shall be necessary to create a boosted pressure zone to serve those portions of the system. The use of pressure boosting systems on individual service lines shall be limited to a maximum of 10 individual systems in any given service area. The minimum static water pressure at street elevation shall be 20 psi in order for individual pressure boosting systems to be installed. Individual pressure boosting systems shall be owned and maintained by the water system owner. Booster station design shall be in accordance with this subchapter.

NR 811.80 Location. (1) Pumps shall take suction from a reservoir, a water main adjacent to a reservoir, or elevated tank, where possible. If necessary, pumps can take suction from a distribution system water main if the installation complies with the requirements of this subchapter.

(2) For pumps not directly supplied by a reservoir or elevated tank, the suction pressure shall be at least 35 psi when the pumps are supplying design flow rates.

(3) Underground installations shall be permitted only if gravity drainage to the ground surface of large volumes of water from the vault can be provided or if the pumps and drivers are protected from damage by water or can be readily replaced. The department may waive the gravity drainage requirement if a minimum of 20 psi can be maintained at street elevation in the boosted zone by the main zone when the station is out of service or if sufficient elevated storage or alternate supply exists within the booster zone. The drain line may not discharge to a storm or sanitary sewer.

(4) In-line submersible pumps may be installed below the ground surface in a watertight installation. Provision shall be made for operational monitoring, pressure monitoring, flow metering, water sampling, and isolation valves. The pumps shall be accessible for servicing and repairs.

(5) Electrical equipment shall be installed above ground except if determined unnecessary by the department to meet the other requirements in this chapter.

(6) Buried stations may not be installed beneath roadways or in a floodplain.

Note: Refer to ch. NR 116 for floodplain definitions.

NR 811.81 Pumps and pressures. (1) The booster pumps shall maintain static pressures in the area served within the range of 35 to 100 psi under normal operating conditions.

(2) The pump capacities for domestic service only shall be as established in Figure No. 1 in the Appendix, or as justified by additional engineering studies. Fire protection shall be provided if feasible and will require additional engineering studies.

(3) Pumping stations which serve more than 50 living units shall be designed such that the peak demand can be met with the largest pump out of service.

(4) For pumps not directly supplied by an adjacent reservoir or elevated tank, the suction pressure shall be at least 35 psi when the pumps are supplying design flow rates. An automatic cutoff control shall be provided that will stop the pumps when the suction pressure falls below 20 psi.

(5) For pumps supplied by an adjacent but not physically connected reservoir or elevated tank, the suction pressure shall be at least 3 psi under all pumping conditions. An automatic cutoff control shall be provided that will stop the pumps when the suction pressure falls below 3 psi.

(6) For those stations servicing a boosted zone without elevated storage, one of the following shall be provided:

(a) A continuously running pump to maintain pressure in the boosted zone. A small feed back line or other means shall be provided to prevent the pump from overheating.

(b) A single speed pump and one or more hydro-pneumatic tanks with a total gross volume at least ten times the rated gallon per minute capacity of the pump.

(c) A pump fitted with a 2 to 3 minute minimum run timer and one or more hydro-pneumatic tanks to prevent frequent pump cycling.

(d) A pump controlled by a variable output control device along with one or more hydro-pneumatic tanks having a total gross volume meeting the requirements of s. NR 811.34 (6).

NR 811.82 Storage requirements. Elevated storage is not required for a boosted pressure zone where the primary pressure zone can provide minimum pressures of 35 psi at street elevation in all areas of the boosted zone. Elevated storage facilities shall be provided for a boosted pressure zone serving more than 50 living units in any of the following situations:

(1) If the primary pressure zone cannot maintain pressures of 3 psi or greater at street elevation in all areas served by the booster pumps including situations where emergency power is provided.

(2) If the primary pressure zone provides pressures of 3 to 35 psi at street elevation in all areas served by the booster pumps and an emergency power source is not provided for the booster station.

NR 811.83 Emergency power requirements. Boosted pressure zone emergency power installations shall meet the following requirements:

(1) Emergency power shall be provided if 50 or fewer living units are being served and the primary pressure zone cannot maintain positive pressures of 3 psi or greater at street elevation in all areas served by the booster pumps, and sufficient elevated storage is not provided.

(2) Emergency power shall be provided if more than 50 living units are being served and the primary pressure zone cannot maintain pressures of 20 psi or greater at street elevation in all areas served by the booster pumps, and sufficient elevated storage is not provided.

(3) Emergency power shall consist of a dedicated on-site engine-generator set with an automatic transfer switch capable of powering at minimum the domestic service pumps and station building demands.

NR 811.84 Station requirements. (1) The on-off operation of the pumps and the system pressure at the booster station shall be monitored at one of the main waterworks pumping stations, other waterworks facility, or wherever the master control panel is located. At stations serving 50 or fewer living units, monitoring may be provided by a light or an audible alarm placed in a conspicuous location outside the station to indicate pump failure. A continuous recording pressure device may be provided.

(2) Pressure gauges shall be provided on the booster pump suction and discharge lines.

(3) A flow meter shall be provided, if practical, in the booster pump discharge line. Booster pump motors shall be provided with hour meters if a flow meter will not be installed.

(4) A metal smooth end sampling faucet shall be installed on the combined booster pump discharge piping.

(5) The design shall provide for automatically bypassing the pumping units when the pumps are not operating.

(6) The design shall include piping and shut-off valves for manually bypassing the station when the station is out of service.

(7) If chemical addition is necessary, the station shall be provided with a separate chemical room meeting the requirements of subchs. VI and VII.

(8) General requirements for above grade stations are listed in subch. IV.

(9) Underground stations shall be equipped with heating, ventilation, and dehumidification equipment. Sump and sump pump equipment shall be provided unless a discharge to the ground surface can be provided. Access manways shall terminate a minimum of 24 inches above grade with an overlapping, locking cover. Sump pump discharge and vent pipes shall be metal and terminate a minimum of 24 inches above grade in a downward facing U-bend with a 24-mesh corrosion resistant screen. Chemical addition equipment may not be installed in underground stations.

SUBCHAPTER XII, WASTE DISPOSAL

NR 811.85 General. The discharge of pollutants from a waterworks facility into the waters of the state or into a publicly owned treatment works, as those terms are defined in s. 283.01, Stats., shall conform to all the applicable requirements of ch. 283, Stats., and the rules adopted under ch. 283, Stats. Provisions shall be made for proper disposal of all wastes from waterworks facilities. Wastes may be from sanitary facilities, laboratories, or treatment plants. If new methods are proposed or the treatment results are uncertain, the department may require laboratory, pilot, or full-scale testing to establish design parameters. Sections NR 811.853 to 811.862 contain general standards to be utilized in meeting the requirements of ch. 283, Stats. System owners proposing discharges other than to already permitted wastewater treatment plants shall obtain a WPDES permit.

NR 811.851 Sanitary wastes. Wastes from toilet facilities shall be discharged to a sanitary sewer system. The floor elevation to a building from which there is a discharge shall be constructed at least one foot above the rim of the nearest sanitary sewer manhole in accordance with s. NR 811.25 (1) (h) to prevent contamination from sewer backup. Where a sanitary sewer system is not available, the installation of an individual POWTS may be approved by the department if the installation meets ch. Comm 83 requirements and if the POWTS separation distances to a community water system well shall comply with the requirements of s. NR 811.12 (5) (d).

NR 811.852 Floor drainage. Floor drains in pump stations and treatment plants shall comply with the requirements of s. NR 811.25 (1) (h).

NR 811.853 Backwash wastewater from iron and manganese filters. **(1)** DISCHARGE TO SANITARY SEWER. Backwash wastewater from iron and manganese removal filters may be discharged to a sanitary sewer if the discharge will not overload the facilities or adversely affect the wastewater treatment process. The radionuclide content of the wastewater shall comply with s. NR 811.856. An equalization tank shall be provided when it is necessary to prevent overloading the sewers or wastewater treatment plant.

(2) DISCHARGE TO SAND FILTERS. All of the following requirements apply when sand filters are used to treat backwash wastewater from iron and manganese removal filters:

(a) Filters shall be designed for a maximum rate of 35 gallons per square foot per day except if testing indicates that higher rates will not cause excessive plugging of the media and a quality effluent can be maintained. Sufficient surface area shall be provided so that during any filtration cycle the wastewater depth over the media does not exceed 2 feet. The filters shall be sized to handle the entire backwash volume from all of the filters at the treatment plant unless the filters are washed on a rotating schedule.

(b) No filter, regardless of the volume of water to be handled, may be smaller than 100 square feet in area. Multiple units may be necessary to facilitate cleaning.

(c) The filter media shall consist of a minimum of 12 inches of sand, 3 to 4 inches of supporting small gravel or torpedo sand, and 9 inches of gravel in graded layers. All fines shall be removed from the media by washing. The filter sand shall have an effective size of 0.3 to 0.5 mm and a uniformity coefficient not exceeding 3.5.

(d) An adequate underdrainage collection system shall be provided. Provision shall be made for sampling the filter effluent.

(e) A cover shall be provided which prevents freezing during the winter months.

(f) The filter shall be located in an area not subject to flooding, and the site shall be graded to prevent ponding of surface runoff. Finished grade elevation shall be designed to facilitate maintenance, cleaning, and removal or replacement of surface sand. An overflow may not be provided.

(g) The radionuclide content of the wastewater shall comply with s. NR 811.856.

(3) DISCHARGE TO LAGOONS. Lagoons used to settle backwash wastewater from iron and manganese removal filters shall meet all of the following design requirements:

(a) Lagoons shall be designed with a volume which is 10 times the total quantity of wastewater discharged during any 24-hour period.

(b) Lagoon length shall be 4 times the width, and the width shall be at least 3 times the depth.

(c) Adequate inlet and outlet devices shall be provided so that velocity currents are minimized.

(d) The radionuclide content of the wastewater shall comply with s. NR 811.856.

(4) DISCHARGE TO DETENTION TANKS. Detention tanks used to settle backwash wastewater from iron and manganese removal filters shall meet all of the following design requirements:

(a) Detention tanks shall be designed to maximize settling by means of inlet piping and baffling configurations. Tanks shall be of sufficient capacity to hold at least 2 complete backwash cycles. The floor shall be sloped to a sump and access manholes provided to facilitate cleaning. A cover shall be provided to prevent freezing.

(b) Pumps shall be provided to discharge the decant water to a storm sewer or receiving watercourse over approximately a 24-hour period. A convenient means of sampling the effluent shall be provided. Any discharge requires a WPDES permit. The radionuclide content of the wastewater shall comply with s. NR 811.856.

(c) Decant water to be returned to the water treatment plant shall meet the requirements of s. NR 811.862.

(d) Settled sludge removed from detention tanks shall be disposed of at a wastewater treatment plant unless the department approves an alternate disposal location on a case-by-case basis.

NR 811.854 Brine wastes from ion exchange plants. The department may allow brine wastes to be discharged to a sanitary sewer system or to a watercourse if sufficient flow is available to provide adequate dilution to meet water quality or effluent standards. Dilution in streams shall be based on the 7-day low flow for the previous 10-year period. Except if discharging to large waterways or sewerage systems that will not be overloaded by the discharge, the minimum requirement shall be an equalization tank of sufficient size to allow brine discharge over a 24-hour period. The radionuclide content of the wastewater shall comply with s. NR 811.856.

NR 811.855 Wastewater from reverse osmosis plants. The department may allow reject wastewater from reverse osmosis membranes to be discharged to a sanitary sewer system or to a watercourse if sufficient flow is available to provide adequate dilution to meet water quality or effluent standards. Dilution in streams shall be based on the 7-day low flow for the previous 10-year period. Except if discharging to large waterways or sewerage systems that will not be overloaded by the discharge, the minimum requirement shall be an equalization tank of sufficient size to allow reject wastewater discharge over a 24-hour period. The radionuclide content of the wastewater shall comply with s. NR 811.856.

NR 811.856 Water treatment plant wastewater radionuclide content compliance with the Unity Equation. Levels of radium and uranium in water treatment plant wastewater to be discharged to a sanitary sewer or to surface water shall meet all of the following requirements:

(1) UNITY EQUATION. The levels of radium and uranium in the wastewater shall meet the limits of the Unity Equation as calculated based upon the requirements of the department of health services under s. HFS 157.30 (3) and Appendix E of ch. HFS 157.

(2) CALCULATIONS. (a) Unity Equation calculations shall be performed for water treatment plants treating wells with combined radium-226 and radium-228, uranium, or both exceeding the maximum contaminant level unless required by the department in individual cases or if other less common radionuclide elements may be of concern.

(b) The water system owner or its consultant shall submit the Unity Equation assumptions and calculations to the department for review and approval before, or along with, the submission of plans and specifications to the department for the radionuclide removal water treatment equipment or plant.

(3) CORRECTIVE ACTIONS. Corrective action as approved by the department shall be taken, if necessary, to maintain the result of the Unity Equation calculations as less than one.

Note: The department's Public Water Supply Section located in Madison may be contacted to obtain a copy of DNR Application of DHS Radionuclide Wastewater Disposal Criteria for help in addressing Unity Equation issues.

NR 811.857 Backwash wastewater from lime softening water treatment plants. Filter backwash wastewater from lime softening water treatment plants shall be disposed of by any of the following methods:

(1) Returned to the inlet end of the plant in accordance with the requirements of s. NR 811.862.

(2) Direct or controlled discharge to a sanitary sewer system may be allowed by the department if the discharge will not overload the facilities or adversely affect the wastewater treatment process.

(3) Discharge to surface water. Suspended solids shall be removed from the filter backwash wastewater before the filter backwash wastewater is discharged to surface water. This will require settling and possibly coagulation. Any discharge requires a WPDES Permit.

NR 811.858 Lime softening sludge. Sludge from plants using lime to soften water will vary in quantity and in chemical characteristics depending on the softening process and the chemical characteristics of the water being softened. The department shall determine special disposal requirements for sludge from plants treating water containing radium-226, radium-228, or uranium. These special requirements shall modify the requirements for specific disposal methods. The requirements for specific disposal methods are as follows:

(1) LAGOONS. The design shall meet the following minimum requirements:

(a) Locations free from flooding, with grading or ditching to divert surface runoff.

(b) Minimum lagoon depth of 4 to 5 feet with interior and exterior slopes of 3:1.

(c) Two years solids storage volume for temporary lagoons and 8- to 10-years storage volume for permanent lagoons.

(d) Multiple cells to provide flexibility in operation.

(e) Adjustable decanting devices.

(f) Means of convenient cleaning where appropriate.

(2) APPLICATION TO AGRICULTURAL LAND. The department may allow liquid sludge to be applied to agricultural land by tank truck if the solids do not exceed 10 to 12% by weight. This method requires proper handling facilities, vehicles, and equipment to allow hauling and spreading which does not create a nuisance. Adequate sludge holding facilities are required for use during times that trucks cannot operate. Higher solids content sludges may also be spread. However, prior to increasing the solids content the local department sludge management specialist shall be contacted to evaluate the acceptability of spreading the high solids sludge. Land application of sludge, including the radium-226 content, shall comply with the applicable requirements of s. NR 204.07.

(3) DISCHARGE TO SANITARY SEWER. Discharge to sanitary sewer may be utilized if a study or experience has shown that problems will not occur in the sewage collection system or at the wastewater treatment plant. An equalization tank may be necessary to even out flows to the sewer system. The radionuclide content of the sludge shall comply with s. NR 811.856.

(4) MECHANICAL DEWATERING. Pilot testing of mechanical dewatering is necessary to show the results that may be obtained. The department shall review and approve proposals on a case-by-case basis to insure that water quality and effluent requirements will be met.

NR 811.859 Spent media. (1) GENERAL. Spent media from water treatment plants may require special handling and disposal. The department shall evaluate on a case-by-case basis the proper handling and disposal techniques for spent media under any of the following circumstances:

(a) Granular activated carbon shall be evaluated when treating water with volatile organic compounds or radium, uranium, or radon gas.

(b) Filter sand, green sand, ion exchange media, membranes, support media, and other media that may retain radionuclide material shall be evaluated when treating water with radium-226, radium-228, or uranium.

(2) DISPOSAL APPROVAL. The department shall be contacted for approval prior to disposal of the medias listed in sub. (1). A written request indicating the type of media, the volume of media, the contaminants of concern and their concentration in the influent water and the media, the proposed method of transportation, and the proposed method of disposal shall be submitted to the department.

NR 811.860 Backwash wastewater from surface water treatment plants. Filter backwash wastewater from surface water treatment plants shall be disposed of by any of the following methods:

(1) RECYCLING. Filter backwash wastewater may be returned to the inlet end of the plant in accordance with the requirements of s. NR 811.862. Membrane filtration plants may not recycle backwash wastewater unless the waste goes through coagulation and settling processes prior to being applied to the membranes. Membrane manufacturers

may have specific feed water quality parameter requirements that could limit recycling. Chemical cleaning waste from membrane plants may not be recycled unless specifically approved by the department. All plants recycling filter wastewater shall have an alternative means of disposing of wastewater available during challenging raw water quality periods.

(2) DISCHARGE TO SANITARY SEWER. The wastewater program of the department may approve direct or controlled discharge to a sanitary sewer system if the discharge will not overload the facilities or adversely affect the wastewater treatment process.

(3) DISCHARGE TO SURFACE WATER. Suspended solids shall be removed from the filter backwash wastewater before the filter backwash wastewater is discharged to surface water. This will require settling and possibly coagulation. Any discharge requires a WPDES Permit. Chemical cleaning waste from membrane plants may not be discharged to surface water.

(4) TREATED BY SECONDARY MEMBRANE. The filter backwash water may be treated by a dedicated membrane system and sent to the clearwell if approved by the department in accordance with all of the following requirements:

(a) The membrane, as can be demonstrated by integrity testing conducted every 8 hours, shall provide a minimum 99.9997 percent (5.5-log) removal of *Cryptosporidium*.

(b) If the membrane cannot be demonstrated to provide a 99.9997 percent (5.5-log) removal of *Cryptosporidium*, UV shall be provided following the membrane. The membrane and UV together shall provide a minimum of 99.9997 percent (5.5-logs) of removal or inactivation of *Cryptosporidium*, or a combination of both.

(c) A target removal of less than 99.9997 percent (5.5-logs) of *Cryptosporidium* may be considered by the department if testing of the backwash water in accordance with s. NR 809.334 and bin classification in accordance with s. NR 810.34 would result in a bin classification less than Bin 4.

NR 811.861 Alum or other coagulant sludge. Alum or other coagulant sludge shall be disposed of by the following methods:

(1) LAGOONS. The general design criteria for lagoons is in s. NR 811.858 (1).

(2) DISCHARGE TO SANITARY SEWERS. Discharge to sanitary sewers may be utilized if a study or experience has shown that problems will not occur in the sewage collection system or at the sewage treatment plant. A holding tank may be necessary to even out flows to the sewer system. The radionuclide content of the sludge shall comply with s. NR 811.856.

(3) MECHANICAL DEWATERING. Mechanical dewatering may be utilized if approved by the department after review of the results of testing.

(4) SUPERNATENT WATER. Any thickener supernatant or liquids from dewatering processes to be recycled shall meet the requirements of s. NR 811.862.

NR 811.862 Recycling backwash wastewater. Filter and contactor backwash wastewater may be recycled if approved by the department in accordance with all of the following requirements:

(1) The filter and contactor backwash wastewater shall be settled in a settling tank or equalization basin prior to being returned to the inlet end of the plant. For surface water systems, a coagulant or polymer may be required to enhance settling to prevent protozoans such as *Giardia lamblia* and *Cryptosporidium* from concentrating. Tanks and basins shall meet all of the following minimum requirements:

(a) The tanks shall contain the anticipated volume of backwash wastewater produced by the plant when operating at design capacity.

(b) The tanks shall be of adequate size to contain the total waste washwater from two consecutive backwashes to provide operation flexibility.

(2) The settled filtered backwash wastewater shall be returned to the head end of the plant at a maximum rate of 10% of the instantaneous flow rate at which raw water is entering the plant. All of the following requirements shall be met:

(a) The point of recycle shall be prior to all treatment and chemical addition except chemical treatment for zebra mussel control at the intake.

(b) A meter shall be provided on the recycle line.

(c) A means shall be provided for controlling the rate at which the settled backwash wastewater is returned.

(3) For systems treating groundwater, the settled filtered backwash wastewater shall be disinfected prior to or at the time that it is returned to the head end of the plant.

(4) Reservoirs to be used to settle backwash wastewater for plants treating potable groundwater shall be constructed to potable reservoir construction standards as required by subch. IX. The discharge of any wastewater or sludge, or both, from such a reservoir to a sanitary or storm sewer main, manhole, or other collection structure, whether by pump or by gravity, shall not be made through a direct connection. The discharge piping shall terminate downward with a one-foot free air break over the receiving structure as required in s. NR 811.64 (4).

(5) For surface water systems that recycle their backwash wastewater, all of the following reporting and record keeping requirements apply:

(a) A current plant schematic showing the origin of all recycle streams, how any recycle streams are transported, and where the recycle streams enter the treatment process shall be maintained on file with the department.

(b) Information on the typical recycle flow rate, the highest observed plant flow rate each year, and the design flow rate of the plant shall be available to the department upon request.

(c) The information in pars. (a) and (b) along with all of the following information shall be maintained on file for a minimum of 10 years: dates when recycle flow rate has exceeded 10 per cent of raw water flow rate entering the plant; how recycle flow rate is controlled; dimension and volume of backwash equalization basin; typical detention time in equalization basin; type of coagulant fed prior to equalization basin; and means of sludge removal from the equalization basin.

SUBCHAPTER XIII, AQUIFER STORAGE RECOVERY

NR 811.87 General. (1) Approval of the department is required prior to the construction of any aquifer storage recovery well or the conversion of any previously constructed well for use as an aquifer storage recovery well.

Note: Approval to construct or develop an aquifer storage recovery well is not an approval to operate an ASR system.

(2) Approval of the department is required prior to the operation of any aquifer storage recovery system.

Note: The department will not issue an approval to operate an ASR system until after it has reviewed and evaluated the results of an approved ASR pilot study.

(3) Only treated drinking water may be placed underground through an ASR system well.

(4) Only a municipal water system may construct an aquifer storage recovery well or operate an ASR system.

(5) The displacement zone around an ASR well may extend no further than 1,200 feet from that ASR well.

NR 811.88 ASR well performance requirements.

(1) Unless the department determines that it is not technically or economically feasible, the quality of the treated drinking water to be placed underground through an aquifer storage recovery well shall comply with the preventive action limits contained in ch. NR 140 prior to underground injection. In all cases, the quality of the treated drinking water to be placed underground through an aquifer storage recovery well shall meet the primary drinking water standards contained in ch. NR 809 and may not contain any substance at a concentration that exceeds a state or federal health advisory prior to underground injection.

Note: Pursuant to s. 160.19 (2) (b), Stats., the department finds that treated drinking water in a municipal water system may at times exceed preventive action limits established for iron, manganese, nitrate, nitrite, copper, lead, fluoride, asbestos, chloroform, bromoform, bromodichloromethane, and dibromochloromethane. Such exceedances may occur at the point of underground injection and within the displacement zone surrounding an aquifer storage recovery well even though the treated water being injected would remain in compliance with federal and state water quality standards for drinking water. The maximum allowable concentration of a primary drinking water contaminant in treated drinking water has been set by the United States Environmental Protection Agency at the lowest level that is considered to be technically and economically achievable at this time. The department also finds that it is not technically or economically feasible to require that residual concentrations of chloroform, bromoform, bromodichloromethane, and dibromochloromethane be removed from the injected water when a disinfection residual is desired at the wellhead to provide additional protection to the water system from potential biological contamination.

(2) All water that is retrieved through an aquifer storage recovery well shall comply with the primary drinking water standards contained in ch. NR 809 and shall be treated to provide a disinfectant residual prior to recovery into any municipal water distribution system.

(3) The quality of treated drinking water stored in a displacement zone shall at all times comply with the primary drinking water standards contained in ch. NR 809. ASR systems shall be designed and operated to maintain compliance with the groundwater standards contained in ch. NR 140, as required by s. NR 140.22. Therefore, treated drinking water stored underground in an ASR system shall comply with the applicable enforcement standards established in ch. NR 140 prior to movement beyond the property boundary of the ASR well site.

Note: An ASR well site is considered to include lands adjacent to the ASR wellhead that are directly owned by the municipal water system and any contiguous properties that are directly owned by the local unit of government of which the water system is a subunit.

(4) At the completion of each aquifer storage recovery cycle, the subsurface water in any portion of a displacement zone may not attain or exceed ch. NR 140 enforcement standards for iron, manganese, nitrate, nitrite, copper, lead, fluoride, asbestos, chloroform, bromoform, bromodichloromethane or dibromochloromethane or ch. NR 140 preventive action limits established for any other substance. The department may grant an exemption from this requirement, in accordance with s. NR 140.28, when an ASR well or ASR system is located in an area where the background concentration of a substance attains or exceeds the groundwater preventive action limit or enforcement standard established for that substance.

Note: Pursuant to s. 160.19 (2) (b), Stats., the department finds that routine operation of an ASR system may result in an exceedance of the preventive action limits established for iron, manganese, nitrate, nitrite, copper, lead, fluoride, asbestos chloroform, bromoform, bromodichloromethane, and dibromochloromethane in a displacement zone. An ASR cycle is normally completed when the volume of water recovered equals the volume of water that was originally injected; however, the department recognizes that some of the treated drinking water injected during an aquifer storage recovery cycle may remain in an aquifer at the completion of the cycle and that substances present in this residual treated drinking water may result in ch. NR 140 preventive action limits being exceeded in an aquifer at the completion of an aquifer storage recovery cycle.

NR 811.89 Well construction requirements for ASR wells. (1) Each well constructed or converted for use as an aquifer storage recovery well shall be completed in a manner that complies with the well construction requirements established in ss. NR 811.12 to 811.20.

(2) Any monitoring well constructed on an ASR well site shall comply with the well construction requirements established in ss. NR 811.12 to 811.20. For the purpose of this subsection, an ASR well site is considered to include only those lands adjacent to the ASR wellhead that are directly owned by the municipal water system.

(3) Each monitoring well that is located beyond the property boundary of an ASR well site and that is constructed as part of an ASR system pilot study, ASR system development study, or for ASR operational monitoring shall comply with the monitoring well construction requirements established in ch. NR 141. For the purpose of this subsection, an ASR well site is considered to include only those lands adjacent to the ASR wellhead that are directly owned by the municipal water system.

(4) Each aquifer storage recovery well shall be enclosed within a lockable protective structure that is secured from tampering or unauthorized entry in a manner that is approved by the department.

(5) Each monitoring well shall be enclosed within a lockable protective covering and secured from tampering or unauthorized entry in a manner that is approved by the department.

NR 811.90 Equipment, appurtenances and piping for ASR wells and ASR systems. (1) Pumping equipment, appurtenances and piping that are to be installed as part of an ASR system shall comply with the requirements of ss. NR 811.30 to 811.37.

(2) Department approval shall be obtained prior to installation or modification of any well, pumping equipment, appurtenances or piping for the purpose of aquifer storage recovery.

(3) Security shall be provided for each ASR well site in a manner that is approved by the department.

NR 811.91 ASR system pilot studies. (1) Department approval is required prior to conducting any ASR system pilot study.

(2) Only a municipal water system may perform an ASR system pilot study.

(3) A request to conduct an ASR system pilot study shall be submitted to the department in writing. The request shall identify the location of each existing well that is being considered for use as an ASR well within the proposed ASR system, the location of any new well that is anticipated to be constructed for use as an ASR well within the proposed ASR system and any additional wells that are to be used or constructed as part of the ASR system pilot study.

(4) Each request to conduct an ASR system pilot study shall contain all of the following:

(a) A preliminary hydrogeologic report that describes the methods and results of any hydrologic investigation, aquifer testing, hydrogeologic modeling or geochemical modeling performed to identify the location of the proposed ASR system well sites. The preliminary hydrogeologic report shall identify the location of each existing public or private water well and each potential source of groundwater contamination that is located within 1200 feet of the outer perimeter of the displacement zone that is calculated to be established around each of the proposed ASR wells within the proposed ASR system. The report shall also identify the well selected for further evaluation during the ASR well pilot test, identify the dimensions of the displacement zone that will be created around the designated test well, and describe the current and anticipated groundwater flow patterns found in the vicinity of the designated test well.

(b) A preliminary engineering report that provides an analysis of the technical feasibility for developing each of the potential ASR wells identified for the proposed ASR system and estimates the probable percentage of treated drinking water that would be recovered from each of the potential ASR wells during an ASR cycle.

(c) Plans and specifications for any well equipment, pumping equipment, appurtenances or piping that is to be constructed or altered in order to complete the proposed ASR system pilot study.

(d) A description of all operating procedures to be followed during the ASR well pilot study. This description shall contain details including the maximum volume of water to be placed underground, the flow rate and pressure of underground injection, the expected water storage period, anticipated water retrieval rates, and methods proposed for disposing of the water recovered during the ASR system pilot study.

(e) A description of all performance and compliance monitoring procedures to be followed during the ASR system pilot study. This description shall include a listing of the sampling locations, methods and schedules that will be used to ensure that the aquifer storage recovery well remains in compliance with the performance requirements set forth in s. NR 811.88.

(f) Plans and specifications for each monitoring well proposed as part of the ASR system pilot study. A minimum of one monitoring well is required as part of the ASR system pilot study. The department may require additional monitoring wells should the proposed ASR system encompass multiple or otherwise unique geologic formations. The department may also waive the monitoring well requirement if water quality data from other ASR system pilot studies conducted in similar geologic conditions is submitted as part of the ASR system pilot study request and is determined to be applicable by the department.

(5) The department may require modification of plans and specifications, operating procedures or compliance and monitoring procedures required in sub. (4) to ensure that compliance with the performance requirements in s. NR 811.88 can be determined.

(6) Within 180 days after completing an approved ASR system pilot study or prior to recovering any water retrieved through an ASR well into a water distribution system, a municipal water system shall submit a final report on the ASR system pilot study to the department.

NR 811.92 ASR system development testing.

(1) Department approval shall be obtained prior to any ASR system development testing.

(2) Following the completion of an approved ASR system pilot study, each additional ASR well that is to be developed within an ASR system shall be subject to ASR system development testing.

(3) The department may require monitoring wells to be installed as part of an ASR system development test if it finds any of the following:

(a) Geologic conditions in the vicinity of the proposed ASR well are not consistent with the conditions examined during the municipal water system's ASR system pilot study.

(b) Geologic conditions in the vicinity of the proposed ASR well are not consistent with the conditions reported in other ASR system pilot studies or ASR system development tests performed by other municipal water systems.

(c) Results obtained during the municipal water system's ASR system pilot study or other aquifer tests indicate that additional monitoring is warranted to ensure compliance with the water quality standards established in chs. NR 140 and 809.

(4) Each request for an ASR system development test shall include a report or testing plan that contains the following:

(a) A comparison of the hydrogeologic conditions and formations found at the ASR system pilot study well site and any well site that is to be evaluated as part of the ASR system development testing request.

(b) An evaluation of the municipal water system's ASR system pilot test results and the transferability of those results to any well that is to be included as part of the ASR system development test.

(c) Plans and specifications for any well equipment, pumping equipment, appurtenances or piping that is to be constructed or altered as part of the ASR system development test.

(d) A description of all operating procedures to be followed during the ASR system development test. This description shall contain details such as, but not limited to, the volume of water to be placed underground, the flow rate and pressure of underground injection, backflushing schedules, the expected water storage period, anticipated water retrieval rates and methods for disposing of water recovered during the ASR system development test.

(e) A description of all performance and compliance monitoring procedures to be followed during the ASR system development test.

(f) A description of any monitoring wells proposed to be constructed or utilized during the ASR system development test.

(5) The department may require modification of plans and specifications, operating procedures or compliance and monitoring procedures required under sub. (4) to ensure that compliance with the performance requirements in s. NR 811.88 can be determined.

(6) Within 180 days after completing an approved ASR system development test or prior to recovering any water retrieved through any newly developed aquifer storage recovery well into a water distribution system, the municipal water system conducting the test shall submit a final report containing the final results of the investigation to the department.

(7) The department may deny a request to perform an ASR system development test if it determines that the test cannot be conducted in a manner that is protective of human health or the environment. Whenever a request to perform an ASR system development test is denied, the department shall provide the person who submitted the request for an ASR development test with a written explanation of the reasons for denying the request.

NR 811.93 Operating an ASR system. (1) Department approval to operate an ASR system shall be obtained prior to recovery of any water retrieved through an aquifer storage recovery well into a municipal water system.

(2) Only the owner of a municipal water system may submit a request to operate an ASR system.

(3) Completion of an ASR pilot study is required before a municipal water system may submit a request to operate an ASR system.

(4) Completion of an ASR system development test and approval of the department is required before any additional aquifer storage recovery well that was not approved as part of an original request to operate an ASR system is connected to the existing ASR system.

(5) A request to operate an ASR system shall be submitted to the department in writing and shall contain the following:

(a) A copy of the final report of the approved ASR system pilot study and copies of any approved ASR system development studies conducted by the municipal water system.

(b) A final plans and specifications report that describes the components of the ASR system. The final plans and specifications report shall include as built drawings for each aquifer storage recovery well and each monitoring well that was constructed as part of the ASR system pilot study or ASR system development study. The report shall also include descriptions of pumping equipment, piping and other appurtenances that are installed or required for ASR system operation.

(c) A proposed final operating plan that describes the entire ASR cycle and shows how the ASR system will be integrated into municipal water system operations. The proposed final operating plan shall contain details including the total volume of water to be injected, rate of injection, pressure of injection, length of the water storage period, rate

of recovery, post–recovery water treatment techniques necessary to maintain a distribution system disinfectant residual, and methods for disposing of any water that cannot be recovered into the water distribution system.

(d) A proposed demand management and water accountability plan that describes actions which the municipal water system is currently conducting or will be initiating to ensure that groundwater and surface water resources are conserved and used as efficiently as possible.

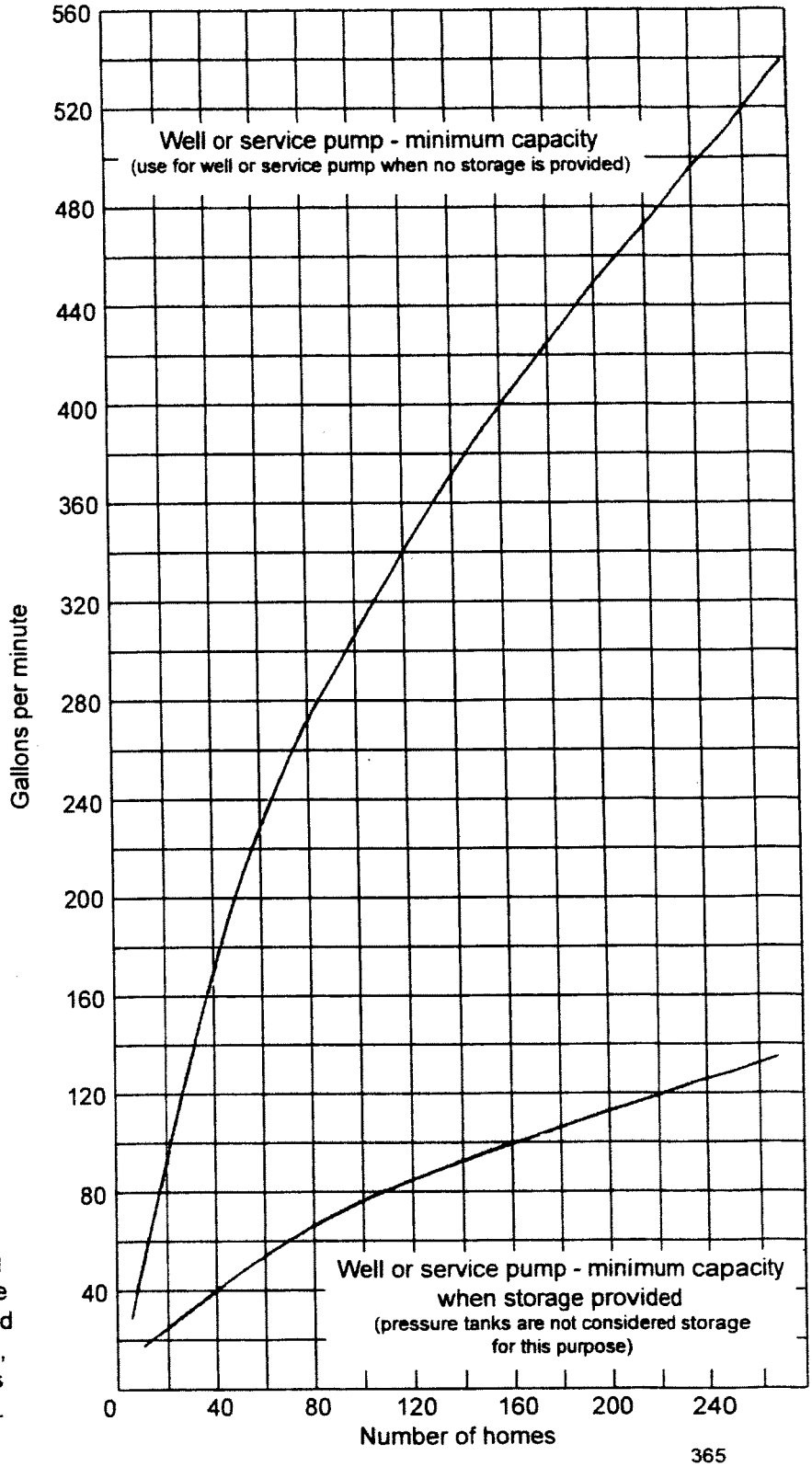
(e) A proposed compliance and monitoring plan that lists all sampling parameters and provides details on monitoring schedules, monitoring locations, sampling methods and quality assurance techniques that will be followed to ensure that compliance with the requirements set forth in s. NR 811.88 is maintained. The compliance and monitoring plan shall provide for testing of the water that is to be injected, stored and recovered through each aquifer storage recovery well and for the groundwater present in any monitoring well that is installed as part of the ASR system. Parameters to be analyzed for each water quality sample collected, the locations for sample collection and the frequency at which water quality samples are to be collected shall be determined by the department following a review of the final ASR system pilot study report or ASR system development study report, the proposed operating plan, the proposed monitoring plan and the drinking water quality monitoring schedule currently followed by the municipal water system. Unless otherwise specified by the department, all water quality results obtained from ASR system compliance monitoring activities shall be compiled and submitted to the department on an annual basis and at least 45 days prior to the start of each new ASR cycle.

(6) The department may require modification of any plans and specifications, operating plans, demand management and water accountability plans or compliance and monitoring plans required in sub. (5) in any manner necessary to ensure compliance with the performance standards set forth in s. NR 811.88.

(7) If requested, the department may consider and approve the modification of plans and specifications, operating plans, demand management and water accountability plans or compliance and monitoring plans required in sub. (5) if information submitted in support of a requested modification demonstrates to the satisfaction of the department that the proposed modifications will continue to ensure compliance with the standards set forth in s. NR 811.88 and any other applicable requirements contained in ch. NR 811.

Appendix

Figure No. 1
Pump capacities for domestic water service.



The number of homes when using figure No. 1 may be reduced by one-third for apartment units, condominium units and mobile homes.

Figure No. 2
Line-shaft vertical turbine pump base installation.
(No outer well casing)

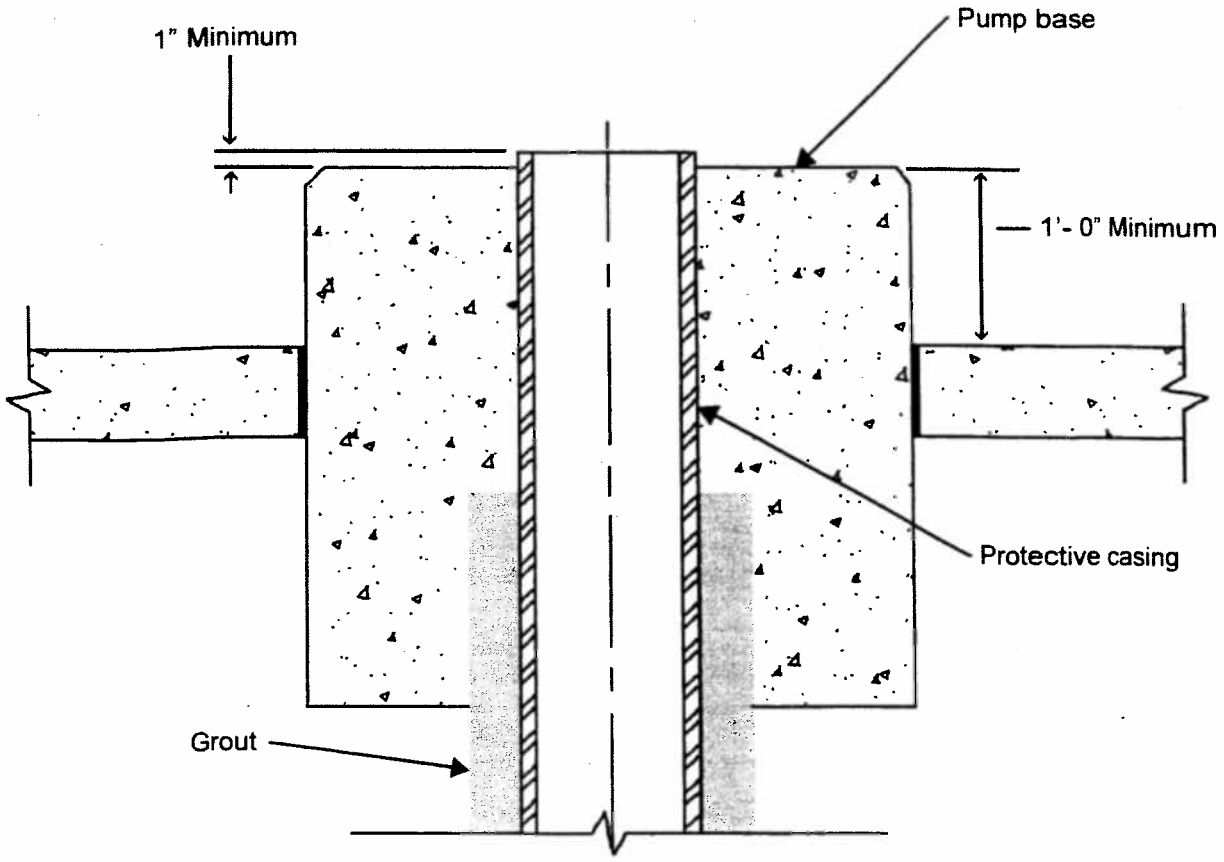


Figure No. 3
Line-shaft vertical turbine pump base installation.
(With an inner ungrouted well casing)

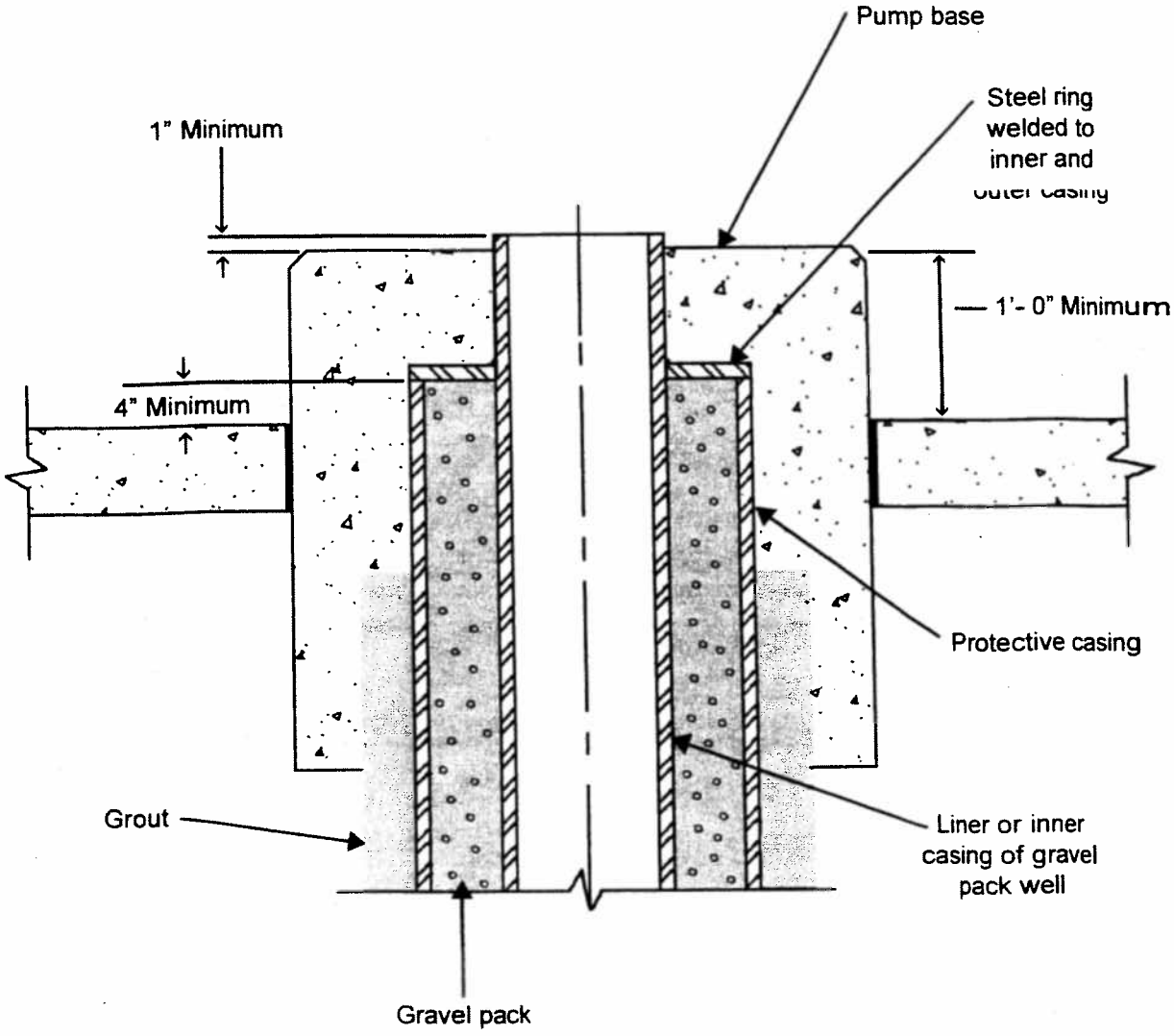


Figure No. 4
Submersible vertical turbine pump base installation.
(Without an outer casing)

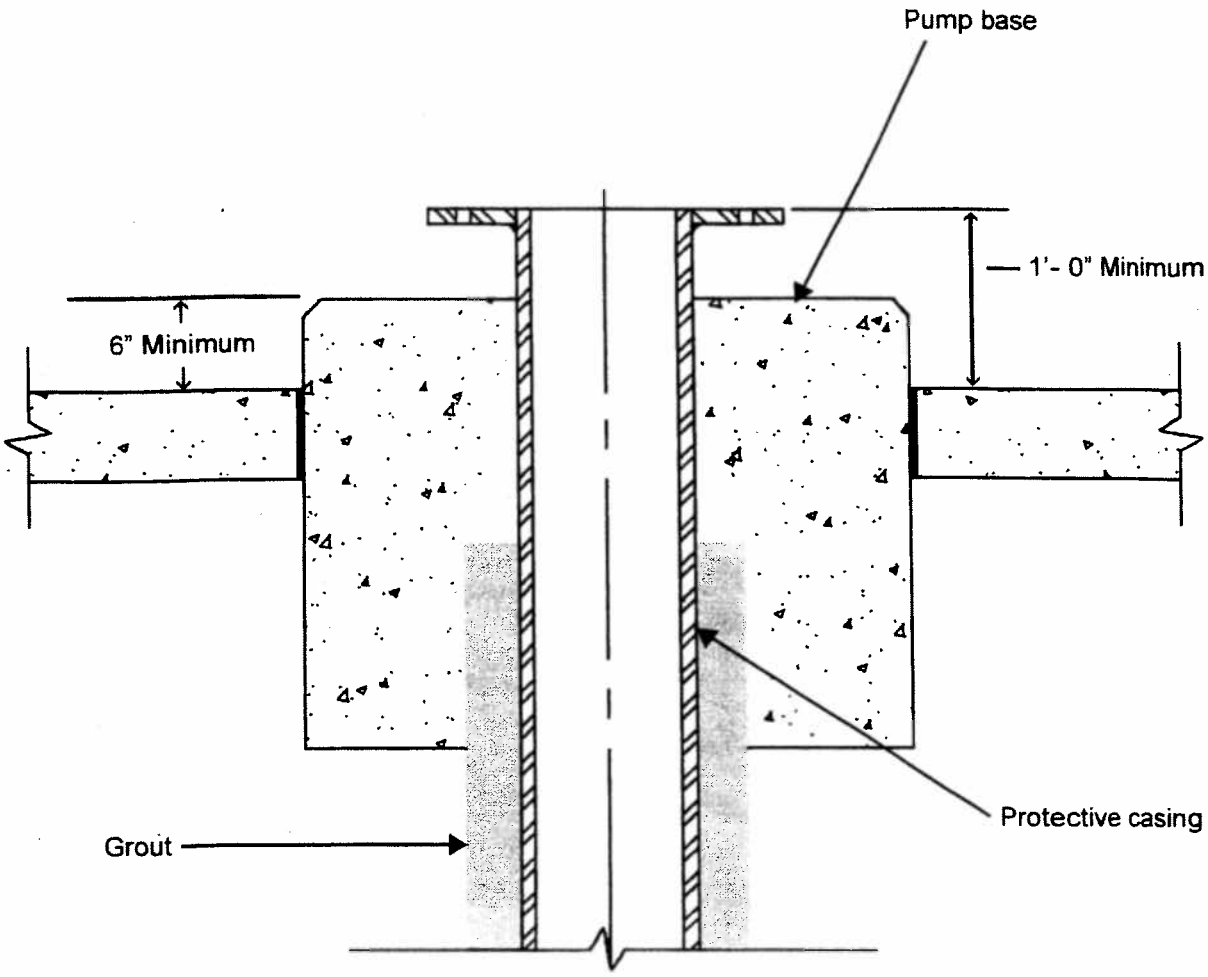


Figure No. 5
Submersible vertical turbine pump base installation.
(With an inner ungrouted well casing)

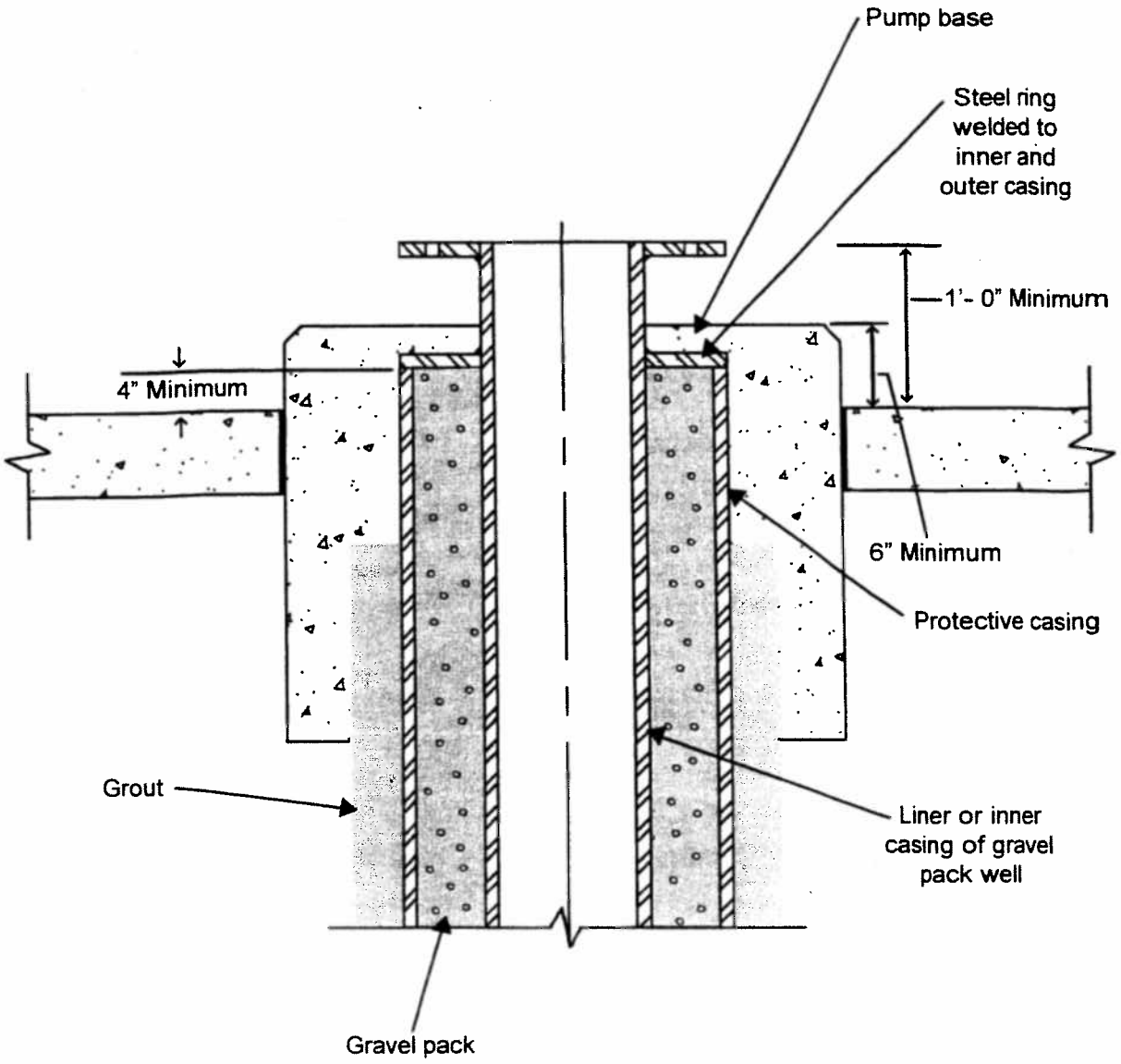


Figure No. 6
Submersible vertical turbine pump base installation.
(With an outer well casing installed to provide a protective collar.)

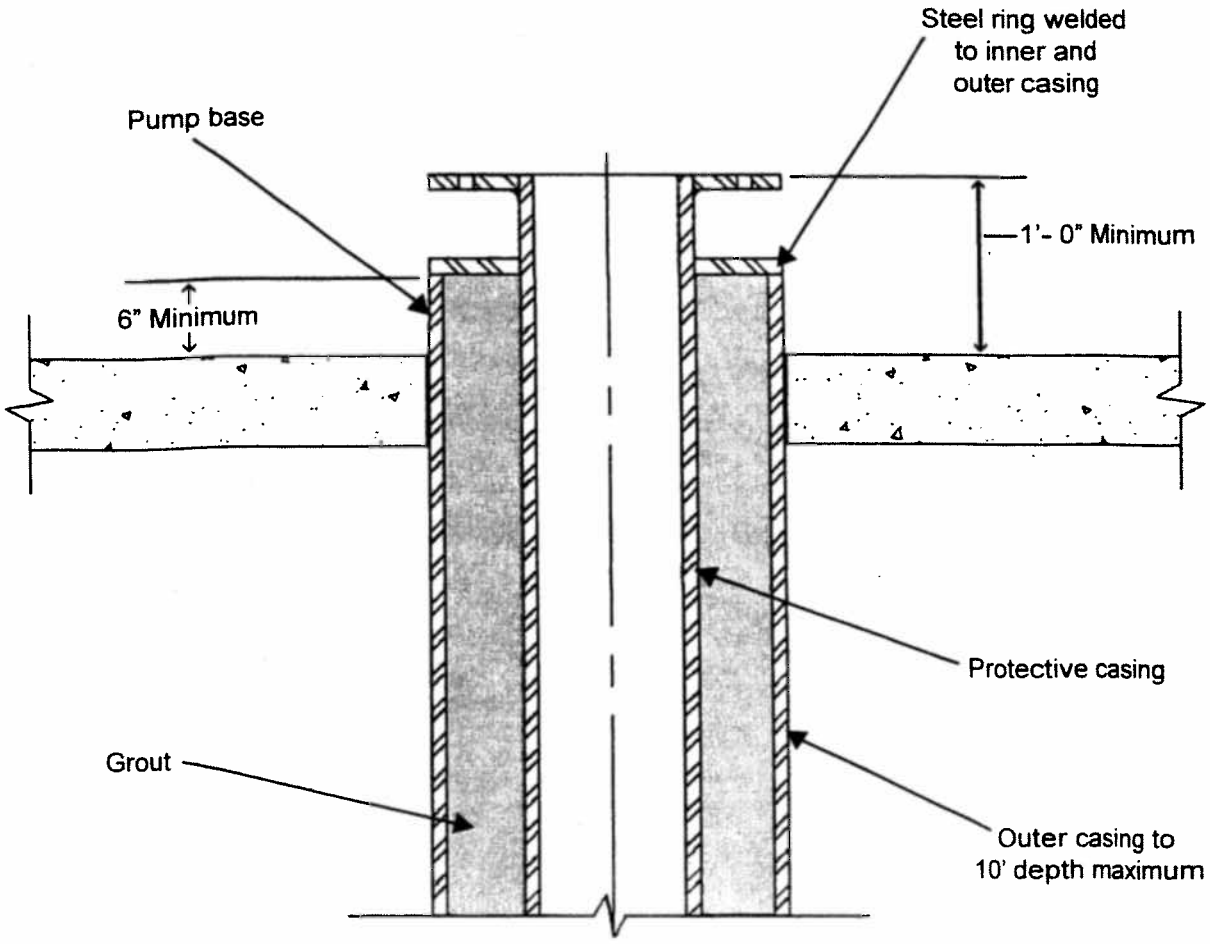
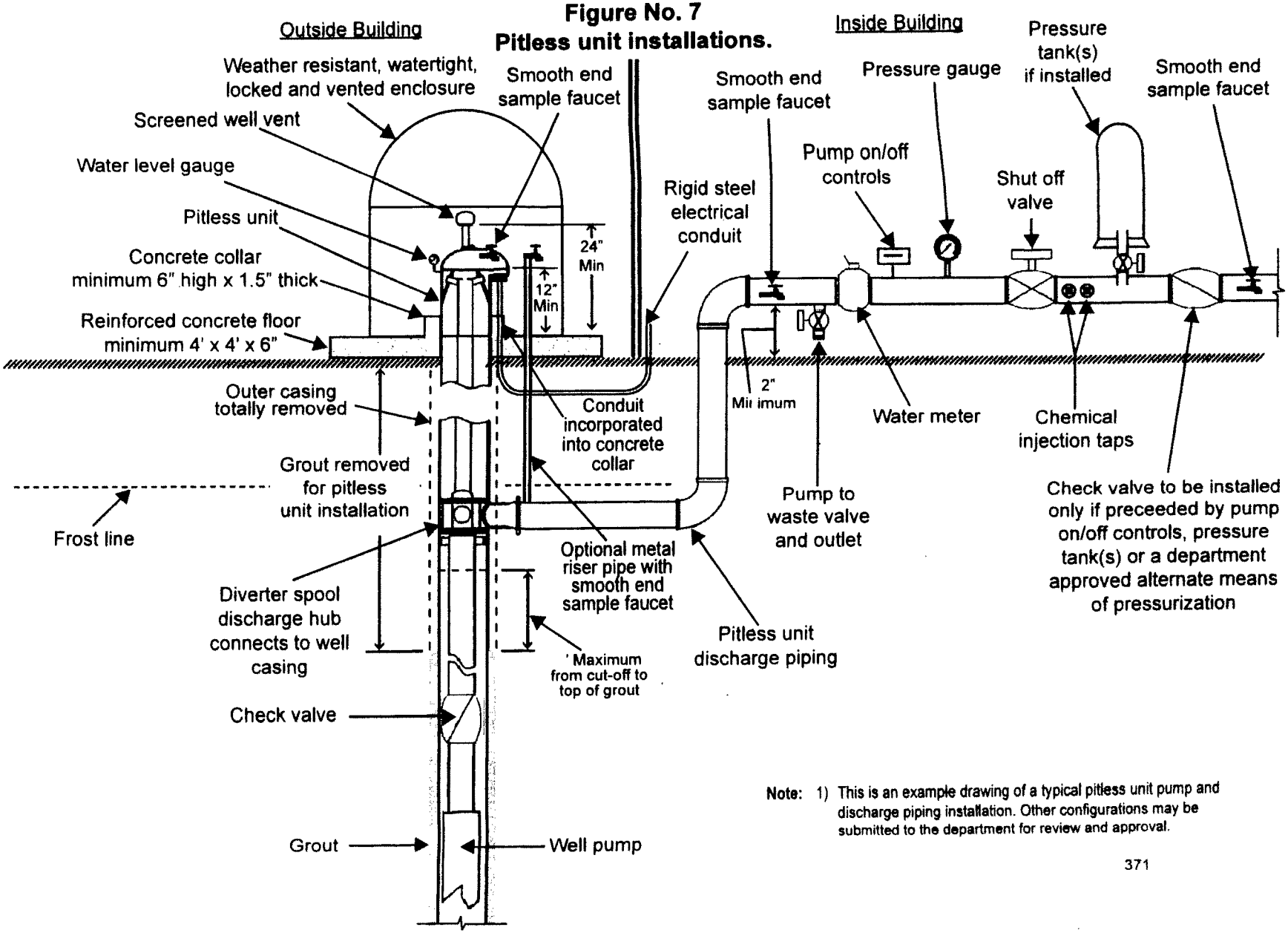


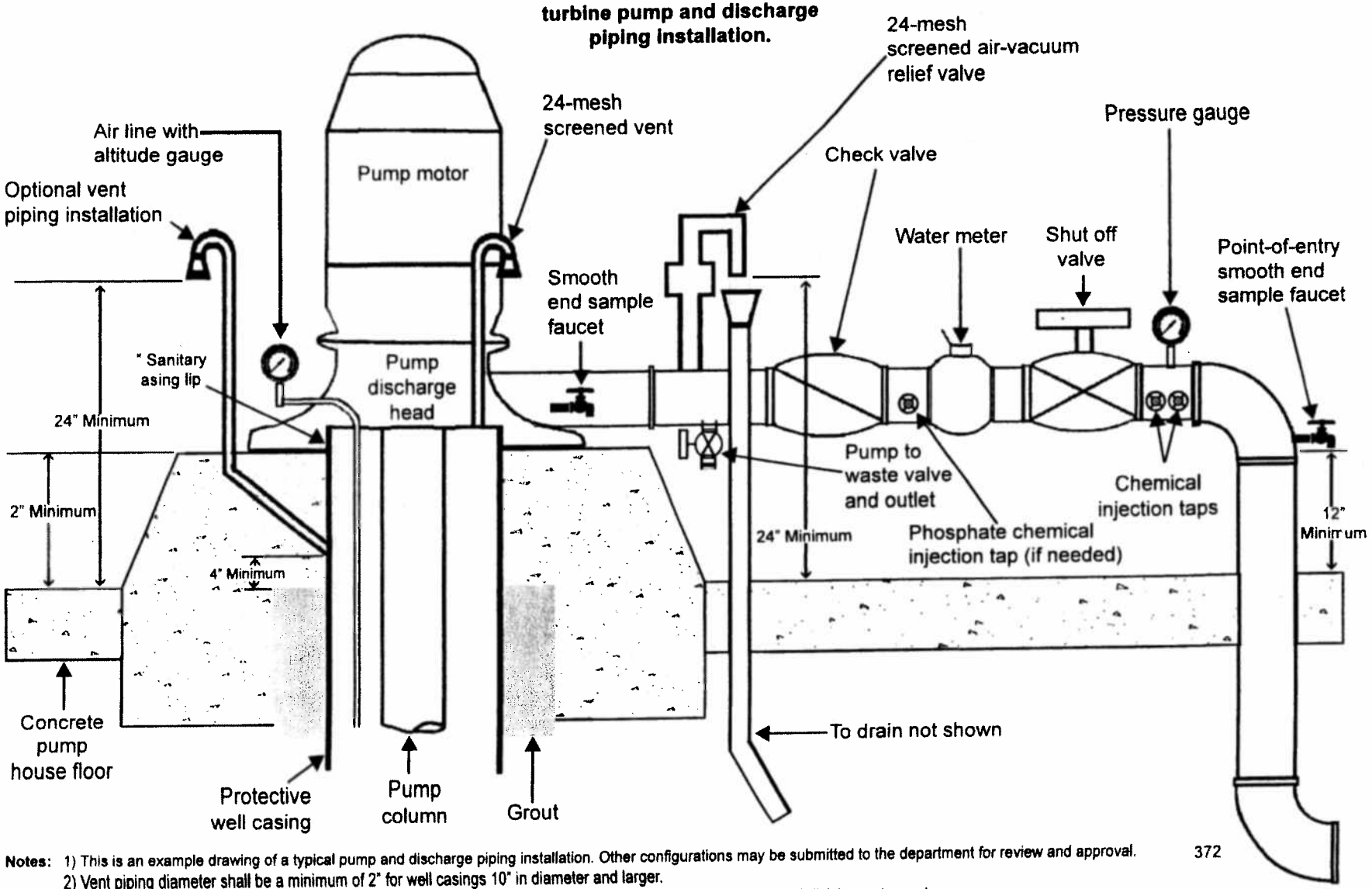
Figure No. 7
Pitless unit installations.



Note: 1) This is an example drawing of a typical pitless unit pump and discharge piping installation. Other configurations may be submitted to the department for review and approval.

Figure No. 8

Example line-shaft vertical turbine pump and discharge piping installation.



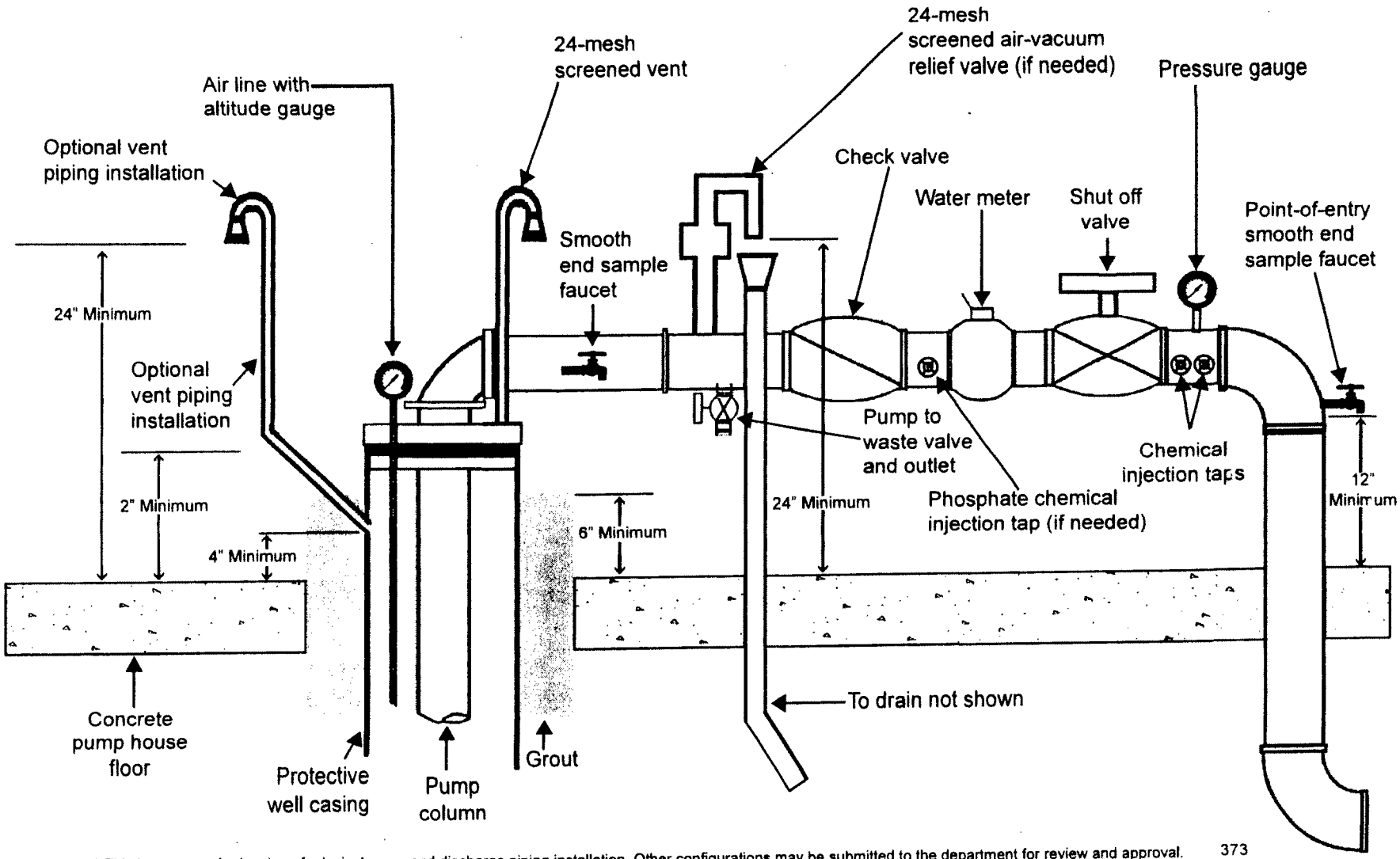
Notes: 1) This is an example drawing of a typical pump and discharge piping installation. Other configurations may be submitted to the department for review and approval.

2) Vent piping diameter shall be a minimum of 2" for well casings 10" in diameter and larger.

3) The pump to waste fitting may be a hydrant installation installed outside the pump station for municipal and subdivision water systems.

Figure No. 9

Example submersible vertical turbine pump and discharge piping installation.



Notes: 1) This is an example drawing of a typical pump and discharge piping installation. Other configurations may be submitted to the department for review and approval.

2) Vent piping diameter shall be a minimum of 2" for well casings 10" in diameter and larger.

3) The pump to waste fitting may be a hydrant installation installed outside the pump station for municipal and subdivision water systems.

Figure No. 10
Common trench installation requirements for water main and sanitary or storm sewers.

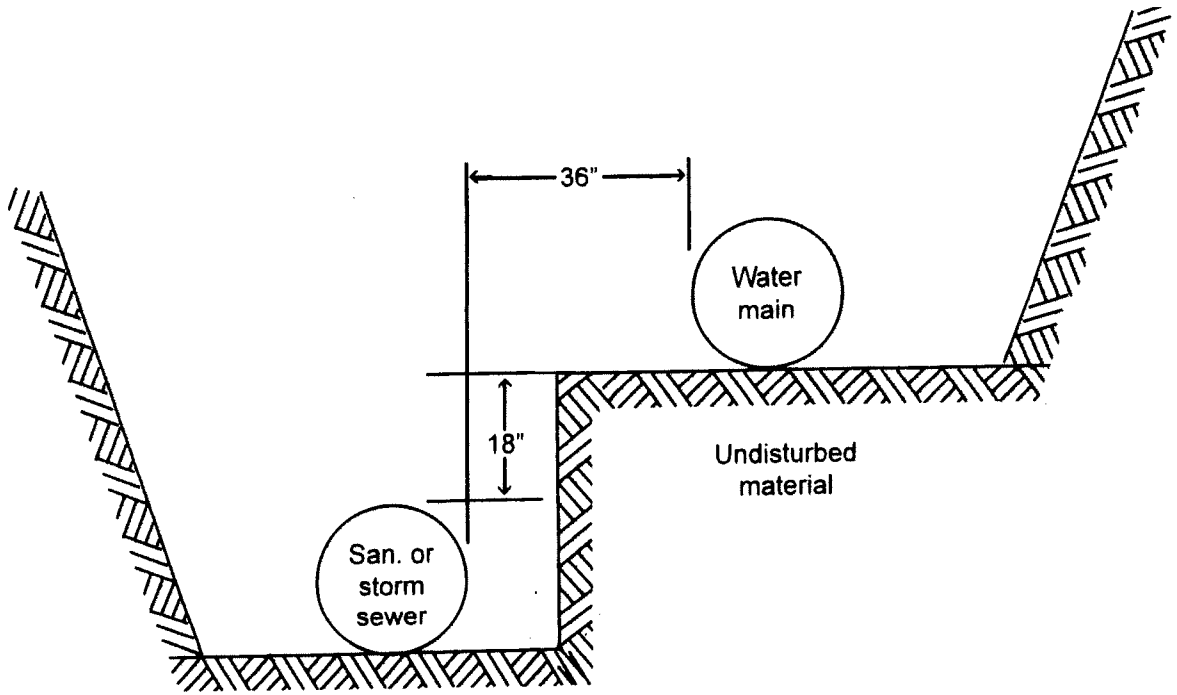
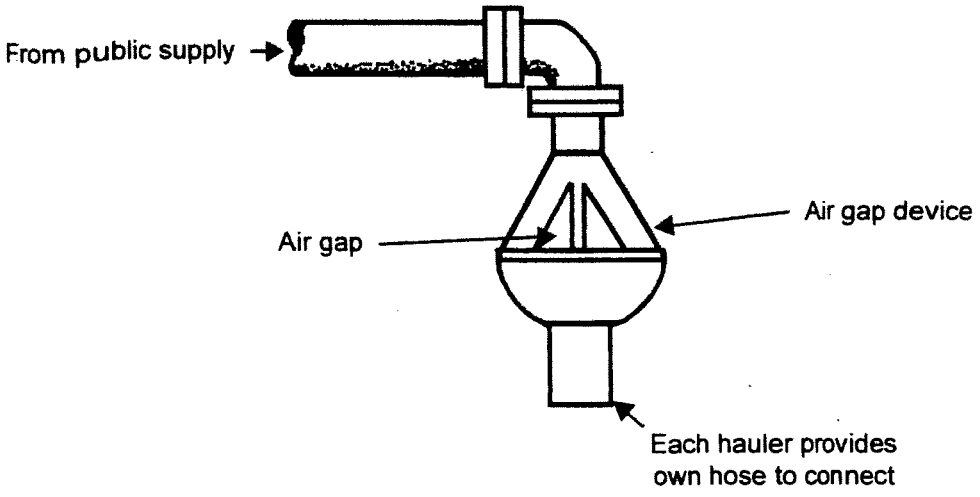
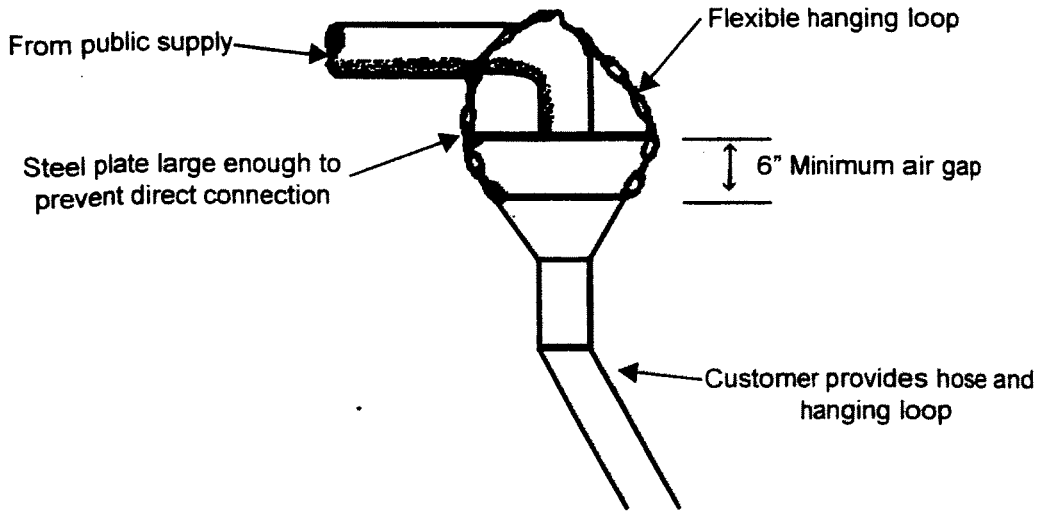


Figure No. 11
Acceptable water loading station devices.





SECTION 4. EFFECTIVE DATE. This rule shall take effect on the first day of the month following publication in the Wisconsin administrative register as provided in s. 227.22(2) (intro), Stats.

SECTION 5. BOARD ADOPTION. This rule was approved and adopted by the State of Wisconsin Natural Resources Board on_____.

Dated at Madison, Wisconsin _____.

STATE OF WISCONSIN
DEPARTMENT OF NATURAL RESOURCES

By _____
Matthew J. Frank, Secretary

(SEAL)

Clearinghouse Rule No. 09-073
Repeal and recreate chapters NR 809 and 811; and create chapter NR 810, Wis. Adm. Code, relating to safe drinking water and design requirements for community water systems, and requirements for the operation and maintenance of public water supply systems.

Final Regulatory Flexibility Analysis

Typically, the Department has little flexibility with drinking water regulations since State rules can be no less stringent than the federal regulation. Flexibility in the rule will be used to reduce monitoring costs and complexity wherever possible. These rules should not have a significant impact on small business since the water systems operated by small businesses such as taverns and restaurants are already subject to the inspection and deficiency correction requirements included in the rule modifications. Therefore, under s. 227.19(3m), Stats., a final regulatory analysis is not required.