

## **Chapter 15.55      WATER WELLS**

- 15.55.010      Purpose.**
- 15.55.020      Scope.**
- 15.55.030      Definitions.**
- 15.55.031      Powers and Duties of the Director.**
- 15.55.032      On-site Water and Wastewater Technical Review Board.**
- 15.55.040      Prohibited Actions.**
- 15.55.050      Permit for Domestic Water System.**
- 15.55.052      Waivers for Wells.**
- 15.55.055      Certificates of On-Site Systems Approval.**
- 15.55.060      General Standards for Domestic Wells.**
- 15.55.070      General Standards for Potable Water Storage.**
- 15.55.080      Well Driller and Pump Installer Certification.**
- 15.55.090      Subdivision Submittal Requirements.**

### **15.55.010      Purpose.**

The purpose of this chapter is to establish minimum requirements to safeguard public health by protecting aquifers from contamination.

### **15.55.020      Scope.**

The provisions of this chapter shall apply to the construction, maintenance, operation and decommissioning of water wells and their associated appurtenances, including water storage, that are not licensed or regulated by the State of Alaska; this includes all nonpublic water systems such as private water systems that serve up to twelve bedrooms or as further defined in 18 AAC 80.

**Exception:** Systems with a determination by the State of Alaska to be regulated by the State of Alaska are not within the scope of this chapter.

### **15.55.030      Definitions.**

The following words, terms, and phrases, when used in this chapter, shall have the meanings ascribed to them in this section, except where the context clearly indicates a different meaning:

**18 AAC 72** - State of Alaska wastewater disposal regulations (Title 18, Alaska Administrative Code, Chapter 72 Wastewater Disposal).

**18 AAC 80** - State of Alaska drinking water regulations (Title 18, Alaska Administrative Code, Chapter 80 Drinking Water).

**AAC** - Alaska Administrative Code.

**ADEC** - the Alaska Department of Environmental Conservation.

**Abandoned well** - a well, the use of which use has been permanently discontinued and but that has not been decommissioned.

**Animal containment area** - any outdoor enclosure or group of enclosures containing one or more horse, mule, cow, llama, or similarly sized animal; four or more dogs, sheep, goats, or swine, or similarly sized animals; ten or more rabbits,

fowl, ferrets, or other domesticated small animals.

**Approved tank manufacturer** - a firm manufacturing tanks approved by the department and holding a valid water and wastewater equipment manufacturer certificate issued by the same department.

**Aquifer** - a formation, group of formations or part of a formation that contains sufficient saturated permeable material to yield water to wells and springs.

**Aquifer - confined** - a formation in which the groundwater is isolated from the atmosphere, at the point of discharge, by impermeable geologic formations. Confined groundwater is generally subject to pressure greater than atmospheric and rises to a level above the upper limit of its aquifer.

**Aquifer - unconfined** - a zone of water saturation where atmospheric pressure is freely communicated to the zone. Its upper limit is at atmospheric pressure, and it has no upper confining layer.

**Artesian well** - a well in which the water from the confined source aquifer rises above the upper limit of the aquifer.

**Bentonite** - an NSF approved montmorillonite aluminum silicate clay. Bentonite comes in powder, granules, or chip form.

**Bentonite chips** - ¼-inch to ¾-inch sized chips of bentonite approved by the NSF for the purpose of water well construction and decommissioning.

**Bentonite granules** - an eight to 20 mesh size bentonite clay approved by the NSF for the purpose of water well construction.

**Bentonite slurry** - a high solids mixture of bentonite particles and water with a consistency of 18 percent solids or greater.

**Casing** - the pipe made of material herein specified or otherwise approved by the department, installed in a well bore hole to prevent sidewall caving, provide access to an aquifer, and provide protection from up-hole or surface contamination of the aquifer.

**Certificate of on-site systems approval (COSA)** - a written confirmation signed by an engineer and the department certifying that the on-site wastewater disposal system or well as regulated by this code are functional and comply with all state and local regulations and codes.

**Certified groundwater professional** - a groundwater professional certified by a nationally recognized organization such as National Groundwater Association (NGWA).

**Certified laboratory** - a laboratory certified by the State of Alaska under 18 AAC 80.

**Certified pump installer** - a person or firm holding a valid state contractor's license, business license, and a current pump installer's certificate issued by the department.

**Certified well driller** - a person or firm holding a valid state contractor license, business license, and a current well driller's certificate issued by the department.

**Community water system** - a public water system that serves at least 15 service connections used by year-round residents or that regularly serves at least 25 year-round residents.

**Contaminant** - any substance which, if introduced into a potable water source, would render the water unsafe for human or animal consumption.

**Department** - Municipality of Anchorage Development Services Department which includes the On-site Water and Wastewater Section.

**Director** - the director or designee of the department unless otherwise indicated in the text of the code.

**Disinfection** - a chemical or physical process utilized to eliminate pathogenic organisms from a potable water source or storage facility.

**Disposal field** – as defined in AMC 15.65.010.

**Domestic use** - water used for residential and noncommercial use, to include activities such as washing vehicles and watering landscaping and gardens.

**Domestic wastewater** - waterborne human wastes or graywater derived from dwellings, commercial buildings, institutions, or similar structures.

**Drawdown** - the distance between the static water level and the pumping water level in a well or an aquifer.

**Drive shoe** - a forged or tempered steel collar with a cutting edge, attached to the lower end of a casing string by threading or welding, to protect the bottom end of the casing as it is driven or otherwise forced into the bored hole.

**Engineer** - a professional engineer registered in the State of Alaska.

**Flowing artesian well** - a water well in which the water from the confined source aquifer flows naturally to the ground surface without benefit of mechanical lift equipment.

**Groundwater monitoring wells** - an existing or abandoned water well, or a newly cased excavation or opening into the ground constructed by digging, boring, drilling, driving, jetting or other methods for the purpose of determining the physical, chemical, biological, or radiological properties of groundwater.

**Groundwater** - subsurface water permanently or seasonally occupying a zone of saturation.

**Grout** - a stable bentonite clay material that is NSF approved, in a slurry or granular form, impervious to and capable of preventing the vertical movement or migration of water.

**Hazardous substance** - those substances which, because of quantity, concentration, or physical/chemical/infectious characteristics, may pose a threat to human health or to the environment when improperly treated, handled, stored, and transported, and disposed of. Hazardous substances include those defined as hazardous under federal, state, and municipal laws.

**Holding tank** - a watertight covered receptacle as required by AMC chapter 15.65 designed and built to receive and store domestic wastewater for disposal at another location.

**Hydrogeologist** - a certified professional geologist, licensed by the State of Alaska who practices groundwater science or a nationally certified groundwater professional.

**Manure/animal excreta** - solid waste from domesticated animals, and for the purposes of this chapter, bedding or other materials contaminated by animal liquid or solid wastes.

**Manure/animal excreta storage area** - any area where manure/animal excreta is being stored temporarily or permanently or is being composted.

**Municipality** - the Municipality of Anchorage.

**Nondomestic wastewater** - liquid or water-carried wastes other than domestic wastewater, including wastes resulting from manufacturing enterprise, industrial establishment, development of natural resources, construction, or stormwater runoff.

**Non-public water system** - a water well that does not meet the definition of a public water system. This includes but is not limited to wells used for the following purposes: private water system; livestock or irrigation; recreational purposes; ground source heat pump; groundwater monitoring wells unless otherwise regulated by another agency or if used exclusively in geotechnical investigation of a site.

**NSF** - the National Sanitation Foundation.

**On-site wastewater disposal system** - any wastewater storage, treatment, or disposal system that serves a facility located on a lot that is not connected to a public sewer.

**Out of service well** - a well that has been found non-functional for 90 or more consecutive days. Examples of non-functional wells include wells without pumps, electrical power, or appurtenances (including a surface discharge point).

**Outer annular space** - the void space between the side wall of the drilled bore hole

and the outside casing wall of a water well.

**Owner** - any person, agent, operator, entity, firm, or corporation having any legal or equitable interest in the property on which an on-site water well exists or for which one is proposed; or recorded in the official records of the municipality as holding an interest or title to the property; or otherwise having possession or control of the property, including the guardian of the estate of any such person, and the executor or administrator of the estate of such person if ordered to take possession of real property by a court.

**Permit** - a written document issued by the department permitting the construction or development of a subsurface potable water source.

**Pitless adapter** - a device attached to the well casing below ground level, constructed to permit the flow of water from the well casing.

**Potable water** - water that meets water quality standards for drinking and culinary purposes.

**Private water system** - as defined under 18 AAC 80.

**Protective well radius** - a prescribed horizontal distance between the well head and potential source of contaminants.

**Public sewer** - a sewage collection system operated by a public utility as defined in Alaska Statute 42.05.701.

**Public water system** - as defined under 18 AAC 80.

**Pump** - a mechanical device used to extract water from a well or water collection system.

**Recovery** - the ability of the water in a well to return to its static level after being drawn down during a period of pumping.

**Sanitary well seal** - a mechanical seal that attaches to the top of the well casing and prevents insects, dirt, water, or other liquid under normal conditions from entering the well and allows air to flow in and out of the well.

**Sealing or sealed** - the act of providing a watertight seal between the casing and the well bore by means of an impervious material.

**Septic tank** - the watertight receptacle designed to receive domestic wastewater and allow the clarified liquids to be discharged into a subsurface soil absorption system.

**Setback** - distance from a water well to a defined object, point or location.

**Sewer** - a sewer that is operated by a public utility as defined in 18 AAC 72.

**Sewer line** - pipeline, conduit, or other constructed conveyance that carries domestic or nondomestic wastewater. This does not include a private sewer line or sewer service line or an open-ended culvert or unlined ditch that conveys stormwater only.

**Sewer main** - a sewer line that is used as a common receiver of sewage from more than one sewer service line and carries wastewater to a treatment works.

**Sewer service line** - a pipeline or conduit that services a single service connection and carries sewage to a sewer main

**Sewage** - domestic or nondomestic wastewater.

**State** - State of Alaska.

**Static water level** - the water level in a well that has not been affected by withdrawal of groundwater.

**Stick up** - the portion of a well's casing extending above the surface of the ground.

**Stormwater** - stormwater runoff, snow melt runoff, and surface runoff and drainage.

**Subsurface drain** - a subsurface drainage structure that intercepts or diverts underground water flows.

**Surface water** - water that is open to the atmosphere and subject to surface runoff.

**Water-carried sewage disposal system** - a wastewater disposal system through which wastes are conveyed with the aid of water.

**Water producing zone** - a subsurface zone producing water and separated from another water bearing layer by at least five feet of silt or clay.

**Water storage** - devices or infrastructure used to store potable water, including but not limited to water storage tanks, pumps, and piping associated with storage of potable water.

**Water table** - a groundwater surface within an aquifer where pressure is equal to the atmosphere.

**Water well** - a bored, drilled, or driven excavation utilized for the purpose of extracting groundwater from an aquifer for domestic use.

**Well cap** - a mechanical cover installed on the top of a well casing that may or may not be watertight.

**Well decommissioning** - the process or procedure by which production from a well is discontinued and the well is properly removed from service.

**Well depth** - the depth of the well as measured from ground surface.

**Well drilling contractor** - a certified well driller, as defined above.

**Well log** - a written report showing the property owner, location, and all pertinent information and data relative to the drilling and completion of a well.

**Well pit** - an excavation, opening, shaft or hole surrounding a well that is large enough for human entrance and temporary occupation and is intended for that purpose.

**Well rehabilitation** - subsurface improvements designed to alter well yield or the physical characteristics of an existing well.

**Well screen** - a filtering device used to keep sediment from entering a water well.

**Well test** - a test conducted by a licensed well driller, a certified pump installer, a hydrogeologist, or an engineer to determine the sustained producing capability of the well and the recovery rate of the well.

**Well vault** - an excavation, opening, shaft or hole surrounding a well that is not large enough for human entrance or temporary occupation and is intended to only be accessed from the ground surface with hands and arms.

**Well yield** - the sustained producing rate of a well determined by a well test.

#### **15.55.031 Powers and Duties of the Director.**

- A. *Authority of the Director.* The director is hereby authorized and directed to enforce the provisions of this chapter. The director is authorized to render interpretations of this chapter and to adopt policies and procedures to clarify the application of its provisions. Such interpretations, policies, and procedures shall follow the intent and purpose of this chapter. Such interpretations, policies, and procedures shall not have the effect of waiving requirements specifically provided for in this chapter.
- B. *Modifications.* Whenever there are practical difficulties involved in carrying out the provisions of this chapter, the director has the authority to grant modifications for individual cases, upon application of the owner or owner's agent, provided the director first finds: the strict application of this chapter would render a particular well project impractical; the modification is in compliance with the intent and purpose of this chapter; and such modification does not substantially lessen protection of health, safety and welfare, or structural integrity compared to strict application of this chapter. A record of decision for each granted modification shall be entered and stored in the files of the department.
- C. *Alternative materials, design, and methods of construction and equipment.* The provisions of this chapter are not intended to prevent the installation of any material or to prohibit designs or methods of construction not specifically prescribed by this chapter, provided any such alternative has been approved by the director. An alternative material, design or method of construction shall be approved where the director finds the proposed design is satisfactory and

complies with the purpose of this chapter, and the material, method or work proposed is, for the purpose intended, at least equivalent in quality, strength, effectiveness, durability, and safety as those prescribed in this chapter.

#### **15.55.032 On-site Water and Wastewater Technical Review Board.**

Decisions made by the director may be appealed to the On-site Water and Wastewater Technical Review Board. The department shall establish an appeal procedure.

#### **15.55.040 Prohibited Actions.**

- A. No person shall cause or permit the construction of a well regulated by this chapter without holding a valid permit issued by the department in the name of the property owner for the specific property and construction proposed. The well drilling contractor shall have a copy of the valid permit at the site of the drilling operation.
- B. No person shall cause or allow the placement of any refuse, trash, waste, or contaminated or hazardous substance into any existing or abandoned well or domestic water source.
- C. The location of a well, on-site wastewater disposal system or subsurface drain, either separately or in combination with each other and other wells, on-site wastewater disposal systems or subsurface drains in the vicinity, shall not have the effect of prohibiting future residential use of an adjacent lot or parcel. The department may require an agreement and necessary easements with the owner of the affected property for the sharing of a well or other resolution of the problem. The agreement shall be recorded.
- D. No person shall cause or allow the construction of a domestic water source violating the laws or regulations of the state or the municipality.
- E. No person may cause the construction, installation, or use of a cross connection between a domestic, active, or decommissioned water well and a public water system.
- F. No property owner shall allow an unmaintained well to remain. A well that is not being properly maintained shall be decommissioned. Proper maintenance shall include a properly installed sanitary seal, positive grading around the well casing or other protection from ponding, and adequate separation to potential sources of contamination.
- G. No person shall allow the waste of water by free-flowing wells, whether by surface discharge or into the lower strata underground, without putting it to beneficial use. Flow shall be sealed within a reasonable amount of time to the satisfaction of the department.

#### **15.55.050 Permit for Domestic Water System.**

- A. *Permit to drill.* An application to drill a new or replacement well shall be submitted to the department by the property owner or the owner's authorized agent prior to the commencement of drilling operations. Drilling operations shall not begin unless the permit application is approved and not until the permit is issued.
  - 1. A permit for a domestic water source shall not be issued if there is no



existing or permitted on-site wastewater disposal system or connection to public sewer service for the property available, scheduled and approved. A variance may be issued for the purposes of groundwater exploration wells constructed in accordance with the standards of this chapter.

2. A permit for a domestic water system shall expire one year from the date of issuance but may be renewed for one additional year at the current renewal fee.

B. *Application.* The application shall be on a form provided by the department and shall be signed by the owner or owner's agent attesting the well shall be sited, drilled, and completed in accordance with standards and provisions in chapters 15.55 and 15.65 of this Title and 18 AAC 80 and 72.

1. The applicant shall submit a site plan, signed by the owner or owner's agent, drawn on an 8 1/2 by 11-inch sheet (or larger if necessary to comply with this chapter) to a scale not smaller than one inch to 50 feet. The site plan shall show the following:
  - a. Legal description of the lot or parcel,
  - b. Location of the proposed well,
  - c. Lot lines, roads, rights-of-way, and easements on or adjacent to the lot,
  - d. Location of all existing structures on the lot,
  - e. Location of all wells within 100 feet of the proposed well on the subject and adjacent properties,
  - f. All applicable protective well radii, and
  - g. The location or proposed location of all components shown in Table A-1, and areas containing hazardous waste or other potential pollutants within 150 feet of the proposed well.
2. *Expiration of permit application.* A permit application to drill a well shall expire one year from the date of submittal.

C. *Revocation, suspension, and restriction of permits.* The director may revoke, suspend, or otherwise restrict a permit issued under this chapter upon any of the following grounds:

1. Any false statements set forth in the application;
2. Any violation of the express terms or provisions of the permit;
3. The commission of any act or omission violating the requirements of this chapter; or
4. Failure to comply with state and federal regulations.

D. *Fees.* Fees shall be assessed in accordance with chapter 23.10.

#### **15.55.052 Waivers for Wells.**

A. *Departmental authority.*

1. The department may issue waivers for the separation distances in Table A-1 if such waivers will not adversely affect achievement of the intent of this chapter.
2. Other modifications from the requirements of this chapter may only be issued by the Director; see AMC 15.55.031.

- B. *Content of waiver application.* A written request for a waiver must be submitted by an engineer and must contain, at a minimum:
1. A description of the waiver being requested;
  2. . Information on soil, topography, lot size, and other technical information relevant to the request;
  3. Any measures that are proposed to mitigate adverse effects associated with the waiver; and
  4. A narrative signed and dated by the engineer describing the need for the waiver and identifying any adverse impacts associated with granting the waiver request.
- C. *Departmental review and decision.* The department must review each waiver request and must issue a written decision. A denial of a waiver request must include reasons for the denial. A record of the request, review and analysis procedure, and approval or denial shall be maintained by the department for public inspection.

**15.55.055 Certificates of On-site Systems Approval.**

- A. Prior to the transfer by gift, deed or contract of ownership or use interest in real property with an on-site water system regulated by this chapter, the transferor shall obtain a Certificate of On-Site Systems Approval (COSA) from the department. If a COSA is not obtained prior to transfer of title, the water system shall be deemed out of compliance with this chapter until such time as a certificate is obtained. The department may issue fines for water systems out of compliance per AMC 14.60.030.

**Exception:** This section does not apply to transfers between spouses, or to a family trust.

- B. The department shall issue a COSA if the department finds information provided by an engineer demonstrates the system for which the certificate is sought conforms to the applicable provisions of chapter 15.55 and state statutes in effect at the time of original installation or at the time of any subsequent modification and does not presently create a health hazard.
- C. When the system for which the certificate is sought does not conform to applicable state or municipal code provisions as specified in AMC 15.55.055B, the department may deny the issuance of a COSA approval.
- D. If no health hazard is posed by postponing correction of the well's defects, the department may issue a conditional COSA with a date for compliance specified. This conditional certificate may be issued with conditions necessary to ensure the public health and safety are not endangered. The specific requirements for approval of a conditional COSA shall be all the following:
1. The conditional COSA fee has been paid,
  2. If required, an approved design and issued permit for the required upgrades or repairs,
  3. Minimum two (2) estimates for the related construction have been

submitted to the department, and

4. The Department has received a letter from an established escrow agency stating that funding for the proposed construction specifically is being held in escrow. The funding amount to be held shall be:
  1. One-and-a-half (1.5) times the highest of three (3) construction estimates, or
  2. Two (2) times the highest of two (2) construction estimates.

**Exception:** Items 3. and 4. are not required for upgrades or repairs that cost less than \$2,000.

- E. The request for a COSA shall be submitted on forms provided by the department.
- F. An as-built survey completed by a state registered land surveyor is required to be submitted. The survey is to be drawn to a standard engineering scale not smaller than 1 inch = 100 feet. The as-built survey shall include, but not be limited to, all structures, driveways, parking areas, septic system standpipes and water wells.
- G. All test procedures used to collect the information necessary to meet the requirements of this section shall be developed and modified by the department.
- H. For wells serving three or fewer dwelling units, a well yield test shall be completed as described in 15.55.060.F.1. If the flow test demonstrates that the minimum sustained rate of production and recovery is less than 150 gallons per day per bedroom, the department will issue an advisory notice with the COSA identifying the well as low yield.
- I. Water quality testing shall be completed as described in 15.55.060F.2. The COSA shall not be denied if an arsenic concentration of greater than 10 ug/L is reported. The owner or owner's agent will complete the following as applicable:
  1. When a COSA well water sample indicates a nitrate concentration greater than 5.0 mg/L and a well log is not available, inspect the well casing for the correct minimum depth and perforations. If perforations are found above minimum allowable depth, the casing is to be lined to 40 feet.
  2. When a COSA well water sample indicates a nitrate concentration greater than 10 mg/L, an investigation shall be conducted to determine if the well is a source of contamination. If the well is determined to be a source of contamination, the contamination source shall be abated. In determining whether a well is the source of contamination, the following minimum steps shall be completed:
    - a. Review nitrate levels of neighboring wells,
    - b. Review nitrate history for the well and neighboring wells for trends,

- c. Review the soil profile for the well and neighboring wells with the objective to determine:
    - I. Whether the aquifer is subject to contamination from loose, gravel type soils extending from grade to the aquifer.
    - II. Whether the aquifer is subject to contamination from shallow, fractured bedrock,
  - d. Review the subject and neighboring properties for sources of contamination, both past and present,
  - e. Inspect the well casing for correct minimum depth and perforations. If perforations found, the casing is to be lined to 40 feet, and
  - f. Provide a written narrative to the department discussing the investigation process, findings, summary of remediation efforts and conclusion.
- J. The department shall compile and make available to the public comprehensive guidelines regarding the procedures to be followed in applying for and obtaining a COSA.

**15.55.060 General Standards for Domestic Wells.**

*A. Prohibited wells.*

- 1. Well pit construction is prohibited. At time of COSA, all existing well pits are to be backfilled and the well retrofitted to meet current code.
- 2. Well vaults are discouraged but will be allowed if the well casing is susceptible to vehicle damage and it is shown to provide adequate protection against flooding and no reasonable alternative exists. The vault cover shall be water-tight and rated for traffic. Any drainage piping installed shall be constructed to prevent the entrance of vermin.

*B. Well location and minimum setbacks.* The location of a well shall be at a site readily accessible year-round for testing, repair, or maintenance purposes. The well casing shall be protected from vehicular impact. The minimum separation requirements between wells and other specified facilities or areas shall be:

TABLE A-1:

SEPARATION OF WELL FROM:	MINIMUM HORIZONTAL SEPARATION (FEET)
Private sewer line/ Sewer service line (including stormwater service line)	25
Subsurface drain	25
Petroleum Hydrocarbon storage tank	25
Sewer line/sewer main (including stormwater)	100
Any other source of potential contamination	100
Holding tank	100
Snow Disposal Site	See Project Manual and Engineering Design Criteria Manual
Septic absorption field	100
Sewer manhole or cleanout	100
Septic tank	100
Animal containment areas	50
Manure/animal excreta storage areas	100
Wastewater Sump/lift station inside building	25

C. *Well drilling.* Any drilling method used in the construction of a well shall meet the following requirements:

1. The well driller shall notify the department of the proposed date of commencement of any drilling, rehabilitation, deepening, or decommissioning operation prior to the start of the operation.
2. The ground surface surrounding the well for at least ten feet shall be sloped or contoured to allow surface water to drain away from the well.
3. The well driller shall exercise reasonable care during an excavation or drilling operation to prevent contamination to any aquifer.
4. Organic drilling fluid may be used only if the fluid is approved for such use by the National Sanitation Foundation (NSF) or by an equivalent organization. These fluids are listed in NSF Standard 60 and NSF Standard 61 and in associated product listings described in those two standards.
5. Water used in the drilling process shall be obtained from a source providing potable water.
6. Water wells shall be drilled and cased with non-perforated pipe to a minimum depth of 40 feet, in unconsolidated materials and in bedrock. If bedrock is encountered at a depth greater than 20 feet and less than 40 feet, then the casing shall extend a minimum of 20 feet into the bedrock. Where it is necessary to case bedrock to meet these requirements, an oversized borehole shall be drilled from surface to the required depth into the bedrock. The resulting oversized borehole shall be grouted in accordance with subsection 15.55.060D.2.
7. A well completed in unconsolidated formations shall be constructed so that water only enters the well from a single water producing zone.

D. *Well casing and liners.* Casing and liners shall be installed using potable water materials in new or like new condition, free of pits or breaks. Steel

pipng shall comply with ASTM A53 Grade B. Polyvinyl chloride (PVC) and high-density polyethylene (HDPE) piping shall be NSF approved for potable water. The minimum wall thickness or rating from Table A-2 shall apply. Casing greater than the nominal size of six inches shall have a wall thickness of at least 0.250 inches.

TABLE A-2:

Material	Nominal Size (Inside Diameter) (Inches)	OUTSIDE DIAMETER (INCHES)	MINIMUM WALL THICKNESS (INCHES)	Rating
Steel	4	4.50	0.237	
Steel	5	5.563	0.244	
Steel	6	6.625	0.250	
PVC	4	4.5	0.237	Schedule 40
PVC	4.5	4.95	0.248	Schedule 40
HDPE	4	4.5	0.265	125 psi

1. *Joints.* All casing joints shall be screw-coupled or welded and shall be watertight. If welded joints are used, the weld shall be at least as thick as the thickness of the well casing.
2. *Grouting.* The annular space shall be sealed in a bridge-free manner to prevent shallow non-potable water or surface waters from entering a potable water aquifer. All wells shall be sealed with bentonite slurry or granules as follows:
  - a. From the pitless adapter level to at least ten feet below the pitless adapter or from the surface to a minimum 20 feet below the surface.
  - b. If bedrock is encountered as described in section 15.55.060C.6., one of the following grouting procedures shall be followed:
    - I. Oversize borehole method: The permanent well casing shall be grouted from the bottom of the borehole up using high solids bentonite slurry (minimum 20 percent solids content). The oversized bore shall be stabilized to eliminate caving and sloughing. If the permanent casing is used as a tremie to place the grout by circulating from the bottom up, a minimum one-inch annulus spacing from the bottom of the bore to surface shall be required. If a temporary casing is used to stabilize the oversized bore, it shall be removed upon completion of grouting procedures.
    - II. Two section casing method: The well driller may elect to install the permanent casing in two sections, consisting of an outer surface casing and an inner (liner) section. The outer surface casing shall meet the requirements for well casing stick up. The liner shall extend a minimum of 10 feet into the surface casing (overlap) and extend a minimum of 20 feet below the casing into bedrock. The 10-foot overlap and 20-foot liner extension into bedrock shall be grouted in accordance with this section.
3. *Pitless adapters.* Pitless adapters shall be installed by a certified pump installer, a certified well driller or by an excavator under the supervision of a certified pump installer or well driller. The burial depth and type of pitless adapter installed shall be recorded on the pump installation log

pursuant to AMC 15.55.060J. When installed, pitless adapters shall be one of the types approved by the Water Systems Council. Clamp-on pitless adapters are prohibited. The pitless adapter shall be sealed with grout prior to backfilling.

4. *Well casing stick up.* All well casing shall extend a minimum of 18 inches above the finished grade, with the ground sloped to drain away from the casing.
5. *Well seal.* The top of the casing shall be closed with a sanitary well cap or watertight well seal of a type approved by the Water Systems Council.
6. *Drive shoe.* When the casing is driven or otherwise forced into the well bore, the bottom of the casing shall be protected from damage using a drive shoe or mechanical device.
7. *Perforating or slotting.* Perforating or slotting of the casing utilized for the purpose of allowing water to enter the well from water producing zones encountered above the bottom of the casing shall not extend higher than 40 feet below the ground surface unless it meets the requirements of section 15.55.060C.6.

E. *Well Accessories.* The commercial installation of well accessories shall be performed by a certified well driller or certified pump installer.

F. *Water well production and water quality testing requirements.*

1. *Well yield testing.* A well yield test shall be performed by a certified well driller or pump installer or a certified civil engineer or a hydrogeologist. The well yield test shall be performed by bailing, air lifting or by pumping. The well yield test shall accurately determine the well's sustained productivity from test data including, but not limited to, static water level, pumping water level, drawdown rate, recovery rate or any other information useful in determining the sustained producing rate. If the well's sustained production rate is less than one gallon per minute, the department may require additional testing by alternative methods.
2. *Water quality testing.* Water from the well shall be sampled by a certified well driller, a certified pump installer or an engineer and analyzed by a certified laboratory for levels of total coliform bacteria, arsenic, and nitrate. The results of this sampling shall be submitted to the department. The total coliform bacteria concentration shall meet water quality standards established in section 15.55.060K. For arsenic and nitrate, the department uses the current ADEC public drinking water standards as a guideline to trigger actions deemed necessary to protect the public health. Such actions may include, but are not limited to, issuing a health advisory, discontinuation of the use of water from the well for drinking water, decommissioning of the well, or requiring water treatment. The department may require other contaminants to be analyzed if deemed necessary for the protection of public health.

G. *Well disinfection.* Wells shall be disinfected as follows:

1. *New or deepened wells.* Immediately after completion of drilling or deepening of a well, the well shall be disinfected. After the well is flushed of drill cuttings, apply a chlorine compound proportioned to provide a concentration of at least 50 ppm as free chlorine to the entire volume of

water in the well bore. The chlorine shall be introduced into the well in a manner that distributes it throughout the entire water depth. Allow the chlorinated water to remain in the well undisturbed for at least 24 hours.

2. *Hydro-fractured or redeveloped wells.* While redeveloping or hydrofracturing wells, a free chlorine residual in the well of at least five (5) ppm shall be maintained.
3. *Pump work.* On completion of pump installation work, a chlorine compound proportioned to provide a concentration of at least 50 ppm as free chlorine to the entire volume of water in the well bore shall be applied. After chlorine is introduced, water shall be circulated in the well, so it reaches all parts of the pumping equipment, inside and out. The chlorinated water shall remain in the well for at least one hour.
4. *Flushing.* After the required disinfection time has expired, the well shall be flushed of all chlorinated water before being placed in service.

H. *Well identification.* All wells shall be labeled with a durable form of construction information upon completion. The construction information shall be secured to the well casing and contain the following information (measured from top of casing):

1. The name of the drilling contractor.
2. The date the well was completed.
3. The total depth.
4. The total depth of casing.
5. Static water level below the top of the casing.
6. Yield.

I. *Well logs and as-built.* The certified well driller shall provide a well log to the department within 30 days of completion of the well. The well log shall include at least the following pertinent information:

1. The property owner's name.
2. The legal description of the property and the street address.
3. The method of drilling (rotary, cable tool, etc.).
4. A description, relative depth, and thickness of each soil stratum penetrated from the ground surface to the total depth. All depths should be logged from the top of casing.
5. The relative depth and thickness of each water bearing stratum (aquifer) penetrated.
6. The total depth drilled.
7. The length, diameter, wall thickness and type of casing used.
8. A description of the liner (if used) and the length and setting depth.
9. The depth and number of perforations, (if any) in the casing or liner.
10. The type and location of any well screen used.
11. The static water level and drawdown level.
12. The well production test results including the method of testing.
13. The dates of commencement and completion of drilling operations.
14. The number and date of the well drilling permit issued by the department.
15. The name and address of the certified well driller.
16. A description of the method of disinfection process used upon completion of the well.



- J. *Pump installation log.* The certified pump installer shall provide a pump installation log to the department within 30 days of completion of the installation of a pump for a new well. The pump installation log shall include at least the following pertinent information:
1. The property owner's name and address.
  2. The legal description of the property.
  3. The date of the pump installation.
  4. The manufacturer, model, and size of the pump.
  5. The depth from top of casing that the pump is installed.
  6. Well depth.
  7. The well permit number and date the well drilling permit was issued by the department.
  8. The name and address of the certified pump installer.
  9. A description of the method of disinfection used.
  10. The manufacturer of the pitless adapter.
  11. The depth from top of casing that the pitless adapter is installed.
  12. The name of the pitless adapter installer.
  13. Response to the question: "Was the pitless adapter grouted?"
- K. *Water quality standards.* Water used for domestic purposes shall not contain total coliform bacteria concentrations exceeding 0 colonies per 100 ml (absent or negative).
- L. *Well decommissioning.* Wells shall be decommissioned by a certified well driller or a certified pump installer in accordance with this subsection. A well may be permanently decommissioned by one of the following methods:
1. Perforate the casing from the bottom to within two feet of the land surface, remove the top two feet of well casing, then grout the entire depth of the well. The top of the cut-off casing shall be sealed with a minimum 0.25-inch-thick plate welded completely around the circumference of the casing. At least one fifty-pound sack of bentonite granules shall be poured around and over the sealed casing prior to backfilling with local soil or fill to finished grade.
  2. Withdraw the casing and fill the borehole with grout as the casing is being withdrawn.
  3. Cut off the casing at a point two feet below ground level and fill the casing with a bentonite slurry pumped from the bottom up or filled in a bridge-free manner with dry bentonite. The top of the cut-off casing shall be sealed with a minimum 0.25-inch-thick plate welded completely around the circumference of the casing. At least one fifty-pound sack of bentonite granules shall be poured around and over the sealed casing prior to backfilling with local soil or fill to finished grade.
- A well decommissioning log shall be submitted to the department within thirty days of completion of the work.

**15.55.070 General Standards for Potable Water Storage.**

- A. No water storage is required by this code; however, when well production is less than 150 gallons per day per bedroom, it may be advisable to install water storage. If water storage is provided, it shall meet the requirements of this section.
- B. *Permit required.* Installation of an interior water storage (i.e. within the building) within the Anchorage Building Safety Service Area (ABSSA) requires a Building Permit in accordance with AMC Title 23. Installation of an exterior water storage tank requires a permit application submitted to the department.
- C. *General water storage requirements.*
  - 1. Water storage tanks shall have National Sanitation Foundation (NSF-61) or equivalent approval; or
  - 2. Water storage tanks shall be designed by an engineer and manufactured by an approved tank manufacturer. Materials and coating used in construction shall be either U.S. Food and Drug Administration (FDA) or NSF-61 approved food grade.
  - 3. Piping and components associated with the water storage tanks shall comply with the latest adopted edition of the Uniform Plumbing Code, as amended where applicable.
  - 4. Water storage tanks shall be clearly and permanently marked "potable water."
  - 5. Water delivery shall be done by water haulers certified by the State of Alaska Department of Environmental Conservation (ADEC).
  - 6. Homeowners may haul their own water provided they obtain the water from a source approved by ADEC and use an NSF-61 approved tank.
- D. *Exterior located water storage requirements.*
  - 1. A permit to install exterior water storage shall be obtained from the department prior to installation. The permit application shall include:
    - a. The legal description of the property.
    - b. An as-built site plan or proposed site plan meeting the requirements of subsection 15.55.050B.1. and including the location of the water storage facilities.
    - c. The number of bedrooms served by the well or water storage facilities.
  - 2. *Location of buried water storage facilities.* The location of buried water storage facilities shall be at a site readily accessible year-round for testing, repair, or maintenance purposes. The minimum separation requirement between buried water storage facilities and other specified facilities and areas shall be in accordance with Table A-1.
  - 3. An exterior water storage tank shall have a minimum of four feet of cover or be insulated to protect from freezing. Tanks buried with less than two feet of cover shall have calculations submitted by an engineer showing adequate measures have been taken to prevent the tank from freezing.

**15.55.080 Well Driller and Pump Installer Certification.**

- A. It shall be unlawful for any person or company to engage in the business of drilling, deepening, or rehabilitating a well regulated under this chapter unless the person or company is certified by the department as a well driller or pump installer.
- B. It shall be unlawful for a person or company to engage in the business of installing, removing, or repairing a water well pump, regulated under this chapter unless the person or company is certified by the department as a pump installer.

**Exception:** An owner may install a water well pump in a well that serves up to two dwellings units if the owner occupies one of these dwelling units.

- C. It shall be unlawful for a person or company to engage in the business of decommissioning a well regulated under this chapter unless the person or company is certified by the department as a well driller or pump installer.
- D. A well driller's or pump installer's certification shall be valid for a period of one calendar year and shall be renewed each subsequent year thereafter.
  - 1. The department will certify annually only when the well driller or pump installer has completed a training class conducted by the department within the past 24 months.
  - 2. Certification may be revoked by the department if the certificate holder is found in violation of this chapter. The period of revocation shall be according to the following schedule:
    - a. One offense within the previous five years shall result in a revocation of the certificate for one month.
    - b. Two offenses within the previous five years shall result in a revocation of the certificate for two months.
    - c. Three offenses within the previous five years shall result in a revocation of the certificate for six months.
    - d. More than three offenses within the previous five years shall result in permanent revocation of the certificate.

**15.55.090 Subdivision Requirements.**

- A. *Water Availability.* A proposed subdivision to be served by private wells must be supported by information demonstrating adequate water is available to serve the proposed wells and existing neighboring wells. A proposed subdivision with more than 5 lots served by private wells shall have an aquifer evaluation performed by a hydrogeologist or qualified engineer to determine if an aquifer test shall be performed in accordance with Aquifer Evaluation and Testing Guidelines maintained by the department.
- B. The submittal shall contain plans and engineering reports required to substantiate the feasibility of developing the proposed lots.

- C. *Plans.* The plans shall contain, but need not be limited to, the following information:
1. The location of existing potable water sources, on-site wastewater disposal systems including both initial and replacement subsurface disposal field sites, public sewage systems, and bodies of water in the proposed subdivision and within 200 feet of the proposed subdivision.
  2. The locations of possible well and wastewater disposal system reserve areas for each lot in the proposed subdivision.
  3. The locations of permitted well and wastewater disposal systems, including both initial and replacement subsurface disposal field sites, within 200 feet of the proposed subdivision.
  4. The minimum horizontal separation distance of each well or water source as shown in Table A-1.
- D. *Community Water System.* A proposed subdivision that will be served by a public water system shall submit an Approval to Construct from ADEC prior to final plat approval.