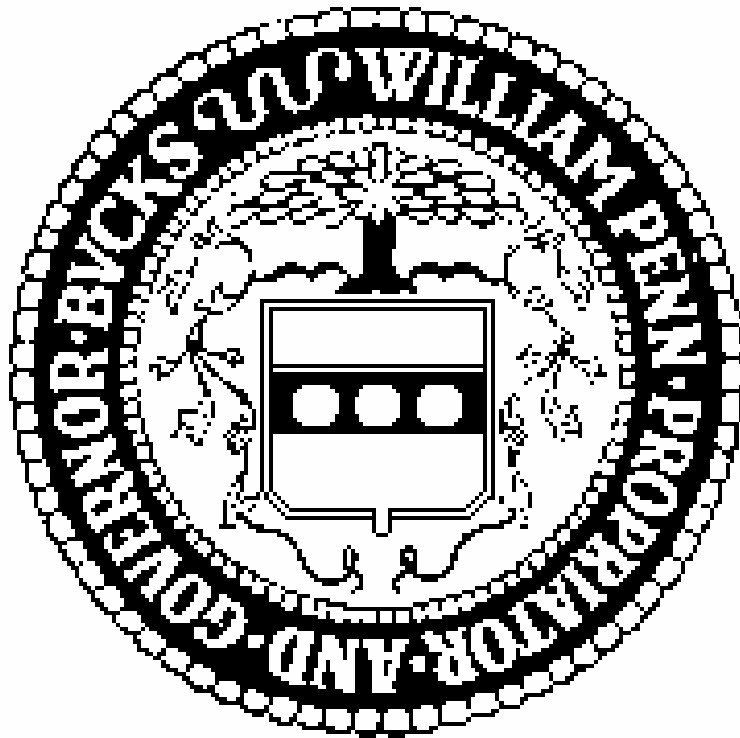


***BUCKS COUNTY DEPARTMENT OF HEALTH
RULES AND REGULATIONS
GOVERNING INDIVIDUAL RESIDENTIAL
WATER SUPPLY SYSTEMS
AND CONSTRUCTION SPECIFICATIONS***



EFFECTIVE DATE: March 1, 2007

**BUCKS COUNTY DEPARTMENT OF HEALTH
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AND CONSTRUCTION SPECIFICATIONS**

SECTION ONE - GENERAL PROVISIONS

1.1 Legal Authority.

Under the provisions of the “Local Health Administration Law”, Act No. 315, approved August 24, 1951, P.L. 1304; Chapter 109 Pennsylvania Safe Drinking Water Act 1984, May 1 (35 P.S. §§ 721.1-721.17) these following Rules and Regulations are hereby adopted.

1.2 Provisions.

The provisions of these Rules and Regulations shall apply to all municipalities in Bucks County within the jurisdiction of the Department and will apply equally to all persons. These Rules and Regulations shall supersede the previously adopted Rules and Regulations effective November 3, 2004, entitled, Rules and Regulations Governing Individual Water Supply Systems.

1.3 Purpose.

The purpose of these Rules and Regulations is to establish minimum standards for location, construction, modification and abandonment of individual residential drinking water supply wells and system installation for the protection of the health and welfare of the public.

1.4 Scope.

No individual residential drinking water supply shall be constructed or altered contrary to the provisions herein.

These regulations do not apply to water supply systems exclusively regulated by the PA Department of Environmental Protection as set forth under the PA Safe Drinking Water Act.

Monitoring, test, agricultural, and geothermal wells not used for human consumption do not fall under these rules and regulations.

SECTION TWO - DEFINITIONS

2.1 List of Definitions.

Abandonment - The process of properly filling and sealing a well, in accordance with these Rules and Regulations.

Alteration - Any action which necessitates entering a well with drilling tools; treating a well to increase yield; altering the physical structure or depth of the well; blasting; removal or replacement of well casing; modifications concerning grouting, curbing; or well abandonment.

Aggregate – Sand, crushed stone or similar materials used to eliminate the physical hazard and open space of abandoned well. Aggregates **shall** not prevent the flow of water through the borehole

Annular space - The space between two cylindrical objects, one of which surrounds the other, such as the space between a drill hole and a casing pipe and a liner pipe.

ANSI - American National Standards Institute.

API - American Petroleum Institute.

Aquifer – An underground geological formation that contains and transmits water.

ASTM - American Society for Testing Materials.

AWWA - American Water Works Association.

BCDH - Bucks County Department of Health.

Casing - An impervious durable pipe placed in a well to prevent the walls from caving in and to seal off surface drainage or undesirable water, gas or other fluids and prevent them from entering the well.

Coliform - All of the aerobic and facultative anaerobic, gram negative, non-spore forming, rod-shaped bacteria that are capable of fermenting lactose with gas formation within forty-eight (48) hours at thirty-five (35C) degrees Celsius. Coliform is a group of bacteria commonly found in waste from humans and animals, and also occurs naturally in soil and surface water.

Construction of wells - All acts necessary to obtain groundwater, or artificially recharge groundwater. Provided, however, such term does not include acts necessary for obtaining or for prospecting for oil, natural gas, minerals, or products of mining or quarrying, or for inserting media to repressure oil, or natural gas formations for storing petroleum, natural gas, or other products and services. This includes the excavation or drilling of wells, but excludes installation of pumps and pumping equipment.

Decommissioned well - Any well that is no longer equipped in such a manner, as to be able to draw groundwater. This shall include wells where the pump, piping and/or electrical components have been disconnected or removed.

Department - means the Bucks County Department of Health (BCDH).

Disinfection - A process that inactivates pathogenic organisms in water by chemical oxidants or equivalent means, such as ultraviolet light.

Drilling - Any act of penetrating soil or rock such as by boring, coring, washing, jetting, driving or digging for purpose of developing an individual residential water supply well or test well.

Drinking water well - Any residential water well which provides or is intended to provide water for human consumption.

Emergency well - A well drilled to address conditions which pose an immediate and significant danger to public health and welfare.

Geothermal well - Any borehole in the ground constructed for the purpose of extracting heat from or transferring heat to the ground or groundwater. This term does not include a trench necessary for installation of horizontal closed-loop heat transfer systems.

Grout - A permanent water tight joint or connection made by filling with concrete, neat cement, or other approved impervious material between the casing and the undisturbed formation surrounding the well or between two (2) strings of casing.

Hydrofracturing - (or hydrofracking) A process to increase yield whereby water is pumped into a new or existing well to clear existing fractures.

Individual water supply well – A well that is used as a potable water source for residential use and serves less than twenty-five (25) people and/or less than fifteen (15) homes.

Lot - Any part of a subdivision or a parcel of land used as a building site or intended to be used for building purposes, whether immediate or future.

Monitoring well - A well used to observe water levels and/or obtain samples of ground water and which will not be used as a drinking water well.

New construction - Any building or structure which is constructed or whose use is modified between residential, commercial or industrial after the effective date of these regulations.

PA DCNR - Pennsylvania Department of Conservation and Natural Resources.

PA DEP - Pennsylvania Department of Environmental Protection.

Person - Shall include any individual, landowner (which is defined as any person holding title to or having a proprietary or equitable interest in either surface or subsurface rights), landlord, lessor, land occupier (including but not limited to easement owner, tenant, lessee or occupant of a structure or land, whether the landowner or not), any corporation, including public or private corporation for profit or not for profit, association, partnership, firm, trust, trustee, estate, executor, executrix, administrator, administratrix or other fiduciaries, department, board, bureau or agency of the Commonwealth, political subdivision, municipality, district, authority or any other legal entity whatsoever which is recognized by law as the subject of rights and duties, and any agent for any individual or corporation or other legal entity set forth above. Whenever used in any clause prescribing and imposing a penalty or imposing a fine or imprisonment the term “Person” shall include all of the above set forth individuals and entities as well as members, officers, and/or employees of any corporation, an association, partnership or firm and the officers, directors of any local agency, municipality, municipal authority and/or political subdivision and the supervisors, councilmen, of any political subdivision public or private corporation for profit or not for profit.

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

Potable water – Water for human consumption that meets the biological and chemical standards of Chapter 109 Safe Drinking Water Act.

Pumps – Any mechanical device which uses natural or artificially generated pressure difference to withdrawal or obtain groundwater.

Pumping equipment – Any materials connected to a pump including, but not limited to, piping well seals and tanks, together with fittings and controls.

Sealant – Used in well abandonment to provide a watertight barrier to the migration of water in the borehole. Sealants usually consist of Portland cement based grouts, bentonite clay, or combinations of these substances.

Test well - A well constructed for the purpose of obtaining information on groundwater or hydrogeologic conditions including yield and quality. Test wells are temporary and not considered individual supply wells. Once the intended use of the well has been completed the well shall be abandoned, or decommissioned.

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

Well yield - The quantity of water per unit of time that may flow or be pumped from a drinking water well under specified conditions.

SECTION THREE - APPLICATION TO CONSTRUCT

3.1 General.

- a. It shall be unlawful to install a new well or modify an existing well without a valid completed well water permit.
- b. Prior to constructing a new well or modifying an existing well, the property owner shall file with BCDH the appropriate application and pay all applicable fees.
- c. The application to construct must be filed on behalf of the current property owner or equitable owner. The well application must be in the same name as the current owner of a valid on-lot sewage disposal application (Act 537) for the property if applicable.
- d. BCDH shall approve or deny the application within seven working days of receipt of an administratively complete application and fee. BCDH shall notify applicants if the application is determined to be incomplete or contains information that cannot be verified. Upon receipt of the supplemental information, BCDH has an additional seven working days to approve or deny the application.
- e. Any requirement to obtain a well permit by a local municipality shall not supersede the requirement to obtain a valid well permit from BCDH.
- f. All sewage system component locations within 125 ft. of the proposed well on said property and all neighboring properties must be clearly staked prior to approval of the well construction permit and the commencement of well drilling.
- g. Verification of property lines and all isolation distances required by these or any other statute, regulation or ordinance is the responsibility of the applicant.
- h. Any relocation of the proposed well site from the permitted location must be submitted in writing and approved by BCDH.
- i. If well construction is not completed within three years of the application approval date, the approval to construct shall expire.

SECTION FOUR - CONSTRUCTION SPECIFICATIONS

4.1 Well Location.

- a. For the proposed well, minimum isolation distances shall be maintained from designated facilities and potential pollution sources as listed in the table below :

- b. Any proposed deviation from the isolation distances in the referenced section, must be submitted in writing to the Department. See Section Eleven (Variance Procedures).

Individual Residential Water-Supply Isolation Distances:

	Potential Pollution Source	Isolation Distance (ft.)
1)	Delineated wetlands or 100-year floodplain	25
2)	Storm drains, retention basins, storm water stabilization ponds, and rainwater pits	25
3)	Community spray irrigation sites, sewage sludge and septage disposal sites.	100
4)	Lakes, ponds, streams or other surface waters.	50
5)	Farm silos, barnyards, manure pits or tanks or other storage areas of animal manure.	200
6)	Subsurface sewage absorption areas, elevated sand mounds, cesspools, sewage seepage pits, single family spray irrigation system, etc.	100
7)	Septic tanks, aerobic tanks, sewage pump tanks, holding tanks.	50
8)	Gravity sewer lines and drains carrying domestic sewage or industrial waste (unless item 9 applies).	50
9)	Gravity sewer lines and drains using cast iron pipe with watertight lead caulked or neoprene gasketed joints, or Schedule 40 polyvinyl chloride (PVC) pipe with solvent welded joints.	10
10)	Sewer lines and drains carrying domestic sewage or industrial waste under pressure (except welded steel pipe or concrete encased pipe).	50
11)	Commercial preparation area or storage area of hazardous spray materials, fertilizers or chemicals; salt piles.	300
12)	Drip irrigation absorption zones.	102

4.2 Casing.

- a. All wells supplying individual residential water supplies shall be equipped with water-tight steel casing of a minimum thickness of .28 inch and weight of nineteen (19) lbs./ft. The casing shall be carried to a minimum depth of thirty (30) feet and five (5) feet into hard bedrock or other impervious strata, whichever is deeper, and grouted in place. A minimum annular clearance of 1.5 inches must be maintained so that grout may be placed in accordance with the provisions of Section 4.3. The criteria established in AWWA Standard A 100-90 must be followed.
- b. Steel casings shall be new pipe meeting ASTM or API specifications for water well construction. If minimum thickness is not considered sufficient to assure reasonable

life expectancy of the well, additional thickness will be provided. Steel casing will be equipped with a drive shoe, if needed, and have full circumference welds or threaded pipe joints.

- c. Water-tight well casing and grout must be placed at a sufficient depth to prevent entrance of surface pollution from surface run-off and polluted aquifers.
- d. The casing and well head shall extend above the finished grade a minimum of twelve (12) inches or to such height as is necessary to prevent entrance of surface water from run-off or flooding, whichever is greater. The ground level shall be graded to drain away from the casing in all directions.
- e. Where surface installations (i.e. pump rooms, etc.) are used, a watertight reinforced concrete platform at least four (4) inches thick and extending for at least two (2) feet in all directions from the center of the casing shall be poured around the casing to provide an effective watertight seal with casing, or shall be made watertight with an effective permanent seal. The surface of the platform shall slope to the edges. The casing shall extend through the slab for at least twelve (12) inches. All pumping equipment shall be protected against freezing. If a pump room is proposed, it shall be so sized to allow adequate working space.
- f. All casings shall be fitted with a metal, bolted, water-tight, vermin resistant well cap.
- g. Well screens, when used shall, provide the maximum amount of open area while still maintaining structural strength, have the size of openings in the screen based on a sieve analysis of the material contained in the surrounding geological formation or gravel pack, be constructed of materials resistant to damage by chemical action of the ground water or cleaning operations, have sufficient diameter to provide adequate specific capacity and low aperture velocity. Usually, the entrance velocity should not exceed 0.1 feet per second, be installed so that the pumping water level remains above the screen under all conditions, be designed and installed to permit removal or replacement without adversely affecting water-tight construction of the well, and be provided with a bottom plate or washdown bottom fitting of the same material as the screen.
- h. Pitless installations are those installations where the casing terminates above the ground surface. Where pitless installations are used, they shall be of a design that provides an effective seal against the entrance of ground or surface water into the well, access casing, and into the piping leading to the pump. All buried suction lines shall be effectively encased, or otherwise protected to prevent external damage or contamination. Pitless installations must be designed as to be structurally sound and to provide for ready removal of drop piping without excavation.
- i. Where venting is required, an overlapping cover or pipe with the opening facing downward shall be required. Such venting shall be effectively protected against the entrance of insects and rodents.

4.3 Grout Materials.

The annular space of all well installations must be filled with one of the following listed grout materials:

- a. Neat cement grout shall consist of a mixture of API Class G (or Class B similar to ASTM C150 Type II) and water in the ratio of 0.67 cu. Ct. (0.019 m³) of water per 94

- lb. (42.7 kg) sack weighing approximately 228 lbs./cu. ft. A maximum of six percent by weight bentonite and two percent by weight of calcium chloride may be added.
- b. Pozmix-cement grout shall consist of a mixture of fifty percent by volume of Pozzolan A (74 lbs. cu. ft 3) (1185kg/m³) and fifty percent by volume of API Spec. 10, Class G. Cement with 0.77 cu. ft. (0.02m³) of water per 84 lbs. (38.2 kg) of mixture. To this mixture may be added a maximum of two (2) percent by weight, bentonite and a maximum of two percent of calcium chloride, at the discretion of the contractor.
 - c. Concrete grout shall contain 5.3 sacks of Portland cement (ASTM C150 Type II) per cubic yard of concrete and a maximum of 7 gal. (0.026 m³) of water per 94 lb (42.7 kg) sack of cement. The maximum slump shall be 4 in. The aggregate shall consist of 47 percent sand and 53 percent coarse aggregate, conforming to ASTM Designation C-33. The maximum size aggregate should be 0.75 in. Concrete grout shall not be placed in an annulus of less than 3 in.
 - d. Sand cement grout shall consist of a mixture of Portland cement (ASTM C150 Type II), sand and water in the proportion of not more than two parts by weight of sand to one part of cement with not more than 6 gal. (0.002 m³) of water per 94 lb. (42.7 kg) sack of cement.
 - e. Bentonite grout shall be pure bentonite with at least 20% solids by weight when mixed with water. Hydration of the bentonite must be delayed until the bentonite mix has been placed down the well. This can be done by using additives with the dry bentonite or in water, mixing calcium bentonite with sodium bentonite, or by using granular bentonite, which has less surface area. In all well installations if rapid loss of grout material occurs during placement, coarse fill material (e.g. sand gravel, crushed stone dry cement) may be used in the zone or zones in which the rapid loss is occurring. The remainder of the annular space shall be grouted as provided below. In no case shall pouring, dumping or shoveling of grout material into the annular space be deemed an approved method of grout placement.
 - f. When drilling is to be continued after grouting, a curing time of twelve (12) hours for Type III cement, and twenty-four (24) hours for Type I or II cement must be provided during which drilling is not permitted, unless a bentonite plug with cement grout or bentonite grout is used.

4.4 Grout Placement.

- a. **Grout Pipe Outside Casing.** The minimum annular space of 1 ½ inches around the entire outside of the casing shall be provided by drilling a borehole 3 inches larger than the outside diameter of the casing to be inserted. All grout shall be placed by pumping through the grout pipe. The entire interval to be grouted shall be open and without obstructions. Washing or jetting with water is required for cleaning the borehole and may serve to remove obstructions caused by caving which otherwise would prevent a proper grout. It is required that the grout pipe extend from the surface to the bottom of the interval to be grouted. The grout pipe may remain extended to the bottom of the interval during and after grouting, or it may be raised slowly as the grout is placed provided that the discharge end of the grout pipe remains submerged on the emplaced grout at all times until grouting is completed. In the event of interruption in the grouting operations, the bottom of the grout pipe shall be raised above the grout level and should not be resubmerged until the air and water have been displaced from the grout pipe.

- b. **Grouting Depth Greater than 30 ft.** The minimum length of grout pipe that shall be inserted into the annular space is 30 feet.
- c. **Grouting Depth of 30 ft. and less.** Grout may be placed by a tremie pipe inserted only a short distance (approximately 5 feet) into the annular space provided that the entire interval to be grouted is clearly visible from the surface and is dry. An annular space larger than the minimum of 1 ½ inches may be required to assure visibility from the surface
- d. **Grout Pipe Casing.** The bottom of the casing is fitted with a packer arrangement, also referred to as a cementing shoe or float shoe, and the casing is placed in the borehole a short distance off the bottom. The float shoe allows grout to be pumped through the grout pipe and upward into the annular space, while preventing grout leakage into the casing during grouting and after removal of the grout pipe. Grouting is continued until cement appears at the surface at which time the grout pipe is disconnected from the float shoe. The float shoe is drilled out after the grout sets and hardens sufficiently.
- e. **Interior Method Two Plug.** The first plug separates the grout from the fluid in the casing and the other separates the grout from water pumped in above it. First, the casing is placed a short distance off the bottom. After pumping water through the casing to circulate fluid in the annular space and clear any obstructions from the hole, the first plug is inserted, and the casing is capped. A measured volume of grout is pumped in, which is sufficient to fill the annular space. The casing then is opened and the second plug inserted. A measured volume of water is pumped in above the second plug until it is pushed to the bottom of the casing and most of the grout is expelled up and into the annular space. The water in the casing is held under pressure to prevent the backflow of grout until it has set and hardened.
- f. **Interior Method Upper Plug.** The casing is placed a short distance off the bottom, and the water is pumped into the casing to circulate fluid through the annular space to clear any obstructions from the hole. A measured quantity of grout slightly greater than that needed to fill the annular space is pumped into the capped casing. Because this grout is in direct contact with the drilling fluid, there will be a narrow zone of weak grout between the drilling fluid and good grout; however, this zone should remain inside the casing and not be forced into the annular space. The casing is opened, and a drillable plug is inserted. A measured volume of water is pumped in above the plug until it is pushed to the bottom of the casing and most of the grout is expelled up and into the annular space. The water in the casing is held under pressure until the grout sets and hardens.
- g. **Interior Method Capped Casing.** The casing is placed a short distance off the bottom, and water is pumped into the casing to circulate fluid in the annular space and clear any obstructions from the hole. The grout pipe passes through an airtight cap at the top of the casing and is positioned 3 to 4 feet above the bottom of the casing. The grout pipe is assembled so that it can be pulled through the cap a distance of about 20 feet after the injection of grout is completed. A bleeder valve is provided to release air from inside the casing as it is filled with water. With the upper end of the casing closed, grouting is started by forcing the cement through the grout pipe upward into the annular space. Grouting is continued until the cement overflows around the casing at ground surface. Just enough water is pumped to clear the cement from the grout pipe, and the grout pipe is lifted free of the grout.

Both the casing and grout pipe shall be kept tightly closed under pressure until the cement sets and hardens.

- h. **Grout Displacement Method.** The hole is filled with the estimated volume of grout required to fill the annular space, and the casing is lowered into the hole. The bottom of the casing is closed with a tight drillable plug. Guides often are used to keep the casing centered in the hole. As the casing is lowered, the grout is forced upward around it to fill the annular space. If the pipe does not sink to the bottom under its own weight, it is filled with water.
- i. **Unconsolidated Formations.** When drilling through an unconsolidated formation, a steel drive shoe shall be required. Grouting shall be done in accordance with the following:
 - 1. If caving conditions are experienced on wells deeper than 30 feet, the annular space shall be grouted from the point where caving occurred or from a depth of 30 feet, whichever is greater, to land surface.
 - 2. If the annular space cannot be grouted in accordance with these regulations, the well shall be abandoned and sealed.
 - 3. Other grouting methods and materials may be used subject to prior written approval of the Department.
- j. **Packers.** Packers, when used, shall be of materials that will not impart taste, odor, toxic substances or bacterial contamination to the well water.
- k. **Gravel Packs.** Gravel packs when used shall be well rounded particles, 95 percent siliceous material, that are smooth and uniform, free of foreign material, properly sized, washed and disinfected immediately prior to or during placement, shall be placed in one uniform continuous operation.
- l. **Gravel Refill Pipes.** Gravel refill pipes, when used, shall be Schedule 40 steel pipe incorporated within the pump foundation and terminated with screwed or welded caps at least 12 inches above the pump house floor or concrete apron, gravel refill pipes located in the grouted annular opening shall be surrounded by a minimum of 1.5 inches of grout. Protection from leakage of grout into the gravel pack or screen shall be provided.

SECTION FIVE-INSPECTION

5.1 Drilling Inspection.

- a. Notice of drilling or well modification must be given to BCDH a minimum of two (2) working days prior to commencement of the work.

5.2 Well Casing and Grouting.

- a. A BCDH representative is to be on site to observe the installation of the well casing,
- b. A BCDH representative is to be on-site to observe the grouting of the well and any other inspection during the well construction.

5.3 Pitless Adapter and Well Seal.

- a. The BCDH must inspect the pitless adapter installation and the installation of a water tight well seal.

5.4 Failure to Comply.

- a. Failure to comply with the BCDH inspection may result in termination of the drilling or alteration activities, and may cause the revocation of the Approval to Construct.

SECTION SIX - WELL DRILLERS

6.1 Driller License.

- a. Only well drillers with a PA DCNR license shall be permitted to construct individual residential water supply wells.
- b. All drilling rigs must also be licensed by the PA DCNR.

SECTION SEVEN - DISINFECTION OF WELL DISTRIBUTION SYSTEM

7.1 General.

- a. Following completion of construction and installation of the pumping equipment, or alteration of a well, the well shall be pumped until the water discharge is clear. The well and distribution system shall be disinfected according to PA DEP disinfection procedures.

SECTION EIGHT - WATER QUALITY

8.1 General.

- a. Water analysis of the completed new well must be conducted by a PA DEP Certified Drinking Water Laboratory.
- b. Water analysis must include the Primary DEP regulated contaminants: total coliform, 21 regulated volatile organic chemicals, arsenic, nitrates and the secondary contaminants: pH, iron, manganese, total dissolved solids, and chlorides.
- c. Analyses for additional parameters may be required if BCDH has reason to suspect that substances may be present in the water that could affect potability.

8.2 Treatment.

- a. If any parameter tested exceeds the maximum contaminant level established by PA DEP, treatment is recommended.

SECTION NINE - CERTIFICATE TO OPERATE

9.1 General.

- a. Upon completion of the well or alteration, the following information must be submitted to the Department for approval to operate the individual residential water supply:
 - 1. Completed forms SA-130 Application to Construct/modify an Individual Residential Well, SA-131 Residential Well Work Sheet.
 - 2. Water analysis results as required in Section 8.
 - 3. Description of any treatment system that was installed.
- b. A Certificate to Operate an individual residential water supply system shall be issued or denied within seven days of receipt of the information required in section 10.1 a.
- c. No individual residential water supply well constructed after promulgation of these Rules and Regulations shall be used unless the individual residential water supply system receives a Certificate to Operate from BCDH.

SECTION TEN - WELL ABANDONMENT

10.1 General.

- a. A permit must be obtained prior to abandoning all wells.
- b. Abandonment procedures shall be subject to BCDH inspection.
- c. Failure to comply with proper abandonment procedures will result in an order to terminate site activities.
- d. Well abandonment procedures must minimally comply with the specifications referenced in the PA DEP/DCNR Water Well Abandonment Guidelines.*
- e. A copy of the PA DEP/DCNR Water Well Abandonment Form* shall be submitted to BCDH within ten days of abandonment.

*Available from BCDH or PA DEP Southeast Regional Office.

10.2 Well Preparation.

- a. The borehole must be cleared of obstructions prior to abandonment. Pumps, pipes, wiring, and air lines must be pulled. An attempt to remove the casing should be made as long as it will not jeopardize the integrity of the borehole. If the casing cannot be removed, it should be cut below the land surface.
- b. Damaged, poorly constructed or dilapidated wells may need to be redrilled in order to apply proper abandonment techniques.

10.3 Materials and Methods

- a. Aggregates
 1. Aggregates may be used in the following circumstances: a) There is no need to penetrate or seal fractures, joints or other openings in the interval to be filled, b) A watertight seal is not required, c) The hole is caving, d) The interval does NOT penetrate a perched or confined aquifer, e) The interval does not penetrate more than one aquifer.
 2. Aggregates should be uncontaminated and of consistent size.
 3. If aggregate is used, a casing seal must be installed. Generally, this can be accomplished by filling at least the upper ten feet of open borehole and the lower five feet with sealant. The length of open borehole sealed should be increased if extenuating circumstances exist. This would include a history of bacterial contamination or possibly deep fracture zones.
- b. Sealants – Sealants are used to provide a watertight barrier to the migration of water in the well bore. An abandoned contaminated well or a well in an area where the groundwater is at a high risk for future contamination require complete and uniform sealing of the well from the bottom to the surface.
 1. Sealing mixtures should be formulated to minimize shrinkage.
 2. A pump and tremie pipe are preferred for delivering the sealant to the bottom of the well.
 3. If aggregate is to be placed above the sealant, sufficient amount of curing time must pass before placing the aggregate above the seal.

4. Types of sealant: a) *neat cement grout*: a ratio of one 94 lb. Bag of Portland cement to no more than 6 gallons of water, b) *concrete grout*: a ratio of one 94 lb. Bag of Portland cement to no more than 6 gallons of water and an equal volume of sand, c) *grout additives*: some bentonite (2% to 8%) can be added to neat cement or concrete grout to decrease the amount of shrinkage. Other additives may be used to alter the curing time or the permeability of the grout, such as calcium chloride can be used as a curing accelerator, d) *high solids sodium bentonite*: composed of 15% to 20% solids content by weight of sodium bentonite when mixed with water, e) *chip bentonite*: chip (coarse grade) or palletized bentonite will form adequate seals. When placed above the water level, water must be added frequently to hydrate the bentonite.

SECTION ELEVEN - VARIANCE PROCEDURES

Should an applicant believe that these regulations impose an undue hardship upon them, an applicant may apply to BCDH for an administrative hearing by submitting a hearing request and proper fee for a hearing. At any administrative hearing, it shall be the burden of the applicant or prove via clear and convincing evidence that 1) the applicant is suffering an undue hardship; and 2) that the applicant has taken sufficient steps to ensure that any variance from these regulations will not adversely affect any aspect of the public health or environmental health. The administrative hearing officer shall have discretion to weight the evidence to determine whether the applicant has met their burden.

SECTION TWELVE - SEVERABILITY

If any section, subsection, paragraph, clause, or provision of these Rules and Regulations shall be declared by a court of competent jurisdiction to be invalid, such decision shall not affect the validity of the Rules and Regulations as a whole or any part thereof. It is hereby declared to be the intention of the Bucks County Department of Health, the Bucks County Board of Health and the Bucks County Commissioners that the remainder of the Rules and Regulations would have been enacted if such invalid section had not been enacted and that it is their intent, intention and desire that the remaining portion of the Rules and Regulations remain in effect.

SECTION THIRTEEN - PENALTY PROVISIONS

13.1 Summary Offense.

In accordance with the provisions of Act No. 315, approved August 24, 1951, P.L. 1304, as amended, any person who violates any of the provisions of these Rules and Regulations or who interferes with the Health Director or any other agent of the Bucks County Department of Health in the discharge of their official duties or who refuses to permit the Director of the Bucks County Department of Health or their authorized representatives to inspect any premises when such inspection is authorized by a properly issued search warrant, shall, for the first offense, upon conviction thereof in a summary proceeding before a District Justice of Bucks County, be sentenced to pay the costs of prosecution and a fine of not less than Thirty (\$30.00) Dollars nor more than Three Hundred (\$300.00) Dollars, and in a default thereof, to undergo imprisonment of not less than ten (10) days nor more than thirty (30) days.

13.2 Misdemeanor Offense.

Any person who violates any of the provisions of these Rules and Regulations, or who interferes with the Health Director or any other agent of the Bucks County Department of Health in the discharge of their official duties, or who refuses to permit the Director of the Bucks County Department of Health or his authorized representative to inspect any premises when such inspection is authorized by a proper issued search warrant, convicted of a second or subsequent offense, shall be guilty of a misdemeanor and shall, upon conviction thereof, be sentenced to pay a fine of not less than Five Hundred (\$500.00) Dollars nor more than One Thousand (\$1,000.00) Dollars or to undergo imprisonment not exceeding one (1) year, or both.

Approved Bucks County Board of Health: January 11, 2007

Approved Bucks County Board of Commissioners: February 7, 2007

Effective Date: March 1, 2007