

**TOWNSHIP OF WASHINGTON
FRANKLIN COUNTY, PENNSYLVANIA**

ORDINANCE NO. *****

**AN ORDINANCE OF WASHINGTON TOWNSHIP, REGULATING THE
INSTALLATION AND USE OF GEOTHERMAL HEATING SYSTEMS WITHIN
WASHINGTON TOWNSHIP AND ESTABLISHING THE MEANS FOR
ENFORCMENT OF THE ORDINANCE**

WHEREAS, the groundwater underlying the community water supply Wellhead protection area is the sole source of Washington Township's existing and future water supply, including drinking water; and

WHEREAS, the Washington Township Supervisors wish to protect and preserve the water resources and water supplies that serve Washington Township residents, and

WHEREAS, the Washington Township Supervisors wish to provide standards of construction for individual geothermal heating systems for residential, institutional, commercial and industrial uses in a comprehensive and coordinated manner so as to assure their continued availability while protecting the Township's water supplies,

NOW, THEREFORE, be it ordained and enacted and it is hereby ordained and enacted as follows:

Section 1. Purpose and Scope

- A. The purpose of this Ordinance is to protect the quality of the groundwater resources in Washington Township. In furtherance of this overall purpose, this ordinance is specifically intended to serve the following sub-purposes:
1. Protect and preserve the water resources and water supply that serves all Washington Township residents;
 2. Conserve and manage geothermal resources and thermal ground waters in a comprehensive and coordinated manner so as to assure their continued availability and productivity;
 3. Establish standards of construction for geothermal heating systems, including residential, institutional, commercial and industrial activities;
 4. Maximize the public welfare and economic benefit to be derived from geothermal resources and thermal ground waters;

5. Minimize the potential for damage or degradation to geothermal resources and thermal ground waters;
 6. Protect of the surface and subsurface environment during development and utilization of geothermal resources and thermal ground waters; and
 7. Allow for the installation and maintenance of geothermal heating systems that are safe and efficient, and utilize modern technology.
- B. This Ordinance is enacted pursuant to the authority contained in the Constitution of the Commonwealth of Pennsylvania and the Second Class Township Code, 53 P.S. § 1506, as amended, which provision authorizes the Township to enact ordinances necessary for the proper management, care and control of the Township and its finances and the maintenance of peace, good government, health and welfare of the Township and its citizens, trade, commerce and manufacturers, and the Pennsylvania Municipalities Planning Code, 53 P.S. §§ 10101, *et seq.*, , as amended, which provisions authorize the Township to enact ordinances regulating development and land uses to (i) ensure the public health and safety, (ii) provide a safe, reliable and adequate community water supply, and (iii) preserve natural values and aquifers.
- C. It shall be the responsibility of any Person owning real property and/or owning or operating a business within Washington Township to make a determination of the applicability of the Wellhead Protection Overlay District as it pertains to the property and/or business under his/her ownership or operation, and his/her failure to do so shall not excuse any violations of said sections.

Section 2. Definitions and Terms.

Abandoned Water Supply Well- A water supply well, the regular use of which has been discontinued for a period of one year or more, or which is in such a state of disrepair that continued use for the purpose of obtaining ground water is impracticable, or which has been replaced by a new well or public water supply.

Alteration - The deepening, re-casing, perforating, re-perforating, the installation of packers or seals, and other material changes in the design of a geothermal heating system.

Annular Space - The space between two (2) cylindrical objects, one of which surrounds the other, such as the space between a drill hole and a casing pipe.

ANSI - American National Standards Institute.

API - American Petroleum Institute.

Approved Grout - Neat cement, cement plus bentonite, bentonite, bentonite plus silica sand, or low-permeability sealing material as approved for use by the Code Official. Approved grout is to be mixed and applied according to manufacturer's specifications (e.g., water content and viscosity) for use in grouting wells and/or geothermal boreholes.

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

ASTM - American Society for Testing and Materials.

Authority - The Washington Township Municipal Authority or its agent(s).

Back Siphonage - The flowing back of used, contaminated or polluted water from a plumbing fixture or vessel or other sources into a potable water supply pipe due to negative pressure in such pipe.

Bentonite - A highly plastic, colloidal clay composed largely of the mineral montmorillonite.

Boring / Borehole - A penetration of soil and/or rock that is augered, drilled, cored, bored, washed, driven, dug, jetted, or otherwise constructed which is generally cylindrical in shape and whose diameter is generally smaller than its depth of penetration.

Bridging Material - Solids added to a drilling fluid to bridge across the pore throat or fractures of an exposed rock thereby building a filter cake to prevent loss of whole mud or excessive filtrate.

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

Chip Bentonite Grout - Chip bentonite grout is composed of dry 3/8 inch (9.5 mm) or 1/2 inch (12.7 mm) sized chips of bentonite.

Closed Loop Systems - A geothermal heat pump system which relies on the contained circulation of geothermal fluids through an underground loop of pipes. The loops act as a subsurface heat exchanger, which transports the heat to or from the ground. The loop of pipe is installed either vertically in borings or horizontally in trenches.

Closed Loop, Horizontal - A Closed Loop System where the loops of the pipe are laid horizontally in the ground, in trenches.

Closed Loop, Vertical - A Closed Loop System where the loops of the pipe are installed vertically into the ground, in well borings.

Constructing - The boring, digging, drilling, or excavating of a geothermal heating system, including the installation of casing or geothermal heating system screens.

Coliform - All of the aerobic and facultative anaerobic, gram negative, non-spore forming, rod shaped bacteria which are capable of fermenting lactose with gas formation within forty-eight (48) hours at thirty-five (35 °C) degrees Celsius.

Community Water Source – Water obtained from a well, spring, or other source that supplies Potable Water for a private well, Public Water System, or Semi-Public Water Supply.

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

Contractor - Any individual, partnership, company, association, corporation, group or entity employed, hired, contracted or otherwise engaged by the Owner to perform defined services for compensation.

Cross Connection - An arrangement allowing either direct or indirect connection through which backflow, including back siphonage, can occur between the drinking water in a public water system and a system containing a potential source of contamination.

Curing Time - Minimum time required for particular types of cementing or grouting materials to harden or set up before drilling or other construction operations can be resumed.

Decommissioning - The act of rendering a well or borehole to a condition where there is no pathway present for surface or subsurface contaminants to travel down to the water table.

Decommissioned Vertical Closed Loop Borehole - A vertical closed loop borehole whose original purpose and use have been permanently discontinued or which is in such a state of disrepair that its original purpose cannot be reasonably achieved.

DEP - Pennsylvania Department of Environmental Protection.

DCNR - Pennsylvania Department of Conservation and Natural Resources.

Direct Exchange (DX) Geothermal System. A type of geothermal heating and, or cooling system where the heat pump refrigerant is circulated through metal piping installed in vertical, inclined, or horizontal boreholes. This type of geothermal system must use a cement-based, special grout in the boreholes and must have electronic corrosion protection for the metal piping.

Drilling Mud - A fluid composed of water and bentonite used in the drilling operation to remove cuttings from the hole, to clean and cool the bit, to reduce friction between the drill stem and the sides of the hole, and to plaster the sides of the hole. Such fluids range from relatively clear water to carefully prepared mixtures of special purpose compounds.

Flowable Fill - Flowable fill is a mixture of Portland cement (ASTM C150), potable water, sand, and a fluidizing agent. This mixture is predominately sand. An example mixture of flowable fill contains approximately 85 percent sand, 9 percent water, 4 percent Portland cement, 2 percent finely ground slag, and a fluidizing agent. Flowable fill and other bridging agents do not meet the permeability requirements to protect ground water quality and prevent flow between aquifer zones.

Flowing Well - A well that yields water by artesian pressure at the ground surface.

Fuse - To make a plastic pipe joint by heat and pressure in accordance with the pipe manufacturer's specifications.

Geothermal Fluid - Any fluid transporting or capable of transporting geothermal heat.

Geothermal Heat - Heat derived from geothermal resources, or heat derived from groundwater.

Geothermal Heating System - A geothermal heat pump system which relies on the contained circulation of geothermal fluids to obtain and to utilize geothermal resources.

Geothermal Resources - The natural heat of the earth, and the energy, in whatever form, below the surface of the earth present in, resulting from, or created by, or which may be extracted from, the natural heat, and all minerals in solution or other products obtained from naturally heated fluids, brines, associated gases, in whatever form, found below the surface of the earth, exclusive of oil, hydrocarbon gas, other hydrocarbon gas, other hydrocarbon substances of helium, but including specifically:

- A. All products of geothermal processes, embracing indigenous steam, hot water and hot brines;
- B. Steam and other gases, hot water, and hot brines resulting from water, gas, or other fluids artificially introduced into geothermal formations;
- C. Heat or other associated energy found in geothermal formations; and
- D. Any by-product derived from them.

Geothermal Well - Any excavation that is drilled, cored, bored, washed, driven, dug, jetted or otherwise constructed when the intended use of such excavation is for the circulation of a geothermal fluid vertically, or the location, acquisition or artificial recharge of groundwater. (Includes open and closed loop vertical systems)

Groundwater - Any water, except capillary moisture, beneath the land surface or beneath the bed of any stream, lake, reservoir, or other body of surface water, whatever may be the geological formation or structure in which such water stands, flows, percolates, or otherwise moves.

Grout - A high-solids fluid mixture of cement or bentonite and potable water of a consistency that can be pumped through a tremie pipe and placed as required. Various additives, such as sand or bentonite may be included in the mixture to meet certain requirements

Grouting, Positive Emplacement - A technique of the installation of grouting materials whereby emplacement is achieved by positive pumping pressure through a tremie pipe from the bottom of the zone upward.

Heat Pump - A mechanical device used for heating and/or cooling which operates by pumping heat from a cooler to a warmer location.

Hydrologic Balance - This term refers to the condition where, in the long term, the rate of local groundwater pumping from an aquifer does not exceed the rate of local groundwater recharge to the aquifer.

IGSHPA - The International Ground Source Heat Pump Association.

Individual Water Supply - A system including wells, pumps, and piping equipment, which supplies water to a private home.

Installation of Pumps and Pumping Equipment - The procedure employed in the placement and preparation for operation of pumps and pumping equipment, including all construction involved in making entrance to the well and establishing seals but not including repairs to existing installations.

Municipality – The Township of Washington, Franklin County, Pennsylvania.

Neat Cement Grout - A fluid mixture of hydraulic cement and water, with or without admixtures in the following proportions; one bag of cement (94 pounds (42.6 kg)) to not less than 5 gallons (18.9 l) nor more than 7 gallons (26.5 l) of water.

Open Loop System - A geothermal heat pump system which relies on the circulation of groundwater from a supply well, spring or surface water. The source for heat, groundwater is moved from the ground to a heat pump. The water then transferred to a discharge area, typically a surface water body, storm or sanitary sewer system or recharge well.

Other Fill and Bridging Materials - Under some limited circumstances, borehole completion without grout (below the minimum 20 foot depth of the approved grout surface

formation seal), may be necessary. Acceptable fill materials are site specific and may include, but may not be limited to: bentonite chips, cuttings removed from the borehole; clean sand, gravel, or a mixture of sand and gravel; and/or cement and water or concrete mixes.

Other Grout and Fill Placement Methods - Other methods of grout or fill placement shall be accepted if such methods allow verification of completion. Such methods must ensure that the grout or fill placement provides environmental protection and the intended system performance.

Owner - The Person who is the holder of the record title to real property or the person entitled to use of the thermal groundwater at the property.

Packer - A mechanical device that is placed in a borehole to prevent the vertical movement of water or grout.

Permeability - A measure of the relative ease with which a porous medium can transmit a liquid under a potential gradient. It is a property of the medium alone and is independent of the nature of the liquid and of the force field causing movement. It is a property of the medium that is dependent upon the shape and size of the pores.

Person - A natural person, firm, partnership, association, social or fraternal organization, corporation, non-profit corporation, trust, estate, receiver, syndicate, branch of government, or similar entities, any group or combination acting as a unit, or the successors or assigns of any of the aforesaid.

Pitless Adaptor - 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.

Pollution - The contamination or other alteration of the physical, chemical, or biological properties of any surface or ground waters which will or can reasonably be expected to render such waters harmful, detrimental, or injurious to domestic, commercial, industrial, agricultural, recreational or other legitimate beneficial use.

Polymer - A substance consisting of molecules characterized by the repetition of one or more types of monomeric units.

Potable Water - Water suitable for human consumption.

Portland Cement (Neat Cement) Grout - A mixture of Portland cement (ASTM C150 Standard Specification for Portland Cement) and not more than 6 gallons (22.7 l) of potable water per bag (1 cubic foot (28.3 l) or 94 pounds (42.6 kg)) of cement shall be used according to the manufacturer's specifications.

Public Water System - A system which provides water to the public for human consumption which has at least 15 service connections or regularly serves an average of at least 25 individuals daily at least 60 days out of the year. The term is either a community or non-community system and includes collection, treatment, storage and distribution facilities under the control of the operator of the system and used in connection with the system. The term also includes a system which provides water for bottling or bulk hauling for human consumption.

Pumpable Bentonite Grout - Pumpable bentonite grout is a high solids mixture of sodium bentonite powder or granules and potable water mixed according to the manufacturer's specifications.

Reservoir - An aquifer or combination of aquifers or zones containing a common geothermal or groundwater resource.

Return Well - A well design and constructed for the return of water to the ground.

Sand-Cement Grout- A mixture of Portland cement - Type I (ASTM C150), 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 gallons (22.7 l) of potable water per bag of cement (1 cubic foot (28.3 l) or 94 pounds (42.6 kg)) shall be used according to the manufacturer's specifications.

Semi-Public Water Supply - A water supply which services one or several facilities such as industrial or commercial establishments, parks, camps, hotels, motels, schools, institutions, eating and drinking establishments or a water supply which services two (2) or more dwelling units and is not a public water system as defined by the Pennsylvania Safe Drinking Water Act (35 P.S. 721.1 et. seq.).

Standing Column Geothermal System - A type of open-loop geothermal heating and/or cooling system that circulates ground water from a water well through a water-source heat pump and returns the discharge water from the water-source heat pump to the same water well it was pumped from. The water withdrawal and return locations within the water well bore are separated as far as is possible. Some standing-column geothermal systems discharge some of the circulating ground water to enhance their heat transfer.

Thermal Groundwater - Groundwater which is less than 250 degrees Fahrenheit at bottom-hole temperature, and possessing sufficient heat to be used for a direct thermal application or in conjunction with a groundwater heat pump.

Thermally Enhanced Bentonite Based Grout - Thermally-enhanced bentonite based grout is a high solids mixture of sodium bentonite, inert additives such as sand or rock dust that enhance thermal conductivity, and potable water mixed according to the manufacturer's specifications. The sand must be clean so as to not introduce contaminants into the grout mixture. The use of special additives to alter permeability, increase thermal conductivity,

increase fluidity, control grout loss, and/or control time of set, and the composition of the resultant slurry, must be used in accordance with the manufacturer's specifications.

Township - Washington Township, Franklin County, Pennsylvania governmental jurisdiction or governing body represented by the Board of Township Supervisors or its agent(s).

Tremie Pipe - A rigid or flexible pipe or a hose that carries the grouting materials to the bottom of the zone being grouted. The tremie pipe is withdrawn as the grout material fills the annular space outside the casing or fills the space between the loop pipes and the borehole wall. The end of the tremie pipe is kept submerged just below the surface of the grout material.

Tremie Placement Method for Fill and Bridging Materials - The tremie pipe shall be lowered to the bottom of the zone being filled, and raised slowly as the fill material is introduced. When using the tremie pipe method to install fills, the bottom of the tremie should be maintained as close as possible to, but not inside of, the emplaced fill.

Tremie Placement Method for Grout - After water or other drilling fluid has been circulated in the annular space sufficient to clear obstructions, grout shall be placed by pressure pumping through a tremie pipe. The tremie pipe shall be lowered to the bottom of the zone being grouted and raised slowly as the material is introduced.

Vertical Closed Loop Borehole - A borehole which is constructed to receive heat exchanger loop pipes and grout material. Fill material may be used below a minimum depth of 20 feet below grade as the subsurface conditions warrant.

Water Source Heat Pump - A heat pump that uses a water-to refrigerant heat exchanger to extract heat from the heat source.

Water Supply Well - Any well that is constructed to remove or return water to the ground.

Water Table - That surface in an unconfined groundwater body at which the pressure is atmospheric. It is defined by the levels at which water stands in wells that penetrate the water body just far enough to hold standing water.

Well - Any excavation that is drilled, cored, bored, washed, driven, dug, jetted, or otherwise constructed when the intended use of such excavation is for the location, acquisition, monitoring, or artificial recharge of groundwater. This includes but is not limited to test wells, test borings, and monitoring wells, in addition to wells to be utilized as individual or semi-public water supplies.

Wellhead Protection Ordinance - The Township Ordinance establishing a Wellhead Protection Overlay District, as may be amended or in effect from time to time, providing for the regulation of land uses within such overlay district for the purpose of protecting

groundwater supplies, providing for reporting requirements for certain regulated land uses within the Wellhead Protection Overlay District, and establishing the means for enforcement of the ordinance, which may be amended from time to time.

Wellhead Protection Overlay District - The area identified and defined by the Wellhead Protection Ordinance.

Well Driller - An individual or company that is permitted or licensed by the State of Pennsylvania to drill wells in Pennsylvania.

Well Screen - A filtering device that allows ground water from unconsolidated and semiconsolidated aquifers to enter the well while at the same time keeping the majority of sand and gravel out of the well and out of the pump. A screen also supports the aquifer material and prevents the borehole from collapsing.

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

Well Tag – A metal marking device supplied by the Township for installation on the well cap for every new or reconstructed water well or geothermal well.

Zone of Saturation - The zone below the water table in which all interstices are filled with ground water.

Section 3. Pre-ordinance Geothermal Heating Systems.

All Geothermal Heating Systems existing within the Township on the effective date of this Ordinance shall be known as Pre-ordinance Geothermal Heating Systems. If any such Pre-ordinance Geothermal Heating Systems exist, they may continue in use as is by the present or any subsequent Owner, except:

- A. If the Owner of any Pre-Ordinance Geothermal Heating System makes an Alteration to the any part of the system, then the entire system shall be brought into compliance with this Ordinance at the time of the Alteration;
- B. If any Pre-Ordinance Geothermal Heating System is determined to be the cause of temperature degradation of Thermal Groundwater, thermal pollution of surface environments and water, harmful intermixing of Geothermal Fluids and other groundwater, or contamination of a Community Water Source or groundwater, then it shall be brought into compliance with this Ordinance;
- C. If any Pre-Ordinance Geothermal Heating System is determined to be defective as set forth below, it shall be subject to the provisions of the subsection entitled Defective Geothermal Heating Systems; or
- D. If any Pre-Ordinance Geothermal Heating System is not used for its designed purpose for a period of twelve (12) months or more, it shall be brought into compliance with this ordinance.

Section 4. Subsurface Water Management Policy.

In furtherance of the purposes of this ordinance, it shall be the policy of the Township that all Geothermal Heating Systems be used in such a manner as to:

- A. Conserve and protect the Geothermal Fluids and groundwater within and adjacent to the Township in order to: enhance reservoir productivity and benefit, prevent wasteful extraction and disposal of Geothermal Fluids and Thermal Groundwater, prevent Geothermal Fluid and Thermal Groundwater temperature degradation, prevent thermal pollution of surface environments and water, and prevent harmful intermixing of Geothermal Fluids and other groundwater;
- B. Allow appropriate utilization of Geothermal Fluids and Thermal Groundwater for residential, commercial, industrial, and other lawful purposes; and
- C. Protect the public health, safety, and welfare from improperly constructed, operated, maintained, or abandoned Geothermal Heating Systems.

Section 5. Registration of Geothermal Heating Systems.

Owners of Pre-ordinance Geothermal Heating Systems within the Township shall register their Geothermal Heating Systems with the Township. Said registration shall be on forms supplied by the Township and may include, but are not limited to: the name and address of the owner, specific location of the Geothermal Heating System, date of construction, depth and diameter of the Geothermal Heating System, specifications of casing, bottom hole temperature, static fluid or water level, type of geothermal utilization system, accessibility for monitoring devices, and disposal method, if any.

Section 6. Postordinance Geothermal Heating Systems.

- A. Geothermal Heating Systems shall be regulated on properties located within the Wellhead Protection Overlay District as follows:
 - 1. All Geothermal Heating Systems shall be prohibited within Zone 1 of the Wellhead Protection District.
 - 2. Open Loop Systems shall be prohibited within Zone 2 of the Wellhead Protection District. Open Loop Systems shall be permitted within Zone 3 of the Wellhead Protection District, provided they are reviewed and approved by the Authority prior to construction. Open Loop Systems within Zone 3 of the Wellhead Protection Overlay District may discharge all returned water to the ground surface provided they do so to an infiltration bed, pond, lake, stream, or other suitable drainage area. Discharge wells are permitted within Zone 3 of the Wellhead Protection Overlay District, but must be constructed using IGSHA standards and

all neighboring water supply well owners within 500 yards shall be notified that an open loop discharge well is being installed near their water supply well.

3. Vertical Closed Loop Systems shall be permitted within Zone 3 of the Wellhead Protection District, provided they are reviewed and approved by the Authority prior to construction.
 4. Vertical Closed Loop Systems may be permitted within Zone 2 of the Wellhead Protection District, provided they are reviewed and approved by the Authority prior to construction. In some cases, the Authority may require additional review by appropriate professional Engineers or Geologists.
 5. Horizontal Closed Loop Systems shall be permitted within Zones 2 and 3 only of the Wellhead Protection Overlay District.
- B. All properties located outside of any zone covered by the Wellhead Protection Overlay District shall be permitted to construct a Geothermal Heating System subject to the provisions of this ordinance.
 - C. All Geothermal Heating Systems that are constructed or undergo Alteration within the Township subsequent to the effective date of this Ordinance shall be known as postordinance Geothermal Heating Systems and shall be subject to the requirements of this Ordinance.
 - D. Only food-grade or USP-grade propylene glycol may be used as a Geothermal Fluid. No other materials or additives may be used except for potable water. A permanent sign must be attached to the heat pump specifying that only approved heat transfer fluids must be used.

Section 7. Application for Geothermal Heating System Permit.

Any persons desiring to construct, install, or alter a Geothermal Heating System within the Township shall first apply for a Geothermal Heating System permit at the Township Office on forms provided for that purpose. No Person shall commence construction or Alteration of a Geothermal Heating System prior to the Owner of the property on which the proposed Geothermal Heating System will be located receiving a permit.

Section 8. Fees.

- A. All applications for a Geothermal Heating System permit shall be accompanied by an application fee, which shall be nonrefundable, and such fee will be according to a fee schedule established by Resolution.
- B. The Township and Authority shall also be entitled to recover from any Owner all costs or fees (the “Costs”) arising out of or related to the review of the application and the inspection of the installation of a Geothermal Heating System. The Costs shall include, but not be limited to, engineer fees, geologist fees, attorney fees, zoning officer fees, and staff/employee time. The Costs may be collected as a Municipal Claim under applicable law against the property.

Section 9. Application Review.

The Township, or any persons designated by the Township, shall review each application for conformity with the applicable Township ordinances and law.

Section 10. Permit Decision Criteria.

Permit decisions shall contain written findings for approval or denial which may include, but are not limited to, the following criteria:

- A. The estimated hydrological impact of the proposed Geothermal Heating System's operations upon the groundwater and surrounding Geothermal Heating Systems;
- B. The adequacy of provisions for environmental protection, public safety, and furtherance of the purposes above;
- C. The compliance of the proposed Geothermal Heating System and its use with this ordinance, the Township's Comprehensive Plan, the Wellhead Protection Overlay District Ordinance and all other applicable laws, ordinances, and regulations; and
- D. The basis for the design of the proposed Geothermal Heating System and its necessity for the system to operate properly and efficiently.

Section 11. Wells for Geothermal Systems – Procedures.

The procedure for opening a permit to drill a well and then closing this permit within the Township shall be as follows:

- A. Before any drilling or site preparation begins, the well driller shall apply for a Well Permit from the Township. At this time, the Township shall provide a copy of the requirements of this Ordinance.
- B. During the well drilling and construction process, the Township or Authority may enter the premises to determine if the well is being installed according to the requirements of this Ordinance.
- C. Within four (4) weeks of the completion of the well, the well owner or driller shall submit a copy of the Pennsylvania Department of Conservation and Natural Resources (PADCNR) Water Well Completion Report to the Township. In addition to this report, the well owner or driller shall submit the following at this time:
 - 1. The address and mapped location of the well.
 - 2. Depth of the well from land surface.
 - 3. Casing length, type, material and volume.
 - 4. Total well depth.
- D. Upon receipt of the data required above, the Township and Authority shall check this information for compliance with the requirements of this section. Within two (2)

weeks after receiving this information, the Township shall issue the well permit provided that all requirements of this Ordinance have been met.

- E. No Geothermal Well shall be put into service without receiving a well permit and meeting the requirements of this Ordinance.

Section 12. Well Construction Requirements.

All Geothermal Heating Systems and wells installed for the purposes of heating and cooling a facility must adhere to the International Ground Source Heat Pump Association's (IGSHPA) *Design & Installation Standards* and the installer(s) and well driller(s) must be certified by the IGSHPA.

The following requirements are based on the American Water Works Association (AWWA) Standard A100-06. AWWA Standard A100-06 or its successors provide the basis for these requirements and shall be followed in the Township.

A. Construction by Licensed Driller

1. All geothermal wells in the Township shall be constructed in accordance with PA Act 610 (Water Well Drillers License Act).
2. The well owner or driller shall submit a copy of the PADCNR Well Completion Report to the Township within four (4) weeks of the completion of the well.

B. Casing: not required unless determined otherwise by the Township.

C. Grout Requirements: A statement that the well has been grouted in accordance with this Section shall be submitted to the Township along with the Water Well Completion Report.

1. Bentonite grout may be utilized if the manufacturer's specifications for use in water well construction are followed.
2. Such grout shall be applied from the bottom of the well continuously to the top of the well with a tremie pipe, until the surface of the ground or such location where the piping for the system is placed in a trench and directed into the dwelling on the property.

Section 13. Well Siting Requirements.

- A. Geothermal wells shall not be sited in floodplains.
- B. Geothermal Wells must maintain the required minimum isolation distances from the potential pollution sources listed in the table below unless doing so is not feasible and the Owner can provide a basis acceptable to the Township and Authority for a lesser distance, which distance shall still further the purposes of this Ordinance.

POTENTIAL POLLUTION SOURCE	MINIMUM SETBACK DISTANCE (FEET)
Lakes, ponds, streams or other surface waters	25
Storm Drains, retention basins, stabilization ponds or stormwater management facilities	25
Preparation areas or storage areas of hazardous spray materials, fertilizers or chemicals, salt piles	100
Gravity sewer lines and drains carrying domestic sewage or industrial waste	50
Septic tanks, aerobic tanks or holding tanks	50
Subsurface sewage disposal systems, elevated sand mounds, other sewage disposal fields	100
Sewage seepage pits, cesspools	100
Farm silos, barnyards, privies and fuel tanks	100
Rainwater pits, ditches	25
Spray irrigation sites, sewage sludge and septage disposal sites	100
Property lines, driveways, and private roads	10
Dedicated public right of ways	20
Building foundations (except for buildings enclosing water wells and/or water well pumps)	30
Any other source of pollution	As approved

Section 14. Additional Requirements.

Since the technology surrounding Geothermal Heating Systems continues to evolve and change, the Township and Authority reserves the right to impose additional requirements on an Owner seeking to install or maintain a system, if the Township or Authority determine that such requirements are necessary to further the purposes of this ordinance. Additionally, the Township may impose further requirements to supplement this ordinance, or amend existing requirements, by resolution duly adopted at a meeting of the Supervisors.

Section 15. Inspection.

The following inspections shall be required by the Authority:

- A. Site inspection before any work is done, showing the location of proposed work.
- B. Inspection of the installed loop (pressure test).

- C. Inspection of grouting.
- D. Inspection of the completely installed system before operations commence and upon commencement of operations.
- E. Periodic inspections no less than once every three years.
- F. Inspection if geothermal system or well is abandoned.
- G. Any other inspections required by applicable law, including the Uniform Construction Code.

Section 16. Well Abandonment.

- A. All abandoned wells must be filled and sealed by a PADCNR licensed water well driller according to the PADEP/DCNR Water Well Abandonment Guidelines. A copy of the PADEP/DCNR Water Well Abandonment form shall be submitted to the Township within thirty (30) days of abandonment.
- B. Abandonment procedures shall be subject to Township inspection.

Section 17. Township Monitoring of Geothermal Facilities.

In connection with the principal functions and activities of the Township resource management responsibility, Township or Authority officials may, upon reasonable notice to the owner, enter upon any property within the Township for purposes of inspecting geothermal facilities, or monitoring the operational characteristics of such facilities, when such inspection or monitoring is reasonably necessary to the assessment of other indices related to geothermal or groundwater reservoir management, or protection of the public safety and welfare. The Township or Authority shall provide affected property owners or occupants with reasonable prior notice, describing the nature, purpose, and duration of the necessary inspection or monitoring; such inspections or monitoring shall be conducted in accordance with applicable Township and state procedures for inspections. If any person refuses to permit any officer or employee to enter and inspect, the officer or employee shall not attempt to force entrance, but shall with the assistance of the Township's attorney, seek a search warrant or other appropriate court order.

Section 18. Defective Geothermal Heating Systems.

Whenever the Authority determines that any Geothermal Heating System within the Township is by the nature of its construction, installation, or operation is adversely interfering with other Geothermal Heating Systems, or is polluting groundwater or surface water, the Authority shall promptly notify the affected owner of the wasteful or defective Geothermal Heating System and require said owner cease operation thereof immediately. Such notice may be verbal and/or written. If the system is causing any adverse effects, then repairs shall be commenced immediately and completed as promptly as possible. If the system is not causing any adverse effects, the owner shall be allowed no more than fifteen days to repair the system. In either instance, if the Owner fails to act promptly, the Township may take such action as may be necessary, in its discretion, and the Owner shall be liable for all Costs related thereto. A Geothermal Heating System continuing wasteful or defective

operation after the expiration of the time provided by notice shall be prosecuted as a violation of this ordinance.

Section 19. Enforcement.

- A. Upon the receipt of a written complaint setting forth the existence of unauthorized construction, modification, or use in violation of this Ordinance, or other notice thereof, the Township shall cause written notice to be given either by personal service or registered or certified mail to the Owner of the Property upon which the violation exists, to immediately cease the construction, modification or the unauthorized use of the system. Such a written notice shall be required to enforce the remedies set forth in this section. However, the Township shall still be entitled to give a verbal notice for defective systems as authorized above.
- B. The Owner shall not be entitled to written notice for any subsequent or similar violations of this Ordinance that occur within 180 days of the service of the first notice. The first notice shall be deemed ongoing for any violations within that time period, and the Township may proceed immediately with enforcement.
- C. Upon failure of such Owner to comply as directed in said notice, the proper Township officials or the Township Solicitor may appear on behalf of the Township and initiate legal proceedings to enforce the provisions of this Ordinance before a District Magistrate.
- D. Any Owner who or which shall violate or permit to be violated the provisions of this Chapter shall, upon being found liable therefore in a civil enforcement proceeding brought by the Township before a District Magistrate, pay a fine of not less than three hundred (\$300.00) nor more than six hundred (\$600.00) dollars, plus all court costs, including reasonable attorneys fees incurred by the Township or Authority as a result thereof. No fine shall commence or be imposed, levied, or be payable until the date of the determination of the violation by a District Magistrate. Each day that a violation exists and is continued shall constitute a separate offense, unless the District Magistrate who determines that a violation has occurred further shall determine that there was a good faith basis for the defendant to have believed that there was no such violation, in which event there shall be deemed to have been only one such violation until the fifth day following the date of determination by such District Magistrate and thereafter every day shall constitute a separate offense.
- E. The Township and Authority shall also be entitled to recover from any Owner all costs or fees (the "Costs") arising out of or related to the enforcement of this ordinance. Such Costs may also include those to remedy violations of this Ordinance, protect the water supply, and abate nuisances. The Costs shall include, but not be limited to, engineer fees, geologist fees, attorney fees, zoning officer fees, and staff/employee time. The Costs may be collected as a Municipal Claim under applicable law against the property.

Section 20. Miscellaneous

- A. Conflicts: Whenever there is a difference between any of the minimum standards or provisions specified in this Ordinance and any provision or standard in any other Ordinance, law, or regulation of the Township, or applicable State or Federal statute and regulation, the more stringent shall apply.
- B. Severability: The provisions of this Ordinance are severable, and should any article, section, subsection, paragraph, clause, phrase or provision of this Ordinance be declared by a court of competent jurisdiction to be invalid, such judgment shall not affect the validity of this Ordinance as a whole or any part or provision thereof other than the part so declared to be invalid.
- C. The provisions of this Ordinance apply only to geothermal wells or the installation of Geothermal Heating Systems. The installation of wells for domestic purposes, to include individual and semipublic water supply systems, is regulated by a separate Ordinance of the Township.
- D. All prior ordinances that are inconsistent herewith are hereby repealed to the extent of such inconsistency.
- E. This Ordinance shall become effective five (5) days after its enactment.

ENACTED AND ORDAINED this ____ day of _____, 2012.

Attest:

WASHINGTON TOWNSHIP SUPERVISORS

Secretary

By: _____
Chairman