

ORDINANCE NO. 133

**AN ORDINANCE OF THE TOWNSHIP OF NOCKAMIXON, BUCKS COUNTY, PENNSYLVANIA, REPEALING AND REPLACING CHAPTER 228 OF THE NOCKAMIXON TOWNSHIP CODE WITH AN ORDINANCE THAT PROTECTS THE QUALITY AND QUANTITY OF THE WATER RESOURCES OF NOCKAMIXON TOWNSHIP BY PLACING RESTRICTIONS ON CONSTRUCTION OF NEW WELLS AND MODIFICATIONS TO EXISTING WELLS.**

**WHEREAS**, Section 603(d) of the Municipalities Planning Code (53 P.S. §10603(d)) authorizes a municipality to regulate the siting, density and design of residential, commercial and other developments to ensure the availability of safe and adequate water supplies.

**WHEREAS**, Section 1601 of the Second Class Township Code provides that the Board may adopt ordinances in which general or specific powers of the township may be exercised, and, by the enactment of subsequent ordinances, the Board may amend, repeal or revise existing ordinances (53 P.S. Section 66601);

**WHEREAS**, in order to protect the quality and quantity of the water resources of Nockamixon Township and thereby protect the health, safety and welfare of the residents of Nockamixon Township, the Board of Supervisors, with the assistance of its committees, engaged in a study of the current factors affecting the Township's water resources.

**WHEREAS**, through extensive investigation, the Township's consultants have determined that to maintain an adequate water supply during drought periods, allowable withdrawals shall not exceed fifty percent (50%) of the fifty (50) year stream base flow (Q750).

**WHEREAS**, through careful study, the Township has recognized the various geologic formations that influence groundwater yields and recharge capabilities that are present in the Township. The Township's consultants, who include, hydrologist Matthew J. Mulhall, P.G., Stephen Donovan, and Dr. Robert Stanfield have determined that fifty percent of the recharge rate in the Diabase, Hornfels and Lockatong geologic zones is approximately eighty (80) gallons per day per acre.<sup>1</sup> The Township's consultants have determined that fifty percent of the recharge rate in the Brunswick geologic zone is approximately one hundred (100) gallons per day per acre.<sup>2</sup>

**WHEREAS**, the Township's consultants have further determined that the average amount of withdrawal of water from the aquifer is 100 gallons per day per person.

**NOW, THEREFORE, BE IT ENACTED AND ORDAINED, and it is hereby ENACTED AND ORDAINED** by the Board of Supervisors of Nockamixon Township, Bucks County, Pennsylvania Chapter 228, Wells, of the Code of Ordinances is amended in full to read as follows:

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<sup>1</sup> See, Posten, Stephen E., 1984 Estimation of Mean Groundwater Runoff in Hard-Rock Aquifers of New Jersey. PP 109-154. in Halasi-Kun, G.J. (ed) Pollution and Water Resources, Columbia University Seminar Series, Vol. 26 new York: Pergamon Press.

<sup>2</sup> See, The U.S. Army Corps of Engineers Philadelphia District/ Final Market Feasibility Study, Tinicum Township, Bucks County Pennsylvania, Alternative Wastewater Treatment Solutions for Hamlets and Villages and Groundwater Monitoring Options (MFS Study, October 1996).

## Chapter 228

### WELLS

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## **A. Purpose, Definitions and Applicability**

### **§228-1. Purpose.**

The purpose of this ordinance is to assure the availability of reliable, safe and adequate water supplies to support the intended land uses within the capacity of available water resources; to assure that new wells do not infringe upon the performance of existing wells; to provide for the collection of accurate groundwater information; and to implement Article I, Section 27, of the Constitution of the Commonwealth of Pennsylvania, which decrees that the people have a right to pure water.

### **§228-2. Definitions.**

- A. **ADEQUATE WATER SUPPLY:** that, where obtainable, the yield of a well or the capacity of a pump and distribution system shall be sufficient to meet the requirements which the user has stated are necessary for drinking, culinary, and other purposes for which well water is intended to be used in the opinion of the Township.
- B. **ANNULAR SPACE:** the space between two circular objects, one of which surrounds the other, such as the opening between a drillhole and a casing pipe or between a casing pipe and a larger pipe.
- C. **APPROVED:** sanctioned by Nockamixon Township, in conformity with applicable laws and regulations.
- D. **AQUIFER CONTRIBUTION:** proportion of the well flow at any given time which comes directly from the aquifer.
- E. **AQUIFER CONTRIBUTION RATES:** the maximum rate at which water can flow from an aquifer to a well. Here assumed to equal the pumping rate measured in the constant head test.
- F. **AQUIFER CONTRIBUTION VOLUME:** the total volume of water which flows from the aquifer to the well during the shortfall time.
- G. **ASSURED TIME:** time it will take to pump the assured volume from the well at the peak demand rate.
- H. **ASSURED VOLUME:** volume of water in a well below the static level and above the constant head level.
- I. **BASE SITE AREA:** the site area (as determined by Deed or survey) minus existing street ultimate rights-of-way, utility rights-of-way, other public easements, land which is restricted due to easements or covenants, and land shown on previous subdivision or land development plans as reserved from development for recreation and/or open space preservation.
- J. **BCHD:** Bucks County Health Department.
- K. **CONE OF DEPRESSION (COD):** refer Zone of Influence (ZOI).
- L. **CONSTANT HEAD:** a stable water level attained under a constant pumping rate. For this application a rate of change of less than 0.5 feet (6 inches) per hour is taken as stable.

- M. **CONSTANT HEAD DRAWDOWN:** drawdown in a well when a constant head condition has been attained, measured from the static water level at the end of the constant head test.
- N. **CONSTANT HEAD LEVEL:** water level in a well at the end of the constant head test. Measured from the top of the casing.
- O. **CONSTANT HEAD PUMPING RATE:** a constant pumping rate at which a stable water level is attained. The pumping rate during the constant head test.
- P. **CONSTANT HEAD TEST:** a pumping test in which pumping rate and drawdown are kept constant with time. For this application a rate of change of less than 0.5 feet (6 inches) per hour is taken as constant.
- Q. **CONTAMINATION:** any matter which will render water unsafe for human consumption.
- R. **DRAWDOWN:** extent of lowering of the water level or potentiometric level in a well when water flows or is pumped from it. Measured from the static water level prior to pumping.
- S. **DRBC:** Delaware River Basin Commission.
- T. **DRILLHOLE or BOREHOLE:** the circular hole made in the rock by the drilling equipment extending from ground surface to the completed depth.
- U. **DRIVEN POINT WELL:** a well constructed by joining a "drive point" with a length of pipe, extended as may be necessary, and driving the assembly into the ground without a preliminary excavation in excess of ten(10) feet depth.
- V. **ESTABLISHED GRADE:** permanent point of contact of the ground or artificial surface with the casing pipe or curbing of the well.
- W. **FLUSHING:** act of causing a rapid flow of water from a well by pumping, bailing or similar operation.
- X. **HYDROPNEUMATIC TANK:** a tank which uses compressed air to maintain pressure in a water supply system. It is only secondarily a water storage tank.
- Y. **LAND DEVELOPMENT:** any of the following activities:
  - 1. The improvement of on e lot or two or more contiguous lots, tracts or parcels of land for any purpose involving:
    - a. a group of two or more residential or nonresidential buildings, whether proposed initially or cumulatively, or a single nonresidential building on a lot or lots regardless of the number of occupants or tenure; or
    - b. the division or allocation of land or space, whether initially or cumulatively, between or among two or more existing or prospective occupants by means of, or for the purpose of streets, common areas, leaseholds, condominiums, building groups or other features.
  - 2. A subdivision of land.
  - 3. Development in accordance with section 503(1.1) of the Municipalities Planning Code.
- Z. **LARGE LAND DEVELOPMENT:** land developments involving a projected water use of 1,000 gallons per day or more.
- AA. **MAJOR SUBDIVISION:** any division or re-division of a lot, tract or parcel of land by any means into three (3) lots or more.

- BB. MINOR SUBDIVISION: any division or re-division of a lot, tract or parcel of land by any means into two (2) lots or less.
- CC. NEAR SURFACE WATER: water in the zone immediately below the ground surface. It may include seepage from barnyards, leaching pools and disposal beds or leakage from sewers, drains and similar sources of contaminated water.
- DD. PA DEP: Pennsylvania Department of Environmental Protection
- EE. PEAK DEMAND RATE: average rate of water use during peak demand periods.
- FF. PEAK DEMAND TEST: a pumping test conducted to evaluate the capability of a well to supply peak demand needs of a use. The test is conducted at a rate equal to or greater than the peak demand rate for the peak time.
- GG. PEAK LOAD: volume of water required by a use during each peak demand period. In this application the peak load is assumed to be half the estimated total daily use water consumption.
- HH. PEAK TIME: length in minutes of each of two daily peak demand periods.
- II. POTABILITY: Fit or suitable for drinking, potable is from the Latin *potare* to drink.
- JJ. POTENTIOMETRIC SURFACE: The surface to which water in an aquifer can rise by hydrostatic pressure. This fundamentally the same as the water table.
- KK. PUMPING WATER LEVEL: that elevation of the surface of the water in a well when water flows or is pumped from it at a given rate.
- LL. Q750: stream base flow during the driest week in 50 years. For the purposes of this Ordinance, Q750 within Diabase, Hornfels, and/or Lockatong geologic zones is equal to 160 gallons per day per acre and within the Brunswick geologic zone is equal to 200 gallons per day per acre. Refer map (attachment J) for determination of geologic zone(s).
- MM. REGULATED WELLS: include all new wells and wells associated with new uses where there is a significant increase in water use. This term includes existing wells only when they are being reactivated or redrilled.
- NN. SAFE WATER: water that is sufficiently free from contamination to be safe for human consumption as defined by the Commonwealth of Pennsylvania or the U.S. D.E.P., which ever is more restrictive.
- OO. SANITARY CONDITION:
  1. When referring to a well, it means that the construction of the well and the installation of the pumping equipment are such that the well is effectively protected against entrance of contaminating matter in the opinion of the Township.
  2. When referring to the surrounding of a well, it means that the location and surrounding area are free from debris or filth of any character and not subject to flooding.
- PP. SEWER: a conduit used or intended for conveying sewage or other wastes.
- QQ. SHORTFALL TIME: time needed to pump the shortfall volume from a well at the peak demand pumping rate.
- RR. SHORTFALL VOLUME: volume of water needed in addition to the assured volume to make up the peak load.

- SS. **SIGNIFICANT INCREASE IN WATER USE:** an increase in water use of 30% or more or an increase of 150 gallons per day or more, of average daily water withdraw.
- TT. **SMALL LAND DEVELOPMENT:** land development that involves a projected water use of less than 1,000 gallons of water use per day.
- UU. **SPECIFIC CAPACITY:** continuous yield of a well at a given drawdown expressed in gallons per minute per foot of drawdown.
- VV. **STATIC LEVEL:** water level in a well before a pumping test when all effects of drilling and previous pumping on the aquifer have dissipated and the well is in equilibrium with atmospheric pressure.
- WW. **STATIC WATER LEVEL:** means that elevation of the surface of the water in a well when no water flows or is being pumped therefrom.
- XX. **STORAGE CONTRIBUTION:** proportion of the well flow at any given time which comes from storage in the well.
- YY. **STUFFING BOX:** an approved receptacle in which packing may be compressed to form a water or airtight junction between two objects.
- ZZ. **THREE PART PUMPING TEST:** peak demand test, followed by the constant head test followed by the recovery test.
- AAA. **TOWNSHIP:** Board of Supervisors of Nockamixon Township or any properly authorized official to Nockamixon Township who may be designated to act for the Township by the Board.
- BBB. **TRANSMISSIVITY:** A measure of the capability of the entire thickness of an aquifer to transmit water. Also known as the coefficient of transmissivity.
- CCC. **VERTICAL ZONE OF CONTAMINATION:** vertical extent of groundwater containing contaminants at concentrations exceeding Federal or State water-quality standards.
- DDD. **WATER TABLE:** The level below the land surface at which the subsurface material is fully saturated with water. The depth of the water table reflects the minimum level to which wells must be drilled for water extraction. The water table is the surface where the pressure head is equal to atmospheric pressure.
- EEE. **WATERTIGHT CONSTRUCTION:** implies cased and grouted construction through firm foundations like clay or rock. Through granular material like sand or gravel, it implies that the casing pipe is of approved quality and assemble watertight.
- FFF. **WELL FLOW:** flow rate of water from a well at a given time. It is the sum of the aquifer contribution and the well storage contribution.
- GGG. **WELL:** any excavation whether drilled, bored, driven, or cored that is less in its diameter than its depth.
- HHH. **WELL SEAL:** an approved, removable arrangement or device used to cap a well or to establish and maintain a junction between the casing or curbing of a well and the piping or equipment installed therein, so as to prevent water from entering the well at the upper terminal.
- III. **WELL STORAGE:** volume of water stored within a well which is available for pumping.
- JJJ. **WELL VENT:** an outlet at the upper end of the well casing to allow equalization of air pressure in the well.

KKK. YIELD: quantity of water per unit of time, which may flow or be pumped from a well at a constant specified drawdown.

LLL. ZONE OF CAPTURE (ZOC): aerial extent of the waters (*i.e.*, ground water, surface water, *etc.*) captured by the pumping waters.

MMM. ZONE OF INFLUENCE (ZOI): zone in which an incremental change in ground water level of 6 inches or more is expected; otherwise known as Cone of Depression (COD).

**§228-3. Applicability.**

- A. No person within Nockamixon Township shall drill a well or withdraw groundwater for any purpose by use of a well except as permitted by this Ordinance and within the regulations herein set forth.
- B. An occupancy permit for a new residential or nonresidential principal building, structure or use, or addition to a nonresidential building which is to be served by a regulated well shall not be issued, unless the regulated well meets the requirements of this Ordinance and those of the PA DEP, DRBC and the BCHD publication *Rules and Regulations Governing Individual Water Supply Systems and Individual Water Supply Well Construction Specifications*, as amended.
- C. Prior to obtaining preliminary plan approval of a major subdivision or a land development, an applicant shall satisfactorily complete all of the well testing and water resources impact studies required herein.

**B. Protection Against Depletion of Existing Wells**

**§228-4. Assuring Adequate Water Supply.**

In order to assure the availability of an adequate water supply to support the intended land uses within the capacity of available water resources and to protect the aquifer, no development or change in use which estimates a significant increase in water use, regardless of size, shall be approved which will:

- A. Reduce the site's attributed stream base flow by more than 50% of the Q750 using the following formula:  
$$\text{Allowable withdrawal}^3 = \text{Base Site Area} \times \text{Q750} \times 0.5$$
- B. Reduce the water table or potentiometric surface in existing wells on adjoining properties by more than 3 feet at any time (*i.e.*, during the test, after recovery, *etc.*)

**§228-5. Responsibility for Adverse Effects to Nearby Wells.**

The applicant seeking approval of a permit for a well related to a major subdivision or large land development shall be responsible for any adverse effect caused by the applicant's

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<sup>3</sup> Formula obtained from The U.S. Army Corps of Engineers Philadelphia District/ Final Market Feasibility Study, Tincum Township, Bucks County Pennsylvania, Alternative Wastewater Treatment Solutions for Hamlets and Villages and Groundwater Monitoring Options (MFS Study, October 1996).

well(s) to any residential domestic water supply well existing prior to the issuance of a well drilling permit; and shall establish financial security with the Township pursuant to Section 228-6 of this Ordinance.

**§228-6. Security.**

- A. An applicant seeking approval of a permit for a well related to a major subdivision or large land development shall deposit with the Township at the time of the issuance of the well utilization permit, financial security in an amount listed in the Nockamixon Township fee schedule times the number of all other groundwater wells located within 1,000 feet of the perimeter lot lines of the subdivision or land development. Without limitation as to other types of financial security which the Township may approve, which approval shall not be unreasonably withheld, Federal or Commonwealth chartered lending institution irrevocable letters of credit and restrictive or escrow accounts in such lending institutions shall be deemed acceptable financial security. Such financial security shall be posted with a bonding company or Federal or Commonwealth chartered lending institution chosen by the party posting the financial security, provided said bonding company or lending institution is authorized to conduct business within Pennsylvania.
- B. An applicant seeking approval of a permit for a well related to a minor subdivision or small land development shall not be required to post financial security to ensure well loss protection to surrounding wells. However, minor subdivision and small land development applicants shall be responsible for remedying adverse effects to property owners when such adverse effects are established pursuant to sections 228-9 and 228-10. In addition, applicant shall be responsible for any additional expense including legal, engineering and administrative costs, which are incurred in curing the problem.

**§228-7. Presumption of Responsibility for Adverse Effect.**

For a period of 60 months from the date any applicant's major subdivision or land development final well(s) is/are put in full production, the applicant shall be presumed to be responsible for any adverse effect to any residential domestic water supply well within 2,500 feet of the perimeter lot lines of the subdivision or land development.

**§228-8. Right to Hearing.**

Any owner of a residential domestic water supply well who experiences an adverse effect to their water supply due to the installation and/or use of production wells related to a minor subdivision, major subdivision or large land development shall have the right to request a hearing.

**§228-9. Procedure for Hearing.**

Any party desiring a hearing pursuant to §228-8 of this Chapter shall make demand therefore to the Township Administrator in writing and with proof of service thereof on either the applicant or upon the owner of the residential domestic water supply well which is alleged to have suffered an adverse effect, as the case may be. The Board of Supervisors shall then schedule a hearing not less than 15 days or more than 90 days after receipt of the demand for hearing. Notice of the hearing shall be given to the applicant and the owner of the residential domestic water supply well which is alleged to have suffered an adverse effect. At the hearing, each

