Below please find the edits to this chapter. Strikethrough represents text to be deleted and yellow highlighted represents text to be added.

AN ORDINANCE AMENDING PART III, "BOARD OF HEALTH LEGISLATION", CHAPTER 350 "WATER SUPPLY", OF THE MUNICIPAL CODE OF THE TOWNSHIP OF HILLSBOROUGH, COUNTY OF SOMERSET, STATE OF NEW JERSEY.

NOW, THEREFORE, BE IT ORDAINED by the Board of Health of the Township of Hillsborough, County of Somerset, State of New Jersey, that Part III, "Board of Health Legislation", Chapter 350 "Water Supply", of the Code of the Township of Hillsborough, Somerset County, New Jersey, is hereby amended as follows:

350-1. PURPOSE AND AUTHORITY

A. This chapter is designed:

1. To ensure that wells constructed in Hillsborough Township will produce a sufficient volume of water to serve their intended users to maintain acceptable standards of hygiene and sanitation;
2. To ensure that wells from new construction do not unduly infringe upon the performance of existing wells; and,
3. In the process of evaluation, to collect data and information about the several groundwater aquifers in Hillsborough Township in order to determine prospects of groundwater supply for existing and potential uses.

B. It has been shown that groundwater supply and well performance vary widely in Hillsborough Township and surrounding municipalities, depending on geological and hydrological factors.

C. Although Hillsborough Township is a rural community and has not had occasion to fully stress the groundwater system, a prudent municipal Board of Health must act in a responsible fashion to protect this essential resource for present and future generations, pursuant to N.J.S.A 26:3-31a and 58:11-23 et seq.

350-2. SEVERABILITY

If any provision of this Ordinance or the application thereof to any person or circumstances is held invalid, such as invalidity shall not affect other provisions or application, and to this end, the provisions of this Ordinance are declared to be severable.

350-3. INCORPORATED BY REFERENCE

The following codes, standards and ordinances are hereby incorporated and made a part of this chapter by reference. If there are conflicts between any part of this and any other applicable law, the more stringent of the two shall apply: New Jersey Safe Drinking Water Act, N.J.S.A 7:10-12.1 et seq.; New Jersey Subsurface and Percolating Waters Act, N.J.S.A. 58:4A-4.1et seq.,

And N.J.A.C., 7:9D-1.1 et seq, New Jersey Well Construction and Maintenance; Sealing of Abandoned Wells

Editor's Note: See N.J.S.A 58:12A-1 et. seq. for the New Jersey Safe Drinking Water Act and see N.J.A.C 7:9D-1.1 et seq. For the Well Construction & Maintenance; Sealing of Abandoned Wells.

All other relevant statutes and codes.

350-4. DEFINITIONS

As used in this chapter:

4-1 ADMINISTRATIVE AUTHORITY
The local Board of Health having jurisdiction or the authorized agent of the administrative authority acting on behalf of the administrative authority.

4-2 ALTERATION
Any physical change in the well, including deepening, modification, or removal, such that there will be a change in size, construction or installation. The term alter shall be construed accordingly. Replacement of pumps and installation of pitless adapters shall be considered a repair and not an alteration.

4-3 APPROVED
Accepted, or accepted under applicable specifications stated or cited in this chapter, or accepted as suitable for the proposed use under procedures and powers of administration delegated in this chapter; and the work approval shall be construed accordingly.

4-4 ARTIFICIAL FRACTURING
The use of any methods to increase or alter the number and size of fractures in a rock well.

4-5 AUTHORIZED AGENT
A licensed health officer, professional engineer, sanitary inspector, plumbing inspector or any other qualified person who is delegated to function within specified limits by the administrative authority.

4-6 BATHROOM, FULL
A room having at least a commode, sink basin, and bathing facilities which include a tub or shower or similar facility.

4-7 BATHROOM, HALF
A room having a commode and a sink basin.

4-8 BEDROOM

Any room within a dwelling unit, furnished or unfurnished, which may reasonably be expected to provide sleeping quarters for any one or more individuals. The term bedroom shall be considered, in absence of any evidence to the contrary, to include any room on the second and/or third floor and any room on the first floor which has no through traffic and no direct door to the outside. The term bedroom shall be considered to include any room or rooms within an expansion attic.

4-9 BOREHOLE

The hole made by driving, jetting, coring, drilling, augering or other means into the ground for the purpose of constructing a well pursuant to this chapter.

4-10 CERTIFICATION

A written statement by the administrative authority attesting that the water supply facilities for the proposed realty improvement are in compliance with the Realty Improvement and Facilities Act, as revised (N.J.S.A 58:11-23 et seq.), N.J.S.A. 58:12A-1 et seq. And the regulations promulgated under either, and the requirements of this chapter.

4-11 CLOSED LOOP GEOTHERMAL WELL

A well or a borehole drilled to a specific depth either singly or in a series, wherein a continuous closed loop of pipe is inserted ~~from one well to another~~ for the purpose of non-contact thermal energy transfer from a fluid in the loop to or from the earth. Closed loop geothermal wells are defined as a ~~Category 4 Special Use Wells in N.J.A.C 7:9D2.1 which includes methane gas extraction wells, closed loop geothermal wells, dewatering wells, or dewatering wellpoints, cathodic protection wells, oil and gas exploration wells, elevator shafts and any other such well which may, in the discretion of the Department require a permit pursuant to the State Act and N.J.A.C 7.9D1.11.~~ Category 5 Well in N.J.A.C 7:9D-2.1, “Well Categories”.

4-12 CONSOLIDATED FORMATION

A geologic formation where the sands, gravels, clays or other similar materials have been lithified. These rock formations will commonly remain stable around an open borehole without caving.

4-13 (TO) CONSTRUCT A WELL

The drilling, building, assembly or installation of a new water supply system or the enlargement of an existing water supply system; and the term “well construction” shall be construed accordingly.

4-14 DAILY LOAD

Twice the peak load.

4-15 DECOMISSIONING

The permanent closure or sealing of any well in accordance with N.J.A.C. 7:9D.

4-16 DRAWDOWN

A decline in the water level in a well, measured from the static level.

4-17 INFLUENCE

A decline in water level in a well due to pumping from any other wells.

4-18 INTERFERENCE

A decline in water level in a well to the extent where the proper operation of the well is threatened due to pumping from any other wells.

4-19 OPEN LOOP GEOTHERMAL WELL

A well designed and installed specifically for use of the earth as a source for heat extraction/rejection. Open loop geothermal wells are defined as a Category 2 non Potable Water Supply Wells N.J.A.C 7:9D2.1, "Well Categories", which includes water withdrawal, fire protection, irrigation, test, industrial, livestock, open loop geothermal and injection or recharge wells.

4-20 PEAK DEMAND RATE

The average rate of discharge of water from a well, in gallons per minute (gpm), during peak demand periods. The peak demand rate equals the sum of the number of full bathrooms in the residence multiplied by three gpm plus the number of half bathrooms multiplied by 1.5 gpm.

4-21 PEAK DEMAND TEST

A pumping test conducted upon a well to evaluate its capability to supply peak demand needs. The test is conducted at a rate and a duration equal to or greater than the peak demand rate and peak demand time. This test has been described in detail by J.L. Hoffman and R. Canace in "Two-Part Pump Test for Evaluating the Water Supply Capabilities of Domestic Wells" - N.J. Geological Survey Ground Water Report Series No. 1-1986.

4-22 PEAK DEMAND TIME

The duration of time, in minutes, during which the peak demand rate is exerted on a well by a home. Peak demand time is computed in the following manner:

Peak Demand Time	=	100 gallons x number of bedrooms
		3 gpm x number of bathrooms

4-23 PEAK LOAD

The volume of water, in gallons, required during each peak demand period. Peak load is equal to the number of bedrooms in the residence multiplied by 100 gallons.

4-24 POTABLE WATER

Any water used or intended to be used for drinking or culinary purposes.

4-25 POTABLE WELL

Any water well used or intended to be used for drinking or culinary purposes which are defined as a Category 1 Potable Wells in N.J.A.C 7:9D2.1 Category 1 Potable Water Supply Wells include: domestic, nonpublic, public community supply, and public non-community wells.

4-26 QUALIFIED GROUNDWATER CONSULTANT

A person who has a degree in geology with a minimum of six hours of graduate course work in hydrogeology, has maintained membership in a professional organization specializing in groundwater geology for the past five years (e.g. National Water Well Association) and meets the criteria of 7:14B-1.6, as amended from time to time.

4-27 REALTY IMPROVEMENT

Any proposed new residence or other building of which the useful occupancy requires the installation or erection of a water supply system. Each family unit in a proposed multiple dwelling shall be construed to be a separate realty improvement.

4-28 RECHARGE

The inflow of groundwater into a well from the aquifer in which the well is drilled.

4-29 REPAIR

To fix, refurbish or replace one or more components of a water supply system in a manner that will restore and preserve the original location, design, construction and installation of the system.

4-30 STANDING COLUMN WELL

A type of Category 2 open loop geothermal well where the water is removed and returned to the same well through the use of an internal, generally 4-inch, casing open only at the base of the column.

4-31 STATIC WATER LEVEL

The water level in the well, either before or after pumping, when all the pumping effects on the aquifer have dissipated and the well is in equilibrium with atmospheric pressure.

4-32 WELL

A hole or excavation larger than four inches in diameter or a hole or excavation deeper than 10 feet in depth that is drilled, bored, cored, driven, jetted, dug, or otherwise constructed for the purpose of removal or emplacement of, or investigation of, or exploration for, fluids, water, oil, gas, minerals, soil, or rock, or for the installation of an elevator shaft.

4-33 WELL DRILLER

A person possessing a New Jersey license as a well driller of the proper class, including, but not limited to, test borers and such other classifications as the Department established by regulation, who engages in well drilling or pump installing.

4-34 YIELD

The maximum rate at which water can be withdrawn continuously from a well.

350-5. WELL PERMITS

A. Application.

Information about each well shall be certified by the applicant's well driller, hydrogeologist, or engineer and furnished to the administrative authority.

B. Permits.

A state well permit and a local permit application is a prerequisite to the issuance of any well permit by the administrative authority under the terms of this chapter for Category 1, 2, and ~~4~~ 5 wells. No person shall locate, construct, or alter any water well or geothermal well (alternatively Category 1,2,and ~~4~~ 5) within Hillsborough Township until a permit for the location, construction, or alteration of such well has been issued by the administrative authority. (Also see 350-16(5), Fees.)

C. Information.

All well applications shall include the locations and technical specifications for all new wells, the location of all pre-existing wells, and the location of all existing wastewater and other subsurface disposal areas, where such information can be reasonably furnished by the applicant, and the location of soil tests for potential subsurface disposal areas within acceptable conditions.

D. Plans.

A certification from the applicant as to the number of bedrooms and bathrooms.

E. Well drillers report.

Well driller shall provide:

(1) Twenty-for-hour notification to administrative authority prior to drilling any well or pump tests and grouting of closed loop geothermal wells.

(2) Well driller's report with the following information:

- (a) Date drilled.
- (b) Geologic formation or rock type, based upon maps and field observations.
- (c) Depth to water bearing formations/fracture zones.
- (d) Elevation at ground surface.
- (e) Depth to bedrock.
- (f) Total depth.
- (g) Length of casing.
- (h) Casing diameters.
- (i) Pump intake level.
- (j) Pump type.
- (k) Static water level as measured from top of casing.
- (l) Yield in gpm.
- (m) Hours pumped and pump rate.
- (n) Drawdown in feet or well monitored continuously at fifteen-minute intervals.
- (o) Height of casing above ground.

350-6. POTABLE WELL STANDARDS FOR INDIVIDUAL LOTS

A. Permit sequencing.
All wells shall be installed, pump tested and approved by the administrative authority regarding water quantity and water quality before any other construction permits are issued.

B. Pump test requirements.
All new wells must be pump tested as set forth in this chapter.

C. Pitless adapter.
A pitless adapter shall be installed in all well construction, or upon alteration or repair of any existing well, or as waived by the administrative authority.

350-7. POTABLE WELL STANDARDS FOR SUBDIVISIONS

A. Approved wells.
For subdivisions in all zones, approved wells shall be required prior to issuance of construction permits on each lot proposed in that subdivision.

B. Hydrogeological report.
For nonresidential and multiple residence development proposals, a hydrogeological analysis may be required prior to granting of approval as to the suitability for subdivision by the administrative authority. Such analysis shall be performed by a qualified expert, and as a minimum shall include pump tests and well interference tests designed to show whether the water supply will be adequate for the intended use. This report shall include the information data specified in § 350-6C below.

C. Report content.
The hydrogeological report for proposed major subdivisions shall be prepared by a qualified groundwater consultant and shall include specifics as follows:

(1) A discussion of the hydrogeology of the site and its environs, specifically including mapping of any fractures or faults via aerial photographs and ground verification.

(2) Location and technical specification for the proposed well(s).

(3) Location of all existing sewage disposal areas and the location of soil tests for potential subsurface sewage disposal areas within 100 feet of the proposed well(s).

(4) The drawdowns for each well, the radius of influence for the same, the project drawdown for all lots, an analysis of any adverse impacts that may be created by

the proposed subdivision and all measures that may be employed to minimize adverse impacts. All methodology used in preparation of this report shall be in conformance with recognized engineering practice for groundwater hydraulics.

350-8. PHYSICAL CONSTRUCTION REQUIREMENTS

All wells constructed within Hillsborough Township shall conform to the standards for the construction of Category 1, 2 and ~~4~~ 5 wells as promulgated by the New Jersey Department of Environmental Protection, N.J.A.C. 7:10-12.1 et seq., and N.J.A.C. 7:9D-2.1 et seq. With the following amendments:

A. Well casing.
The well casing shall be extend to a minimum of 20 feet into unweathered bedrock; however, the total length of the casing in all other cases is 60 feet and 80 feet in areas affected by any contamination as noted by the administrative authority.

B. Minimum distances.
No new well shall be located at a distance less than that shown in the following table from any existing or proposed well.

	Lot Size	Minimum Spacing of New Wells From Other Wells[1]
	Up to 1.5 acres	100 feet[2]
	More than 1.5 up to 3 acres	150 feet
	More than 3 acres	500 feet
	NOTES:	
	[1] The spacing requirements may be waived for multiple wells on single lots that serve one individual residence. The spacing requirement may be reduced at the discretion of the administrative authority, upon adequate justification.	
	2The spacing requirements for small lots may be reduced to not less than 50 feet with a minimum of eighty-foot casing to accommodate spacing from existing wells.	

C. Artificial fracturing.
Artificial fracturing for construction, repair or development of any well is prohibited unless the Board of Health grants a waiver to such prohibition, which waiver shall be based upon the following factors:

(1) The property upon which the well is located has been and continues to be used as a single-family residence of the applicant (not new construction).

(2) The applicant, through his well contractor, has demonstrated that the well(s) servicing the residence are in supply failure.

(3) The Board determines that every available conventional well construction method has been exhausted by the applicant.

(4) The Board determines that there is no other reasonable alternative to providing a water supply to the applicant given the specific conditions with which the applicant is faced.

(5) The Board determines that, based upon the location of the property and the distance from other wells in the area, it is reasonably unlikely that surrounding properties will be adversely affected by the procedure.

(6) The applicant represents, in writing, that it will hold the Board of Health and the Municipality harmless from any liability resulting from the procedure in question.

(7) No other governmental regulation precludes such a procedure.

D. Pump depth.

Placement of the pump shall not be deeper than 10 feet above the bottom of the well, but not less than 10 feet below the depth of the water level measured at the end of a successful peak demand test.

E. Dip tube.

All wells which are to be certified or have been certified shall be equipped with a permanent dip tube, installed with the permanent pump, to facilitate measurement of the water level in the well. The dip tube requires installation of the small-diameter pipe or plastic tube from the top of the well to the final pump level in the well. The internal diameter of the dip tube must be large enough (one-inch diameter) to accommodate commonly used probes.

F. Pipes.

Pipe installed from the well to the residence shall be a minimum of 200 psi strength and bedded in select fill or sand. In addition, pipes shall be sleeved at all points through walls or floors, and openings shall be sealed to prevent leakage.

G. Solder.

Any soldered joints shall be made with no lead solder.

H. Submersible pumps.

All submersible pumps installed must be classified lead-free.

350-9. GENERAL REQUIREMENTS FOR THE THREE-PART PUMP TEST (QUANTIATIVE)

A. Pump test.

The capability of a well to meet the peak demand and the total daily demand of its user shall be evaluated through a three-part pump test. The well must pass the peak demand test as required for the size of the residence or the nonresidential facility to be supported by the well. The well must pass the constant head, recovery, and interference, if applicable, portions of the test to evaluate the long-term yield of the well.

B. Supervision.
All well tests shall be conducted under the supervision of a well driller or a pump installer licensed under the laws of the State of New Jersey, who shall certify the results of the tests to the administrative authority. All test results shall be recorded on "Hillsborough - Well Testing Report" forms issued by the administrative authority.

C. Witnessing.
The administrative authority reserves the right to witness all well tests. A minimum of one-working-day advance notice shall be provided to the administrative authority. The administrative authority reserves the right to allot testing dates in case of scheduling problems. Interference test and seventy-two-hour constant head test shall be designed and witnessed by the applicant's qualified groundwater consultant and will be overseen by the Township's expert witness.

D. Technique.
The three-part-pump test must be performed in one continuous operation as heretofore specified. The well must be at its static level at the beginning of the test; i.e., the well has to be undisturbed for a minimum of 12 hours before testing.

E. Flow meter.
Flow rates at the discharge line must be measured with a water-flow meter. Flow rates must be adjusted by throttling the flow. The flow meter must be checked at least once during the test by timed volumetric measurement.

F. Discharge.
The discharge water must be channeled away from the well head to minimize direct recharge of the well during the test.

G. Water level
The water level in the well must be determined reliably during the tests.

350-10. REQUIREMENT FOR THE PEAK DEMAND TEST

A. Definition.
The peak demand test is a standard drawdown pump test used to determine whether the well can supply the water needed by the household or other facility during times of peak water demand.

B. Pass/fail.

The results of the peak demand test must show that well storage plus well recharge during the peak demand time at least equals the peak load required for the facility proposed to be supported by the well. If the results of the peak demand test are unsatisfactory, the well may be altered or used in conjunction with additional wells; or the design of the proposed facility must be so modified as to lower the peak load requirements sufficiently to accommodate the performance of the well; otherwise, the well shall be abandoned and sealed in accordance with the requirements of N.J.A.C. 7:9d-3.1 et seq.

C. Test protocol.

(1) General.

To perform the peak demand test, the well is pumped at least at the peak demand rate for the peak demand time. If 80% of the available storage in the well has been drawdown prior to the end of peak demand time, the flow rate will be reduced to maintain a constant level in the well at 80% of the available storage.

(2) Residential.

The peak demand rate for residential use equals three gpm for each full bathroom plus 1.5 gpm for each half-bath proposed for the serviced residence; the peak load equals 100 gallons for each proposed bedroom (which equals 1/2 the minimum daily requirements of two persons per bedroom, (according to N.J.A.C. 7:10-12.7) and the peak demand time equals the time required to deliver the peak load at the peak demand rate.

(3) Nonresidential

The peak demand rate for nonresidential use equals two gpm for each major supply fixture (flush toilet, sink, shower head, bathtub, laundry unit, dishwasher, water cooled air conditioners, etc.) proposed for the serviced nonresidential facility; the peak load equals 1/2 of the minimum daily water requirements, according to N.J.A.C. 7:10-12.7; and the peak demand time equals the time required to deliver the peak load at the peak demand rate.

(4) Drawdown.

The drawdown is monitored during the test at one-minute intervals for the first 10 minutes and five-minute intervals thereafter, until the end of the peak demand test. To pass the peak demand test, the well must not be drawdown during the peak demand time below a level less than 10 feet above the pump intake and below a level less than 20 feet above the bottom of the well.

350-11. REQUIREMENT FOR THE CONSTANT RATE TEST

A. Exclusion.

No constant head test or well recovery test is required when the peak demand test is passed. The peak demand test passes if less than 1/2 of the water necessary to satisfy the

peak demand test at the calculated peak demand rate and demand time is drawn from well storage, and the rate of drawdown in the well indicates a flow of water from the aquifer to the well is greater than or equal to five gallons per minute. For example, at 7.5 gpm flow, the rate of drawdown must be less than 1.7 ft./min.:

	(7.5 - 5 gpm	=	1.7 feet/minute
	1.469 gp feet*		
*Volume of water in six-inch well casing.			

B. Definition.

The constant head test is a portion of the drawdown pump test used to determine whether the well can supply the water needed by the household or other facility for the life of the well.

C. Pass/Fail.

The results of the constant head test must show that the well yield (gpm x 1440 min/day) is equal to twice the daily load (two times the peak load). This allows for a factor of two safety factors on present well yield to meet long-term needs. Further, if the results of the constant head test indicate a well yield of less than three gpm, the property for which the well is drilled should be deed-restricted against excessive water usage. The deed restriction shall include restrictions against pool facilities, lawn watering systems, and lawn watering,

D. Test protocol.

To perform the constant head test, the water level in the well is maintained at the water level reached at the end of the peak demand test. This level must be maintained for a period of 30 minutes, with a maximum water level fluctuation of plus or minus two feet after flow adjustment, in order for the well yield to be determined. Further, the water level should not rise or fall by more than five feet at any time after a change in flow rate, or the flow rate must be readjusted. The test is continued until a constant head is maintained for 30 minutes or the well yield is found to be below twice the daily load. The test must be continued for a minimum of 30 minutes after the conclusion of the peak demand test. Water level and flow rate are to be measured every five minutes.

E. Residential.

The daily load is equal to the peak load times two. The daily load equals 200 gallons for each proposed bathroom (which equals twice the peak load and represents the minimum daily requirement of two persons per bedroom, according to N.J.A.C. 7:10-12.7).

F. Nonresidential.

The daily load is equal to the total planned wastewater discharge of the facility.

350-12. REQUIREMENTS FOR THE WELL RECOVERY TEST

A. Exclusion.

A well may be excluded from the recovery portion of the three-part pump test if less than ½ of the water necessary to satisfy the peak demand test at the calculated peak demand rate and peak demand time is drawn from storage.

B. Monitoring.

Immediately after termination of the constant head test, the water level in the well will be monitored. Monitoring will take place at one-minute intervals until 80% of the original static water level in the well has recovered or for four hours, whichever comes first.

C. Pass/fail.

If the well is unable to recharge 80% of the drawdown measured during the well test in the total elapsed pumping time of the peak demand test plus the constant head test or less, the well fails the recovery potion of the three-part pump test and will be considered inadequate for use.

350-13. REQUIREMENTS FOR THE INTERFERENCE TEST ~~(MZ Zone Only)~~

A. ~~Definition~~

~~An interference test is restricted to the MZ Zone, or any zone in which the driller's report indicates the presence of diabase or argillite rock formations, is an evaluation of the influence a new well will have on existing well(s) so as to determine if that influence would be sufficiently large as to interfere with the operation of existing wells. Interference testing will be conducted whenever a well to support new construction on a subsized lot or wherever a proposed well to support new construction is within 500 feet of an existing well. Interference testing shall be required on all multiple residential developments where wells supply potable water.~~

A. Definition.

An interference test is an evaluation of the influence a new well will have on existing well(s) so as to determine if that influence would be sufficiently large as to interfere with operation of existing wells. Interference testing will be required:

1. Whenever the installation of a well is requested to support new construction on a subsized lot (< 2.0 acres) anywhere in Hillsborough Township.

2. In all multiple residential developments in Hillsborough Township where wells supply potable water.

3. In the Mountain Zone (MZ-Zone), or any zone in which the well driller's report indicates the presence of diabase or argillite rock formations.

4. On any lot in the MZ- Zone that is undersized and within 500 ft of an existing well.

B. Pass/fail (MOUNTAIN ZONE):

The results of the interference test must show that the influence of the new well on any existing well at a minimum cannot exceed 5% of the available drawdown or five feet, whichever is less, in the existing wells. ~~If the results of the peak demand test on the new well are unsatisfactory, the well may be used in conjunction with additional wells, provided the interference test on the additional well(s) is satisfactory, or design of the proposed facility must be so modified as to lower the daily demand requirements sufficiently to pass a second interference test; otherwise, the well shall be abandoned and sealed in accordance with the requirements of N.J.A.C 7:9-9.1 et seq.~~ If any influence is observed in the observation wells from the pumping well, a hydrogeological analysis of long-term impacts by a qualified hydrogeologist shall be required prior to granting of approval for the new well.

C. Test protocol (MOUNTAIN ZONE):

1. To perform the interference test, the well is pumped at 80% of the available drawdown or twice the daily demand rate, whichever is greater as determined by the constant head test. A maximum rate of 10 gpm is permissible with approval by the administrative authority. The pumping level (80% of available drawdown) or pumping rate (twice the daily demand rate) is maintained for 72 hours. The interference test can be initiated at the conclusion of the constant head test and will negate the necessity of the recovery test with the prior approval of the administrative authority.
2. Existing residential wells within 500 feet of the well to be pumped shall be offered the opportunity to participate in the interference testing. Any contiguous neighboring property with an existing potable water well shall be offered the opportunity to participate in the interference testing. Prior to any pumping of the new wells, static water levels in any wells to be monitored will be obtained four times at two-hour intervals the day prior to testing and once the morning of the testing to establish background conditions. Each participant in the interference test will be asked to minimize water usage and, if possible, disconnect the well for the duration of the test. The new test well must be monitored at two-hour intervals during the test. Existing residential wells must be monitored at least every two hours during the daylight hours of 8:00 a.m. to 5:00 p.m. during the test.
3. The interference test is designed to stress the aquifer by simulating long-term usage of a new well and the resulting effects on adjacent wells. The duration of the test is necessary to affect the aquifer a sufficient distance from the new well to evaluate interference. Observed drawdown in all the wells plus a basic evaluation of fracture pattern in the area will allow a qualified hydrogeologist to predict long-term pumping levels in the aquifers.

D. Pass/fail (SUBSIZED LOT):

The results of the interference test must show that the influence of the new well on any existing well(s) at a minimum cannot exceed 5% of the available storage or five feet, whichever is less, in the existing well(s). If any influence is observed in the observation wells from the pumping well, a hydrogeological analysis of long-term impacts by a qualified hydrogeologist shall be required prior to granting of approval for the new well.

E. Test protocol (SUBSIZED LOT):

1. To perform the interference test, the well is pumped at 80% of the available drawdown or twice the daily demand rate, whichever is greater as determined by the constant head test. A maximum rate of 10 gpm is permissible with approval by the administrative authority. The pumping level (80% of available drawdown) or pumping rate (twice the daily demand rate) is maintained for 72 hours. The interference test can be initiated at the conclusion of the constant head test and will negate the necessity of the recovery test with the prior approval of the administrative authority.
2. Any contiguous neighboring property with an existing potable water well shall be offered the opportunity to participate in the interference testing. Prior to any test pumping of the new well(s), static water levels in all wells to be monitored will be obtained four times at two-hour intervals the day prior to testing and once the morning of the testing to establish background conditions.
3. The interference test is designed to stress the aquifer by simulating long-term usage of a new well and the resulting effects on adjacent wells. The duration of the test is necessary to affect the aquifer a sufficient distance from the new well to evaluate interference. Observed drawdown in all the wells plus a basic evaluation of fracture pattern in the area will allow a qualified hydrogeologist to predict long-term pumping levels in the aquifers.

350-14. OUT OF SERVICE WELLS

A. All wells that are taken out of service must be ~~sealed~~ decommissioned in accordance with N.J.A.C. 7:9d-3.1 et seq. by a licensed well ~~sealer~~ driller within 30 days of the disconnection.

B. ~~The well is considered to be out of service if a new on-site well or connection of a public water supply system has been installed as a replacement water supply.~~ The well is considered to be out of service if a new on-site well or connection to a public water supply system has been installed as a replacement water supply or meets the criteria for an "abandoned well" as defined by N.J.A.C. 7:9D-1.5.

C. The well driller shall provide proof of a NJDEP well record search & NJDEP approval for well decommissioning before scheduling an inspection with the administrative

authority to verify decommissioning occurred to the standards of 7:9D-3. Documentation and scheduling must be provided and occur twenty-four-hours prior to decommissioning of the well.

~~D. The well sealer shall provide twenty-four-hour notification to the administrative authority prior to sealing the well.~~

~~C.~~ D. The well ~~sealer~~ driller shall submit a completed New Jersey Department of Environmental Protection Well Abandonment Report after sealing the well.

350-15. QUALITATIVE TEST REQUIREMENTS

All wells shall be tested for selected New Jersey Primary and Secondary Drinking Water Quality Parameters as set forth in the New Jersey Safe Drinking Water Act and shall include but not limited to coliform bacteria, nitrates, nitrites, pH, hardness, sodium, sulfates, volatile organics, fluoride, and eighty heavy metals (arsenic, barium, cadmium, chromium, lead, mercury, selenium and silver) or any other parameter as required by the administrative authority.

350-16. GEOTHERMAL WELLS

See N.J.A.C 7:9D-1 et al. for more construction details.

A.
All closed loop and open loop wells must be installed under the direct supervision of a New Jersey licensed well driller of the appropriate Class (Master, Journeyman or Journeyman B),

B.
Open loop geothermal wells are Category 2 non-potable water supply wells and require the same installation specification as Category 1 potable wells, including sections 350-5 and 350-7 as well as N.J.A.C. 7:9D-1, 2.2, and 2.3, to protect the aquifer from potential surface contamination.

C.
The following specific requirements shall apply to all open loop geothermal wells constructed for heating and cooling:
In addition to those requirements specified in N.J.A.C. 7:9D, Any system using artificial gaseous refrigerants with copper or other metal requiring cathodic protection is expressly prohibited.

~~1. Unless otherwise approved by the Administrative Authority, all return water shall be through a return well to the originating aquifer or returned to the original well through the use of a standing column well.~~

~~2. All water returned to the originating aquifer shall, except for a difference in temperature and oxygen content, have the same physical and chemical characteristics as were present~~

~~prior to withdrawal. No corrosion inhibitors, water softeners or other additives shall be added to water that will be returned to the originated aquifer;~~

1. Open loop, in addition to general well permitting requirements in N.J.A.C. 7:9D-1, and construction requirements in N.J.A.C. 7:9D 2.2 and 2.3, a through f, must comply with N.J.A.C. 7:9D-2.3 (g), "Specific Requirements".

2. The annual space between the casing and the oversized borehole shall be sealed in accordance with the requirements in N.J.A.C 7:9D 2.9 and 2.10; and this Chapter and

3. Wells that also provide a potable water supply shall be constructed according to the requirements specified for Category 1 wells in N.J.A.C. 7:9D.

D.

Closed loop geothermal wells are ~~Category 4 Special Use~~ Category 5 Wells as per N.J.A.C. 7:9D-2.1. In addition to general well permitting requirements, and the requirements for construction in 7:9D-2.2, closed loop geothermal wells must comply with 7:9D-2.5, "Requirements for the Installation of Category 5, 6, and 7 Wells".

1. Closed Loop Geothermal Wells, in addition to the requirements of N.J.A.C. 7:9D-1.1 et seq., the surface protective well casing shall extend to a minimum of 20 feet into unweathered bedrock; however, the total length of the casing in all other cases is 60 feet and 80 feet in areas affected by any contamination as noted by the administrative authority.

2. Any system using artificial gaseous refrigerants with copper or metal requiring cathodic protection is expressly prohibited.

~~1. The vertical closed loop geothermal well shall be constructed using a borehole with sufficient diameter to allow for proper grouting;~~

~~2. A surface protective well casing shall be extend to a minimum of 20 feet into into unweathered bedrock; however, the total length of the casing in all other cases in 60 feet and 80 feet in areas affected by any contamination as noted by the administrative authority.~~

~~3. The tremie or grout pipe shall be installed with the closed loop upon completion of the borehole. The entire annular space between the closed loop and the uncasing borehole shall only be sealed under pressure from the bottom of the well to the top in accordance with N.J.A.C. 7:9D2.9 and 2.10 using the following materials:~~

~~a. High grade bentonite, cementitious thermally enhanced grout or Thermal Grout 85 or equal for wells constructed into unconsolidated formations;~~

~~b. Cementations thermally enhanced group wells constructed into consolidated formations; and~~

c. Any thermally enhanced grout approved by NJDEP Water Supply Section, (current approved list attached)

4. The circulating fluids utilized in the closed loop systems shall be potable water or an appropriate mixture of potable water with one of the following antifreeze solutions:
   a. Calcium Chloride;
   b. Ethanol;
   c. Potassium Acetate;
   d. Potassium Carbonate;
   e. Propoylene Glycol; or
   f. Sodium Chloride;

5. Pipe material for the underground buried portion of the heat exchanger shall be 160 psi polyethylene pipe as specified below;
   a. Polyethylene All Material shall maintain a 1600 psi hydrostatic design basis at 73.4 degrees F per ASTMD2837, and shall be listed in PPI TR4 as a PE3408 piping formulation. The material shall be a high density, polyethylene extrusion compound having a cell classification of PE245434C or PE355434C with a UV stabilizer of C, D or E as specified in ASTM D3350 with the following exception; this material shall exhibit zero failures (FO) when tested for 192 or more hours under ASTM D1693, condition C, as required in ASTM D3350;

6. Buried pipe systems shall be joined so that the resultant assembly is leakproof using one of the following methods;
   a. The heat fusion process in accordance with the pipe manufacturer's specifications; or
   b. Those joined using the International Ground Source Heat Pump Association (IGSHPA) approved mechanical stab fittings.

7. Any system using artificial gaseous refrigerants with copper or other metal requiring cathodic protection is expressly prohibited,
8.

350-17. FEES

Well installation permits and witnessing fees are as follows:

A. Well installation permit - replacement: $60

B. Well installation permit - new construction: $300

C. Interference testing: $500 per day; $500 report review; and $300 for public meeting (if necessary).

350-18. VIOLATION AND PENALTIES

A. Any person violating or failing to comply with any provisions of this chapter shall upon conviction thereof be deemed guilty of a class A violation, punishable as provided in Chapter 291, General Provisions, Board of Health, Article II.

B. Each violation of the provision of this chapter or each day a violation is allowed to persist will constitute a separate and distinct offense.

C. Any violations of any sections of N.J.A.C. 7:9D-1.1 et seq., may result in the imposition of fines and penalties in accordance with N.J.A.C. 7:9D, subchapter 4, "Civil Administrative Orders and Penalties".

D. For the purposes of assessing penalties, the continuation of a particular violation for each successive day shall constitute a separate offense, and the person or persons allowing or permitting the continuation of the violation may be punished as provided above for each separate violation.

E. The imposition of a penalty, as provided hereinabove, shall be in addition to any injunctive or remedial relief which is authorized under the laws of the State of New Jersey with the same force and effect as though provided for herein.

350-19. CONDITIONS

A. This Ordinance shall be construed so as not to conflict with any provision of New Jersey or Federal law. In the event of any inconsistency or conflict between the provisions of this Ordinance and State or Federal law, the provisions of State or Federal law shall apply. In the event of any inconsistencies or conflicts between this Ordinance and existing ordinances of the Township, the provisions of this Ordinance shall apply.

B. If any provisions of this Ordinance shall be adjudged invalid, such adjudication shall not affect the validity of the remaining provisions which shall be deemed severable therefrom.

C. This ordinance shall take effect thirty days after the date of first publication in accordance with N.J.S.A. 26:3-69.