

Upper Makefield Township

1076 Eagle Road | Newtown, PA 18940 | p 215.968.3340 | f 215.968.9228 | www.uppermakefield.org

APPLICATION FOR PERMIT TO DRILL WELL

In accordance with provisions of the Upper Makefield Township Codified Ordinance, Chapter 26, a permit to drill a water well is required prior to any drilling.

OWNER: _____ DRILLER: _____
ADDRESS: _____ ADDRESS: _____
TELE # _____ TELE # _____
FAX #: _____ FAX NO.: _____
EMAIL: _____ EMAIL: _____

LOCATION OF DRILL: _____ TMP: _____

USE OF WELL(Circle) : Domestic Monitoring Production New Replacement Existing

PROPOSED DEPTH: _____ DIAMETER: _____ METHOD OF DRILLING: _____

METHOD OF STORAGE PROPOSED: _____

Is there an existing well on the property? Yes No

If yes, how will it be used? _____

If well is to be abandoned, method of abandonment _____

In accepting this permit, Owner agrees to abide by the following conditions:

1. Issuance of this permit does not convey any rights to divert water.
2. This well will not be used for disposal of wastes or contaminated water.
3. In the event this well is abandoned, Owner will assume responsibility for plugging or sealing it in a manner satisfactory to the Township.
4. All wells require the attached Well Registration Form to be completed and returned to Upper Makefield Township within ten (10) days after well completion.
5. This permit is valid for one (1) year from date of issuance, if issued.
6. Vertical centerline of well minimum distance to any part of building not less than two feet (2').
7. This application must be accompanied by a diagram, drawn to scale, showing the following: lot size, location of all existing structures, location of proposed wells including dimensions to all boundary lines and structures, location of any streams or other bodies of water or deemed easements and distance to centerline of same. This diagram must be signed and dated by the person who prepared it.
8. No person shall engage in the use of dry ice, detergents, chlorine, acids or other chemicals in wells for the purpose of increasing or restoring yield without prior notice to Upper Makefield Township.
9. NOTE: If upon inspection this information is found to be incorrect, this permit will be revoked and the persons involved will be considered in violation of the Codified Ordinances and prosecuted for same.

APPLICATION: () Denied () Approved to:

Planning & Zoning Director

Date

Water test requirements:

- Table A:** Large chemical with ecoli and bacteria
- Table B:** Small chemical test with ecoli and bacteria
- Table C:** Replacement well with ecoli and bacteria
(See attached Ordinance)

PART 3

PERMITS

§301. PERMITS.

No private well or private onsite sewage disposal system may be constructed or installed on any lot on which a structure which shall be supported by such system or systems is to be constructed unless the owner or applicant has obtained a zoning permit pursuant to the provisions of the Upper Makefield Township Zoning Ordinance.

(Ord. 56, 3/21/1978, §1)

§302. WELL YIELDS.

1. Definitions. The following definitions shall apply to this Section:

ANNULUS - the annular space between the casing and the wall of the borehole.

AQUICLUDE - a part of a geologic formation, formation or group of formations with virtually no capacity to transmit water.

AQUIFER - rock or sediment in a geologic formation, part of a formation or group of formations which has the capacity to store and transmit water to wells and springs at a reasonable cost.

AQUITARD - a saturated, but poorly permeable part of a formation, formation or group of formations which does not transmit water freely to a well or spring. However, an aquitard may transmit appreciable amounts of water to or from adjacent aquifers.

BOREHOLE STORAGE - the volume of water contained in the well under non-pumping conditions. It is obtained by multiplying the area of the borehole cross-section for the height of the water column. In a domestic well (6 inch diameter), borehole storage equals approximately one and a half (1½) gallons per foot of water column.

COMBINED YIELD - the combination of well yield as defined below plus contribution to well flow from borehole storage over a minimum two (2) hour period.

LONG-TERM PUMPING TEST - the pumping test of a well lasting forty-eight (48) hours or longer.

QUALIFIED GROUND WATER PROFESSIONAL - professional geologist/hydrogeologist licensed to practice in the Commonwealth of Pennsylvania.

WATER-BEARING ZONE - fractures or other openings in the bedrock which yield measurable quantities of water on a continuous basis and contribute to the yield of the well.

WATER

WELL YIELD - amount or volumen of water that flows from the aquifer into the well and measured at the completion of all drilling and well development in accordance with the procedures outlined below in subsection (3) of this Section.

2. A drill record, geologic log and testing report shall be prepared for each well and shall include the name, address, phone number and signature of the professional geologist and/or licensed Pennsylvania well driller. This information shall be provided to the Township along with a map which indicates the location of this well on the land development plan at a scale not exceeding one (1) inch equals four hundred (400) feet and will be required for the issuance of a building permit.
3. The information submitted to the Township pursuant to subsection (2) above shall include data on well yield collected in accordance with the following procedures:
 - A. Well yield shall be measured with an accuracy of +/- ten (10) percent and reported in gallons per minute (gpm). The yield of the well, at the completion of drilling and well development shall be determined by means of a continuous flow test of minimum two (2) hour duration. If the yield of the well is determined with the use of the drilling rig, by airlifting, the required two (2) hour period shall begin after the ground water stored in the borehole has been evacuated. If a submersible pump is used to ascertain the yield of the well, the two (2) hour period shall commence when the water level in the well drops at a rate of one-half ($\frac{1}{2}$) feet per hour or less while maintaining the pumping rate constant.
 - B. Determination of well yield shall be accomplished in the absence of significant precipitation events, or the effect from precipitation shall be properly accounted for.
 - C. Any factors that may artificially inflate the well yield, including, but not limited to, recirculation of water, recharge from precipitation, addition of water by driller, etc. must be included in the information submitted to the Township.
 - D. Location and yield of water-bearing zones encountered during drilling shall be recorded as accurately as possible by the geologist present at the site and/or by the driller.
 - E. Daily measurements of water levels in the well shall be collected at the start and end of drilling and included in the record. Measurements shall be made with appropriate tools and with an accuracy of +/- 0.1 foot.
 - F. Yields of three (3) gpm or more are considered sufficient for domestic wells in Upper Makefield Township, provided:
 - (1) The yield of three (3) gpm or more is obtained from water-bearing zones located below one hundred fifty (150) feet and some of the yield is from a depth of two hundred (200) feet or more.
 - (2) The well can sustain a pumping rate of four and a half ($4\frac{1}{2}$) gpm for a minimum of two (2) hours from aquifer contribution and borehole storage.

- G. Yields of less than three (3) gpm are considered inadequate for domestic wells in Upper Makefield Township. However, a permit can be issued by the Township, at its sole discretion, when certification signed by a professional geologist/hydrogeologist indicates the well can provide a reliable, long-term supply.
- H. The yield of a well shall be determined based solely on the contribution of water-bearing zones located below one hundred fifty (150) feet. That is, water-bearing zones encountered to a depth of one hundred fifty (150) feet and the yield thereof shall not be included in the computation of well yield. Except as noted below (§304).
- I. The driller or professional geologist shall indicate on the well record the appropriate setting for the submersible pump.

(Ord. 56, 3/21/1978, §2; as amended by Ord. 115, 4/17/1985, §1; by Ord. 151, 8/16/1989, §1; by Ord. 156, 4/18/1990, §1; and by Ord. 216, 4/21/1999, §4)

§303. WELL CASING.

All wells shall be cased for a minimum of forty (40) feet and the casing shall extend a minimum of five (5) feet into competent bed rock. The casing shall extend a minimum of one (1) foot above final grade and the annulus shall be grouted with cement or equal material so as to form a tight seal.

(Ord. 56, 3/21/1978, §3; as amended by Ord. 216, 4/21/1999, §5)

§304. WELL DEPTH.

All domestic wells shall be drilled to a minimum depth of two hundred (200) feet (or more, where necessary) in order to meet Upper Makefield Township requirements pertaining to well yield. It should be noted that this is the minimum depth required and many wells may have to be drilled deeper. Conversely, when, due to above normal yields (for domestic wells), drilling of the well is terminated at less than two hundred (200) feet, the long-term reliability of the well as a source of water supply shall be certified by a professional geologist.

(Ord. 56, 3/21/1978, §4; as amended by Ord. 216, 4/21/1999, §6)

§305. WATER QUALITY.

The quality of the ground water at the well shall be determined via bacteriological and chemical analysis of a sample collected after pumping the well for a minimum of two (2) hours. This information shall be submitted to the Township together with the information set forth in §302(2) above. The analysis shall be performed by a State-approved laboratory and shall include the following parameters:

WATER

SECONDARY CONTAMINANTS

	SMCL (mg/L)
pH*	6.5 - 8.5 units
Temperature*	N/A degrees
Chloride	250
Sulfate	250
Total Dissolved Solids	500
Color	15 color units
Odor	3 threshold odor numbers
Turbidity	0.5 to 1 NTU**
Iron	0.3
Manganese	0.05
Copper	1

SMCL = Secondary Maximum Contaminant Level

* Can be measured in the field

** Performance standard

MICROBIOLOGICAL CONTAMINANTS

	MCLG
Total Coliforms*	0

MCLG = Maximum Contaminant Level Goal

* If positive, analyze for fecal coliform

INORGANIC CHEMICALS

	MCL (mg/L)
Arsenic	0.05
Barium	2.0
Cadmium	0.005
Chromium	0.1

Lead	0.005
Mercury	0.002
Nitrate + Nitrite (as Nitrogen)	10.0

VOLATILE ORGANIC CHEMICALS

	MCL (mg/L)
Benzene	0.005
Carbon Tetrachloride	0.005
o-Dichlorobenzene	0.6
para-Dichlorobenzene	0.075
1,2-Dichloroethane	0.005
1,1-Dichloroethylene	0.007
cis-Dichloroethylene	0.07
trans-1,2-Dichloroethylene	0.1
Dichloromethane	0.005
1,2-Dichloropropane	0.005
Ethylbenzene	0.7
Monochlorobenzene	0.1
Styrene	0.1
Tetrachloroethylene	0.005
Toluene	1.0
1,2,4-Trichlorobenzene	0.07
1,1,1-Trichloroethane	0.2
1,1,2-Trichloroethane	0.005
Trichloroethylene	0.005
Vinyl Chloride	0.002
Xylenes (Total)	10.0

SYNTHETIC ORGANIC CHEMICALS

WATER

	MCL (mg/L)
Alachlor	0.002
Atrazine	0.003
Chlordane	0.002
Dibromochloropropane	0.002
Ethylenedibromide	0.00005
Hexachlorocyclopentadiene	0.05
Lindane	0.0002
Methoxychlor	0.04
Simazine	0.004
Carbofuran	0.04
2,4D	0.07
Endothal	0.1

MCL = Maximum Contaminant Level

(Ord. 56, 3/21/1978; as added by Ord. 216, 4/21/1999, §7)

§306. INFORMATION REQUIRED BY THE TOWNSHIP.

Prior to the issuance of a building permit and/or a certificate of use and occupancy, and upon completion of the installation of any private well (whether or not any permit is required), the owner of the premises upon which the well has been installed shall produce a certificate of quality for the water within the well, a certificate setting forth the rate of flow of water from the well and information stating the depth to water and the geologic description.

(Ord. 56, 3/21/1978, §5; as amended by Ord. 115, 4/17/1985, §2; and by Ord. 216, 4/21/1999, §8)

§307. PENALTIES.

Any person, firm or corporation who shall violate any provision of this Part shall, upon conviction thereof, be sentenced to pay a fine of not more than six hundred dollars (\$600.00) plus costs and, in default of payment of said fine and costs, to a term of imprisonment not to exceed thirty (30) days. Each day that a violation of this Part continues shall constitute a separate offense.

(Ord. 56, 3/21/1978, §6; as amended by Ord. 186, 12/6/1995; and by Ord. 216, 4/21/1999, §8)

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Individual Water-supply Well Isolation Distances

BCDH Rules and Regulations Governing Individual Water Supply Systems

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

DRILL RECORD, GEOLOGIC LOG, YIELD AND TESTING REPORTS (TO BE RETURNED TO U.M.T. UPON COMPLETION OF WELL DRILLING PROJECT)

Must be signed by well driller and/or professional geologist

1. General Information:

TMP#: _____

Subdivision/Lot #: _____

Property Owner: _____

Address: _____

Phone No.: _____

Drilling Co. _____ Driller's Name _____

State License No. _____

Address _____

Phone No. _____

Well Use: (check one)

Domestic

Monitoring

Production

Other, specify: _____

Estimated average daily use during peak 30-day period gpd _____

Wastewater Disposal:

Onsite septic (locate on plan)

Spray Irrigation (locate on plan)

Other, specify: _____

Is Well Metered? Yes No

Well Location Map (not to exceed 1" = 400')

Attached to this form

2. Well Construction Information:

Start Date: _____	<u>Water bearing Zones</u>		
Completion Date: _____	Depth (bgs)	Yield (gpm)	bgs = below ground surface; b/c = below top of casing measurements must be in feet and gallons per minute (gpm)
Drilling method: _____	_____	_____	
Depth drilled (bgs): _____	_____	_____	
Depth of completed well (bgs): _____	_____	_____	
Grout (bgs): _____	_____	_____	
Top _____	Total yield at end of drilling: _____		
Bottom _____			

<u>Casing:</u>	Top (bgs)	Bottom (bgs)	Diameter (in)	Material
Casing 1	_____	_____	_____	_____
Casing 2	_____	_____	_____	_____
Open hole	_____	_____	_____	_____

Geologic Log (can be attached):

Description	Top (bgs)	Bottom (bgs)
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

<u>Pump Information:</u>	<u>Optional Pump Information:</u>
Pump Intake (bgs): _____	Installation Date: _____
	Pump Installer: _____
	Pump manufacturer: _____
	Pump type: _____
	Pump capacity (hp) _____
	<i>hp = horse power</i>

3. Pumping tests and yield certification:

Pumping test method:

Airlifting with drill rig

Submersible Pump

Test date: _____
 Start time: _____
 End time: _____
 Total time: _____

Pumping test notes:
 Tests required

1. Peak yield (gpm): _____

>4.5 gpm during 2 hours of pumping

2. Constant Level Yield (gpm): _____

>3 gpm after water level drop is less than 1/2 foot per hour, or after borehole is evacuated by the drill rig.

Pumping test data: Static water level (btc): _____
 (Attach additional sheets if necessary)

Time	Water Level (btc)	Pumping Rate (gpm)	Notes:
_____	_____	_____	
_____	_____	_____	
_____	_____	_____	
_____	_____	_____	
_____	_____	_____	
_____	_____	_____	
_____	_____	_____	
_____	_____	_____	
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_____	_____	_____	
_____	_____	_____	
_____	_____	_____	
_____	_____	_____	
_____	_____	_____	
_____	_____	_____	

Professional Geologist may certify well yield and construction if yield is < 3 gpm and/or well is < 200' deep

Geologist Name: _____
 Company: _____
 Address: _____

Geologist Signature: _____
 Date: _____
 Phone No.: _____

Driller Name: _____
 Company: _____
 Address: _____

Driller Signature: _____
 Date: _____
 Phone No.: _____

* If different then Information Included In Section 1.

**WELL REGISTRATION FORM FOR EXISTING WELLS
(TO BE RETURNED TO U.M.T. UPON COMPLETION OF WELL DRILLING PROJECT)**

1. Well Construction:

- 3 gallons per minute (gpm) certified rate of flow from the well
- depth to water information
- geologic descriptions

2. Water Quality:

A. Small Chemical Test

- Samples analyzed by a State approved laboratory for the following parameters:

Physical Characteristics	SMCL (mg/L)	Well P/F*	SMCL = Secondary Maximum Contaminant Level
Turbidity	5 NTU	_____	
Color	15 color units	_____	
Threshold Odor Number	3 threshold odor numbers	_____	
pH*	6.5-8.5 pH units	_____	*Well P/F = pass/fail
Chemical Characteristics			
Chloride	250	_____	Notes:
Nitrate + Nitrite (as Nitrogen)	10	_____	
Iron	0.3	_____	
Manganese	0.05	_____	
Copper	1	_____	
Hardness	250	_____	
Detergent (MBAS)	0.5	_____	
Total Dissolved Solids (TDS)	500	_____	
TCE (Trichloroethylene)	5 ug/L	_____	
Bacteriological Characteristics			
Total Coliform	0 per 100 mL	_____	
Total Plate Count	< 500 counts/mL	_____	
Fecal Coliform	< 1 per 100 mL	_____	

- Copy of the sample results to the Code Enforcement Officer within 30 days
- Any proposed treatment system must be certified by a professional engineer.

3. Purchaser notification:

- copy of water quality certification must be provided to the purchaser for the property specifying each contaminant not in compliance with the standards and a written description of treatment system, to include instructions on how to maintain the system