



MICHIGAN DEPARTMENT OF ENVIRONMENT, GREAT LAKES, AND ENERGY

Geologic Resources Management Division

Requirements For Sources of Water and Water Wells Used in Conjunction with Oil And Gas or Mineral Well Drilling and Operations

Issued by authority of the Michigan Department of Environment, Great Lakes, and Energy and Part 615 and Part 625 Act 451 PA 1994, as amended and Part 127 Act 368 PA 1978 as amended and Act 399 PA 1976 as amended.

These requirements address the concern for the health and safety of persons using the water for drinking purposes, and also to prevent possible pollution of fresh water aquifers. Water wells drilled in conjunction with oil and gas or mineral well operations often supply drinking water for the drilling crew, and frequently are retained by the landowner for private use. It is imperative that these wells be drilled according to the specifications approved by the Michigan Department of the Public Health.

The specifications contained herein are made part of and a condition of this permit and all permits to drill for Oil and Gas or Mineral Wells. In addition, the applicant must identify and address the water source in the Environmental Impact Assessment of the Application of Permit to drill.

Fresh water fluid is required for drilling and setting conductor and/or surface pipe through fresh water aquifers in all oil and gas or mineral wells. Both riparian surface water (ponds, rivers, etc.) and water supply wells are used as the water source. Requirements for water from each source are listed in Part I and Part II below:

Part I Surface Water Source

Surface water used for drilling and setting conductor and/or surface pipe must be disinfected with chlorine per the recommendations below. Care should be taken to prevent the release of oil or brine from hoses, tanks, etc. while surface waters are being pumped.

Recommended quantities of Chlorine source products to be added to 100 Barrels of surface water for the desired concentrations

Product Used	Clear Water (10 PPM)	Cloudy Water (25 PPM)	Dirty Water (50 PPM)
Laundry Bleach	1 gallon	2 1/2 gallons	5 gallons
Commercial grade liquid chlorine	1/2 gallon	1 1/4 gallons	2 1/2 gallons
Tablets or granulated chlorine	6/10 lb.	1 1/2 lbs.	3 lbs.

Chlorine Source Materials:

- Sodium Hypochlorite (liquid granulated)
- Calcium Hypochlorite (tablets or granulated)
- Laundry Bleach (5 1/4% by weight active chlorine)
- Commercial Grade Swimming Pool Chlorine (10-13% by weight active chlorine)

For clear water, use 10 ppm active chlorine. If water is cloudy use 20-25 ppm and up to 50 ppm if the water is turbid and has any organic matter in it. Try to achieve .5 to 2 ppm residual chlorine. There is sufficient residual chlorine if you can taste or smell it. Water containing organic debris cannot be positively disinfected and must not be used.

A contact period of 20 minutes is enough for clear water to have sufficient residual chlorine. Two hours is desirable with cloudy or dirty water. Do not add chlorine and mix in drilling mud immediately. The drilling mud will use up the chlorine.

Part II Water Well Source

A. Water Wells Used Other Than Exclusively for Oil and Gas or Mineral Well Drilling and Operations

If a water well drilled in connection with oil and gas or mineral well drilling or operations is 1) used as a source of drinking water, or 2) to be turned over to the landowner, or 3) to be used for purposes other than oil and gas or mineral well drilling or operations, these water wells fall under the authority of Act 368, P.A. 1978, Part 127, as Amended, or Act 399, P.A. 1975, as amended and Rule 403 under Part 615 (R 324.403) of Michigan Administrative Rules. Rule 403 under Part 615 states:

(1) A water well that is drilled and used for drinking water purposes during the drilling of the well or retained after drilling completion or final completion shall be drilled pursuant to rules promulgated under part 127 of Act No. 368 of the Public Acts of 1978, as amended, being §333.12701 et seq. of the Michigan Compiled Laws.

(2) A water well that is not to be retained after drilling completion or final completion shall be completed and abandoned as instructed by the supervisor and shall meet all of the following minimum requirements:

(a) Be located not less than 50 feet from drilling mud pits, pipe racks, salt and mud mixing sites, and the wellhead.

(b) Be drilled with chlorinated fresh water.

(c) Be grouted pursuant to the well construction and grouting rules contained in the well construction code promulgated under part 127 of Act No. 368 of the Public Acts of 1978, as amended, being §333.12701 et seq. of the Michigan Compiled Laws.

(d) Geologic records shall be filed with the supervisor on a form prescribed by the supervisor.

(e) The wellhead, including annulus, shall be sealed and a check valve shall be installed in the surface discharge line to prevent contaminants from entering the well.

(f) The well shall be abandoned and plugged pursuant to the plugging and abandonment rules contained in the well construction code promulgated under part 127 of Act No. 368 of the Public Acts of 1978, as amended, being §333.12701 et seq. of the Michigan Compiled Laws.

In addition to these regulations, the Supervisor of Wells Instruction 1-2013 – Water Well Construction and Abandonment Requirements also states that neat cement is required for grouting all water wells

associated with oil and gas operations. The neat cement mixture ratio shall consist of 1 bag of Portland cement (94 lbs) to not more than 6 gallons of fresh water, and up to 5% by weight bentonite gel. Notification of water well drilling shall be provided to the GRMD at least 5 days prior to the commencement of all water well drilling activities.

Potable water wells must be located at an approved distance in accordance with local health department rules and regulations. This distance is generally 300 feet from potential contamination sources including the oil/gas wellhead based on Part 127, R 325.1622 (Rule 122). Exceptions to the potable water well being located closer than 300 feet to a potential source of contamination are described in Part 127, R 325.1613 (Rule 113). This Rule provides for deviations from minimum well distances from a potential or known source of contamination. Deviations from the 300 foot rule for potable water wells will be evaluated on a case by case basis by the local health department.

For water wells that will be used for potable drinking water purposes or will be turned over to the landowner after drilling activities are completed, the Permittee must contact the local health department, or the Michigan Department of Environmental Quality, Water Resource Division at (517) 284-6524, to ensure compliance. **This must be done before drilling the water well.** A copy of the local health department's permit or authorization for such a well must be submitted as part of the application for permit for drilling an oil and gas or mineral well otherwise it must be plugged as in subpart C below.

The [Supervisor of Wells Instruction 1-2013](#) provides detailed requirements related to water well drilling and construction standards, well grouting, well plugging and abandonment, water well location and minimum spacing from contamination sources, water well pump and plugging records filing requirements, and water well ownership and Assumption of Responsibility by Landowner. These requirements apply to both potable and non-potable water wells related to oil and gas activities. Refer to the Instruction for additional information related to water wells on oil and gas sites.

B. Water Wells Used Exclusively with Oil & Gas or Mineral Wells

Non-potable water wells that are to be used exclusively for oil and gas well drilling activities shall fall under the authority of Rule 403 (2). In addition, non-potable water wells must be grouted using neat cement. The neat cement mixture ratio shall consist of 1 bag of Portland cement (94 lbs) to not more than 6 gallons of fresh water, and up to 5% by weight bentonite gel. Notification of water well drilling shall be provided to the GRMD at least 5 days prior to the commencement of all water well drilling activities.

C. Water Well Plugging and Abandonment Requirements

a. Pump, drop pipe, packer, other equipment, debris or obstructions that may interfere with sealing operations shall be removed from the well prior to well plugging.

b. The well casing, or the hole if the casing is pulled, shall be plugged from the bottom to the top using neat cement.

c. The neat cement mixture ratio shall consist of 1 bag of Portland cement (94 lbs) to not more than 6 gallons of fresh water, and up to 5% by weight bentonite gel.

d. Water wells that exhibit artesian flow or contain subterranean gases shall have the casing left in place and filled with neat cement from the bottom of the well to 4 feet below ground surface.

e. If there is evidence of flow outside the casing, it shall be corrected by pressure grouting from the bottom of the well to the top using neat cement.

f. The well casing and grout shall terminate at 4 feet below ground surface. The remaining portion of the hole will be backfilled with clean native soil or backfill and graded to the existing surrounding grade.

D. Requirements for Approval of Abandonment by District Geologist

- a. Water well must be plugged in accordance with the requirements above.
- b. Water well records must be filed.

E. Records

a. The permittee or their water well contractor/driller shall submit to the Geologic Resources Management Division (GRMD) within 30 days after the water well completion, the Wellogig® Water Well and Pump Record (preferred option) or the Water Well Record for Oil and Gas Operations (Form EQP-7200-10). If the Wellogig® Water Well and Pump Record is submitted to GRMD, it must contain the Permit Number for the oil/gas well, and the oil/gas well name.

b. The permittee or their water well contractor/driller shall submit to the GRMD within 30 days after the water well is plugged, the Wellogig® Abandoned Well Plugging Record (preferred option) or the Water Well Plugging Record (Form EQP-7200-20). If the Wellogig® Abandoned Well Plugging Record is submitted to GRMD, it must contain the Permit Number for the oil/gas well, and the oil/gas well name.

F. Water Well Ownership and Assumption of Responsibility by Landowner

a. Water wells that are to be retained by the property owner after drilling completion or final completion of the oil or gas well must submit an Assumption of Responsibility by Landowner (EQP-7240) form to the GRMD. The Assumption of Responsibility by Landowner form must be signed by the permittee/company and property owner and must describe the transfer of responsibility of ownership of the well to the property owner. The Assumption of Responsibility by Landowner form shall be submitted and approved within six months after oil/gas well plugging has occurred.

b. Water wells that are to be retained or used for drinking water after drilling completion or final completion of the oil or gas well must meet Part 127 and local health department sanitation codes. The permittee shall make the necessary arrangements with the landowner and the local health department prior to the transfer of ownership of a potable water well. GRMD staff should receive proof of approval by the local health department prior to issuing the Assumption of Responsibility by Landowner. The Assumption of Responsibility by Landowner form shall be submitted and approved within six months after oil/gas well plugging has occurred.

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