

**STATE OF MICHIGAN DEPARTMENT OF
ENVIRONMENTAL QUALITY**

SUPERVISOR OF WELLS INSTRUCTION 1-2013

WATER WELL CONSTRUCTION AND ABANDONMENT REQUIREMENTS

Purpose

The purpose of this Supervisor of Wells Instruction is to provide direction under the existing water well construction and well plugging/abandonment rules, which are stated in Rule 403 of Part 615, Supervisor of Wells, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended (NREPA).

Applicable Statutes and Rules

Part 615, Supervisor of Wells, of the Natural Resources and Environmental Protection Act, 1994, PA 451, as amended (NREPA).

Rule 403 under Part 615 of the NREPA (R 324.403 of the Michigan Administrative Rules).

Part 127, Water Supply and Sewer Systems of the Public Health Code, 1978 PA 368, as amended, being §333.12701 et seq. of Michigan Compiled Laws.

Rule 113 under Part 127 (R 325.1613) Deviations from minimum standards.

Rule 122 under Part 127 (R 325.1622) Wells; distances from contamination sources.

Rule 133a under Part 127 (R 325.1633a) Construction of wells; grouting.

Rule 164 under Part 127 (R 325.1664) Abandonment of wells; plugging materials.

Background

The Supervisor of Wells is issuing this Instruction to revise and update the requirements for water well drilling, construction, and plugging/abandonment associated with oil and gas activities. Water wells used for drinking water at oil and gas sites or retained for other uses (termed "potable wells" herein) are subject to Part 127 of the Public Health Code and that provision is reaffirmed in Part 615 Rules. Water wells used only for drilling and/or production operations (termed "non-potable wells" herein) are exempt from the requirements of Part 127 per Section 333.12703(1) but are subject to Part 615 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."

The purpose of this Instruction is to assure the protection of public health and the environment in the drilling, construction, and plugging/abandonment of water wells associated with oil and gas operations.

Instruction

This Instruction is applicable to water supply wells relating to oil and gas activities. Monitor wells and piezometers are exempt from this Instruction.

Water wells drilled and used in conjunction with oil and gas activities must meet the following requirements:

Water Well Drilling and Construction Standards

- A. Non-potable water wells will be drilled using chlorinated fresh water, and be constructed pursuant to Rule 403 of Part 615 of the NREPA and be grouted using neat cement.
- B. Potable water wells shall be located and constructed in accordance with Part 127 Rules and must adhere to local health department sanitation codes and regulations. For potable water wells, the permittee shall notify the local health department and obtain any necessary water well permit prior to the start of water well drilling activities.
- C. Notification of water well drilling shall be provided to the Department of Environmental Quality, Office of Oil, Gas, and Minerals (OOGM) at least five (5) days prior to the commencement of the water well drilling activities.

Water Well Grouting

A. Water wells installed using rotary-bored or auger methods in unconsolidated glacial drift deposits or bedrock where the permanent well casing is installed in an oversized borehole shall have the entire annular space between the permanent well casing and borehole grouted using neat cement. If a well screen is installed, the bottom of the grouted interval shall be not more than ten (10) feet above the top of the well screen. The top of the grouted interval shall be two (2) feet below the water service line or ground surface for wells that are completed using an above ground connection tee.

1. The neat cement mixture ratio shall consist of one (1) bag of Portland cement (94 pounds [lbs]) to not more than six (6) gallons of fresh water, and up to five (5) percent by weight bentonite gel. Grouting shall be conducted in one continuous operation without major delays or breaks.

2. Neat cement will be placed in the annular space using a tremie/grout pipe or circulated through the casing and be grouted from the bottom of the annular space upward towards the ground surface. The borehole diameter shall be at least two (2) inches larger than the nominal size of the well casing. In addition, the annular space between the well casing and borehole must be at least two and seven eighths (2 7/8) inches or larger when using a tremie/grout pipe.

3. The neat cement shall be allowed to set for a minimum of 12 hours to ensure that the cement has not settled out in the annular space. If the cement has settled in the annular space, additional neat cement must be added to the annular space to bring the cement up to within two (2) feet of the water service line connection or to ground surface for water wells completed with an above ground connection tee prior to the commencement of oil and gas well drilling activities.

B. Water wells installed using cable tool, hollow rod, jetting, or other drilling method where the permanent well casing is driven shall be grouted to either of the following provisions:

1. Where temporary casing or oversized borehole is not used or where the temporary casing or oversized borehole is less than 25 feet in depth, dry granular bentonite shall be maintained around the permanent casing as it is being driven.

2. By installing a temporary casing or oversized borehole not less than three (3) inches larger than the nominal size of the permanent casing and extending not less than 25 feet below the established ground surface and grouting the annular space surrounding the permanent well casing using neat cement.

C. Water wells that are installed in bedrock shall have neat cement placed in a manner that isolates zones of lower groundwater quality from zones of higher groundwater quality.

Water Well Location - Minimum Spacing from Contamination Sources

Non-potable water wells must be located at least 50 feet from reserve pits, pipe racks, salt and mud mixing sites, or other chemical storage areas, and the wellhead. 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 Rule 122 of Part 127. The use of neat cement on all potable and non-potable water wells provides consistency with Part 127 and local health sanitation codes. Exceptions to the potable water well being located closer than 300 feet to a potential source of contamination are described in Rule 113 of Part 127. 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.

Water Well Plugging/Abandonment

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 one (1) bag of Portland cement (94 lbs) to not more than six (6) gallons of fresh water, and up to five (5) percent 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 four (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 four (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.

Water Well Pump and Plugging Records

A. The permittee or their water well contractor/driller shall submit to the OOGM 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 the OOGM, 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 OOGM 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 OOGM, it must contain the Permit Number for the oil/gas well, and the oil/gas well name.

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 OOGM. 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 (6) 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. The OOGM 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.

THIS INSTRUCTION IS EFFECTIVE May 1, 2013.

Date: May 10, 2013


HAROLD R. FITCH
ASSISTANT SUPERVISOR OF WELLS

Attachments:

EQP-7200-10 Water Well Record for Oil, Gas, or Mineral Operations
EQP-7200-20 Water Well Plugging Record for Oil and Gas Operations
Wellogig® Water Well and Pump Record
Wellogig® Abandoned Well Plugging Record
EQP-7240 Assumption of Responsibility by Landowner