

**STATE OF MICHIGAN
DEPARTMENT OF ENVIRONMENTAL QUALITY**

Supervisor of Mineral Wells Instruction 1-2005

Containment and Disposal of Drilling Mud and Cuttings from Test Wells

Purpose

The purpose of this Instruction is to provide direction and clarification of the statutory and rule requirements under the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended (NREPA) on containment and disposal of drilling mud and cuttings generated in the drilling of test wells where metallic sulfide minerals may be encountered.

Authority

This Instruction is issued under the authority of Part 625, Mineral Wells, of the NREPA, Section 62506, which states:

The supervisor of mineral wells shall prevent the wastes defined in and prohibited by this part. Acting directly or through his or her deputy or authorized representative, and following public hearing, the supervisor of mineral wells shall promulgate rules subject to the approval of the department and issue orders and instructions necessary to enforce these rules.

“Waste” includes, among other things, damage to surface water, groundwater, soils, or property associated with the drilling or operating a mineral well. *[See MCL 324. 62501]*

Definitions

As used in this Instruction,

“Aquifer” means a geologic formation, group of formations, or portion of a formation that is capable of yielding significant quantities of groundwater to wells or springs. *[Rule 299.4101 (k) under Part 115, Solid Waste Management, of the NREPA; see also Rule 299.5101 under Part 201, Environmental Remediation, Rule 299.9101 under Part 111, Hazardous Waste Management]*

“Fresh water” means water that is free of contamination in concentrations that may cause disease or harmful physiological effects and which is safe for human consumption. *[Rule 299.2302 (u) under Part 625]*

“Test well” means a well, core hole, core test, observation well, or other well drilled from the surface to determine the presence of a mineral, mineral resource, ore, or rock unit, or to obtain geological or geophysical information or other subsurface data related to mineral exploration and extraction. ... *[Part 625, MCL 324. 62501 (o)]*

Background

The drilling, development, production, operation, and plugging of test wells is regulated under Part 625. The administrative rules under Part 625 contain extensive requirements for the

storage and disposal of drilling mud and cuttings from test wells. Therefore, the mud and cuttings are not subject to regulation as solid waste under Part 115. Section 11506 (1) states:

"Solid waste" ... does not include the following: ... (l) Other wastes regulated by statute.

The administrative rules under Part 625 contain extensive requirements for the storage and disposal of drilling mud and cuttings from test wells that penetrate below the deepest fresh water aquifer. Those requirements, in Rule 299.2357 (1) through (10), include specifications for the location, construction, lining, and closure of pits, and for materials that may be placed in them.

For test wells that do not penetrate below the deepest fresh water aquifer, the Part 625 rules allow mud and cuttings to be placed in an unlined pit, which may be backfilled with native soils or other clean fill and left in place (see Rule 299.2357 (11) and (12)). However, this may conflict with the Part 625 prohibition of waste (see above) and with other provisions of the NREPA if the mud or cuttings contain minerals that, if present in sufficient volumes and concentrations, may cause contamination of ground water. In particular, this is a concern for test wells drilled in rocks containing significant concentrations of sulfide minerals.

It is difficult to specify a *de minimis* volume of sulfide minerals in cuttings for which there is no reasonable expectation of a threat of contamination, since this is affected by a variety of factors that are unique to each case. However, one cubic foot of metallic sulfide cuttings may be taken as a very conservative threshold volume. For a test well with a typical diameter in rock with a very high metallic sulfide concentration of 30 percent, this volume is generated from 65 feet of borehole. Also, the concern over potential contamination increases as the number of wells in an area increases.

Instruction

1. For the drilling of a test well that does not penetrate an aquifer or penetrates an aquifer or aquifers that contain only fresh water, in areas of the state where metallic sulfides may be expected to be encountered, a pit for the storage and disposal of drilling mud and cuttings shall conform to the following standards:
 - a. The bottom of the pit shall not be below the observed groundwater level, and the pit shall not be in a fill area that may be susceptible to erosion.
 - b. The walls and bottom of the pit shall be lined with one inch of bentonite or bentonite grout, a 20-mil polyvinyl chloride synthetic liner, or an equivalent liner material approved by the Supervisor of Mineral Wells.

2. For the drilling of a test well subject to Paragraph 1 above that penetrates more than 50 feet of rock with an average metallic sulfide content greater than three percent by volume, the handling of drilling mud and cuttings shall conform to the following standards:
 - a. Immediately upon completion of drilling, any free water in the pit shall be either:
 - i. Removed and reused or properly disposed of in accordance with state and federal law.
 - ii. Mixed with bentonite, cement, native soil or other clean fill material, if the pit is to be buried in place subject to b.iii. below.
 - b. Where there are ten or fewer test wells drilled within a radius of 660 feet from the well in question, the mud and cuttings shall be disposed of by one of the following methods:

- i. Emplaced in the well during plugging operations, provided that the glacial drift and all other permeable zones in the well bore are sealed in conformance with the Part 625 rules.
 - ii. Disposed of at a licensed waste disposal facility.
 - iii. Buried in place and backfilled with native soils or other clean fill, provided one of the following criteria is met:
 - A. The pit contains less than one cubic foot of metallic sulfide cuttings.
 - B. The mud and cuttings are mixed with cement.
 - c. Where more than ten test wells are drilled within a radius of 660 feet from the well in question, the mud and cuttings shall be disposed of in conformance with b.i. or b.ii. above.
3. For the drilling of a test well that is not described in Paragraph 1 above, a pit for the storage and disposal of drilling mud and cuttings shall conform to the requirements of Rule 299.2357.

Notwithstanding the requirements of this Instruction, in the event that mud and cuttings buried in place under Paragraph b.iii. above are determined by the Department to pose unacceptable risks to public health, safety, welfare, or the environment, the well owner or permittee shall remain liable for the performance of response actions as required by Part 201 and Part 625 of the NREPA.

All other applicable provisions of Part 625 and rules promulgated thereunder, and of other state and federal law, remain in effect. The Supervisor of Mineral Wells may impose special requirements for containment and disposal of drilling mud and cuttings from test wells on a case-by-case basis.

THIS INSTRUCTION IS EFFECTIVE IMMEDIATELY.

Date: 6/1/05



STEVEN E. CHESTER
DIRECTOR
DEPARTMENT OF ENVIRONMENTAL QUALITY