

3-15-83

STATEMENT OF NEED AND REASONABLENESS

In the Matter of the Proposed  
Adoption of Amendments Relating  
to Registration of Engineers and  
Construction of Monitoring Wells

The amendments to 7 MCAR § 1.210 C. and new rule 7 MCAR § 1.212 and 7 MCAR § 1.226 are being proposed pursuant to Laws, 1981, Chapter 179. The 1981 legislation which amended Minn. Stat., Chapter 156A, allows registered professional engineers who wish to drill monitoring wells to be able to do so without having to become licensed as water well contractors. However, the 1981 amendment does require that such engineers register with the Commissioner of Health, in order to be exempt from the licensing requirement. The law authorized the Commissioner of Health to adopt rules regarding monitoring wells and the registration of engineers. The rules discussed herein are proposed in pursuit of that authorization.

7 MCAR § 1.210 C.8. The term "confining bed" is being defined because it is a new term which is being used in these amendments. It is a term which has recently come into common use because it is more broadly descriptive than the term "aquitard" which has fallen into disuse.

7 MCAR § 1.210 C.15. The term "monitoring well" is used in the statute (Minn. Stat. § 156A.03, subd. 3, 1981 Supp.) without any

specific definition thereof. The definition being supplied in the proposed rule incorporates the statutory definition of a well (with regard to its mode of construction) (Minn. Stat. § 156A.02, subd. 1 (1980)) and explains that the qualifying term "monitoring" means the special purpose for which that type of well can be used. The definition supplied in the rule comports with that which is generally used by engineers and well drillers. The law used two terms "monitoring well" and "ground water quality sampling well" without defining either. There is no known technical difference between the two. In order to avoid any confusion, the term "groundwater quality sampling well" is defined as being synonymous with monitoring well. However, the single term "monitoring well" is used throughout the proposed amendment and proposed new rules.

7 MCAR § 1.212. This new rule prescribes the procedure by which an engineer may register with the Commissioner of Health for the purpose of drilling monitoring wells in Minnesota. The rule requires that registration be made annually which will provide a current listing of the people working in this field. A current listing is necessary in order for the Minnesota Department of Health to be able to determine who in the field setting is responsible for assuring compliance with the prescribed standards and who should be completing well records and submitting them to the Department as required by law. Annual registration is consistent with the interval for licensing water well contractors. The registration fee is required to pay for the cost of administering the registration

program. It is the same fee as that which is being charged for water well contractors and mineral explorers. Registration on a calendar year basis will be administratively efficient. It allows registration of monitor well engineers one month in advance of the water well contractors and will help to balance the licensing and registration work load. The provision that an engineer may not drill monitoring wells unless he is currently registered with the Commissioner merely repeats the language of the law and is included in the rule only for the purpose of informing one who may read the rule without benefit of the statute.

7 MCAR § 1.216 A. Because monitoring wells may be installed at contamination sites or in areas where the quality of the groundwater may be questionable, these wells produce water which may be unfit for human or animal consumption and which could be detrimental for other uses. Because the type or degree of contamination may be difficult to ascertain, it is necessary to restrict the use of the water from these wells to groundwater testing purposes only.

7 MCAR § 1.216 B. This sentence repeats the statutory restrictions which are imposed upon persons who drill monitoring wells. It is included here only to inform persons who may not have a copy of the statute available when they read the rule.

7 MCAR § 1.216 C. This is a general statement which applies to all phases associated with monitoring wells and reflects the overriding

legislative concern as stated in Minn. Stat. § 156A.01, that the quality of groundwater shall be protected, by requiring compliance with the existing Well Code. Since protection of groundwater is of paramount importance, and since monitoring wells are also water wells, it is necessary that the practices which have been established for the safe drilling of water wells also be followed in the drilling of monitoring wells. The construction and abandonment of any well regardless of its intended use, should be done in such a way as to have a minimum impact on groundwater quality. The existing Well Code was adopted to achieve that purpose which can only be fully served if the Well Code is also imposed during the construction and abandonment of monitoring wells.

7 MCAR § 1.216 D. This portion of the rule recognizes that monitoring wells serve purposes different from those of drinking water or agricultural wells. Some of the types of practices which are prohibited in the construction of these latter types of wells must be used in constructing a monitoring well. In certain instances the rule prescribes the use of additional precautions and in others it relaxes requirements contained in the existing Well Code.

Groundwater bearing formations (aquifers) consist of permeable types of geological materials which are normally separated by nearly impermeable, generally horizontal layers (confining beds). These protect the lower aquifers from water in the overlying aquifers which may be contaminated.

The purpose of a monitoring well ordinarily is to locate contamination near a site where contaminants may have been discharged. In order to be able to obtain the most useful information, it may be necessary to place the monitoring well at a point in the ground where the contamination is most likely to be intercepted. Contamination is generally carried by gravity from the area of highest potential head to an area of lower head. In areas where the surface materials are permeable, contaminants are carried vertically as a liquid from the surface into the groundwater. Rainfall may accelerate or dissolve chemicals and hasten this groundwater contamination process. Contaminants may also move horizontally at the interface of the water table or impermeable formation (confining bed). Regardless of the purpose for which a monitoring well is intended, it is paramount that a monitoring well and its mode of construction not provide additional paths of contaminant transport to lower aquifers. If it is necessary to monitor a lower aquifer, special techniques have to be employed to prevent the monitoring well from serving as a conduit for contamination, during and after construction. It is also essential to develop a rationale for exploring the deeper aquifers and to develop a plan of action for conducting further monitoring activities in a manner that will not exacerbate groundwater contamination. This need to protect groundwater from contamination by controlling drilling practices applies to the remainder of the rule and serves as the basis for all the restrictions, precautions and protective measures which are imposed in the rule.

7 MCAR § 1.216 D.1. This provision is a general prohibition against deliberately cross connecting two aquifers. It is based on the reasons stated in the preceding paragraph. The second sentence reflects a recognition that drilling is not so certain a practice that one can always predict with sufficient lead time what will be encountered. This sentence prescribes the procedure to be followed if the confining layer is breached. Compliance with this procedure should prevent the passage of large quantities of potentially contaminated water into the lower aquifer.

7 MCAR § 1.216 D.2. This provision allows for the drilling of shallow monitoring wells without special approval. For drilling to the first aquifer, there is no need to impose more stringent requirements than are contained in the existing Code and the person constructing the well can use his own judgement as to how to meet those standards. If a lower aquifer is to be drilled into, at a site of existing or potential contamination, additional construction, sealing, or casing precautions may have to be taken to prevent cross contamination between aquifers, particularly if the well is to be located in a site which is known to be heavily contaminated. In this instance, the State (administrative authority) reserves to itself the authority to decide whether and how the work can proceed safely, and, if necessary, the State will impose additional restrictions.

7 MCAR § 1.216 D.3. This provision acknowledges the fact that monitoring wells, if they are to serve the intended purpose, will

often have to be drilled in a known zone of contamination. In addition, a properly planned engineering study may specify that monitoring wells be placed at distances which are much closer to the sources of contamination than 7 MCAR § 1.217 C. would otherwise permit.

7 MCAR § 1.216 D.4. This provision serves to remind the person who is drilling a monitoring well that there are certain standards in effect for the materials which can be used in the construction of any well, whether it is a water well or a monitoring well. The use of stainless steel casing is permitted because in some cases of high soil or water acidity, and in instances where organic chemicals are sampled, stainless steel may be the only material available which is both sufficiently strong and impervious, so as not to dissolve into or affect the quality of the water being sampled.

7 MCAR § 1.216 D.5. Since a monitoring well is not to be used as a production well, and is commonly not equipped with a permanent pump, it is not mandatory to know what its yield is. Yield test information is most important to the well owner. However it is useful to the State in providing another data point in the State's groundwater mapping effort. The proposed rule requires that the information be provided to the State only if a yield test is done.

7 MCAR § 1.216 D.6. Since the usefulness of a monitoring well could be diminished if it is disinfected according to the provisions of the existing Well Code, for example, chlorine disinfection may

interfere with detailed chloride analysis, the proposed rule allows for the use of alternate disinfection methods or materials.

7 MCAR § 1.216 D.7. The requirement for venting is eliminated because the wells are not commonly equipped with permanent pumps and it would otherwise be impossible for the wells to be protected as prescribed later in the proposed rule and still be vented. Since protection is much more important over the life of the well than is venting, the venting requirement is eliminated. If the person constructing the well determines that a vent is necessary in a particular installation, the rule does not preclude the use of a vent, as long as adequate protection is still provided.

7 MCAR § 1.216 D.8. Monitoring wells are not usually constructed to provide high or even moderate water yields. The Well Code requirement establishing a two-inch casing size minimum is based on supplying an adequate water yield to the homeowner or consumer. Therefore, the two-inch minimum casing size is restrictive. However, a minimum casing size of one and one-half inches is needed for the deeper, drilled monitoring wells to facilitate adequate well development, sampling, and to allow for proper sealing and abandonment.

7 MCAR § 1.216 E.1. The use of a locked, overlapping cap is required because monitoring wells are typically located in open areas, with no pumps permanently attached to them. Use of the



locked cap will prevent the introduction of foreign materials, either accidentally or deliberately.

7 MCAR § 1.216 E.2. Because these wells are commonly located in areas near or at landfills, industrial sites, etc., they may be subject to damage from vandals or vehicle impact, i.e., snowmobiles, trucks, heavy construction equipment. Since the need for protecting a monitoring well may be dependent upon location, casing materials or local hazards, the driller or engineer is allowed to chose the protective measure which is most appropriate to the situation.

7 MCAR § 1.216 E.2.a. Three posts is the minimum number of posts that will provide a geometrical arrangement which can protect the well from impact on all sides. Four-inch diameter Schedule 40 steel pipe is of sufficient strength to provide impact protection to the well. It is readily available and is commonly used for well construction. Placement of the posts two feet from the well will allow access to the well and still create a spatial arrangement that will protect the well from low speed vehicle impact. The posts should rise four feet above the land surface so they may be visible above ordinary vegetation and snow. The posts need support to hold them in an upright position. Support strength should equal or exceed minimum pipe strength. The posts buried to a depth of four feet into solid ground or, to a depth of two feet if surrounded by concrete, will provide adequate lateral support to hold the posts upright securely. Filling the posts with concrete will prevent the

pipe from filling with rain which could cause corrosion and weaken the pipe. A concrete post without reinforced steel rods provides inadequate strength to protect the well casing. Chemical treatment of wood with a biocidal material is necessary to prevent rotting and weakening of the protective posts.

MCAR § 1.216 E.2.b. Allowing the use of a 12-inch high concrete platform serves a similar protective purpose and can be used in areas where there may be little snow or vegetation.

7 MCAR § 1.216 E.2.c. This provision allows the installer to protect the casing by alternate means. Such flexibility is intended to facilitate compliance with the rule, perhaps at a lower cost.

7 MCAR § 1.216 E.3. This provision allows some flexibility as to which, if any, protective measures have to be undertaken. Protection of monitoring wells increases the cost of a monitoring system. In certain areas where access to motorized vehicles or heavy equipment is prohibited or minimal, damage to the wells is much less likely to occur. Where the wells are frequently inspected or sampled, repair needs will become readily apparent to those in charge of the monitoring program. Such frequent inspection will allow for immediate repairs to be undertaken.

7 MCAR § 1.216 E.4. An over-sized steel casing is necessary to protect the plastic casing from physical or chemical damage, because

plastic casing is much more fragile than steel casing. An overlapping locking steel cap is needed for the outer casing to prevent the entry of water or extraneous matter from entering the space between the inner and outer casing. In addition, the inner casing must be capped to assure that foreign substances do not enter the well.

7 MCAR § 1.216 E.5. Seventy-two hours is considered a reasonable time in which to do whatever may be necessary to bring a damaged well into compliance with the Well Code, while still assuring that contaminants will have very little time in which to enter the casing. If a damaged well cannot be repaired, it is important that it be properly sealed and abandoned to prevent introduction of contamination into the ground water. Seven days represents a reasonable amount of time to accomplish this.

7 MCAR § 1.217 C.4 and 1.218 D. are being repealed because the rule relating to monitoring wells being proposed here includes what would be termed "observation wells". The proposed rule makes no distinction between temporary and permanent wells because such a distinction was difficult to enforce under the existing rule and also because the potential for contamination is greatest at the time of construction. This warrants treating every well as if it were permanent rather than allowing construction by unrestricted methods for "temporary" wells.