



ON-SITE SYSTEMS TECHNICAL REVIEW BOARD SUMMARY OF ACTION



June 12, 2002

Members Present Craig Woolard, PHD, PE, Sharon Minsch, Wes Turner, MD, Joel Neimeyer, PE, Chris Allard, PE

Staff Present: Jim Cross, PE, Sonnet Fleener, Steve Morris PE, DHHS, Jeff Urbanus, DHHS, Keven Kleweno, PE, ADEC, Hallie Stewart, AWWU, Joe Murdy, Director

Guests: Betty Evans, Earl Dotten, AWWA

Chairperson Sharon Minsch called the meeting to order. A motion to approve the summary of action from May was made. It was seconded and approved.

Joe Murdy, Director of Development Services, stopped by and expressed appreciation for the work that is done by the Tech Board.

Annual Report

Jim received comments from Craig and Sharon and will integrate those into a final letter, get Sharon's signature and send it to the assembly. A motion to approve with those changes was made and seconded.

Innovative Code & Contract Status

The changes on the innovative code were finished last month, and it was sent to legal. Jim also sent an e-mail to legal to clarify some of the questions about fees, notification to new owners, and the phrase in the contract that said new owners needed a new contract, but he has not received any answers yet. He hopes to receive the final code and contract by next month.

AWWA Update

Sharon asked Jim to respond to Mr. Sullivan's letter; Jim replied that he would do that after talking with Keven about his meeting with the water well association.

Earl asked if there were any questions about the recommendations they had sent to the board a few months ago. Jim asked if he would go over them again. Earl explained that in response to situations in certain areas of town showing high and increasing nitrate levels over the years, AWWA proposed some recommendations for surface seals that would protect the groundwater resource from contamination from on-site septic systems. AWWA feels the current code is inadequate. It calls for seating the well casing 3-feet into the bedrock and sealing it with bentonite, but doesn't address how that should be done. They felt 3-feet into the rock is meaningless in many instances because bedrock in the Anchorage area is highly fractured, especially in shallow bedrock.

AWWA came to the consensus that they should go with an oversized hole into the bedrock a certain number of feet and then use a bentonite slurry in the annulus. The two main points of concern were how big an annulus, and how deep to go. After much discussion they settled on two methods of grouting with the bentonite slurry. One is to use a tremmy pipe down the annulus itself, and pump from the bottom up. If you use that method, they would recommend a 2-inch annulus all the way around the pipe requiring a 10-inch hole. The other method is to use the 6-inch well casing as a tremmy pipe and push the bentonite down through the bottom and up the outside of the pipe. This would require an 8-inch hole.

Joel asked the definition of shallow bedrock. Earl said that had been discussed at length, and anything from 0 – 100 ft. could be considered shallow bedrock. The AWWA committee felt that if you encountered bedrock prior to 60 feet the dry grout method was sufficient. If you encounter bedrock from 60 feet on, the more advanced grouting techniques should be used. They decided the oversized hole should go into the bedrock a minimum of 20 feet. Every well is different, but that zone is the most fractured. Wells should be a minimum of forty feet grouted, no matter where you hit bedrock. Generally speaking, they felt this should cover all the rotten fractures. He explained the problem with the rotten bedrock in the shallow areas is that septic

systems leach down to the top of the bedrock, get into the fractures, and the fractures go everywhere, not just straight down. The idea of these guidelines is to set parameters to contain some of the contamination and protect the resource, not to solve contamination problems.

Joel asked what the cost to the homeowner would be to use the advanced grouting techniques. Earl answered that it would be \$2500.00 to \$3000.00. Joel asked if there is any information about the percentage of "cure" wells can expect using this method. Earl replied in those areas where retrofits have been done, they have met with significant success and nitrates have diminished significantly or completely gone away. Steve Morris asked how many originals had been done. Earl answered none. He said that no one would pay for this voluntarily but he had a lot of people asking about protection from contamination. Joel asked if this had been done in the lower 48 and if there had been any studies to demonstrate that this would address the nitrate problem. Earl replied that he did not know of any studies but it has been done in other states and AWWA had some recommendations and some regulation changes that happened in Maine and New Hampshire. Joel said he would like to talk to the county or state health departments and ask if they actually measured the results. He would be interested to see if they were successful. If they were, he feels it would give us confidence to ask homeowners to spend an extra \$3000.00.

Jim said that he agreed with Earl but in the latest nitrate study done by Montgomery-Watson, they tried to statistically model an area in Anchorage that would be prone to elevated nitrates by topography, geology, depth to bedrock, and soils. They could not get any correlation. That basically shows that shallow bedrock areas are not more prone to elevated levels of nitrates than other areas. Identifying shallow bedrock and grouting methods with nitrates was not supported in that study. The other thing of note is at the end of the study the USGS was involved and they believed the depth of water entering the well bore was directly related to the elevated nitrates. For example, a 400-foot well has perforations that start at 25 feet, and it has elevated nitrates. If we had funding to follow up, we could put packers in and sample high nitrate wells at different levels and film them to see what the nitrates are at different levels. It would take more study to verify the USGS assumptions.

Sharon said that we have big high producing wells that are not surface water that have high nitrates. Jim said he knows of one well that produces 30 gallons a minute and has high nitrates. Joel said it is possible that the deeper aquifers are already contaminated. Earl agreed and said that the new requirements would begin to separate the upper zones from the deeper water source, and begin to confine contaminants to the upper zone. Jim said we do have a very minimal code requirement for well construction into bedrock. If you hit bedrock at 10-12 feet you only have to drill a couple feet into it and seat your casing and then continue drilling through bedrock until you hit a water-bearing zone. That is very minimal construction when you are discussing contamination. Earl said the actual code wording is "or casing refusal". Jim said yes, you could hit bedrock at 4 feet and meet casing refusal at 5 feet and still have a legal well. Earl continued by saying most other areas in the US have substantially more construction requirements than we have within the Municipality of Anchorage, and certainly in the rest of the state. Craig added that he felt nitrates were just one issue. There is the general concept of sealing the well to prevent surface contamination down the annulus of the well whether it is nitrates or any other type of contaminants. Jim said he hoped everyone understood that when they said nitrates, bacteria and any other type of surface contaminants were included.

Chris Allard asked about the instances where there is deep bedrock. If we are trying to prevent contamination down the annulus shouldn't the same grout methods be used anyway? Earl replied that the current methodology for those circumstances is to use the dry grout method. That is where you take bentonite chips or granules and the six-inch pipe has an oversize drive shoe at the end. That's where (in theory) your annulus comes from. The ¼ or 3/8 inch bentonite chips follow the annulus as you drive the casing down. When the chips are hydrated they swell to 2 ½ - 3 times their common size. Once the bentonite is hydrated it never hardens, it's pliable and it is long lasting, making it the best sealing material. Neat cement has been used in places but it doesn't work nearly as well. The dry grout method has worked well where it has been done properly. It is a very economical method of grouting, and the homeowner has very little extra cost.

Jim said we might consider changing the minimum casing depth in the code so that whether you encounter bedrock or not you have to go to a minimum depth before you perforate. Another question to consider once you encounter bedrock is whether there should be a minimum penetration depth. Do you have to go a minimum of 20 feet in the bedrock and seal that even if you don't encounter bedrock until 150 feet?

Craig asked if the Montgomery Watson report showed the depth to bedrock information for the Anchorage area, and if so, do we have that information. Jim replied that we do. Craig then asked if anyone had looked at how many areas have shallow bedrock. Jim replied that basically on Hillside the further you go up, the more bedrock you will find. Earl added that it varies significantly throughout the Municipality. One lot may

have bedrock at 20 feet, and 2 lots over it may be 100 feet. Joel asked how the driller determines the size of the borehole. If he presumes that the well will be 60 feet and he is drilling six inch and then encounters bedrock, he has to pull it out and set up for an 8-inch borehole. Joel says essentially at that moment you are requiring a homeowner to pay for two wells. Earl said that you are not asking a homeowner to pay for two wells. If a driller says that he is not going to encounter shallow bedrock and then does 35 or 50 feet, he removes the shallow amount of casing, drills the oversize hole and installs 8-inch casing. It is not two wells. Joel said that it is certainly more expensive than to set up and drill just once. Earl replied that there is no way to know where you will encounter bedrock. Jim said that you could require an 8-inch borehole and grout that as standard construction.

Keven asked why we were focusing on the wells at all. We have the Montgomery-Watson study, and we have almost all the source assessments done for the Class A water systems. He feels we should put that information together and determine areas that have high nitrates, then go with improved, additional treatment to the wastewater disposal system. This would take care of the source contamination, instead of worrying about the wells. Earl said it was a good idea but you are only addressing nitrates. Jim said it would address all water-soluble contaminants. Keven said the well is not the source of contamination. In the examples he has worked with in Class C wells, they have gone in and redone the wells, re-grouted, drilled deeper and never found water. They had to go back up to the 25, 30, 40-foot depths, perforate and put in nitrate treatments. When we start looking at all the ramifications, he feels that we should look to the source of the contamination. Jim said that we have done that. The code that will hopefully be done soon gives the Municipality of Anchorage the power to mandate areas that have to use nitrogen reducing septic systems.

Joel asked again what happened in other areas in the US. He would like to know if communities using these techniques found they had value. He feels it should have value, because if you have a lot of wells bringing contamination into an aquifer and on all future wells you prevent that source of contamination, at least you have stopped further contamination. Keven said that in some places along the Kenai River they are using this grouting method because the lower aquifer at one time was artesian, and so they are requiring this technique to keep the pressure up in the lower aquifer, and it keeps the water from the unconfined aquifer from mixing with the confined aquifer.

As a closing comment Earl said there has been some discussion on nitrates as they go through the soil. One of the best things that can happen is that contaminants can get diluted in the shallow aquifers and become less of a problem. It has more opportunity to dilute if you leave the threshold at 60 feet instead of going to the 40 feet. The deeper you protect the more opportunities there are for contaminants to dilute.

Well Ordinance

The Well Ordinance was handed out to the members of the board along with a copy that had comments from Tobben Spurkland and Ted Moore.

Sharon said part of the Well Ordinance we should look at is point of use treatment versus advisory with nitrates, and the arsenic regulations. Jim said one of the things to consider when talking about nitrates, arsenic, and health affects, is the inclusion of the Health Department. Jim needs to meet with Steve Morris and define responsibilities between DSD and DHHS. Craig feels the arsenic and nitrate issues need to be resolved, and the main issue is whether to require some sort of treatment or just notification for advisory purposes. Sharon said that since we were talking about 2 – 3000 dollars for well construction, we should consider the fact that if you are over 10 on nitrates your only options are to drill deeper, which in some instances has been successful, and some not, convert to hauled water, which is 2 – 3000 dollars to install storage tanks and decommission the well, or install a point of use system which is also costly.

Everyone should review the well code and the comments from the engineers, make their own comments, and prepare to discuss it next month.

Sharon asked if Keven, Craig and anyone else who attended the arsenic classes would take some time at the next meeting to present information on arsenic. They agreed and it will be on the agenda next month.

There will be two proposals for innovative systems on the agenda for next month, one by Bob Shafer, and one by Jeff Garness.

The meeting was adjourned