



October 5, 2004

U.S. Army Engineer District, Alaska
P.O. Box 6898
Elmendorf AFB, Alaska 99506-6898

Attn: Mr. Carey Cossaboom

RE: RESPONSE TO LETTER DATED SEPTEMBER 27, 2004

In accordance with your request, I am pleased to respond to your letter dated September 27, 2004. In that letter, you questioned Shannon & Wilson's decision to terminate the "deep" well at Site 26 before reaching the potential "deep" aquifer and also bring attention to the fact that a local resident was not hired for bear protection.

Shannon & Wilson's decision to terminate the "deep" well before the potential confining layer was breached was based on professional judgment which considered the observed subsurface conditions, capabilities of the on-site equipment and personnel, and the hydrologic and environmental implications of failing to maintain separation of the shallow and "deep" aquifer. Based on subsurface conditions at the "shallow" well, a potential confining layer was encountered at about 22 feet below ground surface (bgs), but was not sampled and not known to have been frozen. During the drilling of the deep well, crystalline ice was observed exiting the casing with the cuttings at 18 to 19 feet bgs, at the presumed top of the potential confining layer. A split-spoon sample was driven to 21.5 feet and contained solidly frozen, gray, clayey silt with lenses of gravel/fractured rock. The silt began to flow from the split-spoon as it thawed. These conditions are not suitable for sealing a conductor casing into the silt and maintaining a seal at the conductor casing and around the borehole. The drilling could degrade the permafrost, causing instability of the material surrounding the casing and borehole. A cement/grout seal may not adhere to the frozen soil, may not adequately cure, and the heat of hydration could exacerbate the permafrost degradation. The stability of the formation is necessary to maintain the physical separation of these two aquifers. As the permafrost thaws the stability is lost and the ability to maintain separation of the aquifers and control the potential pressure of the underlying aquifer is lost. The integrity of the confining layer is critical and something that cannot be replaced. Completion of a deep well which may compromise this integrity is not professional and possibly subject to environmental litigation by the landowner. We believe the choice to suspend this well was correct.

It may be argued that the overlying aquifer was not contaminated, so what if the two aquifers commingle? Although the Northeast Cape site has been investigated for 10 years, we understand that the groundwater flow direction has not been determined. The lack of adequate characterization of the groundwater flow direction further supports a "better safe than sorry"

approach in investigating the possible “deep” aquifer. Seasonal fluctuations in groundwater flow direction and groundwater quality are common and, at a minimum, should be characterized before one allows the potential connection of the aquifers to proceed. I asked Discovery Drilling to respond to your letter also. A copy of their response is attached to this letter.

We acknowledge that a local resident was not hired for bear protection. As outlined in our Work Plan, Site Health and Safety Plan, Section 8.2, the situation which would cause us to hire a “bear watch” was the presence of a bear or bears. Local residents reported to our field crew that no bears had been sited this year and no bears were observed during our field activities. Therefore, a “bear watch” was not deemed necessary.

We understand you are considering a contract modification that would de-scope these activities from the scope of work and require an equitable adjustment. Shannon & Wilson and our subcontractor(s) undertook the planning, preparing, and implementation of these tasks. Although the “deep” well was suspended before completion due to a change in conditions and the “bear watch” was not determined to be necessary, we feel an adjustment is not warranted.

I trust this information responds to your questions and concerns. If you have questions or comments, please contact Matt Henry or the undersigned at (907) 561-2120.

Sincerely,

SHANNON & WILSON, INC.



John Spielman, C.P.G.
Delivery Order Manager

Encl: Copy of Response by Discovery Drilling

Discovery Drilling, Inc.
P.O. Box 111165
Anchorage, Alaska 99511-1165

September 28, 2004

Mr. John Spielman
Shannon & Wilson, Inc.
5430 Fairbanks Street, Suite #3
Anchorage, Alaska 99518

Dear Mr. Spielman;

This letter is to provide a response to the letter authored by Mr. Cossaboom, that you forwarded to my attention regarding the scheduled "deep well installation" that did not take place at N.E. Cape during the recently completed field effort. My response is as follows:

As a rule, Discovery Drilling takes very seriously its responsibility to be good stewards of the planets water resources that we come in contact with, be it in the planning or field implementation stages of a project. Before we take actions that may impact water resource quality, flow or location, we consider the implications very carefully. In some instances we will allow certain highly capable and very driven clients of ours to sign off on "being responsible" for actions required of us that might have negative impacts on the water resource. In most cases, even if a client is highly motivated, we will not be a party to poor or questionable decisions that impact the water resource. There are very few things on the planet that are as critical as our water.

In this particular instance, we were asked to pursue placing a well into a (assumed) confined aquifer. It was further (assumed) that it was under pressure, possibly artesian and possibly substantially artesian. We assumed based on other available logs from nearby that the aquitard was a reasonably substantial layer of clay or dense silt (assumed to be unfrozen). No assumptions were made concerning the possible quality of the assumed confined aquifer. It was considered prudent by all parties that I talked with, that a conductor casing be placed into the aquitard to secure the separation of the 2 assumed aquifers, particularly in light of the substantial volume of water in the unconfined aquifer. When we drilled into the aquitard, the material encountered was a frozen mixture of coarse rock, ice and fines. This material in an unfrozen state, is not ideal for seating and sealing a conductor casing. This material in a frozen state poses the high potential for irreparable problems. Frozen, ice rich soils, are only stable if they remain undisturbed and frozen. In the presence of flowing water there is no stability. In the absence of stability there is no controlling flowing water. Doing something like this would be a very questionable thing, if it were here in town with a full range of options and resources at our disposal to deal with whatever might come up. At NE Cape, we have no access to any options or resources whatsoever! It is very easy for others to find fault with our decisions or actions. It would be equally easy for others to find fault with us if we were responsible for having an uncontrolled artesian flow that co-mingled the 2 aquifers, or washed out the hillside creating major erosion and flooding/icing as happened north of Fairbanks in the late 70's or upsetting the pressure balance of the confined aquifer as happened at Gold Hill/ Ester a few years ago. My driller (that has been doing this all his life) was not comfortable with being able to control the possible outcomes and I agree with him 100%. If your clients at the Corp can provide detailed instructions on how the installation should have been handled to eliminate the concerns we had, I may reconsider my judgment. For the moment I personally stand by the decision, to be safe as opposed to sorry, as the right one.

Please call at your convenience if you should have any questions with regard to the above information.

Sincerely,

Kyle Brown
President