

How Different Oil-Gas and Geothermal Wells Cementing

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Abstract

Renewable energy, to which belong a geothermal well drilling, producing hot water for energy and heat generation, becomes quickly more than an idea and enters into our daily routine. Only few years ago spots of enthusiast were drilling for geothermal hot water, whereas presently it becomes a government and economy driven tendency.

There is very popular concept of converting oil and gas wells into geothermal wells, there is also number of wells drilled for hot water and struck the hydrocarbon, there is limited or no guideline for geothermal wells and instead used ones of oil and gas.

If the well is designed for district heating, then possibility of finding oil is there and if aimed deeper for hotter water or steam, then one can hit also a gas.

Well cementing is a critical part of the well construction and well future integrity. Often neglected or not focused enough, this becomes an issue, when the well is not performing as it should, when water leaks all over and still owners have to explain to the authorities and community about what went wrong. Especially when wells are getting closer to the rural areas (geothermal is almost there), the risk of being harmful is progressively increasing.

Do operators know the associated risks? We should remember, that oilfield exists now for over 150 years, whereas the "hype" of geothermal drilling occurs since last 20 years. They obviously cannot have the same level of experience. Most of the parties involved in the geothermal activity are having non-drilling background, e.g. water drillers, funding banks, insurers, municipalities, although the decisions are taken at their level often the most important.

The first recorded oilfield cementing operation was conducted almost 100 years ago. That first operation took place in 1903 when Frank F. Hill with Union Oil Co. mixed and dumped 50 sacks of cement by bailer to shut off water flow in a California oilwell. After 28 days, the cement was drilled out and the well was completed successfully. [1]

The requirement of well geometry may be different, for example, the production casings of oil & gas wells can be smaller than those of geothermal wells, because the geothermal wells require ESP pump chamber, higher pumping rates for economy. Cementing geothermal wells can be less costly, less problematic. There may be more economical cement used, eg. for low temperature district heating. But if en-route of drilling for water, the gas or oil gets hit, then quick plan change can be very expensive.

So how much differences are between oil-gas and geothermal wells with regards to cementing?