From: Bob Carver
To: IPCN Enquiries Mailbox
Subject: Submission Narrabri gas project
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The Santos response does not address the following issues related to Ground water contamination and spills.
Well bores are sealed between zones of interest by cement pumped behind Casing filling the space between the original drilled hole and the casing ran inside that hole.
A significant cause of contamination is migration of gas behind casing due to poor cement not effectively sealing this space.
In oil and gas wells this is a common problem which typically manifests itself by surface pressures or petroleum product in well Annuli that should not have and pressure.

Channels in cement are common and will cause ground water contamination as gas migrates up the well bore behind casing. Once this happens repairs work can be carried out to attempt to seal off any flow behind pipe. This typically is expensive and not 100% certain of shutting off gas migration as well as compromises the original wellbore as holes are required to inject sealing products into the channel. These holes are typically above the production zone so impact the integrity of the well for the rest of its life. Shutting in a well or taking if off production does not stop the migrating gas as it is essentially outside the wellbore.

Electric line Logging is done to Assess the quality of cement coverage behind casing. Do santos intend to run Cement Bond logging campaigns on all wells? Who will determine if the Logging results are successful or if remedial work is needed to repair failed cement jobs? This is typically left to the oil company engineers to determine if further expense is require to repair poor cement behind pipe. Meaning they become the referee. As any log analysis is subjective most times the case is made to not do anything.

These cement channels will create underground spills which cannot be seen unless by monitoring wells. Of course once a monitoring well indicates contamination the damage has already occurred. How will Santos assure that
1. Cementing of well casing strings is adequately assessed?
2. What logging is planned to assess cement?
3. Will logging be on all casing strings and on all wells?
4. On the 8000 wells Santos reference they have successfully completed how many of these wells have surface pressure on Annuli that should have zero pressure? (indicating migration behind pipe)

There are many techniques to improve cement bonding and placement. Centralisation, gas tight additives in the cement, cement slurries with accelerated thickening times often referred to right hand set slurries, Reciprocation and rotation of Casing pipe during the cementing operation to list a few. All are subject to implementation practices which vary greatly in the discipline Applied During execution.

On low cost wells such as the Narrabri wells will need to be, Cementing and cement evaluation costs will be trimmed as much as possible. Putting the ground water Tables at risk of contamination. What costs are built into the project economics per well for
Cementing?
Cement evaluation?
Remedial repair of poor cement or failed cement?

Thank you
Robert Carver.

Sent from my iPad