



Douglas A. Ducey
Governor

State of Arizona
Oil and Gas Conservation Commission

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Dennis L. Turner, Oil and Gas Administrator

Commissioners:
Frank Thorwald, Chair
J. Dale Nations, Ph.D., Vice Chair
Stephen R. Cooper
William C. Feyerabend

MINUTES OF MEETING
JULY 17, 2020

PRESENT

Mr. Frank Thorwald,	Chairman, Arizona Oil & Gas Conservation Commission (AOGCC)
Dr. Dale Nations,	AOGCC Vice Chairman
Mr. Bill Feyerabend,	AOGCC Member
Mr. Stephen Cooper,	AOGCC Member
Mr. Jay Skardon,	AOGCC Counsel, Office of the Attorney General
Mr. Dennis Turner,	AOGCC Program Administrator
Ms. Marta Hodan,	AOGCC Program Administrator
Ms. Tawnya Cook,	Arizona Department of Environmental Quality (ADEQ)

CALL TO ORDER

Mr. Thorwald called the AOGCC Meeting of July 17, 2020 to order at 1:09 pm via virtual meeting at the Arizona Department of Environmental Quality (ADEQ), Phoenix, Arizona. No one reported any conflicts of interest and the roll call confirmed a sufficient number were present for a quorum.

DISCUSSION AND APPROVAL OF MEETING MINUTES

Mr. Feyerabend moved, seconded by Mr. Thorwald, that:

THE MINUTES OF MAY 15, 2020 PUBLIC MEETING BE ACCEPTED AS PRESENTED

Motion carried unanimously.

Mr. Feyerabend moved, seconded by Mr. Cooper, that:

THE MINUTES OF MAY 15, 2020 DESERT MOUNTAIN ENERGY SPACING EXCEPTION PUBLIC HEARING BE ACCEPTED AS PRESENTED

Motion carried unanimously.

HALLIBURTON VIRTUAL PRESENTATION ON WELL CEMENTING PRINCIPLES (3:07)

Mr. Todd Ennenga, Director of Government Affairs for Haliburton introduced Mr. Simon Turton, Global Tech Advisor and expert on cementing well principals with Haliburton, to present on well cementing principles.

The presentation began with a brief history of cement and then explained the purpose of cementing oil & gas wells. Cementation restricts fluid movement between formations to provide isolation of fresh water aquifers. Additionally, it bonds and supports casing to protect from corrosion and shock loads from drilling and/or seals off loss circulation zones and helps prevent well control incidents. Types of cement commonly used in the U.S. include Poz/Portland Blend Cement and foamed cement.

Different categories of salts include static salts, plastic salts, and polyhalite salts. Static salts are immobile and potential problems can arise if the liquid cement causes salt to dissolve into the cement slurry. Plastic salts are mobile, therefore if it dissolves it will move back in and fill up any micro annuli or areas that may have been dissolved. These types of salts cause stresses on the cement sheath and the annulus and the tubulars inside the well. Haliburton has a program called Well Life that will allow them to model and come up with mechanical properties that would be needed for the cement to withstand the stresses the flowing salt may impose on the annulus. The last category of salts are overpressure rafts – polyhalite salts. This is a magnesium based brine which will contaminate the cement, which then creates a substance so thick that it is basically immobile, which will lead to an early termination of the job.

There are available options when cementing through static salts. 1-10% NaCl will shorten the transition time for initial compressive strength. 10-18% has less effect on the transition time and initial compressive strength development. 18-37% increases the transition time and delays the initial compressive strength. Haliburton's product Salt Shield will allow cementing through tacky hydrite or magnesium chloride situation. An alternative to NaCl is KCl. KCl is much easier to control slurry properties and can provide some protection against formation salt dissolution. There is the potential for washouts or formation salt leaching, which can possibly affect the slurry.

One of the biggest challenges in oil & gas well cement design is to deliver dependable barriers. Annular pressure buildup can be put in two categories short term or long term. In the short-term category, there is the potential loss of overbalance pressure. In the long-term category, the

hydrocarbon migration can occur after the cement job has been completed and considered successful.

The types of annular gas migration and the four flow mechanisms were discussed. One of the leading causes of a poor cement job, or gas flow, is poor mud removal prior to cementation. Halliburton's best practice for proper cementation is called CAMPS. **Centralization** – how well the pipe is positioned in the open hole; **Annular Fluid Velocity** – the faster you pump, the more turbulence created in the annulus and the more efficient displacement of the fluid ahead; **Mud Conditioning** – the cement job must be designed for the correct mud properties, if the properties have changed, it could be ineffective at displacing fluid and ensure well is properly conditioned; **Pipe Mechanical Aids** – the movement of the pipe, either pull the pipe in and out of the well as it is being cemented or rotate it at 25 RPM; **Spacers and Flushes** – choose the right spacer package for the type of mud.

The best practices of micro-annular flow, include avoiding pressure tests at the wrong time, casing should be tested either as soon as the plug is bumped or once cement is fully set. The transmission of hydrostatic pressure as cement sets is important to understand, as cement sets in 4 stages. As a fluid, cement can exert full hydrostatic pressure on the formation, keeping it under control.

Hydrostatic pressure is lost on the formation as the cement gels. Once the cement sets, nothing will flow through it. When the hydrostatic pressure becomes equivalent to the formation pressure it is called critical static gel strength. The area of concern for transmission of hydrostatic pressure is gas flow. Gas flow area is measured in the lab by machine. There are different ways to calculate hydrostatic pressure loss due to static gel strength development and flow potential factor. The area of concern in the flow factor scale is anything from 8-15, which is severe. If greater than 15, redesign is needed. When designing plug & abandonment, best practices to consider include a non-shrinking design, the plug base, stinger size, fluid separation, plug setting tools, displacement calculations, restoring cap rock and temperature.

Halliburton uses the iCem Service predictive design tool for modelling and prediction. WellLife Cement software helps evaluate if a given cement formulation will last for the life of the well. Halliburton has various cementing additives to offer.

Post presentation discussion: Dr. Nations stated that much of what was discussed has to do with petroleum production and would not relate directly to the gasses in the Holbrook Basin and asked how cementing these wells would be approached. Mr. Thorwald clarified what types of gasses are found in Arizona. In the Holbrook Basin there is a very high salt content. Mr. Turton stated that gas would permeate through cement faster than oil will. Gas well cementing really presents a lot more consideration than an oil well, so best practices should be used. Mr. Thorwald stated that we have a very high salt content in the water here, is there anything specific that has to be done specifically to address this. Mr. Turton explained that they would first analyze the type of salt, and then look to reduce the permeability of the cement. For example, latex additives would be beneficial to protect the metal tubulars from any kind of corrosion. Mr. Thorwald then asked if Mr. Turton recommends any particular kind of tubular coating to protect the tubes from both the corrosion and acid. Mr. Turton replied that he isn't an expert on this, as they don't supply that. Mr. Feyerabend suggested a tool that would help with cementing wells in Arizona, as they are shallower than most other wells. Mr. Turton recommended using the "CAMPS" best practice method.

ARIZONA ENERGY PARTNERS (AEP) 16-1 (1:07:24)

Mr. Turner gave a brief background on Arizona Energy Partners 16-1. On July 15th data was received regarding perforations, demonstrating beneficial use. Mr. Turner recommended to the Commission that they opt for one of two approaches to continue temporary abandonment status. Mr. Turner turned it over to the Commission for discussion and a vote. Dr. Nations stated that he feels the data presented adequately supports reason for temporary abandonment. No representatives from Arizona Energy Partners are on the call. There was discussion around the extension and from what date it would be extended.

Dr. Nations moved, seconded by Mr. Feyerabend to:

GRANT TEMPORARY ABANDONMENT STATUS FOR 1-YEAR FROM AUGUST 13, 2020

Motion carried unanimously.

RARE EARTH EXPLORATION LLC 12-1 STATE AND 28-1 STATE (1:12:51)

Mr. Turner provided a brief background on Rare Earth Exploration 12-1 and 28-1 State. Mr. Turner already had a plug and abandonment application for 12-1 and appears to have a complete application for 28-1, he just needs to review and make sure. If it is approved, both 12-1 and 28-1 can be plugged and abandoned. Mr. Brad Haycraft asked the Commission if it would be possible to give him a short extension so that he can move his own rig to plug the well, as the cost of plugging in Arizona is very expensive. Mr. Haycraft is asking for 30 days at the most, through August 30th if possible.

Dr. Nations moved, seconded by Mr. Thorwald to:

APPROVE THE DELAY OF THE PLUG & ABANDON ORDER FOR A PERIOD OF ONE MONTH FROM 7/31/2020 TO 8/30/2020

Motion carried unanimously.

Mr. Haycraft gave an update on Rare Earth's future drilling plans – 2 prospects trying to get started drilling at least by the end of the year. One well is east of the town of Woodruff. Another well in the beginning stages is up in Navajo County, east of Holbrook.

REPORT BY THE OIL AND GAS ADMINISTRATOR

Pollard Helium 36-1: Mr. Turner has been in communication with the bond company to let them know that we will be moving ahead. The bond company is interested in having control over the say of who might be doing the plug and abandonment of the well. Mr. Turner indicated that there is a company operating in the area that can likely do the job, so he will send the insurance company more details on how to contact Pollard Helium. Mr. Thorwald asked if Mr. Turner had heard any word from Pollard Helium. Mr. Turner said he has not.

Pinta South Operating Company: Mr. Turner has received a few more permits since the last meeting – they have actually maxed out their bond on the 10 drilling permits they have. Drilling has been suspended on a couple of their wells. Mr. Wesley Marshall of Pinta South Operating Company stated that they will be drilling some more wells and sending in another performance bond for \$25,000 to do more wells. Mr. Turner asked what the plans are for the wells that they have finished drilling. Mr. Marshall explained they are waiting on the geologist to finish up going through all the rocks and will work with Mr. Turner in regards to the 60 day time.

Desert Mountain Energy: Has obtained the permits and drilled two wells. Mr. Robert Rohlfing of Desert Mountain Energy informed the Commission that they had completed both wells as of that day. Mr. Rohlfing explained that in the first well they drilled they encountered numerous highly porous freshwater zones with low ph, so they made the decision to individually cement and isolate each individual zone if it was greater than 10 feet in thickness. On the 1st well in-between zones 3 and 4 there was very high alkaline. They made a decision and squeezed 548 sacks of cement into that zone. On the second well there were some very interesting flow rates. These wells should be completed in about a month. They are also looking to drill one or two more wells in the 4th quarter of this year.

Prize Energy Resources, Inc.: Will be public noticing their aquifer protection permit that resembles Ranger Development's from about 2 years ago.

Lean Performance Board: This is an on-going program to develop something that can be viewed online rather than having to physically be in the office at ADEQ. There will be a performance board and a flow board that the Commissioners will be able to access online using Trello. The Administrator will be showing the Commissioners in the future how to look at progress of what is going on.

Introduce new Oil & Gas Administrator: Ms. Marta Hodan is the new Administrator replacing Mr. Turner. Ms. Hodan will be the point of contact moving forward, as Mr. Turner will be leaving at the end of August. Mr. Turner gave a brief background of Ms. Hodan's professional experience and education regarding oil & gas.

REPORT BY THE AOGCC CHAIRMAN

Coconino Plateau Water Advisory Council: Dr. Nations and Mr. Thorwald and staff from ADEQ are working on some follow-up questions.

Legislation: No legislation going on right now. Continuing to try and reach out to legislators in both the Senate and the House, with not a lot of luck. Mr. Thorwald will continue to try and reach out so he can give them correct information so they can make a wise decision.

Website redesign: Mr. Thorwald has a meeting on Monday with the Communications staff. They are going to be adding a section on a newsletter that talks about helium in Arizona. Additional links will be added to provide various updates and communications, videos and information about each Commissioner.

Web portal: This is separate from the website redesign. Still in the works on the automation process as well as getting IT bid specs. Dr. Nations suggested providing information for land owners and how their property might be affected when there is a company coming in and leasing property and obtaining oil & gas leases. Mr. Thorwald informed him that is one of the areas they are looking to add.

Budget: Mr. Thorwald has been involved with budget discussions with ADEQ and been given budget estimates. It is subject to change given changes to financial status with the State as well as with COVID19. There is a certain amount of money expected to be set aside for the portal work. Mr. Thorwald also stated we are looking at a variety of other ways to potentially raise additional funds to finish up all the other work sooner rather than later.

Rules update: Mr. Turner, Ms. Hodan and Mr. Thorwald participated in a Governor’s Regulatory Review Council (GRRC) training session on rules updates, 5-year reports to be able to move forward. Still missing information from IOGCC due to the virus, but hopefully they will get that soon and still be able to get this in before the end of the year.

Procedures manual/ SOPs: With Ms. Hodan on board, Mr. Turner can focus on getting these done. Ms. Hodan will take over whatever Mr. Turner cannot finish.

Legislation affecting the Arizona Oil and Gas Conservation Commission: Nothing going on right now that affects the Commission.

CALL TO THE PUBLIC

Mr. Robert Rohlifing commented that he feels there needs to be caution & review before adopting a policy of notifying the public when a company is looking to lease land and obtaining oil & gas permits.

ADJOURN

Dr. Nations moved, seconded by Mr. Thorwald that:

THE MEETING BE ADJOURNED

Motion carried unanimously. The meeting was adjourned at 3:01 p.m.

REVIEWED



 FRANK THORWALD
 CHAIRMAN

9/25/2020

 DATE

Jim Ballard	Wesley Marshall, Pro Helium
Katherine Ball	Patrick Kane
Simon Turton, Haliburton	Lisa Atkins
Todd Ennenga, Haliburton	Robert Rohlifing, Desert Mountain Energy
David Haag, AZ State Land	Scott Bowles, Cobalt Group
Brad Haycraft, Rare Earth Exploration	Joe Dixon