

**NOTICE TO OPERATORS DRILLING MESAVERDE GROUP
OR DEEPER WELLS IN THE MAMM CREEK FIELD AREA
IN GARFIELD COUNTY
WELL CEMENTING PROCEDURE AND REPORTING REQUIREMENTS**

July 23, 2004

Revised February 9, 2007 and April 25, 2018

This Notice to Operators was developed considering information that was included in the March 10, 2006 report on the Phase I Hydrogeologic Characterization of the Mamm Creek Field Area in Garfield County as well as other pertinent information regarding the prudent drilling of oil and gas wells in the Mamm Creek Field Area.

Until further notice, the following conditions shall be attached to all approved Permits-to-Drill for all Mesaverde Group or deeper wells in the Mamm Creek Field, Garfield County:

1. The Mamm Creek Field Area is defined as follows:
 - Township 6 South, Ranges 91-93 West, 6th P.M.
 - Township 7 South, Ranges 91-93 West, 6th P.M.
 - Township 8 South, Ranges 91-93 West, 6th P.M.
 - Township 9 South, Range 91 West, 6th P.M.
2. Wells shall be required to be cemented as specified in conditions of approval on the permit.
 - a. The cement coverage shall be verified with a cement bond log.
 - b. The cement compressive strength for all cement slurries used to cement the production casing shall be sufficient to meet the requirements of Rule 317. i. and allow the cement to be easily identified with the use of a cement bond log (CBL).
3. A drilling prognosis showing projected top of gas and formation tops shall be required with the Application for Permit-to-Drill Form 2. This information shall be provided in the form of a wellbore diagram showing the top of gas, formation tops, and top of cement for each stage.

Procedure and Reporting Changes:

1. Upon completion of the primary cementing operation, the annular fluid level around the production casing shall be monitored for a minimum of 4 hours prior to the installation of the casing slips. This requirement may also be met by setting the casing slips immediately after cementing and maintaining the ability to monitor the annular fluid level and keep the hole full. The amount of mud that is used to keep the hole full shall be recorded. If mud volumes in excess of twenty (20) barrels are necessary to keep the hole full, the loss of fluid shall be reported to the COGCC immediately. The record of the mud volume needed to keep the hole full shall be included on the Sundry Notice, Form 4 requesting approval to complete the well.
2. The bradenhead pressure shall be measured at intervals of 6, 12, 24, 48 and 72 hours after the production casing is cemented. If bradenhead pressures greater than one hundred fifty (150) psig are observed, such pressures shall be immediately

reported to the COGCC and a remediation procedure shall be prepared for COGCC approval.

3. Following the cementing operation, a combination temperature/cement bond log shall be run within 12 to 48 hours to locate the actual cement top. If the cement top does not meet the requirements of this Notice to Operators, the COGCC shall be immediately notified and a remediation procedure shall be prepared for COGCC approval. Running the CBL may be delayed if a temperature survey is conducted within 6 to 48 hours of cementing and if the operator monitors the bradenhead pressure on a daily basis after the initial 72 hour period on all wells on the pad until the CBL is run. If the option of delaying the running of the CBL is chosen, the results of the temperature survey and the bradenhead monitoring shall be reported via e-mail to the COGCC West Region Engineering Supervisor within 7 days of cementing. If bradenhead pressures greater than one hundred fifty (150) psig are observed during the extended monitoring period it shall be immediately reported to the COGCC and a remediation procedure shall be prepared for COGCC approval. The operator shall maintain the ability to immediately and safely commence remedial cementing operations if needed.

NOTE:

The option of deferring the running of the CBL beyond 48 hours is not allowed in the below-defined East Mamm Creek Area. The CBL shall be run within 12 to 48 hours within the East Mamm Creek Area.

4. The East Mamm Creek Area within the Mamm Creek Field is described as follows:

Township 6 South, Range 92 West 6th P.M.

Section 33: E $\frac{1}{2}$

Section 34: S $\frac{1}{2}$ NW $\frac{1}{4}$, S $\frac{1}{2}$

Section 35: S $\frac{1}{2}$ SW $\frac{1}{4}$

Township 7 South, Range 92 West

Section 1: S $\frac{1}{2}$ SW $\frac{1}{4}$

Section 2 and 3: All

Section 4: N $\frac{1}{2}$ SE $\frac{1}{4}$, Lots 1 and 2

Section 10: N $\frac{1}{2}$ NE $\frac{1}{4}$

Section 11: N $\frac{1}{2}$, N $\frac{1}{2}$ NE $\frac{1}{4}$

Section 12: W $\frac{1}{2}$

Operators drilling within the East Mamm Creek Area are required to follow the general procedures described above and the special procedures described in 4.a. through g. below:

- a. An operator may use only one (1) rig at a time to drill that operator's first five (5) wells within the East Mamm Creek Area. If the first five (5) wells are drilled without incident, then the operator may request approval from the Director to use two (2) rigs at a time. No more than two (2) rigs shall be used by an operator in the East Mamm Creek Area.

b. Surface casing shall be set at a depth equivalent to 15% of the proposed total depth of the well, or five hundred (500) feet below the depth of any water well within a one (1) mile radius, whichever is greater, and shall be cemented to surface.

c. Operators shall perform a Formation Integrity Test (FIT) at least fifty (50) feet below the surface casing shoe. The test shall be performed to an equivalent mud weight of 13.0 pounds per gallon (ppg). A loss of more than 10% of the surface pressure applied to perform the test, in a 15 minute time period, shall constitute failure. Failed FIT's shall be reported to the COGCC staff immediately. COGCC staff shall be notified at least 8 hours in advance of the test to allow them the opportunity to witness it. The results of the test shall be reported on the Form 4 Sundry Notice Request to Complete and noted on the wellbore schematic that accompanies the Form 4. The FIT report shall include the depth of the test, the mud weight, the initial and final surface pressures and the equivalent mud weight.

d. If the well bore does not test to the equivalent of mud weight of 13.0 ppg during the above noted FIT, the operator shall be required to set intermediate casing at a depth at least fifty (50) feet below the top of the Mesaverde Formation. The intermediate casing shall be cemented to a height of at least five hundred (500) feet above the depth of the intermediate casing shoe if no kicks have been encountered in the Wasatch Formation. If kicks have been encountered in the Wasatch Formation the top of cement shall be adjusted to comply with Rule 317.i. and to cover all gas bearing intervals. If intermediate casing is necessary, the requirement to obtain a temperature survey and cement bond log on the production casing within a 12 to 48 hour period following the cementing of the production casing shall not apply. The operator shall obtain COGCC staff approval to complete the well prior to conducting completion operations.

e. All drilling rig employees shall have adequate understanding of and be able to operate the blowout prevention system. Well control training for blowout prevention shall be required for at least one (1) person at the well site during drilling operations.

f. Choke pressures during well control operations shall be restricted to levels that will not cause the maximum wellbore integrity demonstrated by the FIT to be exceeded. As a precautionary measure, if the choke pressure exceeds the surface pressure used to determine wellbore integrity during the FIT, it shall be immediately reported to the COGCC staff and the operator shall submit a report of the well control event on a Sundry Notice, Form 4 within 24 hours. The report shall include the following information:

- date and time of the event,
- total depth of the well at the time of the event,
- surface casing depth, size and cementing data,
- type of kick (gas, water, or oil),

- shut in drill pipe pressure, shut in casing pressure, or any other pressure measurement or information used to determine the mud weight required to control the kick,
- initial mud weight at the time of the event,
- pit gain volume,
- mud weight required to control the kick,
- maximum choke pressure that occurred while circulating out the kick,
- any indication of fluids migrating outside of the surface casing (surface expression, etc.),
- a narrative description of the well control event and current condition of the well.

g. In addition to the bradenhead pressure measurement requirements in the entire Mamm Creek Field Area, in the East Mamm Creek Area the bradenhead pressure of each well on a pad shall be monitored daily until 30 days following the cementing of the production casing of the last well on the pad. Following that, the bradenhead pressures shall be monitored monthly for the following 12 month period. If bradenhead pressures greater than one hundred fifty (150) psig are observed, such pressures shall be immediately reported to the COGCC and a remediation procedure shall be prepared for COGCC approval. These requirements shall also apply to monitoring intermediate casing pressure if intermediate casing is required.

5. Prior to completion of the well, the bradenhead pressure record, cement bond log, temperature survey log, and revised formation tops shall be provided to the COGCC West Region Engineering Supervisor along with a Sundry Notice, Form 4 requesting approval to complete the well.
6. All information shall be submitted electronically via e-mail to the West Region Engineering Supervisor. A separate e-mail with the required attachments, provided in the required format, shall be sent for each well.

The attachments shall include the following:

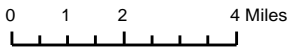
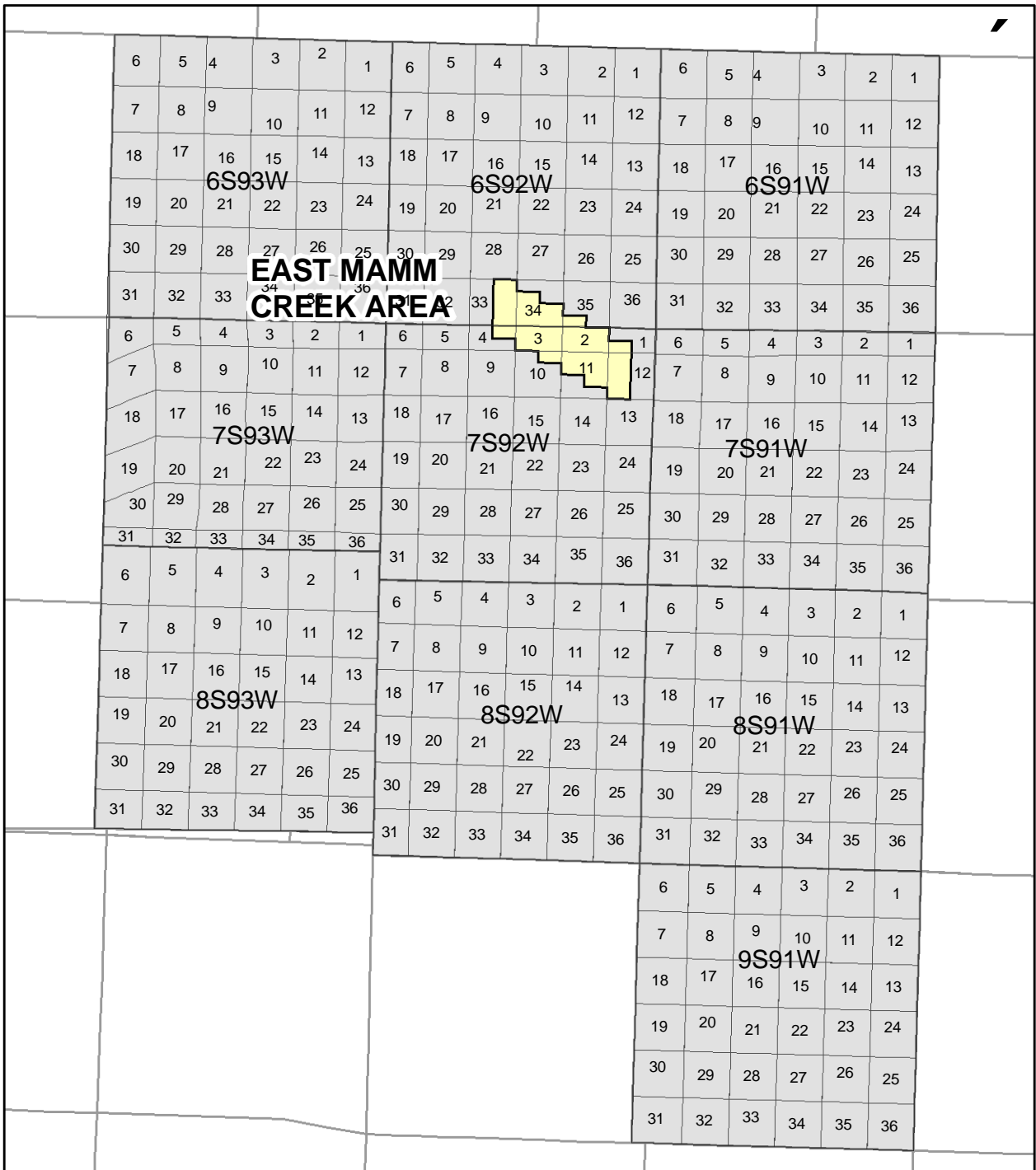
- a.) Results of the FIT and the final mud weight.
- b.) A CBL with temperature survey in *.pdf or Schlumberger format.
- c.) A Sundry Notice, Form 4 requesting approval to complete the well stating the well has been successfully cemented according to the approved plan.
- d.) A summary of the bradenhead pressure measurements.
- e.) A wellbore diagram with the as-built cement tops, formation tops, top of gas, casing shoes etc.
- f.) A temperature survey in a single page format.

7. The COGCC shall review the casing and cementing operations and approval shall be obtained by the operator from the COGCC prior to commencement of completion operations on all wells in the field.
8. The bradenhead pressure shall be monitored and recorded when performing fracturing operations. If intermediate casing is set, then the intermediate casing pressure shall also be monitored and recorded.

The West Region Engineering Supervisor is: Craig Burger Office (970) 625-2497 ext
2 Cell (970) 319-4194 e-mail: craig.burger@state.co.us

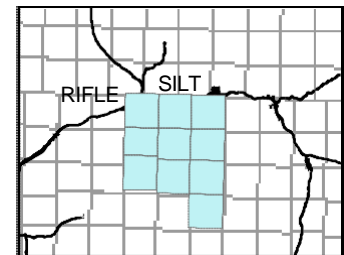
Change Date	Description of Changes
July 23, 2004	Document Created
February 9, 2007	Revised
April 25, 2018	Revised contact information

See map below:



Legend

- Lands Under the Mamm Creek Field Notice to Operators



VICINITY MAP

**NOTICE TO OPERATORS IN MAMM CREEK FIELD AREA
GARFIELD COUNTY, COLORADO**