Bob Anthony
Commissioner

Todd Hiett
Commissioner

Dana Murphy
Commissioner

OKLAHOMA
Corporation Commission

P.O. BOX 52000
OKLAHOMA CITY OKLAHOMA 73152-2000

255 Jim Thorpe Building
Telephone: (405)521-2302
FAX: (405)521-3099

OIL & GAS CONSERVATION DIVISION

Tim Baker, Director

March 25, 2015

MEDIA ADVISORY – ONGOING OCC EARTHQUAKE RESPONSE

The Oklahoma Corporation Commission's Oil and Gas Conservation Division (OGCD) has issued new directives to disposal well operators in Oklahoma as part of the continuing evolution of the agency's induced seismicity "traffic light" system.

Under the new directives, disposal well operators in "Areas Of Interest" that inject into the Arbuckle formation have until April 18, 2015 to prove to the OGCD that the disposal well is not injecting below the Arbuckle formation. There is broad agreement among seismologists that injecting below the Arbuckle poses a potential risk of causing earthquakes, as it puts the well in communication with the solid "basement" rock.

Operators who cannot show the well is not below the Arbuckle and who do not have an approved plugging plan will be required to reduce their disposed volume by 50 percent.

The directive applies to 347 of the approximately 900 Arbuckle disposal wells in Oklahoma.

At the same time, the definition of "Area Of Interest" (AOI) is evolving to include "seismic swarms."

a. "Swarm" is defined as an area consisting of at least two (2) events with epicenters within .25 miles of one another, with at least one (1) event with a magnitude 3.0 or higher.

b. Area Of Interest is a ten (10) kilometers area (approximately six miles) with the central mass of the swarm serving as the area center.

Previously, a 10 kilometer circle around a 4.0 magnitude earthquake constituted an AOI. The change is expected to more than double the number of disposal wells with an area of interest.

The "traffic light" system was first put in place in 2013 in response to the concerns over the possibility of earthquake activity being caused by oil and gas wastewater disposal wells in Oklahoma. It has been in a state of constant evolution since then, as new data becomes available.

(more)

(Earthquake response, pg. 2.)

Other elements of the traffic light system include:

- The "yellow light" permitting program that requires seismicity review for any proposed disposal well and requires special permitting based on seismicity concerns to any well:
    - proposed within 3 miles of a stressed fault, even in the absence of seismicity
    - proposed within 6 miles (10 kilometers) of an earthquake "swarm" or magnitude 4.0 event
- Rules increasing from monthly to daily the required recording of well pressure and volume from disposal wells that dispose into the Arbuckle formation (the state's deepest injection formation).
- Rules requiring Mechanical Integrity Tests for wells disposing of volumes of 20,000 barrels a day or more have increased from once every five years to every year, or more often if so directed by the Commission.
- Full review of disposal well operations in an Area of Interest

None of these elements should in any way be viewed as a final step. The traffic light system will continue to evolve.

-OCC-

All OCC advisories and releases are available at www.occeweb.com

Editors, Producers: See attached letter to operators, maps

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OIL & GAS CONSERVATION DIVISION

Tim Baker, Director

March 18, 2015

RE: Wells located within Areas Of Interest for Induced Seismicity

Your company has been identified as operating one or more Arbuckle disposal well(s) located within one or more of the Oil and Gas Conservation Division's (OGCD) Areas Of Interest for induced seismicity. A map of the Areas Of Interest is available at www.occeweb.com under "Hot Topics."

As part of the continued evolution of the OGCD's "traffic light" system in regards to induced seismicity, delineation of **Areas Of Interest** now includes "**seismic swarms**."

a. "Swarm" is defined as an area consisting of at least two (2) events with epicenters within .25 miles of one another, with at least one (1) event with a magnitude 3.0 or higher.
b. Area Of Interest is a ten (10) kilometers area (approximately six miles) with the central mass of the swarm serving as the area center.

As you are aware, Oklahoma has experienced a dramatic increase in the number of earthquakes over the past few years. There is general agreement among seismologists that fluid disposal into or in communication with the crystalline basement rock presents a potential risk for induced seismicity. As part of the effort to reduce this risk, the OGCD is directing you establish that your well(s) listed on the attached page are not disposing into or in communication with the crystalline basement rock. Wells disposing into the Reagan Sand or Granite Wash are considered to be in communication with the crystalline basement rock. All wells found to be in contact or communication with the crystalline basement rock must be plugged back. To be in compliance with this directive, the following criteria have been established:

A. The following criteria have been established as sufficient information to satisfy the OGCD that a well is not in contact or communication with the crystalline basement rock:
   1) Driller's logs, gamma ray logs, and formation evaluation logs.
   2) If logs need to be run, a gamma ray log to total depth will be acceptable.
   3) Additional evaluation processes are possible, but must be approved by OGCD.

B. The following criteria has been established for wells that will be required to plug back:
   1) Plug back procedures and a plugging schedule must be approved by the OGCD.
      a. A well is not allowed to dispose an amount that exceeds the actual annual average total disposal volume while an approved plugging schedule is in effect.
   2) The appropriate OGCD District Office must be contacted to allow a field inspector to witness the plug back procedures.
   3) Before and after plug back, a measurement consisting of a static water level within the well measured by four (4) similar fluid level shots at 15 minute intervals must be taken.
   4) After plugging operations are completed, the daily reports must be submitted to and approved by OGCD to obtain final approval.

Operators will have until April 18th, 2015, to satisfy the criteria set forth above. After this date all disposal wells not meeting the criteria must reduce their volumes by fifty percent (50%). The 50% reduction will be based on the annual volume reported on the OCC Form 1012 Fluid Injection Report. All wells shall be allowed a minimum disposal of 1,000 bbls per day. Once the OGCD has found the well(s) to be in compliance with this directive, normal operations will be allowed to resume.

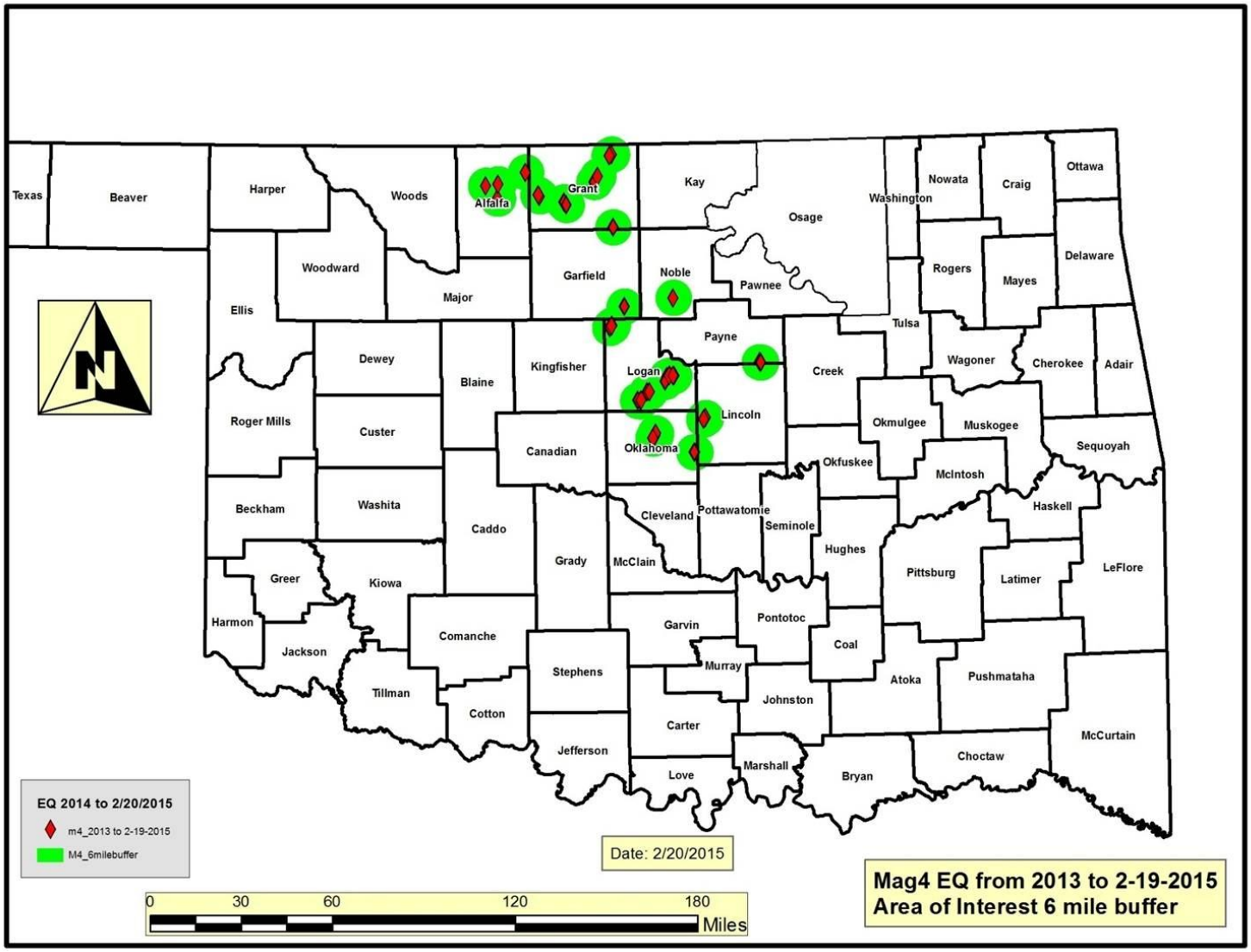
If you are not already doing so, within seven (7) days of receipt of this letter you must begin daily recording and weekly reporting to OGCD of the well volume(s) and pressure(s). The new email address for reporting volumes is ogvolumes@occemail.com. Contact Charles Lord (405-522-2751 or c.lord@occemail.com) if you are not currently reporting, or if you have any other questions about these directives.

Thank you in advance for your cooperation and attention to the directives set forth in this letter.

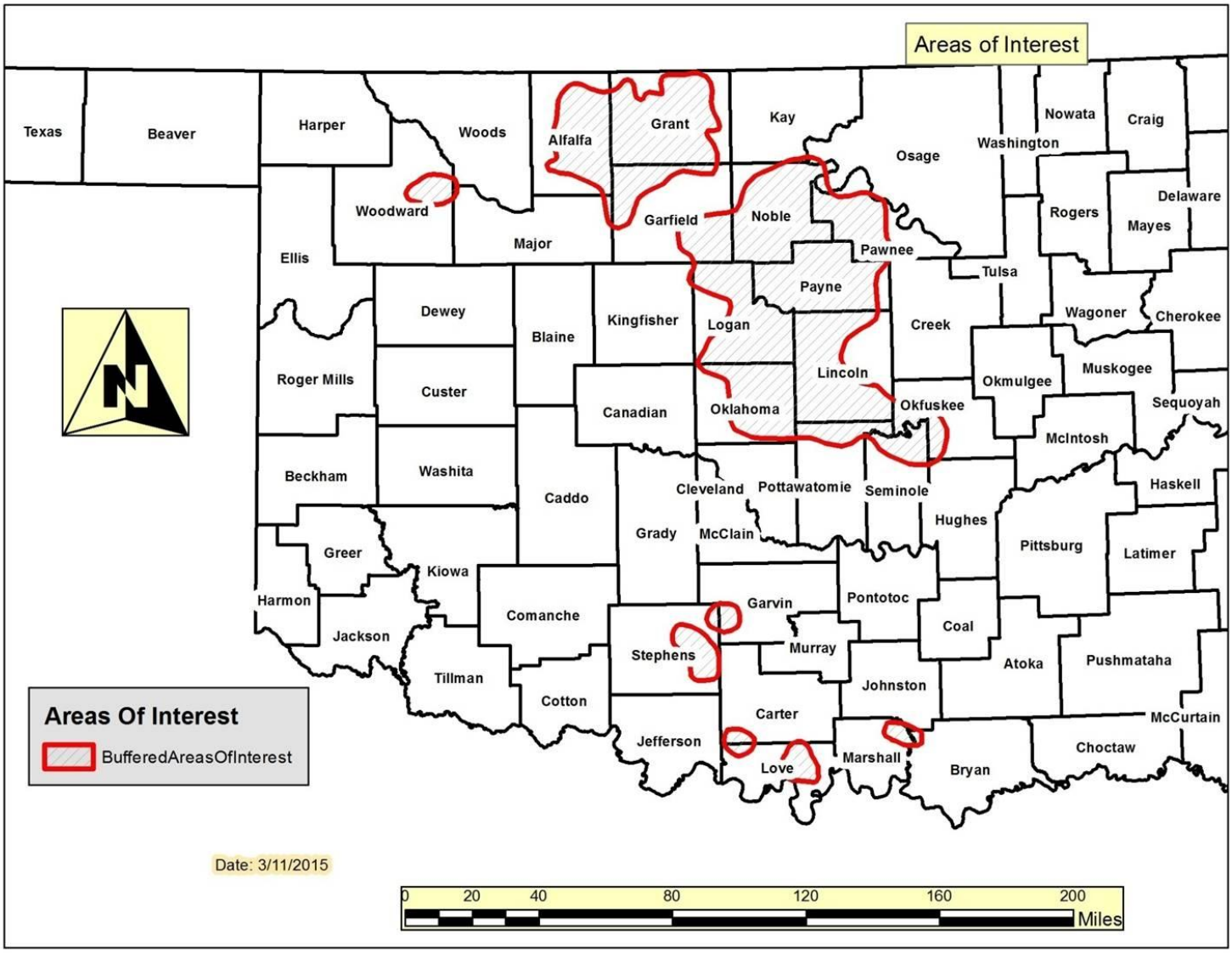
Sincerely,

Tim Baker, Director
Oil and Gas Conservation Division

Enclosures: Well List



Previous Areas of Interest Map



New Areas of Interest Map