

**OIL AND GAS DOCKET NO. 10-0251513**

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**THE APPLICATION OF NEWFIELD EXPLORATION MID-CONTINENT, INC. TO INJECT  
FLUID INTO A RESERVOIR NOT PRODUCTIVE OF OIL OR GAS, BRITT, THOMAS  
LEASE WELL NO. 106, ALLISON-BRITT (12350) FIELD, WHEELER COUNTY, TEXAS**

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**HEARD BY:** Andres J. Trevino P.E., Technical Examiner  
Marshall Enquist, Hearings Examiner

**APPEARANCES:**

**APPLICANT:**

Jamie Nielson  
Kerry Pollard  
Fernando Lorenzo  
Steve Towns  
Steve Tipton  
Eric Hillerman

**REPRESENTING:**

Newfield Exploration Mid- Continent, Inc.

**PROTESTANTS:**

Glenn Johnson  
Wayman Gore  
Dr. Rex McLellan  
Dr. Gary Wooley

Chesapeake Operating, Inc.

**OBSERVER:**

Paul Tough

**PROCEDURAL HISTORY**

Application Filed:	April 17, 2007
Request for Hearing:	April 5, 2007
Notice of Hearing:	May 16, 2007
Date of Hearing:	July 17, 2007
Transcript Received:	August 22, 2007
Proposal For Decision Issued:	April 11, 2008

**EXAMINERS' REPORT AND PROPOSAL FOR DECISION****STATEMENT OF THE CASE**

Newfield Exploration Mid-Continent, Inc. ("Newfield") requests authority pursuant to Statewide Rule 9 to operate Well No. 106 on its Britt, Thomas Lease in the Allison-Britt (12350) Field in Wheeler County as a disposal well. This application is protested by Chesapeake Operating, Inc. ("Chesapeake"), an operator in the Allison-Britt (12350) Field which has a producing well within 0.6 miles of the proposed disposal well.

**DISCUSSION OF THE EVIDENCE****Applicant's Evidence**

The subject well was drilled by Santa Fe Energy Operating Partnership as a producing well in 1987. The well produced from the Granite Wash Formation until 1992 when the rods parted and well production fell off. The well will be recompleted into a disposal well. The well is drilled through the Brown Dolomite to a maximum depth of 14,924 feet. The well has 400 feet of 13 <sup>3</sup>/<sub>8</sub>" surface casing with cement circulated from the casing shoe to the ground surface, and 8 <sup>5</sup>/<sub>8</sub>" intermediate casing set below the base of the Brown Dolomite, which occurs at a depth of 4,596 feet. The top of cement behind the intermediate casing (now the longstring) is estimated to be 4,375 feet. The original longstring of 5 <sup>1</sup>/<sub>2</sub>" casing set at 12,900 feet will be cut off at 6,300 feet. (See Newfield Exh. No. 22 Wellbore Diagram attachment). The Texas Commission on Environmental Quality recommends that usable-quality ground water be protected to a depth of 350 feet.

The proposed injection will be through 4 <sup>1</sup>/<sub>2</sub>" tubing set on a packer at approximately 4,595 feet, but no higher than 100 feet above the top of the injection interval. The proposed injection interval is the Brown Dolomite formation, the top of which occurs at about 4,596 feet. The proposed injection interval is between 4,645 and 5,825 feet. The proposed maximum injection volume is 30,000 BWPD, with an estimated average of 3,500 BWPD. The proposed maximum injection pressure is 2,322 psig.

There are no oil or gas well bores within a 1/4 mile radius of the proposed disposal well. The nearest Chesapeake producing well is approximately 0.6 miles to the northwest. The Brown Dolomite is found throughout Wheeler County and is non-productive in this area and is the preferred formation for disposal. Within a 10 mile radius of the Britt, Thomas No. 106 there are twelve approved commercial and/or non-commercial disposal wells permitted in the Brown Dolomite and three pending non-commercial disposal wells (includes both of Newfield's disposal wells).

Newfield plans to use the proposed well to dispose of produced water and frac water generated as a result of the active and ongoing development of the Allison Britt (12350) Field and the Stiles Ranch (Granite Wash) Field in this area. Newfield currently operates approximately 115 wells in the area. The wells produce 10,000 to 15,000 bbls of water per day. Most of the water is produced from producing wells while the rest comes as a result of completing new wells. The new wells are fracture stimulated, then are required to flow back the frac water. Newfield has one disposal well in the area, the Britt Ranch K 1-37 which serves as the disposal well for the 115 Newfield wells in the area.

Newfield is planning to drill and complete an additional 250 wells in the area. Newfield seeks to increase disposal capacity by adding two disposal wells, the Britt, Thomas Well 106 and the Britt Ranch "E" Well 308. The disposal wells will be placed throughout the field where future drilling is expected to take place and to better serve future development wells.

Newfield is planning to run flowlines between the producing wells and the disposal wells to minimize or eliminate the need to truck produced water to the disposal well. Reducing trucking costs will increase the economics of a producing well which in turn will increase the economic life of the well. Because the future wells will be tied in with flowlines to the disposal well, placing the disposal wells in optimum location throughout the field will minimize the overall costs of disposal. Newfield is planning to drill multiple wells from the same pad site to reduce the quantity of flowlines and reduce the impact to the environment. Newfield also requests the additional disposal wells to increase redundancy, should a disposal well be shut down due to mechanical reasons.

Newfield Exploration Mid-Continent, Inc. has an active P-5 on file with the Commission, with \$250,000 financial assurance. There are no pending enforcement actions against Newfield.

Notice of the subject application was published in *The County Star News*, a newspaper of general circulation in Wheeler County, on February 22, 2007. A copy of the application was mailed on February 14, 2007 to the Wheeler County Clerk's Office and the surface owner (David M. Britt Jr.) and the offset operator (Chesapeake Operating Inc.) within ½ mile of the proposed well. Newfield provided a letter of support for the application from the Britt's family attorney. The Britt family is both the surface owner and mineral interest owner on the Britt Ranch. The letter states the family's desire to add disposal capacity in order to reduce truck traffic.

### **Protestant's Evidence**

Chesapeake Operating has protested Newfield's application for a disposal permit as it believes injection into the Brown Dolomite will corrode its wells which produce from the Allison-Britt (12350) Field. Chesapeake believes allowing additional injection into the Brown Dolomite will cause additional damage to surrounding wells and cause great economic harm. Beginning in October 2006, Chesapeake began to experience a series of casing failures with its own producing wells. Most of the wells are not cemented across the Brown

Dolomite as it is not standard operating practice to do so. The wells were repaired at an average cost of \$600,000.00 to pull and replace casing or to repair the leak. The recovered casing revealed the casings had extensive corrosion adjacent to the Brown Dolomite. The eleven wells experiencing the casing failures are centered around the Atherton Well No. 1D, a disposal well operated by Chesapeake. Chesapeake believes that oxygenated water within the Brown Dolomite is being pushed towards the producing wells by the operation of the injection well and is causing the corrosion of the casings. Chesapeake does not believe the oxygen is being introduced by the injected water as both Chesapeake and Newfield personnel and experts testified that the injected water is treated with corrosion inhibitors, biocides and oxygen scavengers. Chesapeake believes the existing formation water in place is oxygenated and is causing the corrosion. The corrosion experts of both parties testified that oxygen is needed to cause some types of corrosion to occur.

Chesapeake gave testimony that the cost of repairing the casing leaks in the wells is not the only issue, but that after returning some of the wells back to production after the wells were repaired, production in some cases was less than before the well was repaired or ceased producing altogether. Chesapeake argues that reserves will be lost as the repaired wells may be damaged and ultimately recover less hydrocarbons. One of Chesapeake's corrosion experts, Dr. Gary Wooly, also suggested the low velocity travel of the formation water moving past the casing will cause small particles of corroded casing material to be washed away or "eroded" by the water as the disposal well injects water towards the unprotected casing.

#### **EXAMINERS' OPINION**

The examiners believe that this application should be approved. The Britt, Thomas Well 106 will be completed in a manner which will confine disposal fluids to the proposed disposal interval in the Brown Dolomite. Surface casing is set and cemented through the base of usable quality water. The longstring production casing will also be cemented up through the top of the Brown Dolomite to prevent migration from the injection interval. There are no oil or gas wells within the one-quarter mile radius of review and the water wells in the area will be protected by surface casing as recommended by the TCEQ.

Approval of the requested permit is in the public interest given it is in the public interest to produce the Granite Wash in the area. The Granite Wash wells in Wheeler County require safe and economical means of saltwater disposal. Having a disposal well close to the producing wells will reduce disposal cost. Lower disposal costs will extend the economic life of the well. Extending the economic life of the well will allow the well to produce more hydrocarbons. The significant reduction in truck miles driven will reduce the operating costs for wells in the area and will result in the recovery of additional hydrocarbons. Additionally, Newfield seeks redundancy in having additional well capacity should the existing disposal well, the Britt Ranch K disposal Well 1037, be required to be shut down for any reason.

Chesapeake did not prove that injection/disposal into the Brown Dolomite will cause corrosion in uncemented well bores across the Brown Dolomite. The Brown Dolomite is the preferred disposal formation in the area as evidenced by the twelve permitted commercial and non-commercial disposal wells and three additional pending disposal wells within ten miles of the Britt, Thomas well No. 106. All disposal wells in the area dispose into the Brown Dolomite. The Brown Dolomite is a blanket formation that exists at predictable depths through out the Panhandle and parts of Oklahoma. In some parts of the Panhandle, the Brown Dolomite is productive of both oil and gas. With literally thousands of wells having penetrated the Brown Dolomite both cemented and uncemented over the past decades, the eleven Chesapeake wells are the only wells that have been suggested as having a corrosion problem due to the Brown Dolomite.

Chesapeake presented a theory that the Brown Dolomite formation water is naturally oxygenated and that the displacement of in situ water by the act of disposal of produced water is causing the oxygenated water to corrode the uncemented casing. Chesapeake did not present any water sample analysis or any studies to suggest the that Brown Dolomite formation water is actually oxygenated. One of the eleven wells (the Atherton No. 501) was cemented across the Brown Dolomite and experienced a casing leak on January 2007. Chesapeake did not provide any evidence that would indicate the levels of oxygen in the formation water of the Brown Dolomite throughout the Panhandle area to compare whether the subject area is unique or all areas of the Brown Dolomite are equally oxygenated.

The eleven wells which had the corrosion problems were clustered around a Chesapeake operated disposal well, the Atherton Well No. 1D. At the time of the hearing Chesapeake had not shut in their own disposal well which they feel is causing their own wells to fail at an average cost of \$600,000.00 each to repair. Additionally, at the time of the hearing, Chesapeake has not informed adjacent operators to their disposal well that Chesapeake's disposal well may cause the operators well to fail prematurely.

Ten of the eleven wells that failed were purchased from Bravo Resources and Chesapeake's expert could not verify the condition of the casings when the wells were originally completed or whether adequate cathodic protection measures were ever under taken when the wells were first completed. After Chesapeake took over operations of the eleven wells from Bravo Resources, Chesapeake evaluated cathodic protection for their newly purchased wells which were several years old at the time. Chesapeake's own employee, Greg Drwenski assumes that nine out of the eleven wells with corrosion problems did not have cathodic protection when Chesapeake purchased the wells. In 2005, Chesapeake purchased cathodic protection for the Miller 302, 402, 502, 602, 802, the Atherton 301, 501, 3069 and the 4069. All of these wells had corrosion problems. Installing cathodic protection after the well has been in the ground for several years will not reverse corrosion if it has already occurred.

The evidence indicates that the operation of the subject disposal well will not adversely impact any other producing wells in the area or any subsurface useable quality water.

**FINDINGS OF FACT**

1. Notice of this hearing was given to all persons entitled to notice at least ten (10) days prior to the hearing. Notice of the application was published in *County Star-News*, a newspaper of general circulation in Wheeler County, on February 22, 2007.
2. The Britt, Thomas No. 106 will be recompleted into a disposal well. Newfield Exploration Mid-Continent, Inc. plans to plugback the well to a maximum depth of approximately 6,200 feet. The top of the Brown Dolomite occurs at approximately 4,596 feet.
3. The maximum requested injection volume is 30,000 barrels of water per day and the maximum requested surface injection pressure is 2,322 psi. The requested disposal interval is the Brown Dolomite formation between approximately 4,645 and 5,825 feet.
4. The Britt, Thomas No. 106 is cased and cemented in a manner to protect usable quality water and injection will be confined to the injection interval.
  - a. The subject well has 398 feet of 13 <sup>3</sup>/<sub>8</sub>" surface casing cemented to surface.
  - b. The subject well has approximately 6,525 feet of 8<sup>5</sup>/<sub>8</sub>" casing with top of cement at approximately 4,375 feet, which is above the top of the Brown Dolomite.
  - c. Injection will be through tubing set on a packer no higher than 100 feet above the top of the injection interval.
  - d. The Texas Commission on Environmental Quality recommends that usable-quality water be protected to 350 feet in the area of the proposed well.
5. There are no wellbores within one-quarter mile of the proposed disposal well.
6. Due to planned increasing development of the Granite Wash in the Allison-Britt (12350) Field and the Stiles Ranch (Granite Wash) Field, large quantities of produced water must be disposed of. The Granite Wash wells in Wheeler County require an economic means to dispose of the produced water in order to recover the hydrocarbons. Use of the Britt, Thomas No. 106 as a disposal well is in the public interest to promote this development by providing a safe and economic means of disposal of the fluids associated with production.
7. The Britt family (surface owner) is in support of the proposed disposal well as it will reduce truck traffic on the ranch there by increasing safety.
8. Newfield Exploration Mid-Continent, Inc. has an active P-5 on file with the Commission, with \$250,000 financial assurance.

9. Chesapeake did not provide evidence that the Brown Dolomite formation water is naturally oxygenated.
10. The Brown Dolomite is a blanket formation that is a preferred disposal formation. The Brown Dolomite is not known by the oil and gas industry as a corrosive formation.
11. With thousands of wells being completed through the Brown Dolomite, Chesapeake only provided their own eleven wells as evidence as having corrosion problems and did not prove this is an industry wide problem.
12. Ten of the eleven wells that failed were purchased from Bravo Resources. A Chesapeake employee assumes cathodic protection was not originally in place on nine of those ten wells as Chesapeake installed cathodic protection in 2005.

**CONCLUSIONS OF LAW**

1. Proper notice was issued in accordance with the applicable statutory and regulatory requirements.
2. All things have occurred to give the Railroad Commission jurisdiction to consider this matter.
3. The use or installation of the proposed injection well is in the public interest.
4. The use or installation of the proposed injection well will not endanger or injure any oil, gas, or other mineral formation.
5. With proper safeguards, as provided by terms and conditions in the attached final order which are incorporated herein by reference, both ground and surface fresh water can be adequately protected from pollution.
6. Newfield Exploration Mid-Continent, Inc. has made a satisfactory showing of financial responsibility to the extent required by Section 27.051 of the Texas Water Code.
7. Newfield Exploration Mid-Continent, Inc. has met its burden of proof and satisfied the requirements of Chapter 27 of the Texas Water Code and the Railroad Commission's Statewide Rule 9.

**EXAMINERS' RECOMMENDATION**

Based on the above findings and conclusions, the examiners recommend that the application be approved as set out in the attached Final Order.

Respectfully submitted,

Andres J. Trevino, P.E.  
Technical Examiner

Marshall Enquist  
Hearings Examiner