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October 5, 2011

Hand delivered

Jami Bailey, Director
Oil Conservation Division
1220 South St. Francis Drive
Santa Fe, New Mexico 87505

Re: Targa/Case 14161

Dear Ms. Bailey:

Enclosed are six copies each of Apache/Momentum's Proposed Findings and Conclusions and Proposed Order. The forms are also being e-mailed to Commission counsel.

Very truly yours,

James Bruce

Attorney for Apache Corporation
and Momentum Operating Co. Inc.

cc: William Scott w/encl.

STATE OF NEW MEXICO
ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT
OIL CONSERVATION COMMISSION

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IN THE MATTER OF THE HEARING CALLED BY THE OIL CONSERVATION COMMISSION FOR THE PURPOSE OF CONSIDERING:

APPLICATION OF TARGA MIDSTREAM SERVICES, LIMITED PARTNERSHIP TO AMEND ORDER NO. R-13052, LEA COUNTY, NEW MEXICO. **Case No. 14161**

FINDINGS AND CONCLUSIONS

(Proposed by Apache Corporation and Momentum Operating Co., Inc.)

FINDINGS:

(1) Division Order No. R-13052, entered on November 18, 2008, authorized Targa Midstream Services, L.P. ("Targa") to inject gas processing waste from its Monument gas plant into the Devonian and Fusselman formations in an open hole interval at depths of 8350-9200 feet subsurface in its proposed Monument AGI Well No. 1, to be located 662 feet from the south line and 2513 feet from the east line of Section 36, Township 19 South, Range 36 East, NMPM, Lea County, New Mexico. **Order No. R-13052.**

(2) Ordering Paragraph (2) of Order No. R-13052 required Targa, before injection commenced into the Monument AGI Well No. 1, to re-enter the NMGSAU Well No. 285 (API No. 30-25-12481) to 9755 feet subsurface and re-plug the well, due to the lack of existing cement plugs immediately above and below the equivalent Devonian/Fusselman injection interval. The NMGSAU Well No. 285, operated by Apache Corporation ("Apache"), is located in Unit F of Section 36 and produces from the unitized Grayburg-San Andres interval. **Order No. R-13052.**

(3) The original plugs in the NMGSAU Well No. 285 were never tagged and their exact locations are not certain. **Transcript ("Tr.") at 47, lines 1-7.**

(4) The NMGSAU Well No. 285 is located 2850 feet north-northwest of the Monument AGI Well No. 1. **Apache Exhibit 1.**

(5) Operations to re-plug the NMGSAU Well No. 285 were commenced on February 24, 2011. On March 17, 2011, after drilling to 4100 feet, the work string twisted off. **Tr. at 11, lines 4-20.** Additional problems were subsequently encountered with the re-plugging operations until the rig was released on May 19, 2011 without the required re-plugging being successful. **Targa Exhibit 1; Tr. at 11-15.**

(6) The re-plugging operations on the NMGSAU Well No. 285 were conducted by Apache Corporation ("Apache") under an agreement with Targa. **Tr. at 10, lines 3-6; Tr. at 85, lines 41-5.** However, the decision to cease re-plugging operations on the NMGSAU Well No. 285 was made by Targa. **Tr. at 16, lines 4-6; Tr. at 87, lines 14-23.**

(7) The NMGSAU Well No. 285 has not been re-plugged according to the plugging procedure in the Sundry Notice approved by the Division's Hobbs District Office, **Apache Exhibits 4 and 4A**, and Apache does not consider the well to be plugged as required by Order No. R-13052, thus preventing a path for migration of acid gas from the injection zones into other formations productive, or potentially productive, of oil or gas. **Tr. at 69, lines 8-15; Tr. at 79, lines 9-12; Tr. at 85, lines 12-21.**

(8) On March 21, 2011, after the initial problems had been encountered with the re-plugging of the NMGSAU Well No. 285, Targa commenced drilling the Monument AGI Well No. 1. The well reached total depth in May 2011 but has not been completed. **Tr. at 16, lines 16, 17, 25; Tr. at 17, line 1; Tr. at 51, lines 7-12.**

(9) Targa obtained extensions of the injection commencement deadline in Order No. R-13052 in both 2009 and 2010, and thus there was no need to commence the Monument AGI Well No. 1 in March 2011. **Tr. at 59, lines 4-12.**

(10) Targa has applied for an order amending Order No. R-13052 to (i) delete the requirement to re-enter and re-plug NMGSAU Well No. 285, and (ii) retain the Graham State NCT-F Well No. 7 (API No. 30-025-12482) as an active saltwater disposal well in the San Andres formation pursuant to Division Administrative Order Nos. SWD-561 and SWD-561-A. **Application of Targa.**

(11) Rose Diagrams, obtained from dipmeter logs in the Monument AGI Well No. 1, **Tr. at 26, lines 13-15**, measure what is happening only in the immediate wellbore area (a few inches to a few feet from the wellbore), and do not accurately represent regional or areal fracture trends. **Tr. at 62, lines 13-16; Tr. at 105, lines 14-16.**

(12) While the Rose Diagrams showed that some of the fractures in the near-wellbore portion of the injection formations were oriented in a northeast-southwest direction, **Tr. at 27, lines 5-6**, areal geological studies indicate a northwest-southeast regional fracture trend. **Tr. at 62, lines 11-24.** The fracture trend would generally match the northwest-southeast faults located to the west of the Monument AGI Well No. 1, and the injection plume would be oriented in those directions. **Momentum Exhibit 1; Tr. at 103, lines 22-25; Tr. at 104, lines 1-3 and 14-18.**

(13) There is significant shallow production in the area of the Monument AGI Well No. 1, including from the Grayburg-San Andres and Abo formations. There is additional future development potential in these and other shallower zones. **Tr. at 50, lines 2-9; Tr. at 67, lines 5-12; Tr. at 73, lines 17-25; Tr. at 74, lines 2-19.**

(14) The Devonian and Fusselman formations in the area to the north and west of the Monument AGI Well No. 1 have not been thoroughly evaluated using modern drilling and

completion techniques. **Tr. at 48, lines 4-8; Tr. at 64, lines 4-7 and 20-25; Tr. at 66, lines 13-16.**

(15) Targa assumed a homogeneous reservoir thickness (net pay) of 318 feet and radial flow in calculating the injection plume's volume and radius. **Tr. at 28, lines 3-6.**

(16) The injection zone is highly fractured and heterogeneous, and the injectate will follow paths with higher porosity and permeability. **Tr. at 76, lines 15-23; Tr. at 102, lines 16-18; Tr. at 112, lines 1-12.** The log for the Monument AGI Well No. 1 shows only 34 feet of porous interval with porosity above 6%. Additionally, the interval between 8477-8532 feet exhibits significantly higher porosity than the rest of the proposed injection interval, which would likely be the dominant interval in taking the injection fluids. **Targa Exhibit 6; Tr. at 107, line 7 through Tr. at 111, line 22.**

(17) Using more accurate and reasonable reservoir thicknesses of 34 feet results in an injection plume with a radius of well over 4000 feet, using the volumetric calculation. **Tr. at 77, lines 14-25; Tr. at 78, lines 1-14; Tr. at 112, line 25 through Tr. at 113, line 5.**

(18) Targa did not include the volume of the actual acid gas injection stream with the 5000 barrels/day of disposal water, which could be in excess of 1000 barrels/day. Including the additional injection volume of the acid gas injection stream would increase the radius of the injection plume. **Tr. at 75, lines 13-15; Tr. at 105, lines 21-25; Tr. at 106, lines 7-25.**

(19) If the acid gas plume reaches the NMGSAU Well No. 285 it would likely migrate to shallower formations, resulting in loss of confinement of the injectate in the disposal zone. **Tr. at 113, lines 4-25.**

(20) Deep wells in this area were drilled 50-60 years ago, cement plug tops were estimated by calculation instead of by tagging, and Apache and Momentum are concerned about the casing and cementing integrity of those wells.

(21) It is uncertain if the acid gas would remain in the dense gas phase if it migrates to another formation. If it does not, the adversely affected area would be much greater than calculated by any of the parties to this case. **Tr. at 106, lines 17-24; Tr. at 113, lines 14-25.**

CONCLUSIONS:

(1) The existing cement plugs in the NMGSAU Well No. 285 are not adequate to contain injected fluids from the Monument AGI Well No. 1 in the target disposal formations, and the Division was correct in requiring the re-entry and re-plugging of the NMGSAU Well No. 285 in Order No. R-13052.

(2) Targa has the burden of proof to show that injection operations in the Monument AGI Well No. 1, without re-plugging the NMGSAU Well No. 285, will not cause waste or impair correlative rights.

(3) The NMGSAU Well No. 285 has not yet been properly re-plugged as required by Order No. R-13052.

(4) There is a reasonable possibility that injectate from the Monument AGI Well No. 1 will reach the NMGSAU Well No. 285. If it does so, the injectate could migrate to productive and potentially productive zones, resulting in a loss of containment in the permitted formation, causing waste and impairment of correlative rights.

(5) Targa has failed to meet its burden of proof to demonstrate that its requested amendment of Order No. R-13052 will not cause waste or impair correlative rights.

(6) Targa's application to amend Order No. to delete the requirement to re-enter and re-plug the NMGSAU Well No. 285 should be denied unless and until the NMGSAU Well No. 285 is re-plugged in accordance with Order No. R-13052.