



RAILROAD COMMISSION OF TEXAS

OFFICE OF GENERAL COUNSEL

OIL AND GAS DOCKET NO. 8A-0262124

THE APPLICATION OF KINDER MORGAN PRODUCTION CO. LLC FOR A PERMIT TO INJECT FLUID INTO A RESERVOIR PRODUCTIVE OF OIL OR GAS, SACROC UNIT WELL NO. 21-03, KELLY-SNYDER FIELD, SCURRY COUNTY, TEXAS

HEARD BY: Donna K. Chandler, Technical Examiner
Mark J. Helmueller, Hearings Examiner

APPEARANCES:

Sandy Buch
Sal Gutierrez, Jr.
John Nelson

Richard Palmer
Frank Kubacak
Anchor Holm

REPRESENTING:

Kinder Morgan Production Co. LLC

Frank Kubacak

EXAMINERS' REPORT AND PROPOSAL FOR DECISION

PROCEDURAL HISTORY

Application Filed:	April 17, 2009
Protest Received:	April 27, 2009
Request for Hearing:	June 9, 2009
Notice of Hearing:	June 29, 2009
Date of Hearing:	August 31, 2009
Transcript Received:	September 8, 2009
Proposal For Decision Issued:	September 24, 2009

STATEMENT OF THE CASE

Kinder Morgan Production Co. LLC ("Kinder Morgan") requests authority pursuant to Statewide Rule 46 to inject salt water into the Wichita-Albany formation on its SACROC Unit, Well No. 21-03 in the Kelly-Snyder Field in Scurry County.

This application is protested by Frank Kubacak ("Kubacak"). Kubacak is the surface owner of the tract on which the well is located.

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

Kinder Morgan proposes to use the SACROC Unit No. 21-03 well to dispose of salt water produced from its wells on the SACROC Unit, which is productive from the Canyon Reef at a depth of approximately 6,500 feet. Kinder Morgan proposes that the salt water be injected into the Wichita Albany between 4,000 and 5,000 feet. The Wichita Albany is not productive in the No. 21-03 well. The closest production from the Wichita Albany is approximately 12 miles away from the No. 21-03 well. However, Kinder Morgan filed the application pursuant to Statewide Rule 46 instead of Statewide Rule 9 because there are 18 other Wichita Albany disposal wells on the SACROC Unit which have been permitted pursuant to Statewide Rule 46. Additionally, at least one well within the bounds of the SACROC Unit produced from the Wichita Albany, in a field called the Diamond -M- (Wichita Albany) Field. This producer was in the far southwest portion of the Unit and the No. 21-03 is in the northernmost portion of the Unit.

The SACROC Unit was formed in 1953 and waterflooding was initiated in 1954. In 1972, CO₂ injection was initiated and the miscible CO₂ flood consisting of CO₂ injection alternated with water injection (WAG) project continues today. There are more than 2,000 wells on the Unit and recovery to date is over 2.8 billion BO, or approximately 46% of original oil in place. Current production is approximately 30,000 BOPD.

In the WAG project, CO₂ is injected into the Canyon Reef and becomes miscible with the oil in the reservoir. Following a cycle of CO₂ injection, a slug of water is injected to push the oil to producing wells. When the southern portion of the Unit was being flooded, the produced water was put back into the Canyon Reef in the northern portion of the Unit. As a result of this water injection, the northern portion has become overpressured and cannot sustain additional CO₂ injection until water is removed from the reservoir. This produced water is the water which is proposed for injection into the No. 21-03 well. Due to limited disposal capacity, Kinder Morgan currently has wells shut-in which are capable of producing 900 BOPD.

Kinder Morgan plans to ultimately have 22 wells disposing into the Wichita Albany on the SACROC Unit. As previously discussed, 18 have already been permitted. Currently, only four wells on the Unit are disposing into the Wichita Albany, with total disposal of about 30,000 BWPD. All of the existing and proposed Wichita Albany disposal wells are located on the outskirts of the Unit which are currently shut-in oil wells which will be converted to disposal wells.

The No. 21-03 well was drilled in 1950 to a total depth of approximately 7,068 feet and is currently shut-in. The well has 1,744 feet of 7⁵/₈" surface casing cemented from the casing shoe to the ground surface. The well has 7,058 feet of 5¹/₂" casing cemented to surface using three stages. The Texas Commission on Environmental Quality

recommends that usable-quality ground water be protected to a depth of 350 feet. Kinder Morgan plans to plug and abandon the Canyon Reef by setting a cast iron bridge plug at 6,900 feet, with 20 feet of cement on top, a cement plug at 6,000 feet, and a cast iron bridge plug at 5,000 feet, with 20 feet of cement on top. Though the requested disposal interval is 4,000-5,000 feet, Kinder Morgan plans to perforate between 4,300 and 4,700 feet. (See attached wellbore diagram). A type log of a nearby well indicates the presence of several hundred feet of dolomite/limestone intervals between the base of usable quality water and the top of the disposal interval.

The proposed disposal will be through 2 $\frac{7}{8}$ " tubing set on a packer no higher than 100 feet above the perforated interval. The proposed maximum injection volume is 15,000 BWPD and the proposed maximum injection pressure is 2,000 psig.

There are three wellbores within a $\frac{1}{4}$ mile radius of the proposed disposal well. Two of the wells, the No. 21-02 and No. 21-06, have been plugged and abandoned, with plugs set above the top of the Wichita Albany. The third well, the No. 20-07, has been shut-in since 2004 but passed a mechanical integrity test in July 2009. The No. 20-07 has cement behind casing through the Wichita Albany.

Notice of the subject application was published in *The Snyder Daily News*, a newspaper of general circulation in Scurry County, on April 12, 2009. A copy of the application was filed on April 16, 2009 with the Scurry County Clerk's Office. Also on April 16, 2009, a copy of the application was sent to the surface owner of the tract on which the well is located. There are no offsetting operators within $\frac{1}{2}$ mile of the well.

Kinder Morgan has an active P-5 on file with the Commission, with \$250,000 financial assurance.

Protestant's Evidence

Kubacak owns the surface rights of the acreage on which the No. 21-03 well is located. It is Kubacak's position that Kinder Morgan should have filed the application pursuant to Rule 9, as the Wichita Albany is not productive within 2 miles of the No. 21-03 well.

Kubacak raises cattle on his land around the subject well and has water wells on the land for his cattle. He believes that the proposed disposal into the Wichita Albany may harm usable quality water resources in the area. The Dockum formation is the shallow aquifer present in the area of the SACROC Unit. The Dockum contains good quality groundwater and is found at approximately 550 feet. Groundwater in the area generally flows from northwest to southeast, across almost the entirety of the SACROC unit toward the city of Snyder. The No. 21-03 well has surface casing set at 1,700 feet, with cement to surface. Kubacak questions the integrity of the cement more than 50 years after the well was completed. Additionally, Kubacak is not convinced that there is sufficient vertical

confinement between the Wichita Albany and the shallower usable quality water zones. Kubacak believes that a cement bong log and/or a injection profile log should be required before the No. 21-03 is used for injection.

EXAMINERS' OPINION

The examiners recommend approval of the application, with conditions that Kinder Morgan isolate the Canyon Reef by setting a cast iron bridge plug at 6,900 feet, with 20 feet of cement on top, a cement plug at 6,000 feet, and a cast iron bridge plug at 5,000 feet, with 20 feet of cement on top. With this plug back operation, the No. 21-03 will be completed in a manner which will protect usable quality water resources and confine disposal fluids to the Wichita Albany. Both the surface casing and production casing are cemented to surface and there are no wellbores within a ¼ mile which could provide a conduit for migration of injected fluids out of the Wichita Albany interval and into usable quality water. Additionally, there are several hundred feet of dolomite/limestone intervals between the Wichita Albany and the base of usable quality water.

Approval of the requested permit is in the public interest. It will provide Kinder Morgan with an economical means of disposing of the extraneous produced water resulting from its ongoing WAG project on the SACROC Unit. Disposal of this water into a zone other than the Canyon Reef productive interval is necessary to reduce the pressure of the Canyon Reef in the northern portion of the Unit. Pressure reduction is necessary to allow the injected CO₂ to be miscible with the oil, resulting in recovery of tertiary reserves from the unit. Some producing wells are currently shut-in until disposal options are available.

The Commission's rules address Kubacak's concerns about protection of fresh water resources on his ranch. The completion of the No. 21-03 well and surrounding wells within ¼ mile were investigated to insure that fluids cannot escape the disposal zone or migrate into shallower usable quality water zones. Additionally, prior to any disposal operations, Kinder Morgan is required to perform an annulus pressure test on the well to insure the its mechanical integrity.

Kubacak argued that the application should have been filed pursuant to Statewide Rule 9, instead of Statewide Rule 46, as the closest Wichita Albany production is 12 miles away. Typically, a formation is considered non-productive if it is not productive within 2 miles, and such application is considered pursuant to Statewide Rule 9. The examiners believe that this application can be considered pursuant to Statewide Rule 46, as 18 other Wichita Albany disposal wells on the Unit have already been approved pursuant to Rule 46 under a single Project Number. Approval of this application under Statewide Rule 9 would require the issuance of a separate Permit Number for this well, which could result in confusion both for reporting requirements for Kinder Morgan and Commission staff regulatory oversight. Because Statewide Rules 9 and 46 require the same proof and Kinder Morgan has met this burden, the examiners recommend approval of the application as filed.

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.
 - a. Notice of the application was published in *The Snyder Daily News*, a newspaper of general circulation in Scurry County, on April 12, 2009.
 - b. A copy of the application was filed on April 16, 2009 with the Scurry County Clerk's Office.
 - c. On April 16, 2009, a copy of the application was sent to the surface owner of the tract on which the well is located.

2. The SACROC Unit Well No. 21-03 is cased and cemented in a manner to protect usable quality water.
 - a. The well was drilled in 1950 to a total depth of approximately 7,068 feet and is currently shut-in.
 - b. The well has 1,744 feet of 7⁵/₈" surface casing cemented from the casing shoe to the ground surface.
 - c. The well has 7,058 feet of 5¹/₂" casing cemented to surface using three stages.
 - d. The Texas Commission on Environmental Quality recommends that usable-quality ground water be protected to a depth of 350 feet. The subject well was drilled in September 2006 to a total depth of approximately 10,080 feet.
 - e. There are several hundred feet of shale intervals between the proposed injection interval and the base of usable quality water in this area.

3. Fluids injected into the No. 21-03 well will be confined to the Wichita Albany disposal interval.
 - a. The proposed disposal interval is the Wichita Albany between 4,000-5,000 feet. Kinder Morgan plans to perforate between 4,300 and 4,700 feet.
 - b. The proposed disposal will be through 2⁷/₈" tubing set on a packer no higher than 100 feet above the perforated interval.

- c. All three wellbores within ¼ mile of the subject well are either plugged or completed in a manner which will not provide a conduit for migration of injected fluids from the Wichita Albany.
 - d. Cast iron bridge plugs must be set at 6,900 feet and 5,000 feet, both with 20 feet of cement on top, and a cement plug must be set at 6,000 feet to isolate the Canyon Reef.
 - e. A type log of a nearby well indicates the presence of several hundred feet of dolomite/limestone intervals between the base of usable quality water and the top of the disposal interval.
- 4. Use of the SACROC Unit Well No. 21-03 to dispose of produced water from Kinder Morgan's wells on the SACROC Unit is in the public interest to provide for disposal of extraneous produced water resulting from its ongoing CO₂ WAG project on the SACROC Unit.
 - 5. Kinder Morgan Production Co. LLC has an active P-5 on file with the Commission, with \$250,000 financial assurance.

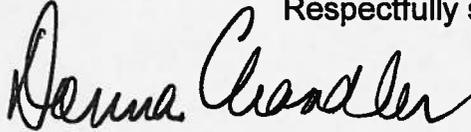
CONCLUSIONS OF LAW

- 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 as it will result in the recovery of additional oil in the ongoing tertiary recovery project on the SACROC Unit.
- 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. Kinder Morgan Production Co. LLC has made a satisfactory showing of financial responsibility to the extent required by Section 27.073 of the Texas Water Code.
- 7. Kinder Morgan Production Co. LLC has met its burden of proof and satisfied the requirements of Chapter 27.051 of the Texas Water Code and the Railroad Commission's Statewide Rule 46.

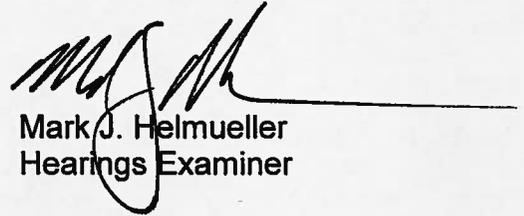
EXAMINERS' RECOMMENDATION

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,



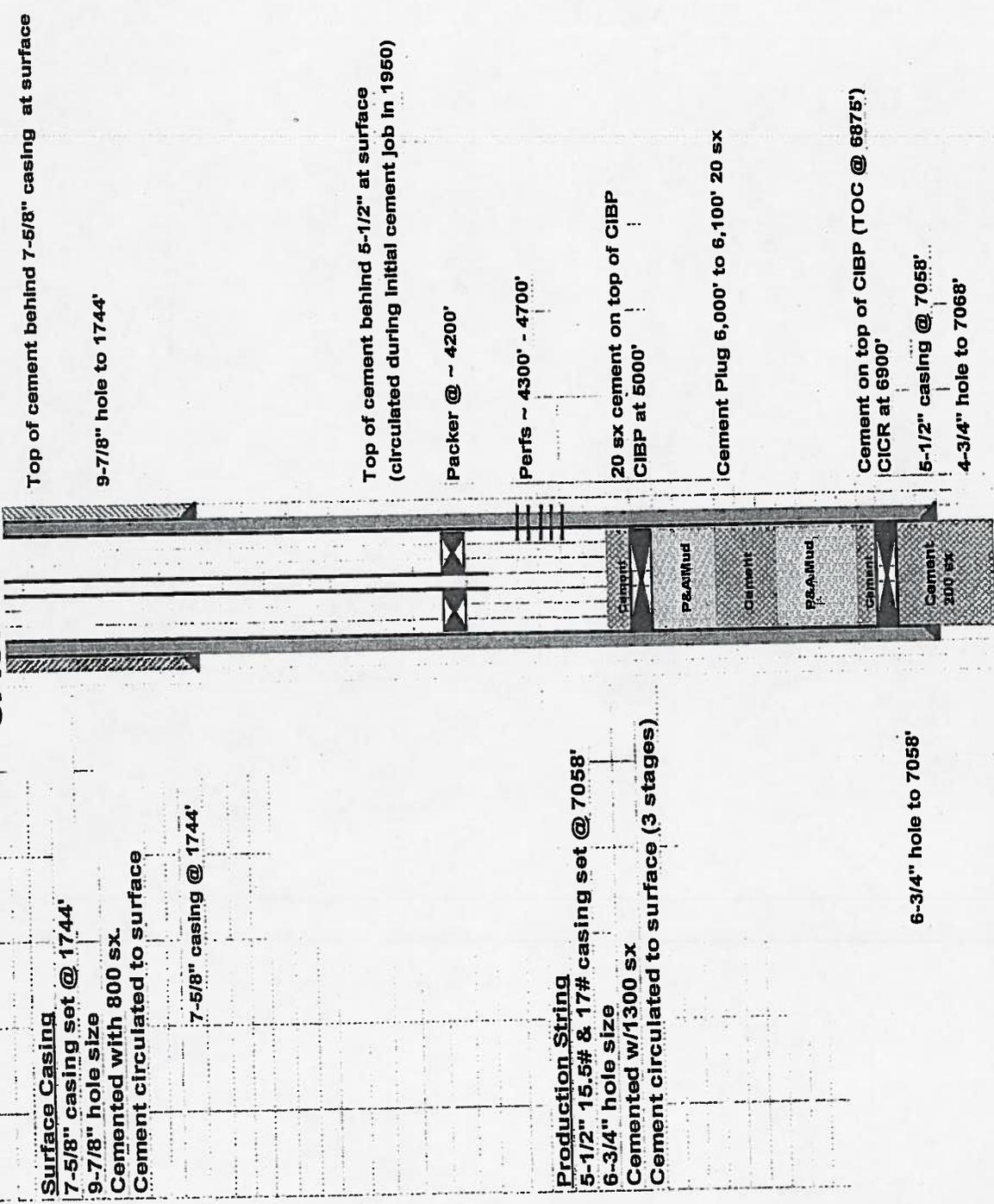
Donna K. Chandler
Technical Examiner



Mark J. Helmueller
Hearings Examiner

21-3 Wellbore Schematic – Proposed Completion

SACROC 21-3



Top of cement behind 7-5/8" casing at surface

9-7/8" hole to 1744'

Top of cement behind 5-1/2" at surface (circulated during initial cement job in 1950)

Packer @ ~ 4200'

Perfs ~ 4300' - 4700'

20 sx cement on top of CIBP at 5000'

Cement Plug 6,000' to 6,100' 20 sx

Cement on top of CIBP (TOC @ 6875') CIBP at 6900'

5-1/2" casing @ 7058'

4-3/4" hole to 7068'

Surface Casing
7-5/8" casing set @ 1744'
9-7/8" hole size
Cemented with 800 sx
Cement circulated to surface

7-5/8" casing @ 1744'

Production String
5-1/2" 15.5# & 17# casing set @ 7058'
6-3/4" hole size
Cemented w/1300 sx
Cement circulated to surface (3 stages)

6-3/4" hole to 7058'

TD @ 7068'