

**THE STATE CORPORATION COMMISSION
OF THE STATE OF KANSAS**

Before Commissioners: Pat Apple, Chairman
 Shari Feist Albrecht
 Jay Scott Emler

In the matter of the application of Quail Oil)	Docket No.: 17-CONS-3484-CUIC
& Gas, LC to authorize injection of saltwater)	
into the Arbuckle formation at the Sly 2-6)	CONSERVATION DIVISION
SWD well, located in Section 6, Township)	
<u>17S, Range 6E in Morris County, Kansas.</u>)	License No.: 33185

PRE-FILED TESTIMONY

OF

RENE STUCKY

1 Q. What is your name and business address?
2 A. Rene Stucky, 266 North Main Suite 220, Wichita, Kansas 67202.
3 Q. By whom are you employed and in what capacity?
4 A. I am employed by the Conservation Division of the Kansas Corporation Commission, as
5 Supervisor of the Underground Injection Control ("UIC") Department and the Production
6 Department.
7 Q. How long have you been employed by the KCC?
8 A. About 11 years. Before becoming Supervisor, I was an Environmental Scientist in the
9 UIC Department, where I reviewed and processed injection applications.
10 Q. What is your educational background and training?
11 A. I have a Bachelor's degree in Geology from Wichita State University in Wichita, Kansas,
12 and I have worked as a Petroleum Geologist in the industry for over 20 years.
13 Q. Have you previously testified before this Commission?
14 A. Yes.
15 Q. What does your position with the Conservation Division involve?
16 A. I supervise everyone in the Conservation Division's UIC and Production Departments
17 and manage the two departments.
18 Q. Are you familiar with this docket, 17-CONS-3484-CUIC?
19 A. Yes.
20 Q. How are you familiar with this docket?
21 A. I have thoroughly reviewed and personally worked this application.
22 Q. What has Operator applied for?
23 A. Operator has applied to inject saltwater into the Sly #2-6SWD, API #15-127-20597-00-
24 00 ("the subject well"), at a maximum rate of 5,000 barrels of water per day and a
25 maximum surface pressure of 650 pounds per square inch into the Arbuckle formation in
26 Section 6, Township 17 South, Range 6 East, Morris County.
27 Q. The January 31, 2017 "Notice of Filing Application" published in the Council Grove
28 Republican stated 500 pounds of pressure was requested as opposed to the 650 pounds of
29 pressure requested on the application. Can you explain the difference?
30 A. Yes. After receiving the application, I spoke with Wray Valentine, who on behalf of
31 Operator verbally agreed to reduce the requested pressure to 500 pounds per square inch.

1 Q. Does Operator's application comply with the KCC regulations?

2 A. Yes. As it pertains to the subject well, the application complies with KCC regulations.

3 Q. How did you determine that it complies with KCC regulations?

4 A. First, I reviewed the surface casing depth in the subject well. In this area of Morris
5 County, Table 1 of the Commission's April 1, 1994, Order in Docket #34,780-C specifies
6 that surface casing should be set at least 20 feet below the Wreford formation. In Section
7 6, Township 17 South, Range 6 East, which is the location of the subject well, the base of
8 the Wreford formation is 200 feet deep. The subject well has 8 and 5/8-inch steel surface
9 casing set at 286 feet, cemented to surface with 190 sacks of cement, which adequately
10 covers the Wreford formation.

11 Second, I reviewed the proposed zone of injection for the subject well. The injection
12 zone is the Arbuckle formation at a depth of 2,670 feet. With the base of any potential
13 fresh water at 200 feet, there are many confining shale layers in the 2,400 feet between
14 the Arbuckle formation and any fresh water zone, which will contain any migration of
15 the disposed water.

16 Third, I reviewed the completion documentation for the subject well. As stated
17 previously, the surface casing meets KCC regulations and is cemented to surface. The 5
18 1/2-inch production casing is set at 2,762 feet and cemented with 185 sacks of cement up
19 to a depth of 1,350 feet, as verified by a Dual Receiver Cement Bond Log. The injection
20 zone is adequately isolated and meets KCC regulations.

21 Fourth, I reviewed whether a mechanical integrity test had been performed on the
22 subject well to establish structural integrity. The subject well passed a mechanical
23 integrity test on December, 29, 2016, as witnessed by a KCC District employee (see
24 January 12, 2017, application filing, page 14).

25 Fifth, I conducted an Area of Review ("AOR") to check for possible environmental
26 concerns due to nearby wells. I plotted the subject well on a map along with all
27 producers, plugged wells, and water wells. Within a 1/2 mile radius the only wells present
28 were two producers owned by Operator. Those wells are recently drilled and meet KCC
29 regulations. The AOR did not show any concerns with Operator's application.

30 Sixth, I reviewed the application to determine whether proper notice of the application
31 has been given. Operator published notice on January 31, 2017, in the proper county

1 newspaper. Operator also attested that a copy of the application was delivered or mailed
2 to the surrounding parties within ½ mile. There appear to be no issues with notice of the
3 application.

4 Finally, I considered the requested rate and pressure. Operator originally asked for 650
5 pounds per square inch (psi) of pressure, but published for 500 psi and has agreed to 500
6 psi. There is little threat to public safety at this pressure, but the Arbuckle is a very
7 porous reservoir and generally requires no surface pressure. The requested injection rate
8 of 5,000 barrels per day can be handled safely with the construction of the well.

9 Q. What is your opinion of the protests in this matter?

10 A. I have reviewed each protest docketed, as well as approximately 100 postcards that were
11 not docketed. Speaking in general terms, the protests are related to three concerns. The
12 first is hydraulic fracturing (“fracking”). Since the subject well will not be fracked and
13 was never intended to be fracked, that is not a relevant concern regarding Operator’s
14 application.

15 The second area of general concern is the protection of water resources. The
16 protection of fresh and useable water is always an important concern and is also one of
17 the Commission’s main functions. That concern is the reason for many of our regulations
18 regarding well construction, and the reason I analyzed the subject well’s construction,
19 which is included in my testimony above. The subject well meets all Commission
20 regulations and will protect the fresh and useable waters by its construction.

21 The third area of general concern is the possibility of induced seismicity. Induced
22 seismicity has become a problem in Oklahoma and parts of Kansas. The Conservation
23 Division has been very active in working on this problem with Kansas Geological
24 Survey, Kansas Department of Health and Environment, and various Oklahoma agencies.

25 In Kansas, the primary concern has been on the southern border in Harper and Sumner
26 Counties. Recent horizontal production in those two counties has caused large volumes
27 of saltwater to be disposed into the Arbuckle formation. For example, in Harper County
28 in 2011, before the increase in seismicity, just 20,612,308 barrels of fluid were injected
29 in to the Arbuckle. In 2015, however, 120,522,055 barrels of fluid were injected. Some
30 disposal wells in Harper County averaged over 20,000 barrels per day in 2015. In
31 Sumner County, 16,888,895 barrels of fluid were injected into the Arbuckle in 2011, but

1 23,520,191 barrels of fluid were injected into the Arbuckle in 2015. These are large
2 volumes and show the dramatic increases from previous years. Just across the border in
3 Oklahoma similar increases also occurred.

4 Although there are many factors both known and unknown that can lead to induced
5 seismicity, changes in pore pressure associated with significantly increased injection
6 volumes can cause a critically stressed fault to move, inducing an earthquake. A
7 reduction in the rate of disposal in these two counties, along with a more stringent
8 reduction in certain critical areas within the counties, has greatly reduced the number of
9 felt earthquakes originating in this area over the last two years.

10 However, there are many places in Kansas and other states where Arbuckle disposal
11 wells are prominent on ancient faulted rifts and uplifts, without any evidence of induced
12 seismicity. In fact, the rifts and uplifts often serve as the traps for large oil and gas
13 deposits, and thus high volume disposal wells are present along with producing wells.

14 The requested rate and pressure in the present application, and the location of the
15 subject well, do not raise any significant concerns about possible induced seismicity
16 because the situation in Morris County and its neighboring counties is very different from
17 what is occurring in Harper and Sumner County. For example, Morris County only had
18 1,046,323 barrels of water disposed into the Arbuckle in 2015, with the vast majority
19 from one well. Chase County had a total of 820,878 barrels of water disposed into the
20 Arbuckle in 2015, with the majority also coming from one well. Wabaunsee County had
21 a total of 4,131,128 barrels of water disposed of into the Arbuckle in 2015 from five
22 wells. Marion County is by far the most active county in this area and had a total of
23 11,850,574 barrels of water disposed of into the Arbuckle in 2015 from 50 wells. These
24 are far lower rates of injection than in Harper and Sumner County. At the same time, a
25 search of United States Geological Survey statistics back to 1960 does not show any
26 seismic activity in any of the counties surrounding the subject well.¹ With this evidence, I
27 do not see a reasonable threat in this area for induced seismicity from Operator's
28 proposed disposal.

29 Q. Do you have any specific response to Ms. Hoedel's pre-filed testimony?

¹ See <https://earthquake.usgs.gov/earthquakes/search/>

1 A. Yes. I understand her general concern regarding induced seismicity, but I do not believe
2 it is appropriate to associate the subject well with the possibility of induced seismicity,
3 based upon what I have discussed above. Her policy concerns regarding tourism are
4 really outside of the jurisdiction of the Commission.

5 Q. Do you have any specific response to Mr. Abers's pre-filed testimony?

6 A. Yes. As Mr. Abers states, there are faults in the area. There are also faults in many other
7 areas of Kansas and other states, where active injection is not associated with induced
8 seismicity. Injection volumes in the area surrounding Operator's well are much lower
9 than the injection volumes in Harper and Sumner County where seismicity has occurred,
10 and there is no recent record of seismic activity in the area surrounding Operator's well
11 even though injection is occurring. Because of this, I do not believe granting Operator's
12 application is likely to increase the possibility of induced seismicity in the area.

13 Q. Do you have a recommendation regarding whether to approve Operator's application?

14 A. Yes. I recommend approval of the application.

15 Q. Does this conclude your testimony as of this date, May 31, 2017?

16 A. Yes

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CERTIFICATE OF SERVICE

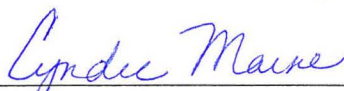
I, Cyndee Maine, certify that on 5/31/2017, 2017, I did cause a true and correct copy of the Pre-Filed Testimony of Rene Stucky to be served by United States mail, first class, postage prepaid to the following:

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