

**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 Norstar	)	Docket No.: 17-CONS-3403-CVAC
Petroleum Inc., for authorization to impose a	)	
vacuum on its Hume Bros Lease located in the	)	CONSERVATION DIVISION
NW/4 of Section 34, Township 29 South, Range	)	
<u>41 West, Stanton County, Kansas.</u>	)	License No.: 31652

**PRE-FILED TESTIMONY**

**OF**

**JIM HEMMEN**

1 Q. What is your name and business address?  
2 A. Jim Hemmen, 266 North Main Suite 220, Wichita, Kansas 67202.  
3 Q. By whom are you employed and in what capacity?  
4 A. I'm employed by the Conservation Division of the Kansas Corporation Commission as a  
5 Research Analyst within the Division's Production Department.  
6 Q. How long have you been employed by the KCC?  
7 A. Since July 1982.  
8 Q. Have you previously testified before this Commission?  
9 A. Yes. I have testified as an expert witness on numerous occasions.  
10 Q. What does your position with the Conservation Division involve?  
11 A. I provide technical input concerning various applications, including those involving  
12 unitizations, horizontal wells, well-location exceptions, alternate tract units, flaring, and  
13 vacuum or high volume pumps. I enforce the Commission's gas gathering regulations,  
14 review gas well test reports for accuracy, monitor monthly production from  
15 Hugoton/Panoma gas wells, and generally present Staff recommendations before the  
16 Commission where appropriate.  
17 Q. Are you familiar with this docket, 17-CONS-3403-CVAC?  
18 A. Yes.  
19 Q. How are you familiar with this docket?  
20 A. I have reviewed all filings in the docket, including all pre-filed testimony.  
21 Q. K.A.R. 82-3-131 says an application is required for the use of a vacuum pump and for  
22 use of a high volume pump, except in fields unitized for secondary recovery. Is there a  
23 difference between a vacuum pump and a high volume pump?  
24 A. There is not necessarily a difference. The distinction hinges upon whether the reservoir  
25 pressure has already declined to something close to atmospheric pressure and also upon  
26 how the pump has been sized and is intended to be operated. If the pump is capable of  
27 staying even with the rate of entry of fluids into the wellbore from the surrounding  
28 reservoir or of staying slightly ahead of the rate of entry, then the wellhead pressure  
29 reading should be pulled down to a low enough reading to be negative, indicating the  
30 presence of a vacuum in the wellbore. If the pump is operated in this manner, it is a  
31 vacuum pump. If reservoir pressure is not that low, but the pump can increase total daily

1 fluid production to more than 2,500 barrels of fluid per day, it is considered a high  
2 volume pump.

3 Q. What does Norstar Petroleum (Applicant) seek in this case?

4 A. There are three wells on the Hume Brothers lease that simultaneously make crude oil and  
5 natural gas. They are not in a field that has been unitized for secondary recovery.  
6 Applicant's Mr. Pfeiffer has stated in conversation with me the following regarding the  
7 three wells: (1) a decline in reservoir pressure has reduced oil production rates; (2) in  
8 part, the reduction in oil production can be attributed to natural gas building up pressure  
9 in the wellbore, inhibiting the flow of crude oil to the surface; and (3) although  
10 previously the natural gas production was vented directly into the atmosphere from the  
11 backside of the wells, Applicant wants to, and since August 2017 has begun, selling the  
12 gas production via pipeline. As I understand it, Applicant wants to add compression  
13 sufficient to induce a vacuum so as to (1) increase the amount of natural gas produced,  
14 thus increasing revenue; and (2) see if the drawdown of pressure inside the wellbores will  
15 raise oil production. Where the Commission comes in is that induced wellhead pressures  
16 under vacuum conditions require Commission approval, so Applicant seeks that  
17 approval. Realize that this is more information I have gathered from conversation with  
18 Mr. Pfeiffer, and not so much information present in the application or Mr. Pfeiffer's  
19 testimony.

20 Q. Is the field nearly depleted, as required by K.A.R. 82-3-131(a)?

21 A. Applicant has not provided any solid evidence that it is. Applicant seems to equate its  
22 lease becoming uneconomic with the field being nearly depleted. But even if its lease is  
23 becoming uneconomic, which Applicant merely asserts, it is not proper to equate the two.  
24 In its rebuttal testimony, Staff is hoping that Applicant will provide whatever evidence it  
25 sees of the field being nearly depleted.

26 Q. Does the application contain everything required under K.A.R. 82-3-131(b)(1) thru (5)?

27 A. Yes.

28 Q. Are there other issues the Commission should consider, outside the explicit requirements  
29 of K.A.R. 82-3-131?

1 A. Yes. Statutorily the Commission is tasked with the protection of correlative rights and the  
2 prevention of waste. If one reviews the application in isolation, without considering the  
3 protest, obviously possible correlative rights violations are not an issue.

4 The question of preventing waste, however, still remains, even when considering the  
5 application in isolation. Applicant has not provided any sort of economic analysis to  
6 demonstrate that the cost of compressor operation over time, versus the value of the  
7 additional oil and natural gas reserves which the compressor may produce, will result in  
8 increased profits. Nor does Applicant provide an analysis of how many oil reserves  
9 would ultimately be left in the ground without the assistance of a compressor. So it  
10 becomes impossible to tell whether approval of the application will prevent waste.  
11 Further, Mr. Butner's opinion regarding Applicant's production decline being caused by  
12 mechanical problems seems to be a plausible alternative explanation of the observed  
13 decline. Applicant should address these considerations when preparing its rebuttal  
14 testimony.

15 Reviewing the application in light of the protest, the protection of correlative rights  
16 does come into play. The thing is, as I understand it, Applicant intends to reduce  
17 pressures of gas in the wellbores in part so as to increase the oil production rate. The  
18 compressor, as applied for, will not function as a high-volume pump within the oil  
19 column. So in terms of correlative rights, Applicant's vacuum would only be restoring  
20 the natural ability of the wells to flow oil, unhindered by the artificial constraints of  
21 backpressure resulting from gas accumulating within the wellbores. There is simply no  
22 evidence, from Anadarko's use of vacuum within the field or otherwise, to lead Staff to  
23 believe that Applicant's vacuum could or will result in production being pulled out from  
24 under Protestant's leases.

25 Protestant essentially admits this in Mr. Butner's testimony, when he states "[t]he test  
26 results shown by Mr. Pfeiffer indicate that using compression will not result in much, if  
27 any, additional production..." (P. 3, Lines 6-7). It certainly would not come anywhere  
28 close to resulting in production in excess of the Commission's daily oil allowable. Thus,  
29 in reviewing Protestant's testimony, I do not see how correlative rights violations could  
30 come into play. This is especially true in light of the fact that, as I understand it,  
31 Applicant is selling natural gas into a separate sales line from the one that White

1 Exploration sells into, so Applicant's gas production will not result in increases in line  
2 pressure potentially harming Protestant's ability to make gas sales off its own wells.

3 Reviewing the application, in light of the protest, in terms of possible waste occurring  
4 also does not really change the analysis. Protestant says in Mr. White's testimony, that "if  
5 [Applicant] is allowed to impose vacuum compression, then [Protestant] will be forced,  
6 as a practical matter, to also seek approval and to use vacuum compression on its leases  
7 and we do not believe that it is economically feasible or wise to place our wells on a  
8 vacuum" (P. 8, Lines 15-19). It is not clear how Protestant will be forced as a practical  
9 matter to do so, in light of Mr. Butner's admission that a vacuum will not result in much,  
10 if any, additional production on Applicant's lease. And it is not at all clear how  
11 Commission approval of Applicant's application would require Protestant to do  
12 something Protestant thinks is uneconomic. I would note that even assuming that were  
13 the case, Protestant's complaint that imposing a vacuum on its wells could compromise  
14 or eliminate its ability to sell casinghead gas from its wells seems unlikely. I believe an  
15 operator should probably be able to avoid the introduction of oxygen while under  
16 vacuum through the use of good-quality piping and valves. At any rate, Applicant is  
17 already selling gas while pulling vacuum on two of their wells and, to date, no issues  
18 involving oxygen-contamination appear to have arisen.

19 In light of all this, I do not believe Protestant's concerns should change any  
20 Commission analysis regarding possible waste or potential correlative rights violations.

21 Q. Does Staff have a recommendation regarding whether to approve the application?

22 A. Not at this time. As discussed above, Staff wants to see more testimony from Applicant  
23 regarding (1) the degree of depletion of the Morrow Keyes Sand; (2) the projected  
24 economics pertaining to the cost of operation of the compressor as compared to the  
25 revenue from the additional oil that is expected to be recovered; (3) the potential for  
26 stranded reserves without the assistance of a compressor, and (4) the possibility that  
27 Applicant's production declines stem from mechanical issues. To the extent Protestant  
28 can shed additional light on these issues, Staff would also like to see Protestant's rebuttal  
29 testimony.

30 Q. Does this conclude your testimony as of this date, September 28, 2017?

31 A. Yes.

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**CERTIFICATE OF SERVICE**

I, Cynthia K. Maine, certify that on September 28, 2017, I did cause a true and correct copy of the Pre-Filed Testimony of Jim Hemmen to be served by electronic mail, to the following:

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