STATE OF NEW MEXICO

ENERGY, MINERALS and NATURAL RESOURCES DEPARTMENT

OIL CONSERVATION DIVISION
AZTEC DISTRICT OFFICE

1000 RIO BRAZOS ROAD
AZTEC, NEW MEXICO 87410
(505) 334-6178

November 5, 1991

Mr. Joe H. Cox
Mallon Oil Company
1099 18th St
Suite 2740
Denver CO 80202

Re: Deliverability Test

Dear Joe:

The conditions you described for the Davis-Federal Com 3 #15 are not unusual for many wells in the Blanco Mesaverde Pool. The calculated deliverability is not intended to equal the tested flow rate. The big difference between your calculated deliverability and your producing rate is caused by the difference in your shut-in and flowing pressures.

I have attached an example of how the test is to be calculated.

Sincerely,

Frank Chavez, District Supervisor

FC:sh

Enc

State of New Mexico
Energy, Minerals and Natural Resources Department

Form C-122-A
Revised 4-1-91

OIL CONSERVATION DIVISION
P.O. Box 2088
Santa Fe, New Mexico 87504-2088

WELL DELIVERABILITY TEST REPORT FOR 19 _90_ (Re-Test)

POOL NAME	POOL SLOPE	FORMATION	COUNTY
Blanco - Mesaverde	0.75	Mesaverde	Rio Arriba

OPERATOR				WELL NAME AND NUMBER	
Mallon Oil Company				Davis-Federal Comm. 3 #15	
UNIT LETTER	SECTION	TOWNSHIP	RANGE	PURCHASING PIPELINE	
O	3	25 N	2 W	Phelps Dodge Refining Company	
CASING O.D. - INCHES	CASING I.D. - INCHES	SET AT DEPTH - FEET	TUBING O.D. - INCHES	TUBING I.D. - INCHES	TOP - TUBING PERF. - FEET
5.5	4.892	8277	2.875	2.441	3481
GAS PAY ZONE	WELL PRODUCING THRU		GAS GRAVITY	GRAVITY X LENGTH	
FROM 5433' TO 5798' (CASING) Csg. TUBING			0.684	3481	
DATE OF FLOW TEST		DATE SHUT-IN PRESSURE MEASURED			
FROM 12/16/90 TO 12/23/90		12/31/90			

PRESSURE DATA - ALL PRESSURES IN PSIA

(a) Flowing Casing Pressure (DWt)	(b) Flowing Tubing Pressure (DWt)	(c) Flowing Meter Pressure (DWt)	(d) Flow Chart Static Reading	(e) Meter Error (Item c - Item d)	(f) Friction Loss (a - c) or (b - c)	(g) Average Meter Pressure (Integr.)
97.77	N/A	67.9	67.9	0	29.87	67.9
(h) Corrected Meter Pressure (g + e)	(i) Avg. Wellhead Press. P_t = (h + f)	(j) Shut-in Casing Pressure (DWt)	(k) Shut-in Tubing Pressure (DWt)	(l) P_c = higher value of (j) or (k)	(m) Del. Pressure P_d = _70_ % P_c	(h) Separator or Dehydrator Pr. (DWt) for critical flow only
67.9	97.77	1307	1307	1307	(914.9)	

FLOW RATE CORRECTION (METER ERROR)

Integrated Volume - MCF/D	Quotient of $\dfrac{\text{Item c}}{\text{Item d}}$ = 1	$\sqrt{\dfrac{\text{Item c}}{\text{Item d}}}$ = 1	Corrected Volume
326.6			Q = 326.6 MCF/D

WORKING PRESSURE CALCULATON

$(1-e^{-x})$	$(F_c Q_m)^2 (1000)$	$(1-e^{-x})(F_c Q_m)^2 (1000)$	P_t^2	$P_w^2 = P_t^2 + R^2$	$P_w = \sqrt{P_w^2}$
0.292344	439.192	128.3949	996,112.5854	996,241	998.1187

Header also: $R^2 =$

DELIVERABILITY CALCULATION

$$D = Q\left[\frac{P_c^2 - P_d^2}{P_c^2 - P_w^2}\right]^n = 326.6 \left[\left(\frac{1,708,249 - 837,042.01}{1,708,249 - 996,241}\right)^n \left(\frac{\frac{871,206.99}{712,008.0}}{}\right)^n = \frac{1.2236}{} = 1.1634\right] = 379.97 \text{ MCF/D}$$

REMARKS: _Pressure adjusted for wellbore liquids per Gas Testing Manual_

SUMMARY		
Item h	67.9	Psia
P_c	1307	Psia
Q	326.6	MCF/D
P_w	998.12	Psia
P_d	914.90	Psia
D	379.97	MCF/D

Company _Mallon Oil Company_
By _Joe H. Cox, Jr_ (Joe H. Cox, Jr)
Title _Production Manager_
Witnessed By _Charles Oleson_
Company _Contract Pumper for Mallon Oil Co._

MALLON OIL COMPANY
1099 18th Street, Suite 2750, Denver, Colorado 80202
(303) 293-2333

October 25, 1991

New Mexico Conservation Division
1000 Rio Brazos Road
Aztec, NM 87410

Attention: Mr. Frank Chavez
            District III Supervisor

Re: Davis-Federal Comm. 3 #15, Unit O, Section 3, T25N, R2W
      Rio Arriba County, New Mexico
      1990 Deliverability Re-Test

Dear Mr. Chavez:

As we have discussed, regarding the above referenced well, Mallon's deliverability calculations include adjustments for the effects of liquid columns in the tubing and casing. In our latest conversation of October 17, we discussed the adjustment for liquids and you stated that the tests, as used by your district, neglect this factor. I would like to give you a little more background on the Davis well, and what appear to me to be significant factors for using the adjusted test figures.

As I mentioned over the phone, the tests we have conducted so far have been flowed up the casing-tubing annulus. The tests were conducted during the colder months, and that, combined with the fact that the well has a string of rods in the tubing, thus creating a change in the effective inner diameter at the tubing head, has caused freezing conditions when tubing flow has been attempted. With casing flow, our P_w has been obtained from the tubing, which, due to the periodic pumping of the well to reduce to reduce the buildup of liquids, has a higher than normal liquid column and a resulting lower surface pressure. (The well has not been pumped during the conditioning or test periods). This artificially low P_w, when applied without adjustment to the deliverability equation, results in a substantially lower deliverability factor.

Before adjustment for liquids the ratio of P_w/P_c in the Davis well 1990 re-test is 0.075 versus an average ratio of 0.64 for all of the 3977 wells tested in the Blanco Mesaverde pool. The resulting "deliverability factor" $((P_c^2-P_d^2/P_c^2-P_w^2)^n)$ from the deliverability equation is 0.61 for the Davis well and 1.22 for the pool average. The result is a deliverability value that is nearly 40% below the actual flow rate during the test and 14.4% below the average daily sales during the nine months since the test was run.

The adjusted values of P_f an P_w were based on the depth to the gas/liquid interface as determined by sonic fluid level shooting, and the specific gravities of the produced fluids as measured at the surface. The calculations were based on formulae and examples in the Gas Well Testing Manual For Northwest New Mexico.

I feel that it should not be the intention of the Commission to penalize a well for unusual well bore conditions, such as the annular flow and high liquid level due to the rods and pump in the Davis well. I would like to request that the adjusted test be used in this case.

If I can help you with any further information, please feel free to contact me.

Sincerely,

MALLON OIL COMPANY

Joe H. Cox, Jr.
Production Manager

JHC/tm

Attachment