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TORP

Post-it® Fax Note 7671	Date 4/1/97	# of pages ▶
To Tim Carr	From Rodney Reynolds	
Co./Dept. KGS	Co. TORP	
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Memo

To: Paul Willhite
Don Green
Shapour Vossoughi

From: Rodney Reynolds

CC: Tim Carr
Paul Gerlach
Saibal Bhattacharya

Date: April 1, 1997

Re: Wellbore flowing pressures in the Schaben Field

I am in receipt of a copy of the recent fluid level data acquired by Ritchie Exploration on the wells they operate in the Schaben Field. From my experience as a production engineer, I am familiar with how this data is acquired, the instruments used to acquire this data, the accuracy limitations associated with these instruments, and how to interpret the data. My evaluation of the data indicates that of the 23 wells on which data was received, 15 of the wells are operating in a pumped off condition. This is the general practice of the oil industry, especially when dealing with marginal production. However, occasionally situations dictate that backpressure be held against the formation in wells that have high productivity, produce excessive amounts of water, to assist in reducing lifting costs, or in some instances may assist in maintaining some percentage in oil cut. I also spoke with Danny Biggs (production superintendent) and Jack Gurley (petroleum engineer) for Pickrell Drilling Company, concerning fluid levels on their wells. They indicated that they have not recently shot fluid levels, but in general they try to pump the wells off, however they have a few large water producers they cannot pump off. They said its time to shoot fluid levels and they will supply a copy of the results to me.

I have also compared the recently acquired fluid level data to the fluid level information acquired from the historic information contained in the well files, on which TORP based the model and simulation. The recent data correlates with the data we used, with 2 exceptions. The recent data indicates the Moore B-6 is carrying approx. 200' fluid above the perforations and the well files indicated it to be pumped off and the Moore D-4 which Ritchie field personnel indicated to me had "a lot of fluid in the hole" and the recent data indicates it is pumped off.

Porosity and water saturation in different Mississippian zones :

n p : zone not present, n l : no log in the well, l s : log short and ends above zone, n res : no resistivity log.

Base of pay @ -2143.5

Well name and API	KB	Base Pay	Miss top	Log ends @	M5 range	avg. range	Por.	Sw	M3 range	avg. range	Por.	Sw	M1 range	avg. range	Por.	Sw	M0 range	avg. range	Por.	Sw	Msub-range	Avg.-range	Por.	Sw	Comments
MOORE "D" #2 (API # 99-0000-0010)	2270	4413.5	4365		n p	n p			4365-75				4375-90	4382-90	15.7	63.8	4390-07	4390-94	15.8	60.00	4407-4413.5				Old Miss top @ 4377
MOORE "C" #2 (API # 99-0000-0017)	2289	4432.5	4394		n p	n p			4394-02				4402-26	4402-18	17.5	60.3	4426-32.5				n p	n p			
MOORE "B" #7 (API # 15-135-20019)	2294	4437.5	4399		n p	n p			n p	n p			4399-10				4410-35	4412-35	10.6	89.20	4435-37.5				
MOORE "D" #1 (API # 15-135-00675)	2275	4418.5	4364		n p	n p			4364-72	4365-72	15	59.3	4372-86	4372-86	17.3	56.2	4386-09	4386-01	19.4	50.70	4409-4418.5				Old OWC @ 4401
MOORE "B" #2 (API # 99-0000-0011)	2273	4416.5	4387		n p	n p			n p	n p			4387-11	4398-11	17.9	61.5	4411-16.5				n p	n p			
MOORE "B" #5 (99-000-00014)	2278	4421.5	4386		n p	n p			n p	n p			4386-96	4388-96	14.8	66.9	4396-18	4396-04	16.7	60.30	4418-21.5				
3-C MOORE (1513521024)	2296	4439.5	4416		n p	n p			n p	n p			4416-37	4416-37	18.4	62.5	4437-39.5				n p	n p			
MOORE "D" #4 (API # 99-0000-0018)	2301	4444.5	4402		n p	n p			n p	n p			4402-17	4408-17	12.4	72.6	4417-38	4417-32	15.5	65.30	4438-44.5				
MOORE "D" #3 (API # 15-135-30030)	2285	4428.5	4370		n p	n p			n p	np			4370-91	4384-91	12.4	73.7	4391-11	4391-10	14.7	74.00	4411-28.5				
MOORE "B" #4 (API # 99-0000-0013)	2297	4440.5	4389		n p	n p			n p	n p			4389-02	4394-02	13.5	70.5	4402-22	4402-22	15.6	68.70	4422-40.5				
REIN "A" #6 (API # 15-135-21023)	2314	4457.5	4423		n p	n p			n p	n p			4423-32	4426-32	20.4	43.15	4432-54	4432-54	16.3	66.54	4454-57.5	4454-57.5	14.8	86.2	
CSO 1-B MOORE 9900000009	2288	4431.5	4398		n p	n p			n p	n p			4398-22	4400-22	20.8	56	4422-31.5				n p	n p			
MOORE "B" #3 (99-000-00012)	2301	4444.5	4417		n p	n p			n p	n p			4417-33				4433-44.5	4436-44.5	17.1	53.80	n p	n p			Old Miss. top @ 4436
#6 MOORE "B" (API # 15-135-00479)	2311	4454.5	4410		n p	n p			n p	n p			4410-19				4419-36	4424-36	13.9	67.10	4436-54.5				Old Miss top @ 4418
Moore C #1 (99-000-00016)	2290	4433.5	4420		n p	n p			4420-26	4420-26	11.7	74.1	4426-33.5	4426-31	13.7	71.6	4431-33.5				n p	n p			Old OWC @ 4431
REIN NO. 4-A (API # 15-135-91401)	2316	4459.5	4429		n p	n p			n p	n p			4429-33				4433-43	4433-43	13.2	65.10	4443-59.5	4443-57	17.5	60	Old OWC @ 4457, Miss top @ 4429
REIN "A" #2 (API # 15-135-30031)	2281	4424.5	4380		n p	n p			n p	n p			4380-94	4383-94	16.1	58.5	4394-09	4394-08	16.3	63.70	4409-24.5				Old Mstop & OWC @ 4380 & 4422.
Rein A 1 (99-000-00067)	2295	4438.5	4410		n p	n p			n p	n p			4410-20	n l			4420-38.5	n l			n p	n p			No log. Old Mstop & OWC @ 4428 & 4455.
GNEISH #1 (API # 15-135-30032)	2266	4409.5	4369		n p	n p			n p	n p			4369-79	4370-79	18.8	50.4	4379-01	4379-86	14.4	76.40	4401-09.5				Old OWC @ 4407
Wittman #2 (15-135-30066)	2261	4404.5	4368		n p	n p			4368-74				4374-92	4376-92	13.3	74	4392-04.5				n p	n p			Old Mstop & OWC @ 4374 & 4395
#1 JOHN WITTMAN (API # 15-135-30046)	2275	4418.5	4378		n p	n p			n p	n p			4378-95	4380-95	14.3	63.7	4395-18.5	4395-04	14.6	66.40	n p	n p			Old OWC @ 4409
#3 Wittman (15-135-23520)	2284	4427.5	4384		n p	n p			n p	n p			4384-97	l s			4397-21	l s			4421-27.5	l s			D/N too short
HAMBURG #2-A (API # 99-0000-0031)	2283	4426.5	4392		4392-97	4393-97	10.5	66.5	4397-16	4397-16	17.1	59.4	4416-26.5	4416-26.5	19.5	61.7	n p	n p			n p	n p			
Borger #1 (99-000-0072)	2243	4386.5	4329		n p	n p			4329-34	n res			4334-48	n res			4348-73	n res			4373-86.5	n res			No Res. values
Borger #2 (15-135-30005)	2233	4376.5	4330		n p	n l			4330-47	n l			4347-62	n l			4362-76.5	n l			n p	n p			No log
Gneich #2 (99-0000-0064)	2302	4445.5	4415		n p	n p			n p	n p			4415-20	n l			4420-38	n l			4438-45.5	n l			No log
Schaben #1 (99-0000-0069)	2293	4436.5	4434		n p	n p			4434-36.5	n l			n p	n p			n p	n p			n p	n p			No log
Williams Estate #2 (99-0000-0037)	2281	4424.5	4423		n p	n p			4423-24.5	4424-24.5	14.1	68.4	n p	n p			n p	n p			n p	n p			
Lyle Schaben #2 (1513523925)	2279	4422.5	4384		n p	n p			4384-04	4390-04	16.3	61.5	4404-22.5	4404-22.5	15.1	82.4	n p	n p			n p	n p			
Humburg #1 A(1513500323)	2273	4416.5	4357		4357-66				4366-82	4368-82	16.9	61.4	4382-07	4382-92	18.4	51.3	4407-16.5				n p	n p			Old Mstop & OWC @ 4368 & 4407
BORGER #2-"A" (API # 15-135-30004)	2280	4423.5	4384		4384-86.5				4386.5-05	4391-00	16.1	63	4405-23.5				n p	n p			n p	n p			
BORGER NO.1 (15-135-23399)	2277	4420.5	4365		4365-77	4365-77	15.1	65	4377-96	4377-96	18.6	54.9	4396-20.5	4396-10	24.3	67	n p	n p			n p	n p			
Borger #2 (15-135-23524)	2285	4428.5	4391.5		4391.5-0.5	n l			4400.5-16.5	n l			4416.5-28.5	n l			n p	n p			n p	n p			No log
Borger #3 (99-000-00070)	2276	4419.5	4365		4365-73	n l			4373-92	n l			4392-19.5	n l			n p	n p			n p	n p			No log
BORGER #4 (15-135-00505)	2290	4433.5	4392		4392-0.5	4392-98	9.1	84.8	4400.5-16.7				4416.7-33.5				n p	n p			n p	n p			
#1 BORGER (API # 99-0000-0028)	2290	4433.5																							
#2 Borger (99-000-00071)	2275	4418.5	4379.5		n p	n l			4379.5-98	n l			4398-13	n l			4413-18.5	n l			n p	n p			No log
DORA WAGNER NO.1 (99-0000-0032)	2283	4426.5	4382 - M7		4385-91	4385-91	18	50.5	4391-11.5	4391-02	19.5	52	4411.5-26.5				n p	n p			n p	n p			
DORA WAGNER NO.3 (99-000-00034)	2268	4384-85 4411.5	18.1/49.8 4360.5-M7		4371-86	4371-86	12.5	78.6	4386-04	4386-96	15.1	72.3	4404-11.5				n p	n p			n p	n p			
#1 ANNA M. WILLIAMS (15-135-30039)	2263	4406.5	4360-M7		4363-73.5	4363-70	18.3	47	4373.5-96				4396-06.5				n p	n p			n p	n p			
ANNA WILLIAMS #2 (API #15-135-30160)	2269	4412.5	4370-M7		4387-09				4409-12.5				n p	n p			n p	n p			n p	n p			
ANNA M WILLIAMS #3 (15-135-30159)	2262	4370-80 4405.5	20.7/57.7 4347-M7		4365.5-76	4365.5-75.5	22.8	38.8	4376-98				4398-05.5				n p	n p			n p	n p			
#1 H.L. WILLIAMS EST.(99-0000-0060)	2261	4404.5	4359		4359-68	4360-68	17.1	56.8	4368-92	4368-70	17.9	45.8	4392-04.5				n p	n p			n p	n p			
GILLIG "B" NO.1 (15-135-00465)	2286	4429.5	4378.5		4378.5-86	4378.5-86	15.5	67	4386-15.5	4386-93	14.7	66	4415.5-29.5				n p	n p			n p	n p			
#1 ROBERT B. LENT (15-135-30251)	2273	4416.5	4372		4372-82	4372-82	13.2	62.5	4382-01	4382-93	16.2	63.7	4401-16.5				n p	n p			n p	n p			
Humburg #1 (99-0000-0035)	2283	4426.5	4381		n p	n p			4381-00	4383-00	20	46	4400-24.5	4400-17	18.9	55.1	4424.5-26.5								
Borger #1 A (99-0000-0029)	2290	4433.5	4385		n p	n p			4385-04	4385-04	14.9	59.4	4404-26	4404-10	18.1	59.6	4426-33.5								
GILLIG #1 (15-135-20160)	2271	4414.5 4376-79.5	4376-M7 22.2/31.2		4379.5-90	4379.5-90	16.9	63	4390-11	4390-93	17.7	64.7	4411-14.5												
DORA WAGNER NO.2 (99-0000-0033)	2270	4413.5	4369-M7		4372-78	4374-78	17.1	49.1	4378-98.5	4378-94	15.6	65.4	4398.5-13.5				n p	n p							
#1 WEGLE (1513523133)	2257	4400.5																							
RAHM NO.1 (1513521155)	2225	4368.5																							
Henry #2 (15-135-21293)	2253	4396.5																							
#1B Frank Rein (15-135-22058)	2310	4453.5																							