

EARLOUGHER ENGINEERING  
PETROLEUM CONSULTANTS-CORE ANALYSES  
3316 EAST 21ST STREET  
TULSA, OKLAHOMA 74114

31-30-1W  
INMAN 1  
" "  
BATES UNIT 'B' 3-1

July 31, 1970

Beardmore Oil Inc.  
Suite 700, One-Twenty Bldg.  
Wichita, Kansas 67202

Attention - Mr. Heber Beardmore

Re - Bates Unit  
Inman No. 1 WSW  
Water Analysis

Gentlemen:

Attached are results of complete analysis for a sample of water from WSW Inman No. 1 secured July 24, 1970. Approximately 12,000 barrels of water had been produced before the sample was taken. Analyses for other samples are included for comparison purposes.

WATER ANALYSIS

Results indicate that the sample secured while swabbing July 2, contained some water used during the fracture treatment. Latest results show an increase in calcium, magnesium, sodium, barium and chloride content and a decrease in silica and dissolved iron. Comparison of results continues to show that ArcoHib S-232W treatment will be needed to prevent barium sulfate scale formation in the positive displacement pump and immediately downstream in the meter and valves.

Yours very truly

EARLOUGHER ENGINEERING



H. L. Brockey, Engineer

HLB bw  
Encl - 3 copies

**EARLOUGHER ENGINEERING  
TULSA, OKLA.**

**RESULTS OF WATER ANALYSES**

31-30-1W  
INMAN 1  
become's Bates Unit B 3-1

SAMPLE RECEIVED 7-28-70 RESULTS REPORTED 7-31-70 LABORATORY NO. 1579

COMPANY Beardmore Oil, Inc. LEASE Bates Unit  
 FIELD OR POOL Bates  
 SECTION 31, 36 TWP. 30S RGE. 1W COUNTY Sumner STATE Kansas  
 SOURCE OF SAMPLE AND DATE TAKEN:  
 No. 1 1579 - Inman No. 1 (Stalnaker Perf 2768-2851') 7-24-70  
1/ No. 2 1574 - Inman No. 1 (Stalnaker Perf 2768-2851') 7- 2-70  
1/ No. 3 1563 - Produced water 5- 6-70  
 No. 4 \_\_\_\_\_  
 No. 5 \_\_\_\_\_

**CHEMICAL AND PHYSICAL PROPERTIES**

	NO. 1	NO. 2	NO. 3	NO. 4	NO. 5
SPECIFIC GRAVITY @ 60/60° F	1.162	1.160	1.136		
pH	5.1	5.8	6.8		
TOTAL ALKALINITY AS CaCO <sub>3</sub>	18.	18.	54.		
SUPERSATURATION AS CaCO <sub>3</sub>	--	--	--		
UNDERSATURATION AS CaCO <sub>3</sub>	2.	--	--		
CALCIUM	15,800.	15,600.	12,400.		
MAGNESIUM	2,940.	2,830.	2,340.		
SODIUM	70,300.	68,800.	59,900.		
BARIUM	110.	90.	0		
SULFATE	0	0	770.		
CHLORIDE	145,000.	142,000.	170,000.		
SILICA	6.	16.	9.		
TOTAL IRON	95.	151.	28.		
ALUMINUM	.9	1.2	.4		
TURBIDITY AS SiO <sub>2</sub>	110.	>150.	10.		
Temperature °F	* 104.	* 104.	70.		
CaCO <sub>3</sub> Stability Index	- .7	- .1	+ .5		
Ca/Mg Ratio	5.4	5.5	5.3		
TOTAL DISSOLVED SOLIDS	234,000.	229,000.	195,000.		
CARBON DIOXIDE	200.	210.	45.		
HYDROGEN SULFIDE	0	0	.1		
DISSOLVED OXYGEN	ND	ND	.04		

REMARKS: 1/ Included for comparison.  
\* Estimated.

INJECTION RATE: B/D PRODUCED WATER RATE: B/D  
 TREATMENT: \_\_\_\_\_

NOTE: N. D. = NOT DETERMINED. ALL RESULTS REPORTED AS MILLIGRAMS PER LITER UNLESS OTHERWISE MARKED.

bw

By Inman W. Hartman



# GORDON LAB, INC.

925 PATTON ROAD • P. O. BOX 605 • GREAT BEND, KANSAS 67530

## WATER ANALYSIS

DATE December 14, 1973

TO Mr. Gene Stearns  
Phillips Petroleum Company  
Box 287 Great Bend, Kansas

### Bates Unit-B Produced Water

	1.	2.	3.	
Specific Gravity	<u>1.130</u>	_____	_____	Milligrams per liter
Chlorides	<u>105,400</u>	_____	_____	Milligrams per liter
Calcium	<u>12,000</u>	_____	_____	Milligrams per liter
Magnesium	<u>1,800</u>	_____	_____	Milligrams per liter
Sulfates	<u>692</u>	_____	_____	Milligrams per liter
Bicarbonates	<u>183</u>	_____	_____	Milligrams per liter
Iron	<u>18</u>	_____	_____	Milligrams per liter
Hydrogen Sulfide	<u>0</u>	_____	_____	Milligrams per liter
Barium	<u>0</u>	_____	_____	Milligrams per liter
pH	<u>5.5</u>	_____	_____	
Sulfate Reducing Bacteria	_____	_____	_____	
_____	_____	_____	_____	
_____	_____	_____	_____	

cc: **Gene Hendricks**  
**Joe Cronin**

RESPECTFULLY SUBMITTED

LABORATORY ANALYST

Pivonka

BY \_\_\_\_\_

**T. J. Gordon**

To convert to parts per million, divide by specific gravity.



# GORDON LAB, INC.

925 PATTON ROAD • P. O. BOX 605 • GREAT BEND, KANSAS 67530

## WATER ANALYSIS

DATE December 14, 1973

TO Mr. Gene Stearns  
Phillips Petroleum Company  
Box 287 Great Bend, Kansas

Hummon Oil Company Crawford #1

	1.	2.	3.	
Specific Gravity	<u>1.132</u>	_____	_____	Milligrams per liter
Chlorides	<u>112,000</u>	_____	_____	Milligrams per liter
Calcium	<u>14,300</u>	_____	_____	Milligrams per liter
Magnesium	<u>904</u>	_____	_____	Milligrams per liter
Sulfates	<u>900</u>	_____	_____	Milligrams per liter
Bicarbonates	<u>195</u>	_____	_____	Milligrams per liter
Iron	<u>25</u>	_____	_____	Milligrams per liter
Hydrogen Sulfide	<u>0</u>	_____	_____	Milligrams per liter
Barium	<u>0</u>	_____	_____	Milligrams per liter
pH	<u>5.5</u>	_____	_____	
Sulfate Reducing Bacteria	_____	_____	_____	
_____	_____	_____	_____	
_____	_____	_____	_____	

cc: **Gene Hendricks**  
**Joe Cronin**

RESPECTFULLY SUBMITTED

LABORATORY ANALYST

Pivonka

BY

*T. J. Gordon*  
*Analyst*

**T. J. Gordon**

To convert to parts per million, divide by specific gravity.