PTS Labs

CORE ANALYSIS SERVICES

WORLDWIDE CORE ANALYSIS

Wellco Oil AS

Greenzyme® Flood Summary

5% Greenzyme® - Brazilian Crude Oil

5% Greenzyme® - Norway Crude Oil

January 2007

File No.: 22594

Prepared by:

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January 26, 2007

Wellco Oil AS
Haakon Vlls gt. 10
P. O. Box 1604, Vika
N-0119 Oslo Norway

Attn: Hans Petter Hjermstad

Re: Geenzyme® Flood Summary 5% Greenzyme® - Brazilian Crude Oil
5%
Greenzyme® - Norway Crude Oil

File No.: 22594

Dear Mr. Hjermstad:

This report presents final data for the Greenzyme ® Flood Summery on 5% Greenzyme® - Brazilian Crude Oil and 5% Greenzyme® - Norway Crude Oil.

Laboratory procedures have been included in the report.

We appreciate the opportunity to be of service to Wellco Oil AS. If we may be of further assistance, please telephone 1-713-680-2291.

Thank you,
PTS Laboratories, Inc.

Chuck Devier
Director of Operations

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SECTION I

Laboratory Procedure

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Greenzyme® Coreflood
Unsteady-State Method

- **Sample Preparation**

Two 6 inches long and 1.50-inch diameter Berea core sample were selected for Greenzyme® coreflood tests under overburden conditions. The sample was cleaned, dried and properties were measured at 1000 psi net confining stress.

- **Fluid Preparation**

Synthetic brine of 35,000 ppm NaCl was prepared using deionized water and reagent grade chemicals. The brine was filtered and degassed prior to use. A Brazilian crude oil was selected for the first flood test and Grane crude oil was selected for the second flood test. The crude oil samples were filtered and degassed prior to use.

- **Pre-Test Procedure**

The sample was vacuum saturated with brine and loaded into overburden cells at 1000 psi simulated reservoir stress. To ensure full saturation, brine was injected against backpressure. Water permeability, Kw, was determined at 100 percent brine saturation. Crude oil was injected at constant rate to drive the sample to residual water saturation, Swr. Water and oil volumes produced were recorded. Oil permeability at residual water saturation, KoSwr, was determined.

- **Sample Aging**

Following the KoSwr measurement, the sample was heated to 180ºF while maintaining 1000 psi confining stress. The sample was aged under these conditions for two weeks. Upon completion of aging the sample was allowed to cool to 122 ºF and oil permeability at residual water saturation, KoSwr, was determined. Water was injected at a constant rate of 2 cc/minute to drive the sample to residual oil saturation, Sor. Incremental volumes of water and oil production were collected as a function of time. Permeability to water and residual oil saturation (KwSor) was measured.

- **Greenzyme® Flood**

Five pore volumes of 5 % Greenzyme® was flowed through the sample at constant flow rate of 1 feet/day. The oil volumes produced were monitored and recorded. Once sufficient Greenzyme® was injected into the sample, flow was stopped and a 48 hour soak was conducted. After 48 hours flow was resumed using the simulated formation brine, flow was continued until a water cut of 99.9 percent was obtained. Oil volumes produced were monitored and recorded. Permeability to water at residual oil saturation (KwSor) was measured at the end of the test.

Test results are presented in tabular and graphical format.

SECTION II

5% Greenzyme® - Brazilian Crude Oil

Tabular Data
Graphical Data

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GREENZYME® FLOOD SUMMARY

Simulated Reservoir Stress: 1000 psi
Test Temperature 122.0° F

Crude oil: Brazilian Crude oil
Location: Houston

Sample ID	Permeability to Air, millidarcies	Porosity, percent	Permeability to Brine, millidarcies	Initial Condition Data			Post Waterfloc	
				Initial Water Saturation (Swi), percent	Initial Oil Saturation (So), percent	Permeability to Oil at Initial Water Saturation (KoSwi), millidarcies	Residual Oil Saturation (Sor), percent	Oil Produced, percent OOIP
6" Berea #1	901.	22.5	595.	21.18	78.82	425	37.48	52.45

Sample ID	Post 5 PV Greenzyme Solution Flood			Post Water Flood After Enzyme		
	Residual Oil Saturation (Sor), percent	Additional Oil Produced percent OOIP	Permeability to Water at Residual Oil Saturation (KwSor), millidarcies	Residual Oil Saturation (Sor), percent	Additional Oil Produced percent OOIP	Permeability to Water at Residual Oil Saturation (KwSor), millidarcies
6" Berea #1	36.18	1.65		32.58	4.57	46.5

Brazilian Crude oil

Density @ 70 ° F =	0.933	g/cm^3	23	API
Density @ 122 ° F=	0.913	g/cm^3	26	API
Viscosity @ 122 ° F=	101	Cp		

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Greenzyme® FLOOD SUMMARY

Simulated Reservoir Stress: 1000 psi

Test Temperature 122.0° F

Crude oil: Brazilian Crude oil
Location: Houston

Date: 25-Jan-07

Test Time, min.	Fluid Injected, Pore Volume	Oil Produced, cm3	Oil produced % Original Oil, in Place
5% Strength Greenzyme®			
13.3	0.08	0.050	0.16
34.2	0.21	0.150	0.49
55.0	0.34	0.250	0.81
96.7	0.59	0.350	1.13
138.3	0.85	0.433	1.40
238.3	1.46	0.460	1.49
338.3	2.07	0.480	1.56
538.3	3.30	0.490	1.59
738.3	4.53	0.500	1.62
938.3	5.75	0.510	1.65
48 hour soak			
Simulated Formation Brine			
4.6	5.99	0.100	1.98
9.2	6.23	0.150	2.14
14.8	6.51	0.230	2.40
20.4	6.80	0.320	2.69
24.9	7.02	0.400	2.95
35.3	7.56	0.510	3.31
83.4	10.02	0.850	4.41
132.3	12.51	1.080	5.15
257.3	18.90	1.320	5.93
357.4	24.02	1.400	6.19
465.0	29.51	1.410	6.22

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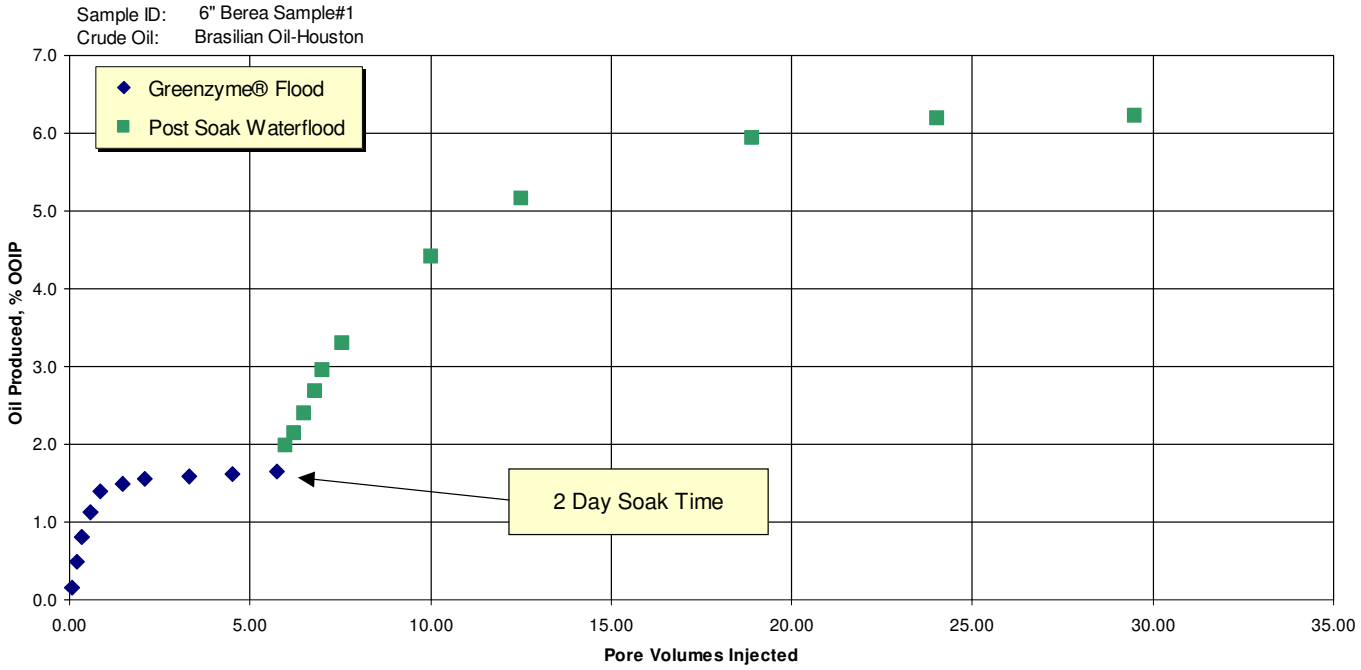
Oil Produced vs Pore Volumes Injected



SECTION III

5% Greenzyme® - Norway Crude Oil

Tabular Data
Graphical Data

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GREENZYME® FLOOD SUMMARY

Simulated Reservoir Stress: 1000 psi
Test Temperature 122.0° F

Crude oil: Grane Crude oil
Location: Norway

Sample ID	Permeability to Air, millidarcies	Porosity, percent	Permeability to Brine, millidarcies	Initial Condition Data			Post Waterfloo	
				Initial Water Saturation (Swi), percent	Initial Oil Saturation (So), percent	Permeability to Oil at Initial Water Saturation (KoSwi), millidarcies	Residual Oil Saturation (Sor), percent	Oil Produced, percent OOIP
6" Berea #2	625.	21.3	472.9	24.31	75.69	391.1	34.62	54.26

Sample ID	Post 5 PV Greenzyme Solution Flood			Post Water Flood After Enzyme		
	Residual Oil Saturation (Sor), percent	Additional Oil Produced percent OOIP	Permeability to Water at Residual Oil Saturation (KwSor), millidarcies	Residual Oil Saturation (Sor), percent	Additional Oil Produced percent OOIP	Permeability to Water at Residual Oil Saturation (KwSor), millidarcies
6" Berea #2	33.31	1.74		27.75	7.33	47.3

Grane Crude oil

Density @ 70 ° F =	0.9395	g/cm^3	22	API
Density @ 122 ° F=	0.9155	g/cm^3	25	API
Viscosity @ 122 ° F=	60.47	Cp		

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Greenzyme® FLOOD SUMMARY

Simulated Reservoir Stress: 1000 psi

Test Temperature 122.0° F

Crude oil: Grane Crude oil
Location: Norway

Date: 25-Jan-07

Test Time, min.	Fluid Injected, Pore Volume	Oil Produced, cm^3	Oil produced % Original Oil, in Place
5% Strength Greenzyme®			
15.0	0.10	0.050	0.19
33.8	0.23	0.090	0.33
56.3	0.38	0.160	0.59
79.6	0.54	0.220	0.81
103.8	0.70	0.280	1.04
143.3	0.96	0.350	1.30
183.8	1.24	0.400	1.48
362.9	2.44	0.450	1.67
558.8	3.76	0.460	1.70
967.7	6.51	0.470	1.74
48 hour soak			
Simulated Formation Brine			
2.7	6.66	0.020	1.81
5.2	6.80	0.070	2.00
7.8	6.95	0.150	2.30
12.6	7.22	0.350	3.04
17.7	7.50	0.750	4.52
22.5	7.77	1.050	5.63
28.2	8.09	1.350	6.74
33.8	8.41	1.490	7.26
82.7	11.15	1.750	8.22
130.2	13.81	1.850	8.59
179.6	16.58	1.900	8.78
229.9	19.40	1.950	8.96
278.8	22.14	1.970	9.04
404.4	29.18	1.980	9.07

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Oil Produced vs Pore Volumes Injected

Sample ID: 6" Berea Sample#2
Crude Oil: Grane Oil-Norway