From: Edmond Shtepani Intertek <edmond.shtepani@intertek.com>
Sent: Tuesday, June 8, 2010 2:46 PM
To: Wang, Yun <Yun.Wang@bp.com>
Subject: CCE at 243 F
Attach: WTC-10-001812 BP CCE Tables 060810.xls

Yun,

The results are attached. The CCE at 100F and SSST and MSST to follow

Regards,

Edmond

Dr. Edmond Shtepani, P.Eng.
Vice President/Director
Intertek Westport Technology Center
6700 Portwest Drive
Houston, TX 77024
Office Phone: 713 479 8425
Cell Phone: [redacted]
Email: edmond.shtepani@intertek.com
www.westport1.com

ATTACHMENT INFO

Name: WTC-10-001812 BP CCE Tables 060810.xls

Comments: THIS FILE WAS PRODUCED IN NATIVE FORMAT

ATTACHMENT INFO

DW 0007231

TREX 010419.0002

TREX-010419.0002

TABLE 1
AVERAGE FLUID COMPRESSIBILITIES WITH @ 243.0 F (390.4 K) WITH MIXER

Pressure Range From (psia)	To (psia)	Average Fluid Compressibility (psi^{-1})
13500	12500	1.2284E-05
12500	11500	1.2789E-05
11500	10500	1.3753E-05
10500	9500	1.5323E-05
9500	8500	1.7331E-05
8500	7500	2.0654E-05
7500	**6438 Psat**	**2.6101E-05**

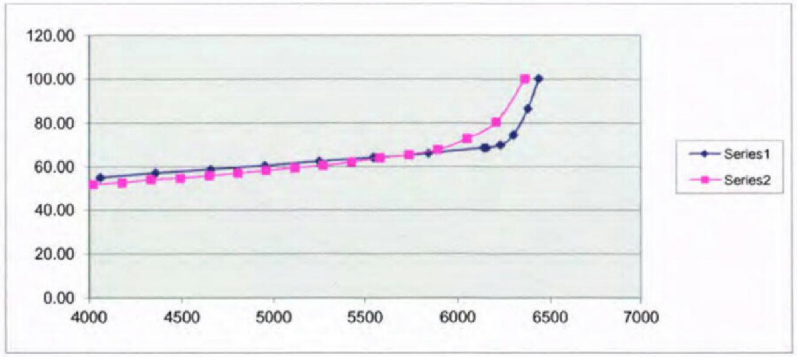
Pressure Range From (MPa)	To (MPa)	Average Fluid Compressibility (MPa^{-1})
93.08	86.18	1.7816E-03
86.18	79.29	1.8550E-03
79.29	72.39	1.9947E-03
72.39	65.50	2.2225E-03
65.50	58.61	2.5137E-03
58.61	51.71	2.9957E-03
51.71	**44.39 Psat**	**3.7857E-03**

Psat - Saturation Pressure

TABLE 2
CONSTANT COMPOSITION EXPANSION @ 243.0 F (390.4 K) WITH MIXER

Pressure (psia)	Pressure (MPa)	Relative Volume [1]	Y-Function [2]	Liquid Volume (% of Vtot)	Fluid Density (g/cc)
13500	93.08	0.886046			
12500	86.18	0.897065			
11500	79.29	0.908687			
10500	72.39	0.921358			
9500	65.50	0.935696			
8500	58.61	0.952199			
7500	51.71	0.972281			
6438 *	**44.39**	**1.000000**		**100.00**	
6378	43.98	1.002437	3.8373	86.50	
6299	43.43	1.005779	3.8117	74.51	
6230	42.96	1.008803	3.7894	70.01	
6155	42.44	1.012208	3.7652	68.68	
6141	42.34	1.012860	3.7606	68.67	
5844	40.29	1.027735	3.6647	66.27	
5547	38.25	1.045009	3.5688	64.25	
5250	36.20	1.065157	3.4729	62.52	
4953 **	34.15	1.088782	3.3770	60.48	
4656 **	32.10	1.116648	3.2811	58.81	
4359 **	30.05	1.149738	3.1852	57.08	
4062 **	28.01	1.189343	3.0893	55.03	
3765 **	25.96	1.237177	2.9934	52.87	
3468 **	23.91	1.295569	2.8975	50.09	
3171 **	21.86	1.367750	2.8016	47.17	
2874 **	19.82	1.458330	2.7057	43.55	
2577 **	17.77	1.574099	2.6098	40.12	
2280 **	15.72	1.725457	2.5138	36.03	
1983 **	13.67	1.929138	2.4179	31.75	

[1] Volume at indicated pressure per volume at saturation pressure
[2] Y Function = ((Psat-P)/P)/(Relative Volume - 1)
* Saturation Pressure
** Asphaltenes Precipitation



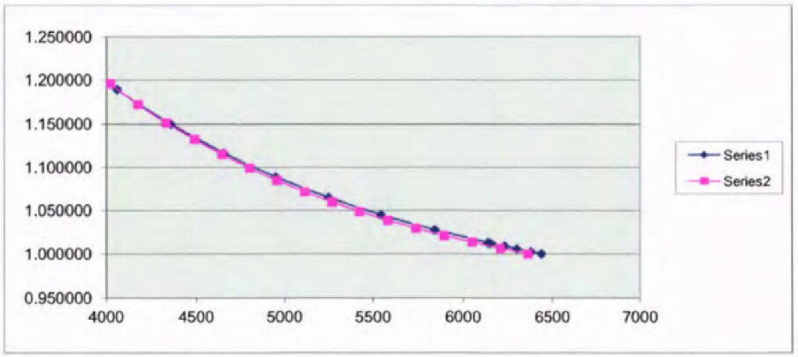


TABLE 3
AVERAGE FLUID COMPRESSIBILITIES WITH @ 243.0 F (390.4 K) WITHOUT MIXER

Pressure Range From (psia)	To (psia)	Average Fluid Compressibility (psi^{-1})
13500	12500	1.3071E-05
12500	11500	1.3339E-05
11500	10500	1.4003E-05
10500	9500	1.5571E-05
9500	8500	1.8090E-05
8500	7500	2.2475E-05
7500	**6362 Psat**	**2.6983E-05**

Pressure Range From (MPa)	To (MPa)	Average Fluid Compressibility (MPa^{-1})
93.08	86.18	1.8958E-03
86.18	79.29	1.9346E-03
79.29	72.39	2.0309E-03
72.39	65.50	2.2584E-03
65.50	58.61	2.6238E-03
58.61	51.71	3.2597E-03
51.71	**43.86 Psat**	**3.9135E-03**

Psat - Saturation Pressure

TABLE 4
CONSTANT COMPOSITION EXPANSION @ 243.0 F (390.4 K) WITHOUT MIXER

Pressure (psia)	Pressure (MPa)	Relative Volume [1]	Y-Function [2]	Liquid Volume (% of Vtot)	Fluid Density (g/cc)
13500	93.08	0.879364			
12500	86.18	0.891010			
11500	79.29	0.903056			
10500	72.39	0.915881			
9500	65.50	0.930368			
8500	58.61	0.947509			
7500	51.71	0.969293			
6362 *	**43.86**	**1.000000**		**100.00**	
6206	42.79	1.006580	3.8200	80.41	
6050	41.71	1.013719	3.7591	73.12	
5894	40.64	1.021470	3.6982	67.93	
5738	39.56	1.029898	3.6373	65.62	
5582	38.49	1.039071	3.5764	64.18	
5426	37.41	1.049069	3.5155	62.30	
5270	36.34	1.059981	3.4546	60.63	
5114	35.26	1.071908	3.3937	59.49	
4958	34.18	1.084966	3.3328	58.31	
4802	33.11	1.099288	3.2719	57.07	
4646	32.03	1.115026	3.2110	55.94	
4490	30.96	1.132352	3.1501	54.71	
4334	29.88	1.151471	3.0892	54.10	
4178	28.81	1.172616	3.0283	52.69	
4022	27.73	1.196062	2.9674	51.80	

[1] Volume at indicated pressure per volume at saturation pressure
[2] Y Function = ((Psat-P)/P)/(Relative Volume - 1)
* Saturation Pressure