Knight Piésold
CONSULTING

Appendix D
Laboratory Core Data

Core Lab
PETROLEUM SERVICES

CONVENTIONAL PLUG ANALYSIS

Powertech USA Inc.

Various samples

CL File Number: HOU-070985

Date: January 25, 2008

This report is based entirely upon the core samples, soils, solids, liquids, or gases, together with related observational data, provided solely by the client. The conclusions, inferences, deductions and opinions rendered herein reflect the examination, study, and testing of these items, and represent the best judgement of Core Laboratories. Any reliance on the information contained herein concerning the profitability or productivity of any well, sand, or drilling activity is at the sole risk of the client, and Core Laboratories, neither extends nor makes any warranty or representation whatsoever with respect to same. This report has been prepared for the exclusive and confidential use of the client and no other party.

CONVENTIONAL PLUG ANALYSIS PROTOCOL

Sample Preparation
1.0" diameter plugs were drilled with liquid nitrogen and trimmed into right cylinders with a diamond-blade trim saw. The samples were encapsulated in Teflon tape and stainless steel screens. All sample trims were archived.

Core Extraction
Samples soaked in methanol to remove any salt present.

Sample Drying
Samples were humidity oven dried at 140° F and 40% relative humidity to weight equilibrium.

Porosity
Porosity was determined using Boyle's Law technique by measuring grain volume at ambient conditions & pore volume at indicated net confining stresses (NCS)

Grain Density
Grain density values were calculated by direct measurement of grain volume and weight on dried plug samples. Grain volume was measured by Boyle's Law technique.

Permeability
Permeability to air was measured on each sample using steady-state method at indicated NCS.

PowerTech USA
Various samples

Start Date: 10-19-07
File No: HOU-070985

Core Sample Log (Updated 01-25-08)

Smpl	Depth	Plug Quality					Smpl	Smpl	End		Material Weights	
No.	(ft)	Good	Fair	Poor	Failed	Vert	Len	Dia	Trims	Remarks	Teflon	Screens
1H	252.20		x				1.33	1.00		DB 07-11-11C	0.717	0.611
1V	252.35			x		x	0.67	1.00		DB 07-11-11C	0.465	0.651
2H	480.70	x					1.75	1.00		DB 07-29-1C	1.044	0.596
2V	480.80			x		x	1.00	1.00		DB 07-29-1C	0.805	0.604
3H	609.10	x					2.20	1.00		DB 07-29-1C	1.328	0.601
3V	609.20					x	1.88	1.00		DB 07-29-1C	1.220	0.605
4H	412.30	x					2.33	1.00		DB 07-11-11C	1.505	0.599
4V	412.45		x			x	1.66	1.00		DB 07-11-11C	1.325	0.602
5H	423.60	x					2.00	1.00		DB 07-11-14C	0.812	0.729
5V	423.35	x				x	1.80	1.00		DB 07-11-14C	0.552	0.734
6H	430.20		x				0.70	1.00		DB 07-11-14C	0.410	0.737
6V	430.35	x				x	1.50	1.00		DB 07-11-14C	0.594	0.752
7H	453.50	x					1.70	1.00		DB 07-11-14C	0.625	0.744
7V	453.45		x			x	0.75	1.00		DB 07-11-14C	0.315	0.719
8H	420.40	x					1.25	1.00		DB 07-11-16C	0.471	0.743
8V	420.10	x				x	1.90	1.00		DB 07-11-16C	0.717	0.732
9H	455.90	x					1.25	1.00		DB 07-11-16C	0.575	0.718
9V	455.45	x				x	1.50	1.00		DB 07-11-16C	0.634	0.719
10H	503.30	x					1.50	1.00		DB 07-11-16C	0.557	0.733
10V	503.45				x	x	-	1.00		DB 07-11-16C		
11H	573.25	x					1.25	1.00		DB 07-32-4C	0.567	0.730
11V	573.40	x				x	1.00	1.00		DB 07-32-4C	0.572	0.722
Totals		14	4	2	1	11						

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Analyst: AM

Sample ID	Powertech ID	As Received sample mass (kg)	starting volume (mL)	ending volume (mL)	density (g/mL)	description	time in graduated cylinder (min)
51719-75	DB07-11-11C 425'5" to 427'4"	3.92	1395	3140	2.25	mushy sand	5
51719-25	DB07-29-1C 590' to 592'3"	4.32	1995	3880	2.29	mushy sand	5
51660-24	CN-3C 130-131	1.40	2100	2855	1.85	solid sand	40
51660-60	IN-2C 464-465	1.58	1300	2045	2.12	mushy sand	5
51660-59	IN-1C 464-465	1.02	1250	1750	2.04	clumped, wet sand	5
51719-86	DB07-32-2C 580 - 580.5	0.84	1705	2170	1.81	clumped, wet sand	30
51719-2	DB07-32-4C 550'0" to 551'1"	2.30	1015	1925	2.53	clumped, wet sand	180
51719-35	DB07-11-16C 412'1" to 414'3"	3.30	2100	3565	2.25	clumped, wet sand	960
51719-62	DB07-11-14C 11/1/07 436'7" to 438'7"	3.18	1990	3430	2.21	clumped, wet sand	30

Avg of 7 = 2.24

Powertech USA Inc.
Various samples

CL File No.: HOU-070985
Date: January 25, 2008
Analyst(s): MS,MM,JH

CONVENTIONAL PLUG ANALYSIS

Sample Number	Depth (ft)	Net Confining Stress (psig)	Porosity (%)	Kair (mD)	Grain Density (g/cm3)	Footnote
1H	252.20	600	10.50	1.04	2.356	
1V	252.35	600	10.15	.228	2.356	
4H	412.30	600	9.68	.041	2.511	
4V	412.45	600	9.59	.015	2.514	
DB 07-29-1C						
2H	480.70	600	8.90	.078	2.613	
2V	480.80	600	9.30	.007	2.610	
3H	609.10	600	12.26	.073	2.603	
3V	609.20	600	10.84	.008	2.793	
DB 07-11-14C						
5H	423.60	600	29.56	3207	2.645	
5V	423.35	600	30.34	1464	2.645	
6H	430.20	600	31.90	4161	2.640	
6V	430.35	600	30.16	939	2.646	
7H	453.50	600	10.86	1.00	2.519	
7V	453.45	600	11.82	.043	2.543	
DB 07-11-16C						
8H	420.40	600	30.50	2697	2.643	
8V	420.10	600	30.17	1750	2.651	
9H	455.90	600	6.99	.004	2.536	
9V	455.45	600	7.65	.012	2.556	
10H	503.30	600	12.96	.697	2.474	
10V	503.45	600				(6)
DB 07-32-4C						
11H	573.25	600	29.15	2802	2.641	
11V	573.40	600	29.04	619	2.645	

Footnotes :

(6) : Denotes all plug attempts failed.

Core Analyses for Powertach USA Inc. at Dewey-Burdock Site

Sample Number	Depth (ft)	Confining Stress (psig)	Porosity (%)	Air Intrinsic Permeability[1] k_a (mD)	Particle Density (g/cm^3)	Notes
DB 07-11-11C						
1H	252.20	600	10.50	1.040	2.356	Fuson Shale
1V	252.35	600	10.15	0.228	2.356	Fuson Shale
4H	412.30	600	9.68	0.041	2.511	Fuson Shale
4V	412.45	600	9.59	0.015	2.514	Fuson Shale
DB 07-29-1C						
2H	480.70	600	8.90	0.078	2.613	Skull Creek shale
2V	480.80	600	9.30	0.007	2.610	Skull Creek shale
3H	609.10	600	12.26	0.073	2.603	Fuson Shale
3V	609.10	600	10.84	0.008	2.793	Fuson Shale
DB 07-11-14C						
5H	423.60	600	29.56	3,207	2.645	
5V	423.35	600	30.34	1,464	2.645	
6H	430.20	600	31.90	4,161	2.640	
6V	430.35	600	30.16	939	2.646	
7H	453.50	600	10.86	1.000	2.519	Morrison Shale
7V	453.45	600	11.82	0.043	2.543	Morrison Shale
DB-07-11-16C						
8H	420.40	600	30.50	2,697	2.643	
8V	420.10	600	30.17	1,750	2.651	
9H	455.90	600	6.99	0.004	2.536	Morrison Shale
9V	455.45	600	7.65	0.012	2.556	Morrison Shale
10H	503.30	600	12.96	0.697	2.474	Morrison Shale
10V	503.45	600	No data			
DB 07-32-4C						
11H	573.25	600	29.15	2,802	2.641	
11V	573.40	600	29.04	619	2.645	

(1) Assumed air temperature = 70°F.

(2) Assumed water temperature = 52.8°F, water density = 0.999548 g/cm^3, and water dynamic viscosity = 0.0125

(3) $K_w = k_a \times (\rho_w g/\mu_w)$, and 1.0 mD = 0.987×10^{-11} cm^2 (See Constants Tab).

Hole No	mDarcy horizontal perm	verical perm	ratio h/v	% horizontal porosity	verical porosity
DB 07-11-14C	3207	1464	2.2:1	29.56	30.34
	4161	939	4.4:1	31.9	30.16
DB 07-11-16C	2697	1750	1.5:1	30.5	30.17
DB 07-32-4C	2802	619	4.5:1	29.15	29.04
Avg	3217	1193	2.7:1	30.3	29.9