

COMMISSION

OIL CONSERVATION

CASE NUMBER

Ocean

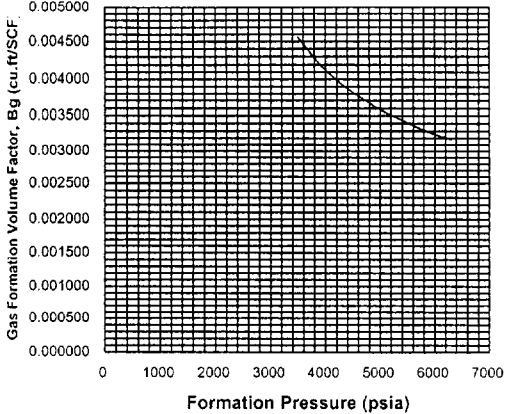
EXHIBIT

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Equations by Starling-Carnahan (Dake book, pp19-20). Wichert-Aziz correction for sour gases applied (accurate for 15-7000 psia, 0.001-0.999 mole % CO₂<54.4% and H₂S<73.8%. See O&G Journal 10/18/93 pg. 52. Do not use initial pressures < 1500 psia. Required Input: Standard conditions, initial reservoir temp and pressure, and gas gravity OR gas composition (mole %). Mole percentage of C1 to C5+ also required for any Heating Value calculation. Current version of this worksheet does not allow for metric units.

Field:		Well:	
Input Data		Input Data	Computed Data
Gas grav, Gg (air=1) =	0.710	%C1 = 80.613	ghc (air=1) = 0.7024
Cond? (Yes=1,No=0)	0	%C2 = 10.249	ghc, degR = 390.1104
Metric? (Yes=1,No=0)	0	%C3 = 4.611	Ppch, psia = 669.0351
Reservoir Temperature =	163	%iC4 = 0.642	Tpc, degR = 389.6879
Reservoir Pressure =	6300	%nC4 = 1.325	Ppc, psia = 670.0464
Standard Pressure =	14.7	%C5+ = 1.057	CWA = 1.2272
Standard Temperature =	60	% N2 = 0.876	%pc, degR = 388.4607
		% CO2 = 0.635	Ppc*, psia = 667.9363
		% H2S = 0.000	Init. Ppr = 9.4320
Computed Data		Total %	100.008
Res Temp, deg. F	163.0	Tpr =	1.6038
Res Pr, psia	6300.0	Calc'd Gg	0.7224
		t=1/Tpr =	0.6235

WARNING: Z factor accurate for 0.2<Ppr<24.0 & 1.15<Tpr<3.0
Gas viscosity accurate for 100-8000 psi, 100-340 degF, 0.9<CO₂ mole %<3.2.



Pr, psia	Ppr	Y	df/dY	Yk+1	Init. Y	Z	Eg	Gas Den.	Gas Visc	Cr=CgPpc	Cg	Bg	Bg
							SCF/cu.ft.	gm/cc	cp.			(cu.ft./SCF)	(bbbls/SCF)
6300	9.4320	#####	2.47887	0.27766	0.27766	1.09445	326.8	0.280796	0.032696	0.047018	7.039E-05	0.003060	0.000545
6100	9.1326	#####	2.37066	0.27368	0.27368	1.07511	322.2	0.276772	0.032099	0.049911	7.472E-05	0.003104	0.000553
5900	8.8332	#####	2.26343	0.26952	0.26952	1.05593	317.3	0.272561	0.031489	0.053122	7.953E-05	0.003152	0.000561
5700	8.5337	#####	2.15730	0.26515	0.26515	1.03693	312.1	0.268146	0.030865	0.056697	8.488E-05	0.003204	0.000571
5500	8.2343	#####	2.05243	0.26057	0.26057	1.01815	306.7	0.263510	0.030227	0.060695	9.087E-05	0.003260	0.000581
5300	7.9349	#####	1.94897	0.25574	0.25574	0.99963	301.0	0.258632	0.029573	0.065185	9.759E-05	0.003322	0.000592
5100	7.6355	#####	1.84711	0.25066	0.25066	0.98142	295.1	0.253490	0.028904	0.070247	0.0001052	0.003389	0.000604
4900	7.3360	#####	1.74708	0.24529	0.24529	0.96357	288.7	0.248059	0.028219	0.075982	0.0001138	0.003463	0.000617
4700	7.0366	#####	1.64914	0.23961	0.23961	0.94617	282.1	0.242312	0.027517	0.082505	0.0001235	0.003545	0.000632
4500	6.7372	#####	1.55358	0.23358	0.23358	0.92928	275.0	0.236217	0.026797	0.089959	0.0001347	0.003637	0.000648
4300	6.4377	#####	1.46075	0.22718	0.22718	0.91301	267.4	0.229741	0.026060	0.098511	0.0001475	0.003739	0.000666
4100	6.1383	#####	1.37108	0.22036	0.22036	0.89748	259.4	0.222847	0.025305	0.108359	0.0001622	0.003855	0.000687
3900	5.8389	#####	1.28501	0.21309	0.21309	0.88282	250.8	0.215496	0.024532	0.119738	0.0001793	0.003987	0.000710
3700	5.5395	#####	1.20311	0.20533	0.20533	0.86919	241.7	0.207649	0.023743	0.132915	0.000199	0.004137	0.000737
3500	5.2400	#####	1.12599	0.19704	0.19704	0.85680	231.9	0.199265	0.022938	0.148193	0.0002219	0.004311	0.000768
3300	4.9406	#####	1.05433	0.18818	0.18818	0.84586	221.5	0.190309	0.022121	0.164100	0.0002457	0.004514	0.000804
3200	4.7909	#####	1.02078	0.18353	0.18353	0.84101	216.0	0.185606	0.021708	0.173828	0.0002602	0.004629	0.000824
3100	4.6412	#####	0.98887	0.17873	0.17873	0.83662	210.4	0.180751	0.021294	0.184290	0.0002759	0.004753	0.000847
3000	4.4914	#####	0.95872	0.17378	0.17378	0.83271	204.6	0.175740	0.020879	0.195531	0.0002927	0.004889	0.000871
2900	4.3417	#####	0.93041	0.16867	0.16867	0.82933	198.5	0.170575	0.020463	0.207596	0.0003108	0.005037	0.000897
2800	4.1920	#####	0.90404	0.16341	0.16341	0.82651	192.4	0.165255	0.020049	0.220527	0.0003302	0.005199	0.000926
2700	4.0423	#####	0.87970	0.15800	0.15800	0.82428	186.0	0.159784	0.019635	0.234369	0.0003509	0.005377	0.000958
2600	3.8926	#####	0.85748	0.15245	0.15245	0.82267	179.4	0.154167	0.019225	0.249163	0.000373	0.005573	0.000993
2500	3.7429	#####	0.83744	0.14675	0.14675	0.82172	172.7	0.148409	0.018818	0.264954	0.0003967	0.005789	0.001031
2400	3.5932	#####	0.81967	0.14093	0.14093	0.82145	165.9	0.142520	0.018416	0.281790	0.0004219	0.006028	0.001074
2300	3.4434	#####	0.80420	0.13499	0.13499	0.82188	158.9	0.136510	0.018020	0.299729	0.0004487	0.006293	0.001121
2200	3.2937	#####	0.79108	0.12894	0.12894	0.82302	151.8	0.130393	0.017632	0.318840	0.0004774	0.006589	0.001174
2100	3.1440	#####	0.78032	0.12280	0.12280	0.82490	144.5	0.124183	0.017253	0.339214	0.0005079	0.006918	0.001232
2000	2.9943	#####	0.77193	0.11658	0.11658	0.82751	137.2	0.117896	0.016884	0.360970	0.0005404	0.007287	0.001298
1900	2.8446	#####	0.76588	0.11030	0.11030	0.83086	129.8	0.111551	0.016525	0.384269	0.0005753	0.007702	0.001372
1800	2.6949	#####	0.76216	0.10399	0.10399	0.83493	122.4	0.105164	0.016179	0.409326	0.0006128	0.008169	0.001455
1700	2.5452	#####	0.76070	0.09765	0.09765	0.83971	115.0	0.098756	0.015846	0.436430	0.0006534	0.008699	0.001550
1600	2.3954	#####	0.76144	0.09131	0.09131	0.84518	107.5	0.092345	0.015527	0.465962	0.0006976	0.009303	0.001657
1500	2.2457	#####	0.76432	0.08499	0.08499	0.85132	100.0	0.085950	0.015222	0.498429	0.0007462	0.009995	0.001780
1400	2.0960	#####	0.76924	0.07870	0.07870	0.85809	92.6	0.079586	0.014933	0.534506	0.0008002	0.010795	0.001923
1300	1.9463	#####	0.77811	0.07245	0.07245	0.86547	85.3	0.073272	0.014658	0.575094	0.000861	0.011725	0.002088
1200	1.7966	#####	0.78484	0.06627	0.06627	0.87341	78.0	0.067021	0.014399	0.621408	0.0009303	0.012819	0.002283
1100	1.6469	#####	0.79532	0.06017	0.06017	0.88188	70.8	0.060845	0.014155	0.675119	0.0010108	0.014120	0.002515
1000	1.4971	#####	0.80747	0.05415	0.05415	0.89085	63.7	0.054757	0.013927	0.738570	0.0011057	0.015689	0.002795
900	1.3474	#####	0.82116	0.04822	0.04822	0.90027	56.8	0.048766	0.013714	0.815151	0.0012204	0.017617	0.003138
800	1.1977	#####	0.83633	0.04240	0.04240	0.91011	49.9	0.042879	0.013516	0.909942	0.0013623	0.020036	0.003569
700	1.0480	#####	0.85285	0.03669	0.03669	0.92033	43.2	0.037102	0.013333	1.030915	0.0015434	0.023155	0.004124
600	0.8983	#####	0.87066	0.03109	0.03109	0.93090	36.6	0.031441	0.013166	1.191349	0.0017836	0.027325	0.004867
500	0.7486	#####	0.88966	0.02561	0.02561	0.94179	30.1	0.025898	0.013013	1.414642	0.0021179	0.033173	0.005909
450	0.6737	#####	0.89959	0.02291	0.02291	0.94734	27.0	0.023171	0.012943	1.563570	0.0023409	0.037076	0.006604
400	0.5989	#####	0.90978	0.02025	0.02025	0.95296	23.8	0.020475	0.012876	1.749546	0.0026193	0.041958	0.007474
350	0.5240	#####	0.92023	0.01761	0.01761	0.95865	20.7	0.017810	0.012814	1.988476	0.002977	0.048238	0.008592
300	0.4491	#####	0.93094	0.01500	0.01500	0.96440	17.7	0.015174	0.012755	2.306869	0.0034537	0.056616	0.010084
250	0.3743	#####	0.94189	0.01243	0.01243	0.97020	14.6	0.012570	0.012701	2.752438	0.0041208	0.068348	0.012174
200	0.2994	#####	0.95307	0.00988	0.00988	0.97606	11.6	0.009995	0.012651	3.420605	0.0051212	0.085951	0.015309
150	0.2246	#####	0.96448	0.00737	0.00737	0.98197	8.7	0.007451	0.012606	4.534019	0.0067881	0.115295	0.020536
100	0.1497	#####	0.97611	0.00488	0.00488	0.98794	5.7	0.004938	0.012567	6.760338	0.0101212	0.173993	0.030991
95	0.1422	#####	0.97728	0.00464	0.00464	0.98854	5.5	0.004688	0.012564	7.111898	0.0106476	0.183261	0.032642
90	0.1347	#####	0.97846	0.00439	0.00439	0.98914	5.2	0.004438	0.012560	7.502517	0.0112324	0.193560	0.034477
85	0.1273	#####	0.97964	0.00414	0.00414	0.98973	4.9	0.004189	0.012557	7.939090	0.011886	0.205070	0.036527
80	0.1198	#####	0.98082	0.00390	0.00390	0.99034	4.6	0.003941	0.012553	8.430233	0.0126213	0.218019	0.038833
75	0.1123	#####	0.98200	0.00365	0.00365	0.99094	4.3	0.003692	0.012550	8.986859	0.0134547	0.232695	0.041447
70	0.1048	#####	0.98319	0.00341	0.00341	0.99154	4.0	0.003444	0.012547	9.623001	0.0144071	0.249467	0.044435
65	0.0973	#####	0.98438	0.00316	0.00316	0.99214	3.7	0.003196	0.012544	10.357009	0.015506	0.268820	0.047882
60	0.0898	#####	0.98557	0.00292	0.00292	0.99274	3.4	0.002948	0.012541	11.213349	0.0167881	0.291398	0.051904
55	0.0823	#####	0.98676	0.00267	0.00267	0.99334	3.1	0.002701	0.012538	12.225592	0.0183035	0.318082	0.056656
15	0.0225	#####	0.99636	0.00072	0.00072	0.99818	0.9	0.000733	0.012518	0.000000	0	1.171978	0.208752

Note: Last pressure included so that Cr and Cg values are not zero. It is not plotted.

