



Basis: 1 - Michael Baker Jr. Inc., "Transport of North Slope Natural Gas to Tidewater" Prepared for ANGDA April 7, 2005 Pg. 36.
 2 - ANGDA PP presentation, slide 1 "General Makeup of ANS gas", see right table below & chart to left
 3 - Petroleum Filling History of Central Alaskan North Slope Fields, Wilmer Dallam Masterson IV, B.S. M.A. dissertation, University of Texas at Dallas, May, 2001
 4 - USGS Open-file report 03-041 version 1.0, Geochemistry of Natural Gas, North Slope, Alaska - Burruss, Lillis and Collett

Components	Mole%
Methane	76.19
Carbon Dioxide	12.07
Ethane	6.19
Propane	3.17
N-Butane	0.93
Pentanes	0.83
I-Butane	0.47
Nitrogen	0.077
Hydrogen Sulfide***	0.000073
Balance:	99.9270073
Unknown constituents:	0.0729927

Energia Cura Calculations, 8/8/10

Characterization of the Physical Properties of Natural Gas as Sourced from the Prudhoe Bay Field Expressed in USCS Units

														Standing-Katz Adjustments for CO ₂ and H ₂ S				Corresponding States			Compressibility		Super		(Ideal Gas)												
SC or BC = Standard Conditions at 14.696 psia & 60F or "base conditions"														$\epsilon = 120(A^{0.9} - A^{1.6}) + 15(B^{0.5} - B^{4.0})$ and $T_{pc} = T_c - \epsilon$ and $P_{pc} = (P_c + T_{pc})/T_c + B(1-B)\epsilon$				at 520-R or 60F	at 14.7 psig	at 2300 psig	(Air at SC = 28.9625)	Factor	Factor	Compressibility	at 100F	(Ideal Gas)											
$(\mu \cdot \Sigma yM^{1/2} / \Sigma yM^{1/2})$														ϵ	A	B	T_{pc}	P_{pc}	T_{pr}	P_{pr}	P_{pr}	Factor Z	Factor Z	Factor Z	Vapor Pressure	Specific Heat	at SC	at SC									
Raw ANS Gas	Formula	Fraction	Mol%	Volume	Spec. Vol.	Density	Spec. Wght.	Mol wt	Mol wt ^{1/2}	$yM^{1/2}$	$\mu yM^{1/2}$	μ	μ at SC	at SC	P_c	T_c	T_{pc}	P_{pc}	ϵ	Σ CO ₂ & H ₂ S	H ₂ S	Adjusted	Adjusted	Pseudo-reduced T	Pseudo-reduced P	Pseudo-reduced P	Ideal Gas	at 32F & atm	at 32F & 1450 psia	Factor at 32F	Vapor Pressure	Specific Heat	Raw ANS Gas				
				ft ³ /lb	ft ³ /lb	lb/ft ³	lb/ft ³	g/mol	√ g/mol	Mol%*√g/mol	μyM ^{1/2}	μ	μ at SC	at SC	psia	°R	°R	psia	°R	Mol Fractions	Mol Fraction	°R	psia	°R	psia	psia	(dimensionless)	(dimensionless)	(dimensionless)	(dimensionless)	psia	BTU/lb-°F	BTU/ft ³	mmBTU/mcf * Y			
Methane	CH ₄	0.7619	76.19%	0.0988	23.654	0.04251013	0.0423	16.0430	4.0054	3.0517	0.0327	0.0107	0.0107	1.151700E-07	666.4	342.72	261.12	507.73016	14.0252	0.1207	0.0008	386.04	7.4168	1.156010738	0.114662574	0.058572624	0.024764137	0.005104008	0.003327479	1.78719E-07	0.001763333	0.9997	0.7394	0.52676	909.4	692.87186	
Carbon Dioxide	CO ₂	0.1207	12.07%	0.0342	8.6229	0.11674028	0.1160	30.0700	5.4836	0.6619	0.0097	0.0147	0.0147	1.582300E-07	1,071.0	547.38	66.07	129.2697	0.0000	0.0000	0.0008			1.156010738	0.114662574	0.058572624	0.024764137	0.005104008	0.003327479	1.78719E-07	0.001763333	0.9997	0.7394	0.19909	0.0	0	
Ethane	C ₂ H ₆	0.0619	6.19%	0.0783	12.62	0.08003260	0.0792	44.0100	6.6340	0.4106	0.0037	0.0089	0.0089	9.579900E-08	706.5	549.54	34.02	43.73235	0.149128	0.033945	0.0135486	3.5153E-13			0.114662574	0.058572624	0.024764137	0.005104008	0.003327479	1.78719E-07	0.001763333	0.9997	0.7394	0.40789	1618.7	100.19753	
Propane	C ₃ H ₈	0.0317	3.17%	0.0727	8.6059	0.11923740	0.1162	44.0970	6.6406	0.2105	0.0016	0.0075	0.0075	1.162500E-05	616.0	665.64	21.10	19.5272	0.033945	0.0135486	3.5153E-13			0.114662574	0.058572624	0.024764137	0.005104008	0.003327479	1.78719E-07	0.001763333	0.9997	0.7394	0.38847	2314.9	73.38233		
N-Butane	C ₄ H ₁₀	0.0093	0.93%	0.0703	6.5291	0.15731846	0.1532	58.1230	7.6238	0.0709	0.0005	0.0073	0.0073	7.857700E-08	548.8	765.27	7.12	5.10384	0.033945	0.0135486	3.5153E-13			0.114662574	0.058572624	0.024764137	0.005104008	0.003327479	1.78719E-07	0.001763333	0.9997	0.7394	0.39500	3010.8	28.00044		
Pentanes	C ₅ H ₁₂	0.0083	0.83%	0.0673	5.2596	0.39329615	0.1901	72.1500	8.4941	0.0705	0.0005	0.0066	0.0066	7.104200E-08	488.1	845.61	7.02	4.05123	0.033945	0.0135486	3.5153E-13			0.114662574	0.058572624	0.024764137	0.005104008	0.003327479	1.78719E-07	0.001763333	0.9997	0.7394	0.38831	3706.9	30.76727		
I-Butane	C ₄ H ₁₀	0.0047	0.47%	0.0714	6.5291	0.15669418	0.1532	58.1230	7.6238	0.0358	0.0003	0.0071	0.0071	7.642400E-08	527.9	734.49	3.45	2.48113	0.033945	0.0135486	3.5153E-13			0.114662574	0.058572624	0.024764137	0.005104008	0.003327479	1.78719E-07	0.001763333	0.9997	0.7394	0.38669	3000.4	14.10188		
Hyd. Sulfide***	H ₂ S	7.3E-06	7.3E-08	0.0461	11.134	0.09052054	0.0898	34.0820	5.8380	0.0000	0.0000	0.0117	0.0117	7.642400E-35	1,306.0	212.4	0.00	0.000095338	0.0000	0.0000	0.0000			0.114662574	0.058572624	0.024764137	0.005104008	0.003327479	1.78719E-07	0.001763333	0.9997	0.7394	0.23838	0.0	0		
Nitrogen	N ₂	0.0008	0.08%	0.0510	13.546	0.07397713	0.0738	28.0134	5.2928	0.0041	0.0001	0.0165	0.0165	1.783600E-07	493.1	227.07	0.17	0.379687	0.0008	0.0008	0.0008			0.114662574	0.058572624	0.024764137	0.005104008	0.003327479	1.78719E-07	0.001763333	0.9997	0.7394	0.28433	0.0	0		
Compound (psuedo)		0.9993	99.93%					57.63610	4.51607	0.04892	0.010833						400.07	712.28																		939	
Treated ANS Gas														Treated ANS Gas																							
Methane	CH ₄	10.7200%	86.91%	0.0988	23.654	0.04251013	0.0423	16.0430	4.0054	4.4294	0.0046	0.0107	0.0107		666.4	342.72	297.86	579.16824																		909.4	790.35954
Ethane	C ₂ H ₆	0.7471%	6.94%	0.0783	12.62	0.08003260	0.0792	30.0700	5.4836	0.0410	0.0004	0.0089	0.0089		706.5	549.54	38.12	49.01084465																		1618.7	112.2913719
Propane	C ₃ H ₈	0.3826%	3.55%	0.0727	8.6059	0.11923740	0.1162	44.0970	6.6406	0.0254	0.0002	0.0075	0.0075		616.0	665.64	23.65	21.88413304																		2314.9	82.23957723
N-Butane	C ₄ H ₁₀	0.1123%	1.04%	0.0703	6.5291	0.15731846	0.1532	58.1230	7.6238	0.0086	0.0001	0.0073	0.0073		550.6	765.27	7.98	5.738634006																		3010.8	31.38009311
Pentanes	C ₅ H ₁₂	0.1002%	0.93%	0.0673	5.2596	0.39329615	0.1901	72.1500	8.4941	0.0085	0.0001	0.0066	0.0066		488.6	845.6	7.87	4.544864366																		3706.9	34.48087949
I-Butane	C ₄ H ₁₀	0.0567%	0.53%	0.0714	6.5291	0.15669418	0.1532	58.1230	7.6238	0.0043	0.0000	0.0071	0.0071		527.9	734.49	3.87	2.780602391																		3000.4	15.80397692
Nitrogen	N ₂	0.0083%	0.09%	0.0510	13.546	0.07397713	0.0738	28.0134	5.2928	0.0005	0.0000	0.0173	0.0173		493.1	227.07	0.20	0.425515221																		0.0	0