PRODUCTION CASES

GOR = 46.7
Water Cut of Emulsion = 50%

TOTAL GAS AT INLET

$V_{Emulsion}$ (m^3)	$V_{Emulsion}$ (bbl)	V_o (m^3)	V_o (bbl)	V_g (m^3)	V_g (SCF)
159	1000	80	500	3713	131,111
397.5	2500	199	1250	9282	327,777
795	5000	398	2500	18563	655,555
1033.4	6500	517	3250	24130	852,139
FUTURE CASES					
1589.8	10000	795	5000	37122	1,310,945
2066.8	13000	1033	6500	48260	1,704,278

GAS LIBERATED AT FWKO (GOR method from Lab Analysis)

$V_{Emulsion}$ (m^3)	$V_{Emulsion}$ (bbl)	V_o (m^3)	V_o (bbl)	V_g (m^3)	V_g (SCF)
159	1000	80	500	2449	86,486
397.5	2500	199	1250	6132	216,550
795	5000	398	2500	12247	432,499
1033.4	6500	517	3250	15919	562,174
FUTURE CASES					
1589.8	10000	795	5000	24491	864,892
2066.8	13000	1033	6500	31839	1,124,384

GAS LIBERATED AT TREATER (Total Inlet Gas - Gas Liberated at FWKO - Gas Liberated at Tanks)

$V_{Emulsion}$ (m^3)	$V_{Emulsion}$ (bbl)	V_o (m^3)	V_o (bbl)	V_g (m^3)	V_g (SCF)
159	1000	80	500	1174	41,447
397.5	2500	199	1250	2926	103,317
795	5000	398	2500	5868	207,235
1033.4	6500	517	3250	7629	269,412
FUTURE CASES					
1589.8	10000	795	5000	11736	414,447
2066.8	13000	1033	6500	15257	538,788

FUEL GAS USAGE AT HEATER TREATER

$V_{Emulsion}$ (m^3)	$V_{Emulsion}$ (bbl)	V_o (m^3)	V_o (bbl)	V_g (m^3)	V_g (SCF)	V_g ($m^{3/}s$)	% Total Gas	Dispersion Case No.
159	1000	80	500	158	5,580	0.0018	4.3	**Case 1**
397.5	2500	199	1250	368	12,996	0.0043	4.0	**Case 2**
795	5000	398	2500	613	21,648	0.0071	3.3	**Case 3**
1033.4	6500	517	3250	963	34,008	0.0111	4.0	**Case 4**
Max Duty	(2.5 MMBTU/HR Burner)			1460	51,559	0.0169		**Case 5**
FUTURE CASES								
1589.8	10000	795	5000	1226	43,296	0.0142	3.3	**Case 6**
2066.8	13000	1033	6500	1927	68,051	0.0223	4.0	**Case 7**
Max Duty				2919	103,084	0.0338		**Case 8**

GAS TO HP FLARE STACK (FWKO Gas + Treater Gas - Fuel Gas)

$V_{Emulsion}$ (m^3)	$V_{Emulsion}$ (bbl)	V_o (m^3)	V_o (bbl)	V_g (m^3)	V_g (SCF)	V_g ($m^{3/}s$)	% Total Gas	Dispersion Case No.
159	1000	80	500	3465	122,353	0.0401	93.3	**Case 10**
397.5	2500	199	1250	8690	306,871	0.1006	93.6	**Case 11**
795	5000	398	2500	17502	618,086	0.2026	94.3	**Case 12**
1033.4	6500	517	3250	22585	797,578	0.2614	93.6	**Case 13**
FUTURE CASES								
1589.8	10000	795	5000	35001	1,236,043	0.4051	94.3	**Case 14**
2066.8	13000	1033	6500	45169	1,595,120	0.5228	93.6	**Case 15**

GAS TO LP FLARE STACK CAPTURED FROM TANKS (Vasques & Beggs)

$V_{Emulsion}$ (m^3)	$V_{Emulsion}$ (bbl)	V_o (m^3)	V_o (bbl)	V_g (m^3)	V_g (SCF)	V_g ($m^{3/}s$)	% Total Gas	Dispersion Case No.
159	1000	80	500	90	3,178	0.0010	2.4	**Case 20**
397.5	2500	199	1250	224	7,910	0.0026	2.4	**Case 21**
795	5000	398	2500	448	15,821	0.0052	2.4	**Case 22**
1033.4	6500	517	3250	582	20,553	0.0067	2.4	**Case 23**
FUTURE CASES								
1589.8	10000	795	5000	895	31,607	0.0104	2.4	**Case 24**
2066.8	13000	1033	6500	1164	41,106	0.0135	2.4	**Case 25**

CALCULATION FOR
GAS LIBERATED AT FWKO

From Core laboratories Report
Page 32

Analytical Expression (Solution GOR - below bubblepoint)

$R_s=1.3258P^{0.48}-0.031378P^{0.8}$

R_s= solution gas-to-oil ratio (m^3/m^3)
P= pressure in the vessel of interest (KPag)

INPUTS

P= **240** kPag
Rs= **46.7** At Bubblepoint from Analysis

OUTPUTS

$R_s=1.3258P^{0.48}-0.031378P^{0.8}$ = **15.8903629**

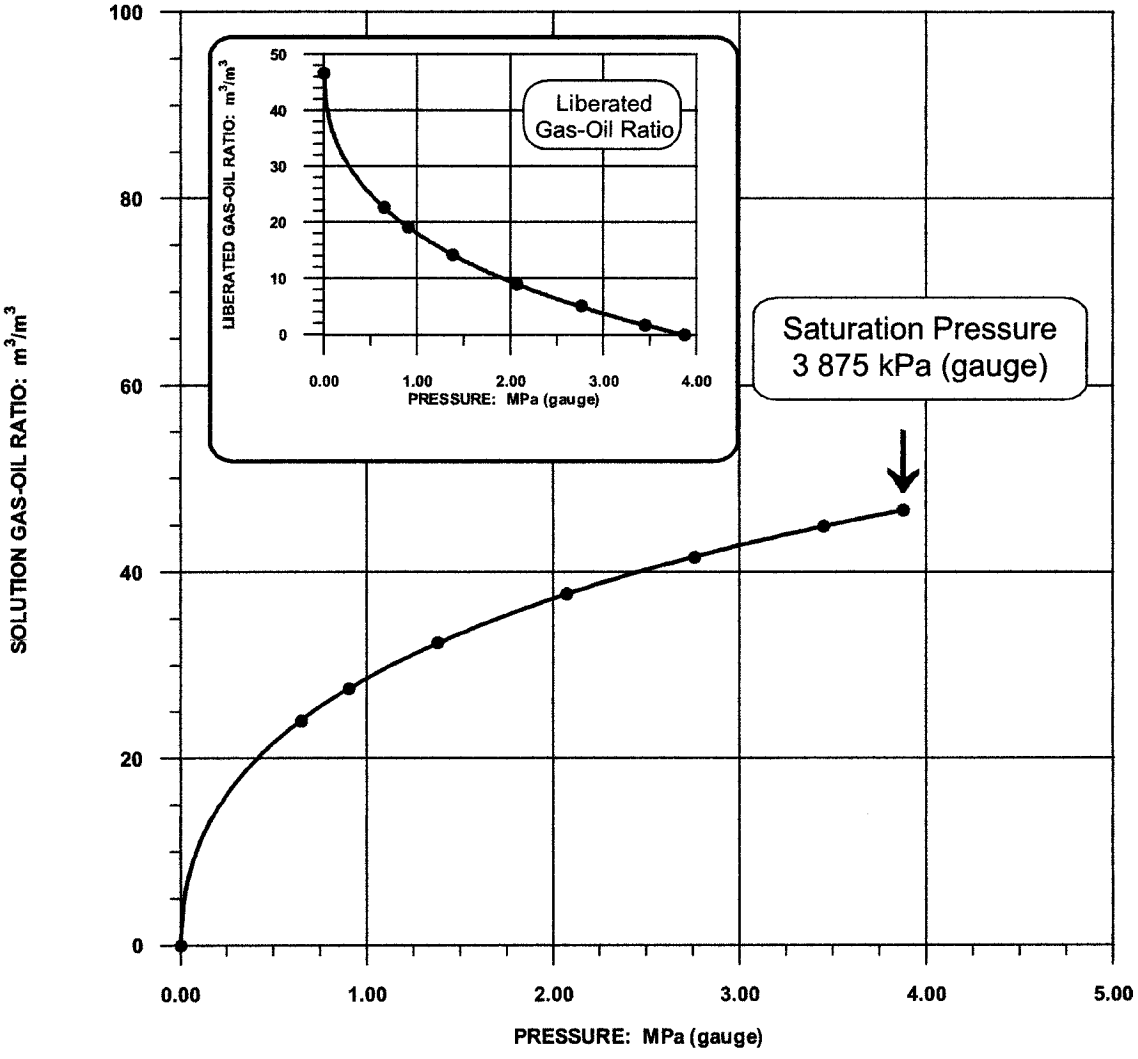
RESULTS (Gas Liberated in FWKO = Rs at bubble point - Rs at FWKO pressure)

Water Cut of Emulsion = 50%

R_L (m^3/m^3)	$V_{Emulsion}$ (m^3)	$V_{Emulsion}$ (bbl)	V_o (m^3)	V_o (bbl)	V_g (m^3)	V_g (SCF)
30.809637	159	1000	80	500	2449	86,499
	397.5	2500	199	1250	6123	216,246
	795	5000	398	2500	12247	432,493
	1033.4	6500	517	3250	15919	562,186
	1589.8	10000	795	5000	24491	864,877
	2066.8	13000	1033	6500	31839	1,124,372

Molopo Energy Canada Ltd.
Molopo Pierson 100/12-27-001-28W1/00
52134-2010-1532

GAS-OIL RATIOS



Analytical Expression (Solution GOR - below bubblepoint)

$1.3258E00 * P^{0.480} - 3.1378E-02 * P^{0.800}$

where; P is defined as pressure, kPa(g)

Statistical Summary		Legend	
r squared:	0.999984	●	Laboratory Data
Confidence Interval (+/-):	0.07	----------	Confidence Limits
Confidence:	99 %	———	Analytical Expression

Estimation of Flaring and Venting Volumes from Upstream Oil & Gas Facilities

CAPP Guidline - May 2002

EUB Rule of Thumb

$V_s=0.0257*V_o*\Delta P$

V_s= volume of solution gas released (m^3)
V_o= oil production volume(m^3)
ΔP= pressure drop (kPa)

Standing Correlation

$R_s=\gamma_g(p/519.7*10^{y_g})^{1.204}$

R_s= solution gas-to-oil ratio (m^3/m^3)
γ_g= specific gravity of solution gas
p= absolute pressure in the vessel of interest (kPa(abs) (KPag+101.325kPa)
γ_o= specific gravity of oil
T= Temperature of Interest (K) (T in °C + 273)
y_g= $1.225+0.00164T-(1.769/\gamma_o)$

Vasquez & Beggs

$R_s=C_1\gamma_g p^{C2}\exp((C_3/\gamma_o T-C_4/T)$

	$\gamma_o < 0.876$	$\gamma_o \geq 0.876$
C_1	0.0003204	0.0007803
C_2	1.1870	1.0937
C_3	1881.24	2022.19
C_4	1748.29	1879.28

INPUTS

EUB Rule of Thumb

$V_{Emulsion}$=	**159**	m^3	Emulsion production volume(m^3)
H2O Cut	**50**	%	
ΔP=	**175**	kPa	pressure drop (kPa)

Standing Correlation & Vasquez & Beggs

γ_g=	**0.932**				specific gravity of solution gas
p=	**175**	kPag	**276.325**	Kpa(abs)	guage pressure in the vessel of interest
γ_o=	**0.842**				specific gravity of oil
T=	**38**	°C	**311**	K	Temperature of Interest (in °C)

OUTPUTS

EUB

$V_s=0.0257*V_o*\Delta P$ = 357.551 m^3 where $R_s=V_s/V_o$ = **4.4975**

Standing

$y_{g=}$ $1.225+0.00164T-(1.769/\gamma_o)$ = -0.36591

$R_s=\gamma_g(p/519.7*10\text{^}y_g)^{1.204}$ = **1.20137**

Vasquez & Beggs

For γo = 0.842

C_1	=	0.0003204
C_2	=	1.1870
C_3	=	1881.24
C_4	=	1748.29

$R_s=C_1\gamma_g p^{C2}\exp((C_3/\gamma_o T-C_4/T)$ = **1.1264**

RESULTS

	EUB	Standing	V&B
$V_{Emulsion}$ (m^3)	159	159	159
$V_{Emulsion}$ (bbl)	1000	1000	1000
V_o (m^3)	80	80	80
V_o (bbl)	500	500	500
R_s (m^3/m^3)	4.50	1.20	1.13
V_g (m^3)	358	96	90
V_g (SCF)	12,627	3,373	3,162

Estimation of Flaring and Venting Volumes from Upstream Oil & Gas Facilities

CAPP Guidline - May 2002

EUB Rule of Thumb

$V_s=0.0257*V_o*\Delta P$

V_s=	volume of solution gas released (m^3)
V_o=	oil production volume(m^3)
ΔP=	pressure drop (kPa)

Standing Correlation

$R_s=\gamma_g(p/519.7*10^{\wedge}y_g)^{1.204}$

R_s=	solution gas-to-oil ratio (m^3/m^3)
γ_g=	specific gravity of solution gas
p=	absolute pressure in the vessel of interest (kPa(abs) (KPag+101.325kPa)
γ_o=	specific gravity of oil
T=	Temperature of Interest (K) (T in °C + 273)
y_g=	$1.225+0.00164T-(1.769/\gamma_o)$

Vasquez & Beggs

$R_s=C_1\gamma_g p^{C2}\exp((C_3/\gamma_o T-C_4/T)$

	$\gamma_o < 0.876$	$\gamma_o \geq 0.876$
C_1	0.0003204	0.0007803
C_2	1.1870	1.0937
C_3	1881.24	2022.19
C_4	1748.29	1879.28

INPUTS

EUB Rule of Thumb

$V_{Emulsion}$=	**397.5**	m^3	Emulsion production volume(m^3)
H2O Cut	**50**	%	
ΔP=	**175**	kPa	pressure drop (kPa)

Standing Correlation & Vasquez & Beggs

γ_g=	**0.932**				specific gravity of solution gas
p=	**175**	kPag	**276.325**	Kpa(abs)	guage pressure in the vessel of interest
γ_o=	**0.842**				specific gravity of oil
T=	**38**	°C	**311**	K	Temperature of Interest (in °C)

OUTPUTS

EUB

$V_s=0.0257*V_o*\Delta P$ = 893.878 m^3 where $R_s=V_s/V_o$ = **4.4975**

Standing

$y_{g=}$ $1.225+0.00164T-(1.769/\gamma_o)$ = -0.36591

$R_s=\gamma_g(p/519.7*10^{y_g})^{1.204}$ = **1.20137**

Vasquez & Beggs

For γo = 0.842

C_1	=	0.0003204
C_2	=	1.1870
C_3	=	1881.24
C_4	=	1748.29

$R_s=C_1\gamma_g p^{C2}\exp((C_3/\gamma_o T-C_4/T)$ = **1.1264**

RESULTS

	EUB	Standing	V&B
$V_{Emulsion}$ (m^3)	397.5	397.5	397.5
$V_{Emulsion}$ (bbl)	2500	2500	2500
V_o (m^3)	199	199	199
V_o (bbl)	1250	1250	1250
R_s (m^3/m^3)	4.50	1.20	1.13
V_g (m^3)	894	239	224
V_g (SCF)	31,567	8,432	7,906

Estimation of Flaring and Venting Volumes from Upstream Oil & Gas Facilities

CAPP Guidline - May 2002

EUB Rule of Thumb

$V_s=0.0257*V_o*\Delta P$

V_s=	volume of solution gas released (m^3)
V_o=	oil production volume(m^3)
ΔP=	pressure drop (kPa)

Standing Correlation

$R_s=\gamma_g(p/519.7*10\text{^}y_g)^{1.204}$

R_s=	solution gas-to-oil ratio (m^3/m^3)
γ_g=	specific gravity of solution gas
p=	absolute pressure in the vessel of interest (kPa(abs) (KPag+101.325kPa)
γ_o=	specific gravity of oil
T=	Temperature of Interest (K) (T in °C + 273)
$y_{g=}$	$1.225+0.00164T-(1.769/\gamma_o)$

Vasquez & Beggs

$R_s=C_1\gamma_g p^{C2}\exp((C_3/\gamma_o T-C_4/T)$

	$\gamma_o < 0.876$	$\gamma_o \geq 0.876$
C_1	0.0003204	0.0007803
C_2	1.1870	1.0937
C_3	1881.24	2022.19
C_4	1748.29	1879.28

INPUTS

EUB Rule of Thumb

$V_{Emulsion}$=	**795**	m^3	Emulsion production volume(m^3)
H2O Cut	**50**	%	
ΔP=	**175**	kPa	pressure drop (kPa)

Standing Correlation & Vasquez & Beggs

γ_g=	**0.932**				specific gravity of solution gas
p=	**175**	kPag	**276.325**	Kpa(abs)	guage pressure in the vessel of interest
γ_o=	**0.842**				specific gravity of oil
T=	**38**	°C	**311**	K	Temperature of Interest (in °C)

OUTPUTS

EUB

$V_s=0.0257*V_o*\Delta P$ = 1787.76 m^3 where $R_s=V_s/V_o$ = **4.4975**

Standing

$y_{g=}$ $1.225+0.00164T-(1.769/\gamma_o)$ = -0.36591

$R_s=\gamma_g(p/519.7*10\text{^}y_g)^{1.204}$ = **1.20137**

Vasquez & Beggs

For γo = 0.842

C_1	=	0.0003204
C_2	=	1.1870
C_3	=	1881.24
C_4	=	1748.29

$R_s=C_1\gamma_g p^{C2}\exp((C_3/\gamma_o T-C_4/T)$ = **1.1264**

RESULTS

	EUB	Standing	V&B
$V_{Emulsion}$ (m^3)	795	795	795
$V_{Emulsion}$ (bbl)	5000	5000	5000
V_o (m^3)	398	398	398
V_o (bbl)	2500	2500	2500
R_s (m^3/m^3)	4.50	1.20	1.13
V_g (m^3)	1788	478	448
V_g (SCF)	63,134	16,864	15,812

Estimation of Flaring and Venting Volumes from Upstream Oil & Gas Facilities

CAPP Guidline - May 2002

EUB Rule of Thumb

$V_s=0.0257*V_o*\Delta P$

V_s=	volume of solution gas released (m^3)
V_o=	oil production volume(m^3)
ΔP=	pressure drop (kPa)

Standing Correlation

$R_s=\gamma_g(p/519.7*10\text{^}y_g)^{1.204}$

R_s=	solution gas-to-oil ratio (m^3/m^3)
γ_g=	specific gravity of solution gas
p=	absolute pressure in the vessel of interest (kPa(abs) (KPag+101.325kPa)
γ_o=	specific gravity of oil
T=	Temperature of Interest (K) (T in °C + 273)
$y_{g=}$	$1.225+0.00164T-(1.769/\gamma_o)$

Vasquez & Beggs

$R_s=C_1\gamma_g p^{C2}\exp((C_3/\gamma_o T-C_4/T)$

	$\gamma_o < 0.876$	$\gamma_o \geq 0.876$
C_1	0.0003204	0.0007803
C_2	1.1870	1.0937
C_3	1881.24	2022.19
C_4	1748.29	1879.28

INPUTS

EUB Rule of Thumb

$V_{Emulsion}$=	**1033.4**	m^3	Emulsion production volume(m^3)
H2O Cut	**50**	%	
ΔP=	**175**	kPa	pressure drop (kPa)

Standing Correlation & Vasquez & Beggs

γ_g=	**0.932**				specific gravity of solution gas
p=	**175**	kPag	**276.325**	Kpa(abs)	guage pressure in the vessel of interest
γ_o=	**0.842**				specific gravity of oil
T=	**38**	°C	**311**	K	Temperature of Interest (in °C)

OUTPUTS

EUB

$V_s=0.0257*V_o*\Delta P$ = 2323.86 m^3 where $R_s=V_s/V_o$ = **4.4975**

Standing

$y_{g=}$ $1.225+0.00164T-(1.769/\gamma_o)$ = -0.36591

$R_s=\gamma_g(p/519.7*10\text{^}y_g)^{1.204}$ = **1.20137**

Vasquez & Beggs

For γo = 0.842

C_1	=	0.0003204
C_2	=	1.1870
C_3	=	1881.24
C_4	=	1748.29

$R_s=C_1\gamma_g p^{C2}\exp((C_3/\gamma_o T-C_4/T)$ = **1.1264**

RESULTS

	EUB	Standing	V&B
$V_{Emulsion}$ (m^3)	1033.4	1033.4	1033.4
$V_{Emulsion}$ (bbl)	6500	6500	6500
V_o (m^3)	517	517	517
V_o (bbl)	3250	3250	3250
R_s (m^3/m^3)	4.50	1.20	1.13
V_g (m^3)	2324	621	582
V_g (SCF)	82,066	21,921	20,554

Estimation of Flaring and Venting Volumes from Upstream Oil & Gas Facilities

CAPP Guidline - May 2002

EUB Rule of Thumb

$V_s=0.0257*V_o*\Delta P$

V_s= volume of solution gas released (m^3)
V_o= oil production volume(m^3)
ΔP= pressure drop (kPa)

Standing Correlation

$R_s=\gamma_g(p/519.7*10^{y_g})^{1.204}$

R_s= solution gas-to-oil ratio (m^3/m^3)
γ_g= specific gravity of solution gas
p= absolute pressure in the vessel of interest (kPa(abs) (KPag+101.325kPa)
γ_o= specific gravity of oil
T= Temperature of Interest (K) (T in °C + 273)
y_g= $1.225+0.00164T-(1.769/\gamma_o)$

Vasquez & Beggs

$R_s=C_1\gamma_g p^{C2}\exp((C_3/\gamma_o T-C_4/T)$

	$\gamma_o < 0.876$	$\gamma_o \geq 0.876$
C_1	0.0003204	0.0007803
C_2	1.1870	1.0937
C_3	1881.24	2022.19
C_4	1748.29	1879.28

INPUTS

EUB Rule of Thumb

$V_{Emulsion}$=	**1589.8**	m^3	Emulsion production volume(m^3)
H2O Cut	**50**	%	
ΔP=	**175**	kPa	pressure drop (kPa)

Standing Correlation & Vasquez & Beggs

γ_g=	**0.932**				specific gravity of solution gas
p=	**175**	kPag	**276.325**	Kpa(abs)	guage pressure in the vessel of interest
γ_o=	**0.842**				specific gravity of oil
T=	**38**	°C	**311**	K	Temperature of Interest (in °C)

OUTPUTS

EUB

$V_s=0.0257*V_o*\Delta P$ = 3575.06 m^3 where $R_s=V_s/V_o$ = **4.4975**

Standing

$y_{g=}$ $1.225+0.00164T-(1.769/\gamma_o)$ = -0.36591

$R_s=\gamma_g(p/519.7*10\text{^}y_g)^{1.204}$ = **1.20137**

Vasquez & Beggs

For γo = 0.842

C_1	=	0.0003204
C_2	=	1.1870
C_3	=	1881.24
C_4	=	1748.29

$R_s=C_1\gamma_g p^{C2}\exp((C_3/\gamma_o T-C_4/T)$ = **1.1264**

RESULTS

	EUB	Standing	V&B
$V_{Emulsion}$ (m^3)	1589.8	1589.8	1589.8
$V_{Emulsion}$ (bbl)	10000	10000	10000
V_o (m^3)	795	795	795
V_o (bbl)	5000	5000	5000
R_s (m^3/m^3)	4.50	1.20	1.13
V_g (m^3)	3575	955	895
V_g (SCF)	126,252	33,724	31,620

Estimation of Flaring and Venting Volumes from Upstream Oil & Gas Facilities

CAPP Guidline - May 2002

EUB Rule of Thumb

$V_s=0.0257*V_o*\Delta P$

V_s=	volume of solution gas released (m^3)
V_o=	oil production volume(m^3)
ΔP=	pressure drop (kPa)

Standing Correlation

$R_s=\gamma_g(p/519.7*10^{y_g})^{1.204}$

R_s=	solution gas-to-oil ratio (m^3/m^3)
γ_g=	specific gravity of solution gas
p=	absolute pressure in the vessel of interest (kPa(abs) (KPag+101.325kPa)
γ_o=	specific gravity of oil
T=	Temperature of Interest (K) (T in °C + 273)
y_g=	$1.225+0.00164T-(1.769/\gamma_o)$

Vasquez & Beggs

$R_s=C_1\gamma_g p^{C2}\exp((C_3/\gamma_o T-C_4/T)$

	$\gamma_o < 0.876$	$\gamma_o \geq 0.876$
C_1	0.0003204	0.0007803
C_2	1.1870	1.0937
C_3	1881.24	2022.19
C_4	1748.29	1879.28

INPUTS

EUB Rule of Thumb

$V_{Emulsion}$=	**2066.8**	m^3	Emulsion production volume(m^3)
H2O Cut	**50**	%	
ΔP=	**175**	kPa	pressure drop (kPa)

Standing Correlation & Vasquez & Beggs

γ_g=	**0.932**				specific gravity of solution gas
p=	**175**	kPag	**276.325**	Kpa(abs)	guage pressure in the vessel of interest
γ_o=	**0.842**				specific gravity of oil
T=	**38**	°C	**311**	K	Temperature of Interest (in °C)

OUTPUTS

EUB

$V_s=0.0257*V_o*\Delta P$ = 4647.72 m^3 where $R_s=V_s/V_o$ = **4.4975**

Standing

$y_{g=}$ $1.225+0.00164T-(1.769/\gamma_o)$ = -0.36591

$R_s=\gamma_g(p/519.7*10\text{^}y_g)^{1.204}$ = **1.20137**

Vasquez & Beggs

For γo = 0.842

C_1	=	0.0003204
C_2	=	1.1870
C_3	=	1881.24
C_4	=	1748.29

$R_s=C_1\gamma_g p^{C2}\exp((C_3/\gamma_o T-C_4/T)$ = **1.1264**

RESULTS

	EUB	Standing	V&B
$V_{Emulsion}$ (m^3)	2066.8	2066.8	2066.8
$V_{Emulsion}$ (bbl)	13000	13000	13000
V_o (m^3)	1033	1033	1033
V_o (bbl)	6500	6500	6500
R_s (m^3/m^3)	4.50	1.20	1.13
V_g (m^3)	4648	1241	1164
V_g (SCF)	164,133	43,843	41,107

Fuel Gas Usage CALCULATION

Company: Molopo Energy
Project Name: Pierson Oil Battery
Project No.: 10001
Prepared By: Mike Kohut
Date: June 30, 2010

Enter temperature, pressure, and one of either the compositon or the molecular weight/specific gravity:

Temperature: 60 °F
Pressure: 89 psia
Molecular Weight or S.G. 0 (0 to calculate based on composition)

Gas S.G.: 0.93
M.W.: 27.00

Gas Composition

Properties	Mole frac.	MW	MW %
H_2	0.0000	2.0159	0.00
He	0.0003	4.0026	0.00
N_2	0.0828	28.0134	2.32
CO_2	0.0022	44.0100	0.10
H_2S	0.0012	34.0800	0.04
C1	0.4743	16.0430	7.61
C2	0.2505	30.0700	7.53
C3	0.1342	44.0970	5.92
iC4	0.0122	58.1230	0.71
nC4	0.0277	58.1230	1.61
iC5	0.0046	72.1500	0.33
nC5	0.0048	72.1500	0.35
C6	0.0027	86.1770	0.23
C7+	0.0025	100.2040	0.25
Total	1.0000		27.00

CALCULATED GAS PROPERTIES:

Gas density = 0.445 lb/ft^3

Heating Values: Net = 1327.63 Btu/scf
Gross = 1455.04 Btu/scf

Specific Heat (Cp) = 0.44503 BTU/LB/°F

Thermal Conductivity = 0.0136 Btu/ft/hr/°F

Fuel Octane No. = 109.04

RESULTS

Inlet water cut = 50%

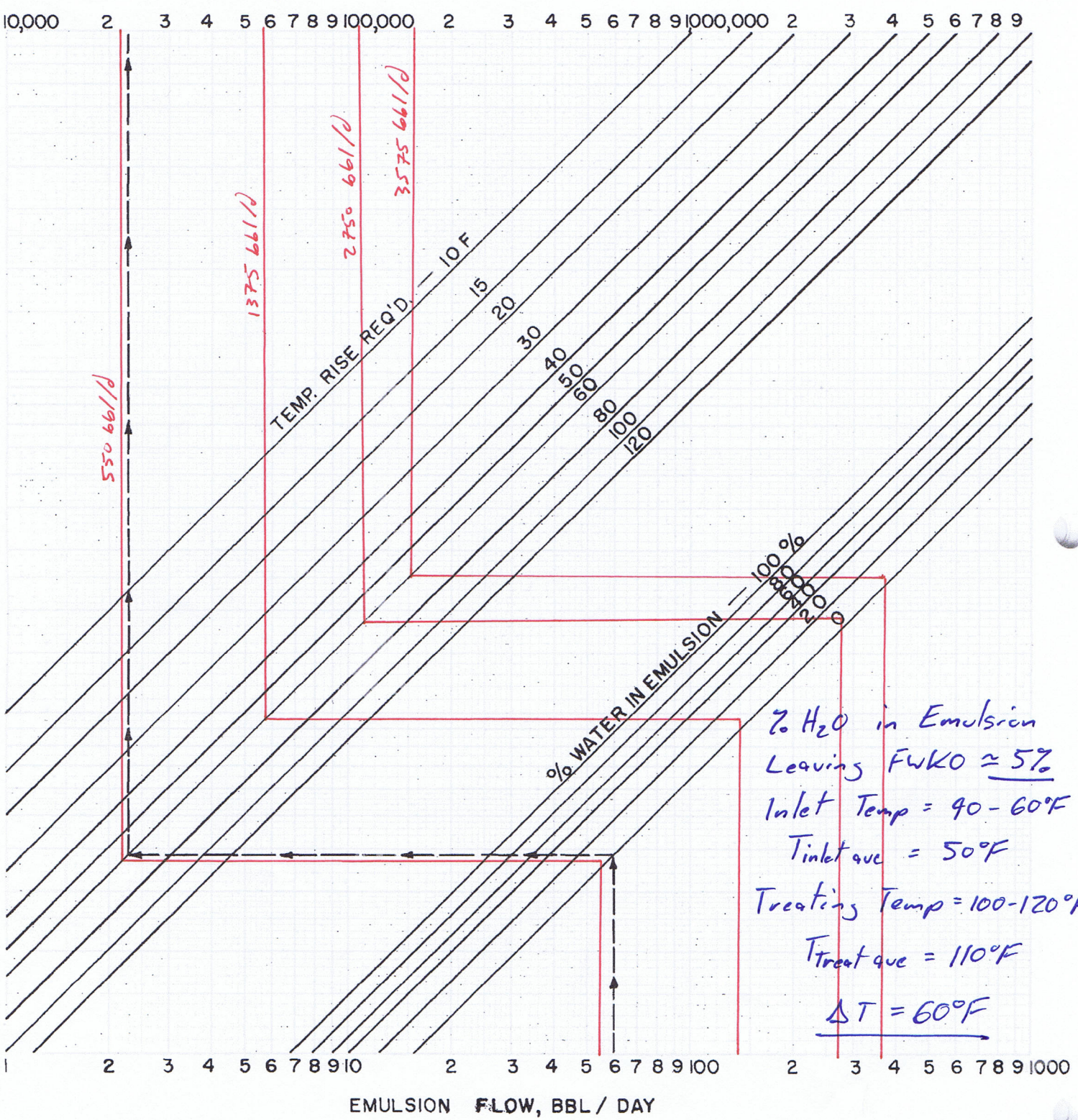
Emulsion Flow Rate @ Inlet (bbl/d)	Water Cut From FWKO (%)	Emulsion Flow Rate to Treater (bbl/d)	Heat Input ΔT (°F)	Efficiency (%)	Duty Required (Btu/hr) (From Sivalls)	Fuel Gas Consumption (SCF/hr)	Fuel Gas Consumption (SCFD)	Fuel Gas Consumption (m^3/d)
1000	5	550	60	80	270,000	232	5,567	158
2500	5	1375	60	80	630,000	541	12,989	368
5000	5	2750	60	80	1,050,000	902	21,649	613
6500	5	3575	60	80	1,650,000	1417	34,020	963
max duty				80	2,500,000	2148	51,545	1460
Total Future - Add 2nd Treater Equivalent								
10000	5	5500	60	80	2,100,000	1804	43,298	1226
13000	5	7150	60	80	3,300,000	2835	68,040	1927
max duty				80	5,000,000	4295	103,090	2919

NOTE: Equipment Losses to Ambient approx. 50,000 BTU/HR maximum Included

FIGURE 3

HEAT REQUIRED FOR OIL- WATER EMULSIONS

FOR TREATER, DIRECT HEATER, INDIRECT HEATER, OR VJ HEATER SIZING



% H_2O in Emulsion Leaving FWKO ≃ 5%

Inlet Temp = 40 - 60°F

$T_{inlet\ ave}$ = 50°F

Treating Temp = 100-120°F

$T_{treat\ ave}$ = 110°F

ΔT = 60°F

NOTE: FOR CAPACITIES LARGER THAN THE CHART RANGE, DIVIDE THE RATE BY 10, USE THIS ON THE CHART, THEN MULTIPLY THE HEAT REQUIRED BY 10 TO FIND THE CORRECT HEAT REQUIRED

SIVALLS TANKS, INC.

C.R.S. 10-1-67