Royalty Formulas – Natural Gas

R% = Price Component (r_p) + Quantity Component (r_q)
R% has a minimum of 5% and a maximum of 50%

Price Component (r_p)	
Price ($/GJ)	**r_p**
$PP \leq Sp_2$	$(PP - Sp_1) * 0.0450$
$Sp_2 > PP \leq Sp_3$	$(PP - Sp_2) * 0.0300 + 0.1125$
$PP > Sp_3$	$(PP - Sp_3) * 0.0100 + 0.2325$
Maximum	30%
PP is the par price for the month in $/GJ	
Note: r_p can be negative	

Quantity Component (r_q)	
Quantity ($10^3m^3/d$)	**r_q**
$ADP \leq (Sq_2 * DF)$	$[ADP - (Sq_1*DF)]*(0.0500/DF)$
$(Sq_2 * DF) > ADP \leq (Sq_3 * DF)$	$[ADP - (Sq_2*DF)]*(0.0300/DF) + 0.1000$
$ADP > (Sq_3 * DF)$	$[ADP – (Sq_3*DF)]*(0.0100/DF) + 0.2500$
Maximum	30%
ADP is the average daily productivity for the month in $10^3m^3/d$	
Note: r_q can be negative	
DF is a depth factor that applies only to the quantity component and is based on the measured depth (MD) of a well where: DF = 1 for MD ≤ 2000 m; $DF = (MD/2000)^2$ for MD > 2000 m; and, The depth factor is capped at 4.	

Royalty Parameters		
	Price ($/GJ)	**%Change (%/$/GJ)**
Sp_1	4.5	4.5%
Sp_2	7	3%
Sp_3	11	1%
	Q ($10^3m^3/d$)	**% Change (%/10^3m^3/GJ)**
Sq_1	4	5%
Sq_2	6	3%
Sq_3	11	1%

Illustration of Depth Factor Adjustment			
MD	**DF**	**Quantity**	**r_q**
≤ 2000 m	1	ADP < 6 $10^3m^3/d$	(ADP – 4) * 0.0500
		6 $10^3m^3/d$ >ADP <11 $10^3m^3/d$	(ADP – 6) * 0.0300 + 0.1000
		ADP >11 $10^3m^3/d$	(ADP-11)*0.0100 + 0.2500
		Maximum	30%
2500 m	1.6	ADP <9.6 $10^3m^3/d$	(ADP-6.4)*0.0313
		9.6 $10^3m^3/d$ > ADP <17.6 $10^3m^3/d$	(ADP-9.6)*0.0188 + 0.1000
		ADP >17.6 $10^3m^3/d$	(ADP-17.6)*0.0063 + 0.2500
		Maximum	30%
3000 m	2.25	ADP < 13.5 $10^3m^3/d$	(ADP-9)*0.0220
		13.5 $10^3m^3/d$ > ADP <24.75 $10^3m^3/d$	(ADP-13.5)*0.0133 + 0.1000
		ADP > 24.75 $10^3m^3/d$	(ADP - 24.75)*0.0044 + 0.2500
		Maximum	30%
3500 m	3.1	ADP <18.6 $10^3m^3/d$	(ADP-12.4)*0.0161
		18.6 $10^3m^3/d$ >ADP <34.1 $10^3m^3/d$	(ADP-18.6)*0.0097 + 0.1000
		ADP >34.1 $10^3m^3/d$	(ADP-34.1)*0.0032 + 0.2500
		Maximum	30%
≥ 4000 m	4	ADP <24 $10^3m^3/d$	(ADP-16)*0.0125
		24 $10^3m^3/d$ >ADP <44 $10^3m^3/d$	(ADP-24)*0.0075 + 0.1000
		ADP >44 $10^3m^3/d$	(ADP-44)*0.0025 + 0.2500
		Maximum	30%